

Brochure

# Electric generators to power the world



We provide motors and generators, services and expertise to save energy and improve customers' processes over the total life cycle of our products, and beyond.

# Generators from the leading global supplier

**ABB is widely acknowledged to be the world's leading supplier of electric motors and generators. With more than a century of manufacturing behind us, we now have 45 production plants in 13 different countries to serve today's global markets.**

We are the market leader in generators for steam and gas turbines, diesel and gas engines, and wind turbines. We are also active in a number of other power generation applications, including generators for geothermal and solar power, synchronous condensers and energy recovery expanders. Our broad product portfolio extends from 14 kVA to 70 MVA.

Our approach is to support our customers throughout the product life cycle: from the initial project concept, through design, installation and many years of successful operation, to eventual migration or replacement. We can deliver an entire generator package customized around your application: in addition to the generator we can provide the cooling system, main terminal box, maintenance tools and control equipment. System monitoring and protection solutions are also available.

## Technology leadership

Significant investments in R&D over many years have helped to make us a technology leader. This gives us the flexibility to respond quickly to advances in turbine or engine designs and evolving market needs. The changing power generation situation in the world presents new challenges for generating equipment. At ABB we are continuously focusing our technology efforts to ensure we have products that not only offer high reliability but also meet the market's requirements with regard to issues like low voltage ride through events, high efficiency, fast response times and frequent starts.

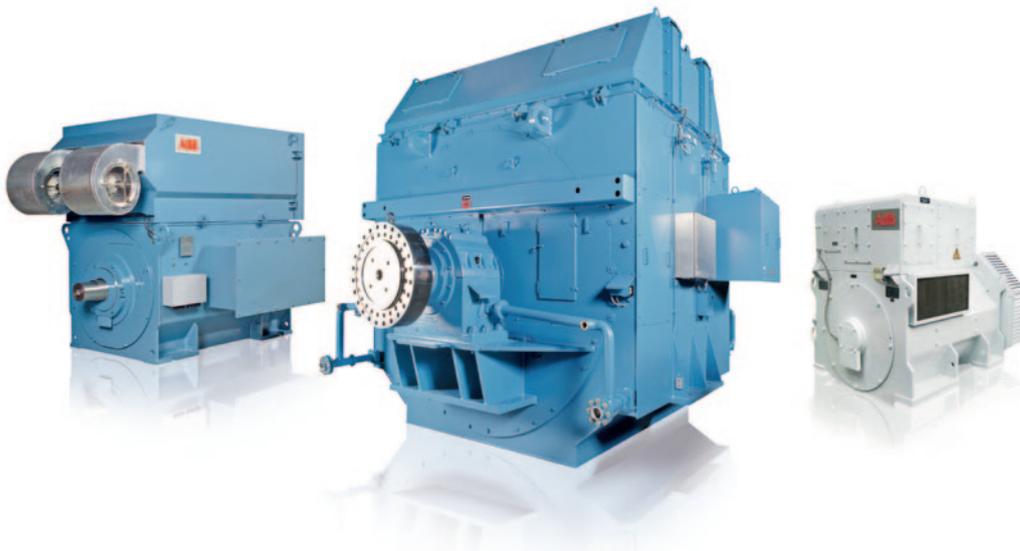
Another major priority is quality. We follow the requirements of the ISO 9001 and ISO 14001 quality and environmental standards, as well as our own rigorous quality program. The desire to produce the best quality influences all the work we do across the entire value chain. Wherever we build our generators and whatever ABB generator you use, you can be sure that you will get the same high quality.

## All major standards

As a supplier to customers in all the world markets, we have strong experience in designing products to cope with different climatic and environmental conditions and to meet the standards and grid codes applicable in the different market areas. Our products comply with all major standards: the electrical designs are based on the relevant IEC standard (NEMA compliance optionally available), and the mechanical designs on ISO standards. In addition, generators for marine or offshore applications follow the design criteria of the applicable classification society, including ABS, BV, CCS, CR, DNV, GL, KR, LR, NK, RINA, and RS.

