1.5 MW
PMDD WIND TURBINE
Platform Evolution
- 20+ years of operational experience from 21,000+ Permanent Magnet Direct Drive (PMDD) wind turbines

High Efficiency
- Permanent Magnet Synchronous Generator (PMSG) eliminates excitation losses
- The absence of gearbox eliminates losses from ancillary systems such as lubricant distribution and thermal management

High Reliability
- The gearless drivetrain design eliminates the possibility of gear failure during the operational life of the turbine
- Maintenance-free design of the toothed belt pitch drive system simplifies pitch system maintenance requirements
- PMSG does not require high maintenance slip rings for conducting power

Highly Adaptable
- Grid Adaptability: Excellent zero, low and high voltage ride through capability and compliant with associated standards across the globe
- Maintenance Adaptability: Dual circuit design of generator and converter enables partial operation when one circuit is compromised
- Environment Adaptability: Flexible operation modes enable adaptation to extreme environmental conditions such as high and low temperature, noise constraints and challenging wind conditions
- Construction Adaptability: Individual blade assembly to conserve site space constraints

1. Blade
2. Hub
3. Pitch System
4. Generator Rotor
5. Generator Stator
6. Nacelle
7. Yaw System
8. Wind Measurement Equipment
### Dynamic Power Curve

#### GW 82/1500

![Power Curve GW 82/1500](image)

#### GW 87/1500

![Power Curve GW 87/1500](image)

Air Density: 1.225 kg/m³

### Technical Specifications

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<th>Item</th>
<th>GW 82/1500</th>
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<td>1500</td>
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<td>Wind Class</td>
<td>IEC IIA</td>
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<td>20</td>
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<td>Operating Temperature Range</td>
<td>-30°C to +40°C</td>
<td>-30°C to +40°C</td>
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<tr>
<td>Survival Temperature Range</td>
<td>-40°C to +50°C</td>
<td>-40°C to +50°C</td>
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#### Rotor System

- Nominated Rotor Diameter m: 82, 87
- Rotor Swept Area m²: 5325, 5909

#### Generator

- Generator Type: Permanent Magnet Synchronous Generator (PMSG)
- Rated Voltage V: 720
- Rated Rotation Speed rpm: 17.3, 16.6/17.3

#### Converter

- Converter Type: Full Power Conversion
- Power Factor Regulation Range: Capacitive 0.95 to Inductive 0.95, dynamically adjustable
- Rated Output Voltage V: 690

#### Brake System

- Aerodynamic Brake System: Blade Pitch Triple-Redundant
- Mechanical Brake System: Hydraulic Mechanical Brake System (for Maintenance)

#### Yaw System

- Type/Design: Motor Drive/Four Planetary Stages for Speed Reduction
- Yaw Brake: Hydraulic Brake

#### Control System and Lightning Protection

- Type: PLC Control System
- Lightning Protection Standard: Complying with IEC 61400-24-2010 and IEC 62305:2006, and in conformance with GL Standards for the Certification of Wind Turbines
- Ground Resistance Ω: ≤4

#### Tower

- Type: Conical Steel Tower
- Hub Height m: 70/85, 75/85
INNOVATING FOR A BRIGHTER FUTURE