W22X

LV - Flameproof Motor

Launching in
2nd semester, 2011

W22X
The new explosion proof motor generation

The W22X line represents what is most modern in driving equipment for explosive atmosphere environments.

As a result of intense research and development, WEG launches its new explosion proof motor line, the W22X. Incorporating the same innovative concepts of the W22 general purpose motors, the W22X line is an evolution in the market of classified area products offering high efficiency levels, energy saving, low operational costs, extended lifetime, low maintenance and assured safety!
Learn more about the W22X line including the benefits and advantages for your plant.

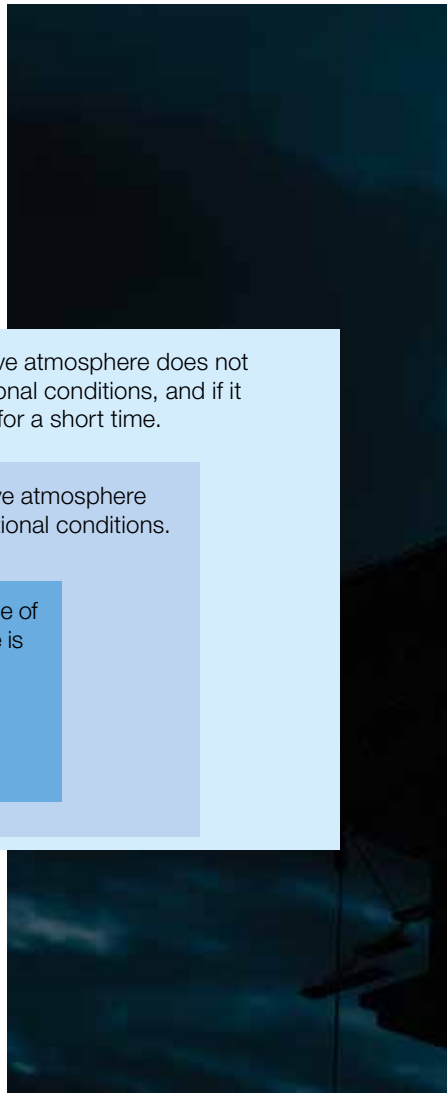
Hazardous Areas

According to IEC 60079-10 standard, Explosive Atmosphere is a “mixture with air, under atmospheric conditions, of flammable substances in the form of gas, vapors, dust, fibers, or flyings which, after ignition, permits self-sustaining propagation”.
Hazardous Area is “an area in which an explosive atmosphere is or may be expected to be present, in quantities such as to require special precautions for the construction, installation and use of equipment”.
For this reason, motors with explosion proof protection are built in such a way to not allow the explosion in the hazardous areas, where they are installed. Explosions may occur either due to the transfer of flames or overheating.

The hazardous areas are classified per zones, groups and temperature classes. The classifications according to the International Electrotechnical Commission (IEC) and National Electrical Committee (NEC) are shown below:

Classification per zones: based upon the frequency of the occurrence and duration of an explosive atmosphere and based on the type of flammable material (gases/vapors or dusts/fibers);

- ***IEC Zone 0 (gases/vapors) or 20 (dusts/fibers)***
Equivalent to ***NEC Class I, Division 1 (gases/vapors) or Class II, Division 1 (dusts/fibers)***
Area in which an explosive atmosphere is present continuously or for long periods or frequently;
- ***IEC Zone 1 (gases/vapors) or 21 (dusts/fibers)***
Equivalent to ***NEC Class I, Division 1 (gases/vapors) or Class II, Division 1 (dusts/fibers)***
Area in which an explosive atmosphere is likely to occur in normal operation occasionally;
- ***IEC Zone 2 (gases/vapors) or 22 (dusts/fibers)***
Equivalent to ***NEC Class I, Division 2 (gases/vapors) or Class II, Division 2 (dusts/fibers)***
Area in which an explosive atmosphere is not likely to occur in normal operation but, if it does occur, will persist for a short period only.



Zone 2/22: The explosive atmosphere does not occur in normal operational conditions, and if it does occur, will persist for a short time.

Zone 1/21: The explosive atmosphere occurs in normal operational conditions.

Zone 0/20: The presence of an explosive atmosphere is continuous

(not applicable for motors and generators)

Classification per groups: subdivision according to the type of flammable material present.

IEC Group I: Gases present in underground mines (example: methane).

