
USER'S MANUAL FOR EW-SERIS WIND TURBINE

CE

Warnings:

- Please excuse from specification alternations without notice;
- It is required to comply with the local law, regulations or the permission From local government before installing WTGS;
- Only under no wind weather should carry out the installation, maintenance and dismantling of WTGS;
- Please make sure the construction for WTGS mechanical and electronic facilities should be done by professionals;
- Color or figuration of pictures might be varied against physical goods;
- It is forbidden to leave the wind turbine generator working under unloaded state (such as without connecting with batteries).
- The safety signs involving the manual are as followed;



Danger---Improper operation might lead to hurt people badly.



Attention---Improper operation might lead to damage products or hurt People.

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1. Abstract

WTGS could produce electricity by rotating the blades. The controller aims to rectify the output and protect generator against severe circumstance. The EW-series generator could be applied in wind-solar hybrid system since it has a solar connector.

2. Application

This WTGS could be applied for home/factory use, which is available for on-grid and off-grid. On-grid matches on-grid inverter while off-grid matches batteries and off-grid inverter.

Not available for circumstances as below:

1 No loading

2 Directly connecting with the appliance

3 Parameter

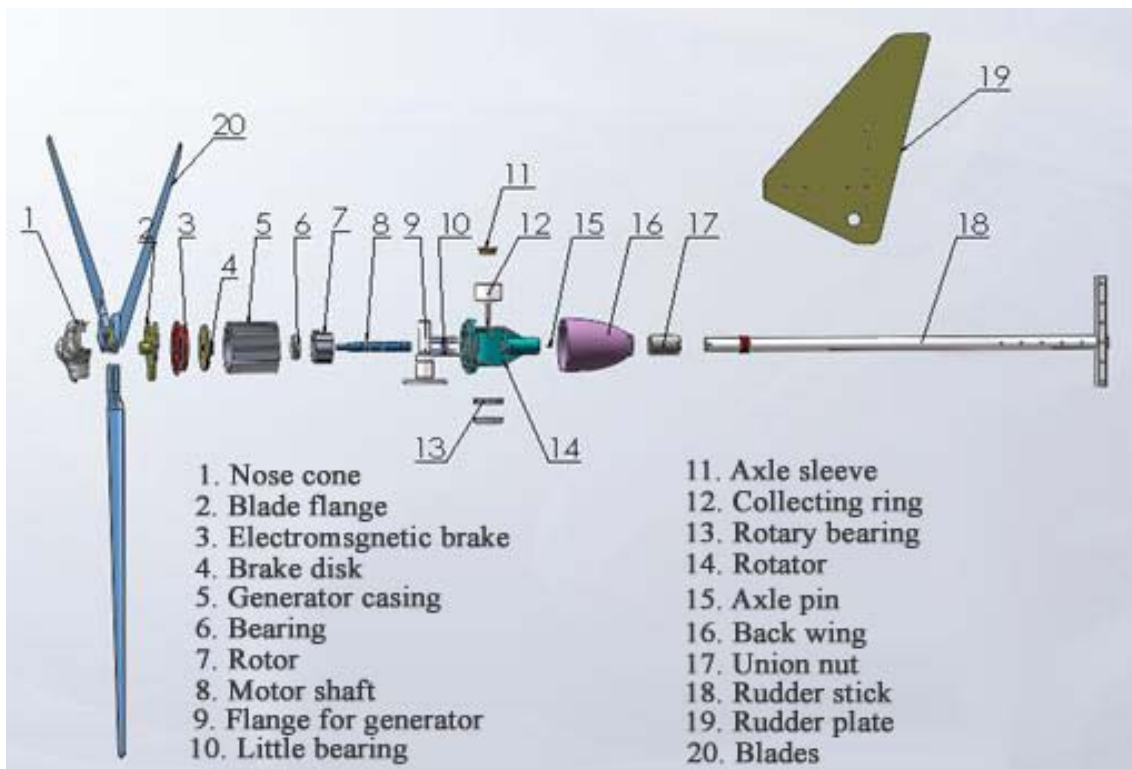
Model	CFW2000W	CFW3000W
Brand	CHENF	CHENF
Rated power (W)	2000	3000
Max. Power (W)	2500	3450
Rated voltage (V)	48/96	48/96
Rated current (A)	42/21	62.5/31.25
Blade No. (Pcs)	3	3
Rotor diameter(m)	3.2	3.7
Generator type	Permanent magnet	Permanent magnet
Blade material	GFRP	GFRP
Start-up wind speed(m/s)	2.5	2.5
Rated wind speed (m/s)	12	12
Survival wind speed(m/s)	45	45
Collector ring type	Sealed and waterproof	Sealed and waterproof
Controller mode	PLC intelligent control	PLC intelligent control
Operating mode	Auto/Manual	Auto/Manual
efficiency	0.95	0.95
Protection	--Dump load --Electromagnetic brake	--Dump load --Electromagnetic brake
Designed lifetime (years)	15-20	15-20

4. Installation

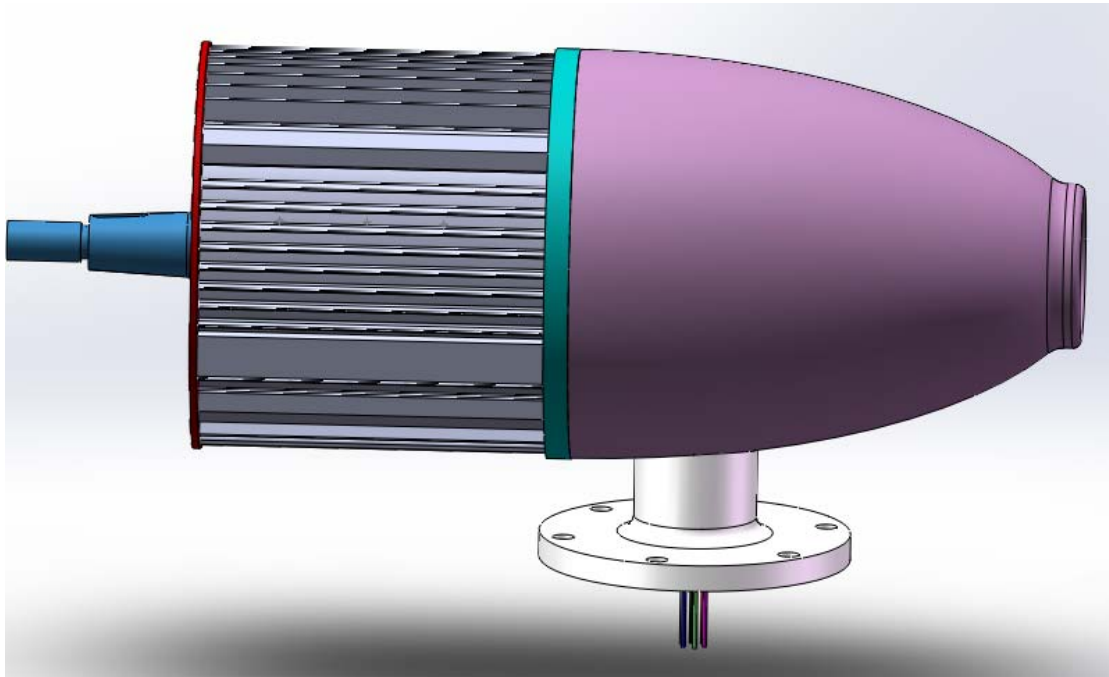
4.1 Site choosing

WTGS should be installed at least 50m away from house or areas people gathering. Trees or buildings should not be nearby so as not to affect wind speed/wind direction. It is forbidden to install on soft lands, uneven ground or areas where easily be influenced by climates. Meanwhile, the distance between generator and battery should also be taken into consideration, since longer distance causes more wastage. Use a thicker cable for connection between long distance if possible .

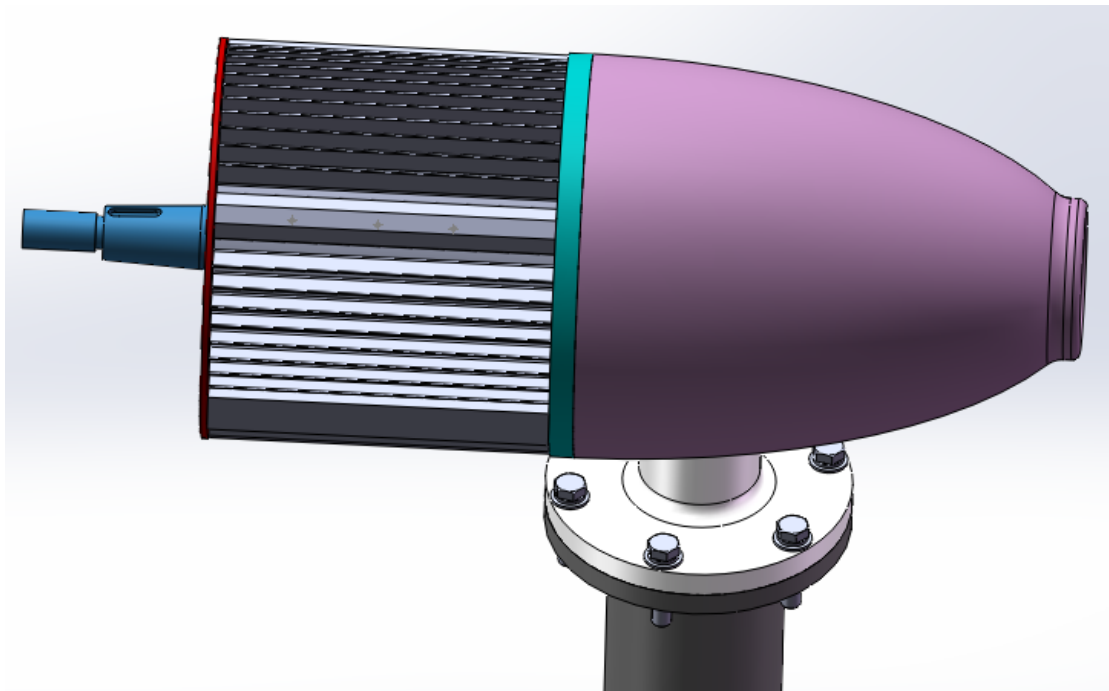
4.2. The installation



1. Connection between wind turbine flange and pole
 Connect the cable respectively with 6 pcs lines in the head. The cable pierce from the pole center and short-circuited with the generator's 3pcs cables.

