

Black Series Generator
The High-Tech Wind Turbine!

Owners Manual

BLACK SERIES WIND GENERATORS

NOTICES:

- This information is believed to be reliable; however, The Black Series Wind power is no responsibility for inaccuracies or omissions. **The user of this information and product assumes full responsibility and risk.**
- All specifications are subject to change without notice.
- Wind generators, like other sources of electrical power, must be installed following the guidelines established by state and local regulations. Consult a local electrical contractor or the local planning and zoning office for details and regulations.
- For your convenience and protection write the serial number of your wind turbine on the front of this manual. Store your purchase invoice with this manual as well. You will need this information in the event of a warranty claim. It also helps the customer service department at Black Series Generator when you have questions about your specific turbine. Thank you.

CONGRATULATIONS!

You have just purchased the most high wind energy utilization coefficient wind turbine in the world!

We believe you will find it easy to install your turbine; however, it is important that you read this manual entire **thoroughly** prior to installation to assure proper performance and safety.

What makes the BLACK SERIES unique in comparison to other turbines is the used of more reasonable design for magnets arrangement reduces the start-up torque of our generator. Black Series Wind Generators can generate electricity at a low wind speed.

If you have any questions after thoroughly reading the manual, please contact your authorized distributor/dealer or preVent GmbH.

Hope You Enjoy.

Unique Features of the BLACK SERIES GENERATOR(BSG)

**The 300W is the latest evolution of the black series of wind turbines from
The improvements are almost all inside the turbine.**

The Features:

- **New Generator:**
Permanent magnetic ring double-generating system;
The new rotor and stator design. The design will improve the Wind Energy utilization coefficient.
Means that only need small wind power generation can begin!
At the same time also guarantee the reliability of the performance.
- **Simple Installation & maintenance:**
BSG used for the first time users will immediately install.
But also the design does not affect the effectiveness and ability of catch the wind.
- **New Blades:** The rotor blades use a highly efficient, true airfoil. They are manufactured using a precision injection molding process that produces blades of exceptional consistency. The result is quieter performance and minimal vibration.
- **New Yaw Shaft:** The yaw shaft is the part of the turbine that mounts to the tower and allows the turbine to rotate into the wind. The **BSG** features a new yaw shaft that allows for stronger clamping forces to the tower, and more agility in the turbine.

The BLACK SERIES also retains these features

Braking: The regulation control circuitry incorporates excessive brake function.

- This will lock the turbine in a silent regulation mode once the batteries are fully charged. The turbine begins producing power again when the battery voltage drops slightly below fully charged.
- **New Body, New Hub:** The body is made from a precision casting process that not only enhances fit and finish, but also leads to a stiffer, more durable body. Every metal accessory is used of stainless steel, even a screw of the turbine all in stainless steel.

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1. SAFETY PRECAUTIONS

The **BSG** has been designed with your safety in mind. However, there are inherent dangers involved with any electrical and/or mechanical equipment.

The BSG is designed with your personal safety as the first priority. However, there are still some inherent dangers involved in the electrical/mechanical equipment. Safety must be the priority concern during installation of the system. If you are not sure, if there is any problem with the wind turbine, don't use it and let the wind turbine work after a professional specialist has checked your system.

Safety must be the primary concern as you plan the location, installation and operation of the turbine. At all times be aware of electrical, mechanical and rotor blade hazards.

If you hear that extreme wind is coming, please also fix one rotor blade to the pole with a rope. Then you will have a long lifetime with your wind turbine without any complications.

The rotor can get a wind power of 3000 N up to the block 500, so the pole or tower must be able to hold this. Please ask static experts, if your pole is strong enough fixed.

- Choose a calm day to erect the tower.
- Undersized wires or bad connections should be avoided as they will often result in overheating and potentially cause electrical fire.
- Never approach an operating turbine during strong winds or during thunderstorms.

1.1 Mechanical Hazard

Rotating blades present the most serious mechanical hazard. The ^{BSG} rotor blades are made of very strong fiberglass. At the tip, the blades may be moving at velocities over 275 miles per hour (440 km/hr). At this speed, the tip of a blade is nearly invisible and can cause serious injury. ***Under no circumstances should you install the turbine where a person could come in contact with moving rotor blades.***

CAUTION: DO NOT INSTALL THE TURBINE WHERE ANYONE CAN APPROACH THE PATH OF THE BLADES.

1.2 Electrical Hazards

The **BSG** is equipped with sophisticated electronics designed to provide protection from over current electrical dangers. The internal electronics of the **BSG** prevent open circuit voltages from rising above 20 volts for 12-volt systems or above 40 volts for 24-volt systems. Please note that the inherent personal dangers from electrical current still exist, therefore caution should always be used when connecting this and other electrical devices.

Heat in wiring systems is often a result of too much current flowing through an undersized wire or through a bad connection. It is important to follow the wire-sizing chart in Section 3.1.2 on page 10 to insure a safe electrical system.

