W21

Three Phase Motor

TECHNICAL CATALOGUE
INDIAN MARKET

W21

In view of the customer satisfaction and looking for the best solution to meet the wide diversity of application and requirement of applications, from standard to heavy application, WEG has developed this dedicated line based at W21 platform.

W21 motors are recognized as of high reliability motors around the world, it is applied from most simple application up to process line and crushers. WEG has continuously worked to achieve a product which satisfies all requirements for Indian market, especially electrical design to meet high ambient temperature and low starting current. Motors shown in this catalogue are according EFF2 efficiency levels. At request, we can supply EFF1 efficiency as well.

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1. General information

The WEG W21 series motors are designed to meet specific requirements of some markets. These motors are available in frame sizes IEC 63 to 355M/L and are suitable for operation up to ambient temperature of 50 ºC with temperature rise restricted to class B (70 K). They are suitable for 415 V, 3 Phase, 50 Hz Supply and are also suitable to operate at tolerances of +- 10% in voltage, +- 5% in frequency and +- 10% combined variation of both voltage and frequency. Additionally, they can operate continuously with a 2% unbalance on power supply voltage.

These motors are supplied with six terminals and are suitable for DOL starting and Star-Delta (except for output ratings below 1.5 kW, which are supplied with internally star-connected windings with three terminals in the terminal box). The minimum Pull Out torque is 210% of the rated torque and the starting current corresponds to 6 times the rated current value. All performance parameters are at rated supply conditions and are subject to tolerance as per IEC standard.

The W21 motors are supplied as standard with EFF2 efficiency level, as per table defined by CEMEP, and the efficiency levels are tested in conformance with IEC 60032-2 requirements.

2. Standards

The W21 motors meet the requirement and regulations of updated version of the following standards:

IEC60034-1 Rotating electrical machines – Part 1: Rating and performance.
IEC60034-2 Rotating electrical machines – Part 2: Standard methods for determining losses and efficiency from tests (excluding machines for traction vehicles).
IEC60034-5 Rotating electrical machines – Part 5: Degrees of protection provided by the integral .design of rotating electrical machines (IP code) – classification.
IEC60034-6 Rotating electrical machines – Part 6: Methods of cooling (IC code).
IEC60034-7 Rotating electrical machines – Part 7: Classification of types of enclosures and mounting arrangements (IM code).
IEC60034-8 Rotating electrical machines – Part 8: Terminal markings and direction of rotation.
IEC60034-9 Rotating electrical machines – Part 9: Noise limits.
IEC60034-11-1 Rotating electrical machines – Part 11-1: Thermal protection.
IEC60034-12 Rotating electrical machines – Part 12: Starting performance of single-speed three-phase cage induction motors.
IEC60034-14 Rotating electrical machines – Part 14: Mechanical vibration of certain machines – Limits of vibration.
IEC60072-1 Dimensions and output series for rotating electrical machines – Part 1: Frame numbers 56 to 400 and flange numbers 55 to 1080.

3. Construction details

3.1 Frame / Endshields

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

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

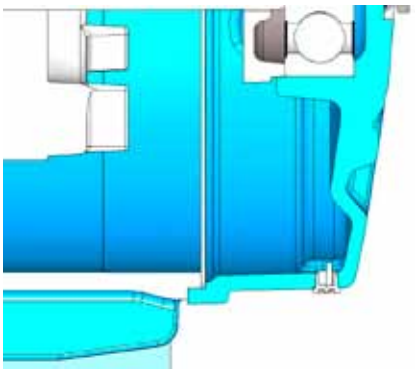


Figure 1 - Position of the drain hole and drain plug on the drive endshield

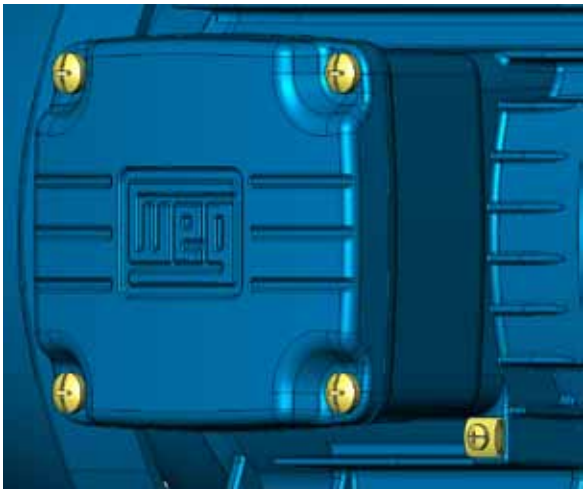


Figure 2 - Detail of the grounding lugs on the frame

3.2 Grounding

The W21 motor frames are designed with three grounding lugs: one grounding lug is placed inside the terminal box and the other two on each side of the frame. These grounding lugs placed on the frame comply with the following configuration:

Up to frame 112 (included): M6
From frame 160 to 200: M10
Above frame 200: M12

3.3 Fan cover

The fan cover is made of steel plate for frame 63 up to 132 and cast iron for frame 160 up to 355.

3.4 Terminal box

Same as the frame and endshields, the terminal box is made of FC-200 cast iron material. It is designed withy plenty internal space for easier cable connection and it allows rotation at 90 degrees steps which results in flexibility on installation. Terminal box holes comply with information given on the table below. The remaining external dimensions of the terminal box are shown on the mechanical tables.

Frame size	Holes dimensions for terminal box
63	2 x M20 x 1.5
71	
80	
90	2 x M25 x 1.5
100	
112	2 x M32 x 1.5
132	
160	2 x M40 x 1.5
180	
200	2 x M50 x 1.5
225	
250	2 x M63 x 1.5
280	
315	
355	

Table 1 - Type of thread and holes dimensions for terminal box

Different number and dimensions of holes are available on request.

In order to guarantee the degree of protection, the cables entry must comply with the same degree of protection indicated on the motor nameplate. If the procedure is not followed accordingly, warranty will be void. If further information is required, contact WEI Service Department.

3.4.1 Connection leads

The connection leads are marked in accordance with IEC 60034-8 and are supplied with specific connection terminals. W21 motors wound for 415 V are fitted with polyester made BMC (Bulk Moulding Compound) terminal blocks, which are reinforced with fiber glass, as shown on the figure below.

Figure 3 - Six-pin terminal block

3.4.2 Connection of accessories

Whenever they are supplied with accessories, the W21 motors are fitted with additional terminal box. This terminal box is supplied with connectors to allow assembly of the accessories terminals and it is designed with a 1xM20x1.5 threaded hole for field installation. The dimensions for the additional terminal boxes can be found the mechanical section of the catalog.

Figure 4 - Additional terminal box attached to terminal box

3.5 Nameplate

Main and additional nameplates are made of AISI 304 stainless steel and all information is laser engraved on them. Important and useful information is included in such nameplates like serial number, output power, voltage, frequency, rated current, degree of protection, power factor, thermal class, bearing type, type of grease and lubrication intervals.

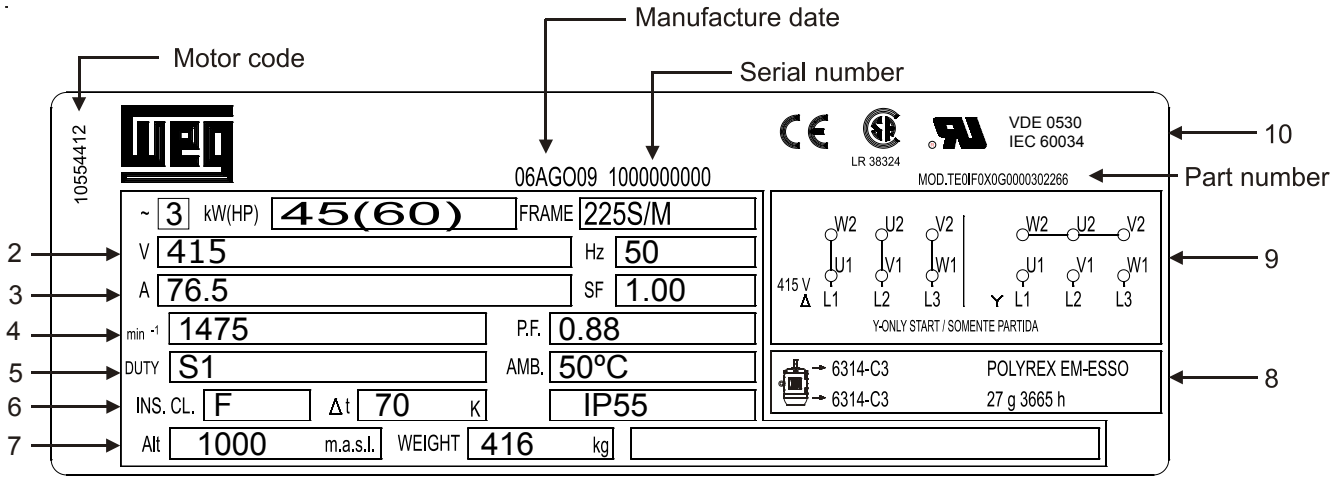


Figure 5 - Typical W21 motor nameplate

Line 1:
PH - Three phase: 3
kW (HP) - Motor rated power: 45 (60)
Frame - Frame size : 225S/M

Line 2:
V - Rated operating voltage: 415
Hz - Frequency : 50

Line 3:
A - Rated operating current: 76.5
SF - Service factor: 1.00

Line 4 :
min $^{-1}$ - Motor rated speed: 1475 RPM
P.F - Power factor: 0.88

Line 5:
DUTY - Duty Cycle: S1
AMB - Ambient temperature: 50°C

Line 6 :
INS CL - Insulation class : F
ΔT - Temperature rise: 70 K
IP55 - Degree of Protection

Line 7:
ALT - Altitude: 1000 m.a.s.l
WEIGHT - Motor weight: 141

Line 8:
6314-C3 - Drive end bearing specification
POLYREX EM-ESSO - Type of grease for bearings
6314-C3 - Non-drive end bearing specification
27 g 3665 h - Amount of grease and relubrication intervals in hours

Line 9 :
Δ - Connection diagram for rated voltage of 415
Y - Connection diagram for motor starting

Line 10 :
Standards/ Certifications

4. Cooling system / Noise level / Vibration level

4.1 Cooling system / Noise level

The W21 standard motor line is totally enclosed fan cooled (IC411), as per IEC 60034-6. Non-ventilated versions (TENV), air over (TEAO) and forced ventilation TEFV (IC416) are available on request. More information about IC 416 can be found in the section about Variable Frequency Drive Operation.

Fans are made of polypropylene from frame IEC 63 to 315 and made of aluminium in frames 355M/L. Designed for low noise level, the W21 motors comply with IEC60034-9 Standard and the corresponding sound pressure levels. Tables below shown sound pressure levels in dB(A) which are obtained upon tests for 50 Hz.

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

Table 2 - Sound pressure levels for 50 Hz motors

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

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

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

4.2 Vibration level

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

Vibration	Shaft Height	63 ≤ H ≤ 132	132 < H ≤ 280	H > 280
	Assembly	Vibration speed RMS (mm/s)		
Grade A	Free supension	1.6	2.2	2.8
Grade B	Free suspension	0.7	1.1	1.8

Table 4 - Speed and vibration levels

5. Shaft / Bearings / Thrusts

5.1 Shaft

The shaft of W21 standard motors is made of AISI 1040/45 steel in frames IEC 63 to 315S/M and in AISI 4140 steel in frames 315B and 355M/L. When supplied with roller bearings as an option, shaft material must be AISI 4140.
Since they are fitted with AISI 4140 steel shaft in frames 315B and 355M/L, W21 motors can be supplied with roller bearings, so they will be suitable for heavy duty applications such as pulley and belt applications. Further information about maximum allowable radial and axial loads on shaft end is given in tables 6, 7 and 8.

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

Shafts are supplied with A type key in frame sizes 63 to 200 and type B in frames 225 to 355, and with dimensions shown in section 14 - Mechanical data. All these shafts are supplied with threaded center hole with dimensions that comply with table 5.

