Brochure

Slip-ring motors for heavy-duty and critical applications

Reliable and efficient solutions to drive your operations

Power and productivity
for a better world™

We provide motors and generators, services and expertise to save energy and improve customers' processes over the total lifecycle and beyond

Join forces with the technology leader
Choose ABB efficiency and quality

The most innovative technology for motors and drives.
Forward-looking products based on more than a century of experience.

A global leader in power and automation technology, ABB designs and manufactures a comprehensive range of motors and generators for all applications. We have more than 100 years of experience in supplying low and high voltage AC motors for use in almost all industries.

Our resources and extensive R&D program have enabled us to become a technology leader in our chosen fields, and ensure we are well-placed to maintain our edge in the future. We utilize the most advanced design and manufacturing technologies to optimize the reliability and efficiency of the solutions we supply.

Our motors are often used in critical applications where downtime must be avoided, so it is vital that they are backed by effective and responsive support. Our global network of service facilities enables us to respond quickly and support our customers wherever they are located in the world.

These advantages - our experience, resources, technological leadership and worldwide sales and service network – have helped us to become the preferred supplier to leading players in a wide range of industries.

Slip-ring motors, ideal for heavy load inertia applications or weak network conditions:

- high starting torque, high inertia – low starting current
- high torque over the entire speed range
- suitable for starting in weak networks
- can be adapted for use with VSDs (variable speed drives)

Our design experience and application expertise have made us a leading manufacturer of high voltage slip-ring induction motors. These motors are widely used in applications requiring high starting torque or low starting current, including mill drives, cement plants, mines, utilities, water works and many more.

Slip-ring motors are known as wound rotor induction motors in certain markets.

These rugged motors with fully braced and vacuum pressure impregnated windings are made for heavy-duty operation. Their high efficiency level is mainly achieved through sophisticated motor design software, the effective use of high quality materials, and advanced ventilation technology. High efficiency means substantial energy savings over the life of the motor.

Compliance with major standards worldwide

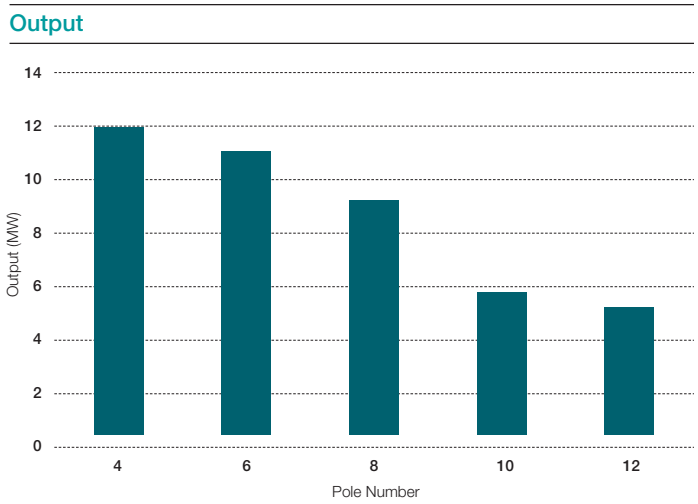
- IEC
- NEMA
- GOST
- CSA
- BS, ANSI, IEEE, VDE, EN

In addition to our comprehensive range of motors designed to meet international IEC standards, we now have a full range of NEMA compliant motors.

