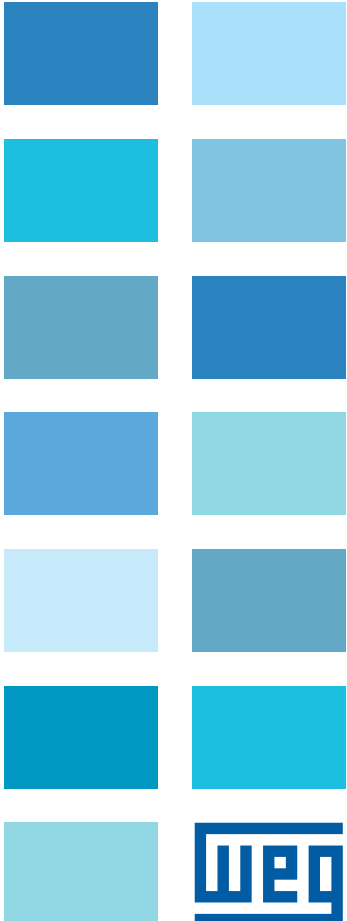
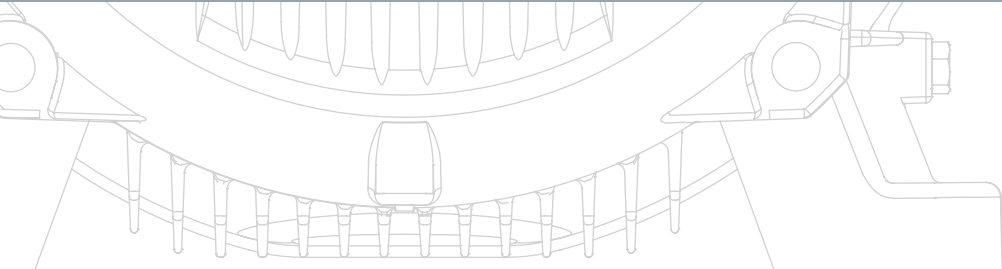
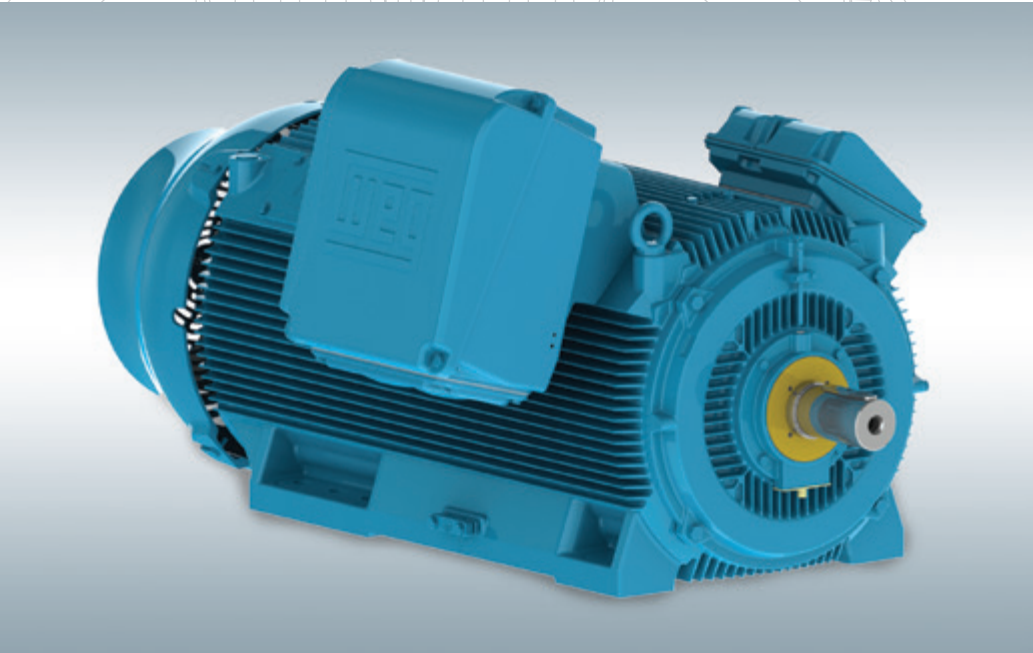
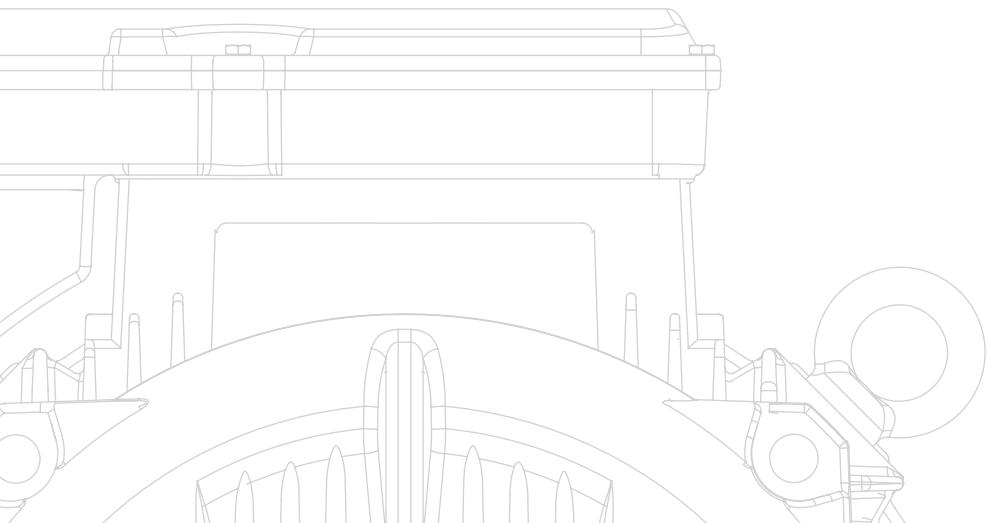




