

Introduce

IGET Wind Generator-400 rotor blades, by applying the latest advanced thermoplastic engineering, are manufactured by precision injection molding process to make blades exceptional consistency of aerodynamic outline and mass distribution that ensures the rotors to operating at nearly no noise performance and minimal vibration. The IGET-400 has very low start-up/cut-in wind speed, high wind energy coefficient, and is specially designed to prevent the blades from feathering by aerodynamical effect.

IGET-400 has adopted high-quality permanent magnet, so the alternator is a miniature set with high power generating efficiency. The unique winding and pole wheel design reduces the start-up torque of alternator that warranty IGET-400 can generate electrical at a very low wind speed.

The IGET-400 body is made from high-quality aluminum by precision casting process to enhance its fitness and excellent finishing. The IGET-400 is designed for various working conditions such as severe climate, sand and salt corrosive environment and marine and etc.

The IGET-400 is an exquisite set with unmatched power generating performance. It is not only a clean power source, but also admiring scenery for modern living environment.

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We believe that you will find your IGET-400 simple to install; however, it is important that you read this manual thoroughly, prior to installation, to assure proper performance and safety.

1. Package Contents

Compare the parts listed below with the contents of the box to make sure that you have everything need for assembly.

Wind turbine generator

Content		Quantity
IGET-400 Generator assembly		1
Rotor blade		3
Rotor hub		1
Front cover		1
Solar & Wind Controller		1
1.2m Cable		1
Connecting rod		1
Blade assembly hardware	M8*30 Bolt	9
	M8 Flat washer	9
	M8 Nylock nut (Can't repeat usage)	18
Front cover assembly hardware	M6*35 Bolt	1
	M6 Flat washer	1
Yaw pole assembly hardware	M8*15 Bolt	4
	M8 Flat washer	4
	M8 Lock washer	4
Tool	M6 Hex key	1
	M8 Wrench	1
	M24 Wrench	1
IGETG-400 Owner Manual		1



Fig.1.1 Wind turbine generator

2. Siting

Siting is an important but complicated issue for wind power system design. Consulting wind energy specialist is highly recommended if user is not familiar with wind system.

Four general rules are listed as below for consideration:

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

The higher the average wind speed, the more the power will HWG-400 is generated. The power available in the wind goes up with the cube of the wind speed. For example, the power available in the wind of 5m.s^{-1} speed is nearly twice as of 4m.s^{-1} .

The lower the wind turbulence, the lower the 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.

2.2 Install the wind turbine at a point as high as you can. The higher the tower, the higher the wind speed and the lower the turbulence. The recommended tower height for the IGET-400 is 8 m above ground level without barrier.

2.3 Barriers (trees, buildings, etc.) to the flow of wind will produce wakes that may extend far downwind of the barrier and to a height considerably above the barrier. These wakes are areas decreased wind speed and potentially damaging turbulence.

As 2 rule of thumb,

- A tower immediately downwind of a building should be at least twice of the height of the building.
- A tower should be at least 6 m higher than the highest barrier within 150 m radius.

2.4 The local and national codes and requirements should be complied with.

3. Tower

3.1 The IGEG-400 is flanged to the tower. Dimensions of the adapter are shown in figure.

3.2 The IGETG-400 is designed to withstand a maximum horizontal direction force of 500 N on tower so the tower is capable of withstanding the wind load.

3.3 A guyed steel pipe tower is the most economical method to fix a turbine. 1 1/2 inch or 2 inch SCH 40 steel pipe is recommended for the HWG-400 guyed tower.

