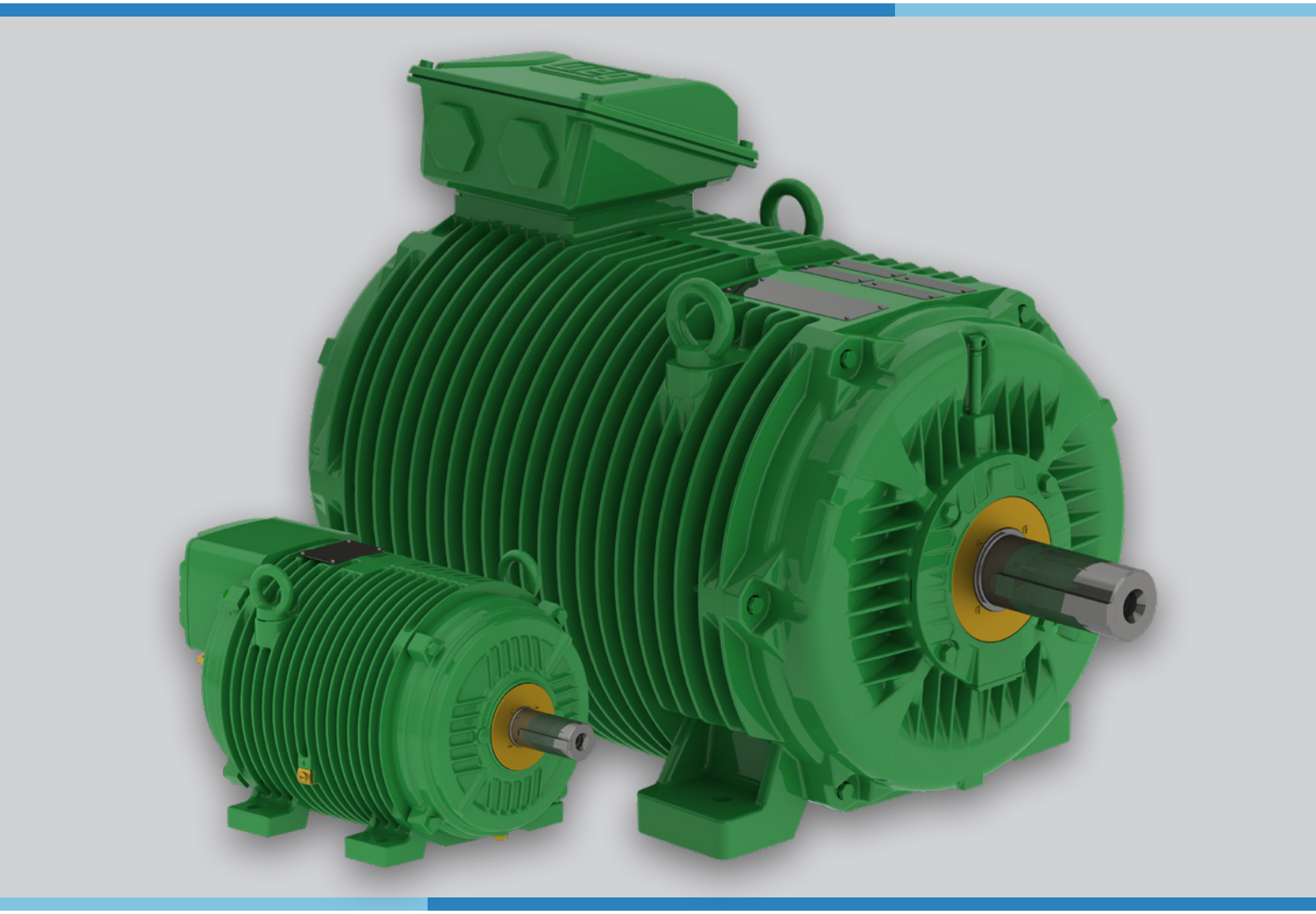
Roller Table

Three-Phase Electric Motor
Technical Catalogue - European Market



Motors | Automation | Energy | Transmission & Distribution | Coatings

Roller Table Motors

Roller Table motors are intended to drive steel mill industry operations. Specially designed to overcome the hard electrical and mechanical requirements that motors are subjected to. They present robust and versatile construction allied to high operating torques, also suitable for frequency inverter operation delivering high performance to ensure reliable operation for harsh environment and tough production process.

The steel industry is known for having one of the most aggressive industrial environments for electric motors operation. Contaminants such as liquids, solids, and vapors are found in this environment, which makes the operation of the equipment difficult. In addition, high torque, heavy-duty speeds, and special dimensions are some application requirements for electric motors.

One of the most common equipment in this sector, requiring high-efficiency products, is the “Roller Table”.
In order to offer a product that fully suits the specific requirements of the steel industry, WEG offers its Roller Table motors, a complete dedicated motor line for roller table application, ranging from 132 to 400 IEC frame sizes.

The Roller Table range has a rugged construction and is synonymous with reliability and long mean time between failures (MTBF). Roller table drive systems are composed of several motors, where their correct speed, torque, and sync are crucial for the rolling process quality.

Therefore, the use of one or a group of frequency inverters is very usual for this applications. For this reason, WEG Roller Table motors winding are suitable for frequency inverter operation, being supplied with WEG’s WISE® Insulation System, ensuring a longer lifespan for the bearings, even in high moisture conditions.
There are construction versions for the direct coupling to the rollers or through gearboxes, with dedicated flange and shaft end dimensions.

During the steel lamination process, the motors driving the rollers are subjected to sudden torque variation, sometimes from zero to overload. In order to meet these application conditions, WEG Roller Table motors’ electrical design foresees the worst application conditions, ensuring high starting and breakdown torques.
WEG Roller Table motors are still designed to reduce the energy consumption, meeting the IE3 Premium Efficiency rated, to allow for even greater reductions in the total cost of ownership.

