




Brochure

High voltage modular induction motors

Motors that match your needs

Power and productivity
for a better world™



A large, light blue industrial motor or generator unit is the central focus of the image. It is situated in a factory or industrial setting, with a white metal railing in the foreground. The unit has a complex, angular design with several vertical supports. In the background, there are white structural beams, a red fire escape, and various cables and pipes. The lighting is bright, coming from overhead industrial lights.

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

Custom-built to perform with perfection

Energy-efficient, reliable and productive

ABB high voltage modular induction motors are designed to operate at the highest levels of efficiency, reliability and availability in the toughest and most demanding process applications.

All ABB high voltage modular induction motors are tailor-made to meet the precise needs of each customer and each application. Built from the motor industry's most successful modular platform, each module is designed to match a broad variety of demanding application requirements while having the flexibility to be adapted to highly specific configurations.

These high-performance motors are available with all types of options, enclosures and cooling arrangements; they comply with all international standards; they are optimized for variable speed control; they pass through the most stringent of testing procedures at each stage of production; and they can be configured for the broadest range of applications – from pumps, fans and compressors to blowers, conveyors, crushers and ship thrusters.

Their defining characteristic are quality of design and quality of manufacturing. That is what makes them stand apart, that is what enables them to operate at the peak of efficiency and reliability and with the lowest life cycle costs, resulting into optimized cost of ownership.



The best support on the market

ABB offers unrivaled resources and support to all its motor customers. We are the world's leading manufacturer of motors and generators. We are also the world's leading supplier of variable speed drives. And, we've been manufacturing motors since the dawn of the industry, more than 130 years ago.

ABB has 43 motor factories in 15 countries worldwide, a global service and partner network in more than 100 countries, and around 15,000 dedicated motor professionals ready to share their knowledge and provide expert advice.

Equipped with the most advanced configuration and optimization tools, our local sales team will quickly and efficiently find, configure and optimize the right motor for each application. Dedicated ABB R&D centers are at hand to provide additional engineering for specially demanding requirements.

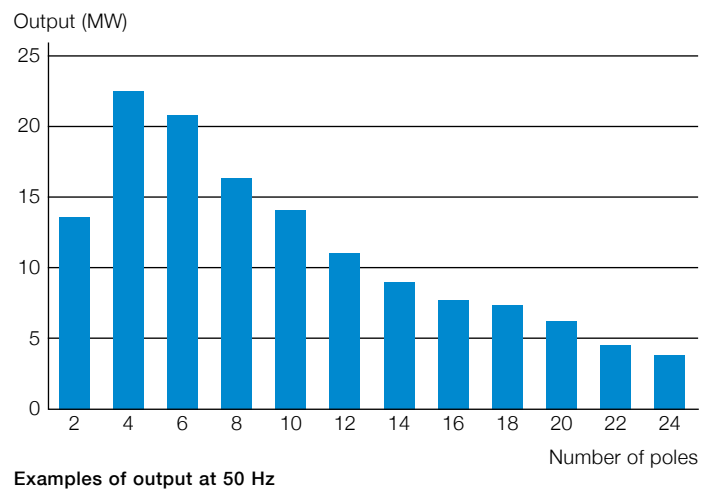
Motors for every application

Tailored for the toughest environments

ABB high voltage modular induction motors are built to withstand the most demanding process requirements and the toughest operating environments – hazardous or safe, cold or hot, dusty or humid, onshore or offshore.

Our range of motors is the most comprehensive on the market. The motors meet all international standards and national requirements – including IEC, European (EN) and NEMA – and cover all protection types from open ventilated to dust ignition proof.

Motor output extends up to 23 MW or 30,000 hp with frame sizes ranging from 400 to 1,000 mm. The standard range extends from 2 to 12 poles, with options for up to 24 poles. Operating voltages are from 575 V to 13.8 kV at 50 or 60 Hz. Ambient operating temperature is from minus 50 degrees to plus 60 degrees Celsius. All motors can be mounted either vertically or horizontally.





