

Solutions for Pulp & Paper

Industrial Motors
Commercial &
Appliance Motors
Automation
Digital &
Systems
Energy
Transmission &
Distribution
Coatings

**High performance
technology** for each
stage of the process.



Driving efficiency and sustainability



Pulp & Paper

High performance reliability and productivity

Developing high performance products with state-of-the-art technology translates into our greatest objective: ***to offer solutions for your application.***

We are part of your industry ***from the beginning to the end of the productive process.***

We have a specialized team to support you at all stages of the project, from the specification to the maintenance of your plant, in order to ensure that your company never stops.

**Reliability and productivity.
This is WEG.**





01
TIMBER
YARD

02
FIBER
LINE

03
DRYING

04
POWER AND
RECOVERY
BOILER

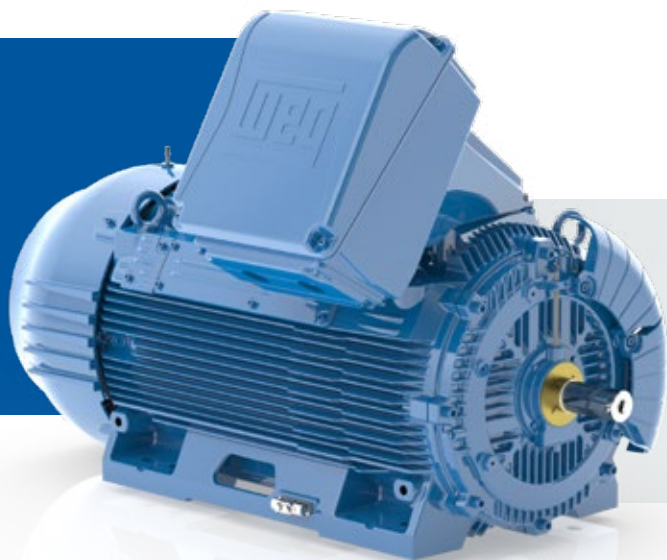
05
PAPER
MACHINE

06
PAPER
RECYCLING

Timber yard



In the Timber Yard, the cellulose manufacturing process begins. WEG provides the **full drive and automation solution** for the equipment to receive, handle, classify and store chips, which will be used in the cellulose process or in boilers for heat and electric energy generation.



W51HD. Robust, compact, efficient and reliable in the severest operating conditions.

The W51HD motor line meets the severe chopper duty cycle at both low and medium voltage with direct on-line starter, VSDs and soft starter.



MCCs

WEG has solutions from the supply of high torque motors to the most advanced automation systems, including robust electrical infrastructure.

We have numerous installations on the market, with flexibility for different drive arrangements, which work in heavy duty to guarantee the supply of chips for cellulose production and biomass generation.

In this area, due to the large concentration of motors, Low Voltage Motor Control Centers (MCCs) of the CCM06 line are widely used, which can be conventional or smart, certified in accordance with the NBR IEC 60439-1 standard. TTA/PTTA, type 1 and 2 coordination, according to IEC 60947, guaranteeing high reliability of operation and maintenance and meeting the safety requirements of regulatory standard NR10. The configuration of the fixed or removable drawers of these MCCs can be supplied with direct on-line starters with smart relays, WEG VSDs and soft-starters, at operating voltages up to 690 V_{ac}, controlled via Fieldbus communication network.

In addition to the electrical and mechanical configurations required in this process, the intense handling of logs and chips can damage the equipment paintwork, and the use of zinc-based coatings (W-POXI ZSP 315 N 1277 and LACKPOXI N 1277) is recommended, providing corrosion protection and great mechanical resistance.

Fiber line



We provide the **full solution to drive the shredder**, one of the most important processes in the production of Pulp. Taking into account the characteristics of the shredder, the drive must be prepared for high inertia and highly resistant torques.

The starting method used for this high power load is a direct result from the capacity of the power grid, since the required starting current is much higher than the machine rated current. One of the drive options is the start with a Pony-Motor (W50 and W51HD lines), reducing the impact on the power grid during the start of the shredder.



Refiner Motor

W50 and W51HD Lines -
Pony-Motor Application



In addition to starting the shredder, we are responsible for the specification, sizing and supply of the screw feeder and its auxiliary systems. Our flexible and optimized solution provides **cost, space and maintenance reductions**.

In this application, the motor and VSD set can operate with constant torque throughout the speed range, in addition to withstanding momentary overspeed when necessary.

Coatings

In addition to maintaining good appearance and conservation, the colors used to paint tanks, equipment and pipes make it possible to identify fluids, risks and signs. Therefore, to keep colors bright and resistant to sun and rain, WEG provides the **WEGTHANE HPA 501** line, which, when combined with epoxy primer, provides an exceptionally durable system.



Fiber line

CFW11M/W

The CFW11M/W is the new generation of cabinet-mounted modular drive, a VSD with excellent static and dynamic performance, as well as high-precision torque, speed and position control. The CFW11M/W G2 series has a modular design, with configurations from one to five power units (UP11G2), one control unit (UC11G2) and wiring cables. The modular assembly increases the VSD reliability and simplifies maintenance, making it perfect for panel builders. A single control unit (UC11G2) can control up to 5 UP11 G2 power units.



The CFW11 modular VSD is available in two versions:

Air-cooled (CFW11M)

The air-cooled version is available in the following current ranges¹⁾:
634 A to 3,012 A (550-2,500 HP / 400-1,850 kW - ND) at 436 to 750 V_{DC}; 496 A to 2,356 A (550-2,500 HP / 400-1,850 kW - ND) at 574 to 970 V_{DC} or 439 A to 2,085 A (600-2,800 HP / 440-2,000 kW - ND) at 758 V_{DC} at 1,150 V_{DC}.

Water-cooled (CFW11W)

The water-cooled version is available from²⁾:
780 A to 3,705 A (1,000-5,000 HP / 750-3,750 kW - ND) at 574 V_{DC} to 1,150 V_{DC}.