3.4 The tower should be properly electrically grounded.

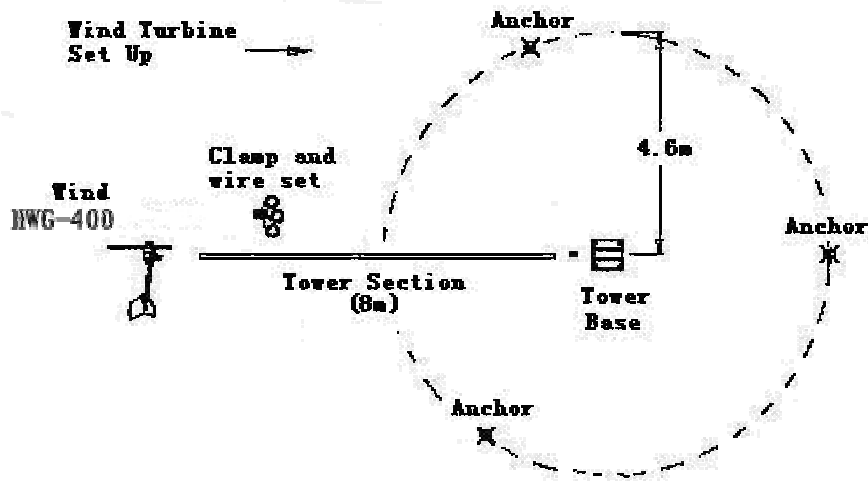


Fig.3.1 The tower base pad layout



Fig.3.2 Fix tower base



Fig.3.3 Fix tower bolt



Fig.3.4 Connect tower tube



Fig.3.5 Fix wires and clamp



Fig.3.6 Fix malleable clamp



Fig.3.7 Pull to rise tower

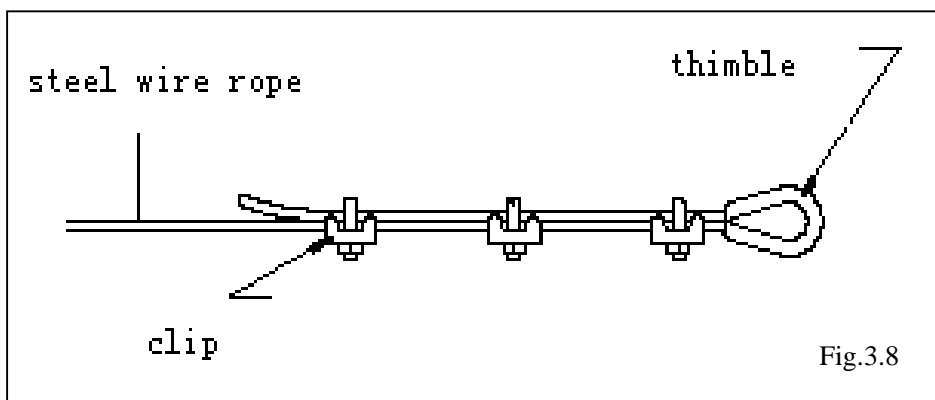
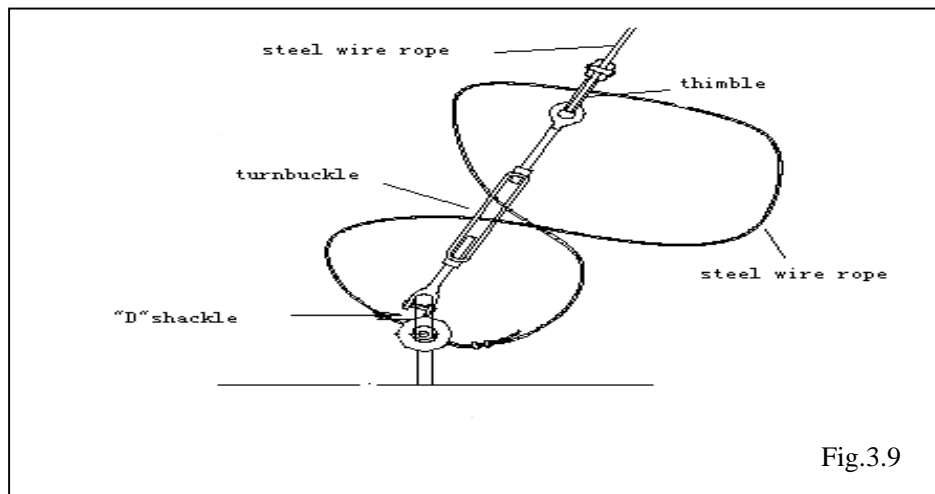


