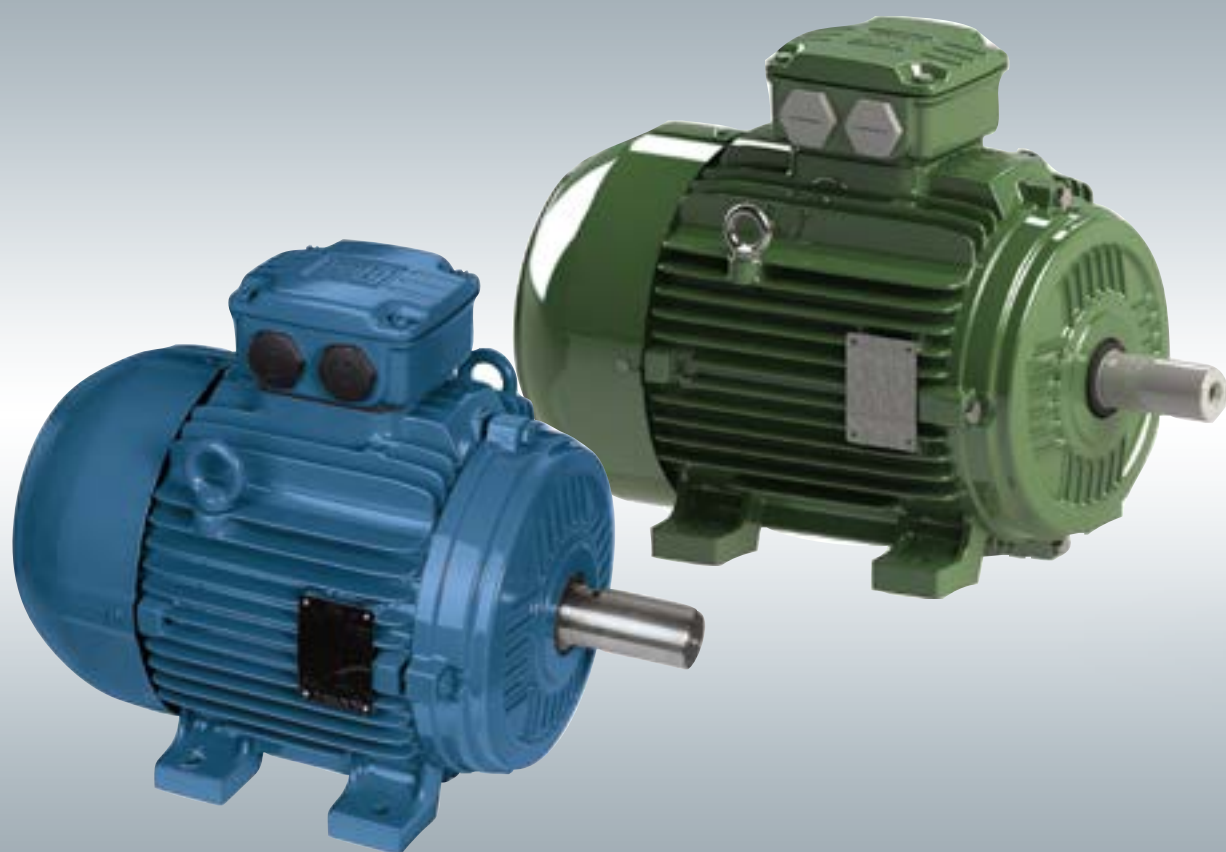


# W21

Three Phase LV motors

Technical Catalogue - Asia Market







## About WEG

Founded in 1961, WEG is acknowledged today as one of the largest manufacturers of electric motors in the world. More than 33,000 people are employed in the different manufacturing units which cover over 2,500,000 square meters of constructed area.

In support of exports in over 135 countries worldwide, WEG has branch offices located in all five continents and has manufacturing plants in 12 countries supported by more than 1400 service centers around the world. WEG's great success with export activities is based on the company's willingness to meet worldwide standard requirements, keeping product inventories in strategic locations, personnel training and prompt service.

## About WEG (Nantong) Electric Motor Mfg. Co., Ltd

With the expansion of WEG Group's business, in addition to setting up commercial branches around the world, the establishment of factories in overseas strategic markets has also become a solid backing to support local business growth. WEG Group established the first manufacturing plant in Asia in 2005 in the Nantong Economic and Technological Development Zone, Ji-angsu, namely WEG (Nantong) Electrical Motor Manufacturing Co., Ltd. ("WEG Nantong"). The company covers an area of 67,000 square meters, with a construction area of 33,500 square meters, and currently employs 650 people. It is a high-efficiency motor manufacturer integrating R&D, design, production, testing, sales, after-sales service and motor maintenance. The annual production capacity of motors exceeds 3 million kilowatts. The company has a research and development center in collaboration with the headquarters, more than 270 sets of various advanced large and medium-sized production equipment, and a complete and scientific management system. It has successively obtained "ISO9001:2015 Quality Management System Certification" and "ISO14001:2015 Environmental Management System" and "ISO45001-2018 Occupational Health and Safety Management System Certification" provide a strong guarantee for the sustainable development of enterprises. The products sell well in domestic and foreign markets, and are widely used in many industrial segments such as pulp and paper, water treatment, marine, food and beverage, power energy, metallurgy, mining, petroleum and natural gas, urban infrastructure, etc., and are well received by domestic and foreign customers.

## About WEG (Jiangsu) Electric Equipment Co., Ltd

Since the establishment of WEG Nantong factory in 2005, WEG brand awareness and market share have been increasing in the Chinese market year by year. WEG Group is optimistic about the development potential and opportunities of the Chinese market. In order to establish a competitive advantage and ensure the sustainable growth of WEG business, the WEG Rugao Greenfield Project with a total investment of US\$120 million came into being.

Established in 2015 and located in Jiangsu Rugao Economic and Technological Development Zone, WEG(Jiangsu) Electrical Equipment Co., Ltd. ("WEG Rugao" for short) is the third motor manufacturing plant established by WEG Group in China. Covering a total area of about 180,000 square meters, the second phase of the project has now been completed and officially put into production in 2020. There are about 1000 employees, and the products mainly cover small and medium-sized low-voltage motors and reducers. The annual design capacity of industrial motors is 800,000 units and 200,000 sets of parts. WEG Rugao is the motor manufacturing plant with the highest degree of industrial automation in the group. In addition to highly automated intelligent warehousing, a large number of automated production equipment such as robots are equipped to production, which provides a strong guarantee for the high volume and high quality of products. The ISO9001, ISO14001 and ISO45001 system certifications obtained are also recognition of its scientific and complete management system. In addition to supplying the Chinese market, the products are also exported to Europe, America, Asia and Africa and other countries and regions. They are widely used in various industrial fields, including traditional applications such as fans, pumps and compressors. The company has established a R&D low-voltage center, through the WMS system (WEG manufacturing system), six sigma and other lean production systems to ensure to provide customers with high-quality products and services.

## Certifications

### WEG China



### WEG Global







### W21 Line - High Efficiency Motors

The increasing demand for electrical energy to sustain global development requires consistent heavy investments in power 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. Consequently, any initiatives to increase energy efficiency, by using high efficiency electric motors and frequency inverters, are to be welcomed, as they can make a real contribution to reductions in global energy demand.

At the same time as efficiency initiatives make an impact in traditional market sectors, the application of new technologies in emerging sectors is resulting in profound changes in the

way that electric motors are applied and controlled. By integrating these changes together with the demands for increased energy efficiency, WEG has taken up the challenge and produced a new design of high efficiency motor; one motor that recognised worldwide for its quality, reliability and efficiency.

Using the latest generation of computerised tools, such as structural analysis software (finite element analysis) and computer fluid dynamics, as well as electrical design optimisation software, an innovative - next generation - product has been developed: the W21 motor.

Several key objectives have been achieved in the design of the W21 motor:

- Reduction of noise and vibration levels
- Increased energy efficiency
- Compatibility with present & future generations of frequency inverters
- Global design
- Global warranty



W21\_IE3



W21\_IE4

### Sustainability and Carbon Emission reduction through Premium Efficiency Motors

The Premium Efficiency (IE4) level established in IEC 60034-30-1.2014 is considered the highest efficiency class which a squirrel cage induction motor can achieve whilst remaining economically viable.

It is also the optimum solution to increase the efficiency of an existing application through direct replacement.

So, why have IE4 motors not become the Industry standard? It may be argued that IE4 motors are also premium in price when comparing against IE2 and IE3 efficiency motors.

Whilst this is not strictly untrue, it should be appreciated when considering their lifetime that the cost of acquisition typically represents only 1% of the total cost of ownership of an electric motor. In contrast, the associated energy savings provided by IE4 motors far outweigh this additional investment in purchase price.

The reduction in CO<sub>2</sub> emissions is one of the direct consequences, and therefore benefits, of increasing efficiency in industry.

For example, according to the guidelines set out by the International Energy Agency (IEA) of 504 kg of CO<sub>2</sub> per 1,000kWh, it is possible to reduce CO<sub>2</sub> emissions by approximately 1,000 kg per year with one 3 kW IE3 efficiency motor and by 25,000 kg per year with a 250 kW IE3 efficiency motor, when compared against equivalent standard efficiency (IE1) machines.

Go to our website at [www.weg.net](http://www.weg.net) to check the potential reduction in CO<sub>2</sub> emissions and the return on investment. The W21 line from WEG is the first complete range of IE4 motors available to Industry...

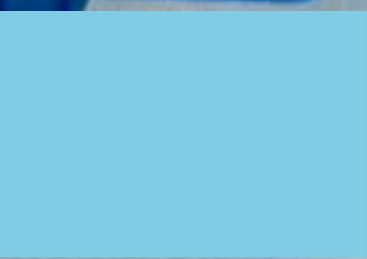
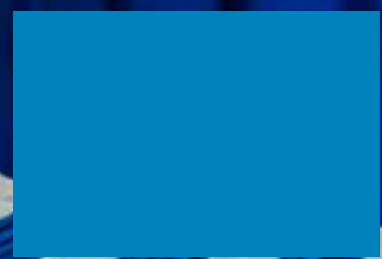
...We call it **WEGnology**

**WEG Green**



## Table of Contents

|   |    |
|---|----|
| Cast iron frame, W21 Multi-voltage motor .....                              | 8  |
| Aluminum motor, W21 Multi-voltage motor .....                               | 9  |
| W21 Inverter Duty motor .....   | 10 |
| Fan & Exhaust motor.....  | 11 |
| Smoke Extraction motor .....  | 12 |
| W21 Brake motor .....   | 13 |
| Cas iron frame, Ex nA - Non sparking motor.....                             | 14 |
| Cas iron frame, Ex d / Ex de - Explosion proof motor.....                   | 15 |
| Cas iron frame, Ex e – Increased safety motor .....                         | 16 |
| Cas iron frame, Ex d Brake - Explosion proof brake motor .....              | 17 |
| Cas iron frame, Zone21 Dust Ignition Proof motor.....                       | 18 |
| 1. Construction details .....   | 19 |
| 1.1 Frame / Endshields.....   | 19 |
| 1.2 Grounding.....  | 19 |
| 1.3 Fan cover.....  | 19 |
| 1.4 Terminal box.....   | 19 |
| 1.5 Terminal block.....   | 19 |
| 1.6 Nameplate .....   | 20 |
| 2. Cooling system / Noise level / Vibration level.....                      | 21 |
| 2.1 Cooling system and Noise Level.....                                     | 21 |
| 2.2 Vibration level.....  | 21 |
| 3. Shaft / Bearings / Thrusts.....  | 21 |
| 3.1 Shaft.....  | 21 |
| 3.2 Bearings .....  | 21 |
| 3.2.1 Bearing lock.....   | 22 |
| 3.2.2 Bearing temperature monitoring.....                                   | 23 |
| 4. Degree of protection / Painting.....                                     | 23 |
| 4.1 Degree of protection .....  | 23 |
| 4.2 Painting .....  | 23 |
| 4.2.1 Tropicalized painting .....   | 24 |
| 5. Ambient / Insulation .....   | 24 |
| 6. Variable speed drive application.....                                    | 24 |
| 6.1 Considerations regarding voltage spikes and the insulation system ..... | 24 |
| 6.2 Torque limit of variable torque drive application.....                  | 24 |
| 6.3 Considerations regarding bearing currents.....                          | 25 |
| 6.4 Forced ventilation kit.....   | 25 |
| 7. Tolerances for electrical data .....                                     | 26 |
| 8. Space heater .....   | 26 |
| 9. Thermal Protections .....  | 26 |
| 10. Packaging .....   | 26 |
| W21 Cast iron frame, Multi-voltage motor exploded view .....                | 28 |
| W21 Cast iron frame, Variable frequency motor exploded view.....            | 29 |
| 11. Construction Features .....   | 30 |
| 12. Electrical Data .....   | 34 |
| 13. Mechanical data .....   | 45 |
| 14. Terminal box .....  | 47 |
| 15. Mountings .....   | 48 |
| 16. Services .....  | 49 |





## Cast Iron Frame W21 Multi-voltage Motor

Three phase asynchronous motor, with lower acquisition cost and high technology. Easy to adapt to the most application types, allowing to your company agility during installation, easy operation and low maintenance cost. The project is according to IEC34 standards, which guarantees higher energy savings. The following types of W21 motors are available: IE1, IE2, IE3, IE4 and suitable for the use with Frequency Inverters.

### Standard Features:

Electrical:  
 Insulation class: F (B,  $\Delta T=80$  K)  
 Ambient temperature: 40 °C , 1000 m.a.s.l  
 Voltage:  
 Frame 80-100,  
 220-240/380-415V(50Hz) // 440-460V (60Hz)  
 Connection type  $\Delta$ - $\Delta$ /Y-Y//Y-Y  
 Frame 112 and above,  
 380-415/660-690 (50Hz) // 440-460V(60Hz)  
 Connection type  $\Delta$ - $\Delta$ /Y-Y// $\Delta$ - $\Delta$   
 Service Factor: 1.00  
 Design: N  
 Duty: S1  
 Thermal Protection: frame 160 and above, equipped with PTC Thermistor (one per phase)

Mechanical:  
 Frame: 80 to 355M/L  
 Squirrel cage rotor (die aluminum)  
 Protection Degree: IP55  
 Cooling Method: TEFC (Totally Enclosed Fan Cooled)  
 Sealing: V-ring  
 Paint Color: IE2 - RAL 5009  
 IE3 - RAL 5009  
 IE4 - RAL 6002  
 Frame 225 and above,, with regreasing system  
 Terminal box with metric threaded holes  
 Drain hole  
 Vibration Level A

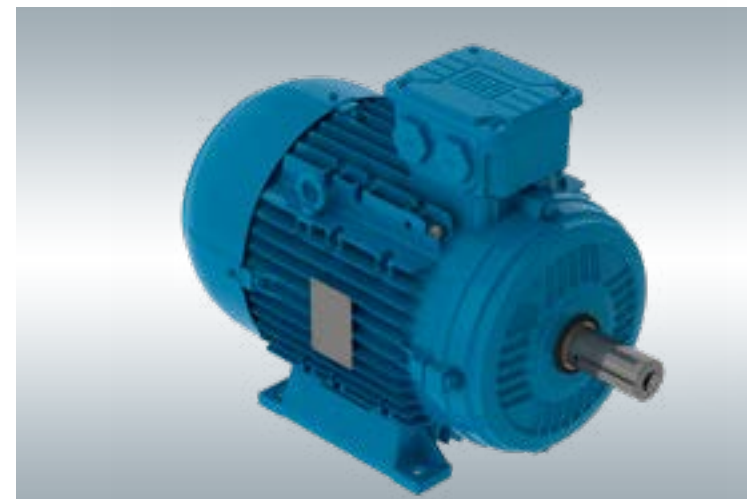
### Optional Features:

Electrical:  
 Insulation Class: H; Design H  
 Thermal Protection: frame up to 132(include), with PTC Thermistor, Thermostat or PT100  
 Mechanical:  
 Others mountings  
 Protection Degree: IP56, IP65, IP66, IPW55, IPW56  
 Sealing: Lip seal, Oil seal, Labyrinth taconite(frame 132 and above)  
 Space Heater, Double shaft ends  
 Roller bearings available for frame 160 and above

| Features                                  | Benefits  |
|---|---|
| WISE Insulation System                    | Increase the electrical strength of the stator, allowing the motor to operate with frequency inverters, without damaging by the voltage peaks*.                                   |
| Efficiency                                | IE3 and IE4 motors, guarantee a fast return of investment.  |
| Painting plan for Industrial Environments | Suitable for the use in slightly severe and sheltered environments, with low average humidity, regular temperature variations.  |
| Cast Iron Frame                           | More mechanical strength for your application   |
| State-of-the-art Ventilation System       | Uniform refrigeration of the motor with significant temperature reduction in the external surface and bearings, guarantee high performance and energy saving to your application, |
| Customization                             | Product suitable to meet the most demanded applications in the industry.  |

\* Notes:

| Motor Rated Voltage | Tehcnical Criteria for use of motors fed by inverters |                                 |                                    |                                       |
|---------------------|---|---------------------------------|------------------------------------|---------------------------------------|
|                     | Voltage peak in the motor (Maximum)                   | dV/dt Inverter Outlet (maximum) | Rise Time(*) of Inverter (Minimum) | MTBP(*) Time between pulses (minimum) |
| Vn < 460V           | ≤ 1600V   | ≤ 5200 V/μs                     | ≥ 0,1 μs                           | ≥ 6 μs                                |
| 460V ≤ Vn < 575V    | ≤ 2000V   | ≤ 6500 V/μs                     |                                    |                                       |



## Aluminum Frame W21 Multi-Voltage motor

WEG Aluminum Frame motor were specially designed to meet market requirements in reference to mounting flexibility since they allow all mounting positions. The foot mounting system offers great flexibility and it is quite simple allowing change on the mounting configuration without requiring any machining or modification on motor feet. The terminal box can be rotated in 90 degrees. Besides that, these motors allow great advantage on standardization and stock flexibility due to the fact that just one motor is required with mounting possibility on all positions. Additionally, these motors are fully interchangeable with existing cast iron frame motors.

### Standard Features:

Electrical:  
 Insulation class: F (B,  $\Delta T=80$  K)  
 Ambient temperature: 40 °C , 1000 m.a.s.l  
 Voltage:  
 Frame 80-100,  
 220-240/380-415V(50Hz) // 440-460V (60Hz)  
 Connection type  $\Delta$ - $\Delta$ /Y-Y//Y-Y  
 Frame 112 and above,  
 380-415/660-690 (50Hz) // 440-460V(60Hz)  
 Connection type  $\Delta$ - $\Delta$ /Y-Y// $\Delta$ - $\Delta$   
 Service Factor: 1.00  
 Design: N  
 Duty: S1  
 Thermal Protection: frame 160 and above, equipped with PTC Thermistor (one per phase)

Mechanical :  
 Frame: 63 to 200M/L  
 Squirrel cage rotor (die aluminum)  
 Protection Degree: IP55  
 Cooling Method: TEFC (Totally Enclosed Fan Cooled)  
 Sealing: V-ring  
 Painting Color: IE2 - RAL 5009; IE3 - RAL 5009  
 Terminal box metric threaded holes  
 Drain holes  
 Vibration Level A

### Optional Features:

Electrical:  
 Insulation class:H; Design H  
 Thermal Protection: Frame132 and below, PTC thermistor, Thermostat or PT100 as optional  
 Mechanical:  
 Others Mounting  
 Protection Degree: IP56, IP65, IP66, IPW55, IPW56  
 Sealing: Lip seal, Oil seal,, Labyrinth Taconite( frame 132 and above)  
 Space Heater; Double Shaft ends

| Features                                 | Benefits  |
|--|---|
| Multi-mounting                           | change the mounting without requiring any machining or modification on motor feet.  |
| Aluminum Frame                           | better heat dissipation   |
| WISE Insulation System                   | Increase the electrical strength of the stator, allowing the motor to operate with frequency inverters, without damaging by the voltage peaks*. |
| Efficiency                               | IE3 and IE4 efficiency guarantee the fast return on investment  |
| Painting plan for industrial environment | applicable for severe conditions: low humidity, normal temperature variation  |
| Reinforced Ventilation System            | reducing significantly temperature on motor surface and in bearing, guarantee the performance and saving energy                                 |
| Customization                            | Suitable for diverse applications in industry   |

\* Notes:

| Motor Rated Voltage | Tehcnical Criteria for use of motors fed by inverters |                                 |                                    |                                       |
|---------------------|---|---------------------------------|------------------------------------|---------------------------------------|
|                     | Voltage peak in the motor (Maximum)                   | dV/dt Inverter Outlet (maximum) | Rise Time(*) of Inverter (Minimum) | MTBP(*) Time between pulses (minimum) |
| Vn < 460V           | ≤ 1600V   | ≤ 5200 V/μs                     | ≥ 0,1 μs                           | ≥ 6 μs                                |
| 460V ≤ Vn < 575V    | ≤ 2000V   | ≤ 6500 V/μs                     |                                    |                                       |

## W21 Cast Iron Frame Inverter Duty

WEG TEBC cast iron motors were designed to meet several applications where wide speed range variation is required. The windings are enameled with class H varnish and exclusive patented WISE insulation. The independent fan system offers low noise level and maximum cooling at low speeds. As additional feature, the W21 TEBC motor can be supplied with encoder which allows perfect motor speed control for critical applications.

### Standard Features:

Electrical:  
 Insulation class: F (B,  $\Delta T=80$  K)  
 Ambient temperature: 40 °C , 1000 m.a.s.l  
 Voltage:  
 Frame 80-100,  
 220-240/380-415V(50Hz) // 440-460V (60Hz)  
 Connection type  $\Delta$ - $\Delta$ /Y-Y//Y-Y  
 Frame 112 and above,  
 380-415/660-690 (50Hz) // 440-460V(60Hz)  
 Connection type  $\Delta$ - $\Delta$ /Y-Y// $\Delta$ - $\Delta$   
 Service Factor: 1.00  
 Design: N  
 Duty: S1  
 Thermal Protection: frame 160 and above, equipped with PTC Thermistor (one per phase)

### Mechanical:

Frame: 63 to 355M/L  
 Squirrel cage rotor (die aluminum)  
 Protection Degree: IP55  
 Cooling Method: TEFC (Totally Enclosed Fan Cooled)  
 Sealing: V-ring  
 Paint Color: IE2 - RAL 5009  
 IE3 - RAL 5009  
 IE4 - RAL 6002  
 Frame 225 and above,, with regreasing system  
 Terminal box with metric threaded holes  
 Drain hole  
 Vibration Level A



### Optional Features:

Electrical:  
 Insulation Class: H; Design H  
 Thermal Protection: frame up to 132(include), with PTC Thermistor, Thermostat or PT100

### Mechanical:

Others mountings  
 Protection Degree: IP56, IP65, IP66, IPW55, IPW56  
 Sealing: Lip seal, Oil seal, Labyrinth taconite(frame 132 and above)  
 Space Heater, Double shaft ends  
 Roller bearings available for frame 160 and above

| Features                                  | Benefits  |
|---|---|
| Reinforced Insulation System              | Operating in extreme conditions, protecting the coil winding and extending the motor's life.  |
| Efficiency                                | IE3 and IE4 motors, guarantee a fast return of investment.  |
| Painting plan for Industrial Environments | Suitable for the use in slightly severe and sheltered environments, with low average humidity, regular temperature variations.  |
| Cast Iron Frame                           | More mechanical strength for your application   |
| State-of-the-art Ventilation System       | Uniform refrigeration of the motor with significant temperature reduction in the external surface and bearings, guarantee high performance and energy saving to your application, |
| Customization                             | Product suitable to meet the most demanded applications in the industry.  |

\* Note: Derating Curve: operating on rated frequency, use the derating curve to check if the maximum torque was suitable for maximum speed operation.

| Motor Rated Voltage              | Technical Criteria for use of motors fed by inverters |                                 |                                    |                                       |
|----------------------------------|---|---------------------------------|------------------------------------|---------------------------------------|
|                                  | Voltage peak in the motor (Maximum)                   | dV/dt Inverter Outlet (maximum) | Rise Time(*) of Inverter (Minimum) | MTBP(*) Time between pulses (minimum) |
| 575V ≤ V <sub>RATED</sub> ≤ 690V | ≤ 2400V   | ≤ 7800 V/μs                     | ≥ 0,1 μs                           | ≥ 6 μs                                |



## Fan and Exhaust Motor

Most suitable for OEM customers. Standard cooling method is Totally Enclosed Air Over (TEAO), can supply with terminal box and terminal block, or without terminal box and extended leads (1 meter), which allows long distance connection.

### Standard Features:

Electrical:  
 Insulation class: F (B,  $\Delta T=80$  K)  
 Ambient temperature: 40 °C , 1000 m.a.s.l  
 Voltage:  
 Frame 80-100,  
 220-240/380-415V(50Hz) // 440-460V (60Hz)  
 Connection type  $\Delta$ - $\Delta$ /Y-Y//Y-Y  
 Frame 112 and above,  
 380-415/660-690 (50Hz) // 440-460V(60Hz)  
 Connection type  $\Delta$ - $\Delta$ /Y-Y// $\Delta$ - $\Delta$   
 Service Factor: 1.00  
 Design: N  
 Duty: S1  
 Thermal Protection: frame 160 and above, equipped with PTC Thermistor (one per phase)

### Mechanical:

Frame: 63 to 200M/L Aluminum frame  
 80 to 355M/L Cast iron frame  
 Squirrel cage rotor (die aluminum)  
 Protection Degree: IP55  
 Cooling Method: TEFC (Totally Enclosed Fan Cooled)  
 Sealing: V-ring  
 Paint Color: RAL 5009  
 Frame 225 and above,, with regreasing system  
 Terminal box with metric threaded holes  
 Drain hole  
 Vibration Level A  
 Without Terminal box, with 1 meter extended leads  
 If separated terminal box was required, please contact WEG Sales.

| Features                                 | Benefits  |
|--|---|
| WISE Insulation System                   | Increase the electrical strength of the stator, allowing the motor to operate with frequency inverters, without damaging by the voltage peaks*. |
| Efficiency                               | IE2 and IE3 motors, guarantee a fast return on investment.  |
| Painting plan for industrial environment | Suitable for the use in slightly severe and sheltered environments, with low average humidity, regular temperature variations.                  |
| Customization                            | Product suitable to meet the most demanded applications in the industry.  |





## Smoke Extraction Motor

Assure safety where a large concentration of people in commercial and industrial facilities is present, for example : shopping centers, factories, warehouses, covered parking lots, tunnels and other places. The Smoke Extraction motors are certified\* for high temperatures and guarantee a fast smoke and heat extraction and delay in fire propagation, allowing free access to the emergency exits.

### Standard Features:

Electrical:  
 Insulation class: F (B,  $\Delta T=80$  K)  
 Ambient temperature: 40 °C , 1000 m.a.s.l  
 Voltage:  
 Frame 80-100,  
 220-240/380-415V(50Hz) // 440-460V (60Hz)  
 Connection type  $\Delta$ - $\Delta$ /Y-Y//Y-Y  
 Frame 112 and above,  
 380-415/660-690 (50Hz) // 440-460V (60Hz)  
 Connection type  $\Delta$ - $\Delta$ /Y-Y// $\Delta$ - $\Delta$   
 Service Factor: 1.00  
 Design: N  
 Duty: S1  
 Thermal Protection: frame 160 and above, equipped with PTC  
 Thermistor (one per phase)

### Mechanical:

Frame: 63 to 200M/L Aluminum frame  
 80 to 355M/L Cast iron frame  
 Squirrel cage rotor (die aluminum)  
 Protection Degree: IP55  
 Cooling Method: TEFC (Totally Enclosed Fan Cooled)  
 Sealing: V-ring

Paint Color:RAL 5009  
 Frame 225 and above,, with regreasing system  
 Terminal box with metric threaded holes  
 Drain hole  
 Vibration Level A  
 Without Terminal box, with 1 meter extended leads  
 AISI 304 Stainless steel nameplate  
 Dimensional according to IEC-72 standards  
 Electrical performance according to IEC34 standards  
 Regreasing System:  
 Frame 160 and above (300°C/1hour and 400°C/2hours)  
 Frame 225 and above (200°C/2hours)  
 Cooling method: TEFC

| Duty              | F200  | F300   | F400  |
|-------------------|---|--|---|
|                   | S1 - 40°C   | S1 - 40°C  | S1 - 40°C   |
|                   | S2* - 200°C - 2hours  | S2* - 300°C - 1hour  | S2* - 400°C - 2hours  |
| Motor Certificate | WEG Declaration   | BSRIA-U.K.<br>Frame 80 to 250<br>Certificate applicable to<br>300°C/2hours | BSRIA-UK.<br>Frame 80 to 180<br>Output: 0.75kW-27kW<br>CTICM-France<br>Frame: 90 to 280<br>Poles: IV,VI,VIII,VI/IV,VIII/IV,VI |
| Insulation Class  | Class F, temp. rise 80K   | Class H, temp. rise 80K or 105K  |   |
| Standard          | EN 12101-3  |  |   |
| Poles/ Frame      | 2, 4/2 (frame 80 to 315S/M)<br>4, 6, 8, 8/4, 6/4 (frame 80 to 355M/L) |  |   |
| Cooling Method    | TEFC or TEAO (foot mounted or flange mounted/frame 80 to 250)         |  |   |

\* Operate in normal condition and emergency condition.

| Features                                  | Benefits  |
|---|---|
| WISE Insulation System                    | Increase the electrical strength of the stator, allowing the motor to operate with frequency inverters, without damaging by the voltage peaks*.                                   |
| Painting plan for Industrial Environments | Suitable for the use in slightly severe and sheltered environments, with low average humidity, regular temperature variations.  |
| Cast Iron Frame                           | More mechanical strength for your application   |
| State-of-the-art Ventilation System       | Uniform refrigeration of the motor with significant temperature reduction in the external surface and bearings, guarantee high performance and energy saving to your application, |
| Customization                             | Product suitable to meet the most demanded applications in the industry.  |



## W21 Brake Motor

In order to have high performance, it is necessary to have equipment working according to its needs. WEG Brake motor is perfect to equipment where fast safety stops, positioning and time saving are required. WEG braking solutions allows synergy in the production process, helping with agility and safety. WEG Brake motors are available in efficiency up to IE4 and they are suitable for the use with frequency inverters (with independent power supply)\*. The standard braking torque for each size of motors can be found in the table. If the required braking torque was not listed, please contact WEG sales.

