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Siemens Hydrogen-Cooled Generators with Water-Cooled Stator Windings SGen-3000W Series

Over 600 MVA

Answers for energy.

SIEMENS

Hydrogen-cooled generators with water-cooled stator windings

Siemens offers in its Siemens Generator (SGen™) product line hydrogen-cooled, two-pole generators with water-cooled stator windings. The SGen-3000W series has ratings over 600 MVA for steam turbine and single-shaft steam and gas turbine applications.

Cooling performance is improved by a factor of approximately 14 through the use of hydrogen gas in place of air as the coolant for the rotor winding and stator core. At the same time, frictional losses are significantly lower than with air-cooled, thus improving the overall generator efficiency.

An increased output per unit volume of stator winding active material is possible because of the higher thermal conductivity and specific heat of water. It is this advantage of water that makes it possible to build generators for higher ratings than is possible using air or hydrogen as the cooling medium for the stator winding components.

For over 40 years Siemens has made many detailed improvements to the design of hydrogen-cooled generators with water-cooled stator windings:

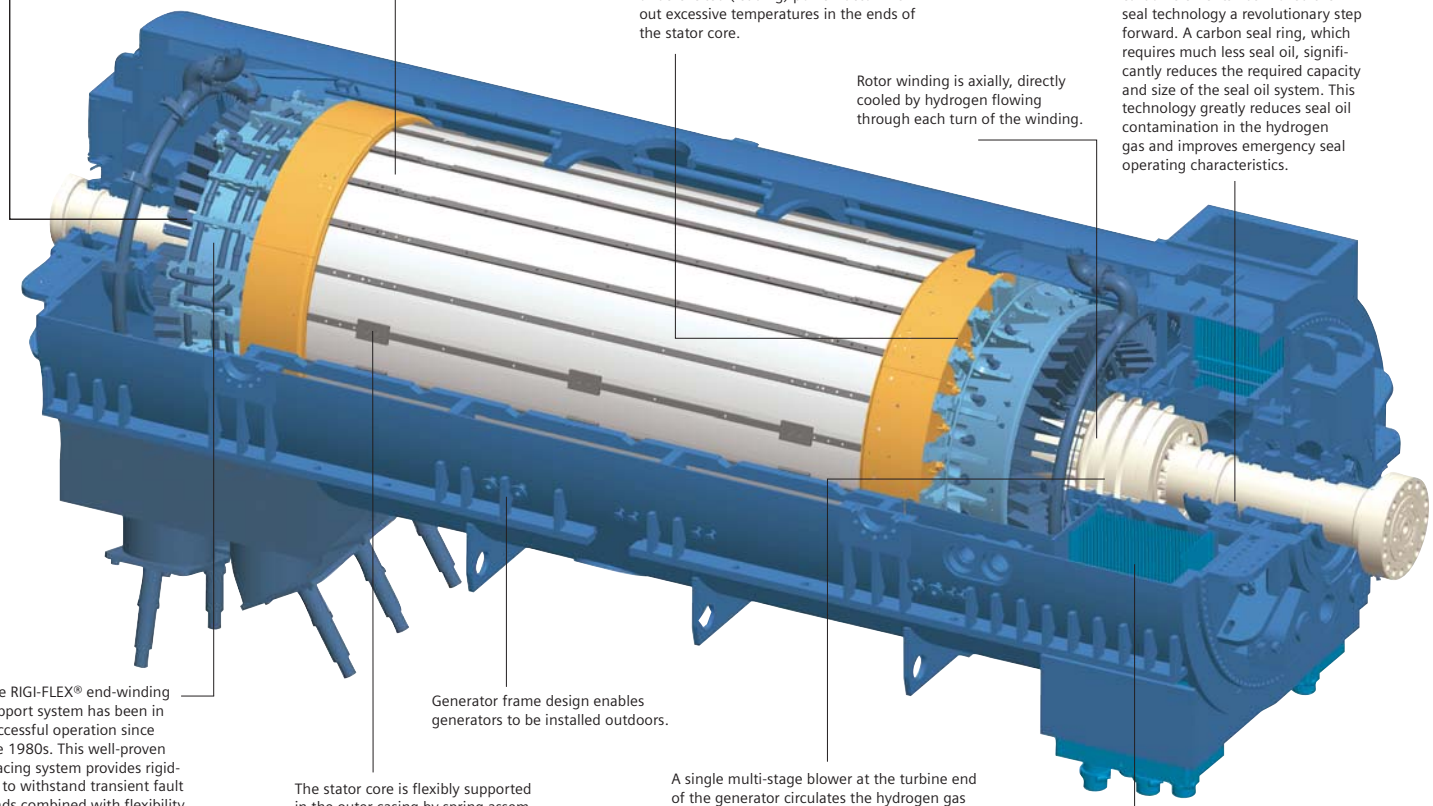
- Smaller size and therefore reduced space requirements in the turbine building
- Higher efficiency
- Totally enclosed system minimizes the risk of contamination inside the generator.

Consistent improvement in the design of hydrogen-cooled generators with water-cooled stator windings has brought about operating efficiencies of up to 99%.

A proven modular system enables the production of a wider range of generators by using rotors with different diameters as well as different active body lengths.

The same design philosophies and tools are used in the design of the entire product line of air-cooled, hydrogen-cooled, and hydrogen-cooled with water-cooled stator winding generators. This means that customers with hydrogen-cooled with water-cooled stator winding generators benefit from the manufacturing and operational advances made with respect to the entire product line of generators.

A design requiring low maintenance in connection with our worldwide service network can result in the highest availability.



Technical data

Frequency	Model	Power factor	Apparent power	Efficiency	Terminal voltage
50 Hz	SGen5-3000W	0.85	675 MVA to 940 MVA	up to 99%	15 kV to 21 kV
60 Hz	SGen6-3000W	0.85	600 MVA to 1,270 MVA	up to 99%	16 kV to 27 kV

Coolant:	Hydrogen gas at 5 to 6 bar
Design:	In accordance with IEC and IEEE/ANSI standards
Thermal classification:	Class F insulation system
Type of enclosure:	IP64 (IEC60034-5); suitable for outdoor installation
Excitation:	Static or brushless
Transport dimensions:	Suitable for rail transport in most countries

Customer benefits

- Efficiency up to 99%
- Hydrogen seal with carbon elements requires minimal seal oil and has improved emergency operating characteristics
- Uniform temperature profile promotes reliability
- Suitable for outdoor installation
- Simplified installation
- Transport dimensions suitable for rail transport in most countries
- Design based on field-proven generator component designs