# B&P Elektromotoren

## HGF

### Three-phase Induction Motor



# HGF

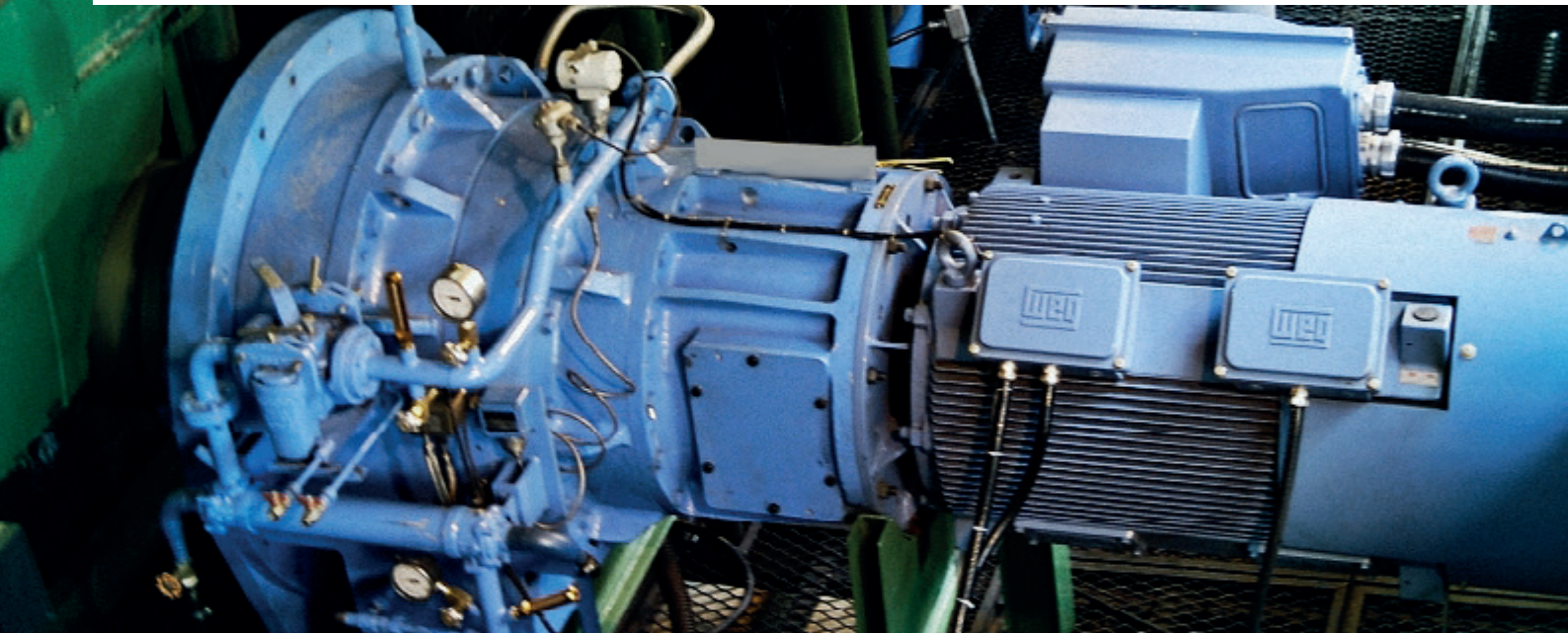
## Three-phase Induction Motor

The HGF line is differentiated by its high performance combined with low maintenance costs. This product line is ideal for operating in the toughest applications, which require increased strength and durability of motors.

The HGF motors are being designed according to the highest technological standards available in the market, using modern computer software for mechanical, electrical and thermal analysis and proving the results with rigorous tests and checks.

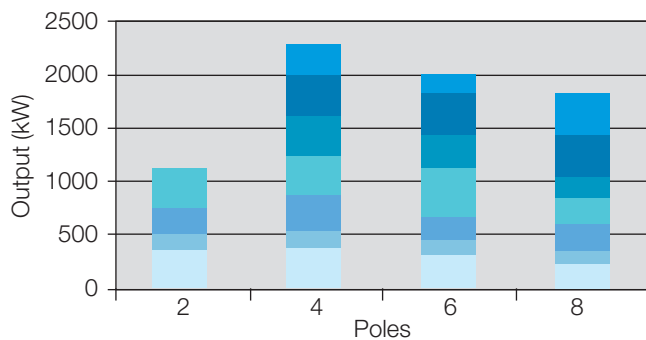
The result of this innovative development is a flexible product, suitable to the requirements of international standards and fully aligned with world market trends.

