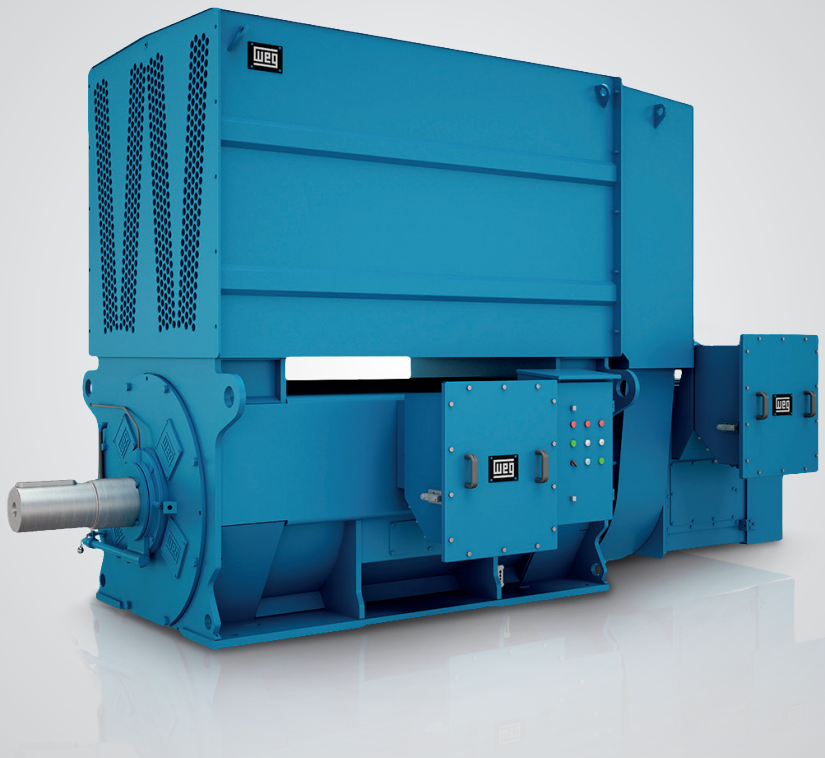


# THREE-PHASE INDUCTION MOTORS

With lifting control system automatic brushes



Motors | Automation | Energy | Transmission & Distribution | Coatings



# THREE-PHASE INDUCTION MOTORS WITH LIFTING CONTROL SYSTEM AUTOMATIC BRUSHES

WEG developed three-phase induction motors with wound rotors with a control system for automatic brush lifting, for operation in harsh environments, which demand high strength and durability, adapting to different applications.

They offer an easy way to implement modifications in your projects, in order to make them interchangeable with existing motors from any manufacturer, reducing operating costs resulting from stoppages to change motors.

WEG motors with control system for automatic brush lifting stand out for the flexibility of their electrical and mechanical design, being able to be applied in several types of mills (rollers, balls, bars, SAG), crushers, fans, exhausts, belts conveyors, wagon turners and pullers, centrifugal pumps, rotary kilns, electric excavators among others.

