B&P Elektromotoren

W22Xd - Flameproof Motors

- Rib-cooled
- Tube-cooled

Ex d | Ex d e
Medium and High Voltage

ATEX - European Directives

ATEX is a contraction of "**AT**mosphere **EX**plosible", the French term for "Potentially Explosive Atmosphere".

Standard framework conditions have been set for explosion protection in all European Union Member States for handling of potentially explosive atmosphere by creating the:

- ATEX 95 Product Directive 94/9/EC (for manufacturers)
- ATEX 137 Worldplace Directive 99/92/EC (for users)

IECEx Scheme

The objective of the IECEx System is to **facilitate international trade** in equipment and services for use in explosive atmospheres, while maintaining the required level of safety.

IECEx System is accepted in many countries and aims to be the world approval system for electrical equipment to be installed in potentially explosive atmospheres.

The IECEx International Certification System comprises four different Schemes:

- Certified Equipment Scheme
- Certified Service Facilities Scheme
- Conformity Mark Licensing System
- Certified Persons Scheme

North American Standards and Regulations

The use of electrical equipment in hazardous areas in the U.S. and Canada requires specific assessment for the safety of persons and property according to the framework of the National Fire Protection Association documents:

- NFPA 70
- National Electrical Code (NEC)

Besides NEC compliance, electric motors and generators for use in hazardous locations (hazloc) must also be designed, manufactured and certified in accordance with the standards:

- UL 674
- CSA C22.2 No. 145-11

The hazloc certification obliges a previous certification for General Locations in accordance with the standards:

- UL 1004
- CSA C22.2 No. 100-04

NEC contains two different classification systems, the Division Classification System and the Zones Classification System, for electrical and electronic equipment concerning hazardous locations where fire or explosion hazards may occur due to flammable gases, vapors, liquids or combustible dusts.

Rui Moura Guedes, Quality Engineering Manager:

"Your operation safety starts with the reliability of our processes."

Global Certifications

Standard Certifications

WEG flameproof motors comply with **major Standards worldwide** and are designed, manufactured and certified according to:

ATEX

IEC IECEx

C SA US

Other Local Certifications

In addition to the **major certifications worldwide** WEG flameproof motors have local certifications available.
See below some examples:

EAC EX
BELARUS, RUSSIA & KAZAKHSTAN

INMETRO
BRAZIL

NEPSI
CHINA

PESO / CCoE
INDIA

SONCAP
NIGERIA

SASO
SAUDI ARABIA

Other local certifications are available on request.

Certification Bodies

These classified area products and product quality system are certified by **Notified Bodies** officially **recognized worldwide:**

CSA
CANADA

INERIS
FRANCE

TUV
GERMANY

PESO / CCOE
INDIA

SONCAP
NIGERIA

CCVE
RUSSIA

INTERTEK
SPAIN

BASEEFA
UK

Alexandra Rodrigues, Certifications Analyst:

“By looking ahead standards and regulations, we’re helping you to stay ahead.”

Marine and Offshore Approvals

They also **comply with the requirements** of all major Classifications Societies members of **IACS** (International Association of Classification Societies).

CCS
CHINA

BV
FRANCE

GL
GERMANY

RINa
ITALY

NKK
JAPAN

DNV
NORWAY

RMRS
RUSSIA

KR
SOUTH KOREA

LRS
UK

ABS
USA

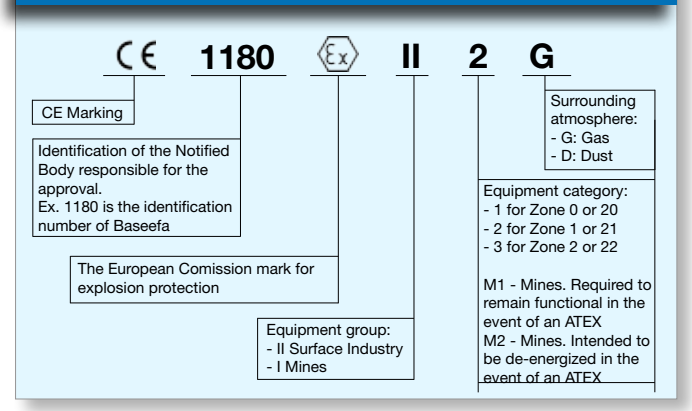
WEG is one of the first motor manufacturers in the world to be granted a license to use the **IECEx conformity mark**.

The mark is used on Ex products to demonstrate that the equipment meets the requirements of the relevant Standards and addresses the market globally.