Normal duty cycle (ND)

110% for 60 seconds every 10 minutes
150% for 3 seconds every 10 minutes

Heavy duty cycle (HD)

150% for 60 seconds every 10 minutes
200% for 3 seconds every 10 minutes

Notes: 1) Motor powers are reference values specified for WEG 4-pole motors: 440 V_{AC} for models with DC power supply from 436 to 750 V_{DC}; 575 V_{AC} for models with DC power supply from 574 to 970 V_{DC}, and 690 V_{AC} for models with DC power supply from 758-1150 V_{DC}. Appropriate sizing is required according to the rated current of the motors used.

2) Maximum motor powers are reference values only; they are specified for WEG 4-pole 690 V motors for models with DC power supply from 758 to 1,150 V_{DC}. Appropriate sizing is required according to the rated current of the motors used.

Fiber line

Benefits

- High compactness and power density.
- Sensorless or closed-loop vector control, scalar control (V/f) or VVW control.
- The sensorless vector control allows high torque and fast response, even at very low speeds or at the start.
- Various configurations are possible: 6, 12 or 18 pulses, as well as regenerative braking, allowing low harmonic levels.
- Vector control with encoder allows high drive precision throughout the entire speed range (even with the motor stopped).
- Optimal braking function for vector control, allowing controlled braking of the motor, which eliminates the need for a braking resistor in some applications.
- Auto-tuning function for vector control: allows automatic configuration of control parameters and regulators based on the identification (also automatic) of motor and load parameters.
- The same platform as the CFW11 series, sharing features and most accessories.
- Integrated SoftPLC, equivalent to a small PLC, which allows you to customize and integrate the VSD into the application.
- Communication protocols: Modbus-RTU, Modbus-TCP, Profibus-DP, DeviceNet, EtherNet/IP and PROFINET IO.

To mount the complete VSD in a cabinet, additional items are required, such as an input rectifier, power bus, pre-charge circuit, cabinet ventilation or cooling system¹⁾, mounting rack²⁾, protection fuses and input reactance

Notes: 1) Panel ventilation is required for the CFW11M G2, while liquid cooling system is required for the CFW11W.

2) The mounting rack is required for the CFW11M G2 and allows you to mount up to three power modules side by side on 800 mm wide cabinets.



CFW11M



CFW11W

Drying



At this stage, the objective is **to reduce the moisture content of the cellulose pulp**. With this in mind, WEG developed the ideal solution to guarantee the lowest levels of vibration in the system and protection against humidity.

WEG W22 WELL motor line (WEG Extra Long Life) was especially designed to maximize the reliability and productivity of equipment where continuous processing occurs, and reduction of maintenance jobs is essential.

To withstand the high temperatures of the dryer (120 °C on average), which may cause mechanical failures of the shaft and bearings, the motors of the W22 WELL Line have an exclusive design, meeting the requirements of the main manufacturers on the market.

Furthermore, they meet the specifications of vibration grade B (flatness below 0.127 mm) in accordance with the NBR / IEC 60034-14 standard in order to guarantee the lowest vibration levels in the system. They operate with reduced bearing temperatures, resulting in a bearing life of 50,000 hours and longer lubrication intervals. They also have a high degree of IPW66 protection, provided by the exclusive W3Seal sealing system, 211P painting plan with PU finish and internal anti-corrosive paint, ensuring protection against humidity, which is very common in this area.





To control and protect these motors, smart Motor Control Centers - CCM03i with direct on-line starters and smart relays or VSDs are used, which can be monitored and controlled remotely.



212P painting plan (optional)

It meets the estimated durability requirements above 15 years for C5I and C5M environments, according to ISO 12944.



External Topcoat **LACKTHANE N 2677** - Excellent color and gloss retention.

Intermediate painting **WEGPOXI WET SURFACE 89 PW** - Guarantee of good barrier protection against chemical agents and humidity.

Primer **LACKPOXI N 1277** - Coating with 85% zinc content, which provides excellent corrosion protection and mechanical damage resistance.

Power and recovery boiler

In the area of Recovery and Power Boilers, WEG has **suitable solutions** for driving fans, exhaust fans and pumps of different powers and specialties. The W60 motors and MVW01 medium voltage VSDs are manufactured to provide the **best cost-benefit aiming for high performance and low maintenance**, while turbogenerators and transformers guarantee power generation and distribution.



Compact design

With the smallest frame on the market, the W60 requires the smallest installation space when compared to similar motors on the market.

The motors of the W60 line were designed to meet the needs of industrial applications, guaranteeing high performance and reliability, even in harsh operating conditions. They are available in three different configurations: open, self-ventilated motors (IC01, WP-II), or closed motors cooled by an air-to-air (IC611, TEAAC) or air-water (IC81W, TEWAC) heat exchanger.

With its compact design, lightweight components, reduced dimensions and base that allow for a significant reduction in the space required for installation, the W60 is the most compact modular motor available on the market. Developed with the most modern technology in magnetic components, low-loss fans and optimized heat exchange, it has high power density, is robust—with the highest quality cast iron frames and endshields—and features a rigid shaft in its standard version, ensuring the lowest vibration and noise levels and the best efficiency.

VSDs of the MVW01 line have a multilevel structure with High Voltage IGBTs (3.3 or 6.5 kV), which provides a reduction in the number of power components, increasing their efficiency and reliability. They can be supplied in voltages of 2.3 kV, 3.3 kV, 4.16 kV or up to 6.9 kV and in powers of up to 22,500 HP (16,875 kW), with 12, 18, 24 or 36-pulse input rectifiers (low harmonic distortion), IP41/NEMA1 (standard) or IP44 (on request), and with DeviceNet, Modbus, Profibus-DP or Ethernet network communication.



Power and recovery boiler

Turbogenerators

As a result of constant investments in research, development, manufacturing, installations and after-sales services, WEG is on the list of the main global suppliers of solutions and equipment for small, medium and large thermoelectric plants, providing turbogenerator sets, steam turbines, gearboxes and electric energy generators.

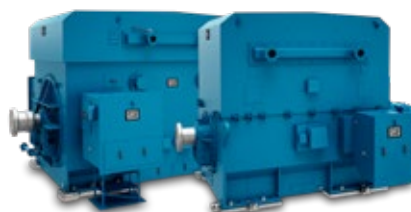
WEG 2 and 4-pole power generation systems are available in powers up to 200,000 kVA (higher powers on request), designed according to the needs of each customer, operating with voltages up to 13,800 V. Manufactured in verticalized processes with state-of-the-art technology—which guarantees versatility, high performance and quality components—they provide reliability, long service life and require low maintenance.

