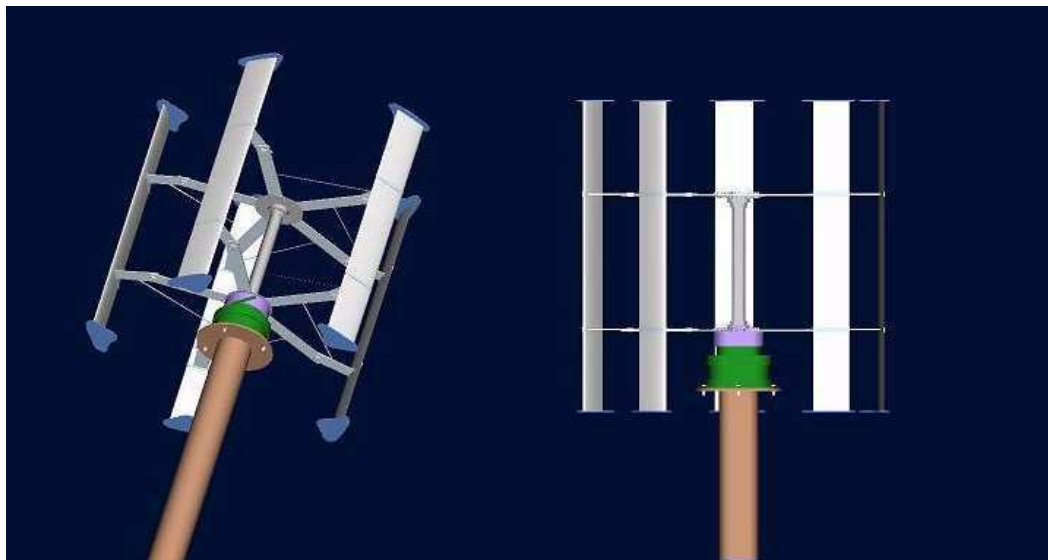




INSTRUCTIONS
for
INSTALLATION, TESTING, AND MAINTENANCE
3KW and 10KW VAWT
Wind Generators



WINDECO LIMITED

Energy Creation House

Ladysmith Road

Grimsby

N E Lincs

DN32 9TW

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1 About the product

This product can be used by in many areas where there is a good wind resource, such as building roofs in cities, Green buildings, and off-grid locations worldwide. Our wind turbines provide stable and reliable electricity for lighting, household electrical appliances, telecommunications sites, remote equipment, and military operations. It is the ideal power supply equipment for families and companies.

2 Major components and working rationale

The system consists of a pillar, wind generator, batteries for energy storage (Off Grid System), and the inverter / controller. The Mill is pushed by wind at speed from approx. 5.5mph to 55mph to rotate and make the generator produce power in varying AC form. This varying AC power is changed into DC form by the charge controller / rectifier to be saved in storage batteries. Then, DC power is changed into standard AC power through the inverter at 50hz or 60hz for worldwide usage.

3 Connectivity instructions

Connect the batteries in series mounting based on different voltages with the wires provided with the storage batteries. Then connect it with the corresponding terminal of the inverter/controller. Make sure that all of the contacts of the batteries and inverters are well connected. Anode end should be connected with anode end while cathode end should be connected with cathode end. If you do not understand series / parallel / wiring, call us or call your local electrician.

4 Installation instructions

4.1 How to find a good location

The turbine and pillar should be installed on a flat area with a good wind resource. Placement in the absence of large structures and trees is encouraged. There should be nothing higher than the turbine within a 100 feet radius.

4.2 How to set up the foundation

Fix the base onto the concrete foundation according to the Foundation Figure, and position the base to a level position. Curing period for the concrete foundation is 100 hours, although waiting 28 days is recommended. Enough space should be given to lift the wind turbine unit. The distance of the generator to the inverter/controller should be less than 43 feet, dependent upon the wire size used.

(Note: Controller may be placed into an accessible, weatherproof, ventilated container).

4.3 How to assemble the pillar and wind generator

4.3.1 Assemble the pillar and pilot set up

Lift the pillar to the base of the concrete foundation, to place and to the foundation bolts, then tighten all the nuts in turn.