Our products are typically used in critical power generation applications, and we know that local support and fast response are vital. With our global organization and network of local service centers, we are able to respond quickly no matter where you are located. We offer a complete portfolio of life cycle services, from pre-purchase advice, through installation, maintenance and spare parts, to migration and upgrades. Our advanced preventive and predictive maintenance solutions and efficient spare parts logistics system help to maximize power production and minimize downtime.

The huge installed base of ABB generators – producing power in a full range of applications and operating conditions in all parts of the world – gives us the expertise to ensure that the generator we supply will be the best possible match for your needs.



# Generators for steam and gas turbines



With a wide range of synchronous 4-pole turbine-driven generators available, we are able to supply the right products for many different customer needs. Our generators for steam and gas turbines are producing power around the world, in power utilities, paper mills, sugar plants, on- and offshore oil and gas installations, waste incineration plants, and many other sectors.

Our **high voltage (HV) generators** for either steam or gas turbines are built to match the specific site conditions. The range now supports outputs up to 70 MVA with proven reliability.

We also supply **pre-engineered generators** for steam and gas turbines. These products offer the advantages of standardization, including short delivery times, while meeting all the most common needs in the market.

ABB **low voltage (LV) generators** can be used for smaller steam turbines and gas turbine applications. They feature a standard design for cost efficiency, together with a full selection of options for added versatility.

We have delivered generators for steam and gas turbines to locations all over the world and worked with customers to ensure that our products provide optimum performance in their applications. In particular, we have extensive experience in meeting the different standards and grid codes that are required globally.

## Product range

High voltage generators		Low voltage generators	
Output	Up to 70 MVA	Output	14–5,000 kVA
Voltage	3–15 kV	Voltage	400–690 V
Speeds	Up to 1,800 rpm	Speeds	1,500/1,800 rpm



# Generators for diesel and gas engines



**We have supplied more GWh of power in diesel and gas engine applications than any other generator manufacturer. Our unrivalled experience means you can be sure we will propose the best product for your requirements.**

Our **high voltage (HV) generators** have been proven reliable with most currently available four-stroke reciprocating diesel and gas engines. The gen-sets are normally used in decentralized power plants. Typical applications include electric utilities and district heating plants, and the marine and offshore sectors.

ABB **low voltage (LV) industrial generators** combine the cost advantages of a standard design with a wide variety of options, enabling deployment across a broad range of situations. They are ideal for producing continuous or standby power for schools, hospitals, offices and factories, and for demanding applications like mines, telecommunications, cogeneration, and transportation.

**Low voltage (LV) marine generators** are used in main, auxiliary or emergency power generation. They can be built into diesel generating sets or operated as shaft generators. They are used in cruisers, ferries, ice-breakers, multi-purpose tankers, LNG tankers, ice-going vessels, supply vessels, drilling rigs, and more.

Key targets of our development program are further improved efficiency in gas engine applications, higher overall reliability and even better vibration tolerance. In the case of engine induced vibration, we work closely with gen-set manufacturers, applying sophisticated tools and our own extensive experience to analyze the impacts of external torsional and linear vibrations. This is one of the ways we ensure that our generators will deliver the trouble-free operation our customers expect.

## Product range

High voltage generators		Low voltage generators	
Output	1–60 MVA	Output	14–5,000 kVA
Voltage	1–15 kV	Voltage	400–690 V
Speeds	200–1,800 rpm	Speeds	600–1,800 rpm



# Wind power generators



Over the last 30 years we have supplied more than 30 000 generators to leading wind turbine manufacturers in all significant markets. No matter which of the main electrical drivetrain concepts you choose – from direct drive to medium and high speed – we offer the solutions you need. As the technology leader we can supply generators and converters in perfectly matched packages.

ABB low speed direct drive permanent magnet generators (LS PMGs) provide good system efficiency, especially in low wind areas.

