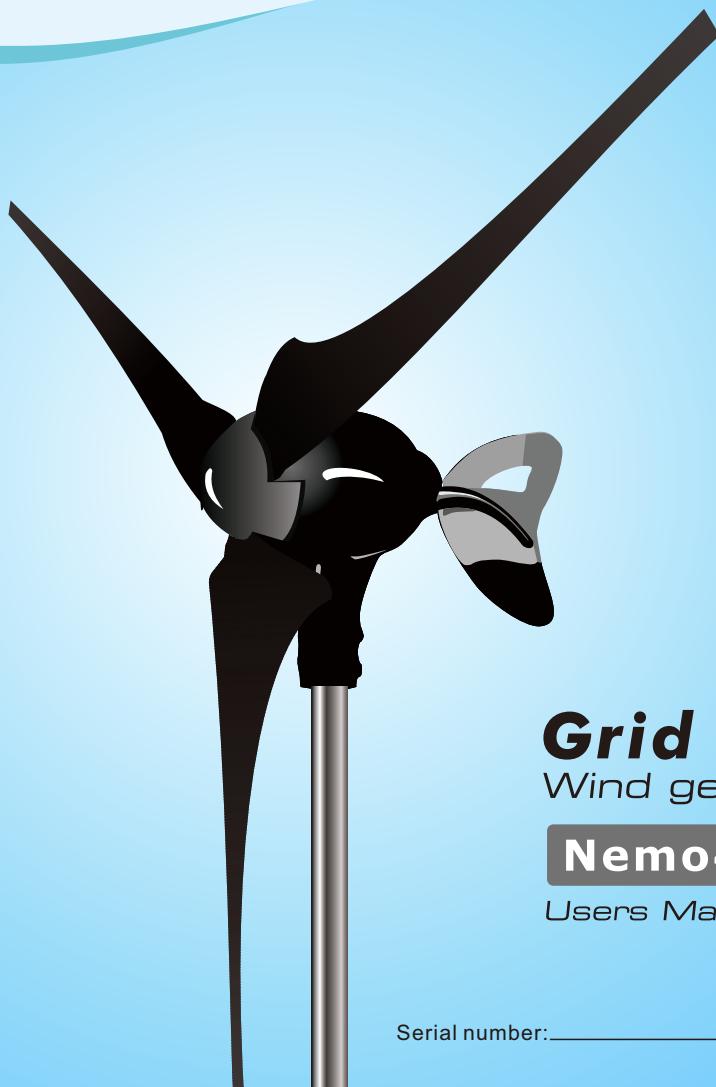


Version 1.0



Grid Tie Wind generator

Nemo4000 DC250V

Users Manual

Serial number: _____



Please read and understand this manual completely before operating the machine.

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1.Getting Started

Congratulations on the purchase of your new Nemo4000 grid tie Shoot Power Wind Turbine. This manual will provide you with a good basic understanding of the operation and maintenance of this unit. If you have any questions regarding the operation and/or maintenance of the unit, please consult your point of purchase or contact us at:



www.shootpower.com
Email:info@shootpower.com

In the unlikely event that this product does not function properly, prohibit all persons except for trained technicians from handling its internal systems and contact either the dealer from whom you purchased it or Shoot Power customer service department: info@shootpower.com

- ◆ The specifications of this product may change due to improvements without prior notice.
- ◆ For explanation purposes, the illustrations and images throughout this manual may differ from the actual product.
- Certain installation procedures are dangerous. Always ask a trained professional to perform the installation work.
- Be aware that manufacturer assumes no responsibility for accidents or damage caused by improper installation, use, or attempts to modify this product.
- Be aware that the manufacturer assumes no responsibility for accidents or damage sustained as a result of not following the procedures and warnings specified in this manual.
- ⊗ Failure to operate this product in accordance with the content of sections labeled “Danger”, “Warning”, and “Caution” may result in accidental death, injury, fire and/or damage to the product itself.

2.Safety instruction

Particularly important information is distinguished in this manual by the following notations.

Safety information is indicated as shown below.



This symbol indicates information that could result in death or severe injury if ignored. It is used to indicate information of a particularly dangerous and/or urgent nature.



This symbol indicates information that could result in death or severe injury if ignored.