Frame size	Number of Poles	Dimension
63	All	M4
71	All	M5
80	All	M6
90	All	M8
100	All	M10
112	All	M10
132	All	M12
160	All	M16
180	All	M16
200	All	M20
225S/M	All	M20
250S/M	All	M20
280S/M	All	M20
315S/M	All	M20
315B	2 poles	M20
	Others	M24
355M/L	2 poles	M20
	Others	M24

Table 5 - Center hole dimensions for drive end shaft

As an option, W21 motors can be supplied with stainless steel shaft AISI 316 and AISI 420 for highly corrosive environments.
Note: 2 poles motors will have, as an option, only the shaft end with AISI 316 stainless steel.

5.2 Bearings

W21 motors are supplied with 62 series ball bearings on drive end for frame 63 to 100, and 63 series from frame 112M and above. Bearing life time is L10h with 20,000 hours in conformance with maximum radial and axial loads as described in tables 5 and 6. For direct coupling arrangements (free of radial and axial thrusts), bearing life time will be L10h with 40,000 hours.

Note: Life time L10 means that at least 90% of the bearings submitted to maximum indicated loads will reach the numbers of predicted hours. The maximum allowable radial and axial loads for standard configuration are given in tables 6 and 7 ahead. Maximum radial load values consider axial load as void. At the same time, maximum axial load values consider radial load as void. Contact WEI to get information about bearing life time for applications with combined axial and radial loads.

The bearing life time depends on the type and size of the bearing, on radial and axial mechanical loads that the motor is submitted to, on operating conditions (ambient, temperature), and on speed and quality of the grease. Therefore, the bearing life time is directly related to correct application, maintenance and lubrication. When amount of grease and lubrication intervals are followed accordingly, bearings are expected to reach their pre-defined life time. W21 motors are supplied with ZZ bearings (sealed for life) in frames 63 to 132 and open from frame size 160 and above. Amount of grease and lubrication intervals are given on the nameplate and are shown in tables 9 and 10 ahead. Excess of grease, which is an amount of grease exceeding what is indicated on the nameplate, can result in bearing over temperature.

5.2.1 Bearing locking

For the standard line, the drive end bearing is locked axially with the external bearing cap in frame sizes 160 up to 200, and with internal and external bearing cap in frame sizes 225 up to 355. The non-drive end bearing is fitted with a spring washer in frame sizes 63 up to 200, and pre-load spring in frame sizes 225 up to 355 to take any axial play.
When supplied with roller bearings (optional feature that is available from frame 132), the non-drive end bearing is locked and any axial play is compensated by axial play of the drive end roller bearing. The minimum allowable radial loads for roller bearings are shown in table 8 ahead.

Important:

1 - Special applications
Motor operations at different conditions compared to the normal ones, such as ambient temperature, altitude, axial and radial loads above those given by the tables included in this document require specific and different lubrication intervals from those given herewith.

2 - Roller bearings
Roller bearings require minimum radial load so as to ensure correct operation. They are not recommended for direct coupling arrangement neither for 2 pole motors.

3 - Frequency drive operation motors
Bearing life time may be reduced when motor is driven by frequency drive and speed above the normal one. The speed itself is one of the items taken into consideration when defining bearing life time.

4 - Motors with modified mounting configuration
Motors supplied with horizontal mounting but for vertical operation, lubrication interval 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 where the load is applied which is on the middle of the shaft end length L/2 and at the very end of the shaft end L.

Radial thrust (L10 with 20,000 hours)

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

Table 6 - Maximum radial thrusts for ball bearings
**1 kN = 101.97 kgf = 224.8 lbf*

Axial thrust (L10h with 20,000 hours)

50 Hz - Fa in (kN*) - 20,000 hours							
Frame	Poles	Horizontal		Vertical with shaft upwards		Vertical with shaft downwards	
		Pushing	Pulling	Pushing	Pulling	Pushing	Pulling
63	2	0.19	0.19	0.18	0.20	0.19	0.19
	4	0.27	0.27	0.26	0.29	0.28	0.26
	6	0.34	0.35	0.33	0.37	0.35	0.34
	8	0.34	0.35	0.33	0.37	0.35	0.34
71	2	0.20	0.28	0.19	0.30	0.20	0.27
	4	0.29	0.40	0.27	0.42	0.29	0.38
	6	0.35	0.49	0.35	0.52	0.37	0.48
	8	0.46	0.60	0.44	0.63	0.46	0.59
80	2	0.26	0.42	0.25	0.43	0.27	0.40
	4	0.35	0.56	0.32	0.60	0.36	0.53
	6	0.45	0.70	0.42	0.74	0.46	0.67
	8	0.55	0.83	0.53	0.88	0.56	0.80
90	2	0.37	0.43	0.34	0.47	0.38	0.40
	4	0.51	0.59	0.48	0.65	0.53	0.55
	6	0.63	0.71	0.58	0.79	0.64	0.67
	8	0.76	0.86	0.72	0.93	0.78	0.82
100	2	0.37	0.59	0.32	0.67	0.38	0.55
	4	0.50	0.81	0.44	0.90	0.52	0.75
	6	0.65	1.02	0.58	1.14	0.68	0.95
	8	0.78	1.19	0.71	1.32	0.81	1.12
112	2	0.54	1.14	0.48	1.23	0.56	1.08
	4	0.73	1.55	0.66	1.67	0.76	1.47
	6	0.96	1.94	0.89	2.05	0.99	1.86
	8	1.07	2.15	0.97	2.35	1.11	2.05
132	2	0.72	1.32	0.61	1.51	0.76	1.21
	4	0.99	1.81	0.84	2.05	1.03	1.66
	6	1.22	2.20	1.05	2.45	1.27	2.05
	8	1.37	2.45	1.16	2.80	1.44	2.25
160	2	2.40	1.69	2.20	2.05	2.75	1.48
	4	2.95	2.25	2.65	2.65	3.40	1.95
	6	3.40	2.70	3.10	3.25	3.95	2.40
	8	3.85	3.15	3.55	3.70	4.40	2.85
180	2	3.20	2.30	2.90	2.75	3.65	2.00
	4	3.90	3.00	3.55	3.65	4.55	2.65
	6	4.65	3.75	4.20	4.45	5.30	3.30
	8	5.20	4.35	4.80	5.10	6.00	3.90
200	2	3.55	2.55	3.10	3.25	4.25	2.10
	4	4.45	3.45	3.95	4.25	5.30	2.95
	6	5.20	4.20	4.65	5.10	6.10	3.65
	8	6.00	5.00	5.50	5.90	6.90	4.50
225	2	4.35	3.55	3.65	4.60	5.40	2.90
	4	5.50	4.70	4.70	6.00	6.80	3.95
	6	6.60	5.80	5.80	7.20	8.00	5.00
	8	7.50	6.70	6.60	8.20	8.90	5.90
250	2	4.30	3.50	3.55	4.65	3.55	2.75
	4	5.30	4.45	4.30	6.10	6.90	3.50
	6	6.40	5.60	5.40	7.30	8.10	4.60
	8	7.30	6.50	6.30	8.20	9.00	5.50
280	2	4.15	3.35	3.00	5.10	5.90	2.20
	4	5.80	5.00	4.35	7.40	8.20	3.55
	6	7.20	6.40	5.70	8.80	9.60	4.90
	8	8.40	7.60	7.10	9.80	10.5	6.30
315	2	3.65	2.85	1.91	5.60	6.40	1.13
	4	6.10	5.40	3.85	9.10	9.80	3.10
	6	7.40	6.60	4.75	10.9	11.7	3.95
	8	8.50	7.70	5.70	12.2	13.0	4.95
355	2	3.70	2.95	0.75	7.50	8.30	-
	4	6.60	5.80	2.10	12.5	13.2	1.37
	6	7.70	7.00	2.75	14.7	15.4	2.00
	8	7.70	7.00	2.75	14.7	15.4	2.00

Table 7 - Maximum axial thrusts for ball bearings
** 1 kN = 101.97 kgf = 224.8 lbf*

Radial thrust (L10 with 20,000 hours)

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

Table 8 - Maximum radial thrusts for roller bearings
** 1 kN = 101.97 kgf = 224.8 lbf*

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

Lubrication intervals – Ball bearings

Lubrication Intervals (50 Hz)			
Frame	Poles	Bearings	Hours
160	2	6309	11,400
	4		12,600
	6		12,600
	8		12,600
180	2	6311	8,600
	4		12,600
	6		12,600
	8		12,600
200	2	6312	7,500
	4		12,600
	6		12,600
	8		12,600
225	2	6314	2,800
	4		7,300
	6		10,300
	8		12,400
250	2	6314	2,800
	4		7,300
	6		10,300
	8		12,400
280	2	6314	2,800
	4	6316	6,500
	6		9,300
	8		11,700
315	2	6314	2,800
	4	6319	5,600
	6		8,100
	8		10,900
355	2	6316	2,200
	4	6322	4,500
	6		6,800
	8		9,500

Table 9 - Lubrication interval for ball bearings

Lubrication intervals – Roller bearings

Lubrication Intervals (50 Hz)			
Frame	Poles	Bearings	Hours
160	4	NU309	12,600
	6		12,600
	8		12,600
180	4	NU311	12,600
	6		12,600
	8		12,600
200	4	NU312	12,600
	6		12,600
	8		12,600
225	4	NU314	5,600
	6		8,200
	8		10,600
250	4	NU314	5,600
	6		8,200
	8		10,600
280	4	NU316	4,700
	6		7,300
	8		9,700
315	4	NU319	3,700
	6		6,100
	8		8,600
355	4	NU322	2,700
	6		4,900
	8		7,200

Table 10 - Lubrication intervals for roller bearings

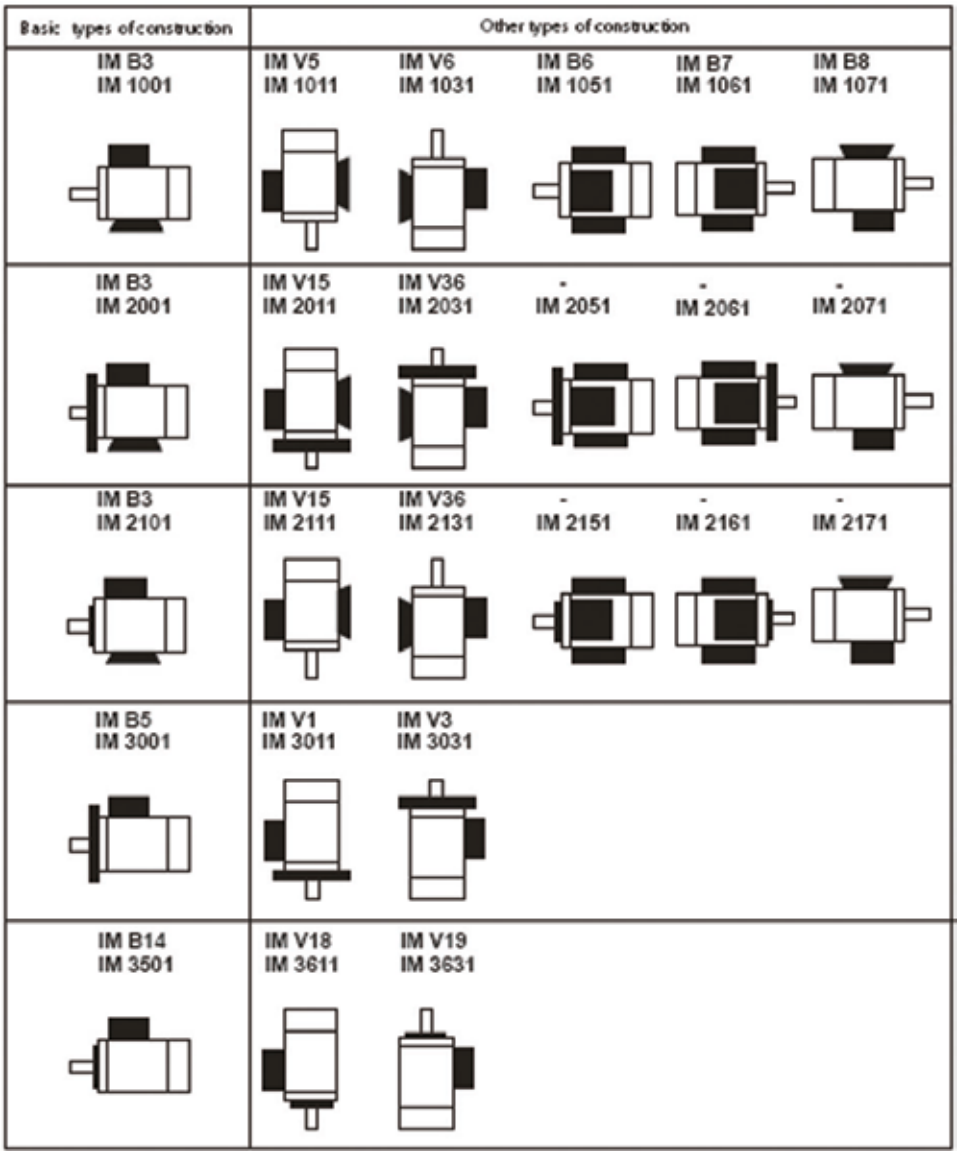
5.2.2 Bearing monitoring

Optionally, bearing temperature detectors can be installed to monitor bearing operating conditions. The most commonly accessory is the PT-100 temperature detector for continuous operating temperature monitoring. This monitoring is quite important since it affects directly the grease and bearing life time.