IEC Ex INE 001

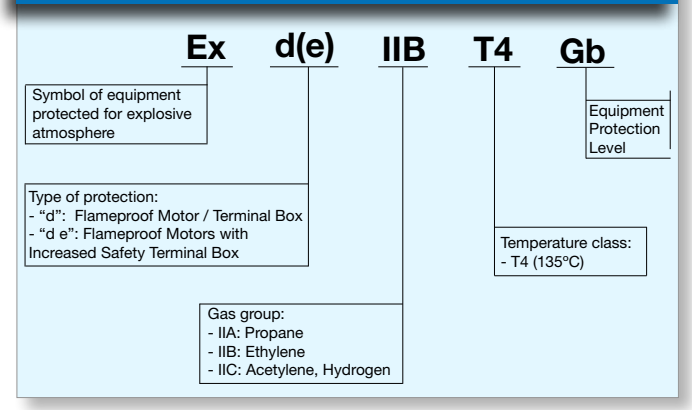
Marking of Equipment

Directive 94/9/CE (Only ATEX)



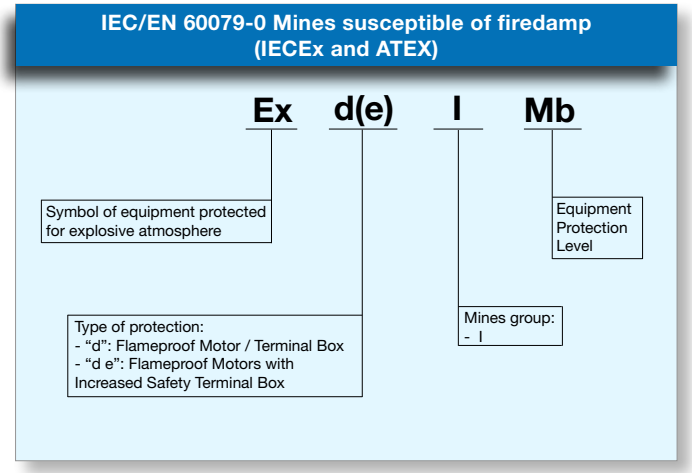
ATEX marking

IEC/EN 60079-0 Explosive Gas Atmosphere (IECEx and ATEX)



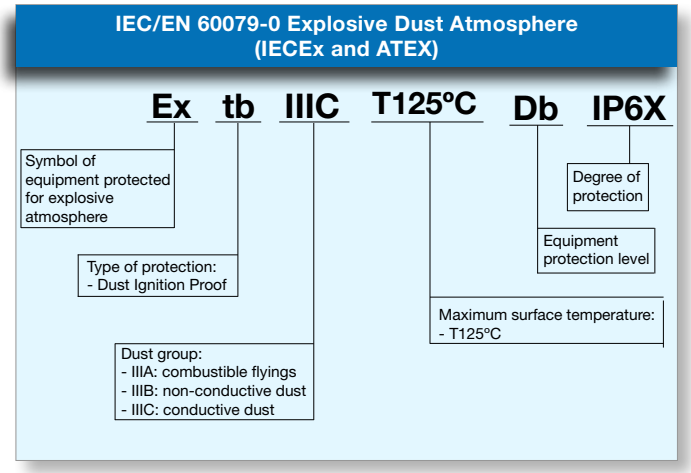
IECEx / ATEX marking for explosive gas atmosphere

IEC/EN 60079-0 Mines susceptible of firedamp (IECEx and ATEX)



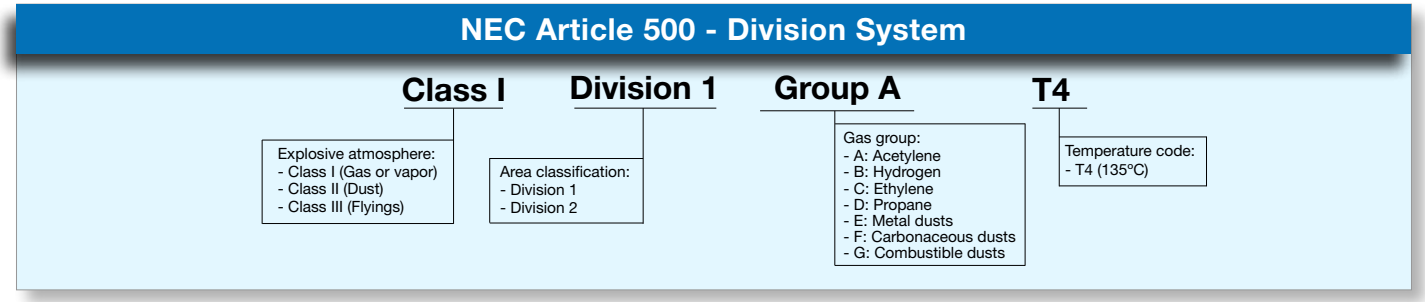
IECEx / ATEX marking for mines susceptible to firedamp

IEC/EN 60079-0 Explosive Dust Atmosphere (IECEx and ATEX)

