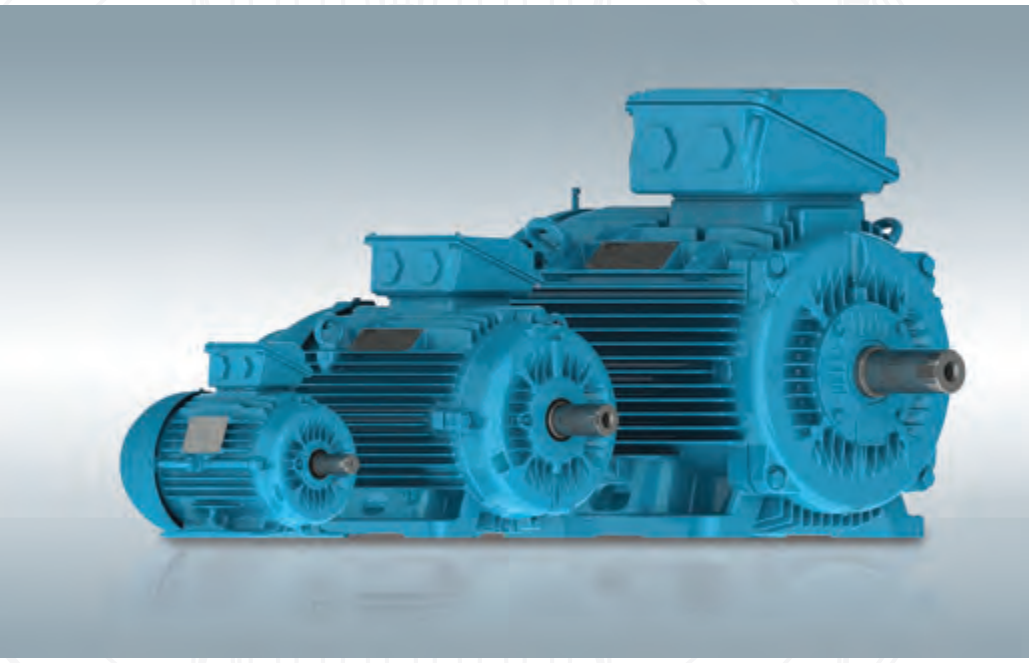
W22

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 Premium Efficiency Motors

The Premium Efficiency (IE3) level established in IEC 60034-30: 2008 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 Premium Efficiency motors not become the Industry standard?
It may be argued that premium efficiency motors are also premium in price when comparing against standard efficiency (IE1) and high efficiency (IE2) motors.
Whilst this is not strictly untrue, it should be appreciated when considering their lifetime that the cost of acquisition typically represents only 1% of the total cost of ownership of an electric motor. In contrast, the associated energy savings provided by premium efficiency motors far outweigh this additional investment in purchase price.

The reduction in CO_2 emissions is one of the direct consequences, and therefore benefits, of increasing efficiency in industry.
For example, according to the guidelines set out by the International Energy Agency (IEA) of 504 kg of CO_2 per 1000 kWh, it is possible to reduce CO_2 emissions by approximately 1000 kg per year with one 3 kW premium efficiency motor and by 25000 kg per year with a 250 kW premium efficiency motor, when compared against equivalent standard efficiency (IE1) machines.

Go to our website at www.weg.net to check the potential reduction in CO_2 emissions and the return on investment of W22 Premium Efficiency motors.
The W22 line from WEG is the first complete range of IE3 motors available to Industry...

...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 well known efficiency bands EFF1, EFF2 and EFF3.
However, in July of 2009 the European Community introduced the regulation 640/2009 (implementing Directive 2005/32/EC) relating to the scope of supply, implementation dates and efficiency levels of electric motors sold in the European market. This directive bases the efficiency levels on the values stipulated in IEC 60034-30.

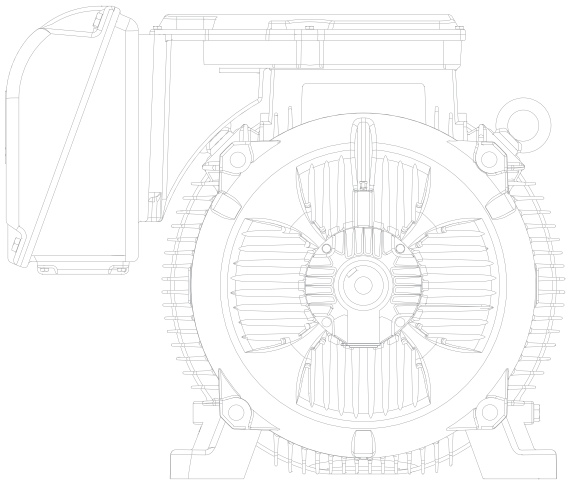
Scope

The Scope of the European Ecodesign Directive covers single speed, three-phase 50 Hz or 50/60 Hz, squirrel cage induction motors that:

- Have 2 to 6 poles
- Have a rated voltage U_N up to 1000 V
- Have a rated output P_N between 0.75 kW and 375 kW
- Are rated on the basis of continuous duty operation

Effective Dates

- From 16 June 2011, motors shall not be less efficient than the IE2 efficiency level (defined in Table 1);
- 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 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 equipped with a variable speed drive.



Output	IE1 - Standard Efficiency			IE2 - High Efficiency			IE3 - Premium Efficiency		
	Poles			Poles			Poles		
kW	2	4	6	2	4	6	2	4	6
0.75	72.1	72.1	70.0	77.4	79.6	75.9	80.7	82.5	78.9
1.1	75.0	75.0	72.9	79.6	81.4	78.1	82.7	84.1	81.0
1.5	77.2	77.2	75.2	81.3	82.8	79.8	84.2	85.3	82.5
2.2	79.7	79.7	77.7	83.2	84.3	81.8	85.9	86.7	84.3
3	81.5	81.5	79.7	84.6	85.5	83.3	87.1	87.7	85.6
4	83.1	83.1	81.4	85.8	86.6	84.6	88.1	88.6	86.8
5.5	84.7	84.7	83.1	87.0	87.7	86.0	89.2	89.6	88.0
7.5	86.0	86.0	84.7	88.1	88.7	87.2	90.1	90.4	89.1
11	87.6	87.6	86.4	89.4	89.8	88.7	91.2	91.4	90.3
15	88.7	88.7	87.7	90.3	90.6	89.7	91.9	92.1	91.2
18.5	89.3	89.3	88.6	90.9	91.2	90.4	92.4	92.6	91.7
22	89.9	89.9	89.2	91.3	91.6	90.9	92.7	93.0	92.2
30	90.7	90.7	90.2	92.0	92.3	91.7	93.3	93.6	92.9
37	91.2	91.2	90.8	92.5	92.7	92.2	93.7	93.9	93.3
45	91.7	91.7	91.4	92.9	93.1	92.7	94.0	94.2	93.7
55	92.1	92.1	91.9	93.2	93.5	93.1	94.3	94.6	94.1
75	92.7	92.7	92.6	93.8	94.0	93.7	94.7	95.0	94.6
90	93.0	93.0	92.9	94.1	94.2	94.0	95.0	95.2	94.9
110	93.3	93.3	93.3	94.3	94.5	94.3	95.2	95.4	95.1
132	93.5	93.5	93.5	94.6	94.7	94.6	95.4	95.6	95.4
160	93.8	93.8	93.8	94.8	94.9	94.8	95.6	95.8	95.6
200 up to 375	94.0	94.0	94.0	95.0	95.1	95.0	95.8	96.0	95.8

Table 1 - Efficiency levels

WEG can support the movement towards these high efficiency levels by offering a comprehensive range of products that exceed the IE2 and IE3 criteria detailed above. Additionally our variable speed drives are perfectly matched to our motors, affording you the 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

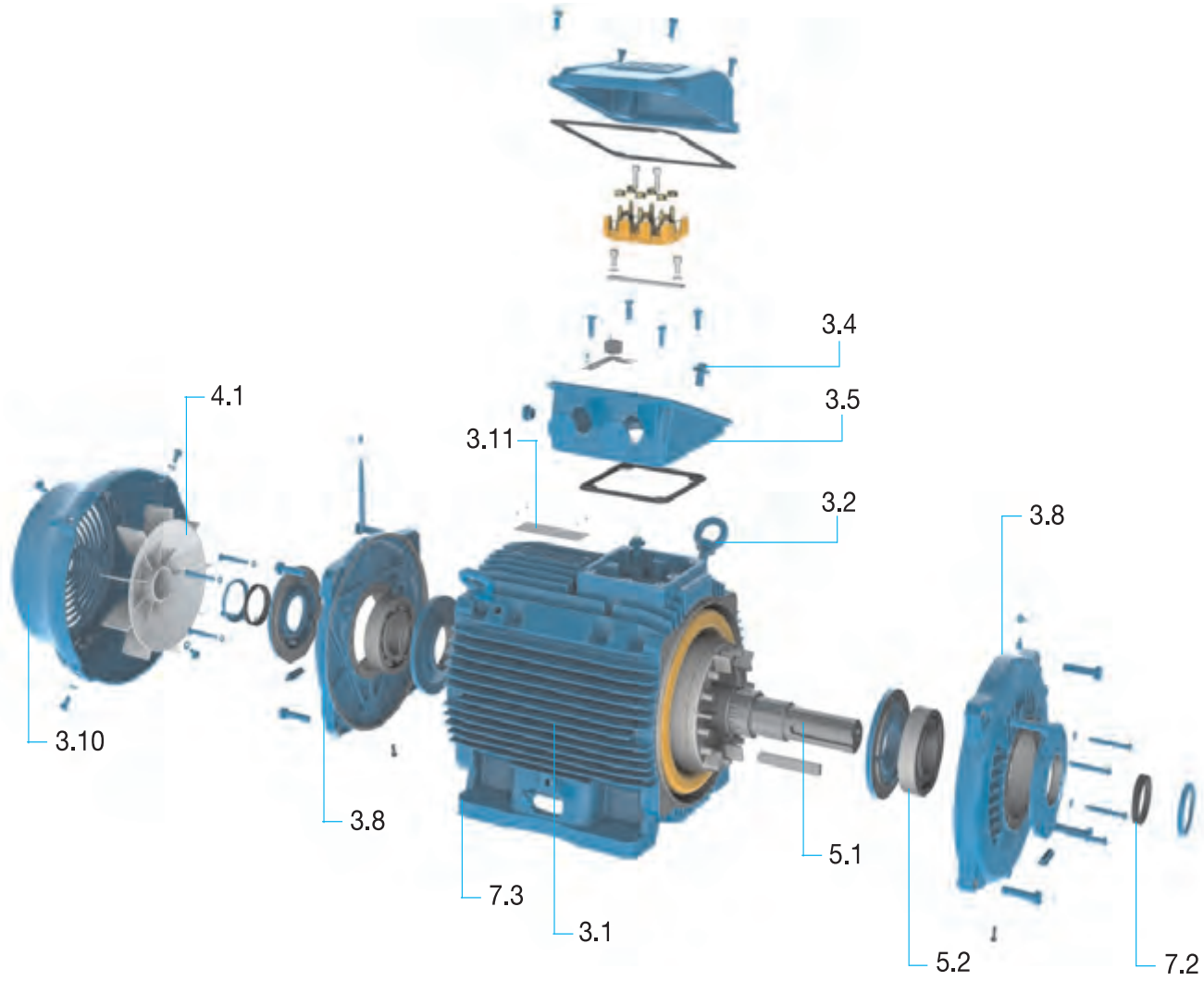


Table 2 - Visual Index

Table of Contents

1. Versions Available

For the European market, W22 motors are available in four versions in accordance with IEC 60034-30: Standard Efficiency (IE1), High Efficiency (IE2), Premium Efficiency (IE3) and Super Premium Efficiency (IE4). In figure 1 the efficiency levels of W22 motors at 50 Hz can be compared with the minimum levels established by IEC 60034-30.

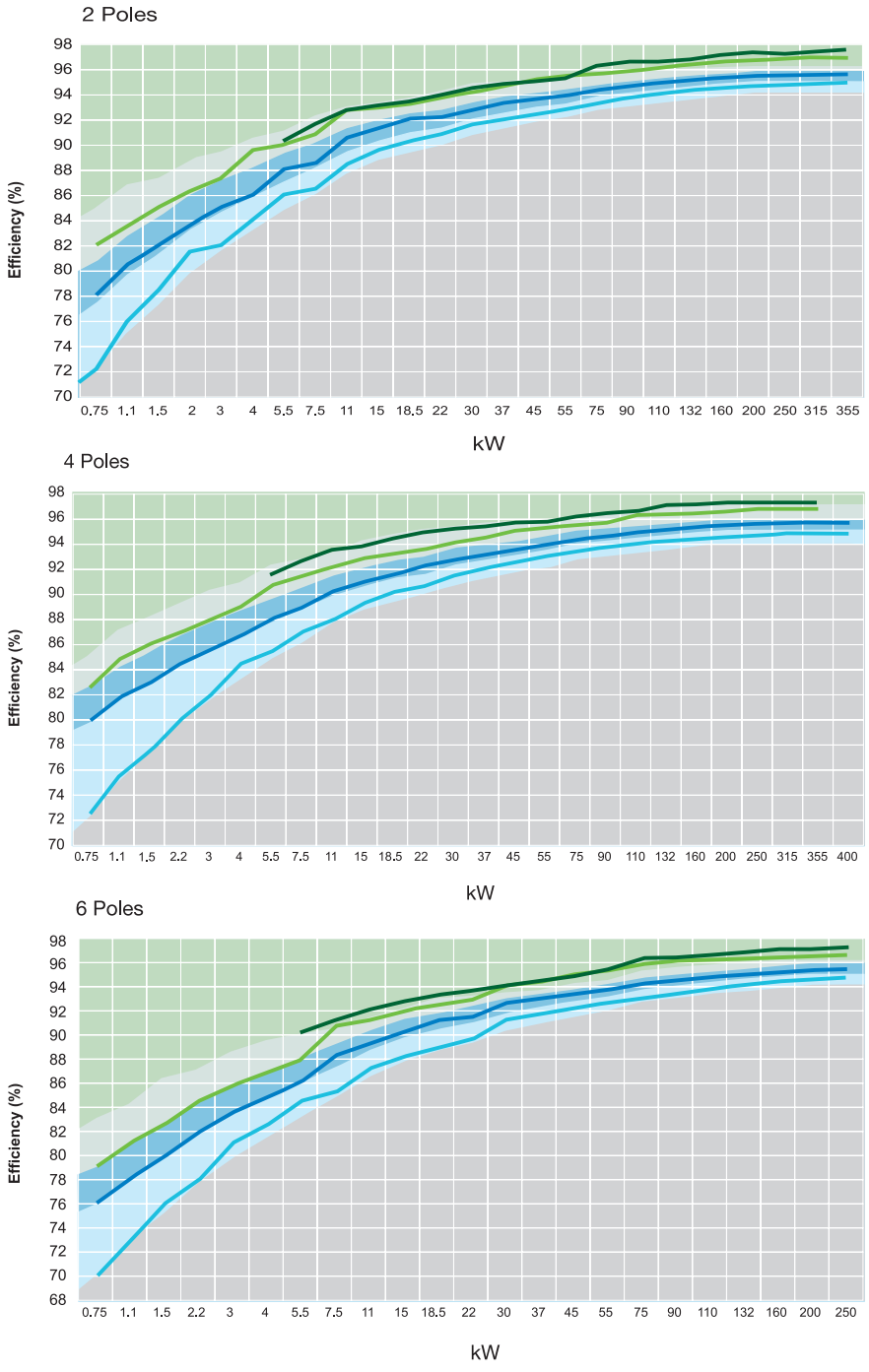


Figure 1 - Efficiency levels

- W22 Standard Efficiency (IE1)
- W22 High Efficiency (IE2)
- W22 Premium Efficiency (IE3)
- W22 Super Premium Efficiency (IE4)
- IE1
- IE2
- IE3
- IE4

For all four efficiency levels the W22 motors exceed the minimum figures required by the Standard. They 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.

Premium Efficiency motors have the output versus frame ratio as per EN 50347 Standard, allowing replacement of existing EFF2 and EFF1 motors with Premium Efficiency units.

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.

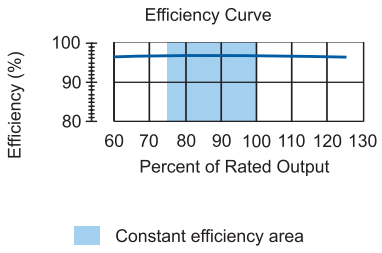


Figure 2 - Typical efficiency curve of W22 line

2. Standards

W22 motors meet the requirements and regulations of the latest version 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 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.

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.

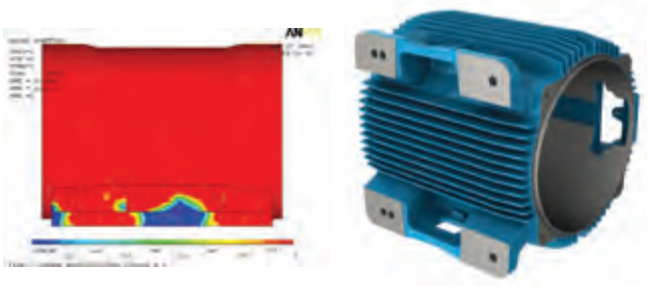


Figure 4 - Solid feet

3.2 Eyebolts

Eyebolts are available 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.

Front side

Figure 6 - Flat surfaces for vibration monitoring on the back and front 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).

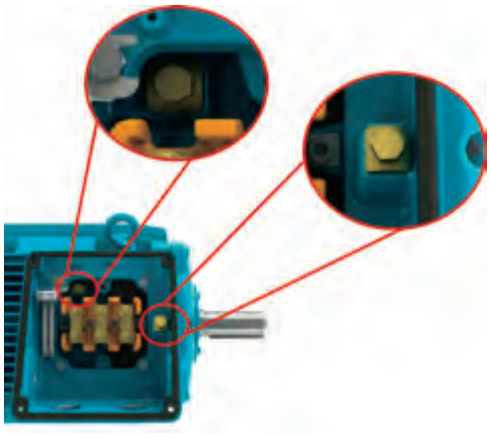


Figure 7 - Earth terminals in the terminal box

Motors on frames 225S/M to 355A/B are fitted with one more earth terminal in the frame. It is located at the same side 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 mm^2 to 185 mm^2.

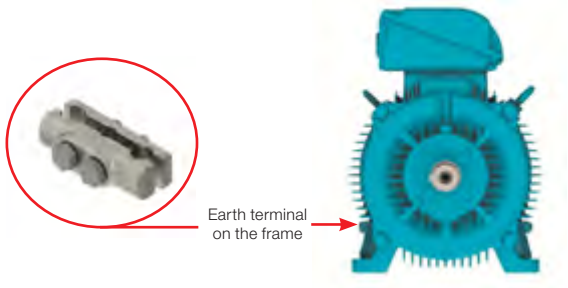


Figure 8 - Earth terminal position on the frame.

Optionally, the motor can be supplied with an additional earth terminal on the opposite side of the terminal box.

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.
It is possible to supply 355A/B motors with an oversized terminal box. In this case, the aspect of the motor with side and top mounted terminal box is shown in the figures 9.1 and 9.2.

Figure 9.1 and 9.2 - Frame size 355A/B with oversized terminal box

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).

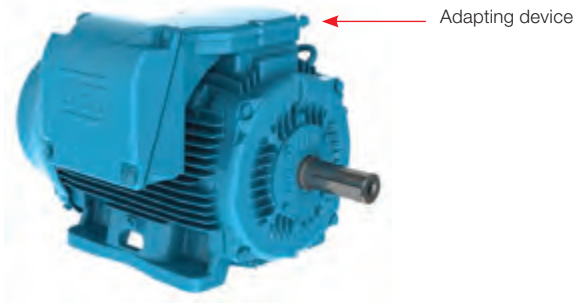


Figure 10 - Terminal box mounted on the left side viewing from shaft end

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.

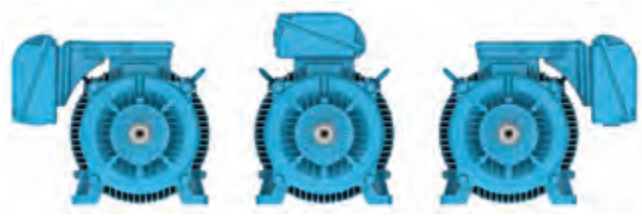


Figure 11 - Terminal box mounted on both sides and on top (versatility)

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 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 entries to maintain the degree of protection during transport and storage.
In order to guarantee the degree of protection, cable entries must comply with at least the same degree of protection 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 355A/B are provided with the terminal block as shown in the 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

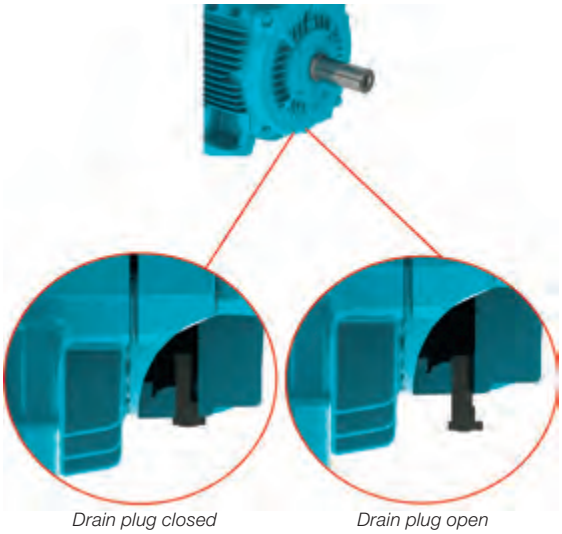
The drive end endshield (figure 16) is designed with fins for better thermal heat dissipation, and to ensure low bearing operating temperatures, resulting in extended lubrication intervals.

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 for frame range 160 to 355. These plugs leave the factory in the closed position and must be opened periodically to allow the exit of condensed water. In the 63 to 132 frame range, plugs are automatic and made of plastic.



Drain plug closed *Drain plug open*

Figure 17: Detail of the drain plug position on drive endshield (160-355)

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.

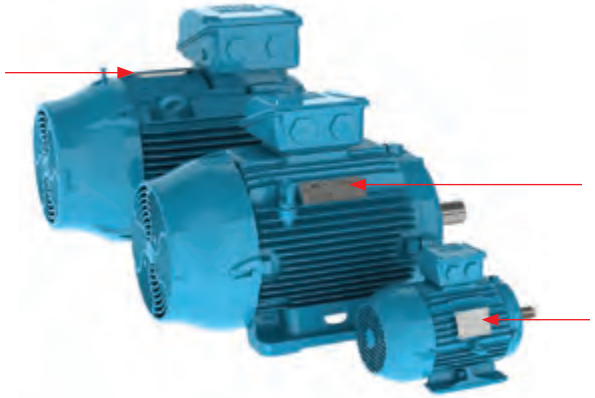


Figure 19 - Nameplate position of W22 motors

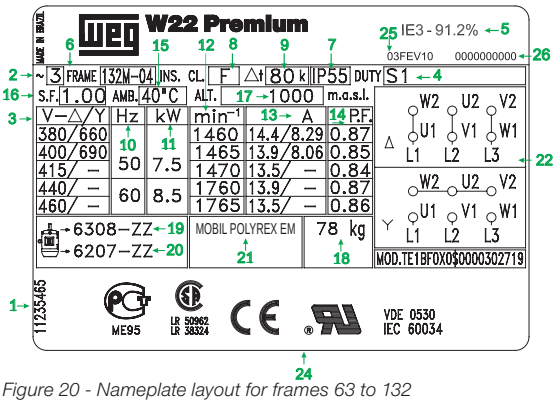


Figure 20 - Nameplate layout for frames 63 to 132

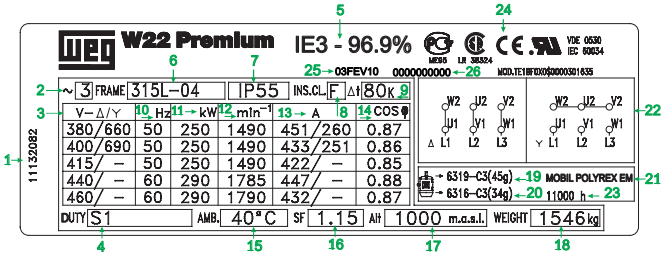


Figure 21 - Nameplate layout for frames 160 to 355

1 - Motor code
2 - Three phase
3 - Rated operating voltage
4 - Service duty
5 - Efficiency
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 specification and amount of grease
20 - Non-drive end bearing specification and amount of grease
21 - Type of grease for bearings
22 - Connection diagram
23 - Relubrication intervals in hours
24 - Certification labels
25 - Manufacturing date
26 - Serial number

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).

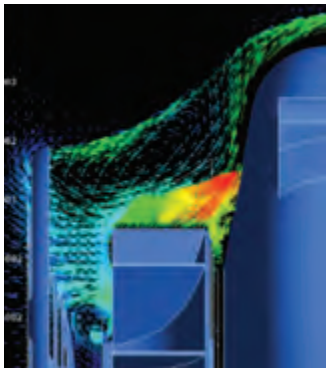


Figure 23 - Cooling system operation

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 Premium Efficiency 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 Premium Efficiency 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 ≤ H ≤ 160	2	5	7	8
180 ≤ H ≤ 200	2	4	6	7
225 ≤ H ≤ 280	2	3	6	7
H = 315	2	3	5	6
355 ≤ H	2	2	4	5

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 ≤ H ≤ 132	132 < H ≤ 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 of W22 standard motors is made of 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 frames 315L, 355M/L and 355A/B, W22 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 and have dimensions shown in section 17 - Mechanical data.

W22 motors can be supplied with a second shaft end as per dimensions shown in section 17 - Mechanical data.

Information about 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 size 160 and above can be supplied with NU series roller bearings, where high radial loads may occur.

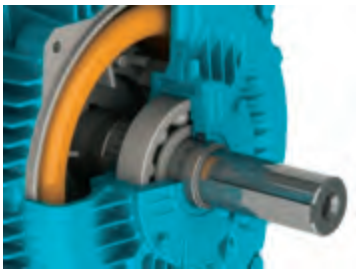


Figure 24: Bearing view

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 is 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.
Bearings lifetime depends on the type and size of the bearing, the radial and axial mechanical loads it is submitted to, operating conditions (environment, temperature), 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 interval is shown in tables 12 and 13 - 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 table 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 lifetime in combined axial and radial loads condition contact WEG.
2. The radial force value Fr usually results from information recommended on catalogues of pulley/belts manufacturers. When this information is not available, the force Fr, 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:

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

Where:
Fr is the radial force caused by pulley and belt coupling [N];
Pn 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 30 HP (22 kW)	2.0	3.1
2	(Fans and Blowers, Centrifugal Pumps, Winding machines, Compressors, Machine tools) with outputs higher than 30 HP (22 kW), Mixers, Plungers, Printer Machines	2.4	3.3
3	Presses, vibrating screens, Piston and screw compressor, pulverisers, helicoidal conveyors, woodworking machines, Textile machines, Kneading machines, Ceramic machines, Pulp and paper industrial grinders	2.7	3.4
4	Overhead cranes, Hammer mills, Metal laminators, Conveyors, Gyratory Crushers, Jaw Crusher, Cone Crushers, Cage Mills, Ball Mills, Rubber Mixers, Mining machines, Shredders	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.

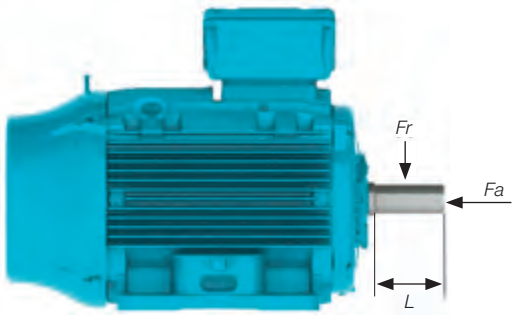


Figure 25 - Radial and axial thrust on motor shaft

5.2.1 Permissible Loads

Radial Thrust - Ball Bearings

Maximum permissible radial thrust - 50 Hz - Fr 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

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
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 pemissible axial thrusts for ball bearings

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

Lubrication Intervals (40 °C - Rated Speed)

Lubrication intervals (hours)				
Frame	Poles	Bearing	50 Hz	60 Hz
160	2	6309	22000	20000
	4		25000	25000
	6			
	8			
180	2	6311	17000	14000
	4		25000	25000
	6			
	8			
200	2	6312	15000	12000
	4		25000	25000
	6			
	8			
225	2	6314	5000	4000
	4		14000	12000
	6		20000	17000
	8		24000	20000
250	2	6314	5000	4000
	4		14000	12000
	6		20000	17000
	8		24000	20000
280	2	6314	5000	4000
	4	6316	13000	10000
	6		18000	16000
	8		20000	20000
315	2	6314	5000	4000
	4	6319	11000	8000
	6		16000	13000
	8		20000	17000
355	2	6314	5000	4000
		6316	4000	On request
	4	6322	9000	6000
	6		13000	11000
	8		19000	14000

Table 12 - Lubrication intervals for ball bearings

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

Lubrication intervals (hours)				
Frame	Poles	Bearing	50 Hz	60 Hz
160	4	NU309	25000	25000
	6			
	8			
180	4	NU311	25000	25000
	6			
	8			
200	4	NU312	25000	21000
	6			25000
	8			
225	4	NU314	11000	9000
	6		16000	13000
	8		20000	19000
250	4	NU314	11000	9000
	6		16000	13000
	8		20000	19000
280	4	NU316	9000	7000
	6		14000	12000
	8		19000	17000
315	4	NU319	7000	5000
	6		12000	9000
	8		17000	15000
355	4	NU322	5000	4000
	6		9000	7000
	8		14000	13000

Table 13 - Lubrication intervals for roller bearings

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 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).

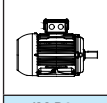
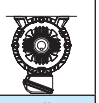
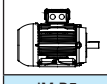
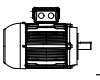
Basic mountings	Other type of mounting				
IM B3	IM V5	IM V6	IM B6	IM B7	IM B8
IM 1001	IM 1011	IM 1031	IM 1051	IM 1061	IM 1071
					
IM B35	IM V15	IM V36	- *)	- *)	- *)
IM 2001	IM 2011	IM 2031	IM 2051	IM 2061	IM 2071
					
IM B34	IM V17	IM V37	- *)	- *)	- *)
IM 2101	IM 2111	IM 2131	IM 2151	IM 2161	IM 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; C flange in accordance with NEMA MG 1 Part 4 standard is 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 meaning:

a) First characteristic numeral: referred 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 applied to the shaft of W22 motors in frame 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, and not recommended for use in flange mounted motors.

Figure 27 - WSeal®

Alternatively, W22 motors can be supplied with other sealing systems, for example, Oilseal, tachonite labyrinth and the WEG exclusive W3 Seal®, among others (see Section 15 - Optional features).
When fitted with flange, the recommended seal is lip leal (no contact with liquid) and Oilseal (with 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 "C2" performance criteria indicated in ISO 12944-2 Standard in regards 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

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

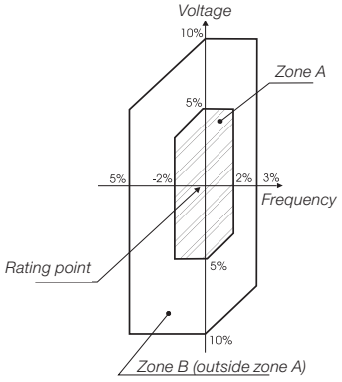


Figure 29 - Rated voltage and frequency limits for electric motors

IEC 60034-1 states that the motor must be suitable to perform its main function (supply torque) continuously at 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 at Zone A. The temperature rise will also be higher than that of rated voltage and frequency and that operating at Zone A. Prolonged operation near Zone B boundary 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 -30 °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 (Pmax).

Pmax = Pnom x correction factor

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

Table 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:

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

Upon service factor calculation, we can see that SF 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

Note: 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 highligthed 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 W22 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 (In), as per table 17.

Service factor	Relay setting current
1.0 up to 1.15	In x S.F.
≥ 1.15	(In 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 has a product called RPW which is an electronic relay intended specifically to read the PTC signal and operate its output relay. For more information go to the website www.weg.net.

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 go back to the original position instantaneously, allowing the silver contact to close again.

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

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

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 current and it is highly effective in cases of locked rotor.