ABB premium quality

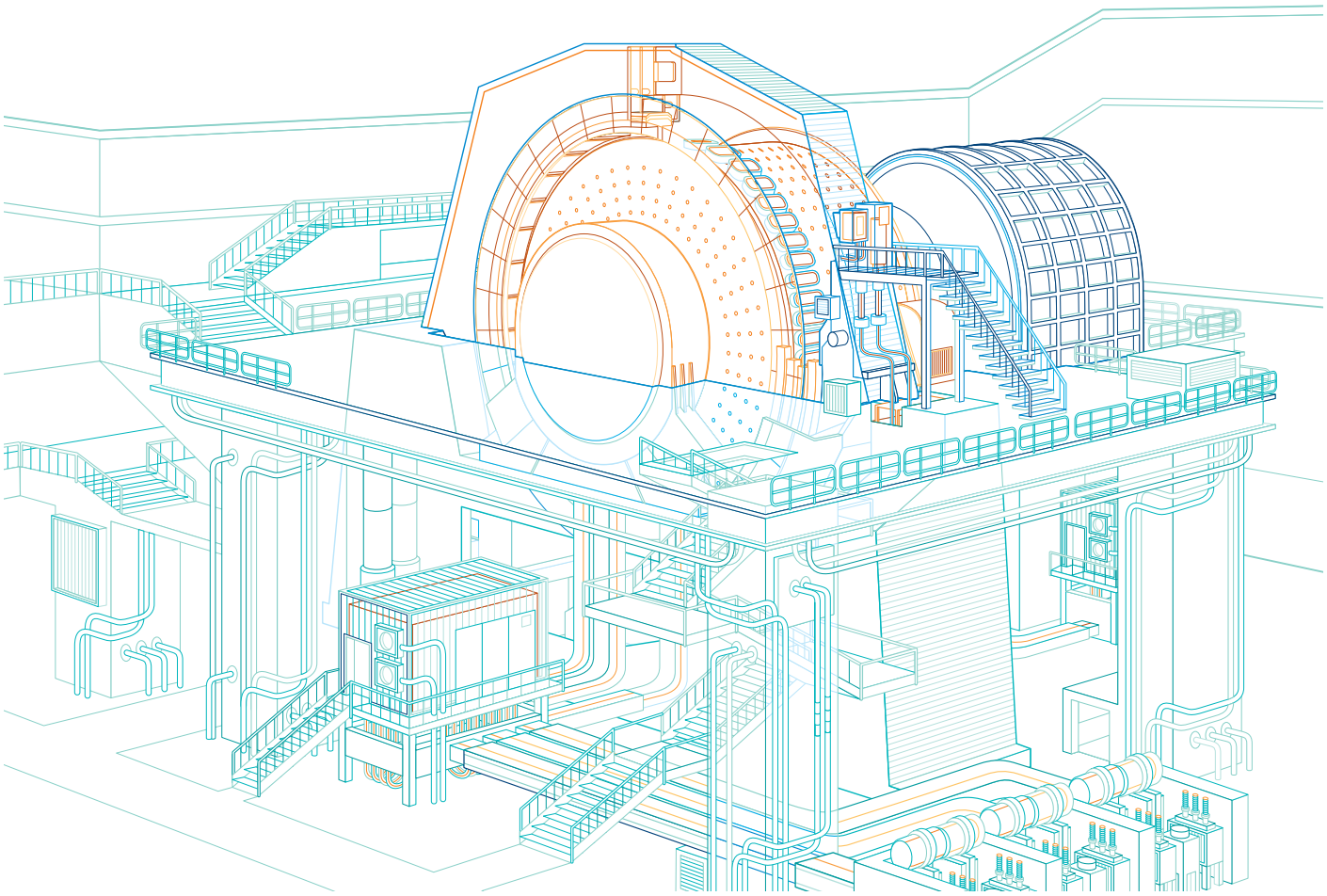
- high efficiency
- low noise
- long lifetime
- VPI (vacuum pressure impregnation) insulation system
- advanced design
- over 100 years of experience in motors and generators
- global ABB service network
- ISO 9001 quality certification
- ISO 14000 environmental certification

Wide product range
Slip-ring motors to suit all requirements



Main features:

- Direct on line, VSD
- Shaft heights: 400 to 800 mm
- Power: up to 11900 KW
- Poles: from 4 to 12, as option up to 24
- Frequency 50, 60 Hz
- Output power: 400 to 15,000 HP at 60 Hz
- Voltage: from 4 to 13.8 kV
- Horizontal or Vertical
- IEC, NEMA, CSA
- Safe area motors



High quality components for top performance
Putting advanced technology to work

The stator
The stator is designed and built – from the first welded joints onwards - to produce a compact and uniform system that can deliver a long operating life, even in difficult conditions. Ventilation is optimized by the use of special radial ducts.

The lamination is insulated from the stator core by means of a heat-resistant inorganic resin (Class F), while the windings and connections are insulated by means of mica-based tapes. Once the winding is complete, the whole stator is vacuum pressure impregnated to form a single block that will keep its rigidity over the entire life of the motor.

The terminal boxes are designed to make cable connection easier and reduce installation time.

The bearings
The bearings are designed to deliver a long operating life with easy maintenance.