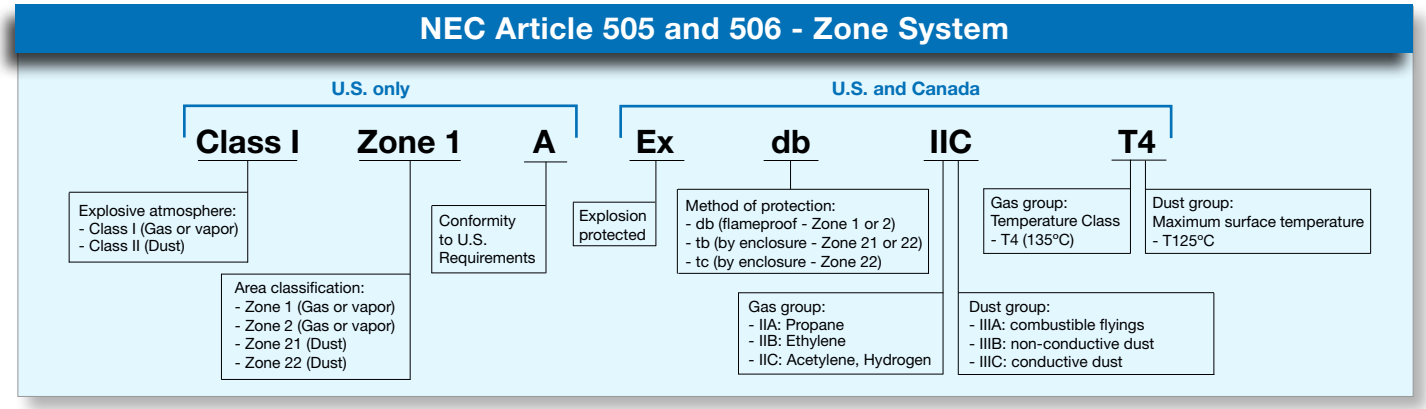


IECEx / ATEX marking for explosive dust atmosphere

NEC Article 500 - Division System



NEC Article 505 and 506 - Zone System



North American markings

Terminology

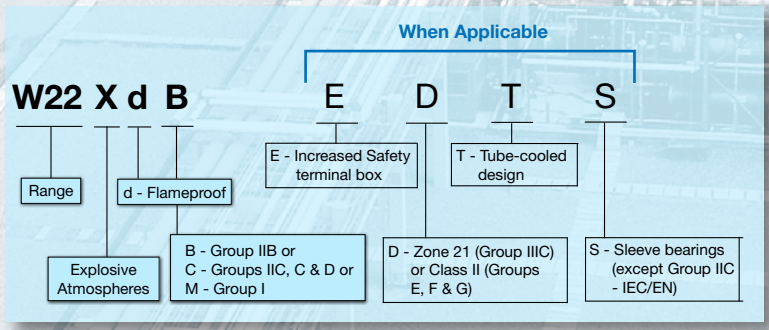
The below terminology standardizes the designation for W22 series hazardous areas motors globally and clearly identifies the classified area to which the motor is designed to be installed.

This terminology stipulates the following:

- W22Xd - Flameproof Ex d motors
- W22Xn - Non-sparking Ex nA motors
- W22Xe - Increased Safety Ex e motors
- W22Xtb - Protection by enclosure
  Zone 21 Dust Ignition Proof motors
- W22Xtc - Protection by enclosure
  Zone 22 Dust Ignition Proof motors

The “W22Xd” terminology shall include the following hazardous area complementary information:

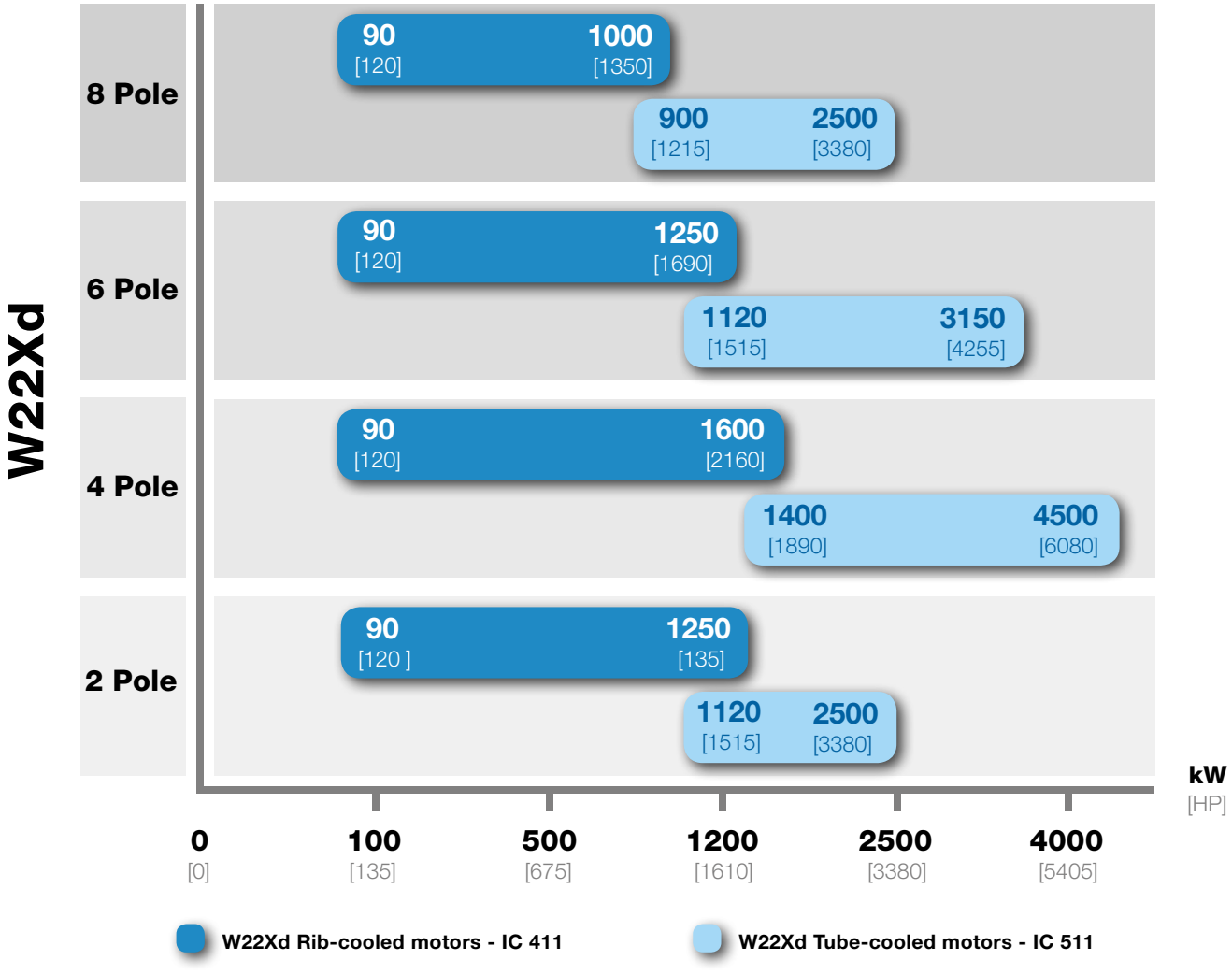
- W22XdB - Gas group IIB *(IEC/EN and NEC 505)*
- W22XdC - Gas group IIC *(IEC/EN and NEC 505)*
  - Gas groups C & D *(NEC 500)*
- W22XdM - Group I, category M2 *(IEC/EN)*



