User Manual

MAX XG Series
Horizontal axis wind turbine
Rotating Tail Design
XG-600W
XG-1KW
XG-2KW

CONTENT

THANK YOU FOR PURCHASING MAX NATURE XG SERIES SMALL WIND TURBINE SYSTEM, IN ORDER TO ENSURE THE PRODUCT OPERATING SAFELY AND EFFICIENTLY, PLEASE READ THIS MANUAL CAREFULLY BEFORE USE THE SYSTEM. MAY YOU HAVE A GOOD TIME WITH OUR PQRODUCTS!

THE WIND SYSTEM MENTIONED IN THE MANUAL ARE MAX XG SERIES SMALL WIND TURBINE.

1. SUMMARIZE

The manufacturing plant of MAX NATURE GREEN ENERGY LIMITED Located on beautiful shore of Yellow Sea – Jiaonan, Shandong Province; marketing center located in Weifang, Shandong Province; it is high-tech enterprise which collect R&D, production, market in one. Our company engaged in exploit of wind and solar renewable energy application. We can offer the user with high quality, reliable and energy-efficient power supply solutions. Our company own advanced equipments, multi-term patent technology and top ranking talents. The products are reasonable designed with stable quality, The company has passed ISO9001 international quality management system certification.

The company independently developed more than twenty different models like off-grid and on-grid types, horizontal and vertical types.

XG Series horizontal axis wind turbine:

Unique rotating tail type: 600w /1kw/ 2kw/ 3kw/ 5kw

Electronic control Variable Pitch type: 10kw/ 15kw/ 20kw/ 30kw/ 50kw

Electronic control Variable Pitch type is original creation of our company; adopt electronic control marching type blades, with goods stability and security.

XG-H Series vertical axis wind turbine:

300w/ 500w/ 1000w/ 2000w/ 3000w/ 5000w, all direct drive types, after repeatedly testing and updating more than one year, the products are superior to other similar products, can be used as scenery and to generate electricity.

Generators are self research and developed, **enclosures** are made by fine steel cast, with advantages of small volume, high accuracy, low weight, and elegant appearance.

Stators adopt special magnetic circuit design, to reduce the torque of generator effectively.

Rotors are made from neodymium iron boron, to make the wind turbines superior to other similar products.

Blades are streamlining designed, with good pneumatic character, using high quality glass fiber reinforced plastic, demanding small wind to start and can survive in high wind.

Controllers and Inverters adopt chip control, pulse width modulation, to achieve regulator output and automatically protection.

Rotating Tail Advantages:

a, Tail rotates by the gravity, and uses maintenance-free bearing, no mechanical damage to the tail itself at all. Traditional folding-type tail can be damaged if the tower shakes, accelerate the mechanical wear of the tail.

b, The tail moving in the axial direction can reduce mechanical friction and make sure free maintenance. Folding-type tail is static upward movement which could easily cause bearing wear, so its bearing need regularly replacement for the user.

c, The rotating tail is made of high-density glass steel, mold production, no welding, ensure the precision and quality. Traditional folding-type tail is hand-welded structure, can’t guarantee the precision and quality of the tail.

2. TECHNICAL PARAMETER

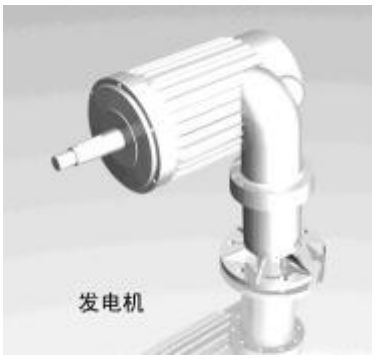
(Adjustable on demand)

Model	XG600W	XG-1KW	XG-2KW
Rotor diameter	2.5m	2.8m	3.8m
Rated rotor speed	400 r/min	360 r/min	320 r/min
Rated wind speed	8m/s		
Rated Power	600w	1000w	2000w
Maximum Power	720w	1200w	2500w
Max. start torsion moment (n/m)	<0.3	<0.4	<0.8
Output voltage	24V	48v	72v
Start up wind speed	2.5(m/s)		
Work speed	3-25(m/s)		
Security wind speed	50(m/s)		
Height of tower	6(m) *Optional as demand*		
Tower type	Cable guyed *Optional as demand*		
Material of enclosure	Fine cast steel		
Material of magnet steel	NdFeB38sh(neodymium-iron-boron 38sh)		
Material of stator	QZY-2/180/470		
Generator style	3-phase AC PM		
Material of the blades	Fiberglass-Reinforced Plastic		
Blades quantity	3 FRP blades		
Top quality except tower	40kg	60kg	90kg
Suggest batteries	2pcs 12v150ah	4pcs 12v150ah	6pcs 12v200ah
Service life	>15 years		
Output control system	Wind solar hybrid controller / Off—grid controller / On-grid controller		
Mated solar panel	24v100w--200w	48v200w--400w	72v600w--800w
Class of insulation	B		
Corrosion prevention	Galvanization/painting		
Over speed protection	Tail control by revolving shaft/ Automatic yaw/ Automatic unload by controller		

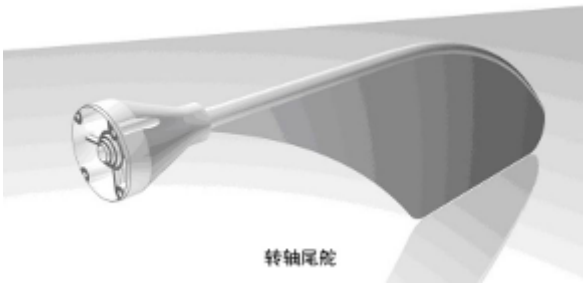
3. STRUCTURE COMPONENTS

Blades, generator, tail, tower, electrical system, etc

Electrical system include: electric control box, batteries, wire, and cable. (See figure)