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4.3.2 Main parts and Main Shaft of the unit. Fig 1

1. Stabilizer Airfoil	13. Bolt, Nut, Gasket, Spring Gasket
2. Retaining Arm	14. Airfoil
3. Pillar / Tower	15. Bolt, Nut
4. Cotter Pins	16. Bolt, Gasket, Spring Gaskets
5. Bolt, Gasket, Spring Gasket	17. Brake Hub Main Shaft
6. Bolt, Bolt and Gasket, Spring Gasket, Set Screw	18. Set Screw
7. Connecting Base, Inner Ring	19. Nut, Gasket, Spring Gasket
8. Generator (PMG)	20. Upper Main Drive Connection
9. Main Shaft Bearing & Lock Pin	21. Connecting Base
10. Set Screw	22. Bolt, Nut and Gasket, Spring Gasket
11. Upper Flange	23. Pillar / Tower
12. Set Screw	24. Spring

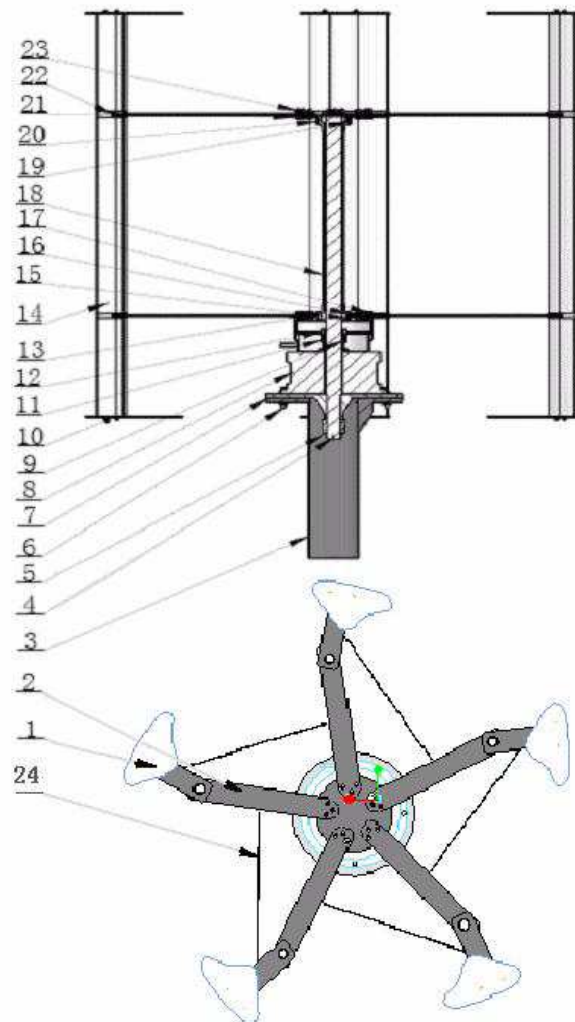


Fig 1

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4.3.3 Installation process

Step 1: Install the Upper Flange and Brake Hub onto the Main Shaft. Fasten them with bolt and Set Screw as shown in Figure 2.