Another WEG specialty is the supply of panels, MCCs, medium voltage cubicles, VSDs, rectifiers, battery packs, transformers, substations, automation and control systems for generation and industrial processes, all in a single solution for the implementation of electricity generation and cogeneration plants.

For this solution to be efficient, safe and profitable, WEG provides the thermal balance study with analysis of thermodynamic efficiency, electrical energy consumption and self-sufficiency, aiming at maximizing and selling surplus energy.



Condensing and backpressure turbines



2 and 4-pole generators



Power and recovery boiler

Step-up transformer

WEG has the **best solutions** in transformers to increase the voltage of energy generated in recovery and power boilers. The portfolio includes a complete line of transformers for powers up to 500 MVA, offering options in either mineral oil, to reduce equipment costs, or vegetable oil, to **significantly reduce environmental impacts**.



Coatings

Pipes, tanks and equipment that operate at high temperatures demand special attention, as surface heating accelerates the corrosion processes. To minimize such damage, WEG provides the **W-TERM HPD 364**, **W-TERM HPA 660**, **ETHYL ZINC SILICATE N 1661** and **ETHYL ZINC ALUMINUM SILICATE N 2231**, coatings, which are used in all situations, such as maintenance of heated surfaces up to 150 °C, and in equipment and pipes that operate at temperatures up to 400 °C.



Paper machine

Innovative solutions that increase reliability and performance and improve the quality of the final product. WEG provides the full electrical package, which includes motors, drive panels with VSDs, control and supervisory systems, and engineering and commissioning services of the pulp mass preparation process, paper machine and rewinders.

The induction motors commonly used to drive sectional drives require a dedicated design and use forced ventilation due to the wide speed range with constant torque necessary for the application. This condition results in:

- Higher energy consumption
- Higher number of electromechanical components in the electrical panel
- Higher number of components for maintenance
- Increased number of cables
- Higher physical space
- The ventilation motor can cause the machine to stop

The use of the W22 Magnet Drive System allows these inconveniences to be solved, as synchronous motors provide higher speed stability, which is a great advantage for the application. For example, when setting the machine up, the WEG system eliminates manual adjustments, improving the quality of the final product and reducing costs in comparison to manual setup.





For the control and supervision of paper machines, automation systems must have a high degree of reliability and availability. To meet those requirements, WEG provides completely integrated systems, which include VSDs, programmable logic controllers, control/management stations and engineering stations that can operate from field instrumentation to process management levels.



Coatings

Ideal for machine maintenance, **WEGPOXI WET SURFACE 88 HT** is a paint that offers excellent chemical resistance in a single, high build coat, reducing application costs in maintenance painting and new jobs in environments with high humidity and areas with aggressive splashes and spills.

It provides extra-fast drying, allowing the area/equipment to be released in less time. In addition, it can be applied over wet surfaces and in a wide operating temperature range from 5 °C to 70 °C.

Paper recycling



In the paper recycling process, hydropulpers have the main function of disaggregating and separating paper fibers from contaminating materials, stirring and mixing this material with water.

The paper fibers, together with the water, pass through a sieve at the bottom of the hydropulper that retains contaminants, allowing the pulp to follow the normal papermaking process.

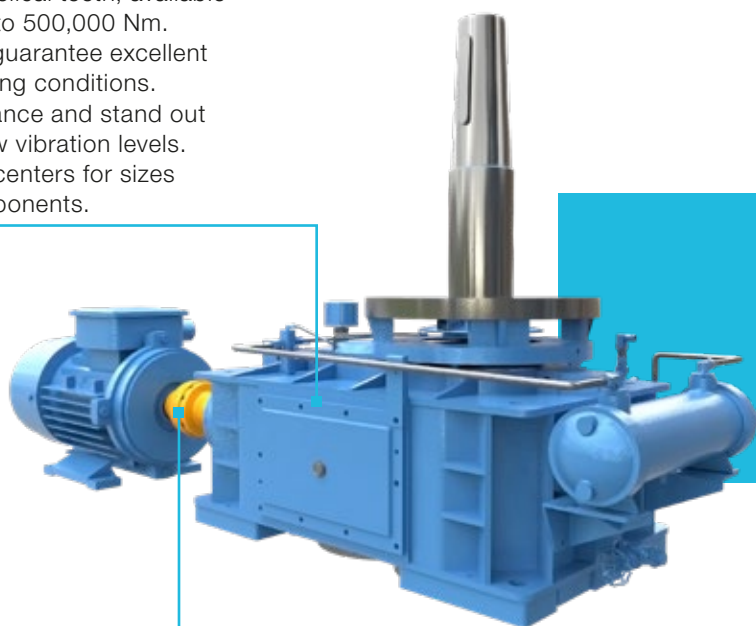
The Industrial gearbox series is the most complete solution on the market for driving hydropulpers, as it has a high degree of reliability, flexibility and customization required for this application. Furthermore, WEG has a line of Elastic Couplings, ideal for transmitting power and drive rotation from the electric motor to the gearbox.





Industrial gearboxes feature cylindrical gears with helical teeth, available in ratios from 1.12 to 355, and capacity from 2,000 to 500,000 Nm. They were designed for industrial applications and guarantee excellent performance and reliability in the most severe working conditions. They combine high power density and low maintenance and stand out for their high mechanical strength, durability and low vibration levels. They have a split housing at the height of the shaft centers for sizes above E14, allowing easy access to all internal components.

Series C and D couplings are flexible and torsionally elastic with polyurethane elements resistant to dust, water, oil and weather. They withstand radial, axial and angular misalignments between the coupled shafts and also absorb shocks and vibrations from the driven or driving machine. They are available in twelve sizes and two mounting styles, with capacities from 10,000 to 580,000 Nm and shafts from 30 to 470 mm in maximum diameter. On the D series, radial disassembly is possible with one or both machines coupled.



Energy supply



Energy supply is vital for any operation. Providing complete solutions, WEG offers a wide range of transformers and conventional substations, ensuring **full reliability in energy supply** for a great variety of applications.