CAUTION: FOLLOW THE WIRE SIZING CHART IN SECTION 3.1.2 ON PAGE 10 TO HELP AVOID THE RISK OF AN ELECTRICAL FIRE.

Batteries can deliver a dangerous amount of current. If a short occurs in the wiring from the batteries, a fire can result. In order to avoid this threat, a properly sized fuse or circuit breaker is required in the lines connecting to the battery.

CAUTION: FUSE ALL CONNECTIONS. FOLLOW THE FUSE SIZING GUIDELINES IN SECTION 3.1.5 ON PAGE 12 TO MINIMIZE THE RISK OF FIRE AND/OR AN ELECTRICAL FAILURE.

1.3 Installation

CAUTION: INSTALLATION PROCEDURES SHOULD BE PERFORMED AT GROUND LEVEL.

CAUTION: MAKE SURE THAT ALL BATTERIES ARE DISCONNECTED THROUGHOUT THE INSTALLATION PROCESS.

CAUTION: NEVER INSTALL THE **BSG** UPSIDE

DOWN. Please follow these precautions during the installation

process:

- Choose a calm day.
- THINK SAFETY! Have someone available to help during the installation process.
- Disconnect batteries from turbine wiring.
- Prior to attaching the wires to the battery, tie the wind turbine output lead wires (*positive = red; negative = black*) together near the battery to be sure that the rotor will not spin-up during installation.

NOTE: Do not install the blade assembly until the turbine is mounted on the tower.

1.4 Operation

Check support structures, blades, and electrical systems on a regular basis.

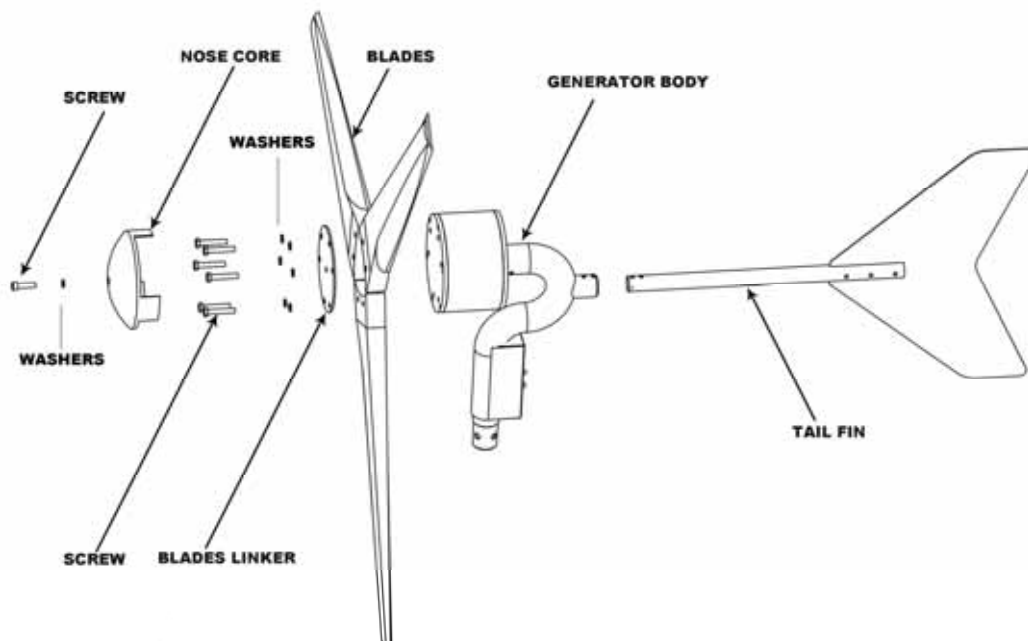
- The rotor blades are very strong; however, if they come in contact with a solid object, they can break. Use common sense about safety when locating the turbine.
- When performing periodic inspections, or at anytime when you must approach the path of the blades, disconnect the power leads from the battery and tie the wind turbine output leads together to stop (*slow down*) the blades from rotating. The turbine can also be shut down through the use of a stop switch. Please refer to Figure 3 on page 12 on how to install a stop switch in your system.

CAUTION: NEVER APPROACH THE TURBINE DURING OPERATION.

2. PACKAGE CONTENTS

Compare the parts shown in Figure 1 to ensure that the contents of the box contain all necessary parts.

CAUTION: THE EDGES OF THE ROTOR BLADES ARE SHARP. PLEASE HANDLE WITH CARE.



NOTE: need add screw washers when assembly 6blades and 1nose cone.

Figure 1

First please compare the parts listed below with the contents in the box which you receive to make sure that you have everything needed for assembly.