### Standard Features:

Electrical:  
 Insulation class: F (B,  $\Delta T=80$  K)  
 Ambient temperature: 40 °C , 1000 m.a.s.l  
 Voltage:  
 Frame 63-100,  
 220-240/380-415V(50Hz) // 440-460V (60Hz)  
 Connection type  $\Delta$ - $\Delta$ /Y-Y//Y-Y  
 Frame 112 and above,  
 380-415/660-690 (50Hz) // 440-460V (60Hz)  
 Connection type  $\Delta$ - $\Delta$ /Y-Y// $\Delta$ - $\Delta$   
 Service Factor: 1.00  
 Design: N  
 Duty: S1  
 Thermal Protection: frame 160 and above, equipped with PTC  
 Thermistor (one per phase)

### Mechanical:

Frame: 63 to 200M/L Aluminum frame  
 80 and above Cast iron frame  
 Squirrel cage rotor (die aluminum)  
 Protection Degree: IP55  
 Cooling Method: TEFC (Totally Enclosed Fan Cooled)  
 Sealing: V-ring  
 Frame 225 and above,, with regreasing system  
 Terminal box with metric threaded holes  
 Ball bearings  
 Drain hole  
 Vibration Level A

| Frame | BKT (Nm) | Frame | BKT (Nm) | Frame | BKT (Nm) | Frame | BKT (Nm) |
|-------|----------|-------|----------|-------|----------|-------|----------|
| 63    | 2        | 71    | 4        | 90L   | 8        | 132S  | 60       |
|       | 4        |       | 8        |       | 16       |       | 80       |
| 63    | 2        | 80    | 4        | 100L  | 16       | 160M  | 80       |
|       | 4        |       | 8        |       | 32       |       | 150      |
| 63    | 2        | 80    | 4        | 112M  | 32       | 160M  | 80       |
|       | 4        |       | 8        |       | 60       |       | 150      |
| 71    | 4        | 90S   | 8        | 132S  | 60       | 160L  | 80       |
|       | 8        |       | 16       |       | 80       |       | 150      |

\* BKT = Braking torque

### Optional Features:

Electrical:  
 Insulation Class: H; Design H  
 Thermal Protection: frame up to 132(include), with PTC  
 Thermistor, Thermostat or PT100

### Mechanical:

Others mountings  
 Protection Degree: IP56, IP65, IP66, IPW55, IPW56  
 Sealing: Lip seal, Oil seal, Labyrinth taconite(frame 132 and above)  
 Space Heater  
 Roller bearings available for frame 160 and above

| Feature                                   | Benefits  |
|---|---|
| High Performance Braking system           | IE3 and IE4 motors, guarantee a fast return of investment.  |
| Manual Braking Release (Optional)         | Possibility to keep the motor free switching during emergency or necessary situations   |
| WISE Insulation System                    | Increase the electrical strength of the stator, allowing the motor to operate with frequency inverters, without damaging by the voltage peaks*.                                   |
| Efficiency                                | IE3 and IE4 motors, guarantee a fast return of investment.  |
| Painting plan for Industrial Environments | Suitable for the use in slightly severe and sheltered environments, with low average humidity, regular temperature variations.  |
| State-of-the-art Ventilation System       | Uniform refrigeration of the motor with significant temperature reduction in the external surface and bearings, guarantee high performance and energy saving to your application, |
| Customization                             | Product suitable to meet the most demanded applications in the industry.  |

\* Note:

| Motor Rated Voltage | Technical Criteria for use of motors fed by inverters |                                 |                                    |                                       |
|---------------------|---|---------------------------------|------------------------------------|---------------------------------------|
|                     | Voltage peak in the motor (Maximum)                   | dV/dt Inverter Outlet (maximum) | Rise Time(*) of Inverter (Minimum) | MTBP(*) Time between pulses (minimum) |
| Vn < 460V           | ≤ 1600V   | ≤ 5200 V/μs                     | ≥ 0,1 μs                           | ≥ 6 μs                                |
| 460V ≤ Vn < 575V    | ≤ 2000 V  | ≤ 6500 V/μs                     |                                    |                                       |



## Cast Iron Frame Ex ec - Non Sparking Motor

The installation of electric motors where a flammable mixture is not frequently present but may represent risks, must comply to the most demanded safety standards for the protection of life, machines and environment. Following the highest safety standards, WEG Ex nA motors are flexible to adapt to various applications allowing to your company agility during installation, easy operation, low maintenance cost and safety. WEG Ex nA motors are available in efficiency IE1, IE2 and IE3 and suitable for the use with frequency inverters.

### Standard Features:

**Electrical:**  
 Insulation class: F (B,  $\Delta T=80$  K)  
 Ambient temperature: 40 °C , 1000 m.a.s.l  
**Voltage:**  
 Frame 63-100,  
 220-240/380-415V(50Hz) // 440-460V (60Hz)  
 Connection type  $\Delta$ - $\Delta$ /Y-Y//Y-Y  
 Frame 112 and above,  
 380-415/660-690 (50Hz) // 440-460V(60Hz)  
 Connection type  $\Delta$ - $\Delta$ /Y-Y// $\Delta$ - $\Delta$   
**Service Factor:** 1.00  
**Design:** N  
**Duty:** S1  
**Thermal Protection:** frame 160 and above, equipped with PTC  
 Thermistor (one per phase)  
**Zone 2:** Temperature class T3  
**Zone 22:** Maximum temperature of motor surface T125°C

### Mechanical

Frame material: cast iron  
 Squirrel Cage Rotor (Die aluminum)  
 Protection Degree: IP55  
 Cooling Method: TEFC(Totally Enclosed Fan Cooled)  
 Sealing: V-ring  
 Frame 160 and above with regreasing system  
 Terminal box with metric threaded holes  
 Drain Holes  
 Vibration Level A  
 IECEx certification

### Optional Features:

**Electrical:**  
 Insulation Class: H; Design H  
 Thermal Protection: frame up to 132(include), with PTC  
 Thermistor, Thermostat or PT100

**Mechanical:**  
 Others mountings  
 Protection Degree: IP56, IP65, IP66, IPW55, IPW56  
 Sealing: Lip seal, Oil seal, Labyrinth taconite(frame 132 and above)  
 Space Heater,  
 Roller bearings available for frame 160 and above

| Features  | Benefits  |
|---|---|
| Reduced surface temperature                       | Do not allow conductive dust ignition in contact with the motor or during suspension in the air.  |
| Certification for the use with frequency inverter | Guarantee applications in speed variation and hazardous area such as Zone 2 according to certification  |
| Efficiency  | IE2 and IE3 efficiency motors, guarantee a fast return on investment  |
| WISE Insulation System                            | Increase the electrical strength of the stator, allowing the motor to operate with frequency inverters, without damaging by the voltage peaks*. |
| Painting plan for Severe Environment              | Special for industrial severe environments, sheltered or not, which may contain SO2, steam, solid contaminants and high humidity.               |
| Flexibility                                       | Product suitable to meet the most demanded applications in the industry.  |

**Notes:**  
**Classification**  
 WEG Ex nA motor line, which was up to now designed to operate at areas classified as Zone 2 (combustible gas), are now suitable to operate also at Zone 22 containing non-conductive combustible dusts. Based on a careful design carried out in conformance with pre-established requirements of applicable European Standards and Directives these motors offer you the reliability and safety that you need.

IEC Standard: Zone 2 (gas) and 22 (non-conductive dust); Group II  
 CENELEC Standard: Group II; Category 3G (gas) and 3D (non-conductive dust)

Certification  
 WEG non sparking motors meet standard EN IEC 60079-0 and EN IEC 60079-15 (no-sparking), as well as EN 61241-0 and EN 61241-1 (Zone 22 - non-conductive dust and as customer option, they are certified by BASEEFA. WEG Manufacturing System meets ATEX Directive 94/9-EC and is certified by PTB (Physikalisch-Technische Bundesanstalt).



## Cast Iron Frame Ex d/Ex de - Explosion Proof Motor

The installation of electric motors where flammable products are continuously handled, processed or stored, must comply with the most demanding safety standards in order to guarantee life protection, machines and environment. Following to the highest safety standards WEG explosion proof motors are made of robust construction, modern system of flame retention with joint parts carefully designed, precision machining in the T-box eliminating imperfections in the joint parts and fixation with high mechanical strength bolts.

### Standard Features:

**Electrical:**  
 Output range: 0.55kW to 315kW  
 Insulation class: F(B,  $\Delta T=80$  K)  
 Ambient temperature: 40 °C , 1000 m.a.s.l  
**Voltage:**  
 Frame 90-100L,  
 220-240/380-415V(50Hz) // 440-460V (60Hz)  
 Connection type  $\Delta$ - $\Delta$ /Y-Y//Y-Y  
 Frame 112 and above,  
 380-415/660-690 (50Hz) // 440-460V(60Hz)  
 Connection type  $\Delta$ - $\Delta$ /Y-Y// $\Delta$ - $\Delta$   
**Service Factor:** 1.00  
**Design:** N  
**Duty:** S1  
**Thermal Protection:** frame 160 and above, equipped with PTC  
 Thermistor (one per phase)

**Mechanical**  
 Frame size: 90 to 355M/L  
 Squirrel Cage Rotor (Die aluminum)  
 Protection Degree: IP55  
 Cooling Method: TEFC(Totally Enclosed Fan Cooled)  
 Sealing: V-ring  
 Frame 225 and above with regreasing system  
 Paint color: RAL5009  
 Terminal box with metric threaded holes

### Optional Features:

**Electrical:**  
 Insulation Class: H; Design H  
 Thermal Protection: frame up to 132(include), with PTC Thermistor,  
 Thermostat or PT100  
**Mechanical:**  
 Others mountings; Protection Degree: IP56, IP65, IP66, IPW55,  
 IPW56  
 Sealing: Lip seal, Oil seal, Labyrinth taconite (frame 132 and above)  
 Space Heater, Roller bearings available for frame 160 and above

| Feature   | Benefits  |
|---|---|
| Modern flame retention system with robust frame, end shields and T-box. | Avoid flame propagation from inside the motor to the external side, guaranteeing safety protection to the life, machines and environment. |
| Certification for the use with frequency inverters – T4                 | Guarantee in speed variation applications and hazardous areas such as Zone 1 and Zone 2, according to CESI certification.                 |
| Additional nameplate for the use with frequency inverters.              | Easy identification of the conditions of operation temperature (speed and torque range)   |
| Efficiency  | Premium Efficiency (EFF1) motors, guarantee a fast investment pay back.   |
| Painting Plan for Severe Environments                                   | Special for industrial severe environments, sheltered or not, which may contain SO2, steam, solid contaminants and high humidity.         |
| Customization   | Product suitable to meet the most demanding applications in the industry.   |

### \*Notes:

| Motor Rated Voltage | Technical Criteria for use of motors fed by inverters |                                 |                                    |                                       |
|---------------------|---|---------------------------------|------------------------------------|---------------------------------------|
|                     | Voltage peak in the motor (Maximum)                   | dV/dt Inverter Outlet (maximum) | Rise Time(*) of Inverter (Minimum) | MTBP(*) Time between pulses (minimum) |
| Vn < 460V           | ≤ 1600V   | ≤ 5200 V/μs                     | ≥ 0,1 μs                           | ≥ 6 μs                                |
| 460V ≤ Vn < 575V    | ≤ 1800V   | ≤ 6500 V/μs                     |                                    |                                       |

**Classification:**  
 IEC Standard Zone 1; Group IIB  
 CENELEC Standard Group IIB; Category 2  
 The classification for Zone 1 means that the motor is suitable to operate also in Zone 2 once Zone 1 represents an operating condition worse than Zone 2. The same applies to Groups and Categories: Ex d and Ex de motors are suitable to operate also in Group IIA and Category 3.  
**Certification:**  
 WEG explosion proof motors (Ex d) with increased safety terminal boxes (Ex de) are manufactured according to standard EN IEC 60079-0 and EN IEC 60079-1 and have EC-Type Examination Certificate from CESI (Centro Elettrotecnico Sperimentale Italiano S.P.A). WEG Manufacturing System meets ATEX Directive 94/9-EC and is certified by PTB (Physikalisch-Technische Bundesanstalt).





## Cast Iron Frame Ex e Increased Safety Motor

The installation of electric motors where flammable products are continuously handled, processed or stored, must comply with the most demanded safety standards in order to guarantee life protection, machines and environment.

WEG increased safety motors are certified by PTB – Physikalisch - Technische Bundesanstalt. The PTB certificates of conformity for explosion proof in increased safety enclosure “e” as per EN50014/ EN50019 are:

Ex e – Increased safety motors (class of temperature T3 / T4).

### Standard Features:

#### Electrical:

Output Range: 0.18kW to 100kW  
 Insulation class: F (B,  $\Delta T=80$  K)  
 Ambient temperature: 40 °C , 1000 m.a.s.l  
 Voltage: 218-242/380-420/655-690V  
 Design: N  
 Duty: S1  
 Temperature rise: T1/T2/T3/T4

#### Mechanical:

Frame: 80 to 315S/M  
 Squirrel Cage rotor (die aluminum)  
 Protection Degree: IP55  
 Sealing: V-ring  
 Paint color: RAL 5010  
 Thermal Protection: Frame 160 and above, 110°C/T4 (one per phase)  
 Terminal box with increased safety  
 Cooling method: TEFC (totally enclosed fan cooled)  
 Fan material: Aluminum

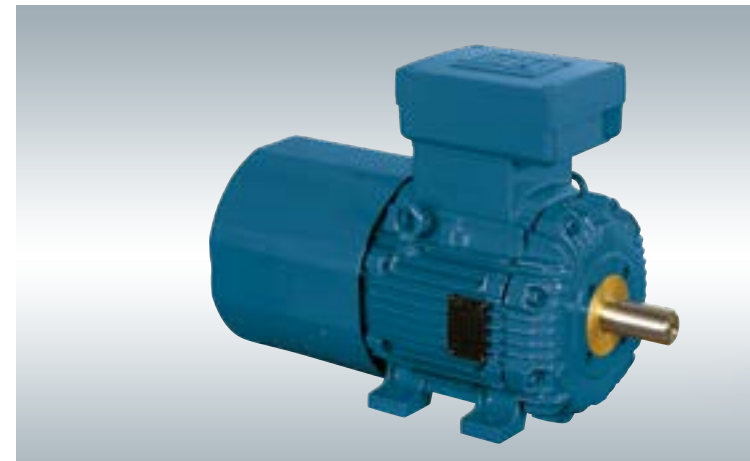
### Optional Features:

Mechanical:  
 Others Mountings  
 Protection Degree: IP56, IP65, IP66  
 Sealing: Lip seal, Oil seal, Labyrinth taconite  
 Roller bearings available for frame 160 and above

| Features                                  | Benefits  |
|---|---|
| WISE Insulation System                    | Increase stator electrical strength, allowing the motor to operate with frequency inverters, without damaging by the voltage peaks.   |
| Painting Plan for Industrial Environments | Suitable to be used in slightly severe and sheltered environments, with low average humidity, regular temperature variations.   |
| Cast Iron Frame                           | More strength for your application  |
| State-of-the-art Ventilation System       | Uniform refrigeration of the motor with significant temperature reduction in the external surface and bearings, guarantee high performance and energy saving to your application. |
| Customization                             | Product suitable to meet the most demanded applications in the industry.  |

#### Notes:

Classification:  
 IEC Standard: Zone 1 and 2, Group II  
 CENELEC Standard: Group II; Category 2 and Zone 1  
 The classification in Zone 1 means that the motor is suitable to operate also in Zone 2 Category 3) once Zone 1 represents an operating condition worse than Zone 2.  
 WEG increased Safety motors (Ex e) are manufactured according to standard EN IEC 60079-0 and EN IEC 60079-7 and have EC-Type Examination Certificate from PTB (Physikalisch-Technische Bundesanstalt). WEG Manufacturing System meets ATEX Directive 94/9-EC and is certified by PTB (Physikalisch-Technische Bundesanstalt).



## Cast Iron Frame Ex d Brake Motor

The installation of electric motors where flammable products are continuously handled, processed or stored must comply with the most demanding safety standards in order to guarantee life protection, machines and environment. Following to the highest safety standards WEG explosion proof motors integrate the high performance of the brakes. Proper solution to equipment where fast safety stops are required, as well as precise positioning with safety in hazardous areas such as Zone 1 and Zone 2. WEG Exd motors with brake are available in IE2 efficiency and are certified to operate with frequency inverters.\*

### Standard Features:

#### Electrical:

Output range: 2.2kW to 18.5kW  
 Insulation class: F(B,  $\Delta T=80$  K)  
 Ambient temperature: 40 °C , 1000 m.a.s.l  
 Voltage:  
 380-415/660-690V(50Hz) // 440-460V(60Hz)  
 Connection Type  $\Delta$ - $\Delta$ /Y-Y// $\Delta$ - $\Delta$

#### Design: N

Duty: S1  
 Temperature class: T3 or T4  
 Thermal Protection: PTC thermistor 130°C/T4 and 155°C T3,  
 Thermostat 140°C-Brake

#### Mechanical:

Frame: 132S to 160L  
 Squirrel Casge rotor (die aluminum)  
 Protection Degree: IP55  
 Cooling method: TEFC: (Totally enclosed fan cooled)  
 Painting plan: 202P  
 Paint Color: RAL 5009  
 Terminal box with metric threaded holes



### Optional Features:

Mechanical:  
 Others Mountings  
 Protection degree: IP56, IP65, IP66  
 Sealing: Lip seal, oil seal, labyrinth taconite

| Features  | Benefits   |
|---|--|
| High performance braking system   | Guarantee precise braking, fast and safe with easy maintenance.  |
| Manual brake release  | Possibility to keep the motor free during emergency situations or whenever necessary.  |
| Modern flame retention system with robust frame, end shields and T-box. | Avoid flame propagation from inside the motor to the external side, guaranteeing safety life protection, machines and environment.             |
| Certification for the use with frequency inverters – T4.                | Guarantee in speed variation applications and hazardous areas such as Zone 1 and Zone 2, according to CESI certification.                      |
| Additional nameplate  | Easy identification of the motors in the factory and traceability.   |
| Efficiency  | Premium Efficiency (EFF1) motors, guarantee a fast investment pay back.  |
| Painting Plan for Severe Environments                                   | Special for industrial severe environments, sheltered or not, which may contain SO <sub>2</sub> , steam, solid contaminants and high humidity. |
| Customization   | Product suitable to meet the most demanded applications in the industry.   |

#### \* Notes:

| Motor Rated Voltage | Technical Criteria for use of motors fed by inverters |                                 |                                    |                                       |
|---------------------|---|---------------------------------|------------------------------------|---------------------------------------|
|                     | Voltage peak in the motor (Maximum)                   | dV/dt Inverter Outlet (maximum) | Rise Time(*) of Inverter (Minimum) | MTBP(*) Time between pulses (minimum) |
| Vn < 460V           | ≤ 1600V   | ≤ 5200 V/μs                     | ≥ 0,1 μs                           | ≥ 6 μs                                |
| 460V ≤ Vn < 575V    | ≤ 1800V   | ≤ 6500 V/μs                     |                                    |                                       |

#### Classification:

IEC Standard: Zone 1; Group IIB  
 CENELEC Standard: Group IIB; Category 2  
 The classification in Zone 1 means that the motor is suitable to operate also in Zone 2 once Zone 1 represents an operating condition worse than Zone 2.  
 The same applies to Groups and Categories: Ex d and Ex de motors are suitable to operate also in Group IIA and Category 3.  
 Certification:  
 WEG explosion proof motors (Ex d) with increased safety terminal boxes (Ex de) are manufactured according to standard EN IEC 60079-0 and EN IEC 60079-1 and have EC-Type Examination Certificate from CESI (Centro Elettrotecnico Sperimentale Italiano S.P.A). WEG Manufacturing System meets ATEX Directive 94/9-EC and is certified by PTB (Physikalisch-Technische Bundesanstalt).



## Motor for zone 21 Dust Ignition Proof



WEG WDIP line (Dust Ignition Proof) has been specially designed to maximize safety and quality of hazardous area motors – Zone 21 (grain processing, cereals, textile fibers, powder coating, polymers, etc.)

Reliability and safety under the presence of conductive dust in suspension in the air (cloud) or layer (up to 5mm), according to IEC standards.

### Standard Features:

#### Electrical:

Output range: 0.12kW to 250kW  
 Insulation class: F (B,  $\Delta T=80$  K)  
 Ambient temperature: 40 °C , 1000 m.a.s.l  
 Voltage:

Frame 80-100,  
 220-240/380-415V(50Hz) // 440-460V (60Hz)  
 Connection type  $\Delta$ - $\Delta$ /Y-Y//Y-Y

Frame 112 and above,  
 380-415/660-690 (50Hz) // 440-460V(60Hz)  
 Connection type  $\Delta$ - $\Delta$ /Y-Y// $\Delta$ - $\Delta$

Service Factor: 1.00

Design: N

Duty: S1

#### Mechanical:

Frame: 80 to 355M/L

Squirrel cage rotor (die aluminum)

Protection Degree: IP66

Sealing: frame 80, oil seal  
 frame 90S to 355M/L, W3 seal

Paint color: RAL 5009

Thermal protection: 140°C (one per phase)

Cooling method: TEFC (Totally enclosed fan cooled)

### Optional features:

#### Electrical:

Insulation class: H; Design H

Thermal Protection: PTC thermistor, thermostat or PT100

#### Mechanical:

Protection degree: IP65

Sealing: frame 90S to 355M/L, oil seal

Space heater; Roller bearings available for frame 160 and above.

| Features                                  | Benefits  |
|---|---|
| WISE Insulation System                    | Increase stator electrical strength, allowing the motor to operate with frequency inverters, without damaging by voltage peaks.   |
| Efficiency                                | Premium Efficiency (EFF1) motors, guarantee a fast investment pay back.   |
| Painting Plan for Industrial Environments | Suitable to be used in slightly severe and sheltered environments, with low average humidity, regular temperature variations.   |
| Cast Iron Frame                           | More strength for your application  |
| State-of-the-art Ventilation System       | Uniform refrigeration of the motor with significant temperature reduction in the external surface and bearings, guarantee high performance and energy saving to your application. |
| Customization                             | Product suitable to meet the most demanded applications in the industry.  |

#### Notes:

##### Classification:

IEC Standard: 61241-1

Zone 21 (dust); Group II

##### Certification:

WEG Cast iron Multivoltage Motors for Zone 21 meet ATEX Directive 94/9/EC 94/4/EC and have EC-Type Examination Certificate from CESI (Centro elettrotecnico Sperimentale Italiano S.P.A. as per EN 60079-15 and EN 61241-1.

WEG Motors for Zone 21 of WDIP Line (Dust Ignition Proof) are manufactured according to Standard EN 61241-0, EN 61241-1, EN IEC 60079-0 and EN IEC 60079-1 and have EC-Type Examination Certificate from CESI (Centro Elettrotecnico Sperimentale Italiano S.P.A.). WEG Manufacturing System meets ATEX Directive 94/9-EC and is certified by PTB (Physikalisch-Technische Bundesanstalt).

## 1. Construction Details

### 1.1 Frame / endshields

The frames can be cast iron or aluminum. The cast iron frame and endshields are manufactured with FC-200 cast iron and they were designed in such a way to improve the heat exchange and to provide enough mechanical strength to meet the most critical applications. Frame 112 and above are fitted with lifting eyebolts for easier handling on installation.



Figure 1. Cast iron frame (left) and Aluminum frame (right)

All endshields are designed with drain holes to allow drainage of condensed water out of frame. These drain holes are fitted with rubber plugs that allow draining such condensed water and comply with the degree of protection.

### 1.2 Grounding

The W21 cast iron motor, frame 80 to 200 are designed with two grounding lugs: one is placed inside the terminal box, another one is on the frame. Frame 225-355 are designed with three grounding lugs: one is inside the terminal box and the other two are on the frame.



Figure 2. Grounding

### 1.3 Fan cover

The standard fan cover is made of steel plate.



Figure 3. Fan cover in steel plate

### 1.4 Terminal box

The terminal box is made of aluminum. It is designed with plenty internal space for easier cable connection and it allows rotation in 90 degrees steps which results in flexibility on installation. Cast iron terminal box is optional if required.



Figure 4.1 - Aluminum Terminal box



Figure 4.2 - Cast iron terminal box

### 1.5 Connection Leads

The connection leads are marked in accordance with IEC 60034-8 and are supplied with specific connection terminals. W21 motors wound for 380V are fitted with polyester made BMC (Bulk Moulding Compound) terminal blocks, which are reinforced with fiber glass, as shown on the figure below.

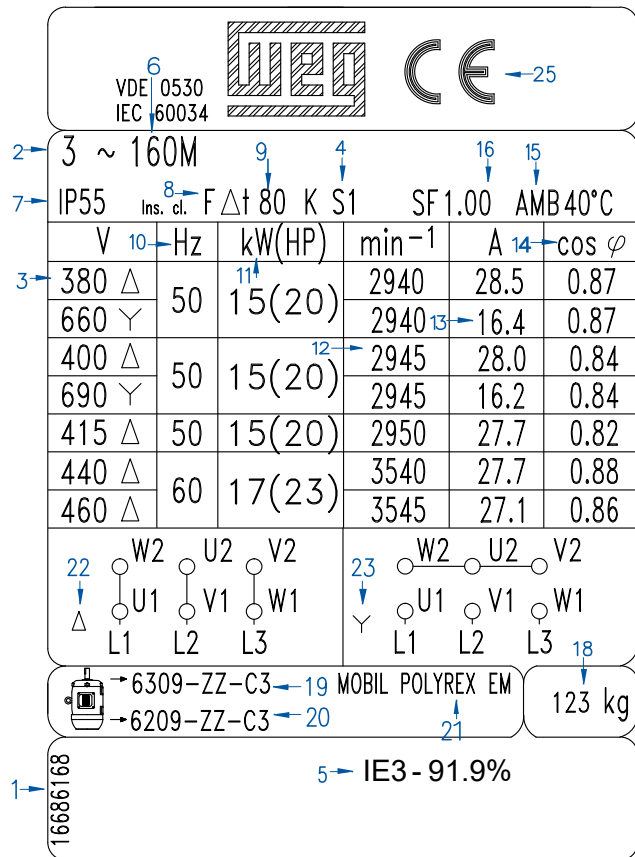


Figure 5 - Six-pin terminal block



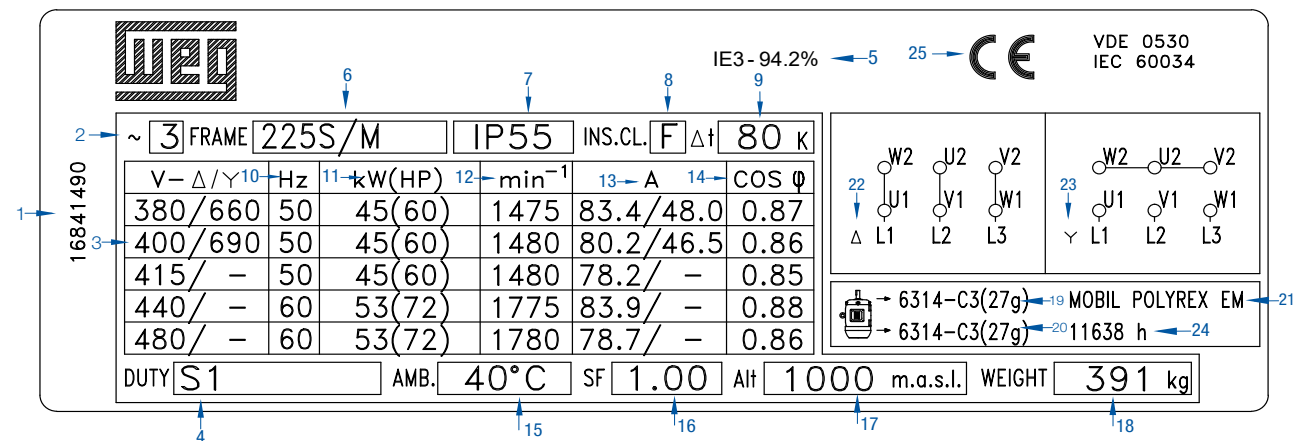
### 1.6 Nameplate

Nameplates are made of AISI 304 stainless steel. All the information are printed onto the nameplates by laser. Nameplate included main informations of motor, such as: serial number, output, voltage, current, frequency, protection degree, power factor, insulation class, bearings type, grease and regreasing interval, etc. IEC frame up to 200 has vertical nameplate and frame 225 and above has horizontal nameplate.



#### Details on nameplate

1. Motor material number
2. Three phase
3. Rated voltage
4. Duty
5. Efficiency
6. Frame size
7. Protection degree
8. Insulation class
9. Temperature rise
10. Frequency
11. Rated output
12. Full load speed (rpm)
13. Rated Current
14. Power factor
15. Ambient temperature
16. Service factor
17. Altitude
18. Weight
19. DE bearing type
20. NDE bearing type
21. Bearing grease type
22.  $\Delta$  connection diagram
23. Y connection diagram
24. Regreasing interval
25. Certification



## 2. Cooling system / Noise level / Vibration level

### 2.1 Cooling system / Noise level

The W21 standard motor line is totally enclosed fan cooled TEFC (IC411), as per IEC60034-6. Non-ventilated TENV (IC410), air over TEAO (IC418) and forced ventilation (TEBC) are available on request. More information about IC416 can be found in the section about Variable Frequency Drive Operation. Fans are made of polypropylene from frame IEC63 to 315 and made of aluminum in frames 355M/L. Designed for low noise level, the W21 motors comply with IEC60034-9 standard and the corresponding sound pressure levels. Tables below shown sound pressure levels in dB (A), the permit tolerance is + 3dB).

| Frame | 2 Poles | 4 poles | 6 poles | 8 poles |
|-------|---------|---------|---------|---------|
| 63    | 52      | 44      | 43      | -       |
| 71    | 56      | 43      | 43      | 41      |
| 80    | 59      | 44      | 43      | 42      |
| 90    | 64      | 49      | 45      | 43      |
| 100   | 67      | 53      | 44      | 50      |
| 112   | 64      | 56      | 48      | 46      |
| 132   | 68      | 60      | 52      | 48      |
| 160   | 70      | 67      | 56      | 51      |
| 180   | 70      | 64      | 56      | 51      |
| 200   | 74      | 69      | 58      | 53      |
| 225   | 82      | 70      | 61      | 56      |
| 250   | 82      | 70      | 61      | 56      |
| 280   | 83      | 76      | 66      | 59      |
| 315   | 84      | 77      | 69      | 62      |
| 355   | 81      | 79      | 73      | 70      |

Table 1 - Sound pressure level for 50Hz motors

The noise level figures shown on the table above are taken at no load. Under load the IEC 60034-9 standard foresees an increase of the sound pressure levels as shown on table 3.

Table 3 - Maximum expected increase of sound pressure level for loaded motors

| Shaft height H(mm) | 2 poles | 4 poles | 6 poles | 8 poles |
|--------------------|---------|---------|---------|---------|
| 90 ≤ H ≤ 160       | 2       | 5       | 7       | 8       |
| 180 ≤ H ≤ 200      | 2       | 4       | 6       | 7       |
| 225 ≤ H ≤ 280      | 2       | 3       | 6       | 7       |
| H = 315            | 2       | 3       | 5       | 6       |
| 355 ≤ H            | 2       | 2       | 4       | 5       |

Note: with canopy can decrease the noise level in 2 dBs.

### 2.2 Vibration level

W21 motors are dynamically balanced with half key and the standard version meets the vibration levels of Grade A (without special vibration requirements) described in IEC 60034-14 Standard. As an option, motors can be supplied in conformance with vibration of Grade B. The RMS speed and vibration levels in mm/s of Grades A and B are shown in table 4.