6. Mounting

The mounting configuration for W21 complies with IEC 60034-7 Standard. Standard mountings and their variations are shown on the figure below. After the designation (see table below) a characteristic letter is used to define the terminal box position. So the mounting IM B3 can be noticed on WEG documents as shown below (without code IM):

B3R – terminal box on right side of the frame viewing the motor from shaft end.
B3L – terminal box on left side of the frame viewing motor from shaft end.
B3T – terminal box on top of the frame.



**) Non-defined mountings by IEC 60034-7*
Table 11 - Mounting configurations

Important:
1. The mountings IM B34 and IM B14 (with C flange as per DIN 42.948) are not available up to frame sizes 132.

2. For vertically shaft down mounted motors, the application of a drip cover is recommended to prevent from ingress of small objects into the fan cover/ fan.

3. For vertically shaft up mounted motors installed in environments containing liquids, the application of a rubber slinger is recommended to prevent from ingress of such liquids into the motor through the shaft.

7. Degree of protection / Painting

7.1 Degree of protection

The W21 motors are supplied with degree of protection in conformance with 60034-5. They are IP55 which means:

a) First characteristic numeral 5: machine protected against dust. The enclosure is protected against contacts moving parts and ingress of dust 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 Painting

The W21 motors are supplied as standard with painting plan 203A (internal WEG designation), consisting of:

- Primer: one coat with 20 to 55 µm of alkyd primer;
- Finishing: one coat with 50 to 75 µm of alky synthetic enamel.

This painting plan can be applied to normal ambient applications, slightly severe, protected or unprotected, for industrial applications, with low relative humidity, regular temperature variations and environments containing SO_2.

Note: This painting plan is not recommended for direct exposure to acid steam, alkalis, solvents and salty environments.

Optionally, other painting plans are available, which are suitable to guarantee additional protection aggressive environments, either protected or unprotected (see Section 12 - Optional features).

7.2.1 Tropicalized painting

High humidity can result in premature insulation system deterioration which is the main component that ensures motor life time. Any ambient with up to 95% of relative humidity does not require additional protection, other than space heaters to avoid water condensation inside the motor. However, for any ambient with relative humidity above 95%, an epoxy painting is applied on all inside motor components which is known as tropicalized painting. If humidity is more than 95% it should be specified in the enquiry to ensure this tropicalized painting.

8. Ambient & Insulation

The rated output power given on the electrical tables, unless otherwise specified, refers to continuous duty operation S1, as per IEC 60034-1 and at following environments:

- With temperature varying between -20°C to +50°C;
- With altitudes up to 1000 meters above sea level;
- With relative humidity up to 60% (above 60% we suggest to install space heaters to avoid accumulation of condensed water inside the motor).

For temperature and altitude different than those given above, figures of table 12 must be applied in order to find out the factor to be used to define the available useful output (Pmax).

$P_{max} = P_{nom}$ x correction factor

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

Table 12 - Correction factors for altitude and ambient temperature

The W21 motors are supplied with class F insulation and Class B (70°C) temperature rise at normal operating conditions – ambient temperature of 50ºC (unless otherwise specified).

The difference between the temperature of the class F insulation (95°C) and the temperature rise of the design (70°C) means that, in practice, W21 motors are suitable to supply output ratings up to 15% above the rated values, then reaching temperature rise value of the insulation class F.

All W21 motors are supplied with WISE® insulation system which consists of enamel wires meeting temperature of 200°C and impregnated with continuous solvent free resin flow. The WISE® insulation system allows motor operation with variable frequency drive (see section ahead).

9. Variable frequency drive application

9.1 Considerations about rated voltage

The stator of W21 motors is supplied with class F insulation and it is suitable for DOL starting or with variable frequency drive. Optionally, these motors can be supplied with class H insulation.

These motors are supplied with WEG exclusive insulation system - WISE® (WEG Insulation System Evolution) – which ensures superior electric insulation characteristics. They are suitable for variable frequency drive application, taking into account the limits shown in table 13.

Motor rated voltage	Peak voltage on motor terminals (phase to phase)	dV/dt on motor terminals (phase to phase)	Rise time	Time between
Vn ≤ 460 V	≤ 1600 V	≤ 5200 V/µs	≥ 0,1 µs	≥ 6 µs
460 V < Vn ≤ 575 V	≤ 1800 V	≤ 6500 V/ µs		
575 V < Vn ≤ 690 V	≤ 2200 V	≤ 7800 V/ µs		

Table 13 - Limit conditions for variable frequency drive operation without application of filter

Notes:
1 - For the three cases above the maximum recommended switching frequency is limited at 5 kHz.
2 - If one of the above conditions is not followed accordingly (including the switching frequency), filter must be applied on frequency drive outlet.

9.2 Torque restrictions on variable frequency drive applications

Self-ventilated variable frequency drive motors have their torque limited at low frequencies due to ventilation reduction. Curves and derating tables must be applied to define the torque available.

Constant flux condition

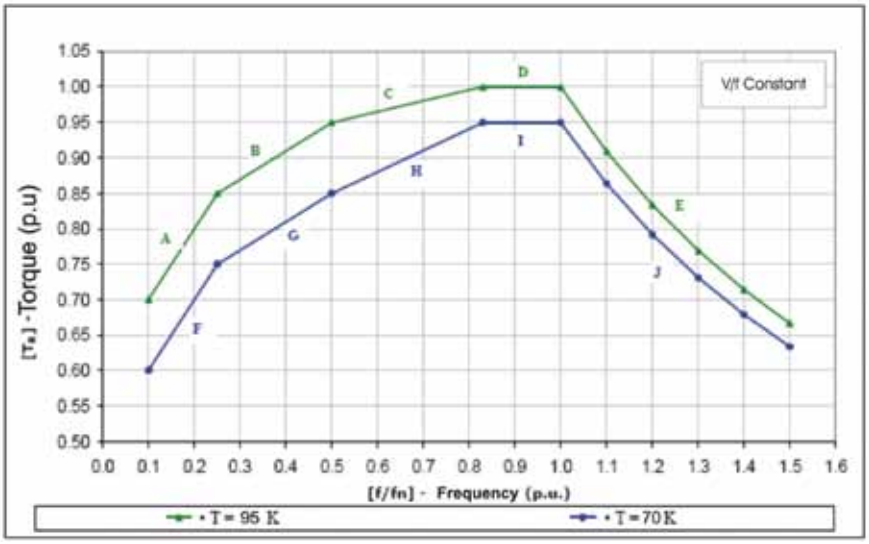


Figure 6 - Derating curve for constant flux

Derating for limit temperature rise for the insulation system thermal class*		
Interval	Limited by	Apply this equation
A	0.10 ≤ f/fn < 0.25	TR = (f/fn) + 0.60
B	0.25 ≤ f/fn < 0.50	TR = 0.40(f/fn) + 0.75
C	0.50 ≤ f/fn < 0.83	TR = 0.15(f/fn) + 0.87
D	0.83 ≤ f/fn ≤ 1.0	TR = 1.0
E	f/fn > 1.0	TR = 1/(f/fn)

Derating to keep temperature rise obtained with sinusoidal source**		
Interval	Limited by	Apply this equation
F	0.10 ≤ f/fn < 0.25	TR = (f/fn) + 0.50
G	0.25 ≤ f/fn < 0.50	TR = 0.40(f/fn) + 0.65
H	0.50 ≤ f/fn < 0.83	TR = 0.15(f/fn) + 0.70
I	0.83 ≤ f/fn ≤ 1.0	TR = 0.95
J	f/fn > 1.0	TR = 0.95/(f/fn)

Table 14 - Equation for torque definition at constant torque condition

(*) When top curve is used (green color), motor temperature rise will be limited by the temperature class of the insulation material. For example, for class F insulation motors, the temperature rise will be limited at 95°C (for ambient temperature of 50ºC). This curve can only be used for class F insulation and class B temperature rise motors in order to ensure that, when driven by frequency drive, the temperature rise remains class F (above 70°C and below 95°C).

(**) When lower curve is used (blue color), the motor temperature rise of variable frequency drive will be the same driven by sinusoidal source. In other words, class F insulation motors with class B temperature rise will remain with class B temperature rise(≤ 70°C for ambient temperature of 50ºC) even when driven by variable frequency drive.

Note: The derating curves given in figure 6 are related to temperature on motor winding and with thermal class. These curves do not consider thermal tolerance factor of the motors. They are intended to show the torque limitations for variable frequency drive motors.

9.3 Restrictions about current flowing through the bearings

Motors up to frame IEC 280S/M do not require additional features for variable frequency drive application. From frame 315S/M additional measures must be taken to avoid current flowing through the bearings. The solution for this problem is to use insulated bearings or insulated hub endshields (usually non-drive endshield) and grounding brush, usually mounted on drive endshield.

WEG can supply a kit to modify motors that are not originally supplied with such protection.

9.4 Forced ventilation kit

For those cases that require independent cooling system, the W21 Motors can be supplied with a forced ventilation kit, as shown in figure 7.

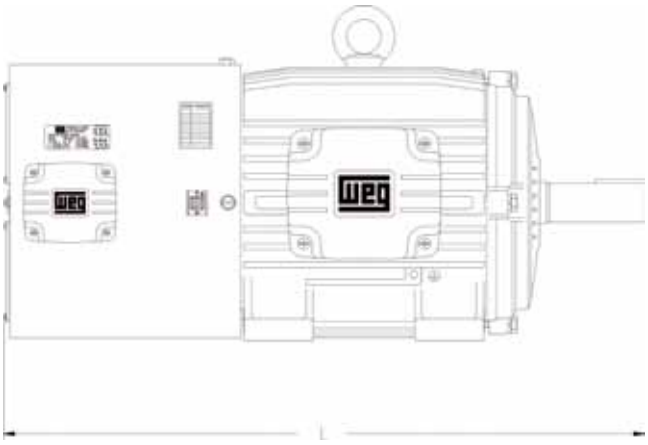


Figure 7 - Forced ventilation kit for W21 motors

When the forced ventilation kit is installed, the overall motor length is modified as shown in table 15.