Power transformers

Weight and size reduction, different insulating oil types, longer service life and monitoring systems are just a few of the items assessed by the WEG technical team to develop oil transformers that **provide high level solutions** for the customers.

The portfolio includes a complete line of distribution and power transformers up to 800 kV, isolated with mineral oil to reduce equipment costs, or vegetable oil to significantly reduce environmental impacts



Dry-type transformers

Transformers insulated with epoxy are the best option to fulfill the demand for transformers that provide greater **safety, use less space and reduce installation and maintenance costs.**

This product line offers solutions for all kinds of environments. Vacuum pressure encapsulated with class H resin (certification UL at 200 °C), WEG transformers provide immunity to partial discharges and a relevant increase in the equipment service life. They are available in powers from 112.5 to 20,000 kVA, in voltage classes up to 36.2 kV, with protection rating up to IP55.



Energy supply

Conventional high-voltage substations

WEG Substations division has know-how and **extensive experience in designing and building medium and high-voltage electrical systems** all over Brazil. It offers solutions for turnkey conventional substations, from the basic design to the detailed engineering design with electrical studies, product and material supply, and specialized works and services, which include commissioning and after-sales support, coordinating and integrating all the participants of the process.

Proven experience in the delivery and energization of more than 350 substations at voltages up to 550 kV.



High-voltage equipment

WEG has a full line of Switch-Disconnectors, which are electromechanical devices capable of interrupting or establishing low-intensity currents when operated. In operating conditions, in the closed position they withstand high-amplitude currents, such as those typical of short circuits.

They are intended to ensure the insulation of equipment or parts of lines or substations, allowing to confirm visually that the insulated segment is de-energized.

- Rated current: 630 to 4,000 A
- Voltage classes: 15 to 550 kV

Energy supply

Mobile substations and transformers

Aiming at ensuring the uninterrupted energy supply, WEG developed a line of mobile substations and transformers available for all industries, from the conception of the solution to its commissioning. For either an emergency repair or scheduled maintenance in a conventional substation, the mobile solutions provide ***quick restoration of the energy supply***.



Customized solutions for your company

Energy supply

E-houses

The ELW E-Houses are an integrated solution designed and manufactured to order, meeting each customer's specific needs.

E-house functions

Assembled in a single platform, they integrate the electrical and automation systems, such as transformers, medium voltage controlgear and switchgear, MCCs and auxiliary equipment. The units are delivered assembled, interconnected and tested at the factory. They represent a customized solution, eliminating the need for masonry works and different suppliers. In addition, since there are no size limitations, they can be used in small and large installations, in many different (even aggressive) environments and industrial activities.

Advantages

- Shorter lead time to execute the projects
- Shorter assembly time in the field
- Little construction site infrastructure required (lower mobilization and demobilization costs)
- Factory assembly and field installation are not subject to weather conditions
- Unique engineering for the integration of all the devices and systems
- Reduction of storage area and field interference
- Better process control and quality systems
- Special lines of credit for being classified as equipment
- Reduction of customer resources for engineering, project and supply management (optimization of the procurement process)
- Property tax is not charged on the system (it is not considered a building)
- Logistic gain in the manufacturing, platform testing, start-up and commissioning
- Shorter lead time



Energy supply

Substation and distribution

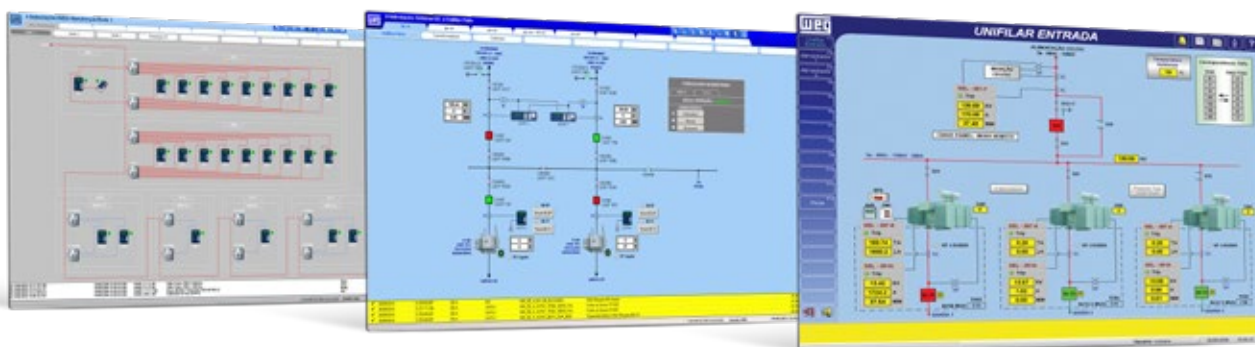
WEG solutions are also present in the control and supervision of substations for industries and utility companies, with automation of substations using the **latest technology on the market**. WEG MCC-MV (MV Switchgear and Control) is assembled and tested at the factory for voltages from 2.3 kV to 36 kV, interrupting current from 25 kA to 50 kA with vacuum or SF6 circuit breaker. They were developed to comply with the strict national and international standards NBR IEC 62271-200.



Substation supervision and control system

Main characteristics

- Integration using IEC protocol 61850
- Time synchronism by GPS
- Remote monitoring via Internet
- Oscillography tools



Solutions in energy efficiency



Energy efficiency

The increasing demand for electrical energy to sustain global development requires consistent heavy investment in energy supply generation. However, in addition to complex medium and long term planning, these investments rely on natural resources, which are becoming depleted due to constant pressures upon the environment. The best strategy, therefore, to maintain energy supply in the short term is to avoid wastage and increase energy efficiency. Electric motors play a major role in this strategy; since around 40% of global energy demand is estimated to be related to electric motor applications.

As a consequence of this need to reduce energy consumption and carbon dioxide emissions, many Governments worldwide have imposed local Regulations, also known as MEPS (Minimum Energy Performance Standards) to numerous types of equipment, including electric motors.