Table 4. - Speed and vibration levels

| Vibration | Shaft Height (mm) | Vibration speed RMS (mm/s) |               |         |
|-----------|-------------------|----------------------------|---------------|---------|
|           |                   | 60 ≤ H ≤ 132               | 132 < H ≤ 280 | H > 280 |
| Grade A   | Free Suspension   | 2.8                        | 2.8           | 2.8     |
| Grade B   | Free Suspension   | 1.1                        | 1.8           | 1.8     |

## 3. Shaft / Bearings / Thrusts

### 3.1 Shaft

The shaft of W21 standard motors is made of GB45 steel, in frames IEC 63 to 315S/M, and in GB45 steel or 42CrMo steel for frames 355M/L. When supplied with roller bearings as optional, the shaft material must be 42CrMo. As they are fitted with 42CrMo steel shafts in frames 355M/L, W21 motors can employ roller bearings, making them suitable for heavy duty applications such as pulley and belt applications. Information about maximum allowable radial and axial loads on shaft ends is given in tables 6, 7 and 8.

Important: To modify bearings from ball into roller, drive end and non-drive end bearing caps (internal and external) need to be replaced since non-drive end bearing remains locked. If further information is required, please contact WEG service Department.

Shafts are supplied with A type key in frame sizes 63 to 200 and type B in frames 225 to 355, and with dimensions shown in section 14- Mechanical data. All these shafts are supplied with threaded center holes with dimensions that comply with table 4.

| Frame  | Poles        | Dimension | Depth of thread (mm) |
|--------|--------------|-----------|----------------------|
| 63     | All          | M4        | 7                    |
| 71     | All          | M5        | 12.5                 |
| 80     | All          | M6        | 16                   |
| 90     | All          | M8        | 19                   |
| 100    | All          | M10       | 22                   |
| 112    | All          | M10       | 22                   |
| 132    | All          | M12       | 28                   |
| 160    | All          | M16       | 36                   |
| 180    | All          | M16       | 36                   |
| 200    | All          | M20       | 42                   |
| 225S/M | All          | M20       | 42                   |
| 250S/M | All          | M20       | 42                   |
| 280S/M | All          | M20       | 42                   |
| 315S/M | All          | M20       | 42                   |
| 355M/L | 2 poles      | M20       | 42                   |
|        | Others Poles | M24       | 50                   |

Table 4. Center hole dimensions for Drive end shaft

### 3.2 Bearings

WEG motors are supplied with ball bearings as standard, and have regreasing system for motor frame 225 and above. WEG cooperate with international recognized bearing brands (FAG, NSK, NTN, C&U etc), assuring the excellent performance of motor and longer motor life. If specific bearing brand was required, please inform WEG before placing order. The W21 series motors frame 63 to 100 are supplied with 62 series bearings on drive end, and for frame 112 and above with 63 series bearings.

Bearing life time is L10h with 20,000 hours in conformance with maximum radial and axial loads as described in tables 5 and 6. For direct coupling arrangements (free of radial and axial thrusts), bearing life time will be L10h with 40,000 hours.

Note: Life time L10 means that at least 90% of the bearings submitted to maximum indicated loads will reach the numbers of predicted hours. The maximum allowable radial and axial loads for standard configuration are given in table 5 and 6. The values of the maximum radial load consider axial load as nil. The values of the maximum axial load consider radial load as nil. Contact WEG to get information about bearing life time for applications with combined axial and radial loads.

The bearing life time depends on the type and size of bearings,



on radial and axial mechanical loads that the motor is submitted to, on operating conditions (ambient, temperature), and on speed and quality of the grease. Therefore, the bearing life time is directly related to correct application, maintenance and lubrication. When amount of grease and lubrication intervals are followed accordingly, bearings are expected to reach their pre-defined life time. W21 motors are supplied with ZZ bearings (sealed for life) ZZ-C3 bearing is used for 160-200, and open bearing is used for 225 or above. Amount of grease and lubrication intervals are given on the nameplate and are shown in tables 8 and 9. Excess of grease, which is an amount of grease exceeding what is indicated on the nameplate, can result in bearing over temperature.

### 3.2.1 Bearing locking

For the standard line, the drive end bearing is locked axially with the external bearing cap in frame size 160 up to 200, and with internal and external bearing cap in frame size 225 up to 355. The non drive end bearings is fitted with a spring washer in frame size 63 up to 200, and pre-load spring in frame size 225 up to 355 to take any axial play. When supplied with roller bearings (optional feature that is available from frame 132), the non-drive end bearing is locked and an axial play is compensated by axial play of the drive end roller bearing. The minimum allowable radial loads for roller bearing are shown in table 7.

#### Important:

- Special applications:** Motor operation under adverse operating conditions, such as higher ambient temperatures and altitudes or abnormal axial / radial loads, may require specific lubrication measures and alternative relubrication intervals to those indicated in the tables provided within this technical catalogue.
- Roller bearings:** Roller bearings require a minimum radial load so as to ensure correct operation. They are not recommended for direct coupling arrangements, or for use on 2 pole motors.
- Frequency inverter driven motors:** Bearing life may be reduced when a motor is driven by a frequency drive at speeds above nominal. Speed itself is one of the factors taken into consideration when determining motor bearing life.
- Motors with modified mounting configurations:** For motors supplied with horizontal mounting but working vertically, lubrication intervals must be reduced by half.
- Figures for radial thrusts:** The figures given in the tables below for radial thrusts take into consideration the point upon which the load is applied, either at the centre of the shaft (L/2) or at the end of the shaft (L), figure 25.

### Radial thrust (L10 with 20,000 hours)

| Frame  | 50 Hz - Fr (kN*) - 20,000 hours |      |        |      |        |      |        |      |
|--------|---------------------------------|------|--------|------|--------|------|--------|------|
|        | 2Poles                          |      | 4Poles |      | 6Poles |      | 8Poles |      |
|        | L/2                             | L    | L/2    | L    | L/2    | L    | L/2    | L    |
| 63     | 0.35                            | 0.28 | 0.40   | 0.28 | 0.40   | 0.28 | 0.40   | 0.28 |
| 71     | 0.47                            | 0.43 | 0.53   | 0.48 | 0.66   | 0.55 | 0.74   | 0.55 |
| 80     | 0.64                            | 0.58 | 0.72   | 0.65 | 0.84   | 0.76 | 0.98   | 0.79 |
| 90     | 0.66                            | 0.60 | 0.76   | 0.69 | 0.90   | 0.81 | 1.03   | 0.94 |
| 100    | 0.94                            | 0.85 | 1.03   | 0.93 | 1.22   | 1.10 | 1.40   | 1.26 |
| 112    | 1.66                            | 1.50 | 1.96   | 1.72 | 2.24   | 1.76 | 2.58   | 1.80 |
| 132    | 1.94                            | 1.75 | 2.25   | 2.03 | 2.58   | 2.33 | 2.88   | 2.60 |
| 160    | 2.50                            | 2.25 | 2.87   | 2.58 | 3.20   | 2.65 | 3.81   | 2.76 |
| 180    | 4.27                            | 3.87 | 3.98   | 3.61 | 4.70   | 4.15 | 5.06   | 4.10 |
| 200    | 4.01                            | 3.67 | 4.57   | 4.19 | 5.19   | 4.75 | 5.81   | 5.31 |
| 225    | 5.23                            | 4.81 | 5.92   | 5.33 | 6.67   | 6.01 | 7.54   | 6.18 |
| 250    | 5.12                            | 4.66 | 5.52   | 5.03 | 6.48   | 5.91 | 7.15   | 6.51 |
| 280S/M | 4.92                            | 4.54 | 6.41   | 5.91 | 7.37   | 6.79 | 7.57   | 6.98 |
| 315S/M | 4.48                            | 4.16 | 7.01   | 6.42 | 7.83   | 7.17 | 8.49   | 7.78 |
| 355M/L | 4.03                            | 3.79 | 8.53   | 7.83 | 9.33   | 8.56 | 11.4   | 10.5 |

Table 5 - Maximum radial thrusts for ball bearings

### Axial thrust (L10 with 20,000 hours)

| Frame | Poles | 50 Hz - Fr (kN*) - 20,000 hours |         |                             |         |                               |         |
|-------|-------|---------------------------------|---------|-----------------------------|---------|-------------------------------|---------|
|       |       | Horizontal                      |         | Vertical with shaft upwards |         | Vertical with shaft downwards |         |
|       |       | Pushing                         | Pulling | Pushing                     | Pulling | Pushing                       | Pulling |
| 63    | 2     | 0.19                            | 0.19    | 0.18                        | 0.20    | 0.19                          | 0.19    |
|       | 4     | 0.27                            | 0.27    | 0.26                        | 0.29    | 0.28                          | 0.26    |
|       | 5     | 0.34                            | 0.35    | 0.33                        | 0.37    | 0.35                          | 0.34    |
|       | 8     | 0.34                            | 0.35    | 0.33                        | 0.37    | 0.35                          | 0.34    |
| 71    | 2     | 0.20                            | 0.28    | 0.19                        | 0.30    | 0.20                          | 0.27    |
|       | 4     | 0.29                            | 0.40    | 0.27                        | 0.42    | 0.29                          | 0.38    |
|       | 6     | 0.35                            | 0.49    | 0.35                        | 0.52    | 0.37                          | 0.48    |
|       | 8     | 0.46                            | 0.60    | 0.44                        | 0.63    | 0.46                          | 0.59    |
| 80    | 2     | 0.26                            | 0.42    | 0.25                        | 0.43    | 0.27                          | 0.40    |
|       | 4     | 0.35                            | 0.56    | 0.32                        | 0.60    | 0.36                          | 0.53    |
|       | 6     | 0.45                            | 0.70    | 0.42                        | 0.74    | 0.46                          | 0.67    |
|       | 8     | 0.55                            | 0.83    | 0.53                        | 0.88    | 0.56                          | 0.80    |
| 90    | 2     | 0.37                            | 0.43    | 0.34                        | 0.47    | 0.38                          | 0.40    |
|       | 4     | 0.51                            | 0.59    | 0.48                        | 0.65    | 0.53                          | 0.55    |
|       | 6     | 0.63                            | 0.71    | 0.58                        | 0.79    | 0.64                          | 0.67    |
|       | 8     | 0.76                            | 0.86    | 0.72                        | 0.93    | 0.78                          | 0.82    |
| 100   | 2     | 0.37                            | 0.59    | 0.32                        | 0.67    | 0.38                          | 0.55    |
|       | 4     | 0.50                            | 0.81    | 0.44                        | 0.90    | 0.52                          | 0.75    |
|       | 6     | 0.65                            | 1.02    | 0.58                        | 1.14    | 0.68                          | 0.95    |
|       | 8     | 0.78                            | 1.19    | 0.71                        | 1.32    | 0.81                          | 1.12    |
| 112   | 2     | 0.54                            | 1.14    | 0.48                        | 1.23    | 0.56                          | 1.08    |
|       | 4     | 0.73                            | 1.55    | 0.66                        | 1.67    | 0.76                          | 1.47    |
|       | 6     | 0.96                            | 1.94    | 0.89                        | 2.05    | 0.99                          | 1.86    |
|       | 8     | 1.07                            | 2.15    | 0.97                        | 2.35    | 1.11                          | 2.05    |
| 132   | 2     | 0.72                            | 1.32    | 0.61                        | 1.51    | 0.76                          | 1.21    |
|       | 4     | 0.99                            | 1.81    | 0.84                        | 2.05    | 1.03                          | 1.66    |
|       | 6     | 1.22                            | 2.20    | 1.05                        | 2.45    | 1.27                          | 2.05    |
|       | 8     | 1.37                            | 2.45    | 1.16                        | 2.80    | 1.44                          | 2.25    |
| 160   | 2     | 2.40                            | 1.69    | 2.20                        | 2.05    | 2.75                          | 1.48    |
|       | 4     | 2.95                            | 2.25    | 2.65                        | 2.65    | 3.40                          | 1.95    |
|       | 6     | 3.40                            | 2.70    | 3.10                        | 3.25    | 3.95                          | 2.40    |
|       | 8     | 3.85                            | 3.15    | 3.55                        | 3.70    | 4.40                          | 2.85    |
| 180   | 2     | 3.20                            | 2.30    | 2.90                        | 2.75    | 3.65                          | 2.00    |
|       | 4     | 3.90                            | 3.00    | 3.55                        | 3.65    | 4.55                          | 2.65    |
|       | 6     | 4.65                            | 3.75    | 4.20                        | 4.45    | 5.30                          | 3.30    |
|       | 8     | 5.20                            | 4.35    | 4.80                        | 5.10    | 6.00                          | 3.90    |
| 200   | 2     | 3.55                            | 2.55    | 3.10                        | 3.25    | 4.25                          | 2.10    |
|       | 4     | 4.45                            | 3.45    | 3.95                        | 4.25    | 5.30                          | 2.95    |
|       | 6     | 5.20                            | 4.20    | 4.65                        | 5.10    | 6.10                          | 3.65    |
|       | 8     | 6.00                            | 5.00    | 5.50                        | 5.90    | 6.90                          | 4.50    |
| 225   | 2     | 4.35                            | 3.55    | 3.65                        | 4.60    | 5.40                          | 2.90    |
|       | 4     | 5.50                            | 4.70    | 4.70                        | 6.00    | 6.80                          | 3.95    |
|       | 6     | 6.60                            | 5.80    | 5.80                        | 7.20    | 8.00                          | 5.00    |
|       | 8     | 7.50                            | 6.70    | 6.60                        | 8.20    | 8.90                          | 5.90    |
| 250   | 2     | 4.30                            | 3.50    | 3.55                        | 4.65    | 3.55                          | 2.75    |
|       | 4     | 5.30                            | 4.45    | 4.30                        | 6.10    | 6.90                          | 3.50    |
|       | 6     | 6.40                            | 5.60    | 5.40                        | 7.30    | 8.10                          | 4.60    |
|       | 8     | 7.30                            | 6.50    | 6.30                        | 8.20    | 9.00                          | 5.50    |
| 280   | 2     | 4.15                            | 3.35    | 3.00                        | 5.10    | 5.90                          | 2.20    |
|       | 4     | 5.80                            | 5.00    | 4.35                        | 7.40    | 8.20                          | 3.55    |
|       | 6     | 7.20                            | 6.40    | 5.70                        | 8.80    | 9.60                          | 4.90    |
|       | 8     | 8.40                            | 7.60    | 7.10                        | 9.80    | 10.5                          | 6.30    |
| 315   | 2     | 3.65                            | 2.85    | 1.91                        | 5.60    | 6.40                          | 1.13    |
|       | 4     | 6.10                            | 5.40    | 3.85                        | 9.10    | 9.80                          | 3.10    |
|       | 6     | 7.40                            | 6.60    | 4.75                        | 10.90   | 11.7                          | 3.95    |
|       | 8     | 8.50                            | 7.70    | 5.70                        | 12.2    | 13.0                          | 4.95    |
| 355   | 2     | 3.70                            | 2.95    | 0.75                        | 7.50    | 8.30                          | -       |
|       | 4     | 6.60                            | 5.80    | 2.10                        | 12.5    | 13.2                          | 1.37    |
|       | 6     | 7.70                            | 7.00    | 2.75                        | 14.7    | 15.4                          | 2.00    |
|       | 8     | 7.70                            | 7.00    | 2.75                        | 14.7    | 15.4                          | 2.00    |

Table 6 - Maximum axial thrusts for ball bearings

\*1 kN = 101.97 kgf = 224.8 lbf

### Radial thrusts (L10 with 20,000 hours)

| Frame | 50 Hz - Fr (kN*) - 20,000 Hours |      |         |      |         |      |
|-------|---------------------------------|------|---------|------|---------|------|
|       | 4Poles                          |      | 6 Poles |      | 8 Poles |      |
|       | L/2                             | L    | L/2     | L    | L/2     | L    |
| 160   | 6.01                            | 3.69 | 5.91    | 3.62 | 6.05    | 3.71 |
| 180   | 10.5                            | 5.78 | 10.4    | 5.69 | 10.3    | 5.65 |
| 200   | 13.4                            | 8.40 | 13.3    | 8.34 | 13.5    | 8.43 |
| 225   | 17.1                            | 8.73 | 16.9    | 8.56 | 17.0    | 8.66 |
| 250   | 16.8                            | 10.3 | 16.7    | 10.2 | 16.6    | 10.1 |
| 280   | 23.4                            | 14.5 | 23.2    | 14.4 | 22.9    | 14.2 |
| 315   | 28.6                            | 14.3 | 27.4    | 13.7 | 27.9    | 14.0 |
| 355   | 40.2                            | 25.4 | 40.2    | 25.2 | 39.6    | 24.8 |

Table 7 - Maximum radial thrust for roller bearing

\* 1 kN = 101.97kgf = 224.8 lbf

### Lubrication Intervals - Ball bearings

| Frame | Lubrication intervals (50Hz) |         |       |
|-------|------------------------------|---------|-------|
|       | Poles                        | Bearing | Hours |
| 160   | 2                            | 6309    | 18100 |
|       | 4                            |         | 20000 |
|       | 6                            |         | 20000 |
|       | 8                            |         | 20000 |
| 180   | 2                            | 6311    | 13700 |
|       | 4                            |         | 20000 |
|       | 6                            |         | 20000 |
|       | 8                            |         | 20000 |
| 200   | 2                            | 6312    | 11900 |
|       | 4                            |         | 20000 |
|       | 6                            |         | 20000 |
|       | 8                            |         | 20000 |
| 225   | 2                            | 6314    | 4500  |
|       | 4                            |         | 11600 |
|       | 6                            |         | 16400 |
|       | 8                            |         | 19700 |
| 250   | 2                            | 6314    | 4500  |
|       | 4                            |         | 11600 |
|       | 6                            |         | 16400 |
|       | 8                            |         | 19700 |
| 280   | 2                            | 6314    | 4500  |
|       | 4                            |         | 10400 |
|       | 6                            |         | 14900 |
|       | 8                            |         | 18700 |
| 315   | 2                            | 6314    | 4500  |
|       | 4                            |         | 9000  |
|       | 6                            |         | 13000 |
|       | 8                            |         | 17400 |
| 355   | 2                            | 6316    | 3520  |
|       | 4                            |         | 7200  |
|       | 6                            |         | 10800 |
|       | 8                            |         | 15100 |

Table 8 - Lubrication interval for ball bearings

| Frame | Lubrication Interval (50Hz) |         |       |
|-------|-----------------------------|---------|-------|
|       | Poles                       | Bearing | Hours |
| 160   | 4                           | NU309   | 20000 |
|       | 6                           |         | 20000 |
|       | 8                           |         | 20000 |
| 180   | 4                           | NU311   | 20000 |
|       | 6                           |         | 20000 |
|       | 8                           |         | 20000 |
| 200   | 4                           | NU312   | 20000 |
|       | 6                           |         | 20000 |
|       | 8                           |         | 20000 |
| 225   | 4                           | NU314   | 8900  |
|       | 6                           |         | 13100 |
|       | 8                           |         | 16900 |
| 250   | 4                           | NU314   | 8900  |
|       | 6                           |         | 13100 |
|       | 8                           |         | 16900 |
| 280   | 4                           | NU316   | 7600  |
|       | 6                           |         | 11600 |
|       | 8                           |         | 15500 |
| 315   | 4                           | NU319   | 6000  |
|       | 6                           |         | 9800  |
|       | 8                           |         | 13700 |
| 355   | 4                           | NU322   | 4400  |
|       | 6                           |         | 7800  |
|       | 8                           |         | 11500 |

Table 9 - Lubrication interval for roller bearings

### 3.2.2 Bearing temperature monitoring

On request, W21 motors can be equipped with bearing temperature detectors which monitor bearing operating conditions. The most commonly used accessory is the Pt-100 temperature detector for continuous monitoring of bearing operating temperature.

This type of monitoring is extremely important considering that it directly affects the grease and bearing lives particularly on motors equipped with regreasing facilities. For motors with insulation class F, it is recommended to set up the maximum bearing Pt-100 Alarm temperature as 110°C and the maximum trip temperature as 120°C.

## 4. Protection degree / Painting

### 4.1 Protection Degree

W21 motors are supplied with degrees of protection in conformance with IEC 60034-5. As standard, they are IP55, which means:

- First characteristic numeral 5: machine protected against dust. The enclosure is protected against contact with moving parts. Ingress of dust is not totally prevented, but dust does not enter in sufficient quantity to interfere with satisfactory operation of the machine.
- Second characteristic numeral 5: Machine protected against water jets. Water projected by a nozzle against the machine from any direction shall have no harmful effect.

### 4.2 Painting

W21 motors are supplied as standard with WEG internal painting plan 207A(80-132) and 203A(160-355). This plan consists of:

- Primer: Cast Iron (One-component epoxy ester with thickness 20-55µm); Aluminum (no primer);
- Top coat: Two-component acrylic polyurethane with thickness 40-70µm.

A) Finish coat color: RAL color or according to the customer



- definition.
- B) Gloss level: 30-60°.
- C) Adherence grade: Gr0-Gr1.
- D) Resistance to salty spray: No.

Recommended for applications in rural, urban and industrial environment indoor or outdoor, with low contamination of corrosive agents and low relative humidity and with normal variations of temperature.

**Note:**  
These painting plans are not recommended for direct exposure to acid steam, alkalis, solvents and salty environments.

Alternative painting plans are available on request, which are suitable to guarantee additional protection in aggressive environments, either protected or unprotected.

#### 4.2.1 Tropicalized painting

The integrity of the insulation system is the primary consideration when determining the lifetime of an electric motor. High humidity can result in premature deterioration of the insulation system, therefore for any ambient temperature with relative humidity above 95%, it is recommended to coat all internal components of the motor with an epoxy painting, also known as tropicalization. If the application has relative humidity above 95%, please inform WEG to ensure the tropicalization painting for the motor.

### 5. Ambient / Insulation

Unless otherwise specified, the rated power outputs shown in the electrical data tables within this catalogue refer to continuous duty operation S1, as per IEC 60034-1 and under the following conditions:

- With ambient temperature range -20°C to +40°C
- With altitudes up to 1000 metres above sea level
- With related humidity up to 60% (when it is above 60%, we recommend to install space heater in order to avoid water condensation inside of motor).

For operating temperatures and altitudes differing from those above, the factors indicated in table 150 must be applied to the nominal motor power rating in order to determine the derated available output (Pmax).

**Pmax = Pnom x correction factor**

| T (°C) | Altitude (m) |      |      |      |      |      |      |      |      |
|--------|--------------|------|------|------|------|------|------|------|------|
|        | 1000         | 1500 | 2000 | 2500 | 3000 | 3500 | 4000 | 4500 | 5000 |
| 10     |              |      |      |      |      |      | 0.97 | 0.92 | 0.88 |
| 15     |              |      |      |      |      | 0.98 | 0.94 | 0.90 | 0.86 |
| 20     |              |      |      |      | 1.00 | 0.95 | 0.91 | 0.87 | 0.83 |
| 25     |              |      |      | 1.00 | 0.95 | 0.93 | 0.89 | 0.85 | 0.81 |
| 30     |              |      | 1.00 | 0.96 | 0.92 | 0.90 | 0.86 | 0.82 | 0.78 |
| 35     |              | 1.00 | 0.95 | 0.93 | 0.90 | 0.88 | 0.84 | 0.80 | 0.75 |
| 40     | 1.00         | 0.97 | 0.94 | 0.90 | 0.86 | 0.82 | 0.80 | 0.76 | 0.71 |
| 45     | 0.95         | 0.92 | 0.90 | 0.88 | 0.85 | 0.81 | 0.78 | 0.74 | 0.69 |
| 50     | 0.92         | 0.90 | 0.87 | 0.85 | 0.82 | 0.80 | 0.77 | 0.72 | 0.67 |
| 55     | 0.88         | 0.85 | 0.83 | 0.81 | 0.78 | 0.76 | 0.73 | 0.70 | 0.65 |
| 60     | 0.83         | 0.82 | 0.80 | 0.77 | 0.75 | 0.73 | 0.70 | 0.67 | 0.62 |
| 65     | 0.79         | 0.76 | 0.74 | 0.72 | 0.70 | 0.68 | 0.66 | 0.62 | 0.58 |
| 70     | 0.74         | 0.71 | 0.69 | 0.67 | 0.66 | 0.64 | 0.62 | 0.58 | 0.53 |
| 75     | 0.70         | 0.68 | 0.66 | 0.64 | 0.62 | 0.60 | 0.58 | 0.53 | 0.49 |
| 80     | 0.65         | 0.64 | 0.62 | 0.60 | 0.58 | 0.56 | 0.55 | 0.48 | 0.44 |

Table 10 - Correction factors for altitude and ambient temperature

W21 motors are supplied with class F insulation and Class B (80 K) temperature rise at normal operating conditions (unless

otherwise specified). The difference between the temperature of the class F insulation (155 K) and the temperature rise of the design (80 K) means that, in practice, W21 motors are suitable to supply output ratings 15% above the rated values up to a limit where the temperature rise reaches the temperature rise value of the insulation class.

All W21 motors are wound with the WISE® insulation system which consists of enamelled wire meeting temperatures up to 200°C and impregnated with solvent free resin. The WISE® system also permits motor operation with variable speed drives.

| IEC     | Temperature rise (Average value measured by resistance method) | Maximum Temperature Tmax (from amb. temp 40C) |
|---------|--|---|
| Class B | 80K  | 130°C   |
| Class F | 105K   | 155°C   |
| Class H | 125K   | 180°C   |

### 6. Variable speed drive application

#### 6.1 Considerations about rated voltage

The stator windings of W21 motors are wound with class F insulation (class H optional) and are suitable for either DOL starting or via a variable speed drive. They incorporate the WEG exclusive insulation system - WISE® (WEG Insulation System Evolution) - which ensures superior electrical insulation characteristics.

The stator winding is suitable for variable speed drive application, taking into account the limits shown in table 11.

| Motor rated voltage | Voltage Spikes at motor terminals (phase-phase) | dV/dt* at motor terminals (phase-phase) | Rise time* | Time between pulses |
|---------------------|---|---|------------|---------------------|
|                     |   |   |            |                     |
| Vn < 460V           | ≤ 1600 V  | ≤ 5200 V/μs                             | ≥ 0.1 μs   | ≥ 6 μs              |
| 460V ≤ Vn < 575V    | ≤ 2000 V  | ≤ 6500 V/μs                             |            |                     |
| 575 V ≤ Vn < 690 V  | ≤ 2400 V  | ≤ 7800 V/μs                             |            |                     |

Table 11 - Limit conditions for variable frequency drive operation without application of filter

\* : dV/dt and Rise time are in accordance with NEMA standard MG1-Part 30

#### Notes:

- In order to protect the motor insulation system, the maximum recommended switching frequency is 5 kHz.
- If one or more of the above conditions is not attended, a filter (load reactor or dV/dt filter) must be installed in the output of the VSD.
- General purpose motors with rated voltage greater than 575 V, which at the time of purchase did not have any indication of operation with VSD, are able to withstand the electrical limits set in the table above for rated voltage up to 575 V. If such conditions are not fully satisfied, output filters must be used.
- General purpose motors of the multi-voltage type, for example 380-415/660//440-460V or 380/660 V, which at the time of purchase did not have any indication of operation with VSD, are able to be driven by a VSD in the higher voltage only if the limits set in the table above for rated voltage up to 460 V are fully attended in the application. Otherwise, a load reactor or a dV/dt filter must be installed in the VSD output.

#### 6.2 Torque derating criteria

In order to keep the temperature rise of WEG motors within acceptable levels, when under VSD supply, the speed range-

related loadability limits established in figures 7 (for operation under constant flux condition) or 8 (for operation under optimal flux condition) must be observed.

#### Notes:

- The derating curves below are related to the motor thermal capability only and do not concern the insulation class. Speed regulation will depend on VSD mode of operation and proper adjustment.
- Torque derating is usually required when the motor drives constant torque loads (e.g. screw compressors, conveyors, extruders, etc.). For squared torque loads, such as pumps and fans, no torque derating is normally required.
- W21 motors of frame sizes ≥ 90S can be blower cooled (independently ventilated) under request. In such case, the motor will be suitable for VSD operation without torque derating regardless the load type.
- For operation above base (nameplate) speed, mechanical issues must be also observed. Please contact WEG.
- Applications with motors rated for use in hazardous areas must be particularly evaluated - in such case please contact WEG.

#### Constant flux condition

Applicable when the motor is supplied by any commercial drive operating with any control scheme other than the Optimal Flux® available in WEG drives.

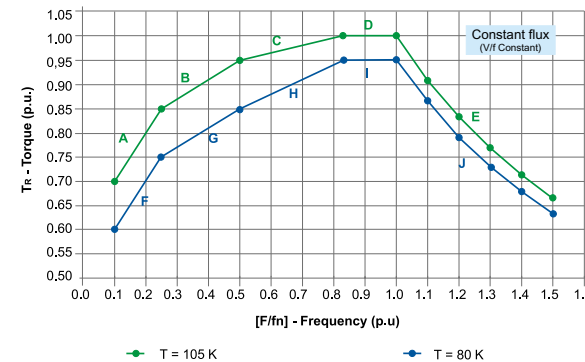


Figure 7 - Derating curves for constant flux condition

| Derating curve for insulation class F(DT=105K)* |                    |                                     |
|---|--------------------|-------------------------------------|
| Interval  | Frequency Range    | Torque Calculation                  |
| A   | 0.10 ≤ f/fn < 0.25 | T <sub>R</sub> = (f/fn) + 0.60      |
| B   | 0.25 ≤ f/fn < 0.50 | T <sub>R</sub> = 0.40 (f/fn) + 0.75 |
| C   | 0.50 ≤ f/fn < 0.83 | T <sub>R</sub> = 0.15 (f/fn) + 0.87 |
| D   | 0.83 ≤ f/fn ≤ 1.0  | T <sub>R</sub> = 1.0                |
| E   | f/fn > 1.0         | T <sub>R</sub> = 1 / (f/fn)         |

| Derating curve for insulation class F(DT=80K)* |                    |                                     |
|--|--------------------|-------------------------------------|
| Interval                                       | Frequency Range    | Torque Calculation                  |
| F  | 0.10 ≤ f/fn < 0.25 | T <sub>R</sub> = (f/fn) + 0.50      |
| G  | 0.25 ≤ f/fn < 0.50 | T <sub>R</sub> = 0.40 (f/fn) + 0.65 |
| H  | 0.50 ≤ f/fn < 0.83 | T <sub>R</sub> = 0.30 (f/fn) + 0.70 |
| I  | 0.83 ≤ f/fn ≤ 1.0  | T <sub>R</sub> = 0.95               |
| J  | f/fn > 1.0         | T <sub>R</sub> = 0.95 / (f/fn)      |

Table 12 - Torque calculation for derating curves

#### Optimal Flux® condition

The study of the composition of the overall motor losses and its relation to operation parameters such as the frequency, the magnetic flux, the current, and the speed variation led to the determination of an optimal flux value for each operating frequency. The implementation of this solution within the CFW09 and CFW11 control algorithms allow that the motor optimal flux condition be automatically applied by the drive throughout the speed range, resulting in a continuous minimization of losses. As a consequence of this loss minimization, the use of the optimal flux control provides higher efficiency and lower temperature rise. Therefore, the torque derating factors for this operation condition are milder than for constant V/f, as shown in figure 8.

The optimal flux solution was developed for low frequency

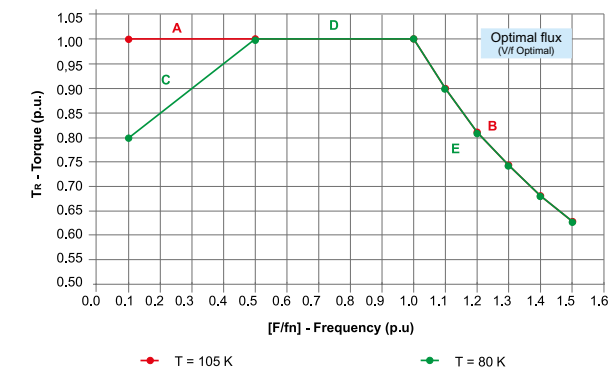
applications with constant torque loads and it should neither be used with variable torque loads nor when the operating range includes points above the base (rated) frequency.