This emphasizes WEG's commitment not only to our customers, but also to the environment as WEG develops more and more optimized global solutions for its products and processes.

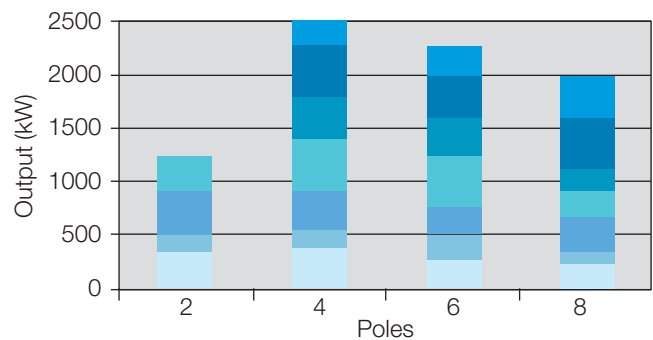


With the project updating in all aspects, the HGF motors present excellent performance levels, with one of the best rated output x frame size ratio available in the market.

**Output x poles x frame size (4.160 V - 50 Hz)**



**Output x poles x frame size (4.160 V - 60 Hz)**



Frames

- 315 (5006/7/8T and 5009/10/11T)
- 355 (5807/8/9T and 5810/11/12T)
- 400 (6806/7/8T and 6809/10/11T)
- 450 (7006/10)
- 500 (8006/10)
- 560 (8806/10)
- 630 (9606/10)

Notes: 2 pole motors are available in 500, 560 and 630 (8006/10, 8806/10 and 9606/10) frame sizes on request. Larger output ratings are available under request.