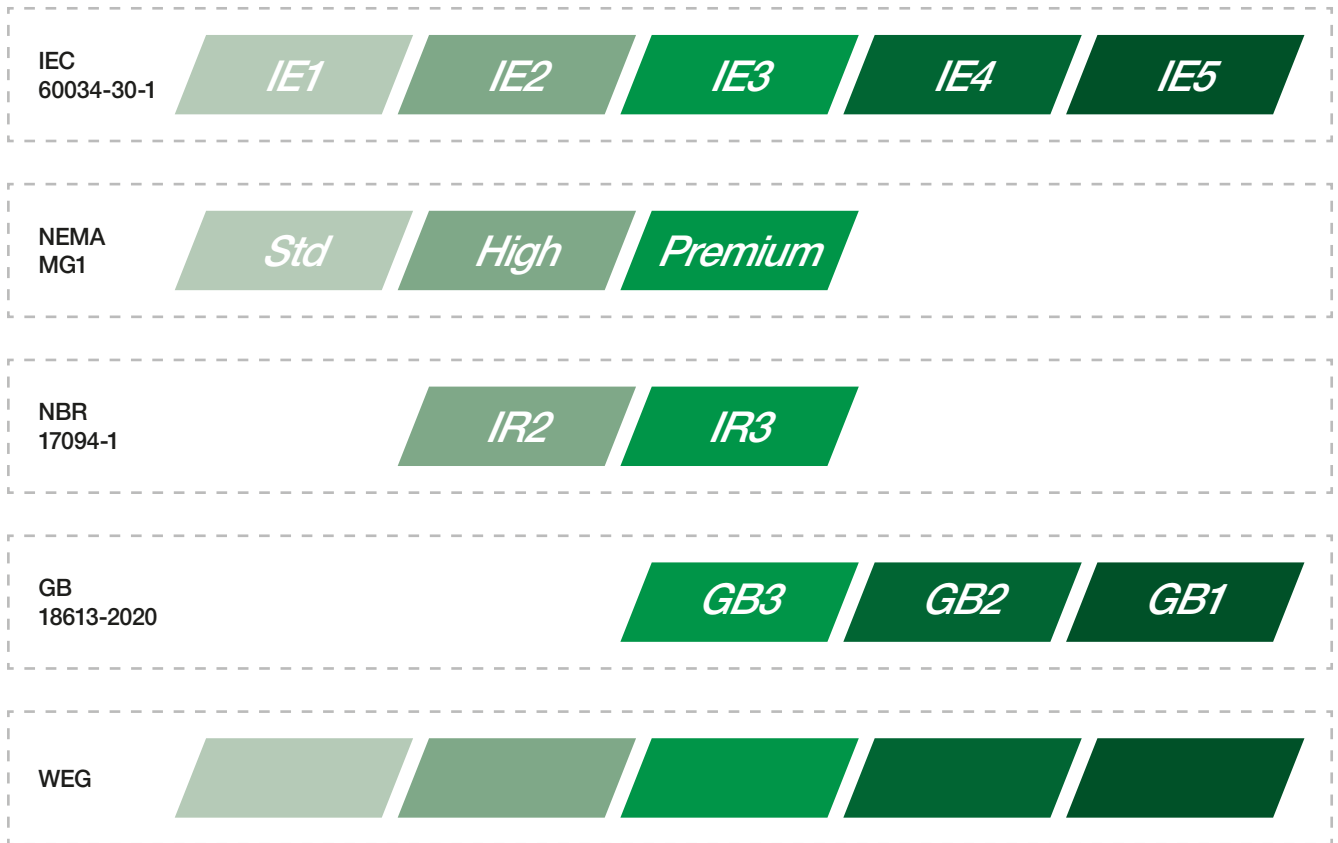
Whilst the specific requirements of these MEPS differ slightly between countries, the implementation of regional standards such as ABNT, IEC, MG-1, which define the efficiency levels and test methods to determine these efficiencies, allow a standardization of the definition, measurement and publication format for efficiency data amongst motor manufacturers, simplifying the correct motors selection.

WEG fully understands the requirements of these Global regulations, and today offers one of the most comprehensive ranges of electric motors complying with these minimum efficiency levels. Furthermore, as a forward thinking Company whose philosophy is to provide its Customers with products which offer optimum performance, energy savings, fast return on investment and sustainability, WEG continues to focus its efforts in the research and development of electric motors with efficiency levels exceeding those defined in currently published International standards.

What can we do for your industry to grow in a sustainable way?



Efficiency grade



See+ Energy efficiency simulator

- The new SEE+ will help the user to discover how much he wastes electrical energy through simulations that estimate the electrical energy savings and the reduction of CO2 emission quickly, simply and objectively within Motion Drive – Gearboxes, Motors and Variable Frequency Drives.
- The new version of the “calculator” has four options for calculation that allows the user to simulate the replacement of a motor or a gearbox in operation started or not by a frequency drive, evaluate what will be the return of investment comparing the purchase of a new motor versus repairing a failed one and identify the benefit when purchasing a motor more efficient than the market standard driven or not by a frequency inverter.
- Available in three languages: English, Portuguese and Spanish, the new SEE+ can be used anywhere in the world and at any time through a computer, tablet or smartphone through your WEB browser and in soon we will have the same benefits for the “projects” area.



Coatings



WEG offers technology in coatings for different kinds of aggressive environments. They are products with great color and gloss retention, resistant to contacts with chemicals and high temperatures. Whether preventing accidents with corrosion, reducing expenses with maintenance or avoiding non-scheduled stoppages in production, WEG high performance coatings ensure greater productivity and profit for your company.

The different characteristics found in the paper and cellulose industry—such as the contact with aggressive compounds (acids, bases) and solid contaminants, besides the presence of high humidity, high temperatures, sulfides and other corrosive agents—generate the demand for high-performance materials and coatings.

The main environments, situations and operating conditions characteristic of the pulp and paper industries are classified below. All the plans presented are classified within the category of atmospheric corrosivity C5 (aggressive Industrial Corrosive), in accordance with ISO 12944-2 and are recommended based on our expertise acquired over years of experience in corrosion protection.

High temperatures

Zinc and silicone-based coatings that provide corrosion resistance.

Structures in humid environments **WEGPOXI WET SURFACE 88 HT**

Excellent resistance in humid environments and application on wet surfaces.

