Renewable generators
High speed permanent magnet generator (HS PMG)
Compact design, maximized power per weight ratio

Proven ABB solutions provide continuous operation for maximum energy production with the lowest lifetime cost.

- Wind turbine proven High speed permanent magnet generator family available for other Renewable applications
- Easy upgrade for doubly-fed turbine OEMs to the full converter concept
- Robust PM generators offer the smallest possible size and weight
- High efficiencies, also in partial load, reaching up to 98%
- Grid code compliance and all the benefits of the full converter concept

Easy offshore solution
ABB modular platform includes high speed Doubly-fed, Induction and Permanent magnet generators.

With Full Converter Supply Permanent magnet generators offers best efficiency characteristics over entire operation range. Compared to the cage induction machine, PM rotor is equally robust, but stator current is lower having thus lower cabling costs. Compared to conventional electrically magnetized synchronous generator or Doubly-fed wound rotor generators, stator current is low, but rotor is much simpler without insulated windings, slip-rings and excitation machines.

With a compact size, permanent magnet high speed generators are fit for geared drive trains in wind, hydro and tidal turbines.

No need to change the turbine platform
The high speed (HS) solution is especially interesting for doubly-fed (DF) turbine manufacturers who can use the same familiar HS drivetrain for new offshore turbines without having to do extensive re-engineering. It also enables them to use their existing manufacturing facilities and established supply chain for easy logistics.

The advanced full converter (FC) concept can be realized by using robust high efficiency PM generators that are designed to fit most turbine types in use today.

ABB has almost 20 years of experiences in HS PMG and the generator family has been expanded up to 7 MW with a product in frame size 710.
**Typical data for medium speed generators up to 7.9 MW**

<table>
<thead>
<tr>
<th>Frame size</th>
<th>500, 560 and 710</th>
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</thead>
<tbody>
<tr>
<td>Power</td>
<td>1.5 - 7.9 MW</td>
</tr>
<tr>
<td>Efficiency at rated speed</td>
<td>Up to 98% ( &gt; 97% down to 20% load)</td>
</tr>
<tr>
<td>Cooling</td>
<td>Air and water cooling</td>
</tr>
<tr>
<td>Mounting and protection</td>
<td>IM1001 (inclined 4...6 deg), IP54</td>
</tr>
<tr>
<td>Voltage</td>
<td>690 V, 1000 V, 3.3 kV</td>
</tr>
<tr>
<td>Rated speed options</td>
<td>Between 1000...1800 rpm</td>
</tr>
<tr>
<td>Operation speed range</td>
<td>0...2000 rpm</td>
</tr>
<tr>
<td>Max. overspeed</td>
<td>Up to 2500 rpm (depending on size)</td>
</tr>
<tr>
<td>Insulation class / Temp. rise</td>
<td>F/B and F/F</td>
</tr>
</tbody>
</table>

- 2.5 MW: 2400 x 1700 x 1800; ~ 7 tn
- 3.0 MW: 2500 x 1700 x 2000; ~ 10 tn
- 5.0 MW: 3100 x 1800 x 2300; ~ 13 tn
- 7.0 MW: 3300 x 1800 x 2400; ~ 15 tn

Patented ABB PM rotor technology has proven short circuit withstand without demagnetization.

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**Your reliable partner**

ABB motors are based on reliable designs, proven in thousands of installations, and provide high productivity in demanding conditions.

With ABB you always have a partner to discuss different motor solutions to optimize your process. Our services do not stop at sales. We make it easy for you to reach us at every stage of your motor’s life cycle.

ABB’s extensive global network ensures local service delivery whenever and wherever you need it. The worldwide network includes over 60 service centers and more than 150 authorized service providers.

We offer predefined maintenance programs for all lifetime phases of all ABB motors, and preventive diagnosis and updates can help to further boost your competitiveness when needed.

For more information please visit: [new.abb.com/motors-generators](http://new.abb.com/motors-generators)