Our medium speed permanent magnet generators (MS PMGs) deliver over 98% efficiency, which is the highest available in the market. Benefits of this lower speed design include high reliability and compact size, and it offers a proven way to reduce top head mass. The nominal speed can be selected between 100 and 500 rpm using a single or two-stage gear. MS solutions can be either fully integrated (gearbox and generator share the same frame, bearings and shaft) or semi-integrated (gearbox and generator are only partly integrated via a flange connection).

ABB high speed (HS) generators are available in three types: squirrel cage, doubly-fed and PM. HS is the mainstream solution both on land and at sea. Using ABB HS PM generators with the full converter concept delivers the best kWh production and smallest size and

weight, while enabling easy manufacturing and logistics. For turbine OEMs, this combination offers a fast-track route from doubly-fed to the benefits of the full converter concept– without the need for extensive re-engineering.

Our generators help turbine manufacturers to meet all the criteria vital for wind power installations – high system efficiency, excellent reliability, small size, low weight, and proven grid code compliance. In offshore wind power, reliability and efficiency are particularly important, and the majority of the offshore turbines now operating rely on ABB generators.

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## Product range

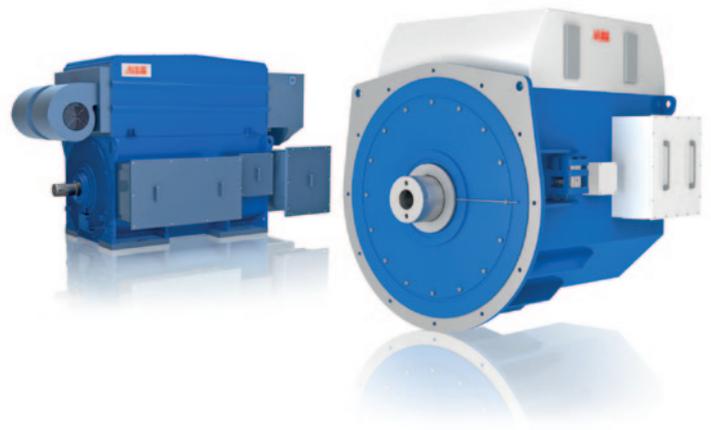
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### Induction and synchronous generators

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Output	1–8 MVA (and more)
Voltage	690 V – 12 kV
Speeds	14–2,000 rpm dependent on concept

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## Other applications



Two areas presently attracting a lot of interest in the energy sector are renewable energy sources, and technologies to boost the energy efficiency of processes. We are actively involved in both these fields and we can build generators tailored for each specific site and application.

Our generator platform uses standard modules for reliable operation and reduced lead times. At the same time it allows plenty of scope for customization, and active components are designed to provide the optimum electrical characteristics for the specific installation. As well as supplying customized generators, we have the experience and tools necessary to help site operators with the design of their overall installation.

Equipment for **geothermal power** production sites typically has to withstand corrosive gases or other aggressive environmental factors. We can incorporate special coatings into the design or use pressurization to ensure that the generator is robust enough for the ambient conditions at the site.



Generators for **solar power** plants are often designed for sites in hot environments where water supplies are limited. For sites where cooling water is not available, we can supply air-cooled generators. Specific electrical requirements may include connection to a weak network and operation over a broad load spectrum. We can also design solar power generators for daily starting. In cases where generators have to operate with large load variations or produce power continuously, we can supply dual shaft end designs to allow two smaller turbines to be coupled at the same time.

**Synchronous condensers** are used to support network voltage by providing reactive power compensation, and they also contribute to the overall short circuit power capacity in the network node where they are installed. This improves the chances that equipment will be able to ride through network fault conditions. A synchronous condenser is basically a synchronous generator operating without a prime mover. ABB offers module-based synchronous condenser solutions with active components designed according to project-specific needs. These modules feature minimal footprint on site and minimal need for external auxiliary support.

# Contact us

[www.abb.com/motors&generators](http://www.abb.com/motors&generators)

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