Frame size	Number of poles	Total motor length (L)	
		Without forced ventilation	With forced ventilation
90S	All	304	548
90L	All	329	573
100	All	376	646
112	All	393	660
132S	All	452	715
132M	All	490	753
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	817	1146
	4-8	847	
250S/M	2	923	1222
	4-8		
280S/M	2	1036	1332
	4-8		
315S/M	2	1126	1452
	4-8	1156	

Table 15 - Motor length with and without the forced ventilation kit

10. Tolerances for electrical data

The following tolerance figures 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	$\left(\frac{1 - \cos \Phi}{6}\right)$ Minimum 0.02 Maximum 0.07
Slip	± 20% for Pnom ≥ 1 kW ± 30 % for Pnom < 1 kW
Starting current	+ 20% (without lower limit)
Starting torque	- 15% + 25%
Breakdown torque	- 10 %
Moment of inertia	± 10 %

11. Construction features

Frame			63	71	80	90	100
Mechanical features							
Frame	Material		FC-200 cast iron				
Degree of protection			IP55				
Grounding			Triple (one inside the terminal box and two on the frame - at opposite sides)				
Cooling method			Totally enclosed fan cooled (IC411)				
Fan	Material		Polypropylene				
Fan cover	Material		Steel plate				
Endshields	Material		FC-200 cast iron				
Drain hole			With automatic plastic drain plug				
Bearings	Type		Ball, double shielded (ZZ) with C3 clearance				
	Locking		Without bearing caps, with spring washer on NDE shield				
	DE	2p	6201	6203	6204	6205	6206
		4 - 8p					
	NDE	2p	6201	6202	6203	6204	6205
		4 - 8p					
Bearing seal			V'Ring				
Lubrication	Type of grease		Polirex® EM 103 (Exxon Mobil)				
			With bearing lubricated for life				
Terminal box	Type		Of flat lid, supplied with BMC terminal block				
	Material		FC-200 cast iron				
Additional terminal box			Mandatory when accessories are supplied (space heater, thermal protection) - with hole M20 x 1.5				
Cables entry	Size		2 x M20 x 1.5	2 x M20 x 1.5	2 x M20 x 1.5	2 x M25 x 1.5	2 x M25 x 1.5
	Plug		With flat plastic plug for transportation and storage, cable gland as optional				
Shaft	Material		AISI 1040/45	AISI 1040/45	AISI 1040/45	AISI 1040/45	AISI 1040/45
	Threaded hole	2p	M4	M5	M6	M8	M10
		4 - 8p	M4	M5	M6	M8	M10
Key			Supplied with type A open key				
Vibration			Grade A				
Balance			With half key				
Nameplate	Material		AISI 304 stainless steel				
Painting	Type (203A)		Prime: one with 20 to 55 µm of alkyd primer Finishing: one coat with 50 to 75 µm of alkyd synthetic enamel				
	Color		RAL 5007				
Electrical features							
Voltage			415 V				
Design			N				
Winding	Material		Copper				
	Insulation		WISE® (WEG Insulation System Evolution), Class F insulation				
	Impregnation		Dip and bake solvent-free resin				
Service factor			1.0 as standard on nameplate - motors with class B (70°C) temperature rise can supply service factor 1.15 continuously				
Rotor			Aluminium die cast				
Space heaters			Every time the output power is equal or above 30 kW				
Line test			All motors				

Frame			112	132	160	180	200
Mechanical features							
Frame	Material		FC-200 cast iron				
Degree of protection			IP55				
Grounding			Triple (one inside the terminal box and two on the frame - at opposite sides)				
Cooling method			Totally enclosed fan cooled (IC411)				
Fan	Material		Polypropylene				
Fan cover	Material		Steel plate		FC-200 cast iron		
Endshields	Material		FC-200 cast iron				
Drain hole			With automatic plastic drain plug				
Bearings	Type		Ball, double shielded (ZZ) with C3 clearance		Ball, single shielded (Z) with C3 clearance		
	Locking		Without bearing caps, with spring washer on NDE shield				
	DE	2p	6307	6308	6309	6311	6312
		4 - 8p					
	NDE	2p	6206	6207	6209	6211	6212
		4 - 8p					
Bearing seal			V'Ring				
Lubrication	Type of grease		Polirex® EM 103 (Exxon Mobil)				
			With bearing lubricated for life				
Terminal box	Type		Of flat lid, supplied with BMC terminal block				
	Material		FC-200 cast iron				
Additional terminal box			Mandatory when accessories are supplied (space heater, thermal protection) - with hole M20 x 1.5				
Cables entry	Size		2 x M32 x 1.5	2 x M32 x 1.5	2 x M40 x 1.5	2 x M40 x 1.5	2 x M50 x 1.5
	Plug		With flat plastic plug for transportation and storage, cable gland as optional				
Shaft	Material		AISI 1040/45	AISI 1040/45	AISI 1040/45	AISI 1040/45	AISI 1040/45
	Threaded hole	2p	M10	M12	M16	M16	M20
		4 - 8p	M10	M12	M16	M16	M20
Key			Supplied with type A open key				
Vibration			Grade A				
Balance			With half key				
Nameplate	Material		AISI 304 stainless steel				
Painting	Type (203A)		Prime: one with 20 to 55 µm of alkyd primer Finishing: one coat with 50 to 75 µm of alkyd synthetic enamel				
	Color		RAL 5007				
Electrical features							
Voltage			415 V				
Design			N				
Winding	Material		Copper				
	Insulation		WISE® (WEG Insulation System Evolution), Class F insulation				
	Impregnation		Dip and bake solvent-free resin				
Service factor			1.0 as standard on nameplate - motors with class B (70°C) temperature rise can supply service factor 1.15 continuously				
Rotor			Aluminium die cast				
Space heaters			Every time the output power is equal or above 30 kW				
Line test			All motors				

Frame			225S/M	250S/M	280S/M	315S/M	315B	355M/L
Mechanical features								
Frame	Material		FC-200 cast iron					
Degree of protection			IP55					
Grounding			Triple (one inside the terminal box and two on the frame - at opposite sides)					
Cooling method			Totally enclosed fan cooled (IC411)					
Fan	Material		Polypropylene				Aluminium	
Fan cover	Material		FC-200 cast iron					
Endshields	Material		FC-200 cast iron					
Drain hole			With automatic plastic drain plug					
Bearings	Type		Ball, open with C3 clearance					
	Locking		Locked on DE with internal and external bearing caps and pre-load springs on NDE					
	DE	2p	6314	6314	6314	6314	6314	6316
		4 - 8p	6314	6314	6316	6319	6319	6322
	NDE	2p	6314	6314	6314	6314	6314	6314
		4 - 8p	6314	6314	6316	6316	6316	6319
Bearing seal			V'Ring					
Lubrication	Type of grease		Polirex® EM 103 (Exxon Mobil)					
			With grease fitting					
Terminal box	Type		Of flat lid, supplied with BMC terminal block					
	Material		FC-200 cast iron					
Additional terminal box			Mandatory when accessories are supplied (space heater, thermal protection) - with hole M20 x 1.5					
Cables entry	Size		2 x M50 x 1.5	2 x M63 x 1.5	2 x M63 x 1.5	2 x M63 x 1.5	2 x M63 x 1.5 (removable base)	2 x M63 x 1.5 (removable base)
	Plug		With flat plastic plug for transportation and storage, cable gland as optional					
Shaft	Material		AISI 1040/45	AISI 1040/45	AISI 1040/45	AISI 1040/45	AISI 4140	AISI 4140
	Threaded hole	2p	M20	M20	M20	M20	M20	M20
		4 - 8p	M20	M20	M20	M20	M20	M24
Key			Supplied with B type key					
Vibration			Grade A					
Balance			With half key					
Nameplate	Material		AISI 304 stainless steel					
Painting	Type (203A)		Prime: one with 20 to 55µm of alkyd primer Finishing: one coat with 50 to 75µm of alkyd synthetic enamel					
	Color		RAL 5007					
Electrical features								
Voltage			415 V					
Design			N					
Winding	Material		Copper					
	Insulation		WISE® (WEG Insulation System Evolution), Class F insulation					
	Impregnation		Continuous flow of solvent-free resin					
Service factor			1.0 as standard on nameplate - motors with class B (70°C) temperature rise can supply service factor 1.15 continuously					
Rotor			Aluminium die cast					
Space heaters			Every time the output power is equal or above 30 kW					
Line test			All motors					

12. Optional features

Frame	63	71	80	90	100
Vibration					
Grade A	S	S	S	S	S
Grade B	O	O	O	O	O
Suitable for sensor SPM (1 x hole M8 on endshields for radial/vertical reading)	NA	NA	NA	NA	NA
Balance					
Balance with half key	S	S	S	S	S
Balance without key	O	O	O	O	O
Balance with entire key	O	O	O	O	O
Space heaters (standard for motors above 30 kW, 2 pole in frame size 200)					
110-127 V	O	O	O	O	O
220-240 V	O	O	O	O	O
110-127 / 220-240 V	O	O	O	O	O
380-480 V	O	O	O	O	O
Winding thermal protection					
Bimetallic thermal protector for alarm	O	O	O	O	O
Bimetallic thermal protector for tripping	O	O	O	O	O
Thermistor for alarm	O	O	O	O	O
Thermistor for tripping	O	O	O	O	O
PT100 two leads, one per phase	O	O	O	O	O
PT100 two leads, two per phase	O	O	O	O	O
PT100 three leads, one per phase	O	O	O	O	O
PT100 three leads, two per phase	O	O	O	O	O
Bearing thermal protection					
Bimetalic thermal protector for DE and NDE bearings	O	O	O	O	O
Thermistor for DE and NDE bearings	O	O	O	O	O
PT100 with two leads for DE and NDE bearings	O	O	O	O	O
PT100 with three leads for DE and NDE bearings	O	O	O	O	O
Terminal box					
Removable base plate (with standard holes)	NA	NA	NA	NA	NA
Removable base plate (without holes or different holes)	NA	NA	NA	NA	NA
Additional terminal box (with 1 x M20 x 1.5) mandatory with supplied with accessories	O	O	O	O	O
BMC terminal block	S	S	S	S	S
Flat plastic plug	S	S	S	S	S
Threaded plastic plug	O	O	O	O	O
Plastic cable gland	O	O	O	O	O
Brass cable gland	O	O	O	O	O
Stainless steel cable gland (only NPT thread)	O	O	O	O	O
Sealing compound on cables entry	O	O	O	O	O
Rubber gasket on cables entry	NA	NA	NA	O	O
Inside of terminal box painted yellow for saferty (Munsell 2.5 YR 6/14)	O	O	O	O	O
Cables outlet towards fan cover	O	O	O	O	O
Cables outlet towards shaft end	O	O	O	O	O
Degree of protection					
IP55	S	S	S	S	S
IP56	O	O	O	O	O
IP65	O	O	O	O	O
IP66	O	O	O	O	O
Shaft end sealing					
V'Ring	S	S	S	S	S
Lip seal	O	O	O	O	O
Oil seal (mandatory for flange mounting)	O	O	O	O	O
Oil seal with stainless steel spring	O	O	O	O	O
Viton lip seal	O	O	O	O	O
Viton oil seal	O	O	O	O	O
Viton oil seal with stainless steel spring	O	O	O	O	O
Labyrinth tachonite	O	O	O	O	O
W3Seal®	O	O	O	O	O
Painting plan					
203A	S	S	S	S	S
202E	O	O	O	O	O

Some combinations of optionals can not be supplied, then contact WEG.
Description: S (standard) O (optional) NA (not available)

112	132	160	180	200	225S/M	250S/M	280S/M	315S/M	315B	355M/L
S	S	S	S	S	S	S	S	S	S	S
O	O	O	O	O	O	O	O	O	O	O
NA	NA	O	O	O	O	O	O	O	O	O
S	S	S	S	S	S	S	S	S	S	S
O	O	O	O	O	O	O	O	O	O	O
O	O	O	O	O	O	O	O	O	O	O
O	O	O	O	O	O	O	O	O	O	O
O	O	O	O	S (*)	S	S	S	S	S	S
O	O	O	O	O	O	O	O	O	O	O
O	O	O	O	O	O	O	O	O	O	O
O	O	O	O	O	O	O	O	O	O	O
O	O	O	O	O	O	O	O	O	O	O
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O	O	O	O	O	O	O	O	O	O	O
O	O	O	O	O	O	O	O	O	O	O
NA	NA	NA	NA	NA	O	O	O	O	S	S
NA	NA	NA	NA	NA	O	O	O	O	O	O
O	O	O	O	S (*)	S	S	S	S	S	S
S	S	S	S	S	S	S	S	S	S	S
S	S	S	S	S	S	S	S	S	S	S
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S	S	S	S	S	S	S	S	S	S	S
O	O	O	O	O	O	O	O	O	O	O
O	O	O	O	O	O	O	O	O	O	O
O	O	O	O	O	O	O	O	O	O	O
S	S	S	S	S	S	S	S	S	S	S
O	O	O	O	O	O	O	O	NA	NA	NA
O	O	O	O	O	O	O	O	NA	NA	NA
O	O	O	O	O	O	O	O	NA	NA	NA
O	O	O	O	O	O	O	O	O	O	O
O	O	O	O	O	O	O	O	O	O	O
O	O	O	O	O	O	O	O	O	O	O
O	O	O	O	O	O	O	O	O	O	O
O	O	O	O	O	O	O	O	O	O	O
S	S	S	S	S	S	S	S	S	S	S
O	O	O	O	O	O	O	O	O	O	O