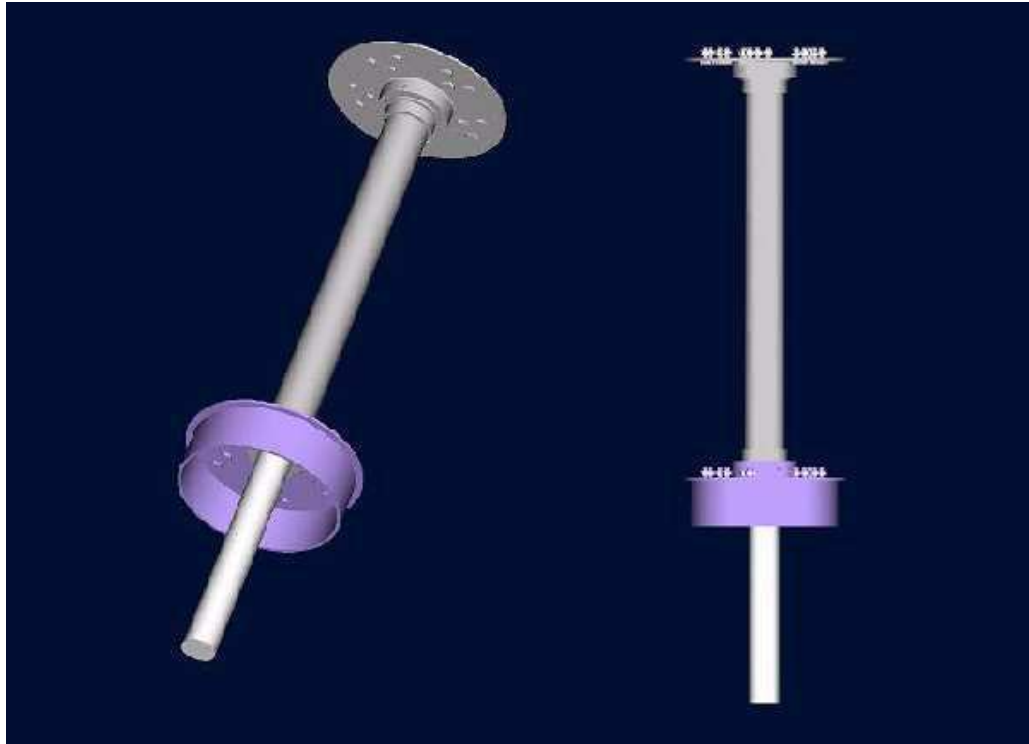


Fig 2

Step 2: Install the Inner Ring on the axis of the generator, tighten with bolt and Set Screw as shown in Figure 3.

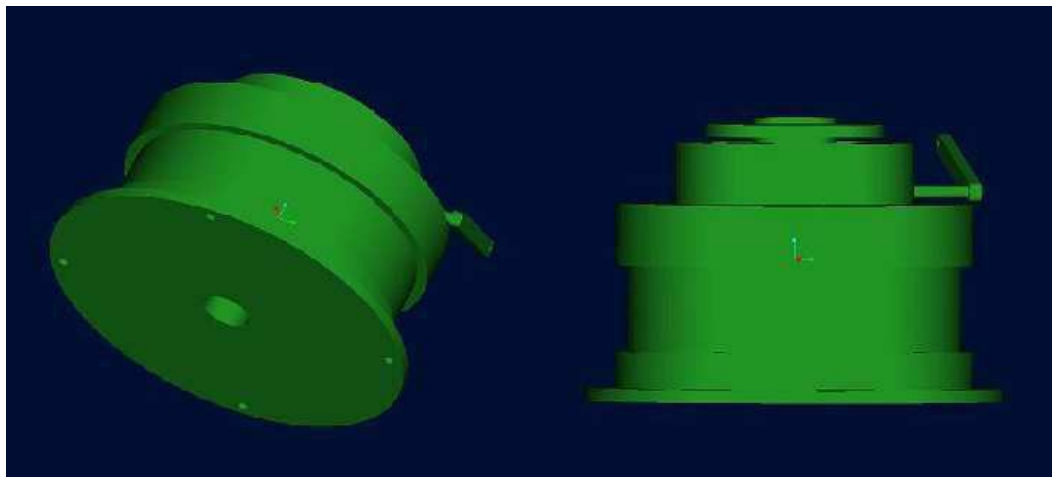


Fig 3

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Step 3: Install the main shaft onto the generator, fasten with nuts, gaskets and spring gaskets as shown in Figure 4.