Product Overview

Standard Features

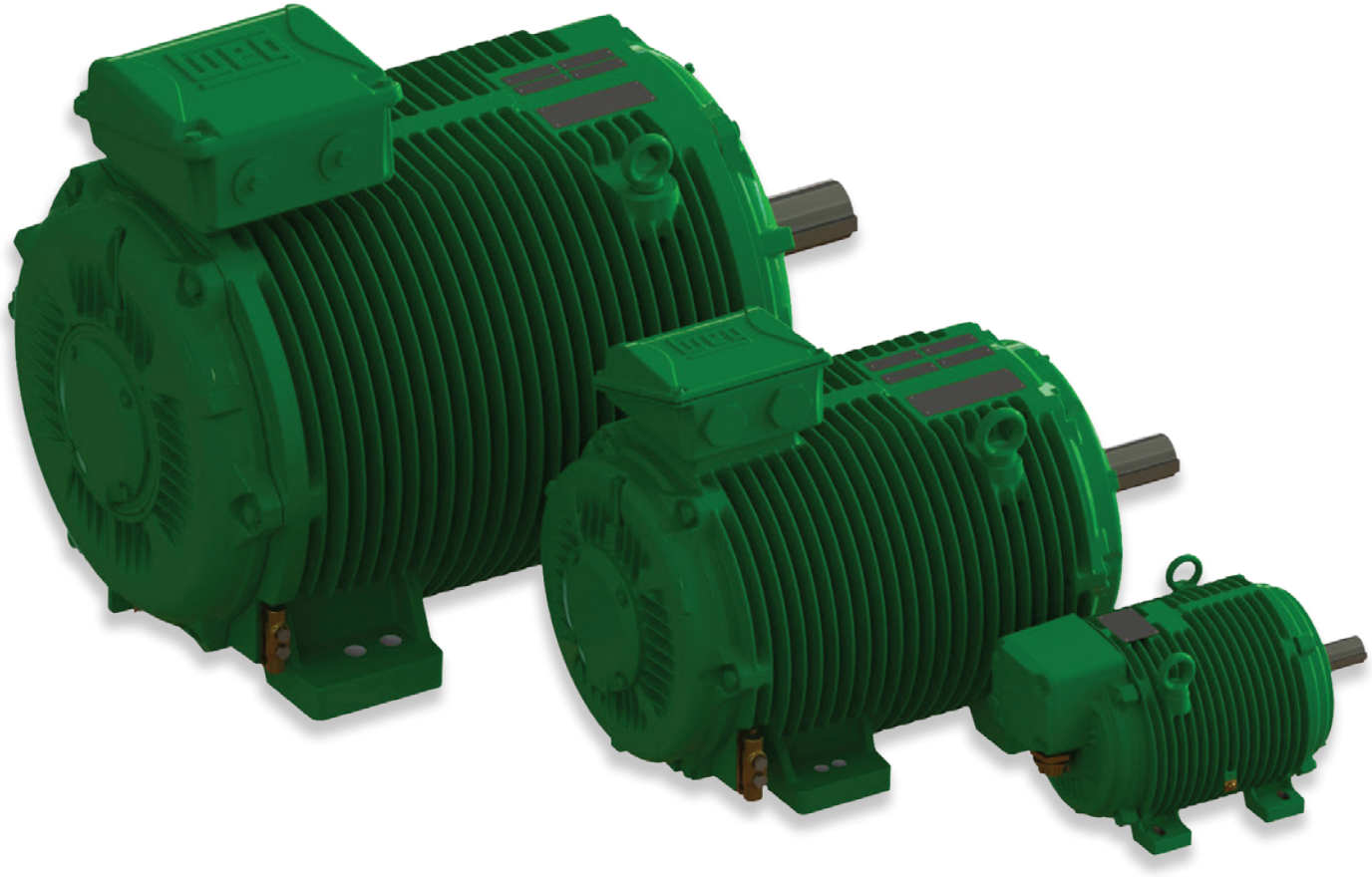
- Efficiency level: IE3 Premium
- Number of Poles: 4 up to 12
- Frequency: 50 Hz
- Voltage: 400 V
- Frames: 132M up to 400
- Colour: RAL 6002 (Green)
- Shaft sealing: W3 Seal®
- Joint sealing: Permatex® + O´Ring
- WISE® Insulation System
- Insulation class: F (ΔT 105 K)
- Space Heaters
- Degree of protection: IPW55
- Mounting: B3 (up to 200) or B3T (from 225 up to 400)
- Painting plan 212P
- Internal epoxy coating (tropicalized)
- Rubber drain plug
- Terminal block
- Frame material: Cast Iron FC-200
- Shaft Material: AISI 420
- Triple grounding (1 inside terminal box + 2 on the frame)
- Regreasing system for frames 225 up to 400
- Shielded bearings up to frame 200L
- Cooling system: IC410
- Grease Mobil Polyrex EM

Optional Available

- Frequency: 60 Hz
- Voltage: other rated voltages as optional
- Insulation class H (class F temperature rise for VFD application)
- Mounting: B3T (up to 200)
- Grease system for frames 132 up to 200
- Degree of protection: IPW66
- Cable glands
- Shaft material: AISI 4140
  AISI 316
  AISI 1040/1045

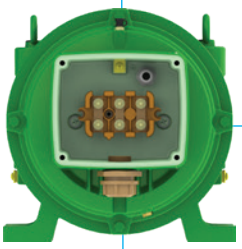
Upon Request

- Frames 355 and 400 and NEMA versions
- Mounting B5, B35, B3L and B3R
- Nodular cast iron
- Brake
- Encoder Leine & Linde 861