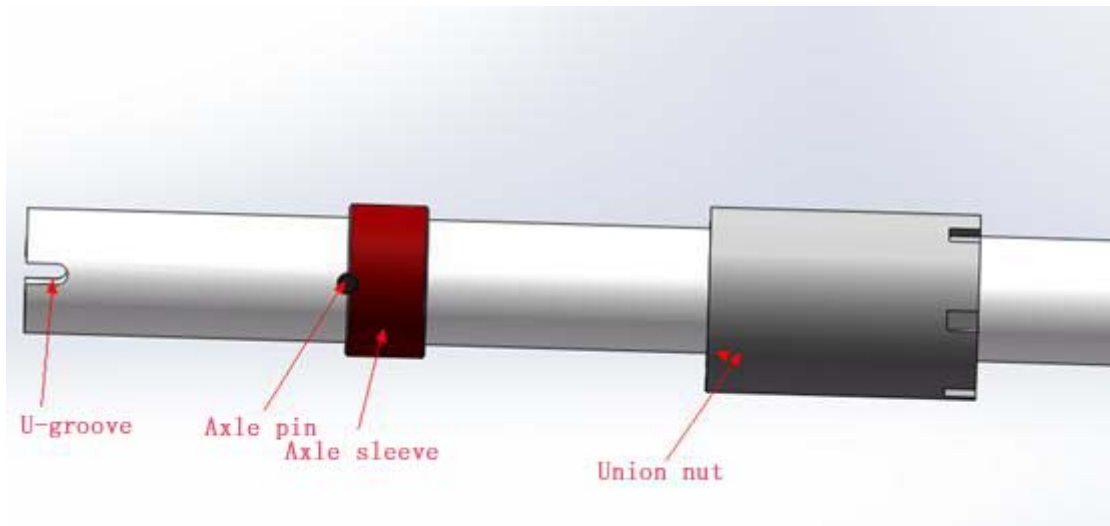
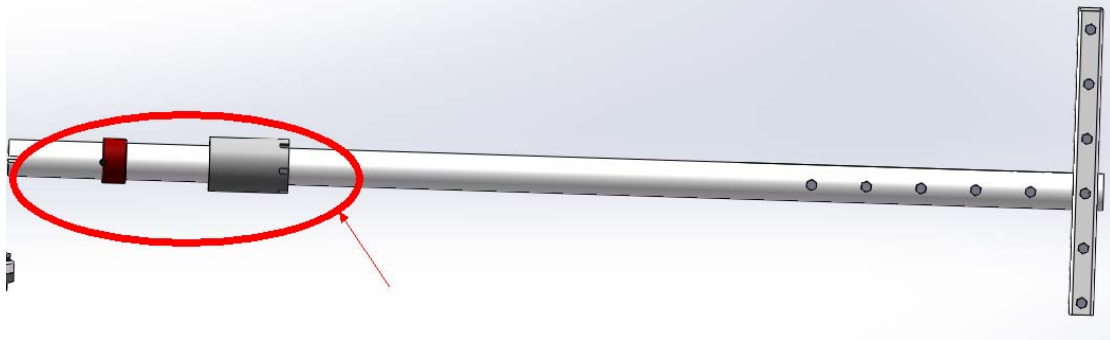


2. Fasten wind generator flange with pole with 6 pcs 12x50mm hex bolts;

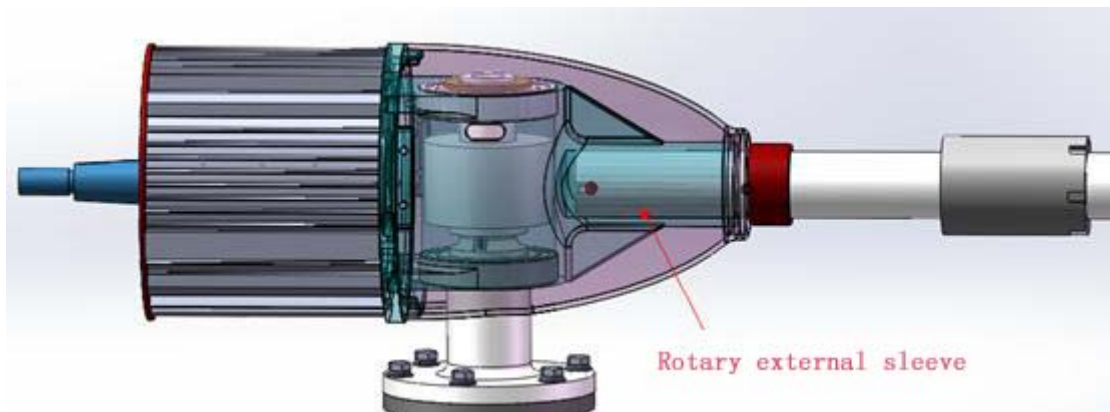


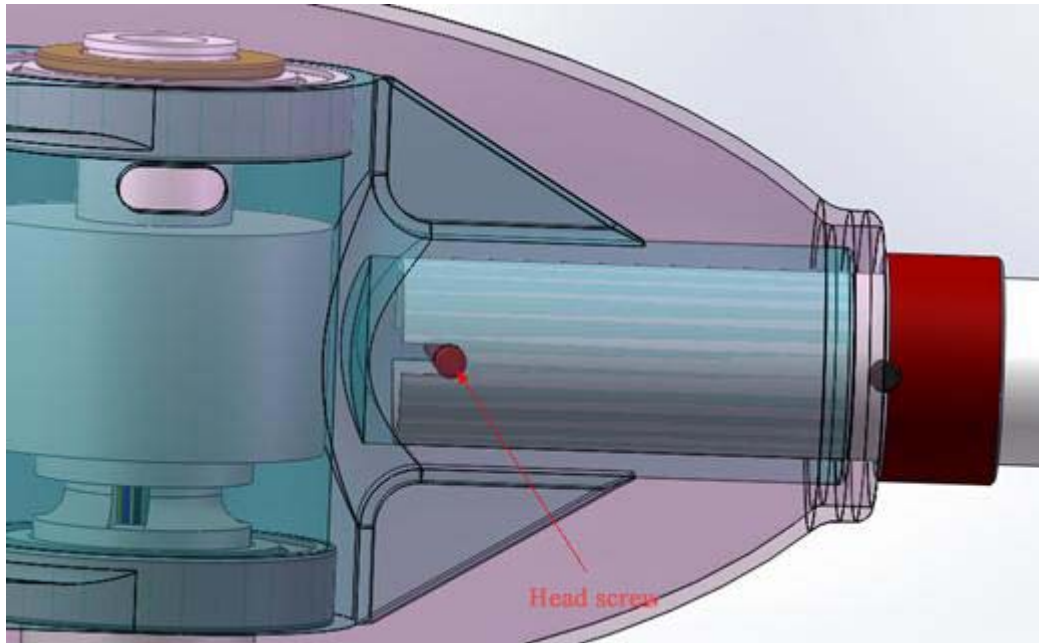
3. The installation of tail vane pole

Insert union, bushings and pin onto tail vane by order.

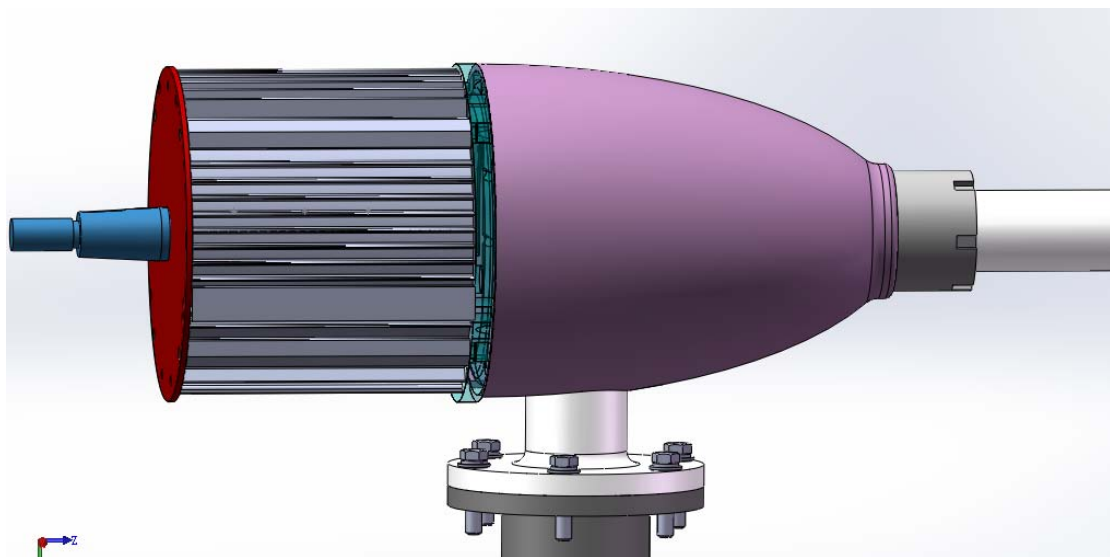


Then insert the tail vane into rotary sleeve, making U-groove placed into head screws





Finally, fasten union and rotary sleeve with crescent wrench.