Outstanding Performance

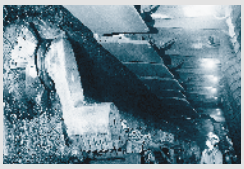
These motors are designed according to the most demanding standards in the world for flameproof motors and offer one of the most comprehensive rated output vs frame size ratio available in the market.

Outputs in Medium Voltage (1100V < Un ≤ 6600V - 50Hz)

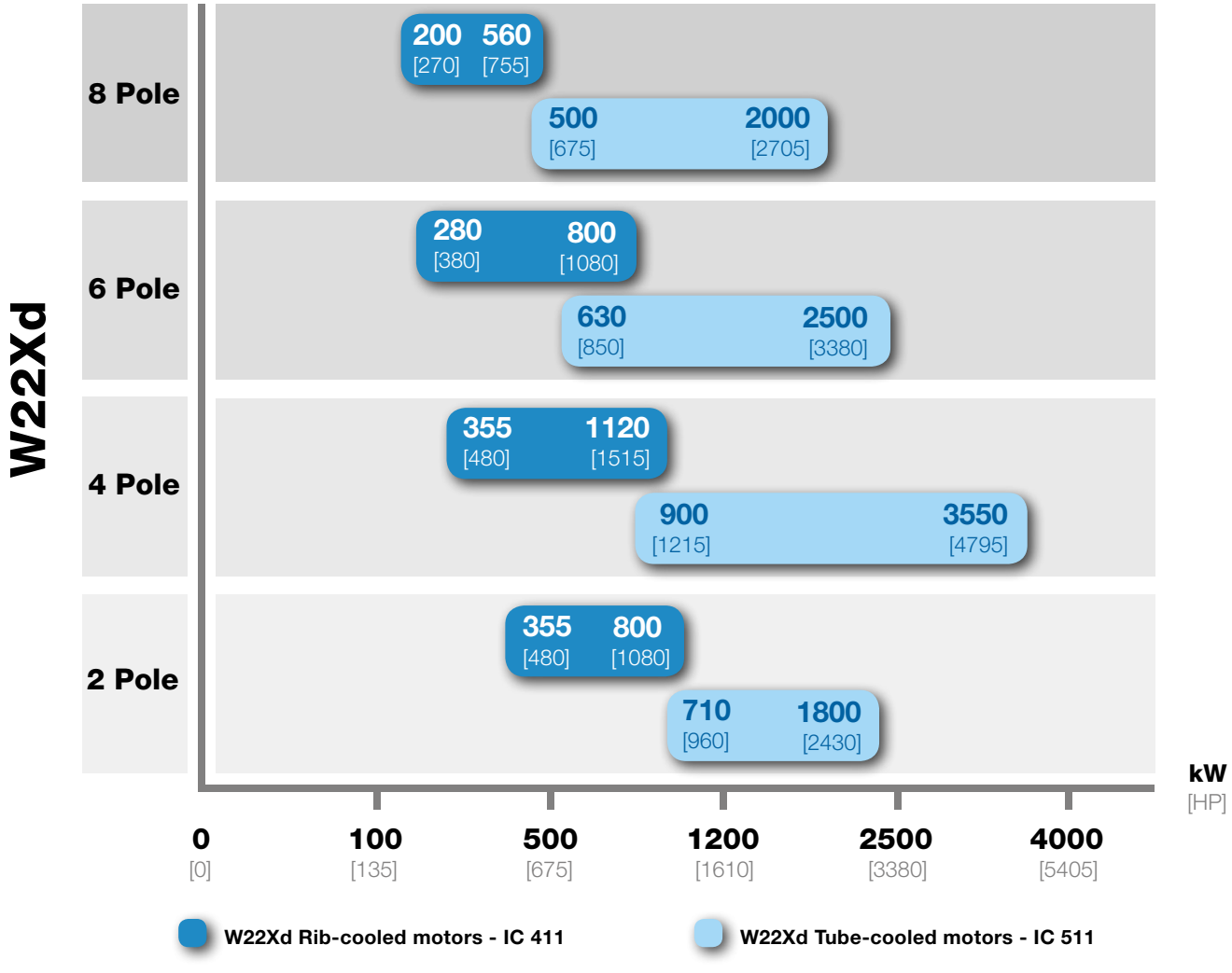


Please refer to us for other outputs and speeds

From severe underground **Coal Mines** in the
to offshore **Oil Platforms** in



Outputs in High Voltage (6600V < Un ≤ 11000V - 50Hz)



Please refer to us for other outputs and speeds

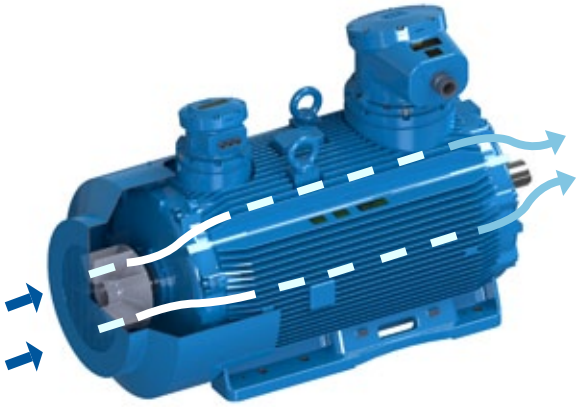
depth of the **Black Sea Coal Basin**,
the abrasive waters of the rigorous **North Sea**...

Cooling Methods