 CAUTION //

This symbol indicates information that could result in death, severe injury, or damage to limited property if ignored.

Be aware that failure to use the product in the manner indicated by  CAUTION // may, depending on circumstances, also have severe consequences. All of the symbols described above indicate important safety information. Obey all safety information when using this product.

Safety information is indicated as shown below.

This symbol is intended to draw reader's attention to Danger/Warning/Caution information. Specific details on the nature of the threat to safety are indicated inside or beside the symbol.



This symbol indicates prohibited actions. Specific details on the prohibited action are indicated inside or beside the symbol.



This symbol indicates instruction that must be followed. Specific details on the mandatory instructions are indicated inside or beside the symbol.

 DANGER //

For safety reasons, do not install the wind generator before inspecting the durability/quality of the pole and the area in which it will be installed. If the pole and the location are not suitable, injury or death may result.



Install this product so that the tips of the rotor blades have at least 3.5m (11.5 ft) clearance from any surrounding objects. After installation is complete, clear away all scaffoldings, making sure that the rotor blades are far out of reach of people, pets and/or livestock.



Never touch a moving rotor blade by your hand or any other part of the body. The rotor blades are sharp and accidental contact can result in death or severe injury.



The body of wind generator will also move in accordance with wind direction once it begins to make contact with the wind. Exercise caution if it is necessary to approach the wind generator to perform installation or maintenance work.

 WARNING //

Do not install the wind generator in close proximity to electric or telephone lines. A fallen pole or contact between the rotor and electric/telephone lines could result in electrocution, disconnection, damage or malfunction of the turbine.



Do not install the wind generator in close proximity to structures such as smokestacks that attain extremely high temperatures. The heat could melt the insulation on electrical cables, resulting in electrocution, fire or other damage.



Do not install the wind generator if the pole to which it will be attached is not standing straight up. The wind generator could fall, causing an accident or mechanical damage/malfunction.



Do not use the wind generator for any purpose other than generating electricity from natural wind. Do not attempt to generate electricity by mounting the wind generator on a moving vehicle. Do not use the wind generator in close proximity to an exhaust duct or in any other extremely high-temperature environment. Doing so could result in fire, injury, or damage to the wind generator.



Discontinue use if the lines or cables are damaged (i.e. exposed wires, cut cables, plug damage). Continued use could result in electrocution, fire, or short circuits.

-  Do not pull on, excessively bend, or attempt to modify the wires/cables of the wind generator. Doing so could result in cord damage, electrocution, or fire.
-  Never attempt to disassemble or modify the wind generator. Doing so could result in electrocution, fire, or wind generator malfunction.
-  Due to conditions of use, this system may not continuously supply stable electrical power. Do not attempt to use the electricity generated by the wind generator to power medical devices or other equipment related to human life systems support.
-  Do not attempt to use the electricity generated by the wind generator to power personal computers not equipped with batteries or other auxiliary power sources.

CAUTION

-  Observe all safety precautions when working on the wind generator in high locations. Take care to ensure that hardware and other parts do not fall from the wind generator. Falling parts can cause injuries or other accidents.
-  Before assembling the wind generator, secure adequate space to ensure that work can be completed safely. Inadequate space can result in injuries or other accidents.

3. Installation siting

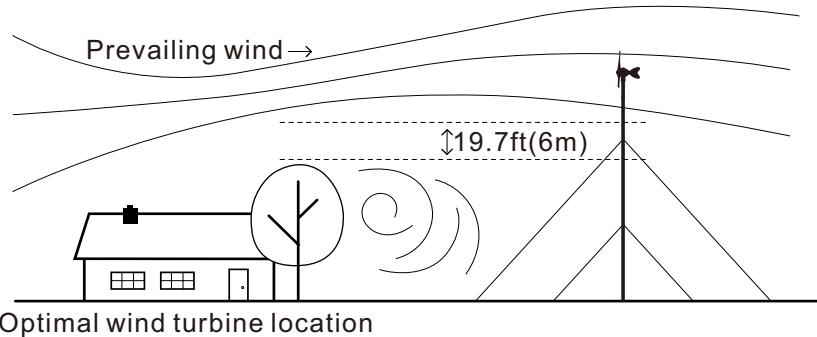
Small changes in wind speed can have a dramatic effect on power production. The location of your wind turbine should be carefully considered.