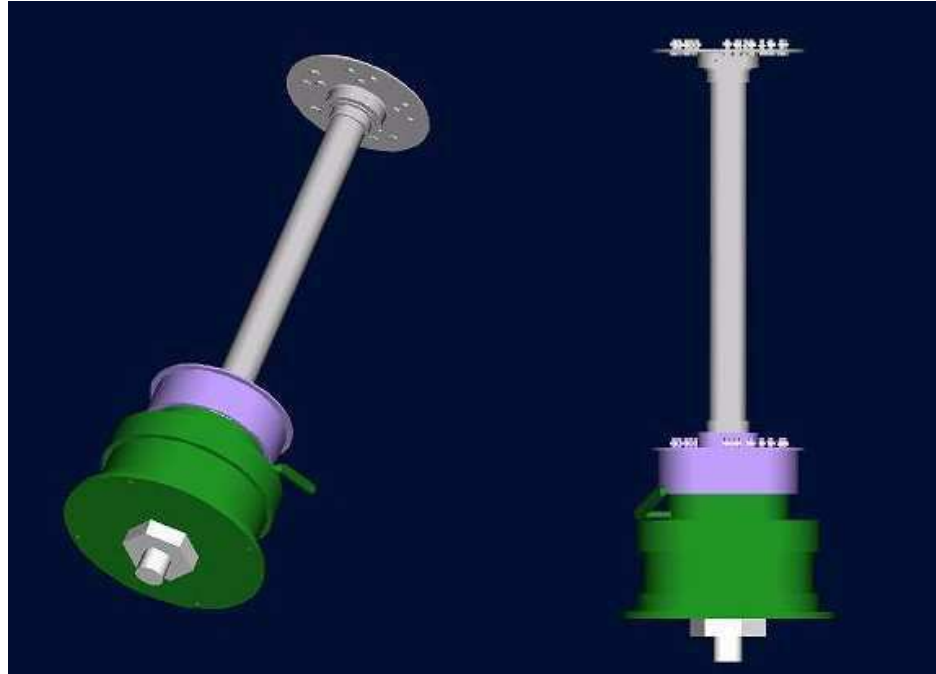


Fig 4

Step 4: Connect the long and short retaining arms to the upper and lower flanges with round nuts. Then install airfoils (blades) to the retaining arms and fasten with bolts and nuts. Next, install the stabilizer airfoil to the blades and fasten with bolts, gaskets, and spring gaskets. Lastly, silicon the airfoil and stabilizer airfoil on each end with structural silicone for fibreglass. Please refer to Figure 5.

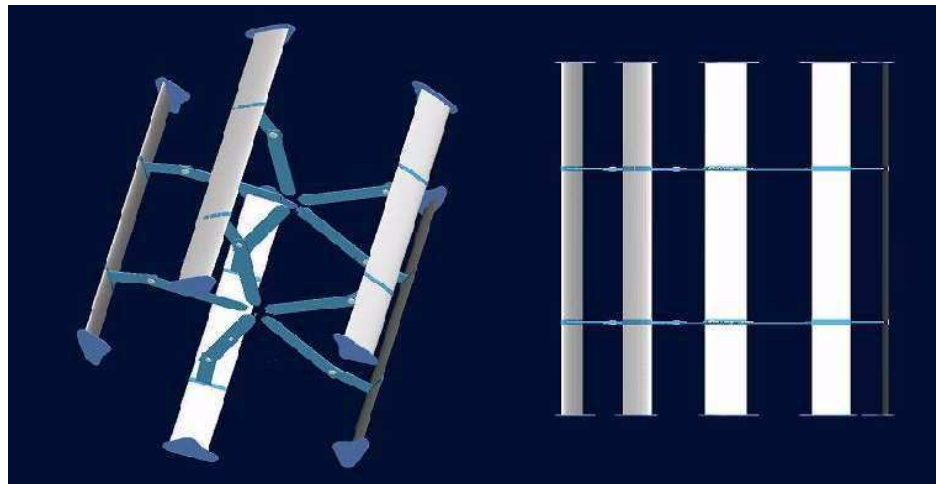


Fig 5

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Step 5: Install retaining arm to the upper flange and brake hub and fasten with bolts, nuts, gaskets and spring gaskets. Then install the spring and the tensioner. When the spring is extended, turn the tensioner around it 5 times as shown in Figure 6.

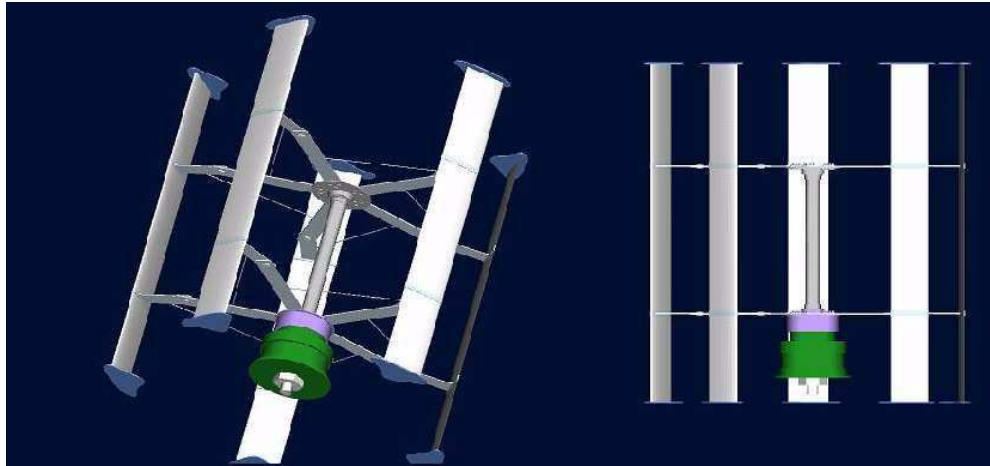


Fig 6

Step 6: Assemble the wind generator. Install the wind turbine on top of the tower and fasten with bolts, nuts, gaskets, and spring gaskets as shown in Figure 7.

