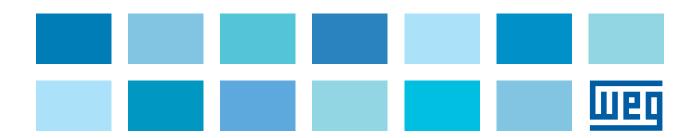


Solutions for the Pump Industry



The WEG Group

WEG is a global manufacturer of energy efficient electric products for the pump industry. With more than 29,000 employees all over the world and a daily production of 60,000 motors, WEG is a leading electric motor producer globally and one of the largest suppliers of electric-electronic products and systems in the world. Operating in over 135 countries, with revenues of over US\$ 3.1 billion, WEG global presence is supported through its branch network established in 32 countries, manufacturing plants and distributors in all five continents.



WEG Serves You Globally

Our global structure allows us to be closer to our customers. Over 32 subsidiaries established in key countries are prepared to provide you with technical and commercial support; our manufacturing plants strategically located in the main markets can serve you with short deliveries; and our network of over 1250 Authorized Service Agents located in the five continents are fully equipped to give you prompt sales and service support.



WEG at a Glance

- US\$ 3.1 billion yearly turnover (2013)
- Manufacturing plants in 9 countries
- Over 29,000 employees

Global Product Certifications



Spain

Kazakhstan Belarus

















UL



Water

WEG products stand out for the flexibility of their electrical and mechanical design, adapting to the strictest customer requirements in different applications. With a complete range of products for the Pump Industry, WEG is always committed to providing industry with superior quality and excellence worldwide.





Master Line - Three Phase Induction Motors

The Master line (M line) motor is a product with high efficiency, meeting the requirements of international standards and in line with the world market trends.

General Purpose Motors, Non-sparking Motors Increased Safety Motors, Pressurized Motors

- Output power: up to 50,000 kWRated speed: from 3600 to 300 rpm
- Frame sizes: IEC 280 to 1800
- Frequency: 50 or 60 Hz
- Voltage: from 220 up to 13,800 V
- Cooling method: IC01, IC81W, IC611 and others (WP-II, TEWAC and TEAAC)
- Degree of protection: IP23 to IP56/IP65
- Horizontal and vertical mountings available

Note: NEMA or IEC designs.

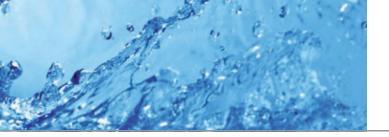
S Line - Synchronous Motors

Synchronous motors are being used in a variety of applications because of their efficiency, the power factor correction, high torques and low starting currents, constant speed under load variations, low operating and maintenance costs and their ability to drive different types of loads.

General Purpose Motors Pressurized Motors

- Output power: up to 110,000 kW
- Rated speed: from 3600 to 150 rpm
- Frame sizes: IEC 280 to 1800
- Frequency: 50 or 60 Hz
- Voltage: from 220 up to 13,800 V
- Cooling method: IC01, IC81W, IC611 and others (WP-II, TEWAC and TEAAC)
- Degree of protection: IP23 to IP56/IP65
- Horizontal and vertical mountings available

Note: NEMA or IEC designs.





W60 Line - Three Phase Induction Motors

The WEG W60 motor line is designed for industrial applications, focused on pumps, compressors and fans, ensuring high performance and reliability even under the most severe operating conditions.

General Purpose Motors Non-sparking Motors

- Output power: from 800 up to 4250 kW
- Rated speed: from 3600 to 1500 rpm
- Frame sizes: IEC 450 to 560
- Frequency: 50 or 60 Hz
- Voltage: from 2300 up to 10,000 V
- Cooling method: IC01, IC81W, IC611 (WP-II, TEWAC and TEAAC)
- Degree of protection: IP24 to IP55

Note: NEMA or IEC designs.