Content		Quantity
Manual		1
Generator assembled		1
Blades		3
Nose Cone		1
Blade Linker		1
Tail Fin		1
Solar & wind hybrid controller.		1
Hardware	Cone screw M8x35	1
	Blades screw M8x45	6
	Tail Screw M6x30	2
	Screw washers	7 Spring washers

		6 washers
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3. WIRING AND INSTALLATION PROCEDURES

Your **BSG** is shipped partially disassembled. Refer to page 18 for assembly instructions. Please completely read all procedures before beginning installation.

NOTE: Do not install the blade/hub assembly until the turbine is mounted on the tower

Required Tools:

- 6.0mm hex key wrench
- 8.0mm hex key wrench
- 14.0 hex key wrench
- Torque wrench with 250*30mm hex drives
- Soldering iron or propane torch
- Rosin core solder

- Wire strippers
- Wire crimpers

3.1 Wiring

3.1.1 Electrical Connections

NOTE: Refer To All Local and National Codes before Installation.

CAUTION: MAKE SURE THE TURBINE IS DISCONNECTED FROM THE BATTERIES DURING INSTALLATION.

CAUTION: CONNECTIONS SHOULD BE INSPECTED PERIODICALLY FOR SIGNS OF CORROSION AND CLEANED WHEN NECESSARY.

NOTE: All electrical power cables should be physically protected. Run the wires inside the tower or conduit for maximum protection.

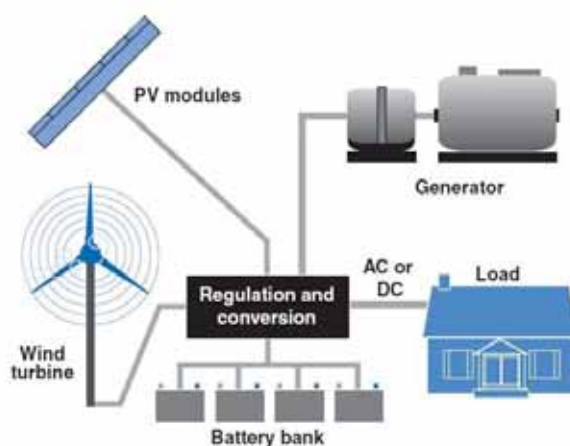


Figure 2

3.1.2 Wire Size

To select the appropriate size wire, measure the distance from the batteries to your **BSG**, then refer to the following wire sizing chart as *minimum* sizes. If cost is not an issue, a larger sized wire will improve the performance of your **BSG**.

We recommend these as the *minimal* wire sizes; for optimal performance you should use the largest wires that are practical and affordable. Local, state, and national electrical codes can substitute these recommendations, and should be followed to insure the safety of your system..

12volt :

Distance of generator to batteries(m)	10.6	10.7-17.6	17.7-28.2	28.3-44.1	44.2-68.1	68.1-110
Wire sqmm	6	10	16	25	35	50

24volt :

Distance of generator to batteries(m)	10.6	10.7-17.6	17.7-28.2	28.3-42.4	42.3-70.6	70.7-112.9
Wire sqmm	2.5	4	6	10	16	25

48volt :

Distance of generator to batteries(m)	10.6	10.7-17.6	17.7-28.2	28.3-44.1	44.2-68.1	70.7-112.9
Wire sqmm	1.25	2	3	5	8	12.5

Wiring Resistance and Regulation

Depending on your exact system configuration including other charging sources in your system, wiring resistance may affect the regulation set point of the turbine. Higher wiring resistance (smaller wires) will tend to lower the voltage at which the turbine enters regulation and stops charging. The recommended wiring sizes should provide little effect on the regulation set point, but all installations should be observed over time to ensure that the batteries are charged to the proper voltage.

3.1.3 Grounding/Lightning Protection

Properly grounding the turbine is very important in protecting the electronics for long-term operation. Grounding procedures must be followed along with any local electrical codes.

IMPORTANT: SEVERE TURBINE DAMAGE CAN RESULT FROM IMPROPER GROUNDING! FAILURE TO PROPERLY GROUND WILL VOID YOUR WARRANTY.

It is very important to ground your battery bank and ground your tower for lightning and static protection. Proper grounding also enhances the safety of your turbine system. The green lead wire provides grounding for the body of the turbine. This wire must be connected to the system earth ground. This is usually done by connecting a wire from a ground rod near the base of the tower to the green turbine lead wire. For additional lightning and static protection, another wire should connect this ground rod to the tower pipe.

3.1.4 Fusing

The **BSG** is capable of producing high amperages. As with all electrical installations, you must protect each of your turbines with a properly sized fuse or circuit breaker. The **BSG** should be wired with an appropriately sized "slow-blow" type fuse between itself and the batteries. If a controller is used, the fuse should be placed between the switch and the batteries.

3.1.5 Charge Controller

In the package, you will also find a solar & wind hybrid controller which is shown in the following picture, please note, this charger only use for Max.400W wind generator:

Please read this Manual carefully before using this equipment.

