

Converteam: a key partner for Wind Turbine manufacturers

With over 100 years of electrical machines experience, and over 15 years specifically in the wind industry, Converteam is well placed to understand the demanding requirements of the wind turbine market.



Direct Drive PMGs - When simplicity matters

Direct Drive PMGs offer an intrinsically simple and robust technology, due to a dramatic decrease in the number of components, with an extensive increase in part load efficiency. The Direct Drive concept removes the requirement for a gear box, allowing the rotor to be directly connected to a low speed multi-pole generator which rotates at the same speed.

The elimination of gearbox reduces the complexity of the system, thus reducing the maintenance requirements of the drive train.

Direct Drive PMGs are now recognized in the wind industry as a reference technology, in particular to meet the requirements of the offshore wind market. Wind farm developers recognize the benefits of this technology for increased through life value.

Converteam is a global market leader for wind converters with more than 22 GWs delivered to date. With our impressive pedigree in electrical machines, we are also a technology leader for wind generators: delivering our first Medium Speed Permanent Magnet Generator (PMG) for wind in 2004, and the industry's largest Direct Drive Wind PMG in 2008.

With Converteam's global footprint of electrical machines factories, based in Europe, Asia and America, we are able to fully support our customer's global business with local manufacturing.

Converteam's DD-PMG: the most compact and cost effective Direct Drive PMGs

Converteam will be your partner for delivering the most compact, cost effective, and reliable Direct Drive Permanent Magnet Generator fulfilling your requirements for wind turbines.

Converteam solutions utilize the latest design and manufacturing techniques, including exceptional insulation performance, high reliability and excellent efficiency in either a conventional (inner rotor) or inverted (outer rotor) radial-flux generator topology.

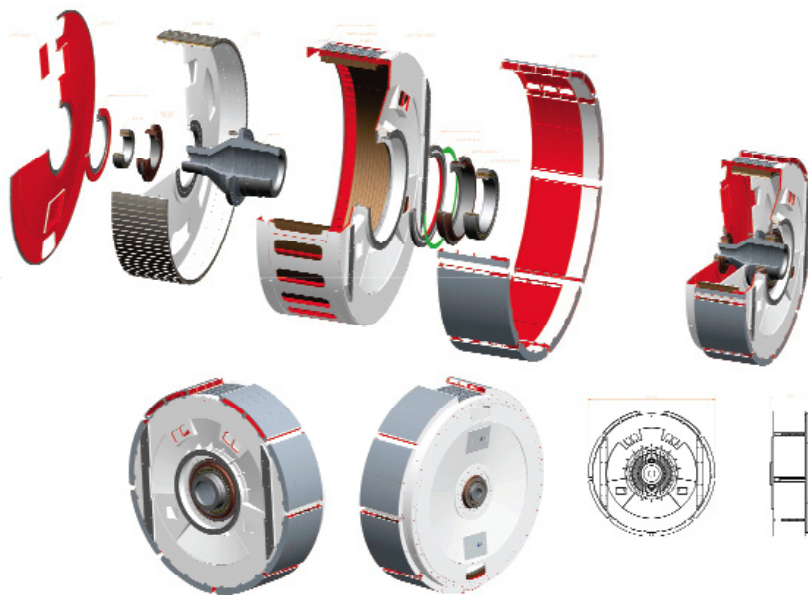
Converteam's DD-PMGs	Value for customer
Patented cooling arrangement	Very high power density
Electrical and electromagnetic design capabilities	Optimization between efficiency and power density
Patented ultra low cogging torque	Increased reliability, higher life expectancy
Exceptional insulation performance (highly reliable resin Insulation System)	Higher life expectancy, lower cost, increased reliability, increased reliability
Deep understanding of the properties of magnets, such as NdFeB (Neodymium-Iron-Boron) from extensive rotating machines experience	Reduced cost Increased Power Density



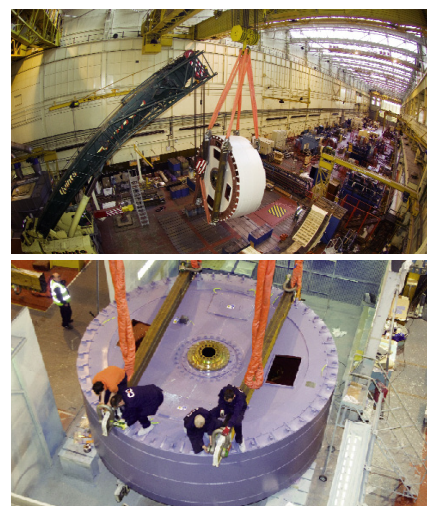
Converteam's understanding of the whole power conversion chain, supported by a full range of power converters, enables us to optimize the complete electrical drive train, with a "full system" integrated approach.

Converteam Customized Solutions

Converteam can customize its standard product platforms to design and build any rating of Direct Drive PMG from 1 to 10 MW. Converteam solutions can be rapidly tailored into many different mechanical arrangements, to adapt its solutions for customer turbine requirements.



Converteam Direct Drive PMG Range:			
Features (examples)	DD-3000	DD-6000	DD-8000
Power (MW)	3	6	8
Speed (rpm)	15	12.5	12
Voltage (V)	690 900	690 900 3300	900 3300 6600
Weight (tons)	44 to 55	70 to 80	85 to 95
Diameter (m)	5	5.5	7
Full load efficiency (%)	94 to 95	94 to 95	94 to 95
Thermal class	F or B	F or B	F or B
Insulation class	F	F	F
Cooling	CACW CACA	CACW CACA	CACW CACA



For more information please contact Converteam

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