Each installation is different and is often a compromise between tower height, distance from the battery bank, local zoning requirements and obstacles such as buildings and trees.

In general the higher the tower the greater the wind speed and ultimately the power production. However, towers are expensive and can easily exceed the cost of the turbine.

The minimum recommended tower height is 25 ft (7.6 m) on open ground or 20 ft (6m) above nearby obstructions. Try to locate the wind turbine in the “cleanest” turbulent free air as possible. Turbulence will reduce the efficiency of the wind turbine and may accelerate wear on rotating components.

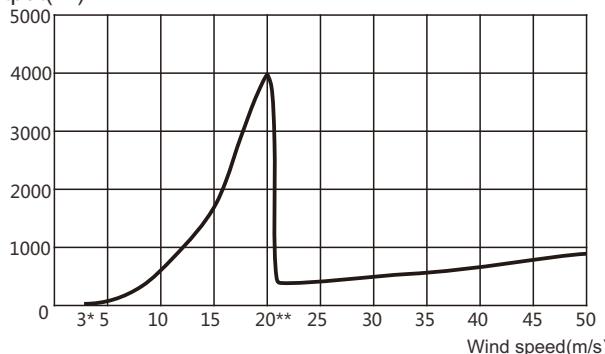
Safety must be the primary concerned when selecting the mounting location. Install wind turbine so there is no possibility of accidental contact with rotating blades even if it requires installing the wind turbine in a less than ideal location. Safety has precedence over efficiency.



4.Specifications

| | |
|---------------------|---|
| Wind Turbine Type | Horizontal axis, up-wind |
| UPC code | 839290007076 |
| Rotor Diameter | 1776mm(69.9") |
| Weight | 18kg(38lbs) |
| Mount Diameter | 48.6mm(1-15/16") |
| Number Blades | 3 |
| Blade Material | Carbon-fiber |
| Body Material | Aluminum diecast |
| Product Finish | Teflon-based paint |
| Generator | Synchronous-type, three phase power generator with neodymium iron boron magnets |
| Controller | Built-in |
| Yaw control | Free yaw (360 degrees) |
| Direction Control | Swing-tail |
| Over Wind Control | Stall control(600rpm mode) |
| Start-up wind speed | 3m/s(11KPH, 6.7MPH) |
| Cut-out wind speed | - |
| Survival wind speed | 49.2m/s(177KPH, 110MPH) |
| Rated Power | 1KW (12.5m/s, 45KPH, 28MPH) |
| Rated Rotor Speed | 1200rpm |
| Peak Power | 4KW (20m/s, 72KPH, 45MPH) |
| Maximum Rotor Speed | 1200rpm(20m/s, 72KPH, 45MPH) |
| Output Voltage | DC250V |
| Braking System | Regenerative electromagnetic braking system |
| Recommended System | PV inverter(constant voltage type) |

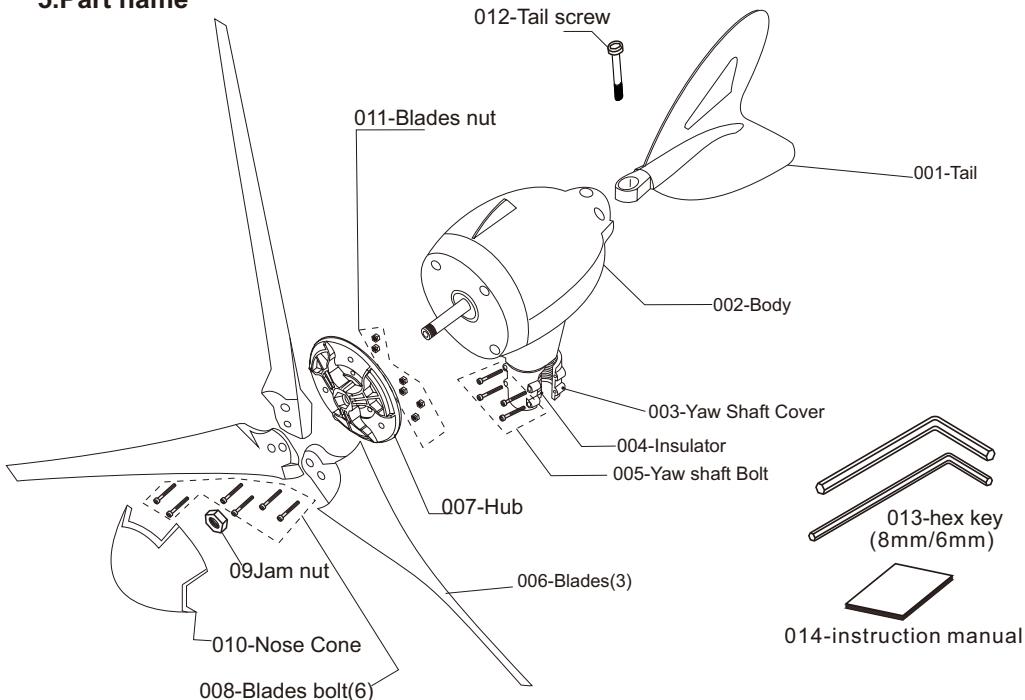
Power output(W) Output power characteristics