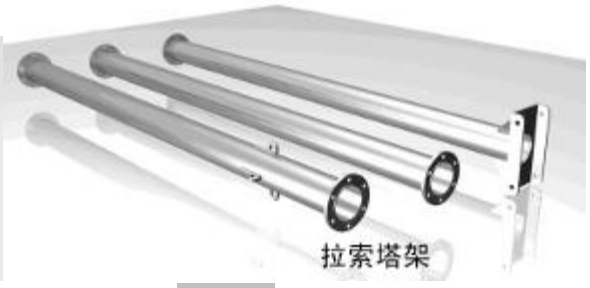


Generator

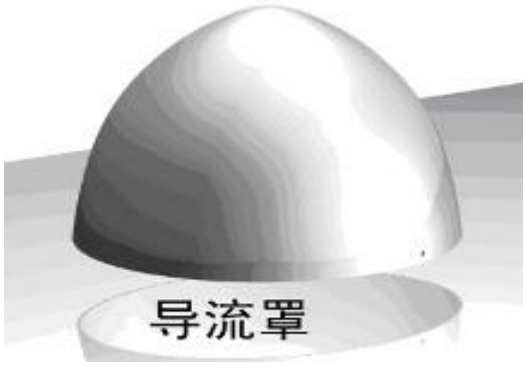


Tail

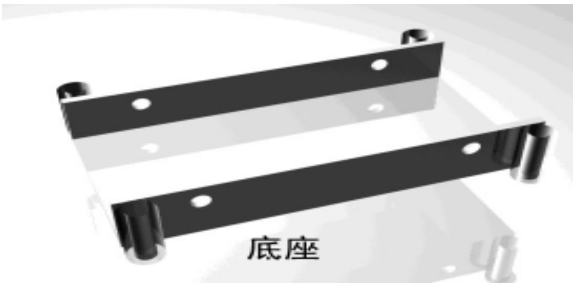
Blade



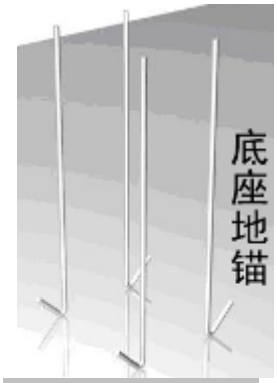
Tower (guyed pole)



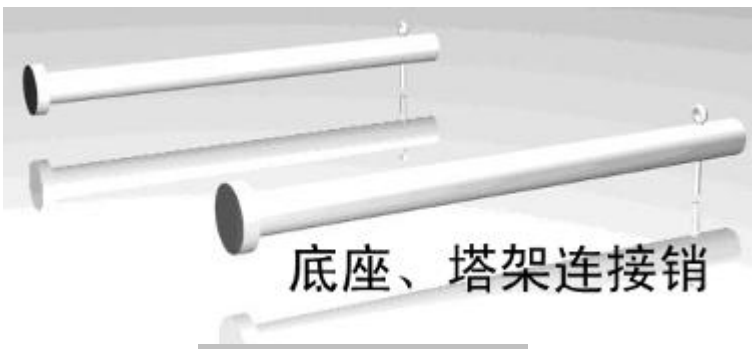
Air guide Cover



Base

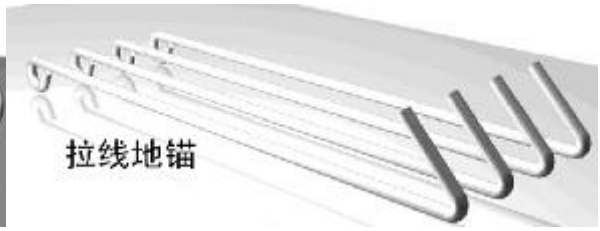


Anchors for base

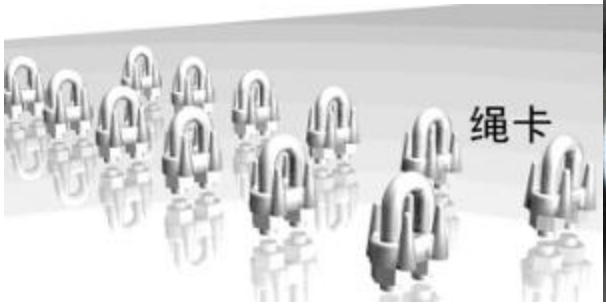


Pins for base and pole

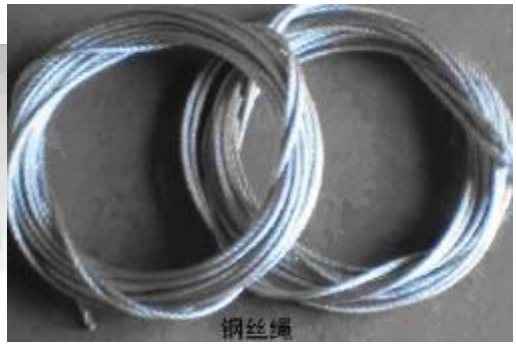
Wire grip



Anchors for wire



Rope clip



Wire

Controller

Inverter

4. PACKING LIST

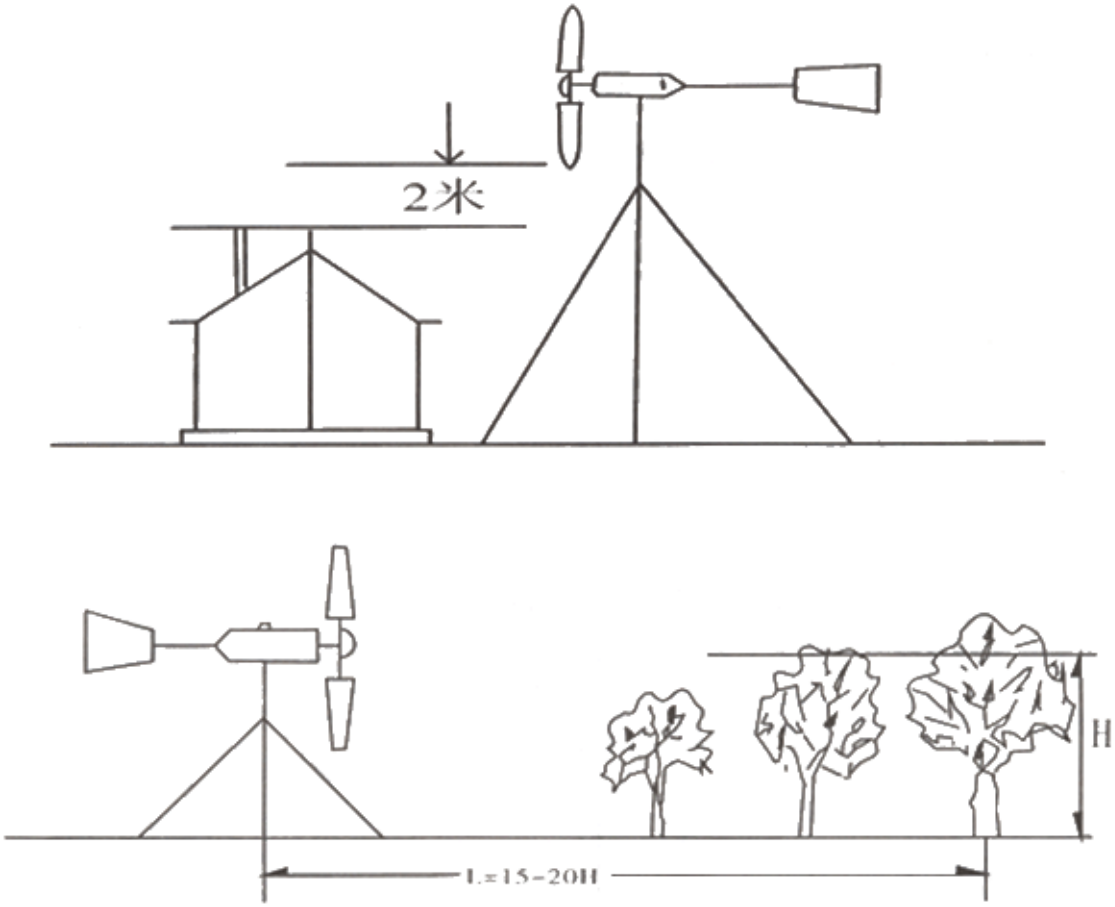
Please check the packing list for its completeness before installation.