Fig.3.8

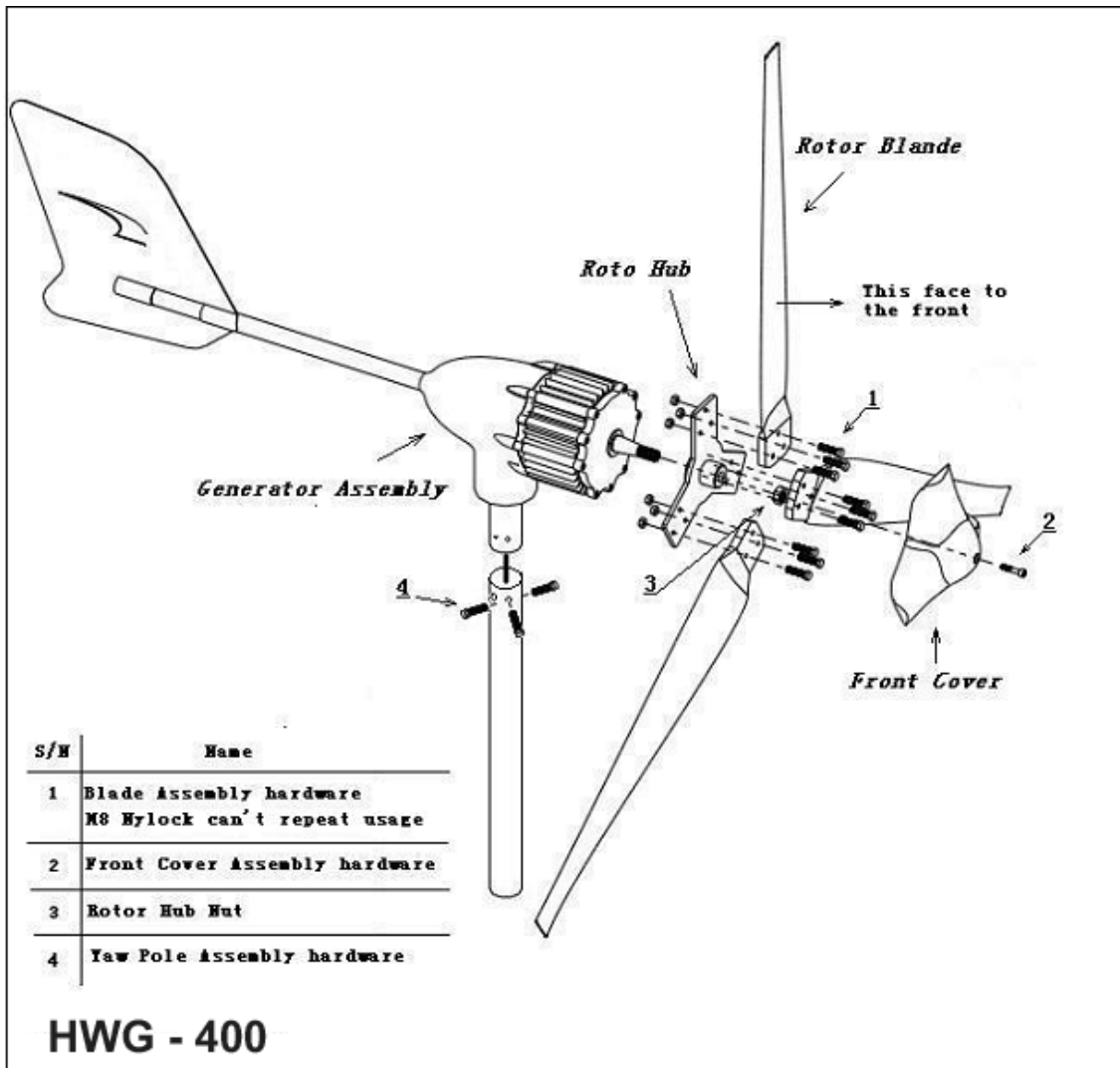


Warning:

- 1. As the turnbuckle is easily turned as the steel guy wire rope loose. So the turnbuckles must be guarded by the ∞ shape safety wires.**
- 2. As the wind turbine generator is quite heavy, enough persons should be available for erection when it is not erected by a pulling machine.**

4. IGET-400 Assembling

Assemble HWG-400 referring to following figures.