Some combinations of optionals can not be supplied, then contact WEG.
Description: S (standard) O (optional) NA (not available)

Frame	63	71	80	90	100
211E	0	0	0	0	0
212E	0	0	0	0	0
212P	0	0	0	0	0
213E	0	0	0	0	0
Epoxy internal painting (Tropicalized)	0	0	0	0	0
Colors					
RAL and Munsell colors are available, on request	0	0	0	0	0
Fan					
Plastic	S	S	S	S	S
Conductive plastic	0	0	0	0	0
Aluminum	0	0	0	0	0
Cast iron	0	0	0	0	0
Shaft					
AISI 1040/45	S	S	S	S	S
AISI 4140	0	0	0	0	0
AISI 316 (stainless steel) – 2 pole motors have only shaft end of stainless steel	0	0	0	0	0
AISI 420 (stainless steel)	0	0	0	0	0
A type key	S	S	S	S	S
B type key	0	0	0	0	0
C type key	0	0	0	0	0
Double shaft end	0	0	0	0	0
Shaft locking device (standard for roller bearing motors)	0	0	0	0	0
Drain					
Automatic plastic drain	S	S	S	S	S
Threaded drain plg (enclosed)	0	0	0	0	0
Stainless steel drain plug (enclosed)	0	0	0	0	0
T type drain (Automatic)	0	0	0	0	0
Optionals for variable frequency drive operation					
Insulated NDE hub	NA	NA	NA	NA	NA
Insulated DE hub	NA	NA	NA	NA	NA
Insulated DE bearing	NA	NA	NA	NA	NA
Insulated NDE bearing	NA	NA	NA	NA	NA
NDE grounding brush	NA	NA	NA	NA	NA
Forced ventilation kit without encoder (inform auxiliary motor voltage)	NA	NA	NA	0	0
Forced ventilation kit prepared for encoder (inform auxiliary motor voltage)	NA	NA	NA	0	0
Forced ventilation kit with encoder (inform auxiliary motor voltage)	NA	NA	NA	0	0
Encoder Hengstler RI58	0	0	0	0	0
Encoder Dynapar HS35	0	0	0	0	0
Other features					
NU series bearings	NA	NA	NA	NA	NA
Assembly parts (nuts and bolts) of stainless steel	0	0	0	0	0
Drip cover (recommended for vertically shaft down motors)	0	0	0	0	0
Rubber slinger (Recommended for vertically shaft up motors)	0	0	0	0	0
Joints sealing with Loctite 5923	0	0	0	0	0
Bolts sealing with Loctite 5923	0	0	0	0	0
Clockwise rotation direction	0	0	0	0	0
Counter clockwise rotation direction	0	0	0	0	0
Rotation direction nameplate	0	0	0	0	0
Cables connect on lower voltage (available only for terminal block motors)	S	S	S	S	S
Service factor 1.15 on nameplate (all class B (80 K) temperature rise motors can have service factor 1.15 continuously)	0	0	0	0	0
Class H insulation	0	0	0	0	0
Additional information nameplate	0	0	0	0	0
Tests (other tests on request)					
Routine test	0	0	0	0	0
Type test	0	0	0	0	0
Noise level test	0	0	0	0	0
Vibration test	0	0	0	0	0
Manufacturing and inspection plan	0	0	0	0	0

Some combinations of optionals can not be supplied, then contact WEG.
Description: S (standard) O (optional) NA (not available)

112	132	160	180	200	225S/M	250S/M	280S/M	315S/M	315B	355M/L
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	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	NA	NA
0	0	0	0	0	0	0	0	0	NA	NA
0	0	0	0	S	0	0	0	0	S	S
0	0	0	0	0	0	0	0	0	0	0
S	S	S	S	S	S	S	S	S	NA	NA
0	0	0	0	0	0	0	0	0	S	S
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	NA	NA	NA	NA	NA	NA
0	0	0	0	0	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	0	0	0
S	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	0	0	0
NA	NA	NA	NA	NA	0	0	0	0	0	0
NA	NA	NA	NA	NA	0	0	0	0	0	0
NA	NA	NA	NA	NA	0	0	0	0	0	0
NA	NA	NA	NA	NA	0	0	0	0	0	0
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	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	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	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	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0

Some combinations of optionals can not be supplied, then contact WEG.
Description: S (standard) O (optional) NA (not available)

13. Electrical data

Output		IEC Frame	Locked rotor current IL/In	Full Load Torque (kgfm)	Locked rotor torque TL/Tn	Break-down torque Tb/Tn	Inertia J kgm²	Allowable locked rotor time (s)		Weight (kg)	Sound dB (A)	415 V							Full load current In (A)
												Rated speed (rpm)	Efficiency (η)			Power Factor (Cos φ)			
													% of full load						
kW	HP							Hot	Cold				50	75	100	50	75	100	
II Poles/ 3000 rpm / 50Hz																			
0.12	0.16	63	4.8	0.042	3.0	3.1	0.0001	27	59	6	52	2810	49.0	57.0	60.5	0.52	0.62	0.72	0.383
0.18	0.25	63	4.5	0.064	2.8	2.7	0.0001	30	66	7	52	2730	60.0	66.0	66.5	0.60	0.72	0.81	0.465
0.25	0.33	63	4.5	0.088	2.9	2.9	0.0002	25	55	7	52	2760	61.5	66.5	69.3	0.58	0.70	0.79	0.635
0.37	0.5	71	5.5	0.128	3.0	3.2	0.0003	23	51	10	56	2810	67.2	72.0	73.6	0.65	0.77	0.85	0.823
0.55	0.75	71	5.5	0.191	2.9	3.0	0.0005	16	35	11	56	2800	72.2	76.0	76.0	0.68	0.78	0.85	1.19
0.75	1	80	5.8	0.262	2.9	3.1	0.0008	25	55	14	59	2790	76.0	80.0	79.5	0.76	0.84	0.88	1.49
1.1	1.5	80	6.0	0.381	3.0	2.9	0.0009	13	29	15	59	2810	77.1	80.2	79.7	0.69	0.80	0.86	2.24
1.5	2	90S	6.0	0.520	2.3	2.4	0.0021	12	26	20	64	2810	80.0	81.5	82.0	0.76	0.83	0.88	2.89
2.2	3	90L	6.0	0.763	2.3	2.4	0.0024	9	20	22	64	2810	81.5	82.5	82.5	0.76	0.85	0.88	4.22
3	4	100L	6.0	1.02	2.3	2.6	0.0062	11	24	31	67	2860	83.5	85.0	85.0	0.83	0.88	0.90	5.46
4	5.5	112M	6.0	1.36	2.1	2.6	0.0084	18	40	42	64	2870	85.5	85.5	86.0	0.81	0.88	0.90	7.19
5.5	7.5	132S	6.0	1.84	2.2	2.5	0.0206	17	37	61	68	2910	86.0	87.5	88.0	0.78	0.86	0.89	9.77
7.5	10	132S	6.0	2.51	2.2	2.3	0.0243	13	29	67	68	2910	87.0	87.5	88.2	0.79	0.87	0.90	13.1
9.2	12.5	132M	6.0	3.09	2.1	2.3	0.0280	14	31	72	68	2900	88.0	89.0	89.0	0.82	0.87	0.89	16.2
11	15	160M	6.0	3.65	2.0	2.4	0.0471	17	37	104	70	2935	87.5	89.0	89.5	0.80	0.85	0.88	19.4
15	20	160M	6.0	4.99	2.0	2.3	0.0559	13	29	111	70	2930	89.0	90.0	90.0	0.81	0.85	0.88	26.3
18.5	25	160L	6.0	6.15	2.0	2.4	0.0677	11	24	129	70	2930	90.0	90.3	90.7	0.75	0.84	0.87	32.6
22	30	180M	6.0	7.30	2.1	2.4	0.1249	18	40	180	70	2935	90.5	91.5	91.5	0.80	0.86	0.89	37.6
30	40	200L	6.0	9.91	2.3	2.3	0.2063	19	42	239	74	2950	90.5	92.5	92.5	0.78	0.85	0.87	51.9
37	50	200L	6.0	12.2	2.3	2.3	0.2242	18	40	253	74	2955	91.3	92.8	93.0	0.82	0.87	0.88	62.9
45	60	225S/M	6.0	14.8	2.2	2.3	0.4485	27	59	411	82	2955	91.0	92.0	93.0	0.86	0.90	0.91	74.0
55	75	250S/M	6.0	18.1	2.2	2.4	0.5023	23	51	490	82	2955	92.0	93.0	93.2	0.86	0.90	0.91	90.2
75	100	280S/M	6.0	24.6	2.1	2.4	1.18	35	77	655	83	2970	92.0	93.2	93.8	0.84	0.87	0.89	125
90	125	280S/M	6.0	29.5	2.0	2.5	1.27	32	70	705	83	2970	92.0	93.5	94.0	0.82	0.87	0.89	150
110	150	315S/M	6.0	36.1	2.1	2.6	1.41	26	57	780	84	2970	93.0	94.4	94.5	0.79	0.85	0.88	184
132	175	315S/M	6.0	43.2	2.3	2.8	1.65	22	48	992	84	2975	93.6	94.8	95.0	0.81	0.86	0.88	220
160	220	315S/M	6.0	52.4	2.3	2.6	2.12	17	37	1020	84	2975	94.1	95.0	95.4	0.81	0.87	0.89	262
250	340	355M/L	7.2	81.6	1.9	2.5	5.75	65	143	1750	81	2985	94.4	95.8	96.0	0.88	0.91	0.92	394
Optional Frames																			
200	270	315S/M	6.0	65.4	2.2	2.9	2.17	49	108	1045	84	2980	95.2	95.8	96.1	0.79	0.84	0.87	333

This performance information and electrical data are related to 50ºC ambient temperature only
Performance parameters indicated above are subject to tolerances as per IEC 60034-1 and are at rated supply voltage & frequency. Please see page 18 for tolerance details.
1 kgf.m = 9,81 N.m = 7.233 lbf.ft