Typical industries served: 1 Air separation | 2 Cement | 3 Chemical, oil and gas | 4 Marine | 5 Metals and minerals | 6 OEMs and system integrators | 7 Power generation | 8 Pulp and paper | 9 Water and wastewater



Typical applications served

| | |
|-------------|-------------|
| Blowers | Mixers |
| Chippers | Pulpers |
| Compressors | Pumps |
| Conveyors | Refiners |
| Extruders | Shredders |
| Fans | Thrusters |
| Hoists | Mill stands |

Motor mechanical structure

Efficiency and reliability start here

Each component and each design detail of an ABB high voltage modular induction motor are engineered and manufactured to maximize motor performance and provide a uniquely low cost of ownership over a long and productive operating life.

Rotor

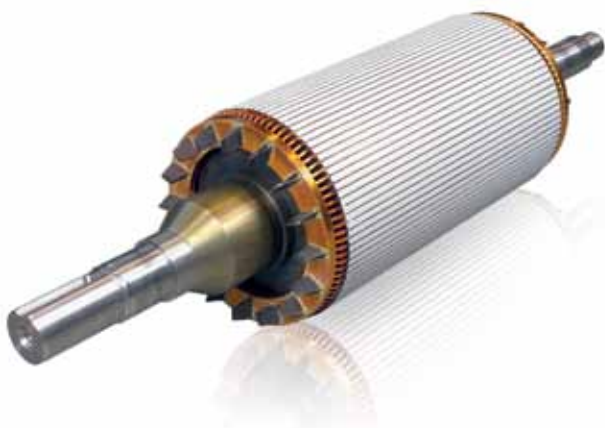
The key to a long rotor operating life is minimal vibration. This is achieved through robust construction and careful balancing.

ABB selects the shaft material according to the demands of the application and the ambient conditions in which the motor is to operate. Squirrel cages are made of copper, copper alloy or aluminum, depending on the load and customer requirements. Additional stiffness is provided by fabricated rotor bars, which enable the motors to withstand long periods of heavy use. Aluminum bars and end rings are used to ensure optimal starting characteristics. And, once assembled each rotor is dynamically balanced at full operating speed in accordance with the ISO 1940-1 and ISO 11342 standards on mechanical vibration.

Stator

The stator core is welded and machined to form a solid and compact unit that retains its rigidity throughout the life of the motor. Radial air ducts ensure uniform and efficient cooling.

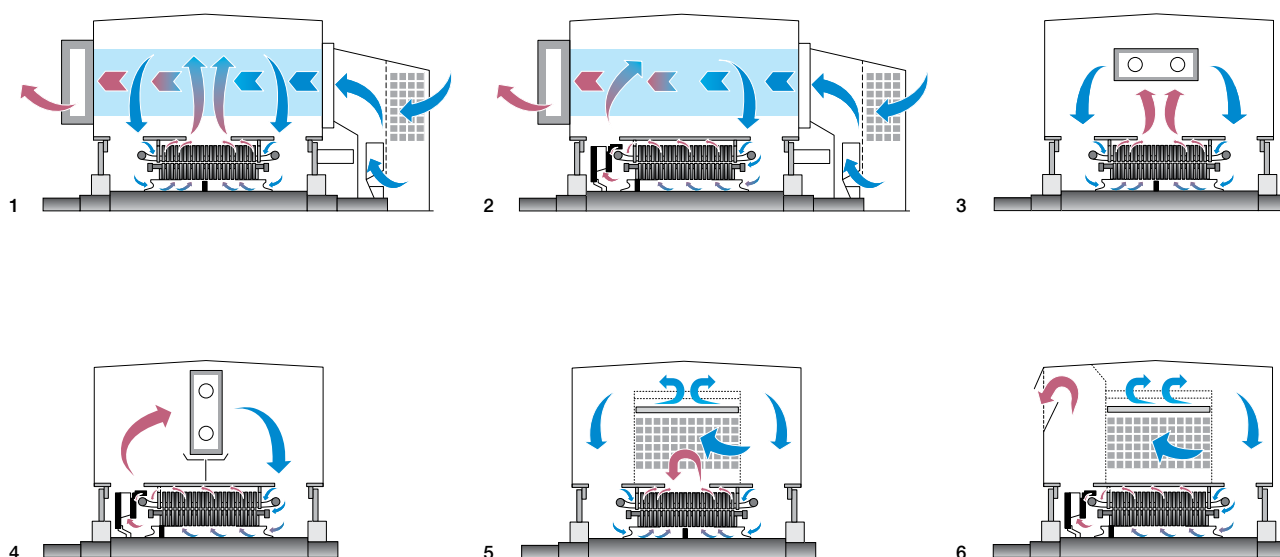
When completely wound and connected, the stator is vacuum pressure impregnated and cured with ABB's Micadur® Compact Industry insulation system, a specially formulated epoxy resin used by ABB to insulate all its rotating electrical machines over the past 30 years. Micadur ensures a sealed and homogeneous insulation system, resulting in low dielectric losses, high dielectric strength, excellent heat transfer and the elimination of hazardous internal partial discharges. As standard, all motors are designed to stay within temperature Class F.



