



ELECTRIC DRIVES
FOR EVERY DEMAND

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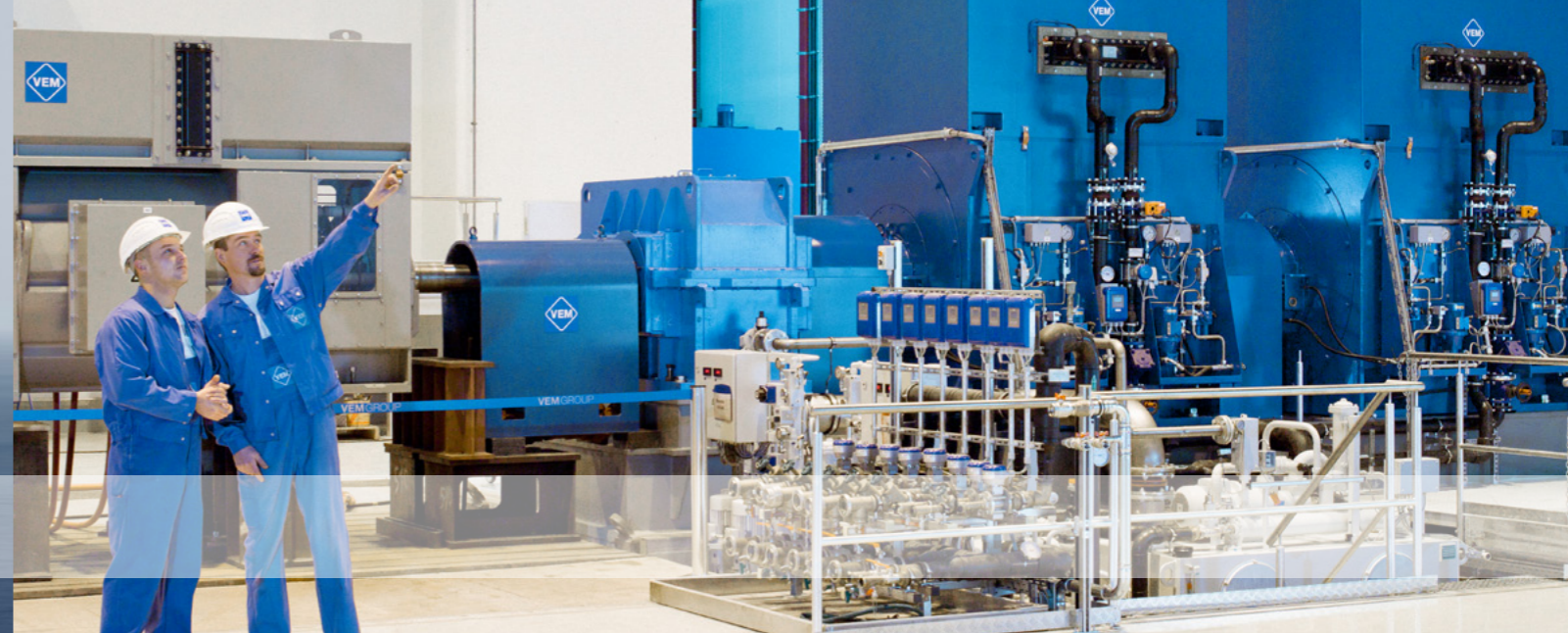
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Wind turbine generators 4 MW

Medium and normal-speed
generators

www.vem-group.com



Wind turbine generators in the 4 MW category

Our VEM generators lead the market in technology, and have played a major role in setting the product generation standard in wind turbines. We have been producing high-performance wind turbine generators at over 3 MW in large numbers for several years.

We supply asynchronous and synchronous generators at up to 8 MW developed specifically for onshore and offshore wind turbines. Our highly capable project calculation and design departments ensure that our wind turbine generators are tailored to individual requirements, yielding solutions to specification such as integrating asynchronous generators and gearboxes into a compact unit (hybrid custom solution).

Our generator product portfolio covers every power range and design, including the following standard generator types:

- Asynchronous generators with a slip-ring rotor
- Asynchronous generators with a squirrel-cage rotor
- Synchronous generators (electrically energised)
- Permanent-magnet synchronous generators (medium speed)
- Permanent-magnet synchronous generators (high speed)

Technical specifications	Asynchronous slip-ring rotor	Asynchronous squirrel-cage rotor	Synchronous electrically energised	PM medium speed	PM normal speed	Custom solution Asynchronous Hybrid
Power	3.6 MW	3.75 MW	3.7 MW	3.8 MW	2.7 MW	3.5 MW
Voltage	950 V	730 V	800 V	720 V	690 V	3,300 V
Current	1,994 A	2 x 1,644 A	2 x (3 x 479 A)	2 x 1,600 A	2 x 1,150 A	681 A
Frequency	50 Hz	47.9 Hz	68.1 Hz	75 Hz	110 Hz	34.7 Hz
Power factor	0.94	0.9	0.93*	-0.95	0.98	0.9
Rated speed	1,200 min ⁻¹	1,440 min ⁻¹	1,362 min ⁻¹	375 min ⁻¹	1,650 min ⁻¹	524 min ⁻¹
Efficiency	96.8 %	97.2 %	> 98.0 %	98.3 %	> 98.0 %	97.0 %
Shaft height	630	630	630	1,120	560	1,000
IP code	IP 54/IP 55	IP 54/IP 55	IP 54/IP 55	IP 54/IP 55	IP 54/IP 55	IP 54/IP 55
Model	IM 1101	IM 1001	IM 1101	IM 9101	IM 1001	IM 5210
Cooling type	IC 6A1A6	IC 6A1A6	IC 6A1A6	IC 7A1W7	IC 6A1A6	IC 4A6W7

*Passive rectifier operation

Benefits of VEM wind turbine generators

- High level of production depth – a prerequisite for rapid and flexible fulfilment of custom requirements
- Solutions tailored to specification for unique site conditions
- Designed for load capacity and bearing lifetime according to Germanischer Lloyd and TÜV
- Optimum efficiency even at partial load, noise-reduced machines
- Dimensional adjustments to nacelle design specification using 3D CAD
- Continuous high insulation resistance on coil forms
- Optimised for voltage converter operation
- Rotor winding designed for high voltage gradients in converter operation
- Ready for UL/CSA certification



3.75 MW asynchronous generator with a squirrel-cage rotor



3.6 MW asynchronous generator with a slip-ring rotor



3.7 MW synchronous generator (electrically energised)



3.5 MW asynchronous custom hybrid drive solution