Stainless steel structure

Adhesion promoter epoxy/polyurethane system.

General structure

High build epoxy system with anticorrosion pigments.



Pulp and Paper Industry





IA

WEGnology

IoT

MES

WEGdigital SOLUTIONS

A new way to combine people, companies and smart products.

We have formatted all of our expertise and provided the market with a new way of combining people, companies, software and smart products, producing a global solution that transforms energy into more reliable, efficient and smart solutions.

Regardless of the size of your industry, we can help you:

Scalable and Flexible Solutions

- Easy implementation regardless of the industry characteristics.
- Flexible, customized solution.

WEG Expertise

- We can help increase the operating efficiency of our partners and reduce waste from the various industrial processes.

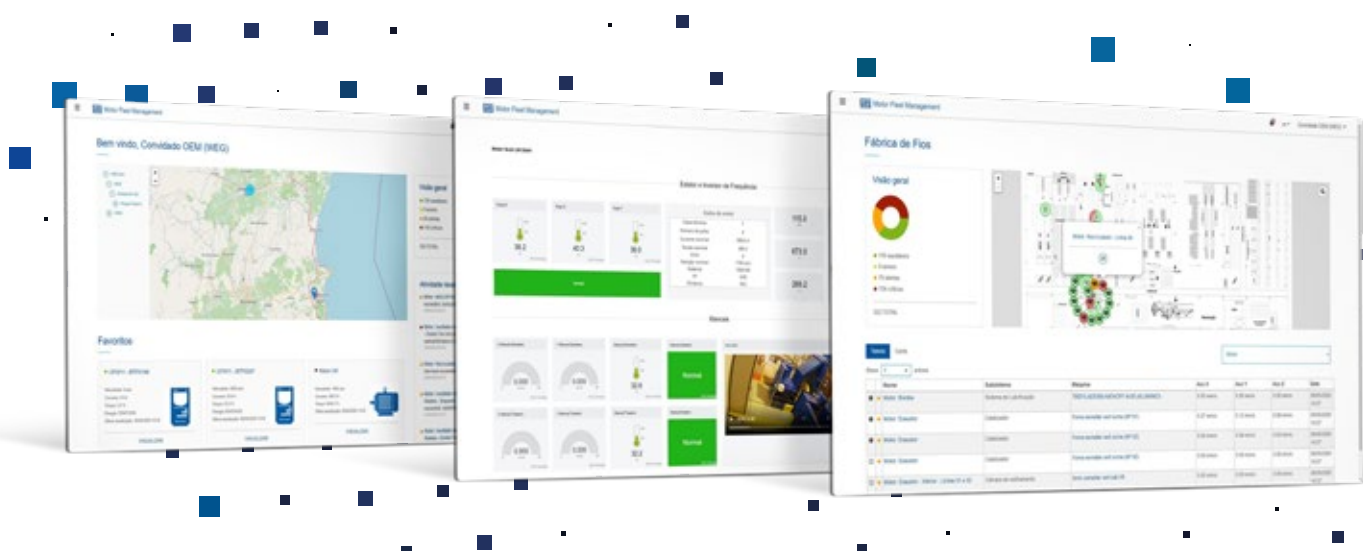
Co-working

- We assist in the transition from traditional industry to Industry 4.0.
- We share technologies and experiences for your business.



Manage your drive fleet in real time

With WEG Motion Fleet Management, it is possible to connect the operational status of different types of drives for low voltage motors (VSDs, soft-starters and smart relays) and medium voltage motors (VSDs and soft-starters), gearboxes, gearmotors and other assets in any type of industry or installation. Through periodic data collection, valuable insights are generated to increase the performance and availability of the machine fleet on the shop floor. Thus, it is possible to establish and schedule predictive maintenance plans, significantly reducing the unplanned downtime.



Structure

WEG Motor Fleet Management is a modular solution, with a flexible structure based on layers, which meets the customers' needs.

Assets and scans

WEG Motor Fleet Management allows online monitoring of low and medium voltage motors and drives, as well as gearboxes, gearmotors, compressors, pumps and fans/exhausters.

WEG Scans and Gateways are hardware designed for collecting data and connecting assets to the WEG cloud server, which hosts the WEG Motor Fleet Management application. For motor monitoring, the WEG Motor Scan and Cassia X1000 Gateway are used—data can be uploaded via gateway or smartphone. For low or medium voltage drives, data is sent through the WEG Drive Scan.



Diagnostics and Integration

With active subscriptions to the Management layer of WEG Motor Fleet Management, users will be able to complement their experiences by subscribing to specific modules such as WEG Specialist and WEG Exchange.

Structure

Specialist module

The Specialist module uses algorithms specially developed by WEG for advanced data analysis through Machine Learning and Artificial Intelligence. Those algorithms are applied to the data collected by WEG Scans and thus generate useful information, something essential for efficient fleet management.

WEG Motor Specialist has a submodule for diagnosing mechanical failures and another for evaluating the motor energy consumption. Both features were developed by the WEG team of experts and validated in the company's laboratories.

With WEG Drive Specialist, the user can analyze the energy cost involved in the process and correlate the periods of operation with those of highest consumption. It is also possible to identify and solve problems related to the cooling system in advance, in addition to providing insights into the quality of energy applied to the VSDs, thus increasing the availability and reliability of assets. Regarding the actions involved in maintenance, the customer can act preventively for the health of the VSD. Those advanced analysis algorithms follow and learn the operating patterns and deviations of the monitored electric motor, generating indicators of failure due to imbalance, misalignment, bearing (advanced failure) and external vibration.

This type of information is very useful for the operation and maintenance team, as it helps in the decision making processes, speeds up the repairs and minimizes unscheduled downtime. To benefit from the Specialist layer, the respective assets must have an active subscription to the WEG Motion Fleet Management layer. Both subscriptions are annual and per asset.



Computer vision with artificial intelligence



The ESOS intelligent vision system has the basic resources of an industrial PLC coupled to an industrial optical sensor, capable of processing Artificial Intelligence and Computer Vision algorithms in its high performance processor.

