

Westwind 20kW Wind Turbine

SYSTEM

Type	3 Φ Grid Connected
Configuration	Horizontal Axis
Rotor Diameter	10 m (32.8 ft)
Centerline Hub Height	15, 18, 24 and 30 m (49.2, 59.0, 78.7 and 98.4 ft)

PERFORMANCE PARAMETERS

Rated Electrical Power	20 kW @14 m/s (25.3 mph)
Wind Speed Ratings:	
cut-in	3 m/s (10.2 mph)
shut-down (high wind)	18 m/s (61 mph)
design speed	60 m/s (134 mph)
Calculated Annual Output @ 100 % availability	5.4 m/s (12 mph) 22,660 kWh 6.7 m/s (15 mph) 48,260 kWh 8.0 m/s (18 mph) 82,630 kWh

ROTOR

Type of Hub	Passive Pitch Control
Rotor Diameter	10 m (32.8 ft)
Swept Area	100 m ² (1076 ft ²)
Number of Blades	3
Rotor Solidity	0.05
Rotor Speed @ rated wind speed	160 rpm nominal (variable)
Location Relative to Tower	Upwind
Cone Angle	0°
Tilt Angle	6°
Rotor Tip Speed	84 m/s (188 mph) @ 160 rpm
Design Tip Speed	6

BLADE

Length	5 m (16.4 ft)
Material	Carbon and glass fibre reinforced plastic
Blade Weight	25 kg (330 lbs) approximate

GENERATOR

Type	3 phase/36 pole synchronous
Frequency	50 Hz variable
Voltage	3 phase @ 50 Hz, 240-380 VAC
kW @ Rated Wind Speed	20 kW
kW @ Peak Continuous	25 kW
Insulation	Class F
Enclosure	Totally Enclosed Air Over
Options	Arctic low temp -40°C

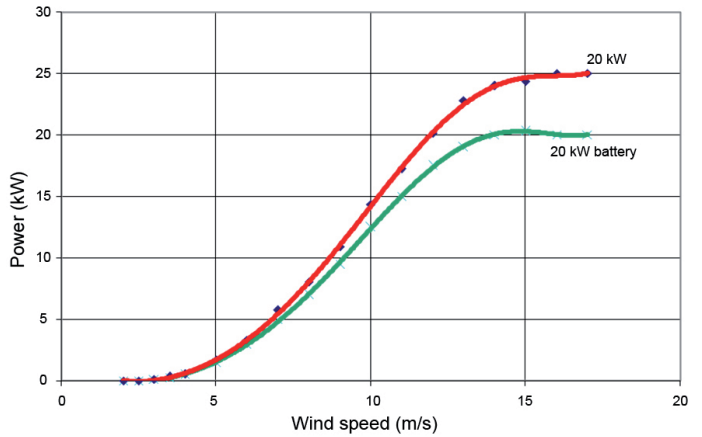
YAW SYSTEM

Normal	Free, passive
Optional	Furl damp
Electrical	Slip ring brush set

TOWER

Type	Free standing galvanized monopole
Tower Height	15/18/24/30 m
Options	Towers with guy wires & gin pole

WESTWIND 20KW ESTIMATED ANNUAL ENERGY OUTPUT



FOUNDATION

Type	Concrete pads
------	---------------

CONTROL SYSTEM

Type	Electronis, passive pitch regulation and passive side furling
------	---

ROTOR SPEED CONTROL

Running	Passive pitch regulation
Start up	Aerodynamic
Shut-down	Aerodynamic and manual furling

APPROXIMATE SYSTEM DESIGN WEIGHTS

Tower Monopole	2700 kg (10,000 lb)
Rotor & Drive train	920 kg (5,340 lb)

DESIGN LIFE

25 Years

DESIGN STANDARDS

Designed in accordance with:
98/37/EC The Machinery Directive,
73/23/EEC The Low Voltage Directive
89/336/EEC The Electromagnetic Compatibility Directive

Applicable Standards:
BS EN 60204-1:1998
BS 5559:1991
BS EN 61293:1995
BS 3535:1990
BS EN 60439:1994
BS EN 60447:1994
BS EN 60073:1997
BS EN 61000-6-2:1999
BS 60034
BS EN 61400-2:2006

DOCUMENTATION

Installation Guide and Operation & Maintenance Manual

SCHEDULED MAINTENANCE

Semi-annual or after severe events.

For more information on the Westwind 20kW Wind Turbine please call 01565 757829 or email: enquiries@perpetualenergy.co.uk