Rotor



Stator



1 Cooling air-to-air symmetric | 2 Cooling air-to-air unsymmetric | 3 Cooling air-to-water symmetric | 4 Cooling air-to-water unsymmetric | 5 Cooling weather-protected symmetric | 6 Cooling weather-protected unsymmetric

Bearings

The bearings used by ABB are designed for a reliable, continuous service life of more than 100,000 hours, and for ease of maintenance. The motors are fitted with SPM nipples and grease valves as standard, and are tested at up to IP 56 protection against dust ingress and water. ABB also offers a broad range of bearing options, including spherically seated self-aligning sleeve bearings, thrust bearings, and special bearings such as cylindrical roller bearings and deep-groove ball bearings. All bearings have a sealing system that prevents dust penetration.

ABB's portfolio of bearing monitoring systems includes a complete range of continuous or periodic monitoring options for different kinds of measurements, like temperature and vibration monitoring. We can also provide solutions that are adapted to the customer's existing vibration measurement systems.



Bearings

Cooling systems

Efficient cooling is vital for peak motor performance in all ambient operating conditions. ABB offers a variety of symmetrical and asymmetrical cooling systems to match operational requirements. They range from weather-protected open ventilated systems to totally enclosed systems fitted with air-to-air or air-to-water coolers.

Frame and terminal boxes

The compact, rigid, welded frame is designed to reduce overall weight, provide high lateral and torsional stability, and ensure minimal vibration levels in all operating conditions and over the whole speed range.

Terminal boxes are designed to facilitate cable connection and shorten installation times. They can be mounted on either side of the motor, and are equipped with a pressure relief device as an added safety feature. Design options are available, including an oversized main terminal box, separate star point terminal box, and phase insulated, phase separated and phase segregated terminal boxes.

Accessories

ABB offers an extensive range of accessories for different industrial segments, applications and operating environments. The range includes separate auxiliary boxes for the heater and other components, water leakage detectors, temperature transmitters, surge voltage arresters, digital pulse encoders and vibration monitoring systems and equipment.

Testing, testing and more testing Making sure the motor performs perfectly



Each ABB high voltage induction motor passes through a stringent program of tests at each stage of the production process.

ABB's testing program is far above the ordinary. It is one of the many factors that differentiate an ABB motor from others on the market.

Testing is the only way to ensure that each and every component is manufactured and configured correctly, and that the motor is performing reliably under load and according to customer specifications. Only when all the test procedures have been satisfactorily completed and approved by the customer is the motor allowed to leave the ABB factory.

Nothing is omitted from ABB testing procedures: Noise levels, vibration, torque and temperature, as well as all the individual components as they progress through the production process.

When the motor is assembled, we conduct a full-scale operating test and measure all the critical values. This can be performed in our factories at different loads and in combination with transformers, variable speed drives and other electrical equipment. The test report is handed over immediately after the tests are concluded. We also perform customized tests to measure special characteristics.