WEG Automation supplies fuses in versions D and NH. Go to the site www.weg.net for more 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)		
$V_{rated} \leq 460$ V	≤ 1600 V	≤ 5200 V/µs	≥ 0.1 µs	≥ 6 µs
460 V < $V_{rated} \leq 575$ V	≤ 1800 V	≤ 6500 V/µs		
575 V < $V_{rated} \leq 690$ V	≤ 2200 V	≤ 7800 V/µs		

(*) 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 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);

- Blower cooling (use of an independent ventilation 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 under VSD supply, 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 are related to the motor thermal capability only and do not concern the insulation class. Speed regulation will depend on VSD mode of operation and proper adjustment.
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 of frame sizes ≥ 90S can be blower cooled (independently ventilated) under request. In such case, the motor will be suitable for VSD operation without torque derating regardless the load type.
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.
5 - Applications with motors rated for use in hazardous areas must be particularly evaluated - in such case please contact WEG.

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.

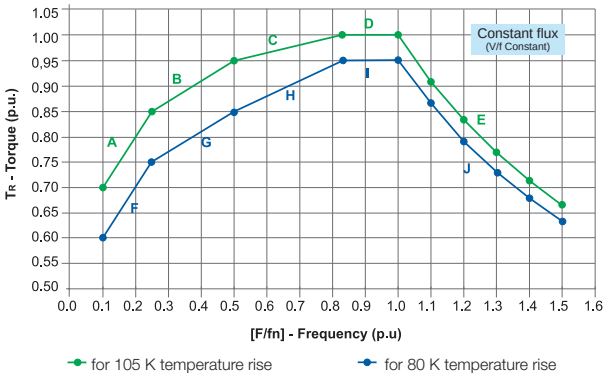


Figure 32 - Derating curves for constant flux condition

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

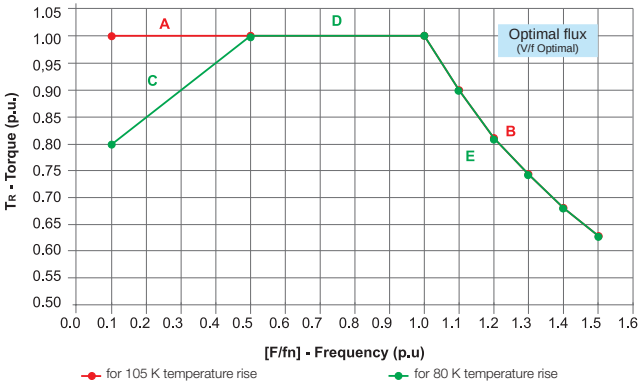


Figure 33 - Derating curves for Optimal Flux® condition

HP	TEFC Motors			ODP Motors		
	2 poles	4 poles	6 poles	2 poles	4 poles	6 poles
0.25	7200	3600	2400	7200	3600	2400
0.33	7200	3600	2400	7200	3600	2400
0.50	7200	3600	2400	7200	3600	2400
0.75	7200	3600	2400	7200	3600	2400
1	7200	3600	2400	7200	3600	2400
1.5	7200	3600	2400	7200	3600	2400
2	7200	3600	2400	7200	3600	2400
3	7200	3600	2400	7200	3600	2400
5	7200	3600	2400	7200	3600	2400
7.5	5400	3600	2400	7200	3600	2400
10	5400	3600	2400	5400	3600	2400
15	5400	3600	2400	5400	3600	2400
20	5400	3600	2400	5400	3600	2400
25	5400	2700	2400	5400	2700	2400
30	5400	2700	2400	5400	2700	2400
40	4500	2700	2400	5400	2700	2400
50	4500	2700	2400	4500	2700	2400
60	3600	2700	2400	4500	2700	2400
75	3600	2700	2400	3600	2700	2400
100	3600	2700	1800	3600	2700	1800
125	3600	2700	1800	3600	2700	1800
150	3600	2700	1800	3600	2700	1800
200	3600	2250	1800	3600	2700	1800
250	3600	2250	1800	3600	2250	1800
300	3600	2250	1800	3600	2250	1800
350	3600	1800	1800	3600	2250	1800
400	3600	1800	-	3600	2250	-
450	3600	1800	-	3600	2250	-
500	3600	1800	-	3600	2250	-

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 Kit

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.

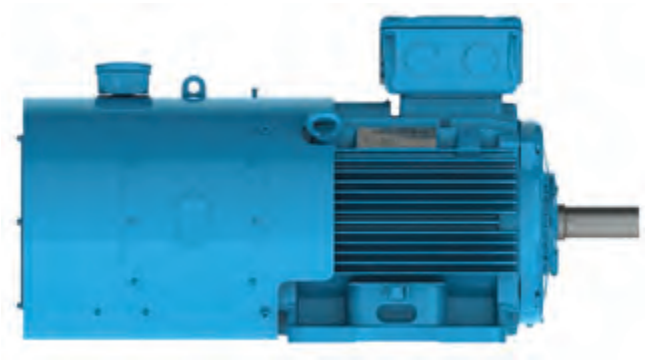


Figure 34 - Forced ventilation kit for W22 motors

When the forced ventilation kit is assembled on the motor in the factory, the overall motor length will be as shown in table 21. 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.

Frame size	Poles	Total motor length (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

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 - HS35 - 1024ppr (hollow shaft)
- Kübler - Model 5020 - 1024ppr (hollow shaft)
- Hengstler - RI58 - 1024ppr (hollow shaft)
- Line & Linde - XH861 - 1024ppr (hollow shaft)
- Hubner Berlin - HOG 10 - 1024ppr (hollow shaft)
- Hubner Guinsen - FGH4 - 1024ppr (shaft)

Other models can be supplied on request.
Note: The encoders described above are of the 1024 pulses per revolution type. As on 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 Pnom ≤ 150 kW / -0.1 (1-η) for Pnom > 150 kW Where η is a decimal number
Power factor	$\frac{1 - \cos \varnothing}{6}$ Minimum 0.02 and Maximum 0.07
Slip	± 20% for Pnom ≥ 1 kW and ± 30 % for Pnom < 1 kW
Starting current	20% (without lower limit)
Starting torque	- 15% + 25%
Breakdown torque	- 10 %
Moment of inertia	± 10 %

Table 21 - 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	
	Colour		Standard (IE1) and High Efficiency (IE2): RAL 5009 Premium Efficiency motors (IE3): 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 protector			Without thermal protector							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)	Simple 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
		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							
	Colour		Standard (IE1) and High Efficiency (IE2): RAL 5009 Premium Efficiency motors (IE3): 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 protector			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							
Additional terminal box	0	0	0	0	0	0	0
Terminal box with removable base	NA	NA	NA	NA	NA	NA	NA
Gland plate	0	0	0	0	0	0	0
Epoxy compound on leads entry	0	0	0	0	0	0	0
Self-extinguishing foam at lead entry	S	S	S	S	S	S	S
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
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
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
Insulated drive end bearing	NA	NA	NA	NA	NA	NA	NA
Insulated non drive end bearing	NA	NA	NA	NA	NA	NA	NA
Bearing cap							
Without bearing cap	S	S	S	S	S	S	S
With bearing cap	NA	0	0	0	0	0	0
Bearing 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®	NA	NA	NA	0	0	0	0

Notes: Other optional features, on request.
Some combinations of optional features are not allowed - then 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
NA	NA	NA	0	0	0	0	S	S	S
0	0	0	0	0	0	0	0	0	0
0	0	0	NA	NA	NA	NA	NA	NA	NA
S	S	S	S	S	S	S	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
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
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
NA	NA	NA	0	0	0	0	0	0	0
NA	NA	NA	0	0	0	0	0	0	0
Bearing cap									
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
S	S	S	S	S	S	S	S	S	S
Bearing 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	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 refi neries such as petrochemical industries that follow Petrobras specifi cations Note: Meets Petrobras N 1735 Standard (condition 3)	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 refi neries such as petrochemical industries that follow Petrobras specifi cations Note: Meets Petrobras N 1735 Standard (condition 3)	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 Not: Meets Petrobras N 1735 Standard (condition 4)	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)	0	0	0	0	0	0	0

Notes: Other optional features, on request.
Some combinations of optional features are not allowed - then 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
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

Frame	63	71	80	90	100	112	132
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)	O	O	O	O	O	O	O
Inside of terminal box painted (Munsell 2.5 YR 6/14)	O	O	O	O	O	O	O
Inside epoxy painting (tropicallized)	O	O	O	O	O	O	O
Lubrication							
Mobil Polyrex EM	S	S	S	S	S	S	S
Aeroshell 7	O	O	O	O	O	O	O
Isoflex NBU-15	O	O	O	O	O	O	O
Grease nipple							
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	O	O	O	O	O	O	O
Suitable to take 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)	O	O	O	O	O	O	O
Threaded drain plug	O	O	O	O	O	O	O
Stainless steel drain plug	O	O	O	O	O	O	O
T type drain plug	O	O	O	O	O	O	O
Grounding							
Additional grounding on the frame (outside the terminal box)	O	O	O	O	O	O	O
Other mechanical optionals							
Drip cover (recommended for vertical shaft down applications)	O	O	O	O	O	O	O
Rubber slinger (recommended for vertical shaft up applications)	NA	NA	NA	O	O	O	O
Stainless steel hardware	O	O	O	O	O	O	O
Grease outlet through the endshield	NA	NA	NA	NA	NA	NA	NA

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
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
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
Grease nipple									
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
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

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
Rotation direction							
Both	S	S	S	S	S	S	S
Clockwise rotation direction	0	0	0	0	0	0	0
Counter clockwise rotation direction	0	0	0	0	0	0	0
Nameplate with indication of rotation direction	0	0	0	0	0	0	0
Connection leads							
Leads connection at highest voltage (available only for motors fitted with terminal block)	0	0	0	0	0	0	0
Leads connection at lowest voltage (available only for motors fitted with terminal block)	S	S	S	S	S	S	S
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
Forced ventilation kit							
Forced ventilation kit with enconder provision (inform auxiliary motor voltage)	NA	NA	NA	0	0	0	0
Forced ventilation kit without encoder provision (informe 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

Notes: Other optional features, on request.
Some combinations of optional features are not allowed - then 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
0	0	0	0	0	0	0	0	0	0
Connection leads									
0	0	0	0	0	0	0	0	0	0
S	S	S	S	S	S	S	S	S	S
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
Forced ventilation kit									
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

16. Electrical Data

W22 - Standard Efficiency - IE1 (1)

Output		Frame	Full load torque (kgfm)	Locked rotor current Il/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 pole - 3000 rpm - 50 Hz																			
0.12	0.16	63	0.040	3.8	2.3	2.3	0.0001	27	59	4.3	52.0	2720	45.5	53.5	56.0	0.55	0.68	0.80	0.387
0.18	0.25	63	0.060	5.0	2.4	2.4	0.0001	10	22	4.7	52.0	2790	52.0	57.0	59.0	0.54	0.67	0.77	0.570
0.25	0.33	63	0.090	4.3	2.5	2.3	0.0001	25	55	5.1	52.0	2720	52.0	57.0	60.0	0.50	0.65	0.76	0.791
0.37	0.5	71	0.130	4.9	2.3	2.4	0.0003	16	35	5.5	56.0	2770	62.0	66.5	67.0	0.60	0.75	0.84	0.949
0.55	0.75	71	0.190	5.0	2.5	2.5	0.0004	7	15	6.5	56.0	2780	64.0	70.0	70.0	0.56	0.71	0.82	1.38
0.75	1	80	0.260	5.1	2.5	2.6	0.0007	14	31	9.5	59.0	2760	68.5	72.0	72.1	0.62	0.76	0.84	1.79
1.1	1.5	80	0.380	6.3	2.6	2.6	0.0009	7	15	13.5	59.0	2800	74.0	76.5	76.5	0.64	0.77	0.84	2.47
1.5	2	90S	0.510	6.3	2.7	2.6	0.0020	7	15	15.0	68.0	2840	77.5	78.5	78.5	0.63	0.76	0.83	3.32
2.2	3	90L	0.750	6.8	2.6	2.9	0.0026	7	15	16.7	68.0	2850	81.0	81.5	81.5	0.63	0.77	0.85	4.58
3	4	100L	1.02	6.7	2.3	2.8	0.0059	9	20	23.5	67.0	2870	81.5	82.0	82.0	0.69	0.81	0.87	6.07
4	5.5	112M	1.36	6.8	2.4	3.0	0.0080	9	20	31.0	64.0	2875	82.0	84.0	85.0	0.71	0.82	0.87	7.81
5.5	7.5	132S	1.84	6.5	2.4	3.0	0.0179	11	24	42.0	68.0	2910	85.0	86.0	86.0	0.71	0.81	0.87	10.6
7.5	10	132S	2.52	6.4	2.3	2.6	0.0233	11	24	65.0	68.0	2900	85.5	86.5	86.5	0.72	0.82	0.87	14.4
9.2	12.5	132M	3.08	7.5	2.7	3.1	0.0234	8	18	65.0	68.0	2910	87.0	87.5	87.5	0.70	0.81	0.86	17.6
11	15	160M	3.66	6.8	2.0	2.7	0.0372	11	24	97.0	67.0	2930	87.8	88.6	88.4	0.70	0.81	0.86	20.9
15	20	160M	4.99	7.2	2.2	2.8	0.0480	9	20	108	67.0	2930	89.5	89.8	89.5	0.71	0.81	0.86	28.1
18.5	25	160L	6.13	7.8	2.4	3.1	0.0589	7	15	122	67.0	2940	90.3	90.7	90.3	0.70	0.80	0.86	34.4
22	30	180M	7.30	7.3	2.2	3.1	0.0867	7	15	156	67.0	2935	90.7	91.0	90.8	0.76	0.84	0.88	39.7
30	40	200L	9.91	6.3	2.1	2.4	0.1532	18	40	220	72.0	2950	91.6	92.0	91.6	0.76	0.84	0.87	54.3
37	50	200L	12.2	6.5	2.2	2.4	0.1780	16	35	232	72.0	2950	92.0	92.5	92.0	0.76	0.84	0.87	66.7
45	60	225S/M	14.8	6.9	2.0	2.8	0.2471	10	22	356	75.0	2960	91.8	92.6	92.4	0.78	0.86	0.89	79.0
55	75	250S/M	18.1	6.7	2.0	2.7	0.3736	12	26	413	75.0	2960	92.2	93.0	92.8	0.79	0.86	0.89	96.1
75	100	280S/M	24.5	6.8	1.8	2.8	0.8492	28	62	630	77.0	2975	92.5	93.5	93.3	0.78	0.86	0.88	132
90	125	280S/M	29.5	7.0	2.0	2.8	0.9804	20	44	664	77.0	2975	93.0	93.8	93.7	0.80	0.87	0.89	156
110	150	315S/M	36.0	6.8	1.8	2.7	1.52	26	57	848	77.0	2980	93.3	94.3	94.0	0.78	0.85	0.88	192
132	175	315S/M	43.1	6.7	1.8	2.6	1.66	24	53	879	77.0	2980	93.5	94.3	94.3	0.79	0.86	0.89	227
150	200	315S/M	49.1	7.0	2.2	3.0	1.95	20	44	880	77.0	2975	94.0	94.5	94.5	0.77	0.85	0.87	263
160	220	315S/M	52.3	7.6	2.0	2.8	2.04	21	46	950	77.0	2980	94.0	94.5	94.5	0.80	0.87	0.90	272
185	250	315S/M	60.5	7.7	2.0	2.8	2.23	14	31	993	77.0	2980	94.4	94.6	94.6	0.77	0.84	0.88	321
200	270	315L	65.4	7.7	2.1	2.8	2.17	17	37	1135	78.0	2980	94.4	94.7	94.6	0.80	0.87	0.90	339
220	300	315L	71.9	8.0	2.3	2.8	3.21	14	31	1224	78.0	2980	94.5	94.8	94.7	0.82	0.88	0.90	373
250	340	315L	81.7	7.9	2.4	2.8	5.39	14	31	1316	78.0	2980	94.5	94.8	94.7	0.83	0.88	0.91	419
260	350	315L	85.1	7.0	2.4	2.5	3.70	20	44	1340	78.0	2975	94.5	94.8	94.8	0.83	0.89	0.91	435
280(*)	380	315L	91.5	8.5	2.8	2.8	3.21	14	31	1443	78.0	2980	94.5	94.9	94.8	0.84	0.88	0.90	474
300(*)	400	315L	98.1	7.5	2.5	2.5	4.15	12	26	1500	78.0	2980	94.8	95.0	95.0	0.84	0.88	0.90	506
315	430	355M/L	103	7.8	2.1	2.6	5.60	22	48	1770	80.0	2985	94.6	94.9	94.8	0.87	0.90	0.91	527
355	480	355M/L	116	7.9	2.2	2.8	6.01	14	31	1830	80.0	2985	94.6	95.0	94.8	0.86	0.90	0.91	594

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

W22 - Standard Efficiency - IE1 (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	
II pole - 3000 rpm - 50 Hz																	
0.12	0.16	2690	48.0	55.0	58.8	0.59	0.74	0.84	0.369	2735	43.0	51.0	53.5	0.52	0.64	0.75	0.416
0.18	0.25	2760	54.0	58.0	59.5	0.59	0.73	0.82	0.560	2810	49.2	55.0	58.0	0.51	0.62	0.73	0.588
0.25	0.33	2685	54.0	59.0	60.0	0.56	0.71	0.81	0.782	2740	50.0	55.5	59.9	0.47	0.60	0.72	0.806
0.37	0.5	2740	64.6	67.5	66.6	0.67	0.81	0.88	0.959	2790	59.1	64.9	66.6	0.55	0.70	0.80	0.966
0.55	0.75	2740	65.4	70.0	70.0	0.61	0.76	0.84	1.42	2810	62.4	69.5	69.5	0.52	0.67	0.79	1.39
0.75	1	2730	70.8	72.7	72.1	0.69	0.82	0.88	1.80	2775	66.2	70.6	72.1	0.56	0.70	0.80	1.81
1.1	1.5	2775	75.3	76.8	76.1	0.70	0.82	0.88	2.50	2815	72.2	75.5	76.4	0.57	0.71	0.80	2.50
1.5	2	2820	78.5	79.1	79.1	0.70	0.81	0.87	3.31	2855	75.5	77.9	78.3	0.57	0.71	0.80	3.33
2.2	3	2830	81.0	81.5	81.5	0.70	0.82	0.88	4.66	2860	80.5	81.3	81.3	0.57	0.72	0.82	4.59
3	4	2855	82.4	83.0	83.0	0.75	0.85	0.89	6.17	2880	80.5	82.4	83.5	0.64	0.77	0.84	5.95
4	5.5	2860	83.0	84.2	84.5	0.77	0.86	0.89	8.08	2885	80.8	83.4	84.8	0.66	0.78	0.85	7.72
5.5	7.5	2895	85.4	86.0	86.0	0.77	0.85	0.89	10.9	2915	84.0	85.5	86.0	0.66	0.78	0.84	10.6
7.5	10	2890	86.3	86.5	86.5	0.78	0.86	0.89	14.8	2910	84.5	86.0	86.5	0.66	0.78	0.84	14.4
9.2	12.5	2900	87.9	88.0	88.0	0.76	0.85	0.89	17.8	2915	85.8	87.5	87.9	0.63	0.76	0.83	17.5
11	15	2920	88.4	88.7	88.1	0.76	0.85	0.88	21.6	2935	87.1	88.3	88.4	0.65	0.77	0.84	20.6
15	20	2945	89.9	89.8	89.1	0.76	0.84	0.88	29.1	2935	89.0	89.7	89.6	0.67	0.78	0.84	27.7
18.5	25	2935	90.8	90.8	90.1	0.75	0.84	0.88	35.5	2945	89.7	90.4	90.3	0.65	0.76	0.84	33.9
22	30	2925	90.9	90.8	90.3	0.80	0.86	0.89	41.6	2940	90.4	91.0	91.0	0.73	0.82	0.87	38.7
30	40	2945	91.8	91.9	91.2	0.80	0.86	0.88	56.8	2955	91.3	92.0	91.8	0.72	0.81	0.86	52.9
37	50	2945	92.2	92.4	91.6	0.80	0.87	0.88	69.7	2950	91.7	92.4	92.1	0.72	0.81	0.85	65.8
45	60	2955	91.9	92.5	92.5	0.82	0.88	0.90	82.1	2960	91.6	92.6	92.4	0.75	0.84	0.88	77.0
55	75	2955	92.3	92.9	92.5	0.83	0.88	0.90	100	2965	91.9	93.0	92.8	0.75	0.84	0.87	94.8
75	100	2970	92.7	93.5	93.1	0.81	0.88	0.89	138	2980	92.2	93.4	93.3	0.75	0.84	0.87	129
90	125	2970	93.1	93.7	93.5	0.83	0.89	0.90	162	2980	92.8	93.7	93.7	0.77	0.85	0.88	152
110	150	2975	93.6	94.4	93.9	0.82	0.87	0.89	200	2980	93.0	94.2	94.0	0.75	0.83	0.87	187
132	175	2975	93.8	94.2	94.1	0.83	0.88	0.90	237	2980	93.2	94.3	94.4	0.76	0.84	0.88	221
150	200	2975	94.2	94.5	94.5	0.80	0.85	0.88	274	2980	94.5	94.7	94.7	0.75	0.82	0.86	256
160	220	2975	94.2	94.5	94.4	0.83	0.89	0.91	283	2980	93.8	94.4	94.5	0.77	0.85	0.89	265
185	250	2975	94.6	94.6	94.5	0.80	0.86	0.89	334	2980	94.2	94.5	94.6	0.74	0.82	0.87	313
200	270	2980	94.5	94.7	94.6	0.83	0.89	0.91	353	2980	94.2	94.6	94.6	0.77	0.85	0.89	330
220	300	2975	94.6	94.8	94.5	0.84	0.89	0.91	389	2980	94.5	94.8	94.8	0.80	0.87	0.89	363
250	340	2975	94.5	94.8	94.5	0.85	0.89	0.91	442	2980	94.3	94.8	94.8	0.81	0.87	0.90	408
260	350	2970	94.3	94.7	94.7	0.85	0.90	0.92	453	2975	94.7	94.9	94.9	0.82	0.88	0.90	424
280	380	2975	94.6	94.8	94.8	0.86	0.89	0.90	499	2980	94.4	94.9	94.9	0.83	0.87	0.90	456
300	400	2975	94.8	94.9	94.9	0.86	0.89	0.91	528	2980	94.8	95.1	95.1	0.82	0.87	0.89	493
315	430	2980	94.2	94.9	94.8	0.88	0.91	0.91	555	2985	94.6	94.9	94.9	0.86	0.89	0.91	507
355	480	2980	94.6	94.9	94.6	0.88	0.91	0.91	627	2985	94.6	95.0	94.9	0.84	0.89	0.91	572

W22 - Standard Efficiency - IE1 (1)

Output		Frame	Full load torque (Nm)	Locked rotor current Il/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 pole - 3000 rpm - 50 Hz																			
Optional frames (high-output design)																			
0.37	0.5	63	0.130	5.0	2.2	2.2	0.0002	7	15	7.2	52.0	2740	60.0	62.0	64.0	0.58	0.73	0.82	1.02
0.55	0.75	80	0.190	5.1	2.6	2.6	0.0004	21	46	8.0	59.0	2755	64.5	68.5	69.0	0.60	0.74	0.83	1.39
0.75	1	71	0.270	5.5	2.8	2.8	0.0005	12	26	9.0	56.0	2740	71.0	72.0	72.1	0.70	0.82	0.89	1.69
1.1	1.5	90S	0.370	6.3	2.7	2.6	0.0012	7	15	15.0	68.0	2880	74.5	76.5	76.5	0.63	0.76	0.83	2.50
1.5	2	80	0.530	5.5	2.8	2.7	0.0009	15	33	15.0	59.0	2745	76.0	77.0	77.2	0.71	0.82	0.87	3.22
2.2	3	100L	0.750	7.5	2.2	2.7	0.0045	13	29	27.0	67.0	2860	81.0	81.5	81.5	0.73	0.83	0.88	4.33
2.2	3	90S	0.760	6.8	2.8	2.9	0.0021	9	20	16.7	68.0	2810	81.0	81.5	81.5	0.63	0.77	0.85	4.58
3	4	112M	1.02	7.2	2.4	2.8	0.0063	20	44	37.0	64.0	2875	83.0	83.5	83.5	0.75	0.84	0.89	5.83
3(*)	4	90L	1.04	6.0	3.4	3.0	0.0025	7	15	23.5	64.0	2820	81.0	81.5	81.5	0.57	0.71	0.80	6.64
4	5.5	100L	1.35	8.4	3.2	3.4	0.0064	8	18	32.0	67.0	2885	83.0	84.0	83.5	0.69	0.81	0.87	7.95
4	5.5	132S	1.34	6.5	2.3	2.8	0.0179	13	29	61.0	65.0	2910	83.0	84.0	84.0	0.67	0.78	0.85	8.09
5.5	7.5	112M	1.87	7.7	2.5	3.0	0.0096	10	22	40.0	64.0	2870	85.5	86.0	86.0	0.79	0.86	0.89	10.3
5.5	7.5	132M	1.84	6.5	2.4	3.0	0.0179	11	24	42.0	68.0	2910	85.0	86.0	86.0	0.71	0.81	0.87	10.6
7.5(*)	10	112M	2.54	7.2	3.1	3.2	0.0094	8	18	42.0	64.0	2875	85.5	86.5	86.5	0.64	0.77	0.84	14.9
7.5	10	132M	2.52	6.4	2.3	2.6	0.0233	11	24	65.0	68.0	2900	85.5	86.5	86.5	0.72	0.82	0.87	14.4
9.2	12.5	160M	3.06	6.6	1.8	2.5	0.0335	13	29	93.0	67.0	2925	87.5	88.1	88.0	0.73	0.83	0.87	17.3
11	15	132M	3.66	8.0	3.0	3.4	0.0270	8	18	74.0	68.0	2925	87.5	89.5	89.5	0.67	0.79	0.85	20.9
15	20	160L	4.99	7.2	2.2	2.8	0.0480	9	20	108	67.0	2930	89.5	89.8	89.5	0.71	0.81	0.86	28.1
22	30	160L	7.29	7.8	2.6	3.3	0.0804	7	15	140	67.0	2940	90.5	91.0	91.0	0.73	0.82	0.87	40.1
22	30	180L	7.30	7.3	2.2	3.1	0.0867	7	15	156	67.0	2935	90.7	91.0	90.8	0.76	0.84	0.88	39.7
30	40	180L	9.94	8.2	2.2	2.9	0.1301	8	18	194	76.0	2940	91.5	91.8	91.5	0.78	0.86	0.89	52.9
30	40	200M	9.91	6.3	2.1	2.4	0.1532	18	40	220	72.0	2950	91.6	92.0	91.6	0.76	0.84	0.87	54.3
37	50	200M	12.2	6.5	2.2	2.4	0.1780	16	35	232	72.0	2950	92.0	92.5	92.0	0.76	0.84	0.87	66.7
45	60	200L	14.8	7.0	2.3	2.5	0.2204	13	29	272	72.0	2955	92.3	92.6	92.5	0.77	0.85	0.88	79.8
55	75	225S/M	18.1	7.2	2.1	2.7	0.3238	9	20	394	75.0	2960	92.2	93.0	92.8	0.81	0.87	0.89	96.1
75	100	250S/M	24.6	7.8	2.4	3.0	0.4924	9	20	457	75.0	2965	93.0	93.5	93.3	0.78	0.86	0.89	130
110	150	280S/M	36.0	7.0	2.0	2.8	1.10	20	44	702	77.0	2975	93.5	94.2	94.0	0.79	0.86	0.89	190
132	175	280S/M	43.2	7.2	1.9	2.7	1.33	16	35	759	77.0	2975	94.0	94.3	94.3	0.81	0.86	0.89	227
200	270	315S/M	65.4	7.7	2.1	2.8	2.46	17	37	1135	77.0	2980	94.4	94.7	94.6	0.80	0.87	0.90	339
200	270	355M/L	65.3	7.4	1.7	2.7	3.66	28	62	1430	80.0	2985	94.5	94.8	94.7	0.82	0.87	0.89	343
220	300	355M/L	71.8	7.7	1.8	2.8	4.09	20	44	1496	80.0	2985	94.5	94.8	94.7	0.83	0.88	0.90	373
250	340	355M/L	81.6	7.9	2.1	2.8	4.63	20	44	1592	80.0	2985	94.5	94.8	94.7	0.86	0.88	0.90	423
280	380	355M/L	91.5	7.6	2.0	2.6	5.06	17	37	1663	80.0	2980	94.6	94.9	94.8	0.86	0.90	0.91	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 - Standard Efficiency - IE1 (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	
II pole - 3000 rpm - 50 Hz																	
Optional frames (high-output design)																	
0.37	0.5	2690	62.1	62.6	63.0	0.64	0.77	0.86	1.04	2770	57.5	60.9	64.1	0.53	0.68	0.79	1.01
0.55	0.75	2725	66.8	69.3	68.7	0.68	0.80	0.87	1.40	2770	62.2	67.1	68.6	0.55	0.69	0.79	1.41
0.75	1	2710	71.9	71.9	72.1	0.75	0.86	0.91	1.74	2760	70.0	71.7	72.5	0.65	0.79	0.86	1.67
1.1	1.5	2860	75.5	77.1	77.1	0.70	0.81	0.87	2.49	2890	72.6	75.9	76.3	0.57	0.71	0.80	2.51
1.5	2	2710	76.8	76.7	77.2	0.77	0.85	0.89	3.32	2765	75.3	76.9	77.7	0.67	0.79	0.85	3.16
2.2	3	2840	81.0	81.2	81.2	0.77	0.86	0.89	4.52	2870	80.5	81.5	81.9	0.70	0.81	0.86	4.25
2.2	3	2790	81.0	81.5	81.5	0.70	0.82	0.88	4.66	2820	80.5	81.3	81.3	0.57	0.72	0.82	4.59
3	4	2860	83.5	83.4	82.8	0.79	0.87	0.90	6.12	2885	82.4	83.4	83.7	0.71	0.81	0.87	5.73
3	4	2800	82.1	81.7	81.5	0.63	0.76	0.84	6.66	2835	79.8	81.0	81.6	0.52	0.67	0.77	6.64
4	5.5	2870	83.9	84.3	83.2	0.75	0.85	0.90	8.12	2895	81.9	83.6	83.5	0.64	0.77	0.84	7.93
4	5.5	2900	83.5	84.0	84.8	0.73	0.83	0.87	8.24	2920	81.0	84.0	85.0	0.63	0.75	0.82	7.98
5.5	7.5	2860	86.0	86.5	86.2	0.82	0.88	0.90	10.7	2880	85.0	86.5	86.7	0.76	0.84	0.88	9.92
5.5	7.5	2895	85.4	86.0	86.0	0.77	0.85	0.89	10.9	2915	84.0	85.5	86.0	0.66	0.78	0.84	10.6
7.5	10	2860	86.8	86.9	86.3	0.71	0.82	0.88	15.0	2885	84.3	85.9	86.3	0.57	0.71	0.80	15.1
7.5	10	2890	86.3	86.5	86.5	0.78	0.86	0.89	14.8	2910	84.5	86.0	86.5	0.66	0.78	0.84	14.4
9.2	12.5	2915	87.9	88.0	87.5	0.77	0.86	0.89	17.9	2930	87.0	88.0	88.2	0.69	0.80	0.85	17.1
11	15	2915	88.5	89.5	89.0	0.74	0.84	0.88	21.3	2930	86.4	89.0	89.5	0.60	0.74	0.81	21.1
15	20	2945	89.9	89.8	89.1	0.76	0.84	0.88	29.1	2935	89.0	89.7	89.6	0.67	0.78	0.84	27.7
22	30	2930	90.7	91.0	91.0	0.77	0.84	0.88	41.7	2945	90.2	90.8	90.8	0.70	0.80	0.86	39.2
22	30	2925	90.9	90.8	90.3	0.80	0.86	0.89	41.6	2940	90.4	91.0	91.0	0.73	0.82	0.87	38.7
30	40	2935	91.6	91.6	91.1	0.81	0.88	0.90	55.0	2945	91.3	91.8	91.7	0.75	0.84	0.88	51.4
30	40	2945	91.8	91.9	91.2	0.80	0.86	0.88	56.8	2955	91.3	92.0	91.8	0.72	0.81	0.86	52.9
37	50	2945	92.2	92.4	91.6	0.80	0.87	0.88	69.7	2950	91.7	92.4	92.1	0.72	0.81	0.85	65.8
45	60	2950	92.5	92.5	92.2	0.81	0.87	0.89	83.3	2960	92.0	92.6	92.6	0.73	0.83	0.87	77.7
55	75	2955	92.3	92.8	92.4	0.83	0.88	0.90	100	2960	92.1	93.0	93.0	0.79	0.86	0.88	93.5
75	100	2960	93.2	93.5	93.1	0.82	0.88	0.90	136	2970	92.7	93.4	93.3	0.74	0.83	0.87	129
110	150	2970	93.6	94.1	93.8	0.82	0.87	0.90	198	2975	93.3	93.9	94.0	0.76	0.84	0.88	185
132	175	2970	94.1	94.2	94.1	0.84	0.87	0.90	237	2980	93.9	94.3	94.4	0.79	0.85	0.88	221
200	270	2980	94.5	94.7	94.6	0.83	0.89	0.91	353	2980	94.2	94.6	94.6	0.77	0.85	0.89	330
200	270	2980	94.5	94.8	94.8	0.84	0.88	0.90	356	2985	94.3	94.6	94.7	0.80	0.86	0.89	330
220	300	2985	94.5	95.5	95.9	0.89	0.92	0.93	375	2990	93.9	95.3	96.0	0.86	0.90	0.92	347
250	340	2980	94.6	94.8	94.8	0.87	0.89	0.90	445	2985	94.4	94.8	94.8	0.84	0.87	0.90	408
280	380	2975	94.6	94.8	94.6	0.86	0.89	0.90	500	2980	94.4	94.9	94.9	0.83	0.87	0.90	456

