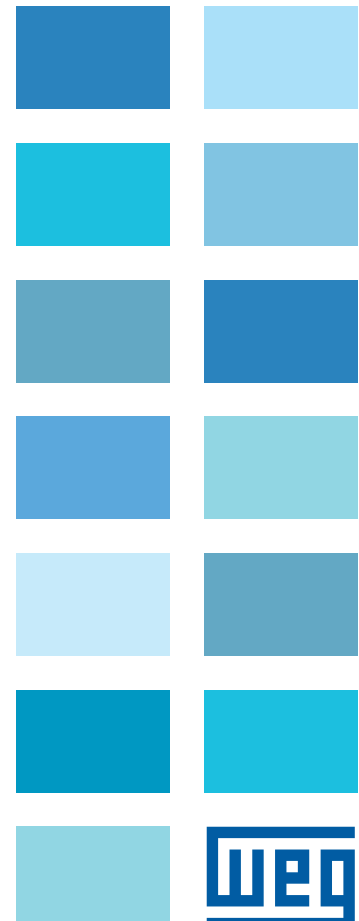
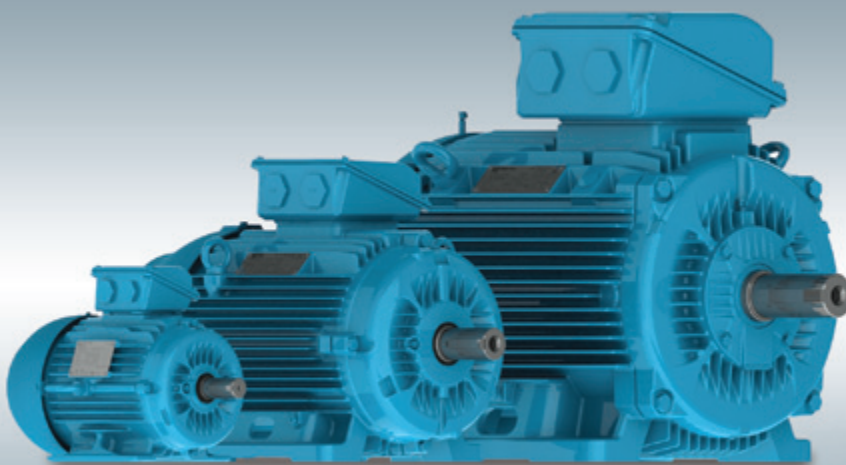


W22

Three-Phase Electric Motor

Technical Catalogue
European Market





W22 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 that exceeds the performance of WEG's existing W21 motor line, which is recognised worldwide for its quality, reliability and efficiency.

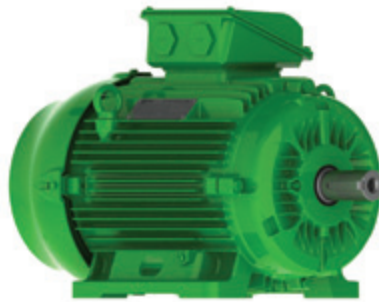
Using the latest generation of computerised tools, such as structural analysis software (finite element analysis) and computer fluid dynamics, as well as electrical design optimisation software, an innovative - next generation - product has been developed: the W22 motor.

Several key objectives have been achieved in the design of the W22 motor:

- Reduction of noise and vibration levels
- Increased energy efficiency and reduced thermal footprint
- Easy maintenance
- Compatibility with present & future generations of frequency inverters
- Flexible and modular design



Frame 63 to 132



Frame 160 to 200



Frame 160 to 355

Sustainability and Carbon Emission Reduction Through Super Premium Efficiency Motors

The Super 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 Super Premium Efficiency motors not become the Industry standard?

It may be argued that super premium efficiency motors are also super premium in price when comparing against standard efficiency (IE1), high efficiency (IE2) and premium efficiency (IE3) motors.

Whilst this is not strictly untrue, it should be appreciated when considering their lifetime that the cost of acquisition of an induction motor typically represents only 2% of the total cost of ownership. In contrast, the associated energy savings

provided by Super Premium and Premium efficiency motors far outweigh this additional investment in purchase price.

The reduction in CO₂ emissions is one of the direct consequences, and therefore benefits, of increasing efficiency in industry. Using IE4 rated motors today will show that a company is serious about saving energy, carbon reduction and saving money.

Go to our website at www.weg.net to check the potential reduction in CO₂ emissions and the return on investment of W22 Premium Efficiency motors.

The W22 Super Premium Efficiency line from WEG is the most complete range of IE4 motors available to Industry today, designed to offer not only significantly lower energy consumption, but lower noise and vibration levels, higher reliability, easier maintenance and lower cost of ownership.

...we call it **WEGnology**

Minimum Energy Performance Standards - Europe

Increasingly, the World seeks a path of sustainability and new ways to reduce energy consumption.

A significant percentage of the electrical energy utilized in facilities around the World is consumed by electric motors.

Consequently, Governments around the World are implementing Energy Efficiency Programs in order to enforce the use of high efficiency motors.

Up until 2009, Europe did not have any specific regulations relating to the energy efficiency levels of electric motors.

There existed only a voluntary agreement between Manufacturers from 1998 that determined the efficiency bands EFF1, EFF2 and EFF3.

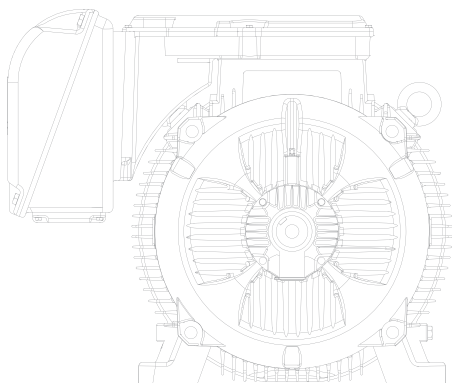
However, in July 2009 Commission Regulation 640/2009 (implementing EuP Directive 2005/32/EC of July 2005) was adopted, which determined the ecodesign requirements relating to the scope, implementation dates and efficiency levels for electric motors and their use with variable speed drives.

Also referred to as EU MEPS (European Minimum Energy Performance Standards), the efficiency levels for electric motors are determined in two IEC standards: IEC/EN 60034-30-1, which details the efficiency classes in the form of 'IE' codes, and IEC/EN 60034-2-1 which defines the methods to be used to measure the efficiency.

The EU Regulation is mandatory within the European Economic Area, EEA (EU countries plus Norway, Iceland and Liechtenstein), from 16th of June 2011.

EU MEPS does not apply outside Europe. Manufacturers can continue to supply IE1 non-CE marked motors to customers located in Europe for further shipment to non-European markets.

A new version of the EuP Directive (2009/125/EC) became effective on 21st October 2009 to expand the ecodesign requirements for Energy Related Products, whilst January 2014 saw the adoption of the Commission Regulation 4/2014 (amending the scope of 640/2009) which came into force with effect from 27th July 2014.



Scope

The scope of the EuP motor regulation (which is more limited than that of the IEC 60034-30-1 standard), covers single speed, three-phase squirrel-cage induction motors for 50Hz or 50/60Hz operation which:

- Have 2, 4, or 6 poles
- Have a rated voltage (U_N) up to 1000 V
- Have a rated output (P_N) between 0.75kW and 375 kW
- Are rated for continuous duty operation (S1)
- Are intended for use at altitudes up to 4,000 metres above sea level or at ambient air temperatures between -30°C and +60°C.

However, the Regulation does not apply to:

- a) Motors designed to operate wholly immersed in liquid
- b) Motors completely integrated into a product where its energy efficiency cannot be measured independently
- c) Motors designed to operate exclusively:
 - at altitudes greater than 4,000 metres above sea level
 - in ambient air temperatures exceeding 60°C
 - in maximum operating temperature above 400°C
 - where ambient air temperatures are below -30°C (or 0°C for water cooled motors)
 - where water coolant temperatures are below 0°C or above 32°C at the inlet to the product
 - in potentially explosive atmospheres defined in the Directive 94/9/EC
- d) Brake motors

Effective Dates

The implementation dates of the Regulation are as follows:

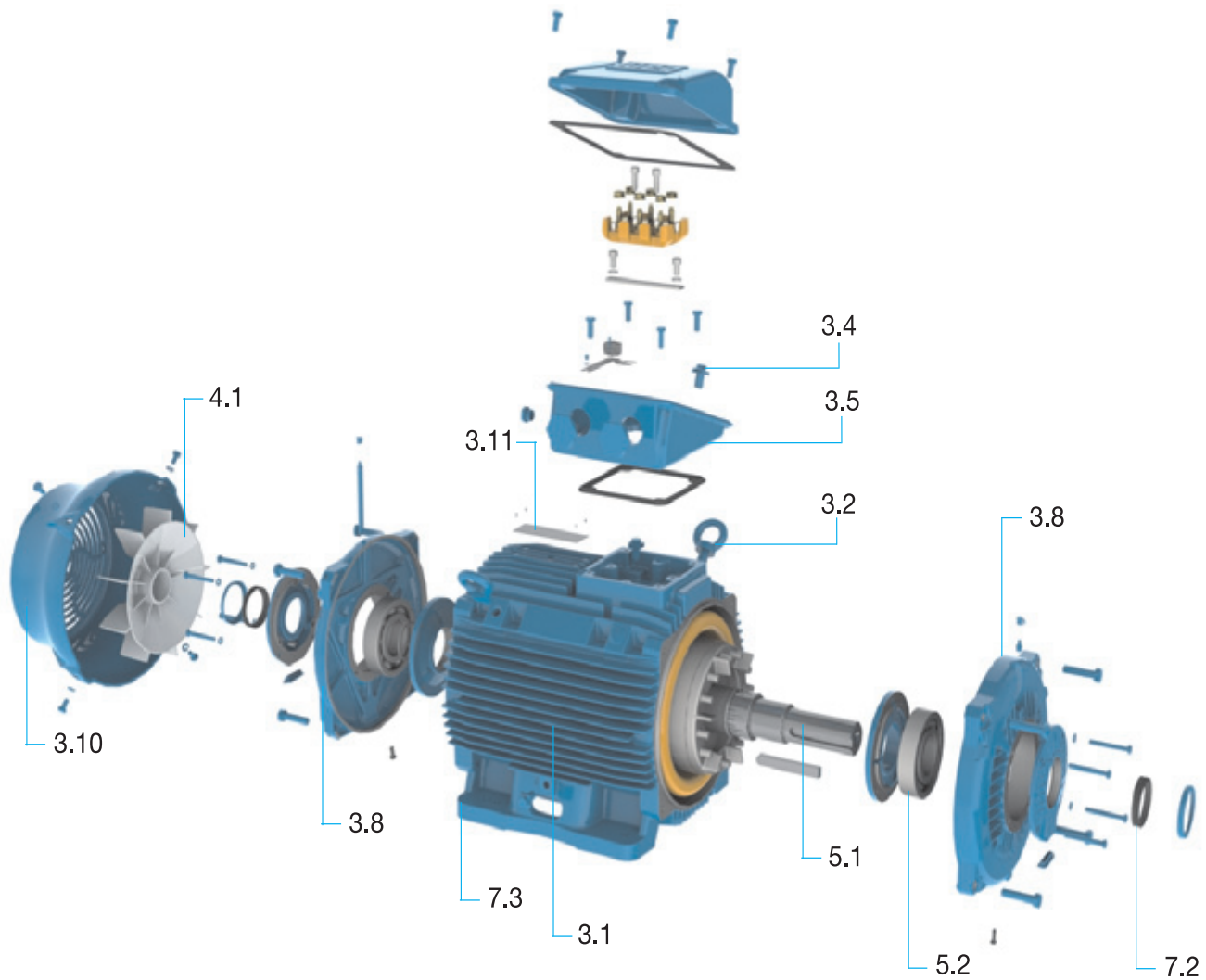
- From 16 June 2011, motors shall not be less efficient than the IE2 efficiency level;
- From 1 January 2015 motors with a rated output of 7.5-375 kW shall not be less efficient than the IE3 efficiency level (defined in Table 1) or meet the IE2 efficiency level and be operated / equipped with a variable speed drive;
- From 1 January 2017 all motors with a rated output of 0.75-375 kW shall not be less efficient than the IE3 efficiency level or meet the IE2 efficiency level and be operated / equipped with a variable speed drive.

Output	IE1 - Standard Efficiency				IE2 - High Efficiency				IE3 - Premium Efficiency				IE4 - Super Premium Efficiency			
	Poles				Poles				Poles				Poles			
kW	2	4	6	8	2	4	6	8	2	4	6	8	2	4	6	8
0.12	45.0	50.0	38.3	31.0	53.6	59.1	50.6	39.8	60.8	64.8	57.7	50.7	66.5	69.8	64.9	62.3
0.18	52.8	57.0	45.5	38.0	60.4	64.7	56.6	45.9	65.9	69.9	63.9	58.7	70.8	74.7	70.1	67.2
0.20	54.6	58.5	47.6	39.7	61.9	65.9	58.8	47.4	67.2	71.1	65.4	60.6	71.9	75.5	71.4	68.4
0.25	58.2	61.5	52.1	43.4	64.8	68.5	61.6	50.6	69.7	73.5	68.6	64.1	74.3	77.9	74.1	70.8
0.37	63.9	66.0	59.7	49.7	69.5	72.7	67.6	56.1	73.8	77.3	73.5	69.3	78.1	81.1	78.0	74.3
0.40	64.9	66.8	61.1	50.9	70.4	73.5	68.8	57.2	74.6	78.0	74.4	70.1	78.9	81.7	78.7	74.9
0.55	69.0	70.0	65.8	56.1	74.1	77.1	73.1	61.7	77.8	80.8	77.2	73.0	81.5	83.9	80.9	77.0
0.75	72.1	72.1	70.0	61.2	77.4	79.6	75.9	66.2	80.7	82.5	78.9	75.0	83.5	85.7	82.7	78.4
1.1	75.0	75.0	72.9	66.5	79.6	81.4	78.1	70.8	82.7	84.1	81.0	77.7	85.2	87.2	84.5	80.8
1.5	77.2	77.2	75.2	70.2	81.3	82.8	79.8	74.1	84.2	85.3	82.5	79.7	86.5	88.2	85.9	82.6
2.2	79.7	79.7	77.7	74.2	83.2	84.3	81.8	77.6	85.9	86.7	84.3	81.9	88.0	89.5	87.4	84.5
3	81.5	81.5	79.7	77.0	84.6	85.5	83.3	80.0	87.1	87.7	85.6	83.5	89.1	90.4	88.6	85.9
4	83.1	83.1	81.4	79.2	85.8	86.6	84.6	81.9	88.1	88.6	86.8	84.8	90.0	91.1	89.5	87.1
5.5	84.7	84.7	83.1	81.4	87.0	87.7	86.0	83.8	89.2	89.6	88.0	86.2	90.9	91.9	90.5	88.3
7.5	86.0	86.0	84.7	83.1	88.1	88.7	87.2	85.3	90.1	90.4	89.1	87.3	91.7	92.6	91.3	89.3
11	87.6	87.6	86.4	85.0	89.4	89.8	88.7	86.9	91.2	91.4	90.3	88.6	92.6	93.3	92.3	90.4
15	88.7	88.7	87.7	86.2	90.3	90.6	89.7	88.0	91.9	92.1	91.2	89.6	93.3	93.9	92.9	91.2
18.5	89.3	89.3	88.6	86.9	90.9	91.2	90.4	88.6	92.4	92.6	91.7	90.1	93.7	94.2	93.4	91.7
22	89.9	89.9	89.2	87.4	91.3	91.6	90.9	89.1	92.7	93.0	92.2	90.6	94.0	94.5	93.7	92.1
30	90.7	90.7	90.2	88.3	92.0	92.3	91.7	89.8	93.3	93.6	92.9	91.3	94.5	94.9	94.2	92.7
37	91.2	91.2	90.8	88.8	92.5	92.7	92.2	90.3	93.7	93.9	93.3	91.8	94.8	95.2	94.5	93.1
45	91.7	91.7	91.4	89.2	92.9	93.1	92.7	90.7	94.0	94.2	93.7	92.2	95.0	95.4	94.8	93.4
55	92.1	92.1	91.9	89.7	93.2	93.5	93.1	91.0	94.3	94.6	94.1	92.5	95.3	95.7	95.1	93.7
75	92.7	92.7	92.6	90.7	93.8	94.0	93.7	91.6	94.7	95.0	94.6	93.1	95.6	96.0	95.4	94.2
90	93.0	93.0	92.9	91.1	94.1	94.2	94.0	91.9	95.0	95.2	94.9	93.4	95.8	96.1	95.6	94.4
110	93.3	93.3	93.3	91.5	94.3	94.5	94.3	92.3	95.2	95.4	95.1	93.7	96.0	96.3	95.8	94.7
132	93.5	93.5	93.5	91.9	94.6	94.7	94.6	92.6	95.4	95.6	95.4	94.0	96.2	96.4	96.0	94.9
160	93.8	93.8	93.8	92.5	94.8	94.9	94.8	93.0	95.6	95.8	95.6	94.3	96.3	96.6	96.2	95.1
200	94.0	94.0	94.0	92.5	95.0	95.1	95.0	93.5	95.8	96.0	95.8	94.6	96.5	96.7	96.3	95.4
250	94.0	94.0	94.0	92.5	95.0	95.1	95.0	93.5	95.8	96.0	95.8	94.6	96.5	96.7	96.5	95.4
315 up to 1000	94.0	94.0	94.0	92.5	95.0	95.1	95.0	93.5	95.8	96.0	95.8	94.6	96.5	96.7	96.6	95.4

Table 1 - Minimum efficiency levels (according to IEC 60034-30-1 : 2014).

WEG can support the movement towards these high efficiency levels by offering a comprehensive range of products meeting the IE1, IE2, IE3 and even IE4 criteria detailed above. Additionally our variable speed drives are perfectly matched to our motors, affording you the most reliable package of motor / drive products in industry. To learn more about WEG, our products and the new Global Directives, go to www.weg.net or www.weg.net/green

Visual Index



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1. Versions Available

For the European market, W22 motors are available in three versions in accordance with IEC 60034-30-1 : 2014: High Efficiency (IE2), Premium Efficiency (IE3) and Super Premium Efficiency (IE4). Figure 1 shows the efficiency levels established by IEC 60034-30-1 : 2014 for induction motors.

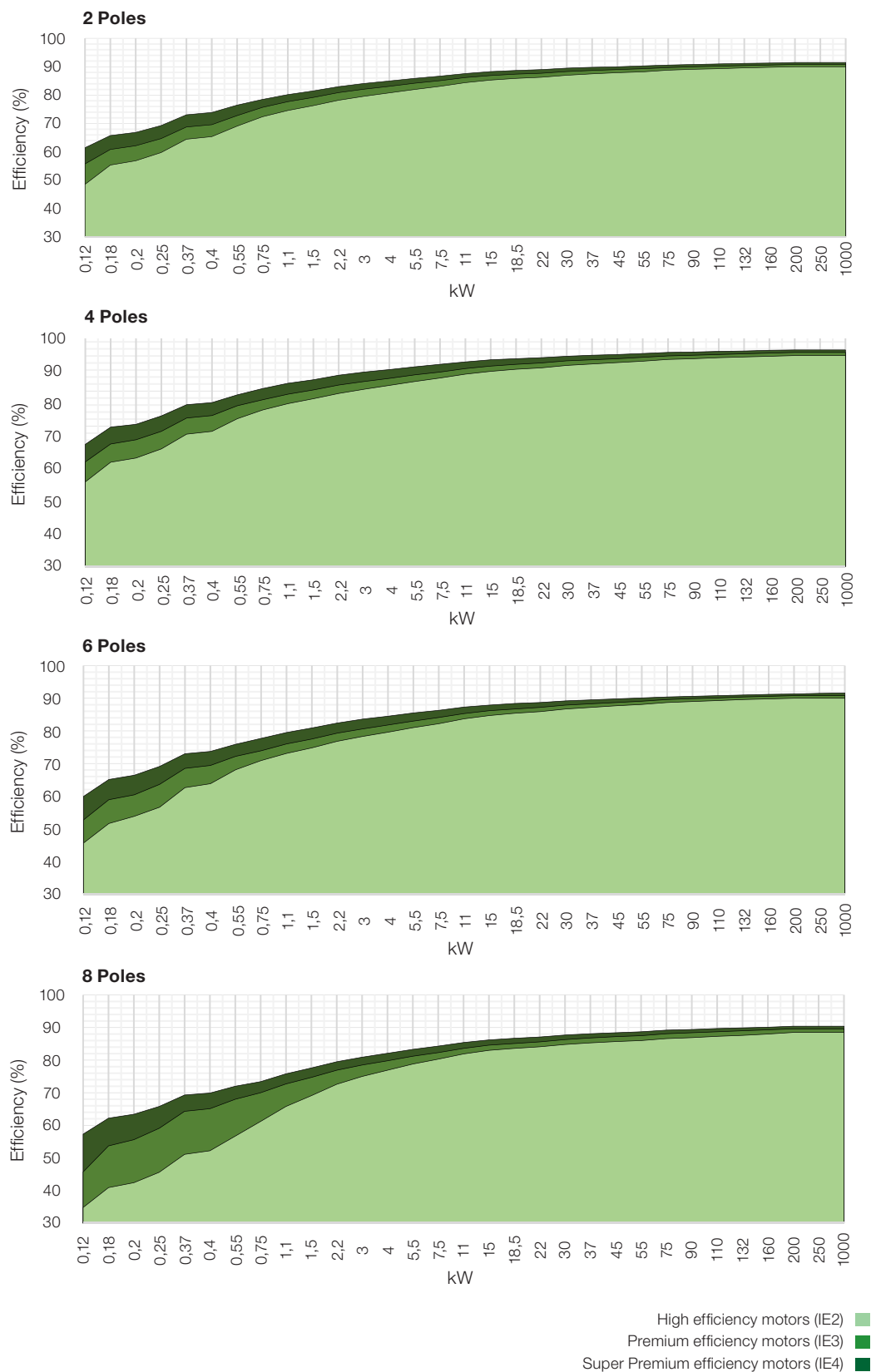


Figure 1 - Efficiency levels according to IEC 60034-30-1

W22 motors are fully tested and have their efficiency figures declared in accordance with IEC 60034-2-1: 2007 Standard with stray load losses directly determined by summation of losses.

All motors, even Super Premium (IE4) and Premium Efficiency (IE3), have the output versus frame ratio as per EN 50347 Standard, allowing direct replacement of existing lower efficiency motors with Super Premium / Premium Efficiency machines.

Another characteristic of the electrical design of the W22 line is that it was conceived so that its efficiency remains practically constant in the 75% to 100% load range. Therefore, even when the motor does not run at full load its efficiency is not considerably affected (see figure 2), resulting in high levels of energy efficiency.

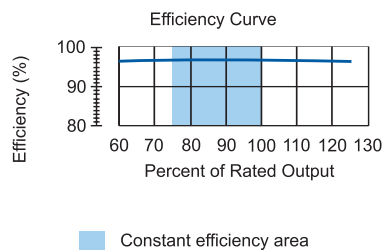


Figure 2 - Typical efficiency curve of W22 line

2. Standards

W22 motors meet the requirements and regulations of the latest versions of the following Standards:

- IEC 60034-1 Rotating electrical machines - Part 1: Rating and performance.
- IEC 60034-2-1 Rotating electrical machines - Part 2-1: Standard methods for determining losses and efficiency from tests (excluding machines for traction vehicles).
- IEC 60034-5 Rotating electrical machines - Part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP code) - classification.
- IEC 60034-6 Rotating electrical machines - Part 6: Methods of cooling (IC code).
- IEC 60034-7 Rotating electrical machines - Part 7: Classification of types of enclosures and mounting arrangements (IM code).
- IEC 60034-8 Rotating electrical machines - Part 8: Terminal markings and direction of rotation.
- IEC 60034-9 Rotating electrical machines - Part 9: Noise limits.
- IEC 60034-11-1 Rotating electrical machines - Part 11-1: Thermal protection.
- IEC 60034-12 Rotating electrical machines - Part 12: Starting performance of single-speed three-phase cage induction motors.

- IEC 60034-14 Rotating electrical machines - Part 14: Mechanical vibration of certain machines - Limits of vibration.
- IEC 60034-30-1 Rotating electrical machines - Part 30: Efficiency classes for single-speed three-phase cage induction motors.
- IEC 60072-1 Dimensions and output series for rotating electrical machines - Part 1: Frame numbers 56 to 400 and flange numbers 55 to 1080.
- EN 50347 General purpose three-phase induction motors having standard dimensions and outputs - frame numbers 56 to 315 and flange numbers 65 to 740.

3. Construction Details

The information included in this document refers to standard construction features and the most common variations for W22 motors in low voltage for general applications in frame sizes from IEC 63 to 355A/B. W22 motors for special and/or customised applications are available on request. For more information, please contact your WEG office or distributor.

3.1 Frame

The W22 frame (figure 3) is manufactured in FC-200 cast iron to provide high levels of mechanical strength to cater for the most critical applications. The cooling fins are designed to minimize the accumulation of liquids and dust over the motor.



Figure 3 - W22 Frame

The motor feet are completely solid for better mechanical strength (figure 4), allowing easier alignment and installation.

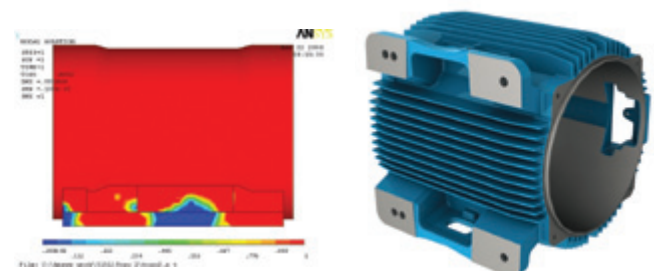


Figure 4 - Solid feet

3.2 Eyebolts

Eyebolts are provided as standard from frame size 100L. The position of the eyebolts are shown in the table 3:

Number of eyebolts	Description
1	Frames 100L to 200L Motors with feet and with side mounted terminal box
2	Frames 100L to 200L Motors with feet and with top mounted terminal box
2	Frames 100L to 200L - Motors without feet and with C or FF flange
2	Frames 225S/M to 355A/B - Motors with feet and side or top mounted terminal box. These motors have four threaded holes in the upper part of the frame for fastening of the eyebolts (figure 5)
2	Frames 225S/M to 355A/B - Motors without feet and with C or FF flange. These motors have four threaded holes in the upper part of the frame for fastening of the eyebolts and two more threaded holes in the bottom part

Table 3: Eyebolts

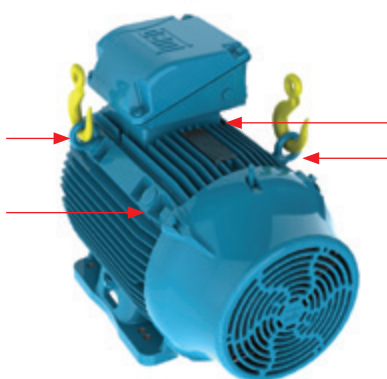


Figure 5: Motor with four threaded holes for fastening of the eyebolts

3.3 Points for Vibration Monitoring

To allow easy maintenance, specifically vibration testing, the 160 to 355 frames are designed with flat areas on both ends for better placement of the accelerometer (figure 6). These areas are available both in vertical and horizontal planes.

As an option M8 threads for SPM accelerometers can be supplied.



Figure 6 - Flat surfaces for vibration monitoring on the top, front and side.

3.4 Earth Terminals

All frames from 63 to 355A/B are provided with two earth terminals located inside and adjacent to the terminal box (see figure 7).

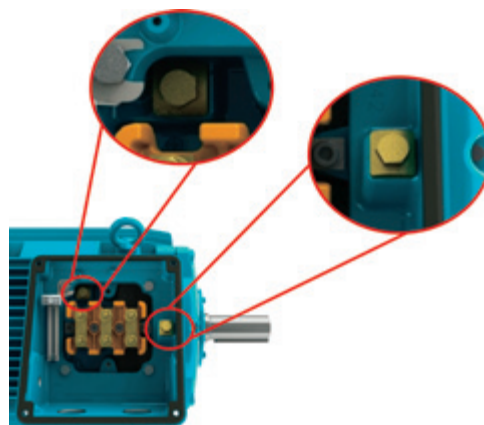


Figure 7 - Earth terminals in the terminal box

Motors in frames 225S/M to 355A/B are fitted with an additional earth terminal on the frame. It is located on the same side of the main cable entry of the terminal box (see Figure 8) and is responsible to equalize electrical potential and provide greater safety for operators. Capable of withstanding cables from 25 mm² to 185 mm².

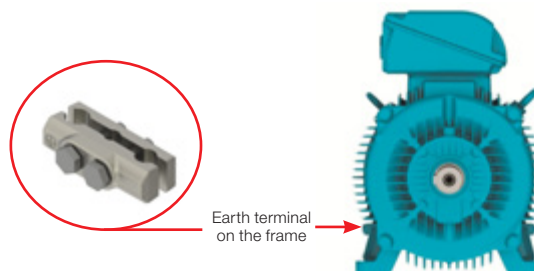


Figure 8 - Earth terminal position on the frame.

Optionally, the motors can be supplied with an additional earth terminal on the frame.

3.5 Terminal Box

The terminal box of W22 motors is made with FC-200 cast iron, which is the same material used to produce the frame and endshields. It is diagonally split for easier handling of leads and connections.

For frame sizes 225S/M to 355A/B the terminal box is positioned towards the drive end of the motor and on top as standard.

This arrangement allows improvement of the airflow over the cooling fins, thus reducing motor operating temperatures. Terminal box position on either the left or right hand side of the motor is possible through the use of an adaptor (see figure 10).

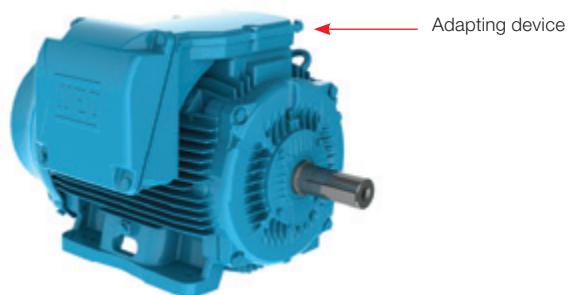


Figure 10 - Terminal box mounted on the left side viewing from shaft end

When supplied from the factory with a side mounted terminal box arrangement, this can be positioned on the opposite side simply by rotating the adaptor.

Similarly, by removing the adaptor and adjusting the length of the motor leads, the terminal box can be positioned on top of the motor.

The flexibility of terminal box positions on the W22 motor offered by the adaptor can be seen in figure 11.



Figure 11 - Terminal box mounted on both sides and on top (versatility)

Conversely, factory supplied motors with the terminal box position on top can be modified to side mounting by fitting the adaptor and extending the motor leads.

For the frame size range 63 to 200 the terminal box position is centralized on the motor frame and can be supplied in two configurations - top (standard) or left / right side (optional). A motor with a side mounted terminal box (B3R or B3L) can have the terminal box position located on the opposite side through modification.

Please Note: For all terminal box position modifications please contact WEG or your local WEG service centre.

For all frames, the terminal box can be rotated in 90° increments. Motors in IEC frame sizes 315L, 355M/L and 355A/B are supplied as standard with removable cast iron cable gland plates. As an option, the gland plates can be supplied undrilled.

Motors are supplied with plastic threaded plugs in the cable glands to maintain the degree of protection during transport and storage.

In order to guarantee the degree of protection, cable glands must comply with at least the same degree of protection as that indicated on the motor nameplate. Lack of compliance with such detail can invalidate the motor warranty. If required, please contact the WEG Service Area for further advice.

3.6 Power Supply Connection Leads

Motor power supply leads are marked in accordance with IEC 60034-8 and are connected to a terminal block made from a polyester based resin BMC (Bulk Moulding Compound), duly reinforced with fibre glass (see figure 12).



Figure 12: Six-pin terminal block

Motors in frame size 355A/B are provided with the terminal block indicated in figure 13.



Figure 13: 355A/B terminal block

3.7 Accessory Connection Leads

Accessory terminals are assembled on connectors whenever the motor is supplied with a terminal block. They may be assembled inside the main power terminal box or in a separate accessory terminal box (figure 14).

Whether the accessory terminals are assembled inside the main power or a separate terminal box, an M20 x 1.5 threaded hole is provided for fitting of cable glands for the incoming connection leads.

In the Mechanical Data section of this catalogue it is possible to check the quantity of connectors that may be assembled inside the main power and accessory terminal boxes.



Figure 14: Accessory terminal box attached to power terminal box

For frames 132 to 355, there is also the option of providing a dedicated terminal box for the connection of space heaters as shown in figure 15.



Figure 15: Two accessory terminal boxes attached to power terminal box

3.8 Endshields

The drive end endshield (figure 16) is designed with fins for better thermal heat dissipation, and to ensure low bearing operating temperatures, resulting in extended lubrication intervals.

For the frames 225S/M to 355A/B, where ventilation is critical for thermal performance of the motor, the endshield fastening screws are placed in such a way so as not to block airflow to any fin, thus contributing to better thermal exchange.

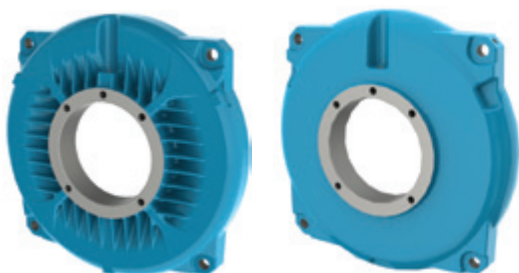


Figure 16 - Drive and non-drive endshields

3.9 Drains

The endshields have holes for drainage of water that may condense inside of the frame. These holes are supplied with rubber drain plugs, in accordance with figure 17. These plugs leave the factory in the closed position and must be opened periodically to allow the exit of condensed water.

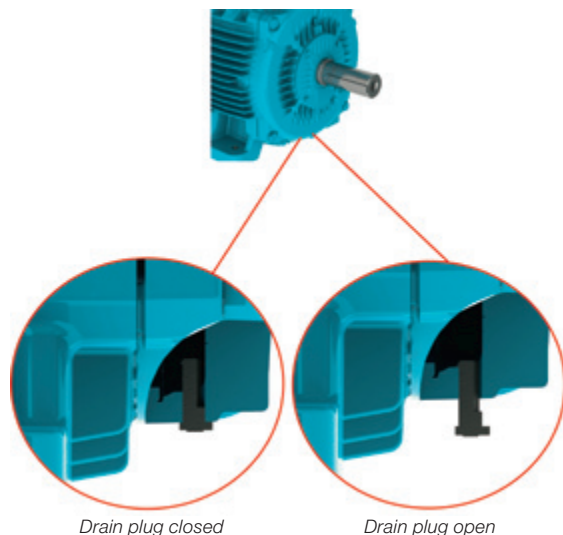


Figure 17: Detail of the drain plug position on drive endshield.

3.10 Fan Cover

The fan cover is made of steel for frames 63 to 132 and FC-200 cast iron for frames 160 to 355. The cast iron fan covers have an aerodynamic design, which results in a significant reduction in noise level and optimized airflow between frame fins for heat exchange improvement. Figure 18 shows the aerodynamic design of the cast iron fan cover.



Figure 18 - Fan cover

3.11 Nameplate

The nameplate supplies information determining motor construction and performance characteristics. The line name is given on the first line of the nameplate together with nominal efficiency levels as required by IEC 60034-30-1.

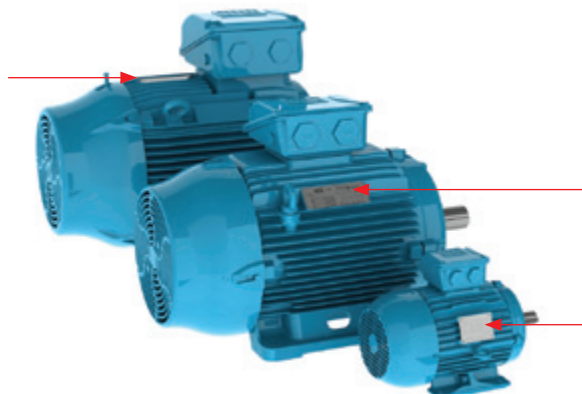


Figure 19 - Nameplate position of W22 motors

W22 Premium														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
3~132M-04	IP55	INS	CL	F	Δ	T	80	K	S1	16	SF	1.00	AMB	40°C
V	Hz	kW	RPM	13	A	14	PF	IE	code	100%	75%	50%	27	
380 Δ / 660 Y	50	7.5	1460	14.4	8.29	0.86		IE3		91.2	91.5	91.4		
400 Δ / 690 Y			1465	13.9	8.06	0.84				91.5	91.5	91.0		
415 Δ / -			1470	13.5	-	0.83								
460 Δ / -	60	11	1770	12.2	-	0.83				91.7	91.0	90.2		
NEMA Eff 91.7% 10HP 460 V 60Hz 1770 RPM														
12.4A	PF	0.83	Des	A	Code	L	SF	1.15	CC029A	6308-ZZ	19			
										6207-ZZ	20			
										MOBIL POLYREX EM	21			
										ALT 1000 m.a.s.l.	17			
										79 kg	18			
										MOD.TE1BFOXOS				
										CE	IEC	60034-1		

Figure 20 - Nameplate layout for frames 63 to 132

W22 Premium														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
3~315L-04	IP55	INS	CL	F	Δ	T	80	K	S1	16	SF	1.00	AMB	40°C
V	Hz	kW	RPM	13	A	14	PF	IE	code	100%	75%	50%	27	
380 Δ / 660 Y	50	250	1490	451	260	0.87		IE3		96.8	96.6	96.4		
400 Δ / 690 Y			1490	433	251	0.86				96.9	96.6	96.2		
415 Δ / -			1490	422	-	0.85				96.2	96.2	95.4		
460 Δ / -	60	11	1790	384	-	0.85								
NEMA Eff 96.2% 340HP 460 V 60Hz 1790 RPM														
11000 h										Alt 1000 m.a.s.l.	1546kg			
										CE	IEC	60034-1		

Figure 21 - Nameplate layout for frames 160 to 355

- 1 - Motor code
- 2 - Number of phases
- 3 - Rated operating voltage
- 4 - Service duty
- 5 - Efficiency Code - IE
- 6 - Frame size
- 7 - Degree of protection
- 8 - Insulation class
- 9 - Temperature rise
- 10 - Frequency
- 11 - Motor rated power
- 12 - Full load speed (rpm)
- 13 - Rated operating current
- 14 - Power factor
- 15 - Ambient temperature
- 16 - Service factor
- 17 - Altitude
- 18 - Motor weight
- 19 - Drive end bearing type and amount of grease (where applicable)
- 20 - Non-drive end bearing type and amount of grease (where applicable)
- 21 - Type of grease for bearings
- 22 - Connection diagram
- 23 - Relubrication intervals in hours
- 24 - Certification labels
- 25 - Manufacturing date
- 26 - Serial number
- 27 - Partial load efficiencies

4. Cooling System and Noise Level / Vibration Level / Impact Resistance

4.1 Cooling System and Noise Level

The W22 standard motors are totally enclosed fan cooled (IC411), as per IEC 60034-6 (figure 22). Non-ventilated versions (TENV), air over (TEAO) and with forced ventilation TEFV (IC416) are available on request. More information about IC416 option can be found in section 12 - Variable speed drive application.



Figure 22 - Cooling system

The cooling system (fan, non drive endshield and fan cover) is designed to minimize the noise level and improve thermal efficiency (figure 23).

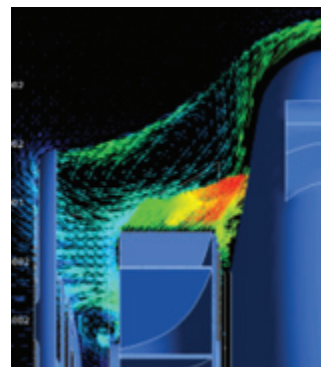


Figure 23 - Cooling system operation

W22 motors comply with IEC 60034-9 Standard and the corresponding sound pressure levels. Tables 4 and 5 show sound pressure levels in dB(A) which are obtained upon tests at 50 Hz and 60 Hz.

IEC 50 Hz				
Frame	Sound pressure level - dB(A) at 1 meter			
	2 poles	4 poles	6 poles	8 poles
63	52	44	43	-
71	56	43	43	41
80	59	44	43	42
90	64/ 62(*)	49	45	43
100	67	53	44	50
112	64	56	48	46
132	68/ 67(*)	60/ 56(*)	52	48
160	67	61	56	51
180	67	61	56	51
200	72/ 69(*)	65/ 63(*)	60	53
225	75/ 74(*)	66/ 63(*)	61	56
250	75/ 74(*)	66/ 64(*)	61	56
280	77	69	65	59
315S/M	77	71	67	61
315 L	78	74/ 73(*)	68	61
355M/L	80	76/ 74(*)	73	70
355A/B	83	76	73	70

(*) Applicable to IE3 and IE4 Motors.

