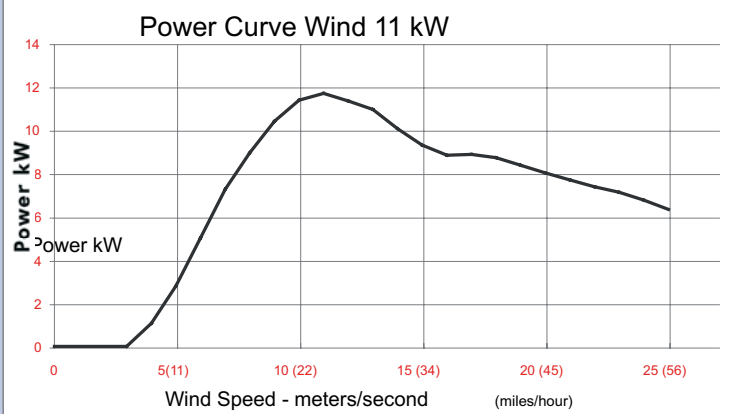




Wind 11kW, Energy Production Data



Wind Speed (m/s)	Power kW
3	0.0
4	1.1
5	2.8
6	5.0
7	7.3
8	8.9
9	10.4
10	11.4

Indicative Annual Electricity Output for Wind Turbine

Annual Average Wind Speed	Typical Terrain Conditions	Annual Electricity Production*
4.5 m/s	Villages, small towns, woods or agricultural areas with many high hedges	19,000 kWh
5.5 m/s	Agricultural areas with some windbreaks and some buildings	30,000 kWh
6.5 m/s	Open landscape with few buildings and no windbreaks	40,000 kWh
Average UK family energy consumption	3 bed semi-detached house	4,000 kWh (non heating) 20,000 kWh (heating)

NOTES:

Power is a measure of energy flow. It is measured in kilowatts (kW)

Amounts of energy are measured in kilowatt-hours (kWh) e.g. A turbine generating 3 kW continuous output for 20 hours will have produced 60 kWh of electrical energy.

* Listed electricity productions are estimates for typical sites. Local topography and obstacles such as buildings and trees can significantly influence the annual energy production of a wind turbine.

Key Component Parameters

Twin Blade Rotor	glass fibre, mounted on TEETER hub 13 m diameter, swept area 133 m ² Reflection free, light grey
18m Tower	lattice or tubular (hot dip galvanized steel)
Weights	nacelle and rotor - 900 Kg towers 1600/2200 Kg
Rotation	low constant speed 56 rpm nominal
Gearbox	two stage, gear ratio 1:18, low noise
Generator	11 kW, 3 phase, 400 Volts @ 50 Hz (marine grade)

Operational Parameters

Wind Speed Parameters m/s (mph)	
Starting speed	2.5 (5.6)
Cut in	3.5 (7.8)
Rated 11 kW output	9.5 (21)
Cut out	>25 (56)
Temperature Range	
-20°C to +50°C	
Lifetime and Servicing	
20 years design life Service once yearly	

Noise Levels	dB(A)	Comparator
at 30 m	50	conversational speech, 50-60 dB(A) car at 100 m driving at 40 mph, 55 dB(A)
at 60 m	45	living room, 40 dB(A)
over 100 m	<40	rural night time background, 20-40dB(A)

Control and Monitoring System

Data input and management

Integrated microprocessor with multiple sensor inputs.

Data: wind speed, power, voltages, currents and phase, rpm, vibration and temperature alerts.

LCD display in control box. Can output to local PC or be monitored remotely via internet.

System protection

Base level: Passive stall of blades limits power output.

Second level: Control system activates mechanical brake if:

- Wind speed exceeds 25 m/s
- Abnormal vibration
- Grid disconnected or generator overheats

Third level: Centrifugally activated aerodynamic brakes built into rotor tips as a final safety measure.

Also Manual override RED BUTTON

Certification

The Wind 11 kW has a Danish HB certificate and is the only small wind turbine to have received this.

In the UK the turbine has received the Clear Skies accreditation under number WT5038 making the turbine eligible for all grant schemes for small wind turbines.