4.1 Mounting the rotor hub

- 4.1.1 Remove the nut, lock washer and flat washer from the alternator shaft;
- 4.1.2 Slide the rotor hub onto the alternator shaft and place the flat washer, lock washer;
- 4.1.3 Thread and tighten the nut on. The nut should be tightened to 70-85 Nm.

4.2 Mounting rotor blades

- 4.2.1 Blades are in front of the rotor hub with the flat side facing front.
- 4.2.2 Insert three bolts in holes on the hub and blade. Place flat washers on the end of bolts, thread and tighten nylock self-locking nut. Nuts should be tightened to 8-12 Nm.

4.3 Attaching the spinner

Place the spinner over the center of the hub. Thread the M6*35bolt with lock washer and flat washer into the screw hole on the alternator shaft and tighten by hex key.

4.4 Mounting the yaw pole

Slide the yaw pole onto the yaw shaft of the head assembly and fastened by four bolts M8/15 with flat washers and lock washers.



Fig.4.1 Drill through the tower tube to the electric wire



Fig.4.2 Fix wind turbine head assembly



Fig.4.3 Fix wind turbine rotor hub



Fig.4.4 Fix wind turbine rotor blade



Fig.4.5 Fix wind turbine front cover



Fig.4.5 Fix wind turbine screw cover



Fig.4.6 Fix Solar & Wind Controller Inverter



Fig.4.7 Completing the wind turbine system installs

5. IGET-400 Cable Wiring

5.1 The fundamental wiring diagram of single HWG-400 system is as shown.

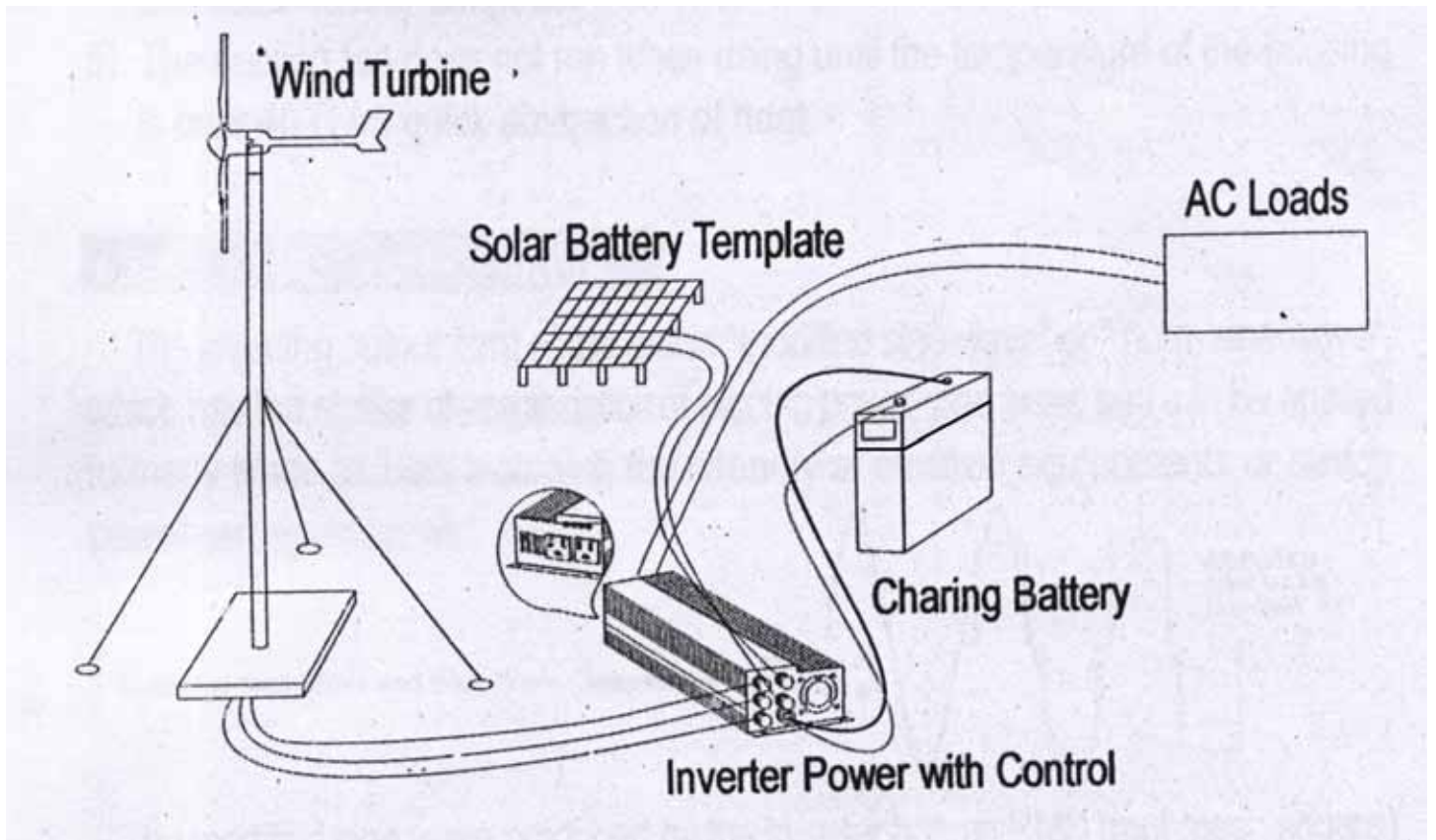


Fig.5.1 **IGET-400** Cable Wiring

5.2 The regulator is shown as following.

5.2.1 Before erecting the IGET-400 tower, connect the IGETG-400 with the regulator, and turn the breaker switch on the regulator to close position. After erecting, make sure that batteries are connected tightly and correctly with the regulator, and then turn the breaker switch to cut position.

5.2.2 The electric circuit breaker on the regulator protects batteries in case of accidental short.

5.3 W- 400 lied with solar & wind hybrid inverter

5.4 The batter capacity is subject to client's requirement, but a 100-150AH/12V battery is recommended for a single IGET-400 System.