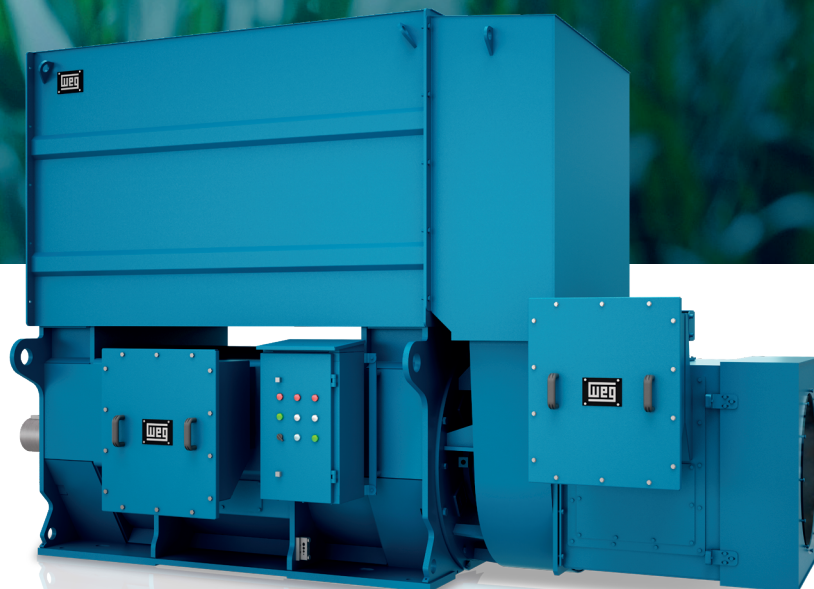




## Technical Characteristics

- Rated output: up to 50,000 kW
- Number of poles: 4 up to 14
- Frame size: IEC 355 up to 1,800
- Voltage: 220 up to 13,800 V
- Frequency: 50/60 Hz
- Constructive form: horizontal
- Cooling system: IC611, IC616, IC666, IC81W, IC86W
- Degree of protection: IP55 up to IP66
- Duty: S1 up to S5
- Standard: IEC/NEMA
- Integrated control system for motors with liftable brush holder

*Note: other features upon request.*





## Liftable Brush Holder

### Brush Lifting Device

The brush lifting device has been simplified, with a significant reduction in parts and components, facilitating its maintenance. Constant pressure springs are used, reducing the wear of the brushes.

The set for activating the automatic system movement (lowers/lift) of brushes has been optimized with the use of reducer and inductive sensors, ensuring reliability in operation.

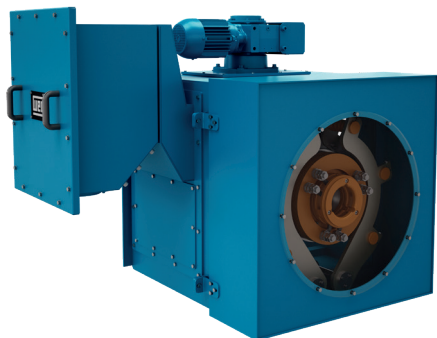
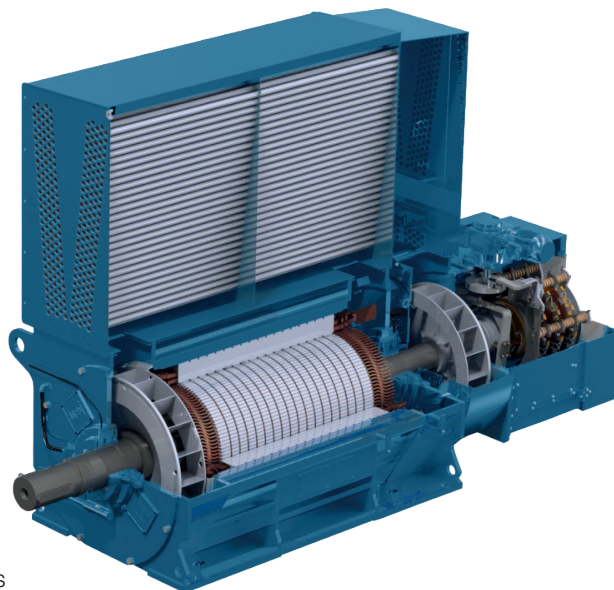
On commissioning, it allows the use of the system in manual operation mode or through the digital interface in the control system.

### Control System

It's been incorporated to the electric motor a control system that has the logic operation of the integrated brush lifting system. The main purpose was to combine a robust and easy-to-implement project in the commissioning and operation of the equipment (only 2 input signals and 3 output signals).

This system has features for failures investigation and operation monitoring via integrated HMI, facilitating the maintenance of the system, preventing undue maneuvers in the movement mechanism of the brush holder and in the start of the main electric motor, increasing safety in motor operation.