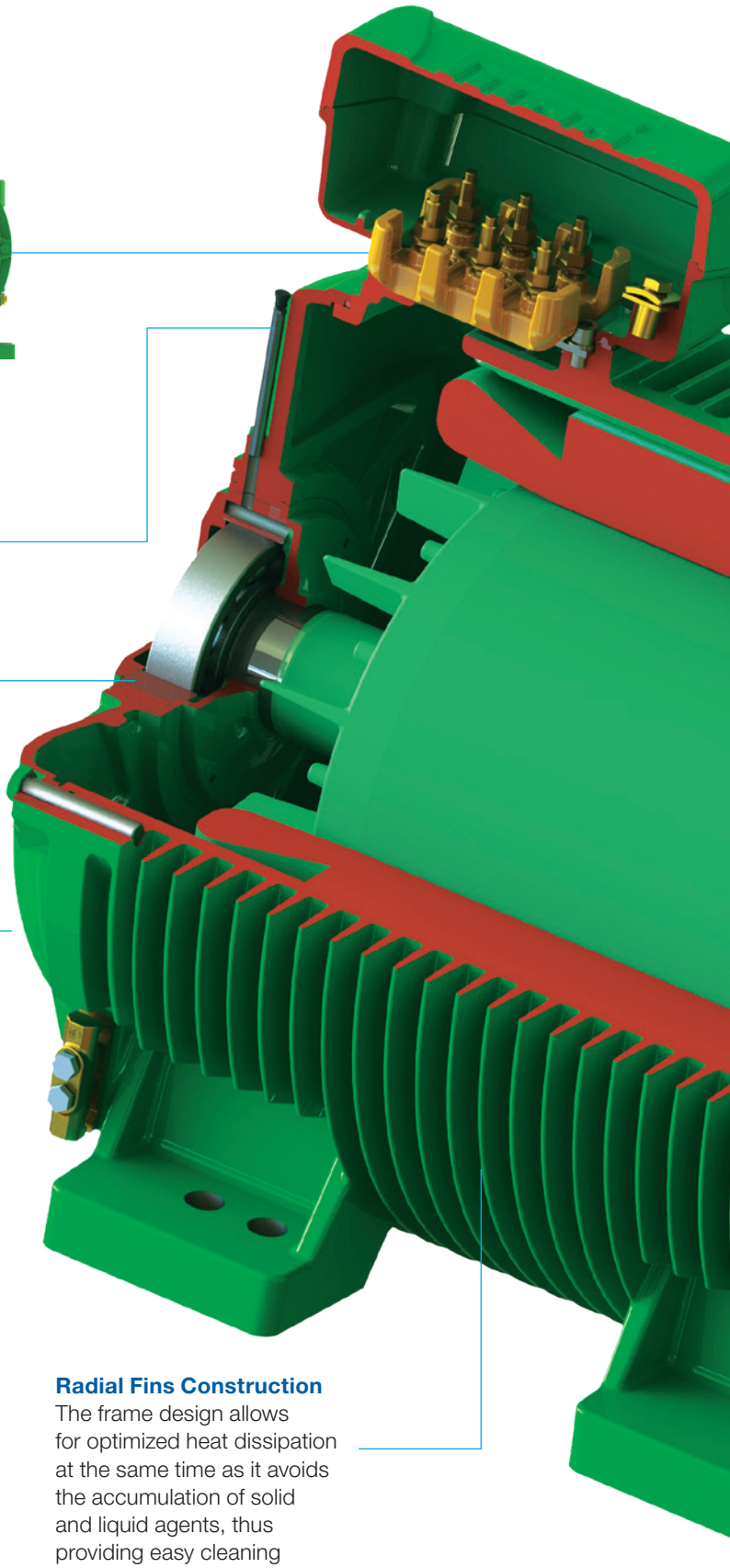
Components Design

Terminal Block
Terminal boxes are fitted with a polyester-based resin BMC (Bulk Moulding Compound) reinforced with fiberglass, offering easy and safe connections.



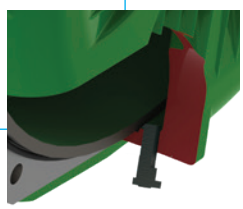
Design Flexibility
WEG Roller Table motors offer a very flexible construction design, meeting the requirements of new projects and also existing motor replacement with total reliability. The motors are available in several configurations, including footless and flange-mount motors.

Relubrication System
The motors can be fitted with a positive pressure relubrication system, composed of grease nipple and automatic grease relief valve, allowing the motor drive end and non-drive end relubrication with the motor in operation.



Non-Ventilated Construction
Provides lower maintenance indices due to its reduced number of components, improving mechanical stiffness and resulting in smaller machine length.

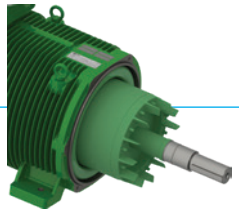
Drain System
The end shields have holes for drainage of any water that may condense inside the frame. These holes are supplied with specially designed drain plugs. These plugs leave the factory, and so must be kept, in the opened position to allow the exit of condensed water.



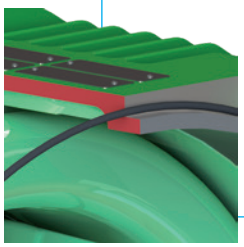
Radial Fins Construction
The frame design allows for optimized heat dissipation at the same time as it avoids the accumulation of solid and liquid agents, thus providing easy cleaning procedures.

Painting Plan
The Painting Plan applied to Roller Table motors provides them with a high chemical and mechanical resistance, being the most indicated coating for indoor or outdoor aggressive environments. It exceeds the C5 (I and M) performance criteria. Indicated on the ISO 12944-2 Standard Meeting 10000 hours neutral salt-spray resistance as per ISO 7253 Standard.