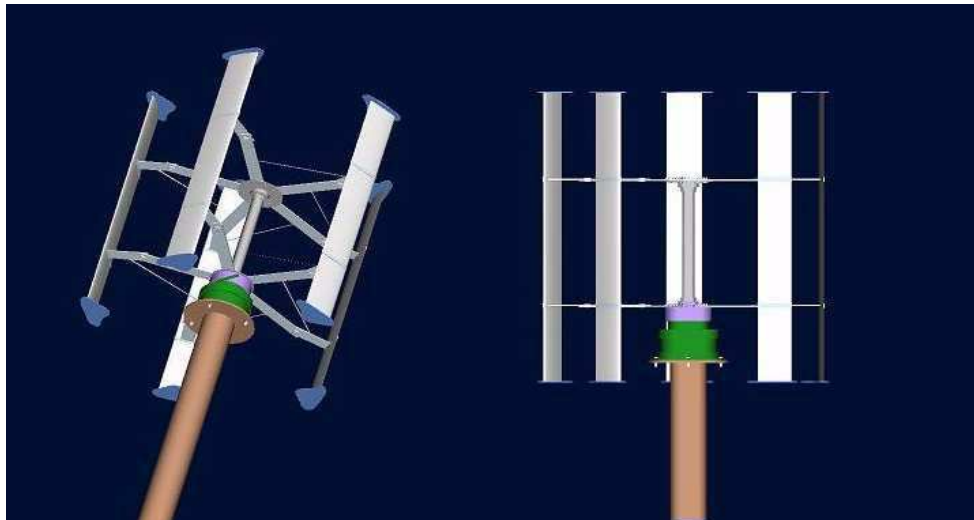


Fig 7

Note: All bolt connections should be reinforced with Loc-Tite® on the bolt threads.
Grease all moving parts with marine grade grease!

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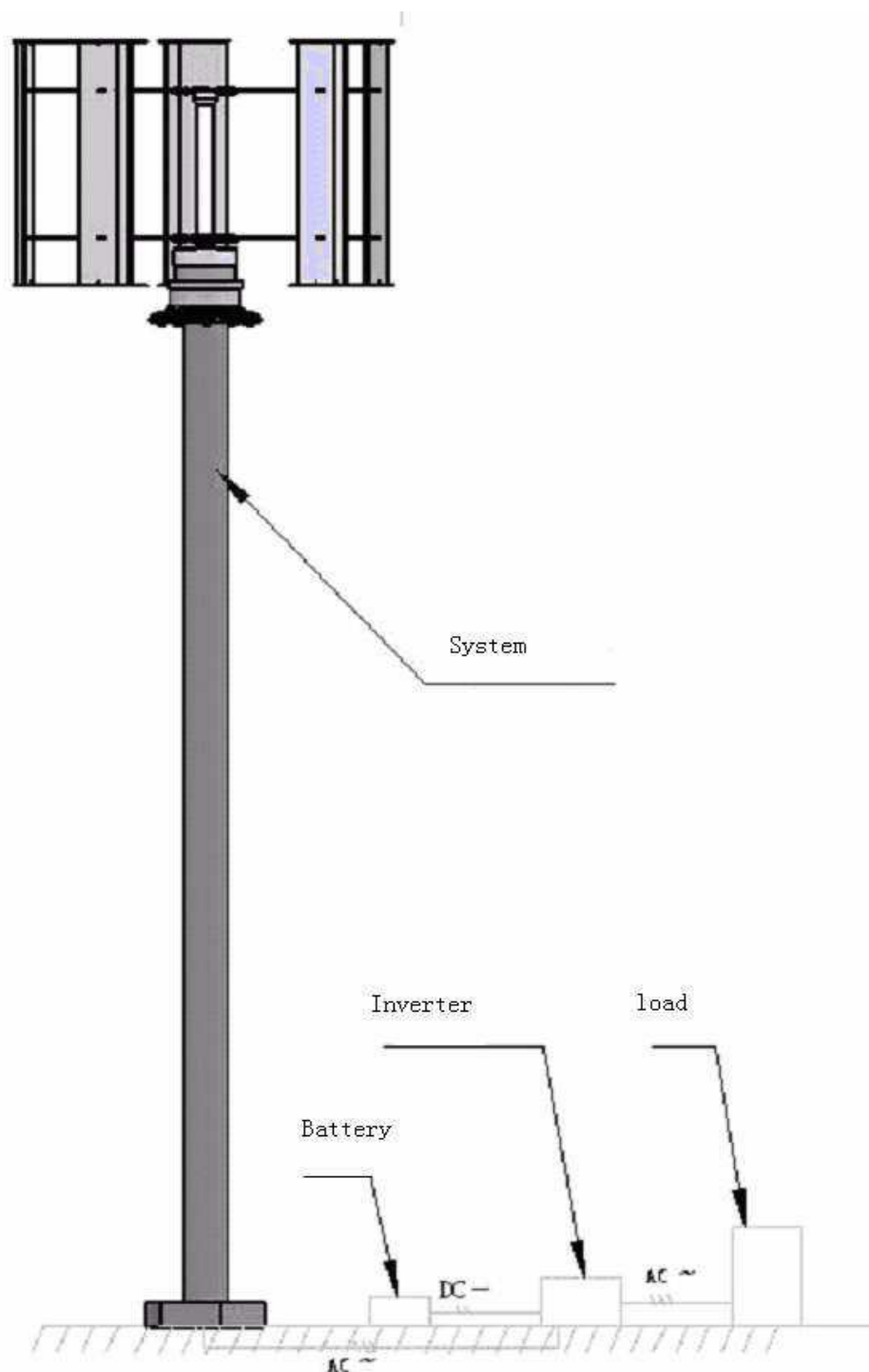