Output		IEC Frame	Locked rotor current IL/In	Full Load Torque (kgfm)	Locked rotor torque TL/Tn	Break-down torque Tb/Tn	Inertia J kgm²	Allowable locked rotor time (s)		Weight (kg)	Sound dB (A)	415 V							Full load current In (A)
												Rated speed (rpm)	Efficiency (η)			Power Factor (Cos φ)			
													% of full load						
kW	HP							Hot	Cold				50	75	100	50	75	100	
IV Poles/ 1500 rpm / 50Hz																			
0.12	0.16	63	4.2	0.083	2.4	2.5	0.0005	20	44	7	44	1415	45.0	54.0	58.5	0.46	0.56	0.67	0.426
0.18	0.25	63	4.0	0.125	2.2	2.5	0.0006	23	51	8	44	1400	53.8	59.5	62.0	0.52	0.63	0.72	0.561
0.25	0.33	71	4.5	0.178	2.2	2.3	0.0008	38	84	11	43	1370	62.0	66.0	68.0	0.48	0.60	0.69	0.741
0.37	0.5	71	4.4	0.258	2.7	2.8	0.0008	37	81	11	43	1395	68.0	72.0	73.5	0.48	0.60	0.70	1.00
0.55	0.75	80	6.0	0.375	2.6	2.8	0.0024	17	37	14	44	1430	69.0	73.0	75.0	0.56	0.69	0.78	1.31
0.75	1	80	5.5	0.516	2.4	2.6	0.0029	14	31	15	44	1415	73.5	76.2	76.2	0.62	0.74	0.83	1.65
1.1	1.5	90S	5.6	0.755	2.3	2.4	0.0050	8	18	20	49	1420	70.0	76.0	77.0	0.55	0.69	0.79	2.52
1.5	2	90L	6.0	1.03	2.7	2.7	0.0067	12	26	23	49	1420	80.3	82.0	81.7	0.64	0.77	0.83	3.08
2.2	3	100L	6.0	1.51	2.7	2.9	0.0084	14	31	32	53	1420	81.0	82.3	83.0	0.65	0.78	0.83	4.44
3	4	100L	6.0	2.07	2.7	2.7	0.0100	10	22	34	53	1410	83.6	85.0	84.7	0.68	0.79	0.86	5.73
4	5.5	112M	6.0	2.71	2	2.4	0.0188	15	33	46	56	1440	86.0	87.0	87.0	0.70	0.80	0.85	7.53
5.5	7.5	132S	6.0	3.68	1.9	2.3	0.0465	16	35	62	60	1455	86.0	86.5	87.3	0.68	0.79	0.85	10.3
7.5	10	132M	6.0	5.02	1.9	2.3	0.0543	12	26	68	60	1455	86.4	88.0	88.5	0.70	0.80	0.85	13.9
9.2	12.5	160M	5.8	6.16	2.2	2.4	0.0652	15	33	95	67	1455	86.0	87.5	88.0	0.63	0.75	0.81	18.0
11	15	160M	6.0	7.36	2.2	2.5	0.0803	16	35	105	67	1455	87.6	89.4	89.9	0.70	0.79	0.84	20.2
15	20	160L	6.0	10.0	2.2	2.4	0.1154	13	29	126	67	1460	89.0	90.4	90.6	0.67	0.78	0.83	27.8
18.5	25	180M	6.0	12.3	2.4	2.6	0.1794	18	40	175	64	1470	89.5	91.0	91.7	0.67	0.78	0.83	33.8
22	30	180L	6.0	14.6	2.5	2.6	0.2153	14	31	190	64	1470	91.0	91.5	92.0	0.69	0.79	0.83	40.1
30	40	200L	6.0	19.8	2.2	2.5	0.3586	17	37	242	69	1475	91.0	91.5	92.5	0.71	0.80	0.84	53.7
37	50	225S/M	6.0	24.4	2	2.3	0.6299	24	53	350	70	1475	91.2	92.0	92.5	0.77	0.84	0.87	64.0
45	60	225S/M	6.0	29.7	2.1	2.5	0.8398	20	44	387	70	1475	91.0	92.9	93.0	0.77	0.85	0.88	76.5
55	75	250S/M	6.0	36.3	2.2	2.5	0.9798	17	37	460	70	1475	92.7	93.1	93.5	0.80	0.87	0.90	90.9
75	100	280S/M	6.0	49.4	2	2.4	2.17	34	75	735	76	1480	93.0	93.8	94.3	0.80	0.86	0.88	126
90	125	280S/M	6.0	59.2	2	2.4	2.57	31	68	802	76	1480	93.0	93.9	94.5	0.80	0.86	0.88	151
110	150	315S/M	6.0	72.4	2.2	2.4	2.81	27	59	865	77	1480	92.8	94.4	94.4	0.78	0.85	0.88	184
132	175	315S/M	6.0	86.6	2.1	2.4	3.77	31	68	1010	77	1485	93.6	94.7	95.1	0.79	0.85	0.88	219
150	200	315S/M	6.0	98.4	2.2	2.4	3.77	24	53	1010	77	1485	94.0	95.0	95.2	0.77	0.84	0.86	255
160	220	315S/M	6.0	105	2.4	2.6	3.77	22	48	1010	77	1485	94.5	95.0	95.3	0.75	0.82	0.85	275
200	270	315B	6.0	131	1.9	2.9	4.02	33	73	1240	79	1485	93.8	95.0	95.0	0.68	0.77	0.81	362
250	340	355M/L	6.0	163	2	2.3	10.3	42	92	1615	79	1490	95.0	95.5	95.8	0.78	0.84	0.86	422
315	430	355M/L	6.0	206	2	2.3	10.3	42	92	1770	79	1490	95.0	95.8	96.2	0.79	0.84	0.86	530
Optional Frames																			
185	250	315B	6.0	121	1.8	2.7	4.02	23	51	1240	79	1485	94.0	94.5	95.0	0.65	0.76	0.82	330

This performance information and electrical data are related to 50ºC ambient temperature only
Performance parameters indicated above are subject to tolerances as per IEC 60034-1 and are at rated supply voltage & frequency. Please see page 18 for tolerance details.
1 kgf.m = 9,81 N.m = 7.233 lbf.ft

Output		IEC Frame	Locked rotor current IL/In	Full Load Torque (kgfm)	Locked rotor torque TL/Tn	Break-down torque Tb/Tn	Inertia J kgm²	Allowable locked rotor time (s)		Weight (kg)	Sound dB (A)	415 V							Full load current In (A)
												Rated speed (rpm)	Efficiency (η)			Power Factor (Cos φ)			
													% of full load						
kW	HP							Hot	Cold				50	75	100	50	75	100	
VI Poles/ 1000 rpm / 50Hz																			
0.12	0.16	63	3.5	0.128	2.2	2.1	0.0007	41	90	8.0	43	910	42.0	50.0	54.5	0.46	0.55	0.65	0.471
0.18	0.25	71	3.3	0.194	2.0	2.2	0.0008	50	110	10.5	43	905	46.0	54.0	57.0	0.46	0.55	0.62	0.708
0.25	0.33	71	3.5	0.271	2.2	2.2	0.0010	43	95	11.5	43	900	53.0	60.5	64.0	0.40	0.50	0.57	0.953
0.37	0.5	80	4.5	0.388	2.5	2.5	0.0024	12	26	14.0	43	930	54.0	62.5	65.0	0.45	0.57	0.67	1.19
0.55	0.75	80	4.5	0.576	2.3	2.3	0.0031	10	22	15.5	43	930	60.0	65.0	67.0	0.50	0.63	0.73	1.56
0.75	1	90S	4.8	0.794	2.1	2.1	0.0050	16	35	20.8	45	920	70.0	72.6	72.4	0.54	0.67	0.76	1.90
1.1	1.5	90L	4.8	1.16	2.3	2.2	0.0067	14	31	23.0	45	925	71.0	75.2	75.2	0.50	0.64	0.75	2.72
1.5	2	100L	4.8	1.55	2.2	2.5	0.0112	18	40	29.0	44	940	74.0	77.3	77.5	0.53	0.66	0.74	3.64
2.2	3	112M	5.0	2.28	2.2	2.3	0.0187	14	31	36.0	48	940	77.5	80.5	80.1	0.53	0.66	0.74	5.16
3	4	132S	5.3	3.04	2.0	2.2	0.0349	20	44	55.0	52	960	80.0	82.7	82.5	0.58	0.70	0.77	6.57
4	5.5	132M	6.0	4.06	2.1	2.3	0.0504	18	40	65.0	52	960	83.6	85.5	85.8	0.59	0.70	0.77	8.42
5.5	7.5	132M	6.0	5.58	2.2	2.4	0.0659	14	31	75.0	52	960	84.0	85.8	85.8	0.54	0.66	0.74	12.1
7.5	10	160M	6.0	7.53	2.3	2.6	0.1221	17	37	103.0	56	970	87.0	88.2	88.0	0.62	0.74	0.81	14.6
9.2	12.5	160L	6.0	9.24	2.3	2.8	0.1436	12	26	115.0	56	970	86.5	88.0	87.6	0.61	0.74	0.81	18.0
11	15	160L	6.0	11.0	2.4	2.9	0.1760	13	29	129.0	56	970	87.2	88.3	88.3	0.62	0.75	0.82	21.1
15	20	180L	6.0	15.1	2.0	2.4	0.3034	9	20	188.0	56	970	88.5	89.0	89.0	0.80	0.86	0.88	26.6
18.5	25	200L	6.0	18.5	2.1	2.3	0.3767	15	33	219.0	58	975	89.7	90.7	90.2	0.74	0.82	0.86	33.2
22	30	200L	6.0	22.0	2.3	2.4	0.4485	14	31	237.0	58	975	89.0	90.9	91.3	0.70	0.79	0.84	39.9
30	40	225S/M	6.0	29.8	2.0	2.3	0.9884	22	48	366.0	61	980	90.5	91.5	92.0	0.76	0.85	0.86	52.8
37	50	250S/M	6.0	37.0	2.1	2.4	1.22	20	44	440.0	61	975	91.0	92.4	92.5	0.79	0.85	0.87	64.0
45	60	280S/M	6.0	44.5	2.3	2.6	2.30	24	53	610.0	66	985	90.5	92.3	92.6	0.68	0.78	0.83	81.5
55	75	280S/M	6.0	54.4	2.3	2.5	2.64	23	51	655.0	66	985	91.6	93.2	93.5	0.71	0.82	0.85	96.3
75	100	315S/M	6.0	74.2	2.3	2.5	3.45	20	44	775.0	69	985	91.6	93.5	93.7	0.71	0.81	0.85	131
90	125	315S/M	6.0	89.0	2.1	2.3	4.14	18	40	861.0	69	985	92.5	94.0	93.9	0.70	0.80	0.84	159
110	150	315S/M	6.0	109	2.3	2.6	5.29	18	40	990.0	69	985	93.4	94.4	94.5	0.66	0.76	0.82	197
132	175	315B	6.0	130	1.7	2.3	6.52	34	75	1320.0	69	990	93.7	94.1	94.1	0.71	0.79	0.82	238
160	220	315B	6.0	157	1.7	2.3	7.46	26	57	1380.0	69	990	93.5	94.0	94.4	0.71	0.79	0.82	288
200	270	355M/L	6.0	197	2.1	2.3	12.4	85	187	1700.0	73	990	93.5	94.5	94.8	0.67	0.76	0.81	362
250	340	355M/L	6.0	245	2.2	2.2	14.8	64	141	1830.0	73	995	94.0	95.1	95.6	0.70	0.79	0.82	444

This performance information and electrical data are related to 50ºC ambient temperature only
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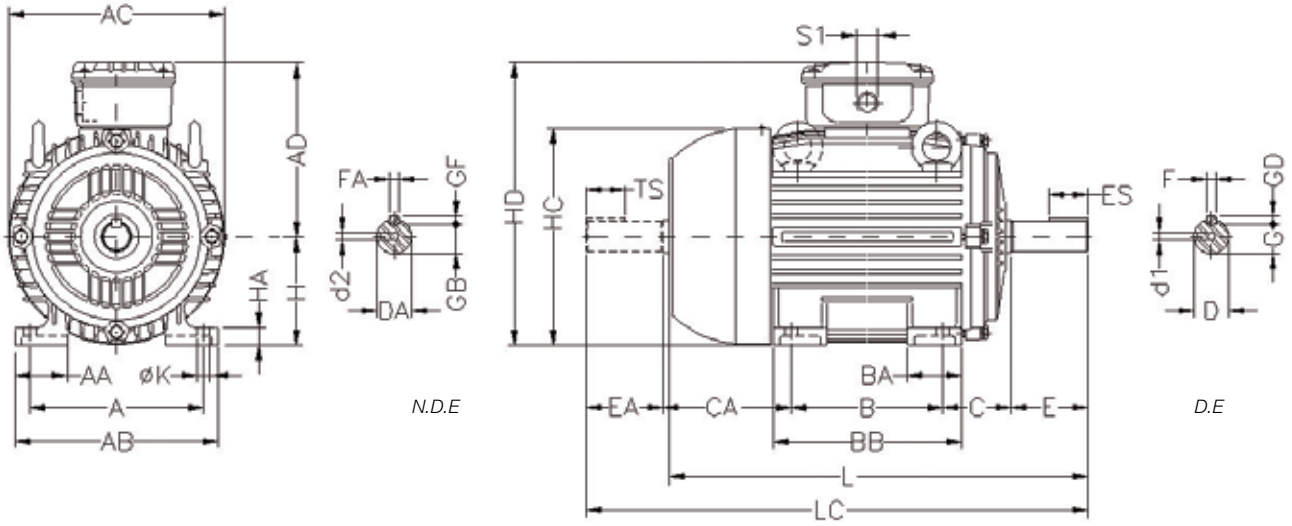
1 kgf.m = 9,81 N.m = 7.233 lbf.ft

