



PowerWorks Wind Turbines



100 kW Wind Turbines

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Benefits

- ▶ Low cost, renewable power
- ▶ Quick and easy installation
- ▶ High return on investment
- ▶ Lowers long-term power costs
- ▶ High reliability
- ▶ Low maintenance
- ▶ Fast delivery
- ▶ Withstands extreme weather conditions
- ▶ Displaces fossil-fired toxic emissions
- ▶ Creates "green" brand image



Applications

- Islands
- Universities
- Big box stores
- Resorts & hotels
- Utility wind farms
- Hybrid wind-diesel
- Rural electric co-ops
- Industrial complexes
- Large commercial farms
- Manufacturing facilities
- Municipal electric utilities
- Community wind projects
- Municipal water treatment plants

Robust Design



PowerWorks Wind Turbines

GENERATOR

TYPE
induction

VOLTAGE
3 phase
480 VAC (60 Hz)
380 VAC (50 Hz)

RATED OUTPUT
100 kW

NACELLE

WEIGHT
8,843 lbs (3,848 kg)

ACCESS DEVICE
ladder on tower leg
built-in work platform

CONTROL

BLADE PITCH CONTROL
electro-mechanical

TURBINE CONTROL
proprietary
microprocessor

SYSTEM CONTROL
web based control &
data acquisition system

TRANSMISSION

TYPE
parallel shaft mounted
helical gears

OUTPUT SPEED
1,800 rpm (60 Hz)
1,500 rpm (50 Hz)

ROTOR

BLADE DESIGN
variable pitch, fiber composite

ROTOR DIAMETER
59 ft (18.0 m)

SWEPT AREA
2,463 ft² (229 m²)

ROTATIONAL SPEED
72 rpm

ORIENTATION
downwind, free yaw

HUB HEIGHT
63 ft (19.2m) or 83 ft (25.3 m) lattice
79 ft (24.0m) or 118 ft (36.0m) tube