COMPONENTS NAME	QUANTITY
Generator assembly	1
Wheel Hub	1

Base	1
Blades	3
Tail	1
Cover	1
Wire	30m--6m pole 40m--9m pole
Anchors of Base	2 or 4
Anchors of Wire	4
Charger controller	1(subject to actual purchase order)
Inverter	1(subject to actual purchase order)
Pole	600w-2kw 6m
Wire grip	4
Rope clip	12
Instruction manual	1(print)
Screw hardware	1set

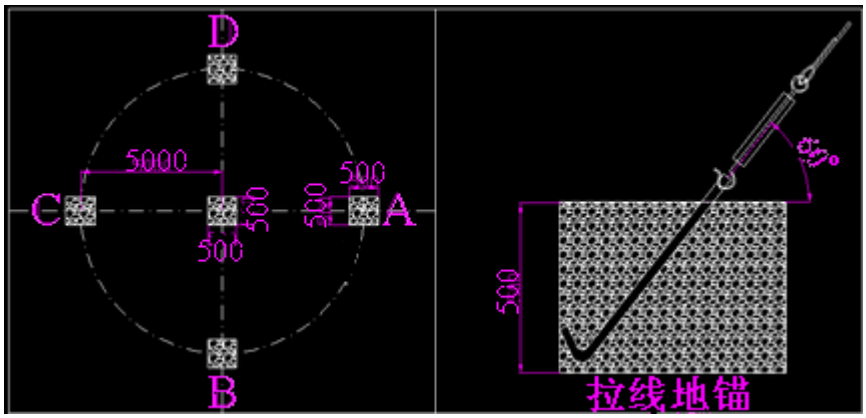
5. CHOSE INSTALLATION SITE

Installation site is very important for the safe and efficient operation of the wind system.
The following statement is as reference.
1). the higher of average wind speed the more power that the wind system will generate.
(The power of wind is in proportion to the cube of wind speed. eg. the wind power on 5m/s wind speed is twice as the power on 4m/s wind speed)
2). Unstable wind is not good for the safe operation of wind generator, and will reduce power that generated by the system.
Heavy turbulence site is inadvisable to install the system.
The higher the wind generator is placed, the stronger wind it will experience. In flat area the suggest height of tower is not lower than 6m.
The airflow around trees and buildings will form turbulence area. Please avoid trees and buildings that will shadow the wind generator!
If the wind generator has to be placed besides the obstacle, chose the site as far away as possible in order to make full use of wind .(see figure)

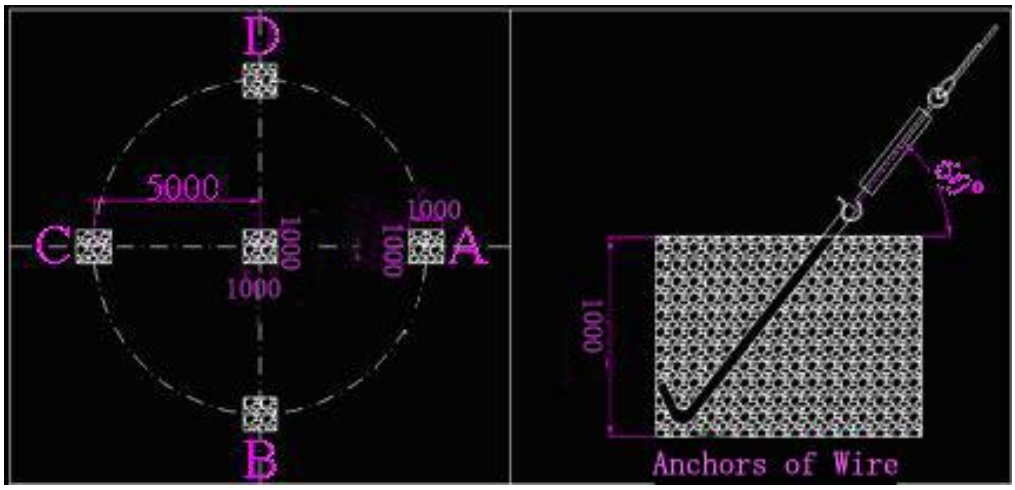


6. FUNDATION

600w/1000w



2000w



1). Dig a square pit at the center of ground:

500mm x 500mm x 500mm (600w/1kw)

1000mm x 1000mm x 1000mm (2kw)

(Above 10KW supply drawing separately)

2). Take the square pit as the centre;

Equally dig 4 pits (A B C D) at radius of 5.0m.

A—C and B—D Diagonal line vertically intersected in the center of the square pit.

(Design the distance between anchor of wire and the pit center according to the height of tower.

Take 9m height tower for example, 5-7m distance is suitable.)