All ABB tests are carried out in accordance with international standards and third-party certifications such as LR (Lloyd's Register), BV (Bureau Veritas), DNV (Det Norske Veritas) and ABS (American Bureau of Shipping).

Optimized for variable speed control

Cuts energy consumption and improves process performance



In addition to being the world's leading manufacturer of low, medium and high voltage motors and generators, ABB is also the market and technology leader in variable speed drives. This dual capability translates into a unique expertise in rotating machines and variable speed control that ABB brings to each motor and drive application.

ABB offers a comprehensive range of low and medium voltage drives for a broad spectrum of applications – from pumps, fans and compressors to conveyors, refiners and thrusters. Equipped with ABB's patented Direct Torque Control technology, the drives provide rapid, accurate and stepless control from zero to full speed.

The ability to vary the speed and torque of an electric motor and the driven load brings a number of significant benefits:

Substantial energy savings

- Instead of the motor running constantly at full speed, the drive automatically decreases or increases the speed of the motor according to demand. A mere 20 percent reduction in the speed of a pump or fan can save as much as 50 percent in energy

Optimal process control

- The drive enables the process to achieve the right speed and torque while maintaining process accuracy. This contributes to a more consistent quality and throughput of the end product

Reduces maintenance

- Adjusting the speed and torque of the motor reduces wear and tear on both the motor and the driven load

Efficient network dimensioning

- ABB drives eliminate equipment like valves, gears and belts, making it possible to improve network dimensioning based on a lower starting current

Functional safety

- Most ABB drives offer functional safety features that comply with the requirements of the European Union Machinery Directive 2006/42/EC

Life cycle services and support

From pre-purchase to migration and upgrades

ABB offers a complete portfolio of services to ensure trouble-free operation and long product lifetimes. These services cover the entire life cycle. Local support is provided through a global network of ABB service centers and certified partners.



Pre-purchase

ABB's front-end sales organization can help customers to quickly and efficiently select, configure and optimize the right motor or generator for their application.

Installation and commissioning

Professional installation and commissioning by ABB's certified engineers represent an investment in availability and reliability over the entire life cycle.

Engineering and consulting

ABB's experts provide energy efficiency and reliability appraisals, advanced condition and performance assessments and technical studies.

Condition monitoring and diagnosis

Unique services collect and analyze data to provide early warnings of problems before failures can occur. All critical areas of the equipment are covered.

Maintenance and field services

ABB offers life cycle management plans and preventive maintenance products. The recommended four-level maintenance program covers the entire product lifetime.

Spare parts

Spare parts and support are offered throughout the life cycle of ABB products. In addition to individual spares, tailored spare part packages are also available.

Repair and refurbishment

Support for all ABB motors and generators and other brands is provided by ABB's global service organization. Specialist teams can also deliver emergency support.

Migration and upgrades

Life cycle audits determine the optimum upgrades and migration paths. Upgrades range from individual components to direct replacement motors and generators.

Training

Product and service training courses take a practical approach. The training ranges from standard courses to specially tailored programs to suit customer requirements.

Specialized support

Specialized support is offered through ABB's global service organization. Local units provide major and minor repairs as well as overhauls and reconditioning.

Service contracts

Service contracts are tailored to the customer's needs. The contracts combine ABB's entire service portfolio and 120 years of experience to deploy the optimal service practices.

Total offer of motors, generators and mechanical power transmission products with a complete portfolio of services