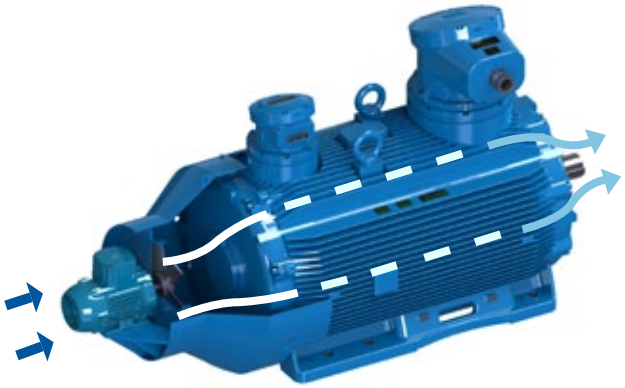
Rib-Cooled Motors

W22Xd rib-cooled motors are available, as standard, with cooling method **IC411** (cooled by an external fan) in accordance with IEC 60034-6 standard.

Non-ventilated **(TEAO - IC418)** or forced ventilation **(TEBC - IC416)** versions are available on request.



IC411
With ribs all around the frame
and cooled by an external fan

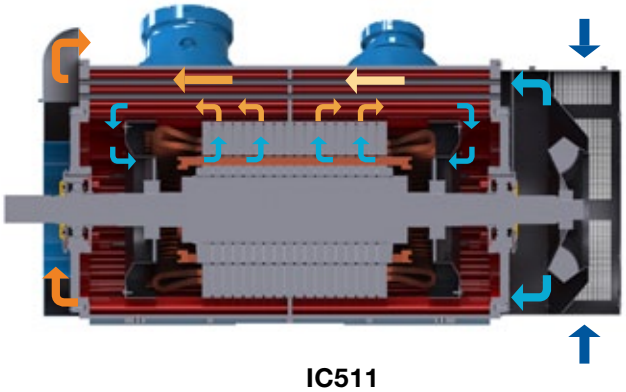


IC416
With ribs all around the frame
and with forced external air ventilation
by independent motor driven fan

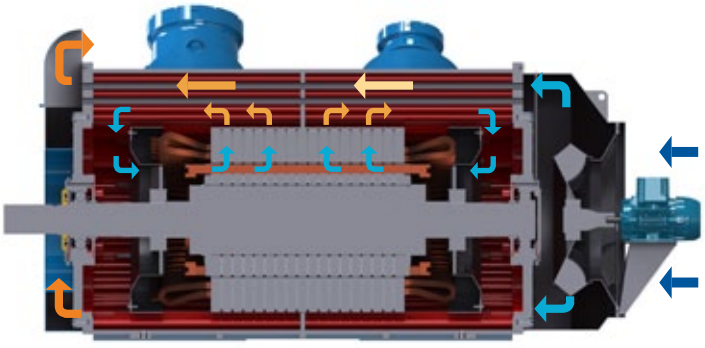
Tube-Cooled Motors

W22Xd tube-cooled motors are available, as standard, with cooling method **IC511** (cooled through an integrated heat exchanger) in accordance with IEC 60034-6 standard.