W22 - Standard Efficiency - IE1 (1)

Output		Frame	Full load torque (Nm)	Locked rotor current Il/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	
IV pole - 1500 rpm - 50 Hz																			
0.12	0.16	63	0.090	3.5	1.8	2.0	0.0003	38	84	5.2	44.0	1350	46.0	53.0	55.0	0.51	0.64	0.75	0.420
0.18	0.25	63	0.130	3.8	1.9	1.9	0.0004	16	35	6.2	44.0	1370	51.0	55.0	57.0	0.52	0.65	0.75	0.610
0.25	0.33	71	0.180	3.7	1.8	1.9	0.0006	28	62	5.5	43.0	1370	53.0	58.0	60.0	0.50	0.62	0.73	0.820
0.37	0.5	71	0.260	3.6	2.0	2.0	0.0007	28	62	7.0	43.0	1370	58.0	62.0	63.0	0.50	0.64	0.73	1.16
0.55	0.75	80	0.380	4.9	2.0	2.4	0.0024	8	18	9.5	44.0	1415	65.0	70.0	71.0	0.57	0.72	0.81	1.38
0.75	1	80	0.520	4.9	2.1	2.3	0.0030	7	15	10.5	44.0	1410	70.0	72.0	72.3	0.58	0.72	0.81	1.85
1.1	1.5	90S	0.750	5.8	1.8	2.4	0.0052	7	15	14.5	49.0	1430	72.5	75.5	75.5	0.60	0.74	0.82	2.57
1.5	2	90L	1.04	5.5	1.9	2.4	0.0066	8	18	17.0	49.0	1410	74.5	77.5	77.5	0.58	0.73	0.82	3.41
2.2	3	100L	1.52	5.6	2.4	2.6	0.0089	9	20	23.0	53.0	1410	79.0	80.0	80.0	0.60	0.74	0.82	4.84
3	4	100L	2.06	6.5	2.5	2.7	0.0105	8	18	30.0	53.0	1420	79.0	81.5	81.5	0.57	0.72	0.81	6.56
4	5.5	112M	2.71	6.2	2.1	2.5	0.0181	9	20	33.0	56.0	1440	82.5	83.5	83.5	0.65	0.77	0.83	8.33
5.5	7.5	132S	3.66	7.5	2.1	2.5	0.0452	7	15	47.0	60.0	1465	84.0	85.5	85.5	0.63	0.77	0.84	11.1
7.5	10	132M	5.00	6.4	2.0	2.5	0.0601	8	18	64.5	60.0	1460	85.5	87.0	87.0	0.63	0.75	0.82	15.2
9.2	12.5	160M	6.14	6.0	2.0	2.4	0.0767	9	20	93.0	61.0	1460	86.8	87.5	87.4	0.64	0.76	0.82	18.5
11	15	160M	7.34	6.0	2.1	2.5	0.0837	9	20	96.0	61.0	1460	87.0	88.0	88.0	0.64	0.76	0.82	22.0
15	20	160L	9.97	6.8	2.6	2.8	0.1185	8	18	121	61.0	1465	89.0	89.7	89.3	0.66	0.76	0.83	29.2
18.5	25	180M	12.3	6.6	2.4	2.8	0.1398	12	26	152	61.0	1465	89.7	90.4	90.2	0.67	0.77	0.84	35.2
22	30	180L	14.6	6.6	2.4	2.9	0.1657	10	22	164	61.0	1465	90.0	90.8	90.7	0.66	0.77	0.84	41.7
30	40	200L	19.9	6.3	2.1	2.6	0.2668	13	29	212	65.0	1470	91.3	91.7	91.5	0.68	0.78	0.84	56.3
37	50	225S/M	24.4	6.7	2.3	2.7	0.3944	10	22	342	66.0	1475	92.0	92.4	92.2	0.71	0.81	0.85	68.1
45	60	225S/M	29.7	6.9	2.4	2.7	0.4684	10	22	363	66.0	1475	92.2	92.2	92.6	0.72	0.82	0.86	81.6
55	75	250S/M	36.3	6.5	2.1	2.5	0.7103	12	26	431	66.0	1475	92.9	93.2	93.1	0.73	0.82	0.85	100
75	100	280S/M	49.2	6.6	2.0	2.6	1.56	22	48	639	69.0	1485	93.0	93.5	93.5	0.73	0.81	0.85	136
90	125	280S/M	59.0	6.8	2.1	2.7	1.87	20	44	673	69.0	1485	93.2	93.8	93.8	0.75	0.83	0.86	159
110	150	315S/M	71.9	6.4	2.0	2.4	2.55	26	57	887	71.0	1490	93.6	94.3	94.1	0.75	0.83	0.86	196
132	175	315S/M	86.3	6.9	2.3	2.4	3.11	22	48	953	71.0	1490	93.9	94.5	94.3	0.74	0.83	0.86	235
150	200	315S/M	98.1	7.0	2.5	2.8	3.34	18	40	1012	71.0	1490	94.0	94.5	94.5	0.74	0.82	0.86	266
160	220	315S/M	105	7.3	2.4	2.5	3.54	18	40	1012	71.0	1490	94.1	94.6	94.5	0.73	0.82	0.86	284
185	250	315S/M	121	6.9	2.4	2.3	3.98	17	37	1071	71.0	1490	94.3	94.7	94.6	0.74	0.82	0.86	328
200	270	315L	131	6.9	2.4	2.3	4.41	16	35	1216	74.0	1490	94.4	94.8	94.7	0.76	0.84	0.85	359
220	300	315L	144	7.7	2.6	2.4	4.85	14	31	1330	74.0	1490	94.5	94.9	94.8	0.74	0.83	0.86	389
250	340	315L	163	7.8	2.7	2.5	5.40	12	26	1399	74.0	1490	94.6	94.9	94.8	0.75	0.83	0.86	443
260	350	315L	170	7.8	2.7	2.5	5.40	12	26	1399	74.0	1490	94.6	94.9	94.8	0.75	0.83	0.86	460
280	380	315L	183	7.9	2.7	2.5	6.16	12	26	1496	74.0	1490	94.6	95.0	94.9	0.74	0.82	0.86	495
300	400	355M/L	196	7.2	2.2	2.4	8.59	18	40	1560	76.0	1490	94.6	95.0	94.9	0.74	0.82	0.85	537
315	430	355M/L	206	7.2	2.4	2.4	8.95	14	31	1670	76.0	1490	94.6	95.0	94.9	0.74	0.82	0.86	557
330	450	355M/L	216	6.8	2.2	2.4	9.84	17	37	1769	76.0	1490	94.6	95.0	94.9	0.75	0.83	0.86	584
355	480	355M/L	232	6.9	2.4	2.3	10.7	15	33	1888	76.0	1490	94.6	95.0	94.9	0.75	0.83	0.86	628
370	500	355M/L	242	7.3	2.6	2.4	11.6	11	24	1971	76.0	1490	94.9	95.1	94.9	0.75	0.83	0.86	654
400	550	355M/L	261	7.3	2.6	2.4	11.6	11	24	1971	76.0	1490	94.7	95.1	94.9	0.74	0.82	0.86	707

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 - Standard Efficiency - IE1 (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	
IV pole - 1500 rpm - 50 Hz																	
0.12	0.16	1330	49.6	55.0	55.1	0.56	0.69	0.79	0.419	1360	42.7	50.9	54.0	0.48	0.60	0.71	0.435
0.18	0.25	1350	51.0	55.0	57.0	0.57	0.69	0.80	0.600	1380	48.0	53.0	55.0	0.48	0.59	0.69	0.660
0.25	0.33	1340	57.3	58.9	58.9	0.55	0.68	0.78	0.830	1385	48.9	55.3	59.4	0.47	0.58	0.69	0.840
0.37	0.5	1345	61.5	63.5	62.6	0.55	0.70	0.78	1.15	1385	54.3	59.8	62.5	0.46	0.59	0.69	1.19
0.55	0.75	1400	68.0	71.3	70.9	0.63	0.78	0.85	1.39	1420	62.0	68.4	70.4	0.53	0.68	0.77	1.41
0.75	1	1395	72.2	72.5	72.1	0.64	0.76	0.84	1.88	1420	68.0	71.0	72.4	0.54	0.67	0.78	1.85
1.1	1.5	1415	73.0	75.5	75.5	0.66	0.79	0.85	2.60	1435	70.5	74.5	75.5	0.56	0.70	0.80	2.54
1.5	2	1400	74.5	77.5	77.5	0.65	0.78	0.86	3.42	1415	72.5	77.5	77.5	0.52	0.67	0.77	3.50
2.2	3	1400	79.0	80.5	79.7	0.67	0.79	0.85	4.98	1420	77.5	79.5	80.0	0.55	0.68	0.78	4.90
3	4	1410	80.0	81.5	81.5	0.64	0.77	0.84	6.66	1430	77.0	81.5	81.5	0.52	0.67	0.78	6.57
4	5.5	1430	82.9	83.1	83.1	0.71	0.81	0.86	8.50	1445	81.0	83.0	83.5	0.59	0.72	0.80	8.33
5.5	7.5	1460	85.0	85.5	85.5	0.70	0.81	0.86	11.4	1470	83.2	85.0	85.5	0.58	0.72	0.81	11.0
7.5	10	1455	86.5	86.8	86.8	0.71	0.80	0.85	15.5	1460	83.7	86.2	86.7	0.57	0.70	0.78	15.4
9.2	12.5	1455	87.5	87.6	87.0	0.69	0.79	0.84	19.1	1465	86.1	87.2	87.5	0.60	0.73	0.80	18.3
11	15	1455	87.8	88.2	87.6	0.69	0.80	0.84	22.7	1465	86.1	87.6	88.0	0.59	0.72	0.79	22.0
15	20	1460	89.5	89.7	88.9	0.71	0.79	0.85	30.2	1470	88.4	89.5	89.4	0.62	0.73	0.81	28.8
18.5	25	1460	90.5	90.6	90.0	0.73	0.81	0.87	35.9	1470	89.0	90.1	90.2	0.62	0.73	0.81	35.2
22	30	1460	90.8	91.0	90.5	0.72	0.81	0.87	42.5	1470	89.3	90.5	90.6	0.61	0.73	0.81	41.7
30	40	1465	91.7	91.7	91.2	0.73	0.81	0.86	58.1	1470	90.8	91.5	91.6	0.63	0.75	0.82	55.6
37	50	1470	92.3	92.4	91.9	0.76	0.84	0.86	71.1	1475	91.6	92.3	92.2	0.68	0.78	0.83	67.3
45	60	1470	92.5	92.2	92.3	0.76	0.85	0.87	85.1	1475	91.9	92.1	92.6	0.68	0.79	0.84	80.5
55	75	1470	93.1	93.1	92.7	0.77	0.84	0.86	105	1475	92.6	93.1	93.1	0.70	0.80	0.84	97.8
75	100	1480	93.3	93.5	93.3	0.77	0.83	0.86	142	1485	92.7	93.4	93.5	0.70	0.79	0.84	133
90	125	1480	93.6	93.9	93.6	0.79	0.85	0.88	166	1486	92.8	93.6	93.8	0.72	0.81	0.85	157
110	150	1490	93.8	94.3	93.9	0.79	0.85	0.87	205	1490	93.3	94.2	94.1	0.72	0.81	0.85	191
132	175	1490	94.2	94.5	94.2	0.78	0.85	0.87	245	1490	93.6	94.4	94.3	0.71	0.81	0.85	229
150	200	1490	94.5	94.6	94.6	0.78	0.85	0.88	274	1490	93.6	94.3	94.5	0.70	0.79	0.84	263
160	220	1490	94.4	94.7	94.4	0.77	0.84	0.87	296	1490	93.8	94.5	94.5	0.70	0.80	0.85	277
185	250	1490	94.5	94.7	94.4	0.78	0.84	0.87	342	1490	94.0	94.6	94.6	0.71	0.80	0.85	320
200	270	1490	94.6	94.8	94.5	0.79	0.86	0.88	365	1490	94.2	94.8	94.8	0.73	0.82	0.86	342
220	300	1490	94.7	94.9	94.7	0.78	0.85	0.87	406	1490	94.3	94.8	94.8	0.71	0.81	0.85	380
250	340	1490	95.4	94.9	94.7	0.79	0.85	0.87	461	1490	95.0	94.8	94.8	0.72	0.81	0.85	432
260	350	1490	95.4	94.9	94.7	0.79	0.85	0.87	479	1490	95.0	94.8	94.8	0.72	0.81	0.85	449
280	380	1490	95.6	95.0	94.8	0.77	0.84	0.87	516	1490	95.2	94.9	94.9	0.71	0.80	0.85	483
300	400	1490	94.7	94.8	94.8	0.78	0.84	0.88	546	1490	94.4	94.9	94.9	0.71	0.80	0.84	524
315	430	1490	94.8	94.9	94.9	0.77	0.84	0.87	580	1490	94.4	94.9	94.9	0.71	0.80	0.85	543
330	450	1485	94.6	94.9	94.9	0.74	0.79	0.85	622	1490	94.4	94.9	95.0	0.72	0.81	0.85	569
355	480	1490	94.7	94.8	94.8	0.78	0.85	0.87	654	1490	94.5	95.0	95.0	0.72	0.81	0.85	612
370	500	1490	94.5	94.7	94.8	0.78	0.85	0.87	682	1490	94.4	94.9	95.0	0.72	0.81	0.85	637
400	550	1490	94.8	94.8	94.8	0.77	0.84	0.87	737	1490	94.5	95.0	95.0	0.71	0.80	0.85	689

W22 - Standard Efficiency - IE1 (1)

Output		Frame	Full load torque (Nm)	Locked rotor current Il/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	
IV pole - 1500 rpm - 50 Hz																			
Optional frames (high-output design)																			
0.18	0.25	71	0.130	3.3	1.7	1.9	0.0004	30	66	5.5	43.0	1350	50.0	57.0	58.0	0.50	0.63	0.73	0.614
0.25	0.33	63	0.180	4.1	2.2	2.2	0.0006	23	51	7.2	44.0	1340	55.0	60.0	60.0	0.52	0.66	0.76	0.791
0.37	0.5	80	0.250	5.0	2.0	2.4	0.0015	23	51	8.5	44.0	1415	63.0	66.0	67.0	0.57	0.71	0.81	0.984
0.55	0.75	71	0.410	4.5	2.5	2.3	0.0008	23	51	9.5	43.0	1320	66.0	69.0	69.0	0.50	0.64	0.74	1.55
0.55	0.75	90S	0.380	5.4	2.1	2.4	0.0030	29	64	15.5	49.0	1415	70.0	73.0	73.0	0.56	0.70	0.78	1.39
0.75	1	90S	0.520	5.4	2.0	2.3	0.0036	20	44	16.5	49.0	1415	70.5	73.5	73.5	0.57	0.70	0.79	1.86
1.1	1.5	80	0.760	5.8	2.9	3.0	0.0032	10	22	14.5	44.0	1415	70.5	75.0	75.5	0.56	0.71	0.80	2.63
1.1	1.5	90L	0.750	5.8	1.8	2.4	0.0052	7	15	14.5	49.0	1430	72.5	75.5	75.5	0.60	0.74	0.82	2.57
1.5	2	100L	1.04	5.4	2.1	2.4	0.0052	21	46	24.0	53.0	1405	79.0	79.5	79.0	0.64	0.76	0.82	3.34
1.5	2	90S	1.04	5.5	2.3	2.4	0.0047	8	18	17.0	49.0	1410	74.5	77.5	77.5	0.58	0.73	0.82	3.41
2.2	3	112M	1.49	5.9	1.7	2.5	0.0104	27	59	38.0	56.0	1440	81.0	82.0	82.0	0.59	0.72	0.79	4.90
2.2	3	90L	1.52	6.2	2.7	2.5	0.0066	8	18	23.0	49.0	1410	79.5	80.0	79.7	0.57	0.71	0.80	5.19
3	4	112M	2.03	5.9	1.7	2.4	0.0124	16	35	39.5	56.0	1440	82.5	83.0	83.0	0.61	0.74	0.81	6.44
4(*)	5.5	100L	2.79	5.5	2.7	2.7	0.0104	8	18	35.0	53.0	1395	82.0	83.0	83.1	0.62	0.74	0.81	8.58
4	5.5	132S	2.69	6.2	1.5	2.5	0.0285	15	33	57.0	60.0	1450	83.0	84.5	84.5	0.67	0.79	0.85	7.94
5.5	7.5	112M	3.72	6.3	2.2	2.8	0.0182	11	24	44.0	56.0	1440	84.0	85.7	85.7	0.55	0.69	0.77	11.7
5.5	7.5	132M	3.66	7.5	2.1	2.5	0.0452	7	15	47.0	60.0	1465	84.0	85.5	85.5	0.63	0.77	0.84	11.1
7.5	10	132S	5.02	6.7	2.1	2.9	0.0433	8	18	64.5	58.0	1455	85.5	87.0	87.0	0.63	0.77	0.84	14.8
9.2	12.5	132M	6.16	7.5	2.2	2.8	0.0565	6	13	70.0	60.0	1455	86.5	87.7	87.7	0.64	0.78	0.85	17.8
11(*)	15	132M/L	7.36	7.5	2.4	2.7	0.0676	5	11	83.0	60.0	1455	87.0	88.4	88.0	0.70	0.81	0.88	20.5
11	15	160L	7.34	6.0	2.1	2.5	0.0837	9	20	96.0	61.0	1460	87.0	88.0	88.0	0.64	0.76	0.82	22.0
15	20	160M	9.97	6.8	2.6	2.8	0.1185	8	18	121	61.0	1465	89.0	89.7	89.3	0.66	0.76	0.83	29.2
18.5	25	160L	12.3	6.6	2.4	2.9	0.1537	7	15	135	61.0	1465	89.5	90.2	90.0	0.64	0.76	0.82	36.2
18.5	25	180L	12.3	6.6	2.4	2.8	0.1398	12	26	152	61.0	1465	89.7	90.4	90.2	0.67	0.77	0.84	35.2
22	30	180M	14.6	6.6	2.4	2.9	0.1657	10	22	164	61.0	1465	90.0	90.8	90.7	0.66	0.77	0.84	41.7
30	40	180L	20.0	6.7	2.9	2.9	0.2075	10	22	190	61.0	1460	90.5	91.2	91.0	0.63	0.74	0.82	58.0
30	40	200M	19.9	6.3	2.1	2.6	0.2668	13	29	212	65.0	1470	91.3	91.7	91.5	0.68	0.78	0.84	56.3
37	50	200L	24.5	6.6	2.3	2.5	0.3342	12	26	237	65.0	1470	92.0	92.4	92.0	0.71	0.81	0.85	68.3
45(*)	60	200L	29.7	6.6	2.3	2.5	0.3735	6	13	255	65.0	1475	92.3	92.7	92.5	0.65	0.76	0.82	85.6
55	75	225S/M	36.3	7.0	2.4	2.7	0.6367	9	20	394	66.0	1475	92.8	93.1	93.1	0.72	0.82	0.82	104
75	100	250S/M	49.4	7.6	2.4	3.0	1.01	8	18	496	66.0	1480	93.1	93.4	93.5	0.73	0.82	0.87	133
90	125	315S/M	59.0	6.0	1.8	2.6	2.22	26	57	887	71.0	1485	93.5	94.2	94.0	0.75	0.83	0.86	161
110	150	280S/M	72.2	6.8	2.1	2.6	2.17	16	35	735	69.0	1485	93.5	94.2	94.1	0.75	0.83	0.87	194
132	175	280S/M	86.6	7.2	2.3	2.6	2.62	14	31	797	69.0	1485	93.7	94.4	94.3	0.74	0.83	0.86	235
200	270	315S/M	131	6.9	2.4	2.3	4.41	16	35	1216	71.0	1490	94.4	94.8	94.7	0.76	0.84	0.87	350
200	270	355M/L	131	6.3	1.8	2.0	5.94	18	40	1378	76.0	1490	94.5	94.9	94.9	0.74	0.81	0.85	358
220	300	355M/L	144	6.4	2.0	2.2	6.48	18	40	1414	76.0	1490	94.6	94.9	94.8	0.73	0.81	0.85	394
250	340	355M/L	163	6.8	2.1	2.4	7.17	18	40	1470	76.0	1490	94.6	95.0	94.9	0.73	0.82	0.85	447
260	350	355M/L	170	6.4	2.4	2.4	7.73	14	31	1571	76.0	1490	94.6	95.0	94.9	0.73	0.82	0.85	465
280	380	355M/L	183	6.6	2.1	2.4	8.05	14	31	1510	76.0	1490	94.6	95.0	94.9	0.74	0.82	0.85	501
300(*)	400	315L	196	7.6	2.5	2.5	6.51	11	24	1540	78.0	1490	95.4	95.8	95.8	0.72	0.80	0.85	532
315	430	315L	206	7.6	2.5	2.5	6.51	11	24	1540	78.0	1490	95.4	95.8	95.8	0.72	0.80	0.85	558

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 - Standard Efficiency - IE1 (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	
IV pole - 1500 rpm - 50 Hz																	
Optional frames (high-output design)																	
0.18	0.25	1325	52.9	58.6	57.6	0.54	0.68	0.78	0.609	1365	47.2	55.3	57.5	0.48	0.60	0.70	0.622
0.25	0.33	1320	57.5	61.0	59.6	0.57	0.71	0.80	0.797	1350	52.3	58.4	59.8	0.48	0.62	0.73	0.797
0.37	0.5	1405	65.4	67.0	66.7	0.62	0.76	0.84	1.00	1425	60.6	64.7	66.6	0.53	0.67	0.77	1.00
0.55	0.75	1295	68.7	70.2	68.3	0.55	0.69	0.78	1.57	1330	62.9	67.6	68.7	0.45	0.59	0.70	1.59
0.55	0.75	1405	71.6	73.4	72.3	0.61	0.74	0.81	1.43	1420	68.6	72.3	73.1	0.52	0.66	0.75	1.40
0.75	1	1405	72.0	73.9	72.8	0.62	0.75	0.82	1.91	1420	68.9	72.8	73.7	0.52	0.66	0.76	1.86
1.1	1.5	1405	73.3	76.4	75.7	0.63	0.77	0.85	2.60	1420	67.3	73.1	75.1	0.51	0.65	0.76	2.68
1.1	1.5	1415	73.0	75.5	75.5	0.66	0.79	0.85	2.60	1435	70.5	74.5	75.5	0.56	0.70	0.80	2.54
1.5	2	1390	79.6	79.1	77.7	0.69	0.79	0.84	3.49	1415	78.1	79.4	79.6	0.60	0.73	0.80	3.28
1.5	2	1400	74.5	77.5	77.5	0.65	0.78	0.86	3.42	1415	72.5	77.5	77.5	0.52	0.67	0.77	3.50
2.2	3	1435	82.2	82.3	81.5	0.65	0.76	0.82	5.00	1445	79.9	81.5	82.0	0.55	0.68	0.76	4.91
2.2	3	1390	80.6	80.5	79.7	0.65	0.75	0.83	5.05	1420	77.4	79.5	79.7	0.53	0.66	0.76	5.05
3	4	1435	83.8	83.3	82.5	0.67	0.78	0.84	6.58	1445	81.1	82.5	83.1	0.56	0.70	0.78	6.44
4(*)	5.5	1380	82.8	82.7	81.9	0.67	0.78	0.83	8.94	1405	81.1	82.8	83.7	0.57	0.71	0.79	8.42
4	5.5	1445	84.1	84.7	83.9	0.73	0.83	0.87	8.23	1455	81.9	84.1	84.5	0.62	0.75	0.82	7.93
5.5	7.5	1435	85.5	86.2	85.4	0.64	0.75	0.80	11.9	1445	82.4	84.9	85.4	0.50	0.64	0.73	11.9
5.5	7.5	1460	85.0	85.5	85.5	0.70	0.81	0.86	11.4	1470	83.2	85.0	85.5	0.58	0.72	0.81	11.0
7.5	10	1450	86.5	86.8	86.8	0.71	0.82	0.87	15.1	1455	83.7	86.2	86.7	0.57	0.72	0.80	15.0
9.2	12.5	1450	87.3	87.8	87.4	0.70	0.82	0.87	18.4	1455	85.3	87.1	87.5	0.59	0.73	0.82	17.8
11(*)	15	1450	87.5	88.4	88.0	0.75	0.84	0.89	21.4	1460	86.5	88.4	88.4	0.67	0.79	0.86	20.1
11	15	1455	87.8	88.2	87.6	0.69	0.80	0.84	22.7	1465	86.1	87.6	88.0	0.59	0.72	0.79	22.0
15	20	1460	89.5	89.7	88.9	0.71	0.79	0.85	30.2	1470	88.4	89.5	89.4	0.62	0.73	0.81	28.8
18.5	25	1460	90.1	90.3	89.7	0.69	0.79	0.84	37.3	1470	88.9	90.0	90.1	0.60	0.73	0.80	35.7
18.5	25	1460	90.5	90.6	90.0	0.73	0.81	0.87	35.9	1470	89.0	90.1	90.2	0.62	0.73	0.81	35.2
22	30	1460	90.8	91.0	90.5	0.72	0.81	0.87	42.5	1470	89.3	90.5	90.6	0.61	0.73	0.81	41.7
30	40	1455	91.3	91.4	90.8	0.69	0.78	0.85	59.1	1465	89.8	90.9	91.0	0.59	0.71	0.79	58.1
30	40	1465	91.7	91.7	91.2	0.73	0.81	0.86	58.1	1470	90.8	91.5	91.6	0.63	0.75	0.82	55.6
37	50	1465	92.3	92.4	91.7	0.76	0.84	0.87	70.5	1470	91.5	92.2	92.1	0.66	0.78	0.83	67.3
45(*)	60	1470	93.1	93.0	92.5	0.72	0.81	0.86	85.9	1475	91.3	92.2	92.3	0.58	0.71	0.78	87.0
55	75	1470	93.0	93.0	92.7	0.76	0.84	0.83	109	1475	92.5	93.1	93.3	0.69	0.80	0.81	101
75	100	1475	93.4	93.4	93.2	0.78	0.85	0.89	137	1480	93.6	93.2	93.5	0.69	0.79	0.85	131
90	125	1485	93.7	94.2	93.9	0.78	0.85	0.87	167	1485	93.2	94.1	94.0	0.72	0.81	0.85	157
110	150	1485	93.7	94.0	93.9	0.78	0.85	0.88	202	1485	93.3	94.1	94.1	0.72	0.81	0.86	189
132	175	1480	93.9	94.3	94.1	0.77	0.85	0.87	245	1485	93.5	94.4	94.4	0.71	0.81	0.85	229
200	270	1490	94.6	94.8	94.5	0.79	0.86	0.88	365	1490	94.2	94.8	94.8	0.73	0.82	0.86	342
200	270	1490	94.7	94.9	94.9	0.78	0.83	0.86	372	1490	94.3	94.8	94.9	0.71	0.79	0.84	349
220	300	1490	94.7	94.7	94.7	0.77	0.83	0.86	410	1490	94.4	94.8	94.8	0.70	0.79	0.84	384
250	340	1490	94.7	94.8	94.8	0.77	0.84	0.86	466	1490	94.4	94.9	94.9	0.70	0.80	0.84	436
260	350	1490	94.7	94.8	94.8	0.77	0.84	0.86	485	1490	94.4	94.9	94.9	0.70	0.80	0.84	454
280	380	1490	94.7	94.8	94.8	0.77	0.84	0.86	522	1490	94.4	94.9	95.0	0.71	0.80	0.84	488
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

W22 - Standard Efficiency - IE1 (1)