## Product overview

### Standard features

- Rated output: 100 up to 3800 HP (75 kW up to 2800 kW)
- Number of poles: 2, 4, 6, 8, 10 and 12
- Frame sizes: IEC 315 to 630 (NEMA 5006/7/8T to 9606/10)
- Frequency: 50 or 60 Hz
- Voltage: 380 V up to 6600 V
- Service factor: 1.00
- Insulation class: F (DT 80 K)
- Degree of protection: IP55
- Mounting: B3 (F-1)
- Cooling method: TEFC – Totally enclosed fan cooled – IC411
- Enclosure material: FC-200 cast iron
- Fan covers: FC-200 cast iron for frames up to 400 (6806/7/8T) and steel for frames 450 (7006/10) and above
- Fans: Aluminum for all frames (except 630 frame size, its material is defined under)
- Terminal box: FC-200 cast iron for all IEC frames and NEMA 5006/7/8 to 6809/10/11. Steel constructed for NEMA frames 7006/10 to 9606/10.
- Accessories terminal box: FC-200 cast iron
- Thermal protection:
  - Windings: PT-100 3 wire, 2 per phase
  - Bearings: PT-100 3 wire, 1 per bearing
- Bearings:
  - Grease lubricated ball bearings for frames up to 500 (8006/10)
  - Grease lubricated roller bearings for frame 560 (8806/10) 4, 6, 8, 10 and 12 pole.
- Insulated non-drive endshield bearing
- Bearing seals:
  - For grease lubricated bearings:
- Labyrinth seal
  - For oil lubricated bearings and sleeve bearings: Mechanical seal
- Vibration: Grade A (IEC)
- Balance: With half key
- Shaft locking device for bearings protection
- Nameplate: AISI 304 stainless steel (laser inscribed)
- Drain: Automatic rubber plug
- Space heater
- Color: RAL 5009 (Blue)

### Optional features

- Suitable for VFD application
- Encoder: Dynapar HS35
- Degree of protection: IP55W or higher
- Mounting: Other mounting configurations
- Cooling method: TEBC – Totally enclosed blower cooled – IC416
- Fans: FC-200 cast iron
- Surrounding muffler
- Drip cover for shaft down applications
- Terminal boxes: Steel welded terminal boxes
- Second terminal box: For “Y” connection with accessible neutral terminal
- Cable gland: Plastic, brass or stainless steel threaded.
- Thermal protection: Bimetallic thermal protection, thermistor (PTC) or calibrated PT-100 for alarm or tripping, at windings or bearings
- Thermometer on bearings with gauge with/without contacts
- Bearings:
  - Oil lubricated bearings.
  - Sleeve bearings for all frame sizes
  - Insulating brush kit for drive end shaft for VFD applications
  - Bearings designed for vertical mounting normal or high thrust applications
- Insulated drive endshield bearing
- Vibration: Grade B (IEC)
- Suitable for vibration detector SPM
- Balance: Special balance levels
- Voltage surge protection: Lightning arrestors and capacitors
- Stainless steel screws
- Internal epoxy coating (tropicalization)

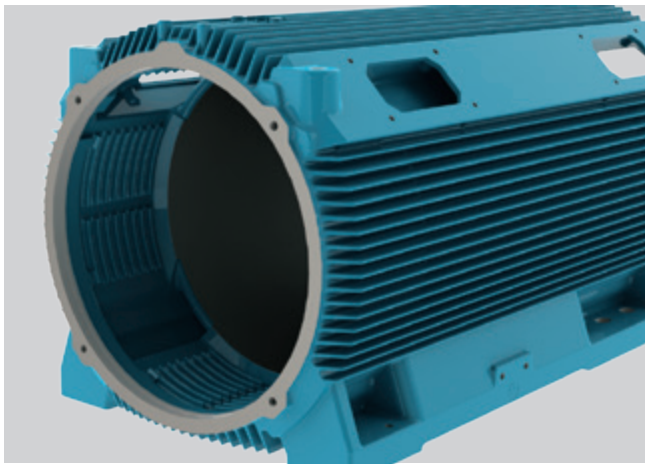
### Other features available under request

- Voltage: 6900 V to 11,000 V
- Service factor: 1.15 or 1.25
- Insulation class: F (105 K), H (80 K, 105 K or 125 K)
- Independent hydraulic oil circulation system for sleeve bearing
- CT for differential and integral protection
- Power factor correction capacitors
- Signal transducer
- Special shaft dimensions
- Tacogenerator
- Non-reverse ratchet
- Base: rail, sliding base, extended feet, rebuilt feet, anchorage plate

For electrical and mechanical data, see the Products & Services area on our website.