3.1.5.1 Security

In the design of this product has been fully taken into account the personal and property safety, but the un-correct using way may lead to the occurrence of failures, even lead to burn this charging controller, in order to guarantee the safety of you, please follow with the following rules when you are using this equipment:

- Need the guidance of the professional or contact with the dealer for the installing way when Installing the charger controller.
- Do not spill any liquid into the charger controller, please don't use the wet cloth to brush the shell of it.
- Do not let children or the lack of independent people to use this product
- This product should not be placed in the electric heater and other sources of heat use, and try to avoid direct sunlight
- Please check carefully before connecting to the solar panels, batteries and the load, their rated voltage should be the same, it should be 12V or (24V).
- Please pay high attention and make sure to connect to the right way of the "+", "-" poles of the solar panels, batteries and load.
- The diameter of the electrical wire should burden to the current..
- The current of the solar panels and load must be less than the rated current of the charger controller.
- The connections must be firmly and ensure good contact.
- Prohibit short circuit for the connected "+", "-" poles of the batteries.

3.1.5.2 Characteristics

B L A C K 2008 charge controller is battery power, constant voltage control mode, the 12 V, 24V batteries Universal. According to the battery voltage level, adjusting the charge current size, decide whether to load electricity or not, and has the following properties:

- .12V, 24V battery control system automatically switches
- .Brake show for the wind generator
- .12V, 24V switch Show
- Keep a full battery
- Prevent excessive battery charge
- Showing excessive battery discharge
- prevent the battery charging solar panels reversely at night

- Reverse connection for the battery protection
- Reverse connection for the solar panels protection.
- When the charge controller start up, it can set automatically the stop charging voltage, load downtime voltage, load restoration voltage according to the battery voltage, these parameters are the Windows default at the ambient temperature at 25 .
- The controller will automatically charge voltage temperature compensation According to the changes of the environmental temperature.
- Users can stop filling according to their own needs.
- To prevent excessive battery discharge, the charge controller control minimum load downtime voltage automatically, it should be not less than 10 V (for 12 V batteries) or 20 V (for 24 V batteries).

3.1.5.3 System wire connection

As shown as the following picture

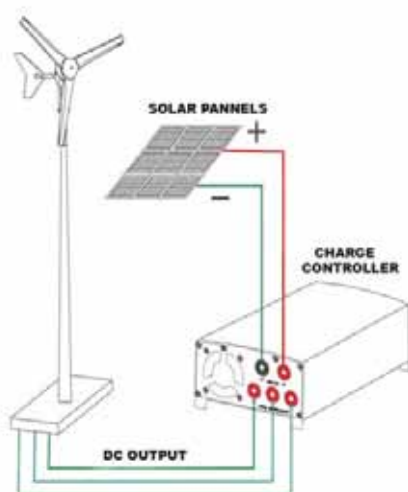


figure 3

- Please connect the “+”、“-”pole of batteries firmly to the end of output “+”、“-”poles of the charge controller.
- Connect the “+”、“-”poles of the solar panel to the solar “+”、“-”poles of charge controller.
- Connect the three phrases of the wind generator to the wind generator as shown in the above picture.

Attention please!

- Please make sure in connection of the “+”、“-”poles of the solar panels, batteries and load.
- According to the current, please select suitable diameter for electric wire, and must not be too small, recommended diameter ≥ 6 sq mm

3.1.5.4 Technic parameter

Style no : B L A C K 2008

input voltage : 12V or 24V DC
 stop voltage : 14.4V or 28.8V
 current of solar module : 10A
 Max. current : 40A
 Max. diameter of rotor blades : 1.80M

BSG in a system with solar panels(Hybrid System)

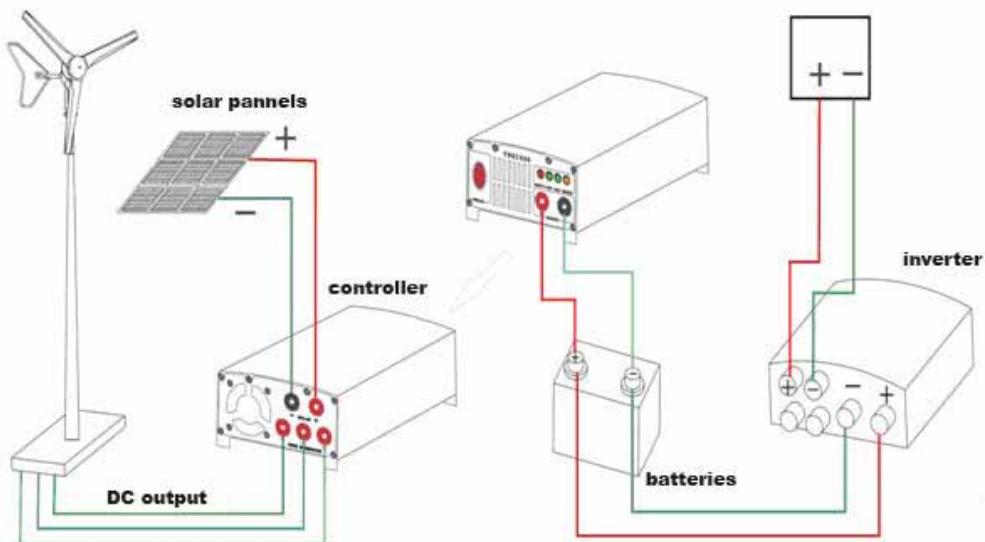


Figure 4-5

NOTE: In this drawing the BSG internal regulator is used. The other type external regulator can also be used. The version type regulator could be used in any of the systems.