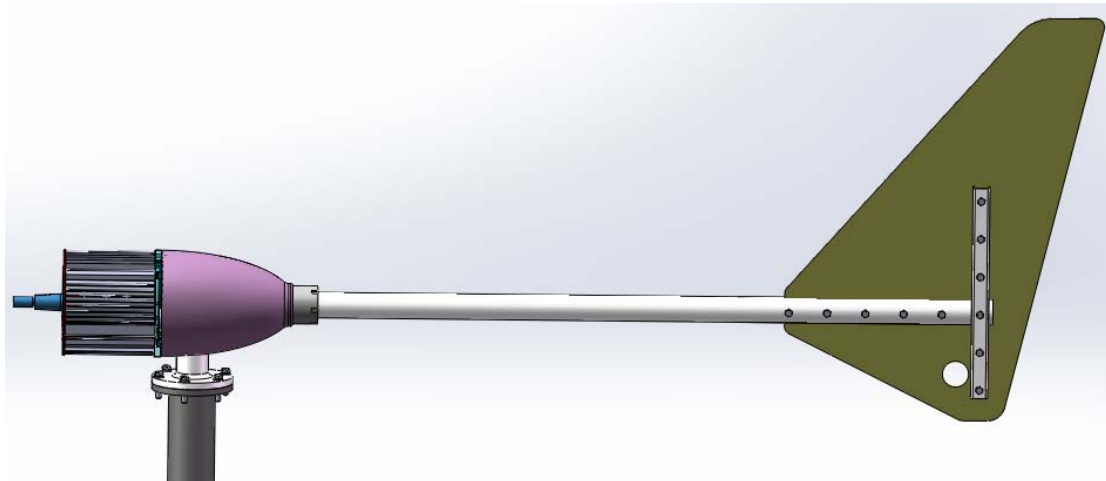
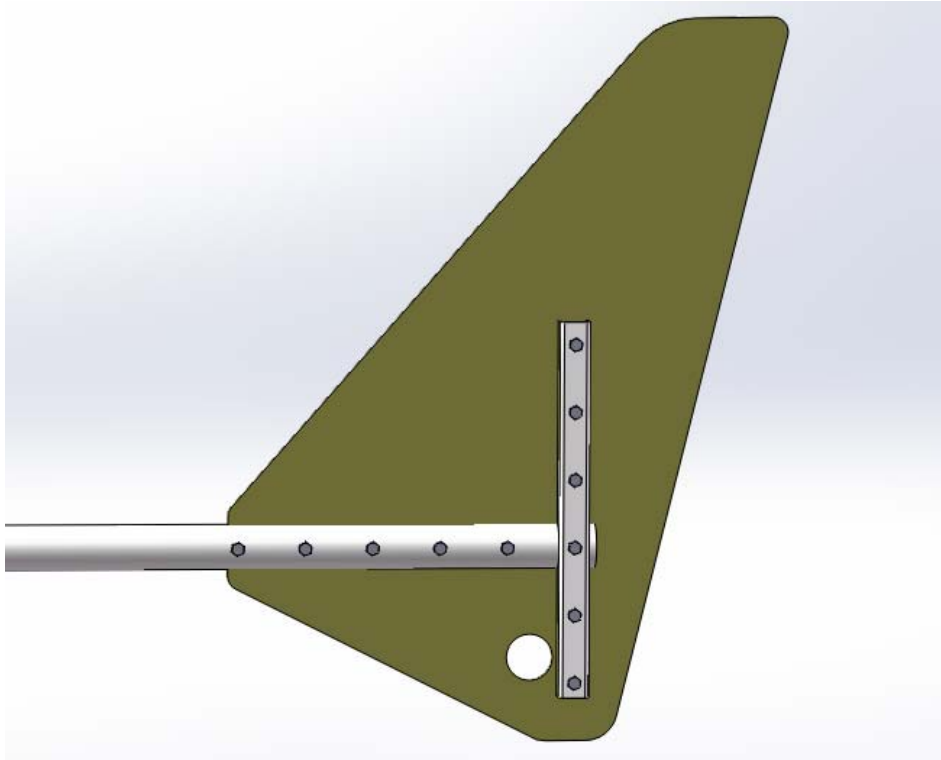


4.The installation of tail vane

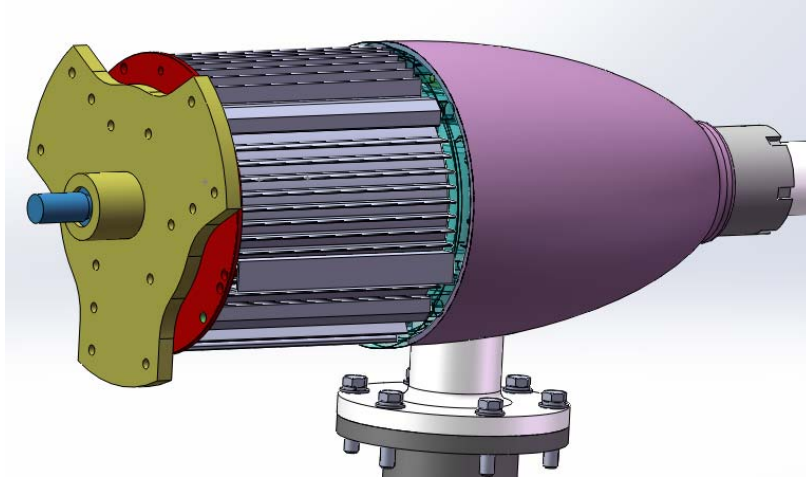
Insert the tail vane into pole, as below, and fasten with screws.

Note: fasten round pipe with 5 pcs M10 * 80mm screw-rudder plate

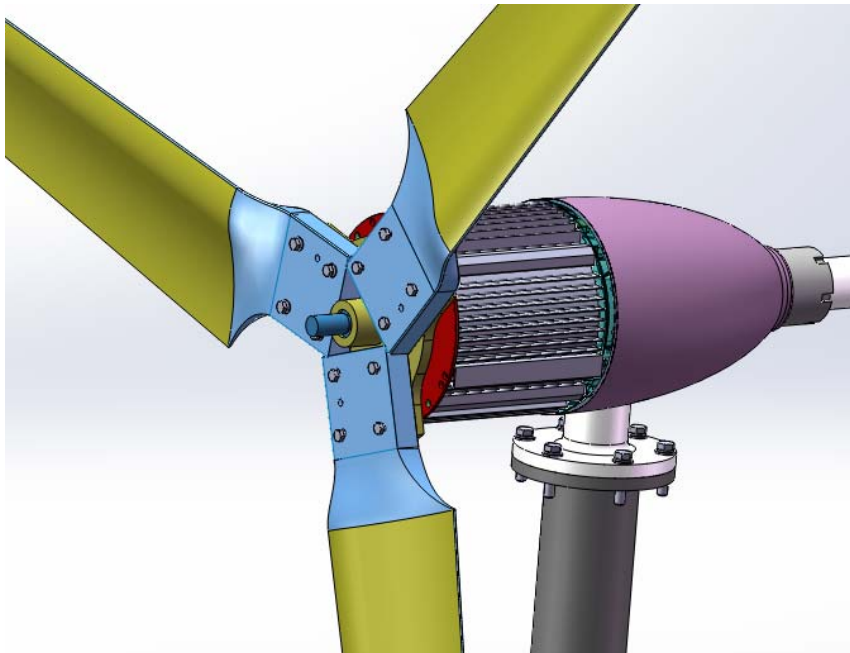
fasten square steel tube with 6pcs M10 * 110mm screw-rudder plate



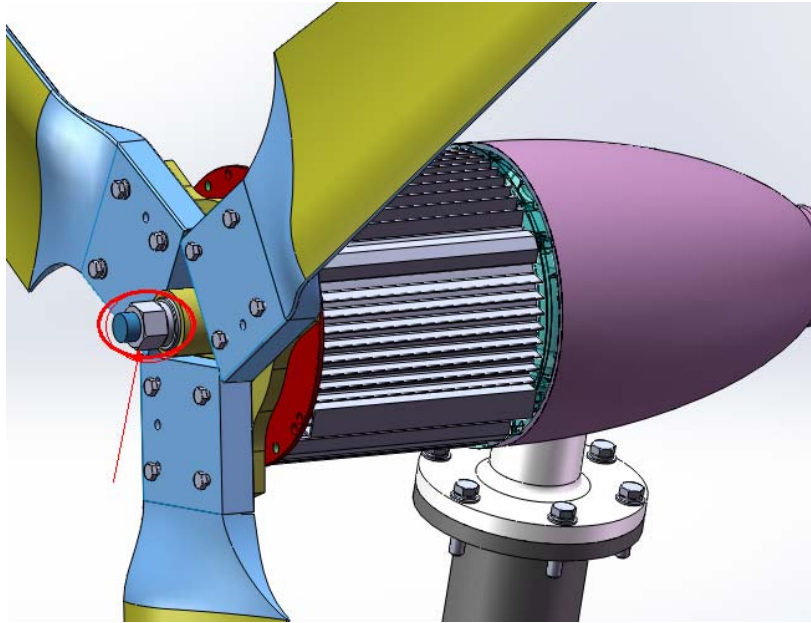
5. Install the blade flange onto motor shaft, as below, the long head is outward.