IEC Group II: Gases present in other explosive atmospheres.
Group II subdivisions:
- ***IEC Group IIA*** (Equivalent to NEC Group D): Propane family gases;
- ***IEC Group IIB*** (Equivalent to NEC Group C): Ethylene family gases;
- ***IEC Group IIC*** (Equivalent to NEC Groups B and A, respectively): Hydrogen and Acetylene family gases.

Group III: Dusts of fibers
Group III subdivisions:
- ***IEC Group IIIA*** (Equivalent to NEC Group G): Solid particles, larger than 500µm suspended – combustible fibers;
- ***IEC Group IIIB*** (Equivalent to NEC Group F): Non-conductive dust, smaller or equal than 500µm, with electrical resistivity smaller or equal to 10^3 Ω.m – grime;
- ***IEC Group IIIC*** (Equivalent to NEC Group E): Conductive dust, smaller or equal than 500µm, with electrical inferior or equal to 10^3 Ω.m – metallic dust.

Classification per temperature classes: according to the temperature limitation, related to the ignition temperature of the flammable material present.

Temperature Class		Maximum surface temperature (°C)
IEC	NEC	
T1	T1	450
T2	T2	300
-	T2A	280
-	T2B	260
-	T2C	230
-	T2D	215
T3	T3	200
-	T3A	180
-	T3B	165
-	T3C	160
T4	T4	135
-	T4A	120
-	T5	100
-	T6	85

Protection

The W22X motor line were designed for operation in hazardous areas classified as IEC Zones 1 and 2, Groups IIA, IIB or IIC, Temperature Class T4 (Equivalent to NEC Class I, Division 2, Groups D and C, Temperature Class T4) and IEC Zones 21 and 22, Groups IIIA, IIIB and IIIC (equivalent to NEC Class II, Division 2, Groups G, F and E).

Features and Benefits

New concept

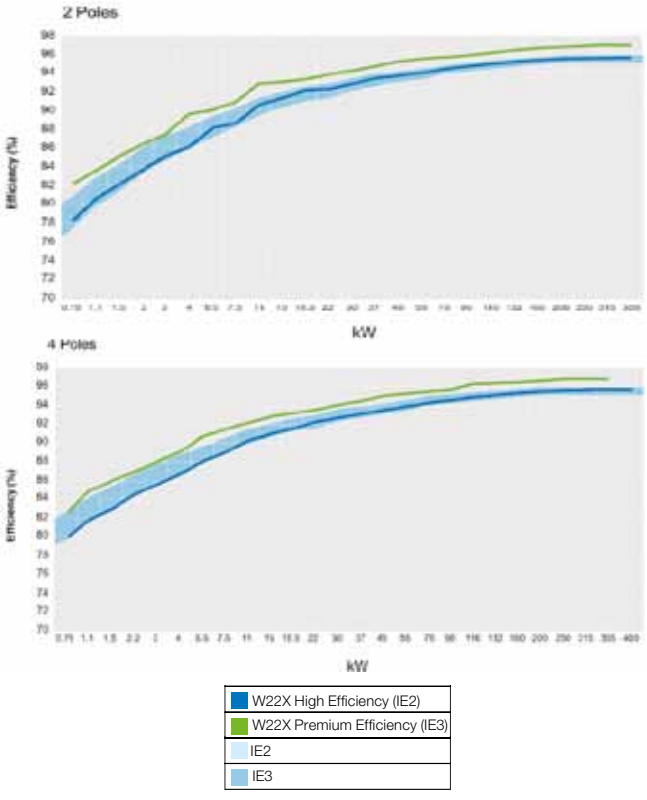
The mechanical design of the W22X motors is based on the W22 general purpose motor line, with the incorporation of some innovative features, including: new frame design with new fins and feet to ensure higher mechanical stiffness and excellent heat dissipation; new endshield design to reduce bearings operation temperature thus increasing the lubrication intervals; new cooling system to reduce the noise levels and improve the heat dissipation significantly.

W22X Premium Efficiency - IE3

W22X High Efficiency - IE2

Energy efficiency

The W22X motor design was developed to exceed the efficiency levels defined by IEC 60034-30 and NEMA MG-1 standards, and is available in the IEC IE3 and IE2 efficiency levels and NEMA Premium Efficiency and High Efficiency levels. Besides counting on the safe operation of this product, the customers may reduce their energy consumption and CO_2 emissions due to the technology employed and performance achieved. The rated power x synchronous speed x frame size ratio also follows the IEC and NEMA standards, allowing the interchangeability between the new W22X motors and the W21 explosion proof motors. The replacement of existing explosion proof motors, with lower efficiency levels by the new W22X with higher efficiency levels offers a fast return-over-the-investment demanded by this operation.