Table 4 - Sound pressure levels for 50 Hz motors

IEC 60 Hz				
Frame	Sound pressure level - dB(A) at 1 meter			
	2 poles	4 poles	6 poles	8 poles
63	56	48	47	-
71	60	47	47	45
80	62	48	47	46
90	68	51	49	47
100	71	54	48	54
112	69	58	52	50
132	72	61	55	52
160	72	64	59	54
180	72	64	59	54
200	76/ 74(*)	68/ 66(*)	62	56
225	80/ 79(*)	70/ 67(*)	64	60
250	80/ 79(*)	70/ 68(*)	64	60
280	81	73	69	63
315S/M	81	75	70	64
315L	82	79/ 77(*)	71	64
355M/L	84	81/ 78(*)	77	75
355A/B	89	81	77	75

(*) Applicable to IE3 and IE4 Motors.

Table 5 - Sound pressure levels for 60 Hz motors

The noise level figures shown in tables 4 and 5 are taken at 1 metre at no load. Under load the IEC 60034-9 Standard foresees an increase of the sound pressure levels as shown in table 6.

Frame (mm)	2 poles	4 poles	6 poles	8 poles
$90 \leq H \leq 160$	2	5	7	8
$180 \leq H \leq 200$	2	4	6	7
$225 \leq H \leq 280$	2	3	6	7
$H = 315$	2	3	5	6
$355 \leq H$	2	2	4	5

Table 6 - Maximum expected increase of sound pressure level for loaded motors.

Note: These figures refer to operating frequencies of 50 Hz and 60 Hz.

The global noise level can be reduced up to 2 dB (A) with the installation of a drip cover.

4.2 Vibration Level

Vibration of an electrical machine is closely related to its assembly on the application and, thus, it is generally desirable to perform vibration measurements under installation and operational conditions. Nevertheless, to allow evaluation of the vibration generated by the electrical machine itself in a way to allow reproducibility of the tests and the obtaining of comparative measurements, it is necessary to perform such measurements with the machine uncoupled, under controlled test conditions. The test conditions and vibration limits described here are those found in IEC 60034-14. The severity of vibration is the maximum value of vibration found among all the recommended measurement points and directions. The table below indicates the recommended admissible values of vibration severity under IEC standard 60034-14 for the frames IEC 56 to 400, for degrees of vibration A and B.

W22 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 7.

Vibration	Frame	$56 \leq H \leq 132$	$132 < H \leq 280$	$H > 280$
	Assembly	Vibration speed RMS (mm/s)	Vibration speed RMS (mm/s)	Vibration speed RMS (mm/s)
Grade A	Free suspension	1.6	2.2	2.8
Grade B	Free suspension	0.7	1.1	1.8

Table 7 - Speed and vibration levels

4.3 Impact Resistance

The W22 motor complies with impact level IK08 - mechanical impact of 5J as per EN 62262 - Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code) ensuring superior mechanical strength for the most demanding applications.

5. Shaft / Bearings

5.1 Shaft

The shaft material for W22 standard motors is AISI 1040/45 steel, in frames IEC 63 to 315S/M, and in AISI 4140 steel for frames 315L, 355M/L and 355A/B. When supplied with roller bearings (optional for frames 160 and above), the shaft material must be AISI 4140.

As they are fitted with AISI 4140 steel shafts in W22 frames 315L, 355M/L and 355A/B, these 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 9, 10 and 11.

Important: Under such circumstances, the non drive end bearing cap needs to be replaced as the non drive end bearing must be locked.

Shafts are supplied with an open profile key way, with a threaded centre hole; dimensions are shown in section 17 - Mechanical data.

W22 motors can also be supplied with a second shaft end with dimensions shown in section 17 - Mechanical data. Information relating to maximum allowable radial and axial loads on the second shaft end is available on request. As an option, W22 motors can be supplied with stainless steel shafts (AISI 316 and AISI 420) for highly corrosive environments.

Note: 2 pole motors will have as an option only the shaft end in stainless steel AISI 316.

5.2 Bearings

W22 motors are supplied with deep groove ball bearings as standard (figure 24). Optionally, frame sizes 160 and above can be supplied with NU series roller bearings for applications where high radial loads may occur.

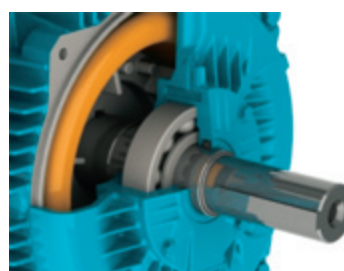


Figure 24: Bearing view

The nominal bearing life L10h is 20000 or 40000 hours in conformance with maximum radial and axial loads as described in tables 9, 10 and 11. When direct coupled to the load (without axial or radial thrusts), the L10h bearing life can be extended to 50000* hours.

* For regreasable motors. Other configurations contact WEG.

In standard configuration, with ball bearings, the drive end bearing is locked axially from frame 160. To compensate for any axial movement the motors are fitted with pre-load washers for frames 63 to 200 and with pre-load springs for frames 225 to 355. When provided with roller bearings, the rear bearing is locked and the axial movement is

compensated by the axial play of the front roller bearing. Minimum and maximum admissible radial loads for roller bearings are shown in table 10 on page 16. The lifetime of the bearing is dependent on its type and size, the radial and axial mechanical loads it is submitted to, operating conditions (environment, temperature, mounting orientation), rotational speed and grease life. Therefore, bearing lifetime is closely related to its correct use, maintenance and lubrication. Respecting the quantity of grease and lubrication intervals allows bearings to reach the lifetime given. W22 motors in IEC frames 225S/M and above are provided as standard with grease fittings in each endshield to permit the relubrication of the bearings. The quantity of grease and lubrication intervals are stamped in the motor nameplate. The lubrication intervals are shown in tables 12 and 13 on page 17. It must be emphasized that excessive lubrication, i.e. a quantity of grease greater than that recommended on the motor nameplate, can result in the increase of bearing temperatures leading to reduced operating hours.

Note:

1. L10 lifetime means that at least 90% of the bearings submitted to the maximum indicated loads will reach the number of hours indicated. The maximum admissible radial and axial loads for the standard configuration are shown in tables 9, 10 and 11. The values of the maximum radial load consider axial load as nil. The values of the maximum axial load consider radial load as nil. For bearing lifetimes with combined axial and radial loads condition contact WEG. 2. The radial force value F_r usually results from information recommended in the catalogues of pulley / belt manufacturers.

When this information is not available, the force F_r , under operation, can be calculated based on the output power, on coupling design characteristics with pulleys and belts and on the type of application. So we have:

$$F_r = \frac{19,1 \cdot 10^6 \cdot P_n}{n_n \cdot dp} \cdot ka \text{ (N)}$$

Where:

F_r is the radial force caused by pulley and belt coupling [N];

P_n is the motor rated power [kW];

n_n is the motor rated speed per minute [rpm];

dp is the pitch diameter of the driven pulley [mm];

ka is a factor that depends on belt tension and type of application (table 8).

Groups and basic types of application		ka factor of the application	
		V belts	Plane belts
1	Fans and blowers, centrifugal pumps, winding machines, compressors, machine tools with outputs up to 22 kW (30 HP)	2.0	3.1
2	Fans and blowers, centrifugal pumps, winding machines, compressors, machine tools with outputs higher than 22 kW (30 HP)	2.4	3.3
3	Presses, vibrating screens, piston and screw compressors, pulverisers, helicoidal conveyors, woodworking machines, textile machines, kneading machines, ceramic machines, pulp and paper industrial grinders (for all power range).	2.7	3.4
4	Overhead cranes, hammer mills, metal laminators, conveyors, gyratory crushers, jaw crushers, cone crushers, cage mills, ball mills, rubber mixers, mining machines, shredders (for all power range).	3.0	3.7

Table 8 - ka factor

Important:

1 - 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.

2 - 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.

3 - 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.

4 - Motors with modified mounting configurations

For motors supplied with horizontal mounting but working vertically, lubrication intervals must be reduced by half.

5 - 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.

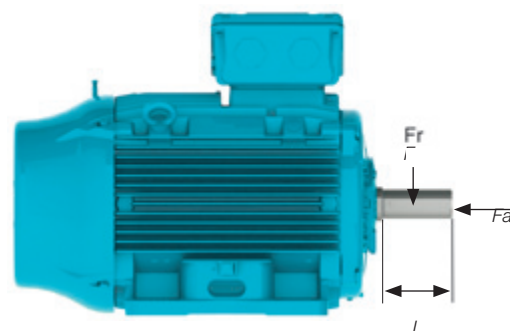


Figure 25 - Radial and axial thrust on motor shaft

5.2.1 Permissible Loads

Radial Thrust - Ball Bearings

Maximum permissible radial thrust - 50 Hz - F_r in (kN) 20000 hours								
Frame	2 poles		4 poles		6 poles		8 poles	
	L	L/2	L	L/2	L	L/2	L	L/2
63	0.4	0.3	0.4	0.3	0.4	0.3	0.4	0.3
71	0.5	0.5	0.6	0.5	0.6	0.5	0.7	0.6
80	0.6	0.6	0.7	0.7	0.8	0.7	1.0	0.8
90	0.7	0.6	0.8	0.7	0.9	0.8	1.0	0.9
100	0.9	1.0	1.0	1.1	1.2	1.3	1.3	1.4
112	1.2	1.3	1.4	1.5	1.6	1.8	1.7	1.9
132	1.8	2.0	2.2	2.4	2.4	2.7	2.6	2.9
160	2.3	2.6	2.6	2.9	2.7	3.3	2.7	3.7
180	3.1	3.5	3.6	4.0	4.2	4.7	4.2	5.2
200	3.7	4.0	4.2	4.7	4.9	5.4	5.7	6.2
225	5.1	5.5	5.2	6.3	5.3	7.0	5.7	8.1
250	4.9	5.3	5.2	5.7	6.5	7.1	6.0	8.2
280	5.0	5.4	6.7	7.2	7.8	8.4	8.7	9.4
315S/M	4.3	4.7	7.0	7.7	8.1	8.8	9.0	9.8
315L	4.6	5.0	4.0	7.3	6.2	8.2	9.1	9.8
355M/L	4.8	5.1	8.5	9.3	9.6	10.4	11.6	12.6
355A/B	4.5	4.7	5.1	7.4	7.4	8.0	6.9	10.6

Table 9.1 - Maximum permissible radial thrusts for ball bearings

Radial Thrust - Ball Bearings

Maximum permissible radial thrust - 50 Hz - Fr in (kN) 40000 hours								
Frame	2 poles		4 poles		6 poles		8 poles	
	L	L/2	L	L/2	L	L/2	L	L/2
63	0.2	0.2	0.3	0.3	0.4	0.3	0.4	0.3
71	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.5
80	0.5	0.5	0.6	0.5	0.6	0.6	0.7	0.7
90	0.5	0.5	0.6	0.5	0.7	0.6	0.8	0.7
100	0.7	0.7	0.7	0.8	0.9	1.0	1.0	1.1
112	0.9	1.0	1.0	1.1	1.2	1.4	1.3	1.4
132	1.4	1.6	1.6	1.8	1.8	2.0	2.0	2.2
160	1.8	2.0	1.9	2.1	2.2	2.4	2.5	2.7
180	2.4	2.7	2.7	3.0	3.2	3.5	3.6	3.9
200	2.8	3.0	3.2	3.5	3.7	4.0	4.3	4.7
225	3.9	4.3	4.3	4.7	4.7	5.2	5.6	6.2
250	3.7	4.1	3.8	4.2	4.9	5.4	5.7	6.3
280	3.8	4.1	4.9	5.4	5.8	6.3	6.5	7.0
315S/M	3.1	3.4	4.9	5.4	5.7	6.2	6.3	6.9
315L	3.4	3.6	4.0	4.9	5.1	5.5	6.4	6.9
355M/L	3.3	3.6	5.8	6.3	6.5	7.1	8.2	8.9
355A/B	3.0	3.2	4.1	4.4	4.2	4.5	5.3	6.8

Table 9.2 - Maximum permissible radial thrusts for ball bearings (horizontal mounting).

Radial Thrust - Roller Bearings

Maximum permissible radial thrust - 50 Hz - Fr in (kN) 20000 or 40000 hours						
Frame	4 poles		6 poles		8 poles	
	L/2	L	L/2	L	L/2	L
160	5,0	3,2	5,1	3,3	5,1	3,3
180	8,8	5,5	8,8	5,6	8,8	5,6
200	11,2	7,3	11,2	7,4	11,3	7,4
225S/M	12,9	7,6	12,9	7,6	13,0	7,8
250S/M	13,7	8,9	13,8	8,9	13,7	8,9
280S/M	19,3	12,6	19,4	12,8	19,6	12,9
315S/M	25,8	12,9	27,4	13,0	27,4	13,2
315L	21,5	10,1	20,1	9,4	26,1	12,2
355M/L	34,0	17,3	33,5	16,4	33,5	16,1
355A/B	31,4	14,9	25,4	12,0	28,4	13,5

Table 10 - Maximum permissible radial thrusts for roller bearings (horizontal mounting)

Note: the figures given for roller bearings take into consideration shaft supplied with steel AISI 4140.



Axial Thrust - Ball Bearings

Maximum permissible axial thrust - 50 Hz - Fa in (kN) - 20000 hours							
Frame	Poles	Horizontal		Vertical with shaft upwards		Vertical with shaft downwards	
		Pushing	Pulling	Pushing	Pulling	Pushing	Pulling
63	2	0.2	0.2	0.2	0.2	0.2	0.2
	4	0.3	0.3	0.3	0.3	0.3	0.3
	6	0.3	0.4	0.3	0.4	0.4	0.3
	8	0.3	0.4	0.3	0.4	0.4	0.3
71	2	0.2	0.3	0.2	0.3	0.2	0.3
	4	0.3	0.4	0.3	0.4	0.3	0.4
	6	0.4	0.5	0.4	0.5	0.4	0.5
	8	0.5	0.6	0.4	0.6	0.5	0.6
80	2	0.3	0.4	0.3	0.4	0.3	0.4
	4	0.4	0.6	0.3	0.6	0.4	0.5
	6	0.5	0.7	0.4	0.7	0.5	0.7
	8	0.6	0.8	0.5	0.9	0.6	0.8
90	2	0.4	0.4	0.3	0.5	0.4	0.4
	4	0.5	0.6	0.5	0.7	0.5	0.6
	6	0.6	0.7	0.6	0.8	0.6	0.7
	8	0.8	0.9	0.7	0.9	0.8	0.8
100	2	0.4	0.6	0.3	0.7	0.4	0.6
	4	0.5	0.8	0.4	0.9	0.5	0.8
	6	0.7	1.0	0.6	1.1	0.7	1.0
	8	0.8	1.2	0.7	1.3	0.8	1.1
112	2	0.5	0.8	0.5	0.9	0.6	0.7
	4	0.7	1.1	0.7	1.2	0.8	1.0
	6	1.0	1.4	0.9	1.5	1.0	1.3
	8	1.1	1.5	1.0	1.7	1.1	1.4
132	2	0.7	1.3	0.6	1.5	0.8	1.2
	4	1.0	1.8	0.8	2.1	1.0	1.7
	6	1.2	2.2	1.1	2.5	1.3	2.1
	8	1.4	2.5	1.2	2.8	1.4	2.3
160	2	2.4	1.7	0.2	2.1	2.8	1.5
	4	3.0	2.3	2.7	2.7	3.4	2.0
	6	3.4	2.7	3.1	3.3	4.0	2.4
	8	3.9	3.2	3.6	3.7	4.4	2.9
180	2	3.2	2.3	2.9	2.8	3.7	2.0
	4	3.9	3.0	3.6	3.7	4.6	2.7
	6	4.7	3.8	4.2	4.5	5.3	3.3
	8	5.2	4.4	4.8	5.1	6.0	3.9
200	2	3.6	2.6	3.1	3.3	4.3	2.1
	4	4.5	3.5	4.0	4.3	5.3	3.0
	6	5.2	4.2	4.7	5.1	6.1	3.7
	8	6.0	5.0	5.5	5.9	6.9	4.5
225	2	4.6	3.8	3.8	4.9	5.7	3.1
	4	5.8	5.0	5.0	6.3	7.1	4.2
	6	6.7	5.9	5.7	7.6	8.4	4.9
	8	7.8	7.0	6.9	8.5	9.3	6.1
250	2	4.5	3.7	3.7	4.9	5.6	3.0
	4	5.4	4.7	4.2	6.6	7.4	3.4
	6	6.8	6.0	5.4	8.0	8.8	4.6
	8	7.8	7.1	6.6	8.9	9.7	5.9
280	2	4.4	3.7	3.2	5.4	6.2	2.4
	4	6.3	5.5	4.6	8.0	8.8	3.9
	6	7.6	6.8	5.8	9.4	10.2	5.0
	8	8.5	7.8	6.6	10.6	11.4	5.8
315S/M	2	4.1	3.3	2.4	5.9	6.7	1.6
	4	6.8	6.0	4.3	10.0	10.7	3.5
	6	8.0	7.2	5.2	11.9	12.7	4.5
	8	9.1	8.3	6.2	13.2	14.0	5.5
315L	2	3.0	2.2	1.1	5.0	5.7	0.4
	4	4.5	3.7	1.4	8.2	8.9	0.6
	6	5.2	4.4	1.9	9.5	10.3	1.2
	8	6.3	5.5	3.4	10.0	10.8	2.6
355M/L	2	4.4	3.7	1.1	8.8	9.5	0.3
	4	7.7	7.0	3.2	13.9	14.7	2.5
	6	9.1	8.4	4.7	15.3	16.0	3.9
	8	10.9	10.2	6.4	17.2	17.9	5.7
355A/B	2	4.1	3.3	On request			
	4	6.8	6.0				
	6	7.8	7.0				
	8	9.8	9.0				

Table 11.1 - Maximum permissible axial thrusts for ball bearings (horizontal mounting).

Axial Thrust - Ball Bearings

Maximum permissible axial thrust - 50 Hz - Fa in (kN) - 40000 hours							
Frame	Poles	Horizontal		Vertical with shaft upwards		Vertical with shaft downwards	
		Pushing	Pulling	Pushing	Pulling	Pushing	Pulling
63	2	0.1	0.1	0.1	0.1	0.1	0.1
	4	0.2	0.2	0.2	0.2	0.2	0.2
	6	0.2	0.2	0.2	0.2	0.2	0.2
	8	0.2	0.2	0.2	0.2	0.2	0.2
71	2	0.1	0.2	0.1	0.2	0.1	0.2
	4	0.2	0.3	0.2	0.3	0.2	0.2
	6	0.2	0.3	0.2	0.3	0.2	0.3
	8	0.3	0.4	0.3	0.4	0.3	0.4
80	2	0.2	0.3	0.1	0.3	0.2	0.3
	4	0.2	0.4	0.2	0.4	0.2	0.3
	6	0.3	0.5	0.3	0.5	0.3	0.4
	8	0.4	0.6	0.3	0.6	0.4	0.5
90	2	0.2	0.3	0.2	0.3	0.2	0.2
	4	0.3	0.4	0.3	0.4	0.3	0.3
	6	0.4	0.5	0.4	0.5	0.4	0.4
	8	0.5	0.6	0.5	0.6	0.5	0.5
100	2	0.2	0.4	0.2	0.4	0.2	0.3
	4	0.3	0.5	0.2	0.6	0.3	0.5
	6	0.4	0.7	0.3	0.8	0.4	0.6
	8	0.5	0.8	0.4	0.9	0.5	0.7
112	2	0.3	0.5	0.3	0.6	0.3	0.4
	4	0.4	0.7	0.4	0.8	0.5	0.6
	6	0.6	0.9	0.5	1.1	0.6	0.8
	8	0.7	1.0	0.6	1.2	0.7	0.9
132	2	0.4	0.9	0.3	1.1	0.5	0.8
	4	0.6	1.2	0.5	1.4	0.6	1.1
	6	0.8	1.5	0.6	1.8	0.8	1.3
	8	0.9	1.7	0.7	2.0	0.9	1.5
160	2	1.8	1.1	1.6	1.5	2.2	0.9
	4	2.2	1.5	1.9	1.9	2.6	1.2
	6	2.5	1.8	2.2	2.3	3.1	1.5
	8	2.9	2.2	2.5	2.7	3.4	1.8
180	2	2.4	1.5	2.1	2.0	2.9	1.2
	4	2.9	2.0	2.5	2.6	3.5	1.6
	6	3.4	2.5	3.0	3.2	4.1	2.1
	8	3.9	3.0	3.5	3.7	4.6	2.6
200	2	2.7	1.7	2.2	2.4	3.4	1.2
	4	3.3	2.3	2.8	3.1	4.1	1.8
	6	3.8	2.8	3.3	3.8	4.8	2.3
	8	4.4	3.4	3.9	4.3	5.3	2.9
225	2	3.4	2.6	2.7	3.7	4.5	1.9
	4	4.2	3.5	3.4	4.7	5.5	2.6
	6	4.8	4.0	3.8	5.7	6.5	3.0
	8	5.7	4.9	4.8	6.4	7.1	4.1
250	2	3.4	2.5	2.5	3.7	4.5	1.8
	4	3.9	3.1	2.6	5.0	5.9	1.8
	6	4.9	4.1	3.6	6.2	7.0	2.8
	8	5.8	4.9	4.5	6.8	7.6	3.8
280	2	3.3	2.5	2.0	4.3	5.1	1.2
	4	4.6	3.8	2.9	6.2	7.0	2.1
	6	5.4	4.7	3.6	7.3	8.0	2.8
	8	6.1	5.4	4.2	8.2	9.0	3.4
315	2	2.9	2.2	1.2	4.8	5.5	0.4
	4	4.7	4.0	2.2	7.9	8.6	1.4
	6	5.6	4.8	2.8	9.4	10.2	2.0
	8	6.4	5.6	3.4	10.4	11.2	2.6
315L	2	3.0	2.2	1.1	5.0	5.7	0.4
	4	4.5	3.7	1.4	8.2	8.9	0.6
	6	5.2	4.4	1.9	9.5	10.3	1.2
	8	6.3	5.5	3.4	10.0	10.8	2.6
355M/L	2	3.1	2.4	0.6	6.7	7.5	0.2
	4	5.5	4.7	1.9	1.1	11.6	1.2
	6	6.3	5.6	2.8	11.8	12.7	2.0
	8	7.6	6.8	3.8	13.2	13.7	2.9
355A/B	2	2.9	2.2	On request			
	4	4.6	3.9				
	6	5.2	4.5				
	8	6.5	5.8				

Table 11.2 - Maximum permissible axial thrusts for ball bearings (horizontal mounting)

Lubrication Intervals (40 °C - Rated Speed)

Lubrication intervals (hours)			
Frame	Poles	50 Hz	60 Hz
160	2	22000	20000
	4	25000	25000
	6		
	8		
180	2	17000	14000
	4	25000	25000
	6		
	8		
200	2	15000	12000
	4	25000	25000
	6		
	8		
225	2	5000	4000
	4	14000	12000
	6	20000	17000
	8	24000	20000
250	2	5000	4000
	4	14000	12000
	6	20000	17000
	8	24000	20000
280	2	5000	4000
	4	13000	10000
	6	18000	16000
	8	20000	20000
315	2	5000	4000
	4	11000	8000
	6	16000	13000
	8	20000	17000
355	2	5000	4000
	4	4000	On request
	6	9000	6000
	8	13000	11000
	2	19000	14000

Table 12 - Lubrication intervals for ball bearings (horizontal mounting).

Note: the amount of grease is indicated on the nameplate.

Lubrication intervals (hours)			
Frame	Poles	50 Hz	60 Hz
160	4	25000	25000
	6		
	8		
180	4	25000	25000
	6		
	8		
200	4	25000	21000
	6		25000
	8		
225	4	11000	9000
	6	16000	13000
	8	20000	19000
250	4	11000	9000
	6	16000	13000
	8	20000	19000
280	4	9000	7000
	6	14000	12000
	8	19000	17000
315	4	7000	5000
	6	12000	9000
	8	17000	15000
355	4	5000	4000
	6	9000	7000
	8	14000	13000

Table 13 - Lubrication intervals for roller bearings (horizontal mounting).

Note: the amount of grease is indicated on the nameplate.

5.2.2 Bearing Monitoring

On request, W22 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.

6. Mounting Forms

Motors are supplied, as standard, in the B3T foot configuration, with the terminal box on top.



Figure 26 - B3T mounting

The mounting configuration for the W22 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 14 - Mountings configurations

* Non-defined mountings by IEC 60034-7.

Important:

1. The mountings IM B34 and IM B14 with C-DIN flange, in accordance with DIN standard EN 50347, are limited to frame size 132; As an option, C Flanges in accordance with NEMA MG 1 Part 4 standard are available for frames 63 to 355M/L.
2. 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.
3. 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.

7. Degree of Protection / Sealing System / Painting

7.1 Degree of Protection

As per IEC 60034-5, the degree of protection of a rotating electrical machine consists of the letters IP (ingress protection), followed by two characteristic numerals, with the following definitions:

- a) First characteristic numeral: refers to protection of people against or approach to live parts and against contacts with moving parts (other than smooth rotating shafts and the like) inside the enclosure and protection of the machine against ingress of solid and foreign objects.
- b) Second characteristic numeral: protection of machines against harmful effects due to ingress of water.

W22 motors are supplied with degrees of protection in conformance with IEC 60034-5. As standard, they are IP55, which means:

- a) 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.
- b) 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.

7.2 Sealing System

The sealing system utilized on the shaft of W22 foot mounted motors in frames 63 to 200 is V'ring. For frames 225S/M to 355A/B the sealing system is the exclusive WSeal®, which consists of a double lipped V'Ring with a metallic cap (see figure 27).

This configuration operates like a labyrinth preventing ingress of water and dust into the motor.



Figure 27 - WSeal®

Alternatively, W22 motors can be supplied with other sealing arrangements, for example, oilseal, taconite labyrinth and the WEG exclusive W3 Seal®, among others (see Section 15 - Optional features).

When the motor is fitted with a flange, the recommended seal is either a lip seal (no contact with liquid) or oilseal (direct contact with liquid).

7.3 Painting



Figure 28 - WEG internal painting plan

W22 motors of frame 63 to 132 are supplied as standard with WEG internal painting plan 207A. This plan consists of:

- Primer: one coat with 20 to 55 μm of alkyd primer;
- Finishing: one coat with 30 to 40 μm of styrenated alkyd synthetic enamel.

And, W22 motors of frame 160 up to 355 are supplied as standard with WEG internal painting plan 203A, consisting of:

- Primer: one coat with 20 to 55 μm of alkyd primer;

- Finishing: one coat with 50 to 75 μm of alkyd synthetic enamel.

These painting plans meet the “C2” performance criteria indicated in the DIN EN ISO 12944-2 Standard with respects to “Corrosivity Category” and may be used in motors applied in normal environments, slightly severe, sheltered or non-sheltered, for industrial use, with low relative humidity, normal temperature variations and the presence of SO_2 .

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 (see section 15 - Optional features).

7.3.1 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.

8. Voltage / Frequency

As defined in IEC 60034-1 the combination of voltage and frequency variations are classified as Zone A or Zone B, as per figure 29.

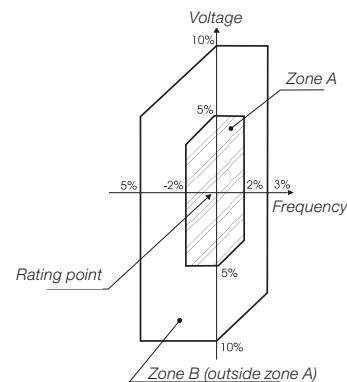


Figure 29 - Rated voltage and frequency limits for electric motors

IEC 60034-1 states that the motor must be suitable to perform its main function (supply torque) continuously within Zone A. However, this motor may not fully meet its performance characteristics due to power supply voltage and frequency variation, which can result in temperature rise above the rated value.

The motor must also be suitable to perform its main function (supply torque) at Zone B. However, the performance characteristic changes will be greater than those operating in Zone A. The temperature rise will also be higher than that at rated voltage and frequency and when operating within Zone A. Prolonged operation near the boundaries of Zone B is not recommended.

9. Overload Capacity

As per IEC 60034-1, motors having rated output not exceeding 315 kW and rated voltages not exceeding 1 kV shall be capable of withstanding a current equal to 1,5 times the rated current for not less than 2 min.

10. 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

For operating temperatures and altitudes differing from those above, the factors indicated in table 15 must be applied to the nominal motor power rating in order to determine the derated available output (P_{max}).

$$P_{max} = P_{nom} \times \text{correction factor}$$

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 15 - Correction factors for altitude and ambient temperature

W22 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 (105 K) and the temperature rise of the design (80 K) means that, in practice, W22 motors are suitable to supply output ratings above the rated values up to a limit where the temperature rise reaches the temperature rise value of the insulation class.

The ratio between temperature rise and service factor is given by the equation below:

$$\Delta T_{FINAL} \cong (S.F.)^2 \times \Delta T_{INITIAL}$$

From the above calculation, we can see that the service factor is approximately 1.15. This reserve of temperature also allows W22 motors with class B temperature rise (80 K) to operate continuously at:

- Up to 15% above its rated output power, considering 40 °C ambient temperature and 1000 m.a.s.l. or;
- Up to 55 °C ambient temperature, keeping the rated output power or;
- Up to 3000 m.a.s.l., keeping the rated output power

Important: Please note that under these conditions combined ambient and temperature rise may reach class F limits.

Bearing lubrication intervals will change under operating conditions other than 40 °C maximum ambient temperature and 1000 metres above sea level. Contact WEG for more information.

All W22 motors are wound with the WISE® insulation system which consists of enamelled wire impregnated with solvent free resin which protects motors with temperatures up to 200 °C. The WISE® system also permits motor operation with variable speed drives (see section 12).

10.1 Space Heaters

The use of space heaters is recommended in two situations:

- Motors installed in environments with relative air humidity up to 95%, in which the motor may remain idle for periods greater than 24 hours;
- 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 7.3.

The supply voltage for space heaters must be defined by the Customer. For all frame sizes, W22 motors can be provided with space heaters suitable for 110-127 V, 220-240 V and 380-480 V. As an option, dual voltage heaters of 110-127 / 220-240 V can be supplied for motor frame sizes 112 to 355A/B, through reconnection of the heater cables inside the terminal box.

The power rating and number of space heaters fitted depends on the size of the motor as indicated in table 16 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 16 - Power and quantity of space heaters

11. Motor Protections

Protections available for the W22 motor line can be classified as follows:

- Based on operating temperature
- Based on operating current

In section 14 - Standard features it is possible to identify the type of protection for each W22 line.

11.1 Protection Based on Operating Temperature

Continuous duty motors must be protected from overload either by a device integrated into the motor or via an independent protection system, usually a thermal relay with rated or setting current, equal to or below the value obtained when multiplying the power supply rated current (I_n), as per table 17.

Service factor	Relay setting current
1.0 up to 1.15	I _n x S.F.
≥ 1.15	(I _n x S.F.) - 5%

Table 17 - Relay setting current referred to service factor

11.1.1 Pt-100



Figure 30 - Pt-100

These are temperature detectors with operating principle 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).

11.1.2 Thermistor (PTC)



Figure 31 - 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 offers a range of electronic relays 'RPW' intended specifically to read the PTC signal and operate its output relay. For further information please visit the website www.weg.net.

11.1.3 Bimetallic Thermal Protectors

These are silver-contact thermal sensors, normally closed, that operate at certain temperature rise. When their operating temperature decreases, they return to their 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.

11.2 Protection Based on Operating Current

Overloads are processes that usually make the temperature increase gradually. To solve this problem, the thermal protectors described in item 11.1 are quite suitable. However, the only way to protect motors against short-circuit currents

is the application of fuses. This type of protection depends directly on the motor current and is highly effective in cases of locked rotor.

WEG Automation supplies a range of fuses in versions D and NH. Visit the website www.weg.net for further information.

12. Variable Speed Drive Application

12.1 Considerations Regarding Voltage Spikes and the Insulation System

The stator windings of W22 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 18.

Rated voltage				
220-240/380-415 V (50 Hz)				
440-460 V (60 Hz)				

Motor rated voltage	Voltage Spikes	dV/dt(*)	Rise time(*)	Time between pulses
	At motor terminals (phase-phase)	At motor terminals (phase-phase)		
$V_{rated} \leq 460 \text{ V}$	$\leq 1600 \text{ V}$	$\leq 5200 \text{ V}/\mu\text{s}$	$\geq 0.1 \mu\text{s}$	$\geq 6 \mu\text{s}$
$460 \text{ V} < V_{rated} \leq 575 \text{ V}$	$\leq 1800 \text{ V}$	$\leq 6500 \text{ V}/\mu\text{s}$		
$575 \text{ V} < V_{rated} \leq 690 \text{ V}$	$\leq 2200 \text{ V}$	$\leq 7800 \text{ V}/\mu\text{s}$		

(*) dV/dt and Rise time definition according to Nema Std. MG1 - Part 30.

Table 18 - Supportability of random wound motors' insulation system

Notes:

- 1 - In order to protect the motor insulation system, the maximum recommended switching frequency is 5 kHz.
- 2 - 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.
- 3 - 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.
- 4 - General purpose motors of the dual voltage type, for example 400/690 V 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.

12.2 Influence of the VSD on the Motor Temperature

Motors operating with frequency inverters may present a higher temperature rise than when operating under sinusoidal supply. This occurs due to the combined effects of the loss increase resulting from the PWM harmonics and the reduction in ventilation experienced by self-ventilated motors when operating at low frequencies. There are basically the following solutions to avoid excessive overheating of the motor in VSD applications:

- Torque derating (oversizing of the self-ventilated motor frame size);

- Forced ventilation (use of an independent cooling system);
- Optimal Flux Solution® (exclusive to applications where both motor and drive are WEG).

12.2.1 Torque Derating Criteria

In order to keep the temperature rise of WEG motors within acceptable levels, when supplied by VSD, the speed range-related loadability limits established in figures 32 (for operation under constant flux condition) or 33 (for operation under optimal flux condition) must be observed.

Notes:

- 1 - The derating curves below relate the motor thermal capability only and do not concern the insulation class. Speed regulation will depend on VSD mode of operation and proper adjustment.
- 2 - 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.
- 3 - W22 motors in frame sizes 90S and above 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.
- 4 - For operation above base (nameplate) speed, mechanical issues must be also observed. Please refer to the maximum limits for safe operation set in Table 19.

12.2.2 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.

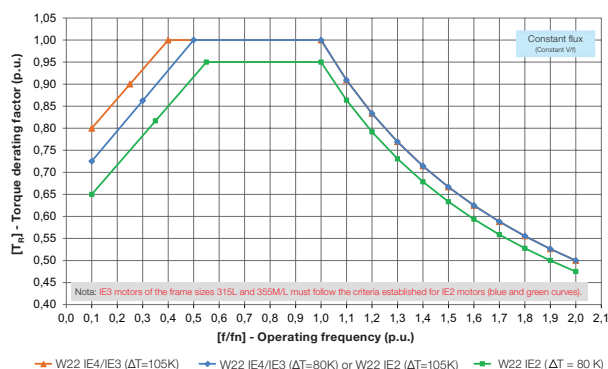


Figure 32 - Derating curves for constant flux condition

12.2.3 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 33.

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 IE2 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.

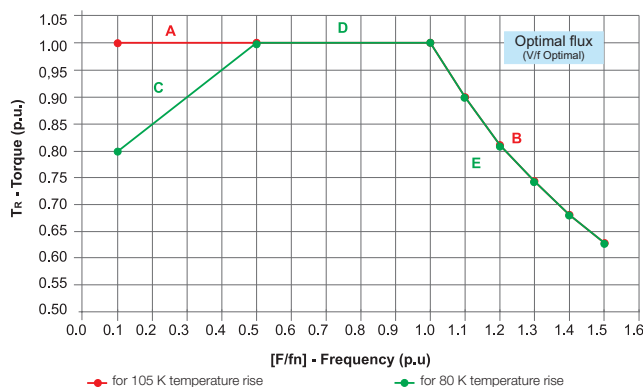


Figure 33 - Derating curves for Optimal Flux® condition

kW	TEFC Motors		
	2 poles	4 poles	6 poles
0.18	7200	3600	2400
0.25	7200	3600	2400
0.37	7200	3600	2400
0.55	7200	3600	2400
0.75	7200	3600	2400
1.1	7200	3600	2400
1.5	7200	3600	2400
2.2	7200	3600	2400
4	7200	3600	2400
5.5	5400	3600	2400
7.5	5400	3600	2400
11	5400	3600	2400
15	5400	3600	2400
18.5	5400	2700	2400
22	5400	2700	2400
30	4500	2700	2400
37	4500	2700	2400
45	3600	2700	2400
55	3600	2700	2400
75	3600	2700	1800
90	3600	2700	1800
110	3600	2700	1800
150	3600	2250	1800
185	3600	2250	1800
220	3600	2250	1800
260	3600	1800	1800
300	3600	1800	-
330	3600	1800	-
370	3600	1800	-

Table 19 - Maximum safe operating speeds (rpm) for W22 motors driven by VSD

Notes:

- 1 - The values in Table 19 are related to mechanical limitations. For operation above nameplate speed, the electrical limitations (motor torque capability) must be also observed.

- 2 - The limits established in Table 19 are in accordance with the NEMA Std. MG 1 - Part 30.
- 3 - The permissible overspeed value is 10% above the limits given in Table 19 (not to exceed 2 minutes in duration) except where the maximum safe operating speed is the same as the synchronous speed at 60 Hz - in such case, please contact WEG.
- 4 - Operation above nameplate speed may require specially refined motor balancing. In such case, vibration and noise limits per NEMA MG1 Parts 7 and 9, respectively, are not applicable.
- 5 - Bearing life will be affected by the length of time the motor is operated at various speeds.
- 6 - For speeds and ratings not covered by the table above, please contact WEG.

12.3 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. W22 motors are normally supplied duly protected per such recommendations when operation with VSD is mentioned at the time of purchase. Otherwise, WEG can modify older motors that were not originally supplied with such protection under request.

12.4 Forced Ventilation

For those cases where an independent cooling system is required, the W22 motors can be supplied with a forced ventilation kit, as shown in figure 34.

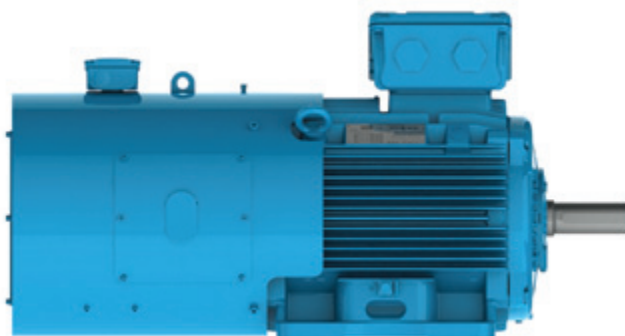


Figure 34 - Forced ventilation kit for W22 motors

When the forced ventilation kit is assembled on the motor in the factory, the overall motor length will be increased, see section 20. External Motor Dimensions with Forced Ventilation. As a local stock modification option, an alternative forced ventilation kit can be fitted. Please contact your local WEG office for details of these dimensions.

12.5 Encoders

W22 motors may be supplied with encoders for speed control in closed loop. Encoders can be fitted to motors with either forced ventilation or with shaft mounted cooling fan (TEFC). When encoders are fitted to TEFC machines, motors may not have a second shaft end or be fitted with drip cover. The following models of encoder are available for supply:

- Dynapar - B58N - 1024ppr (hollow shaft)
- Hengstler - RI58 - 1024ppr (hollow shaft)
- Line & Linde - XH861 - 1024ppr (hollow shaft)
- Hubner Berlin - HOG 10 - 1024ppr (hollow shaft)
- Hubner Guinzen - FGH4 - 1024ppr (shaft)

Other models can be supplied on request.

Note: The encoders described above are of the 1024 pulses per revolution type. As an option, models of 2048 pulses per revolution are available.

For more information on VSD motor applications, visit our website (www.weg.net) and download the Technical Guide - Induction motors fed by PWM frequency inverters (code 028).

