

Synchronous Generators

6 **to** 20 Poles

Altawest Group 



JEUMONT
Electric



Synchronous Generators

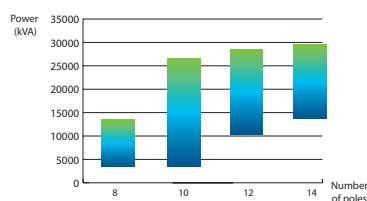
Generator room - Diesel power plant



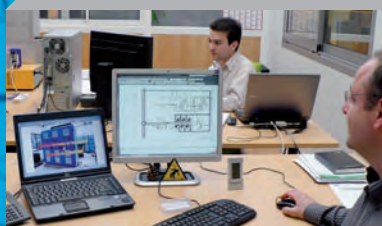
Hydro turbine generator group



Generator range



Engineering office



For more than a century JEUMONT Electric has been supplying generators for Marine and Power generation applications.

Combining the use of the latest technology and the know-how from an extensive Service experience, JEUMONT Electric is offering a comprehensive range of generators for Diesel gen-sets and Hydro-turbines

Markets and applications Marine – Oil & Gas – Power Stations

- Merchant ships
- Oil Rigs, FPSO
- Power Plant Emergency gen-sets
- Diesel engine-driven power plants
- Hydro power plants

JEGSY : A full range of high quality and cost effective generators to meet your needs

- **Voltage** from 3.3 to 13,8 kV, 50 or 60 Hz, Standard P.F. 0.8
- **Insulation Class** F with most components exceeding class H
- **Temperature Rise** B or F
- **Execution** : air cooled - open circuit or heat exchanger
- **Protection index** IP23, IP44 or IP54
- **Power range** from 6 MVA to 60 MVA
- **Speed range** 6 – 20 poles @50 or 60 HZ
- **Standard instrumentation** includes winding PT100, heater,...

JEGSY : A standardized machine with a wide range of options

- Self lubricated sleeve bearing with optional forced lubrication / jacking oil
- Sensors: winding temperature/air temperature/bearing temperature/oil flow control/vibration sensors/current measurement/etc...
- JIREN™ AVR for demanding applications or use of third party product for more conventional applications.
- ATEX compliant on demand.
- Generator protections, Neutral & earthing cubicle etc...



6 to 20 Poles

Reliability, Robustness and High Performance

Combining state of the art technology and extensive service experience

Stator

The stator core is made of low loss pre-insulated magnetic laminations. For special applications (extra-high efficiency machines, hydro generators etc...) mineral insulation is used providing better control of iron losses and higher temperature withstand of the core.

The winding is made of pre-insulated enamelled copper wire, built into coils, machine insulated and pre-formed to enable adequate insertion in the stator slots. Coils have conductive and, when required semi-conductive, external coating to minimize partial discharge and ensure a maximum lifetime of the machine.

After winding and making the necessary connections, the Stator is impregnated under vacuum and pressure (VPI), undergoing a cycle permanently controlled by capacity measurement. Machines with demanding requirements undergo two VPI cycles.

Cooling

JEGSY generators, (stator & rotor) are cooled by a distributed radial air flow. This ensures a homogeneous temperature rise throughout rotor and stator windings providing both an optimisation of power density and an extended lifetime of the machine.

For machines cooled by heat exchangers, the air to air system is provided with an outer fan, and for the water to air system, the heat exchanger can be made using an appropriate material: copper, stainless steel etc...

Final assembly

The generator frame is made of a thick welded and bent steel structure to ensure good vibration behaviour of the generator. The stator is inserted into the frame and secured by a JE patented system. This ensures minimum dismantling time in case of maintenance (typically 2 hours to exchange a stator on site).

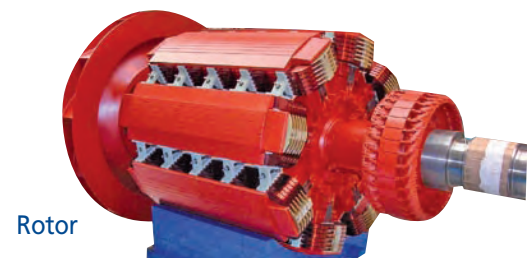
Once assembled with all its auxiliaries the generator is tested according to IEC 34 and additional protocols if required by the customer.