Internal Epoxy Coating
Also known as Tropicalization, the internal epoxy coating is applied to the entire motor interior, including rotor, frame, end shields, terminal box, and coil heads. Its main purpose is to increase the motor resistance against the direct exposure to acid steam, alkalis, solvents, and salty environments, due to the exchange of air with the ambient.



WISE® (WEG Insulation System Evolution)
The WISE® is a system composed of: class F insulation wire (155 °C), enhanced insulation materials in Epoxy varnish/resin. This system allows the motor to operate driven by VFD, ensuring protection against the voltage spikes from the PWM waveform that can have harmful effects on the motor winding, leading to the premature insulation system failure.



Additional Seal
The Roller Table motors are fitted with a special sealing system for the endshields fittings. This system is composed of extended fitting surfaces, an O'Ring component, and Permatex® resin to provide the maximum protection against the ingress of any contaminant agent (solid, liquid or gas) throughout the enclosure assembly clearances.

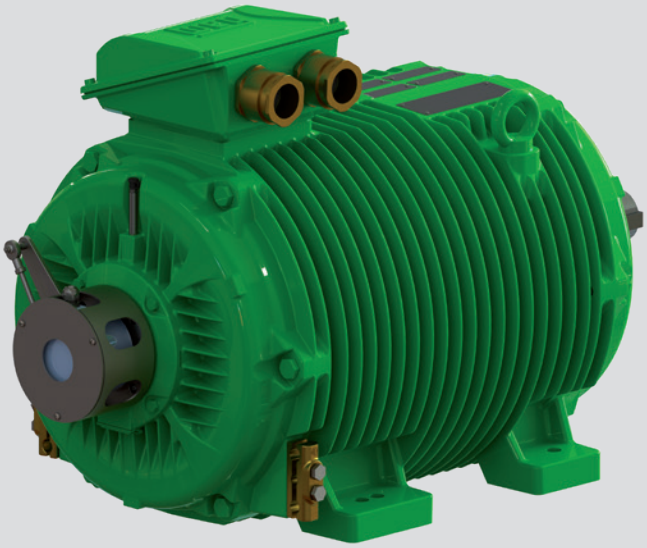
Stainless Steel Shaft
It is suitable to withstand the unusual and harsh application environments, commonly exposed to chemical agents.

W3 Seal® Sealing System
The exclusive W3 Seal® sealing system is composed of three components: V'Ring, O'Ring, and Taconite Labyrinth, that protect the motor against the ingress of solid and liquid contaminant agents through the bearings.

Anti fretting system
WEG Roller Table Motors were designed with anti fretting system in both bearings to avoid common fretting problems in their application preventing the bearings to fret against the end shields.

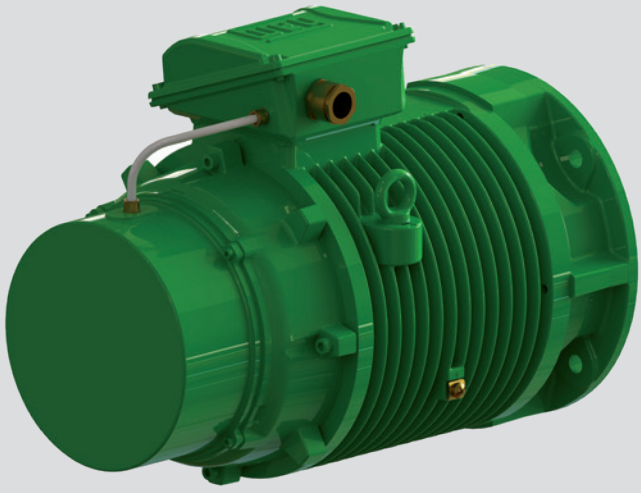
Encoders Available

The use of Variable Frequency Drives is recognized to be one of the major driving forces for energy efficiency because it can adjust motor output to best suit load requirements. Together with encoders, they also provide precise positioning. As both, variable speed and precision are required characteristics of the roller table application; WEG motors can be supplied with encoders Leine & Linde XH861 hollow shaft 1024PPR under request. These encoders are suitable for the harsh conditions present in steel industries. Other encoder models can be supplied in order to fully adapt the motors to the customer particular specifications.



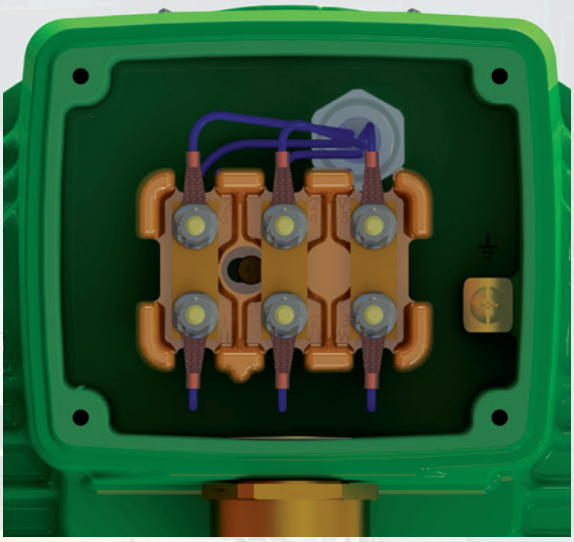
Brake Equipped Versions

The current industrial climate demands high productivity levels and assured safety for the operations. For this reason, the utilization of electromagnetic brake systems is increasing today in electric motor driven applications, avoiding the time wastage and allowing control of any unexpected situation. WEG Roller Table motors are available in brake-equipped versions, specially designed for each application characteristics. The brake enclosure ensures the same Degree of Protection of the motor, which is translated into reliability and a longer lifespan.