3.2 Mounting Tower

Size of tower normally is 80mm diameter outside. There is a soft coupling inside the yaw shaft mount that is designed to provide a secure fit the tower. The pole must be mounted with hardware specifically designed for small wind turbines.

Attaching to Pole

While attaching the turbine to the tower, be careful not to pinch the yaw wires. Slide the yaw all the way down over the end of pole.

Make sure that your tower allows for proper clearance of the blades.



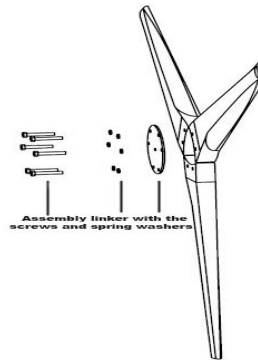
Figure 6

3.3 Rotor linker and Rotor Assembly

Before assembling the hub and rotor refer to *Figure 7* below, and the following detailed instructions.

Assembly with the screws and spring washers

NOTE: To avoid damage to the blades during installation, do not put the blade/hub assembly on the turbine until the turbine is mounted on the tower.



Blades linker direction: copper washer to blades

Figure 7

3.3.1 Mounting the Blades

CAUTION: THE EDGES OF THE ROTOR BLADES ARE SHARP.
PLEASE HANDLE WITH CARE.

Notice that the screw holes in the blades are counter-bored for the socket head cap screws. Place one of the blades with the counter bore facing up, and align the screw holes. Insert one of the socket head cap screws with washers through the blades and hub.

Repeat this procedure on all three blades. Do not over-torque.

Please note that over-torque of blades may cause damage to the blade and compromise the safety of the product.

A: Assembling the rotor blades and the blades protection plate.

B: Blades are in front of the wind turbine with a Blades protection plate. please make sure the concave surface of the blades is outside(or face to you).

C: Fix the blades according to the screw holes on it and the screw holes on the steel plate on wind turbine. Then tighten the Bolt M8x40 through the Blades protection plate and blades. The screw should be turn into the steel plate of the wind generator only 6mm. please pay high attention to this operation, otherwise, the wire coil will be destroyed by the bolts.

How bring the blades in Balance, so that the screws are only fixed with a small torque.

If the system is including the spinner is in balance, please fix all screws with a torque of 22 Nm.

D: Assembling the spinner

Place the spinner on the blades protection plate, thread the **Spinner screw M8x45** into the screw hole on the blades protection plate and tighten by hex key.

NOTE: so that you still can move the blades, then bring the blades in to the right position.

Please make sure adjusted the 3 blades in balance position.

When you got the balance, the blades can stay in at any position.

THIS IS VERY IMPORTANT!

Please add that the balance test, must be done without any wind.

3.3.2 Mounting the blades and adjust balance process:

1: assembly blades with screws and washers. Screws keep slightly.

2: assembly nose cone, and mark the location.

3: unloaded nose cone when adjusted to balance.

4: tight all screws include the screws of blades finally.

NOTE: the relative Position of nose cone and blades is very important, so keep the consistent relative position after and before the adjust balance.



Figure 8

Please inform in point 2, that is should be dangerous to install the blades in the wind, because after assembling, the rotor begin to turn and you can't stop it, so please be sure, that the rotor is anywhere fixed before the wind turbine is not ready installed.

When the wires to the charger are fixed at the generator, the please bring at the other

wind of the wire a shortcut between all three phases.

CAUTION: THE BLADES ARE SHARP. USE CAUTION WHILE HANDLING THE BLADES.

3.4 Step-By-Step Instructions

The following *Step-By-Step-Installation-Procedures* provide you with an outline of the **BSG** installation process. This consolidated reference should only be used as an outline during installation. Refer to the appropriate sections for further details.

- 1) Run the wires from the battery (do not connect to the battery), through the pole to the top of the tower. **Be sure not to connect the wires to the battery until everything else has been completed.**
- 2) Strip the insulation back from each set of wires.
- 3) Connect the wires from the **BSG** to the wires running to the battery.
- 4) Insulate the connections using either heat shrink tubing or a quality electrical tape.

CAUTION: IF THE WIRES ARE HOOKED-UP BACKWARDS YOU WILL DAMAGE THE BSG ELECTRONICS. (IF YOU ARE UNCERTAIN OF THE POLARITY OF THE WIRES, SPIN THE ROTOR SHAFT AND MEASURE THE VOLTAGE DIRECTION WITH A VOLT METER).