The Optimal Flux Solution® may be only applied under the following conditions:

- The motor attends at least IE3 efficiency class;
- The motor is fed by a WEG drive (CFW11, or CFW09 from version 2.40 or higher);
- Sensorless vector control type is used.

Figure 8 - Derating curves for optimal flux condition

#### 6.3 Considerations regarding bearing currents



Motors up to frame size 280S/M generally do not require special features with respect to the bearings for variable speed drive application. From frame size 315S/M upwards additional measures should be taken in order to avoid detrimental bearing currents. This can be accomplished by means of the use of an insulated bearing or an insulated hub endshield in the non drive end side and a shaft grounding brush mounted on the drive endshield.

#### 6.4 Forced ventilation kit

For those cases where an independent cooling system is required, the W21 motors can be supplied with a forced ventilation kit, as shown in figure 9. When the forced ventilation kit is assembled on the motor in the factory, the overall motor length will be as shown in table 13.

(Note: The size in the description table is for reference only, please contact the sales for exact size)

| Frame  | Poles | Motor Length (L)   |                 | Blower motor       |      |                    |
|--------|-------|--------------------|-----------------|--------------------|------|--------------------|
|        |       | without blower kit | with blower kit |                    |      |                    |
| 90S    | All   | 304                | 548             | 0.37kW 2P frame 63 |      |                    |
| 90L    |       | 329                | 573             |                    |      |                    |
| 100L   |       | 376                | 646             |                    |      |                    |
| 112M   |       | 393                | 660             |                    |      |                    |
| 132S   |       | 452                | 715             |                    |      |                    |
| 132M   |       | 490                | 753             |                    |      |                    |
| 160M   |       | 598                | 855             |                    |      |                    |
| 160L   |       | 642                | 899             |                    |      |                    |
| 180M   |       | 664                | 908             |                    |      |                    |
| 180L   |       | 702                | 946             |                    |      |                    |
| 200M   |       | 729                | 976             |                    |      |                    |
| 200L   |       | 767                | 1014            |                    |      |                    |
| 225S/M |       | 2                  | 817             |                    | 1116 | 0.75kW 4P Frame 80 |
|        |       | 4-8                | 847             |                    | 1146 |                    |
| 250S/M | 2     | 923                | 1222            |                    |      |                    |
|        | 4-8   | 923                | 1222            |                    |      |                    |
| 280S/M | 2     | 1036               | 1332            | 3kW 4P Frame 100L  |      |                    |
|        | 4-8   | 1036               | 1332            |                    |      |                    |
| 315S/M | 2     | 1126               | 1422            |                    |      |                    |
|        | 4-8   | 1156               | 1452            |                    |      |                    |
| 355M/L | 2     | 1396               | 1793            |                    |      |                    |
|        | 4-8   | 1466               | 1868            |                    |      |                    |

Table 13 - Total length of motor with / without blower kit





Figure 9 - W21 motor with forced ventilation kit

based on the properties that some materials vary the electric resistance with the variation in temperature (usually platinum, nickel or copper). They are also fitted with calibrated resistances that vary linearly with temperature, allowing continuous reading of motor operating temperature through a monitoring display, with high precision rate and response sensitivity.

The same detector can serve as alarm (with operation above the regular operating temperature) and trip (usually set up for the maximum temperature of the insulation class).



Figure 10 - Pt-100

**9.2 Thermistor (PTC)**



Figure 11 - Thermistor (PTC)

These are thermal protectors consisting of semiconductor detectors with sudden variation of the resistance when reaching a certain temperature.

PTC is considered a thermistor with the resistance increasing drastically to a well defined temperature figure. This sudden resistance variation blocks the PTC current, causing the output relay to operate, and the main circuit to switch-off.

The thermistors are of small dimensions, do not wear and have quicker response if compared to other protectors, although they do not allow continuous monitoring of motor operating temperature.

Together with their electronic circuits, these thermistors provide full protection against overheating caused by overload, under or overvoltage or frequent reversing operations.

Where thermistor protection is required to provide both alarm and trip operation, it is necessary for each phase of the motor winding to be equipped with two sets of appropriately rated thermistors.

WEG Automation has a product called RPW which is an electronic relay intended specifically to read the PTC signal and operate its output relay. For more information go to the website www.weg.net.

**9.3 Bimetallic thermal protectors (Thermostat)**

These are silver-contact thermal sensors, normally closed, that operate at certain temperature rise. When their operating temperature decreases, they go back to the original position instantaneously, allowing the silver contact to close again.

The bimetallic thermal protectors are series-connected with the contactor coil, and can be used either as alarm or trip.

There are also other types of thermal protectors such as Pt-1000, KTY and thermocouples. Contact your local WEG office closest to you for more information.

**10. Packaging**

W21 motors frame 63 to 132 have carton box as standard packaging (figure 12). Frame 160 to 355, the packaging of motor are carton box or wooden box WEG choose different packaging according to the mounting and frame size of motors). The WEG packaging is under continuous improvement, it is subject to change without previous notifications.



Figure 12 - Carton box



Figure 13 - Crate 1



Figure 13 - Crate 2



Figure 13 - Crate 3



Figure 14 - Carton box 2

**7. Tolerances for electrical data**

The following tolerances are allowed in accordance with IEC 60034-1:

|                       |  |
|-----------------------|--|
| Efficiency ( $\eta$ ) | -0.15 (1- $\eta$ ) for Pnom $\leq$ 150 kW /<br>-0.1 (1- $\eta$ ) for Pnom > 150 kW<br>Where $\eta$ is a decimal number |
| Power factor          | $\frac{1 - \cos \phi}{6}$<br>Minimum 0.02 and Maximum 0.07   |
| Slip                  | $\pm 20\%$ for Pnom $\geq$ 1 kW and<br>$\pm 30\%$ for Pnom < 1 kW  |
| Starting current      | 20% (without lower limit)  |
| Starting torque       | - 15% + 25%  |
| Breakdown torque      | - 10 %   |
| Moment of inertia     | $\pm 10\%$   |

Table 14 - Tolerances for electrical data

**8. Space heaters**

The use of space heaters are recommended in two situations:

1. Motors installed in environments with relative air humidity up to 95%, in which the motor may remain idle for periods greater than 24 hours;

2. Motors installed in environments with relative air humidity greater than 95%, regardless of the operating schedule. It should be highlighted that in this situation it is strongly recommended that an epoxy paint known as tropicalized painting is applied in the internal components of the motor. More information can be obtained in section 4.2.1.

The supply voltage for space heaters must be defined by the Customer. For all frame sizes, W21 motors can be provided with space heaters suitable for 110-127 V, 220-240 V and 380-480 V. The power rating and number of space heaters fitted depends on the size of the motor as indicated in table 15 below:

| Frame       | Quantities | Total Power rated (W) |
|-------------|------------|-----------------------|
| 63 to 80    | 1          | 7.5                   |
| 90 and 100  | 1          | 11                    |
| 112         | 2          | 22                    |
| 132 and 160 | 2          | 30                    |
| 180 and 200 | 2          | 38                    |
| 225 and 250 | 2          | 56                    |
| 280 and 315 | 2          | 140                   |
| 355         | 2          | 174                   |

Table 15 - Power and quantity of space heaters

**9. Thermal protections**

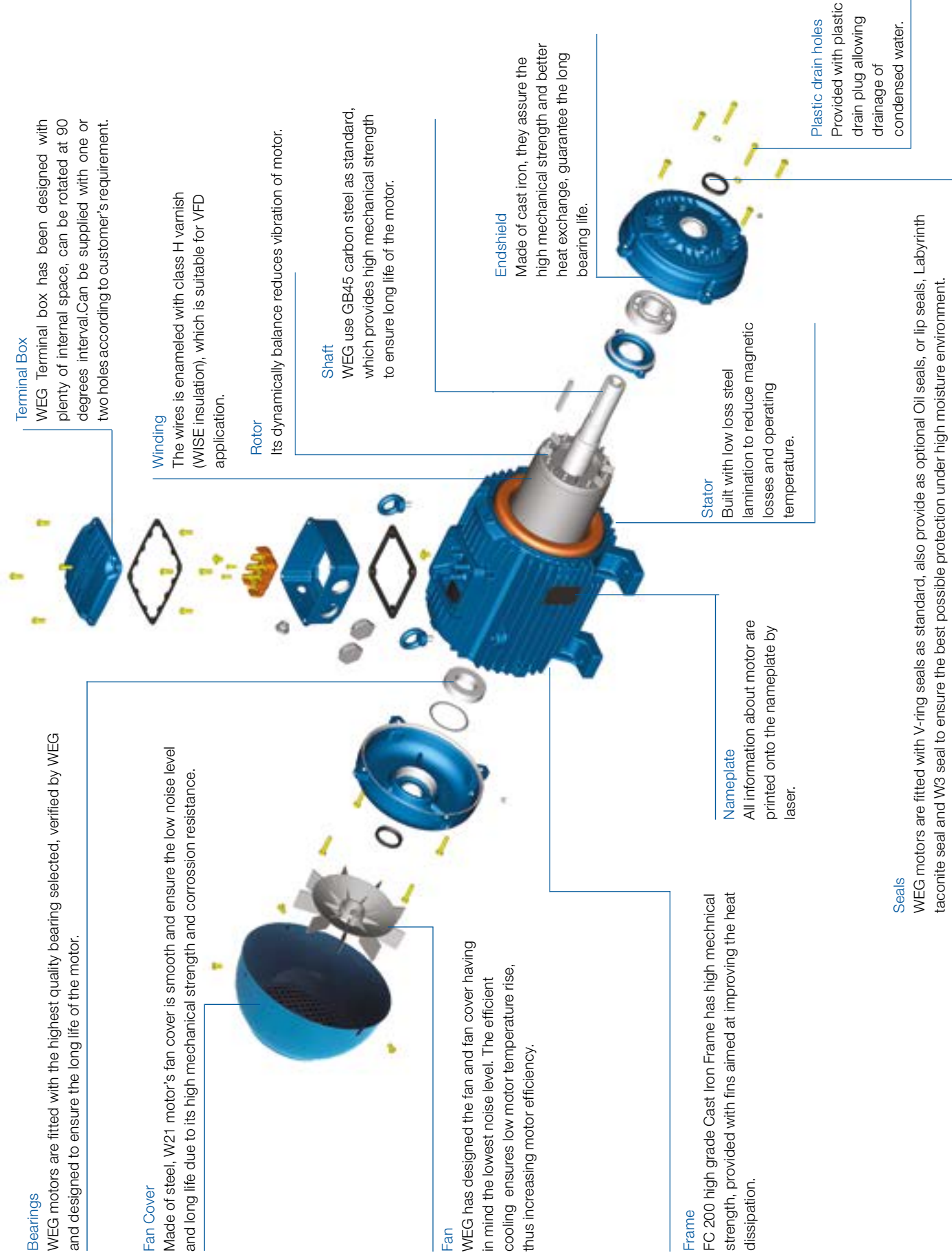
**9.1 Pt-100**

These are temperature detectors with operating principle

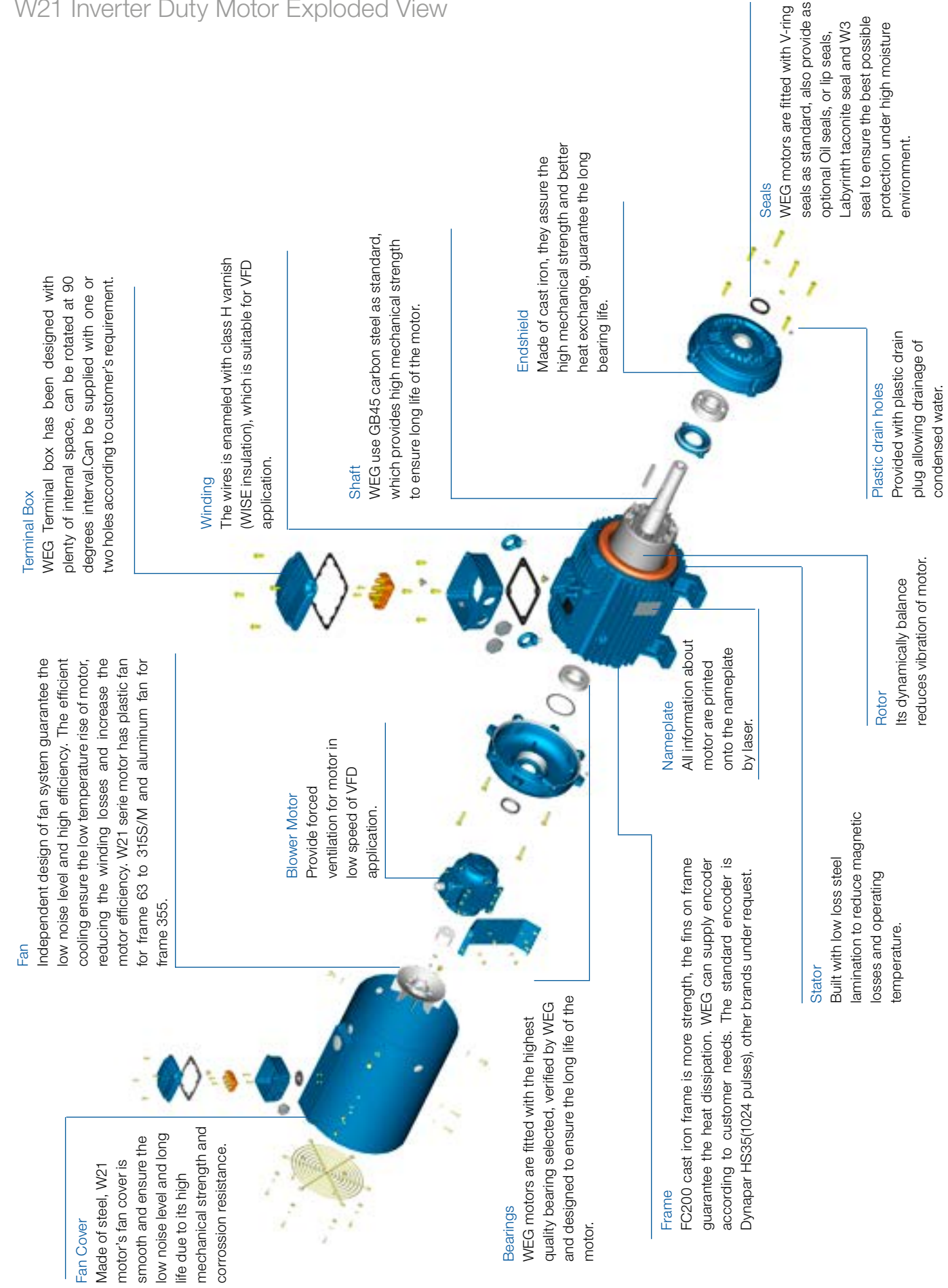




# Cast Iron Frame W21 Multi-voltage Motor Exploded View



# Cast Iron Frame W21 Inverter Duty Motor Exploded View





### 11. Construction Features

| Frame                   | 63                | 71   | 80   | 90S  | 90L       |      |
|-------------------------|-------------------|--|--|------|-----------|------|
| Mechanical Features     |                   |  |  |      |           |      |
| Nameplate Marks         | CE; IEC 60034;    |  |  |      |           |      |
| Mounting                | B3T               |  |  |      |           |      |
| Frame                   | Material          |  | Aluminum   |      |           |      |
| Protection Degree       |                   | IP55   |  |      |           |      |
| Grounding               |                   | NA   |  |      |           |      |
| Cooling method          |                   | TEFC   |  |      |           |      |
| Fan                     | Material          |  | Plastic  |      |           |      |
| Fan cover               | Material          |  | Steel Plate  |      |           |      |
| Endshields              | Material          |  | FC-200 Cast iron   |      |           |      |
| Drain hole              |                   | with automatic plastic drain plug  |  |      |           |      |
| Bearings                | Clearance (D.E)   |  | ZZ   |      |           |      |
|                         | Clearance (N.D.E) |  | ZZ   |      |           |      |
|                         | Locking           |  | None   |      |           |      |
|                         | Drive End         | 2P   | 6201   | 6203 | 6204      | 6205 |
|                         |                   | 4-8P   |  |      |           |      |
| Non Drive End           | 2P                | 6201   | 6202   | 6203 | 6204      |      |
|                         | 4-8P              |  |  |      |           |      |
| Bearing Seal            |                   | V-rings  |  |      |           |      |
| Joint Seal              |                   | None   |  |      |           |      |
| Lubrication             | Type              |  | Mobil Polyrex EM 103                                       |      |           |      |
|                         | Grease fitting    |  | none   |      |           |      |
| Terminal block          |                   | BMC 6 pins   |  |      |           |      |
| Terminal Box            | material          |  | Aluminum   |      |           |      |
| Additional terminal box |                   | None   |  |      |           |      |
| Lead inlet              | Main              | Size   | 2xM20x1.5  |      | 2xM25x1.5 |      |
|                         | Plug              |  | Equipped with plastic cover for transportation and storage |      |           |      |
| Shaft                   | Material          |  | GB45   |      |           |      |
|                         | D.E Threaded hole | 2p   | M4   | M5   | M6        |      |
|                         |                   | 4p-8p  |  |      | M8        | M8   |
| Key                     |                   | A type (China : B type)  |  |      |           |      |
| Vibration               |                   | Grade A  |  |      |           |      |
| Balance                 |                   | 1/2 key  |  |      |           |      |
| Nameplate               | Material          |  | Stainless steel AISI 304                                   |      |           |      |
| Painting                | Plan              |  | 207A   |      |           |      |
|                         | Color             |  | RAL 5009   |      |           |      |
| Electrical Features     |                   |  |  |      |           |      |
| Design                  |                   | N  |  |      |           |      |
| Voltage                 |                   | 220-240/380-415V(50HZ)//440-460V(60HZ),6 terminals, connection type Δ-Δ/Y-Y//Y-Y |  |      |           |      |
| Insulation Class        |                   | F(DT 80K)  |  |      |           |      |
| Service Factor          |                   | 1.00   |  |      |           |      |
| Rotor                   |                   | Die cast aluminum  |  |      |           |      |
| Thermal Protection      |                   | None   |  |      |           |      |

Note: For features out of those described on above table, please consult nearest WEG sales office.

| Frame                   | 100L              | 112M   | 132S   | 132M      | 160M                   |  |
|-------------------------|-------------------|--|--|-----------|------------------------|--|
| Mechanical Features     |                   |  |  |           |                        |  |
| Nameplate Marks         |                   | CE; IEC 60034;   |  |           |                        |  |
| Mounting                |                   | B3T  |  |           |                        |  |
| Frame                   | Material          |  | Cast iron (or Aluminum 100L,112M,132S,132M,160M/L)                             |           |                        |  |
| Protection Degree       |                   | IP55   |  |           |                        |  |
| Grounding               |                   | Single grounding(Terminal box )  |  |           |                        |  |
| Cooling method          |                   | TEFC   |  |           |                        |  |
| Fan                     | Material          |  | Plastic  |           |                        |  |
| Fan cover               | Material          |  | Steel plate  |           |                        |  |
| Endshields              | Material          |  | FC-200 cast iron   |           |                        |  |
| Drain hole              |                   | with automatic plastic drain plug  |  |           |                        |  |
| Bearings                | Clearance (D.E)   |  | ZZ   |           | ZZ-C3                  |  |
|                         | Clearance (N.D.E) |  | ZZ   |           | ZZ-C3                  |  |
|                         | Locking           |  | None   |           |                        | Locked on DE with internal and external bearing caps and pre-load springs on NDE |
|                         | Drive End         | 2P   | 6206   | 6307      | 6308                   |  |
|                         |                   | 4-8P   |  |           |                        |  |
| Non Drive End           | 2P                | 6205   | 6206   | 6207      | 6207                   |  |
|                         | 4-8P              |  |  |           |                        |  |
| Bearing Seal            |                   | V-rings  |  |           |                        |  |
| Joint Seal              |                   | none   |  |           |                        |  |
| Lubrication             | Type              |  | Mobil Polyrex EM 103   |           |                        |  |
|                         | Grease fitting    |  | None   |           |                        |  |
| Terminal block          |                   | BMC 6 pins   |  |           |                        |  |
| Terminal Box            | material          |  | Aluminum   |           |                        |  |
| Additional terminal box |                   | None   |  |           |                        |  |
| Lead inlet              | Main              | Size   | 2xM25x1.5  | 2xM32x1.5 | 2xM40x1.5              |  |
|                         | Plug              |  | Equipped with plastic cover for transportation and storage                     |           |                        |  |
| Shaft                   | Material          |  | GB45   |           |                        |  |
|                         | D.E Threaded hole | 2p   | M10  | M10       | M12                    |  |
|                         |                   | 4p-8p  |  |           | M12                    | M16  |
| Key                     |                   | A type (China : B type)  |  |           |                        |  |
| Vibration               |                   | Grade A  |  |           |                        |  |
| Balance                 |                   | 1/2 key  |  |           |                        |  |
| Nameplate               | Material          |  | Stainless steel AISI 304   |           |                        |  |
| Painting                | Plan              |  | 207A   |           | 203A                   |  |
|                         | Color             |  | RAL 5009   |           |                        |  |
| Electrical Features     |                   |  |  |           |                        |  |
| Design                  |                   | N  |  |           |                        |  |
| Voltage                 |                   | 220-240/380-415V (50HZ)//440-460V (60HZ),6 terminals, Connection type Δ-Δ/Y-Y//Y-Y | 220-240380-415V(50HZ)//440-460V(60HZ),6 terminals,connection type Δ-Δ/Y-Y//Y-Y |           |                        |  |
| Insulation Class        |                   | F(DT 80K)  |  |           |                        |  |
| Service Factor          |                   | 1.00   |  |           |                        |  |
| Rotor                   |                   | Die cast aluminum  |  |           |                        |  |
| Thermal Protection      |                   | None   |  |           | PTC Thermistor -155 °C |  |

Note: For features out of those described on above table, please consult nearest WEG sales office.

| Frame                   |                   | 160L   | 180M | 180L | 200M      | 200L |      |
|-------------------------|-------------------|--|------|------|-----------|------|------|
| Mechanical Features     |                   |  |      |      |           |      |      |
| Nameplate Marks         |                   | CE; IEC 60034;   |      |      |           |      |      |
| Mounting                |                   | B3T  |      |      |           |      |      |
| Frame                   | Material          | Cast iron (or Aluminum 160M/L,180M/L,200M/L)                                     |      |      |           |      |      |
| Protection Degree       |                   | IP55   |      |      |           |      |      |
| Grounding               |                   | Single grounding(Terminal box )  |      |      |           |      |      |
| Cooling method          |                   | TEFC   |      |      |           |      |      |
| Fan                     | Material          | Plastic  |      |      |           |      |      |
| Fan cover               | Material          | Steel Plate  |      |      |           |      |      |
| Endshields              | Material          | FC-200 cast iron   |      |      |           |      |      |
| Drain hole              |                   | with automatic plastic drain plug  |      |      |           |      |      |
| Bearings                | Clearance (D.E)   | ZZ-C3  |      |      |           |      |      |
|                         | Clearance (N.D.E) | ZZ-C3  |      |      |           |      |      |
|                         | Locking           | Locked on DE with internal and external bearing caps and pre-load springs on NDE |      |      |           |      |      |
|                         | Drive End         | 2P   | 6309 | 6311 | 6311      | 6312 | 6312 |
|                         |                   | 4-8P   |      |      |           |      |      |
| Non Drive End           | 2P                | 6209   | 6211 | 6211 | 6212      | 6212 |      |
|                         | 4-8P              |  |      |      |           |      |      |
| Bearing Seal            |                   | V-ring   |      |      |           |      |      |
| Joint Seal              |                   | None   |      |      |           |      |      |
| Lubrication             | Type              | Mobil POLIREX EM 103   |      |      |           |      |      |
|                         | Grease fitting    | None   |      |      |           |      |      |
| Terminal block          |                   | BMC 6 pins   |      |      |           |      |      |
| Terminal Box            | material          | Aluminum   |      |      |           |      |      |
| Additional terminal box |                   | None   |      |      |           |      |      |
| Lead inlet              | Main              | 2xM40x1.5  |      |      | 2xM50x1.5 |      |      |
|                         | Size              |  |      |      |           |      |      |
| Plug                    |                   | Equipped with plastic cover for transportation and storage                       |      |      |           |      |      |
| Shaft                   | Material          |  | GB45 |      |           |      |      |
|                         | D.E Threaded hole | 2p   | M16  | M16  | M16       | M20  | M20  |
|                         |                   | 4p-8p  |      |      |           |      |      |
| Key                     |                   | A type (China : B type)  |      |      |           |      |      |
| Vibration               |                   | Grade A  |      |      |           |      |      |
| Balance                 |                   | 1/2 key  |      |      |           |      |      |
| Nameplate               | Material          | Stainless steel AISI 304   |      |      |           |      |      |
| Painting                | Plan              | 203A   |      |      |           |      |      |
|                         | Color             | RAL 5007   |      |      |           |      |      |
| Electrical Features     |                   |  |      |      |           |      |      |
| Design                  |                   | N  |      |      |           |      |      |
| Voltage                 |                   | 380-415/660-690V(50HZ)//440-460V(60HZ), 6terminals, connection type Δ-Δ/Y-Y//Y-Y |      |      |           |      |      |
| Insulation Class        |                   | F(DT 80K)  |      |      |           |      |      |
| Service Factor          |                   | 1.00   |      |      |           |      |      |
| Rotor                   |                   | Die cast aluminum  |      |      |           |      |      |
| Thermal Protection      |                   | PTC Thermistor -155 °C   |      |      |           |      |      |

Note: For features out of those described on above table, please consult nearest WEG sales office.

| Frame                   |                   | 225S/M   | 250S/M    | 280S/M | 315S/M   | 355M/L  |      |
|-------------------------|-------------------|--|-----------|--------|----------|---------|------|
| Mechanical Features     |                   |  |           |        |          |         |      |
| Nameplate Marks         |                   | CE; IEC 60034;   |           |        |          |         |      |
| Mounting                |                   | B3T  |           |        |          |         |      |
| Frame                   | Material          | Cast iron  |           |        |          |         |      |
| Protection Degree       |                   | IP55   |           |        |          |         |      |
| Grounding               |                   | Double grounding(Terminal box+Outside frame )                                    |           |        |          |         |      |
| Cooling method          |                   | TEFC   |           |        |          |         |      |
| Fan                     | Material          | Plastic  |           |        | Aluminum |         |      |
| Fan cover               | Material          | Steel plate  |           |        |          |         |      |
| Endshields              | Material          | FC-200 cast iron   |           |        |          |         |      |
| Drain hole              |                   | with automatic plastic drain plug  |           |        |          |         |      |
| Bearings                | Clearance (D.E)   | C3   |           |        |          |         |      |
|                         | Clearance (N.D.E) | C3   |           |        |          |         |      |
|                         | Locking           | Locked on DE with internal and external bearing caps and pre-load springs on NDE |           |        |          |         |      |
|                         | Drive End         | 2P   | 6314      | 6314   | 6314     | 6314    | 6316 |
|                         |                   | 4-8P   |           |        | 6316     | 6319    | 6322 |
| Non Drive End           | 2P                | 6314   | 6314      | 6314   | 6314     | 6314    |      |
|                         | 4-8P              |  |           | 6316   | 6316     | 6319    |      |
| Bearing Seal            |                   | V-ring   |           |        |          |         |      |
| Joint Seal              |                   | None   |           |        |          |         |      |
| Lubrication             | Type              | Mobil POLIREX EM 103   |           |        |          |         |      |
|                         | Grease fitting    | regreasing nipples in DE and NDE endshields                                      |           |        |          |         |      |
| Terminal block          |                   | BMC 6 pins   |           |        |          |         |      |
| Terminal Box            | material          | FC-200 cast iron   |           |        |          |         |      |
| Additional terminal box |                   | None   |           |        |          |         |      |
| Lead inlet              | Main              | 2xM50x1.5  | 2xM63x1.5 |        |          |         |      |
|                         | Size              |  |           |        |          |         |      |
| Plug                    |                   | Threaded plug for transport and storage; cable gland as optional                 |           |        |          |         |      |
| Shaft                   | Material          |  | GB45      |        |          | 42CrMo* |      |
|                         | D.E Threaded hole | 2p   | M20       | M20    | M20      | M20     |      |
|                         |                   | 4p-8p  |           |        |          |         |      |
| Key                     |                   | B type (China : C type)  |           |        |          |         |      |
| Vibration               |                   | Grade A  |           |        |          |         |      |
| Balance                 |                   | 1/2 key  |           |        |          |         |      |
| Nameplate               | Material          | Stainless steel AISI 304   |           |        |          |         |      |
| Painting                | Plan              | 203A   |           |        |          |         |      |
|                         | Color             | RAL 5007   |           |        |          |         |      |
| Electrical Features     |                   |  |           |        |          |         |      |
| Design                  |                   | N  |           |        |          |         |      |
| Voltage                 |                   | 380-415/660-690V(50HZ)//440-460V(60HZ),6 terminals, connection type Δ-Δ/Y-Y//Y-Y |           |        |          |         |      |
| Insulation Class        |                   | F(DT 80K)  |           |        |          |         |      |
| Service Factor          |                   | 1.00   |           |        |          |         |      |
| Rotor                   |                   | Die cast aluminum  |           |        |          |         |      |
| Thermal Protection      |                   | PTC Thermistor -155 °C   |           |        |          |         |      |

Note: For features out of those described on above table, please consult nearest WEG sales office.

\*According to the market, the shaft material will have different design.