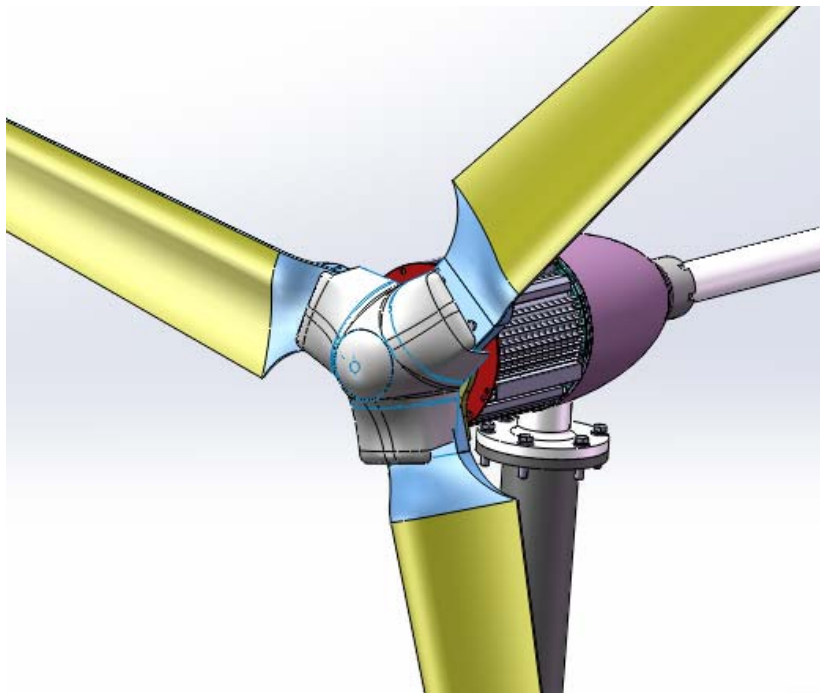
6. Pierce 12 pcs M10 * 70mm screws into wear plate, and then fasten screws the blades onto positioned plate.



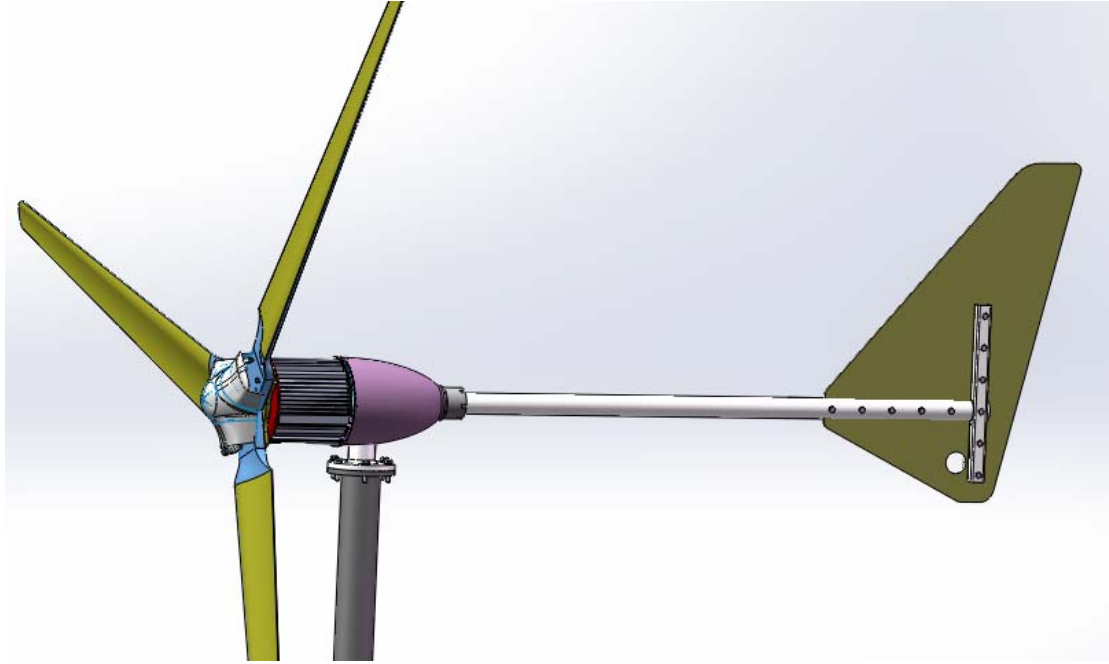
7. Fasten blade flange with M24mm nut, meanwhile, rotate blades clockwise until the blade flange is tightened with motor shaft ;



8. Place nose cone into blades, and fasten it in the front of generator with M6x60mm hexagon socket screws;



After the assembling, the physical digram is as below:



9. The cable wire pierced from wind generator should be connected with controller terminal.

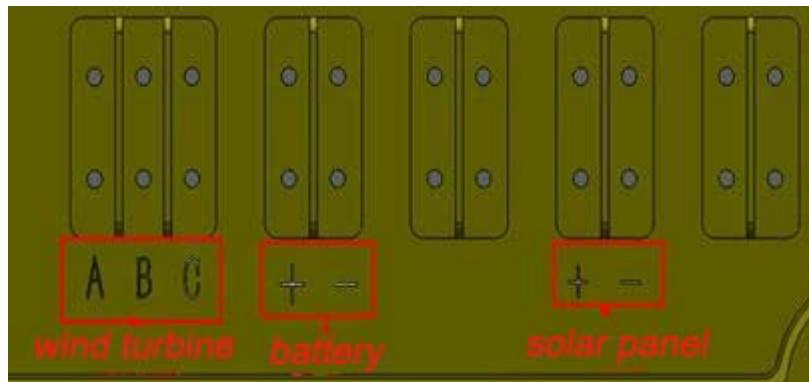
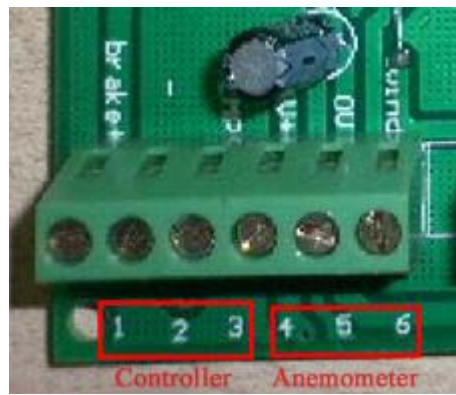
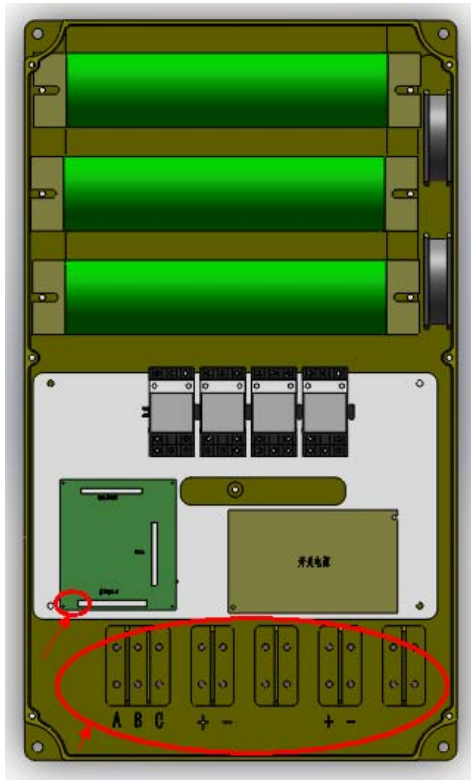
Three wires of wind turbine should be connected to A, B, C terminals, as below.

The rest six wires should be connected with wiring terminal by order as the digital above shows.

Note: 1. three wires of collector ring 1 (red) 2 (yellow) 3 (black)

2. three wires of anemometer 4 (red) 5 (black) 6 (yellow)

The red switch on control cabinet function as emergency stop, in non-emergency or a PLC fault, please do not press the switch, in case it may damage the generator. After unpacking, check that the emergency switch is pressed or not. If pressed, rotate the button as the switch arrow shows. Then PLC can work.

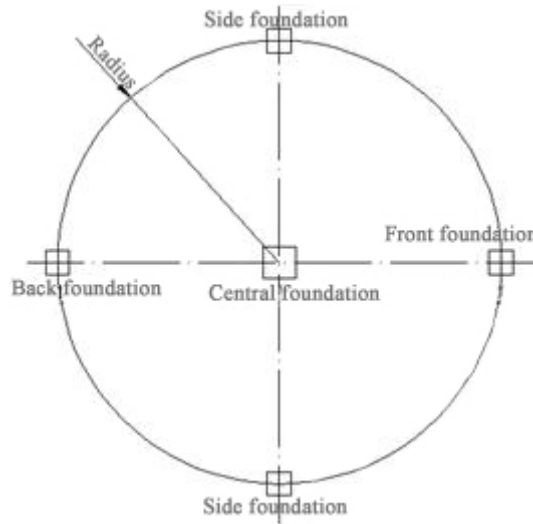


5 The installation of guy cable tower

5.1 Foundation sizing

Please install the generator only under no wind weather.