Output		Frame	Full load torque (Nm)	Locked rotor current Il/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	
VI pole - 1000 rpm - 50 Hz																			
0.12	0.16	63	0.140	2.6	1.7	1.6	0.0005	46	101	6.7	43.0	855	43.0	47.0	48.0	0.44	0.55	0.67	0.540
0.18	0.25	71	0.190	3.1	2.2	2.2	0.0008	30	66	9.0	43.0	900	46.0	53.0	55.0	0.38	0.49	0.58	0.814
0.25	0.33	71	0.270	3.1	2.2	2.2	0.0008	30	66	11.5	43.0	895	48.0	55.0	57.0	0.38	0.48	0.58	1.09
0.37	0.5	80	0.400	3.6	1.7	1.7	0.0019	16	35	12.1	43.0	905	55.0	60.0	63.0	0.50	0.64	0.75	1.13
0.55	0.75	80	0.580	4.5	2.3	2.3	0.0030	10	22	15.5	43.0	930	60.0	65.0	67.0	0.50	0.63	0.73	1.62
0.75	1	90S	0.790	4.2	1.8	2.1	0.0047	17	37	18.0	45.0	920	68.0	70.0	70.0	0.51	0.65	0.75	2.06
1.1	1.5	90L	1.16	4.8	2.0	2.1	0.0060	9	20	22.0	45.0	925	70.0	72.0	73.0	0.47	0.60	0.72	3.02
1.5	2	100L	1.59	4.4	1.9	2.2	0.0093	21	46	27.0	44.0	920	76.0	77.0	76.0	0.52	0.66	0.73	3.90
2.2	3	112M	2.28	5.1	2.3	2.5	0.0165	17	37	37.0	48.0	940	78.0	78.5	78.0	0.53	0.66	0.74	5.50
3	4	132S	3.06	5.3	2.0	2.2	0.0340	20	44	55.0	53.0	955	81.0	82.0	81.0	0.58	0.70	0.77	6.94
4	5.5	132M	4.06	5.8	2.3	2.4	0.0434	19	42	59.0	53.0	960	81.0	82.5	82.5	0.54	0.66	0.74	9.46
5.5	7.5	132M	5.58	6.2	2.3	2.9	0.0604	19	42	72.0	52.0	960	82.5	84.5	84.5	0.51	0.64	0.72	13.0
7.5	10	160M	7.57	5.4	1.9	2.3	0.0966	12	26	103	56.0	965	85.3	85.5	85.3	0.64	0.76	0.83	15.3
9.2	12.5	160L	9.29	5.7	2.0	2.4	0.1229	10	22	113	56.0	965	86.0	86.5	86.0	0.66	0.76	0.83	18.6
11	15	160L	11.1	5.8	2.1	2.4	0.1489	11	24	127	56.0	965	87.0	87.5	87.2	0.65	0.77	0.83	21.9
15	20	180L	15.1	6.8	2.3	2.7	0.2299	6	13	166	56.0	970	88.0	88.5	88.2	0.72	0.82	0.87	28.2
18.5	25	200L	18.5	5.7	2.1	2.4	0.2989	12	26	190	60.0	975	88.3	89.3	88.9	0.64	0.76	0.82	36.6
22	30	200L	22.0	6.0	2.2	2.4	0.3692	13	29	218	60.0	975	89.5	90.0	89.7	0.67	0.77	0.83	42.7
30	40	225S/M	29.8	6.8	2.1	2.7	0.7192	12	26	359	63.0	980	91.0	91.5	91.2	0.74	0.83	0.86	55.2
37	50	250S/M	36.6	6.7	2.1	2.4	1.01	14	31	425	64.0	985	91.7	91.9	91.7	0.74	0.83	0.86	67.7
45	60	280S/M	44.5	6.0	1.9	2.3	1.80	18	40	576	65.0	985	92.0	92.5	92.2	0.69	0.79	0.83	84.9
55	75	280S/M	54.4	6.0	2.2	2.5	2.13	20	44	607	65.0	985	92.7	92.7	92.6	0.64	0.75	0.81	106
75	100	315S/M	73.8	6.4	2.0	2.4	3.81	22	48	837	67.0	990	93.0	93.2	93.0	0.68	0.78	0.83	140
90	125	315S/M	88.6	6.2	2.0	2.2	4.36	18	40	883	67.0	990	93.4	93.6	93.4	0.70	0.80	0.83	168
110	150	315S/M	108	6.2	2.0	2.2	5.07	20	44	941	67.0	990	93.7	94.0	93.8	0.70	0.80	0.83	204
132	175	315S/M	130	6.2	2.1	2.2	5.98	18	40	1012	67.0	990	94.0	94.2	94.1	0.73	0.82	0.85	238
150	200	355M/L	147	5.6	1.8	2.0	7.41	38	84	1340	73.0	995	94.2	94.5	94.5	0.64	0.74	0.79	290
160	220	315L	157	6.5	2.2	2.3	9.53	14	31	1203	68.0	990	94.1	94.4	94.4	0.69	0.79	0.83	295
185	250	315L	182	7.1	2.3	2.4	8.60	12	26	1346	68.0	990	94.2	94.5	94.6	0.70	0.79	0.83	340
200	270	315L	197	7.3	2.4	2.5	12.0	12	26	1488	68.0	990	94.3	94.6	94.6	0.70	0.80	0.83	368
220	300	315L	216	6.8	2.3	2.3	10.7	15	33	1563	68.0	990	94.4	94.7	94.7	0.70	0.80	0.83	404
250	340	355M/L	246	6.0	2.1	2.1	12.0	32	70	1752	73.0	990	94.4	94.7	94.7	0.65	0.75	0.80	476
260	350	355M/L	256	6.0	2.0	2.0	12.0	32	70	1752	73.0	990	94.4	94.7	94.7	0.65	0.75	0.80	495
280	380	355M/L	275	6.2	2.1	2.1	13.2	28	62	1839	73.0	990	94.5	94.8	94.8	0.64	0.75	0.80	533
300	400	355M/L	295	6.2	2.2	2.2	14.3	30	66	1900	73.0	990	94.4	94.7	94.6	0.63	0.74	0.79	579
315	430	355M/L	308	6.2	2.2	2.2	15.0	28	62	1979	73.0	995	94.5	94.8	94.8	0.66	0.76	0.81	592
Optional frames (high-output design)																			
0.25	0.33	80	0.260	3.4	1.8	1.9	0.0015	26	57	8.5	43.0	920	51.0	58.0	60.0	0.52	0.65	0.76	0.791
0.75	1	90L	0.790	4.2	1.8	2.1	0.0047	17	37	18.0	45.0	920	68.0	70.0	70.0	0.51	0.65	0.75	2.06
1.5	2	112M	1.55	5.2	2.0	2.4	0.0147	21	46	36.0	48.0	945	75.5	77.5	77.0	0.53	0.66	0.75	3.75
3	4	112M	3.11	5.4	2.3	2.5	0.0257	15	33	44.0	48.0	940	81.0	82.5	82.0	0.55	0.68	0.75	7.04
3	4	132M	3.06	5.3	2.0	2.2	0.0340	20	44	55.0	53.0	955	81.0	82.0	81.0	0.58	0.70	0.77	6.94
4	5.5	132S	4.06	5.8	2.3	2.4	0.0434	19	42	59.0	53.0	960	81.0	82.5	82.5	0.54	0.66	0.74	9.46
7.5	10	160L	7.57	5.4	1.9	2.3	0.0966	12	26	103	56.0	965	85.3	85.5	85.3	0.64	0.76	0.83	15.3
11	15	160M	11.1	5.8	2.1	2.4	0.1489	11	24	127	56.0	965	87.0	87.5	87.2	0.65	0.77	0.83	21.9
15	20	180M	15.1	6.8	2.3	2.7	0.2299	6	13	166	56.0	970	88.0	88.5	88.2	0.72	0.82	0.87	28.2
18.5	25	200M	18.5	5.7	2.1	2.4	0.2989	12	26	190	60.0	975	88.3	89.3	88.9	0.64	0.76	0.82	36.6
22	30	200M	22.0	6.0	2.2	2.4	0.3692	13	29	218	60.0	975	89.5	90.0	89.7	0.67	0.77	0.83	42.7
37	50	225S/M	36.6	6.8	2.1	2.5	0.8876	11	24	390	63.0	985	91.7	91.9	91.7	0.74	0.83	0.86	67.7
45	60	250S/M	44.5	6.5	2.1	2.3	1.28	15	33	466	64.0	985	92.2	92.4	92.2	0.75	0.84	0.87	81.0
75	100	280S/M	74.2	6.5	2.0	2.5	2.80	14	31	682	65.0	985	93.0	93.1	93.0	0.68	0.79	0.83	140
160	220	355M/L	157	5.6	1.8	2.0	7.86	32	70	1416	73.0	990	94.2	94.6	94.5	0.64	0.74	0.79	309
185	250	355M/L	182	6.0	2.0	2.2	8.57	30	66	1530	73.0	990	94.3	94.6	94.6	0.63	0.74	0.79	357
200	270	355M/L	197	6.0	2.0	2.1	10.2	32	70	1600	73.0	990	94.4	94.7	94.7	0.64	0.75	0.80	381
220	300	355M/L	216	6.4	2.1	2.2	11.1	30	66	1678	73.0	990	94.4	94.8	94.7	0.64	0.74	0.80	419
250(*)	340	315L	246	7.0	2.5	2.5	11.0	11	24	1399	68.0	990	94.8	95.1	95.1	0.65	0.77	0.81	468
260(*)	350	315L	256	8.0	2.8	2.8	11.0	9	20	1496	68.0	990	94.8	95.0	95.0	0.60	0.72	0.78	506

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

W22 - Standard Efficiency - IE1 (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	845	48.5	50.9	50.1	0.47	0.59	0.72	0.504	860	38.5	43.1	45.7	0.43	0.52	0.63	0.577
0.18	0.25	885	49.3	55.1	55.9	0.41	0.52	0.62	0.789	905	42.9	50.5	53.7	0.37	0.46	0.55	0.848
0.25	0.33	880	51.8	57.3	57.6	0.41	0.53	0.63	1.05	905	45.0	52.6	55.5	0.36	0.45	0.54	1.16
0.37	0.5	890	57.0	62.0	65.0	0.54	0.69	0.80	1.08	910	55.0	60.0	62.0	0.47	0.60	0.72	1.15
0.55	0.75	920	62.0	65.8	68.0	0.54	0.67	0.77	1.60	935	58.0	64.0	66.0	0.47	0.59	0.68	1.70
0.75	1	905	70.1	70.6	70.0	0.56	0.70	0.78	2.09	925	65.9	69.1	70.1	0.47	0.61	0.71	2.10
1.1	1.5	915	70.7	74.3	76.1	0.52	0.67	0.77	2.85	930	68.8	69.5	73.0	0.42	0.55	0.67	3.13
1.5	2	910	77.6	77.2	75.2	0.57	0.70	0.76	3.99	925	74.4	76.3	76.3	0.48	0.62	0.70	3.91
2.2	3	930	79.8	78.9	77.7	0.58	0.71	0.78	5.52	945	76.0	77.4	77.9	0.48	0.62	0.71	5.53
3	4	950	81.0	83.0	82.0	0.61	0.72	0.79	7.04	960	80.0	82.0	81.1	0.53	0.66	0.74	6.95
4	5.5	960	82.0	82.5	82.5	0.58	0.73	0.78	9.44	965	80.0	82.2	83.4	0.52	0.64	0.72	9.27
5.5	7.5	955	83.8	85.1	84.4	0.56	0.69	0.76	13.0	965	81.1	83.8	84.3	0.47	0.60	0.69	13.2
7.5	10	960	86.2	85.6	84.7	0.69	0.80	0.85	15.8	970	84.3	85.2	85.4	0.60	0.73	0.81	15.1
9.2	12.5	960	86.8	86.6	85.8	0.71	0.79	0.85	19.2	970	85.1	86.2	86.2	0.62	0.73	0.81	18.3
11	15	960	87.6	87.5	86.6	0.69	0.80	0.85	22.7	970	86.4	87.3	87.4	0.61	0.74	0.81	21.6
15	20	970	88.5	88.4	87.7	0.76	0.85	0.89	29.2	970	87.4	88.3	88.4	0.68	0.79	0.85	27.8
18.5	25	970	89.3	89.6	88.7	0.70	0.80	0.85	37.3	975	87.3	88.8	88.8	0.59	0.72	0.79	36.7
22	30	970	90.3	90.2	89.4	0.72	0.81	0.85	44.0	975	88.6	89.6	89.7	0.62	0.73	0.81	42.1
30	40	975	91.2	91.3	90.7	0.78	0.85	0.87	57.8	980	90.6	91.4	91.2	0.71	0.81	0.85	53.8
37	50	980	91.9	91.7	91.2	0.77	0.85	0.87	70.9	985	91.4	91.9	91.8	0.71	0.81	0.85	66.0
45	60	980	92.3	92.5	91.9	0.74	0.82	0.85	87.5	985	91.6	92.3	92.2	0.65	0.76	0.81	83.8
55	75	980	93.0	92.7	92.3	0.69	0.78	0.83	109	985	92.3	92.5	92.6	0.60	0.72	0.79	105
75	100	990	93.5	93.4	92.9	0.73	0.81	0.85	144	990	92.7	93.1	93.0	0.64	0.75	0.81	139
90	125	990	93.7	93.6	93.1	0.74	0.83	0.84	175	990	93.1	93.5	93.4	0.67	0.78	0.82	163
110	150	989	93.6	93.7	93.7	0.74	0.83	0.84	212	990	93.4	93.9	93.8	0.67	0.78	0.82	199
132	175	985	94.3	94.2	93.9	0.78	0.85	0.87	245	990	93.7	94.1	94.1	0.69	0.80	0.83	235
150	200	990	94.5	94.8	94.8	0.69	0.77	0.82	293	995	93.8	94.4	94.4	0.61	0.71	0.76	291
160	220	985	94.3	94.4	94.2	0.73	0.81	0.84	307	990	93.8	94.3	94.4	0.66	0.77	0.82	288
185	250	990	94.4	94.5	94.4	0.74	0.81	0.84	354	990	93.9	94.4	94.7	0.67	0.77	0.82	331
200	270	990	94.5	94.6	94.4	0.74	0.82	0.84	383	990	94.0	94.5	94.6	0.67	0.78	0.82	359
220	300	990	94.6	94.7	94.5	0.74	0.82	0.84	421	990	94.2	94.7	94.8	0.67	0.78	0.82	394
250	340	990	94.6	94.7	94.6	0.69	0.78	0.82	490	990	94.2	94.6	94.7	0.62	0.73	0.78	471
260	350	990	94.6	94.7	94.6	0.69	0.78	0.82	509	990	94.2	94.6	94.7	0.62	0.73	0.78	490
280	380	990	94.7	94.8	94.7	0.68	0.78	0.82	548	990	94.3	94.7	94.8	0.61	0.72	0.78	527
300	400	990	94.7	94.7	94.5	0.65	0.75	0.80	603	995	94.2	94.6	94.6	0.60	0.70	0.77	573
315	430	995	94.7	94.8	94.7	0.70	0.79	0.83	609	995	94.3	94.7	94.8	0.62	0.73	0.79	585
Optional frames (high-output design)																	
0.25	0.33	905	54.9	60.0	59.6	0.56	0.70	0.80	0.797	930	47.7	55.6	59.0	0.50	0.62	0.73	0.808
0.75	1	905	70.1	70.6	70.0	0.56	0.70	0.78	2.09	925	65.9	69.1	70.1	0.47	0.61	0.71	2.10
1.5	2	940	76.9	77.8	76.3	0.58	0.72	0.78	3.83	950	74.1	76.8	77.1	0.50	0.63	0.72	3.76
3	4	935	82.2	82.7	81.3	0.60	0.73	0.78	7.19	945	79.5	81.9	82.1	0.50	0.64	0.72	7.06
3	4	950	81.0	83.0	82.0	0.61	0.72	0.79	7.04	960	80.0	82.0	81.1	0.53	0.66	0.74	6.95
4	5.5	960	82.0	82.5	82.5	0.58	0.73	0.78	9.44	965	80.0	82.2	83.4	0.52	0.64	0.72	9.27
7.5	10	960	86.2	85.6	84.7	0.69	0.80	0.85	15.8	970	84.3	85.2	85.4	0.60	0.73	0.81	15.1
11	15	960	87.6	87.5	86.6	0.69	0.80	0.85	22.7	970	86.4	87.3	87.4	0.61	0.74	0.81	21.6
15	20	970	88.5	88.4	87.7	0.76	0.85	0.89	29.2	970	87.4	88.3	88.4	0.68	0.79	0.85	27.8
18.5	25	970	89.3	89.6	88.7	0.70	0.80	0.85	37.3	975	87.3	88.8	88.8	0.59	0.72	0.79	36.7
22	30	970	90.3	90.2	89.4	0.72	0.81	0.85	44.0	975	88.6	89.6	89.7	0.62	0.73	0.81	42.1
37	50	980	91.9	91.7	91.2	0.77	0.85	0.87	70.9	985	91.5	91.7	91.9	0.71	0.81	0.85	65.9
45	60	980	92.2	92.1	91.6	0.78	0.86	0.88	84.8	985	92.0	92.4	92.2	0.72	0.82	0.86	79.0
75	100	980	93.3	93.0	92.7	0.72	0.82	0.85	145	985	92.6	93.0	93.0	0.64	0.76	0.81	139
160	220	990	93.5	95.2	95.2	0.73	0.80	0.84	304	990	92.5	94.9	95.4	0.63	0.74	0.80	292
185	250	990	93.5	94.4	94.8	0.73	0.80	0.83	357	990	92.5	94.0	94.8	0.63	0.72	0.79	344
200	270	990	94.0	94.7	94.8	0.74	0.81	0.83	386	990	93.0	94.3	94.8	0.66	0.75	0.79	372
220	300	990	93.8	95.0	95.3	0.72	0.80	0.82	428	995	93.0	94.6	95.3	0.62	0.74	0.79	407
250	340	985	94.9	95.0	95.0	0.67	0.79	0.83	482	990	94.8	95.1	95.1	0.62	0.74	0.79	463
260	350	990	94.8	95.0	95.0	0.65	0.76	0.81	513	990	94.8	95.1	95.1	0.56	0.69	0.76	500

W22 - Standard Efficiency - IE1 (1)

Output		Frame	Full load torque (Nm)	Locked rotor current Il/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		
VIII pole - 750 rpm - 50 Hz																				
0.12	0.16	71	0.180	2.2	2.1	2.0	0.0008	84	185	10.7	41.0	660	36.3	43.4	45.6	0.37	0.45	0.53	0.717	
0.18	0.25	80	0.250	2.8	2.2	2.4	0.0020	29	64	12.6	42.0	695	36.2	44.1	48.6	0.45	0.53	0.62	0.862	
0.25	0.33	80	0.360	3.8	2.1	2.2	0.0027	27	59	13.0	42.0	685	46.0	51.0	53.0	0.45	0.56	0.66	1.03	
0.37	0.5	90S	0.530	3.0	1.9	1.8	0.0038	32	70	15.4	43.0	685	50.6	56.5	57.4	0.44	0.55	0.64	1.45	
0.55	0.75	90L	0.790	3.3	1.9	2.0	0.0055	25	55	16.5	43.0	675	58.0	60.0	60.0	0.43	0.56	0.66	2.01	
0.75	1	100L	1.04	3.5	1.8	2.4	0.0077	33	73	23.8	50.0	705	62.0	67.2	67.8	0.42	0.53	0.62	2.58	
1.1	1.5	100L	1.53	4.0	1.7	2.3	0.0116	27	59	28.5	50.0	700	69.3	72.3	71.2	0.45	0.57	0.66	3.38	
1.5	2	112M	2.09	4.2	2.2	2.2	0.0174	26	57	33.4	46.0	700	73.7	75.4	73.5	0.48	0.61	0.70	4.21	
2.2	3	132S	3.02	6.1	2.5	2.8	0.0592	22	48	55.3	48.0	710	75.8	78.0	77.1	0.55	0.68	0.77	5.35	
3	4	132M	4.12	6.1	2.2	2.6	0.0715	18	40	65.0	48.0	710	78.5	80.1	79.0	0.55	0.68	0.76	7.21	
4	5.5	160M	5.41	4.7	2.0	2.1	0.0878	17	37	101	51.0	720	79.5	82.0	81.5	0.52	0.65	0.72	9.84	
5.5	7.5	160M	7.44	4.7	2.0	2.1	0.1141	16	35	110	51.0	720	82.0	83.2	83.0	0.52	0.65	0.73	13.1	
7.5	10	160L	10.1	4.9	2.2	2.2	0.1492	16	35	130	51.0	720	84.0	85.5	85.0	0.52	0.65	0.73	17.4	
9.2	12.5	180M	12.4	6.3	2.0	2.4	0.2037	10	22	156	51.0	725	86.0	86.5	86.0	0.64	0.76	0.82	18.8	
11	15	180L	14.8	6.4	2.1	2.4	0.2444	10	22	175	51.0	725	87.0	87.5	87.0	0.67	0.78	0.84	21.7	
15	20	200L	20.2	4.6	1.9	2.0	0.3341	22	48	205	53.0	725	87.5	88.0	88.0	0.58	0.70	0.76	32.4	
18.5	25	225S/M	24.5	6.4	1.8	2.4	0.6183	18	40	339	56.0	735	91.0	91.0	90.6	0.66	0.77	0.82	35.9	
22	30	225S/M	29.2	6.4	1.8	2.4	0.7214	16	35	358	56.0	735	91.3	91.3	91.0	0.69	0.79	0.83	42.0	
30	40	250S/M	39.8	6.9	1.9	2.7	1.06	13	29	433	56.0	735	91.6	91.8	91.6	0.67	0.78	0.83	57.0	
37	50	280S/M	48.7	5.0	1.6	2.0	1.81	26	57	575	59.0	740	91.8	92.4	92.3	0.64	0.75	0.79	73.2	
45	60	280S/M	59.2	5.4	1.7	2.0	2.26	21	46	617	59.0	740	92.1	92.6	92.5	0.64	0.75	0.79	88.9	
55	75	315S/M	72.4	5.3	1.6	2.0	3.66	30	66	745	62.0	740	92.6	93.0	93.0	0.65	0.76	0.80	107	
75	100	315S/M	98.7	5.3	1.6	2.0	4.76	30	66	913	62.0	740	93.0	93.5	93.5	0.66	0.76	0.80	145	
90	125	315S/M	118	5.8	1.8	2.1	5.67	26	57	982	62.0	740	93.6	94.0	94.2	0.66	0.76	0.80	172	
110	150	315L	145	5.8	1.8	2.1	12.2	24	53	1180	68.0	740	93.8	94.5	94.5	0.64	0.75	0.80	210	
110	150	315S/M	145	5.8	1.8	2.1	6.93	24	53	1180	62.0	740	93.8	94.5	94.5	0.64	0.75	0.80	210	
132	175	315L	174	6.2	2.0	2.2	12.8	23	51	1290	68.0	740	94.0	94.5	94.6	0.63	0.74	0.79	255	
150	200	355M/L	196	7.0	1.5	2.0	13.8	35	77	1571	70.0	745	94.8	95.0	95.0	0.64	0.75	0.80	308	
160	220	355M/L	209	6.2	1.4	2.2	14.7	48	106	1571	70.0	745	94.5	95.0	95.0	0.62	0.74	0.79	308	
185	250	355M/L	242	6.0	1.4	2.1	15.9	46	101	1653	70.0	745	94.6	95.1	95.1	0.64	0.75	0.80	351	
200	270	355M/L	261	6.2	1.5	2.2	18.4	44	97	1725	70.0	745	94.8	95.2	95.2	0.63	0.74	0.79	384	
220	300	355M/L	288	6.3	1.4	2.1	19.9	42	92	1839	70.0	745	95.0	95.3	95.3	0.64	0.75	0.80	417	
Optional frames (high-output design)																				
2.2	3	132M	3.02	6.1	2.5	2.8	0.0592	22	48	55.3	48.0	710	75.8	78.0	77.1	0.55	0.68	0.77	5.35	
5.5	7.5	160L	7.44	4.7	2.0	2.1	0.1141	16	35	110	51.0	720	82.0	83.2	83.0	0.52	0.65	0.73	13.1	
7.5	10	160M	10.1	4.9	2.2	2.2	0.1492	16	35	130	51.0	720	84.0	85.5	85.0	0.52	0.65	0.73	17.4	
37	50	250S/M	49.4	6.9	1.9	2.7	1.33	12	26	475	56.0	730	91.9	92.0	91.9	0.67	0.78	0.83	70.0	
55	75	280S/M	72.4	5.4	1.7	2.0	2.82	20	44	826	59.0	740	92.4	92.7	93.0	0.64	0.75	0.79	108	
110	150	355M/L	144	5.6	1.1	2.0	9.48	50	110	1343	70.0	745	94.0	94.5	94.6	0.62	0.73	0.79	212	
132	175	355M/L	173	6.0	1.2	2.1	11.3	48	106	1448	70.0	745	94.3	94.9	94.8	0.62	0.74	0.79	254	
160	220	315L	211	6.4	2.2	2.2	10.0	20	44	1350	68.0	740	94.5	94.8	94.8	0.63	0.74	0.79	308	
185(*)	250	315L	244	7.0	2.4	2.4	11.3	12	26	1520	68.0	740	94.5	94.9	94.9	0.62	0.72	0.78	361	

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 - Standard Efficiency - IE1 (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	
VIII pole - 750 rpm - 50 Hz																	
0.12	0.16	650	41.0	47.1	47.6	0.39	0.48	0.57	0.672	670	32.7	40.3	43.2	0.36	0.43	0.50	0.773
0.18	0.25	690	40.7	47.7	50.6	0.47	0.57	0.66	0.819	700	32.8	41.2	46.1	0.43	0.51	0.59	0.921
0.25	0.33	675	48.8	52.8	53.4	0.48	0.60	0.70	1.02	690	43.2	49.4	52.1	0.43	0.53	0.63	1.06
0.37	0.5	680	54.4	59.0	58.3	0.48	0.60	0.69	1.40	690	46.6	53.8	56.1	0.41	0.51	0.61	1.50
0.55	0.75	665	61.7	62.0	60.0	0.47	0.60	0.70	1.99	680	54.8	59.0	59.0	0.41	0.52	0.62	2.09
0.75	1	695	65.6	69.0	68.0	0.46	0.58	0.66	2.54	710	58.3	64.6	66.7	0.39	0.49	0.58	2.70
1.1	1.5	690	72.1	73.6	70.8	0.50	0.62	0.70	3.37	705	66.2	70.7	70.7	0.41	0.53	0.62	3.49
1.5	2	690	75.9	76.2	73.2	0.52	0.65	0.73	4.27	705	71.6	74.2	73.1	0.44	0.57	0.66	4.33
2.2	3	705	77.1	78.3	76.7	0.60	0.73	0.80	5.45	715	74.7	77.5	77.1	0.52	0.65	0.74	5.36
3	4	705	79.7	80.5	78.6	0.60	0.73	0.80	7.25	715	77.1	79.6	79.0	0.51	0.64	0.73	7.24
4	5.5	715	81.3	82.7	81.2	0.57	0.70	0.75	9.98	720	77.8	81.2	81.3	0.48	0.61	0.69	9.92
5.5	7.5	715	83.3	83.5	82.5	0.57	0.69	0.76	13.3	720	80.7	82.6	83.0	0.49	0.62	0.70	13.2
7.5	10	715	85.2	85.8	84.6	0.57	0.69	0.76	17.7	720	82.8	85.0	85.0	0.48	0.62	0.70	17.5
9.2	12.5	720	86.8	86.6	85.4	0.69	0.80	0.84	19.5	730	85.2	86.3	86.2	0.60	0.73	0.80	18.6
11	15	720	87.6	87.4	86.3	0.72	0.81	0.86	22.5	725	86.4	87.3	87.3	0.63	0.75	0.82	21.4
15	20	720	88.5	88.2	87.5	0.64	0.74	0.78	33.4	725	86.4	87.6	88.0	0.53	0.66	0.73	32.5
18.5	25	730	91.3	90.8	90.0	0.70	0.80	0.84	37.2	735	90.6	91.0	90.8	0.63	0.75	0.81	35.0
22	30	730	91.5	91.1	90.3	0.73	0.82	0.84	44.1	735	91.0	91.3	91.2	0.66	0.77	0.82	40.9
30	40	730	92.0	91.7	91.1	0.72	0.81	0.85	58.9	735	91.2	91.7	91.8	0.63	0.75	0.81	56.1
37	50	735	92.2	92.3	91.8	0.69	0.78	0.81	75.6	740	91.4	92.3	92.5	0.60	0.72	0.77	72.3
45	60	735	92.5	92.6	92.1	0.69	0.78	0.81	91.6	740	91.7	92.5	92.6	0.60	0.72	0.77	87.8
55	75	740	93.0	93.1	92.8	0.69	0.79	0.81	111	740	92.2	92.9	93.2	0.61	0.73	0.78	105
75	100	735	93.2	93.3	93.0	0.70	0.79	0.81	151	740	92.7	93.4	93.6	0.63	0.74	0.79	141
90	125	740	93.8	94.0	94.0	0.70	0.79	0.81	180	740	93.1	93.8	94.3	0.62	0.73	0.78	170
110	150	740	93.4	94.4	94.6	0.69	0.78	0.82	215	740	93.4	94.4	94.6	0.60	0.72	0.78	207
110	150	740	93.4	94.4	94.6	0.69	0.78	0.82	215	740	93.4	94.4	94.6	0.60	0.72	0.78	207
132	175	740	94.3	94.5	94.4	0.68	0.77	0.81	262	740	93.6	94.4	94.6	0.59	0.71	0.77	252
150	200	745	95.3	95.3	95.1	0.69	0.79	0.83	289	745	94.2	94.7	94.9	0.59	0.71	0.77	286
160	220	745	94.9	95.2	95.0	0.67	0.78	0.81	316	745	94.1	94.8	95.0	0.58	0.71	0.77	304
185	250	745	94.9	95.2	95.0	0.69	0.78	0.82	361	745	94.3	95.0	95.1	0.60	0.72	0.78	347
200	270	745	95.2	95.3	95.1	0.68	0.78	0.81	394	745	94.4	95.0	95.2	0.59	0.71	0.77	380
220	300	745	95.3	95.4	95.2	0.69	0.78	0.82	428	745	94.7	95.2	95.3	0.60	0.72	0.78	412
Optional frames (high-output design)																	
2.2	3	705	77.1	78.3	76.7	0.60	0.73	0.80	5.45	715	74.7	77.5	77.1	0.52	0.65	0.74	5.36
5.5	7.5	715	83.3	83.5	82.5	0.57	0.69	0.76	13.3	720	80.7	82.6	83.0	0.49	0.62	0.70	13.2
7.5	10	715	85.2	85.8	84.6	0.57	0.69	0.76	17.7	720	82.8	85.0	85.0	0.48	0.62	0.70	17.5
37	50	725	92.1	91.8	91.3	0.71	0.81	0.85	72.4	730	91.6	92.0	92.2	0.63	0.75	0.81	68.9
55	75	735	92.7	92.6	92.5	0.68	0.78	0.80	113	740	92.0	92.6	93.1	0.60	0.72	0.77	107
110	150	740	93.0	94.2	94.5	0.66	0.77	0.82	216	745	92.0	94.1	94.5	0.60	0.71	0.78	208
132	175	740	93.5	94.6	94.8	0.66	0.75	0.81	261	745	92.5	94.4	94.8	0.60	0.71	0.77	252
160	220	740	94.5	94.8	94.8	0.66	0.76	0.80	321	740	94.8	95.0	95.0	0.60	0.72	0.78	300
185(*)	250	740	94.7	94.9	94.9	0.65	0.75	0.80	370	740	94.7	95.0	95.0	0.57	0.69	0.76	356

W22 - High Efficiency - IE2 (1)

Output		Frame	Full load torque (Nm)	Locked rotor current Il/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 pole - 3000 rpm - 50 Hz																			
0.12	0.16	63	0.040	4.8	3.0	2.9	0.0001	37	81	5.7	52.0	2790	53.0	60.0	61.0	0.53	0.66	0.75	0.379
0.18	0.25	63	0.060	5.3	2.3	2.4	0.0001	15	33	6.2	52.0	2790	57.0	62.0	64.0	0.57	0.70	0.79	0.510
0.25	0.33	63	0.090	5.0	2.2	2.2	0.0002	11	24	6.7	52.0	2770	58.0	63.0	65.0	0.57	0.70	0.80	0.690
0.37	0.5	71	0.130	5.8	2.5	2.6	0.0004	12	26	8.3	56.0	2830	68.0	70.0	71.0	0.60	0.75	0.84	0.895
0.55	0.75	71	0.190	5.8	2.4	2.4	0.0005	9	20	10.0	56.0	2780	70.0	72.0	72.0	0.68	0.82	0.88	1.25
0.75	1	80	0.260	6.5	2.8	2.8	0.0008	14	31	12.5	59.0	2800	76.0	78.5	79.5	0.67	0.80	0.86	1.58
1.1	1.5	80	0.380	6.5	2.8	2.8	0.0009	10	22	14.0	59.0	2800	78.0	80.0	80.0	0.67	0.79	0.85	2.33
1.5	2	90S	0.510	7.0	2.6	2.8	0.0021	7	15	17.5	62.0	2865	80.0	82.0	82.0	0.63	0.76	0.83	3.14
2.2	3	90L	0.750	6.6	3.0	3.0	0.0022	9	20	21.0	64.0	2840	83.0	83.6	83.6	0.63	0.76	0.83	4.58
3	4	100L	1.01	8.0	2.4	2.8	0.0064	7	15	28.5	67.0	2880	84.0	85.0	85.0	0.70	0.81	0.86	5.92
4	5.5	112M	1.35	7.0	2.0	2.8	0.0088	10	22	38.0	64.0	2880	86.0	86.0	86.0	0.73	0.83	0.88	7.63
5.5	7.5	132S	1.84	6.8	2.2	3.0	0.0197	17	37	60.0	67.0	2910	86.5	88.0	88.0	0.68	0.79	0.85	10.6
7.5	10	132S	2.51	6.8	2.2	2.9	0.0251	13	29	63.0	67.0	2910	88.0	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	70.0	67.0	2915	88.5	89.0	89.0	0.70	0.81	0.86	17.3
11	15	160M	3.65	7.0	2.3	3.0	0.0446	13	29	104	67.0	2935	90.0	90.6	90.5	0.71	0.82	0.86	20.4
15	20	160M	4.99	7.0	2.3	3.0	0.0517	9	20	112	67.0	2930	91.0	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	67.0	2940	91.3	92.0	92.0	0.70	0.80	0.86	33.7
22	30	180M	7.28	7.3	2.2	3.0	0.0975	9	20	164	67.0	2945	92.0	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	72.0	2955	92.5	93.0	92.9	0.75	0.83	0.87	53.6
37	50	200L	12.2	6.8	2.4	2.6	0.1950	16	35	255	72.0	2950	93.0	93.4	93.3	0.76	0.84	0.87	65.8
45	60	225S/M	14.8	7.0	2.2	2.8	0.2490	12	26	356	75.0	2960	93.3	93.6	93.6	0.79	0.86	0.89	78.0
55	75	250S/M	18.1	7.0	2.2	2.8	0.3736	14	31	413	75.0	2960	93.6	93.9	93.9	0.79	0.86	0.89	95.0
75	100	280S/M	24.5	7.0	2.0	2.8	0.8541	28	62	630	77.0	2975	93.4	94.3	94.3	0.79	0.86	0.89	129
90	125	280S/M	29.5	7.0	2.0	2.8	0.9386	25	55	653	77.0	2975	94.0	94.6	94.6	0.79	0.86	0.89	154
110	150	315S/M	36.0	7.3	2.0	2.9	1.67	24	53	874	77.0	2980	94.3	94.9	94.9	0.79	0.86	0.89	188
132	175	315S/M	43.1	7.3	2.0	2.9	1.96	21	46	931	77.0	2980	94.5	95.1	95.1	0.80	0.87	0.90	223
150	200	315S/M	49.0	7.5	2.2	2.8	0.0000	23	51	940	77.0	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	77.0	2980	94.8	95.3	95.3	0.80	0.87	0.90	269
185	250	315S/M	60.5	7.6	2.2	3.1	2.46	16	35	1032	77.0	2980	94.9	95.5	95.4	0.80	0.86	0.89	314
200	270	315L	65.4	7.5	2.3	2.8	2.68	21	46	1200	78.0	2980	95.0	95.5	95.4	0.82	0.88	0.90	336
220	300	315L	71.9	7.8	2.4	2.8	5.17	14	31	1228	78.0	2980	95.0	95.5	95.5	0.81	0.87	0.90	369
250	340	315L	81.7	7.8	2.4	2.8	5.75	17	37	1316	78.0	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	5.75	12	26	1442	78.0	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	0.0000	18	40	1442	86.0	2980	95.2	95.6	95.6	0.84	0.88	0.90	503
315	430	355M/L	103	7.8	2.1	2.6	5.60	23	51	1777	80.0	2985	95.2	95.6	95.6	0.87	0.91	0.92	517
330	450	355M/L	108	7.0	2.4	2.4	6.03	20	44	1838	80.0	2985	95.3	95.6	95.6	0.88	0.90	0.90	554
355	480	355M/L	116	7.9	2.2	2.8	6.01	14	31	1838	80.0	2985	95.3	95.6	95.6	0.87	0.90	0.91	589
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