TOWER

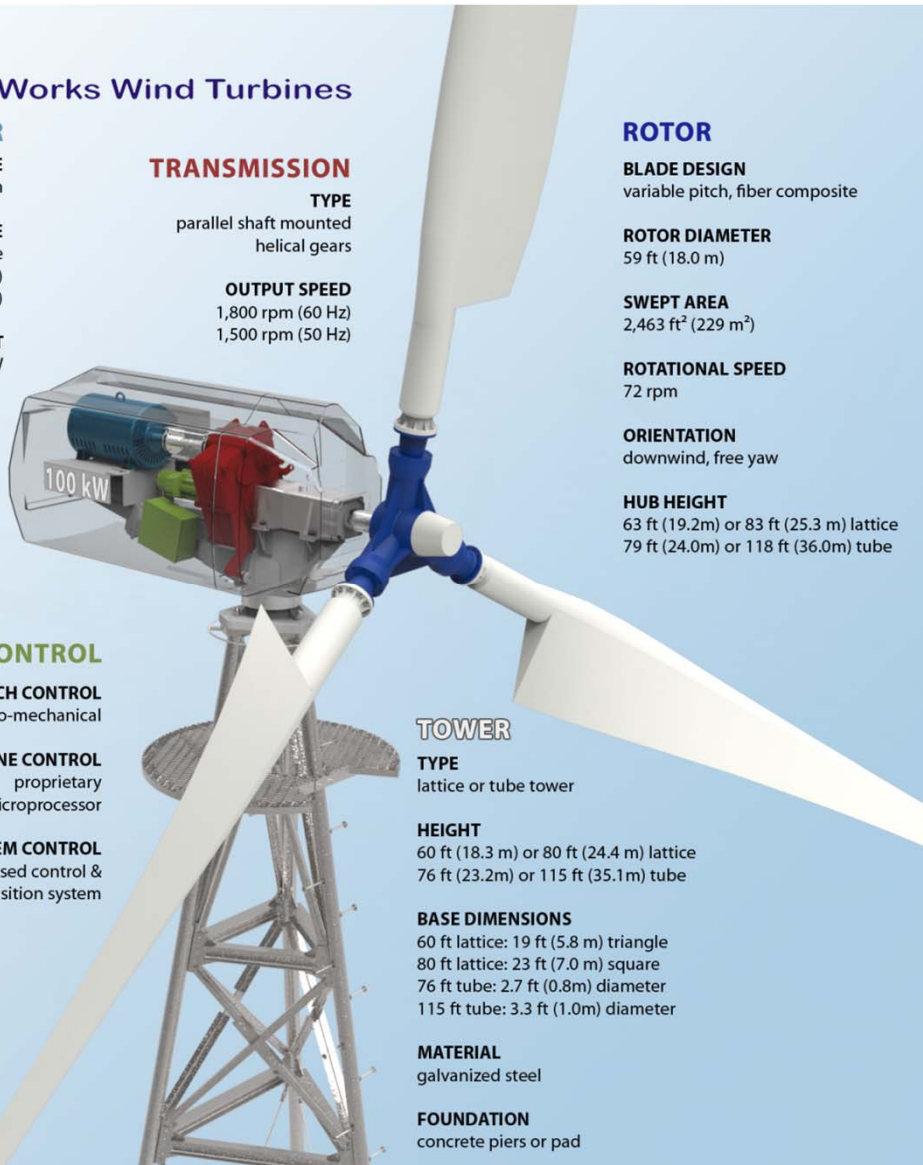
TYPE
lattice or tube tower

HEIGHT
60 ft (18.3 m) or 80 ft (24.4 m) lattice
76 ft (23.2m) or 115 ft (35.1m) tube

BASE DIMENSIONS
60 ft lattice: 19 ft (5.8 m) triangle
80 ft lattice: 23 ft (7.0 m) square
76 ft tube: 2.7 ft (0.8m) diameter
115 ft tube: 3.3 ft (1.0m) diameter

MATERIAL
galvanized steel

FOUNDATION
concrete piers or pad

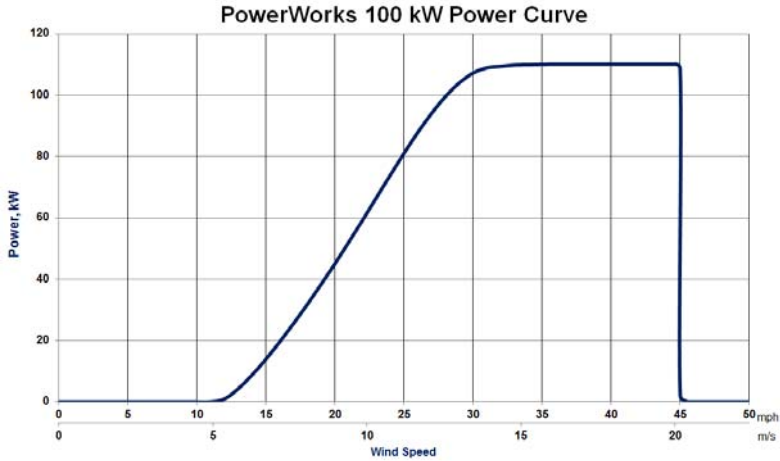


High Reliability/Availability

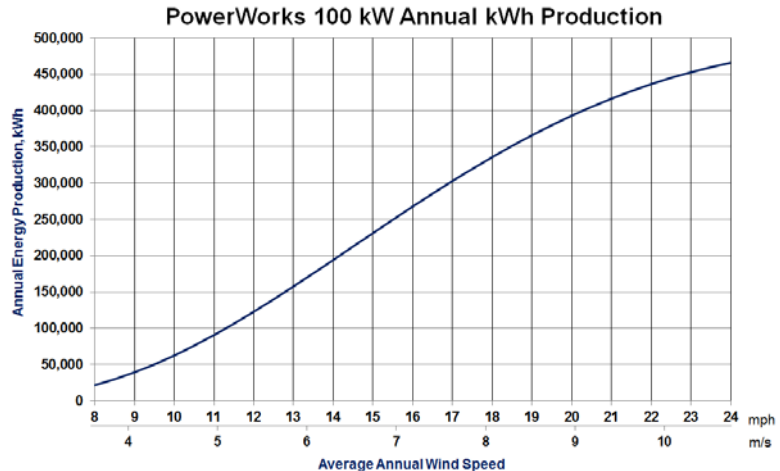
Over 5,000 of these 100 kW wind turbines have been installed in five countries around the world. Now in operation for over 20 years, this wind turbine product line has produced well over 20 billion kWh since the model's inception, which demonstrates the quality of the design and the overall reliability of the product.

Further, the historic turbine operating availability from our Altamont Pass operations, typically at approx. 97% to 98% availability, confirm this turbine's overall remarkable reliability. This 100 kW wind turbine is one of the most reliable wind turbines ever built!

IEC Certified Power Curve



Annual kWh Production



Services & Options

- New or rebuilt wind turbines
- 60 Hz or 50 Hz option
- Cold weather option
- Marine coating option
- Slip ring assembly option
- Standard 2-yr warranty or extended 5-yr warranty
- Extensive spare parts inventory
- Turbine installation and commissioning
- Turbine training program
- Operation and maintenance services
- Complete turbine repair services
- Comprehensive project / site engineering
- Site wind resource analysis
- Support services to fit your needs



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