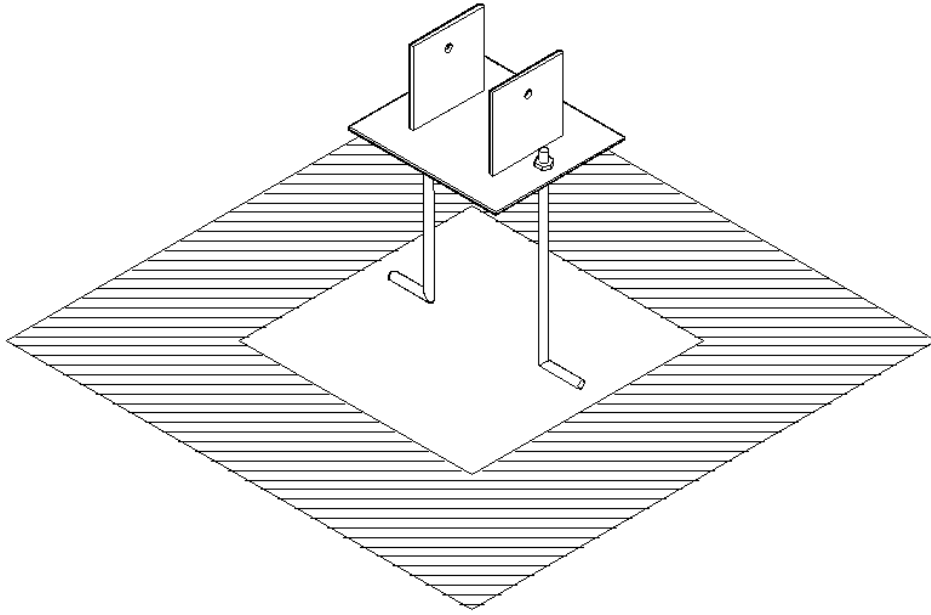
To make the foundation in an open area



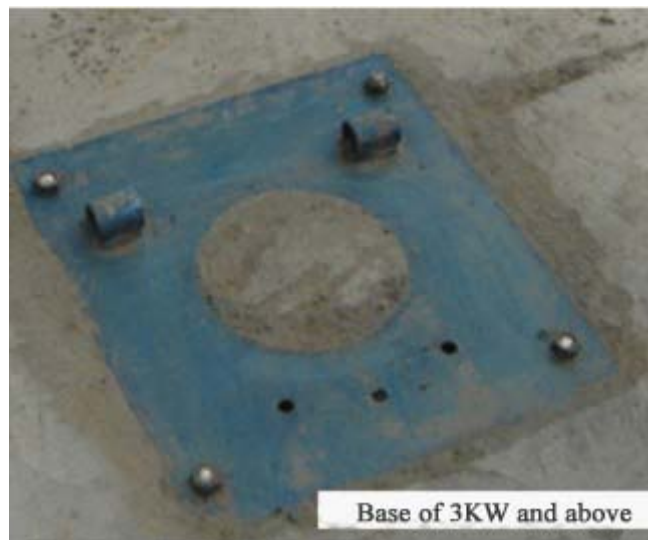
Model		5KW Guy cable tower
Foundation	Radius(m)	6
	Center foundation(m)	0.9*0.9*1.2
	Edge foundation (m)	0.8*0.8*0.9

5.2 Anchor arrangement and pouring foundation

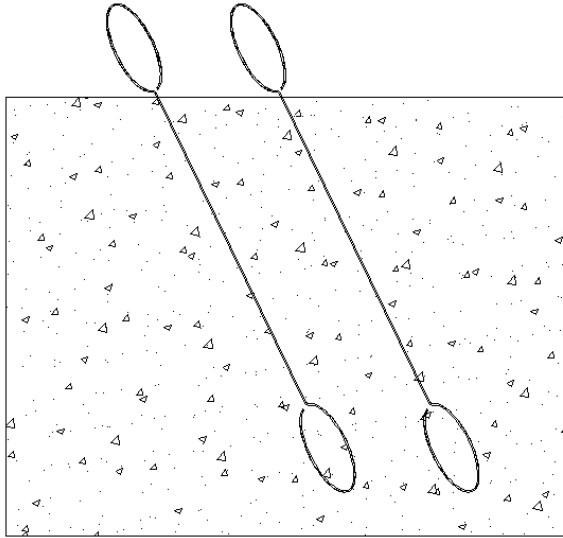
Please dig the basement according to the designed size, and then put the anchor in the basement. Assemble the plate as below. It needs three screw holes forwards to the front side.



Pour the concrete after the anchor and basement are laid down (C25) , picture as below.



Put the edge anchor into the edge basement, and check the distance between the hook and the center as well as the basic level, and then pour the concrete. Picture is as below.



To keep the balance of the tension between each cable, the height of the basement need to be equal with the base of the tower. Otherwise, the unbalance would cause damages for the tower.

5.3 Assemble the tower

Connect the two section of subsidiary pole together, and insert it into the main tower, as below





Connect 4 pieces of steel wire to the end of subsidiary pole, and then connect steel wire which corresponding to the edge basement with the U-shape spend orchid, as below,



The steel which corresponds to the front basement needs to connect with the chain block, as below.



Erect the subsidiary pole, and fix steel wire to the edge basement, as below.



Aim the pin hole of tower to the basement, and insert the pin with smearing grease, as below.



1. Connect each section of the pole by screw as below.



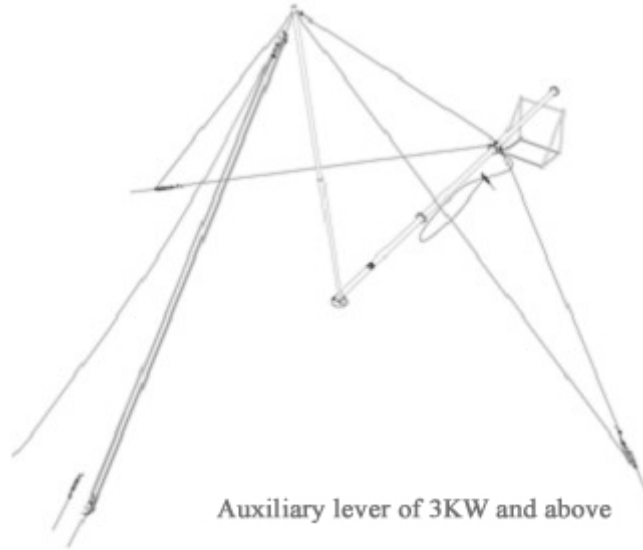
2. To connect the steel wire after connecting the tower as below picture. For safety, you could twine the tower with the steel wire for a circle before fixing the wire with the fixture. There need to be two fixtures for each steel wire, and 10-20 cm need to be left in the end of the wire.



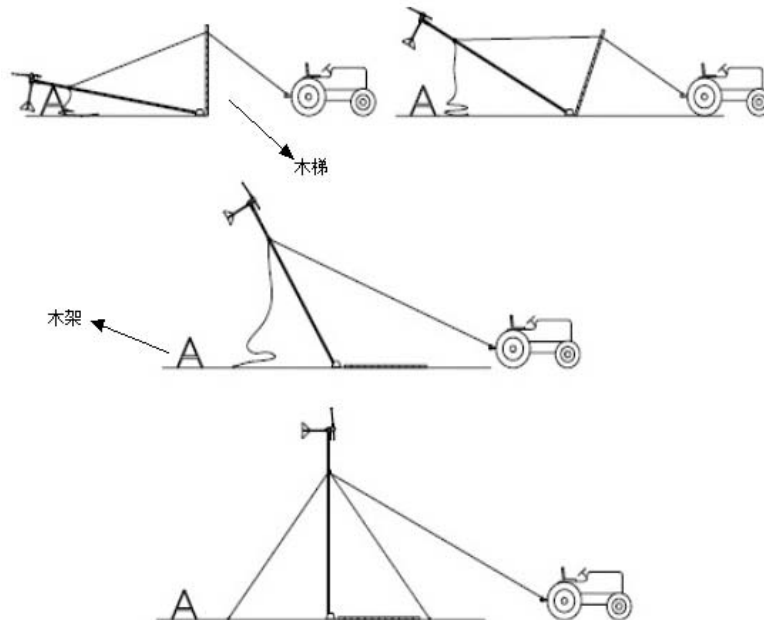
3. Besides aiming the steel wire for front basement, the ends of all other steel wire need to connect with the corresponding basement. And you could fix all wires after the installation of the tower as below



4. Put the tower on a wooden yoke with the height of 1m to 1.5m, as below.



5. Generator installation (In the manual for generator part)
6. You could erect the tower with a winch, tractor and crane. Please note, when using a winch and tractor, there need to be a yoke for generator below 2kw, including 2kw. Pay attention to the tension of each steel wire in the process of erecting in case of any unbalance.



7. Install the bolts to the three holes at the bottom of the tower after erecting the tower.
8. To check the length of 4 pieces of steel wire, and fix them with fixture. Please

note that a proper radian should be left for the steel wire.

9. You need to take the subsidiary pole away and release the steel wire after installation.

5.4 Lay down the tower

Under on wind weather should lay down the tower, and prepare a yoke (which is the same in installing).

- (1) Disconnect the electrical connection so as to stop the generator, which could be referred to the user's manual.
 - (2) **【If using a crane】** The harness should be tied to the generator by professional people. And then release the screw and steel wire to lay down the generator slowly to the yoke.
- **【If using a tractor or winch】** Firstly release the steel wire of the basement, and then connect the steel wire to tractor or winch according to the installing manner by reversing it. Finally, lay down the tower on the yoke slowly.

6. Battery Configuration

Battery bank should be put in building where is broad and ventilated with stable temperature and dry air. Output voltage of battery will decide battery NO. and decide connection in series or parallel, and then design the shelf to place batteries, controller and inverter. To connect batteries in parallel or series according to the requested capability and voltage, and grease all the wire heads with butter or other anti-corrosion material. To avoid the interference of electro magnet, the lead between battery and controller should be less than 3 meters.

Please refer to model and parameter table for the suggested battery capability.