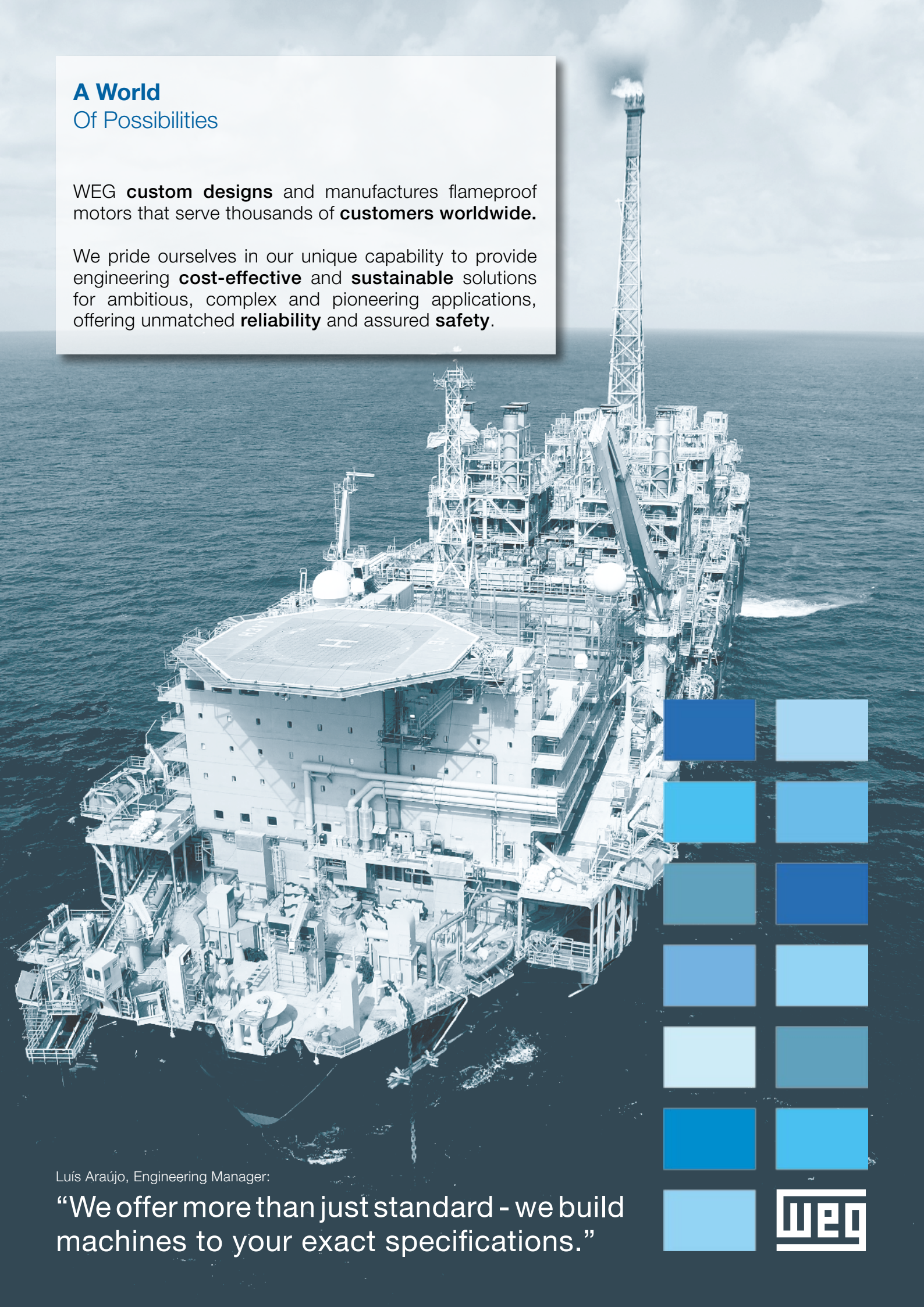
Forced ventilation **(TEBC - IC516)** version is available on request.



IC511
With air-to-air cooler around the stator
and cooled by an external fan



IC516
With air-to-air cooler around the stator
and with forced external air ventilation
by independent motor driven fan



A World
Of Possibilities

WEG **custom designs** and manufactures flameproof motors that serve thousands of **customers worldwide.**

We pride ourselves in our unique capability to provide engineering **cost-effective** and **sustainable** solutions for ambitious, complex and pioneering applications, offering unmatched **reliability** and assured **safety**.