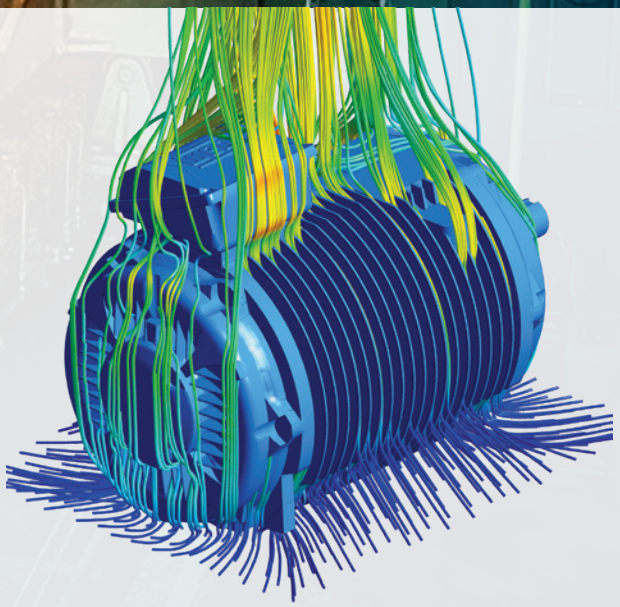
Sealed Construction

The motor sealing system is taken very seriously in WEG Roller Table motors due to the common environment characteristics that they are designed for. The cover fittings are equipped with O'Rings that, in addition to the sealing resin, ensure the protection against the ingress of any liquid or solid contaminant agents. Motors with the terminal box mounted on the non-drive end shield have their sealing system composed of a cable gland, offering greater protection.



High Technology Product

One of the main functions of an electric motor frame is to provide mechanical protection to the winding. It also provides the interface for installation through feet or flange. The motor frame plays a crucial role in its thermal performance because it is responsible for transferring the heat generated inside the motor out to the frame surface. Although WEG Roller Table motors are non-ventilated machines, the design of their fins anticipates the heat exchange and also prevents the build up of dust and water on the frame. Balanced heat dissipation versus mechanical stiffness ratio is present, ensuring optimized thermal performance and resistance against the common high vibration levels and eventual mechanical shocks.