13. Tolerances for Electrical Data

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

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

Table 20 - Tolerances for electrical data

14. Construction Features

Frame			63	71	80	90	100	112	132	160	180	
Mechanical features												
Mounting form			B3T (options are available as per section 6)									
Frame	Material		Cast iron FC-200									
Degree of protection			IP55									
Grounding			Simple grounding - one inside the terminal box and one on the frame (accessible from inside the terminal box)									
Cooling method			Totally enclosed fan cooled - IC411									
Fan	Material	2-4p	Polypropylene									
		6-8p										
Fan cover	Material		Steel							Cast iron FC-200		
Endshields	Material		Cast iron FC-200									
Drain hole			Automatic plastic								Fitted with rubber drain plug	
Bearings	Clearance D.E		ZZ								C3	
	Clearance N.D.E		ZZ								Z-C3	
	Locking		Without bearing cap and with preload washer at non-drive end								DE locating bearing with bearing cap and with preload washer at non-drive end	
	Drive end side	2p	6201	6202	6204	6205	6206	6207	6308	6309	6311	
		4 - 8p										
	Non drive end side	2p			6203	6204	6205	6206	6207	6209	6211	
4 - 8p												
Bearing seal					V'ring							
Lubrication	Type of grease		Mobil Polyrex EM									
	Grease fitting		Without grease fitting									
Terminal block			With terminal block									
Terminal box	Material		Cast iron FC-200									
Leads inlet	Main	Size	2 x M20 x 1.5			2 x M25 x 1.5		2 x M32 x 1.5		2 x M40 x 1.5		
	Plug		Threaded plug for transport and storage; cable gland as optional									
	Accessory	Size	1 x M20 x 1.5 lateral thread when fitted with accessories									
Shaft	Material		AISI 1040/45									
	D.E. Threaded hole	2p	M4	M5	M6	M8	M10	M10	M12	M16		
		4 - 8p										
Vibration			Grade A									
Balance			With half key									
Nameplate	Material		Stainless steel AISI 304									
Painting	Type		207 A							203 A		
	Performance Criteria		Corrosive category C2 according to ISO 12944-2 : 2007									
	Colour		IE2 and IE3: RAL 5009 IE4: RAL 6002									
Electrical features												
Design			N									
Voltage			220-240/380-415//440-460 V					380-415/660//440-460 V				
Winding	Impregnation		Dip and bake									
	Insulation class		F (DT 80K)									
Service factor			1.00									
Rotor			Aluminium die cast									
Thermal protection			Without thermal protection								Thermistor PTC, 1 per phase, for tripping at 155 °C	

Frame			200		225S/M	250S/M	280S/M	315S/M	315L	355M/L	355A/B	
Mechanical features												
Mounting			B3T									
Frame	Material		Cast iron FC-200									
Degree of protection			IP55									
Grounding			Simple grounding - one inside the terminal box and one on the frame (accessible from inside the terminal box)			Double grounding - one inside the terminal box and other one on the frame (accessible from inside the terminal box) + one on the frame (outside the terminal box)						
Cooling method			Totally enclosed fan cooled - IC411									
Fan	Material	2p	Polypropylene								Aluminium	
		4-8p	Polypropylene						Aluminium			
Fan cover	Material		Cast iron FC-200									
Endshields	Material		Cast iron FC-200									
Drain hole			Fitted with rubber drain plug									
Bearings	Clearance D.E		C3									
	Clearance N.D.E		Z-C3		C3							
	Locking		DE locating bearing with bearing cap and with preload washer at non-drive end		Locked on drive end with internal and external bearing cap and with preload springs on non drive end side							
	Drive end side	2p	6312		6314	6314	6314	6314	6314	6316	6316	
		4 - 8p					6316	6319	6319	6322	6322	
	Non drive end side	2p	6212				6314	6314	6314	6314	6314	6314
4 - 8p		6316					6316	6316	6319	6319		
Bearing seal			V'ring		WSeal®							
Lubrication	Type of grease		Mobil Polyrex EM									
	Grease fitting		Without grease fitting		With grease fitting							
Terminal block			With terminal block									HGF terminal block
Terminal box	Material		Cast iron FC-200									
Leads inlet	Principal	Size	2 x M50 x 1.5			2 x M63 x 1.5			2 x M63 x 1.5 (removable gland plate)	2 x M80 x 2 (removable gland plate)		
	Plug		Threaded plug for transportation and storage; cable gland as optional									
	Accessory	Size	1 x M20 x 1.5 lateral thread when fitted with accessories									
Shaft	Material		AISI 1040/45						AISI 4140			
	D.E. Threaded hole	2p	M20			M20	M20	M20	M20	M20	M20	
		4 - 8p								M24	M24	
Vibration			Grade A									
Balance			With half key									
Nameplate	Material		Stainless steel AISI 304									
Painting	Type		203 A									
	Performance Criteria		Corrosive category C2 according to ISO 12944-2 : 2007									
	Colour		IE2 and IE3: RAL 5009 IE4: RAL 6002									
Electrical features												
Design			N									
Voltage			380-415/660//440-460 V									
Winding	Impregnation		Dip and bake		Continuous flow impregnation							
	Insulation class		F (DT 80K)									
Service factor			1.00									
Rotor			Aluminium die cast									
Thermal protection			Thermistor PTC, 1 per phase, for tripping at 155 °C									

15. Optional Features

Frame	63	71	80	90	100	112	132
Mechanical optionals							
Terminal box							
Auxiliary terminal box (thermal protection)	0	0	0	0	0	0	0
Auxiliary terminal box (heaters)	0	0	0	0	0	0	0
Terminal box with removable gland plate	NA	NA	NA	NA	NA	NA	NA
Terminal block							
BMC terminal block - six-pin	S	S	S	S	S	S	S
BMC terminal block - twelve-pin	NA	NA	NA	0	0	0	0
HGF connection terminals	NA	NA	NA	NA	NA	NA	NA
Cable glands							
Plastic cable gland	0	0	0	0	0	0	0
Brass cable gland	0	0	0	0	0	0	0
Stainless steel cable gland	NA	NA	NA	0	0	0	0
Flange							
Flange FF	0	0	0	0	0	0	0
Flange FF (superior)	0	0	0	0	0	0	0
Flange FF (inferior)	NA	0	0	0	0	0	0
Flange C-DIN	0	0	0	0	0	0	0
Flange C-DIN (superior)	0	0	0	0	0	0	0
Flange C-DIN (inferior)	NA	0	0	0	0	0	0
Flange C	0	0	0	0	0	0	0
Flange C (superior)	0	0	0	NA	0	NA	NA
Flange C (inferior)	NA	NA	NA	0	NA	0	0
Cooling fan							
Polypropylene (2 and 4 poles)	S	S	S	S	S	S	S
Polypropylene (6 and 8 poles)	S	S	S	S	S	S	S
Conductive plastic	0	0	0	0	0	0	0
Aluminium (2 and 4 poles)	0	0	0	0	0	0	0
Aluminium (6 and 8 poles)	0	0	0	0	0	0	0
Cast iron	0	0	0	0	0	0	0
Bronze	0	0	0	0	0	0	0
Bearing							
Ball bearing (D.E)	S	S	S	S	S	S	S
Roller bearing (D.E)	NA	NA	NA	NA	NA	NA	NA
Ball bearing (N.D.E)	S	S	S	S	S	S	S
Bearing cap							
Without bearing cap	S	S	S	S	S	S	S
With bearing cap	NA	0	0	0	0	0	0
Bearing optionals							
Angular contact ball bearing (N.D.E)	0	0	0	0	0	0	0
ZZ bearings at both ends	0	0	0	0	0	0	0
2RS bearings at both ends	0	0	0	0	0	0	0
Clearance C4	NA	NA	NA	0	0	0	0
Shaft sealing							
Nitrillic rubber lip seal	0	0	0	0	0	0	0
Nitrillic rubber oil seal	0	0	0	0	0	0	0
Nitrillic rubber oil seal double lip	0	0	0	0	0	0	0
Viton seal	0	0	0	0	0	0	0
Viton oil seal	0	0	0	0	0	0	0
Viton oil seal with stainless steel spring	0	0	0	0	0	0	0
Taconite labyrinth	NA	NA	NA	0	0	0	0
W3 Seal® (brass)	NA	NA	NA	0	0	0	0

Notes: Other optional features, on request.
Some combinations of optional features are not possible - please contact WEG.

S (Standard)
NA (Not available)
O (Optional)

160	180	200	225S/M	250S/M	280S/M	315S/M	315L	355M/L	355A/B
Mechanical optionals									
Terminal box									
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
NA	NA	NA	0	0	0	0	S	S	S
Terminal block									
S	S	S	S	S	S	S	S	S	NA
0	0	0	0	0	0	0	0	0	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA	S
Cable glands									
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
Flange									
0	0	0	0	0	0	0	0	0	0
0	0	0	NA	NA	0	NA	NA	NA	NA
0	0	0	0	0	NA	0	0	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0	0	0	0	0	0	0	0	0	NA
NA	0	0	NA	NA	0	NA	NA	NA	NA
NA	NA	NA	NA	0	NA	0	0	NA	NA
Cooling fan									
S	S	S	S	S	S	S	S	S	NA
S	S	S	S	S	S	S	NA	NA	NA
0	0	0	0	0	0	0	NA	NA	NA
0	0	0	0	0	0	0	0	0	S
0	0	0	0	0	0	0	S	S	S
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
Bearing									
S	S	S	S	S	S	S	S	S	S
0	0	0	0	0	0	0	0	0	0
S	S	S	S	S	S	S	S	S	S
Bearing cap									
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
S	S	S	S	S	S	S	S	S	S
Bearing optionals									
0	0	0	0	0	0	0	0	0	0
0	0	0	0	NA	NA	NA	NA	NA	NA
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
Shaft sealing									
0	0	0	0	0	0	NA	NA	NA	NA
0	0	0	0	0	0	NA	NA	NA	NA
0	0	0	0	0	0	NA	NA	NA	NA
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

Frame	63	71	80	90	100	112	132
Other sealing							
Joints sealing with Loctite 5923 (permatex)	0	0	0	0	0	0	0
Bolt with Loctite 5923 (permatex)	0	0	0	0	0	0	0
Shaft							
AISI 1040/45	S	S	S	S	S	S	S
AISI 4140	0	0	0	0	0	0	0
AISI 304 (stainless steel)	0	0	0	0	0	0	0
AISI 316 (stainless steel)	0	0	0	0	0	0	0
AISI 420 (stainless steel)	0	0	0	0	0	0	0
Locking shaft device (standard for roller bearing motors)	NA	NA	NA	NA	NA	NA	NA
Second shaft end	0	0	0	0	0	0	0
Tapped center hole	S	S	S	S	S	S	S
Degree of protection							
IP56	0	0	0	0	0	0	0
IP65	0	0	0	0	0	0	0
IP66	0	0	0	0	0	0	0
Painting plan							
202P Primer: One coat with 20 to 55 µm of alkyd oxide red. Intermediate: One coat with 20 to 30 µm of isocyanate epoxy paint. Finishing: One coat with 70 to 100 µm of polyurethane paint N2677 Recommended for food processing industries. Meets "C3" performance criteria indicated in ISO 12944-2 Standard in regards to "Corrosivity Category".	0	0	0	0	0	0	0
211E Primer: One coat with 100 to 140 µm of epoxy paint N2630. Finishing: One coat with 100 to 140 µm of epoxy paint N2628. Recommended for motors supplied to Petrobras and its suppliers, to be used in refinery such as petrochemical industries that follow Petrobras specifications. Note: Meets Petrobras N 1735 Standard (condition 3). Meets "C5" performance criteria indicated in ISO 12944-2 Standard in regards to "Corrosivity Category".	0	0	0	0	0	0	0
211P Primer: One coat with 100 to 140 µm of epoxy paint N2630. Finishing: One coat with 70 to 100 µm of PU paint N2677. Recommended for motors supplied to Petrobras and its suppliers, to be used in refinery such as petrochemical industries that follow Petrobras specifications. Note: Meets Petrobras N 1735 Standard (condition 3). Meets "C5" performance criteria indicated in ISO 12944-2 Standard in regards to "Corrosivity Category".	0	0	0	0	0	0	0
212E Primer: One coat with 75 to 105 µm of epoxy paint N1277. Intermediate: One coat with 100 to 140 µm of epoxy paint N2630. Finishing: One coat with 100 to 140 µm of epoxy paint N2628. Recommended for applications in pulp and paper, mining, chemical and petrochemical industries. Note: Meets Petrobras N 1735 Standard (condition 4). Meets "C5" performance criteria indicated in ISO 12944-2 Standard in regards to "Corrosivity Category".	0	0	0	0	0	0	0
212P Primer: One coat with 75 to 105 µm of epoxy paint N1277. Intermediate: One coat with 100 to 140 µm of epoxy paint N2630. Finishing: One coat with 70 to 100 µm of PU paint N2677. Recommended for applications in pulp and paper, mining, chemical and petrochemical industries. Note: Meets Petrobras N 1735 Standard (condition 4). Meets "C5" performance criteria indicated in ISO 12944-2 Standard in regards to "Corrosivity Category".	0	0	0	0	0	0	0
213E Primer: One coat with 75 to 90 µm of Silicate Ethyl paint N1661. Intermediate: One coat with 35 to 50 µm of epoxy paint N1202. Finishing: One coat with 240 to 340 µm of epoxy paint N2628. Recommended for off-shore oil platform. Note: Meets Petrobras N 1374 Standard (condition 5.2). Meets "C5" performance criteria indicated in ISO 12944-2 Standard in regards to "Corrosivity Category".	0	0	0	0	0	0	0

S (Standard)
NA (Not available)
O (Optional)

Notes: Other optional features, on request.

Some combinations of optional features are not possible - please contact WEG.

160	180	200	225S/M	250S/M	280S/M	315S/M	315L	355M/L	355A/B
Other sealing									
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
Shaft									
S	S	S	S	S	S	S	NA	NA	NA
0	0	0	0	0	0	0	S	S	S
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
S	S	S	S	S	S	S	S	S	S
Degree of protection									
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
Painting plan									
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

Frame	63	71	80	90	100	112	132
Painting plan							
Inside of terminal box painted (Munsell 2.5 YR 6/14)	0	0	0	0	0	0	0
Internal epoxy painting (tropicalized)	0	0	0	0	0	0	0
Lubrication							
Mobil Polyrex EM	S	S	S	S	S	S	S
Aeroshell 7	0	0	0	0	0	0	0
Isoflex NBU-15	0	0	0	0	0	0	0
Aeroshell 22	0	0	0	0	0	0	0
Grease nipple / Relubrication							
Carbon steel grease nipple	NA	NA	NA	NA	NA	NA	NA
Stainless steel grease nipple	NA	NA	NA	NA	NA	NA	NA
Balance							
Balance with half key	NA	NA	S(*)	S	S	S	S
Vibration							
Grade A	S	S	S	S	S	S	S
Grade B	0	0	0	0	0	0	0
Provision for vibration detector SPM (1 x hole M8 on D.E. and N.D.E. shield for vertical reading)	NA	NA	NA	NA	NA	NA	NA
Drain							
Rubber drain plug	NA	NA	NA	NA	NA	NA	NA
Plastic drain plug (open) - automatic	S	S	S	S	S	S	S
Plastic drain plug (close)	0	0	0	0	0	0	0
Threaded drain plug	0	0	0	0	0	0	0
Stainless steel drain plug	0	0	0	0	0	0	0
"T" format drain plug	0	0	0	0	0	0	0
Grounding							
Additional grounding on the frame (outside the terminal box)	0	0	0	0	0	0	0
Nameplates							
Second main nameplate (loose)	0	0	0	0	0	0	0
Additional / Tag plate	0	0	0	0	0	0	0
VSD rating plate	0	0	0	0	0	0	0
Direction of Rotation plate	0	0	0	0	0	0	0
Other mechanical options							
Drip cover (recommended for vertical shaft down applications)	0	0	0	0	0	0	0
Rubber slinger (recommended for vertical shaft up applications)	NA	NA	NA	0	0	0	0
Stainless steel hardware	0	0	0	0	0	0	0
Grease outlet through the endshield	NA	NA	NA	NA	NA	NA	NA
Without cooling fan - IC 418 (TEA0)	0	0	0	0	0	0	0
Loose leads in lieu of t/box (up to 2 metres)	0	0	0	0	0	0	0

Notes: Other optional features, on request.

Some combinations of optional features are not allowed - then contact WEG.

(*) 4 poles and upwards

S (Standard)

NA (Not available)

O (Optional)

160	180	200	225S/M	250S/M	280S/M	315S/M	315L	355M/L	355A/B
Painting plan									
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
Lubrication									
S	S	S	S	S	S	S	S	S	S
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
Grease nipple / Relubrication									
0	0	0	S	S	S	S	S	S	S
0	0	0	0	0	0	0	0	0	0
Balance									
S	S	S	S	S	S	S	S	S	S
Vibration									
S	S	S	S	S	S	S	S	S	S
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
Drain									
S	S	S	S	S	S	S	S	S	S
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
Grounding									
0	0	0	0	0	0	0	0	0	0
Nameplates									
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
Other mechanical optionals									
0	0	0	0	0	0	0	0	0	NA
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
NA	NA	NA	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

Frame	63	71	80	90	100	112	132
Electrical optionals							
Winding thermal protection							
Bimetallic alarm thermal protector	0	0	0	0	0	0	0
Bimetallic tripping thermal protector	0	0	0	0	0	0	0
PT100 two wires, one per phase	0	0	0	0	0	0	0
PT100 two wires, two per phase	NA	NA	NA	NA	NA	NA	NA
PT100 three wires, one per phase	0	0	0	0	0	0	0
PT100 three wires, two per phase	NA	NA	NA	NA	NA	NA	NA
Alarm thermistor	0	0	0	0	0	0	0
Tripping thermistor	0	0	0	0	0	0	0
Bearing thermal protection							
Bimetallic thermal protector	NA	NA	NA	NA	NA	NA	NA
Thermistor	NA	NA	NA	NA	NA	NA	NA
Pt-100 two wires	NA	NA	NA	NA	NA	NA	NA
Pt-100 three wires	NA	NA	NA	NA	NA	NA	NA
Pt-100 three wires (calibrated)	NA	NA	NA	NA	NA	NA	NA
Space heaters							
110-127 V	0	0	0	0	0	0	0
220-240 V	0	0	0	0	0	0	0
110-127 / 220-240 V	NA	NA	NA	NA	NA	0	0
380-480 V	0	0	0	0	0	0	0
Direction of Rotation							
Bidirectional	S	S	S	S	S	S	S
Clockwise rotation direction (viewed from DE)	0	0	0	0	0	0	0
Counter clockwise rotation direction (viewed from DE)	0	0	0	0	0	0	0
Service factor							
Service factor 1.00	S	S	S	S	S	S	S
Service factor 1.15	0	0	0	0	0	0	0
Insulation class							
F	S	S	S	S	S	S	S
H	0	0	0	0	0	0	0
Variable Speed Options							
Forced ventilation kit with encoder provision (inform auxiliary motor voltage)	NA	NA	NA	0	0	0	0
Forced ventilation kit without encoder provision (inform auxiliary motor voltage)	NA	NA	NA	0	0	0	0
Encoder	NA	NA	NA	0	0	0	0
Drive end side grounding brush	NA	NA	NA	NA	NA	NA	NA
Non drive end side grounding brush	NA	NA	NA	NA	NA	NA	NA
Insulated drive end ball bearing	NA	NA	NA	NA	NA	NA	NA
Insulated non drive end ball bearing	NA	NA	NA	NA	NA	NA	NA
Insulated DE bearing hub	NA	NA	NA	NA	NA	NA	NA
Insulated NDE bearing hub	NA	NA	NA	NA	NA	NA	NA

Notes: Other optional features, on request.

Some combinations of optional features are not possible - please contact WEG.

S (Standard)

NA (Not available)

O (Optional)

160	180	200	225S/M	250S/M	280S/M	315S/M	315L	355M/L	355A/B
Electrical optionals									
Winding thermal protection									
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
NA	NA	NA	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
NA	NA	NA	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
S	S	S	S	S	S	S	S	S	S
Bearing thermal protection									
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
Space heaters									
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
Rotation direction									
S	S	S	S	S	S	S	S	S	S
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
Service factor									
S	S	S	S	S	S	S	S	S	S
0	0	0	0	0	0	0	0	0	0
Insulation class									
S	S	S	S	S	S	S	S	S	S
0	0	0	0	0	0	0	0	0	0
Variable Speed Options									
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
NA	NA	NA	NA	NA	NA	0	0	0	0
NA	NA	NA	0	0	0	0	0	0	0
NA	NA	NA	0	0	0	0	0	0	0
NA	NA	NA	0	0	0	0	0	0	0
NA	NA	NA	0	0	0	0	0	0	0
NA	NA	NA	0	0	0	0	0	S	S

W22 - High Efficiency - IE2 ^{(1) (2)}

Output		Frame	Full load torque (Nm)	Locked rotor current I _L /I _N	Locked rotor torque T _L /T _N	Breakdown torque T _B /T _N	Inertia J (kgm ²)	Allowable locked rotor time (s)		Weight (kg)	Sound dB (A)	400 V							
												Rated speed (rpm)	% of full load						Full load current I _N (A)
								Hot	Cold				Efficiency			Power factor			
kW	HP												50	75	100	50	75	100	
II pole - 3000 rpm - 50 Hz																			
0,12	0,16	63	0,04	4,8	3,0	2,9	0,00	37	81	5,7	52	2790	51,5	53,8	53,8	0,53	0,66	0,75	0,43
0,18	0,25	63	0,06	5,3	2,3	2,4	0,0001	15	33	6,2	52	2790	57	60,6	60,6	0,57	0,7	0,79	0,54
0,25	0,33	63	0,09	5	2,2	2,2	0,0002	11	24	6,7	52	2770	58	63	65	0,57	0,7	0,8	0,69
0,37	0,5	71	0,13	5,8	2,5	2,6	0,0004	12	26	8,3	56	2830	68	70	71	0,6	0,75	0,84	0,90
0,55	0,75	71	0,19	5,8	2,4	2,4	0,0005	9	20	10	56	2780	70	73,5	74,1	0,68	0,82	0,88	1,22
0,75	1	80	0,26	6,5	2,8	2,8	0,0008	14	31	12,5	59	2800	76	78,5	79,5	0,67	0,8	0,86	1,58
1,1	1,5	80	0,38	6,5	2,8	2,8	0,0009	10	22	14	59	2800	78	80	80	0,67	0,79	0,85	2,33
1,5	2	90S	0,51	7	2,6	2,8	0,0021	7	15	17,5	62	2865	80	82	82	0,63	0,76	0,83	3,14
2,2	3	90L	0,75	6,6	3	3	0,0022	9	20	21	64	2840	83	83,6	83,6	0,63	0,76	0,83	4,58
3	4	100L	1,01	8	2,4	2,8	0,0064	7	15	28,5	67	2880	84	85	85	0,7	0,81	0,86	5,92
4	5,5	112M	1,35	7	2	2,8	0,0088	10	22	38	64	2880	86	86	86	0,73	0,83	0,88	7,63
5,5	7,5	132S	1,84	6,8	2,2	3	0,0197	17	37	60	67	2910	86,5	88	88	0,68	0,79	0,85	10,6
7,5	10	132S	2,51	6,8	2,2	2,9	0,0251	13	29	63	68	2910	88	88,5	88,5	0,72	0,82	0,87	14,1
9,2	12,5	132M	3,07	7,6	2,5	3,2	0,0234	10	22	70	68	2915	88,5	89	89	0,7	0,81	0,86	17,3
11	15	160M	3,65	7	2,3	3	0,0446	13	29	104	67	2935	90	90,6	90,5	0,71	0,82	0,86	20,4
15	20	160M	4,99	7	2,3	3	0,0517	9	20	112	67	2930	91	91,3	91,3	0,71	0,81	0,86	27,6
18,5	25	160L	6,13	7,4	2,4	3,1	0,0625	8	18	124	67	2940	91,3	92	92	0,7	0,8	0,86	33,7
22	30	180M	7,28	7,3	2,2	3	0,0975	9	20	164	67	2945	92	92,4	92,2	0,76	0,84	0,88	39,1
30	40	200L	9,89	6,5	2,4	2,7	0,1703	17	37	226	72	2955	92,5	93	92,9	0,75	0,83	0,87	53,6
37	50	200L	12,2	6,8	2,4	2,6	0,195	16	35	255	72	2950	93	93,4	93,3	0,76	0,84	0,87	65,8
45	60	225S/M	14,8	7	2,2	2,8	0,249	12	26	356	75	2960	93,3	93,6	93,6	0,79	0,86	0,89	78
55	75	250S/M	18,1	7	2,2	2,8	0,3736	14	31	413	75	2960	93,6	93,9	93,9	0,79	0,86	0,89	95
75	100	280S/M	24,5	7	2	2,8	0,8541	28	62	630	77	2975	93,4	94,3	94,3	0,79	0,86	0,89	129
90	125	280S/M	29,5	7	2	2,8	0,9386	25	55	653	77	2975	94	94,6	94,6	0,79	0,86	0,89	154
110	150	315S/M	36	7,3	2	2,9	1,67	24	53	874	77	2980	94,3	94,9	94,9	0,79	0,86	0,89	188
132	175	315S/M	43,1	7,3	2	2,9	1,96	21	46	931	77	2980	94,5	95,1	95,1	0,8	0,87	0,9	223
132	180	315S/M	43,1	7,3	2	2,9	1,96	21	46	931	77	2980	94,5	95,1	95,1	0,8	0,87	0,9	223
150	200	315S/M	49	7,5	2,2	2,8	1,96	23	51	940	77	2980	94,2	94,8	94,8	0,78	0,85	0,89	257
160	220	315S/M	52,3	7,5	2,2	2,9	2,24	23	51	995	77	2980	94,8	95,3	95,3	0,8	0,87	0,9	269
185	250	315S/M	60,5	7,6	2,2	3,1	2,46	16	35	1032	77	2980	94,9	95,5	95,4	0,8	0,86	0,89	314
200	270	315L	65,4	7,5	2,3	2,8	2,68	21	46	1200	78	2980	95	95,5	95,4	0,82	0,88	0,9	336
220	300	315L	71,9	7,8	2,4	2,8	2,98	14	31	1228	78	2980	95	95,5	95,5	0,81	0,87	0,9	369
250	340	315L	81,7	7,8	2,4	2,8	3,42	17	37	1316	78	2980	95,1	95,6	95,5	0,84	0,89	0,91	415
280	380	315L	91,5	7,9	2,3	2,8	4,17	12	26	1442	78	2980	95,2	95,6	95,6	0,85	0,89	0,91	465
300	400	315L	98,1	7,5	2,5	2,5	4,17	18	40	1442	86	2980	95,2	95,6	95,6	0,84	0,88	0,9	503
315	430	355M/L	103	7,8	2,1	2,6	5,6	23	51	1777	80	2985	95,2	95,6	95,6	0,87	0,91	0,92	517
330	450	355M/L	108	7	2,4	2,4	6,03	20	44	1838	80	2985	95,3	95,6	95,6	0,88	0,9	0,9	554
355	480	355M/L	116	7,9	2,2	2,8	6,01	14	31	1838	80	2985	95,3	95,6	95,6	0,87	0,9	0,91	589
370	500	355A/B*	121	7,9	2,5	2,8	6,76	40	88	2046	83	2985	95,8	96,1	96,4	0,85	0,89	0,9	616
400	550	355A/B*	131	7,6	2,4	2,8	6,76	31	68	2043	83	2985	95,8	96,2	96,4	0,85	0,89	0,91	658
450	610	355A/B*	147	7,5	2,5	2,7	7,4	31	68	2160	83	2985	95,8	96,2	96,6	0,85	0,9	0,91	739

Notes:

(1) Efficiency values are given according to IEC 60034-2-1. They are calculated according to indirect method, with stray load losses determined by measurement.

(2) With effect from 1st January 2015, IE2 motors placed onto the European Market and rated at 7.5kw or above, must be used with a variable speed drive unless their design falls outside of the scope of the European Regulation or their final installation will be outside of the EU / EEA.

(*) Fitted with air deflector in the drive end side.

W22 - High Efficiency - IE2 ⁽¹⁾

Output		380 V								415 V							
		Rated speed (rpm)	% of full load						Full load current In (A)	Rated speed (rpm)	% of full load						Full load current In (A)
			Efficiency			Power factor					Efficiency			Power factor			
			50	75	100	50	75	100			50	75	100	50	75	100	
kW	HP	II pole - 3000 rpm - 50 Hz															
0,12	0,16	2765	51,20	53,60	53,60	0,57	0,71	0,79	0,43	2805	51,50	53,80	53,80	0,50	0,63	0,72	0,43
0,18	0,25	2760	56,8	60,4	60,4	0,61	0,75	0,83	0,55	2805	57	60,6	60,6	0,53	0,66	0,76	0,54
0,25	0,33	2740	58,5	63,2	64,8	0,63	0,76	0,84	0,70	2785	58	63	65	0,53	0,66	0,76	0,70
0,37	0,5	2805	69	70,1	70,3	0,66	0,79	0,87	0,92	2845	66,9	69,7	71,2	0,57	0,72	0,82	0,88
0,55	0,75	2750	70	73,2	74,1	0,73	0,85	0,91	1,24	2795	70	73,5	74,1	0,63	0,79	0,86	1,20
0,75	1	2770	77,7	78	78	0,66	0,81	0,87	1,68	2810	75	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	2,43	2815	77,1	80,2	80,2	0,62	0,75	0,82	2,33
1,5	2	2840	80,5	81,6	81,6	0,68	0,79	0,85	3,25	2880	79,3	81,9	82,5	0,58	0,73	0,81	3,08
2,2	3	2820	83,7	83,5	83,2	0,69	0,8	0,85	4,75	2855	82,2	83,4	83,9	0,59	0,72	0,8	4,56
3	4	2865	84,9	85	85	0,76	0,85	0,88	6,09	2890	83,1	84,6	85	0,66	0,78	0,84	5,85
4	5,5	2865	86,6	86	85,8	0,78	0,87	0,9	7,9	2890	85,3	85,9	86,3	0,69	0,8	0,86	7,5
5,5	7,5	2900	87,1	88	87,6	0,74	0,83	0,88	10,8	2915	85,6	87,6	88	0,63	0,76	0,83	10,5
7,5	10	2900	88,4	88,4	88,1	0,77	0,85	0,89	14,5	2915	87,3	88,3	88,7	0,67	0,79	0,85	13,8
9,2	12,5	2905	89,1	89	89	0,75	0,85	0,89	17,6	2920	87,6	88,6	89	0,65	0,77	0,84	17,1
11	15	2930	90,3	90,5	90,1	0,75	0,85	0,88	21,1	2940	89,6	90,5	90,6	0,67	0,79	0,84	20,1
15	20	2945	91,4	91,3	90,9	0,76	0,84	0,88	28,5	2935	90,6	91,2	91,4	0,67	0,78	0,84	27,2
18,5	25	2930	91,6	91,9	91,6	0,74	0,83	0,88	34,9	2945	91	91,9	92,2	0,66	0,77	0,84	33,2
22	30	2940	92,2	92,2	91,8	0,79	0,86	0,89	40,9	2950	91,8	92,4	92,4	0,73	0,82	0,87	38,1
30	40	2950	92,7	92,9	92,6	0,79	0,85	0,88	55,9	2960	92,3	93	93	0,71	0,81	0,86	52,2
37	50	2945	93,2	93,3	93	0,8	0,86	0,88	68,7	2955	92,8	93,4	93,5	0,73	0,82	0,86	64
45	60	2955	93,4	93,5	93,2	0,83	0,88	0,9	81,5	2960	93,1	93,6	93,8	0,76	0,84	0,88	75,8
55	75	2955	93,8	93,8	93,6	0,83	0,88	0,9	99,2	2960	93,3	93,8	94	0,75	0,84	0,88	92,5
75	100	2970	93,6	94,3	94,1	0,82	0,88	0,9	135	2975	93,2	94,2	94,3	0,76	0,84	0,88	126
90	125	2970	94,2	94,6	94,4	0,83	0,88	0,9	161	2975	93,8	94,5	94,5	0,76	0,84	0,88	151
110	150	2975	94,5	94,9	94,8	0,83	0,88	0,9	196	2980	94,1	94,8	94,9	0,76	0,84	0,88	183
132	175	2975	94,6	95,1	94,9	0,83	0,89	0,91	232	2980	94,4	95,1	95,2	0,78	0,86	0,89	217
132	180	2975	94,6	95,1	94,9	0,83	0,89	0,91	232	2980	94,4	95,1	95,2	0,78	0,86	0,89	217
150	200	2980	94,2	94,8	94,8	0,8	0,87	0,89	270	2980	93,8	94,5	94,8	0,74	0,83	0,87	253
160	220	2975	94,9	95,2	95,2	0,83	0,89	0,91	281	2980	94,7	95,3	95,3	0,78	0,86	0,89	262
185	250	2975	95	95,5	95,3	0,83	0,88	0,9	328	2980	94,8	95,5	95,4	0,78	0,85	0,88	307
200	270	2975	95	95,4	95,2	0,85	0,89	0,91	351	2980	94,9	95,5	95,5	0,8	0,87	0,9	324
220	300	2975	95,1	95,4	95,3	0,84	0,88	0,91	385	2980	94,9	95,5	95,6	0,79	0,86	0,89	360
250	340	2980	95,1	95,5	95,3	0,86	0,9	0,91	438	2980	95	95,6	95,6	0,82	0,88	0,91	400
280	380	2975	95,2	95,5	95,4	0,87	0,9	0,91	490	2980	95,2	95,6	95,7	0,83	0,88	0,91	447
300	400	2975	95,2	95,5	95,5	0,87	0,91	0,91	524	2980	95,5	95,7	95,7	0,83	0,87	0,9	485
315	430	2980	94,2	95,5	95,4	0,89	0,92	0,92	545	2985	95,2	95,6	95,7	0,86	0,9	0,92	498
330	450	2980	95,2	95,4	95,4	0,89	0,91	0,91	578	2985	95,3	95,6	95,7	0,87	0,89	0,89	539
355	480	2980	95,3	95,5	95,4	0,89	0,91	0,91	621	2985	95,3	95,6	95,7	0,85	0,89	0,91	567
370	500	2980	95,8	96	96,2	0,86	0,9	0,91	642	2985	95,5	96,3	96,5	0,84	0,88	0,89	599
400	550	2985	95,9	96,2	96,3	0,87	0,9	0,91	694	2985	95,7	96,2	96,5	0,84	0,88	0,91	634
450	610	2985	95,9	96,2	96,5	0,87	0,91	0,91	779	2985	95,7	96,2	96,7	0,84	0,89	0,91	711

W22 - High Efficiency - IE2 ⁽¹⁾ ⁽²⁾

Output		Frame	Full load torque (Nm)	Locked rotor current I/In	Locked rotor torque TI/Tn	Breakdown torque Tb/ Tn	Inertia J (kgm ²)	Allowable locked rotor time (s)		Weight (kg)	Sound dB (A)	400 V								
												Rated speed (rpm)	% of full load						Full load current In (A)	
								Efficiency					Power factor							
kW	HP							Hot	Cold				50	75	100	50	75	100		
II pole - 3000 rpm - 50 Hz																				
Optional frames (high-output design)																				
0,37	0,5	63	0,13	5	2,2	2,2	0,0002	7	15	7,2	52	2740	68	69,5	69,5	0,56	0,71	0,81	0,95	
0,75	1	71	0,26	5,8	2,8	2,8	0,0005	14	31	9	56	2770	77	77,5	77,6	0,67	0,8	0,87	1,6	
0,75	1	90S	0,26	6,5	2,7	2,8	0,0012	25	55	15,5	64	2850	77	79	79	0,61	0,73	0,8	1,71	
1,1	1,5	90S	0,38	6,1	2,5	2,6	0,0014	16	35	16,5	64	2835	80	80,5	80,5	0,65	0,77	0,83	2,38	
1,5	2	80	0,53	6,5	3,1	3	0,0009	15	33	15	59	2770	80	81	81,5	0,65	0,78	0,85	3,13	
1,5	2	90L	0,51	7	2,6	2,8	0,0021	7	15	17,5	64	2865	80	82	82	0,63	0,76	0,83	3,14	
2,2	3	100L	0,74	7,5	2,6	3	0,0043	15	33	26,5	67	2885	82,5	83,6	83,6	0,66	0,78	0,85	4,47	
3	4	L90L	1,03	7,1	3,4	3,4	0,003	9	20	25	64	2840	84	84,6	84,6	0,61	0,75	0,82	6,24	
4	5,5	100L	1,36	7,8	3	3,4	0,0064	10	22	32	67	2870	85,2	85,8	85,8	0,67	0,8	0,86	7,82	
5,5	7,5	112M	1,86	7,3	2,7	3	0,0088	11	24	42	64	2880	86,5	87	87	0,72	0,82	0,87	10,5	
5,5	7,5	132M	1,84	6,8	2,2	3	0,0197	17	37	60	67	2910	86,5	88	88	0,68	0,79	0,85	10,6	
7,5	10	132M	2,51	6,8	2,2	2,9	0,0251	13	29	63	68	2910	88	88,5	88,5	0,72	0,82	0,87	14,1	
7,5	10	L112M	2,55	7,9	3	3,4	0,0109	10	22	45	64	2870	87,3	88,1	88,1	0,67	0,79	0,85	14,5	
11	15	132M	3,69	7,2	2,4	2,9	0,027	11	24	74	68	2905	89,3	89,6	89,6	0,75	0,84	0,88	20,1	
11	15	160L	3,65	7	2,3	3	0,0446	13	29	104	67	2935	90	90,6	90,5	0,71	0,82	0,86	20,4	
15	20	160L	4,99	7	2,3	3	0,0517	9	20	112	67	2930	91	91,3	91,3	0,71	0,81	0,86	27,6	
18,5	25	180M	6,13	7	2,1	2,9	0,0867	10	22	156	67	2940	91,4	92	91,8	0,75	0,84	0,88	33,1	
22	30	160L	7,3	7,9	2,5	3,1	0,0813	10	22	140	67	2935	91,2	91,6	91,6	0,75	0,84	0,89	39	
22	30	180L	7,28	7,3	2,2	3	0,0975	9	20	164	67	2945	92	92,4	92,2	0,76	0,84	0,88	39,1	
30	40	180L	9,94	8,2	2,2	2,9	0,1301	8	18	194	76	2940	91,5	92	92	0,78	0,86	0,89	52,9	
45	60	200L	14,8	6,6	2,1	2,4	0,2204	15	33	272	72	2955	92,5	92,9	92,9	0,76	0,84	0,87	80,4	
55	75	225S/M	18,1	7	2	2,6	0,3238	11	24	394	75	2960	92,8	93,2	93,2	0,81	0,87	0,9	94,6	
75	100	250S/M	24,6	8,2	2,4	3	0,4415	10	22	450	75	2965	94	94,3	94,3	0,79	0,86	0,9	128	
110	150	280S/M	36	7,6	2,3	3	1,11	21	46	702	77	2975	94,5	94,9	94,9	0,78	0,86	0,89	188	
132	175	280S/M	43,2	7,3	1,8	2,7	1,33	18	40	759	77	2975	94,5	94,8	94,8	0,8	0,87	0,89	226	
200	270	315S/M	65,4	7,5	2,3	2,8	2,68	21	46	1150	77	2980	95	95,5	95,4	0,82	0,88	0,9	336	
200	270	355M/L	65,3	7,6	1,9	2,7	3,99	22	48	1487	80	2985	94,8	95,5	95,5	0,83	0,88	0,9	336	
220	300	355M/L	71,8	7,6	1,8	2,5	4,42	21	46	1560	80	2985	95,1	95,6	95,5	0,86	0,89	0,9	369	
250	340	355M/L	81,6	7,9	2,2	2,8	4,85	20	44	1634	80	2985	95,2	95,6	95,6	0,86	0,89	0,91	415	
280	380	355M/L	91,5	7,7	1,9	2,6	5,06	17	37	1669	80	2980	95,2	95,6	95,6	0,86	0,89	0,91	465	
300	400	355M/L	97,9	8	2,5	2,6	5,6	23	51	1777	80	2985	95,2	95,6	95,6	0,87	0,91	0,92	492	
315	430	315L	103	7,9	2,3	2,7	4,17	11	24	1442	86	2980	95,2	95,6	95,6	0,84	0,88	0,9	528	

Notes:

(1) Efficiency values are given according to IEC 60034-2-1. They are calculated according to indirect method, with stray load losses determined by measurement.

(2) With effect from 1st January 2015, IE2 motors placed onto the European Market and rated at 7.5kw or above, must be used with a variable speed drive unless their design falls outside of the scope of the European Regulation or their final installation will be outside of the EU / EEA.

(*) Fitted with air deflector in the drive end side.