*Cut-in: wind speed at which the turbine begins to produce power.

**Cut-out: wind speed at which the turbine stops to produce power.

5. Part name

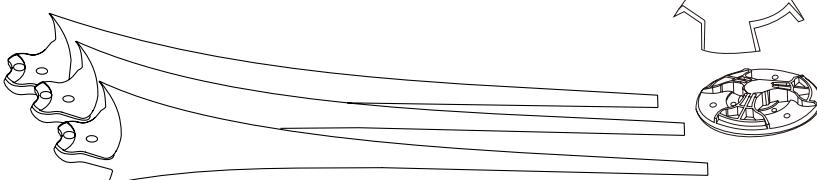


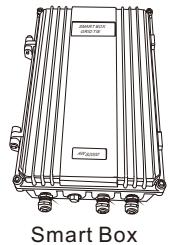
| Item No. | Name | Qty | Item No. | Name | Qty |
|----------|-----------------|-----|----------|------------|-----|
| 001 | tail | 1 | 009 | Jam nut | 1 |
| 002 | Body | 1 | 010 | Nose cone | 1 |
| 003 | Yaw shaft cover | 1 | 011 | blades nut | 6 |
| 004 | insulator | 1 | 012 | tail screw | 1 |
| 005 | Yaw shaft bolt | 4 | 013 | Hex key | 2 |
| 006 | blades | 3 | 014 | manual | 1 |
| 007 | hub | 1 | | | |
| 008 | blades bolt | 6 | | | |