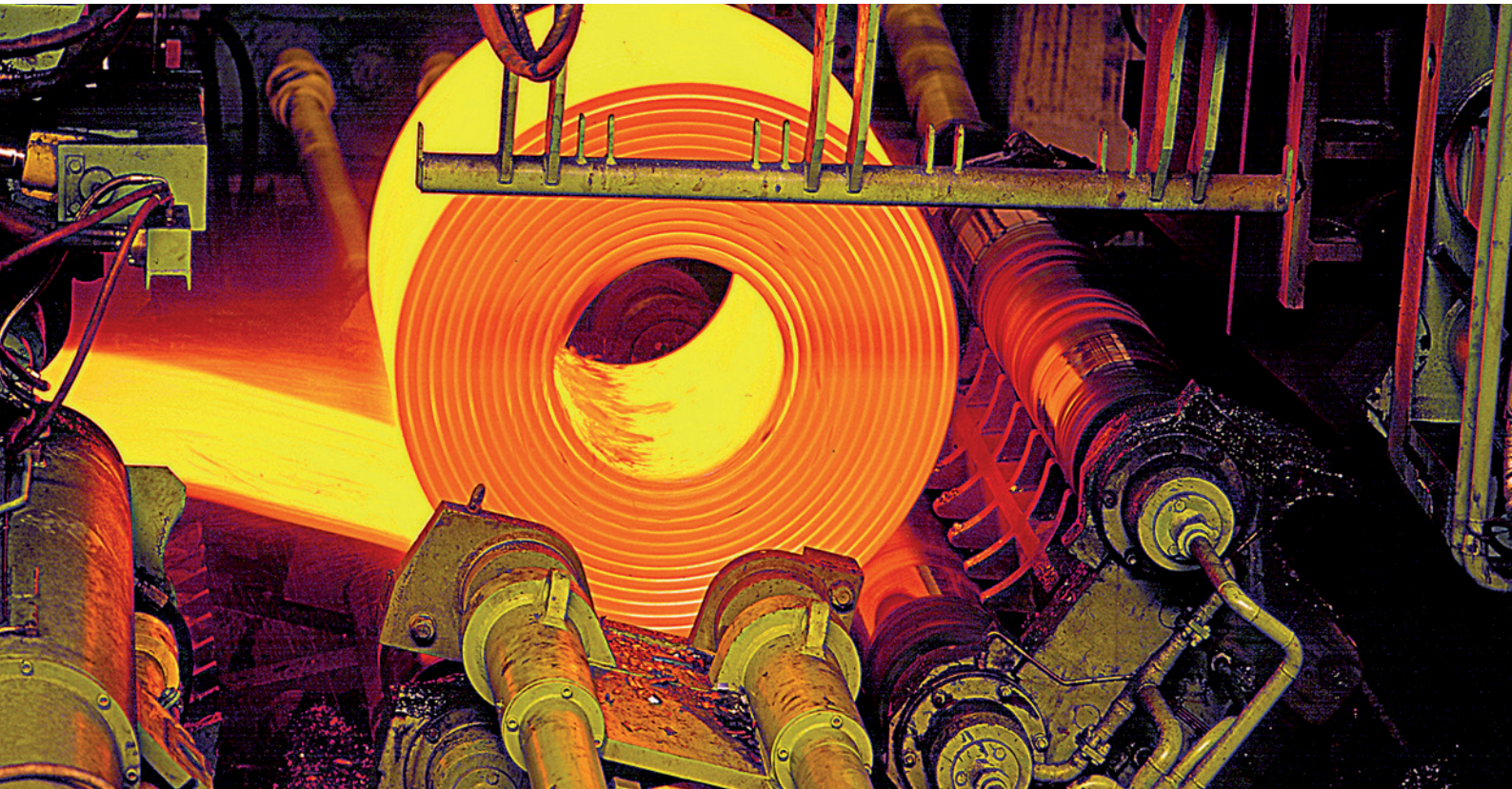


Electrical Data - 50 Hz

Frame size	Poles									
	4		6		8		10		12	
	N.m	kW	N.m	kW	N.m	kW	N.m	kW	N.m	kW
132M	19,6	3	25,5	2,6	19,9	1,5	24,9	1,5	21,9	1,1
	26,1	4	29,4	3	29,2	2,2	-	-	-	-
	32,6	5	36,3	3,7	-	-	-	-	-	-
160L	44,2	6,8	49,0	5	48,4	3,7	40,2	2,4	43,8	2,2
	59,6	9,2	69,6	7,1	65,4	5	62,0	3,7	59,7	3
180M	71,3	11	83,8	8,6	88,4	6,8	82,4	5	78,8	4
	87,5	13,5	97,5	10	112	8,6	98,8	6	98,5	5
200L	96,8	15	121	12,5	130	10	122	7,5	117	6
	119	18,5	146	15	143	11	138	8,5	133	6,8
225S/M	142	22	165	17	175	13,5	178	11	179	9,2
	161	25	184	19	195	15	202	12,5	195	10
250S/M	193	30	241	25	260	20	259	16	263	13,5
	238	37	299	31	338	26	324	20	331	17
280S/M	322	50	386	40	436	34	453	28	425	22
	417	65	531	55	577	45	599	37	598	31
315S/M	519	81	676	70	744	58	723	45	772	40
	641	100	869	90	962	75	964	60	965	50
355M/L	737	115	960	100	1154	90	1124	70	1158	60
	846	132	1056	110	1283	100	1365	85	1351	70
400	1023	160	1344	140	1693	132	1606	100	1737	90
	1278	200	1681	175	2052	160	2120	132	2123	110
	1662	260	2123	220	2565	200	2569	160	2548	132
	-	-	-	-	-	-	2971	185	-	-

** Frames 355 and 400 under request*

Best torque/frame size ratio



Variable Frequency Drive Application

Considerations Regarding Voltage Spikes and the Insulation System

The stator windings of Roller Table motors are wound with class F insulation 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.

Supportability of Random Wound Motors' Insulation System

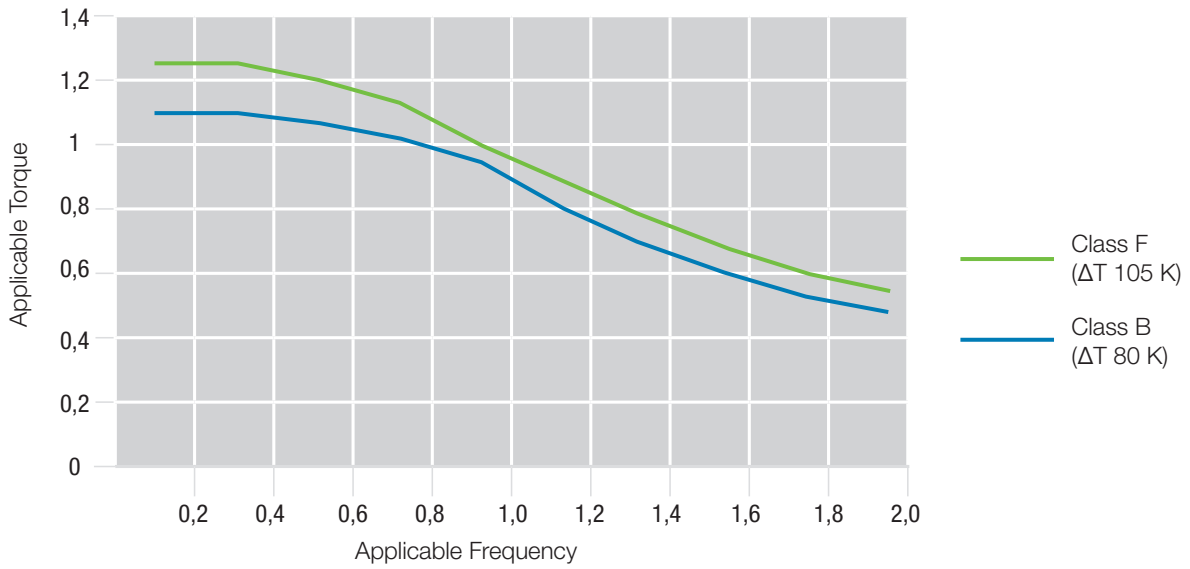
Motor rated voltage	Voltage Spikes [1]	*dV/dt* [2]	Rise time [2]	Time between pulses
	At motor terminals (phase-phase)	At motor terminals (phase-phase)		
V_{rated} < 460 V	≤ 1600 V	≤ 5200 V/µs	≥ 0,1 µs	≥ 6 µs
460 V ≤ V_{rated} < 575 V	≤ 2000 V	≤ 6500 V/µs		
575 V ≤ V_{rated} ≤ 1000 V	≤ 2400 V	≤ 7800 V/µs		

1) Peak voltage in the case of unipolar pulses. Peak-to-peak voltage in the case of bipolar pulses.
2) dV/dt and Rise time definition according to Nema Std. MG1 - Part 30.

Notes: *1 - If one or more of the above conditions is not respected, a filter (load reactor or dV/dt filter) must be installed in the output of the VSD.*
2 - 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.
3 - General purpose motors of the dual voltage type, for example 400/690 V or 380/660 V, which at the time of purchase were not specified for VSD operation, , are permitted to be operated with the VSD at the higher voltage provided that the limits defined in the table above for rated voltage up to 460 V are fully respected. Otherwise, a load reactor or a dV/dt filter must be installed in the VSD output.