Various types of bearings are available, including cylindrical, self-aligning and sleeve versions, with the optimum choice depending on the size, operating characteristics and type of motor. Antifriction bearings are designed for a 100,000 hour working life, and are structured to minimize the noise level and prevent dust penetration.

The rotor
When a motor is operated in difficult conditions - in harsh environments or with demanding operating cycles - vibrations occur that can reduce the useful life of the rotor. ABB motors feature rotors made of materials selected to withstand these conditions, ensuring low vibration levels through their solid structure and perfect balancing of each component. The rotor shaft is built to match the challenges imposed by the motor's specific operating cycles and conditions, and the rotor itself is dynamically balanced at the maximum operating speed.

Each weld is made according to rigorous procedures and undergoes several quality checks, while the windings are produced using techniques to minimize vibrations. A rigid wrapping also prevents the windings from exposure to distorting centrifugal forces.

1 Stator | 2 Rotor

1

2

Engineered for a long operating lifetime
Reliable slip rings and efficient cooling solutions

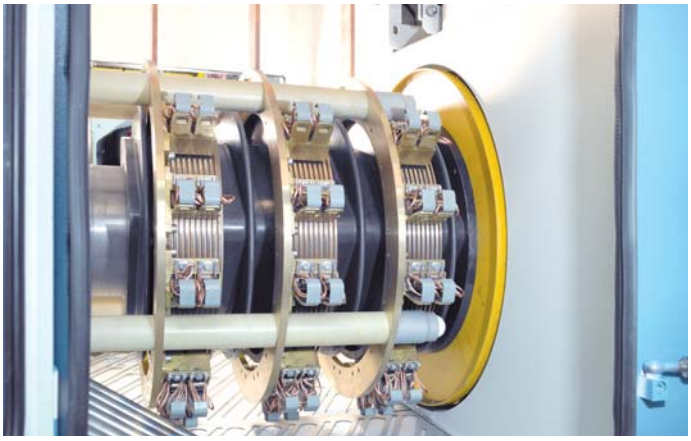
Advanced slip-ring unit
Slip-ring motors can be supplied with:
- permanent contact brushes, or
- brush-lifting gear.

In both cases, the slip rings are mounted at the N-end and enclosed in a separate housing from the motor. This arrangement provides easy access and maintenance, and keeps carbon dust out of the motor. It also makes it possible to have different cooling methods for the slip rings and motor. Replacement machines with an internal slip-ring compartment are available on request.

Slip rings with permanent contact brushes
The slip rings are manufactured from highly corrosion resistant Cu-Sn-Ni alloy and are helical grooved as standard.

Slip rings with brush-lifting gear
Manufactured from stainless steel, these slip rings have a smooth, non-grooved surface. After the motor has achieved full speed, the brush-lifting and slip-ring short-circuiting gear (BLG) first short-circuits the rotor winding and then raises the brushes from the slip rings.

Effective cooling for safe, reliable operation
Internal air circulation is provided by a shaft mounted fan or separate blower. In air-to-air cooled motors, the external cooling air is circulated by a shaft mounted fan or separate blower. Standard versions are always self-ventilated.

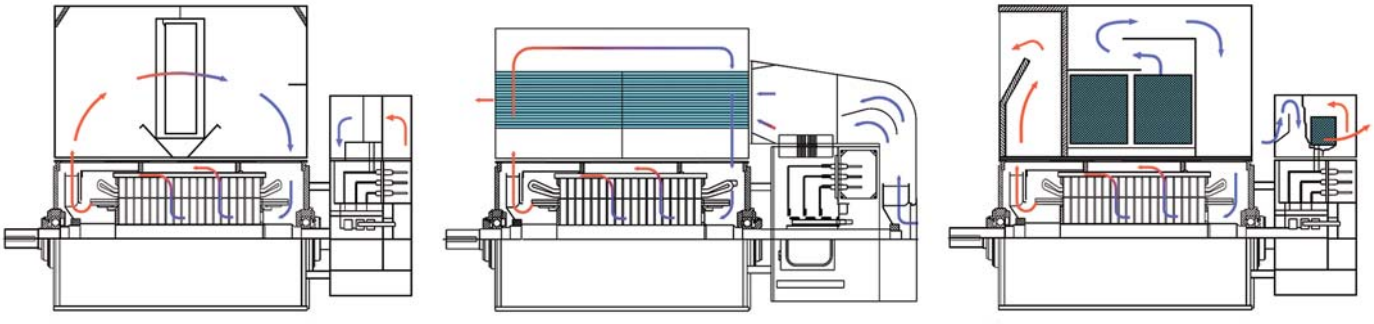


In weather protected motors, the cooling air is drawn through the motor by a shaft mounted fan. Protection is provided by a weatherproof cover which also serves as a silencer.