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.
(*) 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			
kW	HP		50	75	100	50	75	100			50	75	100	50	75	100	
II pole - 3000 rpm - 50 Hz																	
0.12	0.16	2765	54.7	60.8	60.9	0.57	0.71	0.79	0.379	2805	51.4	59.0	60.6	0.50	0.63	0.72	0.383
0.18	0.25	2760	58.0	63.0	64.0	0.61	0.75	0.83	0.510	2805	55.0	60.9	63.6	0.53	0.66	0.76	0.514
0.25	0.33	2740	60.3	64.1	65.0	0.63	0.76	0.84	0.690	2785	55.9	61.7	64.5	0.53	0.66	0.76	0.752
0.37	0.5	2805	69.0	70.1	70.3	0.66	0.79	0.87	0.900	2845	66.9	69.7	71.2	0.57	0.72	0.82	0.882
0.55	0.75	2750	70.8	71.9	71.0	0.73	0.85	0.91	1.29	2795	68.9	71.7	72.5	0.63	0.79	0.86	1.23
0.75	1	2770	77.7	78.0	78.0	0.66	0.81	0.87	1.68	2810	75.0	78.5	79.5	0.64	0.77	0.84	1.56
1.1	1.5	2775	78.9	79.2	79.6	0.73	0.83	0.87	2.43	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	0.80	0.85	4.75	2855	82.2	83.4	83.9	0.59	0.72	0.80	4.56
3	4	2865	84.9	85.0	85.0	0.76	0.85	0.88	6.09	2890	83.1	84.6	85.0	0.66	0.78	0.84	5.85
4	5.5	2865	86.6	86.0	85.8	0.78	0.87	0.90	7.90	2890	85.3	85.9	86.3	0.69	0.80	0.86	7.50
5.5	7.5	2900	87.1	88.0	87.6	0.74	0.83	0.88	10.8	2915	85.6	87.6	88.0	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	89.0	89.0	0.75	0.85	0.89	17.6	2920	87.6	88.6	89.0	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	91.0	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	93.0	93.0	0.71	0.81	0.86	52.2
37	50	2945	93.2	93.3	93.0	0.80	0.86	0.88	68.7	2955	92.8	93.4	93.5	0.73	0.82	0.86	64.0
45	60	2955	93.4	93.5	93.2	0.83	0.88	0.90	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	0.90	99.2	2960	93.3	93.8	94.0	0.75	0.84	0.88	92.5
75	100	2970	93.6	94.3	94.1	0.82	0.88	0.90	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	0.90	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	0.90	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
150	200	2980	94.2	94.8	94.8	0.80	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	95.0	95.5	95.3	0.83	0.88	0.90	328	2980	94.8	95.5	95.4	0.78	0.85	0.88	307
200	270	2975	95.0	95.4	95.2	0.85	0.89	0.91	351	2980	94.9	95.5	95.5	0.80	0.87	0.90	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	0.90	0.91	438	2980	95.0	95.6	95.6	0.82	0.88	0.91	400
280	380	2975	95.2	95.5	95.4	0.87	0.90	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	0.90	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	0.90	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	96.0	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 - High Efficiency - IE2 (1)

Output		Frame	Full load torque (Nm)	Locked rotor current Il/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 pole - 3000 rpm - 50 Hz																			
Optional frames (high-output design)																			
0.37	0.5	63	0.130	5.0	2.2	2.2	0.0002	7	15	7.2	52.0	2740	64.0	67.0	68.0	0.56	0.71	0.81	0.970
0.75	1	71	0.260	5.8	2.8	2.8	0.0005	14	31	9.0	56.0	2770	77.0	77.5	77.6	0.67	0.80	0.87	1.60
0.75	1	90S	0.260	6.5	2.7	2.8	0.0012	25	55	15.5	62.0	2850	77.0	79.0	79.0	0.61	0.73	0.80	1.71
1.1	1.5	90S	0.380	6.1	2.5	2.6	0.0014	16	35	16.5	62.0	2835	80.0	80.5	80.5	0.65	0.77	0.83	2.38
1.5	2	80	0.530	6.5	3.1	3.0	0.0009	15	33	15.0	59.0	2770	80.0	81.0	81.5	0.65	0.78	0.85	3.13
1.5	2	90L	0.510	7.0	2.6	2.8	0.0021	7	15	17.5	62.0	2865	80.0	82.0	82.0	0.63	0.76	0.83	3.14
2.2	3	100L	0.740	7.5	2.6	3.0	0.0043	15	33	26.5	67.0	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	0.0030	9	20	25.0	62.0	2840	84.0	84.6	84.6	0.61	0.75	0.82	6.24
4	5.5	100L	1.36	7.8	3.0	3.4	0.0064	10	22	32.0	67.0	2870	85.2	85.8	85.8	0.67	0.80	0.86	7.82
5.5	7.5	112M	1.86	7.3	2.7	3.0	0.0088	11	24	42.0	64.0	2880	86.5	87.0	87.0	0.72	0.82	0.87	10.5
5.5	7.5	132M	1.84	6.8	2.2	3.0	0.0197	17	37	60.0	67.0	2910	86.5	88.0	88.0	0.68	0.79	0.85	10.6
7.5	10	132M	2.51	6.8	2.2	2.9	0.0251	13	29	63.0	67.0	2910	88.0	88.5	88.5	0.72	0.82	0.87	14.1
7.5	10	L112M	2.55	7.9	3.0	3.4	0.0109	10	22	45.0	64.0	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	0.0270	11	24	74.0	68.0	2905	89.3	89.6	89.6	0.75	0.84	0.88	20.1
11	15	160L	3.65	7.0	2.3	3.0	0.0446	13	29	104	67.0	2935	90.0	90.6	90.5	0.71	0.82	0.86	20.4
15	20	160L	4.99	7.0	2.3	3.0	0.0517	9	20	112	67.0	2930	91.0	91.3	91.3	0.71	0.81	0.86	27.6
18.5	25	180M	6.13	7.0	2.1	2.9	0.0867	10	22	156	67.0	2940	91.4	92.0	91.8	0.75	0.84	0.88	33.1
22	30	160L	7.30	7.9	2.5	3.1	0.0813	10	22	140	67.0	2935	91.2	91.6	91.6	0.75	0.84	0.89	39.0
22	30	180L	7.28	7.3	2.2	3.0	0.0975	9	20	164	67.0	2945	92.0	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	76.0	2940	91.5	92.0	92.0	0.78	0.86	0.89	52.9
45	60	200L	14.8	6.6	2.1	2.4	0.2204	15	33	272	72.0	2955	92.5	92.9	92.9	0.76	0.84	0.87	80.4
55	75	225S/M	18.1	7.0	2.0	2.6	0.3238	11	24	394	75.0	2960	92.8	93.2	93.2	0.81	0.87	0.90	94.6
75	100	250S/M	24.6	8.2	2.4	3.0	0.4415	10	22	450	75.0	2965	94.0	94.3	94.3	0.79	0.86	0.90	128
110	150	280S/M	36.0	7.6	2.3	3.0	1.11	21	46	702	77.0	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	77.0	2975	94.5	94.8	94.8	0.80	0.87	0.89	226
200	270	315S/M	65.4	7.5	2.3	2.8	2.68	21	46	1150	77.0	2980	95.0	95.5	95.4	0.82	0.88	0.90	336
200	270	355M/L	65.3	7.6	1.9	2.7	3.99	22	48	1487	80.0	2985	94.8	95.5	95.5	0.83	0.88	0.90	336
220	300	355M/L	71.8	7.6	1.8	2.5	4.42	21	46	1560	80.0	2985	95.1	95.6	95.5	0.86	0.89	0.90	369
250	340	355M/L	81.6	7.9	2.2	2.8	4.85	20	44	1634	80.0	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	80.0	2980	95.2	95.6	95.6	0.86	0.89	0.91	465
300	400	355M/L	97.9	8.0	2.5	2.6	5.60	23	51	1777	80.0	2985	95.2	95.6	95.6	0.87	0.91	0.92	492
315(*)	430	315L	103	7.9	2.3	2.7	4.01	11	24	1442	86.0	2980	95.2	95.6	95.6	0.84	0.88	0.90	528

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			
kW	HP		50	75	100	50	75	100			50	75	100	50	75	100	
II pole - 3000 rpm - 50 Hz																	
Optional frames (high-output design)																	
0.37	0.5	2705	65.0	67.6	67.4	0.62	0.76	0.83	1.00	2760	61.1	66.2	67.9	0.52	0.66	0.77	0.980
0.75	1	2750	77.0	77.4	77.4	0.73	0.84	0.90	1.64	2890	76.0	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	76.0	78.7	79.2	0.56	0.70	0.78	1.69
1.1	1.5	2810	80.7	80.3	79.6	0.70	0.80	0.85	2.47	2850	79.2	80.4	81.0	0.60	0.74	0.81	2.33
1.5	2	2750	81.0	81.5	81.3	0.71	0.83	0.88	3.19	2790	80.0	81.0	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	84.0	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	85.0	86.0	86.0	0.63	0.76	0.83	7.80
5.5	7.5	2865	87.0	86.9	87.0	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	88.0	87.6	0.74	0.83	0.88	10.8	2915	85.6	87.6	88.0	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	87.0	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	92.0	92.0	0.72	0.82	0.87	32.2
22	30	2930	91.2	91.6	91.5	0.79	0.87	0.90	40.6	2940	91.0	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	92.0	92.0	0.81	0.88	0.90	55.0	2945	91.8	92.3	92.3	0.75	0.84	0.88	51.4
45	60	2950	92.6	92.9	92.9	0.80	0.87	0.89	82.7	2960	92.4	93.0	92.9	0.72	0.82	0.86	78.4
55	75	2955	93.0	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	0.90	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	0.90	235	2975	94.4	94.8	94.8	0.77	0.85	0.88	220
200	270	2975	95.0	95.4	95.2	0.85	0.89	0.91	351	2980	94.9	95.5	95.5	0.80	0.87	0.90	324
200	270	2980	93.9	95.2	95.5	0.90	0.92	0.92	346	2985	93.5	95.1	95.6	0.88	0.90	0.91	320
220	300	2985	95.5	96.2	96.4	0.87	0.91	0.92	377	2990	95.0	96.0	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	0.90	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	0.90	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	0.90	510

W22 - High Efficiency - IE2 (1)

Output		Frame	Full load torque (Nm)	Locked rotor current Il/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	
IV pole - 1500 rpm - 50 Hz																			
0.12	0.16	63	0.080	3.9	1.8	2.0	0.0004	51	112	7.0	44.0	1380	55.0	58.0	59.0	0.54	0.67	0.77	0.381
0.18	0.25	63	0.130	4.1	2.0	2.0	0.0006	40	88	7.2	44.0	1370	53.0	59.0	61.0	0.50	0.63	0.72	0.592
0.25	0.33	71	0.170	4.5	2.0	2.2	0.0007	68	150	10.2	43.0	1400	59.0	65.0	66.0	0.49	0.62	0.71	0.780
0.37	0.5	71	0.260	4.3	2.0	2.0	0.0008	48	106	10.8	43.0	1380	63.0	66.0	68.0	0.50	0.64	0.74	1.06
0.55	0.75	80	0.380	6.0	2.2	2.5	0.0029	18	40	15.0	44.0	1420	72.0	73.8	74.0	0.60	0.73	0.82	1.31
0.75	1	80	0.520	6.0	2.6	2.6	0.0029	15	33	15.0	44.0	1410	79.0	79.6	79.8	0.63	0.76	0.81	1.63
1.1	1.5	90S	0.740	6.5	2.1	2.6	0.0049	14	31	20.8	49.0	1440	81.0	81.8	81.8	0.62	0.75	0.81	2.40
1.5	2	90L	1.01	6.3	2.0	2.8	0.0055	10	22	22.0	49.0	1440	81.5	83.0	83.0	0.57	0.71	0.80	3.26
2.2	3	100L	1.49	7.0	3.1	3.2	0.0105	11	24	34.0	53.0	1435	83.0	84.5	84.5	0.60	0.73	0.81	4.64
3	4	100L	2.06	6.5	3.2	3.3	0.0097	14	31	34.0	53.0	1420	85.0	85.6	85.6	0.63	0.75	0.82	6.17
4	5.5	112M	2.71	6.6	2.0	2.6	0.0156	13	29	43.0	56.0	1440	86.0	86.7	86.7	0.62	0.74	0.80	8.32
5.5	7.5	132S	3.67	7.3	1.9	3.0	0.0528	8	18	67.0	56.0	1460	87.5	88.0	88.1	0.68	0.80	0.86	10.5
7.5	10	132M	5.02	7.2	2.0	3.0	0.0528	8	18	68.0	56.0	1455	88.7	89.0	89.0	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	75.0	56.0	1455	89.2	89.5	89.5	0.69	0.80	0.85	17.3
11	15	160M	7.29	6.4	2.3	2.8	0.1048	10	22	105	61.0	1470	89.0	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	61.0	1465	90.6	91.0	91.0	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	61.0	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	61.0	1465	92.2	92.5	92.3	0.70	0.80	0.85	40.5
30	40	200L	19.9	6.3	2.2	2.6	0.2929	16	35	222	65.0	1470	92.6	93.0	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	66.0	1475	93.0	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	66.0	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	66.0	1475	93.6	93.9	94.0	0.75	0.84	0.87	97.1
75	100	280S/M	49.2	7.2	2.0	2.7	1.64	22	48	639	69.0	1485	93.8	94.4	94.4	0.74	0.83	0.86	133
90	125	280S/M	59.0	7.2	2.1	2.7	1.88	20	44	673	69.0	1485	94.1	94.7	94.7	0.76	0.84	0.87	158
110	150	315S/M	71.9	6.6	2.0	2.4	2.57	26	57	887	71.0	1490	94.3	95.0	95.0	0.74	0.83	0.86	194
132	175	315S/M	86.3	6.6	2.1	2.4	3.12	22	48	953	71.0	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	71.0	1490	95.0	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	71.0	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	71.0	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	74.0	1490	95.0	95.6	95.6	0.77	0.84	0.87	347
220	300	315L	144	7.0	2.6	2.4	4.89	14	31	1333	74.0	1490	95.2	95.7	95.7	0.76	0.84	0.87	381
250	340	315L	163	7.0	2.6	2.4	5.44	13	29	1399	74.0	1490	95.3	95.7	95.7	0.77	0.85	0.88	428
280	380	315L	183	7.2	2.6	2.4	6.20	12	26	1496	74.0	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	76.0	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	76.0	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	76.0	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	76.0	1490	95.5	95.9	95.8	0.75	0.83	0.86	622
370	500	355M/L	242	7.0	2.4	2.4	11.6	15	33	1971	76.0	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	76.0	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	76.0	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

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.
(*) 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			
kW	HP		50	75	100	50	75	100			50	75	100	50	75	100	
IV pole - 1500 rpm - 50 Hz																	
0.12	0.16	1360	56.8	58.7	58.4	0.58	0.71	0.80	0.390	1390	53.2	57.1	59.0	0.51	0.64	0.74	0.382
0.18	0.25	1350	60.4	61.3	60.1	0.54	0.67	0.76	0.599	1380	57.7	60.6	61.2	0.50	0.60	0.70	0.585
0.25	0.33	1380	60.0	65.0	65.0	0.53	0.66	0.74	0.800	1410	57.8	64.5	66.5	0.46	0.59	0.69	0.760
0.37	0.5	1360	64.8	66.5	67.4	0.55	0.68	0.78	1.06	1390	61.2	64.9	67.9	0.46	0.60	0.71	1.06
0.55	0.75	1410	73.0	73.1	73.3	0.65	0.77	0.85	1.34	1425	70.7	73.8	74.1	0.56	0.70	0.80	1.29
0.75	1	1400	80.1	79.9	79.8	0.68	0.80	0.84	1.66	1415	77.9	79.2	80.1	0.60	0.73	0.79	1.61
1.1	1.5	1432	81.9	81.8	81.5	0.67	0.78	0.83	2.47	1444	80.1	81.5	82.1	0.58	0.72	0.79	2.36
1.5	2	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	4.80	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	0.58	0.72	0.80	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	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	87.0	87.9	88.3	0.65	0.77	0.84	10.3
7.5	10	1450	89.0	88.7	88.7	0.75	0.83	0.87	14.9	1460	88.3	89.0	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	17.8	1455	88.7	89.5	89.8	0.65	0.77	0.84	16.8
11	15	1465	89.5	90.2	89.8	0.69	0.79	0.85	21.9	1470	88.5	90.0	90.3	0.61	0.73	0.81	20.9
15	20	1460	91.0	90.9	90.6	0.70	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	0.50	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	0.70	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	0.70	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	0.80	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	0.70	0.81	0.84	192
132	175	1485	94.8	95.2	95.0	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	0.80	0.85	0.88	271	1490	94.8	95.4	95.4	0.75	0.83	0.86	254
160	220	1485	95.0	95.4	95.2	0.80	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	0.80	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	0.80	0.86	0.88	397	1490	95.0	95.6	95.7	0.73	0.82	0.86	372
250	340	1490	95.5	95.9	95.8	0.80	0.87	0.89	445	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	0.80	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	0.80	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	95.0	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	0.80	0.85	683
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

W22 - High Efficiency - IE2 (1)

Output		Frame	Full load torque (Nm)	Locked rotor current Il/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	
IV pole - 1500 rpm - 50 Hz																			
Optional frames (high-output design)																			
0.25	0.33	80	0.170	5.5	2.0	2.5	0.0015	31	68	9.0	44.0	1420	70.0	74.0	74.0	0.61	0.74	0.81	0.602
0.37	0.5	80	0.250	5.7	2.2	2.7	0.0019	23	51	9.5	44.0	1420	73.0	75.5	75.5	0.60	0.73	0.81	0.873
0.55	0.75	71	0.400	4.1	2.4	2.2	0.0008	29	64	11.5	43.0	1340	68.0	70.5	70.5	0.50	0.64	0.74	1.52
0.75	1	90S	0.510	5.9	2.2	2.6	0.0038	19	42	18.0	49.0	1425	78.0	80.0	80.0	0.59	0.72	0.80	1.69
1.1	1.5	90L	0.740	6.5	2.1	2.6	0.0060	9	20	23.0	49.0	1450	80.0	81.8	81.8	0.53	0.68	0.78	2.49
1.1	1.5	L80	0.770	6.6	2.6	2.8	0.0037	11	24	18.5	44.0	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	0.0067	20	44	28.0	53.0	1425	82.5	83.2	83.2	0.62	0.74	0.81	3.21
2.2	3	112M	1.47	7.0	1.9	2.6	0.0117	23	51	39.0	56.0	1460	84.5	85.0	85.0	0.63	0.75	0.81	4.61
2.2	3	L90L	1.50	7.4	2.4	2.9	0.0077	9	20	27.0	49.0	1430	83.8	84.3	84.3	0.56	0.70	0.79	4.77
4	5.5	132M	2.68	7.2	1.9	3.0	0.0341	14	31	60.0	60.0	1455	87.0	87.2	87.2	0.68	0.80	0.85	7.75
4	5.5	132S	2.68	7.2	1.9	3.0	0.0341	14	31	60.0	60.0	1455	87.0	87.2	87.2	0.68	0.80	0.85	7.75
5.5	7.5	132M	3.67	7.3	1.9	3.0	0.0528	8	18	67.0	56.0	1460	87.5	88.0	88.1	0.68	0.80	0.86	10.5
5.5	7.5	L112M	3.72	7.1	2.7	3.0	0.0208	11	24	52.0	56.0	1440	87.0	87.7	87.7	0.55	0.68	0.76	11.6
7.5	10	132S	5.02	7.2	2.0	3.0	0.0528	8	18	68.0	56.0	1455	88.7	89.0	89.0	0.71	0.81	0.86	14.1
7.5	10	160M	4.99	6.1	2.1	2.7	0.0769	15	33	93.0	61.0	1465	88.0	89.2	89.0	0.65	0.77	0.83	14.7
9.2	12.5	160M	6.12	6.0	2.0	2.6	0.0838	13	29	96.0	61.0	1465	88.5	89.5	89.3	0.66	0.77	0.83	17.9
11	15	132M/L	7.39	7.7	2.4	3.2	0.0676	7	15	84.0	56.0	1450	89.0	89.5	89.8	0.65	0.77	0.84	21.0
11	15	160L	7.29	6.4	2.3	2.8	0.1048	10	22	105	61.0	1470	89.0	90.2	90.2	0.65	0.76	0.83	21.2
15	20	180M	9.97	6.6	2.4	2.9	0.1401	14	31	152	61.0	1465	90.8	91.5	91.3	0.66	0.77	0.83	28.6
18.5	25	160L	12.3	6.7	2.5	2.8	0.1607	9	20	140	61.0	1465	90.5	91.0	91.2	0.66	0.78	0.83	35.3
18.5	25	180L	12.3	6.6	2.4	2.8	0.1657	14	31	164	61.0	1465	91.5	91.8	91.6	0.68	0.78	0.83	35.1
30	40	180L	20.0	6.5	2.5	2.6	0.2393	14	31	210	61.0	1465	91.6	92.0	92.3	0.68	0.78	0.83	56.5
37	50	200L	24.5	6.0	2.1	2.5	0.3721	14	31	237	65.0	1470	92.8	93.0	93.0	0.70	0.80	0.83	69.2
45(*)	60	200L	29.8	6.5	2.3	2.6	0.3721	9	20	275	65.0	1470	92.7	93.0	93.1	0.65	0.76	0.82	85.1
55	75	225S/M	36.3	6.9	2.3	2.6	0.6880	15	33	420	66.0	1475	92.8	93.2	93.5	0.74	0.83	0.86	98.7
75	100	250S/M	49.5	7.2	2.4	2.9	1.05	10	22	496	66.0	1475	94.0	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	71.0	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	69.0	1485	94.3	95.0	95.0	0.75	0.83	0.87	192
132	175	280S/M	86.9	6.9	2.3	2.6	2.62	17	37	785	69.0	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	71.0	1490	95.0	95.6	95.6	0.77	0.84	0.87	347
200	270	355M/L	131	6.3	1.8	2.0	5.94	18	40	1404	76.0	1490	95.1	95.6	95.6	0.74	0.81	0.85	355
220	300	355M/L	144	6.4	2.0	2.2	6.48	18	40	1441	76.0	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	76.0	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	76.0	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	76.0	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	78.0	1490	95.4	95.8	95.8	0.72	0.80	0.85	532
315	430	315L	206	7.6	2.5	2.5	6.51	11	24	1540	78.0	1490	95.4	95.8	95.8	0.72	0.80	0.85	558
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

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.
(*) 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			
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	71.0	74.0	73.2	0.65	0.77	0.84	0.618	1425	69.1	73.7	74.4	0.58	0.71	0.79	0.592
0.37	0.5	1410	74.1	75.6	74.8	0.65	0.77	0.84	0.895	1425	71.7	75.1	75.8	0.57	0.70	0.79	0.860
0.55	0.75	1320	70.0	71.0	70.5	0.56	0.69	0.78	1.52	1355	67.0	70.5	70.5	0.46	0.60	0.70	1.55
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	0.80	2.56	1455	79.2	81.5	82.1	0.51	0.65	0.76	2.45
1.1	1.5	1395	81.0	81.0	81.4	0.71	0.82	0.86	2.39	1410	80.0	81.0	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	85.0	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	84.0	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	10.8	1460	87.0	87.9	88.3	0.65	0.77	0.84	10.3
5.5	7.5	1440	87.0	87.7	87.7	0.60	0.73	0.79	11.8	1445	86.0	87.8	87.8	0.50	0.63	0.72	11.8
7.5	10	1450	89.0	88.7	88.7	0.75	0.83	0.87	14.9	1460	88.3	89.0	89.4	0.67	0.78	0.84	13.9
7.5	10	1460	88.5	89.1	88.7	0.69	0.80	0.85	15.1	1470	87.5	89.0	89.1	0.61	0.74	0.81	14.5
9.2	12.5	1460	89.0	89.5	89.3	0.70	0.80	0.85	18.5	1470	88.0	89.4	89.3	0.62	0.74	0.81	17.7
11	15	1445	90.0	89.6	89.8	0.70	0.81	0.86	21.6	1455	89.0	89.5	89.8	0.60	0.74	0.81	21.0
11	15	1465	89.5	90.2	89.8	0.69	0.79	0.85	21.9	1470	88.5	90.0	90.3	0.61	0.73	0.81	20.9
15	20	1460	91.3	91.5	91.0	0.71	0.80	0.85	29.5	1470	90.4	91.4	91.4	0.63	0.74	0.81	28.2
18.5	25	1460	90.5	91.0	91.2	0.71	0.81	0.85	36.3	1470	90.0	91.0	91.2	0.62	0.75	0.81	34.8
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	0.50	0.75	0.81	34.7
30	40	1460	91.9	92.3	92.3	0.72	0.81	0.84	58.8	1465	91.5	92.0	92.3	0.64	0.76	0.82	55.1
37	50	1465	93.1	92.9	92.7	0.74	0.83	0.85	71.4	1472	92.5	93.0	93.2	0.67	0.78	0.81	68.2
45	60	1470	92.8	93.0	93.1	0.70	0.80	0.84	87.4	1475	92.4	92.8	93.1	0.61	0.73	0.79	85.1
55	75	1470	93.0	93.5	93.5	0.78	0.85	0.87	103	1475	92.8	93.2	93.6	0.71	0.81	0.85	96.2
75	100	1470	94.3	94.3	94.1	0.78	0.87	0.90	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	94.0	94.9	95.0	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	0.70	0.80	0.84	230
200	270	1485	95.1	95.5	95.4	0.80	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	95.0	95.6	95.7	0.70	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	0.70	0.80	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	0.70	0.80	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	0.80	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	96.0	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

W22 - High Efficiency - IE2 (1)

Output		Frame	Full load torque (Nm)	Locked rotor current Il/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	
VI pole - 1000 rpm - 50 Hz																			
0.12	0.16	63	0.130	3.0	1.9	2.0	0.0006	52	114	7.2	43.0	905	42.0	50.0	52.0	0.43	0.53	0.63	0.529
0.18	0.25	71	0.200	3.2	2.0	2.0	0.0008	96	211	9.5	43.0	890	52.0	58.0	59.0	0.40	0.51	0.61	0.722
0.25	0.33	71	0.280	3.2	1.9	2.1	0.0008	70	154	11.5	43.0	860	53.0	60.0	61.0	0.37	0.48	0.58	1.02
0.37	0.5	80	0.400	3.9	1.8	2.0	0.0022	27	59	10.5	43.0	910	63.0	67.0	67.0	0.51	0.66	0.76	1.05
0.55	0.75	80	0.590	4.1	2.0	2.2	0.0030	21	46	14.0	43.0	910	65.0	71.0	71.0	0.50	0.65	0.75	1.49
0.75	1	90S	0.790	4.5	2.0	2.1	0.0055	23	51	19.0	45.0	925	74.5	76.0	76.0	0.51	0.64	0.73	1.95
1.1	1.5	90L	1.16	4.7	2.3	2.2	0.0066	17	37	23.0	45.0	925	76.0	78.1	78.1	0.50	0.63	0.73	2.78
1.5	2	100L	1.55	5.0	2.0	2.4	0.0110	23	51	28.5	44.0	940	79.5	80.0	80.0	0.51	0.64	0.73	3.71
2.2	3	112M	2.22	7.1	3.5	3.9	0.0000	17	37	38.0	52.0	965	80.8	82.7	83.5	0.41	0.54	0.64	5.94
3	4	132S	3.04	5.7	2.0	2.4	0.0359	31	68	61.0	52.0	960	82.5	83.6	83.6	0.50	0.63	0.71	7.30
4	5.5	132M	4.06	6.0	2.1	2.5	0.0453	21	46	68.0	52.0	960	84.0	84.8	84.8	0.51	0.64	0.72	9.46
5.5	7.5	132M	5.58	6.4	2.2	2.7	0.0604	19	42	72.0	52.0	960	85.5	86.1	86.1	0.51	0.64	0.72	12.8
7.5	10	160M	7.53	5.8	2.0	2.6	0.1229	17	37	113	56.0	970	88.3	88.7	88.3	0.64	0.76	0.82	15.0
9.2	12.5	160L	9.24	6.0	2.2	2.6	0.1492	14	31	127	56.0	970	88.5	88.9	88.6	0.64	0.76	0.82	18.3
11	15	160L	11.1	6.0	2.3	2.7	0.1664	13	29	136	56.0	970	89.0	89.5	89.2	0.62	0.74	0.81	22.0
15	20	180L	15.1	7.0	2.4	3.0	0.2565	7	15	174	56.0	970	90.3	90.5	90.3	0.70	0.81	0.86	27.9
18.5	25	200L	18.5	5.7	2.1	2.5	0.3517	15	33	214	60.0	975	91.0	91.4	91.2	0.67	0.77	0.82	35.7
22	30	200L	22.0	6.0	2.2	2.7	0.4037	14	31	225	60.0	975	91.4	91.7	91.5	0.65	0.76	0.82	42.3
30	40	225S/M	29.7	6.8	2.1	2.5	0.7192	12	26	359	63.0	985	92.6	92.7	92.6	0.71	0.81	0.86	54.4
37	50	250S/M	36.6	6.7	2.2	2.5	1.10	16	35	438	64.0	985	93.0	93.2	93.0	0.73	0.82	0.86	66.8
45	60	280S/M	44.5	6.2	2.0	2.5	2.02	26	57	596	65.0	985	93.4	93.6	93.4	0.68	0.78	0.82	84.8
55	75	280S/M	54.4	6.2	2.0	2.4	2.36	22	48	629	65.0	985	93.6	93.9	93.8	0.68	0.79	0.83	102
75	100	315S/M	73.8	6.2	1.9	2.2	3.83	23	51	837	67.0	990	94.0	94.3	94.2	0.69	0.79	0.83	138
90	125	315S/M	88.6	6.0	1.9	2.1	4.54	22	48	893	67.0	990	94.4	94.6	94.5	0.72	0.80	0.84	164
110	150	315S/M	108	6.1	2.0	2.2	5.45	20	44	966	67.0	990	94.5	94.9	94.8	0.72	0.80	0.84	199
132	175	315S/M	130	6.4	2.2	2.4	6.35	17	37	1036	67.0	990	94.6	95.0	95.0	0.71	0.80	0.84	239
150	200	355M/L	147	5.6	1.8	2.0	7.41	38	84	1340	73.0	995	94.2	94.5	95.0	0.64	0.74	0.79	290
160	220	315L	157	6.6	2.2	2.4	9.53	14	31	1228	68.0	990	94.8	95.2	95.2	0.70	0.80	0.84	289
185	250	315L	182	6.9	2.3	2.4	10.2	12	26	1358	68.0	990	95.0	95.4	95.4	0.69	0.79	0.83	337
200	270	315L	197	7.0	2.4	2.5	12.4	12	26	1488	68.0	990	95.1	95.4	95.4	0.69	0.79	0.83	365
220	300	315L	216	6.8	2.3	2.3	13.8	14	31	1621	68.0	990	95.2	95.5	95.5	0.69	0.79	0.83	401
250	340	355M/L	246	6.0	2.0	2.2	13.9	34	75	1789	73.0	990	95.3	95.5	95.5	0.66	0.76	0.81	466
260	350	355M/L	256	6.0	2.1	2.2	12.7	34	75	1789	73.0	990	95.3	95.5	95.5	0.66	0.76	0.81	485
280	380	355M/L	275	6.2	2.2	2.2	13.9	27	59	1884	73.0	990	95.4	95.6	95.6	0.64	0.75	0.80	528
300	400	355M/L	295	6.2	2.2	2.2	14.3	30	66	1900	73.0	990	95.4	95.7	95.6	0.63	0.74	0.79	573
315	430	355M/L	308	6.2	2.2	2.2	15.0	28	62	1979	73.0	995	95.4	95.7	95.6	0.66	0.76	0.81	587
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	0.0000	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)																			
0.25	0.33	80	0.270	3.9	1.8	2.0	0.0022	27	59	10.5	43.0	910	63.0	67.0	67.0	0.51	0.66	0.76	0.709
3	4	132M	3.04	5.7	2.0	2.4	0.0359	31	68	61.0	52.0	960	82.5	83.6	83.6	0.50	0.63	0.71	7.30
5.5	7.5	160M	5.52	6.0	2.1	2.6	0.1053	19	42	106	56.0	970	87.5	88.0	87.5	0.63	0.75	0.81	11.2
37	50	225S/M	36.6	6.8	2.1	2.5	0.8876	11	24	390	63.0	985	93.0	93.2	93.0	0.72	0.81	0.86	66.8
45	60	250S/M	44.5	6.4	2.1	2.3	1.29	15	33	466	64.0	985	93.4	93.5	93.4	0.76	0.84	0.87	79.9
75	100	280S/M	73.8	6.4	2.0	2.4	3.03	17	37	702	65.0	990	93.9	94.3	94.2	0.69	0.79	0.84	137
132	175	355M/L	129	6.0	2.0	2.3	0.0000	40	88	1300	73.0	995	94.0	94.5	95.0	0.60	0.72	0.77	260
160	220	355M/L	157	5.9	1.8	2.0	8.34	34	75	1453	73.0	990	94.9	95.3	95.3	0.65	0.75	0.80	303
185	250	355M/L	182	5.7	1.9	2.0	9.24	32	70	1521	73.0	990	95.1	95.4	95.4	0.65	0.75	0.80	350
200	270	355M/L	197	6.5	2.1	2.3	10.9	28	62	1643	73.0	990	95.1	95.5	95.5	0.64	0.75	0.80	378
220	300	355M/L	216	6.0	2.0	2.1	11.8	32	70	1795	73.0	990	95.3	95.5	95.5	0.65	0.75	0.80	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.
(*) 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			
kW	HP		50	75	100	50	75	100			50	75	100	50	75	100	
VI pole - 1000 rpm - 50 Hz																	
0.12	0.16	895	45.4	52.1	52.9	0.46	0.57	0.67	0.514	910	39.1	47.5	50.7	0.41	0.50	0.59	0.558
0.18	0.25	875	54.2	59.0	58.7	0.43	0.55	0.65	0.717	900	50.1	56.8	58.6	0.38	0.48	0.58	0.737
0.25	0.33	845	56.3	61.9	61.5	0.41	0.52	0.62	0.996	865	50.1	57.8	59.7	0.35	0.45	0.54	1.08
0.37	0.5	895	65.2	67.7	66.0	0.56	0.70	0.80	1.06	915	60.5	65.9	67.1	0.48	0.62	0.73	1.05
0.55	0.75	900	67.5	71.8	70.2	0.55	0.69	0.79	1.51	915	62.5	69.6	70.9	0.47	0.61	0.72	1.50
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	2.76	930	74.3	77.3	78.1	0.46	0.59	0.70	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	0.70	3.71
2.2	3	960	82.0	83.1	84.2	0.46	0.60	0.68	5.84	970	79.8	83.2	84.4	0.38	0.50	0.60	6.04
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	85.0	84.6	0.55	0.68	0.74	9.74	960	83.0	84.4	84.9	0.47	0.61	0.69	9.50
5.5	7.5	955	86.4	86.3	86.0	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	0.80	14.7
9.2	12.5	965	88.9	88.8	88.1	0.68	0.79	0.84	18.9	970	88.0	88.8	88.8	0.61	0.73	0.80	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	0.80	0.84	36.9	975	90.5	91.2	91.3	0.63	0.74	0.80	35.2
22	30	970	92.0	91.8	91.2	0.70	0.79	0.84	43.6	975	90.8	91.5	91.6	0.61	0.73	0.80	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	93.0	92.6	0.77	0.84	0.87	69.8	985	92.7	93.2	93.2	0.70	0.80	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	0.80	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	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	95.0	94.8	0.75	0.83	0.85	249	990	94.3	94.9	95.0	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	0.61	0.71	0.76	291
160	220	990	95.0	95.2	95.0	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	95.0	95.5	95.6	0.66	0.77	0.82	390
250	340	990	95.5	95.5	95.4	0.70	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	0.70	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	0.80	597	995	95.2	95.6	95.6	0.60	0.70	0.77	567
315	430	995	95.6	95.7	95.5	0.70	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	0.60	0.71	0.77	754
Optional frames (high-output design)																	
0.25	0.33	895	65.2	67.7	66.0	0.56	0.70	0.80	0.719	915	60.5	65.9	67.1	0.48	0.62	0.73	0.710
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	11.6	970	87.0	87.9	87.8	0.60	0.73	0.79	11.0
37	50	980	93.1	92.9	92.4	0.76	0.83	0.87	69.9	985	92.8	93.2	93.2	0.69	0.79	0.85	65.0
45	60	980	93.4	93.2	92.8	0.79	0.86	0.88	83.7	985	93.3	93.6	93.7	0.73	0.82	0.86	77.7
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	0.64	0.75	0.79	267	995	94.0	94.5	95.0	0.57	0.69	0.75	258
160	220	990	94.5	95.9	96.0	0.70	0.80	0.82	309	990	93.9	95.8	96.0	0.60	0.74	0.80	290
185	250	990	94.4	95.5	95.7	0.70	0.79	0.82	358	990	94.0	95.5	95.8	0.60	0.71	0.78	344
200	270	990	95.0	95.6	95.7	0.70	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	0.80	0.82	426	995	93.4	95.0	95.8	0.62	0.74	0.79	404