W21-Cast iron frame motor - IE2 <sup>(1)</sup>

| Output             |      | Frame   | Full Load Torque (kgfm) | Locked Rotor Current I <sub>L</sub> /I <sub>n</sub> | Locked Rotor Torque T <sub>L</sub> /T <sub>n</sub> | Break-down Torque T <sub>b</sub> /T <sub>n</sub> | Inertia J (kgm <sup>2</sup> ) | Allowable locked rotor time (s) |                | Weight (kg) | Sound dB(A) | 400 V        |      |      |      |      |      |      |      |  | Full load current I <sub>n</sub> (A) |
|--------------------|------|---------|-------------------------|---|--|--|-------------------------------|---------------------------------|----------------|-------------|-------------|--------------|------|------|------|------|------|------|------|--|--------------------------------------|
|                    |      |         |                         |   |  |  |                               | Rated speed (rpm)               | % of full load |             |             |              |      |      |      |      |      |      |      |  |                                      |
|                    |      |         |                         |   |  |  |                               |                                 | Efficiency     |             |             | Power Factor |      |      |      |      |      |      |      |  |                                      |
|                    |      |         |                         |   |  |  |                               |                                 | Hot            |             |             | Cold         |      | 50   | 75   | 100  | 50   | 75   | 100  |  |                                      |
| 2P - 50Hz          |      |         |                         |   |  |  |                               |                                 |                |             |             |              |      |      |      |      |      |      |      |  |                                      |
| 0.75               | 1    | 80      | 0.260                   | 6.5   | 2.8  | 2.8  | 0.0007                        | 14                              | 31             | 13.8        | 59.0        | 2800         | 76.0 | 78.5 | 79.5 | 0.67 | 0.80 | 0.86 | 1.58 |  |                                      |
| 1.1                | 1.5  | 80      | 0.380                   | 6.5   | 2.8  | 2.8  | 0.0008                        | 10                              | 22             | 14.3        | 59.0        | 2800         | 78.0 | 80.0 | 80.0 | 0.67 | 0.79 | 0.85 | 2.33 |  |                                      |
| 1.5                | 2    | 90S     | 0.510                   | 7.0   | 2.6  | 3.1  | 0.0016                        | 12                              | 26             | 23.3        | 62.0        | 2880         | 81.5 | 82.0 | 82.0 | 0.66 | 0.78 | 0.84 | 3.14 |  |                                      |
| 2.2                | 3    | 90L     | 0.750                   | 6.6   | 3.0  | 3.0  | 0.0022                        | 9                               | 20             | 24.0        | 62.0        | 2840         | 83.0 | 83.6 | 83.6 | 0.63 | 0.76 | 0.83 | 4.58 |  |                                      |
| 3                  | 4    | 100L    | 1.00                    | 7.7   | 2.4  | 3.4  | 0.0051                        | 8                               | 18             | 32.9        | 67.0        | 2910         | 83.0 | 84.5 | 85.0 | 0.63 | 0.76 | 0.85 | 5.99 |  |                                      |
| 4                  | 5.5  | 112M    | 1.35                    | 7.0   | 2.0  | 2.8  | 0.0066                        | 10                              | 22             | 40.7        | 64.0        | 2880         | 86.0 | 86.0 | 86.0 | 0.73 | 0.83 | 0.88 | 7.63 |  |                                      |
| 5.5                | 7.5  | 132S    | 1.82                    | 7.5   | 2.2  | 3.4  | 0.0162                        | 13                              | 29             | 62.1        | 67.0        | 2945         | 86.0 | 87.0 | 87.0 | 0.67 | 0.79 | 0.85 | 10.7 |  |                                      |
| 7.5                | 10   | 132S    | 2.48                    | 8.1   | 2.4  | 3.4  | 0.0198                        | 10                              | 22             | 68.4        | 67.0        | 2945         | 87.0 | 88.0 | 88.1 | 0.70 | 0.81 | 0.86 | 14.3 |  |                                      |
| 9.2                | 12.5 | 132M    | 3.04                    | 8.5   | 2.6  | 3.6  | 0.0234                        | 7                               | 15             | 70.0        | 67.0        | 2945         | 88.2 | 89.5 | 89.9 | 0.67 | 0.79 | 0.85 | 17.4 |  |                                      |
| 11                 | 15   | 160M    | 3.64                    | 8.0   | 2.7  | 3.2  | 0.0421                        | 10                              | 22             | 103         | 70.0        | 2940         | 88.5 | 89.4 | 89.4 | 0.71 | 0.81 | 0.86 | 20.7 |  |                                      |
| 15                 | 20   | 160M    | 4.97                    | 8.2   | 2.8  | 3.2  | 0.0506                        | 7                               | 15             | 111         | 70.0        | 2940         | 89.5 | 90.3 | 90.3 | 0.73 | 0.82 | 0.87 | 27.6 |  |                                      |
| 18.5               | 25   | 160L    | 6.13                    | 8.6   | 3.0  | 3.3  | 0.0590                        | 8                               | 18             | 129         | 70.0        | 2940         | 90.0 | 90.9 | 90.9 | 0.71 | 0.81 | 0.86 | 34.2 |  |                                      |
| 22                 | 30   | 180M    | 7.24                    | 8.3   | 2.5  | 3.0  | 0.0975                        | 8                               | 18             | 158         | 70.0        | 2960         | 91.5 | 91.6 | 91.6 | 0.68 | 0.79 | 0.84 | 41.3 |  |                                      |
| 30                 | 40   | 200L    | 9.87                    | 7.2   | 2.4  | 2.8  | 0.1532                        | 10                              | 22             | 219         | 74.0        | 2960         | 91.2 | 92.0 | 92.0 | 0.70 | 0.80 | 0.84 | 56.0 |  |                                      |
| 37                 | 50   | 200L    | 12.1                    | 7.8   | 2.4  | 2.7  | 0.1703                        | 8                               | 18             | 235         | 74.0        | 2965         | 92.0 | 92.5 | 92.5 | 0.74 | 0.83 | 0.86 | 67.1 |  |                                      |
| 45                 | 60   | 225S/M  | 14.8                    | 7.5   | 2.5  | 3.2  | 0.3409                        | 12                              | 26             | 390         | 82.0        | 2960         | 92.0 | 93.1 | 93.1 | 0.78 | 0.86 | 0.88 | 79.3 |  |                                      |
| 55                 | 75   | 250S/M  | 18.1                    | 8.0   | 2.3  | 3.0  | 0.3934                        | 10                              | 22             | 420         | 82.0        | 2955         | 93.0 | 93.2 | 93.2 | 0.79 | 0.86 | 0.89 | 95.7 |  |                                      |
| 75                 | 100  | 250S/M  | 24.7                    | 8.0   | 2.7  | 2.9  | 0.4807                        | 10                              | 22             | 540         | 82.0        | 2960         | 93.6 | 93.8 | 93.8 | 0.83 | 0.87 | 0.89 | 130  |  |                                      |
| 90                 | 125  | 280S/M  | 29.5                    | 7.5   | 1.9  | 2.8  | 1.10                          | 20                              | 44             | 715         | 83.0        | 2970         | 93.5 | 94.1 | 94.1 | 0.77 | 0.85 | 0.88 | 157  |  |                                      |
| 110                | 150  | 315S/M  | 36.0                    | 7.0   | 2.3  | 2.6  | 1.20                          | 20                              | 44             | 770         | 83.0        | 2975         | 94.0 | 94.6 | 94.6 | 0.82 | 0.87 | 0.89 | 189  |  |                                      |
| 132                | 175  | 315S/M  | 43.2                    | 7.8   | 2.2  | 2.7  | 1.41                          | 12                              | 26             | 830         | 83.0        | 2975         | 94.0 | 94.7 | 94.7 | 0.80 | 0.87 | 0.89 | 226  |  |                                      |
| 150                | 200  | 315S/M  | 49.1                    | 8.0   | 2.7  | 2.7  | 1.68                          | 15                              | 33             | 900         | 83.0        | 2975         | 94.9 | 95.0 | 95.0 | 0.80 | 0.87 | 0.90 | 253  |  |                                      |
| 160                | 220  | 315S/M  | 52.4                    | 7.8   | 2.2  | 2.8  | 1.68                          | 12                              | 26             | 900         | 83.0        | 2975         | 94.8 | 95.1 | 95.1 | 0.81 | 0.88 | 0.90 | 270  |  |                                      |
| 185                | 250  | 315S/M  | 60.5                    | 8.2   | 2.4  | 3.0  | 1.83                          | 10                              | 22             | 1000        | 83.0        | 2980         | 95.0 | 95.2 | 95.2 | 0.78 | 0.85 | 0.88 | 319  |  |                                      |
| 200                | 270  | 315S/M  | 65.5                    | 7.9   | 2.4  | 3.2  | 2.01                          | 12                              | 26             | 1050        | 83.0        | 2975         | 95.1 | 95.3 | 95.3 | 0.80 | 0.87 | 0.88 | 344  |  |                                      |
| 220                | 300  | 355M/L  | 71.8                    | 8.5   | 2.2  | 2.8  | 4.50                          | 20                              | 44             | 1500        | 81.0        | 2985         | 95.0 | 95.5 | 95.5 | 0.85 | 0.90 | 0.91 | 365  |  |                                      |
| 250                | 340  | 355M/L  | 81.6                    | 7.8   | 2.2  | 2.5  | 4.83                          | 30                              | 66             | 1650        | 81.0        | 2985         | 95.4 | 95.6 | 95.6 | 0.86 | 0.89 | 0.90 | 419  |  |                                      |
| 280                | 380  | 355M/L  | 91.4                    | 8.5   | 2.3  | 2.7  | 5.90                          | 25                              | 55             | 1850        | 81.0        | 2985         | 95.0 | 95.6 | 95.6 | 0.89 | 0.91 | 0.92 | 462  |  |                                      |
| 300                | 400  | 355M/L  | 97.9                    | 7.8   | 2.0  | 2.6  | 5.90                          | 40                              | 88             | 1850        | 81.0        | 2985         | 95.5 | 95.8 | 95.8 | 0.85 | 0.90 | 0.90 | 502  |  |                                      |
| 315                | 430  | 355M/L  | 103                     | 7.6   | 2.1  | 2.6  | 5.90                          | 40                              | 88             | 1850        | 81.0        | 2980         | 95.5 | 95.8 | 95.8 | 0.86 | 0.90 | 0.91 | 522  |  |                                      |
| 330                | 450  | 355M/L* | 108                     | 7.8   | 2.0  | 2.5  | 5.90                          | 40                              | 88             | 1850        | 81.0        | 2980         | 95.5 | 95.8 | 95.8 | 0.87 | 0.90 | 0.91 | 546  |  |                                      |
| High Output Design |      |         |                         |   |  |  |                               |                                 |                |             |             |              |      |      |      |      |      |      |      |  |                                      |
| 1.5                | 2    | 90L     | 0.510                   | 7.0   | 2.6  | 3.1  | 0.0016                        | 12                              | 26             | 23.3        | 62.0        | 2880         | 81.5 | 82.0 | 82.0 | 0.66 | 0.78 | 0.84 | 3.14 |  |                                      |
| 2.2                | 3    | 100L    | 0.730                   | 7.7   | 2.0  | 2.7  | 0.0043                        | 11                              | 24             | 27.8        | 67.0        | 2920         | 82.5 | 83.6 | 83.6 | 0.66 | 0.78 | 0.85 | 4.47 |  |                                      |
| 5.5                | 7.5  | 112M    | 1.86                    | 7.3   | 2.7  | 3.0  | 0.0088                        | 11                              | 24             | 48.4        | 64.0        | 2880         | 86.5 | 87.0 | 87.0 | 0.72 | 0.82 | 0.87 | 10.5 |  |                                      |
| 5.5                | 7.5  | 132M    | 1.82                    | 7.5   | 2.2  | 3.4  | 0.0162                        | 13                              | 29             | 62.1        | 67.0        | 2945         | 86.0 | 87.0 | 87.0 | 0.67 | 0.79 | 0.85 | 10.7 |  |                                      |
| 7.5                | 10   | 132M    | 2.48                    | 8.1   | 2.4  | 3.4  | 0.0198                        | 10                              | 22             | 68.4        | 67.0        | 2945         | 87.0 | 88.0 | 88.1 | 0.70 | 0.81 | 0.86 | 14.3 |  |                                      |
| 11                 | 15   | 160L    | 3.64                    | 8.0   | 2.7  | 3.2  | 0.0421                        | 10                              | 22             | 103         | 70.0        | 2940         | 88.5 | 89.4 | 89.4 | 0.71 | 0.81 | 0.86 | 20.7 |  |                                      |
| 22                 | 30   | 180L    | 7.24                    | 8.3   | 2.5  | 3.0  | 0.0975                        | 8                               | 18             | 158         | 70.0        | 2960         | 91.5 | 91.6 | 91.6 | 0.68 | 0.79 | 0.84 | 41.3 |  |                                      |
| 75                 | 100  | 280S/M  | 24.6                    | 7.5   | 1.8  | 2.8  | 0.9278                        | 28                              | 62             | 600         | 83.0        | 2970         | 92.5 | 93.8 | 93.8 | 0.75 | 0.84 | 0.87 | 133  |  |                                      |
| 110                | 150  | 280S/M  | 36.0                    | 7.0   | 2.3  | 2.6  | 1.20                          | 20                              | 44             | 770         | 83.0        | 2975         | 94.0 | 94.6 | 94.6 | 0.82 | 0.87 | 0.89 | 189  |  |                                      |
| 200                | 270  | 355M/L  | 65.3                    | 7.2   | 1.8  | 2.7  | 4.29                          | 30                              | 66             | 1420        | 81.0        | 2985         | 95.0 | 95.4 | 95.4 | 0.89 | 0.90 | 0.91 | 333  |  |                                      |

Note:  
 (1) According to IEC-60034-2-1 standard, the efficiency value is measured at direct start-up.  
 (\*)Insulation class "F" with temperature rise ΔT 105K.

W21-Cast iron frame motor - IE2 <sup>(1)</sup>

| Output    |      | Frame | Full Load Torque (kgfm) | Locked Rotor Current I <sub>L</sub> /I <sub>n</sub> | Locked Rotor Torque T <sub>L</sub> /T <sub>n</sub> | Break-down Torque T <sub>b</sub> /T <sub>n</sub> | Inertia J (kgm <sup>2</sup> ) | Allowable locked rotor time (s) |                | Weight (kg) | Sound dB(A) | 380 V        |      |      |      |      |      |    |     |    | 415 V |     |    |    |     |  | Full load current I <sub>n</sub> (A) |
|-----------|------|-------|-------------------------|---|--|--|-------------------------------|---------------------------------|----------------|-------------|-------------|--------------|------|------|------|------|------|----|-----|----|-------|-----|----|----|-----|--|--------------------------------------|
|           |      |       |                         |   |  |  |                               | Rated speed (rpm)               | % of full load |             |             |              |      |      |      |      |      |    |     |    |       |     |    |    |     |  |                                      |
|           |      |       |                         |   |  |  |                               |                                 | Efficiency     |             |             | Power Factor |      |      |      |      |      |    |     |    |       |     |    |    |     |  |                                      |
|           |      |       |                         |   |  |  |                               |                                 | 50             |             |             | 75           | 100  | 50   | 75   | 100  | 50   | 75 | 100 | 50 | 75    | 100 | 50 | 75 | 100 |  |                                      |
| 2P - 50Hz |      |       |                         |   |  |  |                               |                                 |                |             |             |              |      |      |      |      |      |    |     |    |       |     |    |    |     |  |                                      |
| 0.75      | 1    | 2770  | 77.7                    | 78.0  | 78.0   | 0.66   | 0.81                          | 0.87                            | 1.68           | 2810        | 75.0        | 78.5         | 79.5 | 0.64 | 0.77 | 0.84 | 1.56 |    |     |    |       |     |    |    |     |  |                                      |
| 1.1       | 1.5  | 2775  | 78.9                    | 79.2  | 79.6   | 0.73   | 0.83                          | 0.87                            | 2.41           | 2815        | 77.1        | 80.2         | 80.2 | 0.62 | 0.75 | 0.82 | 2.33 |    |     |    |       |     |    |    |     |  |                                      |
| 1.5       | 2    | 2865  | 82.0                    | 81.6  | 81.6   | 0.71   | 0.81                          | 0.86                            | 3.25           | 2890        | 80.8        | 81.9         | 82.5 | 0.61 | 0.75 | 0.82 | 3.08 |    |     |    |       |     |    |    |     |  |                                      |
| 2.2       | 3    | 2820  | 83.7                    | 83.5  | 83.2   | 0.69   | 0.80                          | 0.85                            | 4.75           | 2855        | 82.2        | 83.4         | 83.9 | 0.59 | 0.72 | 0.80 | 4.56 |    |     |    |       |     |    |    |     |  |                                      |
| 3         | 4    | 2900  | 83.9                    | 84.5  | 85.0   | 0.69   | 0.81                          | 0.87                            | 6.16           | 2915        | 82.1        | 84.1         | 85.0 | 0.58 | 0.72 | 0.81 | 6.06 |    |     |    |       |     |    |    |     |  |                                      |
| 4         | 5.5  | 2865  | 86.6                    | 86.0  | 85.8   | 0.78   | 0.87                          | 0.90                            | 7.90           | 2890        | 85.3        | 85.9         | 86.3 | 0.69 | 0.80 | 0.86 | 7.50 |    |     |    |       |     |    |    |     |  |                                      |
| 5.5       | 7.5  | 2935  | 86.0                    | 87.0  | 87.0   | 0.73   | 0.82                          | 0.87                            | 11.0           | 2950        | 85.0        | 87.0         | 87.0 | 0.63 | 0.76 | 0.82 | 10.7 |    |     |    |       |     |    |    |     |  |                                      |
| 7.5       | 10   | 2935  | 87.5                    | 88.0  | 88.1   | 0.74   | 0.84                          | 0.88                            | 14.7           | 2950        | 86.0        | 88.0         | 88.1 | 0.65 | 0.77 | 0.84 | 14.1 |    |     |    |       |     |    |    |     |  |                                      |
| 9.2       | 12.5 | 2935  | 87.5                    | 88.0  | 88.9   | 0.72   | 0.82                          | 0.87                            | 18.1           | 2945        | 87.0        | 88.0         | 88.9 | 0.63 | 0.76 | 0.83 | 17.3 |    |     |    |       |     |    |    |     |  |                                      |
| 11        | 15   | 2935  | 89.0                    | 89.4  | 89.4   | 0.77   | 0.85                          | 0.88                            | 21.2           | 2945        | 88.0        | 89.4         | 89.4 | 0.67 | 0.78 | 0.84 | 20.4 |    |     |    |       |     |    |    |     |  |                                      |
| 15        | 20   | 2935  | 89.5                    | 90.3  | 90.3   | 0.78   | 0.85                          | 0.88                            | 28.7           | 2945        | 89.5        | 90.3         | 90.3 | 0.69 | 0.79 | 0.85 | 27.2 |    |     |    |       |     |    |    |     |  |                                      |
| 18.5      | 25   | 2930  | 90.5                    | 90.9  | 90.9   | 0.77   | 0.85                          | 0.88                            | 35.1           | 2945        | 89.5        | 90.9         | 90.9 | 0.66 | 0.78 | 0.83 | 34.1 |    |     |    |       |     |    |    |     |  |                                      |
| 22        | 30   | 2955  | 91.2                    | 91.5  | 91.5   | 0.72   | 0.82                          | 0.86                            | 42.5           | 2965        | 91.5        | 91.6         | 91.6 | 0.64 | 0.76 | 0.83 | 40.3 |    |     |    |       |     |    |    |     |  |                                      |
| 30        | 40   | 2955  | 91.5                    | 92.0  | 92.0   | 0.75   | 0.83                          | 0.86                            | 57.6           | 2965        | 90.5        | 91.8         | 92.0 | 0.65 | 0.77 | 0.82 | 55.3 |    |     |    |       |     |    |    |     |  |                                      |
| 37        | 50   | 2960  | 92.2                    | 92.5  | 92.5   | 0.79   | 0.85                          | 0.88                            | 69.1           | 2965        | 92.0        | 92.5         | 92.5 | 0.69 | 0.79 | 0.84 | 66.2 |    |     |    |       |     |    |    |     |  |                                      |
| 45        | 60   | 2955  | 92.2                    | 93.0  | 93.0   | 0.80   | 0.87                          | 0.89                            | 82.6           | 2965        | 91.9        | 93.3         | 93.3 | 0.75 | 0.85 | 0.87 | 77.1 |    |     |    |       |     |    |    |     |  |                                      |
| 55        | 75   | 2950  | 93.0                    | 93.2  | 93.2   | 0.81   | 0.87                          | 0.89                            | 101            | 2960        | 93.0        | 93.2         | 93.2 | 0.76 | 0.84 | 0.88 | 93.3 |    |     |    |       |     |    |    |     |  |                                      |
| 75        | 100  | 2950  | 93.7                    | 93.8  | 93.8   | 0.86   | 0.88                          | 0.90                            | 135            | 2965        | 93.4        | 93.8         | 93.8 | 0.80 | 0.85 | 0.88 | 126  |    |     |    |       |     |    |    |     |  |                                      |
| 90        | 125  | 2965  | 93.5                    | 94.1  | 94.1   | 0.80   | 0.87                          | 0.89                            | 163            | 2975        | 93.5        | 94.1         | 94.1 | 0.75 | 0.83 | 0.87 | 153  |    |     |    |       |     |    |    |     |  |                                      |
| 110       | 150  | 2970  | 94.1                    | 94.4  | 94.4   | 0.84   | 0.88                          | 0.90                            | 197            | 2975        | 93.9        | 94.6         | 94.6 | 0.80 | 0.86 | 0.88 | 184  |    |     |    |       |     |    |    |     |  |                                      |
| 132       | 175  | 2970  | 94.1                    | 94.6  | 94.6   | 0.83   | 0.89                          | 0.90                            | 236            | 2980        | 93.9        | 94.9         | 94.9 | 0.78 | 0.86 | 0.88 | 220  |    |     |    |       |     |    |    |     |  |                                      |
| 150       | 200  | 2970  | 94.5                    | 94.9  | 94.9   | 0.83   | 0.88                          | 0.90                            | 267            | 2975        | 94.7        | 95.0         | 95.0 | 0.78 | 0.86 | 0.89 | 247  |    |     |    |       |     |    |    |     |  |                                      |
| 160       | 220  | 2970  | 94.9                    | 95.0  | 95.0   | 0.84   | 0.89                          | 0.91                            | 281            | 2975        | 94.8        | 95.1         | 95.1 | 0.79 | 0.87 | 0.89 | 263  |    |     |    |       |     |    |    |     |  |                                      |
| 185       | 250  | 2975  | 94.9                    | 95.1  | 95.1   | 0.81   | 0.87                          | 0.89                            | 332            | 2980        | 95.0        | 95.2         | 95.2 | 0.76 | 0.83 |      |      |    |     |    |       |     |    |    |     |  |                                      |

W21-Cast iron frame motor - IE2 <sup>(1)</sup>

| Output             |      | Frame   | Full Load Torque (kgfm) | Locked Rotor Current I <sub>L</sub> /I <sub>n</sub> | Locked Rotor Torque T <sub>L</sub> /T <sub>n</sub> | Break-down Torque T <sub>b</sub> /T <sub>n</sub> | Inertia J (kgm <sup>2</sup> ) | Allowable locked rotor time (s) |                | Weight (kg) | Sound dB(A) | 400 V        |      |      |                                      |      |      |      |      |  |  |
|--------------------|------|---------|-------------------------|---|--|--|-------------------------------|---------------------------------|----------------|-------------|-------------|--------------|------|------|--------------------------------------|------|------|------|------|--|--|
|                    |      |         |                         |   |  |  |                               | Rated speed (rpm)               | % of full load |             |             |              |      |      | Full load current I <sub>n</sub> (A) |      |      |      |      |  |  |
|                    |      |         |                         |   |  |  |                               |                                 | Efficiency     |             |             | Power Factor |      |      |                                      |      |      |      |      |  |  |
| kW                 | HP   |         |                         |   |  |  |                               | Hot                             | Cold           |             |             | 50           | 75   | 100  | 50                                   | 75   | 100  |      |      |  |  |
| 4P - 50Hz          |      |         |                         |   |  |  |                               |                                 |                |             |             |              |      |      |                                      |      |      |      |      |  |  |
| 0.55               | 0.75 | 80      | 0.370                   | 5.8   | 2.1  | 2.6  | 0.0022                        | 18                              | 40             | 15.6        | 44.0        | 1440         | 73.0 | 76.0 | 77.1                                 | 0.55 | 0.68 | 0.75 | 1.37 |  |  |
| 0.75               | 1    | 80      | 0.520                   | 6.0   | 2.6  | 2.9  | 0.0029                        | 15                              | 33             | 16.6        | 44.0        | 1410         | 79.0 | 79.5 | 79.6                                 | 0.63 | 0.76 | 0.83 | 1.64 |  |  |
| 1.1                | 1.5  | 90S     | 0.740                   | 6.5   | 2.1  | 2.6  | 0.0049                        | 14                              | 31             | 20.6        | 49.0        | 1440         | 81.0 | 81.8 | 81.8                                 | 0.62 | 0.75 | 0.81 | 2.40 |  |  |
| 1.5                | 2    | 90L     | 1.01                    | 6.5   | 2.4  | 2.8  | 0.0055                        | 10                              | 22             | 24.4        | 49.0        | 1450         | 81.5 | 83.0 | 83.0                                 | 0.57 | 0.70 | 0.78 | 3.34 |  |  |
| 2.2                | 3    | 100L    | 1.49                    | 8.0   | 3.0  | 3.2  | 0.0082                        | 11                              | 24             | 36.6        | 53.0        | 1435         | 83.0 | 84.5 | 84.5                                 | 0.60 | 0.73 | 0.80 | 4.70 |  |  |
| 3                  | 4    | 100L    | 2.04                    | 7.8   | 2.9  | 3.3  | 0.0123                        | 12                              | 26             | 37.6        | 53.0        | 1430         | 83.0 | 85.5 | 86.0                                 | 0.64 | 0.76 | 0.83 | 6.07 |  |  |
| 4                  | 5.5  | 112M    | 2.71                    | 6.6   | 2.0  | 2.6  | 0.0156                        | 13                              | 29             | 43.9        | 56.0        | 1440         | 86.0 | 86.7 | 86.7                                 | 0.64 | 0.76 | 0.82 | 8.12 |  |  |
| 5.5                | 7.5  | 132S    | 3.67                    | 7.3   | 1.9  | 3.0  | 0.0416                        | 8                               | 18             | 60.4        | 56.0        | 1460         | 87.5 | 88.0 | 88.1                                 | 0.68 | 0.80 | 0.86 | 10.5 |  |  |
| 7.5                | 10   | 132M    | 4.97                    | 7.8   | 2.1  | 3.0  | 0.0528                        | 7                               | 15             | 70.5        | 56.0        | 1470         | 86.5 | 88.0 | 88.7                                 | 0.55 | 0.69 | 0.80 | 15.3 |  |  |
| 9.2                | 12.5 | 132M    | 6.16                    | 7.9   | 2.4  | 3.2  | 0.0604                        | 7                               | 15             | 75.7        | 56.0        | 1455         | 89.2 | 89.5 | 89.5                                 | 0.69 | 0.80 | 0.85 | 17.5 |  |  |
| 11                 | 15   | 160M    | 7.29                    | 6.9   | 2.5  | 2.7  | 0.0779                        | 8                               | 18             | 119         | 67.0        | 1470         | 87.5 | 89.0 | 89.8                                 | 0.63 | 0.76 | 0.82 | 21.6 |  |  |
| 15                 | 20   | 160L    | 9.94                    | 7.4   | 2.7  | 3.0  | 0.1023                        | 8                               | 18             | 134         | 67.0        | 1470         | 89.5 | 90.6 | 90.6                                 | 0.64 | 0.76 | 0.82 | 29.1 |  |  |
| 18.5               | 25   | 180M    | 12.2                    | 8.1   | 3.0  | 3.4  | 0.1573                        | 9                               | 20             | 169         | 64.0        | 1475         | 91.0 | 91.4 | 91.4                                 | 0.65 | 0.76 | 0.82 | 35.6 |  |  |
| 22                 | 30   | 180L    | 14.6                    | 8.0   | 2.7  | 3.3  | 0.2010                        | 8                               | 18             | 186         | 64.0        | 1470         | 91.0 | 91.6 | 91.6                                 | 0.68 | 0.79 | 0.84 | 41.3 |  |  |
| 30                 | 40   | 200L    | 19.8                    | 7.0   | 2.5  | 2.6  | 0.2941                        | 10                              | 22             | 246         | 69.0        | 1475         | 92.2 | 92.6 | 92.6                                 | 0.67 | 0.78 | 0.83 | 56.3 |  |  |
| 37                 | 50   | 225S/M  | 24.4                    | 7.2   | 2.2  | 2.7  | 0.6145                        | 10                              | 22             | 330         | 70.0        | 1475         | 92.6 | 93.0 | 93.0                                 | 0.76 | 0.84 | 0.87 | 66.0 |  |  |
| 45                 | 60   | 225S/M  | 29.7                    | 7.4   | 2.4  | 3.0  | 0.7169                        | 10                              | 22             | 385         | 70.0        | 1475         | 93.2 | 93.4 | 93.4                                 | 0.76 | 0.83 | 0.87 | 79.9 |  |  |
| 55                 | 75   | 250S/M  | 36.2                    | 7.2   | 2.5  | 3.0  | 0.8767                        | 10                              | 22             | 430         | 70.0        | 1480         | 93.5 | 93.7 | 93.7                                 | 0.74 | 0.83 | 0.87 | 97.4 |  |  |
| 75                 | 100  | 280S/M  | 49.2                    | 7.2   | 2.2  | 2.6  | 1.80                          | 15                              | 33             | 600         | 72.0        | 1485         | 94.0 | 94.2 | 94.2                                 | 0.78 | 0.86 | 0.87 | 132  |  |  |
| 90                 | 125  | 280S/M  | 59.0                    | 7.8   | 2.6  | 2.8  | 2.27                          | 20                              | 44             | 760         | 72.0        | 1485         | 94.0 | 94.5 | 94.5                                 | 0.79 | 0.85 | 0.88 | 156  |  |  |
| 110                | 150  | 315S/M  | 72.2                    | 7.9   | 2.9  | 3.6  | 2.82                          | 10                              | 22             | 830         | 72.0        | 1485         | 94.4 | 94.5 | 94.5                                 | 0.77 | 0.85 | 0.87 | 193  |  |  |
| 132                | 175  | 315S/M  | 86.6                    | 7.8   | 2.4  | 2.6  | 3.48                          | 15                              | 33             | 1050        | 72.0        | 1485         | 94.0 | 94.5 | 95.0                                 | 0.77 | 0.84 | 0.87 | 231  |  |  |
| 150                | 200  | 315S/M  | 98.4                    | 7.5   | 2.4  | 2.7  | 3.77                          | 20                              | 44             | 1005        | 72.0        | 1485         | 94.1 | 95.1 | 95.1                                 | 0.78 | 0.84 | 0.87 | 262  |  |  |
| 160                | 220  | 315S/M  | 105                     | 7.6   | 2.4  | 2.6  | 3.79                          | 20                              | 44             | 1005        | 72.0        | 1485         | 94.1 | 95.1 | 95.1                                 | 0.76 | 0.84 | 0.87 | 279  |  |  |
| 185                | 250  | 315S/M  | 121                     | 9.2   | 2.9  | 3.5  | 3.77                          | 13                              | 29             | 1005        | 77.0        | 1485         | 94.2 | 95.0 | 95.1                                 | 0.72 | 0.81 | 0.85 | 330  |  |  |
| 200                | 270  | 355M/L  | 131                     | 6.6   | 2.1  | 2.3  | 6.86                          | 49                              | 108            | 1525        | 79.0        | 1490         | 94.9 | 95.4 | 95.4                                 | 0.80 | 0.86 | 0.88 | 342  |  |  |
| 220                | 300  | 355M/L  | 144                     | 7.0   | 2.1  | 2.4  | 6.86                          | 38                              | 84             | 1620        | 79.0        | 1490         | 94.4 | 95.4 | 95.4                                 | 0.79 | 0.86 | 0.88 | 375  |  |  |
| 250                | 340  | 355M/L  | 163                     | 6.9   | 2.2  | 2.5  | 8.12                          | 36                              | 79             | 1615        | 79.0        | 1490         | 94.6 | 95.4 | 95.4                                 | 0.80 | 0.86 | 0.88 | 425  |  |  |
| 260                | 350  | 355M/L  | 170                     | 6.5   | 2.2  | 2.3  | 8.12                          | 32                              | 70             | 1615        | 79.0        | 1490         | 94.6 | 95.4 | 95.5                                 | 0.80 | 0.86 | 0.88 | 445  |  |  |
| 280                | 380  | 355M/L  | 183                     | 7.1   | 2.2  | 2.4  | 9.02                          | 39                              | 86             | 1770        | 79.0        | 1490         | 95.3 | 95.5 | 95.5                                 | 0.81 | 0.87 | 0.88 | 471  |  |  |
| 300                | 400  | 355M/L  | 196                     | 6.7   | 2.2  | 2.4  | 9.92                          | 47                              | 103            | 1770        | 79.0        | 1490         | 95.1 | 95.6 | 95.6                                 | 0.81 | 0.87 | 0.89 | 504  |  |  |
| 315                | 430  | 355M/L  | 206                     | 7.0   | 2.2  | 2.4  | 9.92                          | 42                              | 92             | 1770        | 79.0        | 1490         | 95.1 | 95.4 | 95.6                                 | 0.79 | 0.86 | 0.88 | 535  |  |  |
| 330                | 450  | 355M/L  | 216                     | 6.5   | 2.3  | 2.3  | 10.8                          | 32                              | 70             | 1865        | 79.0        | 1490         | 94.7 | 95.4 | 95.7                                 | 0.81 | 0.87 | 0.89 | 554  |  |  |
| High Output Design |      |         |                         |   |  |  |                               |                                 |                |             |             |              |      |      |                                      |      |      |      |      |  |  |
| 2.2                | 3    | 112M    | 1.48                    | 6.3   | 1.9  | 2.6  | 0.0117                        | 23                              | 51             | 41.4        | 56.0        | 1445         | 84.5 | 85.0 | 85.0                                 | 0.63 | 0.75 | 0.81 | 4.61 |  |  |
| 4                  | 5.5  | 132S    | 2.66                    | 7.2   | 1.9  | 3.0  | 0.0341                        | 8                               | 18             | 55.6        | 56.0        | 1465         | 85.6 | 86.6 | 86.6                                 | 0.58 | 0.72 | 0.80 | 8.33 |  |  |
| 5.5                | 7.5  | 132M    | 3.67                    | 7.3   | 1.9  | 3.0  | 0.0416                        | 8                               | 18             | 60.4        | 56.0        | 1460         | 87.5 | 88.0 | 88.1                                 | 0.68 | 0.80 | 0.86 | 10.5 |  |  |
| 7.5                | 10   | 132S    | 4.99                    | 7.8   | 2.1  | 3.0  | 0.0528                        | 8                               | 18             | 70.5        | 56.0        | 1465         | 88.7 | 89.0 | 89.0                                 | 0.68 | 0.79 | 0.84 | 14.5 |  |  |
| 15                 | 20   | 180L    | 9.94                    | 7.5   | 2.6  | 2.8  | 0.1566                        | 16                              | 35             | 175         | 64.0        | 1470         | 89.7 | 91.2 | 91.2                                 | 0.66 | 0.77 | 0.82 | 29.0 |  |  |
| 15                 | 20   | 180M    | 9.94                    | 7.5   | 2.6  | 2.8  | 0.1566                        | 16                              | 35             | 175         | 64.0        | 1470         | 89.7 | 91.2 | 91.2                                 | 0.66 | 0.77 | 0.82 | 29.0 |  |  |
| 37                 | 50   | 200L    | 24.4                    | 6.0   | 2.4  | 2.7  | 0.3322                        | 14                              | 31             | 271         | 69.0        | 1475         | 92.8 | 93.0 | 93.0                                 | 0.70 | 0.80 | 0.83 | 69.2 |  |  |
| 37                 | 50   | 250S/M  | 24.4                    | 7.2   | 2.2  | 2.7  | 0.6145                        | 10                              | 22             | 330         | 70.0        | 1475         | 92.6 | 93.0 | 93.0                                 | 0.76 | 0.84 | 0.87 | 66.0 |  |  |
| 75                 | 100  | 250S/M  | 49.4                    | 7.5   | 2.7  | 3.2  | 1.26                          | 16                              | 35             | 530         | 70.0        | 1480         | 93.6 | 94.2 | 94.3                                 | 0.74 | 0.84 | 0.87 | 131  |  |  |
| 110                | 150  | 280S/M  | 72.2                    | 7.9   | 2.9  | 3.6  | 2.82                          | 10                              | 22             | 830         | 72.0        | 1485         | 94.4 | 94.5 | 94.5                                 | 0.77 | 0.85 | 0.87 | 193  |  |  |
| 185                | 250  | 355M/L  | 121                     | 6.9   | 2.0  | 2.5  | 6.34                          | 39                              | 86             | 1415        | 79.0        | 1490         | 94.4 | 95.1 | 95.1                                 | 0.77 | 0.84 | 0.86 | 326  |  |  |
| 200                | 270  | 315S/M* | 131                     | 8.0   | 2.4  | 2.6  | 3.80                          | 17                              | 37             | 1005        | 77.0        | 1485         | 94.6 | 94.9 | 95.1                                 | 0.76 | 0.84 | 0.87 | 346  |  |  |