W22 - High Efficiency - IE2 ⁽¹⁾

Output		380 V								415 V							
		Rated speed (rpm)	% of full load						Full load current In (A)	Rated speed (rpm)	% of full load						Full load current In (A)
			Efficiency			Power factor					Efficiency			Power factor			
			50	75	100	50	75	100			50	75	100	50	75	100	
kW	HP																
II pole - 3000 rpm - 50 Hz																	
Optional frames (high-output design)																	
0,37	0,5	2705	68	69,5	69,5	0,62	0,76	0,83	0,975	2760	68	69,5	69,5	0,52	0,66	0,77	0,96
0,75	1	2750	77	77,4	77,4	0,73	0,84	0,9	1,64	2890	76	77,6	77,6	0,62	0,76	0,85	1,58
0,75	1	2830	77,8	79,1	78,3	0,66	0,77	0,83	1,75	2860	76	78,7	79,2	0,56	0,7	0,78	1,69
1,1	1,5	2810	80,7	80,3	79,6	0,7	0,8	0,85	2,47	2850	79,2	80,4	81	0,6	0,74	0,81	2,33
1,5	2	2750	81	81,5	81,3	0,71	0,83	0,88	3,19	2790	80	81	81,7	0,59	0,74	0,82	3,11
1,5	2	2840	80,5	81,6	81,6	0,68	0,79	0,85	3,25	2880	79,3	81,9	82,5	0,58	0,73	0,81	3,08
2,2	3	2870	83,3	83,8	83,2	0,71	0,82	0,87	4,62	2895	81,5	83,2	83,6	0,62	0,75	0,82	4,46
3	4	2830	84,5	84,5	84,6	0,67	0,79	0,85	6,34	2860	84	84,7	84,7	0,57	0,71	0,79	6,24
4	5,5	2860	85,5	85,8	85,8	0,73	0,83	0,88	8,05	2880	85	86	86	0,63	0,76	0,83	7,8
5,5	7,5	2865	87	86,9	87	0,76	0,86	0,89	10,8	2885	85,9	86,8	87,2	0,67	0,79	0,85	10,3
5,5	7,5	2900	87,1	88	87,6	0,74	0,83	0,88	10,8	2915	85,6	87,6	88	0,63	0,76	0,83	10,5
7,5	10	2900	88,4	88,4	88,1	0,77	0,85	0,89	14,5	2915	87,3	88,3	88,7	0,67	0,79	0,85	13,8
7,5	10	2860	87,5	88,1	88,1	0,72	0,83	0,88	14,7	2885	87	88,1	88,1	0,62	0,75	0,83	14,3
11	15	2895	89,7	89,5	89,6	0,79	0,87	0,89	21,1	2910	88,7	89,4	89,8	0,71	0,81	0,86	19,8
11	15	2930	90,3	90,5	90,1	0,75	0,85	0,88	21,1	2940	89,6	90,5	90,6	0,67	0,79	0,84	20,1
15	20	2945	91,4	91,3	90,9	0,76	0,84	0,88	28,5	2935	90,6	91,2	91,4	0,67	0,78	0,84	27,2
18,5	25	2935	91,6	91,8	91,4	0,78	0,86	0,89	34,6	2945	91,2	92	92	0,72	0,82	0,87	32,2
22	30	2930	91,2	91,6	91,5	0,79	0,87	0,9	40,6	2940	91	91,6	91,8	0,72	0,82	0,87	38,3
22	30	2940	92,2	92,2	91,8	0,79	0,86	0,89	40,9	2950	91,8	92,4	92,4	0,73	0,82	0,87	38,1
30	40	2935	91,5	92	92	0,81	0,88	0,9	55	2945	91,8	92,3	92,3	0,75	0,84	0,88	51,4
45	60	2950	92,6	92,9	92,9	0,8	0,87	0,89	82,7	2960	92,4	93	92,9	0,72	0,82	0,86	78,4
55	75	2955	93	93,2	93,2	0,83	0,89	0,91	98,5	2960	92,6	93,2	93,3	0,78	0,86	0,89	92,1
75	100	2960	94,2	94,3	94,1	0,83	0,88	0,92	132	2970	93,8	94,3	94,4	0,75	0,84	0,88	126
110	150	2970	94,7	94,9	94,8	0,82	0,88	0,9	196	2975	94,3	94,8	94,9	0,75	0,84	0,88	183
132	175	2970	94,5	94,7	94,7	0,82	0,88	0,9	235	2975	94,4	94,8	94,8	0,77	0,85	0,88	220
200	270	2975	95	95,4	95,2	0,85	0,89	0,91	351	2980	94,9	95,5	95,5	0,8	0,87	0,9	324
200	270	2980	93,9	95,2	95,5	0,9	0,92	0,92	346	2985	93,5	95,1	95,6	0,88	0,9	0,91	320
220	300	2985	95,5	96,2	96,4	0,87	0,91	0,92	377	2990	95	96	96,3	0,83	0,89	0,91	349
250	340	2980	95,5	96,3	96,4	0,89	0,92	0,93	424	2985	95,4	96,3	96,4	0,86	0,91	0,92	392
280	380	2975	95,2	95,5	95,4	0,87	0,9	0,91	490	2980	95,2	95,6	95,7	0,83	0,88	0,91	447
300	400	2980	94,2	95,5	95,4	0,89	0,92	0,92	519	2985	95,2	95,6	95,7	0,86	0,9	0,92	474
315	430	2980	94,2	95,5	95,4	0,89	0,92	0,92	545	2980	95,2	95,6	95,7	0,82	0,87	0,9	510

W22 - High Efficiency - IE2 ^{(1) (2)}

Output		Frame	Full load torque (Nm)	Locked rotor current I _L /I _N	Locked rotor torque T _L /T _N	Breakdown torque T _B /T _N	Inertia J (kgm ²)	Allowable locked rotor time (s)		Weight (kg)	Sound dB (A)	400 V								
								Rated speed (rpm)	% of full load						Full load current I _N (A)					
									Efficiency			Power factor								
kW	HP							Hot	Cold				50	75	100	50	75	100		
IV pole - 1500 rpm - 50 Hz																				
0,12	0,16	63	0,08	3,9	1,8	2	0,0004	51	112	7	44	1380	55	58	59,1	0,54	0,67	0,77	0,38	
0,18	0,25	63	0,13	4,1	2	2	0,0006	40	88	7,2	44	1370	56	63	64,7	0,48	0,61	0,7	0,57	
0,25	0,33	71	0,17	4,5	2	2,2	0,0007	68	150	10,2	43	1400	60	66	68,5	0,49	0,62	0,71	0,74	
0,37	0,5	71	0,26	4,3	2,2	2,3	0,0008	48	106	11	43	1390	67	71,5	72,7	0,47	0,61	0,71	1,03	
0,55	0,75	80	0,38	6	2,2	2,5	0,0029	18	40	15	44	1430	73	75	77,1	0,6	0,73	0,82	1,26	
0,75	1	80	0,52	6	2,6	2,6	0,0029	15	33	15	44	1410	79	79,6	79,8	0,63	0,76	0,81	1,67	
1,1	1,5	90S	0,74	6,5	2,1	2,6	0,0049	14	31	20,8	49	1440	81	81,8	81,8	0,62	0,75	0,81	2,40	
1,5	2	90L	1,01	6,3	2	2,8	0,0055	10	22	22	49	1440	81,5	83	83	0,57	0,71	0,8	3,26	
2,2	3	100L	1,49	7	3,1	3,2	0,0105	11	24	34	53	1435	83	84,5	84,5	0,6	0,73	0,81	4,64	
3	4	100L	2,06	6,5	3,2	3,3	0,0097	14	31	34	53	1420	85	85,6	85,6	0,63	0,75	0,82	6,17	
4	5,5	112M	2,71	6,6	2	2,6	0,0156	13	29	43	56	1440	86	86,7	86,7	0,62	0,74	0,8	8,32	
5,5	7,5	132S	3,67	7,3	1,9	3	0,0528	8	18	67	60	1460	87,5	88	88,1	0,68	0,8	0,86	10,5	
7,5	10	132M	5,02	7,2	2	3	0,0528	8	18	68	60	1455	88,7	89	89	0,71	0,81	0,86	14,1	
9,2	12,5	132M	6,16	7,7	2,2	3,2	0,0604	7	15	75	60	1455	89,2	89,5	89,5	0,69	0,8	0,85	17,5	
11	15	160M	7,29	6,4	2,3	2,8	0,1048	10	22	105	61	1470	89	90,2	90,2	0,65	0,76	0,83	21,2	
15	20	160L	9,97	6,2	2,3	2,8	0,1255	10	22	125	61	1465	90,6	91	91	0,66	0,76	0,83	28,7	
18,5	25	180M	12,3	6,6	2,4	2,8	0,1657	14	31	164	61	1465	91,5	91,8	91,6	0,68	0,78	0,83	35,1	
22	30	180L	14,6	6,8	2,6	2,9	0,2006	15	33	186	61	1465	92,2	92,5	92,3	0,7	0,8	0,85	40,5	
30	40	200L	19,9	6,3	2,2	2,6	0,2929	16	35	222	65	1470	92,6	93	92,8	0,68	0,78	0,83	56,2	
37	50	225S/M	24,4	6,6	2,2	2,7	0,4438	12	26	342	66	1475	93	93,2	93,2	0,74	0,83	0,86	66,6	
45	60	225S/M	29,7	6,8	2,4	2,7	0,5177	10	22	363	66	1475	93,2	93,7	93,6	0,74	0,83	0,86	80,7	
55	75	250S/M	36,3	6,4	2,2	2,7	0,8118	14	31	444	66	1475	93,6	93,9	94	0,75	0,84	0,87	97,1	
75	100	280S/M	49,2	7,2	2	2,7	1,64	22	48	639	69	1485	93,8	94,4	94,4	0,74	0,83	0,86	133	
90	125	280S/M	59	7,2	2,1	2,7	1,88	20	44	673	69	1485	94,1	94,7	94,7	0,76	0,84	0,87	158	
110	150	315S/M	71,9	6,6	2	2,4	2,57	26	57	887	71	1490	94,3	95	95	0,74	0,83	0,86	194	
132	175	315S/M	86,3	6,6	2,1	2,4	3,12	22	48	953	71	1490	94,6	95,2	95,2	0,76	0,84	0,87	230	
150	200	315S/M	98,1	6,2	2,2	2,4	3,34	30	66	983	71	1490	95	95,4	95,4	0,77	0,84	0,87	261	
160	220	315S/M	105	6,6	2,2	2,4	3,56	20	44	1012	71	1490	94,8	95,4	95,4	0,77	0,84	0,87	278	
185	250	315S/M	121	6,8	2,4	2,4	3,99	18	40	1114	71	1490	94,9	95,6	95,6	0,75	0,83	0,86	325	
200	270	315L	131	6,7	2,4	2,4	4,43	17	37	1216	74	1490	95	95,6	95,6	0,77	0,84	0,87	347	
220	300	315L	144	7	2,6	2,4	4,89	14	31	1333	74	1490	95,2	95,7	95,7	0,76	0,84	0,87	381	
250	340	315L	163	7	2,6	2,4	5,44	13	29	1399	74	1490	95,3	95,7	95,7	0,77	0,85	0,88	428	
280	380	315L	183	7,2	2,6	2,4	6,2	12	26	1496	74	1490	95,4	95,8	95,8	0,76	0,84	0,87	485	
300	400	355M/L	196	7,2	2,2	2,4	8,59	18	40	1510	76	1490	95,5	95,8	95,8	0,74	0,82	0,85	532	
315	430	355M/L	206	7,2	2,4	2,4	8,95	14	31	1643	76	1490	95,5	95,8	95,8	0,74	0,82	0,86	552	
330	450	355M/L	216	6,8	2,2	2,4	9,84	17	37	1769	76	1490	95,5	95,8	95,8	0,75	0,83	0,86	578	
355	480	355M/L	232	6,9	2,4	2,3	10,7	15	33	1752	76	1490	95,5	95,9	95,8	0,75	0,83	0,86	622	
370	500	355M/L	242	7	2,4	2,4	11,6	15	33	1971	76	1490	95,5	95,9	95,8	0,75	0,83	0,86	648	
400	550	355M/L	261	7,8	2,6	2,4	11,6	11	24	1888	76	1490	95,5	95,9	95,8	0,74	0,82	0,86	701	
450	610	355A/B*	294	7,4	2,5	2,8	13,2	20	44	2089	76	1490	95,8	96,1	96,2	0,69	0,8	0,84	804	
500	680	355A/B*	327	7,3	2,4	2,7	14,6	17	37	2246	76	1490	95,9	96,3	96,3	0,72	0,81	0,85	882	

Notes:

(1) Efficiency values are given according to IEC 60034-2-1. They are calculated according to indirect method, with stray load losses determined by measurement.

(2) With effect from 1st January 2015, IE2 motors placed onto the European Market and rated at 7.5kw or above, must be used with a variable speed drive unless their design falls outside of the scope of the European Regulation or their final installation will be outside of the EU / EEA.

(*) Fitted with air deflector in the drive end side.

W22 - High Efficiency - IE2 ⁽¹⁾

Output		380 V								415 V							
		Rated speed (rpm)	% of full load						Full load current In (A)	Rated speed (rpm)	% of full load						Full load current In (A)
			Efficiency			Power factor					Efficiency			Power factor			
			50	75	100	50	75	100			50	75	100	50	75	100	
kW	HP																
IV pole - 1500 rpm - 50 Hz																	
0,12	0,16	1360	56,8	58	59,1	0,58	0,71	0,8	0,39	1390	53,2	57,1	59,1	0,51	0,64	0,74	0,38
0,18	0,25	1350	56	63	64,7	0,52	0,65	0,74	0,57	1380	57,7	63,5	64,9	0,48	0,58	0,68	0,57
0,25	0,33	1380	60	66	68,5	0,53	0,66	0,74	0,75	1410	62	67	68,5	0,46	0,59	0,69	0,74
0,37	0,5	1360	66	71	72,7	0,53	0,66	0,76	1,02	1390	67,5	71,7	72,8	0,44	0,58	0,69	1,02
0,55	0,75	1420	73	75	77,1	0,65	0,77	0,85	1,28	1435	73	75	77,1	0,56	0,7	0,8	1,24
0,75	1	1400	80,1	79,9	79,8	0,68	0,8	0,84	1,70	1415	77,9	79,2	80,1	0,6	0,73	0,79	1,65
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	1430	82,8	83,2	82,8	0,63	0,77	0,83	3,32	1445	80,1	82,3	83,1	0,53	0,68	0,78	3,22
2,2	3	1425	83,5	84,3	84,3	0,65	0,77	0,83	4,78	1440	82,3	84,5	84,9	0,56	0,71	0,79	4,56
3	4	1410	85,6	85,4	85,5	0,67	0,78	0,84	6,35	1425	84,3	85,5	86	0,58	0,72	0,8	6,07
4	5,5	1435	86,5	86,6	86,6	0,67	0,78	0,82	8,56	1445	85,3	86,6	87	0,58	0,71	0,78	8,20
5,5	7,5	1455	88,1	87,7	87,7	0,73	0,83	0,88	10,8	1460	87	87,9	88,3	0,65	0,77	0,84	10,3
7,5	10	1450	89	88,7	88,7	0,75	0,83	0,87	14,8	1460	88,3	89	89,4	0,67	0,78	0,84	13,9
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	89,5	90,2	89,8	0,69	0,79	0,85	21,9	1470	88,5	90	90,3	0,61	0,73	0,81	20,9
15	20	1460	91	90,9	90,6	0,7	0,79	0,85	29,6	1470	90,2	90,9	91,2	0,63	0,73	0,81	28,2
18,5	25	1460	91,8	91,7	91,2	0,72	0,81	0,85	36,3	1470	91,1	91,7	91,7	0,5	0,75	0,81	34,7
22	30	1460	92,5	92,4	91,9	0,74	0,83	0,87	41,8	1465	91,8	92,4	92,4	0,66	0,77	0,83	39,9
30	40	1465	92,9	92,9	92,4	0,72	0,81	0,85	58,0	1470	92,3	92,9	92,9	0,65	0,76	0,81	55,5
37	50	1470	93,2	93,1	92,8	0,78	0,86	0,87	69,6	1475	92,7	93,1	93,3	0,7	0,81	0,85	64,9
45	60	1470	93,5	93,6	93,2	0,78	0,86	0,88	83,4	1475	92,9	93,6	93,7	0,7	0,81	0,84	79,5
55	75	1470	93,8	93,8	93,7	0,79	0,86	0,88	101	1475	93,3	93,9	94,1	0,72	0,82	0,86	94,6
75	100	1480	94,2	94,5	94,2	0,78	0,86	0,87	139	1485	93,5	94,3	94,4	0,71	0,81	0,85	130
90	125	1480	94,4	94,7	94,5	0,8	0,86	0,88	164	1485	93,8	94,6	94,7	0,73	0,82	0,86	154
110	150	1490	94,6	94,9	94,9	0,78	0,86	0,88	200	1490	93,9	94,8	95	0,7	0,81	0,84	192
132	175	1485	94,8	95,2	95	0,79	0,86	0,88	240	1490	94,4	95,1	95,2	0,73	0,82	0,86	224
150	200	1490	95,2	95,4	95,2	0,8	0,85	0,88	272	1490	94,8	95,4	95,4	0,75	0,83	0,86	254
160	220	1485	95	95,4	95,2	0,8	0,86	0,88	290	1490	94,6	95,3	95,4	0,74	0,82	0,86	271
185	250	1485	95,1	95,6	95,5	0,79	0,85	0,87	338	1490	94,7	95,5	95,6	0,72	0,81	0,85	317
200	270	1485	95,1	95,5	95,4	0,8	0,86	0,88	362	1490	94,8	95,6	95,7	0,74	0,82	0,86	338
220	300	1490	95,4	95,7	95,6	0,8	0,86	0,88	397	1490	95	95,6	95,7	0,73	0,82	0,86	372
250	340	1490	95,5	95,9	95,8	0,8	0,87	0,89	446	1490	95,1	95,8	95,9	0,74	0,83	0,87	417
280	380	1490	95,6	95,8	95,8	0,79	0,86	0,88	505	1490	95,2	95,7	95,8	0,73	0,82	0,86	473
300	400	1490	95,6	95,6	95,7	0,78	0,84	0,88	541	1490	95,3	95,7	95,8	0,71	0,8	0,84	519
315	430	1490	95,6	95,7	95,7	0,77	0,84	0,87	575	1490	95,3	95,7	95,8	0,71	0,8	0,85	538
330	450	1485	95,5	95,7	95,7	0,74	0,79	0,85	616	1490	95,3	95,7	95,8	0,72	0,81	0,85	564
355	480	1490	95,6	95,7	95,7	0,78	0,85	0,87	648	1490	95,4	95,8	95,8	0,72	0,81	0,85	607
370	500	1490	95,1	95,5	95,7	0,78	0,85	0,87	675	1490	95	95,7	95,9	0,72	0,81	0,85	631
400	550	1490	95,7	95,8	95,8	0,77	0,84	0,87	729	1490	95,3	95,8	95,8	0,71	0,8	0,85	683
450	610	1490	96	96,2	96,2	0,73	0,83	0,86	826	1490	95,5	95,9	96,1	0,65	0,77	0,82	794
500	680	1490	96,1	96,3	96,3	0,76	0,84	0,87	907	1490	95,7	96,2	96,3	0,69	0,79	0,84	860

W22 - High Efficiency - IE2 ^{(1) (2)}

Output		Frame	Full load torque (Nm)	Locked rotor current I/In	Locked rotor torque TI/Tn	Breakdown torque Tb/ Tn	Inertia J (kgm²)	Allowable locked rotor time (s)		Weight (kg)	Sound dB (A)	400 V								Full load current In (A)
												Rated speed (rpm)	% of full load							
								Efficiency					Power factor							
kW	HP							Hot	Cold				50	75	100	50	75	100		
IV pole - 1500 rpm - 50 Hz																				
Optional frames (high-output design)																				
0,25	0,33	80	0,17	5,5	2	2,5	0,0015	31	68	9	44	1420	62	67	69,5	0,5	0,65	0,72	0,72	
0,37	0,5	80	0,25	5,7	2,2	2,7	0,0019	23	51	9,5	44	1420	69	72	73,2	0,5	0,63	0,73	1,00	
0,75	1	90S	0,51	5,9	2,2	2,6	0,0038	19	42	18	49	1425	78	80	80	0,59	0,72	0,8	1,69	
1,1	1,5	90L	0,74	6,5	2,1	2,6	0,006	9	20	23	49	1450	80	81,8	81,8	0,53	0,68	0,78	2,49	
1,1	1,5	L80	0,77	6,6	2,6	2,8	0,0037	11	24	18,5	44	1400	80,5	81,4	81,4	0,66	0,79	0,84	2,32	
1,5	2	100L	1,03	6,6	2,8	3	0,0067	20	44	28	53	1425	82,5	83,2	83,2	0,62	0,74	0,81	3,21	
2,2	3	112M	1,47	7	1,9	2,6	0,0117	23	51	39	56	1460	84,5	85	85	0,63	0,75	0,81	4,61	
2,2	3	L90L	1,5	7,4	2,4	2,9	0,0077	9	20	27	49	1430	83,8	84,3	84,3	0,56	0,7	0,79	4,77	
4	5,5	132M	2,68	7,2	1,9	3	0,0341	14	31	60	60	1455	87	87,2	87,2	0,68	0,8	0,85	7,75	
4	5,5	132S	2,68	7,2	1,9	3	0,0341	14	31	60	60	1455	87	87,2	87,2	0,68	0,8	0,85	7,75	
5,5	7,5	132M	3,67	7,3	1,9	3	0,0528	8	18	67	60	1460	87,5	88	88,1	0,68	0,8	0,86	10,50	
5,5	7,5	L112M	3,72	7,1	2,7	3	0,0208	11	24	52	56	1440	87	87,7	87,7	0,55	0,68	0,76	11,60	
7,5	10	132S	5,02	7,2	2	3	0,0528	8	18	68	60	1455	88,7	89	89	0,71	0,81	0,86	14,10	
7,5	10	160M	4,99	6,1	2,1	2,7	0,0769	15	33	93	61	1465	88	89,2	89	0,65	0,77	0,83	14,70	
9,2	12,5	160M	6,12	6	2	2,6	0,0838	13	29	96	61	1465	88,5	89,5	89,3	0,66	0,77	0,83	17,90	
11	15	132M/L*	7,36	7,7	2,4	3,2	0,0676	7	15	84	56	1455	89	89,5	89,8	0,65	0,77	0,84	21,00	
11	15	160L	7,29	6,4	2,3	2,8	0,1048	10	22	105	61	1470	89	90,2	90,2	0,65	0,76	0,83	21,20	
15	20	180M	9,97	6,6	2,4	2,9	0,1401	14	31	152	61	1465	90,8	91,5	91,3	0,66	0,77	0,83	28,60	
18,5	25	160L	12,3	6,7	2,5	2,8	0,1607	9	20	140	61	1465	90,5	91	91,2	0,66	0,78	0,83	35,30	
18,5	25	180L	12,3	6,6	2,4	2,8	0,1657	14	31	164	61	1465	91,5	91,8	91,6	0,68	0,78	0,83	35,10	
30	40	180L	20	6,5	2,5	2,6	0,2393	14	31	210	61	1465	91,6	92	92,3	0,68	0,78	0,83	56,50	
37	50	200L	24,5	6	2,1	2,5	0,3721	14	31	237	65	1470	92,8	93	93	0,7	0,8	0,83	69,20	
45	60	200L	29,8	6,5	2,3	2,6	0,3721	9	20	275	65	1470	92,7	93	93,1	0,65	0,76	0,82	85,10	
55	75	225S/M	36,3	6,9	2,3	2,6	0,688	15	33	420	66	1475	92,8	93,2	93,5	0,74	0,83	0,86	98,70	
75	100	250S/M	49,5	7,2	2,4	2,9	1,05	10	22	496	66	1475	94	94,3	94,4	0,74	0,84	0,88	130	
90	125	315S/M	58,8	6,4	2,1	2,4	2,23	25	55	795	71	1490	94,2	94,8	94,8	0,73	0,82	0,85	161	
110	150	280S/M	72,2	7,6	2,4	2,9	2,27	18	40	735	69	1485	94,3	95	95	0,75	0,83	0,87	192	
132	175	280S/M	86,9	6,9	2,3	2,6	2,62	17	37	785	69	1480	94,3	94,9	94,8	0,73	0,82	0,85	236	
200	270	315S/M	131	6,7	2,4	2,4	4,43	17	37	1216	71	1490	95	95,6	95,6	0,77	0,84	0,87	347	
200	270	355M/L	131	6,3	1,8	2	5,94	18	40	1404	76	1490	95,1	95,6	95,6	0,74	0,81	0,85	355	
220	300	355M/L	144	6,4	2	2,2	6,48	18	40	1441	76	1490	95,3	95,7	95,7	0,73	0,81	0,85	390	
250	340	355M/L	163	6,8	2,1	2,4	7,19	18	40	1470	76	1490	95,4	95,8	95,8	0,73	0,82	0,85	443	
260	350	355M/L	170	6,8	2,1	2,4	7,73	18	40	1470	76	1490	95,4	95,8	95,8	0,73	0,82	0,85	461	
280	380	355M/L	183	6,6	2,1	2,4	8,05	14	31	1510	76	1490	95,5	95,8	95,8	0,74	0,82	0,85	496	
300	400	315L	196	7,6	2,5	2,5	6,51	11	24	1540	78	1490	95,4	95,8	95,8	0,72	0,8	0,85	532	
315	430	315L	206	7,6	2,5	2,5	6,51	11	24	1540	78	1490	95,4	95,8	95,8	0,72	0,8	0,85	558	
400	550	355A/B*	261	7,6	2,6	2,9	13,2	20	44	2089	76	1490	95,7	96,1	96,2	0,68	0,79	0,84	714	

Notes:

(1) Efficiency values are given according to IEC 60034-2-1. They are calculated according to indirect method, with stray load losses determined by measurement.

(2) With effect from 1st January 2015, IE2 motors placed onto the European Market and rated at 7.5kw or above, must be used with a variable speed drive unless their design falls outside of the scope of the European Regulation or their final installation will be outside of the EU / EEA.

(*) Fitted with air deflector in the drive end side.

W22 - High Efficiency - IE2 ⁽¹⁾

Output		380 V								415 V							
		Rated speed (rpm)	% of full load						Full load current In (A)	Rated speed (rpm)	% of full load						Full load current In (A)
			Efficiency			Power factor					Efficiency			Power factor			
			50	75	100	50	75	100			50	75	100	50	75	100	
kW	HP		50	75	100	50	75	100			50	75	100	50	75	100	

IV pole - 1500 rpm - 50 Hz

Optional frames (high-output design)

0,25	0,33	1410	62	67	69,5	0,55	0,68	0,76	0,72	1425	63	68	69,5	0,48	0,63	0,72	0,70
0,37	0,5	1410	69	72	73	0,56	0,69	0,78	0,99	1425	69	72	73,2	0,48	0,6	0,71	0,99
0,75	1	1415	79,1	79,9	79,6	0,64	0,76	0,83	1,72	1430	76,9	79,6	80,4	0,55	0,69	0,78	1,66
1,1	1,5	1440	80,9	81,5	81,5	0,59	0,71	0,8	2,56	1455	79,2	81,5	82,1	0,51	0,65	0,76	2,45
1,1	1,5	1395	81	81	81,4	0,71	0,82	0,86	2,39	1410	80	81	81,4	0,62	0,75	0,83	2,27
1,5	2	1415	82,5	82,8	82,8	0,66	0,77	0,83	3,34	1430	81,9	83,2	83,7	0,58	0,71	0,79	3,16
2,2	3	1455	85	84,8	84,3	0,67	0,78	0,83	4,78	1465	83,9	84,9	85,4	0,59	0,72	0,79	4,54
2,2	3	1420	84	84,3	84,3	0,62	0,75	0,81	4,90	1440	83,4	84,4	84,4	0,53	0,67	0,75	4,84
4	5,5	1450	87,5	87,1	86,6	0,72	0,83	0,86	8,12	1459	86,4	87,1	87,4	0,65	0,77	0,83	7,63
4	5,5	1450	87,5	87,1	86,6	0,72	0,83	0,86	8,12	1459	86,4	87,1	87,4	0,65	0,77	0,83	7,63
5,5	7,5	1455	88,1	87,7	87,7	0,73	0,83	0,88	10,80	1460	87	87,9	88,3	0,65	0,77	0,84	10,30
5,5	7,5	1440	87	87,7	87,7	0,6	0,73	0,79	11,80	1445	86	87,8	87,8	0,5	0,63	0,72	11,80
7,5	10	1450	89	88,7	88,7	0,75	0,83	0,87	14,90	1460	88,3	89	89,4	0,67	0,78	0,84	13,90
7,5	10	1460	88,5	89,1	88,7	0,69	0,8	0,85	15,10	1470	87,5	89	89,1	0,61	0,74	0,81	14,50
9,2	12,5	1460	89	89,5	89,3	0,7	0,8	0,85	18,50	1470	88	89,4	89,3	0,62	0,74	0,81	17,70
11	15	1450	90	89,6	89,8	0,7	0,81	0,86	21,60	1460	89	89,5	89,8	0,6	0,74	0,81	21,00
11	15	1465	89,5	90,2	89,8	0,69	0,79	0,85	21,90	1470	88,5	90	90,3	0,61	0,73	0,81	20,90
15	20	1460	91,3	91,5	91	0,71	0,8	0,85	29,50	1470	90,4	91,4	91,4	0,63	0,74	0,81	28,20
18,5	25	1460	90,5	91	91,2	0,71	0,81	0,85	36,30	1470	90	91	91,2	0,62	0,75	0,81	34,80
18,5	25	1460	91,8	91,7	91,2	0,72	0,81	0,85	36,30	1470	91,1	91,7	91,7	0,5	0,75	0,81	34,70
30	40	1460	91,9	92,3	92,3	0,72	0,81	0,84	58,80	1465	91,5	92	92,3	0,64	0,76	0,82	55,10
37	50	1465	93,1	92,9	92,7	0,74	0,83	0,85	71,40	1472	92,5	93	93,2	0,67	0,78	0,81	68,20
45	60	1470	92,8	93	93,1	0,7	0,8	0,84	87,40	1475	92,4	92,8	93,1	0,61	0,73	0,79	85,10
55	75	1470	93	93,5	93,5	0,78	0,85	0,87	103	1475	92,8	93,2	93,6	0,71	0,81	0,85	96,20
75	100	1470	94,3	94,3	94,1	0,78	0,87	0,9	135	1475	93,7	94,2	94,5	0,71	0,82	0,87	127
90	125	1490	94,2	94,8	94,8	0,75	0,84	0,86	168	1490	93,9	94,7	94,8	0,71	0,81	0,84	157
110	150	1480	94,6	95,1	94,9	0,79	0,85	0,88	200	1485	94	94,9	95	0,72	0,81	0,86	187
132	175	1480	94,5	94,7	94,7	0,76	0,84	0,87	243	1485	94,1	94,9	94,9	0,7	0,8	0,84	230
200	270	1485	95,1	95,5	95,4	0,8	0,86	0,88	362	1490	94,8	95,6	95,7	0,74	0,82	0,86	338
200	270	1490	95,3	95,5	95,5	0,78	0,83	0,86	370	1490	94,9	95,5	95,6	0,71	0,79	0,84	346
220	300	1490	95,5	95,6	95,6	0,77	0,83	0,86	407	1490	95	95,6	95,7	0,7	0,79	0,84	381
250	340	1490	95,6	95,7	95,7	0,77	0,84	0,86	462	1490	94,2	95,7	95,8	0,7	0,8	0,84	432
260	350	1490	95,6	95,7	95,7	0,77	0,84	0,86	480	1490	94,2	95,7	95,8	0,7	0,8	0,84	449
280	380	1490	95,6	95,7	95,7	0,77	0,84	0,86	517	1490	95,3	95,7	95,8	0,71	0,8	0,84	484
300	400	1490	95,6	95,8	95,8	0,76	0,82	0,86	553	1490	95,2	95,7	95,8	0,69	0,78	0,84	519
315	430	1490	95,6	95,8	95,8	0,76	0,82	0,86	580	1490	95,2	95,7	95,8	0,69	0,78	0,84	550
400	550	1490	96	96,2	96,1	0,72	0,82	0,86	735	1490	95,4	95,9	96,1	0,65	0,76	0,82	706

W22 - High Efficiency - IE2 ^{(1) (2)}

Output		Frame	Full load torque (Nm)	Locked rotor current I/In	Locked rotor torque TI/Tn	Breakdown torque Tb/Tn	Inertia J (kgm²)	Allowable locked rotor time (s)		Weight (kg)	Sound dB (A)	400 V							
												Rated speed (rpm)	% of full load						Full load current In (A)
								Hot	Cold				Efficiency			Power factor			
kW	HP												50	75	100	50	75	100	
VI pole - 1000 rpm - 50 Hz																			
0,12	0,16	63	0,13	3	1,9	2	0,0006	52	114	7,2	43	905	42	50	51	0,43	0,53	0,63	0,54
0,18	0,25	71	0,2	3,2	2	2	0,0008	96	211	9,5	43	890	52	56	56,8	0,4	0,51	0,61	0,75
0,25	0,33	71	0,28	3,2	1,9	2,1	0,0008	70	154	11,5	43	860	57	60	61,6	0,37	0,48	0,58	1,01
0,37	0,5	80	0,4	3,9	1,8	2	0,0022	27	59	10,5	43	910	63	67	67,6	0,51	0,66	0,76	1,04
0,55	0,75	80	0,59	4,1	2	2,2	0,003	21	46	14	43	910	69	73	73,1	0,5	0,62	0,73	1,49
0,75	1	90S	0,79	4,5	2	2,1	0,0055	23	51	19	45	925	74,5	76	76	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	23	45	925	76	78,1	78,1	0,5	0,63	0,73	2,78
1,5	2	100L	1,55	5	2	2,4	0,011	23	51	28,5	44	940	79,5	80	80	0,51	0,64	0,73	3,71
2,2	3	112M	2,22	7,1	3,5	3,9	0,0257	17	37	38	52	965	80,8	82,7	83,5	0,41	0,54	0,64	5,94
3	4	132S	3,04	5,7	2	2,4	0,0359	31	68	57	53	960	82,5	83,6	83,6	0,5	0,63	0,71	7,30
4	5,5	132M	4,06	6	2,1	2,5	0,0453	21	46	68	53	960	84	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	72	53	960	85,5	86,1	86,1	0,51	0,64	0,72	12,81
7,5	10	160M	7,53	5,8	2	2,6	0,1229	17	37	113	56	970	88,3	88,7	88,3	0,64	0,76	0,82	14,95
9,2	12,5	160L	9,24	6	2,2	2,6	0,1492	14	31	127	56	970	88,5	88,9	88,6	0,64	0,76	0,82	18,28
11	15	160L	11,1	6	2,3	2,7	0,1664	13	29	136	56	970	89	89,5	89,2	0,62	0,74	0,81	21,98
15	20	180L	15,1	7	2,4	3	0,2565	7	15	174	56	970	90,3	90,5	90,3	0,7	0,81	0,86	27,88
18,5	25	200L	18,5	5,7	2,1	2,5	0,3517	15	33	214	60	975	91	91,4	91,2	0,67	0,77	0,82	35,71
22	30	200L	22	6	2,2	2,7	0,4037	14	31	225	60	975	91,4	91,7	91,5	0,65	0,76	0,82	42,32
30	40	225S/M	29,7	6,8	2,1	2,5	0,7192	12	26	359	63	985	92,6	92,7	92,6	0,71	0,81	0,86	54,38
37	50	250S/M	36,6	6,7	2,2	2,5	1,1	16	35	438	64	985	93	93,2	93	0,73	0,82	0,86	66,77
45	60	280S/M	44,5	6,2	2	2,5	2,02	26	57	596	65	985	93,4	93,6	93,4	0,68	0,78	0,82	84,81
55	75	280S/M	54,4	6,2	2	2,4	2,36	22	48	629	65	985	93,6	93,9	93,8	0,68	0,79	0,83	101,97
75	100	315S/M	73,8	6,2	1,9	2,2	3,83	23	51	837	67	990	94	94,3	94,2	0,69	0,79	0,83	138,46
90	125	315S/M	88,6	6	1,9	2,1	4,54	22	48	893	67	990	94,4	94,6	94,5	0,72	0,8	0,84	163,65
110	150	315S/M	108	6,1	2	2,2	5,45	20	44	966	67	990	94,5	94,9	94,8	0,72	0,8	0,84	199,39
132	175	315S/M	130	6,4	2,2	2,4	6,35	17	37	1036	67	990	94,6	95	95	0,71	0,8	0,84	238,76
150	200	355M/L	147	5,6	1,8	2	7,41	38	84	1340	73	995	94,2	94,5	95	0,64	0,74	0,79	288,49
160	220	315L	157	6,6	2,2	2,4	7,61	14	31	1228	68	990	94,8	95,2	95,2	0,7	0,8	0,84	288,80
185	250	315L	182	6,9	2,3	2,4	8,86	12	26	1358	68	990	95	95,4	95,4	0,69	0,79	0,83	337,24
200	270	315L	197	7	2,4	2,5	10,1	12	26	1488	68	990	95,1	95,4	95,4	0,69	0,79	0,83	364,58
220	300	315L	216	6,8	2,3	2,3	11	14	31	1621	68	990	95,2	95,5	95,5	0,69	0,79	0,83	400,62
250	340	355M/L	246	6	2	2,2	13,9	34	75	1789	73	990	95,3	95,5	95,5	0,66	0,76	0,81	466,49
260	350	355M/L	256	6	2,1	2,2	12,7	34	75	1789	73	990	95,3	95,5	95,5	0,66	0,76	0,81	485,15
280	380	355M/L	275	6,2	2,2	2,2	13,9	27	59	1884	73	990	95,4	95,6	95,6	0,64	0,75	0,8	528,45
300	400	355M/L	295	6,2	2,2	2,2	14,3	30	66	1900	73	990	95,4	95,7	95,6	0,63	0,74	0,79	573,36
315	430	355M/L	308	6,2	2,2	2,2	15	28	62	1979	73	995	95,4	95,7	95,6	0,66	0,76	0,81	587,16
355	480	355A/B*	349	6,2	2	2,3	17,1	29	64	2200	73	990	95,3	95,7	95,8	0,63	0,74	0,79	677,06
370	500	355A/B*	364	6	2,2	2,3	17,99	25	55	2300	73	990	95,4	95,8	95,9	0,63	0,74	0,79	704,93
400	550	355A/B*	394	6,1	2	2,3	18,9	29	64	2346	73	990	95,4	95,8	95,9	0,63	0,74	0,79	762,09
Optional frames (high-output design)																			
0,25	0,33	80	0,27	3,9	1,8	2	0,0022	27	59	10,5	43	910	58	61	63	0,51	0,66	0,76	0,75
3	4	132M	3,04	5,7	2	2,4	0,0359	31	68	57	53	960	82,5	83,6	83,6	0,5	0,63	0,71	7,30
5,5	7,5	160M	5,52	6	2,1	2,6	0,1053	19	42	106	56	970	87,5	88	87,5	0,63	0,75	0,81	11,20
37	50	225S/M	36,6	6,8	2,1	2,5	0,8876	11	24	390	63	985	93	93,2	93	0,72	0,81	0,86	66,80
45	60	250S/M	44,5	6,4	2,1	2,3	1,29	15	33	466	64	985	93,4	93,5	93,4	0,76	0,84	0,87	79,90
75	100	280S/M	73,8	6,4	2	2,4	3,03	17	37	702	65	990	93,9	94,3	94,2	0,69	0,79	0,84	137
132	175	355M/L	129	6	2	2,3	7,18	40	88	1300	73	995	94	94,5	95	0,6	0,72	0,77	260
160	220	355M/L	157	5,9	1,8	2	8,34	34	75	1453	73	990	94,9	95,3	95,3	0,65	0,75	0,8	303
185	250	355M/L	182	5,7	1,9	2	9,24	32	70	1521	73	990	95,1	95,4	95,4	0,65	0,75	0,8	350
200	270	355M/L	197	6,5	2,1	2,3	10,9	28	62	1643	73	990	95,1	95,5	95,5	0,64	0,75	0,8	378
220	300	355M/L	216	6	2	2,1	11,8	32	70	1795	73	990	95,3	95,5	95,5	0,65	0,75	0,8	416

Notes:

(1) Efficiency values are given according to IEC 60034-2-1. They are calculated according to indirect method, with stray load losses determined by measurement.

(2) With effect from 1st January 2015, IE2 motors placed onto the European Market and rated at 7.5kw or above, must be used with a variable speed drive unless their design falls outside of the scope of the European Regulation or their final installation will be outside of the EU / EEA.

(*) Fitted with air deflector in the drive end side.