W22 - High Efficiency - IE2 (1)

Output		Frame	Full load torque (Nm)	Locked rotor current Il/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	
VIII pole - 750 rpm - 50 Hz																			
0.12	0.16	71	0.180	2.3	1.9	2.0	0.0008	172	378	9.5	41.0	650	40.0	48.0	50.0	0.35	0.43	0.52	0.666
0.18	0.25	80	0.260	3.1	1.9	2.1	0.0024	48	106	11.5	42.0	670	47.0	53.0	55.0	0.44	0.55	0.65	0.727
0.25	0.33	80	0.360	3.2	1.9	2.1	0.0029	42	92	13.5	42.0	670	49.0	55.0	57.0	0.43	0.55	0.66	0.959
0.37	0.5	90S	0.520	3.5	1.8	2.0	0.0044	37	81	18.0	43.0	690	56.0	62.0	62.0	0.41	0.52	0.62	1.39
0.55	0.75	90L	0.780	3.5	1.9	2.0	0.0060	31	68	22.0	43.0	685	61.0	64.0	64.0	0.44	0.56	0.66	1.88
0.75	1	100L	1.03	4.6	2.0	2.4	0.0110	42	92	28.5	50.0	710	71.0	74.0	74.0	0.40	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	50.0	705	71.0	75.0	75.0	0.40	0.53	0.62	3.41
1.5	2	112M	2.09	4.7	2.4	2.3	0.0202	29	64	39.0	46.0	700	77.0	79.0	79.0	0.44	0.57	0.67	4.09
2.2	3	132S	3.06	5.5	2.2	2.4	0.0592	25	55	62.0	48.0	700	81.0	81.5	81.0	0.52	0.65	0.72	5.44
3	4	132M	4.17	5.5	2.3	2.4	0.0740	19	42	66.0	48.0	700	82.0	82.5	82.0	0.54	0.66	0.73	7.23
4	5.5	160M	5.37	4.7	2.0	2.2	0.1053	29	64	107	51.0	725	84.0	85.0	85.0	0.52	0.65	0.72	9.43
5.5	7.5	160M	7.39	4.7	2.0	2.2	0.1404	21	46	120	51.0	725	85.0	86.0	85.5	0.52	0.65	0.73	12.7
7.5	10	160L	10.1	4.9	2.2	2.3	0.1756	22	48	139	51.0	725	86.0	87.0	87.0	0.52	0.65	0.73	17.0
9.2	12.5	180M	12.4	6.0	2.0	2.5	0.2033	11	24	156	51.0	725	88.0	88.0	87.5	0.63	0.75	0.82	18.5
11	15	180L	14.8	6.0	2.1	2.4	0.2439	11	24	175	51.0	725	88.0	88.5	88.0	0.67	0.77	0.83	21.7
15	20	200L	20.0	4.9	1.9	2.0	0.4220	30	66	226	53.0	730	90.0	90.5	90.0	0.58	0.70	0.76	31.7
18.5	25	225S/M	24.5	6.3	2.0	2.4	0.6183	17	37	339	56.0	735	91.5	91.9	91.7	0.65	0.77	0.82	35.5
22	30	225S/M	29.2	6.1	2.0	2.4	0.7203	16	35	358	56.0	735	91.7	92.0	92.0	0.67	0.78	0.81	42.6
30	40	250S/M	39.8	6.6	2.1	2.7	1.06	13	29	433	56.0	735	92.0	92.4	92.3	0.68	0.79	0.83	56.5
37	50	280S/M	48.7	5.6	1.8	2.1	2.26	26	57	614	59.0	740	93.0	93.5	93.5	0.64	0.74	0.80	71.4
45	60	280S/M	59.2	5.8	1.9	2.1	2.71	23	51	660	59.0	740	93.4	93.8	93.8	0.64	0.74	0.80	86.6
55	75	315S/M	72.4	5.8	1.8	2.1	4.03	32	70	851	62.0	740	93.7	94.2	94.2	0.66	0.76	0.80	105
75	100	315S/M	98.7	5.9	1.8	2.1	5.31	30	66	951	62.0	740	94.1	94.5	94.6	0.68	0.77	0.81	141
90	125	315S/M	118	6.0	1.9	2.1	6.22	26	57	1020	62.0	740	94.4	94.7	94.7	0.68	0.77	0.81	169
110	150	315L	145	6.0	1.9	2.1	12.6	28	62	1244	68.0	740	94.6	94.8	94.8	0.67	0.76	0.80	209
132	175	315L	174	6.3	2.0	2.3	13.2	20	44	1352	68.0	740	94.8	95.1	95.1	0.64	0.75	0.80	250
160	220	355M/L	209	6.0	1.5	2.3	14.4	54	119	1616	70.0	745	95.2	95.6	95.6	0.63	0.74	0.80	302
185	250	355M/L	242	6.1	1.5	2.3	16.5	48	106	1691	70.0	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	70.0	745	95.3	95.6	95.6	0.63	0.74	0.80	377
220	300	355M/L	288	6.3	1.5	2.3	19.9	48	106	1875	70.0	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	70.0	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	49.4	7.5	2.1	2.6	1.66	12	26	570	56.0	730	92.5	93.0	93.0	0.66	0.77	0.82	70.0
55	75	280S/M	72.4	5.8	2.0	2.1	3.16	24	53	710	59.0	740	93.7	94.2	94.1	0.64	0.75	0.80	105
110	150	315S/M	145	6.0	1.9	2.1	7.84	28	62	1300	62.0	740	94.6	94.8	94.8	0.67	0.76	0.80	209
110	150	355M/L	144	6.4	1.3	2.1	10.4	48	106	1379	70.0	745	94.6	95.2	95.2	0.63	0.74	0.79	211
132	175	355M/L	173	6.5	1.3	2.0	12.6	50	110	1473	70.0	745	95.0	95.5	95.4	0.64	0.75	0.80	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			
kW	HP		50	75	100	50	75	100			50	75	100	50	75	100	
VIII pole - 750 rpm - 50 Hz																	
0.12	0.16	635	42.9	50.1	50.8	0.37	0.47	0.56	0.641	655	37.1	45.7	48.8	0.34	0.41	0.49	0.698
0.18	0.25	660	49.3	54.4	54.9	0.47	0.59	0.69	0.722	675	45.0	51.8	54.5	0.42	0.53	0.62	0.741
0.25	0.33	660	51.1	56.2	56.8	0.47	0.59	0.70	0.955	675	47.0	53.8	56.8	0.42	0.53	0.63	0.972
0.37	0.5	680	59.5	63.8	62.4	0.44	0.56	0.67	1.34	695	53.1	59.9	60.9	0.39	0.49	0.59	1.43
0.55	0.75	675	63.3	65.1	63.5	0.47	0.61	0.70	1.88	690	58.5	62.8	63.9	0.41	0.53	0.63	1.90
0.75	1	705	73.0	75.0	73.9	0.44	0.57	0.65	2.37	715	69.2	73.0	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	0.70	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	0.70	5.37
3	4	690	82.7	82.4	80.8	0.58	0.70	0.75	7.52	705	81.1	82.4	82.5	0.50	0.63	0.71	7.13
4	5.5	720	84.8	85.0	84.4	0.56	0.68	0.74	9.73	730	83.2	84.7	85.2	0.49	0.62	0.70	9.33
5.5	7.5	720	85.8	86.0	84.9	0.56	0.68	0.75	13.1	725	84.2	85.7	85.7	0.49	0.62	0.71	12.6
7.5	10	720	86.8	87.2	86.6	0.56	0.69	0.76	17.3	725	85.1	86.7	87.1	0.49	0.62	0.71	16.9
9.2	12.5	720	88.5	87.9	86.8	0.67	0.78	0.84	19.2	725	87.4	87.9	87.8	0.59	0.72	0.80	18.2
11	15	720	88.4	88.3	87.2	0.71	0.80	0.85	22.5	725	87.5	88.5	88.4	0.64	0.75	0.81	21.4
15	20	725	90.5	90.4	89.4	0.62	0.73	0.78	32.7	730	89.4	90.4	90.2	0.55	0.67	0.74	31.3
18.5	25	730	91.8	91.8	91.2	0.69	0.80	0.84	36.7	735	91.1	91.9	91.9	0.62	0.74	0.80	35.0
22	30	730	91.9	91.8	91.4	0.70	0.81	0.83	44.1	735	91.4	92.0	92.2	0.64	0.76	0.80	41.5
30	40	730	92.3	92.3	91.8	0.73	0.82	0.85	58.4	735	91.6	92.3	92.5	0.64	0.76	0.81	55.7
37	50	735	93.3	93.4	93.1	0.68	0.77	0.82	73.6	740	92.6	93.4	93.6	0.61	0.72	0.78	70.5
45	60	735	93.3	93.9	94.0	0.66	0.77	0.81	89.8	740	92.5	93.5	94.1	0.58	0.70	0.77	86.4
55	75	740	94.0	94.2	93.9	0.70	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	0.80	0.82	147	740	93.8	94.4	94.7	0.64	0.75	0.80	138
90	125	740	94.7	94.7	94.4	0.72	0.80	0.82	177	740	94.1	94.6	94.8	0.64	0.75	0.80	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	95.0	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	95.0	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	0.70	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	730	92.7	92.9	92.9	0.70	0.79	0.83	72.9	735	92.5	93.1	93.1	0.64	0.75	0.81	68.3
55	75	740	94.0	94.1	93.7	0.68	0.78	0.82	109	740	93.4	94.1	94.3	0.60	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	94.0	95.2	95.1	0.65	0.76	0.81	217	745	93.0	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	0.60	0.71	0.77	250

W22 -Premium Efficiency - IE3 (1)

Output		Frame	Full load torque (Nm)	Locked rotor current Il/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 pole - 3000 rpm - 50 Hz																			
0.12	0.16	63	0.040	5.4	3.3	3.3	0.0001	30	66	6.2	52.0	2820	58.0	63.0	65.0	0.54	0.67	0.76	0.351
0.18	0.25	63	0.060	5.2	3.2	3.2	0.0002	22	48	6.7	52.0	2800	61.0	66.0	67.0	0.55	0.68	0.77	0.504
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	69.0	0.54	0.68	0.77	0.679
0.37	0.5	71	0.130	6.3	2.5	2.5	0.0004	12	26	7.5	56.0	2790	73.0	74.5	74.5	0.66	0.79	0.85	0.843
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	76.0	0.68	0.81	0.86	1.21
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	82.0	0.63	0.76	0.82	1.61
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	83.5	0.63	0.76	0.82	2.32
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	85.0	0.64	0.76	0.83	3.07
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	32.0	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	0.0080	22	48	41.0	64.0	2900	88.1	89.1	89.5	0.69	0.80	0.86	7.50
5.5	7.5	132S	1.83	8.3	2.6	3.2	0.0216	23	51	65.0	67.0	2930	88.3	89.7	90.0	0.72	0.82	0.87	10.1
7.5	10	132S	2.49	8.5	3.0	3.4	0.0252	17	37	69.0	67.0	2935	89.1	90.5	90.8	0.69	0.80	0.86	13.9
9.2	12.5	132M	3.06	8.5	2.9	3.3	0.0306	16	35	78.0	67.0	2930	90.4	91.1	91.1	0.75	0.84	0.88	16.6
11	15	160M	3.63	8.0	2.7	3.5	0.0554	17	37	115	67.0	2950	91.0	92.3	92.7	0.71	0.81	0.85	20.1
15	20	160M	4.95	8.0	2.6	3.3	0.0625	12	26	119	67.0	2950	91.5	92.5	92.9	0.71	0.81	0.86	27.1
18.5	25	160L	6.11	8.4	2.8	3.6	0.0735	8	18	136	67.0	2950	92.0	92.9	93.2	0.70	0.80	0.86	33.3
22	30	180M	7.25	8.0	2.5	3.3	0.1130	11	24	176	67.0	2955	92.5	93.3	93.7	0.73	0.82	0.87	39.0
30	40	200L	9.85	7.3	2.6	2.9	0.1873	20	44	244	69.0	2965	92.8	94.0	94.1	0.73	0.82	0.86	53.5
37	50	200L	12.1	7.3	2.6	2.9	0.2119	17	37	265	69.0	2965	93.3	94.0	94.6	0.73	0.82	0.86	65.6
45	60	225S/M	14.8	8.0	2.4	3.2	0.4415	12	26	416	74.0	2970	94.6	95.1	95.1	0.77	0.85	0.88	77.6
55	75	250S/M	18.1	7.9	2.8	2.9	0.4924	14	31	485	74.0	2965	94.9	95.3	95.4	0.80	0.86	0.89	93.5
75	100	280S/M	24.5	7.6	2.3	2.9	1.21	32	70	727	77.0	2980	94.5	95.3	95.6	0.82	0.88	0.90	126
90	125	280S/M	29.4	7.4	2.2	2.8	1.34	30	66	762	77.0	2980	94.8	95.6	95.8	0.84	0.89	0.90	151
110	150	315S/M	36.0	7.6	2.5	3.0	2.12	30	66	962	77.0	2980	94.7	95.7	96.1	0.80	0.87	0.89	186
132	175	315S/M	43.1	7.5	2.1	2.8	2.56	30	66	1048	77.0	2980	95.2	95.9	96.3	0.83	0.89	0.90	220
160	220	315S/M	52.3	7.9	2.3	2.8	2.99	24	53	1129	77.0	2980	95.6	96.2	96.6	0.83	0.89	0.91	263
185	250	315S/M	60.5	7.8	2.4	2.7	3.20	22	48	1197	77.0	2980	95.7	96.4	96.6	0.83	0.89	0.90	307
200	270	315L	65.4	8.2	2.6	2.8	3.42	17	37	1305	78.0	2980	96.0	96.5	96.7	0.83	0.89	0.90	332
220	300	315L	71.9	7.7	2.4	2.6	3.72	24	53	1370	78.0	2980	96.1	96.5	96.7	0.84	0.89	0.91	361
250	340	315L	81.7	7.8	2.5	2.7	4.17	17	37	1434	78.0	2980	96.4	96.6	96.8	0.86	0.90	0.91	410
260	350	315L	85.0	7.8	2.5	2.7	4.17	17	37	1434	78.0	2980	96.4	96.6	96.8	0.86	0.90	0.91	426
280	380	315L	91.5	8.0	2.6	3.0	4.17	22	48	1510	78.0	2980	96.2	96.8	96.8	0.87	0.90	0.91	459
315	430	355M/L	103	7.7	2.1	2.5	6.01	18	40	1838	80.0	2980	96.4	96.8	96.9	0.87	0.90	0.91	516
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	83.0	0.63	0.75	0.82	1.59
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	84.5	0.63	0.75	0.82	2.29
2.2	3	100L	0.740	8.5	3.2	3.3	0.0059	22	48	31.0	67.0	2910	85.0	86.6	86.6	0.71	0.82	0.87	4.21
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	89.0	0.73	0.82	0.87	7.46
5.5	7.5	132M	1.83	8.3	2.6	3.2	0.0216	23	51	65.0	67.0	2930	88.3	89.7	90.0	0.72	0.82	0.87	10.1
7.5	10	132M	2.49	8.5	3.0	3.4	0.0252	17	37	69.0	67.0	2935	89.1	90.5	90.8	0.69	0.80	0.86	13.9
11	15	132M	3.66	8.2	2.7	3.0	0.0306	11	24	78.0	67.0	2925	90.6	91.1	91.2	0.75	0.85	0.89	19.6
11	15	160L	3.63	8.0	2.7	3.5	0.0554	17	37	115	67.0	2950	91.0	92.3	92.7	0.71	0.81	0.85	20.1
15	20	160L	4.95	8.0	2.6	3.3	0.0625	12	26	119	67.0	2950	91.5	92.5	92.9	0.71	0.81	0.86	27.1
18.5	25	180M	6.11	7.8	2.4	3.2	0.1081	13	29	172	67.0	2950	92.0	92.9	93.2	0.75	0.84	0.88	32.6
22	30	180L	7.25	8.0	2.5	3.3	0.1130	11	24	176	67.0	2955	92.5	93.3	93.7	0.73	0.82	0.87	39.0
75	100	250S/M	24.6	7.9	3.0	2.8	0.5132	11	24	500	74.0	2965	95.0	95.3	95.4	0.83	0.87	0.89	127
110	150	280S/M	36.0	7.9	2.3	2.9	1.56	21	46	819	77.0	2980	94.8	95.7	96.0	0.82	0.88	0.90	184
200	270	355M/L	65.3	7.5	1.9	2.6	4.31	28	62	1537	80.0	2985	95.7	96.5	96.7	0.84	0.89	0.90	332
220	300	355M/L	71.8	7.7	2.0	2.7	4.61	22	48	1585	80.0	2985	95.8	96.5	96.7	0.85	0.88	0.90	365
250	340	355M/L	81.6	7.7	2.1	2.8	5.04	22	48	1665	80.0	2985	96.0	96.7	96.8	0.86	0.90	0.91	410
260	350	355M/L	84.8	7.7	2.1	2.8	5.04	22	48	1665	80.0	2985	96.0	96.7	96.8	0.86	0.90	0.91	426
280	380	355M/L	91.5	7.5	2.0	2.4	5.58	20	44	1751	80.0	2980	96.2	96.7	96.8	0.88	0.90	0.91	459

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	
II pole - 3000 rpm - 50 Hz																	
0.12	0.16	2795	59.0	63.5	64.8	0.58	0.71	0.79	0.356	2835	57.0	62.4	64.9	0.51	0.64	0.73	0.352
0.18	0.25	2775	62.6	66.6	66.7	0.59	0.73	0.82	0.500	2815	59.6	65.2	66.7	0.51	0.64	0.74	0.507
0.25	0.33	2780	64.6	68.7	68.8	0.59	0.73	0.81	0.682	2820	61.5	67.2	68.7	0.51	0.64	0.74	0.684
0.37	0.5	2765	73.6	74.3	73.6	0.71	0.82	0.87	0.878	2805	72.4	74.5	75.0	0.63	0.76	0.83	0.827
0.55	0.75	2740	75.6	75.7	75.0	0.73	0.84	0.88	1.27	2790	74.4	76.0	76.5	0.65	0.78	0.84	1.19
0.75	1	2805	80.9	82.2	81.6	0.68	0.80	0.85	1.64	2835	79.1	81.7	82.1	0.59	0.72	0.79	1.61
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
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	88.6	89.2	89.1	0.73	0.83	0.88	7.75	2905	87.5	89.0	89.6	0.65	0.77	0.84	7.39
5.5	7.5	2920	88.7	89.7	89.7	0.76	0.85	0.89	10.5	2935	87.8	89.6	90.1	0.68	0.79	0.85	10.0
7.5	10	2925	89.6	90.6	90.6	0.74	0.84	0.88	14.3	2940	88.6	90.3	90.8	0.65	0.77	0.83	13.8
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	2945	91.3	92.3	92.5	0.75	0.84	0.87	20.8	2955	90.7	92.2	92.8	0.68	0.79	0.83	19.9
15	20	2945	91.8	92.5	92.6	0.75	0.84	0.88	28.0	2955	91.2	92.4	93.0	0.68	0.79	0.84	26.7
18.5	25	2945	92.4	92.9	93.0	0.74	0.83	0.88	34.3	2955	91.6	92.8	93.3	0.66	0.77	0.84	32.8
22	30	2950	92.7	93.2	93.4	0.77	0.84	0.88	40.7	2960	92.3	93.3	93.8	0.70	0.80	0.86	37.9
30	40	2960	93.1	94.0	94.0	0.77	0.85	0.88	55.1	2970	92.6	93.9	94.2	0.69	0.79	0.84	52.7
37	50	2960	93.5	94.0	94.4	0.78	0.85	0.88	67.7	2970	93.1	93.9	94.7	0.69	0.79	0.84	64.7
45	60	2965	94.6	94.9	94.8	0.79	0.86	0.89	80.1	2970	94.5	95.2	95.3	0.75	0.84	0.87	74.6
55	75	2960	94.9	95.0	95.1	0.82	0.87	0.90	97.6	2965	94.8	95.3	95.5	0.78	0.85	0.88	91.0
75	100	2975	94.6	95.2	95.4	0.84	0.89	0.91	131	2980	94.4	95.3	95.7	0.80	0.87	0.90	121
90	125	2975	94.9	95.5	95.6	0.86	0.90	0.90	159	2980	94.7	95.6	95.9	0.82	0.88	0.90	145
110	150	2975	94.8	95.7	96.0	0.83	0.89	0.90	193	2980	94.6	95.7	96.1	0.78	0.86	0.88	181
132	175	2975	95.3	95.8	96.1	0.85	0.90	0.90	232	2980	95.1	95.9	96.4	0.81	0.88	0.90	212
160	220	2975	95.7	96.1	96.4	0.85	0.90	0.92	274	2980	95.5	96.2	96.7	0.81	0.88	0.91	253
185	250	2975	95.4	96.1	96.3	0.85	0.90	0.90	324	2980	95.6	96.4	96.7	0.81	0.88	0.90	296
200	270	2975	96.0	96.4	96.5	0.85	0.90	0.91	346	2980	95.9	96.5	96.8	0.81	0.88	0.90	319
220	300	2975	93.1	96.4	96.5	0.86	0.90	0.91	381	2980	96.1	96.5	96.8	0.83	0.88	0.91	347
250	340	2975	96.4	96.5	96.6	0.88	0.91	0.91	432	2980	96.4	96.7	96.9	0.85	0.89	0.91	394
260	350	2975	96.4	96.5	96.6	0.88	0.91	0.91	449	2980	96.4	96.7	96.9	0.85	0.89	0.91	410
280	380	2975	96.2	96.6	96.6	0.87	0.91	0.91	484	2980	96.2	96.8	96.8	0.85	0.89	0.90	447
315	430	2980	94.2	95.5	95.8	0.89	0.92	0.92	543	2985	95.2	95.6	95.8	0.86	0.90	0.92	497
Optional frames (high-output design)																	
0.75	1	2885	79.5	82.5	82.5	0.68	0.78	0.84	1.64	2910	78.4	82.3	83.1	0.60	0.72	0.79	1.59
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	2900	85.4	86.5	86.5	0.75	0.84	0.89	4.36	2915	84.7	86.5	86.8	0.68	0.80	0.86	4.10
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	2920	88.7	89.7	89.7	0.76	0.85	0.89	10.5	2935	87.8	89.6	90.1	0.68	0.79	0.85	10.0
7.5	10	2925	89.6	90.6	90.6	0.74	0.84	0.88	14.3	2940	88.6	90.3	90.8	0.65	0.77	0.83	13.8
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	2945	91.3	92.3	92.5	0.75	0.84	0.87	20.8	2955	90.7	92.2	92.8	0.68	0.79	0.83	19.9
15	20	2945	91.8	92.5	92.6	0.75	0.84	0.88	28.0	2955	91.2	92.4	93.0	0.68	0.79	0.84	26.7
18.5	25	2945	92.1	92.8	92.8	0.78	0.86	0.89	34.0	2955	91.9	92.9	93.4	0.72	0.82	0.87	31.7
22	30	2950	92.7	93.2	93.4	0.77	0.84	0.88	40.7	2960	92.3	93.3	93.8	0.70	0.80	0.86	37.9
75	100	2960	95.0	95.1	95.1	0.85	0.88	0.90	133	2965	94.9	95.4	95.6	0.81	0.86	0.88	124
110	150	2975	94.9	95.6	95.8	0.84	0.89	0.91	192	2980	94.7	95.7	96.1	0.80	0.87	0.90	177
200	270	2980	93.9	95.2	95.8	0.90	0.92	0.92	345	2985	93.5	95.1	95.8	0.88	0.90	0.91	319
220	300	2985	95.5	96.2	96.4	0.87	0.91	0.92	377	2990	95.0	96.0	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
260	350	2980	95.5	96.3	96.4	0.89	0.92	0.93	441	2985	95.4	96.3	96.4	0.86	0.91	0.92	408
280	380	2975	95.2	95.5	95.8	0.87	0.90	0.91	490	2980	95.2	95.6	95.8	0.83	0.88	0.91	447

W22 -Premium Efficiency - IE3 (1)

Output		Frame	Full load torque (Nm)	Locked rotor current Il/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	
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	62.0	63.0	0.52	0.65	0.75	0.367
0.18	0.25	63	0.130	4.7	2.1	2.4	0.0006	30	66	7.2	44.0	1370	62.0	64.0	64.5	0.53	0.63	0.72	0.559
0.25	0.33	71	0.180	4.8	2.1	2.3	0.0007	30	66	8.0	43.0	1370	66.0	69.0	69.5	0.52	0.65	0.74	0.702
0.37	0.5	71	0.260	4.8	2.6	2.6	0.0008	30	66	9.5	43.0	1370	69.0	72.0	72.0	0.51	0.64	0.73	1.02
0.55	0.75	80	0.380	6.6	2.9	3.2	0.0026	20	44	12.5	44.0	1420	77.0	79.0	79.5	0.61	0.74	0.80	1.25
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	84.8	0.59	0.72	0.80	2.34
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	86.0	0.58	0.72	0.80	3.15
2.2	3	100L	1.49	7.4	3.2	3.5	0.0090	18	40	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	0.0182	15	33	44.0	56.0	1450	88.7	89.1	89.1	0.60	0.72	0.79	8.00
5.5	7.5	132S	3.66	8.5	2.4	3.4	0.0528	15	33	69.0	56.0	1465	90.0	90.7	90.7	0.67	0.79	0.85	10.3
7.5	10	132M	4.99	8.5	2.5	3.4	0.0642	13	29	78.0	56.0	1465	91.0	91.5	91.5	0.68	0.79	0.84	13.9
9.2	12.5	160M	6.08	7.2	2.5	3.0	0.1149	16	35	109	61.0	1475	90.0	91.4	91.8	0.66	0.77	0.83	17.4
11	15	160M	7.29	7.0	2.5	3.0	0.1397	17	37	123	61.0	1470	91.0	91.8	92.2	0.65	0.76	0.83	20.7
15	20	160L	9.94	7.3	2.7	3.2	0.1743	10	22	145	61.0	1470	91.8	92.5	93.0	0.65	0.76	0.82	28.4
18.5	25	180M	12.3	7.3	2.7	3.0	0.2001	20	44	180	61.0	1470	92.2	92.9	93.3	0.64	0.76	0.82	34.9
22	30	180L	14.6	7.3	2.8	3.3	0.2272	18	40	198	61.0	1470	92.4	93.0	93.6	0.66	0.77	0.83	40.9
30	40	200L	19.7	7.3	2.5	3.0	0.3469	16	35	243	63.0	1480	93.0	94.0	94.2	0.64	0.75	0.82	56.1
37	50	225S/M	24.4	7.8	2.7	3.0	0.6388	14	31	392	63.0	1480	94.0	94.6	94.6	0.72	0.81	0.86	65.6
45	60	225S/M	29.6	7.9	2.8	3.2	0.6903	13	29	420	63.0	1480	94.2	94.8	94.8	0.70	0.80	0.85	79.4
55	75	250S/M	36.2	7.9	2.8	3.3	1.11	14	31	507	64.0	1480	94.6	95.0	95.3	0.71	0.81	0.86	96.9
75	100	280S/M	49.2	7.6	2.3	2.8	2.25	26	57	729	69.0	1485	94.7	95.2	95.6	0.75	0.83	0.87	130
90	125	280S/M	59.0	7.4	2.3	2.8	2.55	25	55	777	69.0	1485	95.0	95.5	95.8	0.74	0.82	0.86	158
110	150	315S/M	71.9	7.5	2.6	2.7	3.55	30	66	1010	71.0	1490	95.4	95.9	96.3	0.74	0.83	0.86	192
132	175	315S/M	86.3	7.6	2.9	3.0	4.22	26	57	1095	71.0	1490	95.5	96.0	96.4	0.75	0.83	0.86	230
150	200	315S/M	98.1	7.8	2.7	2.9	0.0000	27	59	1180	71.0	1490	95.4	95.8	95.9	0.71	0.81	0.85	266
160	220	315S/M	105	7.6	2.6	2.6	4.65	22	48	1152	71.0	1490	95.7	96.2	96.5	0.75	0.83	0.87	275
185	250	315S/M	121	7.6	2.5	2.5	4.97	18	40	1222	71.0	1490	95.8	96.3	96.5	0.74	0.83	0.87	318
200	270	315L	131	7.6	2.5	2.5	5.30	20	44	1332	73.0	1490	96.1	96.5	96.7	0.74	0.83	0.87	343
220	300	315L	144	7.8	2.6	2.6	5.86	16	35	1430	73.0	1490	96.1	96.6	96.7	0.74	0.83	0.86	382
250	340	315L	163	8.0	2.7	2.6	6.41	16	35	1527	73.0	1490	96.2	96.6	96.9	0.73	0.82	0.86	433
260	350	315L	170	8.0	2.7	2.6	6.41	16	35	1527	73.0	1490	96.2	96.6	96.9	0.73	0.82	0.86	450
280	380	355M/L	183	7.3	2.3	2.4	9.66	20	44	1695	74.0	1490	96.3	96.7	96.9	0.74	0.83	0.86	485
315	430	355M/L	206	7.3	2.3	2.4	10.7	22	48	1772	74.0	1490	96.4	96.7	96.9	0.71	0.81	0.85	552
355	480	355M/L	232	7.2	2.4	2.5	11.6	15	33	1878	74.0	1490	96.5	96.8	96.9	0.74	0.83	0.86	615
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	84.8	0.59	0.72	0.80	2.34
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
5.5	7.5	132M	3.66	8.5	2.4	3.4	0.0528	15	33	69.0	56.0	1465	90.0	90.7	90.7	0.67	0.79	0.85	10.3
9.2	12.5	132M/L	6.12	8.6	2.8	3.5	0.0681	10	22	82.0	56.0	1465	90.3	91.0	91.0	0.64	0.76	0.82	17.4
11	15	160L	7.29	7.0	2.5	3.0	0.1397	17	37	123	61.0	1470	91.0	91.8	92.2	0.65	0.76	0.83	20.7
15	20	180M	9.94	7.0	2.5	3.0	0.1744	23	51	168	61.0	1470	91.9	92.5	92.9	0.66	0.77	0.83	28.1
18.5	25	180L	12.3	7.3	2.7	3.0	0.2001	20	44	180	61.0	1470	92.2	92.9	93.3	0.64	0.76	0.82	34.9
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	8.4	2.8	3.3	1.22	8	18	531	64.0	1480	95.2	95.5	95.5	0.73	0.83	0.87	130
110	150	280S/M	72.2	7.6	2.4	2.8	3.25	24	53	884	69.0	1485	95.4	95.8	96.0	0.74	0.83	0.87	190
200	270	315S/M	131	7.6	2.5	2.5	5.30	20	44	1332	71.0	1490	96.1	96.5	96.7	0.74	0.83	0.87	343
200	270	355M/L	131	7.6	2.5	2.5	7.01	22	48	1495	74.0	1490	95.9	96.5	96.7	0.72	0.81	0.85	351
220	300	355M/L	144	7.4	2.4	2.5	7.52	20	44	1554	74.0	1490	96.0	96.6	96.8	0.72	0.80	0.85	386
250	340	355M/L	163	7.3	2.3	2.4	8.59	16	35	1621	74.0	1490	96.2	96.6	96.9	0.73	0.82	0.85	438
260	350	355M/L	170	7.3	2.3	2.4	8.59	16	35	1621	74.0	1490	96.2	96.6	96.9	0.73	0.82	0.85	456

