WINDFLOW 33/500 1A

WINDFLOW

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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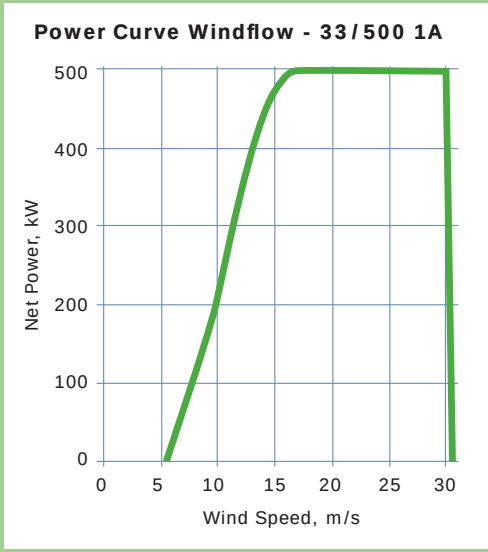
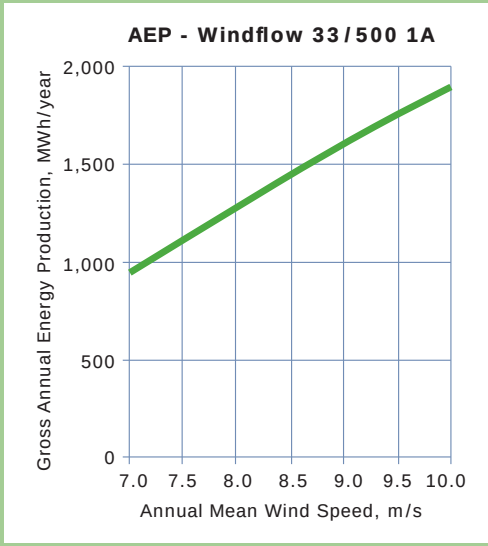


Average power as per IEC 61400-12 normalised to air density = 1.225 kg/m3 and turbulence = IEC class A. Source: S500 General Specification (rev10)



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

10 Min Mean Wind Speed (m/s)	Net Power (kW)
5.5	-
6.0	20
6.5	41
7.0	63
7.5	85
8.0	107
8.5	130
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	-

AMWS (m/s)	AEP (MWh)
7.0	940
7.5	1,109
8.0	1,276
8.5	1,441
9.0	1,600
9.5	1,752
10.0	1,896

WINDFLOW 33/500 1A

Technical Specifications

Rotor

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

Hydraulic System

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

Gearbox

Type	Planetary/parallel with torque limiting system

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

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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