Service Duty and VFD Derating Factors

Roller tables are designed to operate with variable speed demand constant torque even when running at low speeds. For this reason, WEG Roller Table Motors can be driven by frequency inverter, offering constant torque (or slightly above) in speeds lower than rated or with constant power in speeds above rated*.

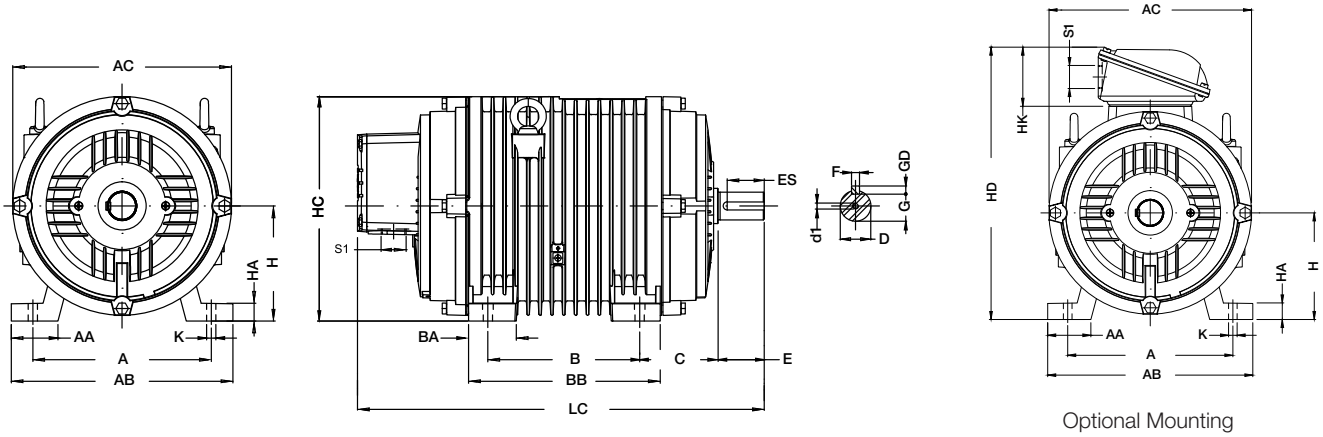


**For the operation of motors in frame sizes 280S/M and above in speeds higher than 1.5 times the rated frequency please contact WEG.*

Mechanical Data

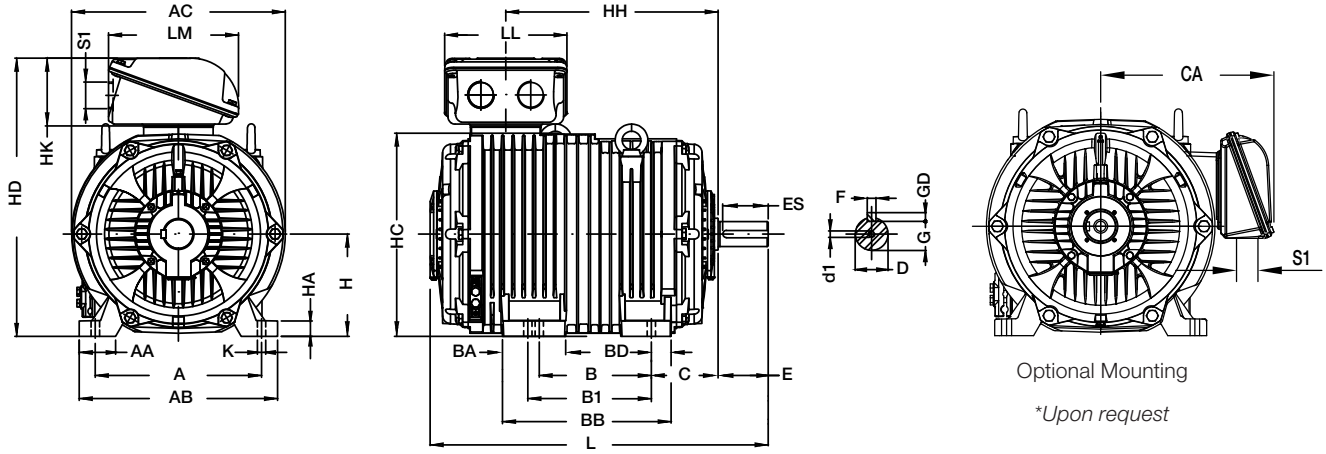
Foot Mounted Motors

Frames 132 to 200



Optional Mounting

Frames 225 to 400



Optional Mounting

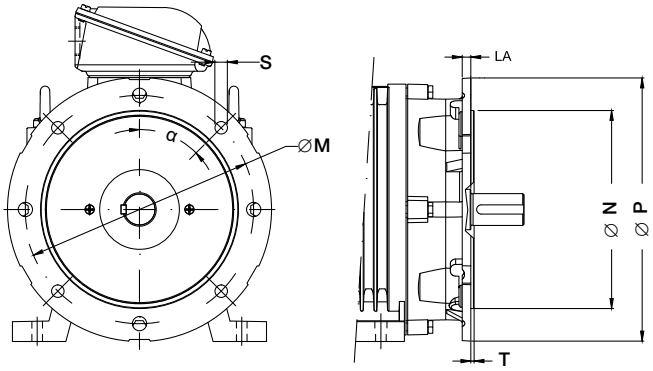
Upon request

Carcaça	A	AA	AB	AC	B	BA	BB	BD	C	Eixo					
										D	E	ES	F	G	GD
132M	216	51	248	265	178	60	222	-	89	38k6	80	63	10	33	8
160L	254	74	308	300	254	60	296		108	42k6	110	80	12	37	
180M	279	80	350	343	241	79	295		121	48k6			14	42,5	9
180L					279		332								
200L	318	81	385	380	305	85	376		133	55m6			16	49	10
225S/M	356	80	436	470	286/311	139	412	44	149	60m6	140	125	18	53	11
250S/M	406	100	506		311/349	149	458	42	168	65m6			18	58	
280S/M	457		557	595	368/419	153	519	47	190	75m6			20	67,5	12
315S/M	508	120	630	650	406/457	190	616	70	216	80m6	170	160	22	71	14
355M/L*	610	140	750	740	560/630	270	796	85	254	100m6	210	200	28	90	16
400*	686	218	840	800	710/800/900	280	1070	85	280	110m6				100	