Applications

- Finished package count
- Control of lot/expiration marking or barcodes
- Visual quality control of packaging

Main characteristics

- Embedded digital inputs and outputs, in addition to RJ45 interface for industrial communication (Modbus, TCP/IP, PROFINET etc.)
- It can be integrated with the main MES shop floor management software applications, feeding data into different types of industrial ERPs
- “All-in-One” concept for fast installations and setups
- Python open-language programmable system, having the main computer vision and Artificial Intelligence tools and libraries implanted
- Industrial equipment with IP66 protection rating



BirminD WEG Group



A common problem among paper plants is the excessive emission of particulate material in chimneys: the malfunction of some equipment can increase the number of pollutants, making the smoke opaquer and causing environmental fines. BirminD has three artificial intelligence modules in B-Cloud (Optimization, Relevance and Simulation), a software application developed with more than seventy Machine Learning algorithms, which help determine the optimal operating point and the root cause of industrial problems.

By collecting data through the connection to the production line database, BirminD stores it in the cloud for at least a year, increasing the traceability of the production process. Therefore, for an assertive decision, it is important to know the main variables, among all those collected, that most impact your process.

In B-Cloud's relevance analysis, the user chooses one variable as 'output' and establishes the others as 'inputs'. Everything else is done by the software: algorithm selection, accuracy calculation and display of the best result. You can solve in hours what usually takes weeks or even months!

The platform creates a relevance ranking, where a percentage of correlation of the variable with the chosen output is assigned; thus, you discover which process variables most impact the output, facilitating decision making through quick and automated analyses.

Problem

1

Pulp and Paper Industry

Excessive emission of particulate material in chimneys. The excessive amount of data that directly influenced the emission of particulate matter made the root cause analysis process difficult, also making it difficult to take corrective actions to adapt to environmental standards.

Method

2

Data treatment

This industry provided BirminD with access to process data that was centralized in a single network. The data was already collected and stored automatically. Once we had the data, the first step was to treat the database, which is linked to the characteristics and formatting of the data as well as of the objective and quality of the analyses.

Solution

3

Analysis

With the data treated, BirminD's Artificial Intelligence Module, B-Zek, was used, testing several Machine Learning algorithms and presenting the result of the one with the greatest reliability. We carried out studies of various relevance analyses in order to verify which variables had the most impact on the smoke opacity index.

Results

4

Analysis

- 400% ROI (*)
- Reduction of the environmental impact of the process
- Significant reduction in analysis time, resulting in corrective measures being taken in more assertive, quick and efficient ways



PC-FACTORY OEE, MES and IoT



Online OEE monitoring systems in paper production and conversion

The WEG Group's PPI-Multitask experience in monitoring overall equipment effectiveness (OEE) contributes to reducing machine downtime and scrap, improving production efficiency, productivity and reducing costs through PC-Factory MES. PC-Factory OEE data collection, monitoring and online management functionalities, in addition to accelerating OEE gains in paper production and conversion processes, eliminate manual recording and spreadsheets in OEE control, automating reporting from production to management systems (ERP).

Data acquisition can be done directly from PLCs and monitoring systems of machines and processes via OPC protocol or Web APIs. There is also the option of connecting to sensors, production and stoppage signals, scales and IoT devices. Online recording and monitoring are carried out using Touch Screen Graphic Terminals, Tablets and Smartphones, and the data collection infrastructure supports wireless or cable options.

Main features

Online monitoring of machines and production orders

- Monitors stoppages, changes in pace in relation to the standard time and quality losses of machines in real time
- Automatically identifies machine root causes of production line stoppages
- Monitors in real time the status of production orders, resources used, productive and unproductive hours, produced, reworked and scrap quantities in your operations
- Activates the help chain through alarms for stoppage, loss of speed, excess production, among others
- Electronic Andon for visual management with the use of monitors on the factory floor and in production support areas
- Monitoring and reporting on mobile devices such as tablets and smartphones

Accurate, real-time information for continuous improvement

- Calculates and monitors indicators such as OEE, Availability, Performance, Quality, TEEP, MTBF and MTTR of equipment in real time
- Graphic terminals enable self-management of performance by the operators themselves, who have access to electronic documents, event history and online indicators of their performance in the shift or accumulated periods
- Allows analysis of history and Pareto charts to identify the main reasons for stoppages, loss of pace, scrap and rework
- Allows trend analysis and monitoring of goals versus performance by period, shift and groups. Several standard reports for production and performance analysis and tools for generating customized reports

Automatic production reporting to the ERP

- Independent or integrated implementation with the main management systems (ERP) on the market; import of items, scripts with standard time, production orders, among others
- Export of the report by production order or item (repetitive mode), with quantity produced, scrap, productive and unproductive hours
- Approved interface for integration with the SAP-PP module of SAP ERP
- Robust and secure integration module for exchanging data with other systems via Web APIs, XML, Text Files or Database

Services



Services and support with the quality of WEG products

Protecting your investment means more than ensuring the plant. It also means to keep your equipment in excellent condition to maximize its useful life. That is why you can count on WEG, which is responsive to the customer's needs, offering comprehensive equipment, services and support.

When it comes to predictive, preventive and corrective maintenance, WEG provides the most efficient solutions in the country—in addition to bringing machines to the factories for repairs, they can be conducted in the field.

WEG achieved a quality reputation by providing support with products and specialized technical services and the capacity to respond promptly to the customers' demands.

An excellent service is assured by people who understand your equipment and process needs. Our experienced team of service engineers and technicians can detect possible performance problems and recommend corrective actions.

In this maintenance context, WEG/TGM performs services on steam turbines, gearboxes, turbogenerators, generators and medium and large motors in a single structure.

Profit more! Have WEG/TGM team maintain your equipment: the only one on the market that offers a complete scope of such services with its own structure and 24/7 technical support. Ensure greater operational availability with the broader scope of supply.

In-house or field maintenance services

WEG also has the same structure and manufacturing standards available to execute services such as: overhaul, restoration, repowering, rewinding, testing and replacement of components, increasing the reliability and the service life of WEG large equipment and from other brands.