Series connection is to connect the anode of one battery to the cathode of the other in consecutive. The graph as follow (the red position is the anode of the battery, and the blue position is the cathode of battery)



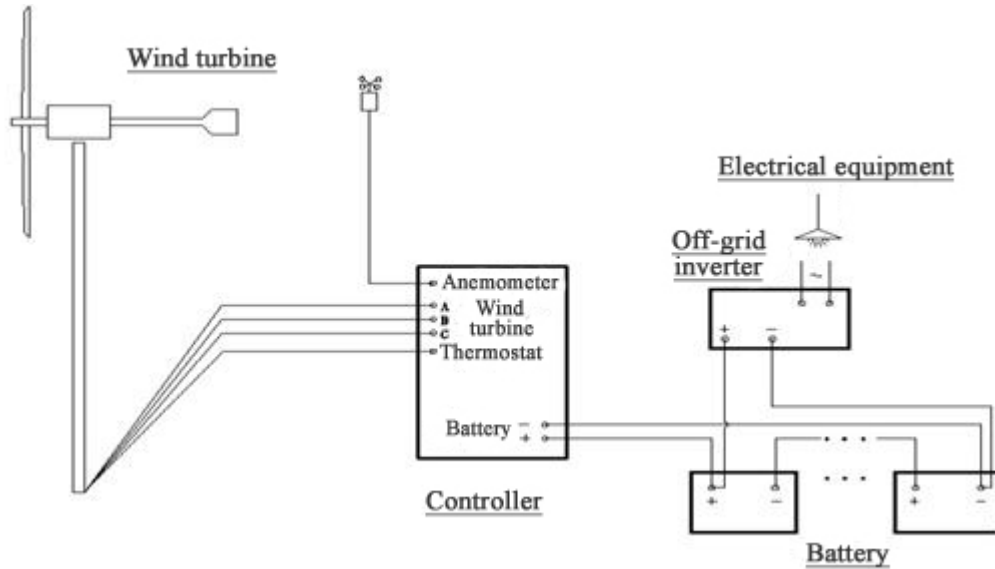
Parallel connection is to connect the anode of one battery to the anode of the other, and the cathode of one battery to the cathode of the other.



※Please check the notification, instruction and maintenance with BATTERY INSTRUCTION.

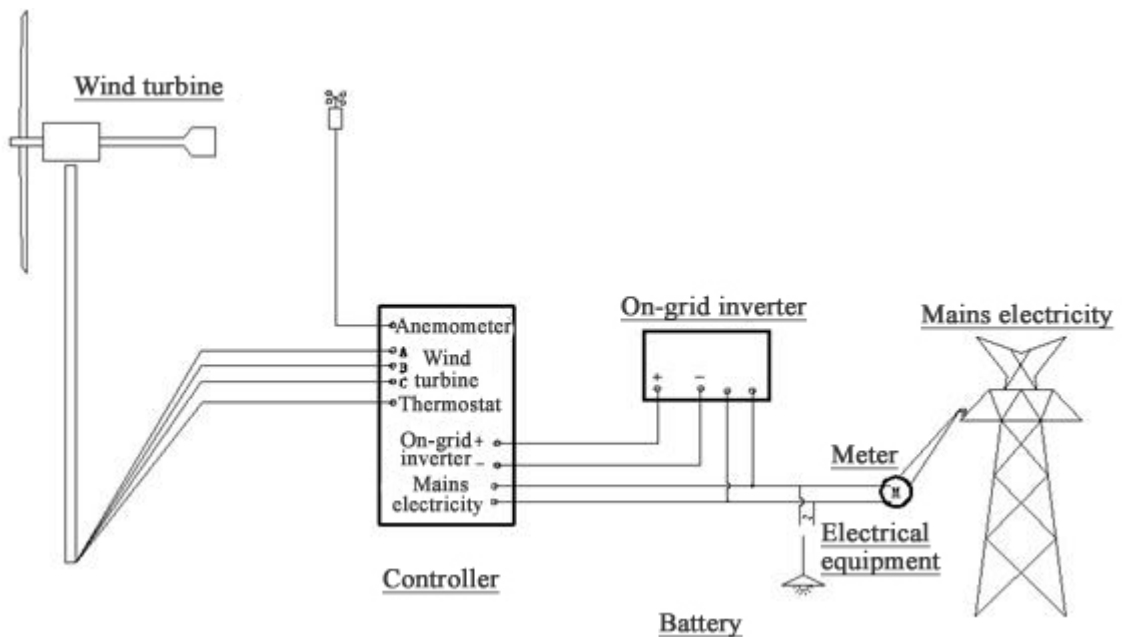
7. Electrical wiring

7.1 Off-grid solution (please refer to the following diagram).



Make sure that the voltages among the wind turbine output, battery bank and inverter input should be the same. Please do not mistakenly connect the position cathode and the negative cathode, which might burn down the generator, batteries or inverter.

7.2 On-grid solution (please refer to the following diagram).



Every model could be applied for on-grid system with the permission of local government, and on-grid inverter and on-grid controller should be purchased by your own part.



Please turn off the main supply before connection.

8 Controller instruction and operation

1. Introduction

Intelligent wind turbine controller can measure wind speed, voltage, current, temperature and other parameters, and display through LCD screen. According to relevant parameter values set by the user, controlling automatically controller unloading and braking to prevent damage of wind turbine. If it's wind-solar controller, when detecting the battery voltage is too high, the controller will automatically disconnect solar and battery to prevent battery overcharge and damage.

2. system components

2.1 Sensor

Sensor includes:

1. wind speed sensor: controller uses it to monitor wind speed.



2. Thermostat: controller uses it to control the temperature of the wind turbine and does not show the temperature. wind turbine will unload brakes when the motor reaches temperature protection.



3 voltage, current, speed acquisition: Monitoring the generator voltage, the intensity is converted to weak current after connecting PLC.

Monitoring of solar charge current, charge current fan.

Note: Do not directly connecting the generator voltage with PLC controller, otherwise it will seriously damage the controller.



(4) **Controller**

The controller is Xinje PLC machine, and installed in the strong electric cabinet. It is as the generator controller after processing the collected data through the use of sensor. Software control has 2 unloading operation, 1 circuit brake, 1 solenoid brake. Short-circuit brake is fail-safe, it means when the PLC faults or PLC is power-off, automatic braking, to avoid excessive speed of wind turbines and cause coaster.

The communications between PLC and PC are half-duplex 485 (three lines, A, B, ground). In the internal PLC, the communication and micro-computer controller part has realized electrically isolated, effectively improving the noise immunity of communication.



3 Controller Manual and Operation

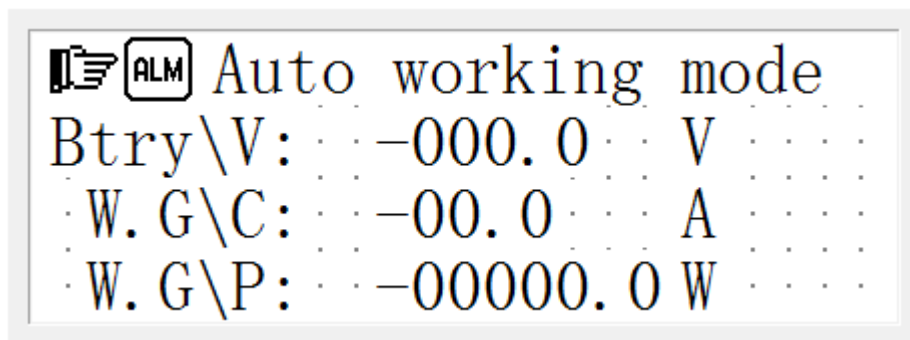
3.1 Related definition

Brakes: When the wind speed, voltage, temperature are beyond the limit, the brake relay, the wind turbine stops rotating to protect itself.

Unloading: When the wind speed and voltage overrun, PLC will discharge excessive energy through unloading circuit by controlling the contactor.

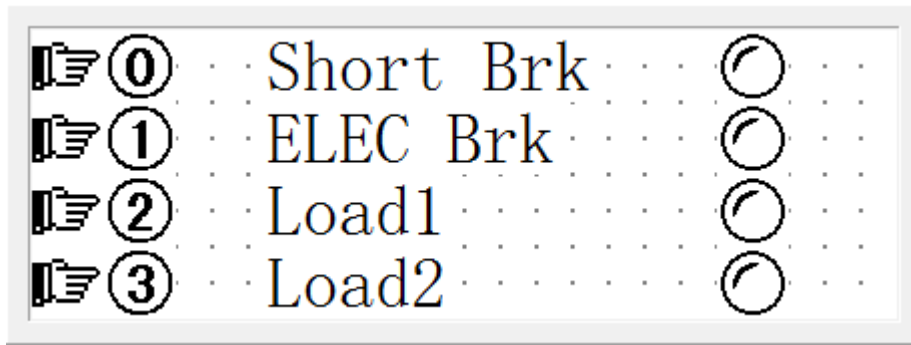
3.2 Man-machine interface operation:

(A) monitor is connected with the power, and displays the main page when booting







Press the ALM key to switch working status

(2) Only in manual mode can be carried out following operation



Only in this page can "0", "1", "2", "3" work.