Output		IEC Frame	Locked rotor current IL/In	Full Load Torque (kgfm)	Locked rotor torque TL/Tn	Break-down torque Tb/Tn	Inertia J kgm²	Allowable locked rotor time (s)		Weight (kg)	Sound dB (A)	415 V							Full load current In (A)
												Rated speed (rpm)	Efficiency (η)			Power Factor (Cos φ)			
													% of full load						
kW	HP							Hot	Cold				50	75	100	50	75	100	
VIII Poles/ 750 rpm / 50Hz																			
0.12	0.16	71	2.5	0.171	1.9	2.1	0.0008	44	97	11	41	685	36.0	44.2	47.2	0.40	0.49	0.56	0.631
0.18	0.25	80	3.1	0.250	1.9	2.1	0.0024	16	35	14	42	700	40.0	49.0	54.2	0.43	0.53	0.62	0.745
0.25	0.33	80	3.4	0.358	2.0	2.1	0.0029	24	53	15	42	680	47.5	55.0	58.0	0.45	0.56	0.65	0.923
0.37	0.5	90S	3.5	0.519	2.1	2.1	0.0045	29	64	18	43	695	51.0	59.0	61.0	0.43	0.53	0.64	1.32
0.55	0.75	90L	3.7	0.776	1.8	2.1	0.0062	25	55	22	43	690	58.0	63.0	65.0	0.44	0.56	0.65	1.81
0.75	1	100L	4.2	1.04	2.0	2.1	0.0095	30	66	27	50	705	65.0	70.0	71.0	0.42	0.54	0.63	2.33
1.1	1.5	100L	4.1	1.53	1.7	2.1	0.0129	23	51	31	50	700	66.0	71.5	72.2	0.43	0.56	0.65	3.26
1.5	2	112M	4.6	2.06	2.5	2.7	0.0243	32	70	43	46	710	76.5	77.8	78.0	0.48	0.60	0.69	3.88
2.2	3	132S	6.0	3.00	2.4	2.7	0.0753	23	51	68	48	715	78.5	81.5	82.5	0.53	0.65	0.73	5.08
3	4	132M	5.8	4.12	2.4	2.7	0.0853	22	48	75	48	710	78.0	82.7	83.5	0.52	0.64	0.72	6.94
4	5.5	160M	5.2	5.34	2.2	2.7	0.1221	33	73	105	51	730	81.3	84.3	86.0	0.47	0.60	0.69	9.38
5.5	7.5	160M	5.2	7.34	2.3	2.7	0.1436	23	51	114	51	730	81.5	84.1	85.2	0.46	0.59	0.69	13.0
7.5	10	160L	4.9	10.1	2.0	2.5	0.1652	15	33	127	51	725	83.5	85.7	85.5	0.51	0.63	0.72	17.0
11	15	180L	6.0	14.8	2.0	2.5	0.3034	12	26	175	51	725	87.0	88.5	88.3	0.66	0.77	0.82	21.1
15	20	200L	4.6	20.0	2.0	2.1	0.4126	23	51	225	53	730	86.5	88.6	89.0	0.56	0.68	0.75	31.2
18.5	25	225S/M	6.0	24.7	1.7	2.4	0.8472	21	46	341	60	730	88.5	90.1	90.0	0.71	0.79	0.84	34.0
22	30	225S/M	6.0	29.4	1.8	2.4	0.9884	22	48	365	60	730	89.0	91.0	91.0	0.72	0.81	0.84	40.0
30	40	250S/M	6.0	40.0	1.8	2.5	1.22	18	40	440	60	730	89.5	91.2	91.2	0.72	0.81	0.84	54.5
37	50	280S/M	6.0	48.7	1.9	2.3	2.30	29	64	590	62	740	90.5	92.2	92.3	0.67	0.77	0.81	68.9
45	60	280S/M	6.0	59.2	2.0	2.4	2.64	26	57	643	62	740	90.5	92.1	92.3	0.65	0.75	0.80	84.8
55	75	315S/M	6.0	72.4	1.9	2.2	3.45	27	59	777	62	740	91.2	92.6	92.6	0.67	0.75	0.81	102
75	100	315S/M	6.0	98.7	1.9	2.2	4.83	20	44	919	62	740	92.0	93.0	93.2	0.65	0.75	0.81	138
90	125	315S/M	6.0	118	2.1	2.4	5.63	23	51	970	62	740	93.5	94.0	94.2	0.63	0.74	0.79	168
110	150	315B	6.0	145	1.8	2.3	7.46	35	77	1340	62	740	93.8	94.0	94.3	0.65	0.75	0.79	205
132	175	315B	6.0	174	1.9	2.3	8.39	30	66	1399	62	740	94.0	94.5	94.4	0.65	0.75	0.79	246
160	220	355M/L	6.0	211	1.6	2.2	16.3	42	92	1620	70	740	93.3	94.7	94.7	0.64	0.75	0.80	294
200	270	355M/L	6.0	263	1.6	2.1	19.5	37	81	1830	70	740	93.3	94.6	95.2	0.60	0.72	0.79	370
Optional Frames																			
0.37	0.5	90L	3.5	0.519	2.1	2.1	0.0045	29	64	18	43	695	51.0	59.0	61.0	0.43	0.53	0.64	1.32

This performance information and electrical data are related to 50ºC ambient temperature only
Performance parameters indicated above are subject to tolerances as per IEC 60034-1 and are at rated supply voltage & frequency. Please see page 18 for tolerance details.
1 kgf.m = 9,81 N.m = 7.233 lbf.ft

14. Mechanical data

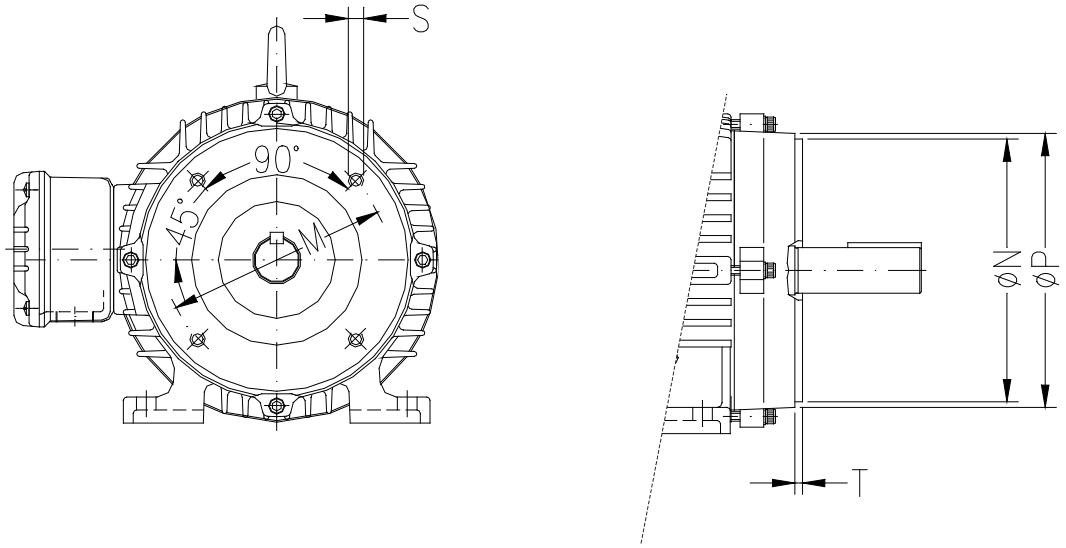


FRAME	A	AA	AB	AC	AD	B	BA	BB	C	CA	SHAFT DIMENSIONS												H	HA	HC	HD	K	L	LC	S1	d1	d2	BEARINGS	
											D	E	ES	F	G	GD	DA	EA	TS	FA	GB	GF												D.E.	N.D.E.
63	100	21	116	125	119	80	22	95	40	78	11j6	23	14	4	8.5	4	9j6	20	12	3	7.2	3	63	8	124	182	7	216	241		EM4	EM3	6201-ZZ	
71	112	30	132	141	127	90	38	113.5	45	88	14j6	30	18	5	11	5	11j6	23	14	4	8.5	4	71	12	139	198		248	276	2xM20x1.5	DM5	EM4	6203-ZZ	6202-ZZ
80	125	35	149	159	136	100	40	125.5	50	93	19j6	40	28	6	15.5	6	14j6	30	18	5	11	5	80	13	157	216	10	276	313		DM6	DM4	6204-ZZ	6203-ZZ
90S	140	38	164	179	155		42	131	56	104	24j6	50	36	8	20	7	16j6	40	28		13		90	15	177	245		304	350		DM8	DM6	6205-ZZ	6204-ZZ
90L						125		156																				329	375	2xM25x1.5				
100L	160	49	188	199	165	140	50	173	63	118	28j6	60	45		24		22j6	50	36	6	18.5	6	100	16	198	265	12	376	431		DM10	DM8	6206-ZZ	6205-ZZ
112M	190	48	220	222	184			177	70	128							24j6			8	20	7	112	18.5	235	296		393	448	2xM32x1.5			6307-ZZ	6206-ZZ
132S	216	51	248	270	212		55	187	89	150	38k6	80	63	10	33	8	28j6	60	45		24		132	20	274	344		452	519		DM12	DM10	6308-ZZ	6207-ZZ
132M						178		225																				490	557					
160M	254	64	308	312	255	210	65	254	108	174	42k6	110	80	12	37		42k6	110	80	12	37	8	160	22	317	415	14.5	598	712	2xM40x1.5	DM16		6309-C3	6209-Z-C3
160L						254		298																				642	756					
180M	279	80	350	358	275	241	75	294	121	200	48k6			14	42.5	9	48k6			14	42.5	9	180	28	360	455		664	782				6311-C3	6211-Z-C3
180L						279		332																				702	820					
200M	318	82	385	396	300	267	85	370	133	222	55m6			16	49	10							200	30	402	500	18.5	729	842	2xM50x1.5	M20		6312-C3	6212-Z-C3
200L						305																						767	880					
225S/M	356	80	436	476	373	286	105	391	149	280	55m6*		100				55m6*		100	16	49	10	225	34	466	598		817	935				6314-C3	
						311				255	60m6	140	125	18	53	11	60m6	140	125	18	53	11						847	995					
250S/M	406	100	506				138	449	168	312	60m6*						60m6*						250	42	491	623	24	923	1071					
						349				274	65m6				58		60m6																	
280S/M	457		557		468	368	142	510	190	350	65m6*						60m6*	140	125	18			280		578	748		1036	1188					
				600		419				299	75m6			20	67.5	12	65m6				58												6316-C3	
315S/M	508	120	628		497	406	152	558	216	376	65m6*			18	58	11	60m6*				53		315	52	613	812	28	1126	1278	2xM63x1.5			6314-C3	
						457				325	80m6	170	160	22	71	14	65m6				58							1156	1308				6319-C3	6316-C3
315B		182	630	698	545	630	162	830			75m6*	140	125	20	67,5	12								47,5	664	860		1432			M20		6316-C3	6314-C3
											100m6	210	200	28	90	16												1502			M24		6322-C3	6319-C3
355M/L	610	140	750	816	685	560	200	760	254	467	75m6*	140	125	20	67.5	12	60m6*	140	125	18	53	11	355	50	725	1040		1396	1561		M20		6316-C3	6314-C3
						630				397	100m6	210	200	28	90	16	80m6	170	160	22	71	14						1466	1661		M24	M20	6322-C3	6319-C3

All dimensions are 'mm'

14.1 Mechanical data - Flanges

14.1.1 “C” Flange

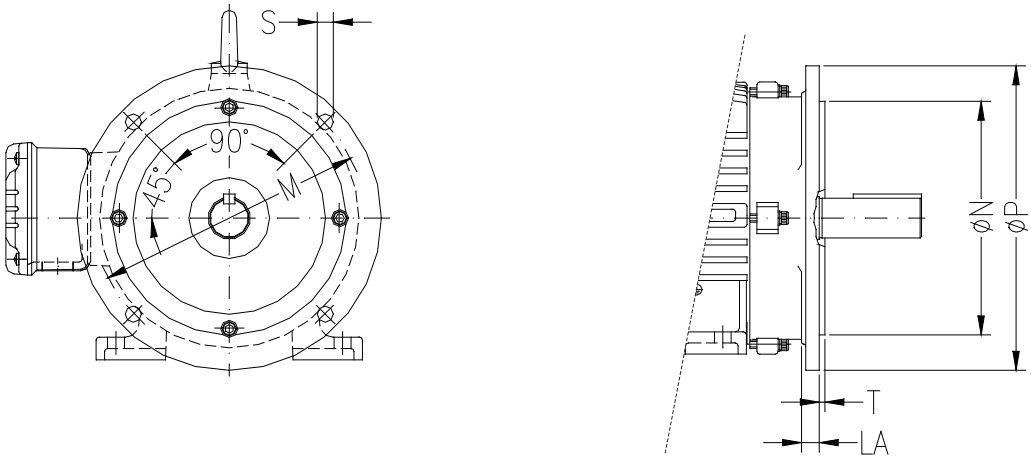


Frame	Flange	M	N	P	S	T	Number of holes
63	FC-95	95.2	76.2	143	UNC 1/4"x20	4	4
71							
80							
90L	FC-149	149.2	114.3	165	UNC 3/8"x16		
90S							
100L							
112M	FC-184	184.2	215.9	225	UNC 1/2"x13	6.3	
132S							
132M							
160M							
160L							
180L	FC-228	228.6	266.7	280			
200L							
180M							
225S/M	FC-279	279.4	317.5	395	UNC 5/8"x11		8
250S/M	FC-355	355.6	406.4	455			
280S/M							
315S/M	FC-368	368.3	419.1				
315B							
355M/L							