6. Assembling module

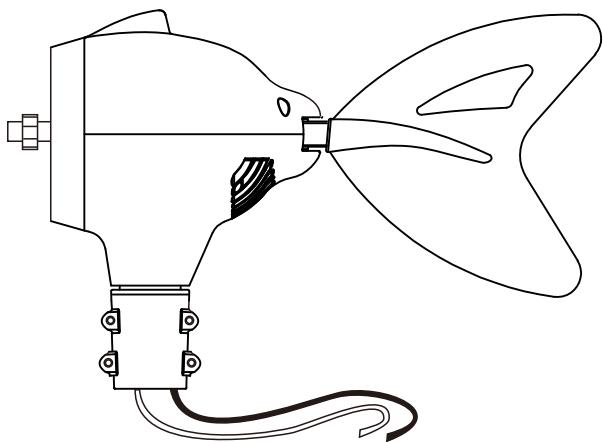
6-1 Verify the following upon purchase

Blades, Hub, and Nose Cone





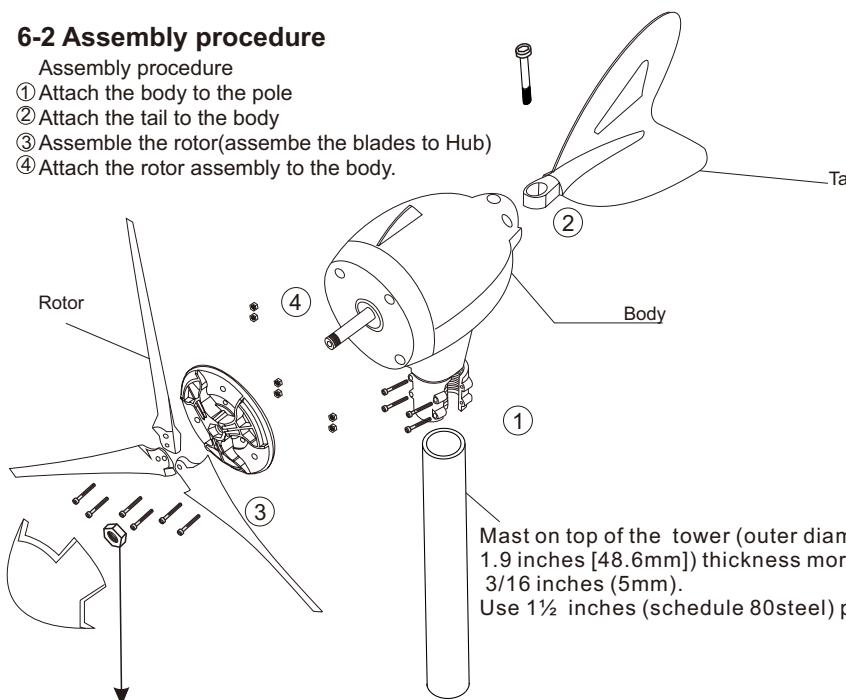
Body Unit



6-2 Assembly procedure

Assembly procedure

- ① Attach the body to the pole
- ② Attach the tail to the body
- ③ Assemble the rotor(assembe the blades to Hub)
- ④ Attach the rotor assembly to the body.



For tightening the main-shaft. Should be able to tighten up to $29.5\pm1.5\text{ft.lb}$ ($40\pm2\text{N.m}$)
 NOTE: Do not press the rotor shaft into the body.

 WARNING //

Failure to observe these safety instructions may result in a severe accident or damage to the wind generator or other parts of the system.

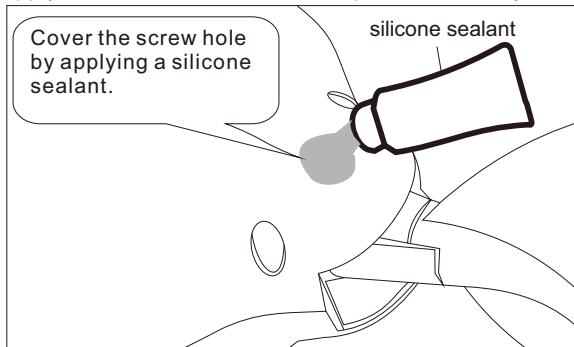
Do not place the wind generator body upside down or inclined during installation or maintenance. Water (rain, snow) can leak inside the body joint gap and cause damage to the turbine. During installation when the body is upside down or inclined and has the possibility of getting wet, put a cover over the body.

-  On the tower top use a mast with an outer diameter of 1.91 inch(48.6mm), 3/16 inch (5mm) of thickness and at least 3 ft (1m) in length. A 1-1/2 inches schedule 80 steel pipe meets this requirement. Do not use plastic pipes.
-  Do not install the wind generator if the pole is not standing straight.
If the wind generator is not mounted in an upright position, it could topple or fall, causing injury or damage to the system.
-  Moving rotor blades are as dangerous as a sharp object. During installation and maintenance, attaching the rotor to the tower body is extremely dangerous because of the potential wind that can rotate the rotor and causing a serious accident such as death or injury. After attaching the rotor to the body, fix the rotor in place to prevent it from rotating until the wind turbine has been completely installed.

-  If the wind turbine has not been completely assembled, a strong gust of wind or similar phenomenon may cause it to fall, causing an injury or other mishaps.

When wind turbine has been completely assembled, in order to prevent corrosion, apply silicone sealant to the screw hole till the screw hole is completely covered.

*Be careful not to apply the silicone sealant to other parts of the body.



6-3 Attaching to pole

While attaching the wind turbine to the tower, be careful not to pinch the AWG#10 (5.5mm²) yaw wires. Slide the yaw all the way down over the end of pole. After the yaw is seated on the pole, move it back up a 1/8th inch (2mm) to prevent the bottom of the yaw from contacting the top of the pole. This way the only contact between the tower and yaw is through the rubber pad, which will reduce noise transmission. Using a torque wrench, tight all mounting fasteners to $16\pm0.74\text{ft.lb}$ ($22\pm1\text{N.m}$). Make sure that your tower allows for proper clearance of the blades. A minimum of 2inches (50mm) clearance must be given between the blades tips and any obstructions.