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	
IV pole - 1500 rpm - 50 Hz																	
0.12	0.16	1355	58.6	62.6	62.5	0.56	0.69	0.78	0.374	1380	55.6	61.3	62.9	0.50	0.62	0.72	0.369
0.18	0.25	1355	63.5	64.4	63.9	0.57	0.67	0.75	0.571	1380	60.8	63.5	64.5	0.50	0.61	0.70	0.555
0.25	0.33	1355	67.0	69.1	68.7	0.56	0.69	0.77	0.718	1380	65.1	68.6	69.7	0.50	0.62	0.71	0.703
0.37	0.5	1355	70.0	72.2	71.3	0.55	0.68	0.76	1.04	1380	67.8	71.5	72.3	0.48	0.61	0.71	1.00
0.55	0.75	1410	78.0	79.1	78.9	0.65	0.77	0.83	1.28	1430	76.0	78.9	80.1	0.57	0.71	0.77	1.24
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	4.66	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	0.65	0.76	0.81	8.00	1455	88.2	88.9	89.3	0.57	0.70	0.77	8.00
5.5	7.5	1460	90.4	90.7	90.3	0.71	0.82	0.87	10.6	1470	89.6	90.7	90.8	0.64	0.76	0.83	10.2
7.5	10	1460	91.4	91.5	91.2	0.72	0.82	0.86	14.4	1470	90.5	91.4	91.7	0.64	0.76	0.83	13.5
9.2	12.5	1470	90.4	91.5	91.6	0.70	0.80	0.85	18.0	1475	89.5	91.2	91.9	0.63	0.74	0.81	17.2
11	15	1465	91.3	91.7	91.7	0.69	0.79	0.85	21.1	1470	90.7	91.7	92.3	0.62	0.74	0.81	20.5
15	20	1465	92.2	92.5	93.0	0.69	0.79	0.84	29.2	1470	91.4	92.4	93.0	0.62	0.74	0.80	28.0
18.5	25	1465	92.5	92.9	93.1	0.68	0.79	0.84	35.9	1470	91.8	92.8	93.4	0.61	0.73	0.80	34.4
22	30	1465	92.8	93.1	93.4	0.70	0.80	0.85	42.1	1470	91.9	92.8	93.6	0.62	0.74	0.81	40.4
30	40	1480	93.5	94.1	94.1	0.69	0.79	0.84	57.7	1480	92.5	93.9	94.2	0.60	0.72	0.80	55.4
37	50	1475	94.1	94.5	94.3	0.76	0.83	0.87	68.5	1480	93.8	94.6	94.7	0.69	0.79	0.85	63.9
45	60	1475	94.3	94.7	94.7	0.77	0.82	0.86	83.9	1480	94.0	94.8	94.8	0.67	0.78	0.84	78.6
55	75	1475	94.7	94.9	95.1	0.75	0.83	0.88	100	1480	94.4	94.9	95.4	0.68	0.79	0.85	94.4
75	100	1480	94.8	95.2	95.4	0.78	0.85	0.88	136	1485	94.6	95.2	95.7	0.73	0.82	0.86	127
90	125	1480	95.1	95.4	95.6	0.77	0.84	0.87	164	1485	94.9	95.5	95.9	0.72	0.81	0.85	154
110	150	1490	95.5	95.9	96.2	0.77	0.85	0.87	200	1490	95.2	95.8	96.3	0.71	0.81	0.85	187
132	175	1490	95.6	96.0	96.3	0.78	0.85	0.87	239	1490	95.3	95.9	96.4	0.72	0.81	0.85	224
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	95.8	96.2	96.3	0.78	0.85	0.88	287	1490	95.5	96.2	96.6	0.72	0.81	0.86	268
185	250	1485	95.9	96.3	96.3	0.77	0.85	0.88	332	1490	95.6	96.3	96.5	0.71	0.81	0.86	310
200	270	1485	96.2	96.5	96.5	0.77	0.85	0.88	358	1490	95.9	96.5	96.7	0.71	0.81	0.86	335
220	300	1490	96.2	96.6	96.6	0.77	0.85	0.87	398	1490	95.9	96.5	96.7	0.71	0.81	0.85	372
250	340	1490	96.4	96.6	96.8	0.77	0.84	0.87	451	1490	96.0	96.5	96.9	0.70	0.80	0.85	422
260	350	1490	96.4	96.6	96.8	0.77	0.84	0.87	469	1490	96.0	96.5	96.9	0.70	0.80	0.85	439
280	380	1490	96.4	96.7	96.8	0.77	0.85	0.87	505	1490	96.2	96.7	97.0	0.71	0.81	0.85	472
315	430	1490	96.5	96.7	96.8	0.74	0.83	0.86	575	1490	96.3	96.7	97.0	0.68	0.79	0.84	538
355	480	1490	96.6	96.8	96.8	0.77	0.85	0.87	640	1490	96.4	96.8	97.0	0.72	0.82	0.85	599
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
5.5	7.5	1460	90.4	90.7	90.3	0.71	0.82	0.87	10.6	1470	89.6	90.7	90.8	0.64	0.76	0.83	10.2
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	1465	91.3	91.7	91.7	0.69	0.79	0.85	21.1	1470	90.7	91.7	92.3	0.62	0.74	0.81	20.5
15	20	1465	92.2	92.5	92.6	0.70	0.80	0.85	29.0	1470	91.6	92.4	93.0	0.63	0.75	0.81	27.7
18.5	25	1465	92.5	92.9	93.1	0.68	0.79	0.84	35.9	1470	91.8	92.8	93.4	0.61	0.73	0.80	34.4
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	95.2	95.1	95.3	0.77	0.86	0.88	136	1480	94.7	95.5	95.5	0.70	0.81	0.86	127
110	150	1485	95.5	95.7	95.8	0.77	0.85	0.88	198	1485	95.3	95.8	96.1	0.72	0.82	0.86	185
200	270	1485	96.2	96.5	96.5	0.77	0.85	0.88	358	1490	95.9	96.5	96.7	0.71	0.81	0.86	335
200	270	1490	96.1	96.5	96.6	0.75	0.83	0.86	366	1490	95.7	96.4	96.7	0.69	0.79	0.84	343
220	300	1490	96.2	96.6	96.7	0.75	0.82	0.86	402	1490	95.8	96.5	96.8	0.69	0.78	0.84	376
250	340	1490	96.3	96.6	96.8	0.76	0.84	0.86	456	1490	96.0	96.6	96.9	0.70	0.80	0.84	427
260	350	1490	96.3	96.6	96.8	0.76	0.84	0.86	475	1490	96.0	96.6	96.9	0.70	0.80	0.84	444

W22 -Premium Efficiency - IE3 (1)

Output		Frame	Full load torque (Nm)	Locked rotor current Il/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	
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	46.0	53.0	55.0	0.44	0.55	0.64	0.492
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	62.0	0.40	0.51	0.60	0.698
0.25	0.33	71	0.280	3.2	2.0	2.0	0.0008	30	66	11.5	43.0	880	60.0	64.0	64.0	0.39	0.51	0.60	0.940
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	69.5	0.51	0.65	0.75	1.02
0.55	0.75	80	0.580	4.8	2.2	2.2	0.0034	19	42	14.5	43.0	925	68.0	72.5	73.0	0.50	0.64	0.75	1.45
0.75	1	L90S	0.780	5.2	2.5	2.8	0.0066	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	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
1.5	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	42.0	48.0	950	83.0	84.5	84.5	0.53	0.64	0.72	5.22
3	4	132S	3.01	6.0	1.9	2.5	0.0566	28	62	61.0	53.0	970	85.0	85.8	85.8	0.52	0.65	0.73	6.91
4	5.5	132M	4.06	6.5	2.2	2.5	0.0566	30	66	66.0	52.0	960	86.0	86.8	86.8	0.53	0.66	0.74	8.99
5.5	7.5	132M/L	5.55	7.0	2.5	2.8	0.0755	26	57	80.0	52.0	965	86.5	88.0	88.0	0.50	0.64	0.72	12.5
7.5	10	160M	7.49	6.5	2.3	2.9	0.1492	20	44	122	56.0	975	89.3	90.3	90.7	0.63	0.74	0.81	14.7
9.2	12.5	160L	9.19	6.5	2.3	2.9	0.1756	18	40	137	56.0	975	90.0	90.6	91.0	0.64	0.75	0.81	18.0
11	15	160L	11.0	6.5	2.4	3.0	0.2111	16	35	143	56.0	975	90.0	90.8	91.2	0.62	0.74	0.81	21.5
15	20	180L	15.0	8.0	2.6	3.2	0.3240	10	22	193	56.0	975	91.3	91.7	92.0	0.65	0.78	0.84	28.0
18.5	25	200L	18.4	6.2	2.2	2.8	0.3861	19	42	223	60.0	980	91.7	92.3	92.5	0.65	0.76	0.82	35.2
22	30	200L	21.9	6.3	2.3	2.9	0.4563	18	40	240	60.0	980	92.0	92.6	92.9	0.65	0.76	0.82	41.7
30	40	225S/M	29.7	7.4	2.3	2.8	0.9559	17	37	401	63.0	985	93.7	94.0	94.0	0.70	0.80	0.85	54.2
37	50	250S/M	36.6	7.4	2.3	2.7	1.42	17	37	486	64.0	985	94.0	94.4	94.4	0.72	0.81	0.85	66.6
45	60	280S/M	44.3	6.8	2.2	2.7	2.80	32	70	678	65.0	990	94.1	94.8	95.0	0.65	0.76	0.82	83.4
55	75	280S/M	54.1	6.7	2.2	2.7	3.25	28	62	723	65.0	990	94.5	95.0	95.3	0.67	0.77	0.82	102
75	100	315S/M	73.8	6.7	2.2	2.6	5.44	32	70	962	67.0	990	95.0	95.6	95.8	0.67	0.78	0.83	136
90	125	315S/M	88.6	6.7	2.2	2.5	6.51	34	75	1048	67.0	990	95.3	95.8	96.1	0.67	0.78	0.83	163
110	150	315S/M	108	6.8	2.4	2.6	7.23	32	70	1106	67.0	990	95.5	96.0	96.2	0.67	0.78	0.83	199
132	175	315S/M	130	7.2	2.5	2.7	8.32	26	57	1190	67.0	990	95.6	96.1	96.3	0.67	0.77	0.82	241
150	200	315L	148	7.1	2.5	2.8	11.1	25	55	1365	68.0	990	95.7	96.1	96.3	0.67	0.78	0.83	271
160	220	315L	157	7.4	2.6	2.7	11.1	24	53	1448	68.0	990	95.7	96.2	96.4	0.67	0.78	0.83	289
185	250	355M/L	182	6.6	2.2	2.4	11.1	34	75	1666	73.0	990	94.9	95.6	95.8	0.64	0.74	0.79	353
200	270	355M/L	196	6.5	2.1	2.3	12.0	40	88	1739	73.0	995	95.4	96.0	96.2	0.64	0.75	0.80	375
220	300	355M/L	215	6.5	2.2	2.3	13.4	36	79	1854	73.0	995	95.5	96.1	96.3	0.64	0.75	0.80	412
250	340	355M/L	245	6.5	2.3	2.4	15.0	38	84	1970	73.0	995	95.5	96.1	96.3	0.64	0.75	0.80	468
260	350	355M/L	255	6.5	2.3	2.4	15.0	38	84	1970	73.0	995	95.5	96.1	96.3	0.64	0.75	0.80	487
280	380	355M/L	274	5.5	2.0	2.4	15.0	38	84	1970	73.0	995	95.1	95.7	96.3	0.64	0.75	0.80	525
Optional frames (high-output design)																			
0.75	1	L90L	0.770	5.5	2.6	3.0	0.0077	26	57	25.0	45.0	945	78.0	80.5	80.5	0.49	0.63	0.72	1.87
1.1	1.5	112M	1.12	5.9	2.3	2.8	0.0220	28	62	39.0	52.0	955	84.0	85.0	85.0	0.52	0.64	0.72	2.59
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	0.0491	30	66	63.0	53.0	970	86.0	87.5	87.5	0.52	0.64	0.72	5.04
3	4	132M	3.01	6.0	1.9	2.5	0.0566	28	62	61.0	53.0	970	85.0	85.8	85.8	0.52	0.65	0.73	6.91
45	60	250S/M	44.7	8.0	2.8	2.8	1.43	18	40	490	64.0	980	92.4	93.9	93.9	0.76	0.84	0.87	79.5
75	100	280S/M	73.8	8.0	3.0	3.5	4.48	8	18	725	65.0	990	94.8	95.3	95.5	0.63	0.75	0.80	142
150	200	315S/M	148	7.1	2.5	2.8	9.40	25	55	1365	67.0	990	95.7	96.1	96.3	0.67	0.78	0.83	271
160	220	355M/L	157	6.5	2.1	2.3	10.2	33	73	1594	73.0	990	94.9	95.8	96.0	0.63	0.74	0.79	305

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	55.1	0.47	0.58	0.68	0.487	910	43.9	51.4	54.2	0.42	0.52	0.61	0.505
0.18	0.25	885	57.7	62.8	61.6	0.43	0.55	0.64	0.694	910	54.5	61.2	61.9	0.38	0.48	0.57	0.710
0.25	0.33	865	62.4	65.2	63.6	0.42	0.55	0.64	0.933	890	57.6	62.8	63.8	0.37	0.48	0.57	0.956
0.37	0.5	915	67.6	69.9	68.6	0.55	0.69	0.79	1.04	930	64.3	68.8	69.7	0.48	0.62	0.72	1.03
0.55	0.75	915	69.9	73.0	72.2	0.54	0.69	0.78	1.48	930	66.0	71.6	73.1	0.47	0.61	0.71	1.47
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	81.2	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
1.5	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	965	85.0	85.8	85.8	0.56	0.69	0.76	6.99	975	85.0	85.8	85.8	0.49	0.62	0.71	6.85
4	5.5	955	86.6	86.9	86.8	0.57	0.70	0.76	9.21	965	85.4	86.6	86.9	0.50	0.63	0.71	9.02
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	89.8	90.3	90.4	0.67	0.77	0.83	15.2	975	88.8	90.2	90.8	0.60	0.71	0.79	14.5
9.2	12.5	970	90.4	90.6	90.6	0.68	0.78	0.83	18.6	975	89.6	90.5	91.2	0.61	0.73	0.79	17.8
11	15	970	90.5	90.8	90.8	0.66	0.77	0.83	22.2	975	89.5	90.7	91.3	0.59	0.71	0.79	21.2
15	20	970	91.5	91.5	91.5	0.68	0.80	0.85	29.3	975	91.6	92.0	92.3	0.69	0.80	0.85	26.6
18.5	25	980	92.2	92.4	92.2	0.69	0.79	0.84	36.3	980	91.2	92.1	92.6	0.61	0.73	0.80	34.7
22	30	980	92.5	92.7	92.7	0.69	0.79	0.84	42.9	980	91.4	92.4	92.9	0.61	0.73	0.80	41.2
30	40	980	93.8	93.8	93.6	0.73	0.82	0.86	56.6	985	93.5	94.0	94.2	0.67	0.78	0.84	52.7
37	50	980	93.8	94.0	93.8	0.74	0.82	0.86	69.7	985	93.8	94.4	94.6	0.69	0.79	0.84	64.8
45	60	990	94.2	94.7	94.7	0.69	0.78	0.84	85.9	990	93.9	94.8	95.1	0.62	0.74	0.81	81.3
55	75	985	94.6	94.9	95.0	0.70	0.79	0.83	106	990	94.3	95.0	95.4	0.64	0.75	0.81	99.0
75	100	990	95.2	95.6	95.6	0.71	0.80	0.84	142	990	94.8	95.6	95.9	0.64	0.76	0.82	133
90	125	990	95.4	95.8	95.9	0.71	0.80	0.84	170	990	95.2	95.8	96.2	0.64	0.76	0.82	159
110	150	990	95.6	96.0	96.0	0.71	0.80	0.84	207	990	95.3	96.0	96.3	0.64	0.76	0.82	194
132	175	990	95.8	96.1	96.1	0.71	0.80	0.84	248	990	95.4	96.0	96.3	0.64	0.75	0.81	235
150	200	990	95.8	96.1	96.1	0.70	0.80	0.84	282	990	95.5	96.1	96.4	0.64	0.76	0.82	264
160	220	990	95.9	96.2	96.2	0.71	0.80	0.84	301	990	95.5	96.1	96.4	0.64	0.76	0.82	282
185	250	990	95.4	95.8	95.8	0.68	0.77	0.81	363	990	94.5	95.5	95.8	0.61	0.72	0.77	349
200	270	995	95.6	96.1	96.1	0.68	0.78	0.82	386	995	95.2	95.9	96.2	0.61	0.73	0.79	366
220	300	995	95.7	96.1	96.2	0.68	0.78	0.82	424	995	95.3	96.0	96.3	0.61	0.73	0.79	402
250	340	995	95.7	96.1	96.2	0.68	0.78	0.82	482	995	95.3	96.0	96.3	0.61	0.73	0.79	457
260	350	995	95.7	96.1	96.2	0.68	0.78	0.82	501	995	95.3	96.0	96.3	0.61	0.73	0.79	475
280	380	995	95.4	96.2	96.4	0.68	0.78	0.82	538	995	94.9	96.1	96.5	0.61	0.73	0.78	518
Optional frames (high-output design)																	
0.75	1	940	78.9	80.5	79.8	0.52	0.67	0.75	1.90	950	77.2	80.2	80.8	0.47	0.60	0.70	1.84
1.1	1.5	950	85.0	85.4	85.0	0.55	0.70	0.77	2.55	955	83.2	84.5	84.9	0.48	0.62	0.70	2.58
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
3	4	965	85.0	85.8	85.8	0.56	0.69	0.76	6.99	975	85.0	85.8	85.8	0.49	0.62	0.71	6.85
45	60	980	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	985	95.3	95.6	95.5	0.66	0.77	0.82	146	990	94.6	95.3	95.6	0.59	0.71	0.77	142
150	200	990	95.8	96.1	96.1	0.70	0.80	0.84	282	990	95.5	96.1	96.4	0.64	0.76	0.82	264
160	220	995	94.6	95.9	96.0	0.67	0.77	0.82	310	995	94.1	95.8	96.0	0.60	0.72	0.79	294

W22 - Premium Efficiency - IE3 (1)

Output		Frame	Full load torque (Nm)	Locked rotor current Il/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	
VIII pole - 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	58.5	0.45	0.55	0.65	0.683
0.25	0.33	80	0.360	3.3	2.0	2.2	0.0034	30	66	14.5	42.0	680	53.0	58.0	60.0	0.45	0.56	0.66	0.911
0.37	0.5	90S	0.520	3.7	2.1	2.4	0.0055	30	66	19.0	43.0	690	61.0	66.0	66.0	0.41	0.53	0.62	1.31
0.55	0.75	90L	0.780	3.6	1.8	2.1	0.0066	29	64	23.0	43.0	685	63.0	66.5	66.5	0.44	0.57	0.67	1.78
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	1.52	4.6	2.1	2.4	0.0143	30	66	33.0	50.0	705	73.0	76.0	76.0	0.41	0.53	0.62	3.37
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	80.5	0.45	0.59	0.68	3.96
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	82.6	0.51	0.65	0.72	5.34
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	86.8	86.6	0.52	0.65	0.72	9.26
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	87.7	0.52	0.65	0.73	12.4
7.5	10	160L	10.0	5.3	2.2	2.5	0.2199	22	48	145	51.0	730	87.0	88.3	88.9	0.52	0.65	0.73	16.7
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	90.3	0.55	0.68	0.76	23.1
15	20	200L	20.0	4.9	1.9	2.1	0.4571	34	75	235	56.0	730	90.0	91.0	91.4	0.56	0.68	0.74	32.0
18.5	25	225S/M	24.5	6.5	1.7	2.5	0.8219	28	62	377	56.0	735	93.0	93.0	92.7	0.63	0.75	0.81	35.6
22	30	225S/M	29.2	6.5	1.8	2.5	0.9574	22	48	402	56.0	735	93.0	93.1	93.0	0.63	0.75	0.81	42.2
30	40	250S/M	39.8	7.4	1.9	2.8	1.43	18	40	490	56.0	735	93.3	93.3	93.2	0.66	0.77	0.83	56.0
37	50	280S/M	48.7	6.0	1.8	2.3	2.82	32	70	673	59.0	740	93.7	94.2	94.2	0.63	0.73	0.79	71.8
45	60	280S/M	59.2	6.0	1.8	2.2	3.49	30	66	741	59.0	740	94.0	94.5	94.5	0.63	0.73	0.79	87.0
55	75	315S/M	72.4	6.0	1.7	2.2	5.11	40	88	936	62.0	740	94.3	94.8	94.8	0.65	0.75	0.80	105
75	100	315S/M	98.7	6.0	1.8	2.2	6.56	40	88	1049	62.0	740	94.6	95.1	95.1	0.65	0.75	0.80	142
90	125	315S/M	118	6.0	1.9	2.2	7.84	40	88	1149	62.0	740	94.9	95.2	95.3	0.65	0.75	0.80	170
110	150	315L	145	6.0	1.9	2.2	12.6	35	77	1367	68.0	740	95.0	95.4	95.4	0.64	0.74	0.79	211
132	175	315L	174	6.0	2.0	2.3	13.2	34	75	1508	68.0	740	95.3	95.7	95.7	0.64	0.74	0.79	252
160	220	355M/L	209	6.4	1.3	2.3	17.4	56	123	1747	70.0	745	95.4	95.8	96.0	0.64	0.75	0.80	301
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	95.6	96.1	96.1	0.65	0.76	0.80	375
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	93.4	93.8	93.8	0.60	0.72	0.79	72.1
55	75	280S/M	72.4	6.6	1.8	2.3	3.38	26	57	812	59.0	740	94.0	94.5	94.5	0.60	0.71	0.77	109
110	150	315S/M	145	6.0	1.9	2.2	9.46	35	77	1367	62.0	740	95.0	95.4	95.4	0.64	0.74	0.79	211
110	150	355M/L	144	6.2	1.3	2.3	12.6	56	123	1484	70.0	745	95.1	95.4	95.4	0.62	0.74	0.79	211
132	175	355M/L	173	6.2	1.3	2.3	14.4	48	106	1587	70.0	745	95.3	95.7	95.7	0.64	0.74	0.79	252

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	
VIII pole - 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	58.4	0.48	0.59	0.69	0.679	685	49.3	56.0	58.2	0.43	0.53	0.62	0.694
0.25	0.33	670	54.9	58.9	59.7	0.48	0.60	0.70	0.909	685	51.3	56.9	59.7	0.43	0.53	0.63	0.925
0.37	0.5	680	62.9	66.9	65.8	0.44	0.56	0.66	1.29	695	59.0	64.7	65.7	0.39	0.50	0.59	1.33
0.55	0.75	675	64.8	67.0	65.7	0.48	0.61	0.70	1.82	690	61.4	65.7	66.6	0.42	0.54	0.64	1.80
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	75.8	0.45	0.58	0.66	3.34	710	71.1	74.9	75.7	0.38	0.50	0.59	3.43
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	83.7	82.9	0.56	0.68	0.75	7.33	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	8.21
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	89.4	90.8	91.5	0.53	0.65	0.72	31.7
18.5	25	730	93.1	92.8	92.2	0.67	0.78	0.83	36.7	735	92.8	93.0	92.9	0.60	0.73	0.80	34.6
22	30	730	93.1	92.9	92.5	0.67	0.78	0.83	43.5	735	92.8	93.1	93.2	0.60	0.73	0.79	41.6
30	40	730	93.4	93.1	92.7	0.70	0.80	0.85	57.8	735	93.1	93.3	93.4	0.63	0.75	0.85	52.6
37	50	740	93.9	94.1	93.9	0.67	0.76	0.81	73.9	740	93.4	94.1	94.3	0.60	0.71	0.77	70.9
45	60	740	94.1	94.4	94.1	0.67	0.76	0.80	90.8	740	93.8	94.5	94.7	0.60	0.71	0.78	84.8
55	75	740	94.5	94.7	94.5	0.69	0.77	0.81	109	740	94.0	94.7	94.9	0.62	0.73	0.79	102
75	100	740	94.7	95.0	94.8	0.69	0.77	0.81	148	740	94.4	95.1	95.2	0.62	0.73	0.79	139
90	125	740	95.1	95.1	95.0	0.69	0.77	0.81	178	740	94.7	95.1	95.4	0.62	0.73	0.79	166
110	150	740	95.2	95.3	95.1	0.68	0.77	0.81	217	740	94.8	95.3	95.5	0.61	0.72	0.78	205
132	175	740	95.5	95.6	95.4	0.68	0.77	0.81	260	740	95.1	95.6	95.8	0.61	0.72	0.78	246
160	220	745	95.6	95.8	95.9	0.68	0.78	0.82	309	745	95.1	95.7	96.0	0.61	0.73	0.78	297
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	95.8	96.1	96.0	0.69	0.79	0.82	386	745	95.3	96.0	96.1	0.61	0.73	0.78	371
Optional frames (high-output design)																	
37	50	700	93.4	93.4	93.4	0.64	0.75	0.81	74.3	735	93.2	93.8	93.8	0.57	0.70	0.77	71.3
55	75	740	94.0	94.2	94.2	0.65	0.74	0.78	114	745	93.8	94.5	94.5	0.57	0.69	0.75	108
110	150	740	95.2	95.3	95.1	0.68	0.77	0.81	217	740	94.8	95.3	95.5	0.61	0.72	0.78	205
110	150	740	94.0	95.2	95.1	0.65	0.76	0.81	217	745	93.0	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	0.60	0.71	0.77	250

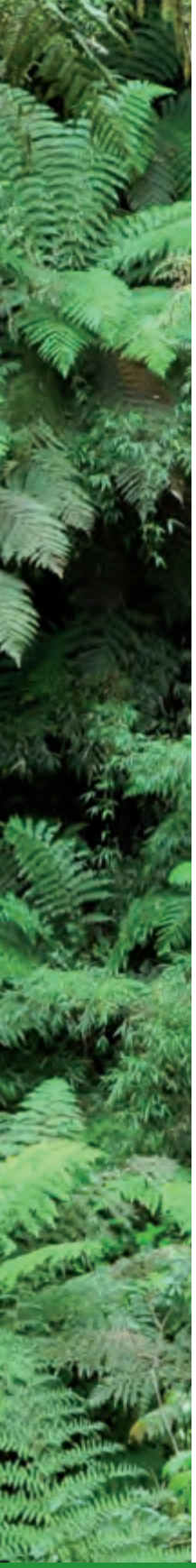
W22 - Super Premium Efficiency - IE4 (1)

Output		Frame	Full load torque (Nm)	Locked rotor current Il/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																			
5.5	7.5	132S	1.82	7.9	2.6	3.4	0.0250	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	180	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	482	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
High-output design																			
IV poles																			
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
High-output design																			

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 Il/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	
VI poles																			
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
High-output design																			



W22 Super Premium

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

In the last two decades, the global energy consumption has increased by 50%.
And the forecast for the next two forthcoming decades is to keep this growing rate constant.

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 reflex of this scenario, electric energy costs are vertiginously rising, and in comparison to other economic indicators, standing out negatively.

One of the main responsible for this accenting grow is the industrial segment, which demands around 30% of the electric energy globally available. And, in industrial applications, electric motors driven systems represents around 65% of all energy consumption.

If we consider industrial and domestic applications, including appliances to our analysis, the electric motor energy consumption represents more than 40% of the total.
This emphasizes the world's demand for more and more efficient products that may not only break this increasing demand, but also provide its reduction and, consequently, energy and money saving.

Aware and concerned about this situation, several Government Authorities are implementing Minimum Energy Efficiency Performance Standards, in order to force the utilization of high-efficient equipments.

In Europe it was not 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 of that, EU Mandatory Minimum Energy-Efficiency Performance Standard (MEPS) for industrial electric motors got in force from July 2009.

With this situation in mind WEG presents its W22 Super Premium efficiency motors line, exceeding the IE4 Efficiency Levels defined in draft IEC Standard 60034-30 edition 2.

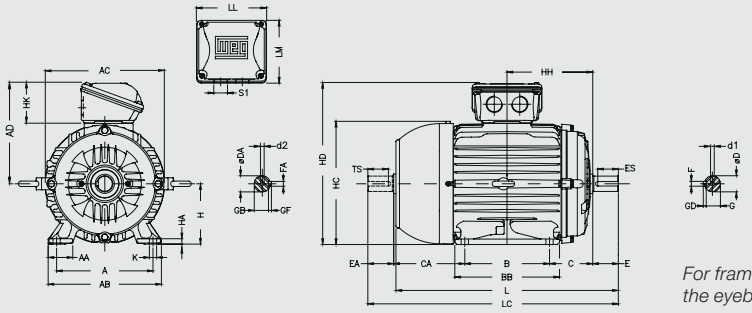
The efficiency performance of these motors far exceeds the minimum efficiency level IE2 requested by Europe and the future required IE3, mandatory as from 2015 on. This enables the customers reducing their Total Cost of Ownership thru the reduction of the energy consumption and their carbon footprint.