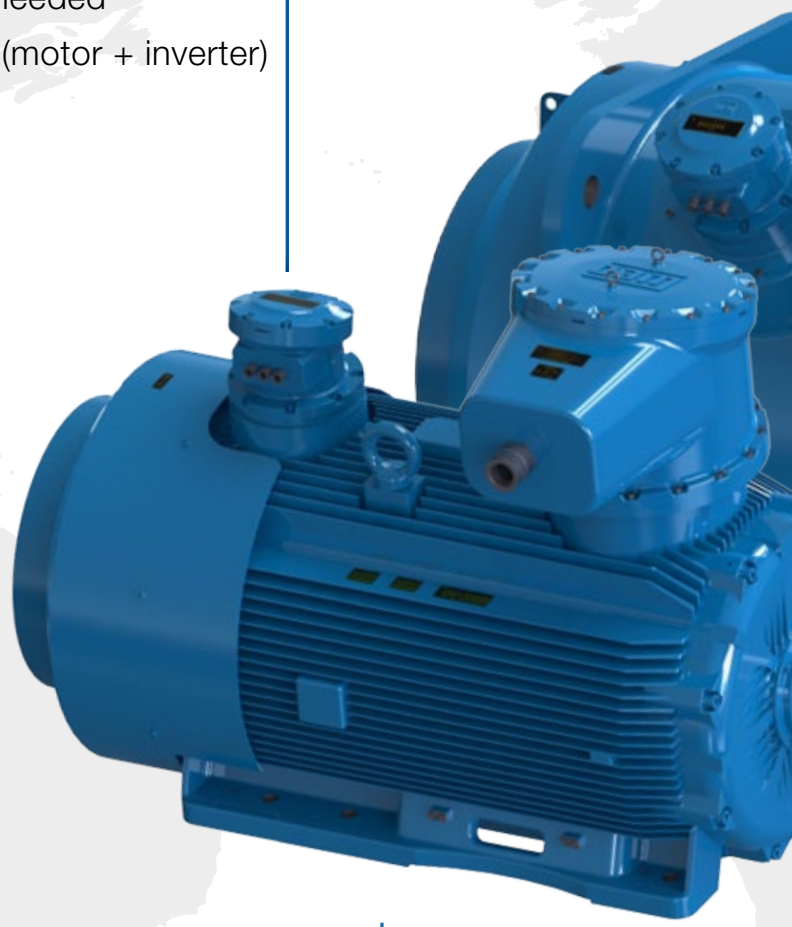
Luís Araújo, Engineering Manager:

"We offer more than just standard - we build machines to your exact specifications."

... Built for EXtremes

Inverter Duty Applications

- No temperature class derating needed
- No combined type test needed (motor + inverter)



Enclosure Robustness

- Maximum protection against mechanical impacts (20 Joule)

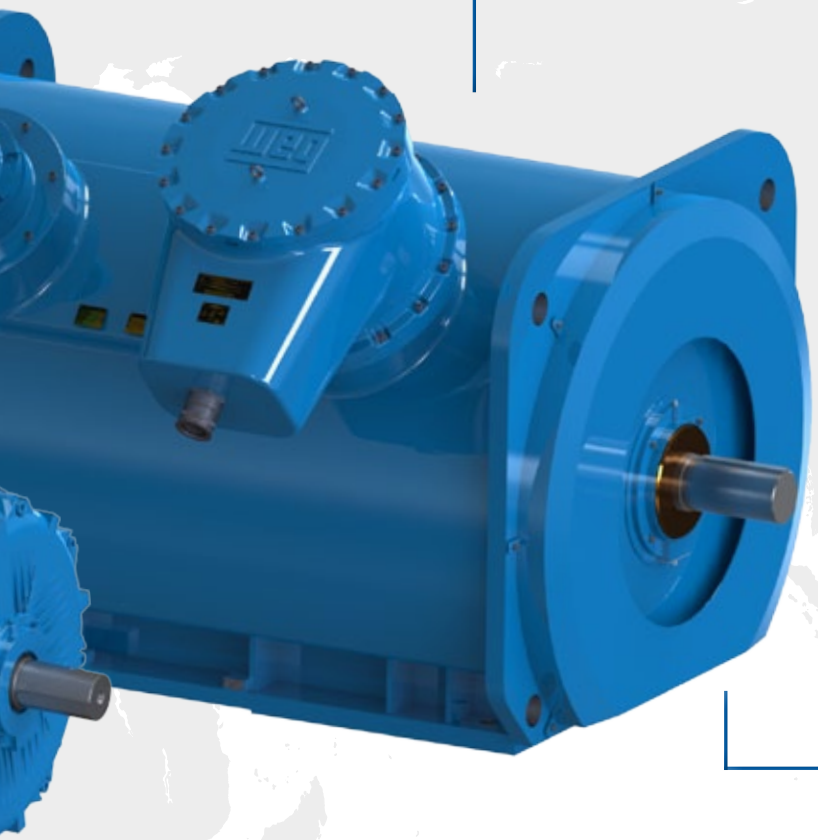
Terminal Boxes Versatility

- Fault rate designs up to 50kA during 1 second
- Large variety of arrangements for accessories (CT's, surge protection, PD monitoring, ...)