** Frames 355 and 400 under request*

Carcaça	H	HA	HC	HD	HH	HK	K	L	LC	LL	LM	S1	d1	Rolamento	
														Dianteiro	Traseiro
132M	132	20	265	352	237,5	80	12	434	499	140	133	M20x1,5	M12	6308-ZZ	6207-ZZ
160L	160	22	310	426	240	101	14,5	575	669	198,5	190		M16	6309-ZZ	6209-ZZ
180M	180	28	351	461	320,5			590	684					6311-ZZ	6211-ZZ
180L					359			628	722						
200L	200	30	390	519	395	119.5	18,5	680	779	230	220	M32x1,5	M20	6312-ZZ	6212-ZZ
225S/M	225	34	455	580	509			825	-			M40x1,5		6314-C3	
250S/M	250	42	470	605	521		24	836							
280S/M	280		555	780	577,5	153		942		269	285	M50x1,5		6316-C3	6316-C3
315S/M	315	48	615	795	704	152	28	1070		314	312			6319-C3	
355M/L	355	50	703	915	853	176		1320		379	382	M63x1,5	M24	6322-C3	6319-C3
400	400		800	1045	1021	328	36	1755		460	544			6324-C3	6322-C3

Flange Mounted Motors



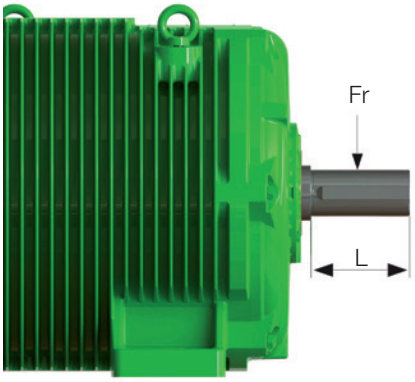
Carcaça	Dimensões da flange"FF" (1)								Número de furos
	Flange	LA	M	N	P	T	S	α	
132M	FF-265	12	265	230	300	15	4	90°	4
160L	FF-300	18	300	250	350	19	5		
180M/L									
200L	FF-350		350	300	400				
225S/M	FF-400		400	350	450			45°	8
250S/M	FF-500		500	450	550				
280S/M (2)									
315S/M (2)	FF-600	22	600	550	660	24	6		
355M/L (2)	FF-740		740	680	800				
400 (2)	FF-940	35	940	880	1000	28			

(1) Flange with frame without foot only for 132 to 250. For 280 to 400 only with frame with foot.
(2) Frames 355 and 400 upon request.

Radial Loads

Maximum Permissible Radial Thrust - 50 Hz - Fr in (kN)

For the standard version, the shaft of Roller Table motors is manufactured with stainless steel AISI 420, for frames 132M to 280S/M. The shaft material will change to AISI 4140 steel in frame sizes 315S/M to 400.
Roller Table motors are supplied with ball bearings as standard for frame sizes 132 to 400. Roller bearings on drive end are available under request.
The nominal bearing life L10h is 20,000 or 40,000 hours in conformance with maximum radial loads as described in tables below.
The bearing life calculation follows the standard ISO 281:1990 and the characteristics are according to the worldwide recognized bearing supplier.



20,000 Hours

Maximum permissible radial thrust - 50 Hz - Fr in (kN) - 20,000 hours						
Frame	4 poles		6 poles		8 poles	
	L	L/2	L	L/2	L	L/2
132	2.3	2.5	2.5	2.8	2.9	3.2
160	3.1	3.5	3.7	4.1	3.9	4.5
180	3.9	4.3	4.5	5.0	5.0	5.5
200	4.6	5.1	5.2	5.7	5.6	6.2
225S/M	6.2	6.8	7.1	7.8	7.6	8.5
250S/M	5.8	6.3	6.5	7.2	7.1	7.8
280S/M	6.4	7.0	6.8	7.4	7.4	8.0
315S/M	7.3	7.9	7.8	8.5	8.3	9.0
355M/L	9.3	10.2	9.9	10.8	10.3	11.3
400	7.8	8.3	9.2	9.8	11.7	12.6

40,000 Hours

Maximum permissible radial thrust - 50 Hz - Fr in (kN) - 40,000 hours						
Frame	4 poles		6 poles		8 poles	
	L	L/2	L	L/2	L	L/2
132	1.8	1.9	1.9	2.1	2.2	2.5
160	2.3	2.6	2.8	3.2	3.1	3.5
180	3.0	3.3	3.5	3.9	3.8	4.2
200	3.5	3.8	3.9	4.3	4.2	4.7
225S/M	4.7	5.2	5.4	5.9	5.9	6.5
250S/M	4.3	4.7	4.9	5.3	5.3	5.8
280S/M	4.7	5.1	4.8	5.2	5.1	5.6
315S/M	5.2	5.6	5.4	5.9	5.6	6.1
355M/L	6.6	7.2	6.9	7.5	7.0	7.6
400	4.9	5.2	5.9	6.3	8.2	8.9

Maximum permissible radial thrusts for ball bearings.

For WEG's worldwide
operations visit our website

www.weg.net

MOTORS

+44 1527 513800

info-uk@weg.net

Redditch - Worcestershire - United Kingdom

Cod: 50040456 | Rev: 05 | Date (m/a): 09/2020.