5.5 The size of cables will cause energy loss (voltage drop) to the system, the larger the cable size, the smaller the energy loss. However, larger size cables will be more costly. The following cable sizes are recommended for the HWG-400 system:

Distance from HWG400 to battery (m)	<50	50-100	100-150
Cable size (mm ²)	4	6	10

5.6 The IGET-400 set includes a 10m cable complete with a private plug at the end of the cable to facilitate the connection between regulator and an electrical socket.

5.7 Various cables are available to suit for different sites.

5.8 The negative pole of the battery should be properly grounded.

6. Maintenance

The IGET-400 is a very reliable set and is designed to run for long periods at severe situations without any maintenance. But routine checking of system tower and cable wiring system is suggested to maintain the reliability and performance of t the system.

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

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

6.3 Maintenance batteries according to battery manual.

7. Safety Precautions

The HWG-400 is designed with your personal safety in the first priority. However, there are still some inherent dangers involved in the electrical/mechanical equipment. Safety must be the prior concern during installation of the system.

7.1 Choose a calm day to erect the tower.

7.2 Undersized wire or bad connection should be avoided as it will often result in overheating and even cause electrical fire.

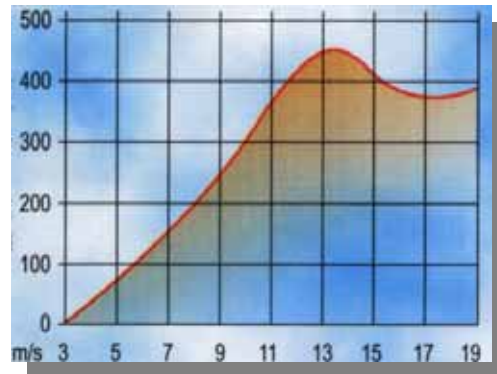
7.3 Never approach the operating turbine during strong wind or thunderstorm day.

8. Specification

8.1 Technical specifications

Rotor diameter	1.4m
Start up wind speed	2.4m.s ⁻¹
Cut-in wind speed	3.0m.s ⁻¹
Rated wind speed	12.5 m.s ⁻¹
Turbine Rated output	400W
Survival wind speed	60 m.s ⁻¹
Solar energy input	12V _{DC} ,100W
Battery Voltage	12V _{DC}
High Voltage Protection	15.2V _{DC}
Low Voltage Protection	10V _{DC}

8.2 Power curve



8.3 Month energy output

