PowerWind 90

The PowerWind 90 is a highly efficient and robust wind turbine with a rated power of 2500 kW and a 90 m rotor diameter. Under IEC wind class IIA and DIBt WZ III certification it has an optimal application for sites with medium to high wind speeds.

Our "German Engineering" combines robust mechanical design with state-of-the-art power electronics. The PowerWind 90 is modeled after the proven modular drive train concept. Its favorable system design benefits from many years of experience gained in the wind power industry and the reliability of the PowerWind 56. Wear & tear and loads have been consequently minimized. Thanks to its full scale converter the PowerWind 90 can comply with the most demanding grid requirements and can also be connected to weaker grids. The optimal combination between rotor, generator, converter, and control system maximizes the energy output. The advanced cooling system allows for smooth operation even under unfavorable climate conditions. Its outstanding grid integration in combination with its high energy yield, unsurpassed reliability, and easy servicing make the PowerWind 90 the next generation's wind energy converter.

PowerWind 90, Bremerhaven, Germany

The mechanical engineering and uncompromised robustness of the PowerWind 90 assure highest durability and reliability.

- Design based on proven modular drive train concept
- All main components sourced from reputable European manufacturers with highest longevity standards
- High reliability due to the combination of technically proven components
- Optimized mechanical structure through the application of multi-body simulation methods

The sophisticated gearbox protection concept shields the gearbox from high loads.

- Optimal load flow and load transfer secured by two main bearings and deformation-resistant machine frame
- Constraint loads reduced by using a maintenance-free hydraulic gearbox support
- Drive train load reduction by decoupling from the electrical grid

The full scale converter allows compliance with the most demanding grid requirements.

- Smooth integration in current and future wind farm configurations
- Extended reactive power capability for fast voltage control
- Excellent fault ride through capability
- Compatible with 50 Hz and 60 Hz grids

The PowerWind 90 delivers unsurpassed reliability, easy servicing, and high availability at all wind and weather conditions.

- Large number of technically proven standard components assuring fast and long-term availability of high quality components from multiple suppliers
- Automatic lubrication of pitch, yaw, and generator bearings
- Dust protection through internal gearings
- User-friendly global remote monitoring (SCADA)
- State-of-the-art operational plant management and safety concept

The PowerWind 90 provides more yield than comparable turbines in its class.

- No rotor power losses by using a permanent magnet synchronous generator
- Aerodynamically-optimized blade profile
- Efficient control algorithms throughout the full range of production
- Optimal rotor, generator, converter, and control system combination for maximum output

Conceptual design and low sound emission minimize the environmental impact of the PowerWind 90.

- Optimized blade tip speed for low sound emission
- Transformer inside the tower as a standard
- Enclosed oil and grease collecting trays

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The innovative cooling concept assures smooth operation in the temperature range from -20°C to +40°C.

- Three independent cooling circuits: gearbox (oil-cooled), generator (air-cooled), converter (water-cooled)
- Innovative converter cooling method
- Energy efficient temperature controlled cooling systems
- Optional: Hot climate version for unfavorable climate conditions

By intentionally limiting the turbine dimensions even difficult logistic requirements are met.

- Standard transport requirements for weight, width, and height are met in many countries, avoiding special and expensive permits
- Reduced crane requirements through its modular design

The engineering experience of PowerWind GmbH goes from the foundation to the tip of the blade.

- All design aspects have been reviewed and optimized to increase efficiency
- Foundation designed to simultaneously reduce construction costs and increase stability

The PowerWind 90 was designed to facilitate servicing and maintenance.

- Spacious nacelle with good accessibility to all components
- Easy replacement of components due to ergonomic on-board crane
- Application of high quality and maintenance-free components
- Easy access to the hub from inside the nacelle
- Customized service packages available

PowerWind provides a wide range of support to its customers from the initial project phase throughout the turbine's lifetime.

- Project and service management support from the initial wind measurement to the scheduling of maintenance and repair
- Large experience with the special requirements of small and medium-size customers

Performance

Rated power output	2,500 kW
Cut-in wind speed	3 m/s
Rated wind speed	14 m/s
Cut-out wind speed	25 m/s
Rotor diameter	90 m
Rotor swept area	6,362 m²
Rotor speed	4-15,5 rpm
Speed control	Individual electrical pitch
Aerodynamic breaking	Individual full span pitch
Operating temperature range	-20°C to +40°C (optional up to +45°C)
Power factor	0.9 ind. to 0.9 cap.
Wind class	IEC 61400 IIA and DIBt WZ III
Gearbox	Two planetary and one spur gear
Gear ratio	1:103
Mechanical brake	Disc brake on high speed shaft (hydraulic)
Yaw drive	4 AC motor drives with planetary gear
Yaw brake	Disc brake (hydraulic)

Generator	Synchronous permanent magnet (air-cooled)
Nominal rotation	1,600 rpm
Enclosure class	IP 54
Converter	Full scale converter (water-cooled)
Tower	Steel tower
Hub height	80 m or 98 m
Nacelle	Glass fibre reinforced plastic
Blades	Glass fibre reinforced plastic
Control system	PowerWind
SCADA	PowerWind SCADA System
Grid connection	50 Hz or 60 Hz/690 V

Available from:

PowerWind Limited
Plot no.352-353
HSIIDC industrial Area Bawal
Rewari,Haryana-123501

info@powerwind.co.in

PI PW90 DataSheet en 08

For further information:
www.powerwind.co.in
Subject to technical modifications.