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GOLDWIND 2.5MW PMDD WIND TURBINE



GOLDWIND 2.5MW PERMANENT MAGNET DIRECT DRIVE (PMDD) WIND TURBINE

GOLDWIND 2.5MW PMDD WIND TURBINES OFFERS

- PMDD technology, simple drive-train construction, high reliability
- Light and compact design compared to other turbines in its class
- Sealed insulation design for excellent dust resistance
- Full power converter, low-voltage and zero-voltage ride-through capabilities for excellent grid connection

Characteristics

HIGH POWER GENERATING EFFICIENCY

- Permanent magnet generator (PMG) eliminates the need for electrical field excitation and associated losses present in induction-type generators
- PMDD generator is more efficient at partial load
- Variety of rotor diameters to maximize efficiency in various wind regimes

COMPACT, LIGHT & EASY TO TRANSPORT

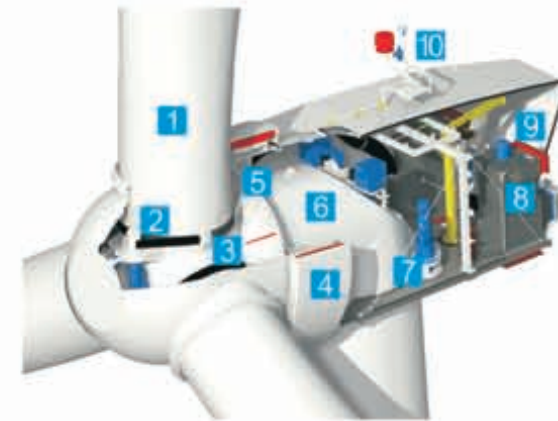
- The external diameter and total weight of the Goldwind 2.5MW wind turbine is smaller than the other generator designs
- The PMDD design results in a significantly lower turbine head mass, and likewise, crane requirements are less stringent, with the largest lift being 55 tons

SUPERIOR POWER QUALITY AND GRID CODE COMPLIANCE

- Full power converter provides flexibility to meet the most stringent grid requirements
- Advanced control systems provide curtailment and ramp-rate control
- As a standard, the Goldwind 2.5MW wind turbine provides reactive power as well as low-voltage and zero-voltage ride through capabilities

SIGNIFICANTLY REDUCED MAINTENANCE COSTS AND TOTAL OPERATING EXPENDITURES

- The design philosophy of the 2.5MW PMDD wind turbine eliminates the sources of expensive faults that require crane mobilization
- The absence of high current slip rings and carbon brushes in the generator eliminates maintenance activity and reduces faults, downtime and overall operating expenditure
- Only one moving part in the drive-train compared to 13+ gears and hundreds of total parts in a conventional gearbox. There is also no need in the Goldwind 2.5MW wind turbine drivetrain for high-speed bearings, couplings, and high speed brake parts
- Only one bearing is required in the drivetrain compared with 20+ in conventional high speed turbine gearboxes. The slow rotational speed of the Goldwind 2.5MW turbine also extends bearing service life beyond the turbine lifetime
- Automatic lubricating system on the yaw bearing reduces the frequency of unplanned maintenance
- Drive belts are used in place of bull and pinion gears in the pitch control system to improve overall performance, eliminate replacement of expensive parts, and effectively eliminate backlash and reduce vibration (fatigue)
- Goldwind's advanced pitch system eliminates localized wear experienced by gear-driven pitch systems
- Ultra capacitors are used in place of lead acid or gel batteries for energy storage in Goldwind's advanced pitch control system. They provide faster and more efficient charge/discharge capabilities than batteries and are ideal for pitch systems, which require quick bursts of power
- Ultra capacitors are smaller and lighter for their power (capacity) than batteries, have a wider operating temperature range provide decreased maintenance interval
- Robust generator cooling system using air-to-air heat exchangers no fluids required



1. Rotor Blade 2. Pitch System 3. Casted Hub 4. PMDD Generator 5. Rotor/Generator Bearing
6. Base Frame 7. Yaw System 8. Heat Exchanger 9. Auxiliary Crane 10. Wind Measurement Equipment

GOLDWIND 2.5MW PMDD WIND TURBINE FAMILY

Version	Rated Power	Hub Height	Wind Class
GW 2.5/90	2.5 MW	70 m, 80 m	IEC IA
GW 2.5/100	2.5 MW	80 m, 90 m	IEC IIA
GW 2.5/103	2.5 MW	80 m, 90 m	IEC IIB
GW 2.5/106	2.5 MW	80 m, 90 m	IEC IIIA
GW 2.5/109	2.5 MW	90 m	IEC IIIB

*TUV-Nord Certifications Obtained or In Progress

GOLDWIND 2.5MW 90, 100, 103, 106 & 109 PMDD WIND TURBINES

Technical Data	GW 2.5/90	GW 2.5/100	GW 2.5/103	GW 2.5/106	GW 2.5/109
Power					
Rated Power	2500 kW				
Cut-in Wind Speed	3 m/s				
Rated Wind Speed	12 m/s	11.1 m/s	10.6 m/s	10.3 m/s	10.3 m/s
Cut-out Wind Speed	25 m/s (10 min avg.)				
Rotor					
Diameter	90 m	100 m	103 m	106 m	109 m
Blades	3				
Type	LM 43.8P or similar	LM 48.8P or similar	LZ 50.3 or similar	HT 52.3 or similar	LM 53.2 or similar
Swept Area	6,362 m ²	7,823 m ²	8,332 m ²	8,825 m ²	9,331 m ²
Speed Range	7 – 16 rpm	7 – 14.5 rpm	7 – 14.5 rpm	7 – 14.5 rpm	7 – 13.5 rpm
Power Control	Collective Pitch Control / Rotor Speed Control				
Safety System	Independent Blade Pitch Control				
	Hydraulic Disk Brake				
	Hydraulic Bolt Lock				
Generator	Permanent Magnet Direct Drive Synchronous Generator				
Rated Voltage	690 V				
Yaw System	4 Induction Motors with Hydraulic Brakes				
Tower	Tubular Steel Tower (Q345C)				
Hub Height	70/80 m	80/90 m	80/90 m	80/90 m	90 m
Foundation	Flat Foundation (Others Possible)				
Converter	Full Power Converter (IGBT Modules)				
Transformer					
Input Voltage	690 V				
Output Voltage	20 kV (Others Possible)				
Control System	Microprocessor Controlled, DFÜ (SCADA)				