7. Connecting the system

7-1 Connecting wind turbine and whole system's all of cables



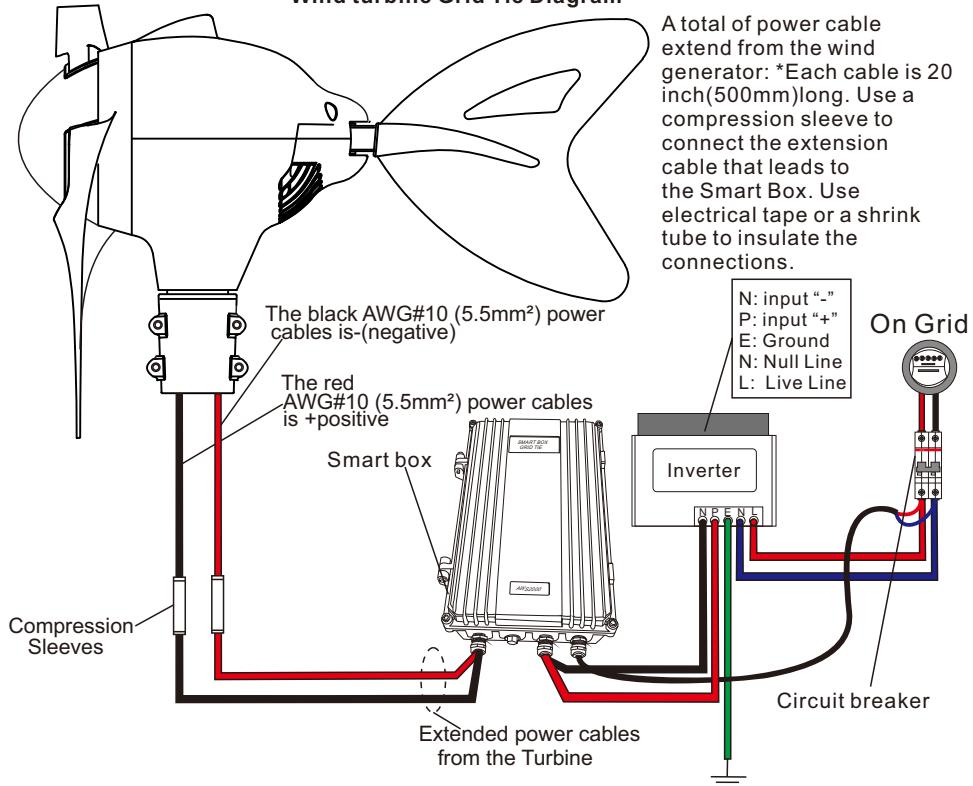
*Pay attention to the + and – terminals when connecting the power cable to the Smart box and inverter. Reverse connection will cause serious damage.

(Be aware that any damage to this product caused by improper connection is NOT covered by the warranty. Connect the cables to the correct terminals).

7-2 Connecting wind turbine, smart box and inverter

The wind generator is designed to use wires with a length of 15m (49ft) and a gauge of AWG #10 (5.5mm²) between the wind generator and the Smart box. However you can select the appropriate wire gauge according to the distance. Please check section 8 ("Considerations when choosing Peripheral Materials/Devices"). Make sure to include the height of the tower.

Wind turbine Grid Tie Diagram



Remark: if the inverter is 3 phases PV type, the connection of the wind turbine to the inverter input terminals is the same as above.

7-3 Install the wind turbine on the top of the pole

Please see the section 6-2 Assembly procedure

7-4 Connecting the wind generator output cable extension

- ① Connecting wind turbine to the Smart box
- ② Connecting Smart box to the inverter
- ③ Connecting the inverter and circuit breaker
- ④ Turn on the circuit breaker
- ⑤ Finish



Please turn on the switch after all of the cables connections are finished. Pay attention to the +and -terminals when connecting the power cable to the Smart box and inverter.

A reverse connection will cause serious damage to the unit.



This manual is intended for individuals who have the knowledge and technical skills needed to work with electrical wiring. If the wind generator is used in an inappropriate configuration or wired incorrectly, its use could cause a severe accident and damage the system, including this product.