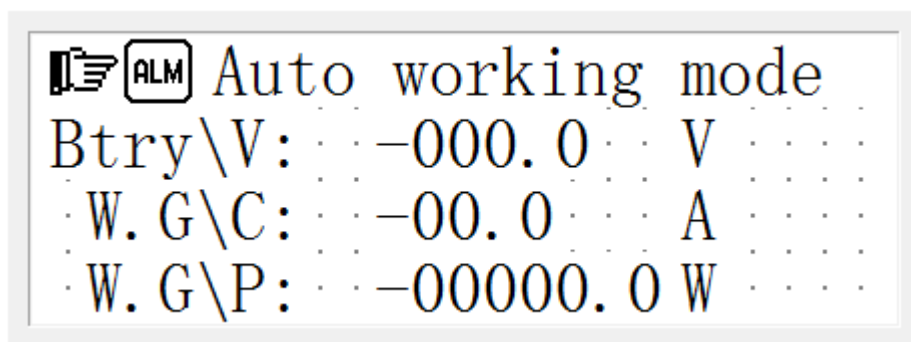
(3) Press  in any page and enter the parameter setting mode, at that time you can enter the setting value on digital panel, then press  to complete the setup.

Press  to clear and re-enter if there are errors,  can also be entered to unset, and then re-enter the setting status.


In the non-setting state, ,  can be entered to select the page

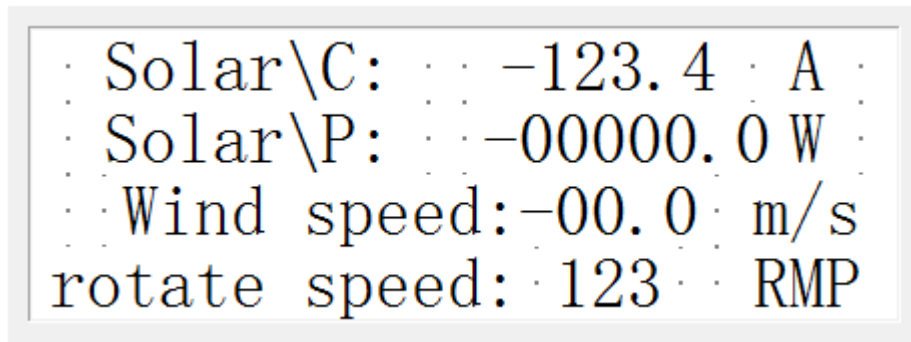
Press the Fn key in any page, it will jump directly to a specific page, as follows

Press F1 to enter the home page




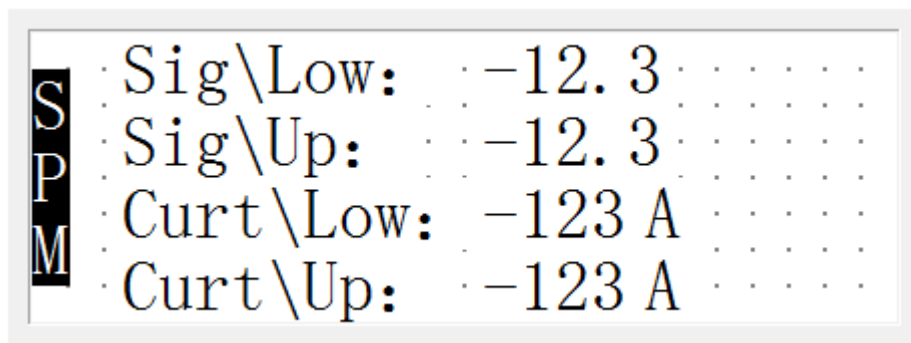
This page displays: battery voltage, wind turbine current, wind turbine power.

Press  to view the page of running status




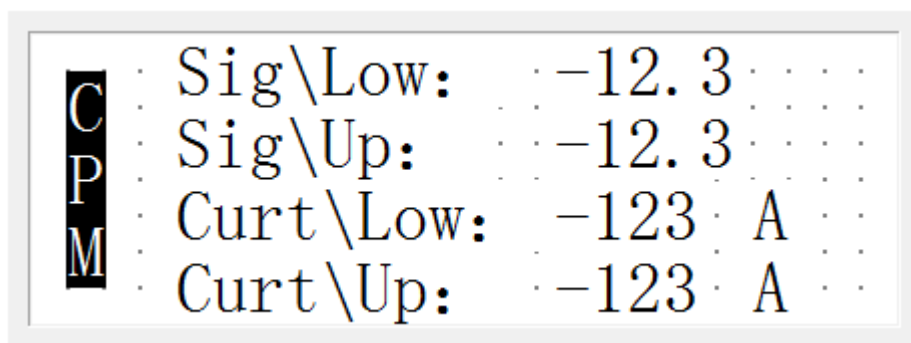
This page displays: Solar current, solar power, wind speed, rotating speed.

Press  to view the parameter setting of solar



Sig\Low: Lower sensor signal current of solar energy
 Sig\Up: maximum sensor signal current of solar energy
 Curt\Low: Lower current of solar energy
 Curt\Up: maximum current of solar energy

Then  to view the page of current parameter of wind turbine



Sig\Low: Lower sensor signal current of wind turbine
 Sig\Up: maximum sensor signal current of wind turbine
 Curt\Low: Lower current of wind turbine
 Curt\Up: maximum current of wind turbine

Press F2 to enter the page of over-voltage protection parameter

V	ELEC\UP:	-123	Hys	: 123
L	short\UP:	-123	Hys	-123
P	Load1\Up:	-123	Hys	-123
T	Load2\Up:	123	Hys	-123

Electromagnetic brake protection:

Maximum electromagnetic: When the battery voltage reaches the setting value, the electromagnetic brake relay starts.

Backlash: When the rotating speed is reduced to this setting value, the electromagnetic brake stops.

Short-circuit brake protection:

Maximum Short-circuit: When the battery voltage reaches the setting value, the short-circuit brake relay starts.

Backlash: When the battery voltage drops to this setting value, the short-circuit brake stops.

Unloading 1 protection:


Maximum unloading 1: when the battery voltage reaches this setting value, unloading 1 relay starts.

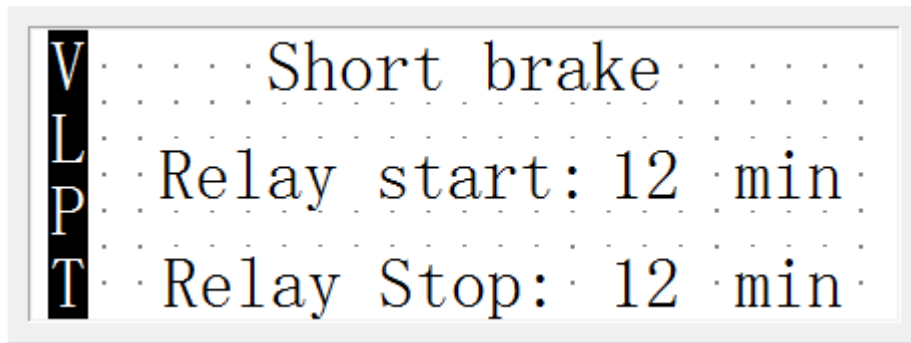
Backlash: When the battery voltage drops to this setting value, the unloading 1 stops.

Unloading 2 protection:

Maximum unloading 2: when the battery voltage reaches the setting value, unloading 2 relay starts.


Backlash: When the battery voltage drops to this setting value, the unloading 2 stops.

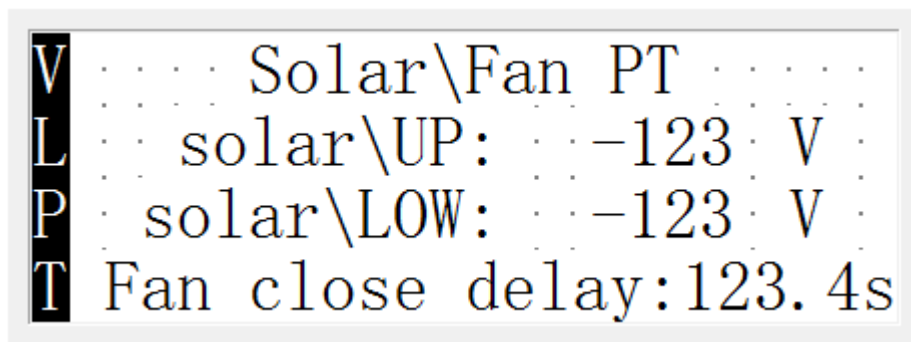
Press  to enter the setting page of over-charge protection.



Relay start: When the electromagnetic brake starts beyond the setting time, short-circuit brake starts.

Relay Stop: When the voltage declines, short-circuit brakes stops beyond the setting time.

In this page, press  to enter solar and fan protection setting

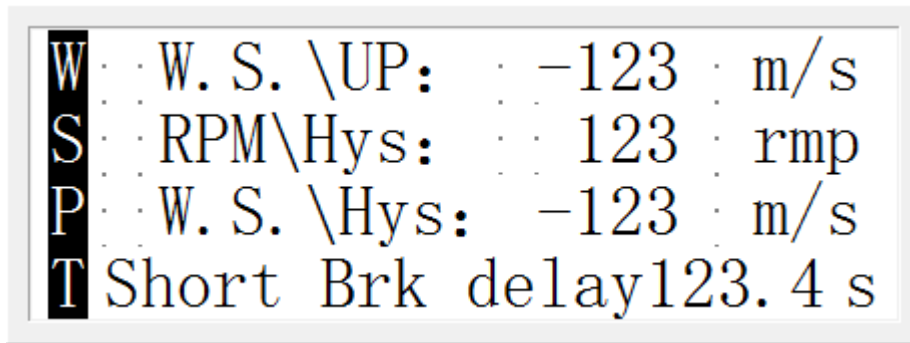


solar\Up: Maximum solar protection. When the battery voltage exceeds the setting value, and the solar relay starts work, then the solar disconnects with battery to prevent battery over-charge.

solar\Low: Lower solar protection. Battery voltage below the setting value, the solar relay stops working.

Fan close delay: The delay for fan to close. The time for wind turbine to continue working as soon as load protection stops.