W22 - High Efficiency - IE2 ⁽¹⁾

Output		380 V								415 V							
		Rated speed (rpm)	% of full load						Full load current In (A)	Rated speed (rpm)	% of full load						Full load current In (A)
			Efficiency			Power factor					Efficiency			Power factor			
			50	75	100	50	75	100			50	75	100	50	75	100	
kW	HP	VI pole - 1000 rpm - 50 Hz															
0,12	0,16	895	45,4	52,1	50,6	0,46	0,57	0,67	0,54	910	39,1	47,5	50,7	0,41	0,5	0,59	0,56
0,18	0,25	875	54,2	55	56,6	0,43	0,55	0,65	0,74	900	50,1	56,5	56,8	0,38	0,48	0,58	0,76
0,25	0,33	845	56,3	60	61,6	0,41	0,52	0,62	0,99	865	50,1	57,8	61,6	0,35	0,45	0,54	1,05
0,37	0,5	895	65,2	67,7	66	0,56	0,7	0,8	1,06	915	60,5	65,9	67,6	0,48	0,62	0,73	1,04
0,55	0,75	900	68	73	73,1	0,53	0,67	0,77	1,48	915	69	73	73,2	0,45	0,59	0,7	1,49
0,75	1	915	75,8	75,9	75,9	0,55	0,68	0,76	1,98	930	73,2	75,6	76,4	0,48	0,61	0,71	1,92
1,1	1,5	915	77,9	78,5	78,5	0,55	0,67	0,77	2,77	930	74,3	77,3	78,1	0,46	0,59	0,7	2,80
1,5	2	930	80,7	80,1	79,8	0,55	0,69	0,76	3,76	945	78,3	79,7	80,3	0,48	0,61	0,7	3,71
2,2	3	960	82	83,1	84,2	0,46	0,6	0,68	5,84	970	79,8	83,2	83,3	0,38	0,5	0,6	6,12
3	4	955	83,4	83,8	83,3	0,54	0,67	0,74	7,39	960	81,4	83,1	83,6	0,46	0,59	0,68	7,34
4	5,5	955	84,9	85	84,6	0,55	0,68	0,74	9,71	960	83	84,4	84,9	0,47	0,61	0,69	9,50
5,5	7,5	955	86,4	86,3	86	0,56	0,68	0,75	13,0	965	84,6	85,7	86,2	0,47	0,61	0,69	12,9
7,5	10	965	88,7	88,6	87,7	0,68	0,79	0,84	15,5	970	87,8	88,6	88,5	0,61	0,73	0,8	14,7
9,2	12,5	965	88,9	88,8	88,1	0,68	0,79	0,84	18,9	970	88	88,8	88,8	0,61	0,73	0,8	18,0
11	15	965	89,6	89,5	88,8	0,66	0,77	0,83	22,7	970	88,4	89,3	89,3	0,59	0,71	0,79	21,7
15	20	965	90,6	90,4	89,7	0,74	0,84	0,88	28,9	970	89,9	90,5	90,6	0,67	0,79	0,85	27,1
18,5	25	970	91,5	91,4	90,8	0,71	0,8	0,84	36,9	975	90,5	91,2	91,3	0,63	0,74	0,8	35,2
22	30	970	92	91,8	91,2	0,7	0,79	0,84	43,6	975	90,8	91,5	91,6	0,61	0,73	0,8	41,8
30	40	980	92,8	92,5	92,1	0,75	0,83	0,87	56,9	985	92,2	92,6	92,7	0,68	0,79	0,84	53,6
37	50	980	93,2	93	92,6	0,77	0,84	0,87	69,8	985	92,7	93,2	93,2	0,7	0,8	0,85	65,0
45	60	980	93,7	93,6	93,1	0,72	0,81	0,84	87,4	985	93,1	93,5	93,5	0,65	0,76	0,8	83,7
55	75	980	93,8	93,8	93,5	0,72	0,82	0,85	105	985	93,3	93,6	93,9	0,65	0,77	0,82	99,4
75	100	990	94,3	94,3	94	0,73	0,82	0,84	144	990	93,7	94,2	94,2	0,66	0,77	0,81	137
90	125	990	94,6	94,5	94,2	0,76	0,82	0,85	171	990	94,2	94,5	94,6	0,69	0,78	0,83	159
110	150	990	94,7	94,9	94,5	0,76	0,82	0,85	208	990	94,2	94,8	94,9	0,69	0,78	0,83	194
132	175	990	94,9	95	94,8	0,75	0,83	0,85	249	990	94,3	94,9	95	0,68	0,78	0,83	233
150	200	990	94,5	94,8	94,8	0,69	0,77	0,82	293	995	93,8	94,4	95	0,61	0,71	0,76	289
160	220	990	95	95,2	95	0,74	0,82	0,85	301	990	94,5	95,1	95,2	0,67	0,78	0,83	282
185	250	990	95,2	95,4	95,2	0,73	0,82	0,84	351	990	94,7	95,3	95,4	0,66	0,77	0,81	333
200	270	990	95,3	95,4	95,2	0,73	0,82	0,85	376	990	94,8	95,3	95,4	0,66	0,77	0,82	356
220	300	985	95,3	95,4	95,2	0,73	0,81	0,84	418	990	95	95,5	95,6	0,66	0,77	0,82	390
250	340	990	95,5	95,5	95,4	0,7	0,79	0,83	480	990	95,1	95,4	95,5	0,62	0,73	0,79	461
260	350	990	95,5	95,5	95,4	0,7	0,79	0,83	499	990	95,1	95,4	95,5	0,62	0,73	0,79	479
280	380	990	95,6	95,6	95,5	0,68	0,78	0,82	543	990	95,2	95,5	95,6	0,61	0,72	0,78	522
300	400	990	95,7	95,7	95,5	0,65	0,75	0,8	597	995	95,2	95,6	95,6	0,6	0,7	0,77	567
315	430	995	95,6	95,7	95,5	0,7	0,79	0,83	604	995	95,2	95,6	95,6	0,62	0,73	0,79	580
355	480	990	95,4	95,7	95,7	0,64	0,75	0,79	713	990	95,2	95,7	95,9	0,62	0,73	0,79	652
370	500	990	95,6	95,8	95,8	0,65	0,76	0,81	724	995	95,2	95,7	95,9	0,61	0,72	0,77	697
400	550	990	95,7	95,9	95,9	0,67	0,77	0,81	782	990	95,2	95,7	95,9	0,6	0,71	0,77	754
Optional frames (high-output design)																	
0,25	0,33	895	56,3	61	62,5	0,56	0,7	0,8	0,76	915	60	62	64	0,48	0,62	0,73	0,74
3	4	955	83,4	83,8	83,3	0,54	0,67	0,74	7,39	960	81,4	83,1	83,6	0,46	0,59	0,68	7,34
5,5	7,5	965	87,9	87,9	86,9	0,67	0,78	0,83	11,60	970	87	87,9	87,8	0,6	0,73	0,79	11,00
37	50	980	93,1	92,9	92,4	0,76	0,83	0,87	69,90	985	92,8	93,2	93,2	0,69	0,79	0,85	65,00
45	60	980	93,4	93,2	92,8	0,79	0,86	0,88	83,70	985	93,3	93,6	93,7	0,73	0,82	0,86	77,70
75	100	985	94,1	94,2	93,9	0,73	0,82	0,85	143	990	93,7	94,2	94,3	0,66	0,77	0,83	133
132	175	995	94,3	94,5	95	0,64	0,75	0,79	267	995	94	94,5	95	0,57	0,69	0,75	258
160	220	990	94,5	95,9	96	0,7	0,8	0,82	309	990	93,9	95,8	96	0,6	0,74	0,8	290
185	250	990	94,4	95,5	95,7	0,7	0,79	0,82	358	990	94	95,5	95,8	0,6	0,71	0,78	344
200	270	990	95	95,6	95,7	0,7	0,79	0,82	387	990	94,4	95,4	95,7	0,62	0,73	0,79	368
220	300	990	94,2	95,4	95,7	0,72	0,8	0,82	426	995	93,4	95	95,8	0,62	0,74	0,79	404

W22 - High Efficiency - IE2 ⁽¹⁾

Output		Frame	Full load torque (Nm)	Locked rotor current I/In	Locked rotor torque TI/Tn	Breakdown torque Tb/Tn	Inertia J (kgm²)	Allowable locked rotor time (s)		Weight (kg)	Sound dB (A)	400 V									
								Rated speed (rpm)	% of full load						Full load current In (A)						
									Efficiency			Power factor									
kW	HP							Hot	Cold				50	75	100	50	75	100			
VIII pole - 750 rpm - 50 Hz																					
0,12	0,16	71	0,18	2,3	1,9	2	0,0008	172	378	9,5	41	650	38	40	42	0,4	0,45	0,55	0,75		
0,18	0,25	80	0,26	3,1	1,9	2,1	0,0024	48	106	11,5	42	670	40	46	46,5	0,46	0,57	0,67	0,83		
0,25	0,33	80	0,36	3,2	1,9	2,1	0,0029	42	92	13,5	42	670	47	50	52	0,45	0,57	0,68	1,02		
0,37	0,5	90S	0,52	3,5	1,8	2	0,0044	37	81	18	43	690	55	58	58	0,42	0,53	0,63	1,46		
0,55	0,75	90L	0,78	3,5	1,9	2	0,006	31	68	22	43	685	59	62	62	0,44	0,56	0,66	1,94		
0,75	1	100L	1,03	4,6	2	2,4	0,011	42	92	28,5	50	710	71	74	74	0,4	0,52	0,62	2,36		
1,1	1,5	100L	1,52	4,6	2,1	2,3	0,0127	29	64	30,5	50	705	71	75	75	0,4	0,53	0,62	3,41		
1,5	2	112M	2,09	4,7	2,4	2,3	0,0202	29	64	39	46	700	77	79	79	0,44	0,57	0,67	4,09		
2,2	3	132S	3,06	5,5	2,2	2,4	0,0592	25	55	62	48	700	81	81,5	81	0,52	0,65	0,72	5,44		
3	4	132M	4,17	5,5	2,3	2,4	0,074	19	42	66	48	700	82	82,5	82	0,54	0,66	0,73	7,23		
4	5,5	160M	5,37	4,7	2	2,2	0,1053	29	64	107	51	725	84	85	85	0,52	0,65	0,72	9,43		
5,5	7,5	160M	7,39	4,7	2	2,2	0,1404	21	46	120	51	725	85	86	85,5	0,52	0,65	0,73	12,70		
7,5	10	160L	10,1	4,9	2,2	2,3	0,1756	22	48	139	51	725	86	87	87	0,52	0,65	0,73	17,00		
9,2	12,5	180M	12,4	6	2	2,5	0,2033	11	24	156	51	725	88	88	87,5	0,63	0,75	0,82	18,50		
11	15	180L	14,8	6	2,1	2,4	0,2439	11	24	175	51	725	88	88,5	88	0,67	0,77	0,83	21,70		
15	20	200L	20	4,9	1,9	2	0,422	30	66	226	53	730	90	90,5	90	0,58	0,7	0,76	31,70		
18,5	25	225S/M	24,5	6,3	2	2,4	0,6183	17	37	339	56	735	91,5	91,9	91,7	0,65	0,77	0,82	35,50		
22	30	225S/M	29,2	6,1	2	2,4	0,7203	16	35	358	56	735	91,7	92	92	0,67	0,78	0,81	42,60		
30	40	250S/M	39,8	6,6	2,1	2,7	1,06	13	29	433	56	735	92	92,4	92,3	0,68	0,79	0,83	56,50		
37	50	280S/M	48,7	5,6	1,8	2,1	2,26	26	57	614	59	740	93	93,5	93,5	0,64	0,74	0,8	71,40		
45	60	280S/M	59,2	5,8	1,9	2,1	2,71	23	51	660	59	740	93,4	93,8	93,8	0,64	0,74	0,8	86,60		
55	75	315S/M	72,4	5,8	1,8	2,1	4,03	32	70	851	62	740	93,7	94,2	94,2	0,66	0,76	0,8	105		
75	100	315S/M	98,7	5,9	1,8	2,1	5,31	30	66	951	62	740	94,1	94,5	94,6	0,68	0,77	0,81	141		
90	125	315S/M	118	6	1,9	2,1	6,22	26	57	1020	62	740	94,4	94,7	94,7	0,68	0,77	0,81	169		
110	150	315L	145	6	1,9	2,1	7,84	28	62	1244	68	740	94,6	94,8	94,8	0,67	0,76	0,8	209		
132	175	315L	174	6,3	2	2,3	9,3	20	44	1352	68	740	94,8	95,1	95,1	0,64	0,75	0,8	250		
160	220	355M/L	209	6	1,5	2,3	14,4	54	119	1616	70	745	95,2	95,6	95,6	0,63	0,74	0,8	302		
185	250	355M/L	242	6,1	1,5	2,3	16,5	48	106	1691	70	745	95,2	95,6	95,6	0,62	0,72	0,78	358		
200	270	355M/L	261	6,3	1,6	2,3	18,4	48	106	1765	70	745	95,3	95,6	95,6	0,63	0,74	0,8	377		
220	300	355M/L	288	6,3	1,5	2,3	19,9	48	106	1875	70	745	95,4	95,7	95,7	0,63	0,74	0,79	420		
250	340	355A/B*	327	6,2	1,5	2,4	21,7	47	103	2092	70	745	95,1	95,7	95,8	0,62	0,73	0,79	477		
260	350	355A/B*	340	6,2	1,5	2,4	21,7	47	103	2092	70	745	95,1	95,7	95,8	0,62	0,73	0,79	496		
280	380	355A/B*	366	7,5	2	2,8	25	44	97	2279	70	745	95,1	95,7	95,8	0,61	0,73	0,79	534		
Optional frames (high-output design)																					
37	50	250S/M	49,4	7,5	2,1	2,6	1,66	12	26	570	56	730	92,5	93	93	0,66	0,77	0,82	70,00		
55	75	280S/M	72,4	5,8	2	2,1	3,16	24	53	710	59	740	93,7	94,2	94,1	0,64	0,75	0,8	105		
110	150	315S/M	145	6	1,9	2,1	7,84	28	62	1300	62	740	94,6	94,8	94,8	0,67	0,76	0,8	209		
110	150	355M/L	144	6,4	1,3	2,1	10,4	48	106	1379	70	745	94,6	95,2	95,2	0,63	0,74	0,79	211		
132	175	355M/L	173	6,5	1,3	2	12,6	50	110	1473	70	745	95	95,5	95,4	0,64	0,75	0,8	250		

Note:

(1) Efficiency values are given according to IEC 60034-2-1. They are calculated according to indirect method, with stray load losses determined by measurement.

W22 - High Efficiency - IE2 ⁽¹⁾

Output		380 V								415 V							
		Rated speed (rpm)	% of full load						Full load current In (A)	Rated speed (rpm)	% of full load						Full load current In (A)
			Efficiency			Power factor					Efficiency			Power factor			
			50	75	100	50	75	100			50	75	100	50	75	100	
kW	HP																
VIII pole - 750 rpm - 50 Hz																	
0,12	0,16	635	36	39,5	40	0,39	0,49	0,58	0,79	655	39	40	42	0,36	0,43	0,51	0,78
0,18	0,25	660	40	45,8	46	0,49	0,6	0,71	0,84	675	42	46,5	47	0,44	0,55	0,64	0,83
0,25	0,33	660	46	49,5	51	0,49	0,61	0,72	1,03	675	49	52,5	53	0,44	0,55	0,65	1,01
0,37	0,5	680	54	57	57	0,45	0,57	0,68	1,45	695	55	58	59	0,4	0,5	0,6	1,45
0,55	0,75	675	58	61	61,7	0,47	0,61	0,7	1,88	690	60	62,2	62,5	0,41	0,53	0,63	1,94
0,75	1	705	73	75	73,9	0,44	0,57	0,65	2,37	715	69,2	73	73,7	0,38	0,49	0,59	2,40
1,1	1,5	700	73,6	76,2	74,9	0,45	0,57	0,66	3,38	705	68,8	73,6	74,5	0,37	0,49	0,59	3,48
1,5	2	695	78,8	79,6	78,5	0,49	0,61	0,7	4,15	705	75,3	78,2	78,9	0,41	0,53	0,63	4,20
2,2	3	695	81,8	81,5	79,9	0,57	0,69	0,75	5,58	705	80,1	81,4	81,4	0,49	0,62	0,7	5,37
3	4	690	82,7	82,4	80,8	0,58	0,7	0,75	7,52	705	81,1	82,4	82,5	0,5	0,63	0,71	7,13
4	5,5	720	84,8	85	84,4	0,56	0,68	0,74	9,73	730	83,2	84,7	85,2	0,49	0,62	0,7	9,33
5,5	7,5	720	85,8	86	84,9	0,56	0,68	0,75	13,10	725	84,2	85,7	85,7	0,49	0,62	0,71	12,60
7,5	10	720	86,8	87,2	86,6	0,56	0,69	0,76	17,30	725	85,1	86,7	87,1	0,49	0,62	0,71	16,90
9,2	12,5	720	88,5	87,9	86,8	0,67	0,78	0,84	19,20	725	87,4	87,9	87,8	0,59	0,72	0,8	18,20
11	15	720	88,4	88,3	87,2	0,71	0,8	0,85	22,50	725	87,5	88,5	88,4	0,64	0,75	0,81	21,40
15	20	725	90,5	90,4	89,4	0,62	0,73	0,78	32,70	730	89,4	90,4	90,2	0,55	0,67	0,74	31,30
18,5	25	730	91,8	91,8	91,2	0,69	0,8	0,84	36,70	735	91,1	91,9	91,9	0,62	0,74	0,8	35,00
22	30	730	91,9	91,8	91,4	0,7	0,81	0,83	44,10	735	91,4	92	92,2	0,64	0,76	0,8	41,50
30	40	730	92,3	92,3	91,8	0,73	0,82	0,85	58,40	735	91,6	92,3	92,5	0,64	0,76	0,81	55,70
37	50	735	93,3	93,4	93,1	0,68	0,77	0,82	73,60	740	92,6	93,4	93,6	0,61	0,72	0,78	70,50
45	60	735	93,3	93,9	94	0,66	0,77	0,81	89,80	740	92,5	93,5	94,1	0,58	0,7	0,77	86,40
55	75	740	94	94,2	93,9	0,7	0,79	0,82	109	740	93,3	94,1	94,3	0,62	0,73	0,78	104
75	100	740	94,4	94,5	94,3	0,72	0,8	0,82	147	740	93,8	94,4	94,7	0,64	0,75	0,8	138
90	125	740	94,7	94,7	94,4	0,72	0,8	0,82	177	740	94,1	94,6	94,8	0,64	0,75	0,8	165
110	150	740	94,8	94,7	94,5	0,71	0,79	0,81	218	740	94,3	94,7	94,9	0,64	0,74	0,79	204
132	175	740	94,6	95,2	95,1	0,68	0,78	0,82	257	740	94,5	95	95,1	0,61	0,72	0,78	248
160	220	745	95,6	95,7	95,6	0,68	0,78	0,82	310	745	94,8	95,4	95,6	0,59	0,71	0,78	299
185	250	745	95,6	95,8	95,6	0,67	0,76	0,81	363	745	94,7	95,3	95,4	0,57	0,68	0,75	360
200	270	745	95,7	95,7	95,6	0,68	0,78	0,83	383	745	94,9	95,4	95,5	0,59	0,71	0,78	374
220	300	745	95,8	95,9	95,7	0,68	0,78	0,81	431	745	95	95,5	95,6	0,59	0,71	0,77	416
250	340	745	95,5	95,8	95,8	0,67	0,77	0,81	489	745	94,7	95,5	95,7	0,58	0,7	0,77	472
260	350	745	95,5	95,8	95,8	0,67	0,77	0,81	509	745	94,7	95,5	95,7	0,58	0,7	0,77	491
280	380	745	95,5	95,9	95,9	0,66	0,76	0,81	548	745	94,7	95,5	95,7	0,57	0,7	0,77	529
Optional frames (high-output design)																	
37	50	730	92,7	92,9	92,9	0,7	0,79	0,83	72,90	735	92,5	93,1	93,1	0,64	0,75	0,81	68,30
55	75	740	94	94,1	93,7	0,68	0,78	0,82	109	740	93,4	94,1	94,3	0,6	0,72	0,78	104
110	150	740	94,8	94,7	94,5	0,71	0,79	0,81	218	740	94,3	94,7	94,9	0,64	0,74	0,79	204
110	150	740	94	95,2	95,1	0,65	0,76	0,81	217	745	93	95,2	95,2	0,59	0,77	0,77	209
132	175	740	94,5	95,4	95,3	0,66	0,75	0,81	260	745	93,5	95,4	95,4	0,6	0,71	0,77	250

W22 -Premium Efficiency - IE3 ⁽¹⁾

Output		Frame	Full load torque (Nm)	Locked rotor current I _L /I _N	Locked rotor torque T _L /T _N	Breakdown torque T _B /T _N	Inertia J (kgm ²)	Allowable locked rotor time (s)		Weight (kg)	Sound dB (A)	400 V								
												Rated speed (rpm)	% of full load						Full load current I _N (A)	
								Hot	Cold				Efficiency			Power factor				
kW	HP												50	75	100	50	75	100		
II pole - 3000 rpm - 50 Hz																				
0,12	0,16	63	0,040	5,4	3,1	3,3	0,0001	30	66	6,2	52,0	2820	58,0	60,8	60,8	0,54	0,67	0,76	0,375	
0,18	0,25	63	0,060	5,2	3,0	3,2	0,0002	22	48	6,7	52,0	2815	61,0	65,9	65,9	0,55	0,68	0,77	0,512	
0,25	0,33	63	0,090	5,5	3,2	3,2	0,0002	17	37	7,2	52,0	2805	63,0	68,0	69,7	0,54	0,68	0,77	0,672	
0,37	0,5	71	0,130	6,0	2,5	2,5	0,0004	12	26	7,5	56,0	2820	73,0	73,8	73,8	0,66	0,79	0,85	0,851	
0,55	0,75	71	0,190	5,9	3,0	3,0	0,0005	18	40	8,5	56,0	2770	75,0	76,0	77,8	0,68	0,81	0,86	1,19	
0,75	1	80	0,260	7,5	3,5	3,5	0,0008	25	55	13,5	59,0	2825	80,0	82,0	81,0	0,63	0,76	0,82	1,63	
1,1	1,5	80	0,380	7,4	3,6	3,6	0,0009	23	51	15,0	59,0	2830	81,0	83,5	83,0	0,63	0,76	0,82	2,33	
1,5	2	90S	0,510	7,6	3,3	3,3	0,0020	15	33	18,5	62,0	2875	83,0	85,0	84,5	0,64	0,76	0,83	3,09	
1,5	2	L90S	0,510	7,6	3,3	3,3	0,0020	15	33	18,5	62,0	2875	83,0	85,0	84,5	0,64	0,76	0,83	3,09	
2,2	3	90L	0,750	7,5	3,4	3,5	0,0026	12	26	23,5	62,0	2870	86,0	86,5	86,3	0,65	0,77	0,83	4,43	
3	4	100L	1,00	8,5	3,4	3,4	0,0064	15	33	35,0	67,0	2910	85,5	87,3	87,3	0,69	0,81	0,86	5,77	
4	5,5	112M	1,34	7,7	2,9	3,5	0,0081	22	48	41,0	64,0	2900	88,0	88,4	88,4	0,69	0,80	0,86	7,59	
5,5	7,5	132S	1,83	7,9	2,4	3,5	0,0180	16	35	62,0	67,0	2930	86,9	88,7	89,4	0,66	0,78	0,84	10,6	
7,5	10	132S	2,49	8,8	2,7	3,6	0,0234	10	22	65,0	67,0	2930	88,5	89,8	90,3	0,68	0,80	0,85	14,1	
9,2	12,5	132M	3,06	8,5	2,9	3,3	0,0303	16	35	78,0	67,0	2930	90,4	91,1	90,7	0,75	0,84	0,88	16,6	
11	15	160M	3,64	8,0	2,6	3,4	0,0482	12	26	105	67,0	2945	90,3	91,4	91,4	0,71	0,82	0,87	20,0	
15	20	160M	4,96	8,3	2,8	3,5	0,0551	8	18	112	67,0	2945	90,9	91,8	92,1	0,67	0,79	0,85	27,7	
18,5	25	160L	6,12	8,6	3,1	3,7	0,0663	6	13	125	67,0	2945	91,5	92,3	92,6	0,69	0,80	0,85	33,9	
22	30	180M	7,26	8,3	2,7	3,6	0,0968	6	13	165	67,0	2950	92,3	93,0	92,9	0,69	0,80	0,86	39,7	
30	40	200L	9,87	7,7	3,0	3,0	0,1703	16	35	225	69,0	2960	92,2	93,2	93,5	0,69	0,80	0,85	54,5	
37	50	200L	12,2	7,7	3,1	3,0	0,1881	13	29	250	69,0	2960	92,6	93,4	93,8	0,69	0,79	0,84	67,8	
45	60	225S/M	14,8	7,7	2,4	3,1	0,2861	13	29	380	74,0	2960	94,2	94,5	94,2	0,78	0,86	0,89	77,5	
55	75	250S/M	18,1	7,8	2,7	3,3	0,3736	19	42	430	74,0	2960	93,6	94,4	94,4	0,77	0,85	0,88	95,6	
75	100	280S/M	24,5	7,5	2,0	3,1	0,9386	36	79	630	77,0	2975	93,7	94,8	94,9	0,78	0,85	0,88	130	
90	125	280S/M	29,5	7,6	2,2	3,1	1,12	27	59	710	77,0	2975	94,3	95,2	95,2	0,81	0,87	0,90	152	
110	150	315S/M	36,0	7,5	1,9	3,0	1,66	38	84	900	77,0	2975	94,3	95,3	95,4	0,78	0,85	0,88	189	
132	175	315S/M	43,1	7,6	2,1	3,1	1,96	34	75	950	77,0	2980	94,5	95,4	95,6	0,78	0,86	0,89	224	
150	200	315S/M	49,0	7,5	2,3	3,1	2,18	20	44	990	77,0	2980	95,0	95,6	95,6	0,80	0,86	0,89	254	
160	220	315S/M	52,3	7,4	2,0	2,9	2,24	28	62	1035	77,0	2980	95,1	95,8	95,8	0,79	0,86	0,89	271	
185	250	315S/M	60,5	7,6	2,3	3,1	2,46	22	48	1090	77,0	2980	95,4	95,8	95,8	0,79	0,86	0,89	313	
200	270	315L	65,5	7,6	2,3	2,9	2,68	23	51	1150	78,0	2975	95,7	96,2	96,0	0,82	0,88	0,90	334	
220	300	315L	71,9	8,5	2,7	3,3	3,13	23	51	1220	78,0	2980	95,9	96,0	96,0	0,81	0,88	0,90	368	
250	340	315L	81,7	7,8	2,7	2,9	3,57	21	46	1350	78,0	2980	96,3	96,0	96,0	0,85	0,90	0,91	413	
260	350	315L	85,0	7,8	2,7	2,9	3,57	21	46	1370	78,0	2980	96,3	96,7	96,0	0,85	0,90	0,91	430	
280	380	315L	91,4	7,5	2,5	2,7	4,17	22	48	1390	78,0	2985	95,4	95,8	96,0	0,84	0,89	0,91	463	
315	430	355M/L	103	7,7	2,1	2,5	6,01	23	51	1800	80,0	2980	95,5	96,0	96,0	0,87	0,90	0,91	520	
330	450	355M/L	108	7,7	2,3	2,5	6,01	28	62	2000	80,0	2980	95,2	95,8	96,0	0,87	0,90	0,91	545	
370	500	355A/B*	121	7,9	2,5	2,8	6,76	40	88	2046	83,0	2985	95,8	96,1	96,4	0,85	0,89	0,90	616	
400	550	355A/B*	131	7,6	2,4	2,8	6,76	31	68	2043	83,0	2985	95,8	96,2	96,4	0,85	0,89	0,91	658	
450	610	355A/B*	147	7,5	2,5	2,7	7,40	31	68	2160	83,0	2985	95,8	96,2	96,6	0,85	0,90	0,91	739	

Note:

(1) Efficiency values are given according to IEC 60034-2-1. They are calculated according to indirect method, with stray load losses determined by measurement.

W22 -Premium Efficiency - IE3 ⁽¹⁾

Output		Rated speed (rpm)	380 V							Full load current In (A)	Rated speed (rpm)	415 V						Full load current In (A)
			% of full load						% of full load									
			Efficiency			Power factor			Efficiency			Power factor						
			50	75	100	50	75	100	50			75	100	50	75	100		
kW	HP		50	75	100	50	75	100			50	75	100	50	75	100		
II pole - 3000 rpm - 50 Hz																		
0,12	0,16	2795	59,0	60,8	60,8	0,58	0,71	0,79	0,380	2835	57,0	60,8	60,8	0,51	0,64	0,73	0,376	
0,18	0,25	2790	62,6	65,9	65,9	0,59	0,73	0,82	0,506	2825	59,6	65,2	65,9	0,51	0,64	0,74	0,514	
0,25	0,33	2780	64,6	68,7	69,7	0,59	0,73	0,81	0,673	2820	61,5	67,2	69,7	0,51	0,64	0,74	0,674	
0,37	0,5	2795	73,6	74,3	73,8	0,71	0,82	0,87	0,876	2825	72,4	73,8	73,8	0,63	0,76	0,83	0,840	
0,55	0,75	2740	75,6	75,7	77,8	0,73	0,84	0,88	1,22	2790	74,4	76,0	77,8	0,65	0,78	0,84	1,17	
0,75	1	2805	80,0	80,5	80,7	0,68	0,80	0,85	1,66	2835	79,1	81,0	81,1	0,59	0,72	0,79	1,63	
1,1	1,5	2810	82,0	83,7	83,1	0,69	0,80	0,85	2,37	2840	80,0	83,0	83,4	0,58	0,72	0,79	2,32	
1,5	2	2860	83,7	85,0	84,4	0,69	0,80	0,85	3,18	2885	82,2	84,8	85,2	0,59	0,72	0,80	3,06	
1,5	2	2860	83,7	85,0	84,4	0,69	0,80	0,85	3,18	2885	82,2	84,8	85,2	0,59	0,72	0,80	3,06	
2,2	3	2855	86,5	86,4	85,9	0,70	0,81	0,86	4,52	2880	85,3	86,4	86,5	0,61	0,74	0,81	4,37	
3	4	2900	86,0	87,4	87,1	0,75	0,84	0,88	5,95	2915	85,0	87,2	87,4	0,66	0,78	0,84	5,68	
4	5,5	2890	88,0	88,2	88,2	0,73	0,83	0,88	7,83	2905	87,5	88,0	88,4	0,65	0,77	0,84	7,49	
5,5	7,5	2925	87,6	88,9	89,2	0,71	0,82	0,87	10,8	2935	86,1	88,3	89,2	0,61	0,74	0,81	10,6	
7,5	10	2926	89,2	90,1	90,1	0,73	0,83	0,88	14,4	2940	87,9	89,7	90,3	0,63	0,76	0,83	13,9	
9,2	12,5	2920	90,7	91,0	90,8	0,79	0,87	0,90	17,1	2935	90,1	91,0	91,3	0,71	0,82	0,87	16,1	
11	15	2940	90,7	91,2	91,2	0,75	0,84	0,88	20,8	2950	89,9	91,3	91,4	0,68	0,79	0,85	19,7	
15	20	2940	91,0	91,6	91,9	0,72	0,82	0,87	28,5	2950	90,3	91,6	91,9	0,63	0,76	0,82	27,7	
18,5	25	2945	92,0	92,3	92,4	0,74	0,83	0,88	34,6	2950	91,0	92,2	92,4	0,64	0,77	0,83	33,6	
22	30	2945	92,4	92,7	92,7	0,74	0,83	0,87	41,4	2955	92,0	92,8	92,7	0,66	0,78	0,84	39,3	
30	40	2960	92,6	93,2	93,3	0,75	0,83	0,87	56,2	2965	91,8	93,0	93,3	0,64	0,76	0,82	54,6	
37	50	2960	93,0	93,6	93,7	0,75	0,84	0,87	69,0	2965	92,0	93,2	93,7	0,63	0,76	0,82	67,0	
45	60	2960	93,8	94,0	94,0	0,81	0,88	0,90	80,8	2965	94,0	94,0	94,3	0,75	0,84	0,88	75,4	
55	75	2960	93,8	94,3	94,3	0,80	0,87	0,90	98,5	2965	93,4	94,3	94,4	0,73	0,83	0,87	93,2	
75	100	2975	93,9	94,7	94,7	0,81	0,87	0,89	135	2980	93,5	94,7	94,9	0,76	0,84	0,87	126	
90	125	2975	94,5	95,0	95,0	0,83	0,88	0,90	160	2980	94,2	95,2	95,2	0,78	0,86	0,89	148	
110	150	2975	94,6	95,4	95,4	0,81	0,87	0,89	197	2980	94,1	95,2	95,4	0,75	0,84	0,87	184	
132	175	2975	94,7	95,5	95,6	0,81	0,87	0,90	233	2980	94,3	95,4	95,6	0,75	0,84	0,88	218	
150	200	2975	95,0	95,6	95,6	0,83	0,88	0,90	265	2980	94,7	95,6	95,6	0,78	0,85	0,89	245	
160	220	2980	95,3	95,8	95,8	0,82	0,88	0,90	282	2980	94,9	95,8	95,8	0,77	0,85	0,88	264	
185	250	2975	95,5	95,8	95,8	0,82	0,88	0,90	326	2980	95,2	95,8	95,8	0,77	0,85	0,88	305	
200	270	2975	95,8	96,2	96,0	0,84	0,89	0,91	348	2980	95,6	96,2	96,0	0,80	0,87	0,89	326	
220	300	2980	96,0	96,0	96,0	0,83	0,89	0,91	383	2980	95,8	96,0	96,0	0,79	0,86	0,89	358	
250	340	2975	96,4	96,0	96,0	0,87	0,91	0,92	430	2980	96,3	96,0	96,0	0,83	0,89	0,91	398	
260	350	2975	96,4	96,0	96,0	0,87	0,91	0,92	447	2980	96,3	96,0	96,0	0,83	0,89	0,91	414	
280	380	2975	96,2	95,8	96,0	0,87	0,91	0,91	487	2980	96,2	95,8	96,0	0,85	0,89	0,90	451	
315	430	2980	95,0	96,0	96,0	0,89	0,92	0,92	542	2985	95,2	95,6	95,8	0,86	0,90	0,92	497	
330	450	2980	95,2	96,0	96,0	0,90	0,91	0,91	574	2985	95,6	96,2	96,2	0,88	0,91	0,92	519	
370	500	2980	95,8	96,0	96,2	0,86	0,90	0,91	642	2985	95,5	96,3	96,5	0,84	0,88	0,89	599	
400	550	2985	95,9	96,2	96,3	0,87	0,90	0,91	694	2985	95,7	96,2	96,5	0,84	0,88	0,91	634	
450	610	2985	95,9	96,2	96,5	0,87	0,91	0,91	779	2985	95,7	96,2	96,7	0,84	0,89	0,91	711	

W22 -Premium Efficiency - IE3 ⁽¹⁾

Output		Frame	Full load torque (Nm)	Locked rotor current I/In	Locked rotor torque Tl/Tn	Breakdown torque Tb/Tn	Inertia J (kgm ²)	Allowable locked rotor time (s)		Weight (kg)	Sound dB (A)	400 V							
								Rated speed (rpm)	% of full load						Full load current In (A)				
									Efficiency			Power factor							
kW	HP							Hot	Cold				50	75	100	50	75	100	
II pole - 3000 rpm - 50 Hz																			
Optional frames (high-output design)																			
0,75	1	90S	0,250	8,2	3,3	3,4	0,0015	24	53	17,0	62,0	2900	79,0	82,5	81,5	0,63	0,75	0,82	1,62
1,1	1,5	90S	0,370	7,8	3,3	3,3	0,0018	19	42	17,5	62,0	2880	82,0	84,2	83,5	0,63	0,75	0,82	2,32
2,2	3	L90L	0,750	7,5	3,4	3,5	0,0026	12	26	23,5	62,0	2870	86,0	86,5	86,3	0,65	0,77	0,83	4,43
3	4	L100L	1,00	8,5	3,4	3,4	0,0064	15	33	35,0	67,0	2910	85,5	87,3	87,3	0,69	0,81	0,86	5,77
4	5,5	132S	1,33	7,5	2,3	3,1	0,0180	24	53	61,0	67,0	2930	86,9	88,7	88,6	0,73	0,82	0,87	7,49
5,5	7,5	132M	1,83	7,9	2,4	3,5	0,0180	16	35	62,0	67,0	2930	86,9	88,7	89,4	0,66	0,78	0,84	10,6
7,5	10	132M	2,49	8,8	2,7	3,6	0,0234	10	22	65,0	67,0	2930	88,5	89,8	90,3	0,68	0,80	0,85	14,1
11	15	132M	3,66	8,2	2,7	3,0	0,0303	11	24	80,0	67,0	2925	90,6	91,1	91,2	0,75	0,85	0,89	19,6
11	15	160L	3,64	8,0	2,6	3,4	0,0482	12	26	105	67,0	2945	90,3	91,4	91,4	0,71	0,82	0,87	20,0
15	20	160L	4,96	8,3	2,8	3,5	0,0551	8	18	112	67,0	2945	90,9	91,8	92,1	0,67	0,79	0,85	27,7
18,5	25	180M	6,12	7,6	2,3	3,1	0,0973	11	24	160	67,0	2945	91,5	92,0	92,6	0,77	0,85	0,88	32,8
22	30	180L	7,26	8,3	2,7	3,6	0,0968	6	13	165	67,0	2950	92,3	93,0	92,9	0,69	0,80	0,86	39,7
75	100	250S/M	24,6	7,6	3,0	2,8	0,5132	11	24	500	74,0	2965	95,0	95,3	94,9	0,83	0,87	0,89	128
110	150	280S/M	36,0	7,5	2,1	3,0	1,33	20	44	760	77,0	2975	95,0	95,5	95,4	0,80	0,87	0,89	187
200	270	355M/L	65,3	7,9	2,1	2,9	3,56	30	66	1300	80,0	2985	95,0	95,6	96,0	0,80	0,87	0,90	334
220	300	355M/L	71,8	7,3	1,9	2,6	4,18	35	77	1400	80,0	2985	95,0	95,6	96,0	0,85	0,89	0,91	363
250	340	355M/L	81,6	7,7	2,4	2,7	4,93	30	66	1500	80,0	2985	95,0	95,6	96,0	0,85	0,89	0,91	413
260	350	355M/L	84,8	7,7	2,4	2,7	4,93	30	66	1520	80,0	2985	95,0	95,6	96,0	0,85	0,89	0,91	430
280	380	355M/L	91,4	8,4	2,3	2,9	5,17	25	55	1590	80,0	2985	95,4	95,8	96,0	0,82	0,88	0,90	468

Note:

(1) Efficiency values are given according to IEC 60034-2-1. They are calculated according to indirect method, with stray load losses determined by measurement.