Rotors

The rotor is made of a pre-machined cylindrical shaft capable of withstanding high tensile stress. The magnetic core is composed of stacks of thick steel laminations

The copper coils are assembled and locked in such a way that at no point of the winding can there be direct contact between copper and steel, even through the insulation. This feature ensures that the machine is protected against rotor earth faults.

After assembly, the rotor undergoes dynamic balancing before painting.



Rotor



Stator



Imagination & energy efficiency



Special Features

JEUMONT Electric has developed a comprehensive service capability for rotating machines both on its own machines but also on these made by third parties. The new range of machines has been designed through a joint effort between our design team and our service engineers.

For decades statistics have shown that a major cause of synchronous generator failure is rotor earth fault.

With JEGSY, JEUMONT Electric has developed a machine on which rotor failure is virtually impossible:

- Rotor windings prevent contact between copper and steel
- Rotor cooling prevents differential thermal expansion to maximize generator lifetime.
- Rotor winding can be fully inspected and repaired on site.

In addition, the stator is mounted from the top of the frame to enable easy stator replacement and avoid the need for machine re-alignment.

A robust machine suitable for Hydro applications

For decades, JEUMONT Electric has been supplying hydro generators, ranging from a few MVA to 350 MVA.

Based upon this experience, JEGSY has been designed to suit hydro power generation where high efficiency and very long lifetime is essential.

Using ALKOPHOS™ mineral insulation of slotted laminations, the stator core can be built with minimal risk of interlaminar hot spots and hence reduced losses and risk of core degradation. The process also ensures, thanks to exceptional temperature withstand, that VPI insulated machines can be repaired without any risk to the stator core.

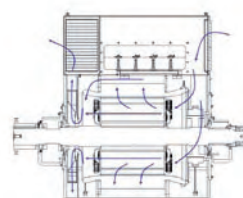
Machines are suitable to withstand over-speeds compatible with PELTON and FRANCIS turbines.

A robust frame can accommodate special types of bearings to cope with thrust and loads generated by the turbine shaft line.

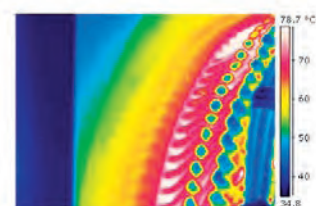
Brushless excitation is offered as a standard but slip-rings can easily be adapted.

JEUMONT Electric has an extensive experience of common projects with turbine makers, offering turnkey and fully integrated solutions to the customer.

Cooling diagram



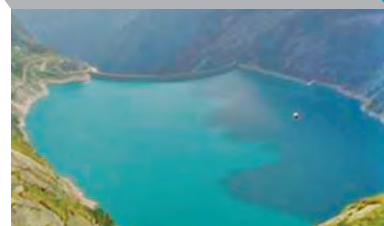
Stator thermal model



Hydro plant generator room



Dam lake



JEUMONT
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6 to 20 Poles

Rigorous quality follow-up

Throughout the manufacturing process, the machine undergoes regular and continuous checks ensuring perfect traceability of product construction and fulfils the most demanding customer requirements:

- Control of winding sections
- Dielectric test before and after VPI
- Sample coil tests
- Capacity measurement during VPI
- Loop test of stator core
- Measurement of impedances and resistances
- Insulation measurement
- Loss factor ($\tan \delta$) measurement
- Partial discharge (optimal)
- Balancing and over-speed
- Routine and type tests as per IEC 34

Services

Over the last 15 years, JEUMONT Electric has developed an extensive service capability. It covers small and medium size machines (with its subsidiary SARELEM) as well as the biggest power plant generators.

JEUMONT Electric has a firm intention to maintain long term relationships with all its customers.

Therefore in addition to designing and manufacturing robust and long lasting machines, JEUMONT Electric provides a strong support to its client throughout the lifetime of its installation

JEUMONT Electric is capable of servicing machines of a few kW up to generators in excess of 1300 MW, with the most stringent quality systems as required in Nuclear Power Plants. This is valid for machines of its own make as well as virtually any type of motors and generators made by third parties.

JEUMONT Electric can mobilise over a hundred people for site operations and can carry out the most complex overhauls. Together with our partners, operations can be carried out all over the world, at short notice.

In addition to Site resources, the services activities have engineering and logistic support in the back-office, intervention preparation area and specific quality follow-up.

Generator test in factory



Test of control cubicles



Site service - generator disassembly



Stator repair on site



Imagination & energy efficiency

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