WEG Motors Pump Water to the Region Badly Hit by Drought in Turkey

Two years of general drought in Turkey increased deprivation amongst the country's poorest population. Without water to drink irrigate crops, the nearly 70 thousand inhabitants of the agricultural district of Suruç suffered the effects of the climate change. According to American Geophysical Union (AGU), the rain already scarce in the Middle East, occurs less and in order to overcame this critical scenario, the region received an impulse for economical development with the "Suruç Plain Irrigation", project of the Southeastern Anatolia Program (GAP), which will irrigate over 94 thousand hectares.

For this project, WEG supplied 08 x M Line Medium-Voltage Asynchronous Motors, which drive the pumps that will take water from the Atatürk dam, located in the Euphrates River, to the irrigation canal.

WEG's participation in this project is a result of 20-years relationship with a local partner from the electric industry.



Atatürk Dam Pumping Station



Mining

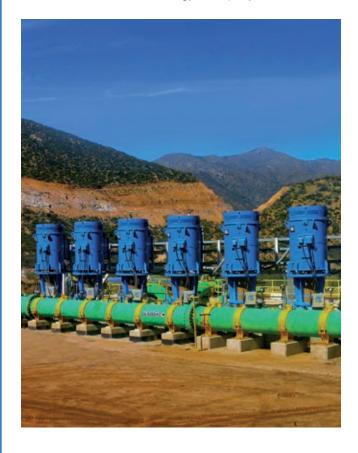
From the coldest to the hottest temperatures, corrosive atmospheres or globally unstable conditions, WEG's solutions reduce maintenance to a minimum, while lasting longer and helping to improve efficiency on Pumping Systems.

WEG Efficiency Helps Save Money on Mining Plant

The industry is constantly re-defining methods of saving money, using natural resources responsibly, reducing costs and to increasing business revenues.

Innovation is a big challenge for companies looking to employ energy efficient solutions which offer long term environmental benefits.

As a practical case, Antofagasta Minerals' Minera Los Pelambres, one of the key copper mines in Chile, planned to increase their reclaim water pumping capacity without changing its pipelines. For this plant, they decided to install engineered high-head vertical turbine pumps operated by six WEG motors MGR7010 - 2000 HP - 4P - 3300 V - 50 HZ - V1, with rated efficiency exceeding 95.5%. This project allowed a 22% increase in pumping capacity and a 33% reduction in equipment running costs helping the mining company save more than US\$ 1 Million in energy costs per year.









W50 High Voltage Motors

The WEG W50 motor line is a product designed for industrial applications ensuring high performance and reliability even under the most severe operating conditions. The W50 motor complies with the strictest criteria of efficiency and safety.



- New frame design ensuring maximum performance between mechanical rigidity and thermal dissipation, thereby reducing motor vibration and increasing lifetime
- Unique fin distribuition design which ensures excellent thermal performance
- The mounting system of the grid and internal baffle ensures low noise levels, even lower than noise levels established by standards
- A high performance and robust product with a compact design
- Low vibration levels which increase lifetime
- WISE insulation on low voltage motors and VPI insultaion for high voltage motors which increases stator electrical strength
- Motor can be provided with sleeve bearings, wide range of accessories, modular blower kit, oversized terminal box and others

Characteristics:

- Output power: 75 up to 1250 kW
- Rated speed: up to 5000 rpm
- Frame sizes: 315 H/G up to 450 J/H
- Frequency: 50 Hz and 60 Hz
- Voltage: 380 up to 6600 V
- Number of poles: 2 up to 12



Oil & Gas

Reliability is the major goal for everybody at WEG and this is why WEG systems are suitable for tough environments.

Motors Drive the Pumping Heart of New Brazilian Refinery

11 x three-phase induction motors, suitable for operation in explosive atmosphere, will be used to drive the centrifugal pumps feeding water into the cooling towers at Petrobras Abreu e Lima Refinery (RNEST) in one of the wealthiest regions of Brazil. These pumps will provide water for circulation and for cooling the plant and equipment which is critically important within the refining process. To enhance their reliability these motors were designed to be robust and use the best quality bearings and components. The windings are precision made and balanced, whilst advanced thermal management ensures cool running. There are several approval bodies that can certify motors for hazardous areas.

