



# Overhauling Services

Complete solutions  
for the revision  
and repair of electric  
motors and generators

**Gamesa Electric** is a worldwide leader in the design, manufacturing and servicing of electrical rotating machines, with extensive experience in Renewable Energies, GenSets, Marine propulsion, Mobility, large scale induction motors for various applications, Permanent Magnet Machines among others.

With more than 85 years of experience in the design, manufacture and repair of electric motors and generators we have developed a broad and competitive product portfolio. This knowledge adds to more than 35 years of experience of in-house technological developments in power electronics.

As part of the larger Siemens Gamesa Renewable Energy, Gamesa Electric harnesses the technological, operational and financial advantages within the Corporation, including its network of maintenance services over five continents. This structure allows respond to the needs of its customers in the various sectors with flexibility and with optimal solutions.

The company has reached framework agreements with important companies for equipment maintenance, making tailored plans with the objective of meet the needs of each client, in each market, with optimal results.

Gamesa Electric's production centres hold the ISO 9001, ISO 14001 and OHSAS 18001 certificates.



Gamesa Electric has extensive experience in repairing motors and generators in the main electrical and industrial generation sectors:

- › Wind
- › Hydro
- › Mobility
- › Marine Propulsion
- › Cement
- › Thermal
- › Mining
- › Oil
- › Nuclear
- › Chemical

# We speak energy

## Why Gamesa Electric?

### Reliability

Gamesa Electric performs preventive and corrective maintenance and repair validation through the most modern diagnostic methods and testing of electrical machines in order to maximize the reliability of the equipment.

### Technology

Gamesa Electric has more than 85 years of experience in the design and manufacture of electric motors and generators. This experience and knowledge enables reverse engineering of damaged equipment (e.g.: designing new replacement parts) making it possible to re-energize equipment, which otherwise wouldn't be operational.

### Availability

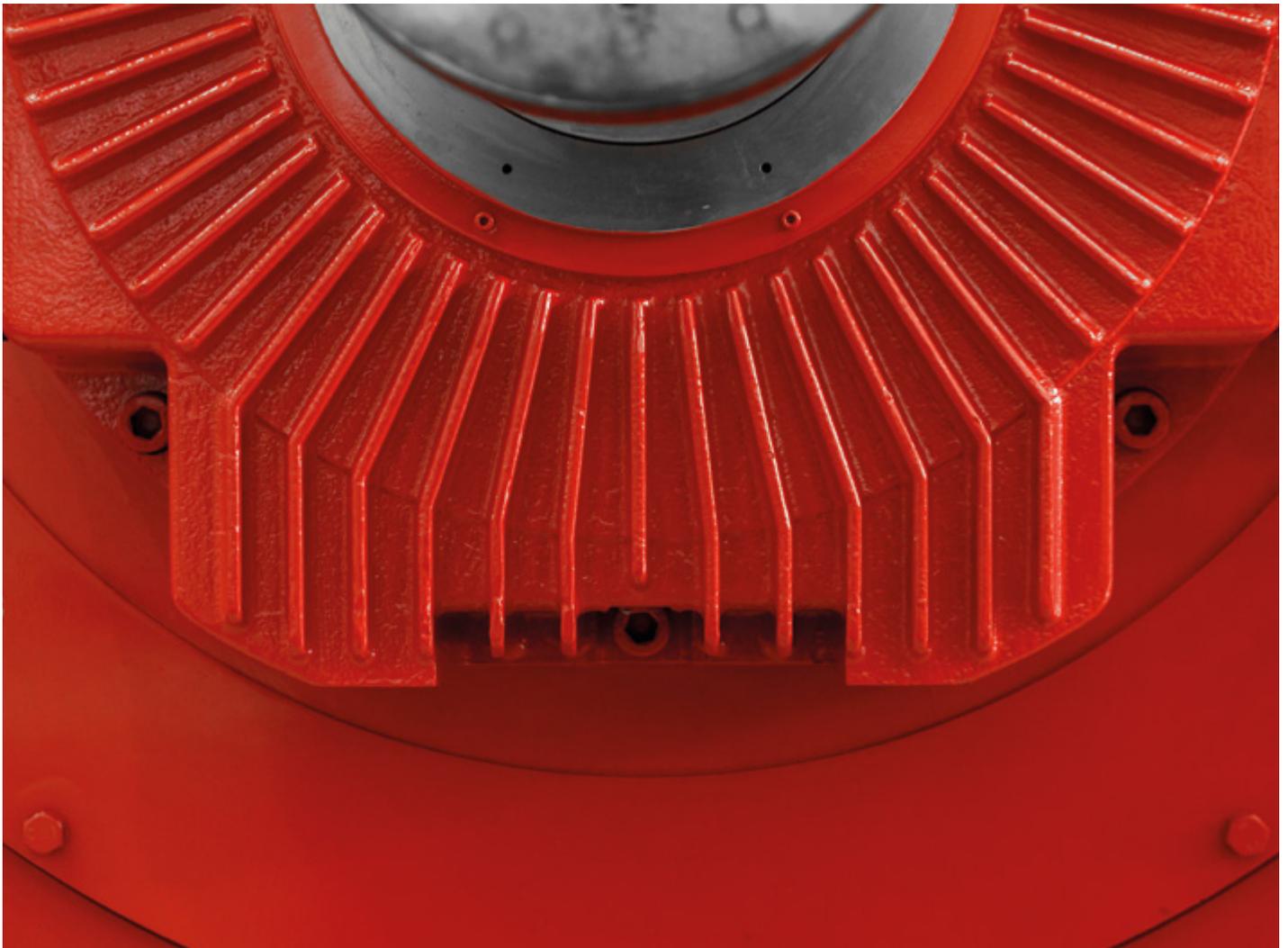
In order to address any customer's queries and adapt to his needs, Gamesa Electric provides a fast response technical assistance service, available at any time.

