

# WINDFLOW 33/500 1A



## Great Returns

- Up to 1,896 MWh/year
- Highest production under 50 m tip height
- Optimised for higher wind speed sites

## Easy Planning

- Low tip heights and visual impact accelerate the planning process
- Standard trucks and single 80T crane ease site access

## Robust and Durable

- Load-avoiding design copes with strong, turbulent and high shear winds
- Certification to IEC 61400 (edition 3) class 1A assures design integrity

## Cost Competitive

- Compact 2-bladed design reduces transport and construction costs
- Grid-friendly generator simplifies connection, especially into weak grids

## Long Term Maintainability

- Standard components from established suppliers assure spares availability
- Proven performance on high wind sites demonstrates reliability
- Comprehensive SCADA system for remote monitoring, control and optimisation

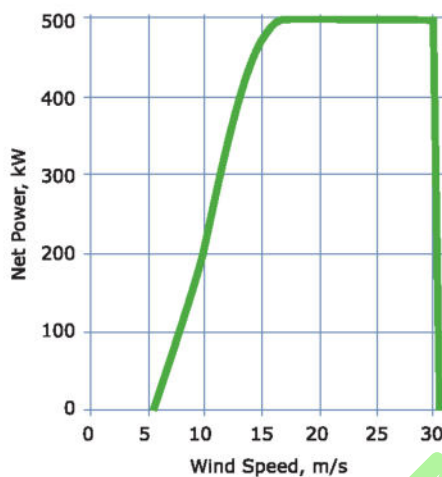


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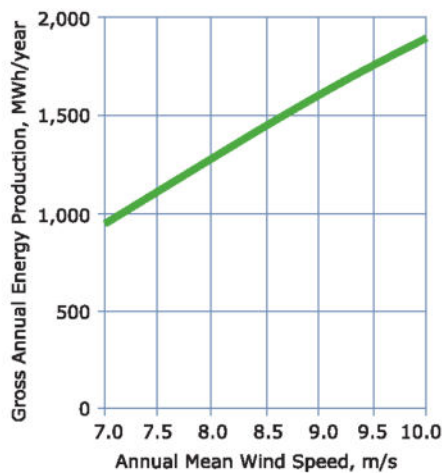


**Power Curve Windflow - 33/500 1A**



Average power as per IEC 61400-12 normalised to air density = 1.225 kg/m<sup>3</sup> and turbulence = IEC class A. Source: S500 General Specification (rev10)

**AEP - Windflow 33/500 1A**



Gross AEP is stated before losses, and will also depend on site conditions

10 Min Mean Wind Speed (m/s)	Net Power (kW)	AMWS (m/s)	AEP (MWh)
5.5	-	7.0	940
6.0	20	7.5	1,109
6.5	41	8.0	1,276
7.0	63	8.5	1,441
7.5	85	9.0	1,600
8.0	107	9.5	1,752
8.5	130	10.0	1,896
9.0	155		
9.5	182		
10.0	211		
10.5	243		
11.0	275		
11.5	308		
12.0	340		
12.5	371		
13.0	396		
13.5	422		
14.0	443		
14.5	462		
15.0	474		
15.5	485		
16.0	492		
16.5	498		
17.0	500		
30.0	500		
30.5	-		

## Technical Specifications

### Rotor

Number of blades	2
Rotor diameter	33.2 m
Rotor speed	48-51 rpm
Swept area	866 m <sup>2</sup>
Orientation	Upwind
Regulation	Full-span pitch control
Hub	Teetering (pitch coupled)
Blade material	Wood epoxy composite

### Hydraulic System

Yawing	1.3°/second or 2.0°/second, geared motor
Pitch actuation	Linear actuation
Braking	Fail-safe calliper
Torque limiting	Radial piston pump

### Gearbox

Type	Planetary/parallel with torque limiting system
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### Generator

Type	Synchronous, directly on-line
Nominal power	500 kW
Voltage	415 V
Frequency	50 Hz/60 Hz

### Tower

Type		Tubular		
Tower	Hub	Tip	Mass	Class
29 m	30 m	46.5 m	15,400 kg	1A
39 m	40 m	56.5 m	30,100 kg	1A
49 m	50 m	66.5 m	28,600 kg	2A

### Controller

Cut in system	Auto synch
Logic system	PLC

### Nacelle

Mass, including rotor	12,700 kg
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### Performance

Maximum power	500 kW
Low wind cut in	5.5 m/s (steady wind)
Rated power at	13.7 m/s (steady wind)
High Wind cut out	30 m/s

### Certification

Type approved	50 Hz – Lloyd's Register 60 Hz – in process
Turbine design	IEC 61400-1 (edition 3) Class 1A
Quality accreditation	ISO 9001:2008

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