3). Put the four anchors into the holes of base and tight with screw.

(Keep the top of screw 20mm above the base). Make the axis of base be directed by pits B D (or A C) and lay flat 40-50mm above the ground. Pour concrete (the proportion of cement, sand, gravel is 1:2:3). adjust the base flat at last.

4). Put the anchor of wire slant into the pits; throw stone to the bottom to cover the anchor,

Then pour concrete, stone and concrete interlace till the pits full.

Keep the circular ring lean to the center of ground, form 60 °angle with horizontal.

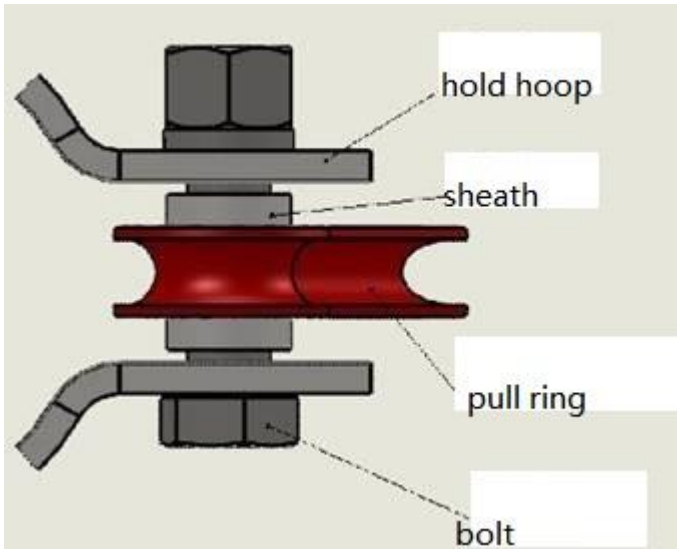
5). Armed with anchor, pouring concrete to the pit until to the top of the circle, make sure the whole circle above the ground.

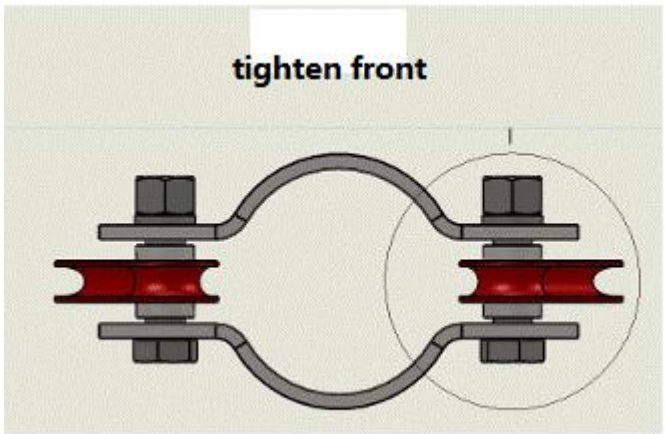
6). The concrete curing period generally lasts for 100 hours, don not do the installation work during this curing period.

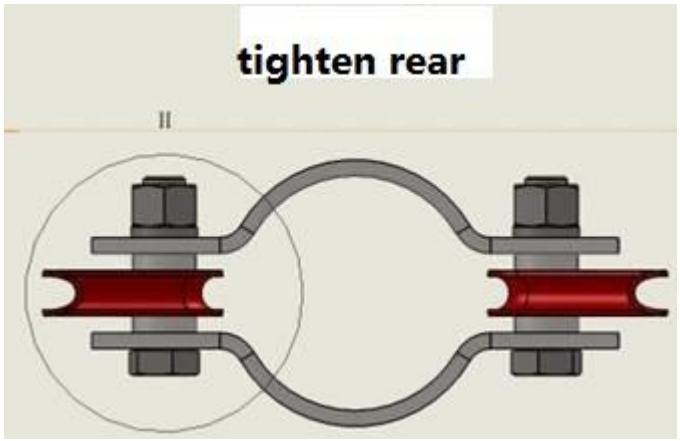
7. INSTALLATION INSTRUCTIONS

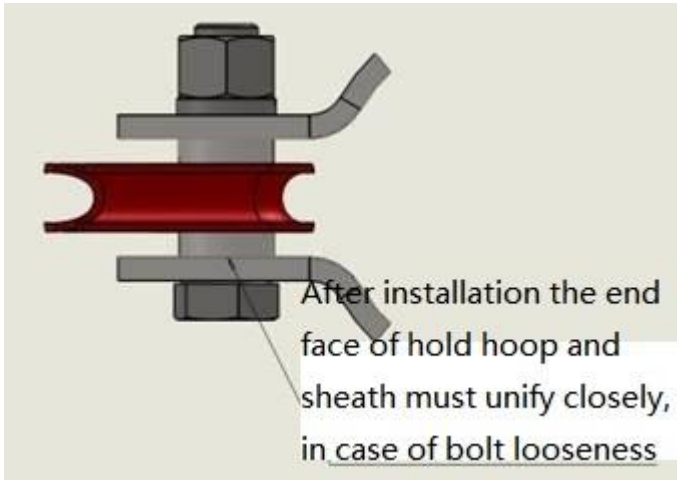
1). Please does the installation work when the wind speed is less than 2m/s.

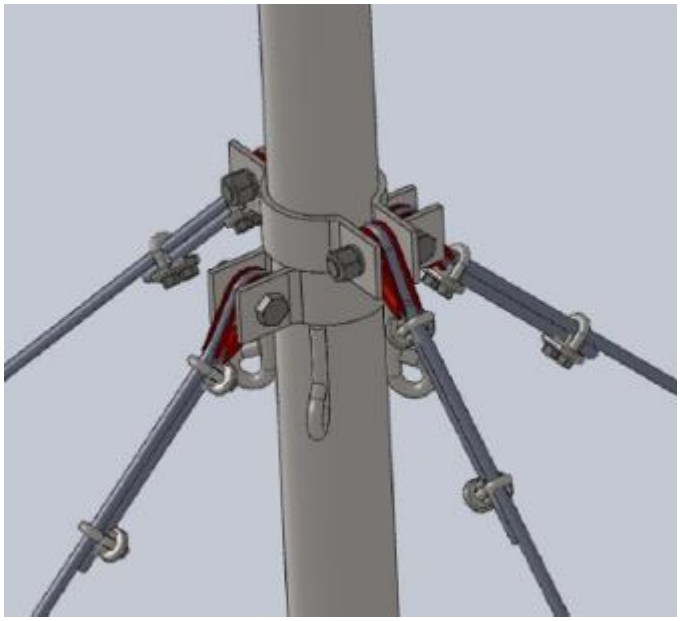
2). Keep the base on bottom of tower flat, put washer on the screw of anchor, tight the nut. Put cable through the tower; connect the two sections of tower and the base. Lay on pit A.
(See figure)