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## Features and benefits

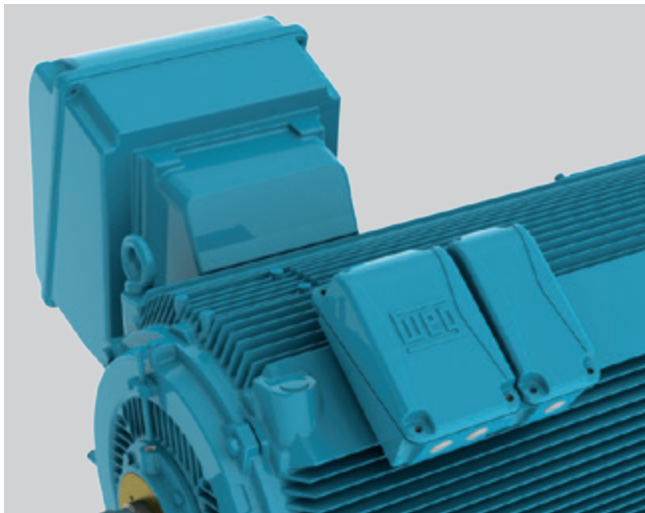


### Frame

With the optimization of the frame's structural design, the intent was the best equation between mechanical rigidity and thermal dissipation possible for enclosures, thereby reducing motor vibration and increasing lifetime.

The HGF motor frames consist of a single piece of high strength cast iron. External and internal fins, in conjunction with the fan and fan cover, provide the maximum heat dissipation possible for a self-ventilated motor, thus enabling increased levels of rated power per frame size and avoiding the overheating of the motor.

The gray cast iron FC-200 produced by WEG foundries is the material recommended by the Standards for explosion proof motors and it provides the HGF motors with higher strength and durability.



### Terminal box

The main and accessories terminals are supplied inside two different terminal boxes, both manufactured in the same gray cast iron of the frame construction.

This ensures a high mechanical strength, not only for the terminal boxes, but for the entire motor, resulting in more durability and larger lifetime. The accessories terminal box is designed with two separated compartments, one for thermal protections and another for space heaters.

Through its oversized dimensions and versatility, the motors will offer easy connection, and can be supplied according to the customer's preference, with flying leads, terminal pins or screws (for high voltage motors), etc. Terminal boxes can be rotated in 90°.

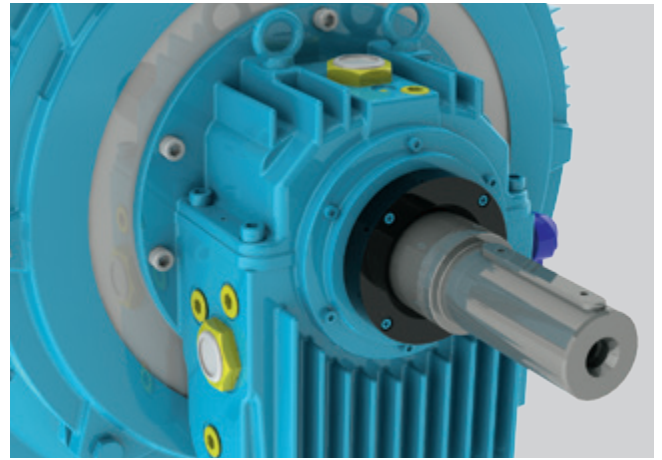
Under demand, the motors can be supplied with steel constructed terminal boxes, and, with a second main terminal box for Y connection with accessible neutral.



### Sleeve bearings

Motors may be fitted with sleeve bearings as an optional feature in direct coupling applications. Sleeve bearings require less maintenance due to the fact that the lubrication intervals are up to three times longer than the lubrication intervals of conventional bearings, and specially because they present a lifetime similar or longer than that the motor itself.

The sleeve bearings are also outstanding for their very low operating noise level and for supporting higher speed levels when compared to conventional bearings.