If you have any questions regarding the wind generator system configuration, contact either the dealer where you purchased this product or Shoot Power Customer Service for more information.

8. Considerations when choosing Peripheral Materials/Devices

8-1 Inverter

- Type: We recommend the use of PV solar inverter.
- 1).The Max input voltage: 400VDC or more.
- 2).The minimum input voltage:200VDC or less.
- We Recommend use SMA company Sunny boy PV inverter or other reliable brands.

8-2 Mounting Tower:

The mounting tower that supports the wind generator is an extremely important part with respect to safety. The mast used to attach the turbine and its foundation, must be strong enough to provide adequate safety.

- Location and height of the mounting tower: select a free and safe location where the ample amount of wind flow is obtained. The height of the pole must be 11.5ft (3.5m) or more to ensure safety from hazard to people.
- The tower must have an upper portion of at least 3ft(1m) in length and an outer diameter of 1.9inches(48.6mm)(the 1½inch schedule 80 steel pipe

meets it). The total tower height must be sufficient to prevent accidents with body or structures.

- The tower must withstand horizontal wind pressure of 231lbf(105kgf) (at a wind speed of 49.2m/s, 110mph, 177KPH).

- If unsure please consult with your local tower contractor for details.

8-3 Cable Diameter Sizes:

To select the appropriate cables gauge, measure the distance between the turbine and the smart box. Make sure to include the height of the tower. Please refer to the following wire gauge chart.

| Distance between the turbine and smart box | Wire Gauge(1 cables per polarity) | | | |
|--|-----------------------------------|-----------------------------|-------|---|
| | Cross Sectional Area | Diameter of the cooper core | AWG # | Maximum Total resistance (round & trip) |
| Up to 20m(49ft) | 5.5mm ² | 2.64mm | 10 | 0.022Ω |
| Up to 30.5m(100ft) | 8.0mm ² | 3.19mm | 8 | 0.03Ω |

NOTES:

- For the connection between the Smart box and the inverter, you can use the same wiring per polarity as in the table. Alternatively you can use a single cable AWG #10. In all the cases the cable between the Smart box and the inverter has to be no more than 3ft long.

8-4 Grounding:

We recommended installing a 1 or 2 ft (30 or 60cm)long grounding jumper between the wind turbine bracket hex bolts and the mast. Use AWG # 6 wires with ring crimp terminals (lugs) .The terminal ring inside diameter should be 3/8 inch or 10 mm. It has to be mounted in between the 2 half-moon brackets and inside one of its 4 hex bolts. Remove the coat of paint on the contact area and use electrical joint compound. The brackets have to be tighten fully, otherwise use stainless steel flat washers to fill the gap. To connect the jumper to the mast pipe, you can use grounding clamps of the same metal as the pipe itself to avoid galvanic corrosion.

Connect the base of the tower/mast to earth ground, using enough ground rods, according to the soil conductivity.

Since the turbine typically has to be mounted on a structure (tower, pipe, etc.) you should take into account the possibility of a lightning strike in your area that could hit the top of the structure.

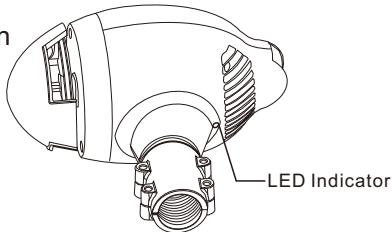
Most of the time a lightning ground system super-exceeds the requirements for a safety ground. However be sure always to meet the requirements as per the local electric code in both cases. Consult a certified electrician or technician specialized in both types of grounding systems.

The customer itself or through a professional contractor, has the responsibility to meet the local electric code.
Please check periodically the Shoot Power website for more information about grounding.

9. Explanation Operations

During operation, the LED indicator on the body of the wind generator can be used to check the operating status of the system.

The indicator LED can light in solid or flashing red and green.



