PRODUCT NOTE

ABB modular synchronous generators 20 MW class

Reliable power production for different operational profiles – in a streamlined and sustainable way

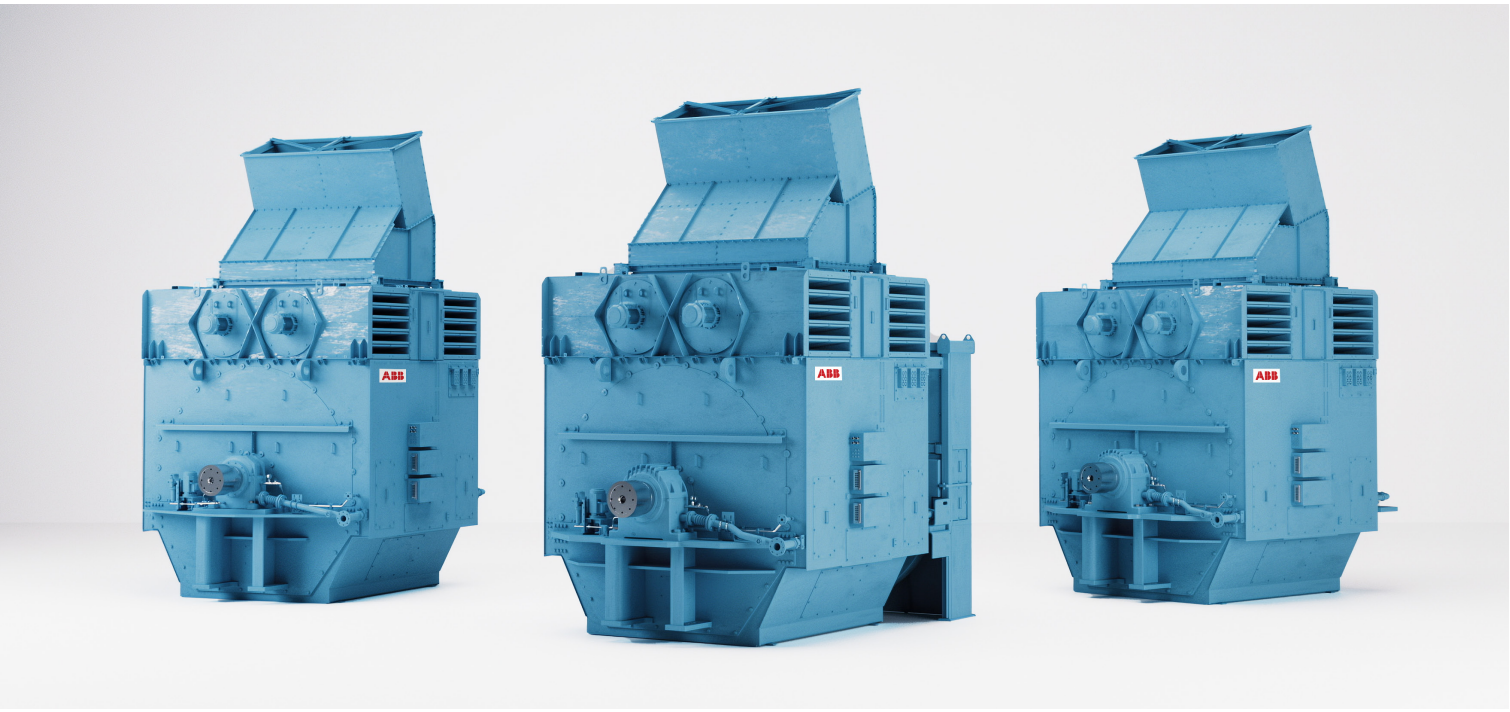


ABB high voltage (HV) synchronous generators have a solid track record for reliable power production. The latest ABB engine generator innovation is ready to meet today's grid code requirements, and it features modular construction and the option to add inertia.

The overall design has been enhanced and includes innovative solutions – like an upgraded cooling unit – for higher efficiency.

ABB's latest modular synchronous generator has been designed in collaboration with major genset OEMs to meet the needs of new genset applications. Modularity means that designs can be produced to cover applications ranging from balancing, with a high number of start/stops every day, through intermediate load, to continuous base-load operation with requirements for high efficiency and inertia to support the grid. In fact, the generator is so versatile that it can also be used in the ancillary services and balancing markets or even operated as a synchronous condenser.