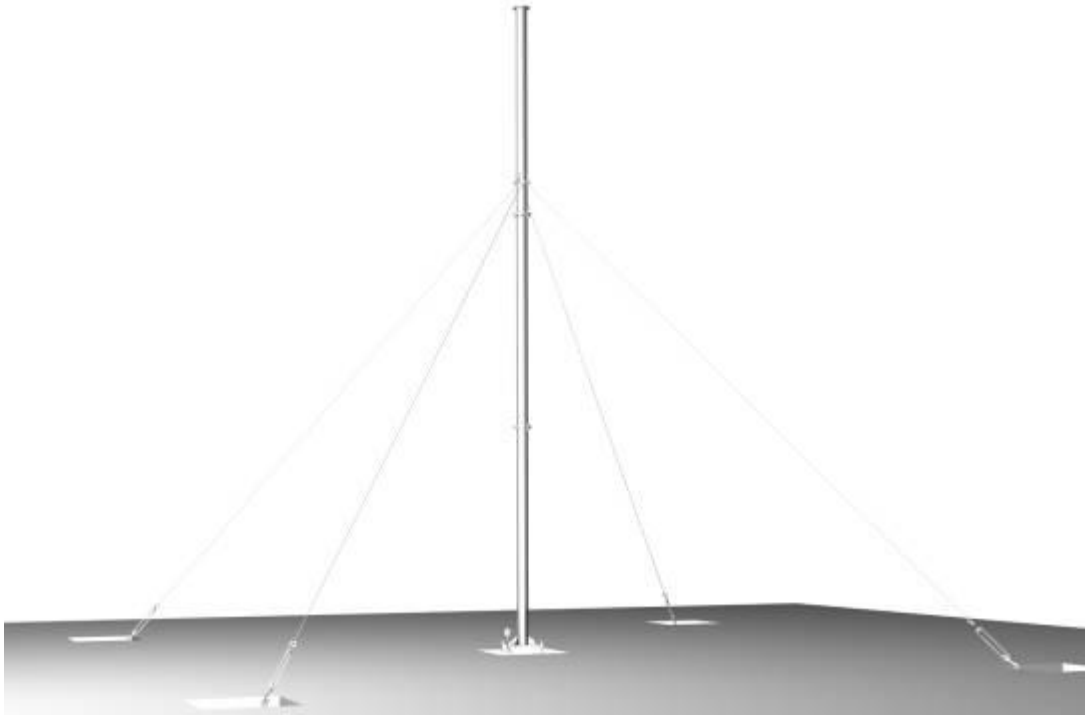





tighten rear

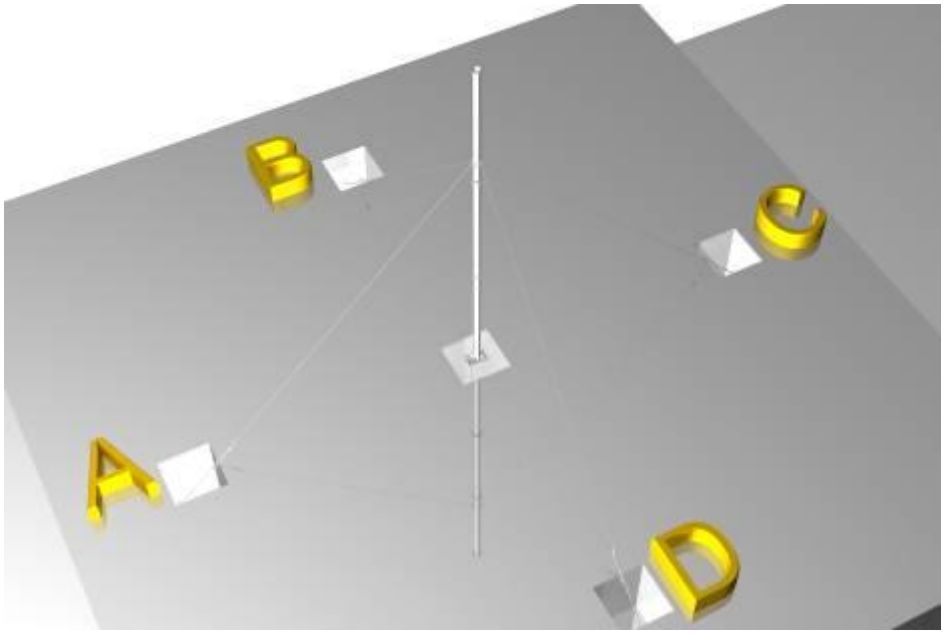

After installation the end face of hold hoop and sheath must unify closely, in case of bolt looseness





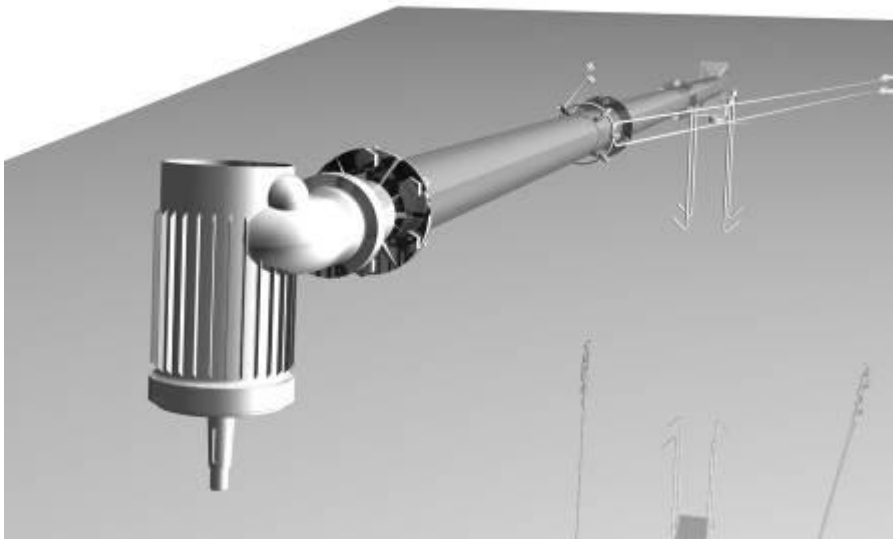
3). Reeve the wire thimble from top to raised face, make a circle around pole and through out (see fig), adjust the length of wire and tight with clip. Loose wire grip, pull up the pole; adjust the wire grid to keep the pole vertical.