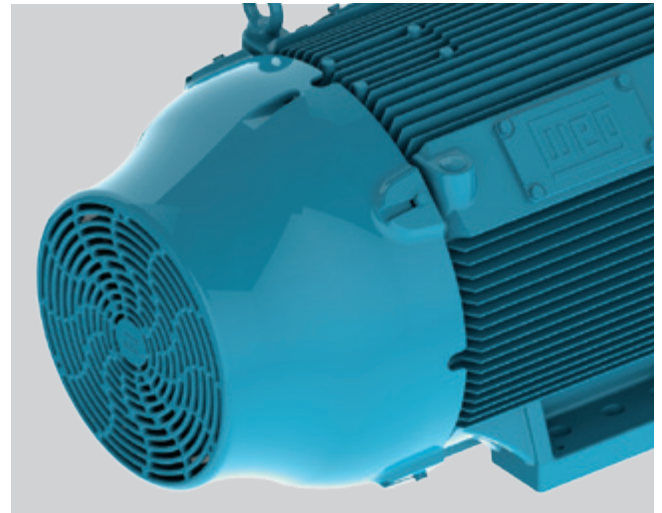


### Fan cover

The fan cover was designed to direct airflow over the entire frame with minimal recirculation in the motor interior, allowing maximum heat exchange and resulting in a cooler motor.

This innovation in the cooling system offers lower noise levels, with reductions of up to 7 dB(A), in addition to the higher mechanical strength and optimal air flow.

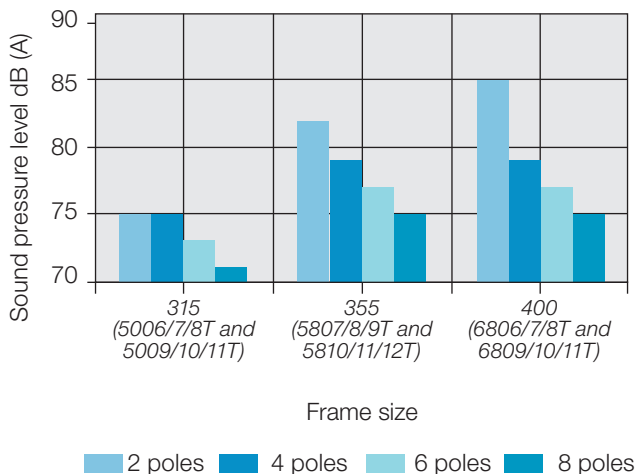
The fan cover is built with cast iron (up to frame 400), further increasing the strength and reliability of the whole. Like the frames, the fan covers are also built with the same material as the recommended by standard for explosion-proof motors, the FC-200 gray type cast iron.



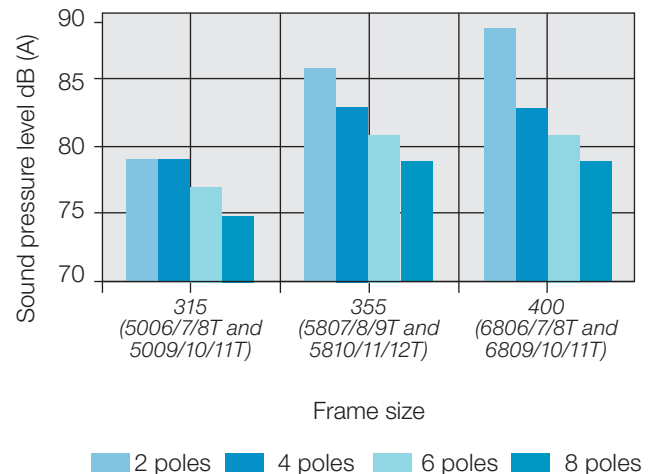
### Sound pressure level

The design of the ventilation system of the HGF line provides mechanical strength and optimum air flow, allowing reductions in the sound pressure level of up to 7 dB (A), thus increasing the reliability and longevity of the motor. The tables below show the sound pressure levels for frames sizes 315 to 400, with the fan cover of cast iron FC-200.

Sound pressure level dB (A) - 50 Hz



Sound pressure level dB (A) - 60 Hz



## Dedicated HGF Lines

The HGF motors can be adapted to the most different needs. The HGF line also utilizes product families (according to relevant standards, ABNT, IEC or NEMA) to suit specific needs and applications, always considering the best solution for the customer.