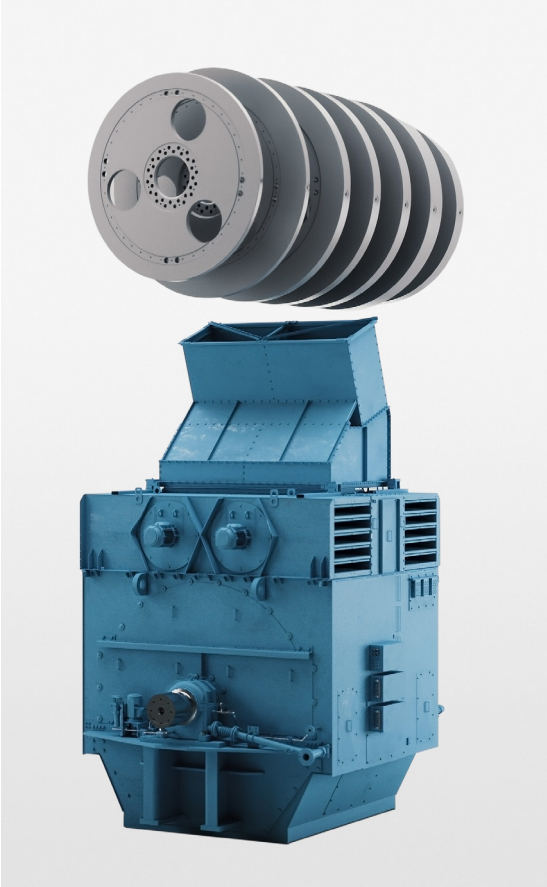
Technical specifications

Standards	IEC 60034, ISO 8528
Duty	Balancing to continuous
Power range	18...21 MW
Voltages	Up to 15 kV
Temperature rise class	B or F
Insulation class	F
Frequency, speed	50Hz/60 Hz, 500/514/600 rpm
IP/IC	IP23/IC0A6
Inertia constant	Up to 2.5 sec
Starts and stops/year	Up to 4000

Grid support and grid code compliance

The transition to renewables is setting new requirements for electricity grids. Reliable balancing power generation is essential to ensure the grid remains resilient to disturbances. Therefore, conventional power generation will also transition towards new operational profiles and applications. Depending on the type of power plant, operational profiles can vary from short-term balancing to continuous generation.

Transmission system operators (TSOs) require power plants to fulfill country-specific grid code requirements before they are allowed to connect to the grid. One of the most demanding requirements is to stay connected when a low voltage/short-circuit event occurs somewhere in the grid. This generally requires the gensets to provide high inertia and fast response to ensure the plant stays in synchronism with the grid when the fault is cleared, and voltage returns to nominal. To ensure the ABB modular engine generator can comply with this requirement, inertia can be optionally added by installing one or two flywheels.