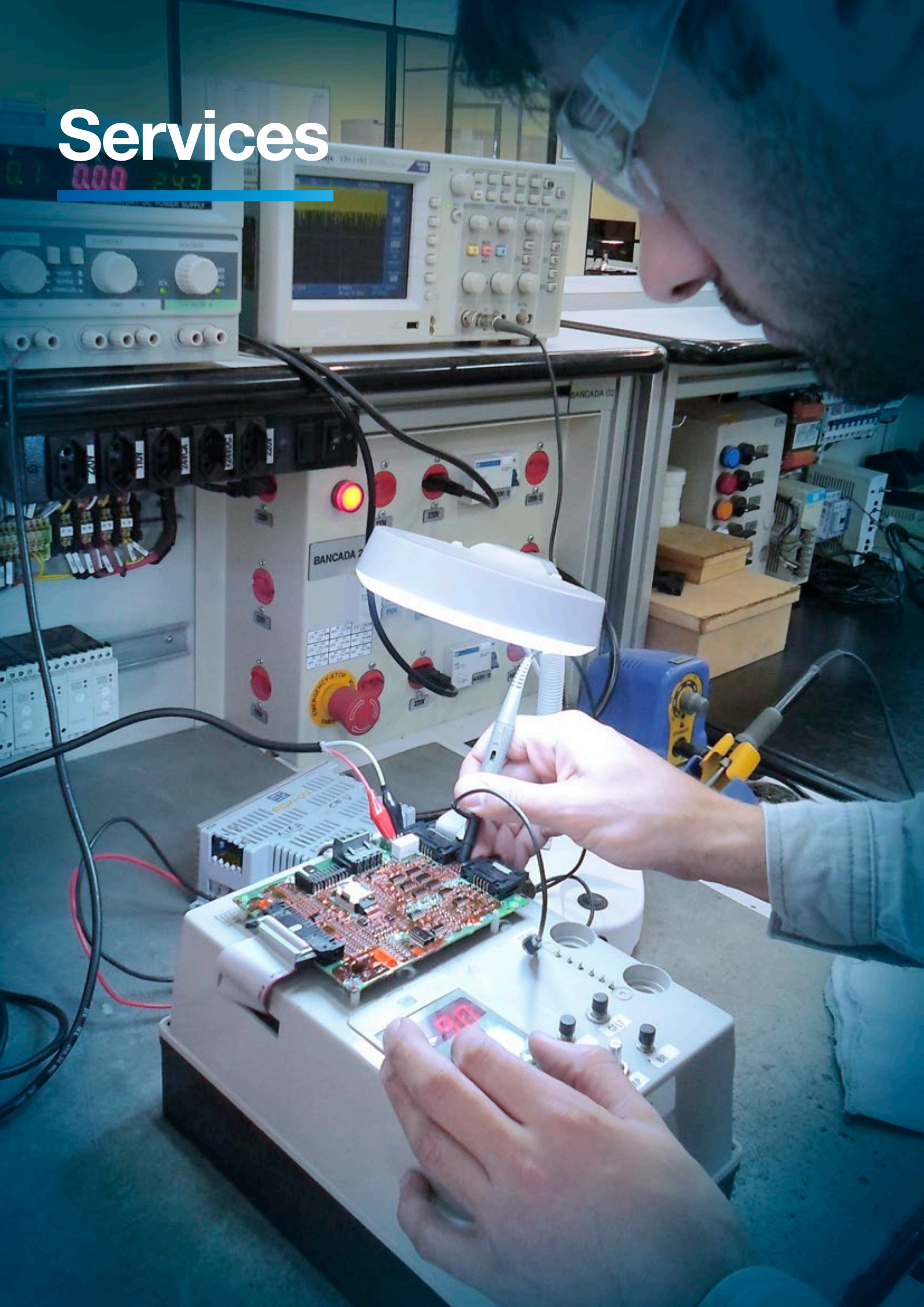
- DC Generators and Motors
- Three-Phase Induction Motors
- Synchronous Motors
- Turbogenerators
- Hydrogenerators
- Synchronous Condensers
- Steam and Hydraulic Turbines
- Gearboxes
- Wind Turbines
- Oil Transformers



24h taking care of
your equipment



Services



Commissioning and start-up

In view of the magnitude of the projects and the complexity of the equipment installed, WEG offers specialized technical support for the installation, from the beginning to the end, including supervision services. The inspection of details of the equipment and the integration of the concept with the whole system are also included.

Field services

WEG has a qualified and trained team at the factory to carry out a series of activities in the field, minimizing the lead times and the impacts of equipment handling and costs.

- Assembly and installation
- Start-up
- Alignment, balancing, adjustment of bearings and machining
- Electromechanical expert report
- Boroscopy
- Partial maintenance
- Complete maintenance
- Small repairs
- Rewinding
- Retrofitting of generators and compensators
- Vibration analysis

Limit of restoration capacity

Definition by means of technical and economic criteria for the feasibility to repair or replace the electric motors. The work is performed with the help of a specific software application, analyzing the data of each plant, allowing the cost analysis of the life cycle of the motors.

Supply of genuine WEG parts

After years in operation, the motors and generators need repair to continue working properly. For this repair, we recommend that you use genuine spare parts supplied by the manufacturer. The WEG team is willing to promptly assist you in the correct identification of the parts.

Preventive maintenance / Maintenance engineering

Verification and preparation of preventive plans according to maintenance concepts focused on reliability and adjustments according to the operating conditions of each plant.

Energy efficiency

Identification of potential reduction in energy consumption of electric motors and drives, and deviations in the power factor, proposing solutions and defining the necessary retrofit. Results presented with individual return deadlines, making the decision flexible.

WEG Services | for processes that cannot stop

Specialized in the manufacture of gearboxes and gearmotors, WEG stands out for its proven experience and knowledge in services and repowering of multi-brand gearboxes. With modern machines and equipment and a manufacturing structure dedicated to providing services, WEG values quality and excellence in all its fields of activity.



Advantages

- Corporate governance and financial strength
- Modern industrial park with state-of-the-art equipment
- Fast, flexible and competitive structure
- Engineering specialized in improvements
- WMS Management System
- ISO 9001 and ISO 14001 certifications

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The scope of WEG Group solutions
is not limited to products and solutions
presented in this catalogue.
To see our portfolio, contact us.

**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.