### HGF General Purpose Line

One of the greatest benefits offered by the HGF motors is the flexibility. Due to its production process, WEG can tailor-make these motors according to customer specifications. This makes the HGF the ideal product **drop-in replacement** motors in any kind of application. This versatility is exemplified by the availability of several mounting configuration and characteristics such as special built bases (rails, sliding base, anchorage plate, etc).

This flexibility on mounting allows the construction of these motors in higher degrees of protection, up to IP66W. This degree of protection is suitable for the most aggressive environments, such as **Siderurgy Industries** applications, where SO<sub>2</sub> gases, vapors, solid contaminating agents, high humidity, alkalis, and solvent drips are constantly present.

HGF motors can be designed to be driven by frequency inverters, offering the maximum in control and precision, two decisive items for the **Sugar and Ethanol Industry**. Special applications such as cane shredders and grinders require speed variation in tough conditions. HGF motors meet this requirements, with higher degrees of protections available and high starting torques. These motors are also used and sugar mills and alcohol distilleries for fans, exhausters and centrifugal pumps.

Hazardous locations can also be served with our **Ex-nA HGF Line**.

Precision and reliability are also essential in the **Pulp and Paper Industry**. In the coiling machine, for example, one of the most fragile applications, an accurate speed control and mechanical strength are demanded. As this is a critical part of the process, the HGF motors are widely used on it, offering low maintenance and outstanding performance levels. For the several other motor applications in this industry, the motors can be supplied with special painting plans and stainless steel screws, resulting in longer lifetimes in the aggressive and corrosive ambient conditions present in the industries.



### NEMA HGF Vertical Line

#### Low or High Thrust Applications

Vertical motors are used in all kinds of industries and applications. The application can be highlighted in the **Water and Wastewater Industry**, where HGF motors are applied to large vertical pumps, mixers, agitators, cooling towers, etc. Through sophisticated tools for finite elements calculation, WEG has designed the new HGF motors for applications with high thrust, making them ideal for vertical applications. To ensure that each motor has an excellent thermal and airflow performance, tests were performed to determinate the most favorable design which maintains lower bearing temperatures. The result is a simple assembly that meets the rigid requirements of high thrust vertical application.

### HGF Mining Line

A constant concern of the **Mining industry** is to reduce operating costs, through lower energy consumption and low maintenance thus increasing product quality. With this in mind, WEG has developed the HGF Mining line, a motor with optimized performance, designed to operate in severe environments. The design has electromechanically differentiated features that ensure durability, strength and robustness in all stages of the process, from material extraction to transportation and processing equipment.

#### Main line features

- Internal anticorrosive coating
- Seal on joints: Permatex
- Painting plan: 214P for severe environments
- Degree of protection: IP66W



### **IEC Non-Sparking (Ex nA) HGF Line NEMA Class I Division 2 HGF Line**

This line was developed for hazardous areas where explosive atmospheres may occur (as standard: an explosive atmosphere will probably not be present under normal operating conditions and, if any, this will be for short periods of time, that is, an explosive atmosphere may be present accidentally).

This type of protection is applied to electrical equipment which does not cause ignition of an explosive atmosphere under normal operating conditions.

The IEC Ex nA HGF motors have been certified by BASEEFA, according to ATEX Directive 94/9/EC and are protected for operation in hazardous areas classified as Zone 2, Group II, Temperature Class T3.

HGF NEMA motors meet the requirements of the standard NEC referring to hazardous areas classified as Class I Division 2, Groups B, C and D, Temperature Code T3.

Optionally, these motors can be designed to operate in areas classified as Class II, Groups F and G. HGF NEMA motors are CSA certified.

Widely used in **Oil & Gas Industry, Pulp & Paper Industry, Sugar & Ethanol Industry**, etc.