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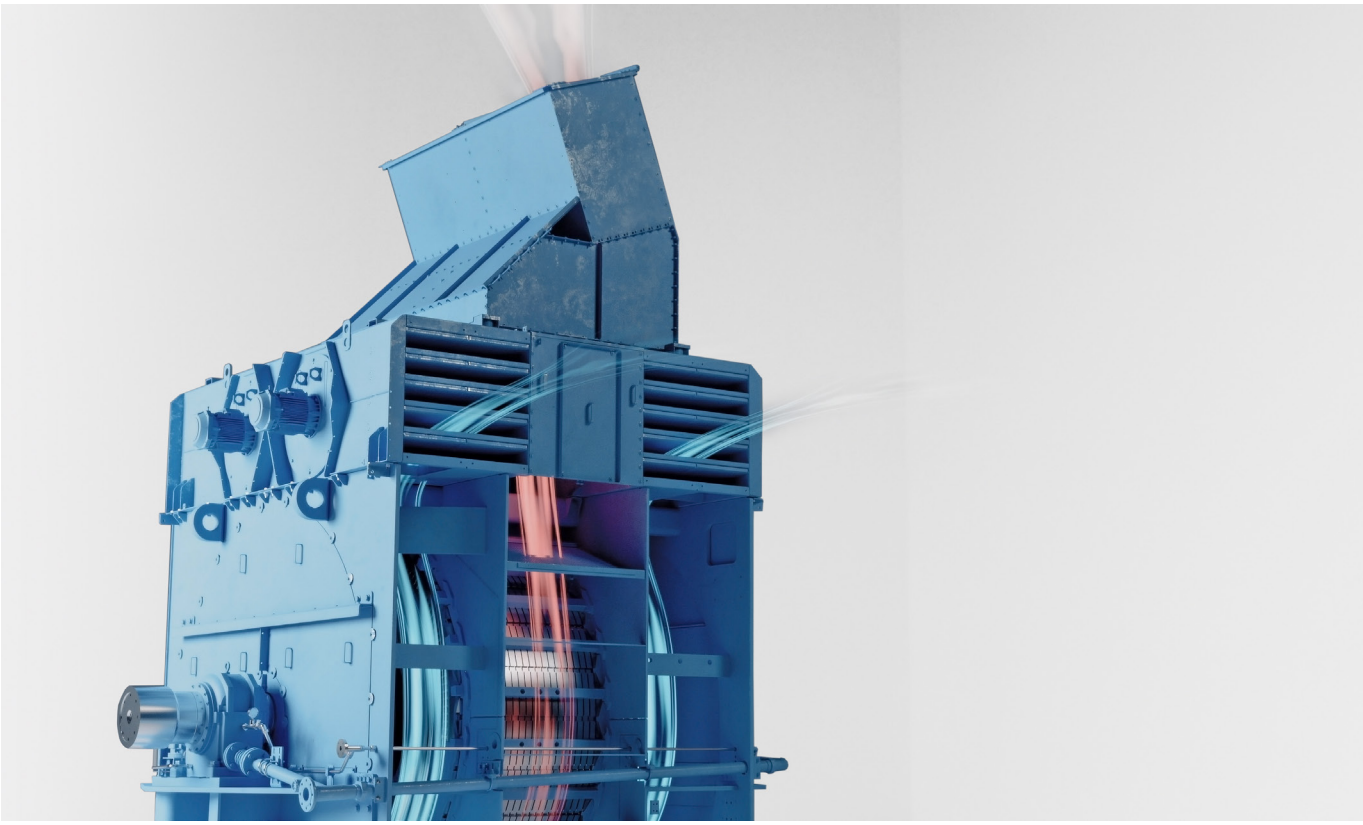
The generator is designed to enable installation of flywheels to add inertia in order to tackle grid code challenges.

New cooling unit



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The upgraded cooling circuit is designed to provide built-in redundancy.

The modular synchronous generator also features an upgraded cooling unit with up to 60% more air flow than provided by traditional cooling arrangements. The unit's four fan motors can be VSD controlled, and built-in redundancy ensures adequate cooling even if only three motors are operating. The upgraded cooling unit enables more efficient cooling by improving the distribution of air flow between the stator winding ends, rotor winding and other key parts. The upgraded cooling unit can be operated on an as-needed basis. This functionality helps increase efficiency and save energy in intermittent and balancing operational profiles when the generator is used less than in continuous operation.

Benefits

Modularity for different applications

Best-in-class lead times

Tailored inertia to match with customer needs

High efficiency design

Tailored maintenance program for different operational profiles

- Increased air flow results in more efficient cooling
- One-point lifting of generator with cooler attached
- Air outlet duct does not require support from floor
- Space for D-end flywheels inside generator (with removal of shaft-mounted fans)
- Energy savings with VSD fan motor control
- Built-in redundancy of the cooling unit
- Inlet air taken from sides of generator where air is cooler than at drive end

Transportation and installation

The generator is designed for easy transportation and assembly on site, and the air duct can be transported separately to reduce the height of the generator package. One-point lifting is possible and no special lifting tools are needed.

The features described above are pre-designed for the generator, enabling the shortest lead times in the market. The generator's design is optimized for concrete and/or separate base-frame mounting types.

Global service network

ABB products are supported with a complete portfolio of services to maximize availability, reliability, and performance. Advanced monitoring and diagnostics tools give advance warning of potential issues to minimize unplanned downtime. Predefined maintenance programs cover all phases of the generator's lifetime.



Based on 140 years of experience in manufacturing and servicing motors and generators, we provide support to maximize performance, uptime and efficiency over the lifetime of your generators.

Our portfolio of services cover regular preventive maintenance programs, advanced monitoring and diagnostics to detect potential problems before they become critical, as well as upgrade and retrofit solutions to extend the lifetime of your generators.

Whatever your applications' needs, we support you to keep your equipment running at top performance.

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