W22 -Premium Efficiency - IE3 ⁽¹⁾

Output		380 V								415 V							
		Rated speed (rpm)	% of full load						Full load current In (A)	Rated speed (rpm)	% of full load						Full load current In (A)
			Efficiency			Power factor					Efficiency			Power factor			
			50	75	100	50	75	100			50	75	100	50	75	100	
kW	HP	II pole - 3000 rpm - 50 Hz															
Optional frames (high-output design)																	
0,75	1	2885	79,5	82,5	81,0	0,68	0,78	0,84	1,67	2910	78,4	82,3	81,5	0,60	0,72	0,79	1,62
1,1	1,5	2865	82,6	84,2	84,0	0,68	0,79	0,84	2,37	2890	81,4	84,0	84,7	0,59	0,72	0,80	2,26
2,2	3	2855	86,5	86,4	85,9	0,70	0,81	0,86	4,52	2880	85,3	86,4	86,5	0,61	0,74	0,81	4,37
3	4	2900	86,0	87,4	87,1	0,75	0,84	0,88	5,95	2915	85,0	87,2	87,4	0,66	0,78	0,84	5,68
4	5,5	2920	87,1	88,6	88,7	0,76	0,85	0,89	7,70	2935	86,6	88,6	89,2	0,69	0,80	0,86	7,25
5,5	7,5	2925	87,6	88,9	89,2	0,71	0,82	0,87	10,8	2935	86,1	88,3	89,2	0,61	0,74	0,81	10,6
7,5	10	2926	89,2	90,1	90,1	0,73	0,83	0,88	14,4	2940	87,9	89,7	90,3	0,63	0,76	0,83	13,9
11	15	2915	90,9	91,0	91,2	0,80	0,87	0,90	20,4	2930	90,2	91,1	91,4	0,72	0,82	0,87	19,2
11	15	2940	90,7	91,2	91,2	0,75	0,84	0,88	20,8	2950	89,9	91,3	91,4	0,68	0,79	0,85	19,7
15	20	2940	91,0	91,6	91,9	0,72	0,82	0,87	28,5	2950	90,3	91,6	91,9	0,63	0,76	0,82	27,7
18,5	25	2940	92,7	92,6	92,4	0,80	0,87	0,90	33,8	2950	92,5	92,9	92,5	0,75	0,84	0,88	31,6
22	30	2945	92,4	92,7	92,7	0,74	0,83	0,87	41,4	2955	92,0	92,8	92,7	0,66	0,78	0,84	39,3
75	100	2960	94,0	94,5	94,7	0,85	0,88	0,90	134	2965	94,0	94,5	94,9	0,81	0,86	0,88	125
110	150	2975	95,0	95,2	95,2	0,84	0,89	0,91	193	2980	94,9	95,4	95,4	0,80	0,87	0,90	178
200	270	2985	95,2	96,0	96,0	0,83	0,89	0,91	348	2990	94,9	95,9	96,0	0,77	0,86	0,89	326
220	300	2980	95,8	95,6	96,0	0,88	0,91	0,92	378	2985	95,7	95,6	96,0	0,85	0,90	0,91	350
250	340	2980	95,5	95,8	95,8	0,89	0,92	0,92	431	2985	95,0	95,6	96,0	0,86	0,90	0,92	394
260	350	2980	95,5	95,8	95,8	0,89	0,92	0,92	448	2985	95,0	95,6	96,0	0,86	0,90	0,92	410
280	380	2985	95,4	95,8	96,0	0,87	0,91	0,92	482	2985	95,6	96,0	96,2	0,84	0,89	0,91	445

W22 -Premium Efficiency - IE3 ⁽¹⁾

Output		Frame	Full load torque (Nm)	Locked rotor current I/In	Locked rotor torque TI/Tn	Breakdown torque Tlb/ Tn	Inertia J (kgm ²)	Allowable locked rotor time (s)		Weight (kg)	Sound dB (A)	400 V								Full load current In (A)
												Rated speed (rpm)	% of full load							
								Efficiency					Power factor							
kW	HP							Hot	Cold				50	75	100	50	75	100		
IV pole - 1500 rpm - 50 Hz																				
0,12	0,16	63	0,090	4,4	2,1	2,3	0,0004	30	66	5,2	44,0	1370	57,0	63,0	64,8	0,52	0,62	0,73	0,366	
0,18	0,25	63	0,130	4,7	2,1	2,4	0,0006	30	66	7,2	44,0	1370	65,0	67,0	69,9	0,53	0,63	0,72	0,516	
0,25	0,33	71	0,180	4,8	2,3	2,3	0,0009	30	66	8,0	43,0	1390	69,0	72,0	73,5	0,52	0,65	0,72	0,682	
0,37	0,5	71	0,260	4,8	2,8	2,9	0,0008	30	66	9,5	43,0	1385	73,0	75,0	77,3	0,50	0,62	0,70	0,987	
0,55	0,75	80	0,380	6,6	2,9	3,2	0,0027	20	44	12,5	44,0	1420	77,0	79,0	80,8	0,61	0,74	0,80	1,23	
0,75	1	80	0,510	6,7	3,0	3,3	0,0032	18	40	14,5	44,0	1420	80,0	82,0	82,5	0,59	0,72	0,81	1,62	
1,1	1,5	90S	0,740	7,6	2,5	3,3	0,0055	15	33	19,5	49,0	1455	83,0	84,5	84,5	0,59	0,72	0,80	2,35	
1,5	2	90L	1,01	7,4	2,6	3,4	0,0066	13	29	23,0	49,0	1450	84,0	86,0	85,5	0,58	0,72	0,80	3,17	
2,2	3	100L	1,49	7,4	3,2	3,5	0,0090	18	40	31,5	53,0	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	37,5	53,0	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	0,0180	15	33	44,0	56,0	1450	88,7	89,1	88,8	0,62	0,74	0,81	8,03	
5,5	7,5	132S	3,67	8,2	2,2	3,3	0,0504	10	22	66,0	56,0	1460	89,7	90,2	89,7	0,67	0,79	0,85	10,4	
7,5	10	132M	5,00	8,3	2,4	3,5	0,0563	7	15	74,0	56,0	1460	90,5	90,8	90,6	0,69	0,80	0,86	13,9	
9,2	12,5	132M/L	6,12	8,6	2,8	3,5	0,0698	10	22	82,0	56,0	1465	90,3	91,0	91,0	0,64	0,76	0,82	17,4	
11	15	160M	7,29	7,5	2,8	3,2	0,1191	11	24	113	61,0	1470	91,1	91,8	91,6	0,65	0,77	0,83	20,9	
15	20	160L	9,97	7,2	2,8	3,1	0,1534	8	18	135	61,0	1465	92,2	92,5	92,3	0,67	0,78	0,84	27,9	
18,5	25	180M	12,3	7,4	3,0	3,2	0,1740	13	29	168	61,0	1470	92,2	92,8	92,8	0,64	0,76	0,82	35,1	
22	30	180L	14,6	7,3	3,4	3,4	0,2097	11	24	185	61,0	1470	92,3	93,0	93,2	0,66	0,77	0,83	41,0	
30	40	200L	19,7	7,5	2,8	3,1	0,3202	12	26	228	63,0	1480	92,9	93,6	93,7	0,63	0,75	0,81	57,1	
37	50	225S/M	24,4	7,7	2,8	3,3	0,5177	13	29	365	63,0	1480	93,4	94,0	94,1	0,70	0,80	0,85	66,8	
45	60	225S/M	29,7	7,5	2,8	3,1	0,6733	12	26	400	63,0	1475	93,9	94,3	94,4	0,71	0,81	0,85	80,9	
55	75	250S/M	36,2	7,5	2,8	3,0	1,05	14	31	440	64,0	1480	94,3	94,7	94,7	0,69	0,80	0,85	98,6	
75	100	280S/M	49,2	7,5	2,2	2,9	2,09	30	66	630	69,0	1485	94,5	95,1	95,2	0,72	0,82	0,85	134	
90	125	280S/M	59,0	7,0	2,2	2,7	2,17	30	66	700	69,0	1485	94,9	95,4	95,4	0,75	0,83	0,86	158	
110	150	315S/M	71,9	7,4	2,2	2,6	2,89	33	73	950	71,0	1490	94,7	95,5	95,6	0,74	0,82	0,86	193	
132	175	315S/M	86,3	7,5	2,3	2,7	3,79	30	66	1010	71,0	1490	95,1	95,7	95,8	0,74	0,82	0,86	231	
150	200	315S/M	98,1	7,8	2,7	2,7	3,77	27	59	1030	71,0	1490	95,4	95,8	95,9	0,71	0,81	0,85	266	
160	220	315S/M	105	7,7	2,6	2,7	3,99	28	62	1080	71,0	1490	95,2	95,9	96,0	0,74	0,82	0,86	280	
185	250	315S/M	121	7,8	2,7	2,9	4,42	25	55	1150	71,0	1490	95,5	96,1	96,0	0,71	0,80	0,85	327	
200	270	315L	131	7,1	2,4	2,4	4,75	21	46	1200	73,0	1485	96,0	96,3	96,0	0,78	0,85	0,87	346	
220	300	315L	144	7,9	2,8	2,8	5,30	12	26	1340	73,0	1490	95,8	96,1	96,2	0,72	0,81	0,85	388	
250	340	315L	163	7,9	2,9	2,7	5,75	19	42	1430	73,0	1490	96,0	96,2	96,2	0,73	0,82	0,86	436	
260	350	315L	170	7,9	2,9	2,7	6,41	19	42	1430	73,0	1490	96,0	96,2	96,2	0,73	0,82	0,86	454	
280	380	355M/L	183	7,3	2,3	2,4	9,66	20	44	1600	74,0	1490	95,9	96,0	96,2	0,74	0,83	0,86	488	
315	430	355M/L	206	7,9	2,5	2,6	9,47	17	37	1750	74,0	1490	96,1	96,3	96,3	0,72	0,81	0,85	555	
355	480	355M/L	232	7,2	2,4	2,5	11,6	15	33	1878	74,0	1490	96,5	96,8	96,5	0,74	0,83	0,86	617	
400	550	355A/B*	261	7,6	2,6	2,9	13,2	20	44	2089	76,0	1490	95,7	96,1	96,2	0,68	0,79	0,84	714	
450	610	355A/B*	294	7,4	2,5	2,8	13,2	20	44	2089	76,0	1490	95,8	96,1	96,2	0,69	0,80	0,84	804	
500	680	355A/B*	327	7,3	2,4	2,7	14,6	17	37	2246	76,0	1490	95,9	96,3	96,3	0,72	0,81	0,85	882	
Optional frames (high-output design)																				
0,75	1	90S	0,500	7,8	2,4	3,3	0,0049	21	46	18,5	49,0	1455	82,5	84,0	84,5	0,60	0,73	0,80	1,60	
1,1	1,5	90L	0,740	7,6	2,5	3,3	0,0055	15	33	19,5	49,0	1455	83,0	84,5	84,5	0,59	0,72	0,80	2,35	
1,5	2	100L	1,01	7,7	3,1	3,4	0,0082	25	55	30,0	53,0	1440	86,0	87,0	87,0	0,61	0,73	0,80	3,11	
2,2	3	112M	1,48	6,8	2,0	3,0	0,0143	31	68	41,0	56,0	1450	87,5	88,2	88,2	0,62	0,74	0,81	4,44	
3	4	112M	2,01	7,1	2,3	3,1	0,0169	25	55	43,0	56,0	1455	88,5	89,1	89,1	0,62	0,74	0,81	6,00	
5,5	7,5	132M	3,67	8,2	2,2	3,3	0,0504	10	22	66,0	56,0	1460	89,7	90,2	89,7	0,67	0,79	0,85	10,4	
9,2	12,5	160M	6,08	7,2	2,5	3,0	0,1118	16	35	109	61,0	1475	90,0	91,4	91,3	0,66	0,77	0,83	17,5	
11	15	160L	7,29	7,5	2,8	3,2	0,1191	11	24	113	61,0	1470	91,1	91,8	91,6	0,65	0,77	0,83	20,9	
15	20	180M	9,94	7,0	2,5	3,0	0,0000	23	51	155	61,0	1470	91,9	92,5	92,3	0,66	0,77	0,83	28,3	
18,5	25	180L	12,3	7,4	3,0	3,2	0,1740	13	29	168	61,0	1470	92,2	92,8	92,8	0,64	0,76	0,82	35,1	
37	50	200L	24,4	7,0	2,6	3,0	0,3994	14	31	284	63,0	1480	93,3	94,0	94,5	0,64	0,76	0,82	68,9	
75	100	250S/M	49,4	7,8	2,8	3,3	1,22	8	18	530	64,0	1480	95,0	95,5	95,2	0,73	0,83	0,87	131	
220	300	355M/L	144	7,4	2,2	2,5	7,34	20	44	1510	74,0	1490	96,0	96,6	96,2	0,72	0,80	0,85	388	
250	340	355M/L	163	7,3	2,3	2,5	7,70	26	57	1550	74,0	1490	95,9	96,6	96,2	0,74	0,82	0,86	436	

Note:
 (1) Efficiency values are given according to IEC 60034-2-1. They are calculated according to indirect method, with stray load losses determined by measurement.

W22 -Premium Efficiency - IE3 ⁽¹⁾

Output		380 V								415 V							
		Rated speed (rpm)	% of full load						Full load current In (A)	Rated speed (rpm)	% of full load						Full load current In (A)
			Efficiency			Power factor					Efficiency			Power factor			
			50	75	100	50	75	100			50	75	100	50	75	100	
kW	HP																
IV pole - 1500 rpm - 50 Hz																	
0,12	0,16	1355	58,6	64,0	64,8	0,56	0,69	0,76	0,370	1380	55,6	63,0	64,8	0,50	0,62	0,72	0,358
0,18	0,25	1355	65,0	67,0	69,9	0,57	0,67	0,75	0,522	1380	65,0	67,0	69,9	0,50	0,61	0,70	0,512
0,25	0,33	1375	67,0	69,1	73,5	0,56	0,69	0,75	0,689	1400	65,1	68,6	73,4	0,50	0,62	0,69	0,687
0,37	0,5	1370	73,0	75,0	77,3	0,53	0,64	0,72	1,01	1395	73,0	75,0	77,3	0,47	0,59	0,68	0,979
0,55	0,75	1410	78,0	79,1	80,8	0,65	0,77	0,83	1,25	1430	76,0	78,9	80,8	0,57	0,71	0,77	1,23
0,75	1	1410	80,8	82,0	82,5	0,64	0,75	0,83	1,66	1425	79,1	81,8	82,8	0,56	0,69	0,79	1,60
1,1	1,5	1450	84,0	84,7	84,3	0,64	0,76	0,83	2,39	1460	82,0	84,1	84,8	0,55	0,69	0,77	2,34
1,5	2	1445	85,0	86,2	85,6	0,63	0,76	0,83	3,21	1455	83,1	85,7	86,1	0,54	0,68	0,77	3,15
2,2	3	1430	87,2	87,1	86,7	0,65	0,77	0,83	4,64	1440	85,7	86,8	87,2	0,57	0,70	0,78	4,50
3	4	1430	87,7	88,0	87,7	0,65	0,77	0,83	6,26	1445	86,3	87,7	88,1	0,56	0,70	0,78	6,07
4	5,5	1445	89,3	89,0	88,6	0,67	0,78	0,83	8,26	1455	88,2	88,9	89,3	0,59	0,72	0,79	7,89
5,5	7,5	1460	89,0	89,4	89,6	0,72	0,82	0,87	10,7	1465	89,1	89,5	89,6	0,63	0,76	0,83	10,3
7,5	10	1460	90,0	90,2	90,4	0,71	0,82	0,87	14,5	1465	89,2	90,3	90,4	0,62	0,75	0,83	13,9
9,2	12,5	1460	91,0	91,1	91,0	0,69	0,80	0,85	17,7	1470	89,5	90,6	91,0	0,60	0,73	0,80	17,2
11	15	1470	91,7	91,4	91,4	0,69	0,80	0,85	21,5	1475	90,6	91,4	91,5	0,61	0,74	0,81	20,6
15	20	1465	92,4	92,4	92,1	0,70	0,80	0,85	29,1	1470	91,6	92,3	92,1	0,62	0,75	0,81	28,0
18,5	25	1470	92,7	92,6	92,6	0,69	0,79	0,84	36,1	1475	91,8	92,6	92,6	0,61	0,73	0,80	34,7
22	30	1470	92,5	92,8	93,0	0,70	0,81	0,85	42,3	1475	91,9	92,8	93,0	0,62	0,74	0,81	40,6
30	40	1475	93,4	93,6	93,6	0,68	0,79	0,84	58,0	1480	92,3	93,3	93,6	0,59	0,72	0,79	56,4
37	50	1480	93,7	93,9	93,9	0,74	0,83	0,86	69,6	1480	93,1	93,9	93,9	0,66	0,78	0,83	66,0
45	60	1475	93,9	94,3	94,4	0,76	0,85	0,88	82,3	1475	94,0	94,4	94,5	0,69	0,79	0,82	80,8
55	75	1480	94,5	94,6	94,7	0,73	0,82	0,86	103	1480	94,0	94,6	94,6	0,66	0,78	0,83	97,5
75	100	1485	94,7	94,9	95,0	0,75	0,83	0,86	139	1490	94,4	94,9	95,2	0,70	0,79	0,84	130
90	125	1480	95,2	95,4	95,2	0,77	0,84	0,87	165	1485	95,0	95,4	95,4	0,72	0,81	0,85	154
110	150	1489	95,0	95,5	95,5	0,78	0,85	0,87	201	1490	94,4	95,4	95,5	0,71	0,81	0,85	189
132	175	1490	95,3	95,6	95,6	0,77	0,84	0,87	241	1490	94,8	95,6	95,6	0,71	0,81	0,85	226
150	200	1490	95,4	95,8	95,9	0,76	0,84	0,87	273	1490	95,4	95,9	96,0	0,69	0,79	0,84	259
160	220	1490	95,7	95,8	95,8	0,77	0,84	0,87	292	1490	95,3	95,8	95,8	0,71	0,81	0,85	273
185	250	1490	95,8	96,0	96,0	0,75	0,83	0,86	340	1490	95,2	96,0	96,0	0,68	0,78	0,83	323
200	270	1485	96,1	96,2	96,0	0,80	0,86	0,88	360	1490	95,9	96,3	96,1	0,76	0,83	0,87	333
220	300	1490	96,0	96,4	96,3	0,75	0,83	0,87	399	1490	95,5	96,2	96,2	0,69	0,79	0,84	379
250	340	1490	95,8	96,0	96,2	0,77	0,84	0,87	454	1490	96,0	96,2	96,4	0,71	0,80	0,85	424
260	350	1490	95,8	96,0	96,2	0,77	0,84	0,87	472	1490	96,0	96,2	96,4	0,71	0,80	0,85	441
280	380	1490	95,5	96,0	96,2	0,77	0,85	0,87	508	1490	95,8	96,0	96,2	0,71	0,81	0,85	476
315	430	1490	95,8	96,0	96,0	0,75	0,83	0,86	580	1490	95,9	96,0	96,0	0,68	0,79	0,84	543
355	480	1490	96,0	96,5	96,5	0,79	0,85	0,87	642	1490	95,5	96,2	96,6	0,74	0,82	0,86	594
400	550	1490	96,0	96,2	96,1	0,72	0,82	0,86	735	1490	95,4	95,9	96,1	0,65	0,76	0,82	706
450	610	1490	96,0	96,2	96,2	0,73	0,83	0,86	826	1490	95,5	95,9	96,1	0,65	0,77	0,82	794
500	680	1490	96,1	96,3	96,3	0,76	0,84	0,87	907	1490	95,7	96,2	96,3	0,69	0,79	0,84	860
Optional frames (high-output design)																	
0,75	1	1450	83,2	84,1	84,0	0,64	0,76	0,83	1,63	1460	81,8	83,8	84,6	0,56	0,70	0,78	1,58
1,1	1,5	1450	84,0	84,7	84,3	0,64	0,76	0,83	2,39	1460	82,0	84,1	84,8	0,55	0,69	0,77	2,34
1,5	2	1430	86,5	86,9	86,4	0,65	0,77	0,83	3,18	1445	85,6	87,0	87,3	0,58	0,71	0,78	3,06
2,2	3	1445	87,9	88,1	87,6	0,66	0,77	0,83	4,60	1455	87,2	88,2	88,5	0,59	0,72	0,79	4,38
3	4	1450	88,6	89,0	89,0	0,66	0,77	0,83	6,17	1460	88,1	89,1	89,1	0,59	0,71	0,79	5,93
5,5	7,5	1460	89,0	89,4	89,6	0,72	0,82	0,87	10,7	1465	89,1	89,5	89,6	0,63	0,76	0,83	10,3
9,2	12,5	1470	92,2	92,3	91,4	0,70	0,81	0,85	18,0	1475	91,6	92,3	92,0	0,64	0,76	0,82	17,0
11	15	1470	91,7	91,4	91,4	0,69	0,80	0,85	21,5	1475	90,6	91,4	91,5	0,61	0,74	0,81	20,6
15	20	1470	92,6	92,9	92,3	0,70	0,80	0,85	29,0	1475	92,0	92,8	92,6	0,63	0,75	0,81	27,8
18,5	25	1470	92,7	92,6	92,6	0,69	0,79	0,84	36,1	1475	91,8	92,6	92,6	0,61	0,73	0,80	34,7
37	50	1480	93,7	94,1	94,4	0,69	0,79	0,84	70,9	1480	92,9	93,8	94,5	0,60	0,73	0,80	68,1
75	100	1475	95,0	95,2	95,2	0,77	0,86	0,88	136	1480	94,7	95,0	95,2	0,70	0,81	0,86	127
220	300	1490	95,8	96,0	96,0	0,74	0,83	0,86	405	1490	95,7	96,0	96,0	0,68	0,78	0,83	384
250	340	1490	95,8	96,0	96,2	0,77	0,84	0,87	454	1490	95,8	96,2	96,4	0,71	0,80	0,85	424

W22 - Premium Efficiency - IE3 ⁽¹⁾

Output		Frame	Full load torque (Nm)	Locked rotor current I/In	Locked rotor torque TI/Tn	Breakdown torque Tb/ Tn	Inertia J (kgm²)	Allowable locked rotor time (s)		Weight (kg)	Sound dB (A)	400 V									
												Rated speed (rpm)	% of full load						Full load current In (A)		
								Hot	Cold				Efficiency			Power factor					
kW	HP												50	75	100	50	75	100			
VI pole - 1000 rpm - 50 Hz																					
0,12	0,16	63	0,130	3,1	1,8	2,1	0,0007	30	66	7,7	43,0	905	50,0	55,0	57,7	0,44	0,53	0,62	0,484		
0,18	0,25	71	0,190	3,2	2,0	2,1	0,0009	30	66	11,5	43,0	900	56,0	62,0	63,9	0,38	0,48	0,57	0,713		
0,25	0,33	80	0,250	4,3	1,7	2,4	0,0000	25	55	12,0	43,0	955	63,6	68,5	68,8	0,47	0,60	0,71	0,739		
0,37	0,5	80	0,390	4,5	1,9	2,1	0,0025	25	55	12,5	43,0	925	66,0	69,5	73,5	0,51	0,65	0,75	0,969		
0,55	0,75	L80	0,570	5,1	2,9	3,1	0,0037	20	44	15,5	43,0	945	70,5	75,2	77,2	0,45	0,58	0,69	1,49		
0,75	1	L90S	0,780	5,2	2,5	2,8	0,0060	31	68	22,0	45,0	940	76,5	79,0	79,0	0,49	0,62	0,71	1,93		
1.1	1.5	L90L	1.13	5.5	2.5	2.8	0.0078	20	44	26.0	45.0	945	79.3	81.4	81.0	0.50	0.64	0.73	2.69		
1,5	2	100L	1,54	5,5	2,3	2,8	0,0143	31	68	32,0	44,0	950	81,5	82,5	82,5	0,49	0,62	0,71	3,70		
2,2	3	112M	2,26	6,0	2,5	2,6	0,0257	26	57	46,0	52,0	950	83,0	84,5	84,5	0,53	0,64	0,72	5,22		
3	4	132S	3,03	5,8	1,8	2,6	0,0416	40	88	65,0	53,0	965	85,0	85,6	85,8	0,53	0,66	0,73	6,91		
4	5,5	132M	4,04	6,1	1,9	2,7	0,0492	25	55	70,0	53,0	965	86,0	86,8	86,8	0,53	0,66	0,73	9,11		
5,5	7,5	132M/L	5,55	7,0	2,5	2,8	0,0755	26	57	78,0	53,0	965	86,5	88,0	88,0	0,50	0,64	0,70	12,9		
7,5	10	160M	7,49	6,3	2,2	2,7	0,1404	16	35	118	56,0	975	88,5	89,3	89,3	0,64	0,76	0,82	14,8		
9,2	12,5	160L	9,19	6,5	2,3	2,9	0,1756	18	40	135	56,0	975	90,0	90,6	90,0	0,64	0,75	0,81	18,2		
11	15	160L	11,0	7,1	2,8	3,2	0,1931	12	26	140	56,0	975	89,0	90,1	90,5	0,60	0,73	0,80	21,9		
15	20	180L	15,0	7,7	2,6	3,2	0,2970	8	18	185	56,0	975	91,5	91,5	91,4	0,71	0,82	0,86	27,5		
18,5	25	200L	18,4	6,3	2,4	2,8	0,3510	16	35	215	60,0	980	91,0	91,7	91,9	0,63	0,75	0,81	35,9		
22	30	200L	21,9	6,4	2,4	2,8	0,4212	15	33	225	60,0	980	91,4	92,0	92,4	0,64	0,76	0,81	42,4		
30	40	225S/M	29,7	7,5	2,4	2,8	0,8194	15	33	380	63,0	985	93,0	93,4	93,1	0,69	0,80	0,84	55,4		
37	50	250S/M	36,6	7,2	2,4	2,7	1,24	20	44	430	64,0	985	93,3	93,5	93,5	0,72	0,81	0,85	67,2		
45	60	280S/M	44,5	6,4	2,1	2,7	2,35	28	62	640	65,0	985	93,9	93,9	93,9	0,67	0,77	0,82	84,4		
55	75	280S/M	54,4	6,8	2,3	2,8	2,69	24	53	665	65,0	985	94,0	94,2	94,3	0,66	0,77	0,82	103		
75	100	315S/M	73,8	6,3	2,0	2,5	4,35	37	81	920	67,0	990	94,6	94,9	94,9	0,67	0,77	0,82	139		
90	125	315S/M	88,6	6,4	2,2	2,5	5,42	35	77	990	67,0	990	95,1	95,5	95,1	0,68	0,78	0,83	165		
110	150	315S/M	108	6,2	2,1	2,4	6,15	31	68	1040	67,0	990	95,4	95,6	95,3	0,70	0,80	0,83	201		
132	175	315S/M	130	7,2	2,6	2,7	7,23	25	55	1100	67,0	990	95,4	95,8	95,6	0,67	0,77	0,82	243		
150	200	315L	148	6,5	2,3	2,5	7,96	25	55	1200	68,0	990	95,4	95,8	95,7	0,67	0,78	0,83	273		
160	220	315L	157	7,5	2,7	2,8	6,87	22	48	1230	68,0	990	95,6	95,6	95,8	0,67	0,77	0,82	294		
200	270	355M/L	197	6,1	2,2	2,3	10,4	39	86	1620	73,0	990	95,5	96,0	95,9	0,66	0,76	0,80	376		
220	300	355M/L	215	6,5	2,0	2,2	12,0	36	79	1710	73,0	995	95,5	96,1	96,0	0,63	0,74	0,80	413		
250	340	355M/L	246	6,4	2,2	2,3	13,9	38	84	1830	73,0	990	95,7	95,9	95,9	0,64	0,75	0,79	476		
280	380	355M/L	274	5,5	1,9	2,2	15,0	38	84	1970	73,0	995	95,1	95,1	96,0	0,64	0,75	0,80	526		
300	400	355M/L	295	5,8	1,9	2,0	15,0	25	55	2493	73,0	990	95,8	96,0	96,0	0,63	0,74	0,80	564		
315	430	355M/L	310	6,1	2,1	2,1	15,0	25	55	2493	73,0	990	95,2	95,8	95,8	0,66	0,76	0,80	593		
355	480	355A/B*	349	6,2	2,0	2,3	17,1	29	64	2200	73,0	990	95,3	95,7	95,8	0,63	0,74	0,79	677		
370	500	355A/B*	364	6,0	2,2	2,3	18,0	25	55	2300	73,0	990	95,4	95,8	95,9	0,63	0,74	0,79	705		
400	550	355A/B*	394	6,1	2,0	2,3	18,9	29	64	2346	73,0	990	95,4	95,8	95,9	0,63	0,74	0,79	762		
Optional frames (high-output design)																					
0,55	0,75	90S	0,560	5,5	2,3	2,8	0,0055	35	77	19,0	45,0	960	77,0	77,2	77,5	0,48	0,62	0,71	1,44		
1,1	1,5	100L	1,13	4,9	2,0	2,4	0,0110	32	70	28,5	44,0	945	80,5	81,0	81,0	0,51	0,65	0,73	2,69		
1,1	1,5	112M	1,12	6,2	2,3	2,8	0,0220	28	62	39,0	52,0	960	80,0	81,0	82,0	0,52	0,64	0,70	2,77		
1,5	2	112M	1,52	6,0	2,1	2,8	0,0202	28	62	42,0	52,0	960	84,5	85,5	85,5	0,51	0,63	0,71	3,57		
2,2	3	132S	2,21	5,7	1,8	2,7	0,0492	30	66	63,0	53,0	970	86,0	87,5	87,5	0,52	0,64	0,72	5,04		
45	60	250S/M	44,5	7,7	2,8	2,8	1,43	18	40	490	64,0	985	92,4	93,9	93,9	0,76	0,84	0,87	79,5		
75	100	280S/M	73,8	7,9	2,7	3,2	4,48	17	37	725	65,0	990	94,1	94,7	94,7	0,63	0,75	0,81	141		

Note:
 (1) Efficiency values are given according to IEC 60034-2-1. They are calculated according to indirect method, with stray load losses determined by measurement.

W22 - Premium Efficiency - IE3 ⁽¹⁾

Output		380 V								415 V							
		Rated speed (rpm)	% of full load						Full load current In (A)	Rated speed (rpm)	% of full load						Full load current In (A)
			Efficiency			Power factor					Efficiency			Power factor			
kW	HP		50	75	100	50	75	100			50	75	100	50	75	100	
VI pole - 1000 rpm - 50 Hz																	
0,12	0,16	890	48,7	54,7	57,7	0,47	0,56	0,66	0,479	910	50,0	55,0	57,7	0,42	0,50	0,59	0,490
0,18	0,25	885	57,7	62,8	63,9	0,43	0,55	0,64	0,669	910	54,5	61,2	63,9	0,38	0,48	0,57	0,688
0,25	0,33	950	65,9	68,0	68,6	0,51	0,64	0,74	0,748	960	61,7	68,2	68,8	0,45	0,57	0,68	0,743
0,37	0,5	915	67,6	69,9	73,5	0,55	0,69	0,79	0,968	930	64,3	68,8	73,5	0,48	0,62	0,72	0,973
0,55	0,75	940	73,4	76,7	77,2	0,49	0,63	0,73	1,48	950	67,9	75,0	77,2	0,42	0,55	0,65	1,52
0,75	1	930	77,5	79,2	78,9	0,53	0,66	0,74	1,95	945	75,3	78,6	79,1	0,46	0,59	0,69	1,91
1.1	1.5	940	81.0	82.0	81.0	0.55	0.69	0.77	2.68	950	77.7	80.7	81.0	0.47	0.61	0.70	2.70
1,5	2	945	82,3	82,6	82,5	0,53	0,66	0,74	3,73	955	80,6	82,3	82,8	0,46	0,59	0,68	3,71
2,2	3	945	83,6	84,4	84,3	0,57	0,68	0,75	5,29	955	82,3	84,3	84,7	0,50	0,62	0,70	5,16
3	4	960	85,0	85,8	85,8	0,57	0,69	0,76	6,99	970	85,2	85,8	86,0	0,49	0,63	0,71	6,84
4	5,5	960	86,3	86,8	86,8	0,57	0,70	0,76	9,21	970	85,4	86,5	86,8	0,49	0,62	0,71	9,03
5,5	7,5	960	87,4	88,3	88,0	0,55	0,68	0,75	12,7	965	85,8	87,7	88,0	0,47	0,61	0,69	12,6
7,5	10	970	88,9	89,0	89,1	0,68	0,79	0,84	15,2	980	88,0	89,0	89,1	0,61	0,73	0,80	14,6
9,2	12,5	970	89,5	90,0	90,0	0,68	0,78	0,83	18,7	975	89,6	90,0	90,0	0,61	0,73	0,79	18,0
11	15	975	89,7	90,3	90,3	0,65	0,77	0,83	22,3	980	88,3	89,8	90,3	0,57	0,70	0,78	21,7
15	20	975	90,7	91,0	91,2	0,75	0,84	0,88	28,4	980	91,3	91,6	91,2	0,68	0,80	0,86	26,6
18,5	25	980	91,0	91,7	91,7	0,68	0,78	0,83	36,9	985	90,3	91,4	91,7	0,59	0,72	0,78	36,0
22	30	980	92,0	92,2	92,2	0,69	0,79	0,84	43,2	980	90,8	91,8	92,2	0,60	0,72	0,79	42,0
30	40	985	93,3	93,3	92,9	0,73	0,82	0,86	57,1	985	92,8	93,4	93,0	0,66	0,77	0,83	54,1
37	50	980	93,3	93,3	93,3	0,75	0,83	0,87	69,3	985	93,3	93,5	93,5	0,69	0,80	0,84	65,5
45	60	985	93,7	93,8	93,8	0,70	0,80	0,83	87,8	990	93,7	94,0	94,0	0,64	0,75	0,81	82,2
55	75	985	94,0	94,2	94,2	0,70	0,79	0,83	107	990	94,0	94,3	94,3	0,63	0,75	0,81	100
75	100	990	94,6	94,8	94,8	0,71	0,80	0,83	145	990	94,3	95,0	95,0	0,64	0,75	0,80	137
90	125	990	95,0	95,1	95,1	0,72	0,80	0,84	171	990	95,0	95,1	95,2	0,65	0,76	0,81	162
110	150	990	94,8	95,0	95,1	0,74	0,82	0,84	209	990	94,8	95,1	95,1	0,68	0,78	0,82	196
132	175	990	95,4	95,8	95,6	0,69	0,79	0,84	250	990	95,4	95,8	95,6	0,65	0,75	0,80	240
150	200	990	95,4	95,7	95,7	0,69	0,80	0,85	280	990	95,4	95,5	95,7	0,65	0,76	0,81	269
160	220	990	95,5	95,8	95,8	0,71	0,80	0,84	302	990	95,3	95,8	95,8	0,64	0,75	0,81	287
200	270	990	95,7	96,0	95,8	0,70	0,79	0,82	387	990	95,3	95,9	95,9	0,63	0,74	0,79	367
220	300	995	95,5	95,9	96,0	0,65	0,76	0,82	425	995	95,5	96,1	96,1	0,61	0,72	0,78	408
250	340	990	95,8	95,8	95,8	0,68	0,77	0,80	496	995	95,5	96,0	96,0	0,61	0,73	0,78	464
280	380	990	95,7	96,1	96,0	0,68	0,77	0,81	547	995	95,2	96,0	96,1	0,61	0,72	0,78	520
300	400	990	95,8	96,0	96,0	0,65	0,76	0,82	579	990	95,8	96,0	96,0	0,61	0,73	0,78	557
315	430	991	95,8	96,2	96,0	0,68	0,78	0,81	615	993	95,3	96,0	96,1	0,61	0,73	0,78	585
355	480	990	95,4	95,7	95,8	0,64	0,75	0,79	713	990	95,2	95,7	95,9	0,62	0,73	0,79	652
370	500	990	95,6	95,8	95,8	0,65	0,76	0,81	724	995	95,2	95,7	95,9	0,61	0,72	0,77	697
400	550	990	95,7	95,9	95,9	0,67	0,77	0,81	782	990	95,2	95,7	95,9	0,60	0,71	0,77	754
Optional frames (high-output design)																	
0,55	0,75	950	76,0	77,0	77,2	0,52	0,66	0,74	1,46	960	77,2	77,5	77,6	0,45	0,59	0,68	1,45
1,1	1,5	940	81,2	80,9	81,0	0,55	0,68	0,75	2,75	950	79,9	80,9	81,5	0,48	0,62	0,70	2,68
1,1	1,5	955	80,0	81,0	82,0	0,55	0,70	0,72	2,83	960	80,0	81,0	82,0	0,48	0,62	0,68	2,74
1,5	2	955	85,1	85,4	84,9	0,54	0,66	0,74	3,63	960	84,0	85,4	85,8	0,48	0,60	0,69	3,52
2,2	3	965	86,5	87,5	87,1	0,55	0,67	0,74	5,19	973	85,6	87,4	87,7	0,48	0,61	0,70	4,99
45	60	985	92,9	93,9	93,8	0,80	0,86	0,88	82,8	985	91,9	93,9	93,9	0,73	0,82	0,86	77,5
75	100	990	94,4	94,6	94,6	0,67	0,78	0,83	145	990	93,8	94,6	94,7	0,60	0,72	0,79	139

W22 - Premium Efficiency - IE3 ⁽¹⁾

Output		Frame	Full load torque (Nm)	Locked rotor current I/In	Locked rotor torque TI/Tn	Breakdown torque Tb/ Tn	Inertia J (kgm ²)	Allowable locked rotor time (s)		Weight (kg)	Sound dB (A)	400 V								
												Rated speed (rpm)	% of full load						Full load current In (A)	
								Efficiency					Power factor							
kW	HP							Hot	Cold				50	75	100	50	75	100		
VIII poles - 750 rpm - 50 Hz																				
0,12	0,16	71	0,180	2,4	1,8	2,0	0,0009	30	66	11,5	41,0	650	44,0	50,0	52,5	0,35	0,43	0,50	0,660	
0,18	0,25	80	0,260	3,3	2,0	2,2	0,0029	30	66	13,5	42,0	680	51,0	57,0	58,7	0,45	0,55	0,65	0,681	
0,25	0,33	80	0,360	3,5	2,0	2,2	0,0034	30	66	14,5	42,0	685	53,0	60,0	64,1	0,42	0,52	0,63	0,894	
0,37	0,5	90S	0,520	3,7	2,0	2,3	0,0055	30	66	19,0	43,0	690	61,0	66,0	69,3	0,41	0,53	0,62	1,24	
0,55	0,75	90L	0,780	3,8	1,9	2,2	0,0066	29	64	23,0	43,0	690	65,0	70,0	73,0	0,44	0,57	0,67	1,62	
0,75	1	100L	1,03	4,6	1,9	2,3	0,0127	30	66	30,5	50,0	710	72,5	75,5	75,5	0,41	0,53	0,62	2,31	
1,1	1,5	100L	1,51	4,6	2,1	2,4	0,0143	30	66	33,0	50,0	710	73,0	76,0	77,7	0,41	0,53	0,62	3,30	
1,5	2	112M	2,07	5,0	2,5	2,8	0,0238	28	62	43,0	46,0	705	79,0	80,5	80,7	0,45	0,59	0,68	3,95	
2,2	3	132S	3,02	6,2	2,3	2,5	0,0690	27	59	69,0	48,0	710	82,0	82,6	82,8	0,51	0,65	0,72	5,33	
3	4	132M	4,12	6,4	2,4	2,6	0,0838	21	46	75,0	48,0	710	82,5	83,5	83,5	0,51	0,64	0,72	7,20	
4	5,5	160M	5,37	5,0	2,1	2,3	0,1229	34	75	114	51,0	725	85,0	86,0	86,0	0,52	0,65	0,72	9,32	
5,5	7,5	160M	7,39	5,0	2,1	2,3	0,1492	28	62	123	51,0	725	86,0	87,3	87,3	0,52	0,65	0,73	12,5	
7,5	10	160L	10,0	5,3	2,2	2,5	0,2199	22	48	145	51,0	730	87,0	88,3	88,5	0,52	0,65	0,73	16,8	
9,2	12,5	180M	12,4	6,0	2,0	2,6	0,2575	15	33	173	51,0	725	89,0	89,3	89,6	0,63	0,75	0,82	18,1	
11	15	180L	14,8	6,5	2,3	2,7	0,2846	12	26	185	51,0	725	89,5	90,0	90,0	0,55	0,68	0,76	23,2	
15	20	200L	20,0	4,8	1,9	2,1	0,4571	34	75	220	56,0	730	89,0	89,6	89,8	0,56	0,68	0,74	32,6	
18,5	25	225S/M	24,5	6,5	1,7	2,5	0,8219	28	62	377	56,0	735	89,8	90,3	90,3	0,63	0,75	0,81	36,5	
22	30	225S/M	29,2	6,5	1,8	2,5	0,9574	22	48	402	56,0	735	90,3	90,8	90,8	0,63	0,75	0,81	43,2	
30	40	250S/M	39,8	7,4	1,9	2,8	1,43	18	40	490	56,0	735	91,0	91,5	91,5	0,66	0,77	0,83	57,0	
37	50	280S/M	48,7	6,0	1,8	2,3	2,82	32	70	673	59,0	740	91,5	92,0	92,0	0,63	0,73	0,79	73,5	
45	60	280S/M	59,2	6,0	1,8	2,2	3,49	30	66	670	59,0	740	92,2	92,4	92,4	0,63	0,73	0,79	89,0	
55	75	315S/M	72,4	6,0	1,7	2,2	5,11	40	88	936	62,0	740	92,2	92,7	92,7	0,65	0,75	0,80	107	
75	100	315S/M	98,7	6,0	1,8	2,2	6,56	40	88	900	62,0	740	92,8	93,3	93,3	0,65	0,75	0,80	145	
90	125	315S/M	118	6,0	1,9	2,2	7,84	40	88	990	62,0	740	93,1	93,6	93,6	0,65	0,75	0,80	173	
110	150	315L	145	6,0	1,9	2,2	9,46	35	77	1367	68,0	740	93,4	93,9	93,9	0,64	0,74	0,79	214	
132	175	355M/L	173	6,2	1,3	2,3	14,1	48	106	1587	70,0	745	93,7	94,2	94,2	0,64	0,74	0,79	256	
160	220	355M/L	209	6,4	1,3	2,3	17,4	56	123	1747	70,0	745	94,0	94,5	94,5	0,64	0,75	0,80	305	
185	250	355M/L	242	6,3	1,3	2,3	18,5	56	123	1819	70,0	745	95,5	95,9	96,0	0,64	0,75	0,80	348	
200	270	355M/L	261	6,2	1,3	2,3	18,9	56	123	1891	70,0	745	94,3	94,8	94,8	0,65	0,76	0,80	381	
220	300	355M/L	288	7,2	1,8	2,5	19,8	30	66	2493	70,0	745	94,8	95,6	95,6	0,65	0,76	0,80	415	
250	340	355A/B*	327	6,2	1,5	2,4	21,7	47	103	2092	70,0	745	95,1	95,7	95,8	0,62	0,73	0,79	477	
260	350	355A/B*	340	6,2	1,5	2,4	21,7	47	103	2092	70,0	745	95,1	95,7	95,8	0,62	0,73	0,79	496	
280	380	355A/B*	366	7,5	2,0	2,8	25,0	44	97	2279	70,0	745	95,1	95,7	95,8	0,61	0,73	0,79	534	
Optional frames (high-output design)																				
37	50	250S/M	49,0	8,5	2,8	3,3	1,61	12	26	550	56,0	735	91,5	92,0	92,0	0,60	0,72	0,79	73,5	
55	75	280S/M	72,4	7,0	2,0	2,5	3,38	26	57	812	59,0	740	92,2	92,7	92,7	0,60	0,71	0,77	111	
110	150	315S/M	145	6,0	1,9	2,2	9,46	35	77	1367	62,0	740	93,4	93,9	93,9	0,64	0,74	0,79	214	
132	175	315L	174	6,0	2,0	2,3	11,3	34	75	1508	68,0	740	93,7	94,2	94,2	0,64	0,74	0,79	256	

Note:

(1) Efficiency values are given according to IEC 60034-2-1. They are calculated according to indirect method, with stray load losses determined by measurement.