All dimensions are ‘mm’

14.1 Mechanical data - Flanges

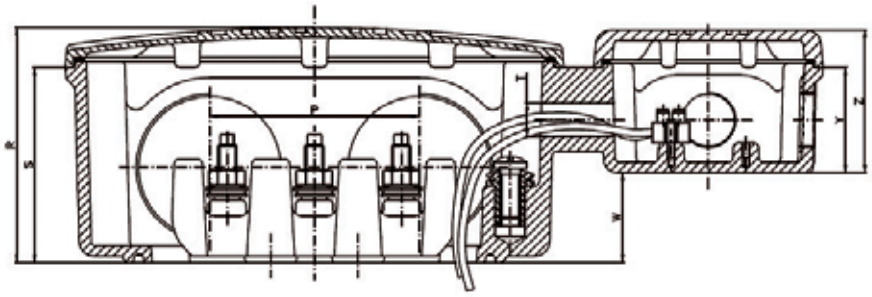
14.1.2 “FF” Flange

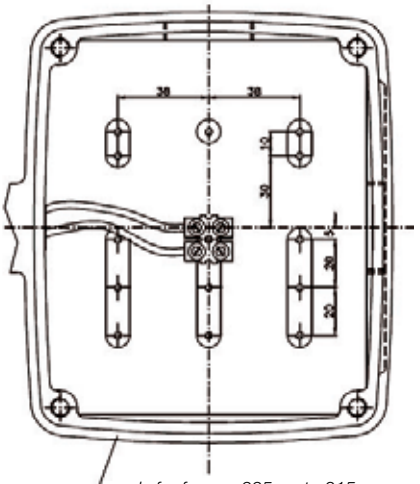


Frame	Flange	LA	M	N	P	S	T	α	Number of holes
63	FF-115	9	115	95	140	10	3	45°	4
71	FF-130		130	110	160		3.5		
80	FF-165	10	165	130	200	12			
90L									
90S									
100L	FF-215	11	215	180	250	15	4		
112M									
132S	FF-265	12	265	230	300				
132M									
160M	FF-300	18	300	250	350	19	5		
160L				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

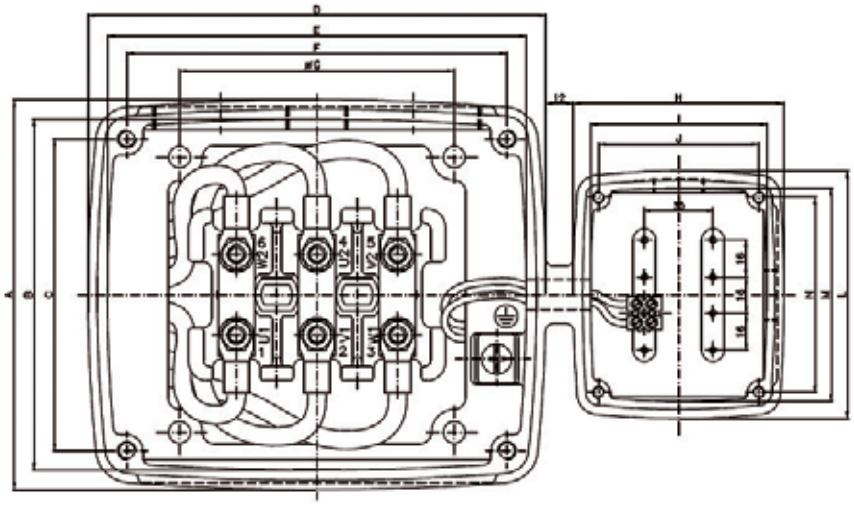
All dimensions are ‘mm’

15. Terminal box drawings





only for frames 225 up to 315



Frame	A	B	C	D	E	F	G	H	I	J
63-100	92	77	70	108	93	85	56	85	71	65
112-132	117	100	88	137	120	108	70	92	77	70
160-180	154	137	124	180	163	150	110	92	77	70
200	170	153	136	200	183	166	120	92	77	70
225-250	212	190	172	250	228	208	150	154	137	124
280	265	243	214	315	293	264	150	154	137	124
315	315	289	260	375	349	318	200	154	137	124

Frame	L	M	N	P	R	S	T	W	Y	Z
63-100	100	86	80	42	59	44	10	3	42,5	57.5
112-132	108	93	85	50	67	49	13.5	7	42	57
160-180	108	93	85	67	89	64	13.5	23	42	57
200	108	93	85	84	94	78	13.5	37	42	57
225-250	180	163	150	100	114	94	17	32.5	61.5	86.5
280	180	163	150	126	143	125	17	63.5	61.5	86.5
315	180	163	150	160	172	144	17	82.5	61.5	86.5

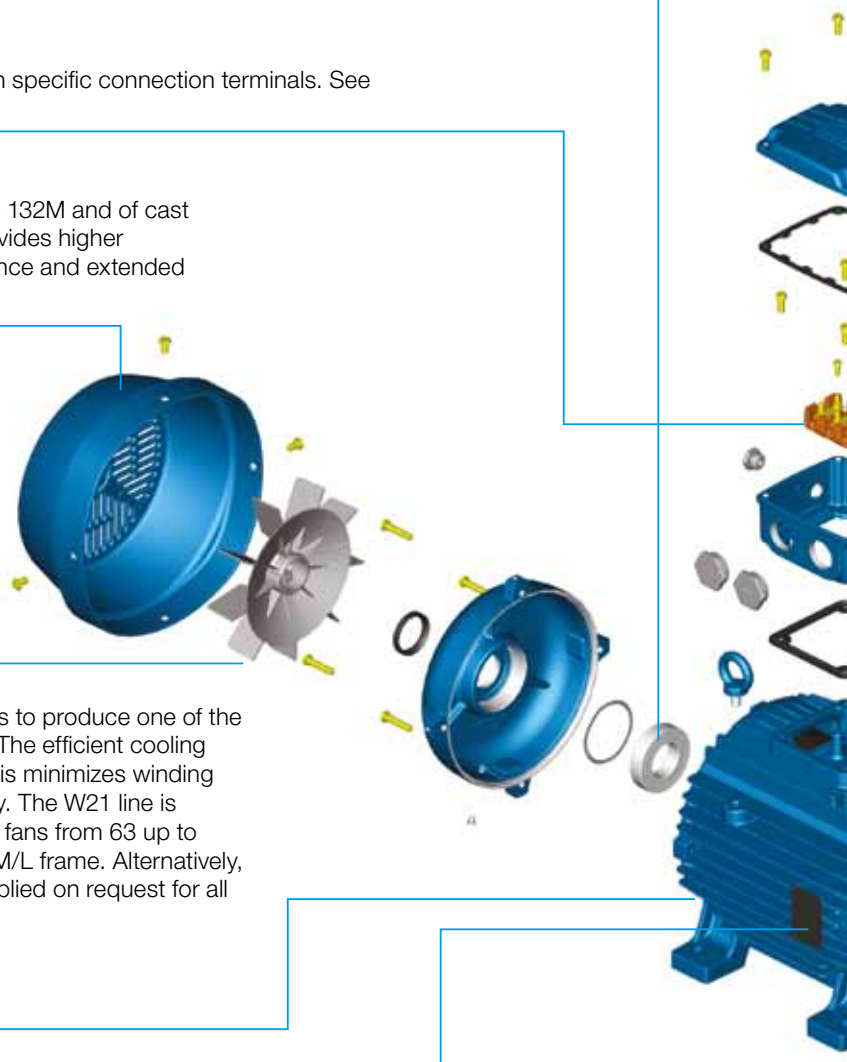
All dimensions are 'mm'

16. Features and benefits

Bearings
WEG motors are fitted with the highest quality bearings selected among the best manufacturers in the world and designed to ensure long life to the motor even under heavy working conditions. See page 9.

Connection leads
The connection leads are supplied with specific connection terminals. See page 6.

Fan cover
Made of steel plate for frames 63 up to 132M and of cast iron for frames 160M and above. It provides higher mechanical strength, corrosion resistance and extended lifetime. See page 5.



Fan
WEG has designed fans and fan covers to produce one of the quietest electric motors in the market. The efficient cooling ensures low motor temperature rise, this minimizes winding losses, thus increasing motor efficiency. The W21 line is supplied with anti-static Polypropylene fans from 63 up to 315S/M frames and aluminum for 355M/L frame. Alternatively, cast iron or aluminum fans can be supplied on request for all frames. See page 8.

Frame
WEG motors are made of FC-200 high-grade cast iron (same density as flameproof motors). The frames are provided with fins aiming at improving the heat dissipation and adequately spaced to minimize air blockage due to build up of dirt. The motors can be mounted in any position, horizontal and vertical, withstanding the maximum axial and radial thrusts. See page 5.

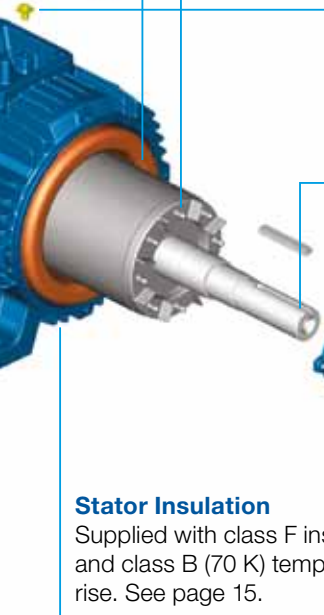
Nameplate
Stainless steel nameplate ensuring a permanent record of all motor data.
See page 7.

Terminal Box
Cast iron made with plenty of internal space. It can be rotated in 90° intervals, having one or two threaded holes to connect the cables or cable glands.
* Available top or side mounted. See page 5.

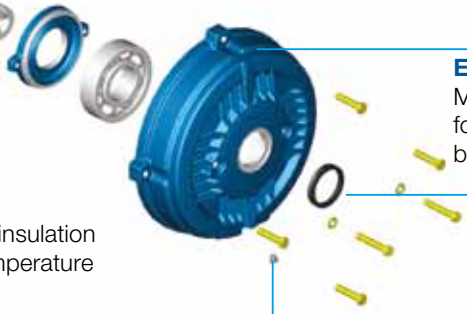
Winding
The wires are enameled with class H varnish. Supplied with patented WISE® (WEG Insulation System Evolution), which allows three times longer motor lifetime designed to work in environments with excess of moisture and suitable for VFD application. See page 16.

Rotor
High pressure die cast rotor dynamically balanced, thus reducing vibrations.

Grounding
The W21 motor frames are designed with three grounding lugs. See page 5.



Shaft
WEG uses SAE/AISI 1040/45 carbon steel as standard, which provides high mechanical strenght, avoiding bending under load and minimizes fatigue which extends lifetime performance. Specially designed to withstand torques caused during motor acceleration and deceleration (brake). Upon special design, shaft can have second end. See page 9.



Endshields
Made of cast iron, provided with external fins for better heat dissipation, thus increasing bearing life time. See page 5.

Seals
WEG motors are fitted with V-ring seals, Oil seals, Lip seals and may also be fitted with Taconite Labyrinth seals or W3Seal to provide the best possible protection in dusty and high moisture environments.

Stator Insulation
Supplied with class F insulation and class B (70 K) temperature rise. See page 15.

Stator Lamination
Built with low loss electrical steel lamination reducing electrical losses and operating temperature.

Drain plugs
Provided with plastic drain plug allowing drainage of condensed water. See page 5.

WEG Worldwide Operations

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