W21-Cast iron frame motor - IE2 <sup>(1)</sup>

| Output    |      | Frame | Full Load Torque (kgfm) | Locked Rotor Current I <sub>L</sub> /I <sub>n</sub> | Locked Rotor Torque T <sub>L</sub> /T <sub>n</sub> | Break-down Torque T <sub>b</sub> /T <sub>n</sub> | Inertia J (kgm <sup>2</sup> ) | Allowable locked rotor time (s) |                | Weight (kg) | Sound dB(A) | 380 V        |      |      |                                      |                   |                |  |    |              |     | 415 V |                                      |     |  |  |  |
|-----------|------|-------|-------------------------|---|--|--|-------------------------------|---------------------------------|----------------|-------------|-------------|--------------|------|------|--------------------------------------|-------------------|----------------|--|----|--------------|-----|-------|--------------------------------------|-----|--|--|--|
|           |      |       |                         |   |  |  |                               | Rated speed (rpm)               | % of full load |             |             |              |      |      | Full load current I <sub>n</sub> (A) | Rated speed (rpm) | % of full load |  |    |              |     |       | Full load current I <sub>n</sub> (A) |     |  |  |  |
|           |      |       |                         |   |  |  |                               |                                 | Efficiency     |             |             | Power Factor |      |      |                                      |                   | Efficiency     |  |    | Power Factor |     |       |                                      |     |  |  |  |
| kW        | HP   |       |                         |   |  |  |                               | Hot                             | Cold           |             |             | 50           | 75   | 100  | 50                                   | 75                | 100            |  | 50 | 75           | 100 | 50    | 75                                   | 100 |  |  |  |
| 4P - 50Hz |      |       |                         |   |  |  |                               |                                 |                |             |             |              |      |      |                                      |                   |                |  |    |              |     |       |                                      |     |  |  |  |
| 0.55      | 0.75 | 1430  | 75.0                    | 76.5  | 77.1   | 0.60   | 0.72                          | 0.78                            | 1.39           | 1445        | 71.0        | 75.5         | 77.1 | 0.51 | 0.60                                 | 0.70              | 1.42           |  |    |              |     |       |                                      |     |  |  |  |
| 0.75      | 1    | 1400  | 79.0                    | 79.5  | 79.6   | 0.68   | 0.80                          | 0.86                            | 1.66           | 1415        | 77.9        | 79.2         | 79.9 | 0.60 | 0.73                                 | 0.81              | 1.61           |  |    |              |     |       |                                      |     |  |  |  |
| 1.1       | 1.5  | 1432  | 81.9                    | 81.8  | 81.5   | 0.67   | 0.78                          | 0.83                            | 2.47           | 1444        | 80.1        | 81.5         | 82.1 | 0.58 | 0.72                                 | 0.79              | 2.36           |  |    |              |     |       |                                      |     |  |  |  |
| 1.5       | 2    | 1440  | 82.8                    | 83.2  | 82.8   | 0.63   | 0.74                          | 0.80                            | 3.44           | 1450        | 80.1        | 82.3         | 83.1 | 0.53 | 0.67                                 | 0.75              | 3.35           |  |    |              |     |       |                                      |     |  |  |  |
| 2.2       | 3    | 1425  | 83.5                    | 84.3  | 84.3   | 0.64   | 0.76                          | 0.82                            | 4.84           | 1440        | 82.3        | 84.5         | 84.9 | 0.56 | 0.70                                 | 0.78              | 4.62           |  |    |              |     |       |                                      |     |  |  |  |
| 3         | 4    | 1425  | 84.0                    | 85.5  | 86.0   | 0.68   | 0.80                          | 0.85                            | 6.24           | 1435        | 82.0        | 85.5         | 86.0 | 0.60 | 0.73                                 | 0.81              | 5.99           |  |    |              |     |       |                                      |     |  |  |  |
| 4         | 5.5  | 1435  | 86.5                    | 86.6  | 86.6   | 0.69   | 0.80                          | 0.84                            | 8.35           | 1445        | 85.3        | 86.6         | 87.0 | 0.60 | 0.73                                 | 0.80              | 8.00           |  |    |              |     |       |                                      |     |  |  |  |
| 5.5       | 7.5  | 1455  | 88.1                    | 87.7  | 87.7   | 0.73   | 0.83                          | 0.88                            | 10.8           | 1460        | 87.0        | 87.9         | 88.3 | 0.65 | 0.77                                 | 0.84              | 10.3           |  |    |              |     |       |                                      |     |  |  |  |
| 7.5       | 10   | 1465  | 87.0                    | 88.2  | 88.7   | 0.59   | 0.71                          | 0.81                            | 15.9           | 1470        | 85.3        | 87.5         | 88.7 | 0.50 | 0.64                                 | 0.77              | 15.3           |  |    |              |     |       |                                      |     |  |  |  |
| 9.2       | 12.5 | 1450  | 89.6                    | 89.4  | 89.3   | 0.74   | 0.82                          | 0.87                            | 18.0           | 1455        | 88.7        | 89.5         | 89.8 | 0.65 | 0.77                                 | 0.84              | 17.0           |  |    |              |     |       |                                      |     |  |  |  |
| 11        | 15   | 1465  | 88.5                    | 89.0  | 89.8   | 0.68   | 0.79                          | 0.84                            | 22.2           | 1475        | 87.0        | 88.5         | 89.8 | 0.60 | 0.72                                 | 0.80              | 21.3           |  |    |              |     |       |                                      |     |  |  |  |
| 15        | 20   | 1465  | 90.0                    | 90.6  | 90.6   | 0.70   | 0.80                          | 0.85                            | 29.6           | 1470        | 88.5        | 90.3         | 90.6 | 0.60 | 0.73                                 | 0.80              | 28.8           |  |    |              |     |       |                                      |     |  |  |  |
| 18.5      | 25   | 1470  | 91.4                    | 91.5  | 91.5   | 0.71   | 0.81                          | 0.85                            | 36.1           | 1475        | 90.7        | 91.5         | 91.5 | 0.62 | 0.74                                 | 0.81              | 34.7           |  |    |              |     |       |                                      |     |  |  |  |
| 22        | 30   | 1465  | 91.0                    | 91.6  | 91.6   | 0.72   | 0.82                          | 0.86                            | 42.4           | 1470        | 91.0        | 91.6         | 91.6 | 0.64 | 0.76                                 | 0.82              | 40.7           |  |    |              |     |       |                                      |     |  |  |  |
| 30        | 40   | 1470  | 93.0                    | 93.1  | 92.4   | 0.72   | 0.81                          | 0.85                            | 58.0           | 1475        | 92.0        | 92.9         | 92.7 | 0.63 | 0.75                                 | 0.81              | 55.6           |  |    |              |     |       |                                      |     |  |  |  |
| 37        | 50   | 1475  | 93.7                    | 93.6  | 92.7   | 0.83   | 0.88                          | 0.90                            | 67.4           | 1480        | 93.1        | 93.6         | 93.2 | 0.77 | 0.85                                 | 0.88              | 62.8           |  |    |              |     |       |                                      |     |  |  |  |
| 45        | 60   | 1475  | 93.8                    | 93.7  | 93.1   | 0.82   | 0.88                          | 0.89                            | 82.5           | 1480        | 93.1        | 93.6         | 93.3 | 0.75 | 0.84                                 | 0.87              | 77.1           |  |    |              |     |       |                                      |     |  |  |  |
| 55        | 75   | 1475  | 94.6                    | 94.4  | 93.5   | 0.78   | 0.85                          | 0.88                            | 100            | 1480        | 94.2        | 94.5         | 94.0 | 0.72 | 0.82                                 | 0.86              | 94.7           |  |    |              |     |       |                                      |     |  |  |  |
| 75        | 100  | 1480  | 94.5                    | 94.7  | 94.2   | 0.82   | 0.87                          | 0.89                            | 136            | 1485        | 94.0        | 94.6         | 94.5 | 0.77 | 0.84                                 | 0.87              | 127            |  |    |              |     |       |                                      |     |  |  |  |
| 90        |      |       |                         |   |  |  |                               |                                 |                |             |             |              |      |      |                                      |                   |                |  |    |              |     |       |                                      |     |  |  |  |



# W21-Cast iron frame motor - IE2 <sup>(1)</sup>

| Output             |      | Frame   | Full Load Torque (kgfm) | Locked Rotor Current I <sub>L</sub> /I <sub>N</sub> | Locked Rotor Torque T <sub>L</sub> /T <sub>N</sub> | Break-down Torque T <sub>B</sub> /T <sub>N</sub> | Inertia J (kgm <sup>2</sup> ) | 400 V                           |      |      |            |     |      | Weight (kg) | Sound dB(A) | Rated speed (rpm) | % of full load |      |       |  |  |  | Full load current I <sub>N</sub> (A) |
|--------------------|------|---------|-------------------------|---|--|--|-------------------------------|---------------------------------|------|------|------------|-----|------|-------------|-------------|-------------------|----------------|------|-------|--|--|--|--------------------------------------|
|                    |      |         |                         |   |  |  |                               | Allowable locked rotor time (s) |      |      | Efficiency |     |      |             |             |                   | Power Factor   |      |       |  |  |  |                                      |
|                    |      |         |                         |   |  |  |                               | Hot                             | Cold |      | 50         | 75  | 100  |             |             |                   | 50             | 75   | 100   |  |  |  |                                      |
|                    |      |         |                         |   |  |  |                               |                                 |      |      |            |     |      |             |             |                   |                |      |       |  |  |  |                                      |
| 6P - 50Hz          |      |         |                         |   |  |  |                               |                                 |      |      |            |     |      |             |             |                   |                |      |       |  |  |  |                                      |
| 0.25               | 0.33 | 80      | 0.260                   | 4.5   | 1.8  | 2.8  | 0.0022                        | 15                              | 33   | 10.5 | 43.0       | 950 | 49.8 | 57.6        | 61.6        | 0.45              | 0.55           | 0.56 | 1.05  |  |  |  |                                      |
| 0.37               | 0.5  | 80      | 0.400                   | 3.9   | 1.8  | 2.0  | 0.0022                        | 27                              | 59   | 13.9 | 43.0       | 910 | 63.0 | 67.0        | 67.6        | 0.47              | 0.62           | 0.72 | 1.10  |  |  |  |                                      |
| 0.55               | 0.75 | 80      | 0.580                   | 4.5   | 2.1  | 2.2  | 0.0030                        | 21                              | 46   | 17.3 | 43.0       | 920 | 65.0 | 71.0        | 73.1        | 0.50              | 0.62           | 0.72 | 1.51  |  |  |  |                                      |
| 0.75               | 1    | 90S     | 0.790                   | 4.5   | 2.0  | 2.1  | 0.0055                        | 23                              | 51   | 21.3 | 45.0       | 925 | 74.5 | 76.0        | 76.0        | 0.51              | 0.64           | 0.73 | 1.95  |  |  |  |                                      |
| 1.1                | 1.5  | 90L     | 1.16                    | 4.7   | 2.3  | 2.2  | 0.0066                        | 17                              | 37   | 26.9 | 45.0       | 925 | 76.0 | 78.1        | 78.1        | 0.50              | 0.63           | 0.73 | 2.78  |  |  |  |                                      |
| 1.5                | 2    | 100L    | 1.55                    | 5.0   | 2.0  | 2.4  | 0.0110                        | 23                              | 51   | 29.3 | 44.0       | 940 | 79.5 | 80.0        | 80.0        | 0.51              | 0.64           | 0.73 | 3.71  |  |  |  |                                      |
| 2.2                | 3    | 112M    | 2.26                    | 6.2   | 2.4  | 2.6  | 0.0224                        | 16                              | 35   | 43.5 | 49.0       | 950 | 80.5 | 82.7        | 82.7        | 0.52              | 0.64           | 0.72 | 5.26  |  |  |  |                                      |
| 3                  | 4    | 132S    | 3.04                    | 5.7   | 2.0  | 2.4  | 0.0359                        | 31                              | 68   | 61.6 | 53.0       | 960 | 82.5 | 83.6        | 83.6        | 0.50              | 0.63           | 0.71 | 7.30  |  |  |  |                                      |
| 4                  | 5.5  | 132M    | 4.06                    | 6.0   | 2.1  | 2.5  | 0.0453                        | 21                              | 46   | 63.2 | 53.0       | 960 | 84.0 | 84.8        | 84.8        | 0.51              | 0.64           | 0.72 | 9.46  |  |  |  |                                      |
| 5.5                | 7.5  | 132M    | 5.58                    | 6.4   | 2.2  | 2.7  | 0.0604                        | 19                              | 42   | 76.0 | 53.0       | 960 | 85.5 | 86.1        | 86.1        | 0.51              | 0.64           | 0.72 | 12.8  |  |  |  |                                      |
| 7.5                | 10   | 160M    | 7.45                    | 6.6   | 2.3  | 2.9  | 0.1055                        | 10                              | 22   | 97.8 | 57.0       | 980 | 86.6 | 87.2        | 87.2        | 0.58              | 0.71           | 0.79 | 15.7  |  |  |  |                                      |
| 9.2                | 12.5 | 160L    | 9.14                    | 6.8   | 2.4  | 3.0  | 0.1266                        | 8                               | 18   | 118  | 57.0       | 980 | 86.5 | 87.5        | 88.1        | 0.56              | 0.70           | 0.78 | 19.3  |  |  |  |                                      |
| 11                 | 15   | 160L    | 11.1                    | 6.5   | 2.4  | 2.8  | 0.1407                        | 10                              | 22   | 132  | 57.0       | 970 | 88.0 | 88.7        | 88.7        | 0.63              | 0.75           | 0.81 | 22.1  |  |  |  |                                      |
| 15                 | 20   | 180L    | 14.9                    | 8.4   | 2.5  | 3.7  | 0.3381                        | 6                               | 13   | 167  | 56.0       | 980 | 87.0 | 89.0        | 89.7        | 0.61              | 0.74           | 0.82 | 29.4  |  |  |  |                                      |
| 18.5               | 25   | 200L    | 18.4                    | 6.3   | 2.3  | 3.0  | 0.3335                        | 11                              | 24   | 212  | 58.0       | 980 | 89.2 | 90.2        | 90.4        | 0.60              | 0.74           | 0.79 | 37.4  |  |  |  |                                      |
| 22                 | 30   | 200L    | 21.9                    | 7.0   | 2.5  | 3.1  | 0.3868                        | 10                              | 22   | 226  | 58.0       | 980 | 89.3 | 90.5        | 90.9        | 0.59              | 0.72           | 0.79 | 44.2  |  |  |  |                                      |
| 30                 | 40   | 225S/M  | 29.7                    | 7.0   | 2.3  | 2.6  | 0.8328                        | 10                              | 22   | 330  | 61.0       | 985 | 92.0 | 92.2        | 92.2        | 0.70              | 0.79           | 0.84 | 55.9  |  |  |  |                                      |
| 37                 | 50   | 250S/M  | 36.6                    | 7.0   | 2.5  | 2.6  | 1.02                          | 10                              | 22   | 400  | 61.0       | 985 | 92.0 | 92.6        | 92.6        | 0.72              | 0.81           | 0.84 | 68.7  |  |  |  |                                      |
| 45                 | 60   | 280S/M  | 44.5                    | 6.8   | 2.2  | 2.7  | 2.02                          | 10                              | 22   | 550  | 66.0       | 985 | 93.0 | 93.2        | 93.2        | 0.67              | 0.77           | 0.82 | 85.0  |  |  |  |                                      |
| 55                 | 75   | 280S/M  | 54.4                    | 6.7   | 2.1  | 2.6  | 2.26                          | 10                              | 22   | 610  | 66.0       | 985 | 93.0 | 93.5        | 93.5        | 0.67              | 0.78           | 0.82 | 104   |  |  |  |                                      |
| 75                 | 100  | 315S/M  | 74.2                    | 6.7   | 2.1  | 2.4  | 3.05                          | 10                              | 22   | 700  | 69.0       | 985 | 93.8 | 94.0        | 94.0        | 0.72              | 0.81           | 0.84 | 137   |  |  |  |                                      |
| 90                 | 125  | 315S/M  | 89.0                    | 6.5   | 2.2  | 2.4  | 3.59                          | 12                              | 26   | 830  | 69.0       | 985 | 94.0 | 94.2        | 94.2        | 0.71              | 0.80           | 0.83 | 166   |  |  |  |                                      |
| 110                | 150  | 315S/M  | 109                     | 6.5   | 2.2  | 2.4  | 4.93                          | 12                              | 26   | 1000 | 69.0       | 985 | 94.1 | 94.6        | 94.6        | 0.69              | 0.79           | 0.84 | 200   |  |  |  |                                      |
| 150                | 200  | 355M/L  | 148                     | 6.0   | 1.9  | 2.2  | 9.05                          | 81                              | 178  | 1460 | 73.0       | 990 | 93.5 | 95.0        | 95.3        | 0.65              | 0.75           | 0.80 | 282   |  |  |  |                                      |
| 160                | 220  | 355M/L  | 157                     | 6.0   | 1.9  | 2.1  | 9.53                          | 76                              | 167  | 1460 | 73.0       | 990 | 93.8 | 95.2        | 95.3        | 0.65              | 0.77           | 0.81 | 297   |  |  |  |                                      |
| 185                | 250  | 355M/L  | 182                     | 6.0   | 1.9  | 2.1  | 10.2                          | 76                              | 167  | 1530 | 73.0       | 990 | 94.2 | 95.2        | 95.3        | 0.65              | 0.75           | 0.80 | 350   |  |  |  |                                      |
| 200                | 270  | 355M/L  | 197                     | 6.1   | 2.2  | 2.3  | 12.1                          | 28                              | 62   | 1650 | 73.0       | 990 | 94.5 | 95.4        | 95.4        | 0.66              | 0.76           | 0.81 | 374   |  |  |  |                                      |
| 220                | 300  | 355M/L  | 215                     | 6.5   | 2.0  | 2.3  | 13.5                          | 25                              | 55   | 1800 | 73.0       | 995 | 94.5 | 95.4        | 95.4        | 0.64              | 0.75           | 0.80 | 416   |  |  |  |                                      |
| 250                | 340  | 355M/L  | 246                     | 6.1   | 1.9  | 2.1  | 14.8                          | 64                              | 141  | 1890 | 73.0       | 990 | 94.6 | 95.2        | 95.4        | 0.69              | 0.78           | 0.81 | 463   |  |  |  |                                      |
| 260                | 350  | 355M/L  | 256                     | 6.0   | 1.8  | 2.0  | 14.8                          | 64                              | 141  | 1830 | 73.0       | 990 | 94.6 | 95.2        | 95.4        | 0.69              | 0.78           | 0.81 | 482   |  |  |  |                                      |
| 280                | 380  | 355M/L* | 275                     | 6.0   | 2.1  | 2.2  | 14.8                          | 54                              | 119  | 1890 | 73.0       | 990 | 94.2 | 95.3        | 95.4        | 0.68              | 0.77           | 0.80 | 530   |  |  |  |                                      |
| 300                | 400  | 355M/L* | 295                     | 6.4   | 1.9  | 2.1  | 14.8                          | 39                              | 86   | 1920 | 73.0       | 990 | 93.8 | 95.0        | 95.0        | 0.69              | 0.78           | 0.81 | 563   |  |  |  |                                      |
| 315                | 430  | 355M/L* | 310                     | 6.0   | 1.9  | 1.9  | 15.5                          | 38                              | 84   | 1950 | 73.0       | 990 | 94.2 | 95.4        | 95.5        | 0.69              | 0.78           | 0.81 | 588   |  |  |  |                                      |
| High Output Design |      |         |                         |   |  |  |                               |                                 |      |      |            |     |      |             |             |                   |                |      |       |  |  |  |                                      |
| 3                  | 4    | 132M    | 3.04                    | 5.7   | 2.0  | 2.4  | 0.0359                        | 31                              | 68   | 61.6 | 53.0       | 960 | 82.5 | 83.6        | 83.6        | 0.50              | 0.63           | 0.71 | 7.30  |  |  |  |                                      |
| 5.5                | 7.5  | 160M    | 5.47                    | 6.4   | 2.1  | 2.7  | 0.1436                        | 14                              | 31   | 106  | 57.0       | 980 | 85.0 | 85.5        | 86.0        | 0.59              | 0.72           | 0.79 | 11.7  |  |  |  |                                      |
| 37                 | 50   | 225S/M  | 36.6                    | 7.0   | 2.5  | 2.6  | 1.02                          | 10                              | 22   | 400  | 61.0       | 985 | 92.0 | 92.6        | 92.6        | 0.72              | 0.81           | 0.84 | 68.7  |  |  |  |                                      |
| 45                 | 60   | 250S/M  | 44.5                    | 7.9   | 2.8  | 2.9  | 1.30                          | 14                              | 31   | 530  | 61.0       | 985 | 92.8 | 93.0        | 93.0        | 0.69              | 0.79           | 0.83 | 84.1  |  |  |  |                                      |
| 75                 | 100  | 280S/M  | 74.2                    | 6.7   | 2.1  | 2.4  | 3.05                          | 10                              | 22   | 700  | 66.0       | 985 | 93.8 | 94.0        | 94.0        | 0.72              | 0.81           | 0.84 | 137   |  |  |  |                                      |
| 132                | 175  | 355M/L  | 130                     | 6.1   | 1.9  | 2.2  | 9.05                          | 90                              | 198  | 1400 | 73.0       | 990 | 93.4 | 94.8        | 95.1        | 0.67              | 0.77           | 0.81 | 247   |  |  |  |                                      |
| 8P - 50Hz          |      |         |                         |   |  |  |                               |                                 |      |      |            |     |      |             |             |                   |                |      |       |  |  |  |                                      |
| 0.18               | 0.25 | 80      | 0.260                   | 3.1   | 1.7  | 2.1  | 0.0024                        | 27                              | 59   | 13.8 | 42.0       | 670 | 34.9 | 44.1        | 45.9        | 0.50              | 0.59           | 0.68 | 0.832 |  |  |  |                                      |
| 0.25               | 0.33 | 80      | 0.360                   | 3.2   | 1.9  | 2.1  | 0.0029                        | 42                              | 92   | 14.7 | 42.0       | 670 | 49.0 | 55.0        | 57.0        | 0.43              | 0.55           | 0.66 | 0.959 |  |  |  |                                      |
| 0.37               | 0.5  | 90S     | 0.520                   | 3.5   | 2.1  | 2.5  | 0.0044                        | 23                              | 51   | 22.8 | 44.0       | 690 | 46.2 | 53.3        | 56.1        | 0.41              | 0.52           | 0.62 | 1.54  |  |  |  |                                      |
| 0.55               | 0.75 | 90L     | 0.780                   | 3.5   | 1.9  | 2.0  | 0.0060                        | 31                              | 68   | 24.3 | 44.0       | 685 | 61.0 | 64.0        | 64.0        | 0.44              | 0.56           | 0.66 | 1.88  |  |  |  |                                      |
| 0.75               | 1    | 100L    | 1.03                    | 4.4   | 1.9  | 2.4  | 0.0110                        | 25                              | 55   | 31.8 | 50.0       | 710 | 61.8 | 66.2        | 66.2        | 0.40              | 0.50           | 0.59 | 2.77  |  |  |  |                                      |
| 1.1                | 1.5  | 100L    | 1.52                    | 4.6   | 2.1  | 2.3  | 0.0127                        | 29                              | 64   | 34.2 | 50.0       | 705 | 71.0 | 75.0        | 75.0        | 0.40              | 0.53           | 0.62 | 3.41  |  |  |  |                                      |
| 1.5                | 2    | 112M    | 2.09                    | 4.7   | 2.4  | 2.3  | 0.0202                        | 29                              | 64   | 39.6 | 46.0       | 700 | 77.0 | 79.0        | 79.0        | 0.44              | 0.57           | 0.67 | 4.09  |  |  |  |                                      |
| 2.2                | 3    | 132S    | 3.06                    | 5.5   | 2.2  | 2.4  | 0.0592                        | 25                              | 55   | 57.3 | 48.0       | 700 | 81.0 | 81.5        | 81.0        | 0.52              | 0.65           | 0.72 | 5.44  |  |  |  |                                      |
| 3                  | 4    | 132M    | 4.17                    | 5.5   | 2.3  | 2.4  | 0.0740                        | 19                              | 42   | 70.1 | 48.0       | 700 | 82.0 | 82.5        | 82.0        | 0.54              | 0.66           | 0.73 | 7.23  |  |  |  |                                      |
| 4                  | 5.5  | 160M    | 5.34                    | 5.5   | 2.1  | 3.0  | 0.0985                        | 13                              | 29   | 95.5 | 53.0       | 730 | 80.0 | 81.9        | 81.9        | 0.48              | 0.61           | 0.70 | 10.1  |  |  |  |                                      |
| 5.5                | 7.5  | 160M    | 7.34                    | 5.5   | 2.1  | 3.0  | 0.1266                        | 9                               | 20   | 118  | 53.0       | 730 | 79.0 | 81.5        | 83.8        | 0.47              | 0.60           | 0.69 | 13.7  |  |  |  |                                      |
| 7.5                | 10   | 160L    | 10.0                    | 5.6   | 2.4  | 3.1  | 0.1555                        | 15                              | 33   | 123  | 53.0       | 730 | 84.0 | 85.3        | 85.3        | 0.50              | 0.63           | 0.71 | 17.9  |  |  |  |                                      |
| 9.2                | 12.5 | 180M    | 12.2                    | 7.0   | 2.1  | 2.9  | 0.1906                        | 8                               | 18   | 156  | 51.0       | 735 | 85.0 | 86.0        | 86.3        | 0.55              | 0.68           | 0.76 | 20.2  |  |  |  |                                      |
| 11                 | 15   | 180L    | 14.6                    | 7.4   | 2.3  | 3.1  | 0.2620                        | 8                               | 18   | 183  | 51.0       | 735 | 85.0 | 86.0        | 86.9        | 0.55              | 0.68           | 0.76 | 24.0  |  |  |  |                                      |
| 15                 | 20   | 200L    | 19.9                    | 5.5   | 2.0  | 2.5  | 0.4228                        | 16                              | 35   | 239  | 53.0       | 735 | 86.3 | 88.0        | 88.0        | 0.51              | 0.65           | 0.74 | 33.2  |  |  |  |                                      |
| 18.5               | 25   | 225S/M  | 24.7                    | 7.4   | 2.1  | 2.8  | 0.8472                        | 18                              | 40   | 340  | 60.0       | 730 | 89.7 | 89.8        | 89.9        | 0.62              | 0.74           | 0.80 | 37.1  |  |  |  |                                      |
| 22                 | 30   | 225S/M  | 29.2                    | 7.5   | 2.2  | 3.0  | 0.9884                        | 18                              | 40   | 365  | 60.0       | 735 | 89.5 | 90.0        | 90.5        | 0.67              | 0.77           | 0.82 | 42.8  |  |  |  |                                      |
| 30                 | 40   | 250S/M  | 40.0                    | 7.5   | 2.1  | 2.8  | 1.22                          | 17                              | 37   | 440  | 60.0       | 730 | 90.0 | 90.0        | 90.4        | 0.69              | 0.79           | 0.83 | 57.7  |  |  |  |                                      |
| 37                 | 50   | 280S/M  | 48.7                    | 7.5   | 1.9  | 2.6  | 2.37                          | 20                              | 44   | 540  | 62.0       | 740 | 91.0 | 91.5        | 91.5        | 0.60              | 0.72           | 0.77 | 75.8  |  |  |  |                                      |
| 45                 | 60   | 280S/M  | 59.2                    | 6.5   | 2.0  | 2.4  | 2.83                          | 20                              | 44   | 640  | 62.0       | 740 | 91.9 | 92.0        | 92.1        | 0.62              | 0.73           | 0.79 | 89.3  |  |  |  |                                      |
| 55                 | 75   | 315S/M  | 72.4                    | 6.5   | 1.8  | 2.2  | 3.17                          | 28                              | 62   | 680  | 62.0       | 740 | 92.0 | 92.3        | 92.4        | 0.63              | 0.74           | 0.79 | 109   |  |  |  |                                      |
| 75                 | 100  | 315S/M  | 98.7                    | 6.6   | 1.9  | 2.4  | 4.37                          | 20                              | 44   | 876  | 62.0       | 740 | 92.5 | 92.6        | 92.8        | 0.65              | 0.75           | 0.79 | 148   |  |  |  |                                      |
| 90                 | 125  | 315S/M  | 118                     | 6.8   | 1.9  | 2.4  | 5.29                          | 23                              | 51   | 970  | 62.0       | 740 | 93.9 | 94.3        | 94.5        | 0.67              | 0.77           | 0.81 | 169   |  |  |  |                                      |
| 110                | 150  | 355M/L  | 145                     | 6.4   | 1.5  | 2.2  | 12.6                          | 41                              | 90   | 1430 | 70.0       | 740 | 92.0 | 92.3        | 92.3        | 0.62              | 0.73           | 0.79 | 218   |  |  |  |                                      |
| 132                | 175  | 355M/L  | 173                     | 6.5   | 1.6  | 2.3  | 13.2                          | 47                              | 103  | 1445 | 70.0       | 745 | 92.0 | 92.5        | 92.6        | 0.63              | 0.73           | 0.79 | 260   |  |  |  |                                      |
| 150                | 200  | 355M/L  | 197                     | 7.0   | 1.6  | 2.2  | 15.9                          | 40                              | 88   | 1600 | 70.0       | 740 | 94.3 | 95.0        | 95.2        | 0.61              | 0.72           | 0.78 | 290   |  |  |  |                                      |
| 160                | 220  | 355M/L  | 209                     | 6.6   | 1.5  | 2.4  | 16.3                          | 42                              | 92   | 1590 | 70.0       | 745 | 94.0 | 94.2        | 94.2        | 0.60              | 0.72           | 0.78 | 314   |  |  |  |                                      |
| 185                | 250  | 355M/L  | 242                     | 6.5   | 1.6  | 2.2  | 17.3                          | 30                              | 66   | 1730 | 70.0       | 745 | 93.0 | 94.2        | 94.4        | 0.58              | 0.70           | 0.78 | 363   |  |  |  |                                      |
| 200                | 270  | 355M/L  | 263                     | 6.8   | 1.6  | 2.1  | 19.5                          | 37                              | 81   | 1830 |            |     |      |             |             |                   |                |      |       |  |  |  |                                      |