W22 - Premium Efficiency - IE3 ⁽¹⁾

Output		Frame	Full load torque (Nm)	Locked rotor current I/In	Locked rotor torque Tl/Tn	Breakdown torque Tb/Tn	Inertia J (kgm²)	Allowable locked rotor time (s)		Weight (kg)	Sound dB (A)	400 V							
												Rated speed (rpm)	% of full load						Full load current In (A)
								Efficiency					Power factor						
								kW	HP				50	75	100	50	75	100	
VIII poles - 750 rpm - 50 Hz																			
0,12	0,16	635	46,6	51,7	52,9	0,38	0,46	0,54	0,638	655	41,8	48,2	51,4	0,34	0,41	0,48	0,677		
0,18	0,25	670	52,8	58,0	58,7	0,48	0,59	0,69	0,675	685	49,3	56,0	58,7	0,43	0,53	0,62	0,688		
0,25	0,33	695	54,0	60,0	64,1	0,44	0,57	0,67	0,884	705	56,0	62,0	64,3	0,39	0,50	0,60	0,902		
0,37	0,5	700	61,0	66,0	69,3	0,44	0,56	0,66	1,23	710	62,0	67,0	69,5	0,38	0,50	0,59	1,26		
0,55	0,75	695	65,0	70,0	73,0	0,49	0,62	0,70	1,64	705	65,0	70,0	73,0	0,42	0,55	0,64	1,64		
0,75	1	705	73,9	76,1	75,1	0,44	0,57	0,66	2,30	715	71,1	74,8	75,5	0,38	0,50	0,59	2,34		
1,1	1,5	700	74,9	76,8	77,7	0,45	0,58	0,66	3,26	710	71,1	76,0	77,7	0,38	0,50	0,59	3,34		
1,5	2	700	79,9	80,6	79,8	0,49	0,63	0,71	4,02	710	77,9	80,2	80,8	0,42	0,56	0,65	3,97		
2,2	3	705	82,9	82,6	81,9	0,57	0,68	0,76	5,37	715	81,2	82,3	82,9	0,48	0,62	0,70	5,27		
3	4	705	83,4	83,5	83,5	0,56	0,68	0,75	7,28	715	81,5	83,2	83,7	0,48	0,61	0,70	7,12		
4	5,5	720	85,6	86,8	86,1	0,56	0,68	0,74	9,54	730	84,4	86,6	86,8	0,49	0,62	0,70	9,16		
5,5	7,5	720	86,7	87,3	87,2	0,56	0,68	0,76	12,6	730	85,2	87,0	87,8	0,49	0,62	0,71	12,3		
7,5	10	725	87,8	88,5	88,6	0,56	0,69	0,76	16,9	730	86,2	88,0	88,9	0,49	0,62	0,71	16,5		
9,2	12,5	720	89,2	89,1	88,9	0,67	0,78	0,84	18,7	730	88,6	89,3	90,0	0,60	0,73	0,80	17,8		
11	15	720	90,0	90,0	89,8	0,59	0,71	0,77	24,2	725	89,0	89,9	90,5	0,52	0,65	0,74	22,9		
15	20	730	90,5	91,0	91,0	0,60	0,71	0,76	33,0	730	89,0	89,6	89,8	0,53	0,65	0,72	31,7		
18,5	25	730	89,8	90,1	90,1	0,67	0,78	0,83	37,6	735	89,8	90,3	90,3	0,60	0,73	0,80	35,6		
22	30	730	90,3	90,6	90,6	0,67	0,78	0,83	44,5	735	90,3	90,8	90,8	0,60	0,73	0,79	42,7		
30	40	730	91,0	91,3	91,3	0,70	0,80	0,85	58,7	735	91,0	91,5	91,5	0,63	0,75	0,85	53,7		
37	50	740	91,5	91,8	91,8	0,67	0,76	0,81	75,6	740	91,5	92,0	92,0	0,60	0,71	0,77	72,7		
45	60	740	91,9	92,2	92,2	0,67	0,76	0,80	92,7	740	91,9	92,4	92,4	0,60	0,71	0,78	86,9		
55	75	740	92,2	92,5	92,5	0,69	0,77	0,81	112	740	92,2	92,7	92,7	0,62	0,73	0,79	104		
75	100	740	92,8	93,1	93,1	0,69	0,77	0,81	151	740	92,8	93,3	93,3	0,62	0,73	0,79	142		
90	125	740	93,1	93,4	93,4	0,69	0,77	0,81	181	740	93,1	93,6	93,6	0,62	0,73	0,79	169		
110	150	740	93,4	93,7	93,7	0,68	0,77	0,81	220	740	93,4	93,9	93,9	0,61	0,72	0,78	209		
132	175	740	93,7	94,0	94,0	0,66	0,75	0,81	263	745	93,7	94,2	94,2	0,60	0,71	0,77	253		
160	220	745	94,0	94,3	94,3	0,68	0,78	0,82	314	745	94,0	94,5	94,5	0,61	0,73	0,79	298		
185	250	745	95,8	96,0	95,9	0,68	0,78	0,82	357	745	95,2	95,7	96,0	0,60	0,72	0,78	344		
200	270	745	94,3	94,6	94,6	0,69	0,79	0,82	392	745	94,3	94,8	94,8	0,61	0,73	0,78	376		
220	300	745	94,8	95,6	95,6	0,67	0,78	0,82	426	745	94,8	95,6	95,7	0,63	0,73	0,78	410		
250	340	745	95,5	95,8	95,8	0,67	0,77	0,81	489	745	94,7	95,5	95,7	0,58	0,70	0,77	472		
260	350	745	95,5	95,8	95,8	0,67	0,77	0,81	509	745	94,7	95,5	95,7	0,58	0,70	0,77	491		
280	380	745	95,5	95,9	95,9	0,66	0,76	0,81	548	745	94,7	95,5	95,7	0,57	0,70	0,77	529		
Optional frames (high-output design)																			
37	50	700	91,5	91,8	91,8	0,64	0,75	0,81	75,6	735	91,5	92,0	92,0	0,57	0,70	0,77	72,7		
55	75	740	92,2	92,5	92,5	0,65	0,74	0,78	116	745	92,2	92,7	92,7	0,57	0,69	0,75	110		
110	150	740	93,4	93,7	93,7	0,68	0,77	0,81	220	740	93,4	93,9	93,9	0,61	0,72	0,78	209		
132	175	740	93,7	94,0	94,0	0,68	0,77	0,81	263	740	93,7	94,2	94,2	0,61	0,72	0,78	250		





W22 Super Premium

Presenting the world's highest and widest efficiency level induction motor range

In the last two decades, global energy consumption has increased by 50% with forecast for that the next two decades will continue to see significant increases in this usage.

This 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.

As a reflection of this scenario, electric energy costs are rising dramatically, and in comparison to other economic indicators, standing out negatively.

One of the main contributing factors to this increase in power consumption is in the industrial sector, which utilises around 30% of the electrical energy globally available. And, in industrial applications, electric motor driven systems represents around 65% of all energy consumption.

Furthermore, if we consider both industrial and domestic applications, including appliances in our analysis, electric motors account for more than 40% of the total energy consumed Globally. This serves to emphasize the scale of worldwide electrical energy consumption by electric motors and the importance placed

upon development of more and more efficient products, not only to fulfil but to reduce this increasing demand, and consequently achieve energy / financial savings and emissions reduction.

In response to this situation, several Government Authorities are implementing Minimum Energy Efficiency Performance Standards, in order to encourage greater utilization of high-efficient equipment.

In Europe it was no different, and motor systems were earmarked as a priority target in the Eco-Design Directive (2005), which has established requirements for Energy-using Products: "EuP Directive". As a result, EU Mandatory Minimum Energy-Efficiency Performance Standard (MEPS) for industrial electric motors entered into force from July 2009.

With this situation in mind WEG presents its W22 Super Premium efficiency motor line, exceeding the IE4 Efficiency Levels defined in the IEC Standard 60034-30-1 from March 2014.

The efficiency performance of these motors far exceed the IE2 minimum required in Europe today, and the IE3 level due to be introduced in January 2015. This enables customers to reduce their Total Cost of Ownership through the reduction in energy consumption and consequently their carbon footprint.

High overall performance which is translated into a lower Total Cost of Ownership, due to its reliability, easy maintenance and energy savings!

W22 - Super Premium Efficiency - IE4 ⁽¹⁾

Output		Frame	Full load torque (Nm)	Locked rotor current I/In	Locked rotor torque Tl/Tn	Breakdown torque Tb/ Tn	Inertia J (kgm²)	Allowable locked rotor time (s)		Weight (kg)	Sound dB (A)	400 V							
								Rated speed (rpm)	% of full load						Full load current In (A)				
									Efficiency			Power factor							
kW	HP							Hot	Cold				50	75	100	50	75	100	
II poles - 3000 rpm - 50 Hz																			
5,5	7,5	132S	1,82	7,9	2,6	3,4	0,0252	27	59	69,0	67	2940	89,0	90,6	90,9	0,71	0,81	0,86	10,2
7,5	10	L132S	2,48	8,3	2,7	3,4	0,0285	16	35	73,0	67	2940	90,3	91,5	91,7	0,69	0,80	0,86	13,7
9,2	12,5	L132M/L	3,05	8,7	2,7	3,4	0,0356	16	35	79,0	67	2935	91,0	91,9	92,1	0,72	0,82	0,87	16,6
11	15	160M	3,63	7,9	2,9	3,5	0,0588	14	31	120	67	2955	91,1	92,3	92,8	0,69	0,80	0,86	19,9
15	20	160M	4,94	8,2	2,9	3,5	0,0698	11	24	126	67	2955	92,1	93,0	93,3	0,70	0,81	0,86	27,0
18,5	25	160L	6,11	8,2	3,1	3,5	0,0841	10	22	144	67	2950	92,8	93,4	93,7	0,71	0,82	0,87	32,8
22	30	180M	7,25	8,2	2,7	3,4	0,1183	8	18	176	67	2955	93,3	93,8	94,0	0,73	0,82	0,87	38,8
30	40	200L	9,84	8,2	3,4	3,1	0,2119	16	35	265	69	2970	93,0	94,1	94,5	0,70	0,80	0,85	53,9
37	50	200L	12,1	8,1	3,4	3	0,2373	14	31	275	69	2970	93,6	94,5	94,8	0,72	0,82	0,86	65,5
45	60	225S/M	14,8	7,4	2,3	2,9	0,3641	17	37	425	74	2965	94,8	95,2	95,2	0,82	0,88	0,91	75,0
55	75	250S/M	18,0	8,2	3	3,1	0,6068	28	62	520	74	2970	94,6	95,3	95,5	0,81	0,88	0,90	92,4
75	100	280S/M	24,5	7,9	2,4	3,1	1,47	50	110	800	76	2980	95,1	96,0	96,3	0,80	0,87	0,90	125
90	125	280S/M	29,4	7,8	2,4	2,9	1,64	45	99	890	76	2980	95,5	96,2	96,5	0,82	0,88	0,90	150
110	150	315S/M	36,0	7,8	2,3	3	2,32	42	92	992	76	2980	94,9	95,9	96,5	0,79	0,86	0,89	185
132	175	315S/M	43,1	7,4	2,3	2,8	2,77	36	79	1095	76	2980	95,6	96,2	96,6	0,83	0,89	0,91	217
150	200	315S/M	49,0	7,6	2,4	2,9	3,20	42	92	1197	76	2980	96,0	96,6	96,8	0,82	0,88	0,90	249
160	220	315S/M	52,3	7,6	2,4	2,9	3,20	42	92	1197	76	2980	96,0	96,6	96,8	0,82	0,88	0,90	265
185	250	315L	60,5	7,9	2,6	2,8	3,50	29	64	1315	77	2980	95,9	96,5	96,8	0,84	0,89	0,91	303
200	270	315L	65,4	8,2	2,7	2,9	3,72	32	70	1345	77	2980	96,3	96,8	97,0	0,83	0,89	0,91	327
220	300	315L	71,9	8,1	2,7	2,7	3,95	25	55	1390	77	2980	96,3	96,7	96,9	0,85	0,90	0,92	356
250	340	315L	81,8	7,5	2,6	2,6	4,15	20	44	1434	77	2975	96,7	96,9	96,9	0,85	0,90	0,92	405
260	350	315L	85,1	7,5	2,6	2,6	4,15	20	44	1434	77	2975	96,7	96,9	96,9	0,85	0,90	0,92	421
280	380	355M/L	91,4	8,4	2,1	2,9	5,36	32	70	1664	80	2985	96,2	96,8	97,0	0,83	0,89	0,91	458
300	400	355M/L	97,9	7,5	2	2,6	5,68	32	70	1751	80	2985	96,5	96,9	97,0	0,86	0,91	0,92	485
315	430	355M/L	103	8,2	2,4	2,7	6,01	23	51	1838	80	2985	96,5	96,9	97,0	0,86	0,91	0,92	509
330	450	355A/B*	108	8,2	2,4	2,6	6,33	24	53	2000	82	2985	96,7	97,0	97,1	0,89	0,92	0,93	527
355	480	355A/B*	116	8,2	2,3	2,6	6,76	20	44	2043	82	2985	96,8	97,1	97,1	0,89	0,92	0,93	567
IV poles - 1500 rpm - 50 Hz																			
5,5	7,5	L132S	3,64	8,4	2,3	3,5	0,0640	16	35	78,0	56	1470	90,8	91,8	91,9	0,63	0,75	0,82	10,5
7,5	10	L132M/L	4,97	8,8	2,3	3,6	0,0791	14	31	84,0	56	1470	91,4	92,3	92,6	0,62	0,74	0,81	14,4
9,2	12,5	160M	6,05	8,6	3	3,3	0,1398	16	35	115	61	1480	91,9	92,9	93,0	0,61	0,74	0,81	17,6
11	15	160M	7,26	8,2	3	3,5	0,1537	14	31	125	61	1475	92,0	93,0	93,3	0,61	0,73	0,81	21,0
15	20	160L	9,91	7,2	3	3,2	0,1813	28	62	150	61	1475	92,7	93,6	93,9	0,63	0,75	0,81	28,5
18,5	25	L180M	12,2	7,9	2,5	3,4	0,2291	16	35	185	61	1480	93,6	94,2	94,2	0,64	0,76	0,83	34,2
22	30	L180L	14,5	8,2	2,7	3,5	0,2594	14	31	200	61	1480	93,7	94,3	94,5	0,63	0,75	0,82	41,0
30	40	200L	19,7	7,4	2,8	3,2	0,3979	18	40	284	63	1485	93,9	94,7	94,9	0,60	0,73	0,81	56,3
37	50	225S/M	24,3	7,9	2,8	3,2	0,7346	21	46	430	63	1485	94,6	95,1	95,2	0,67	0,78	0,84	66,8
45	60	225S/M	29,5	8,3	2,9	3,3	0,7346	15	33	440	63	1485	94,2	95,0	95,4	0,62	0,74	0,82	83,0
55	75	250S/M	36,1	8,3	3	3,4	1,21	17	37	531	64	1485	94,9	95,4	95,7	0,66	0,78	0,83	100
75	100	280S/M	49,0	7,9	2,4	2,9	2,78	40	88	830	69	1490	95,5	96,1	96,2	0,72	0,81	0,85	132
90	125	280S/M	59,0	7,9	2,4	2,9	3,40	40	88	895	69	1485	95,9	96,3	96,4	0,73	0,82	0,86	157
110	150	315S/M	71,9	7,4	2,7	2,7	4,42	54	119	1150	71	1490	95,8	96,4	96,8	0,73	0,82	0,86	191
132	175	315S/M	86,3	7,5	2,8	2,7	5,29	50	110	1332	71	1490	96,1	96,7	96,9	0,73	0,82	0,86	229
150	200	315L	98,1	7,7	3	2,6	5,73	40	88	1430	72	1490	96,3	96,8	96,9	0,74	0,83	0,86	260
160	220	315L	105	7,7	3	2,6	5,73	40	88	1430	72	1490	96,3	96,8	96,9	0,74	0,83	0,86	277
185	250	315L	121	7,7	3	2,6	6,17	32	70	1480	72	1490	96,4	96,8	96,9	0,74	0,83	0,86	320
200	270	315L	131	7,9	3	2,7	6,51	31	68	1527	72	1490	96,4	96,9	97,0	0,74	0,83	0,86	346
220	300	355M/L	144	7,9	2,6	2,8	8,95	36	79	1670	74	1490	95,9	96,6	96,9	0,72	0,81	0,85	386
250	340	355M/L	163	8,2	2,7	2,8	10,0	33	73	1730	74	1490	96,1	96,7	97,0	0,72	0,81	0,85	438
260	350	355M/L	170	8,2	2,7	2,8	10,0	33	73	1730	74	1490	96,1	96,7	97,0	0,72	0,81	0,85	455
280	380	355M/L	183	7,9	2,7	2,7	10,5	28	62	1772	74	1490	96,3	96,8	97,0	0,72	0,81	0,85	490
300	400	355M/L	196	7,8	2,7	2,6	11,1	24	53	1825	74	1490	96,4	96,8	97,0	0,73	0,82	0,86	519
315	430	355M/L	206	7,8	2,9	2,6	11,6	27	59	1878	74	1490	96,5	96,9	97,0	0,73	0,82	0,86	545
330	450	355A/B*	216	7,3	2,5	2,4	12,5	28	62	2062	76	1490	96,7	97,0	97,0	0,77	0,84	0,87	564
355	480	355A/B*	232	7,6	2,8	2,5	13,5	23	51	2089	76	1490	96,7	97,0	97,0	0,75	0,83	0,87	607

Note:
 (1) Efficiency values are given according to IEC 60034-2-1. They are calculated according to indirect method, with stray load losses determined by measurement.

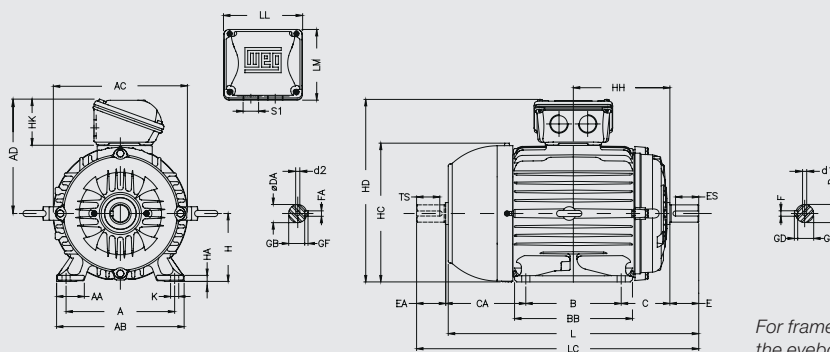
W22 - Super Premium Efficiency - IE4 ⁽¹⁾

Output		Frame	Full load torque (Nm)	Locked rotor current II/In	Locked rotor torque TI/Tn	Breakdown torque Tb/Tn	Inertia J (kgm ²)	Allowable locked rotor time (s)		Weight (kg)	Sound dB (A)	400 V							
												Rated speed (rpm)	% of full load						Full load current In (A)
								Efficiency					Power factor						
kW	HP							Hot	Cold				50	75	100	50	75	100	
VI poles - 1000 rpm - 50 Hz																			
3	4	132S	3,01	6,3	1,8	2,5	0,0568	48	106	61,0	52	970	88,0	89,3	88,6	0,53	0,66	0,73	6,69
4	5,5	132M	4,02	6,6	2	2,6	0,0643	35	77	68,0	52	970	88,5	89,6	89,5	0,53	0,66	0,73	8,84
5,5	7,5	L132M/L	5,49	7,3	2,5	3	0,0833	27	59	84,0	52	975	88,7	90,1	90,5	0,50	0,63	0,71	12,4
7,5	10	160M	7,45	6,8	2,6	2,9	0,1931	21	46	130	56	980	90,6	91,5	91,3	0,62	0,75	0,81	14,6
9,2	12,5	160L	9,14	7,1	2,5	2,9	0,2370	23	51	148	56	980	91,0	91,6	91,8	0,63	0,75	0,81	17,9
11	15	160L	10,9	7,3	2,9	3,2	0,2370	14	31	150	56	980	90,3	91,5	92,3	0,58	0,71	0,79	21,8
15	20	180L	14,9	8,2	2,8	3,4	0,3765	13	29	210	56	980	92,0	92,6	92,9	0,63	0,75	0,82	28,4
18,5	25	200L	18,4	6,6	2,4	2,7	0,4896	23	51	235	60	980	92,7	93,2	93,4	0,63	0,75	0,81	35,3
22	30	200L	21,8	7,0	2,6	2,9	0,5246	18	40	250	60	985	92,4	93,2	93,7	0,59	0,72	0,79	42,9
30	40	225S/M	29,7	7,4	2,4	2,8	1,02	23	51	430	63	985	93,7	94,1	94,2	0,69	0,80	0,84	54,7
37	50	250S/M	36,6	7,3	2,6	2,8	1,65	30	66	520	64	985	94,3	94,7	94,5	0,70	0,81	0,85	66,5
45	60	280S/M	44,3	7,0	2,3	2,8	3,25	35	77	723	65	990	94,4	95,0	95,2	0,65	0,76	0,82	83,2
55	75	280S/M	54,1	7,2	2,6	3	3,92	36	79	740	65	990	94,6	95,3	95,4	0,64	0,75	0,81	103
75	100	315S/M	73,8	6,8	2,3	2,7	7,25	60	132	1106	67	990	95,3	96,0	96,2	0,67	0,77	0,82	137
90	125	315S/M	88,5	6,7	2,2	2,4	7,96	48	106	1180	67	990	95,7	96,1	96,2	0,69	0,79	0,83	163
110	150	315L	108	6,9	2,5	2,6	9,04	44	97	1320	68	990	95,7	96,2	96,3	0,67	0,77	0,82	201
132	175	315L	130	7,2	2,6	2,7	9,95	36	79	1384	68	990	95,9	96,3	96,4	0,67	0,77	0,82	241
150	200	315L	148	7,2	2,7	2,6	11,0	30	66	1448	68	990	95,9	96,3	96,4	0,67	0,78	0,83	271
160	220	315L	157	7,2	2,7	2,6	11,0	30	66	1448	68	990	95,9	96,3	96,5	0,67	0,78	0,83	288
185	250	355M/L	181	6,6	2,1	2,4	13,2	50	110	1854	73	995	95,8	96,4	96,5	0,64	0,75	0,81	342
200	270	355M/L	196	6,6	2,2	2,3	14,1	48	106	1912	73	995	95,8	96,4	96,5	0,64	0,75	0,81	369
220	300	355M/L	216	6,5	2,1	2,3	15,0	48	106	1970	73	990	95,9	96,5	96,5	0,65	0,76	0,81	406
250	340	355A/B*	246	6,5	2,2	2,3	17,1	42	92	2246	73	990	96,1	96,5	96,6	0,66	0,76	0,82	456
260	350	355A/B*	256	6,5	2,2	2,3	17,1	42	92	2246	73	990	96,1	96,5	96,6	0,66	0,76	0,82	474
280	380	355A/B*	275	6,6	2,3	2,3	18,0	35	77	2300	73	990	95,8	96,4	96,6	0,64	0,75	0,81	517
300	400	355A/B*	295	6,5	2,2	2,3	18,9	35	77	2346	73	990	95,9	96,4	96,6	0,65	0,76	0,81	553
315	430	355A/B*	310	6,7	2,4	2,3	18,9	31	68	2346	73	990	95,7	96,3	96,6	0,63	0,74	0,80	588

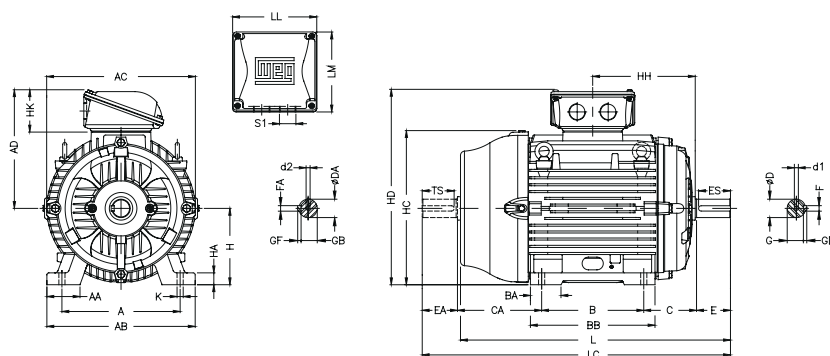
17. Mechanical Data

17.1 Foot Mounted Motors

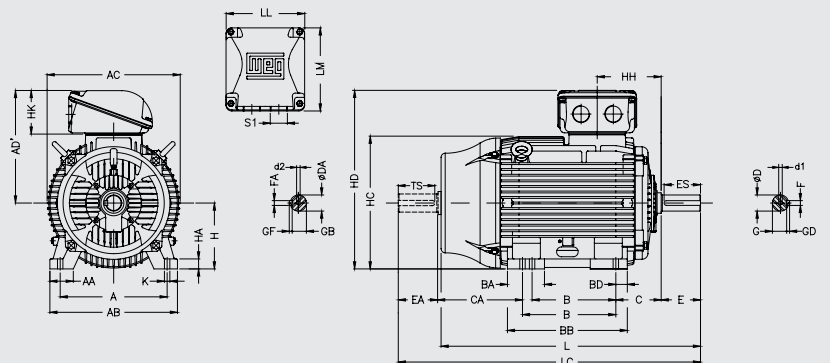
17.1.1 Frames 63 to 132M/L



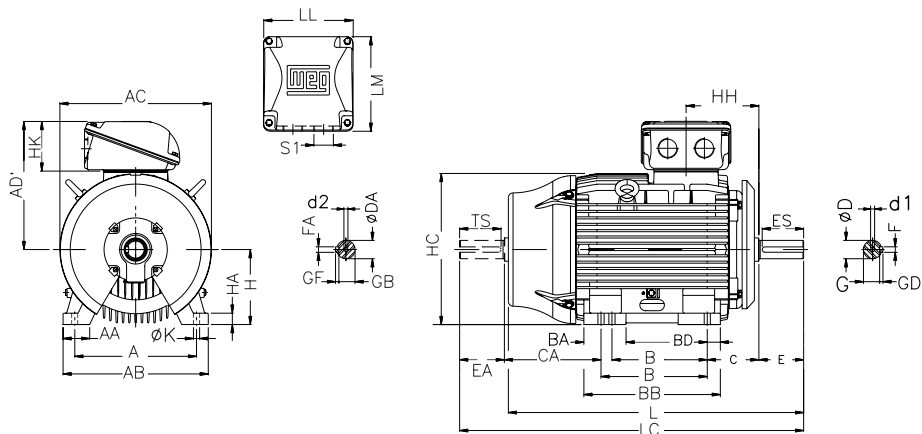
17.1.2 Frames 160M to 200L



17.1.3 Frames 225 to 355M/L



17.1.4 Frame 355A/B

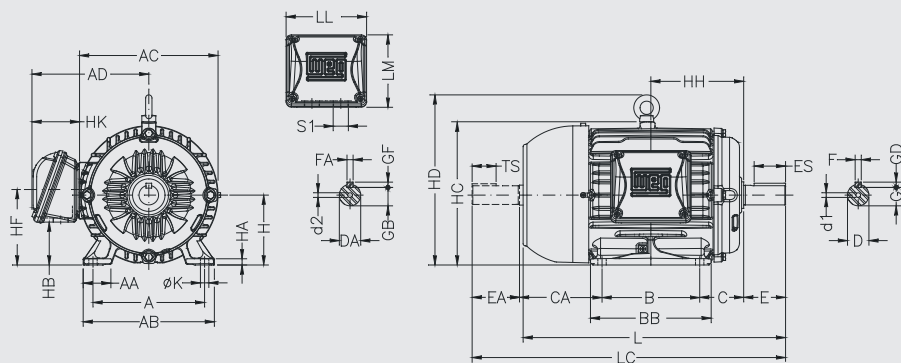


Frame	A	AA	AB	AC	AD	B	BA	BB	BD	C	CA	Shaft																							
												D	DA	E	EA	ES	F	FA	G	GB	GD	GF	TS												
63	100	25.5	116	125	122	80		95		40	78	11j6	9j6	23	20	14	4	3	8.5	7.2	4	3	12												
71	112	28.5	132	141	130	90		113.5		45	88	14j6	11j6	30	23	18	5	4	11	8.5	5	4	14												
80	125	30.5	149	159	139	100		125.5		50	93	19j6	14j6	40	30	28	6	5	15.5	11	6	5	18												
L80											142																								
90S	140	36.5	164	179	157			131		104	56	135	24j6	16j6	50	40	36		8	20	13		7	28											
L90S										104																									
90L						125		156		173		177								104	70		135	118	22j6	60	50	45	6	24	18.5	6	36		
L90L																				128			158												
100L	160	40	188	199	167	140		173		63	162	28j6	24j6	60	50	45	8	6	24	20	7	6	36												
L100L	190	40.5	220	222	192			177		70	128													158											
112M	216	51	248	271	218			187		89	150													38k6	28j6	80	60	63	10	8	33	24	8	7	45
L112M																																			
132S	254	64	308	329	264	210		63		254	108	174	42k6	42k6	110	110	80	12	12	37	37	8	80												
132M/L						254				298														12	12	37	37	8							
180M	279	78	350	360	279	241		70		294	121	200	48k6	48k6				14	14	42.5	42.5	9		9											
180L						279				332															14	14	42.5	42.5	9	9					
200M	318	82	385	402	317	267	82	332	133	222	55m6	16	16	49				53	53	10	10	125													
200L						305		370																											
225S/M	356	80	436	455	384	286/311	124	412	41	149	319/294	55m6(*) 60m6	55m6(*) 60m6	110(*) 140	110(*) 140	125 125	16(*) 18	16(*) 18	49(*) 53	49(*) 53	10(*) 11	10(*) 11	100(*) 125												
250S/M	406	100	506	486	402	311/349	146	467	59	168	354/316	60m6(*) 65m6	60m6(*) 60m6	140(*) 140	140(*) 140	125(*) 125	18(*) 18	18(*) 18	53(*) 58	53(*) 53	11(*) 11	11(*) 11	125(*) 125												
280S/M	457		557	599	472	368/419	151	517	49	190	385/334	65m6(*) 75m6	60m6(*) 65m6	140(*) 140	140(*) 140	125(*) 125	18(*) 20	18(*) 18	58(*) 67.5	53(*) 58	11(*) 12	11(*) 11	125(*) 125												
315S/M	508	120	630	657	530	406/457	184	621	70	216	494/443	65m6(*) 80m6	60m6(*) 65m6	140(*) 170	140(*) 140	125(*) 160	18(*) 22	18(*) 18	58(*) 71	53(*) 58	11(*) 14	11(*) 14	125(*) 125												
315L					575	508	219	752	81		497	65m6(*) 80m6	60m6(*) 65m6	140(*) 170	140(*) 140	125(*) 160	18(*) 22	18(*) 18	58(*) 71	53(*) 58	11(*) 14	11(*) 14	125(*) 125												
355M/L	610	140	750	736	625	560/630	230	760	65	254	483/413	75m6(*) 100m6	60m6(*) 80m6	140(*) 210	140(*) 170	125(*) 200	20(*) 28	18(*) 22	67.5(*) 90	53(*) 71	12(*) 16	11(*) 14	125(*) 160												
355A/B					755	710/800	325	955	70		528/438	75m6(*) 100m6	60m6(*) 80m6	140(*) 210	140(*) 170	125(*) 200	20(*) 28	18(*) 22	67.5(*) 90	53(*) 71	12(*) 16	11(*) 14	125(*) 160												

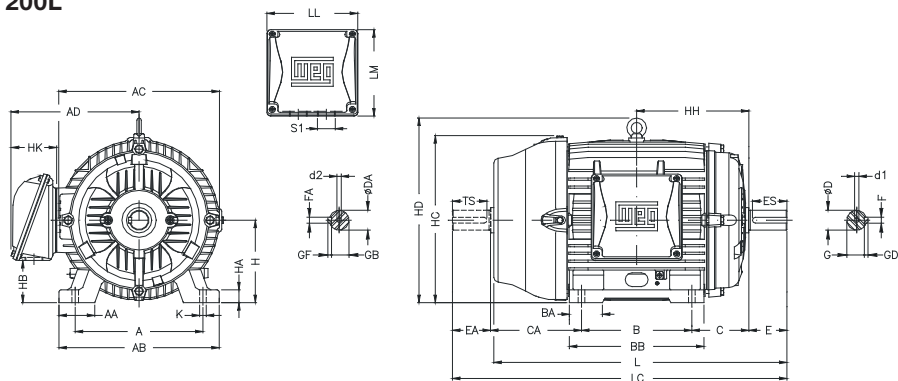
Frame	H	HA	HC	HD	HH	HK	K	L	LC	LL	LM	S1	d1	d2	Bearings					
															D.E.	N.D.E.				
63	63	7	129	189	80	59	7	216	241	108.5	99	2xM20x1.5	M4	M3	6201 - ZZ					
71	71		145	204	90			M5	M4				6202 - ZZ							
80	80	8	163	222	100		M6	6204 - ZZ					6203 - ZZ							
L80																				
90S	90	9	182	249	106	67	10	304	350	115	104	2xM25x1.5	M8	M6	6205 - ZZ	6204 - ZZ				
L90S																				
90L																				
L90L																				
100L	100	10	205	272	133	80	12	376	431	140	133	2xM32x1.5	M10	M8	6206 - ZZ	6205 - ZZ				
L100L																				
112M	112		235	315	140			420	475						M12	M10	6207 - ZZ	6206 - ZZ		
L112M																				
132S	132	20	266	354	159	101	14.5	452	519	198.5	190	2xM40x1.5	M16	M16	6309 - C3	6209 - Z-C3				
132M					178			490	557						M20	M20	6312 C3	6212 Z-C3		
132M/L					191			515	582											
160M					160			22	327						432	213	119,5	18.5	598	712
160L	235	642	756	M24		M24	6319 - C3			6314 - C3										
180M	241.5	664	782																	
180L	180	28	363	467		260.5	702			820										
200M	200	30	405	526.5	266.5	153	24	729	842	269	285	2xM63x1.5	M20	M20	6319 - C3	6319 - C3				
200L								767	880											
225S/M	225	34	453	606	212	176	28	856(*)	974(*)	379	382	2xM80x2	M24	M24	6319 - C3	6316 - C3				
250S/M	250	43	493	646	214			965	1113						1274	1426	6322 - C3	6319 - C3		
280S/M	280	42	580	727	266	147	1071	1223	1363(*)	1505(*)	404	436	6322 - C3	6319 - C3	6319 - C3	6314 - C3				
315S/M	315	48	664	864	264	220	28	1412(*)	1577(*)	460	544	2xM80x2	M24	M24	6322 - C3	6319 - C3				
315L					284			1482	1677						1607(*)	1772(*)	6322 - C3	6319 - C3		
355M/L	355	50	723	943	340	290	1677	1872							6322 - C3	6319 - C3				
355A/B				1013																

17.2 Side Mounted Motors

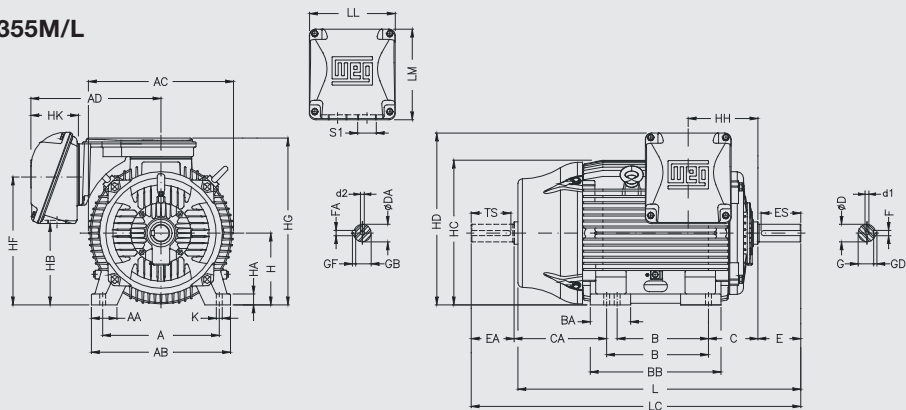
17.2.1 Frames 63 to 132M/L



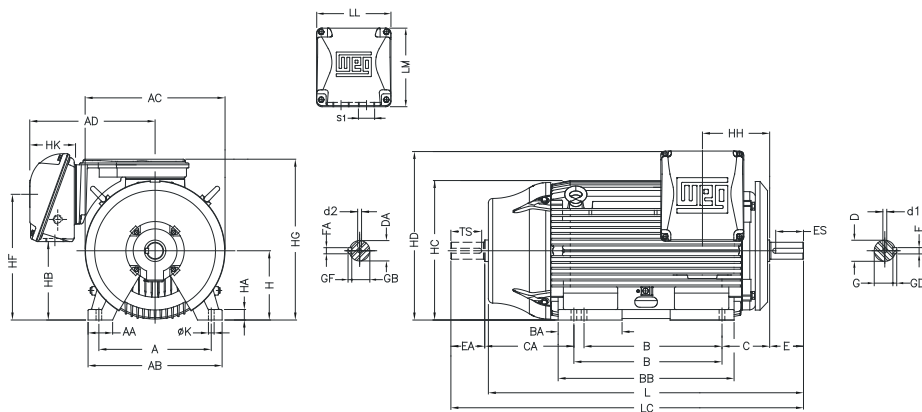
17.2.2 Frames 160M to 200L



17.2.3 Frames 225 to 355M/L



17.2.4 Frame 355A/B



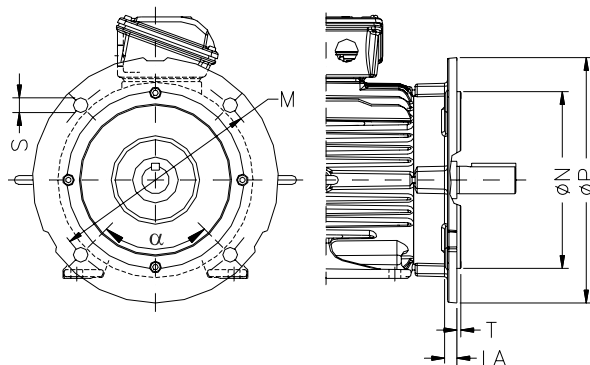
Frame	A	AA	AB	AC	AD	B	BA	BB	C	CA	Shaft																	
63	100	25,5	116	125	123	80	-	95	40	78	D	E	ES	F	G	GD	DA	EA	TS	FA	GB	GF						
71	112	28,5	132	141	131	90		113,5	45	88	14j6	23	14	4	8,5	4	9j6	20	12	3	7,2	3						
80	125	30,5	149	159	140	100		125,5	50	93	19j6	40	28	6	15,5	6	14j6	30	18	5	11	6						
L80										142																		
90S										104																		
L90S	56	135	24j6	50	36			20	16j6	40	28	5	13	5														
90L		104																										
L90L		135																										
100L	160	40	188	199	169	125		173	63	118	28j6	60	45	8	7	22j6	50	36	6	18,5	6							
L100L										162																		
112M										128																		
L112M	177	70	158	38k6	80			63	10	33	8	28j6	60	45	8	42k6	12	37	12	37	8							
132S			187																									
132M			225																									
132M/L	210	63	254	108	174	42k6		110	80	14	42,5	9	48k6	110	80	14	42,5	9										
160M	254	298																										
160L	294	332	121	200	48k6																							
180M	279	78	350	360	281	70		370	133	222	55m6	16	49	10	16*	49*	10*	55m6*	110*	100*	16*	49*	10*					
180L							241																					
200M							254																					
200L	267	82	385	402	319		370	133	222	55m6	16	49	10	16*	49*	10*	55m6*	110*	100*	16*	49*	10*						
225S/M	356	80	436	455	410		286/311	124	412	149	319/294	55m6*	110*	100*	16*	49*	10*	55m6*	110*	100*	16*	49*	10*					
250S/M	406	100	506	486			311/349	146	467	168	354/316	60m6*	140	125	18	53	11	60m6	140	125	18	53	11					
280S/M	457		557	599		445	368/419	151	517	190	385/334	60m6*	140	125	18	53*	11	60m6	140	125	18	53*	11					
315S/M	508		120	630		657	525	406/457	184	621	216	494*/443			65m6	18*	58*	11*						60m6*	140*	125*	18*	53*
355M/L	610	140	750	736	609	560/630	230	760	254	483/413	65m6*	140*			125*	18*	58*	11*						60m6*				
355A/B						710/800	325	955		528/438	65m6*	140*	125*	18*	58*	11*	60m6*	140*	125*	18*	53*	11*	60m6*	140*				

[illegible]

(*) Dimension applicable to 2 pole motors.

17.3 Flange Mounted Motors

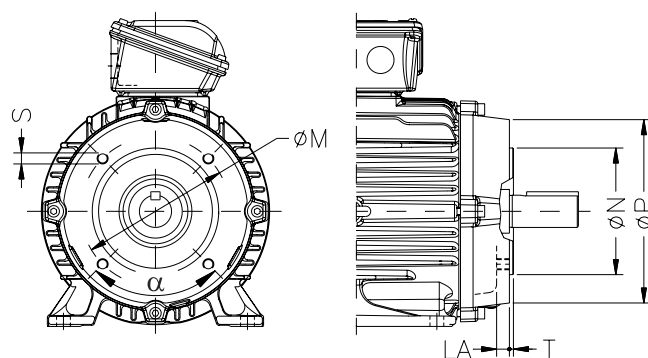
17.3.1 “FF” Flange



Flange “FF”														
Frame	Flange	LA	M	N	P	S	T	α	N° of holes					
63	FF-115	9	115	95	140	10	3	45°	4					
71	FF-130		130	110	160									
80	FF-165	10	165	130	200	12	3.5							
90														
100	FF-215	11	215	180	250	15	4							
112														
132	FF-265	12	265	230	300	19	5							
160	FF-300	18	300	250	350									
180														
200	FF-350		350	300	400									
225	FF-400	18	400	350	450	19	5	22°30'	8					
250	FF-500		500	450	550									
280														
315	FF-600	22	600	550	660	24	6							
355	FF-740		740	680	800/880(*)									

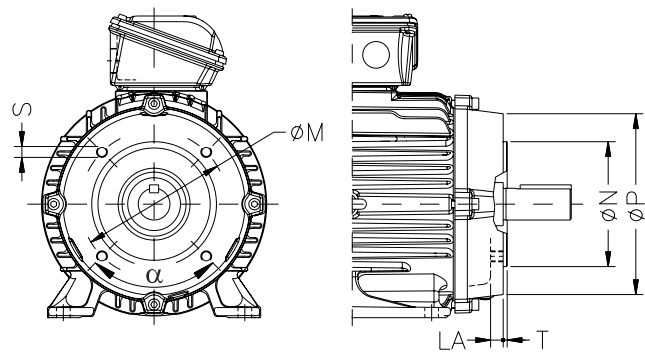
*Only for motors fitted with air deflector in drive end side.