As a major international motor manufacturer, WEG meets all required safety standards worldwide. Petrobras, amongst the five biggest energy companies in the world, says that Abreu e Lima is one of the most advanced refineries ever built in Brazil. It will be the first with the capability to process 100% heavy crude oil with the minimum environmental impact and to produce fuel with a lower sulphur content than that required by the strictest of international standards (10 ppm of sulphur).







W22 Premium Efficiency Motors - IE3

A high efficiency product, enhancing productivity to generate the maximum benefit for the customer. This is the focus of the W22 Line, designed to provide not only significantly lower energy consumption, but lower noise and vibration levels, higher reliability, easier maintenance and lower cost of ownership. A motor designed for energy efficiency, performance and productivity.



Super Premium Efficiency

Characteristics:

Output power: 3 up to 355 kW Frame sizes: 132s up to 355 A/B

Frequency: 50 Hz Voltage: 400 up to 690 V ■ Number of poles: 2, 4 and 6

Applications

Pumps, compressors, fans, crushers, conveyors, mills, centrifugal machines, presses, elevators, packaging machines, grinders, etc.

Features	Benefits
Efficiency levels	High Efficiency - IE2 - Exceeds the IE2 efficiency levels specified in the IEC 60034-30 and the requirements of the EuP-Directive 2005/32/EC Premium Efficiency - IE3 - Exceeds the IE3 efficiency levels specified in the IEC 60034-30 to provide significant energy savings and a fast return on investment
New frame and endshields design	Higher mechanical stiffness and excellent heat dissipation
New terminal box design	Diagonally split oversized terminal box provides optimal conditions for operators to access main and accessories terminals Provides easy and fast modification to the terminal box mounting position (for frames 225S/M to 355A/B)
Low bearing operating temperature	Extended lubrication intervals and longer bearings lifetime
Exclusive WSeal® sealing system	Preventing the penetration of contaminant agents into the motor interior (for frames 225S/M to 355A/B)
New ventilation system	Fins design allows an optimized air flow distribution over the frame and reduces the noise levels
Solid and integrated feet	Stiffness, easy alignment and installation
WISE® insulation system	Increases stator electrical strength and allows the motor operation by frequency inverters, without damage by voltage peaks

W22 Super Premium Efficiency

Aware of the impact high energy consumption is having on natural resources and the environment, some governments are implementing Minimum Energy Efficiency Performance Standards in order to drive the use of high efficient equipment. WEG's W22 Super Premium Efficiency motor line, exceeds the IE4 Efficiency Levels defined in IEC Technical Specification IEC/TS 60034-31 and draft IEC Standard 60034-30 edition 2 offering high overall performance which is translated into a lower Total Cost of Ownership, due to its reliability, easy maintenance and energy savings.

Features	Benefits
Efficiency level	Exceeding the IE4 Efficiency Levels defined in IEC Technical Specification IEC/TS 60034-31 and draft IEC Standard 60034-30 edition 2
W22 platform	Counts on all the innovative features of the W22 General Purpose Motors Platform
Same output x frame ratio when compared to conventional induction motors	Totally interchangeable with existing induction motors
WISE® insulation system	Increases stator electrical strength and allows the motor operation by frequency inverters, without damage by voltage peaks



Efficiency and Reliability on Automation Technologies

Advanced built-in technology for speed variation; compact solutions for short-circuit protection and overload conditions; high short-circuit breaking capacity; reliability and precision on monitoring, operation and protection of electric motors, WEG supplies solutions to control some of the most prestigious pumping projects in the world.