Press F3 to enter the page of wind speed protection parameter



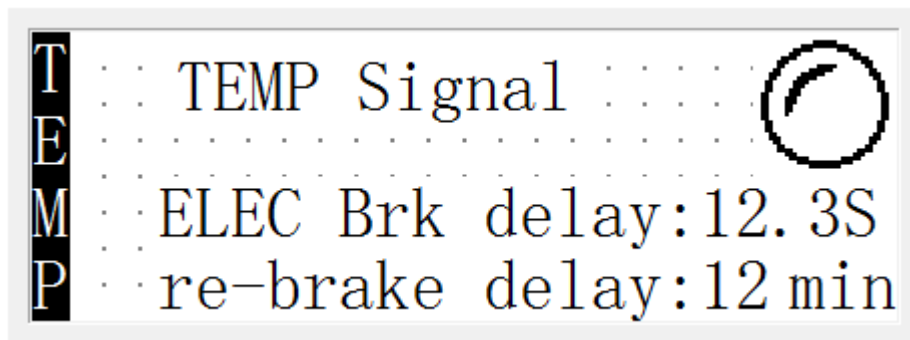
W.S.\UP: Maximum Wind speed. when the wind speed reaches this set value, the controller starts braking and unloading protect.

RPM\Hys: Rotating Speed Backlash. In the status of wind speed protection, when the speed drops to this setting, the electromagnetic brake stops.

W.S.\Hys: Wind Speed Backlash: When the wind speed dropped to this setting, brakes and unloading relay stop working.

Short Brk delay: Short-circuit brake delay: in the status of wind speed protection, when it is over-speed, starts the electromagnetic brake, and then starts short brake beyond this setting time.

Press F4 to enter the page of over-temperature setting

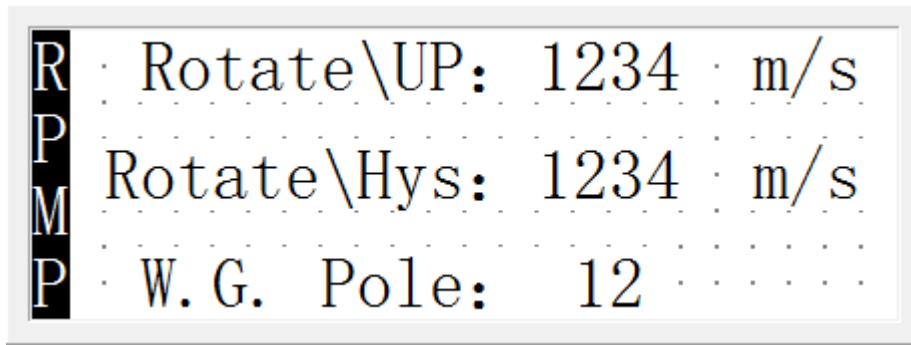


TEMP Signal: Temperature signal. When the temperature is too high, indicator will turn to black.

ELEC Brk delay: The time for electronic brake delay. When the temperature is too high, the electronic brake delay starts at setting time.

re-brake delay: The time for short-circuit re-brake delay. When the temperature is too high, the temperature dropped to normal, short-circuit brakes continue to work.

Press F5 to enter the page of rotating speed protection

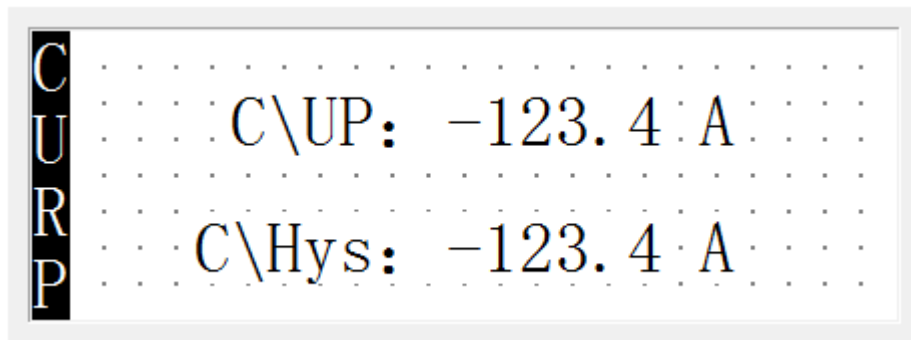


Rotate\UP: Maximum Rotating speed. When it reaches the setting value of rotating speed, starts brakes and unloading protection.

Rotate\Hys: Rotating speed Backlash. When it drops to this rotating speed, stops brakes and unloading.

W.G. Pole: Wind turbine generator pole

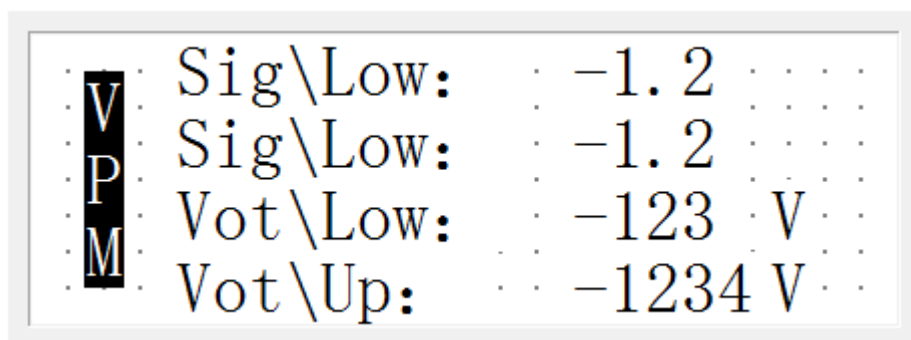
Press F6 to enter the page of current protection



C\UP: Maximum Current. When it reaches the setting value of current, starts brakes and unloading protection.

C\Hys: Current Backlash. When current drops to this rotating speed, stops brakes and unloading.

Press F7 to enter the page of battery voltage parameter



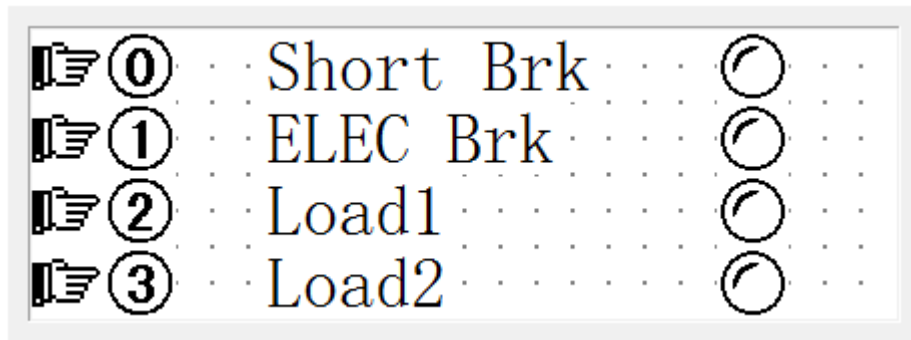
Sig\Low: Lower voltage of sensor signal

Sig\Up: maximum voltage of sensor signal

Vot\Low: Lower voltage of battery

Vot\Up: maximum voltage of battery

Press F8 to enter the page of manual protection



In the home page, when control mode switch into manual mode, press "0", "1", "2", "3" to carry out the protection.

Short Brk: Press "0" in this page, and start short brake protection.

ELEC Brk: Press "1" in this page, and start electronic brake protection.


Load1: Press "2" in this page, and start load1 protection.

Load2: Press "3" in this page, and start load2 protection.

Warning:



When the temperature, voltage, wind speed is too high, man-machine interface will report warnings to remind the owners.

Press  to disarm the alarm when alarm reports.

Note: All parameters have factory set, please do not modify the parameters. Please contact the

manufacturer if modify !

9. Maintenance

Please check and maintain the generator regularly because the environment for generator might be very serious. It is suggested to lay down the tower before storm coming in case of any damage.

No	Item	After storm	Every Month	Every Year	Every 5 year
1	Check blades: look for cracks or abnormal bends. If you locate any damage caused by storms or weather, replace the blades as using damaged or unbalanced blades will compromise the efficiency and lifetime of the windmill.	√			√
2	Grease ball bearings.			√	
3	Check if nuts and bolts have remained tight on mill and tower.	√			√
4	Check electric power cables for corrosion and damage. If you detect any abnormal corrosion, replace cables.	√		√	
5	To repaint the tower if the painting drops caused by climate.			√	
6	To check if the control system is working well.		√		
7	To check the electrolyte level of battery and add if not enough by following instruction.		√		

10 Trouble shooting**1. Why doesn't the electric equipment work normally after connecting to wind system?**

Please check the left energy of batteries, because the equipment can't work smoothly if energy is not enough. But if it is enough, make sure whether the wiring between batteries and inverter is correct.

2. Why can't the batteries be charged?

Check whether the blades are turning or not, because generator has no output at too high or too low wind speed. But if the blades are running normally, please disconnect cables of batteries and inverter at first, then check the output of generator with voltage meter. If the output is in gear, please examine the batteries works or not. If the output is zero, please check the cable of generator.

3. Why can't the blades turn at a normal wind speed?

If the wire of generator output is short-connected, and the blades don't work, please disconnect the cables of batteries and inverter, and then check the generator's cable.

4. Whether the using time of electro-equipment can be prolonged through enhancing the capacity of batteries?

If the suggested batteries capacity is increased, it will cause a lacking energy for long time, which influences the life-span of batteries and leads waste.

Please contact with our engineer by e-mail/mobile if you cannot solve the problem.

*** Color of the pictures might be varied against physical goods;**

*** Please excuse from specification alternations without notice;**

*** Two-year warranty is offered from the purchasing date (natural disaster or force majeure should excluded from the warranty)**