- 5) Once the wires are attached to the **BSG**, Do not use plastic pipe.
- 6) Remove the nut on the rotor shaft, and carefully attach the assembled hub and blades to the rotor shaft without pushing the rotor shaft into the turbine.
- 7) Run all wires from the turbine to the battery. Be sure to crimp and solder the connections using the appropriate sized connectors. If you plan to connect an amp meter into your system.

IMPORTANT: SEVERE UNIT DAMAGE MAY RESULT FROM IMPROPER GROUNDING. FAILURE TO PROPERLY GROUND THE TURBINE WILL VOID YOUR WARRANTY.

- 8) Before attaching the wiring to the battery, make sure that all circuit breakers are in the off position.
- 9) Attach wires to the battery.
- 10) Turn on the circuit breakers. When the BSG is first connected to the battery bank, the

microprocessor will blink the LED twice to indicate that the control circuit is running correctly. Once the blades reach 1600 RPM, the turbine will begin charging and the LED will turn on. The LED can be difficult to see during the day.

11) You have now completed the installation process.

4. TESTING

4.1 General Discussion of Operation

NOTE: The **BSG** Built-in magnetic field with dual power system and scientific wind sweeping leaves area.

NOTE: Bad connections, undersized wires, and inline diodes will cause the internal regulator to not work properly. It is very important that the BSG can “sense” the proper battery voltage.

4.1.1 Over-speed Protection

All wind turbines must have some form of over-speed protection in order to survive high winds. Most small wind turbines rely on a mechanical method of bending or tilting out of the wind. The BSG was unique in using brake circuit for over-speed protection.

But also keep the no noise when it brake.

If the BSG senses the RPM above 1600, it will shut down until the wind speeds reduce.

The controller of BSG will blink the LED.

a) Open Circuit

When the turbine is disconnected from the batteries, it will “free-spin”. In this mode the generator can spin “unloaded” with the wind. The internal regulator has a high-speed regulation to protect the circuit from high voltage conditions. However, when a high voltage condition is sensed, the turbine is stopped which causes the voltage to drop and the high voltage condition to end. The result is an oscillating mode which is not recommended.

Operating the turbine in open circuit for a brief period of time will not damage the turbine. However, operating the turbine in open circuit for a long period of time can cause excessive wear to the turbine and is NOT recommended. We recommend that during long periods of operation the turbine should be connected to a battery or the turbine wires should be shorted. Shorting the turbine will minimize wear to the bearings and prolong turbine life and is quieter than running open circuit.

b) Normal Operation (Charge)

When the generator is connected to a battery bank in need of a charge, the turbine blades will spin “normally” with the wind. The turbine will charge the battery bank as necessary until the battery voltage matches the regulation set point.

NOTE: When switched from open circuit to charge, you may notice a reduction in RPM as the generator is now “under load”. If the batteries are fully charged the turbine blades will slow to a silent spin.

When charging, the **BSG** Controller will turn on the LED.

c) Stall Mode

It will depend on the exact wind speed. When the wind speeds reach 50 mph, RPM reach 1600 RPM. The turbine will shut off completely and the RPM will slow to almost zero.

4.2 Testing

Three quick bench tests can verify if your **BSG** is working correctly.

Test 1

1. Remove blade assembly from turbine and place in a safe location. (*Do not stand the blade assembly against a wall.*)

2. Spin rotor shaft with your fingers while at the same time connecting and disconnecting the two yaw wires.

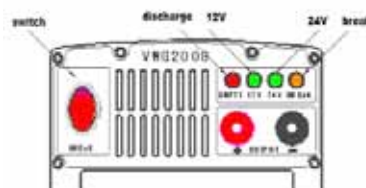
3. With the yaw wires connected, the rotor shaft should become more difficult to rotate and feel “lumpy”. With the yaw wires disconnected it should spin freely. If these conditions do not exist, you should contact your turbine dealer or BSG Wind power.

Test 2

1. Remove blade assembly from turbine and place in a safe location.

2. Each time the **BSG** is connected to a battery, the LED will blink to indicate that the controller is running properly.

The test is in order to let any internal voltage drain. If the LED does not blink when the **BSG** is connected to a battery, you should contact your turbine dealer or BSG Wind power.



5. TROUBLE SHOOTING

If the turbine does not work properly after following the installation instructions, then read this chapter and carefully compare your installation with each section.

5.1 Assembly

Make sure the blade assembly is on tight. You can check by placing the 14.0 hex key in the shaft, holding it and attempting to turn the blade assembly. If you can turn the blade, retighten the blade assembly.

5.2 Electrical System

Measure the voltage at the battery terminals to which the *BSG* is connected. For the factory regulation set point, if the voltage for a 12v system reads 14.4V or higher (24v 28.2), then the turbine will sense the battery is charged and stop producing power.