Employing on a team of senior engineers with extensive market and design experience, WEG is recognized and certified as a manufacturer and supplier of variable speed drives, soft-starters, motor control centers, motor starters, motor circuit breakers and an extensive series of motor control and protection products for pump applications. In addition to the general-purpose applications, we recommend the CFW700 and the Machinery Drive CFW500 as a great option for the most demanding applications.

CFW500



- Voltage range: 220 up to 480 V
- Output current: 1 to 31 A (0.25 to 15 kW)
- SoftPLC built-in
- Expansion modules recognized automatically
- Any expansion module comes with a RS485 port (Modbus-RTU)
- USB port (via expansion module)
- Memory card (allows copy of parameters)
- CANopen / DeviceNet / Profibus-DP as expansion Modules
- Versions with EMC filter
- Softwares WLP and SuperDrive G2 free of charge
- Eletronic boards conformally coated as standard, classifed as 3C2 according to IEC 60721-3-3

Certifications









CFW700



- Voltage range: 220 up to 600 V
- Output current: 3.6 to 211 A (1.1 to 110 kW)
- Control method: V / Hz, sensorless and with encoder
- Encoder interface built-in
- RS485 port standard in the product
- Safety Stop board STO (optional)
- EMC filter (optional)
- Flash Memory (accessory)
- CANopen / DeviceNet / Profibus-DP
- SoftPLC built-in
- DC choke incorporated to the standard product for harmonic mitigation
- Expansion modules recognized automatically
- Memory card (allows copy of parameters)
- Softwares WLP and SuperDrive G2 free of charge
- Eletronic boards conformally coated as standard, classifed as 3C2 according to IEC 60721-3-3

Certifications











Desalination Plant in Algeria





Estimates show that in 30 years the amount of water available per person in the north of Africa will be reduced to 80% of that currently available. As a result, the Algerian government is investing in a plan of seawater desalination.

This includes the construction of three large desalination plants with production capacity of 400 cubic meters of water per day which will greatly benefit a population of over 2 million.

The *Tlemcen-Honaine* plant, located near the city of Oran, close to the border with Morocco, has a production capacity of 150 thousand cubic meters and will supply 750 thousand inhabitants directly making it one of the largest in the world.

WEG supplied 17 x Soft-Starters and 10 x Frequency Drives for the pumps that will withdraw water from the Mediterranean Sea at Honaine.

US\$ 400 million was invested in the three plants. In addition to the desalination plants, the resources will also be used in the construction of dams and for sanitation. According to Daho Ould Kablia, "with the new program, the Algerian government intends to find a balance between the different regions of the country and provide a fair supply and distribution of water and the services related to it".

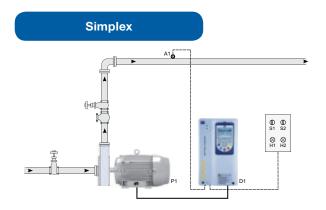




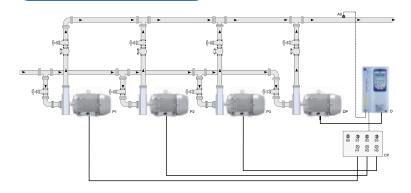
Pump Genius Solution

WEG Frequency Drives are equipped with dedicated and specialized software for pump applications. The Pump Genius software in conjunction with either a CFW500 or CFW11 inverter drive allows the configuration and monitoring of entire systems.

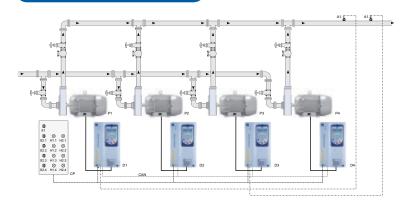
The Pump Genius Architecture within its Flexibility Covers Three Software Options as Given Below