Operating StatusTable

| Mode | RPM | Indicator Light | Status | Cause | Next Operation |
|-------------------------------------|-----------|----------------------------|---|--|---|
| Start/Restart (Inverter Standby) | Max300 | Flashing red | Generating power and waiting the inverter start up | Although the wind turbine start generating power but need waiting inverter start up | Starts in normal operating mode |
| Normal operation | 0-249 | No light | No power output | The power is off, or the wind is weak and the rotor is rotating at 249 rpm or less. | Power off may be because of a power outage. |
| | 300-1000 | Solid green | Generating power. (Wind speed range: 3 to 12 m/s, 11 to 43KPH, 6.7 to 27MPH) | When the rotor is rotating at 0 to 1200rpm | |
| | 1000-1200 | Flashing green | Generating power at controlled rpm. (Wind speed range: 12 to 20 m/s, 43 to 72KPH, 27 to 45MPH) | The rpm is limited to 1200 rpm. | |
| | 600 | Solid red | Generating power at controlled 600rpm. | Wind speed: Over 20m/s, 72KPH, 45MPH | |
| Temperature protection | 0-50 | Flashing red and green | Rotor stopped | When the temperature of the alternator cover exceeds 90°C, 194°F. or temperature sensor damage | Recovers to normal operation when the temperature drops below 60°C, 140°F |

10. Site Elevation:

An important fact to keep in mind is elevation. The higher the wind generator is from sea level, the lower the air density. Air density is directly proportional to the output of your wind generator. Here are some general numbers to keep in mind when determine the maximum output that can be expected.

| FEET | METER | OUTPUT POWER |
|----------------|--------------|--------------|
| 1-500ft | 0-150m | 100% |
| 500-1,000ft | 150-300m | 97% |
| 1,000-2,000ft | 300-600m | 94% |
| 2,000-3,000ft | 600-900m | 91% |
| 3,000-4,000ft | 900-1,200m | 88% |
| 4,000-5,000ft | 1,200-1,500m | 85% |
| 5,000-6,000ft | 1,500-1,800m | 82% |
| 6,000-7,000ft | 1,800-2,100m | 79% |
| 7,000-8,000ft | 2,100-2,400m | 76% |
| 8,000-9,000ft | 2,400-2,700m | 73% |
| 9,000-10,000ft | 2,700-3,000m | 70% |

11. Maintaining the generator system

Monthly/ Yearly Inspection:

Although the wind generator is basically a maintenance-free system, we recommend visual inspections (see details on the operating status table).

- a)Is the system exhibiting operations listed on the “Operating Status Table For example: the indicator lamp is green when the rotor is rotating at a high speed(250-1200rpm), etc.
- b)Are the blades free from damage?
- c)Is there an approximate 3mm gap between the aluminum hub and the front unit face?
- d)Is any debris such as ice, snow, or tree branches jamming the turbines?
- e)Is the joint on the tail moving smoothly?
- f)Is the tail free from any minor damage?



WARNING



If replacement is necessary, only use parts specified by Shoot Power. Use other parts could cause accidents or malfunction.



CAUTION

When strong winds blow, tree branches and other objects may make contact with and damage the wind turbine, its support pole, or its wiring. Continued use of the wind turbine when it is damaged may cause electric shock, a serious accident, or cause the turbine to cease functioning. Inspect all parts of the wind turbine after periods of strong wind.

Do not place the wind generator body upside down or inclined during installation or maintenance. Water (rain, snow) can leak inside from the joint gap of the body and may cause damage to the turbine. When the body is upside down or inclined and have a possibility of getting wet, put a cover over the body to avoid water.

⚠ Important //

In working time, can not connect + and - cables together to make the wind turbine in short circuit, also must keep the connection between the smart box with wind turbine, otherwise, it will damage the wind turbine MPPT controller.

If you want to stop the wind turbine, just need to shut down circuit breaker, the wind turbine will get into 300rpm mode, when the power of the Capacitor is used up completely, the wind turbine will stop automatically.

12. Warranty Information

Shoot Power Wind Turbines are warranted for a 3 year period. Against defective parts or manufacturers workmanship.

What is NOT Covered

- Damage from lightening
- Damage due to extreme winds
- Damage from improper installation (Including poor tower design and inverted hanging)
- Damage from improper wiring
- Damage to blades from debris and wind blown debris

Any and All modifications to the unit, not stated in this manual

No one has the authority to add to or vary this limited warranty, or to create any other obligations in connection to Shoot Power and its products. Any implied warranty is limited to the duration that is stated on this manual.

Shoot Power will not be liable for damages that any person or property might suffer as a result to the breach and or implied warranty. This warranty applies to the original purchaser.



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INFO@SHOOTPOWER.COM