Fig 8

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5. Testing

1. Check all bolts before testing to make certain they are all securely tightened.
2. Turn the mill slightly by hand to check for errors. If there is a connection error, correct this before continuing.
3. Connect all the wires: connect the generator, inverter/controller, and the storage batteries with cables provided as shown in Figure 8.

To avoid risk of danger and accident, installation should not be conducted when there is strong wind, typically greater than 15mph or 7m/s!

6. Instructions on maintenance

Appropriate and timely maintenance of the system is directly related to the performance and life cycle of the system. Key points are:

- 6.1 Inspect, clean, and lubricate all accessible rotating/moving parts once a year.
- 6.2 Clean, de-rust, and paint all of the exposed parts every two years.
- 6.3 Frequently check the tension of pillar guy-wire cables, if applicable. If any of the cables loosen, they should be readjusted promptly. Adjust tower/pillar to a plumb position.

7. Other Reminders:

- 7.1. Inverter/controller should be placed in a dry, ventilated, and non-polluted environment.
- 7.2. If power storage batteries are used, we recommend AGM Type batteries so they may be placed inside or outside in a power shed. Your diesel generator could also be placed here.
- 7.3. Do not leave anything on or near the terminals of the storage batteries, this will prevent short circuits.

8. Troubleshooting

Problem	Possible Cause(s)	too small
Abnormal noise	1. Fastened parts are getting loose 2. Connection between the bearing of the generator and the base is getting loose 3. The bearing of the generator has been damaged 4. Mill rubs with other parts 5. Rotor and stator rubs with each other	
Rotating speed of the mill is obviously decreasing	1. Rotor and stator rubs with each other 2. Short circuit occurred in rotor winding 3. The switch is in the Off position	
Output voltage is low	1. Rotating speed of the generator is low 2. Permanent magnet rotor is de-magnetized. 3. Short circuit exists in the stator winding 4. Slip ring in power transfer and joints of output wires are not conductive. 5. Low voltage power line too long, wire	

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Possible Solution(s)

1. Check the loose parts and fasten again
2. Find out the exact point and fix it
3. Change the bearing

4. Inspect and fix it
5. Repair the rubbing points

1. Disassemble the generator to restore the specification data in the magnet.
2. Find the point of short circuit and peel off old insulation and re-insulate
3. Put the switch to "On"

1. Find the cause to restore the normal speed
2. Change the rotor

3. Find the point, and paint it to insulate.

4. Clean the slip ring and joints.

5. Shorten the wire or enlarge the wire diameter to decrease wire-loss in wire run.



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No output current from the PMG	1. Output wire is broken 2. Stator winding burned/broke.	1. Find the point and reconnect 2. Disassemble and fix
AC output is good, but no DC output	1. DC safety belt broken 2. Output wire is broken 3. Rectifier is damaged	1. Change the safety belt 2. Find the point and reconnect 3. Change the rectifier
Output capacity of the storage batteries is not sufficient	1. Output voltage is too low from the generator, or no power 2. Terminals of the storage batteries are acid etching, conductance broken. 3. Storage batteries expired	1. Refer to the solutions for Problem 3 2. Clean the joints, fasten the connection, and apply protective oil. 3. Change the batteries

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