W21-Cast iron frame motor - IE3 (1)

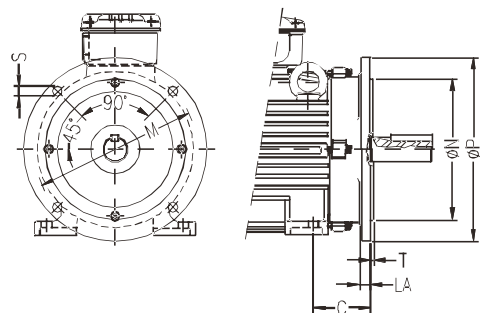
| Output<br>kW       | HP   | Frame   | Full Load Torque (kgfm) | Locked Rotor Current I/In | Locked Rotor Torque Tl/Tn | Break-down Torque Td/Tn | Inertia J (kgm2) | Allowable locked rotor time (s) |      | Weight (kg) | Sound dB(A) | Rated speed (rpm) | 400 V % of full load |      |      |              |      |      | Full load current In (A) |
|--------------------|------|---------|-------------------------|---------------------------|---------------------------|-------------------------|------------------|---------------------------------|------|-------------|-------------|-------------------|----------------------|------|------|--------------|------|------|--------------------------|
|                    |      |         |                         |                           |                           |                         |                  | Hot                             | Cold |             |             |                   | Efficiency           |      |      | Power Factor |      |      |                          |
|                    |      |         |                         |                           |                           |                         |                  |                                 |      |             |             |                   | 50                   | 75   | 100  | 50           | 75   | 100  |                          |
| 2P - 50Hz          |      |         |                         |                           |                           |                         |                  |                                 |      |             |             |                   |                      |      |      |              |      |      |                          |
| 0.75               | 1    | 80      | 0.255                   | 7.5                       | 2.4                       | 2.8                     | 0.0008           | 18                              | 40   | 13.7        | 59          | 2870              | 74.2                 | 78.0 | 80.7 | 0.58         | 0.70 | 0.79 | 1.70                     |
| 1.1                | 1.5  | 80      | 0.379                   | 7.4                       | 3.6                       | 3.6                     | 0.0009           | 23                              | 51   | 15.5        | 59          | 2830              | 81.0                 | 83.0 | 83.0 | 0.63         | 0.76 | 0.82 | 2.33                     |
| 1.5                | 2    | 90S     | 0.508                   | 7.6                       | 3.3                       | 3.3                     | 0.0020           | 15                              | 33   | 21.8        | 62          | 2875              | 83.0                 | 84.0 | 84.5 | 0.64         | 0.76 | 0.83 | 3.09                     |
| 2.2                | 3    | 90L     | 0.744                   | 7.5                       | 2.9                       | 3.5                     | 0.0026           | 12                              | 26   | 28.5        | 62          | 2880              | 83.5                 | 85.5 | 85.9 | 0.65         | 0.77 | 0.83 | 4.45                     |
| 3                  | 4    | 100L    | 1.01                    | 8.1                       | 2.9                       | 3.6                     | 0.0064           | 15                              | 33   | 32.7        | 67          | 2900              | 85.0                 | 86.5 | 87.2 | 0.69         | 0.81 | 0.86 | 5.77                     |
| 4                  | 5.5  | 112M    | 1.34                    | 7.7                       | 2.5                       | 3.5                     | 0.0080           | 14                              | 31   | 42.6        | 62          | 2900              | 87.0                 | 88.0 | 88.3 | 0.69         | 0.80 | 0.86 | 7.60                     |
| 5.5                | 7.5  | 132S    | 1.82                    | 7.9                       | 2.3                       | 3.4                     | 0.0216           | 14                              | 31   | 68.7        | 67          | 2945              | 86.4                 | 88.5 | 89.2 | 0.68         | 0.79 | 0.85 | 10.5                     |
| 7.5                | 10   | 132S    | 2.49                    | 7.2                       | 2.5                       | 3.2                     | 0.0252           | 16                              | 35   | 71.6        | 67          | 2935              | 87.8                 | 89.7 | 90.1 | 0.70         | 0.81 | 0.86 | 14.0                     |
| 9.2                | 12.5 | 132M    | 3.05                    | 8.5                       | 3                         | 3.8                     | 0.0306           | 13                              | 29   | 80.7        | 63          | 2940              | 88.2                 | 90.0 | 90.7 | 0.62         | 0.75 | 0.82 | 17.9                     |
| 11                 | 15   | 160M    | 3.63                    | 9.3                       | 3.1                       | 3.8                     | 0.0506           | 12                              | 26   | 121         | 70          | 2955              | 89.0                 | 90.5 | 91.2 | 0.70         | 0.80 | 0.85 | 20.5                     |
| 15                 | 20   | 160M    | 4.96                    | 8.9                       | 3.1                       | 3.6                     | 0.0565           | 11                              | 24   | 123         | 70          | 2945              | 90.0                 | 91.0 | 91.9 | 0.69         | 0.80 | 0.84 | 28.0                     |
| 18.5               | 25   | 160L    | 6.12                    | 8.8                       | 3.1                       | 3.5                     | 0.0650           | 11                              | 24   | 137         | 70          | 2945              | 90.5                 | 91.5 | 92.4 | 0.73         | 0.82 | 0.86 | 33.6                     |
| 22                 | 30   | 180M    | 7.24                    | 8.3                       | 2.6                       | 3.2                     | 0.1192           | 10                              | 22   | 182         | 70          | 2960              | 92.0                 | 92.7 | 92.7 | 0.69         | 0.80 | 0.85 | 40.3                     |
| 30                 | 40   | 200L    | 9.85                    | 7.6                       | 2.4                       | 2.7                     | 0.2063           | 14                              | 31   | 239         | 74          | 2965              | 92.0                 | 93.0 | 93.3 | 0.76         | 0.84 | 0.87 | 53.3                     |
| 37                 | 50   | 200L    | 12.2                    | 7.3                       | 2.2                       | 2.8                     | 0.2242           | 18                              | 40   | 263         | 74          | 2960              | 92.5                 | 93.5 | 93.7 | 0.74         | 0.82 | 0.85 | 67.1                     |
| 45                 | 60   | 225S/M  | 14.8                    | 8.7                       | 2.6                       | 3.2                     | 0.4961           | 20                              | 44   | 410         | 82          | 2965              | 92.5                 | 93.6 | 94.0 | 0.77         | 0.84 | 0.87 | 79.4                     |
| 55                 | 75   | 250S/M  | 18.1                    | 8.0                       | 2.3                       | 3                       | 0.5303           | 10                              | 22   | 470         | 82          | 2965              | 93.5                 | 94.0 | 94.3 | 0.77         | 0.85 | 0.88 | 95.7                     |
| 75                 | 100  | 280S/M  | 24.6                    | 7.8                       | 2                         | 2.8                     | 1.20             | 20                              | 44   | 700         | 83          | 2975              | 92.5                 | 94.0 | 94.7 | 0.79         | 0.86 | 0.89 | 128                      |
| 90                 | 125  | 280S/M  | 29.5                    | 7.5                       | 2                         | 2.7                     | 1.31             | 20                              | 44   | 780         | 83          | 2970              | 93.5                 | 94.5 | 95.0 | 0.80         | 0.87 | 0.89 | 154                      |
| 110                | 150  | 315S/M  | 36.0                    | 9.0                       | 2.1                       | 3.2                     | 1.40             | 23                              | 51   | 830         | 83          | 2975              | 94.0                 | 95.0 | 95.2 | 0.79         | 0.87 | 0.89 | 187                      |
| 132                | 175  | 315S/M  | 43.2                    | 8.8                       | 1.9                       | 3.1                     | 1.62             | 22                              | 48   | 900         | 83          | 2975              | 94.7                 | 95.4 | 95.4 | 0.79         | 0.87 | 0.90 | 222                      |
| 160                | 220  | 315S/M  | 52.4                    | 7.3                       | 2                         | 2.8                     | 1.97             | 30                              | 66   | 990         | 83          | 2975              | 95.0                 | 95.8 | 95.8 | 0.79         | 0.86 | 0.89 | 271                      |
| 200                | 270  | 355M/L  | 65.3                    | 7.7                       | 2.2                       | 2.7                     | 4.85             | 50                              | 110  | 1490        | 81          | 2985              | 94.0                 | 95.0 | 95.8 | 0.88         | 0.90 | 0.91 | 331                      |
| 220                | 300  | 355M/L* | 71.7                    | 7.8                       | 2.6                       | 2.9                     | 5.06             | 44                              | 97   | 1500        | 81          | 2987              | 94.4                 | 95.4 | 95.8 | 0.84         | 0.88 | 0.89 | 372                      |
| 250                | 340  | 355M/L* | 81.5                    | 9.0                       | 2.8                       | 3.4                     | 5.28             | 35                              | 77   | 1500        | 81          | 2987              | 94.6                 | 95.6 | 95.8 | 0.82         | 0.88 | 0.89 | 423                      |
| High Output Design |      |         |                         |                           |                           |                         |                  |                                 |      |             |             |                   |                      |      |      |              |      |      |                          |
| 0.75               | 1    | 90S     | 0.250                   | 8.2                       | 2.6                       | 3.4                     | 0.0015           | 13                              | 29   | 17.3        | 62          | 2920              | 79.0                 | 82.5 | 83.0 | 0.60         | 0.73 | 0.81 | 1.61                     |
| 1.1                | 1.5  | 90S     | 0.370                   | 7.8                       | 2.2                       | 2.9                     | 0.0018           | 12                              | 26   | 19.4        | 62          | 2895              | 82.0                 | 84.2 | 84.5 | 0.63         | 0.75 | 0.82 | 2.29                     |
| 1.5                | 2    | 90L     | 0.502                   | 7.2                       | 2.2                       | 3.1                     | 0.0020           | 9                               | 20   | 21.8        | 62          | 2910              | 81.3                 | 83.5 | 84.2 | 0.64         | 0.76 | 0.83 | 3.10                     |
| 4                  | 5.5  | 132S    | 1.32                    | 7.2                       | 2.1                       | 3.3                     | 0.0180           | 19                              | 42   | 61.4        | 63          | 2945              | 84.7                 | 87.1 | 88.1 | 0.67         | 0.79 | 0.85 | 7.71                     |
| 5.5                | 7.5  | 132M    | 1.82                    | 7.9                       | 2.3                       | 3.4                     | 0.0216           | 14                              | 31   | 68.7        | 67          | 2945              | 86.4                 | 88.5 | 89.2 | 0.68         | 0.79 | 0.85 | 10.5                     |
| 7.5                | 10   | 132M    | 2.48                    | 8.8                       | 2.8                       | 3.9                     | 0.0252           | 10                              | 22   | 71.6        | 67          | 2950              | 87.0                 | 89.0 | 90.1 | 0.65         | 0.77 | 0.84 | 14.3                     |
| 11                 | 15   | 132M    | 3.65                    | 7.7                       | 2.8                       | 3.4                     | 0.0306           | 12                              | 26   | 84.9        | 63          | 2935              | 89.3                 | 90.0 | 91.2 | 0.70         | 0.81 | 0.86 | 20.2                     |
| 15                 | 20   | 160L    | 4.96                    | 8.9                       | 3.1                       | 3.6                     | 0.0565           | 11                              | 24   | 123         | 70          | 2945              | 90.0                 | 91.0 | 91.9 | 0.69         | 0.80 | 0.84 | 28.0                     |
| 22                 | 30   | 180L    | 7.24                    | 8.3                       | 2.6                       | 3.2                     | 0.1192           | 10                              | 22   | 182         | 70          | 2960              | 92.0                 | 92.7 | 92.7 | 0.69         | 0.80 | 0.85 | 40.3                     |
| 110                | 150  | 280S/M  | 36.0                    | 9.0                       | 2.1                       | 3.2                     | 1.40             | 23                              | 51   | 830         | 83          | 2975              | 94.0                 | 95.0 | 95.2 | 0.79         | 0.87 | 0.89 | 187                      |
| 200                | 270  | 315S/M  | 65.4                    | 7.4                       | 2.2                       | 2.6                     | 2.03             | 49                              | 108  | 1045        | 83          | 2980              | 95.0                 | 95.8 | 95.9 | 0.81         | 0.86 | 0.88 | 342                      |
| 4P - 50Hz          |      |         |                         |                           |                           |                         |                  |                                 |      |             |             |                   |                      |      |      |              |      |      |                          |
| 0.55               | 0.75 | 80      | 0.377                   | 6.6                       | 2.8                       | 3.0                     | 0.0026           | 20                              | 44   | 16.2        | 44          | 1420              | 77.0                 | 79.0 | 80.8 | 0.61         | 0.74 | 0.80 | 1.23                     |
| 0.75               | 1    | 80      | 0.506                   | 7.0                       | 2.7                       | 3.1                     | 0.0032           | 18                              | 40   | 17.7        | 44          | 1445              | 80.3                 | 81.5 | 82.5 | 0.53         | 0.67 | 0.76 | 1.73                     |
| 1.1                | 1.5  | 90S     | 0.739                   | 6.5                       | 2.1                       | 2.7                     | 0.0055           | 15                              | 33   | 24.3        | 49          | 1450              | 82.2                 | 84.1 | 84.1 | 0.59         | 0.70 | 0.78 | 2.42                     |
| 1.5                | 2    | 90L     | 1.01                    | 7.4                       | 2.6                       | 3.4                     | 0.0066           | 13                              | 29   | 25.0        | 49          | 1450              | 84.0                 | 86.0 | 86.0 | 0.58         | 0.72 | 0.80 | 3.15                     |
| 2.2                | 3    | 100L    | 1.49                    | 7.4                       | 3.2                       | 3.5                     | 0.0090           | 18                              | 40   | 35.1        | 53          | 1435              | 86.5                 | 87.0 | 87.0 | 0.60         | 0.73 | 0.80 | 4.56                     |
| 3                  | 4    | L100L   | 2.03                    | 7.8                       | 3.5                       | 3.7                     | 0.0120           | 15                              | 33   | 43.5        | 53          | 1440              | 87.0                 | 88.0 | 88.0 | 0.60         | 0.73 | 0.80 | 6.15                     |
| 4                  | 5.5  | 112M    | 2.69                    | 7.0                       | 2.3                       | 3.1                     | 0.0182           | 15                              | 33   | 47.7        | 56          | 1450              | 86.0                 | 88.0 | 88.8 | 0.60         | 0.72 | 0.79 | 8.03                     |
| 5.5                | 7.5  | 132S    | 3.66                    | 8.2                       | 2.1                       | 2.9                     | 0.0528           | 15                              | 33   | 65.4        | 56          | 1465              | 87.5                 | 89.0 | 89.6 | 0.67         | 0.79 | 0.85 | 10.4                     |
| 7.5                | 10   | 132M    | 4.99                    | 8.5                       | 2.5                       | 3.4                     | 0.0642           | 13                              | 29   | 76.8        | 56          | 1465              | 87.5                 | 90.0 | 90.6 | 0.67         | 0.78 | 0.84 | 14.2                     |
| 11                 | 15   | 160M    | 7.29                    | 7.5                       | 2.9                       | 3.1                     | 0.1071           | 12                              | 26   | 121         | 62          | 1470              | 89.2                 | 90.2 | 91.4 | 0.61         | 0.74 | 0.80 | 21.7                     |
| 15                 | 20   | 160L    | 9.97                    | 7.2                       | 2.7                       | 2.9                     | 0.1263           | 8                               | 18   | 144         | 62          | 1465              | 89.7                 | 90.5 | 92.1 | 0.63         | 0.76 | 0.82 | 28.7                     |
| 18.5               | 25   | 180M    | 12.3                    | 7.8                       | 2.7                       | 3                       | 0.2088           | 12                              | 26   | 183         | 64          | 1470              | 91.0                 | 92.2 | 92.6 | 0.70         | 0.77 | 0.83 | 34.7                     |
| 22                 | 30   | 180L    | 14.6                    | 8.0                       | 2.8                       | 3.1                     | 0.2393           | 20                              | 44   | 202         | 64          | 1470              | 92.0                 | 93.0 | 93.0 | 0.68         | 0.78 | 0.84 | 40.6                     |
| 30                 | 40   | 200L    | 19.7                    | 7.5                       | 2.7                       | 3.2                     | 0.3861           | 9                               | 20   | 271         | 67          | 1480              | 93.0                 | 93.6 | 93.6 | 0.64         | 0.75 | 0.81 | 57.1                     |
| 37                 | 50   | 225S/M  | 24.4                    | 8.0                       | 2.8                       | 3.1                     | 0.6999           | 10                              | 22   | 380         | 70          | 1480              | 93.0                 | 93.9 | 93.9 | 0.70         | 0.80 | 0.84 | 67.7                     |
| 45                 | 60   | 225S/M  | 29.6                    | 8.5                       | 2.8                       | 3.2                     | 0.8398           | 10                              | 22   | 400         | 70          | 1480              | 94.0                 | 94.2 | 94.2 | 0.74         | 0.83 | 0.86 | 80.2                     |
| 55                 | 75   | 250S/M  | 36.2                    | 7.5                       | 3                         | 3.2                     | 1.15             | 8                               | 18   | 470         | 70          | 1480              | 94.2                 | 94.6 | 94.6 | 0.69         | 0.80 | 0.85 | 98.7                     |
| 75                 | 100  | 280S/M  | 49.2                    | 8.1                       | 2.3                       | 3.2                     | 2.11             | 22                              | 48   | 660         | 72          | 1485              | 94.5                 | 95.0 | 95.0 | 0.70         | 0.80 | 0.84 | 136                      |
| 90                 | 125  | 280S/M  | 59.0                    | 8.0                       | 2.3                       | 3.2                     | 2.72             | 20                              | 44   | 800         | 72          | 1485              | 95.0                 | 95.2 | 95.2 | 0.72         | 0.81 | 0.85 | 161                      |
| 110                | 150  | 315S/M  | 72.1                    | 8.0                       | 2.5                       | 3.3                     | 3.33             | 16                              | 35   | 860         | 77          | 1485              | 95.0                 | 95.4 | 95.4 | 0.74         | 0.83 | 0.86 | 194                      |
| 132                | 175  | 315S/M  | 86.6                    | 7.9                       | 2.5                       | 3                       | 3.63             | 18                              | 40   | 1000        | 77          | 1485              | 95.0                 | 95.6 | 95.6 | 0.76         | 0.85 | 0.87 | 229                      |
| 160                | 220  | 315S/M  | 105                     | 8.2                       | 2.4                       | 2.7                     | 3.80             | 18                              | 40   | 1000        | 77          | 1485              | 95.2                 | 95.7 | 95.8 | 0.75         | 0.84 | 0.87 | 277                      |
| 185                | 250  | 315S/M  | 121                     | 9.7                       | 3.7                       | 3.7                     | 3.85             | 13                              | 29   | 1070        | 72          | 1488              | 95.2                 | 95.8 | 95.9 | 0.64         | 0.75 | 0.81 | 344                      |
| 200                | 270  | 355M/L  | 131                     | 6.6                       | 2.1                       | 2.3                     | 7.58             | 40                              | 88   | 1525        | 79          | 1490              | 95.0                 | 95.7 | 96.0 | 0.79         | 0.85 | 0.87 | 346                      |
| 250                | 340  | 355M/L  | 163                     | 7.6                       | 2.3                       | 2.5                     | 8.39             | 27                              | 59   | 1380        | 79          | 1490              | 95.4                 | 96.0 | 96.0 | 0.73         | 0.82 | 0.85 | 442                      |
| 280                | 380  | 355M/L* | 183                     | 6.8                       | 2.6                       | 2.7                     | 9.84             | 33                              | 73   | 1535        | 79          | 1492              | 95.8                 | 96.6 | 96.0 | 0.74         | 0.82 | 0.85 | 495                      |
| 300                | 400  | 355M/L  | 196                     | 8.3                       | 2.4                       | 2.5                     | 10.3             | 17                              | 37   | 1750        | 79          | 1490              | 95.3                 | 96.0 | 96.3 | 0.75         | 0.83 | 0.86 | 523                      |
| 315                | 430  | 355M/L  | 206                     | 8.1                       | 2.1                       | 2.7                     | 10.8             | 33                              | 73   | 1770        | 79          | 1490              | 95.4                 | 96.0 | 96.3 | 0.78         | 0.85 | 0.88 | 537                      |
| High Output Design |      |         |                         |                           |                           |                         |                  |                                 |      |             |             |                   |                      |      |      |              |      |      |                          |
| 0.75               | 1    | 90S     | 0.495                   | 7.8                       | 2.4                       | 3.3                     | 0.0049           | 11                              | 24   | 22.1        | 49          | 1475              | 75.0                 | 80.0 | 82.5 | 0.43         | 0.57 | 0.67 | 1.96                     |
| 1.1                | 1.5  | 90L     | 0.739                   | 6.5                       | 2.1                       | 2.7                     | 0.0055           | 15                              | 33   | 24.3        | 49          | 1450              | 82.2                 | 84.1 | 84.1 | 0.59         | 0.70 | 0.78 | 2.42                     |
| 1.5                | 2    | 100L    | 1.01                    | 7.8                       | 2.4                       | 3.1                     | 0.0082           | 10                              | 22   | 31.3        | 53          | 1450              | 84.0                 | 85.5 | 85.5 | 0.55         | 0.68 | 0.76 | 3.33                     |
| 2.2                | 3    | 112M    | 1.48                    | 6.8                       | 2                         | 3                       | 0.0143           | 31                              | 68   | 44.9        | 56          | 1450              | 87.5                 | 88.2 | 88.2 | 0.62         | 0.74 | 0.81 | 4.44                     |
| 3                  | 4    | 112M    | 2.02                    | 7.8                       | 2.2                       |                         |                  |                                 |      |             |             |                   |                      |      |      |              |      |      |                          |