### Technical Assistance

The technical assistance service of Gamesa Electric counts on the technological resources and the team needed for the diagnosis of machines at site, as well as for the realization of certain repairs without moving the equipment from the customer's site. This is an important cost-saving factor for the client.

### Financial Strength

As part of the larger Siemens Gamesa Renewable Energy, Gamesa Electric harnesses the technological, operational and financial advantages from a leading technological group enabling the company to respond with flexibility and optimal solutions to its customer needs around the world.



## **Motor and generators overhauling**

Gamesa Electric has ideal facilities in its repair facilities in Reinosa (Cantabria) for the revision and repair of electric Motors and Generators. This infrastructure allows offering an initial diagnosis (both static and rotational) of the machines for the preparation of a repair report tailored to the needs of each customer.

In addition, Gamesa Electric has a broad portfolio of testing instruments, both in the company's own facilities and portable, allowing the evaluation of the machines wherever they are:

- › EDA (insulation test equipment)
- › Partial discharges
- › Loss tangent
- › CID - magnetization test
- › Magnetic wedge test equipment
- › Laser Tracker (FARO)
- › Mobile vibration analyzer
- › Laser Alignment Equipment

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The experience accumulated during more than 85 years in the repair of electric motors and generators along with a wide knowledge coming from the development of first-class technologies, both of existing patents as of own patents, allows the company to ensure its customers a high return of their investment by:

- › Adequacy of available resources and technology for the repairs.
- › Testing during manufacturing process as well as on the finished electrical machine ensure the maximum availability of the equipment and maximize the lifetime of the installation.

### Test platform

Gamesa Electric's facilities count on a test bench sized for the performance of dynamic tests to motors and generators:

- › Arrangement: vertical-horizontal.
- › Machine type: synchronous or asynchronous.
- › Type of test: driven machine or motor mode function.
- › Bearings lubrication.
- › Cooling: air, glycol water.
- › Load tests (full load / bifrequency).
- › Power converter availability for system tests.
- › Excitation: Brushless, static, permanent magnets.

### Impregnation stand

In the case of rewinding, Gamesa Electric has a stand of impregnation (VPI) automated with control, acquisition and registration system for the main parameters that intervene in the process, consisting of:

- › Drying: the equipment is inserted in the oven at the required temperature and time according to its type.
- › Impregnation: the equipment is inserted in the impregnation tank and then submitted to three processes:
  - One by inert gas during the precise time and with the pressure level derived from the corresponding process associated to the used resin.
  - Curing: the piece is inserted in the oven during the time and temperature required for curing. Gamesa Electric has both static and rotary ovens.

### Impregnation Characteristics

- › Thermal classes:
  - F: 155 °C
  - H: 180 °C
  - Silicone: 200 °C

Gamesa Electric has a 1,200m<sup>2</sup> workshop destined exclusively for the revision and repair of generators and motors.

The capabilities of these facilities are:

- › Lifting capacity: 70 T
- › Height: 12 m
- › Balancing: 12 T



## Always at your service

Gamesa Electric has a leading service of technical assistance. A team of professionals with extensive experience in the sector, capable of carrying out analysis and plant repairs with a capacity of response that allows reaching the client's facilities in 24h.\*

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