Multi-pump



Multiplex



Key Features

- There is no need for additional PLC, HMI or any external devices thus less space in the panel and investment deduction is required.
- The drive by itself can control, monitor and manager the entire system.
- Eliminates the complexity of previous design control panels.
- By using the PID control excellent results in terms of Energy Savings can be obtained.
- System reliability is maximized due to protections and on-line monitoring present in the software.
- Equal wear and tear of individual pumps is obtained as the logic monitors the runtime of the individual pumps and based on that the specific pump is brought in or out.
- Sleep and wake-up mode makes the last pump to shut on/off when demand is below or over the pressure/flow required keeping the pump in standby mode.
- Pipe charging function allows for initial filling and lubrication as it runs for a timeframe at a preconfigured slow speed. Also, water hammer
- Maximum/minimum system pressure can be configured to trigger when broken or clogged pipe situations occurs.
- Master/slave mode allows for total management of the system. If one pump goes down or communication is interrupted or lost another one will be automatically nominated as master enabling the system to maintain continuous operation.
- Data is exchanged with communication protocols through a single cable allowing for easy installation
- Forced rotation makes the last pump in the system shut off when rotation is at a defined low speed but it is not yet at sleep level. With previous technology, the last pump would run indefinitely. The forced rotation features the equal use of the pumps in the system.



References

HADERA Desalination Plant in Israel High Pressure Pumps

■ 10 x MGW710 - 6000 kW - B3 - 2 P - 11 kV **High Pressure Booster Pumps**

■ 8 x HGF500 - 1400 kW - B3 - 2 P - 3.3 kV Water Intake Pumps

■ 5 x HGF500 - 825 kW - V1 - 8 P - 690 V **Common Booster Pumps**

■ 8 x HGF500 - 1000 kW - B3 - 6 P - 690 V 2nd and 3rd Stages High Pressure Pumps

■ 14 x HGF450 - 1000 kW - B3 - 4 P - 690 V

4th Stage High Pressure Pumps

■ 4 x HGF400 - 710 kW - B3 - 4 P - 690 V **ERS Booster Pumps**

■ 16 x HGF315 - 275 kW - B3 - 4 P - 690 V

Auxiliary Pumps 25 LV motors 11 kW up to 400 kW



TOROMOCHO Project Chinalco -Peru

- 550 x motors ranging from 0.5 HP -3500 HP
- Centrifugal pumps



Chinese Petroleum Co. Refinery in **Taiwan**

■ 04 x HGF315



Centrifugal Pumps - ONEE -Marrocos

■ 05 x BF6400 4P 5500 V 50 Hz







Al Jubail Phase II Desalination Project - Saudi Arabia

- 04 x MGW630A 2100 kW 10P B3R 4160 V 60 Hz
- 06 x MGW500D 2265 kW 2P B3R 4160 V 60 Hz
- 04 x HGF450 1060 kW 4P 4160 V 60 Hz



After Sales Support and Service

Whenever you need technical or commercial support,

Count on us!

- 32 subsidiaries strategically located in key markets
- Distributors and agents in about 85 countries
- Over 1250 Authorized Service Centers covering all five continents
- Genuine replacement parts available for immediate delivery



Services Available

- Factory repairs and redesign
- Site repairs and troubleshooting
- Installation and start-up service
- Inspection and maintenance
- Warranty support
- Technical and commercial training (at the factory or on-site)
- Field support linked to engineering





Sustainability

Environmental protection and sustainability has been a major concern for the company from its inception ensuring the correct use of natural resources and the application of energy efficient solutions.

Effective use of electric power significantly reduces the impact on the environment with further cost savings and improvement in standards of living.

WEG is continually investing in technological innovations to increase the efficiency and performance of its product range to give high productivity, low power consumption, reduced operating costs and high performance in order to benefit customers and the environment.

Throughout it's successful history, the company has focussed on producing reliable and highly efficient products which support globally sustainable development.

WEG currently holds ISO 14001 and ISO 50001 accreditation.

Think Green.



We can't predict the future, but we can see it coming...

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For those countries where there is not a WEG own operation, find our local distributor at www.weg.net.



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