### **HGF API 541 Line**

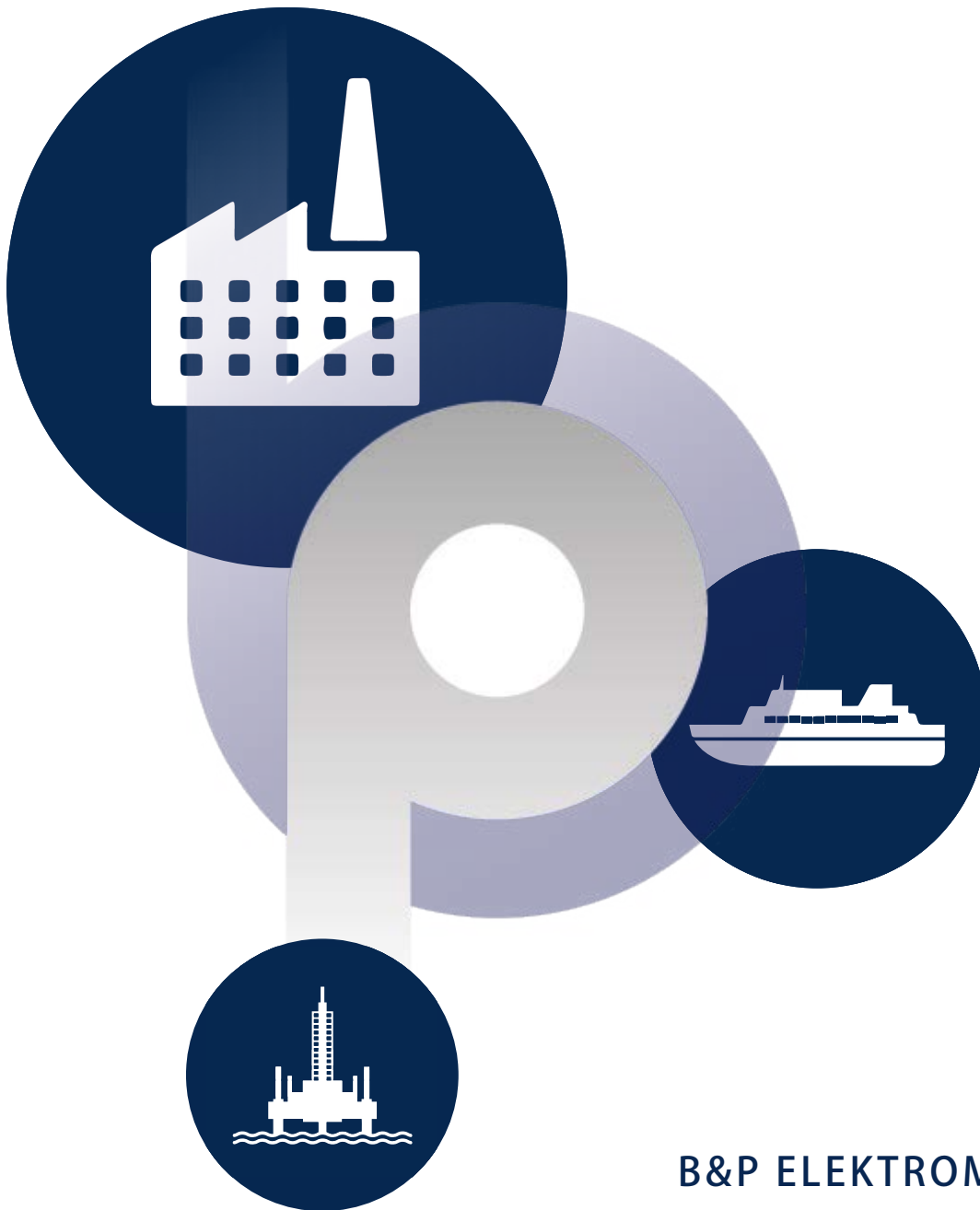
The American Petroleum Institute, known as API, is the leading trade association for the U.S. segment of Petroleum and Natural Gas, representing approximately 400 industries involved in production, refining, distribution and various other aspects of the oil industry.

The HGF API 541 Line was specifically developed to meet the standard determined by the API, called the API 541, for electric motors which will operate in the environments of **Oil & Gas Industry**.

The HGF API 541 line strictly complies with the requirements of the standard, widely used in petrochemical industries not only in America but around the world, and is highly utilized in the Middle East, the largest world oil producing region.

### **Main line features**

- Available according to IEC and NEMA;
- Available for 50°C ambient temperature (mainly for Middle East Region);
- Copper rotor;
- Sleeve bearings;
- Maximum Is/In of 6.5 times;
- Non-sparking aluminum fan with maximum copper composition of 0.2%;
- Closed threaded metallic drain plug;
- Stainless steel screws.



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