Uniform and efficient cooling of the stator is ensured by radial air ducts in the stator core and spacers between the coil ends. The stator frame construction is designed to facilitate an efficient flow of cooling air.

Slip-ring units with permanent contact slip-ring brushes are equipped with a heat exchanger or protective cover similar to that on the motor. A shaft mounted fan circulates cooling air through the slip-ring unit, filter, and upper cover. This cooling system is isolated from the motor's cooling system, thus providing easy maintenance and inspection.

Cooling systems



Water-air cooled
IP55 IC81W
TEWAC

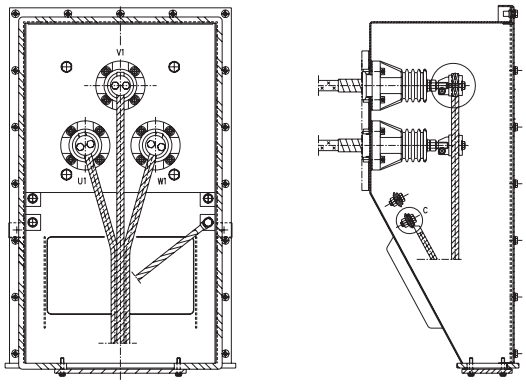
Air-to-air cooled
IP55 IC611
TEAAC

Weather protected
IP23/IPW24 IC01
WPI/WPII

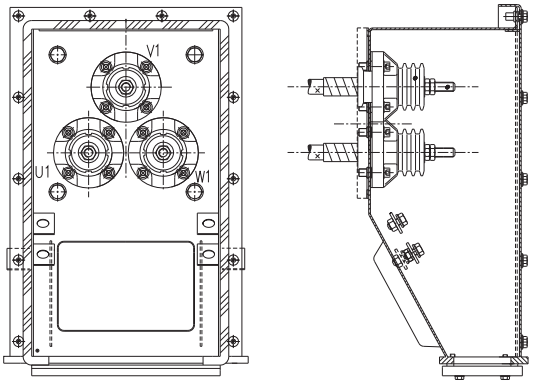
Straightforward connections
Designed for easy installation

The standard terminal box offers plenty of space for easy cable fitting and connection.
Other types of connection box can be provided on request, with the following types available:
- phase separated
- phase segregated
- phase insulated

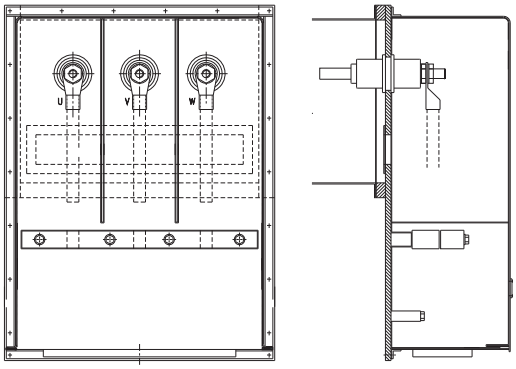
Different types of cable connections, such as Raychem® termination or Elastimold®, are available.
The box is turnable by 90° to provide cable entry from any direction.



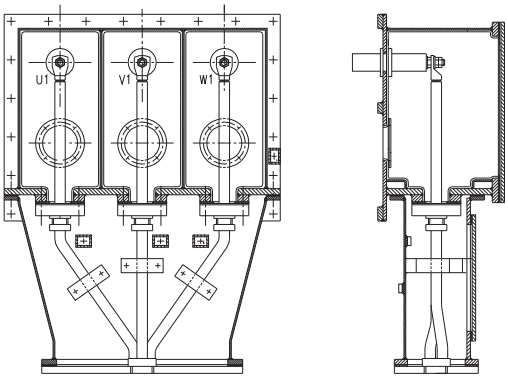
Terminal box big size



Terminal box small size



Phase separated terminal box



Phase segregated terminal box

Contact us

www.abb.com/motors&generators

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