



Danish Inspired, American Made.

500 *kW*
Series

The model name "AW47-500" is written in a white, outlined, sans-serif font. Above the text is a stylized white outline of a three-bladed wind turbine.

AW47-500

When King-Sized Turbines Are Just Too Large

In an age of King-sized wind turbines designed for wide open spaces, *Aeronautica Windpower* is proud to introduce the **500 Series**: One Half megawatt, 'Queen-size' machines designed for 'distributed wind' applications. Many good wind sites just cannot accommodate huge, utility-scale turbines. A large number of sites, especially around populated areas, are better suited to a sub-utility size machine. The 500 is the perfect fit.

More easily permitted, erected, serviced, and financed than its larger cousins, the 500 Series is a great choice for community wind projects, commercial/industrial sites, college or high school campuses, and other places where 'behind the meter', or net-metered power can be utilized. Yet they are also powerful enough to be used as a lower height alternative for many wind farm operations.

Aeronautica 500kW wind turbines are built according to strict IEC 61400 guidelines in our ISO 9001 rated factory to insure the highest degree of quality for a long service life. The Internet-ready SCADA system provides remote access and viewing from remote locations. Our time-tested gearbox isolation system absorbs shocks with ease, adding to long term durability. These turbines are ultra-quiet and highly transportable to reach areas otherwise inaccessible to larger machines.

With its low profile, ultra-low noise signature, and highly efficient output, our 500's provide the perfect

Fast Facts:

Orientation: *Upwind*
Rotor Diameter: *47m*
Rotor Speed: *~25.3RPM*
Hub Height: *65, 55 or 50m*
Pitching: *Active-Stall Regulation*
Blades: *Fiber Reinforced Polyester*

Our 'Queen-Size' turbines are more in-scale with local communities, while still providing lots of power for schools, industrial parks, shopping centers, neighborhood net-metering, wind parks and more!

- ◆ 1/2Megawatt (500kW) design - for Class I, II or III winds
- ◆ Low Overall Height Profiles: from 241' (73.5m) to 302' (92m)
- ◆ Active Stall Regulation (ASR) allows pitchable blades to be optimized for both low and high wind conditions
- ◆ Dual-Wound 200/500 kW Generator: maximizes output at various wind

< Depicts overall height difference between a 2 mW turbine on a 100m tower with a 90m rotor and an *Aeronautica* 500 turbine on a 65m tower with a 54m rotor.



500 kW System Specifications:

Wind Class:

47m rotor: IEC Class Ib and IIA

Blades:

3 blades, upwind orientation, Fiberglass reinforced polyester

Rotor:

Power regulation: Pitching using Active Stall Regulation (ASR)
 Rotor size: 47m diameter
 Rotor speed: 25.3 rpm nominal
 Swept area: 1,735 m²
 Tilt angle: 4°
 Coning angle: 3.0° forward
 Tip speed: 62 – 63 m/s at full load
 Pitch bearings: 4-point ball bearings
 Air brake, normal: Pitch to -20°, actuated by the ASR system
 Air brake, emergency: Pitch to -85° fail safe, activated by hub accumulators
 Nominal pitch speed: 7.5 °/sec
 Mechanical brake: Fail-safe type disk brake
 Brake torque: 1.8 times of nominal torque (approx)
 RPM max. value: 1920 (60 Hz), 1600 (50 Hz), on the high-speed shaft

Generator:

Nom. Electric Power: 200/500 kW (dual wound)
 Generator: Closed, Asynch. Induction, 4/6 pole DW, IP54 or 55
 Generator speed: 1200/1800 (60 Hz) or 1000/1500 (50 Hz) rpm
 Loss in generator: 3 - 4 % at nominal power dependent on type
 Generator cut-in: Thyristor controlled gradual cut-in
 Grid connection: 690 v, 60 Hz (std) or 50 Hz

Certification: DNV for IEC 61400 Ed. 3 Class IB and IIA

Operational:

Yaw motors: 4 pcs. w/electrical brakes built in
 Yaw brakes: 4 pcs. disk hydraulic brakes
 Yaw bearing: 4-point ball bearing
 Cut-in wind speed: 3-4 m/s, based on 10 min average
 Cut-out wind speed: 25 m/s, based on 2 min average
 Extreme wind speed: 70 m/s (50 yr extreme)
 Controller: Mita Teknik
 Operating Temp. Range: -20C TO +50C (Hi and Low Temp. Options Available)
 Noise: 99.5 dBA Sound Power (at Nacelle)

Weights:

Mass of blades: (3): Approx. 16,000 lbs (7,200 kg)
 Mass of nacelle: Approx. 48,400 lbs (22.000 kg)
 Mass of hub: Approx. 17,600 lbs (8.000 kg)
 Mass total, excl tower: Approx. 81,200 lbs (36.909 kg)

Monopole Tower

Construction: Conical Steel, White, 65m, 55m, and 50m towers available
 Nacelle access: Interior tower ladder through locked door
 Surface treatment: In accordance with ISO 12944
 Laser inspected flanges
 Ultrasonic inspection of raw materials and welds

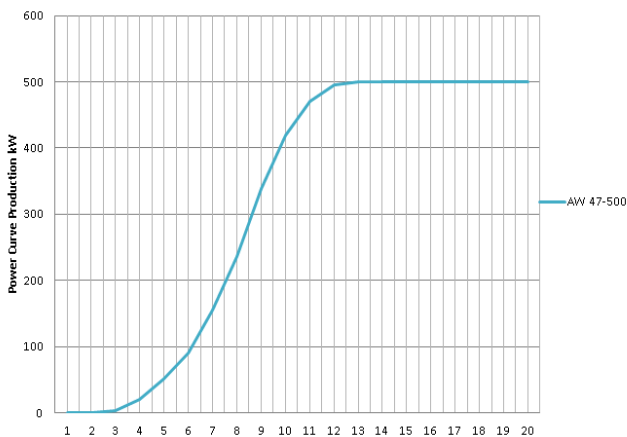
SCADA:

Included in electrical cabinets at base of tower
 Remote surveillance and operation via Internet or ADSL

Safety:

Induction generator has inherent anti-islanding
 Fail-safe hydraulic disk brake
 Grid monitoring for shutdown and operational performance
 Fall protection ladder system

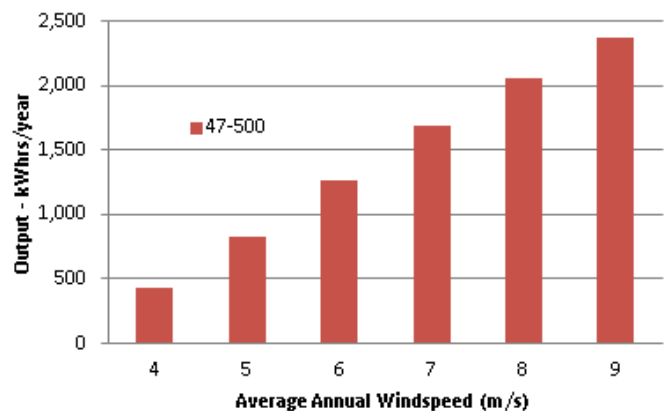
Power Curve Production Comparison



Power Table
m/s 47m

4	20
5	52
6	90
7	155
8	236
9	338
10	420
11	470
12	495
13	500
14	500
15	500
16	500
17	500
18	500
19	500
20	500

Annual Energy Output



The Power and Energy Curves shown are valid for 1.225kg/m³ air density, clean blades and undisturbed horizontal air flow. For the Energy Graph, a Rayleigh wind speed distribution and 100% availability is assumed. Power curve for 47-500 taken from DNV certification for 47-750.





©2013 Aeronautica Windpower, LLC
America's Wind Turbine Company

11 Resnik Rd. Plymouth, MA 02360
1(800)360-0132

www.aeronauticawind.com