- Enables control of maneuvers locally and allows remote access for monitoring
- Degree of protection IP66
- CE certification system. Optional UL
- Standard control voltage: 220 V to 480 V



*Liftable brush holder*

### Brush Compartment

The brush protection box has large inspection windows for both the sides, with easy access for maintenance.

The brushes are positioned on the same side of the inspection window, allowing full access for replacement of the brushes.

### IP66 Protection

To withstand the most contaminated environments and ensure the high protection degree of IP66, special seals are used on all mating joints and brush holder mechanical seal.

## Benefits



Prevents constant and premature wear of brushes and slip rings



Integrated operating logic. Convenience and simplicity on electric motor installation



Reduces downtime for maintenance and brush changes



Increases the lifetime of brushes, slip rings and, consequently, of the motor



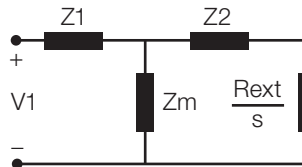
Ease of installation in replacement cases



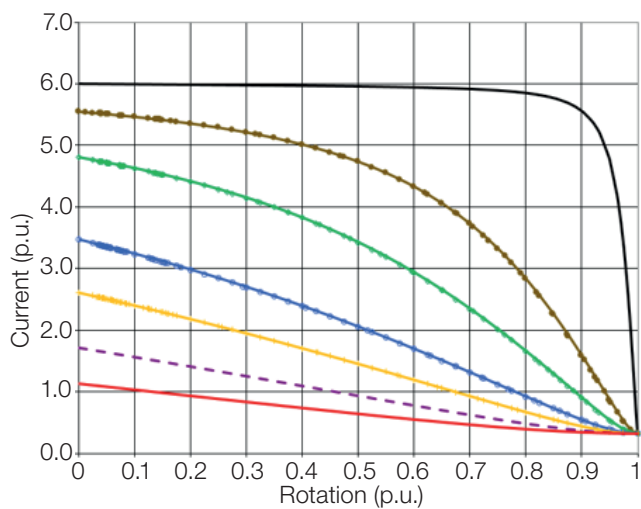
## Wound Rotor Induction Motors (Slip Ring Motors)

Wound rotor three-phase induction motors are recommended in cases where the load has high resistant torque or high inertia at start. External resistors are used only to start the motor, providing high torque and reduction in the inrush current. The brushes are in contact with the slip rings only during the motor startup, thus avoiding unnecessary wear of brushes and slip rings during operation in regime, allowing longer durability for the set.

These motors allow the temporary modification of their electrical circuit through the insertion of the rheostat (external resistance) to the rotor circuit, which promotes changes in the shape of the torque and current versus rotation curves. The greater the external resistance associated with the rotor circuit, the lower its starting current from the electrical machine.

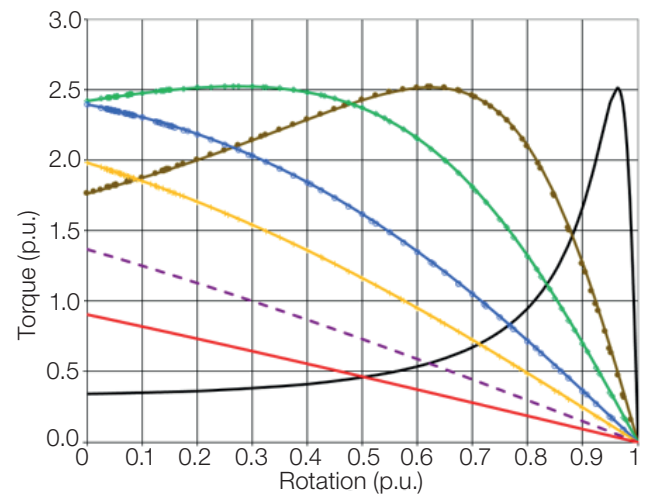


Equivalent induction motor circuit with access to external resistance connection.