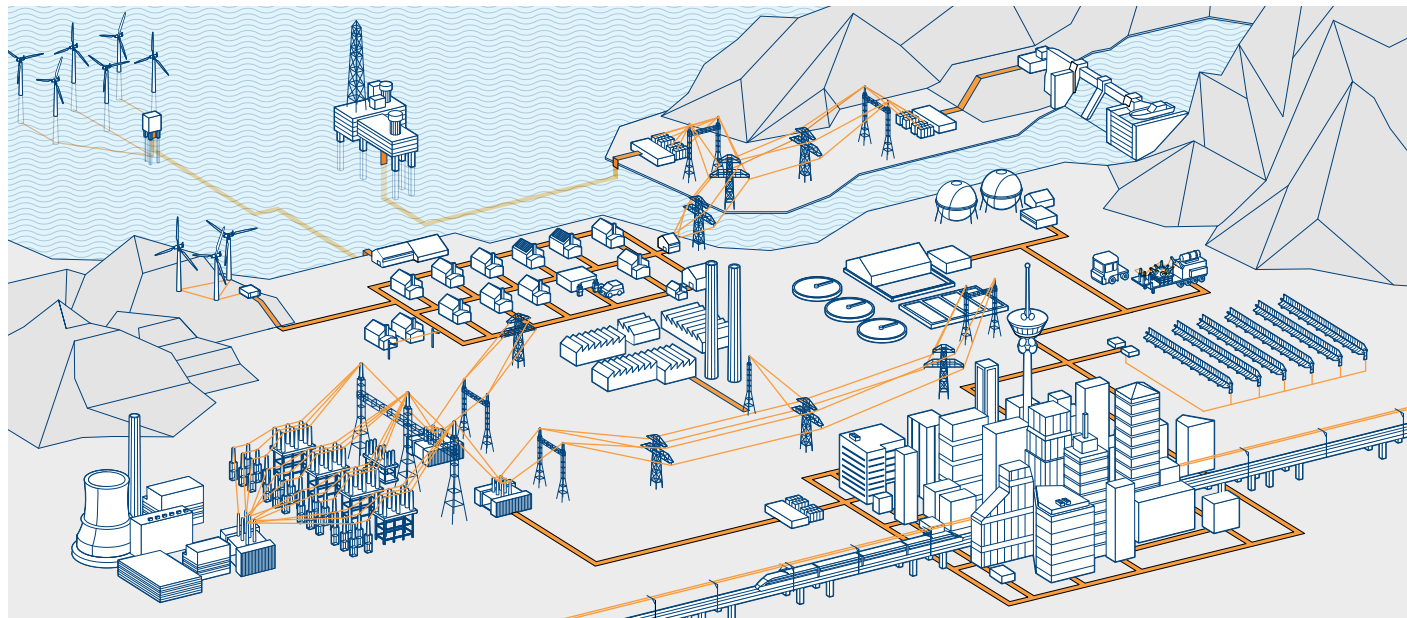


ABB is the leading manufacturer of low, medium and high voltage motors and generators, mechanical power transmission products with an offering of a complete portfolio of services. Our in-depth knowledge of virtually every type of industrial processing ensures we always specify the best solution for your needs.

Low and high voltage IEC induction motors

- Process performance motors
- General performance motors
- High voltage cast iron motors
- Induction modular motors
- Slip-ring modular motors
- Synchronous reluctance motors

Low and medium voltage NEMA motors

- Steel frame open drip proof (ODP) motors
- Weather protected, water cooled, fan ventilated
- Cast iron frame (TEFC)
- Air to air cooled (TEAAC) motors

Motors and generators for explosive atmospheres

- IEC and NEMA motors and generators, for all protection types

Synchronous motors

Synchronous generators

- Synchronous generators for diesel and gas engines
- Synchronous generators for steam and gas turbines

Wind power generators

Generators for small hydro

Other motors and generators

- Brake motors
- DC motors and generators
- Gear motors
- Marine motors and generators
- Single phase motors
- Motors for high ambient temperatures
- Permanent magnet motors and generators
- High speed motors

- Smoke extraction motors
- Wash down motors
- Water cooled motors
- Generator sets
- Roller table motors
- Servo motors
- Traction motors

Life cycle services

- Installation and commissioning
- Service contracts
- Preventive maintenance
- Spare parts
- Diagnosis
- Repair and refurbishment
- Site survey and overhaul
- Replacement motors and generators
- Technical support and consulting
- Training

Mechanical power transmission components, bearings, gears

Contact us

www.abb.com/motors&generators

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