While you are conducting output tests, make sure no other devices such as alternators or photovoltaic panels are charging the batteries at the same time. The total voltage from other charging sources could increase the battery voltage causing the **BSG'S** regulator to think the batteries are charged and prematurely stop charging.

Also, check the condition of each individual battery. One bad battery can create high voltages (16-18 volts) and stop the turbine from charging. Consult the battery manufacturer for testing individual batteries or cells.

5.3 Elevation

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

1-500 ft	(0 – 150 m)	100%
500-1000 ft	(150 – 300 m)	97%
1000 - 2000 ft	(300 – 600 m)	94%
2000 - 3000 ft	(600 – 900 m)	91%
3000 - 4000 ft	(900 – 1200 m)	88%

6. WARRANTY POLICY

What Is Covered and For How Long

For turbines that are one year old or less from date of original purchase or one year and three months from date of build, any defective part will be replaced at no charge. Either a BSG wind power technician or an Authorized Service Center determines a defective part.

What Is Not Covered

- Damage due to lightning
- Damage due to extreme winds (110 MPH+; 60 m/s)
- Damage due to improper installation (including to but not limited to poor tower design & inverted hanging)
- Damage due to improperly wiring to batteries
- Blade damage resulting from contact with flying debris

Limitations and Exclusions

- 1) No one has the authority to add to or vary this limited warranty, or to create any other obligation in connection to BSG Wind power and its products.
- 2) ANY IMPLIED WARRANTY APPLICABLE TO BSG WIND POWER'S PRODUCTS IS LIMITED IN DURATION TO THE SAME PERIOD OF TIME AS THIS WRITTEN WARRANTY.
- 3) BSG WIND POWER SHALL NOT BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL, SPECIAL, OR CONTINGENT DAMAGES THAT ANY PERSON OR PROPERTY MIGHT SUFFER AS A RESULT OF ITS BREACH TO THIS WRITTEN AND OR IMPLIED WARRANTY.
- 4) This warranty applies to the original purchaser and may be transferred.

The Customer's Responsibilities

All of BSG Wind power's products must be installed and operated in accordance to the

owner's manual and local codes. Any modifications to the turbine design will void the warranty and compromise the safety of the machine.

You should keep a copy of the invoice or canceled check to verify the purchase date.

You will be responsible for shipping the turbine to the repair center if necessary.

If You Experience a Problem with Your BSG Wind power Product

Contact your nearest authorized service center or BSG Wind power to determine the nature of the problem.

Either BSG Wind power or the Authorized Service Center will issue a return authorization number to return the turbine, or send you the replacement parts needed to repair the machine.

7. TECHNICAL SPECIFICATIONS

Type No.	BLACK 300-12V
Rotor Diameter(m)	1,22
Start up wind speed(m/s)	1
Cut-in wind speed(m/s)	1.8
Rated wind speed(m/s)	9.5
Turbine Rated output (W)	300
Survival wind speed(m/s)	45
Solar energy input(W)	150
System Voltage(V)	12 or 24

Type No.	Black 600
Rotor Diameter(m)	1.66
Start up wind speed(m/s)	0,8
Cut-in wind speed(m/s)	1.8
Rated wind speed(m/s)	11
Turbine Rated output (W)	600
Survival wind speed(m/s)	45
Solar energy input(W)	150
System Voltage(V)	12/24/48/72

Type No.	Black 1500
Rotor Diameter(m)	2,9
Start up wind speed(m/s)	0,6
Cut-in wind speed(m/s)	1,8
Rated wind speed(m/s)	9.5
Turbine Rated output (W)	1500
Survival wind speed(m/s)	45

Solar energy input(W)	500
System Voltage(V)	48 or 72

8. MAINTENANCE

Although your **BSG** has been designed to run for long periods without requiring any maintenance, reliability and performance will be enhanced if you periodically inspect your system. Before performing any inspection, be sure to shut down the turbine.

CAUTION: NEVER APPROACH THE TURBINE DURING OPERATION.

THE ROTOR BLADES ARE SHARP. PLEASE HANDLE WITH CARE.

The BSG is a very reliable set and is designed to run for long periods at severe conditions without any maintenance. But routine checking of your own system tower and cable wiring system is suggested to maintain the reliability and performance of the system.

The following items should be checked when bad weather:

· Please check the wind turbine in strong wind areas two times the year, in normal wind areas one times the year or after every strong storm with a wind speed over 25 m/s or hail.

·If you polish the blades surface, before the wintertime is coming with a politure with nano or lotus flower effect, then there can not set any ice or snow at the blades.

So the wind turbine can better work under snow conditions. if you are not sure, if there is any problem with the wind turbine, don't use it and fix one blade with a a robe at the pole and let the wind turbine work after a professional specialist have check your system.

·If you hear, that a extreme wind is coming, please also fix one rotor blade to the pole with a robe. Then you will have a long lifetime with your wind turbine without any complications.