| Output<br>kW<br>HP        | Frame | Full Load<br>Torque<br>(kgfm) | Locked<br>Rotor<br>Current<br>I <sub>L</sub> /I <sub>n</sub> | Locked<br>Rotor<br>Torque<br>T <sub>L</sub> /T <sub>n</sub> | Break-<br>down<br>Torque<br>T <sub>b</sub> /T <sub>n</sub> | Inertia J<br>(kgm <sup>2</sup> ) | Allowable locked<br>rotor time (s) |      | Weight<br>(kg) | Sound<br>dB(A) | 400 V      |      |      |              |      |      | Full load<br>current<br>I <sub>n</sub> (A) |      |      |
|---------------------------|-------|-------------------------------|--|---|--|----------------------------------|------------------------------------|------|----------------|----------------|------------|------|------|--------------|------|------|--|------|------|
|                           |       |                               |  |   |  |                                  | Hot                                | Cold |                |                | Efficiency |      |      | Power Factor |      |      |  |      |      |
|                           |       |                               |  |   |  |                                  |                                    |      |                |                | 50         | 75   | 100  | 50           | 75   | 100  |  |      |      |
| <b>2P - 50Hz</b>          |       |                               |  |   |  |                                  |                                    |      |                |                |            |      |      |              |      |      |  |      |      |
| 2.2                       | 3     | L90L                          | 0.740  | 8.0   | 4.2  | 4.0                              | 0.0028                             | 12   | 26             | 35.0           | 62         | 2895 | 85.5 | 87.0         | 88.0 | 0.61 | 0.73                                       | 0.80 | 4.75 |
| 3                         | 4     | 100L                          | 1.00   | 9.5   | 3.5  | 3.6                              | 0.0080                             | 15   | 33             | 41.0           | 67         | 2910 | 87.5 | 89.0         | 89.1 | 0.71 | 0.82                                       | 0.86 | 5.95 |
| 4                         | 5.5   | L112M                         | 1.33   | 9.5   | 3.2  | 4.3                              | 0.0109                             | 27   | 59             | 54.0           | 62         | 2930 | 88.2 | 90.1         | 90.3 | 0.65 | 0.77                                       | 0.83 | 8.11 |
| 5.5                       | 7.5   | 132S                          | 1.82   | 8.7   | 2.6  | 3.8                              | 0.0252                             | 25   | 55             | 69.0           | 63         | 2945 | 87.5 | 89.4         | 90.9 | 0.67 | 0.78                                       | 0.84 | 10.9 |
| 7.5                       | 10    | L132M                         | 2.48   | 9.5   | 3.2  | 4.2                              | 0.0285                             | 22   | 48             | 73.0           | 63         | 2950 | 89.5 | 91.0         | 91.7 | 0.68 | 0.80                                       | 0.85 | 14.6 |
| 9.2                       | 12.5  | L132M/L                       | 3.05   | 8.9   | 2.9  | 3.7                              | 0.0356                             | 16   | 35             | 79.0           | 63         | 2940 | 90.0 | 91.0         | 92.3 | 0.70 | 0.81                                       | 0.86 | 17.6 |
| 11                        | 15    | 160M                          | 3.64   | 8.5   | 3.5  | 3.5                              | 0.0557                             | 24   | 53             | 120            | 70         | 2945 | 91.0 | 92.2         | 92.6 | 0.68 | 0.79                                       | 0.84 | 21.5 |
| 15                        | 20    | 160L                          | 4.95   | 9.2   | 3.4  | 3.9                              | 0.0641                             | 17   | 37             | 126            | 70         | 2950 | 91.0 | 92.3         | 93.3 | 0.71 | 0.80                                       | 0.85 | 28.7 |
| 18.5                      | 25    | L160L                         | 6.11   | 9.3   | 3.4  | 3.8                              | 0.0752                             | 14   | 31             | 144            | 70         | 2950 | 91.5 | 92.5         | 93.7 | 0.73 | 0.82                                       | 0.86 | 34.9 |
| 22                        | 30    | 180L                          | 7.21   | 9.5   | 2.9  | 3.6                              | 0.1301                             | 20   | 44             | 176            | 70         | 2970 | 92.7 | 93.8         | 94.4 | 0.68 | 0.79                                       | 0.84 | 42.2 |
| 30                        | 40    | 200L                          | 9.84   | 7.8   | 3  | 3.5                              | 0.2119                             | 26   | 57             | 265            | 74         | 2970 | 93.4 | 94.4         | 94.5 | 0.70 | 0.81                                       | 0.85 | 56.7 |
| 37                        | 50    | 200L                          | 12.1   | 7.5   | 3  | 3.2                              | 0.2373                             | 22   | 48             | 275            | 74         | 2970 | 93.2 | 94.1         | 94.8 | 0.74 | 0.83                                       | 0.86 | 69.0 |
| 45                        | 60    | 225S/M                        | 14.7   | 9.5   | 3  | 3.9                              | 0.4924                             | 26   | 57             | 425            | 82         | 2975 | 94.4 | 95.1         | 95.1 | 0.78 | 0.86                                       | 0.89 | 80.8 |
| 55                        | 75    | 250S/M                        | 18.0   | 9.0   | 3.6  | 3.6                              | 0.6068                             | 26   | 57             | 520            | 82         | 2970 | 95.2 | 95.4         | 95.4 | 0.80 | 0.87                                       | 0.90 | 97.3 |
| 75                        | 100   | 280S/M                        | 24.5   | 7.9   | 2.6  | 3.3                              | 1.47                               | 56   | 123            | 800            | 83         | 2980 | 93.4 | 94.8         | 95.6 | 0.80 | 0.87                                       | 0.90 | 132  |
| 90                        | 125   | 280S/M                        | 29.4   | 7.8   | 2.5  | 3.3                              | 1.62                               | 41   | 90             | 890            | 83         | 2980 | 94.2 | 95.3         | 95.8 | 0.80 | 0.87                                       | 0.89 | 160  |
| 110                       | 150   | 315S/M                        | 35.9   | 8.2   | 2.7  | 3.6                              | 1.53                               | 71   | 156            | 992            | 83         | 2985 | 94.6 | 95.7         | 96.0 | 0.76 | 0.84                                       | 0.88 | 198  |
| 132                       | 175   | 315S/M                        | 43.1   | 7.5   | 2.3  | 3                                | 1.62                               | 65   | 143            | 1095           | 83         | 2980 | 95.3 | 96.0         | 96.2 | 0.82 | 0.88                                       | 0.90 | 232  |
| 150                       | 200   | 315S/M                        | 49.0   | 7.8   | 2  | 3                                | 2.06                               | 50   | 110            | 1197           | 83         | 2980 | 95.4 | 96.1         | 96.3 | 0.78 | 0.86                                       | 0.90 | 263  |
| 160                       | 220   | 315S/M                        | 52.3   | 8.5   | 3.1  | 4                                | 2.10                               | 40   | 88             | 1197           | 83         | 2980 | 95.7 | 96.2         | 96.3 | 0.78 | 0.87                                       | 0.89 | 284  |
| 220                       | 300   | 355M/L                        | 71.7   | 9.4   | 2.9  | 3.5                              | 5.06                               | 43   | 95             | 1650           | 81         | 2988 | 94.8 | 95.8         | 96.5 | 0.81 | 0.87                                       | 0.89 | 389  |
| 250                       | 340   | 355M/L*                       | 81.5   | 8.9   | 3  | 3.3                              | 5.39                               | 33   | 73             | 1664           | 81         | 2987 | 95.3 | 96.1         | 96.5 | 0.84 | 0.89                                       | 0.89 | 442  |
| 260                       | 350   | 355M/L*                       | 84.8   | 8.7   | 2.9  | 3.2                              | 5.36                               | 31   | 68             | 1667           | 81         | 2986 | 95.4 | 96.1         | 96.5 | 0.84 | 0.89                                       | 0.90 | 455  |
| 280                       | 380   | 355M/L                        | 91.4   | 7.5   | 2.1  | 3                                | 5.36                               | 43   | 95             | 1664           | 81         | 2985 | 96.0 | 96.5         | 96.5 | 0.86 | 0.91                                       | 0.91 | 484  |
| 300                       | 400   | 355M/L                        | 97.9   | 7.0   | 2  | 3                                | 5.68                               | 41   | 90             | 1751           | 81         | 2985 | 96.0 | 96.5         | 96.5 | 0.88 | 0.92                                       | 0.92 | 513  |
| 315                       | 430   | 355M/L                        | 103  | 7.5   | 2.4  | 3                                | 6.01                               | 30   | 66             | 1838           | 81         | 2985 | 96.0 | 96.5         | 96.5 | 0.89 | 0.92                                       | 0.92 | 539  |
| <b>High Output Design</b> |       |                               |  |   |  |                                  |                                    |      |                |                |            |      |      |              |      |      |  |      |      |
| 2.2                       | 3     | L100L                         | 0.729  | 9.5   | 3.2  | 4.0                              | 0.0075                             | 20   | 44             | 40.0           | 67         | 2940 | 87.0 | 87.5         | 88.0 | 0.66 | 0.78                                       | 0.84 | 4.52 |
| <b>4P - 50Hz</b>          |       |                               |  |   |  |                                  |                                    |      |                |                |            |      |      |              |      |      |  |      |      |
| 1.1                       | 1.5   | L90L                          | 0.736  | 8.0   | 2.9  | 3.4                              | 0.0077                             | 20   | 44             | 30.0           | 49         | 1455 | 86.0 | 87.0         | 87.4 | 0.55 | 0.68                                       | 0.76 | 2.52 |
| 1.5                       | 2     | L100L                         | 1.00   | 8.0   | 4  | 4                                | 0.0112                             | 20   | 44             | 39.0           | 53         | 1455 | 87.5 | 88.1         | 88.2 | 0.55 | 0.68                                       | 0.76 | 3.40 |
| 2.2                       | 3     | L112M                         | 1.46   | 8.0   | 2.5  | 3.5                              | 0.0169                             | 25   | 55             | 49.0           | 56         | 1465 | 88.8 | 89.7         | 89.7 | 0.58 | 0.71                                       | 0.78 | 4.78 |
| 3                         | 4     | L112M                         | 1.99   | 7.5   | 2.8  | 3.8                              | 0.0206                             | 20   | 44             | 53.0           | 56         | 1465 | 88.9 | 89.5         | 90.4 | 0.55 | 0.68                                       | 0.74 | 6.81 |
| 4                         | 5.5   | 132S                          | 2.65   | 9.3   | 2.5  | 3.6                              | 0.0566                             | 28   | 62             | 70.0           | 56         | 1471 | 89.5 | 90.6         | 91.1 | 0.69 | 0.80                                       | 0.85 | 7.85 |
| 5.5                       | 7.5   | L132S                         | 3.63   | 8.8   | 2.9  | 3.5                              | 0.0638                             | 19   | 42             | 78.0           | 56         | 1475 | 91.4 | 92.1         | 92.1 | 0.61 | 0.74                                       | 0.82 | 11.1 |
| 7.5                       | 10    | L132M/L                       | 4.95   | 9.3   | 3.2  | 4                                | 0.0788                             | 16   | 35             | 84.0           | 56         | 1475 | 91.6 | 92.6         | 92.6 | 0.60 | 0.73                                       | 0.81 | 15.2 |
| 9.2                       | 12.5  | 160M                          | 6.08   | 8.6   | 3.4  | 3.6                              | 0.1071                             | 18   | 40             | 115            | 67         | 1475 | 90.0 | 91.5         | 93.1 | 0.60 | 0.72                                       | 0.80 | 18.8 |
| 11                        | 15    | L160L                         | 7.26   | 8.7   | 3.4  | 3.6                              | 0.1409                             | 18   | 40             | 152            | 67         | 1475 | 90.5 | 92.0         | 93.3 | 0.61 | 0.73                                       | 0.80 | 22.4 |
| 15                        | 20    | 180M                          | 9.87   | 8.0   | 3  | 3.2                              | 0.2088                             | 27   | 59             | 170            | 64         | 1480 | 92.4 | 93.4         | 94.0 | 0.64 | 0.76                                       | 0.82 | 29.6 |
| 18.5                      | 25    | 180L                          | 12.2   | 7.8   | 3.3  | 3.5                              | 0.2437                             | 27   | 59             | 185            | 64         | 1475 | 92.9 | 93.7         | 94.3 | 0.66 | 0.77                                       | 0.83 | 35.9 |
| 22                        | 30    | 200L                          | 14.4   | 8.2   | 3.3  | 3.8                              | 0.3743                             | 28   | 62             | 284            | 69         | 1485 | 93.6 | 94.5         | 94.7 | 0.64 | 0.76                                       | 0.82 | 43.0 |
| 30                        | 40    | 200L                          | 19.7   | 7.6   | 3  | 3.2                              | 0.3979                             | 19   | 42             | 284            | 69         | 1480 | 93.6 | 94.4         | 95.0 | 0.60 | 0.73                                       | 0.81 | 59.2 |
| 37                        | 50    | 225S/M                        | 24.3   | 8.9   | 3  | 3.3                              | 0.9810                             | 25   | 55             | 430            | 70         | 1485 | 94.8 | 95.3         | 95.3 | 0.68 | 0.79                                       | 0.84 | 70.2 |
| 45                        | 60    | L225S/M                       | 29.5   | 8.7   | 3.1  | 3.3                              | 1.04                               | 20   | 44             | 440            | 70         | 1485 | 94.8 | 95.4         | 95.6 | 0.64 | 0.76                                       | 0.82 | 87.2 |
| 55                        | 75    | 250S/M                        | 36.1   | 8.5   | 3.1  | 3.4                              | 1.21                               | 16   | 35             | 530            | 70         | 1485 | 94.9 | 95.4         | 95.7 | 0.67 | 0.78                                       | 0.83 | 105  |
| 75                        | 100   | 280S/M                        | 49.0   | 7.9   | 2.9  | 2.9                              | 2.78                               | 45   | 99             | 830            | 72         | 1490 | 95.6 | 96.0         | 96.0 | 0.70 | 0.80                                       | 0.84 | 141  |
| 90                        | 125   | 280S/M                        | 58.8   | 9.8   | 3.1  | 3.7                              | 3.40                               | 33   | 73             | 895            | 72         | 1490 | 95.5 | 96.2         | 96.2 | 0.70 | 0.80                                       | 0.85 | 167  |
| 110                       | 150   | 315S/M                        | 71.9   | 7.4   | 2.7  | 3.3                              | 3.33                               | 31   | 68             | 1150           | 72         | 1490 | 96.3 | 96.4         | 96.4 | 0.75 | 0.83                                       | 0.86 | 202  |
| 132                       | 175   | 315S/M                        | 86.3   | 8.5   | 3  | 3.1                              | 3.40                               | 19   | 42             | 1332           | 72         | 1490 | 96.1 | 96.4         | 96.5 | 0.71 | 0.81                                       | 0.85 | 245  |
| 220                       | 300   | 355M/L                        | 144  | 7.0   | 2.6  | 2.8                              | 8.95                               | 52   | 114            | 1670           | 79         | 1490 | 95.9 | 96.5         | 96.7 | 0.75 | 0.83                                       | 0.85 | 407  |
| 250                       | 340   | 355M/L                        | 163  | 7.0   | 2.7  | 2.8                              | 9.84                               | 48   | 106            | 1730           | 79         | 1490 | 96.1 | 96.6         | 96.7 | 0.75 | 0.83                                       | 0.88 | 446  |
| 260                       | 350   | 355M/L                        | 170  | 7.0   | 2.7  | 2.8                              | 9.84                               | 44   | 97             | 1730           | 79         | 1490 | 96.2 | 96.7         | 96.8 | 0.76 | 0.84                                       | 0.85 | 480  |
| 280                       | 380   | 355M/L                        | 183  | 7.5   | 2.7  | 2.7                              | 10.5                               | 33   | 73             | 1772           | 79         | 1490 | 96.2 | 96.7         | 96.8 | 0.72 | 0.82                                       | 0.85 | 517  |
| 300                       | 400   | 355M/L                        | 196  | 7.5   | 2.7  | 2.6                              | 11.1                               | 38   | 84             | 1825           | 79         | 1490 | 96.3 | 96.8         | 96.8 | 0.73 | 0.82                                       | 0.86 | 548  |
| 315                       | 430   | 355M/L                        | 206  | 7.5   | 2.9  | 2.6                              | 11.6                               | 33   | 73             | 1878           | 79         | 1490 | 96.4 | 96.8         | 96.8 | 0.73 | 0.82                                       | 0.86 | 575  |
| <b>6P - 50Hz</b>          |       |                               |  |   |  |                                  |                                    |      |                |                |            |      |      |              |      |      |  |      |      |
| 1.1                       | 1.5   | 100L                          | 1.12   | 6.5   | 2.6  | 3.5                              | 0.0143                             | 35   | 77             | 34.0           | 44         | 960  | 82.0 | 84.0         | 84.5 | 0.52 | 0.64                                       | 0.72 | 2.75 |
| 2.2                       | 3     | L112M                         | 2.22   | 7.0   | 2.8  | 3.2                              | 0.0293                             | 26   | 57             | 48.0           | 49         | 965  | 85.0 | 87.0         | 87.4 | 0.50 | 0.62                                       | 0.71 | 5.39 |
| 3                         | 4     | 132S                          | 3.00   | 6.3   | 2  | 2.8                              | 0.0568                             | 58   | 128            | 61.0           | 53         | 975  | 87.9 | 89.3         | 88.7 | 0.53 | 0.65                                       | 0.73 | 7.04 |
| 4                         | 5.5   | 132M                          | 4.00   | 6.6   | 2.2  | 3                                | 0.0643                             | 42   | 92             | 68.0           | 53         | 975  | 88.3 | 89.7         | 89.7 | 0.52 | 0.65                                       | 0.73 | 9.28 |
| 5.5                       | 7.5   | L132M/L                       | 5.49   | 7.3   | 2.5  | 3.2                              | 0.0833                             | 31   | 68             | 84.0           | 53         | 975  | 88.7 | 89.5         | 90.5 | 0.50 | 0.63                                       | 0.71 | 13.0 |
| 7.5                       | 10    | 160L                          | 7.45   | 8.2   | 3.3  | 3.8                              | 0.1755                             | 18   | 40             | 130            | 54         | 980  | 89.5 | 91.0         | 91.3 | 0.52 | 0.66                                       | 0.74 | 16.9 |
| 11                        | 15    | 180M                          | 10.9   | 8.8   | 2.8  | 3.5                              | 0.3111                             | 10   | 22             | 150            | 56         | 980  | 91.5 | 92.0         | 92.3 | 0.69 | 0.80                                       | 0.85 | 21.3 |
| 15                        | 20    | L180L                         | 14.9   | 8.8   | 3  | 3.6                              | 0.4057                             | 14   | 31             | 210            | 56         | 980  | 92.2 | 92.5         | 92.9 | 0.69 | 0.80                                       | 0.85 | 28.9 |
| 18.5                      | 25    | 200L                          | 18.3   | 6.6   | 2.4  | 3                                | 0.4914                             | 31   | 68             | 235            | 58         | 985  | 92.5 | 93.1         | 93.4 | 0.62 | 0.75                                       | 0.81 | 37.2 |
| 22                        | 30    | 200L                          | 21.8   | 7.0   | 2.7  | 3                                | 0.5246                             | 25   | 55             | 250            | 58         | 985  | 92.6 | 93.4         | 93.7 | 0.59 | 0.71                                       | 0.78 | 45.7 |
| 30                        | 40    | 225S/M                        | 29.6   | 8.0   | 2.8  | 3.1                              | 1.33                               | 33   | 73             | 430            | 61         | 988  | 93.5 | 94.2         | 94.3 | 0.68 | 0.78                                       | 0.83 | 58.2 |
| 37                        | 50    | 250S/M                        | 36.5   | 8.0   | 3.1  | 3.3                              | 1.65                               | 31   | 68             | 520            | 61         | 988  | 94.0 | 94.5         | 94.6 | 0.69 | 0.79                                       | 0.84 | 70.7 |
| 45                        | 60    | 280S/M                        | 44.3   | 7.0   | 2.3  | 2.8                              | 3.25                               | 43   | 95             | 723            | 66         | 990  | 94.0 | 94.7         | 94.9 | 0.66 | 0.77                                       | 0.82 | 87.9 |
| 55                        | 75    | 280S/M                        | 54.1   | 8.0   | 2.8  | 3.1                              | 3.92                               | 42   | 92             | 740            | 66         | 990  | 94.2 | 95.1         | 95.2 | 0.63 | 0.74                                       | 0.80 | 110  |
| 75                        | 100   | 315S/M                        | 73.8   | 8.0   | 3.1  | 3.4                              | 5.14                               | 36</ |                |                |            |      |      |              |      |      |  |      |      |

**FLANGE FF (IEC)**

Installation with constructive mountings  
B35, B5, V1, V3, V15, V36

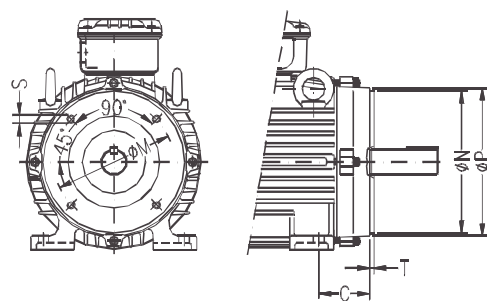


**FLANGE FF (IEC)**

| IEC Frame | "FF" Flange |     |     |     |     |     |     |    |        |   | N° of Holes |
|-----------|-------------|-----|-----|-----|-----|-----|-----|----|--------|---|-------------|
|           | Flange      | C   | LA  | M   | N   | P   | T   | S  | a      |   |             |
| 63        | FF-115      | 40  | 9   | 115 | 95  | 140 | 3   | 10 | 45°    | 4 |             |
| 71        | FF-130      | 45  |     | 130 | 110 | 160 | 3.5 |    |        |   |             |
| 80        | FF-165      | 50  |     | 165 | 130 | 200 |     |    |        |   |             |
| 90S/L     | FF-165      | 56  | 10  | 165 | 130 | 200 | 3.5 | 12 |        |   |             |
| 100L      |             | 63  |     |     |     |     |     |    |        |   |             |
| 112M      | FF-215      | 70  | 11  | 215 | 180 | 250 | 4   | 15 |        |   |             |
| 132S/M    | FF-265      | 89  | 12  | 265 | 230 | 300 | 5   | 19 |        |   |             |
| 160M/L    | FF-300      | 108 | 18  | 300 | 250 | 350 |     |    |        |   |             |
| 180M/L    | FF-350      | 121 |     | 350 | 300 | 400 |     |    |        |   |             |
| 200M/L    |             | 133 |     | 400 | 350 | 450 |     |    |        |   |             |
| 225S/M    | FF-400      | 149 | 22  | 500 | 450 | 550 | 6   | 24 |        |   |             |
| 250S/M    | FF-500      | 168 |     | 600 | 550 | 660 |     |    |        |   |             |
| 280S/M    | FF-500      | 190 |     | 740 | 680 | 800 |     |    |        |   |             |
| 315S/M    | FF-600      | 216 | 254 | 740 | 680 | 800 | 6   | 24 | 22°30' | 8 |             |
| 355M/L    | FF-740      |     |     |     |     |     |     |    |        |   |             |

**FLANGE FC IEC B14A,B14B & NEMA C**

Installation with constructive mountings  
B14, B34, V18, V19



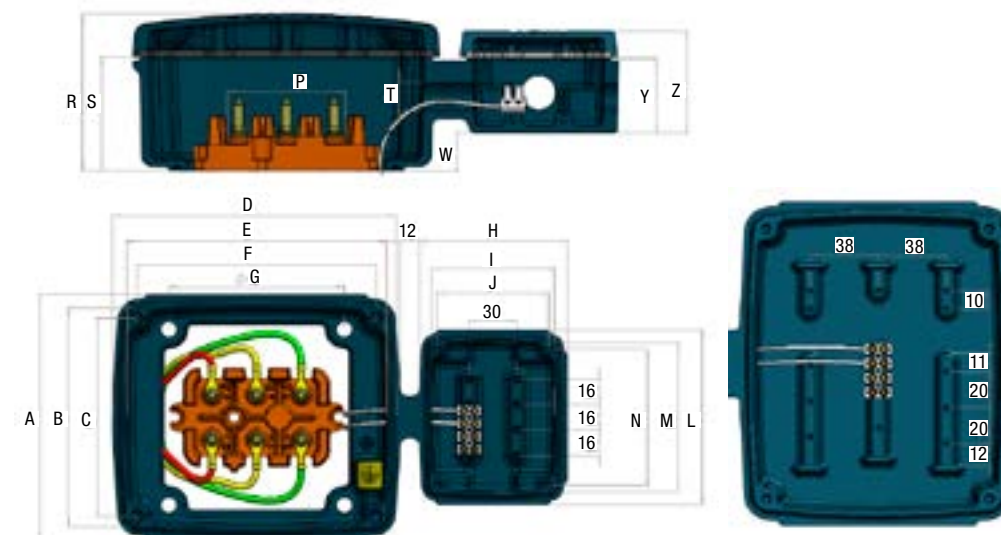
**FLANGE C-DIN (DIN 42677) (B14A)**

| IEC Frame | "C" DIN Flange |     |     |     |     |     |     |   | N° of Holes |
|-----------|----------------|-----|-----|-----|-----|-----|-----|---|-------------|
|           | Flange         | C   | M   | N   | P   | S   | T   |   |             |
| 63        | C-90           | 40  | 75  | 60  | 90  | M5  | 2.5 | 4 |             |
| 71        | C-105          | 45  | 85  | 70  | 105 | M6  |     |   |             |
| 80        | C-120          | 50  | 100 | 80  | 120 | M8  | 3   |   |             |
| 90S/L     | C-140          | 56  | 115 | 95  | 140 |     |     |   |             |
| 100L      | C-160          | 63  | 130 | 110 | 160 | M8  | 3.5 |   |             |
| 112M      |                | 70  |     |     |     |     |     |   |             |
| 132S/M    | C-200          | 89  | 165 | 130 | 200 | M10 | 4   |   |             |
| 160M/L    | C-250          | 108 | 215 | 180 | 250 | M12 |     |   |             |

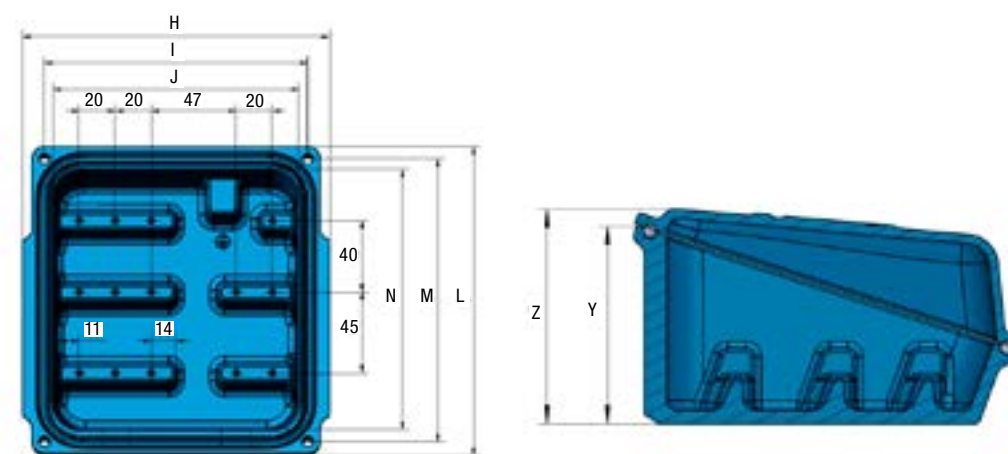
**FLANGE FC (NEMA)**

| IEC Frame | "FC" Flange |              |       |       |     |              |   | N° of Holes |
|-----------|-------------|--------------|-------|-------|-----|--------------|---|-------------|
|           | Flange      | C            | M     | N     | P   | S            | T |             |
| 63        | FC-95       | 40           | 95.2  | 76.2  | 143 | UNC 1/4" x20 | 4 | 4           |
| 71        |             | 45           |       |       |     | UNC 3/8" x16 |   |             |
| 80        |             | 50           |       |       |     | UNC 1/2" x13 |   |             |
| 90S/L     | 56          | UNC 5/8" x11 |       |       |     |              |   |             |
| 100L      | FC-149      | 63           | 149.2 | 114.3 | 165 | 6.3          | 8 |             |
| 112M      | FC-184      | 70           | 184.2 | 215.9 | 225 |              |   |             |
| 132S/M    |             | 89           |       |       |     |              |   |             |
| 160M/L    |             | 108          |       |       |     |              |   |             |
| 180M/L    | FC-228      | 121          | 228.6 | 266.7 | 280 | 6.3          | 8 |             |
| 200M/L    | FC-279      | 133          | 279.4 | 317.5 | 395 |              |   |             |
| 225S/M    |             | 149          |       |       |     |              |   |             |
| 250S/M    | FC-355      | 168          | 355.6 | 406.4 | 455 | 6.3          | 8 |             |
| 280S/M    | FC-368      | 190          | 368.3 | 419.1 | 455 |              |   |             |
| 315S/M    |             | 216          |       |       |     |              |   |             |
| 355M/L    | 254         | 368.3        | 419.1 | 455   | 455 | 6.3          | 8 |             |

14. Terminal Box



\* Additional terminal box is applicable only for frames from 225 to 355



\*355 Additional Terminal Box

| Frame   | A   | B   | C   | D   | E   | F   | G   | H   | I   | J   |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 63-100* | 85  | 74  | 65  | 100 | 88  | 80  | 56  | -   | -   | -   |
| 63-100  | 92  | 77  | 70  | 108 | 93  | 85  | 56  | 85  | 71  | 65  |
| 112-132 | 117 | 100 | 88  | 137 | 120 | 108 | 70  | 92  | 77  | 70  |
| 160-180 | 154 | 137 | 124 | 180 | 163 | 150 | 110 | 92  | 77  | 70  |
| 200     | 170 | 153 | 136 | 200 | 183 | 166 | 120 | 92  | 77  | 70  |
| 225-250 | 212 | 190 | 172 | 250 | 228 | 208 | 150 | 154 | 137 | 124 |
| 280     | 265 | 243 | 214 | 315 | 298 | 264 | 150 | 154 | 137 | 124 |
| 315     | 315 | 289 | 260 | 375 | 349 | 318 | 200 | 154 | 137 | 124 |
| 355     | 355 | 322 | 286 | 425 | 397 | 352 | 260 | 170 | 146 | 136 |

| Frame   | L   | M   | N   | P   | R   | S   | T    | W    | Y    | Z    |
|---------|-----|-----|-----|-----|-----|-----|------|------|------|------|
| 63-100  | 100 | 86  | 80  | 42  | 59  | 44  | 10   | 3    | 42.5 | 57.5 |
| 112-132 | 108 | 93  | 85  | 50  | 67  | 49  | 13.5 | 7    | 42   | 57   |
| 160-180 | 108 | 93  | 85  | 67  | 89  | 64  | 13.5 | 23   | 42   | 57   |
| 200     | 108 | 93  | 85  | 84  | 94  | 78  | 13.5 | 37   | 42   | 57   |
| 225-250 | 180 | 163 | 150 | 100 | 114 | 94  | 17   | 32.5 | 61.5 | 86.5 |
| 280     | 180 | 163 | 150 | 126 | 143 | 125 | 17   | 63.5 | 61.5 | 86.5 |
| 315     | 180 | 163 | 150 | 160 | 172 | 144 | 17   | 82.5 | 61.5 | 86.5 |
| 355     | 171 | 157 | 144 | 163 | 232 | 197 | 23   | 140  | 85   | 95   |

\* The size of single terminal box



## 15. Mounting forms

The mounting configuration for the W21 motor lines comply with IEC 60034-7 standard. Standard mounting forms and their variations are shown in table 14. After the designation, a characteristic letter is used to define the terminal box position. So, the mounting code IM B3 can be seen in WEG documents as detailed below (without IM code).

B3L - terminal box on left hand side of the motor frame

B3T - terminal box on top of the motor frame

B3R - terminal box on right hand side of the motor frame

Note: The terminal box position is defined viewing the motor from the shaft end (figure 26).

























| Basic mountings   | Other type of mounting  |   |  |  |  |
|---|---|---|--|--|--|
| IM B3   | IM V5   | IM V6   | IM B6  | IM B7  | IM B8  |
| IM 1001   | IM 1011   | IM 1031   | IM 1051  | IM 1061  | IM 1071  |
|    |    |    |   |   |   |
| IM B35  | IM V15  | IM V36  | -*)  | -*)  | -*)  |
| IM 2001   | IM 2011   | IM 2031   | IM 2051  | IM 2061  | IM 2071  |
|    |    |    |   |   |   |
| IM B34  | IM V17  | IM V37  | -*)  | -*)  | -*)  |
| IM 2101   | IM 2111   | IM 2131   | IM 2151  | IM 2161  | IM 2171  |
|   |   |   |  |  |  |
| IM B5   | IM V1   | IM V3   |  |  |  |
| IM 3001   | IM 3011   | IM 3031   |  |  |  |
|  |  |  |  |  |  |
| IM B14  | IM V18  | IM V19  |  |  |  |
| IM 3601   | IM 3611   | IM 3631   |  |  |  |
|  |  |  |  |  |  |

Table 16 - Mountings configurations

\* Non-defined mountings by IEC 60034-7

### Important:

- The mountings IM B34 and IM B14 with C-DIN flange, in accordance with DIN standard EN 50347, are limited to frame size 132; C flange in accordance with NEMA MG 1 Part 4 standard is available for frames 63 to 355M/L.
- For motors mounted vertically shaft down fitting of a drip cover is recommended to prevent ingress of small objects into the fan cover. The increase in total length of the motor with drip cover is shown in the section 19.
- For vertically shaft up mounted motors installed in environments containing liquids, the use of a rubber slinger is recommended to prevent the ingress of liquid into the motor through the shaft.



# SERVICE



From our wide Services portfolio, stands out the list of interventions on products from WEG activity areas: Electric Motors, Energy and Automation, being the most common:

### Inspection, Tests and Technical Analyses

From all the inspections, tests and technical analyses we have capacity to offer, we emphasize the following:

- Production and expedition of spare parts to all over the world;
- Application diagnosis on site or in our factory;
- Technical advise on best, reliable and efficient solutions on energy saving.



### Automation

- Analysis of application improvements and technical assessment to the client, helping on the choice of the most appropriate equipment, targeting the application/optimizing installation efficiency
- Manufacturing, Installation, Modification, Start-Up and Maintenance of Electrical Panels
- Support on the settings parametrization of Variable Speed Drives and Soft Starters
- Commissioning and Start-Up of applications with Variable Speed Drives
- WEG Products Training



|  | Products   |       | Procedure |          |
|--|------------|-------|-----------|----------|
|  | Automation | Motor | Internal  | External |
| General Repair and overhaul  | X          | X     | X         | X        |
| Product repair that may include the replacement of the components by original parts      | X          | X     | X         | X        |
| Commissioning and start up   | X          | X     |           | X        |
| Repair of electrical machines (Ex and Safety)  |            | X     | X         | X        |
| Inspection and/or replacement of sleeve bearing or bearings                              |            | X     | X         | X        |
| Repair of the sleeve bearings shell  |            | X     | X         | X        |
| High, Medium and Low Voltage rewinding   |            | X     | X         |          |
| Stator or rotor core replacement   |            | X     | X         |          |
| Brushes and brushes holder replacement   |            | X     | X         | X        |
| Shaft complete replacement or repair of shafts with grinding finishing of complete rotor |            | X     | X         |          |
| Dynamic balancing of rotor (Maximum speed 1600 rpm 20T)                                  |            | X     | X         |          |
| Field dynamic balancing  |            | X     |           | X        |
| Centring service   |            | X     |           | X        |
| Painting (standard and special plan)   |            | X     | X         | X        |
| Inspection, tests and technical analysis   | X          | X     | X         | X        |
| Energy Efficiency Study  | X          | X     |           | X        |
| Training of product maintenance  | X          | X     |           | X        |

### Electric Motors

- Commissioning and Start-Up of applications with electric motors
- Alignment applications with electric motors
- Vibration analysis and failures diagnosis
- Dimensional check of Electric Motors and Components/Spare Parts
- Electric Motors maintenance
- Electric Motors Mechanical and Electrical refurbishment:
  - Replacement of bearings / sleeve bearings
  - Recovery of sleeve bearings
  - Rewinding of Electric Motors (stator/rotor) - in Low, Medium and High Voltage (up to 11kV)
  - Recover / Refurbishment / replacement of spare parts
  - Replacement of rotor shafts
  - Repair and replacement of accessories, temperature sensors and anti-condensation heaters and other auxiliaries
- Balancing in factory up to 1600 rpm (20T, Ø Max. 4640 mm)
- Dynamic balancing on site
- Electric Motors modification to new operating conditions (IP protection, cooling system, auxiliaries mounting form, terminal boxes, external loads, etc)
- Painting and finishing recovery
- Customer training on electric motors
- Repair electric machines (Ex and Safety)
- Energy analysis and efficiency of electric motors



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The values shown are subject to change without prior notice.  
The information contained is reference values.