New terminal box

The terminal box was designed with planty of internal space, allowing easy access and safe handling of the power cables, even when large gauge cables are required.
As an alternative, the terminal box can also be supplied with terminal block for power cables connection and with connector for accessory lead connection. Upon request, these motors can be supplied with an additional terminal box for accessory lead connection. W22X motors still can be supplied with Ex de protecion, when terminal box and accessories meet the “Increased Safety” type of protection.
The main terminal box is supplied with a lateral thread hole for accessories installation, closed with a certified plug. During the accessories leads installation, this plug must be replaced by a certified cable gland in order to ensure motor protection and safety.

Wide range of accessories

The new W22X line offers a wide range of accessories that may be supplied with the motors, which make them suitable for a wide variety of customer specifications, without losing its focus on the safety of the application.
The motors can be supplied with space heaters, windings or bearings thermal protection, additional terminal box, drain plug for condensed water, etc. These new motors also were designed for frequency inverter applications and also count on accessories to fit the requirements of such applications such as, insulated bearings, shaft grounding kit, forced ventilation kit, etc.

Easy maintenance

The new W22X motor is fitted with bearing caps on the external side of the endshields, for easy bearing inspection. The motors also can be supplied with grease nipples and open bearings, which increases the bearing lifetime.
Since the bearing sealing system is placed in the bearing caps, the degree of protection of these motors can be easily improved by replacing these bearing caps and sealing system, which makes the motor suitable for the application in severe ambients with presence of humidity high level and contaminant particles.
The motor feet are double drilled (IEC 160M/L, 180M/L and 200M/L and NEMA 254/6T, 284/6T and 324/6T), flexibilizing the replacement of motors already installed at the plant. The feet still have provisions for dowel pins, making the alignment of motors easier when removed for maintenance from its mounting base.

Wide range of applications

The W22X line is available in two versions: for IEC IIB classified area or IEC IIC (hydrogen gases family).
To enable a higher functionality to the W22X line, these motors will be also certified for applications in ambients where combustible dusts/ fibers may be expected to be present.

Product Features

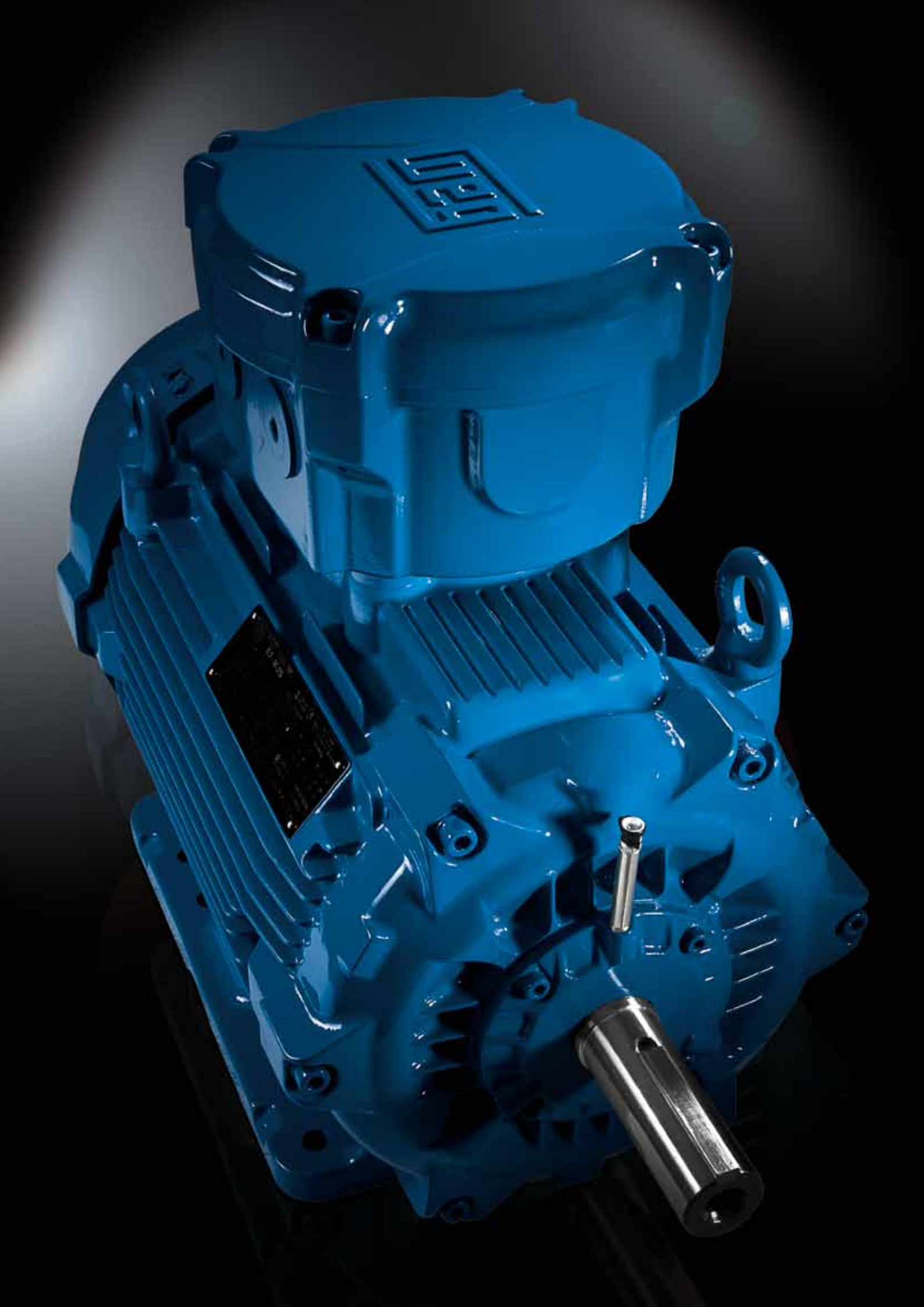
Standard features:

- Suitable for operation in hazardous areas classified as IEC Zones 1 and 2, Groups IIA and IIB, Temperature Class T4 and NEMA Class I, Division 2, Groups D and C, Temperature Class T4;
- Certifying Body: UL (cULus), PTB (IECEx) and CSA (under certification);
- Efficiency levels available: IEC Premium Efficiency (IE3) and High Efficiency (IE2); NEMA Premium Efficiency and High Efficiency;
- Cooling method: TEFC (Totally enclosed fan cooled) - IC411;
- Degree of protection: IP55;
- Rated output: 3.7 kW to 45 kW (5 to 60 HP);
- Frame sizes: IEC 160M/L to 200M/L – NEMA 254/6T, 284/6T and 324/6T*;
- Number of poles: 2, 4, 6, 8, 10 and 12;
- Insulation Class “F” (ΔT 80 K);
- Suitable for frequency inverter operation for voltages up to 575 V;
- Ambient temperature: -20°C to +40°C;
- Enclosure material: frame, endshields, terminal box and fan cover in FC-200 cast iron;
- Grounding: Double grounding (one on the terminal box + one on the frame)
- Fan material: Plastic
- Bearings: ZZ type (shielded), C3 clearance;
- Bearings sealing system: Lip Seal;
- Joints seal: Lumomoly PT/4;
- Shaft material: AISI 1040/45 steel;
- AISI 304 stainless steel laser engraved nameplate;
- Painting plan: 203A (meets 240h salt spray as per ASTM B117-03).

Other features available upon request (covered by certification):

- Hazardous Area classification: Group I and Group IIC;
- Ambient temperature: -55°C to +80°C;
- Double speed;
- Shaft grounding kit;
- Degree of protection IP56, IP65 or IP66;
- Other mounting configurations, including vertical applications;
- Flanges;
- Drain plugs;
- Additional terminal box for accessories;
- Certified threaded plugs in stainless steel;
- Certified cable gland in brass or stainless steel;
- Space heaters;
- Windings or bearings thermal protections;
- Fan material: cast iron, aluminum or bronze;
- Grease nipples in carbon or stainless steel;
- Roller bearings;
- Shaft material: stainless steel or high tensile carbon steel;
- Double shaft end;
- Internal anticorrosive epoxy coating;
- Provisions for SPM detectors;
- Other painting plans;
- Other features available, upon request.

**Frame sizes IEC 71 to 132 - NEMA 143T to 215T and 225 to 355 - NEMA 364/5T to 586/7T will be available in 2012.*



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