(Note: the wire is not allow to be tied to the wire thimble directly, in case of fall down)



4). Lay a 1m holder around pit A, extend the wire grid for pits B、D properly(50mm),lay down the pole slowly, support the pole with holder on the link point.

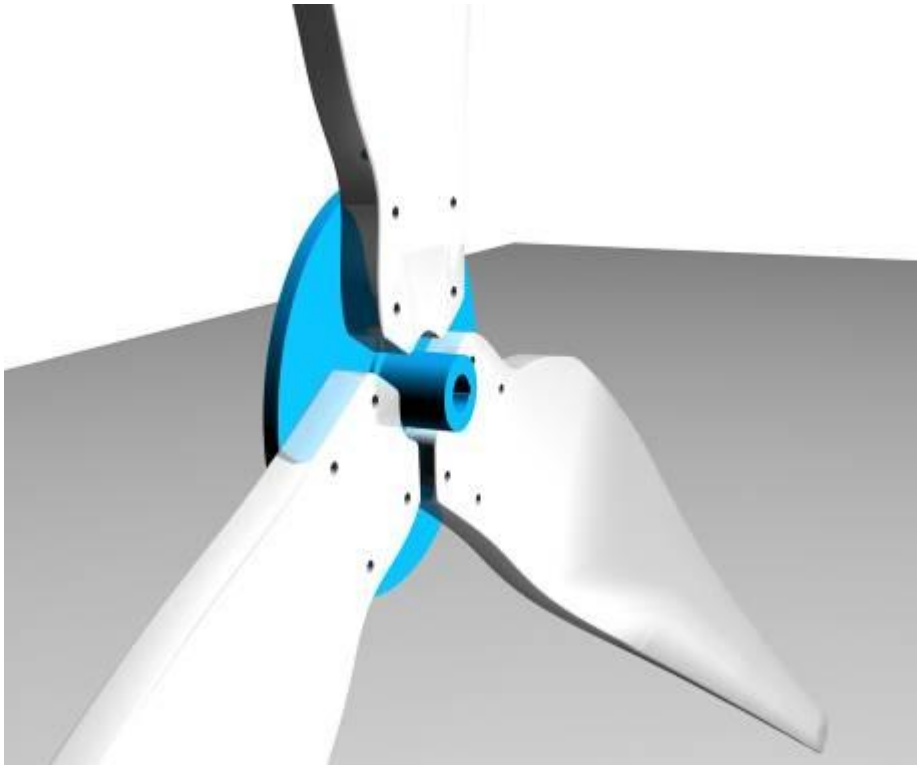
5). Assemble wind turbine:

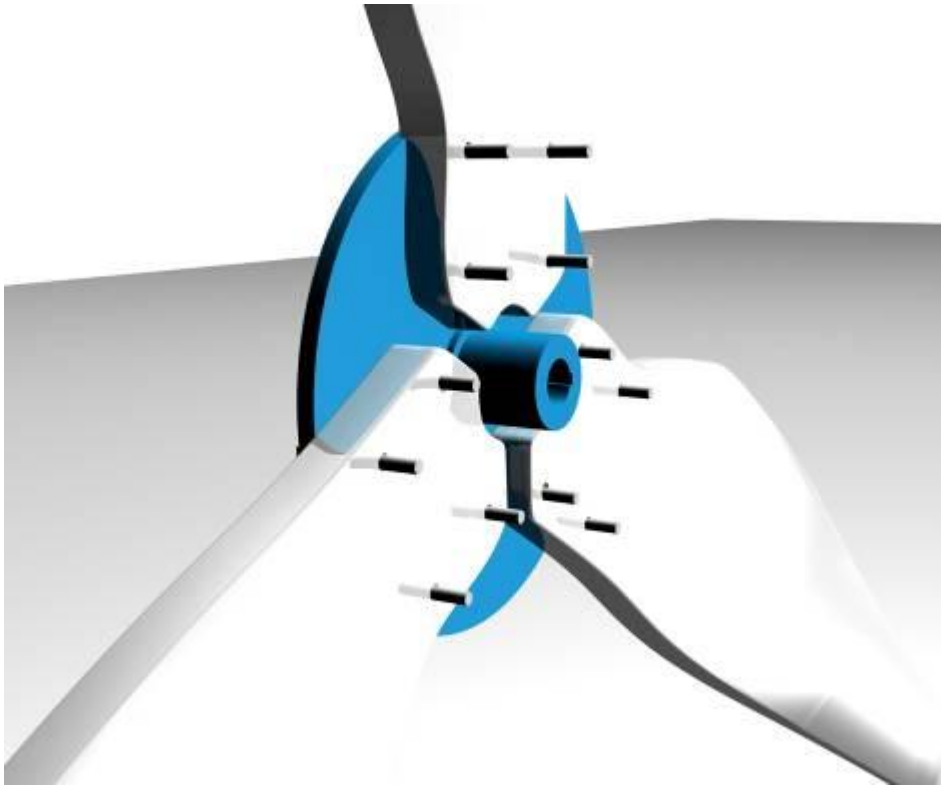


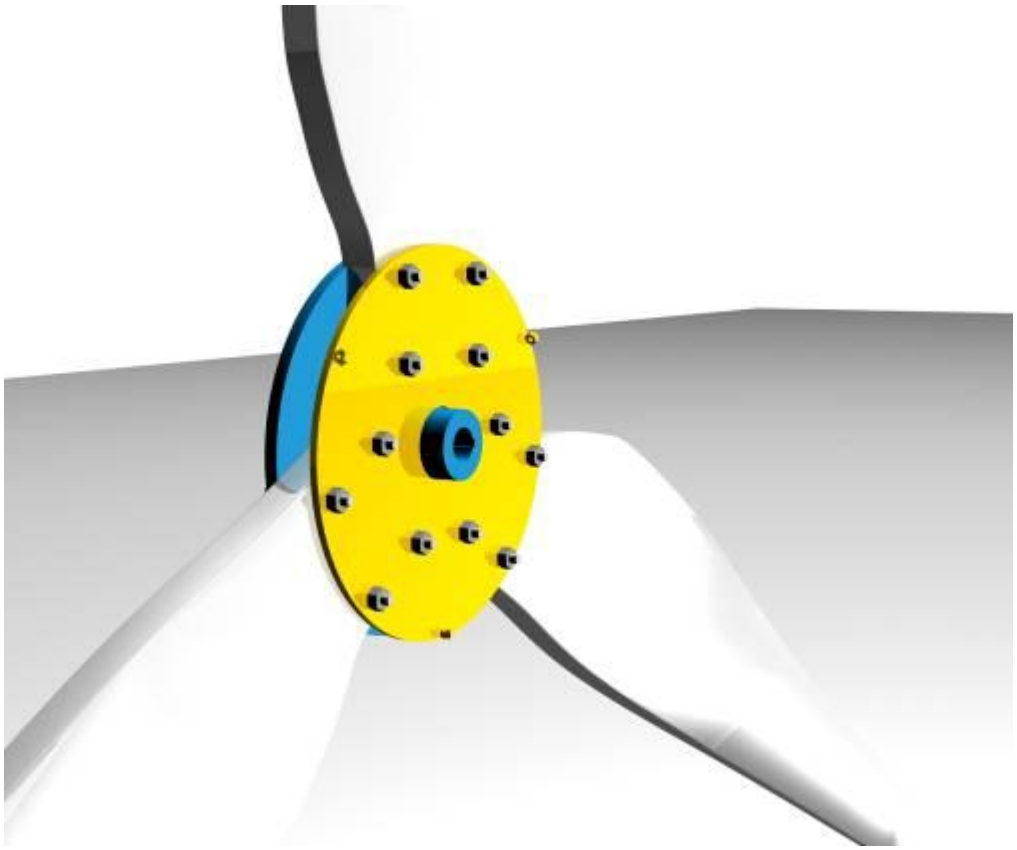
A) Peg graft the generator shaft to pole (or connect with flange), and screw fixed bolt

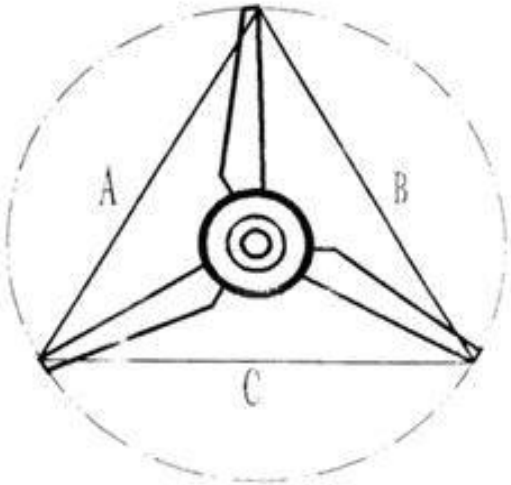
.

B) Fix the tail with four screws on back of generator.
Keep the tail rotate freely.



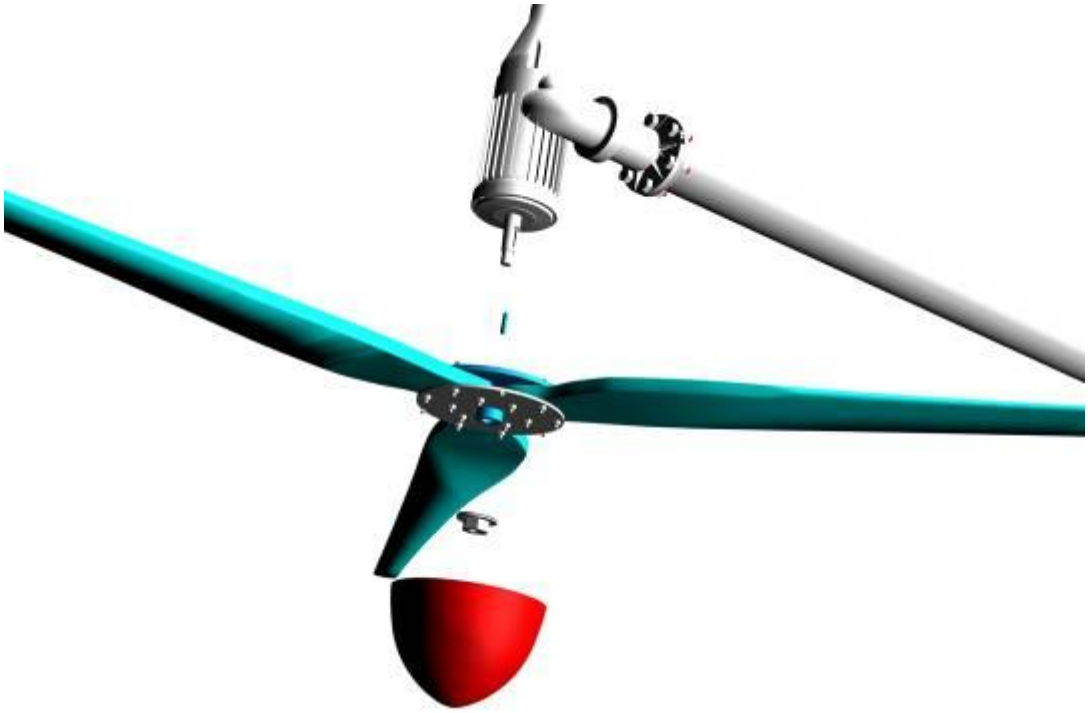






Note:

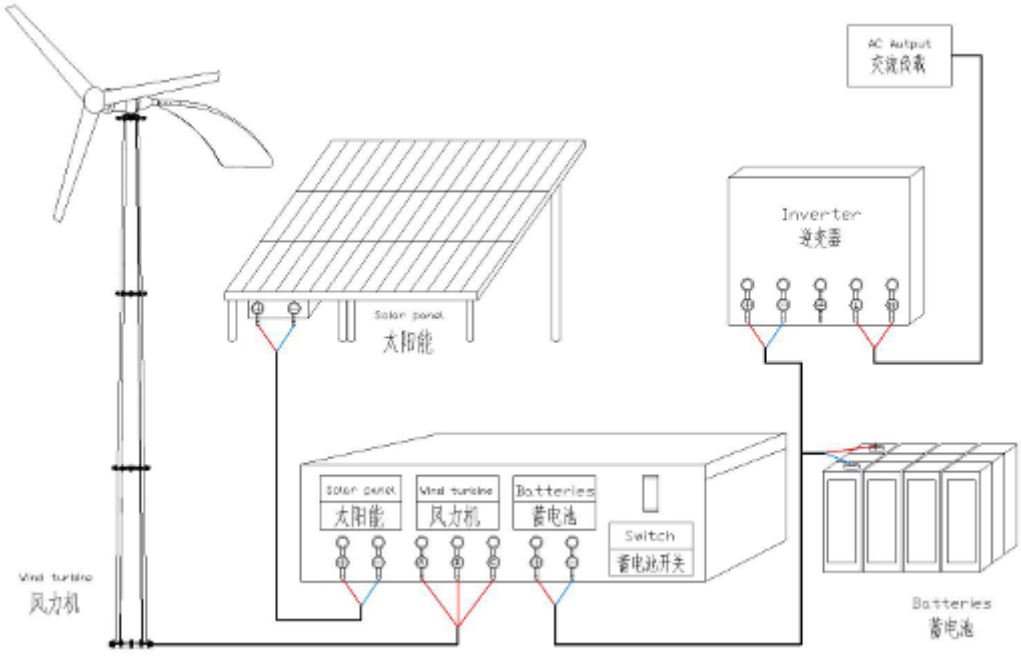
Please pay attention to keep A, B, C in same distance. Random error is acceptable within10mm. If needed, Adjust the distance before fix the screws.



C) Assemble blades hub, the concave side of blades face wind, convex side face generator, mustn't be reversed, place blades assembly into generator shaft, put washer and screw bolt. Run blades to make sure the shaft and hub working well, fix the cover afterwards.

When install the generator on the pole, the 3 cables must be short circuit, screw the line together, in case of run away.

Instruction for control system



D) The red terminal of electrical box should be connected with“＋”pole of battery. the black terminal should be connected with “—”pole of battery. Mustn’t be reversed. (Note: the voltage of battery should agree with the voltage of inverter and generator; the terminal should be connected firmly; to prevent corrosion, the terminal can be coated with oil or Vaseline)

E) Inspect the connection of each part completely to ensure safe, pull up the wind system. (Connect the 3cables before pull up)

F) Installation for free standing pole:

Crane has to be used in installation of free standing pole.

We will supply foundation design, construction drawings separately.

8. MATTERS NEEDING ATTENTION

1). When the generator jitters and makes abnormal noise, it should be stopped and examined carefully.

2). When the blades running in high speed, do not stand people or carry on other work in the plane direction of working blades, in case the blades fly off.

3). the battery must maintain dry and clean all the time. Do not lay metal on top of batteries to avoid short-circuit.

4).The negative earth of the electric control box and the inverter can not be put in the same place to avoid short circuit. To operate inverter should follow the instruction.

5).The wire grip may loose in strong wind. Fasten it with iron wire if it is loose. Inspect the wires after suffering strong winds. (the upper pole must be vertical)

6).The lines of wind power system can not be mixed with other lines. It should be arranged separately. Suggest the lighting use DC power and household appliances use AC power. (the inverter and its output line can not be parallel connected, also the inverter output line can not be connected to the commercial power)

7).When connecting electrical box, connect the battery first, then to the generator output line . The sequence of its decomposition exactly is opposite.

8).Shutdown switch for electrical box is usually on open position. It is used when the capacity of the battery is adequate or to defend strong storm disasters. Only when the blades rotate slowly you can button the shutdown switch. Do not press the button when the blades rotate in high speed. No-load operation is forbidden, in order to secure the blade in high speed.

9. MAINTENANCE

MAX Nature XG series small wind turbine system is reliable and do not need frequent maintenance. The user need inspect the generator –pole -output line timely to ensure the system operating safely.

1). Inspect the wire grip, fixed in time if loosen. During the first three month, this inspection is required, also after suffering strong wind.

2). Inspect if the joint of circuit is fixed, if there is Corrosion phenomenon.

3). Inspect batteries timely according to its demand.

4). Before coming of extreme weather (like typhoon), we suggest lay down the pole to avoid unpredictable accident.

10. TROUBLE SHOOTING

MAX Nature XG series small wind turbine system is designed according to principle of free-maintenance. Normally reasonable installation and use will not cause fault. Please refer to the following table when accidental fault occur.

Fault	Reason	Maintenance Method
Generator shake	1. wire loosen 2. screw of blades loosen 3. blades damaged in outer force 4. the surface of blades freeze, cause lose balance	1. tense the wire 2. screw the loosen parts 3. replace blades 4. clean up the freeze
Unmoral noise	1. the parts loosen 2. bearing of generator has been damaged 3. there is rub between blades and other parts	1. lay down the system, check loosen parts, take sanforizing measure 2. replace bearing 3. inspect fault of blades
rotate speed reduced obviously	1. there is rub from stator of generator 2. the winding of generator is short circuit or output line short circuit 3. the button on the controller be placed on off position	1. replace bearing 2. find short circuit parts, and insulate 3. place the button on
voltage output from generator is low	1. the rotate speed of generator is slow 2. three phase winding of stator short circuit 3. controller short circuit 4. low voltage transmission line is too long, or the diameter of line is thin	1. inspect generator 2.find short circuit parts, and insulate 3. replace controller 4.short the line or widen diameter of the line
Energy output from battery is insufficient	1. output voltage from generator is too low 2. terminal of battery is corroded, cause poor contact 3. the battery lose efficacy	1. inspect the generator 2. clear the terminal, keep contact well and coat oil 3. replace battery

11. WARRANTY

1).generator, blades, inverter, charge controller, warranty one year.

2).warranty time start from the date of contract.

3).do not responsible in the following condition:

A. install the system ignore the instruction manual, cause damage
B. damage caused by force majeure
C. unreasonable installation cause the system full down
D. privately remodel the system

All final explanation rights to the instruction manual here belong to MAX Nature Green Energy Limited.

The parameter subject to change without prior notice;