·Check guy rope tension and tighten if needed, especially after storms. During first three months after erecting the tower, periodic inspection should be carried out.

·Check all electrical connections to make sure they are properly connected, tightened and free from corrosion.

The following items should be checked two months after the initial installation and then every six months thereafter:

• Check blades for chips or nicks. Replace blades if damaged. **Do not operate the turbine with chipped or unbalanced blades. This can cause severe wear,**

damage, and possible failure. Do not install individual blades. The blades are balanced as sets.

- Check the blade bolts and the hub nut for tightness. Please check if the blades are smooth and free of any crack, check all screws that all screws are still fitted, special also the screws which fix the generator.
- Make sure the yaw clamp bolts securing your **BSG** are tightened to the appropriate torque specification see Section 3.2.1.
- Inspect the tower.
- Dirt or debris build-up on the blades and body may cause a decrease in performance of the turbine and or long-term damage that is not covered by the warranty. Wash off any buildup with clean soap and water.
- Check all electrical connections to make sure they are tight and free from corrosion.
- As with all charging systems, check your battery water levels and add distilled water in accordance with manufacturer's recommendation.
- Check the nose cone.

8.1 BATTERIES

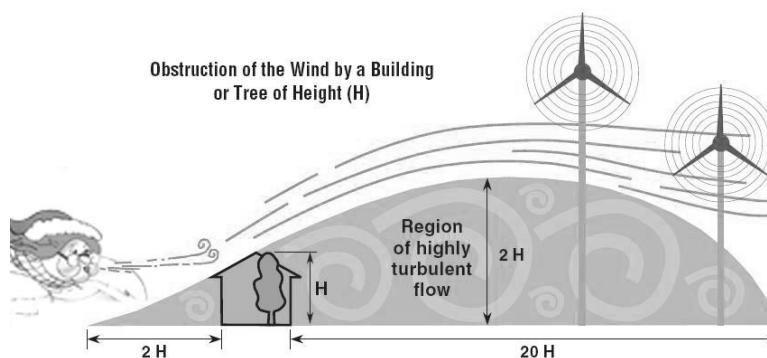
It is important to consult your dealer for the most up-to-date information and for help in selecting the appropriate battery.

NOTE: Refer to battery manufacture for specific recommendations regarding installation, maintenance, charging and operation.

9. SITING

There are two basic requirements for a good site: high average wind speed and low wind turbulence.

The lower the wind turbulence, the lower stress the wind turbine will have to endure. Lower turbulence also results in more power, the zone with high wind speed but high turbulence is not a desirable site.



Power in the wind is the cubic function of the wind speed. This means that small changes in wind speed can have dramatic changes in output. Even slight changes have dramatic effects.

CAUTION: DO NOT INSTALL THE TURBINE WHERE THE PATH OF THE BLADES CAN BE REACHED.

CAUTION: DO NOT APPROACH THE TURBINE FOR ANY REASON UNLESS ROTOR BLADES ARE STOPPED.

Please add safety notice, when the rotor is turning, the blades are nearly transparent. so made sure, that nobody can come in touch with the rotation blades, this is specially very important at boats and yachts. Also take care, that nothing can com in to the turning rotor, like some robe.

When this wind is string, the rotor blades are a little deforming, in the direction of the pole. so it is important, that the pole have in the area of the rotor blades, no bigger diameter then 55 mm.

also you can choice proper position of your BSG according to the figure 9:

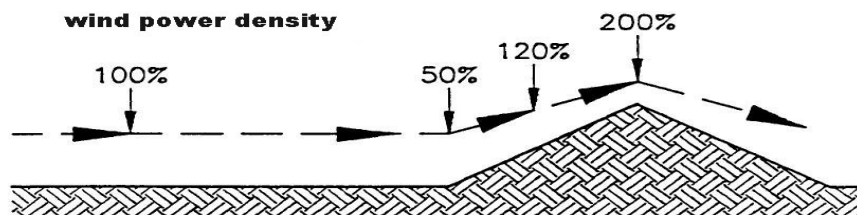


Figure 9

10. TOWERS

There are a few things to consider when choosing the correct tower for your turbine, site and budget. The following is a list of considerations:

- Site: trees, hills, buildings
- Tower budget
- Space for tower; guyed, freestanding, rooftop
- Number of turbines to be installed
- Ease of use

It is important to mount the turbine in the best winds while being balanced by the cost and effort of the installation. As a rule, the higher the tower is erected, the greater the output. However, the taller tower also involves greater tower cost and effort. If purchasing a taller tower will provide significantly more power it might offset the additional cost and effort.

CAUTION: PROPER ENGINEERING, SAFETY CONSIDERATIONS AND LOCAL CODES SHOULD BE ADDRESSED BEFORE ATTEMPTING ANY INSTALLATION.

Tower Kits

Contact your dealer or Black Series Generator Wind power for pricing and product information.