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

17. Mechanical Data

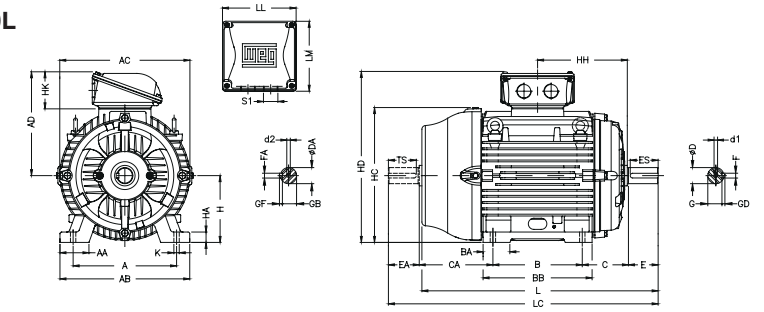
17.1 Foot Mounted Motors

17.1.1 Frames 63 to 132M/L

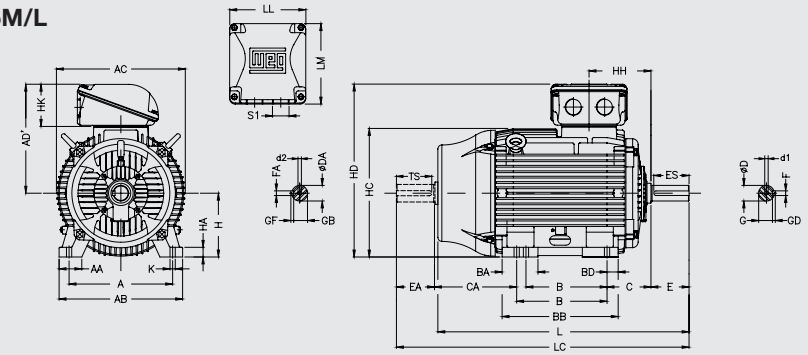


For frames 132 S, 132 M/L and 132 M, the eyebolt will be fitted at 50°.

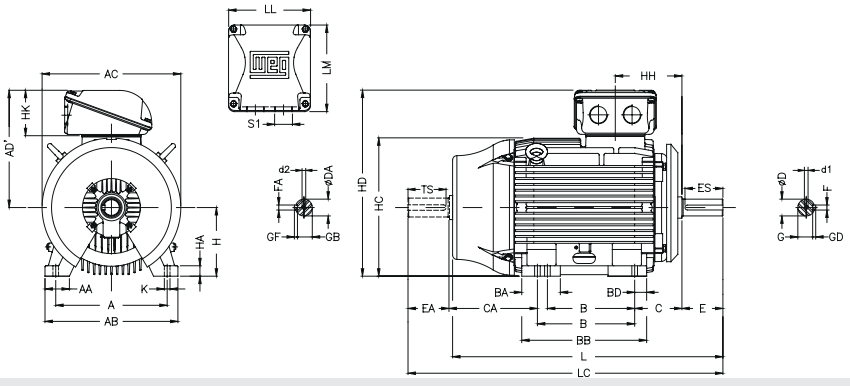
17.1.2 Frames 160M to 200L



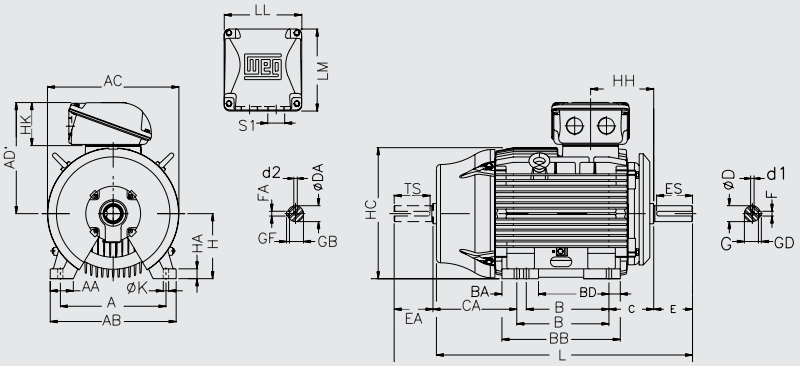
17.1.3 Frames 225 to 355M/L



17.1.4 Frame 355M/L (Only for Motors Fitted with Air Deflector in the Drive End Side)



17.1.5 Frame 355A/B



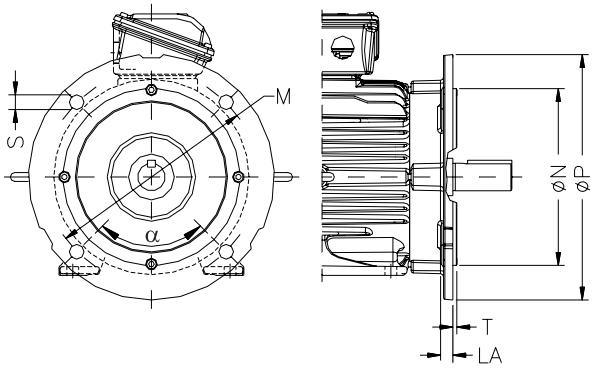
Frame	A	AA	AB	AC	AD(**)	AD	B	BA	BB	BD	C	CA	Shaft											
													D	DA	E	EA	ES	F	FA	G	GB	GD	GF	TS
63	100	25.5	116	125	122	122	80	-	95	-	40	78	11j6	9j6	23	20	14	4	3	8.5	7.2	4	3	12
71	112	28.5	132	141	130	130	90		113.5		45	88	14j6	11j6	30	23	18	5	4	11	8.5	5	4	14
80	125	30.5	149	159	139	139	100		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	157			131		56	104	24j6	16j6	50	40	36	8		20	13	7		28
L90S												135												
90L							125		156			104												
L90L												135												
100L	160	40	188	199	167	167	140		173		63	118	28j6	22j6	60	50	45		6	24	18.5		6	36
L100L												162												
112M	190	40.5	220	222	192	192			177	-	70	128		24j6					8		20		7	
L112M												158												
132S	216	51	248	271	218	218	178		187		89	150	38k6	28j6	80	60	63	10		33	24	8		45
132M									225															
132M/L																								
160M	254	64	308	329	264	264	210	63	254		108	174	42k6	42k6	110	110	80	12	12	37	37		8	80
160L							254		298															
180M	279	78	350	360	279	279	241	70	294		121	200	48k6	48k6				14	14	42.5	42.5	9	9	
180L							279		332															
200M	318	82	385	402	317	317	267	82	332		133	222	55m6					16		49		10		
200L							305		370															
225S/M	356	80	436	455	408	384	286/311	124	412	41	149	319/294	55m6(*)	55m6(*)	110(*)	110(*)	100(*)	16(*)	16(*)	49(*)	49(*)	10(*)	10(*)	100(*)
													60m6	60m6	140	140	125	18	18	53	53	11	11	125
250S/M	406	100	506	486		402	311/349	146	467	59	168	354/316	60m6(*)	60m6(*)	140(*)	140(*)	125(*)	18(*)	18(*)	53(*)	53(*)	11(*)	11(*)	125(*)
													65m6	60m6	140	140	125	18	18	58	53	11	11	125
280S/M	457		557	599	442	472	368/419	151	517	49	190	385/334	65m6(*)	60m6(*)	140(*)	140(*)	125(*)	18(*)	18(*)	58(*)	53(*)	11(*)	11(*)	125(*)
													75m6	65m6	140	140	125	20	18	67.5	58	12	11	125
315S/M	508	120	630	657	525	530	406/457	184	621	70	216	494/443	65m6(*)	60m6(*)	140(*)	140(*)	125(*)	18(*)	18(*)	58(*)	53(*)	11(*)	11(*)	125(*)
													80m6	65m6	170	140	160	22	18	71	58	14	14	125
315L					589	575	508	219	752	81		497	65m6(*)	60m6(*)	140(*)	140(*)	125(*)	18(*)	18(*)	58(*)	53(*)	11(*)	11(*)	125(*)
													80m6	65m6	170	140	160	22	18	71	58	14	14	125
355M/L	610	140	750	736	609	625	560/630	230	760	65	254	483/413	75m6(*)	60m6(*)	140(*)	140(*)	125(*)	20(*)	18(*)	67.5(*)	53(*)	12(*)	11(*)	125(*)
													100m6	80m6	210	170	200	28	22	90	71	16	14	160
355A/B					701	755	710/800	325	955	70		528/438	75m6(*)	60m6(*)	140(*)	140(*)	125(*)	20(*)	18(*)	67.5(*)	53(*)	12(*)	11(*)	125(*)
													100m6	80m6	210	170	200	28	22	90	71	16	14	160

Frame	H	HA	HB(**)	HC	HD	HD(**)	HF(**)	HG(**)	HH	HK	K	L	LC	LL	LM	S1	d1	d2	Bearings	
																			D.E.	N.D.E.
63	63	7	25.5	129	189	-	68.5	-	80	59	7	216	241	108.5	99	2xM20x1.5	M4	M3	6201 - ZZ	
71	71		33	145	204		76		90			248	276				M5	M4	6202 - ZZ	
80	80	8	43.5	163	222		87		100		10	276	313				M6		6204 - ZZ	6203 - ZZ
L80												325	362							
90S	90	9	45	182	249		90		106	67		304	350	115	104	2xM25x1.5	M8	M6	6205 - ZZ	6204 - ZZ
L90S												335	381							
90L									118.5			329	375							
L90L												360	406							
100L	100	10	61.5	205	272	244	106.4		133		12	376	431				M10	M8	6206 - ZZ	6205 - ZZ
L100L												420	475							
112M	112		54.5	235	315	280	112		140	80		393	448	140	133	2xM32x1.5			6207 - ZZ	6206 - ZZ
L112M												423	478							
132S	132	20	75	266	354	319	132		159			452	519				M12	M10	6308 - ZZ	6207 - ZZ
132M									178			490	557							
132M/L									191			515	582							
160M	160	22	79	327	432	374	168		213	101	14.5	598	712	198.5	190	2xM40x1.5	M16	M16	6309 - C3	6209 - Z-C3
160L									235			642	756							
180M	180	28	92	363	467	413	180		241.5			664	782						6311 - C3	6211- Z-C3
180L									260.5			702	820							
200M	200	30	119	405	526.5	464	218		266.5	119,5	18.5	729	842	230	220	2xM50x1.5	M20	M20	6312 C3	6212 Z-C3
200L												767	880							
225S/M	225	34	255	453	606	550	403	523	212	153		856(*)	974(*)	269	285				6314 - C3	
												886	1034							
250S/M	250	43	290	493	646	583	449	566	214		24	965	1113			2xM63x1.5				
280S/M	280	42	383	580	727	696	556	686	266	147		1071	1223	314	312				6316 - C3	
315S/M	315	48	386	664	864	768	615	744	264	176	28	1244(*)	1392(*)	379	382				6314 - C3	
												1274	1426						6319 - C3	6316 - C3
315L			336			774	575	760	284			1353(*)	1505(*)						6314 - C3	
												1383	1535						6319 - C3	6316 - C3
355M/L	355	50	461	723	943	898	700	885	340	220		1412(*)	1577(*)	404	436	2xM80x2	M20		6316 - C3	6314 - C3
												1482	1677				M24		6322 - C3	6319 - C3
355A/B			154		1013	885	665	847		290		1607(*)	1772(*)	460	544		M20(*)		6316 - C3	6314 - C3
												1677	1872				M24		6322 - C3	6319 - C3

Notes:
(*) Dimension applicable to 2 pole motors.
(**) Dimension is applicable to right or left terminal box mounting.

17.2 Flange Mounted Motors

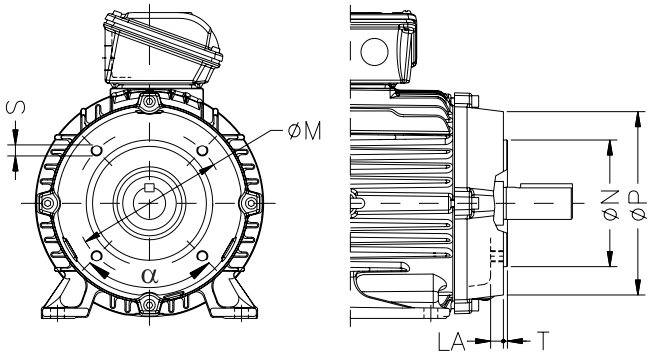
17.2.1 “FF” Flange



Flange “FF”									
Frame	Flange	LA	M	N	P	S	T	α	Nº of holes
63	FF-115	9	115	95	140	10	3	45°	4
71	FF-130		130	110	160		3.5		
80	FF-165	10	165	130	200	12			
90									
100	FF-215	11	215	180	250	15	4		
112									
132	FF-265	12	265	230	300				
160	FF-300	18	300	250	350	19	5		
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(*)				

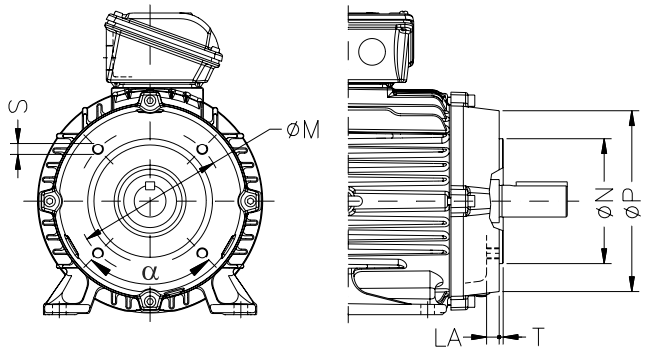
**Only for motors fitted with air deflector in drive end side.*

17.2.2 “C-DIN” Flange



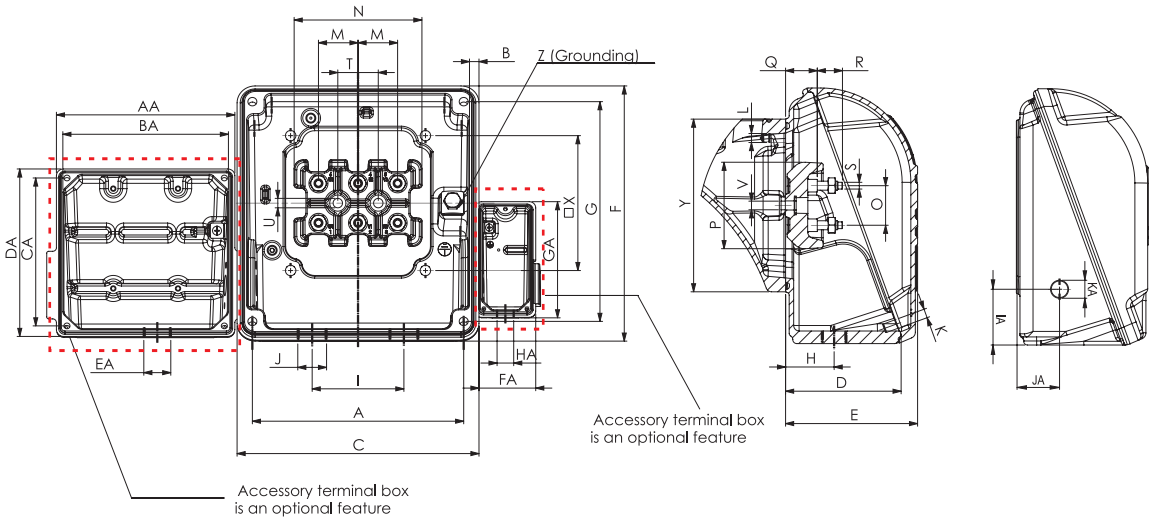
Frame	Flange	LA	M	N	P	S	T	α	N° of holes
63	C-90	9.5	75	60	90	M5	2.5	45°	4
71	C-105	8	85	70	105	M6			
80	C-120	10.5	100	80	120		3		
90	C-140	12	115	95	140	M8			
100	C-160	13.5	130	110	160		3.5		
112									
132	C-200	15.5	165	130	200	M10			
160	C-250	19	215	180	249	M12	6.3		

17.2.3 “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			
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	98	3	115	59.5	67	104	91	31		2xM25x1.5											
100																					
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	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
180																					
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		M10x1.5	M10x1.5	44	140	44	94	28	28	M10x1.5	45	10.5
250S/M										2xM63x1.5											
280S/M	275	13.5	314		147	312	275		126		M12x1.75	M12x1.75	45	153	45	108	34	40	M12x1.75		
315S/M	340	14.5	379	162	176	382	345	78	160												
315L	365			202			390	97	200			M14x2.0	65	210	65	146	48	48	M16x2.0	65	
355M/L			404		220	436				2xM80x2											
355A/B(**)	415	-	460	267	290	544	678	187	140		M10x1.5	M12x1.75	80	-	105	-	-	-	M20x2.5	-	-
				232*				152(*)													

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		70	107	2-10 mm²												6		4
132			103															
160	M6x1.0	110	140	5.2-25 mm²	139	117	117	133		68	131	M20x1.5	47	40	M20x1.5	12	26	
180																		
200	M8x1.25	120	155	5.2-35 mm²									47	45				
225S/M	M10x1.5	150	192	25-50 mm²	198	175	175	189					62	48		16		
250S/M			197															
280S/M			204	35-70 mm²									77	56				
315S/M		200	260										82	69				
315L		260	300	85-120 mm²									97	79				
355M/L																		
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 an the tabel bellow.

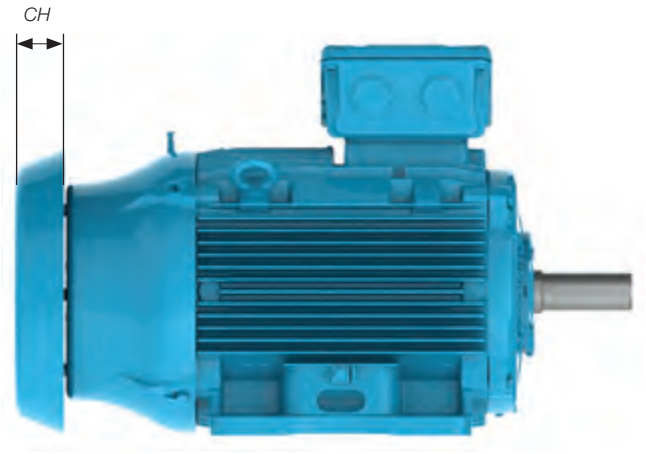


Figure 35 - Motor with drip cover

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. Packaging

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

Figure 36: 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 37: Wooden crates

20.1 Top Mounted Terminal Box

Frame	External height (m)	External width (m)	External lenght (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					
100L	0.33	0.27	0.46	1.4	0.04
L100L					
112M	0.36	0.30	0.46	1.5	0.05
L112M	0.42	0.33	0.60	1.5	0.08
132S	0.42	0.33	0.60	1.7	0.08
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.

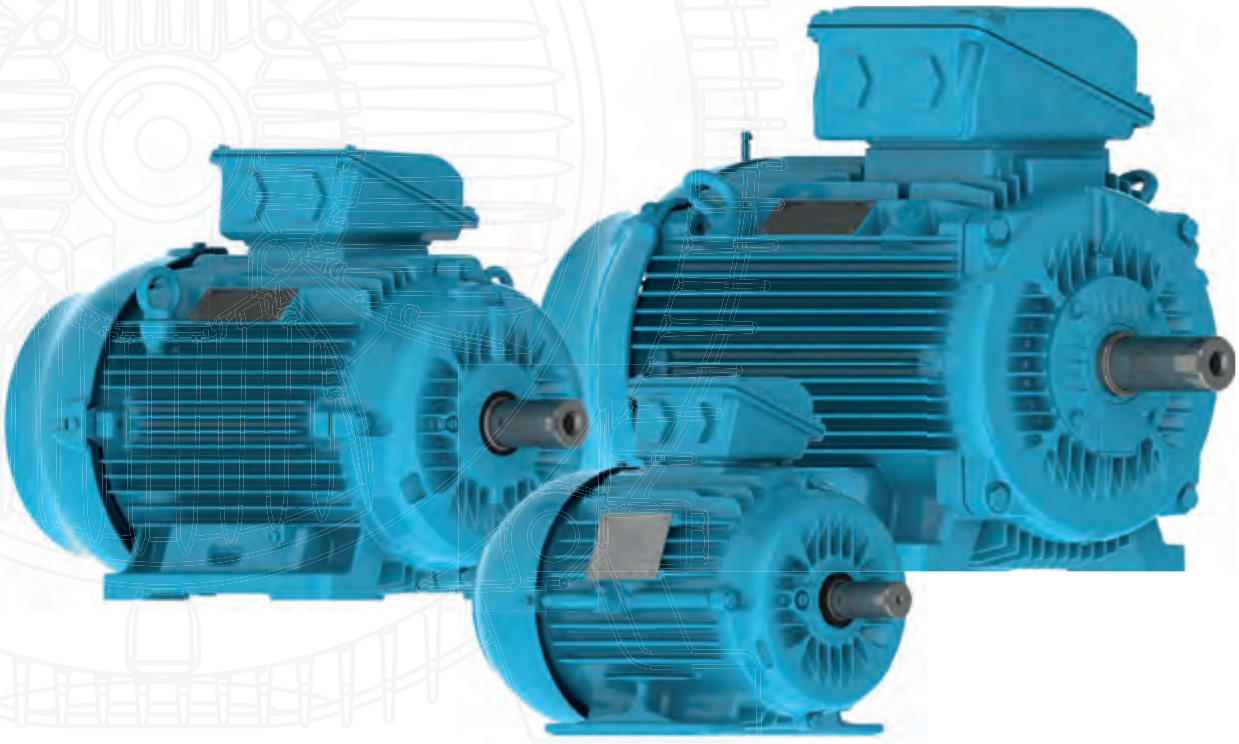
20.3 Top Mounted Terminal Box

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.



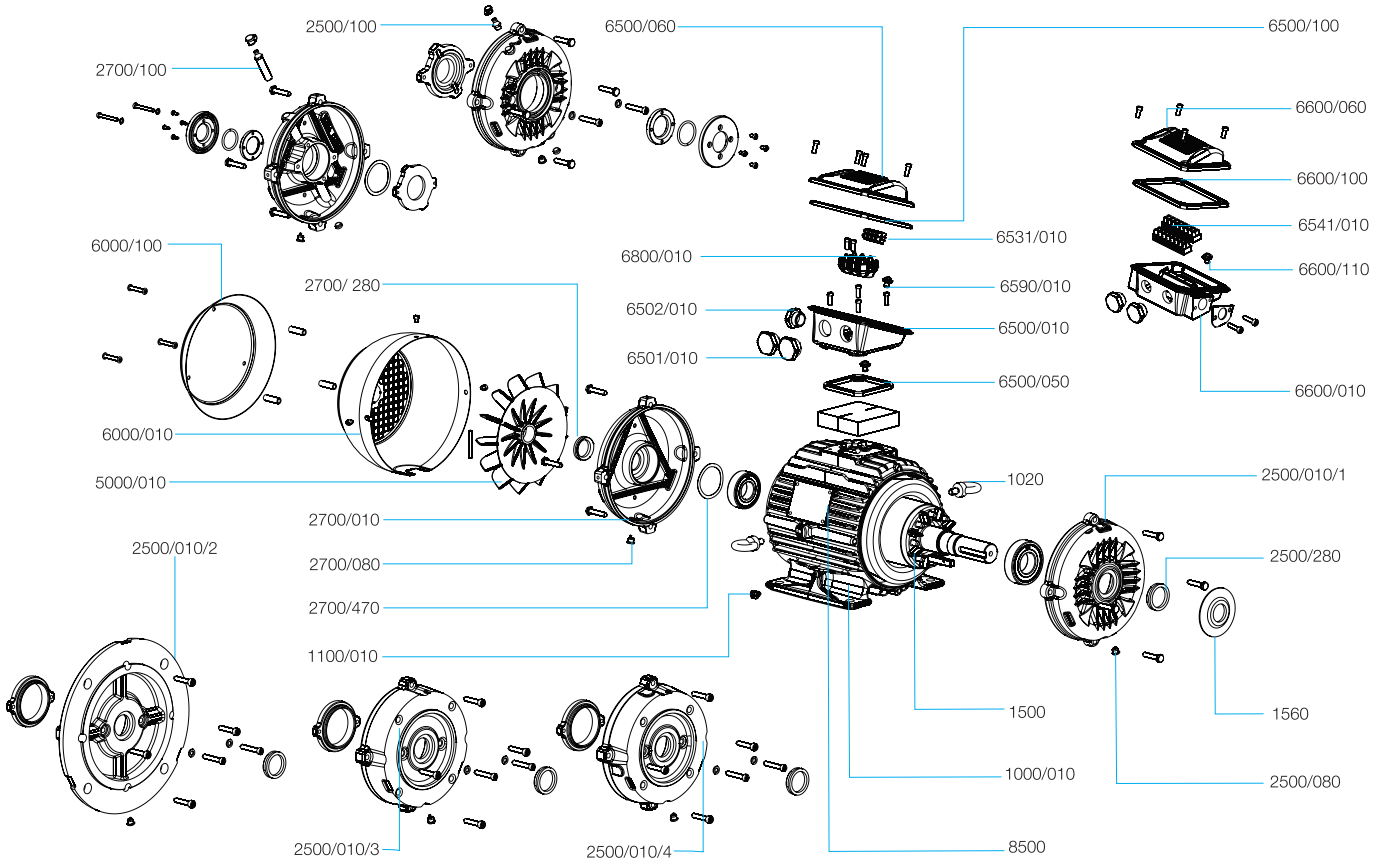
21. Spare Parts

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

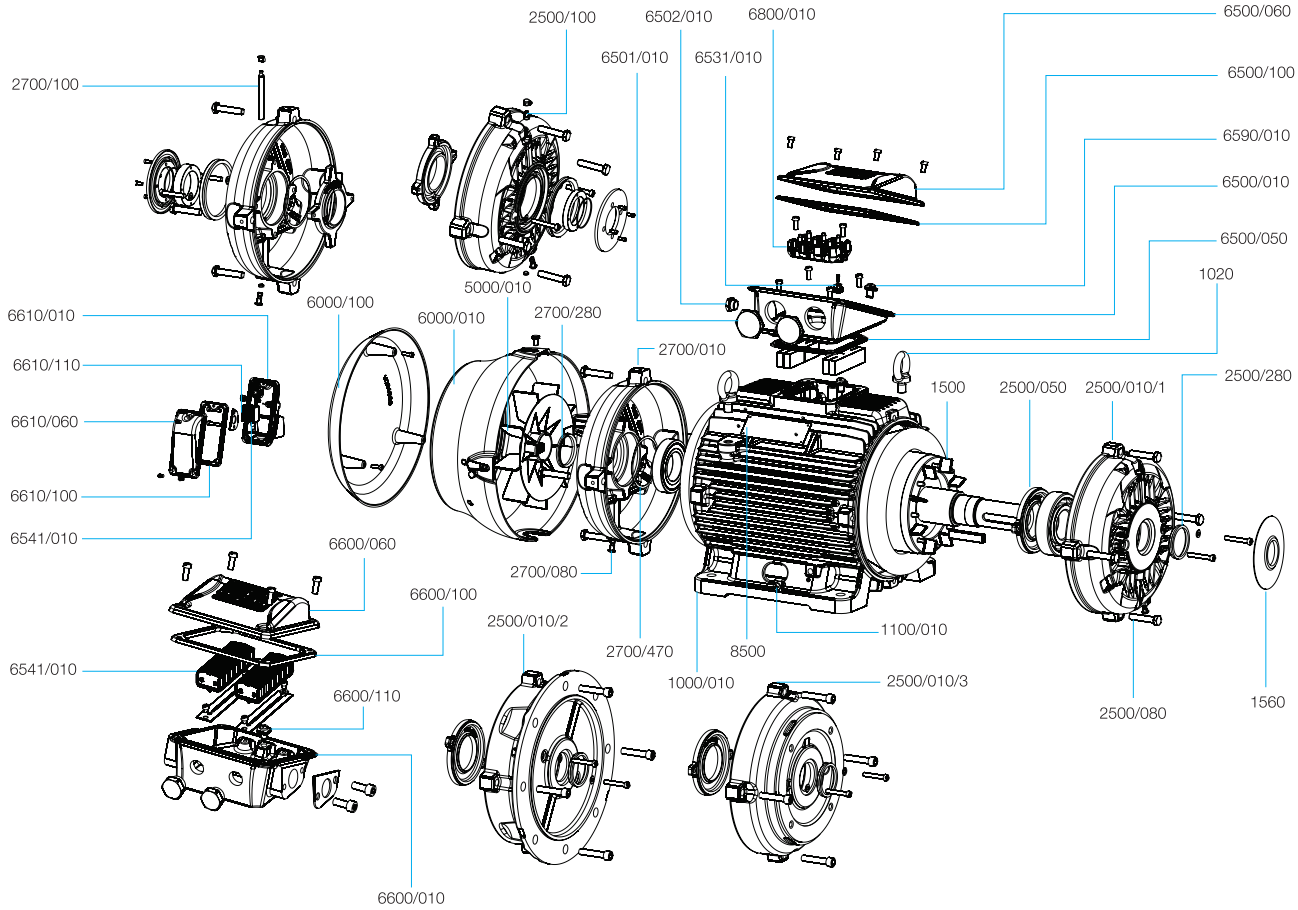
21.1.1 Spare Parts Available 63-112



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	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®, 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 laryrinth 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 steel fabricated in the 63-112 frame.
(5) C flange dimensions according to NEMA MG1 Part 4 standard 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 132-300 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).

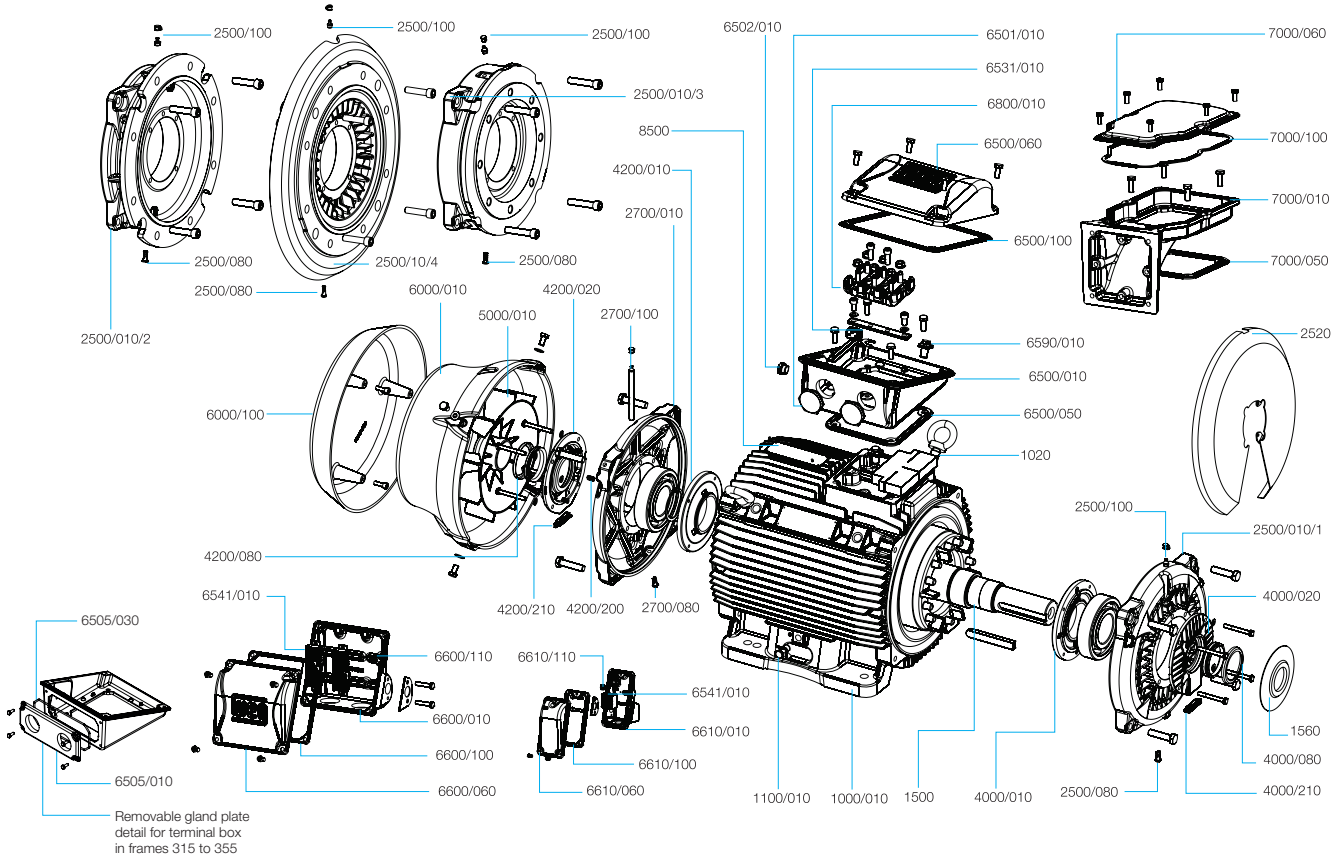
(4) When fitted with grease nipple in the non-drive end. the endshield spare part kit will also have grease relief and internal bearing cap.

(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 steel fabricated to 132 frame.

(7) C flange dimensions according to NEMA MG1 Part 4 standard in the 132-200 range and according to DIN to 132 frame.

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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