From **Gas Pipelines** in the harshness to **Oil rigs** on the hottest

Simplified Maintenance

- Low operating bearing temperature resulting in extended bearings lifetime and longer lubrication intervals



Modular Concept

- Multiple mounting configurations
- Wide range of terminal boxes and certified adaptors

Easy Installation

- Solid and integrated feet on frame

Reduced Sound Pressure Levels

- Cooling system designed for optimum balance of airflow and noise level

of the **Artic Circle** conditions,
spots of the blustery **Arabian Desert**...

Standard Features

- **Classified area certification:**
  - W22XdB: Zones 1 and 2, gas group IIB *(IEC / EN and NEC 505)*
  - Temperature class: T4 (135ºC)
- **Range of operating temperatures:**
  - Up to +40ºC
  - Down to -20ºC
- **Altitude:** Up to 1000 m.a.s.l.
- **Insulation:** Class F ("B" temperature rise - 80K)
- **Impregnation:** VPI (Global vacuum and pressure impregnation)
- **Voltages:** Up to 11000V (50Hz or 60Hz)
- **Duty:** S1 (Continuous)
- **Service factor (SF):** 1.0
- **Winding protections:** RTD - Pt100, 3 wires (2 per phase)
- **Bearing protections:** RTD - Pt100, 3 wires (1 per bearing)
- **Space heater:** 230V, +/- 5%
- **Frame sizes:** From 315 up to 1000
- **Mounting:** B3
- **Cable entries:** On left hand side, facing drive end
- **Enclosure:**
  - Rib-cooled: TEFC (Totally Enclosed Fan Cooled)
  - Tube-cooled: TEAAC (Totally Enclosed Air-to-Air Cooled)
- **Cooling:**
  - Rib-cooled: IC411
  - Tube-cooled: IC511
- **International protection rating:**
  - Frame: IP55
  - Terminal Boxes: IP66
- **Protection by enclosure against mechanical impacts:** 20 Joule
- **Frame material:**
  - Rib-cooled: Cast iron
  - Tube-cooled: Welded steel construction with stainless steel cooling tubes
- **Terminal boxes:**
  - Power supply terminal box (Cast iron)
  - Auxiliary terminal box for thermal protection and heaters (Cast iron)
- **Rotor:** Squirrel cage (Aluminium or copper)
- **Balancing:** Half key
- **Vibration class:** Grade A (IEC 60034-14)
- **Bearings:** Anti-friction or sleeve
- **Fan:** Cast iron, aluminium or welded steel
- **Fan cover:** Steel
- **Grounding:** Double grounding in the frame and terminal boxes
- **Tropical treatment:** Rotor, windings and castings
- **Painting plan:** 202P (C3 - high durability according to DIN EN ISO 12944 standard)
- **Standard colour:** RAL 5009 (Azure blue)

Optional Features

- **Classified area certifications:**
  - W22XdC: Zones 1 and 2, gas group IIC *(IEC / EN / NEC 505)*
    Class I, division 1, gas groups C & D *(NEC 500)*
  - W22XdBD: Zones 1 / 21 and 2 / 22, groups IIB / IIIC
    (IEC / EN / NEC 505 and NEC 506)
  - W22XdCD: Zones 1 / 21 and 2 / 22, groups IIC / IIIC
    (IEC / EN / NEC 505 and NEC 506)
    Class II, division 1, gas groups E, F & G *(NEC 500)*
  - W22XdM: Group I, category M2 *(IEC / EN)*
  - Temperature class: T5
- **Wide range of operating temperatures:**
  - Up to +60ºC
  - Down to -55ºC
- Special mounting arrangements and custom designed solutions
- Increased safety terminal box
- Fault rated terminal boxes certified by a third party (up to 50kA during 1 second)
- Phase segregated or phase insulated terminal boxes
- Accessible neutral point terminal box
- Current transformers (protection or measurement), surge protection (arrestors or capacitors), signal transducers and partial discharge monitoring
- Dedicated terminal box for space heaters
- Heating resistance for terminal boxes
- Wide range of terminal box mounting arrangements through the use of certified adaptors in several designs and different terminal box models (cast iron, welded carbon or stainless steel)
- International protection ratings: IP56, IP65 and IP66
- Certified drain plugs on motor frame or terminal box
- C5 lamination
- Special shaft materials and dimensions
- Sleeve bearings (self-lubricating or oil circulation) - not allowed for IIC execution, as per IEC/EN 60079-1 Standard
- Full key / no key balancing
- Vibration monitoring accessories (provision or supply of SPM, accelerometers, key-phasors,..)
- Special painting plans according to your specification
- Wide range of windings / bearings thermal protections (Pt1000, thermocouples, surge diverters, temperature transmitters,..)
- Suitable for VSD application (without the need for a combined type test)
- Forced ventilation
- Encoder or tacho assembly
- Flying leads
- Motor without fan or fan cover (AOM) - IC418
- Sunshade
- ...

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