— Rext = 0.00 ohm  
 — Rext = 0.125 ohm  
 — Rext = 0.25 ohm  
 — Rext = 0.50 ohm  
 — Rext = 0.75 ohm  
 — Rext = 1.25 ohm  
 — Rext = 2.00 ohm

Current vs. rotation for different external resistances.



— Rext = 0.00 ohm  
 — Rext = 0.125 ohm  
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 — Rext = 0.75 ohm  
 — Rext = 1.25 ohm  
 — Rext = 2.00 ohm

Torque vs. rotation for different external resistances.

Wound rotor induction motors are recommended for:



Reduction of the impact of inrush current  
in relation to the electrical system



Driving loads with high inertia or high  
resistant torque





## Application

Maximum efficiency is obtained from the motors by means of modern software applications, which provide high precision and accuracy to the project. Optimized design, high quality materials and strict control of all the manufacture phases make WEG motors ideal for different industries, such as:



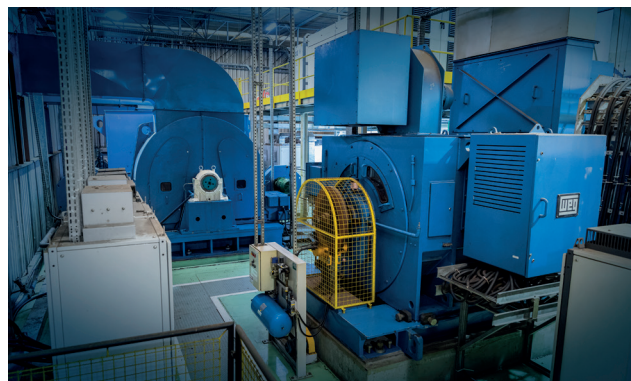
Furthermore, this great versatility allows the choice of the most suitable motor for the application or installation conditions. In order to meet the most demanding world markets, WEG's quality system is certified by the Bureau Veritas Quality Institute, in compliance with the requirements of ISO 9001, ISO 14001 and ISO 50001. The motors with control system for automatic brush lifting are certified by internationally recognized certifying bodies, including INMETRO, CSA, PTB and Baseefa.



## Test Laboratory

WEG motors are tested according to NBR 5383, IEC 60034, NEMA MG 1 and API in modern laboratories. Capable of testing low and high voltage motors with power up to 20,000 kVA and voltages up to 15,000 V, WEG laboratories feature highly accurate controls and fully computerized test monitoring systems.

The tests are divided into three categories: routine, type and special tests. Routine tests are performed in all motors. In addition to routine tests, type and special tests are usually performed in one of a series of the same motors or under the customer's request.



## Technical Assistance

WEG technical team provides the customers with full after sales support. The services include consulting in general and services in the field, such as diagnosis, commissioning of machines and 24x7 support.

WEG also provides its network of authorized repair shops, located in Brazil and worldwide.

The technical assistance team is highly qualified and experienced, able to handle many different situations in the field and to give remote support, using state-of-the-art equipment, which ensures reliable results.



## Services

In order to restore medium and large electrical machines, you can count on WEG service team.

The same technology used to manufacture motors and generators is used for inspection and restoration. The services are executed in the field (at the customer's premises) or on factories: Jaraguá do Sul (Brazil), Sertãozinho (Brazil) and São Bernardo do Campo (Brazil), which is also homologated to execute services on equipment for use in explosive atmospheres. These manufacturing facilities count on the full structure and support of the engineering, industrial process and quality control departments, enabling fast, reliable and quality service.

Service of **WEG products** and other brands:

- DC generators and motors
- Three-phase induction motors (squirrel cage or slip ring; medium and high voltage)
- Synchronous motors (with or without brushes; medium and high voltage)
- Synchronous condensers
- Turbogenerators
- Hydrogenerators
- Wind turbines
- Steam turbines
- Hydraulic turbines
- Alternators

**WEG Services:** Flexibility, agility and experience to optimize your time and productivity.





For WEG's worldwide  
operations visit our website



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The values shown are subject to change without prior notice.  
The information contained is reference values.