17.3.2 “C-DIN” Flange



Frame	Flange	LA	M	N	P	S	T	α	N° of holes
63	C-90	9.5	75	60	90	M5	2.5	45°	4
71	C-105	8	85	70	105	M6			
80	C-120	10.5	100	80	120		M8		
90	C-140	12	115	95	140				
100	C-160	13.5	130	110	160	3.5			
112									
132	C-200	15.5	165	130	200	M10	6.3		
160	C-250	19	215	180	249	M12			

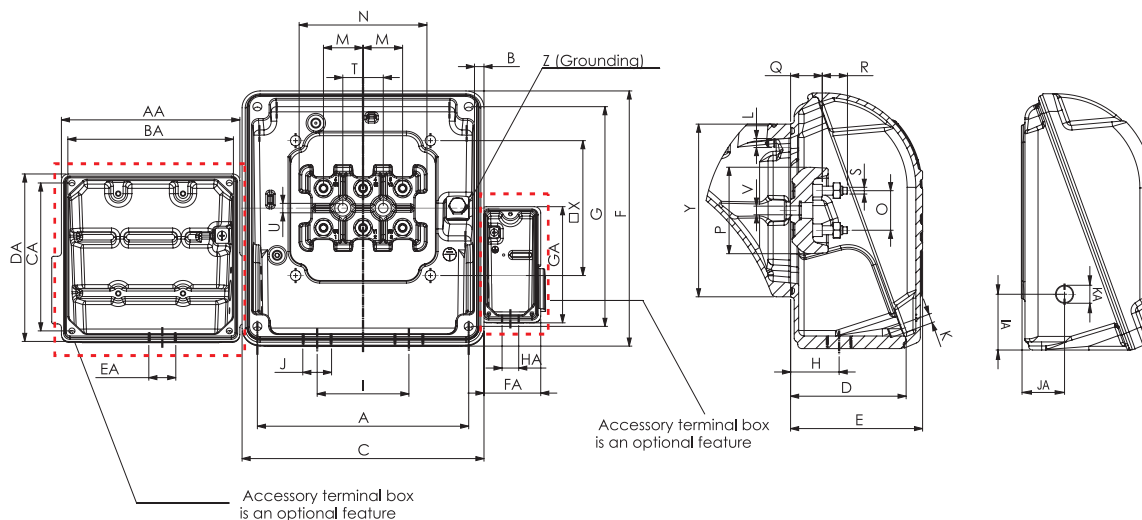
17.3.3 “NEMA C” Flange



Flange “C”									
Frame	Flange	LA	M	N	P	S	T	α	Nº of holes
63	FC-95	8.5	95.2	76.2	143	UNC 1/4"x20	4	45°	4
71		10							
80									
90	FC-149	15	149.2	114.3	165	UNC 3/8"x16	6.3		
100		12							
112	FC-184	13.5	184.2	215.9	225	UNC 1/2"x13	6.3		
132		9							
160		19.5							
180	FC-228	13.5	228.6	266.7	280				
200									
225	FC-279	18.5	279.4	317.5	395	UNC 5/8"x11	6.3	22°30'	8
250	FC-355		355.6	406.4	455				
280									
315	FC-368		368.3	419.1					
355		33.5							



18. Terminal Box Drawings



Frame	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U									
63	90	3.5	108.5	51.5	59	99	85	27	42	2xM20x1.5	M5x0.8	M5x0.8	16	75	16	35	13.5	12	M4x0.7	20	5.8									
71																														
80																														
90																														
100	98	3	115	59.5	67	104	91	31	2xM25x1.5																					
112	117	2.5	140	71	80	133	117	36.5	54	2xM32x1.5	M6x1.0	M6x1.0	23	55	23	52	17	16	M5x0.8	23	6.5									
132																														
160																														
180	175	4	198.5	90	101	190	175	49	84	2xM40x1.5	M8x1.25	M8x1.25										28	90	28	60	21.5	20.5	M6x1	28	6.6
200	204	4.5	230	107	119.5	220	204	59	94	2xM50x1.5			35	112	35	74	24	24	M8x1.25	35	9.5									
225S/M	235	12.5	269	133	153	285	260	71	110	2xM63x1.5			M10x1.5	M10x1.5	44	140	44	94	28	28	M10x1.5	45	10.5							
250S/M											275	13.5	314		147	312	275		126	M12x1.75	M12x1.75			45	153	45	108	34	40	M12x1.75
280S/M											340		379	162	176	382	345	78	160		M14x2.0			65	210	65	146	48	48	M16x2.0
315S/M	365	14.5	404	202	220	436	390	97	200	2xM80x2	M10x1.5	M12x1.75	80	-	105	-	-	-	M20x2.5		-	-								
355M/L																														
355A/B(**)	415	-	460	267 232*	290	544	678	187 152(*)	140																					

Frame	V	X	Y	Z	AA	BA	CA	DA	EA	FA	GA	HA	IA	JA	KA	Max number of connectors														
																Main	Accessories	Space heater												
63	M5x0.8	56	77	0.5-6 mm²	109	90	85	98	M20x1.5	-	-	-	-	-	-	4	16	-												
71			78																											
80			81																											
90			77																											
100			81																											
112		107																												
132		70	103	2-10 mm²												6														
160	M6x1.0	110	140	5.2-25 mm²	139	117	117	133		68	131	M20x1.5	47	40	M20x1.5	12	26	4												
180	M8x1.25	120	155	5.2-35 mm²									198	175					175	189	62	48	77	56	82	69	97	79	-	-
200																														
225S/M	M10x1.5	150	197	35-70 mm²	198	175	175	189		68	131	M20x1.5	62	48	M20x1.5				16	26	4									
250S/M			204										77	56																
280S/M			200	260									300	85-120 mm²								97	79	-	-					
315S/M																														
315L																														
355M/L	-	290																												
355A/B(**)	-	290																												

Notes:

(*) Dimension is applicable to right or left terminal box mounting

(**) Oversized terminal box

19. Drip Cover Data

Utilization of a rain drip cover increases the total length of the motor. The additional land length can be seen on the tabel bellow.

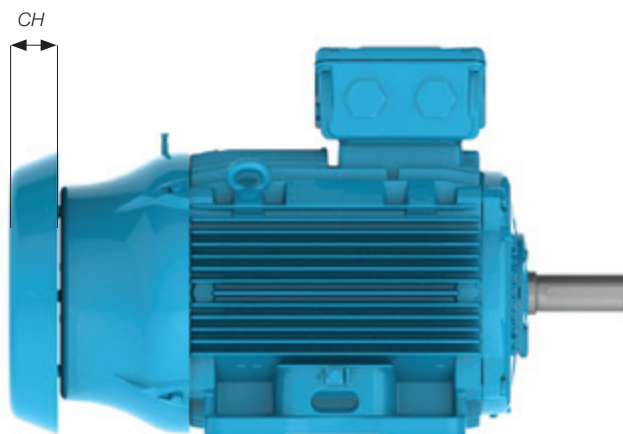


Figure 35 - Motor with drip cover

Frame	Dimension CH (increase motor length (mm))
63	18
71	
80	
90	
100	28
112	31
132	
160	47
180	57
200	67
225S/M	81
250S/M	
280S/M	91
315S/M	
315L	
355M/L	
355A/B	

20. External Motor Dimensions with Forced Ventilation

The use of the forced ventilation kit changes the motor length the overall motor length will be increased according to the table below.

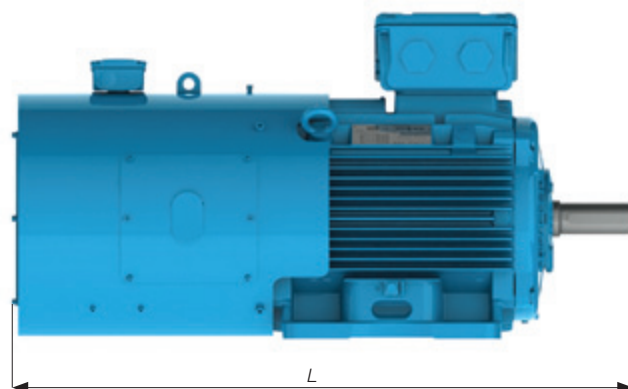


Figure 36 - Motor with forced ventilation

Frame size	Poles	Total motor length in mm (L)	
		Without forced ventilation	With forced ventilation
90S	All	304	548
L90S	All	335	579
90L	All	329	573
L90L	All	360	604
100L	All	376	646
L100L	All	420	690
112M	All	393	660
L112M	All	423	690
132S	All	452	715
132M	All	490	753
132M/L	All	515	778
160M	All	598	855
160L	All	642	899
180M	All	664	908
180L	All	702	946
200M	All	729	976
200L	All	767	1014
225S/M	2	856	1140
	4/8	886	1170
250S/M	2	965	1217
	4/8	965	1217
280S/M	2	1071	1348
	4/8	1071	1348
315S/M	2	1244	1459
	4/8	1274	1489
315L	2	1353	1568
	4/8	1383	1598
355M/L	2	1412	1786
	4/8	1482	1856
355A/B	2	1607	1981
	4/8	1677	2051

Table 20 - Forced ventilation dimensions

20. Packaging

W22 motors in frames 63 to 132 are packaged in cardboard boxes (see figure 36), following the dimensions, weights and volumes opposite:



Figure 37: Cardboard box

For frames 160 to 355A/B, the motors are packaged in wooden crates (see figure 37). Dimensions, weights and volumes are in tables opposite.



Figure 38: Wooden crates

20.1 Top Mounted Terminal Box

Frame	External height (m)	External width (m)	External length (m)	Weight (kg)	Volume (m³)
63	0.26	0.21	0.30	0.2	0.02
71					
80	0.27	0.26	0.36	0.7	0.02
L80	0.32	0.27	0.43	0.9	0.04
90S					
90L					
L90S					
L90L	0.33	0.27	0.46	1.4	0.04
100L					
L100L	0.36	0.30	0.46	1.5	0.05
112M	0.42	0.33	0.60	1.5	0.08
L112M	0.42	0.33	0.60	1.7	0.08
132S					
132M					
132M/L					

20.2 Side Mounted Terminal Box

Frame	External height (m)	External width (m)	External length (m)	Weight (kg)	Volume (m³)
63	0.20	0.24	0.28	0.2	0.01
71	0.20	0.28	0.30	0.2	0.01
80	0.21	0.28	0.36	0.7	0.02
L80	0.24	0.32	0.40	0.8	0.03
90S					
L90S					
90L					
L90L	0.26	0.34	0.43	1.0	0.04
100L	0.27	0.35	0.46	1.6	0.04
L100L	0.32	0.37	0.50	1.4	0.06
112M	0.31	0.38	0.46	1.7	0.05
L112M	0.31	0.38	0.53	1.5	0.06
132S	0.35	0.48	0.60	2.1	0.10
132M					
132M/L					

Note: Values to be added to the net motor weight.

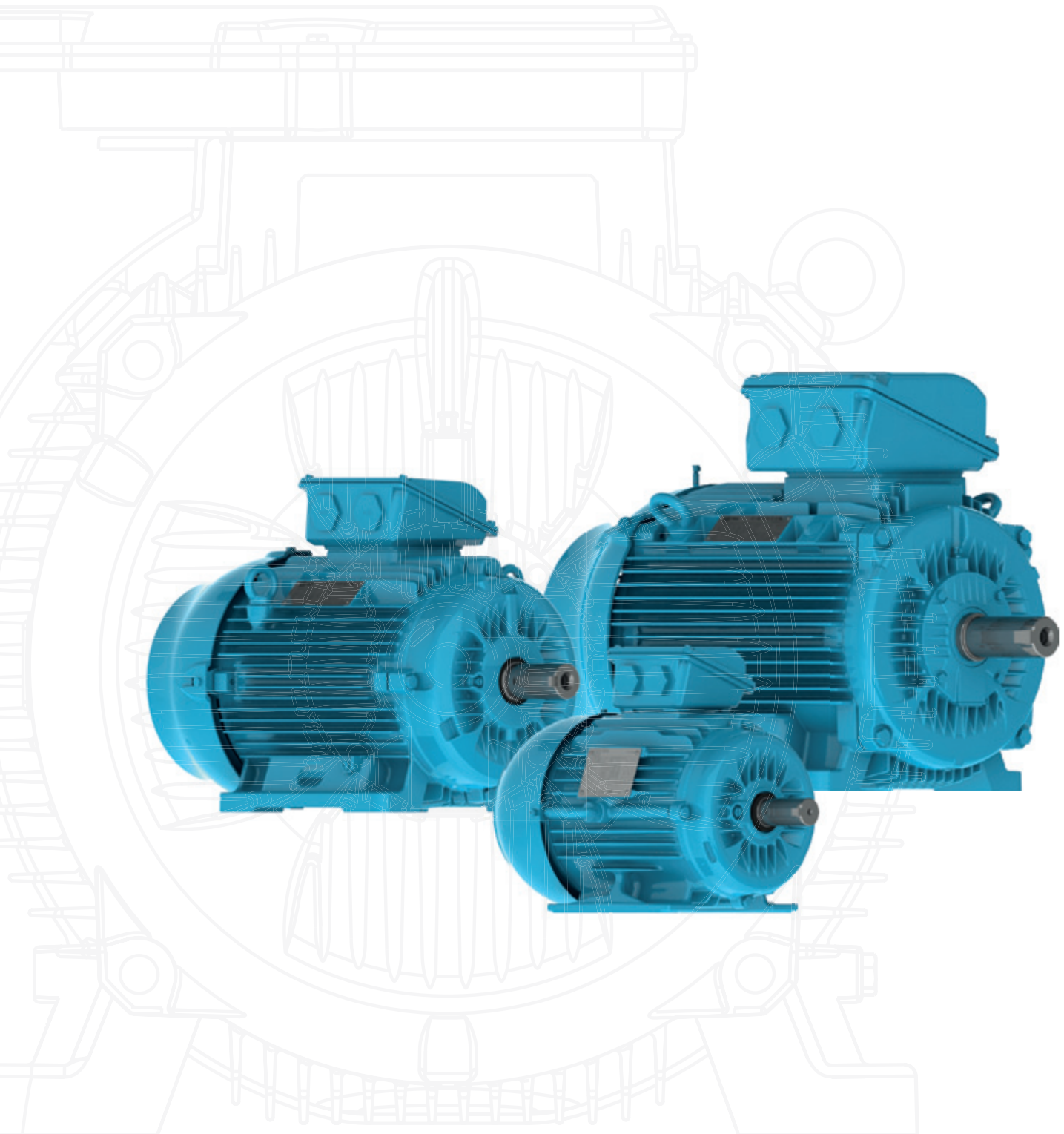
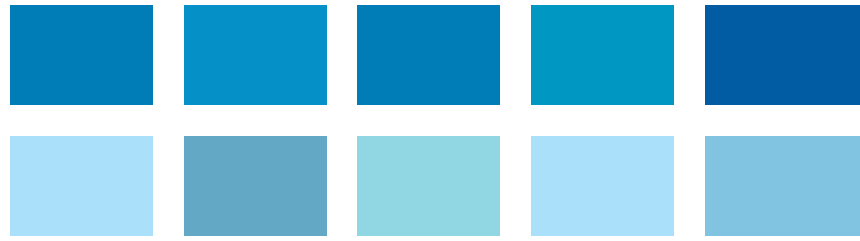
20.3 Top Mounted Terminal Box

Frame	External height (m)	External width (m)	External length (m)	Weight (kg)	Volume (m³)
160	0.50	0.40	0.74	9.2	0.15
180	0.53	0.43	0.82	12.3	0.19
200	0.59	0.51	0.88	13.5	0.27
225S/M	0.90	0.85	1.15	51.9	0.88
250S/M	0.90	0.85	1.25	54.6	0.96
280S/M	1.13	0.85	1.40	67.9	1.34
315S/M	1.13	0.85	1.55	69.9	1.49
315L	1.20	0.90	1.70	111	1.84
355M/L	1.32	1.05	1.73	127	2.40
355A/B	1.32	1.05	1.90	141	2.63

20.4 Side Mounted Terminal Box

Frame	External height (m)	External width (m)	External length (m)	Weight (kg)	Volume (m³)
160	0.40	0.51	0.74	9.85	0.15
180	0.45	0.57	0.82	13.42	0.21
200	0.49	0.63	0.88	14.58	0.27
225S/M	0.78	0.85	1.15	47.70	0.76
250S/M	0.90	0.85	1.25	52.20	0.96
280S/M	0.95	0.95	1.40	71.60	1.26
315S/M	1.13	1.10	1.75	88.40	2.18
315L	1.10	1.12	1.70	138.37	2.10
355M/L	1.20	1.19	1.72	146.00	2.46
355A/B	1.20	1.19	1.90	163.00	2.71

Note: Values to be added to the net motor weight.



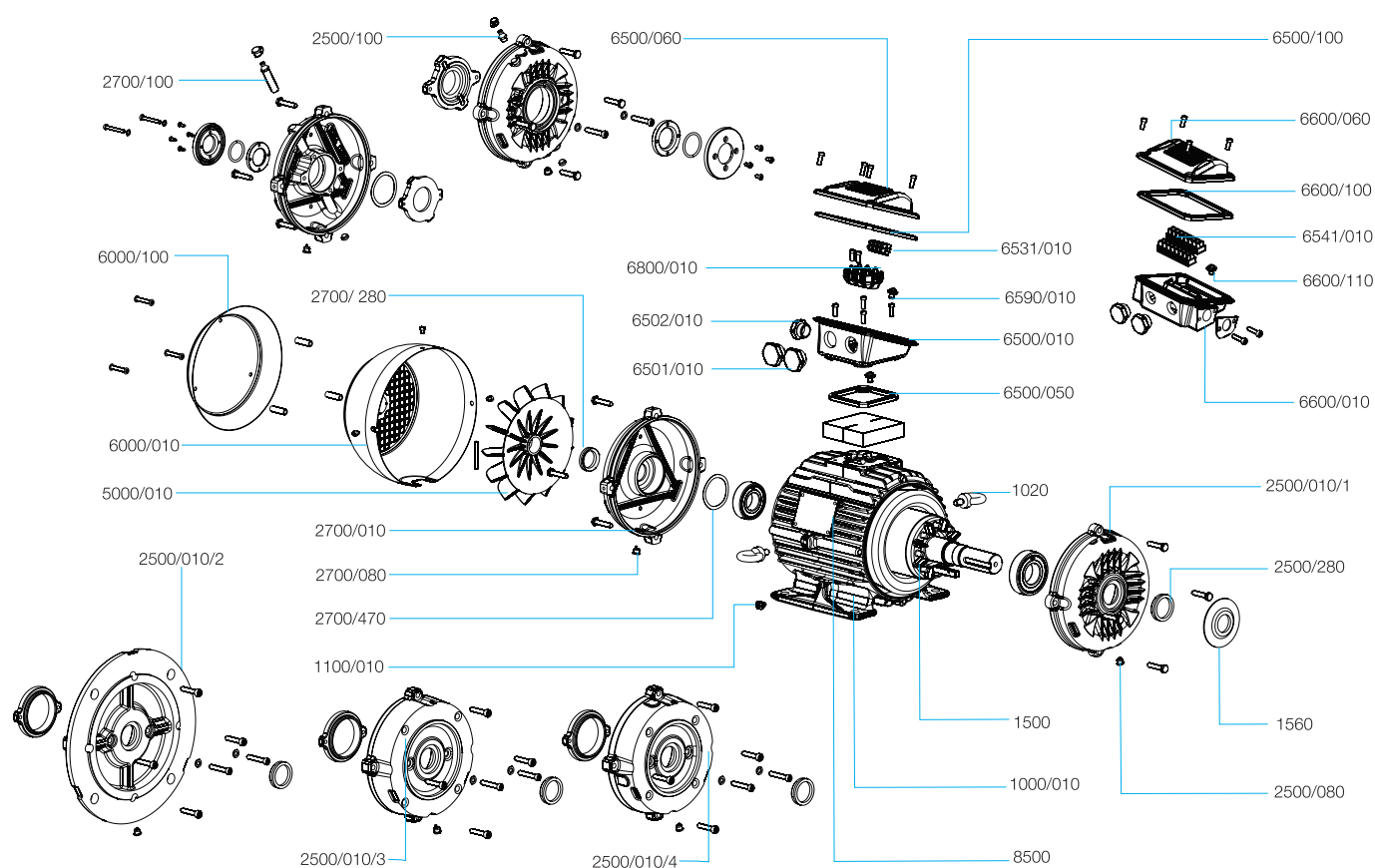
21. Spare Parts

21.1 General Information

The following information is required when purchasing of spare parts:

- Serial number and manufacturing date, both stamped in the nameplate
- Spare part description
- Codes shown are for reference only. Final codes of spare parts will depend on colour

21.1.1 Spare Parts Available 63-112

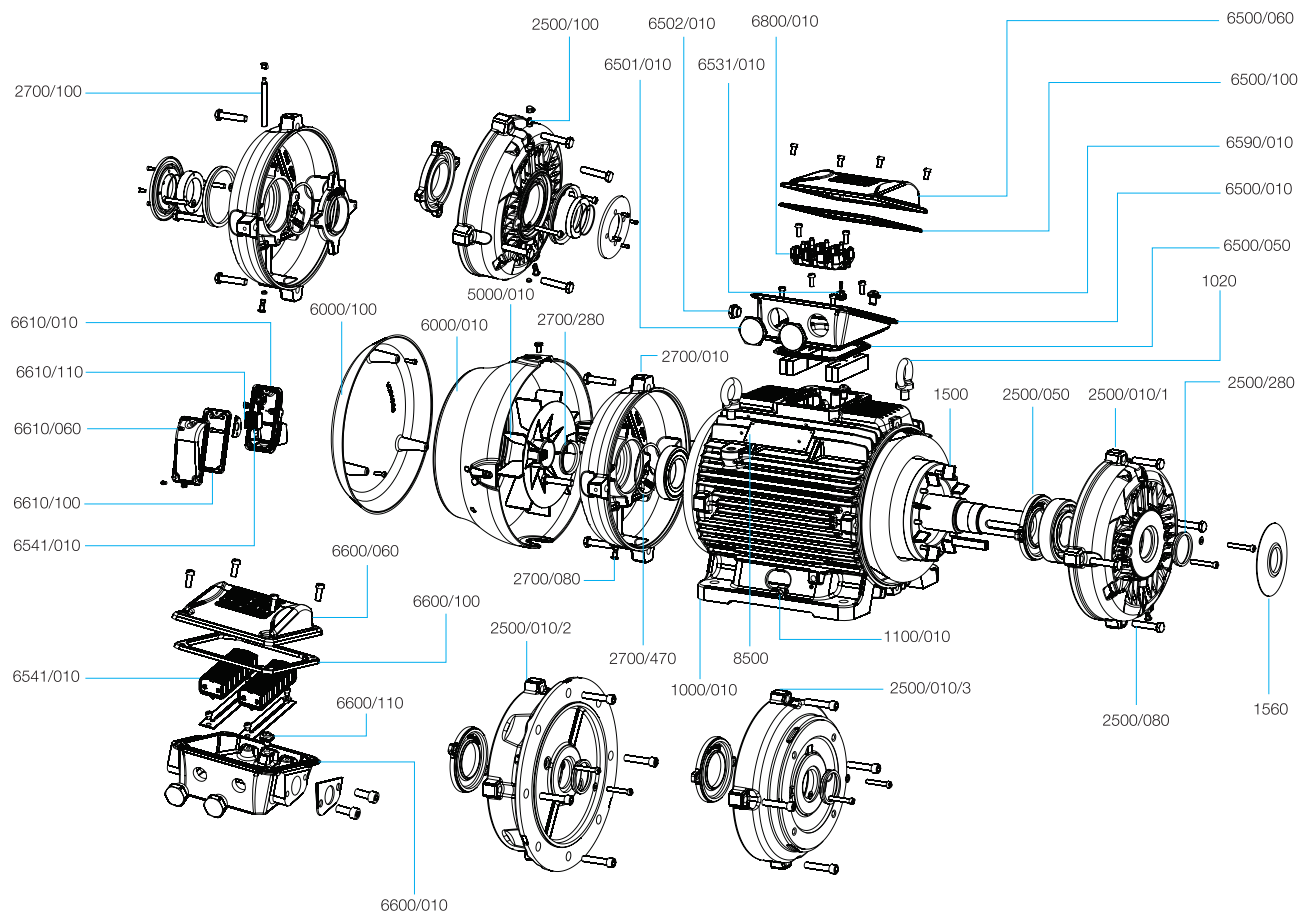


Component		Spare part	
Item	Description	Item	Composition
1000/010	Frame with wound stator	1000	Frame with wound stator
1020	Lifting eyebolt	1020	Lifting eyebolt
1100/010	Earthing terminal	1100	Earthing terminal
1500	Rotor, complete with shaft and key	1500	Rotor, complete with shaft and key
1560	Slinger	1560	Slinger (recommended for vertical shaft up applications, non-flange mounted)
2500/010/1	Endshield, drive end	2500/1	Endshield, drain plug, shaft seal, bolts and washers
2500/080	Drain plug, drive end		
2500/100	Grease nipple, drive end (2)		
2500/280	Shaft seal, drive end (1)		
2500/010/2	FF Flange	2500/2	FF Flange, drain plug, shaft seal, bolts and washers
2500/080	Drain plug, drive end		
2500/100	Grease nipple, drive end (2)		
2500/280	Shaft seal, drive end (1)		
2500/010/3	C Flange (5)	2500/3	C Flange, drain plug, shaft seal, bolts and washers
2500/080	Drain plug, drive end		
2500/100	Grease nipple, drive end (2)		
2500/280	Shaft seal, drive end (1)		
2500/010/4	C-DIN Flange (5)	2500/4	C-DIN Flange, drain plug, shaft seal, bolts and washers
2500/080	Drain plug, drive end		
2500/100	Grease nipple, drive end (2)		
2500/280	Shaft seal, drive end (1)		
2700/010	Endshield, non-drive end	2700	Endshield, drain plug, shaft seal, bolts and washers
2700/080	Drain plug, non-drive end		
2700/100	Grease nipple, non-drive end (2)		
2700/280	Shaft seal, non-drive end (1)		
2700/470	Wave washer for axial displacement		
5000/010	Cooling Fan	5000	Fan (3)
6000/010	Fan cover (4)	6000	Fan cover, bolts
		6050	Fan cover, drip cover and bolts
6000/100	Drip cover	6100	Drip cover, bolts
6500/010	Terminal box	6500	Terminal box complete with lid, gaskets (for lid and terminal box), plugs (for mains and accessories), earthing terminal, bolts and washers
6500/050	Terminal box gasket		
6500/060	Terminal box lid		
6500/100	Terminal box lid gasket		
6501/010	Terminal box plug for main leads		
6502/010	Terminal box plug for accessory leads		
6590/010	Terminal box earthing terminal		
6531/010	Accessory connector	6531	Accessory connector, mounting rail, bolts and washers
6541/010	Accessory connector	6541	Accessory connector, mounting rail, bolts and washers
6600/010	Accessory terminal box	6600	Accessory terminal box, complete with lid, gasket, plugs, earthing terminal, bolts and washers
6600/060	Accessory terminal box lid		
6600/100	Accessory terminal box lid gasket		
6600/110	Accessory terminal box earthing terminal		
6800/010	Terminal block	6800	Terminal block, bolts and washers
8500	Main nameplate	8500	Main nameplate

Notes:

- (1) The shaft sealing may vary with product line. As a spare part, the shaft sealing in the 63-112 range will be supplied as an integral part of the endshield kit. If fitted with labyrinth seal, taconite or W3 Seal®, these are available available from 90 frame upwards.
- (2) When fitted with grease nipple, the endshield spare part kit will also have grease relief, internal bearing cap and labyrinth seal (taconite or W3 Seal®).
- (3) When non-plastic fan is fitted, the spare part kit is also supplied with key and circlip for fan assembly onto the shaft.
- (4) The fan cover material may vary with product line. Considering general purpose, it is fabricated steel in the 63-112 frame range.
- (5) C flange dimensions according to standards NEMA MG1 Part 4 or DIN.

Spare Parts Available 132-200

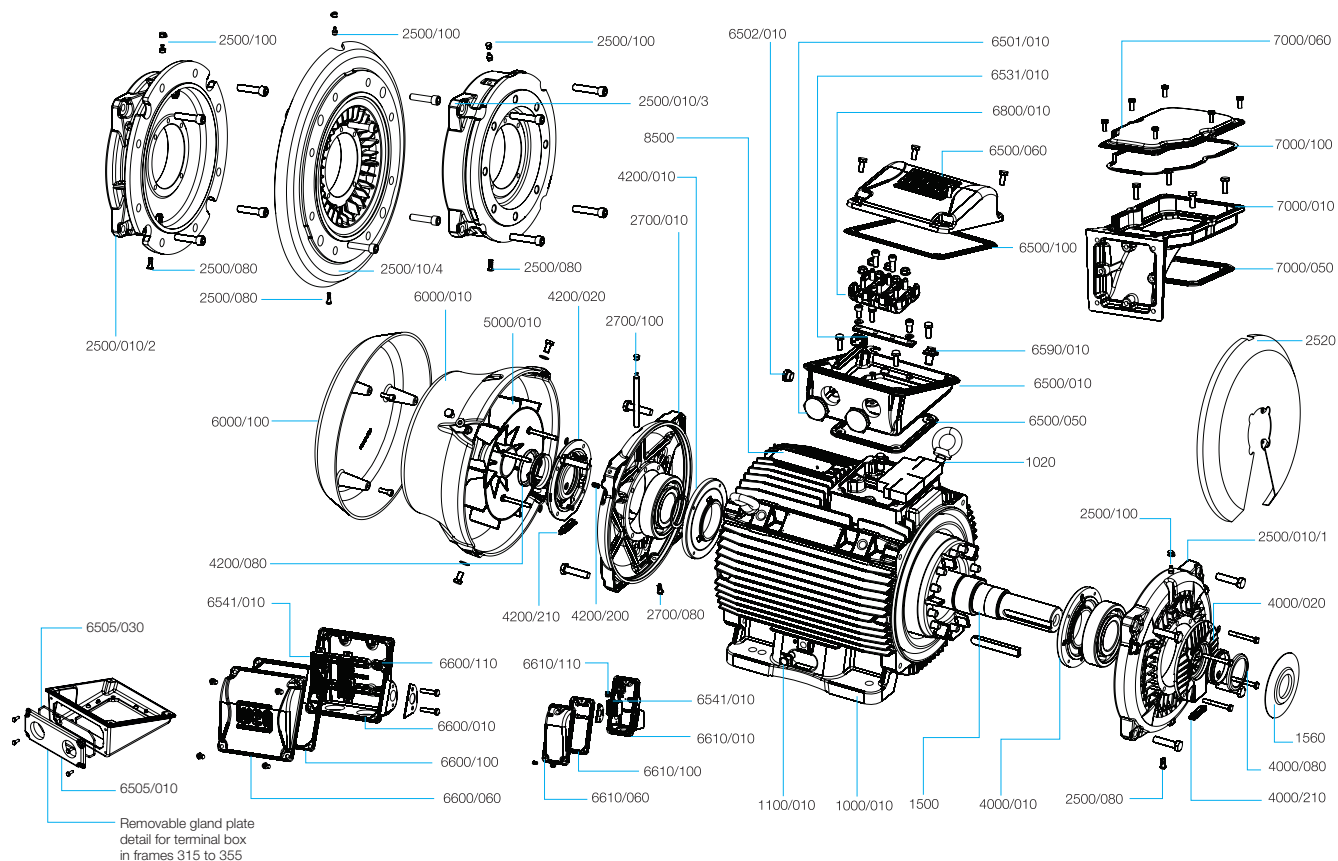


Motor component		Spare part	
Item	Description	Item	Composition
1000/010	Frame with wound stator	1000	Frame with wound stator
1020	Lifting eyebolt	1020	Lifting eyebolt
1100/010	Earthing terminal	1100	Earthing terminal
1500	Rotor, complete with shaft and key	1500	Rotor, complete with shaft and key
1560	Slinger	1560	Slinger (recommended for vertical shaft up applications, non-flange mounted)
2500/010/1	Endshield, drive end	2500/1	Endshield, bearing cap, drain plug, shaft seal, bolts and washers
2500/050	Bearing cap, internal, drive end		
2500/080	Drain plug, drive end		
2500/280	Shaft seal, drive end (1)		
2500/100	Grease nipple, drive end (2)		
2500/010/2	FF Flange	2500/2	FF Flange, drain plug, shaft seal, bolts and washers
2500/080	Drain plug, drive end		
2500/100	Grease nipple, drive end (2)		
2500/280	Shaft seal, drive end (1)		
2500/010/3	C Flange (7)	2500/3	C Flange, drain plug, shaft seal, bolts and washers
2500/080	Drain plug, drive end		
2500/280	Shaft seal, drive end (1)		
2500/100	Grease nipple, drive end (2)		
2700/010	Endshield, non-drive end	2700	Endshield, drain plug, shaft seal, bolts and washers
2700/080	Drain plug, non-drive end		
2700/100	Grease nipple (with extensor pipe), non-drive end (4)		
2700/280	Shaft seal, non-drive end (1)		
2700/470	Wave washer for axial displacement (3)		
5000/010	Fan	5000	Fan (5)
6000/010	Fan cover (6)	6000	Fan cover, bolts
		6050	Fan cover, drip cover and bolts
6000/100	Drip cover	6100	Drip cover and bolts
6500/010	Terminal box	6500	Terminal box, complete with lid, gaskets (for lid and terminal box), plugs (for mains and accessories), earthing terminal, bolts and washers
6500/050	Terminal box gasket		
6500/060	Terminal box lid		
6500/100	Terminal box lid gasket		
6501/010	Terminal box plug for main leads		
6502/010	Terminal box plug for accessory leads		
6590/010	Terminal box earthing terminal		
6531/010	Accessory connector	6531	Accessory connector, mounting rail, bolts and washers
6541/010	Accessory connector	6541	Accessory connector, mounting rail, bolts and washers
6600/010	Accessory terminal box	6600	Accessory terminal box, complete with lid, gasket, plugs, earthing terminal, bolts and washers
6600/060	Accessory terminal box lid		
6600/100	Accessory terminal box lid gasket		
6600/110	Accessory terminal box earthing terminal		
6610/010	Space heater accessory terminal box	6610	Space heater accessory terminal box, complete with lid, gasket, plugs, earthing terminal, bolts and washers
6610/060	Space heater accessory terminal box lid		
6610/100	Space heater accessory terminal box lid gasket		
6610/110	Space heater accessory terminal box earthing terminal		
6800/010	Terminal block	6800	Terminal block, bolts and washers
8500	Main nameplate	8500	Main nameplate

Notes:

- (1) The shaft seal may vary with product line. As a spare part, the shaft seal in the 132-200 range will be supplied as an integral part of the endshield kit. If fitted with labyrinth seal (taconite or W3 Seal) internal bearing cap is mandatory from frame 160.
- (2) When fitted with grease nipple, the endshield spare part kit will also have grease relief.
- (3) Valid when ball bearing is fitted in drive end. When the drive end is fitted with roller bearings, the wave washer is not supplied (non-drive end bearing locked with internal bearing cap).
- (4) When fitted with grease nipple in the non-drive end, the endshield spare part kit will also have grease relief and internal bearing cap.
- (5) When non-plastic fan is fitted, the spare part kit is also supplied with key and circlip for fan assembly onto the shaft.
- (6) The fan cover material may vary with product line. Considering general purpose, it is cast iron in the 160-200 range and fabricated steel in 132 frame.
- (7) C flange dimensions according to NEMA MG1 Part 4 standard (frames 132-200) or DIN standard (frame 132)..

Spare Parts Available 225 - 355



Motor component		Spare part	
Item	Description	Item	Composition
1000/010	Frame with wound stator	1000	Frame with wound stator
1020	Lifting eyebolt	1020	Lifting eyebolt
1100/010	Earthing terminal	1100	Earthing terminal
1500	Rotor, complete with shaft and key	1500	Rotor, complete with shaft and key
1560	Slinger	1560	Slinger
2500/010/1	Endshield, drive end	2500/1	Endshield, grease nipple, drain plug, bolts and washers
2500/080	Drain plug, drive end		
2500/100	Grease nipple, drive end		
2500/010/2	FF Flange	2500/2	FF Flange, grease nipple, drain plug, bolts and washers
2500/080	Drain plug, drive end		
2500/100	Grease nipple, drive end		
2500/0010/3	C Flange (5)	2500/3	C Flange, grease nipple, drain plug, bolts and washers
2500/080	Drain plug, drive end		
2500/100	Grease nipple, drive end		
2500/010/4	FF Flange with air deflector	2500/4	FF Flange with air deflector, grease nipple, drain plug, bolts and washers
2500/080	Drain plug, drive end		
2500/100	Grease nipple, drive end		
2520	Air Deflector	2520	Air Deflector
2700/010	Endshield, non-drive end	2700	Endshield, grease nipple with extensor pipe, drain plug, bolts and washers
2700/080	Drain plug, non-drive end		
2700/100	Grease nipple (with extensor pipe), non-drive end		
4000/010	Bearing cap, internal, drive end	4000	Bearing cap (external and internal), shaft seal, grease relief, bolts and washers
4000/020	Bearing cap, external, drive end		
4000/080	Shaft seal, drive end (1)		
4000/210	Grease relief		
4200/010	Bearing cap, internal, non-drive end	4200	Bearing cap (external and internal), shaft seal, grease relief with extensor pipe, pre-load springs, bolts and washers
4200/020	Bearing cap, external, non-drive end		
4200/080	Shaft seal, non-drive end (1)		
4200/200	Pre-load springs for axial displacement (2)		
4200/210	Grease relief		
5000/010	Fan	5000	Fan (3)
6000/010	Fan cover, cast iron	6000	Fan cover
		6050	Fan cover and canopy
6000/100	Canopy	6100	Canopy
6500/010	Terminal box	6500	Terminal box, complete with lid, gaskets (for lid and terminal box), plugs (for mains and accessories), earthing terminal, bolts and washers
6500/050	Terminal box gasket		
6500/060	Terminal box lid		
6500/100	Terminal box lid gasket		
6501/010	Terminal box plug for main leads		
6502/010	Terminal box plug for accessory leads		
6505/010	Terminal box removable cable gland		
6505/030	Lid gasket of the terminal box removable cable gland		
6531/010	Accessory connector	6531	Accessory connector, mounting rail, bolts and washers
6541/010	Accessory connector	6541	Accessory connector, mounting rail, bolts and washers
6590/010	Terminal box earthing terminal		
6800/010	Terminal block	6800	Terminal block, mounting rail, bolts and washers
6600/010	Accessory terminal box	6600	Accessory terminal box, complete with lid, gasket, plugs, earthing terminal, bolts and washers
6600/060	Accessory terminal box lid		
6600/100	Accessory terminal box lid gasket		
6600/110	Accessory terminal box earthing terminal		
6610/010	Space heater accessory terminal box	6610	Space heater accessory terminal box, complete with lid, gasket, plugs, earthing terminal, bolts and washers
6610/060	Space heater accessory terminal box lid		
6610/100	Space heater accessory terminal box lid gasket		
6610/110	Space heater accessory terminal box earthing terminal		
7000/010	Terminal box adaptor base	7000	Terminal box adaptor for side mounted position, complete with lid, gaskets, bolts and washers
7000/050	Terminal box adaptor base gasket		
7000/060	Terminal box adaptor lid		
7000/100	Terminal box adaptor lid gasket		
8500	Main nameplate (4)	8500	Main nameplate

Notes:

- (1) The shaft sealing may vary with product line. As a spare part, the shaft sealing in the 225-355 range will be supplied as an integral part of the bearing cap kit.
- (2) Valid when ball bearing is fitted in drive end. When the drive end is fitted with roller bearings, pre-load springs are not supplied (non-drive end bearing locked).
- (3) When non-plastic fan is fitted, the spare part kit is also supplied with key and circlip for fan assembly onto the shaft.
- (4) Main nameplate position will vary with terminal box configuration (top and side mounting)
- (5) C flange dimensions according to NEMA MG1 Part 4 standard.

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