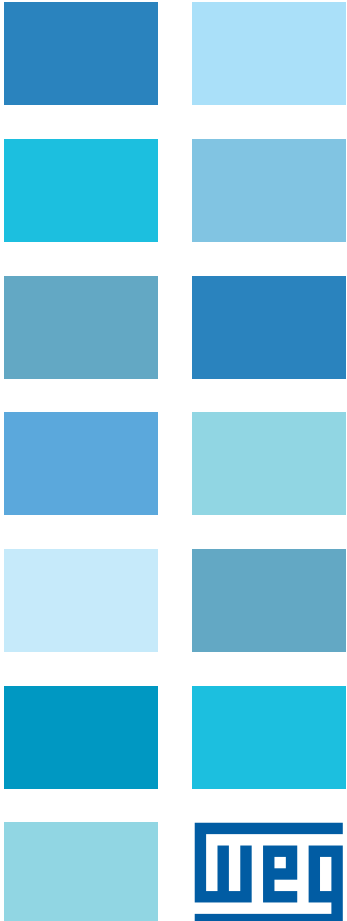


W22 Magnet

Drive System



W22 Magnet Drive System

The W22 Magnet Drive System composes premium and ultra premium efficiency motors with permanent magnets driven by frequency inverters. Perfect for applications where speed variation, precise control at low speeds, low noise levels and compact design are critical.



The highest efficiencies on the market

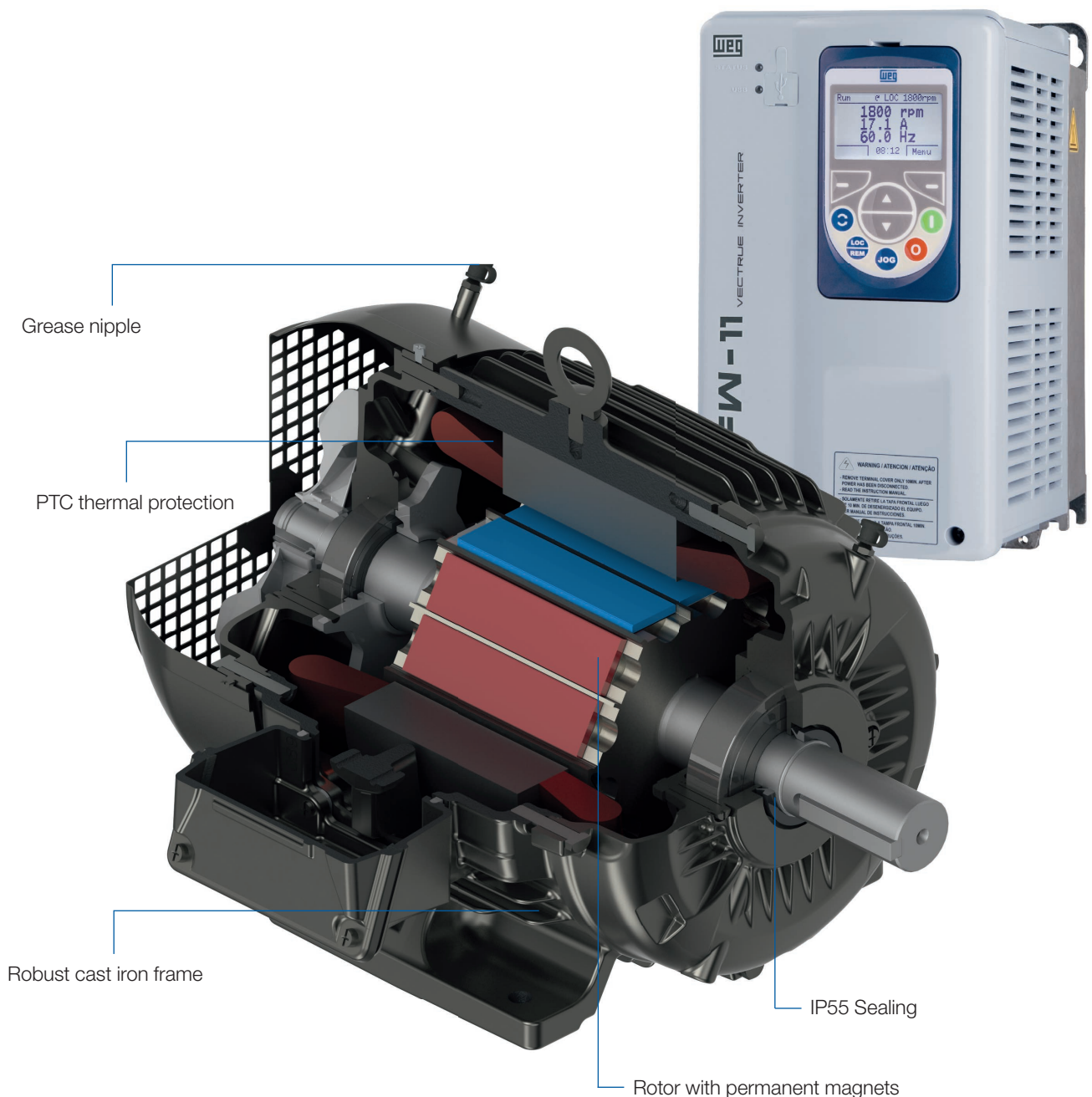
W22 Magnet motors feature rotors with permanent magnets. This technology provides the motor with significant advantages such as higher efficiency and a greater power density per frame. They are driven by WEG CFW11 frequency inverters, which offer constant torque across a wide speed range, operating even at low speeds with efficiency levels above induction motors without requiring forced ventilation. W22 Magnet motors are available in Super Premium (IE4) and Ultra Premium (IE5) versions – the highest efficiency available on the market today.

Drive System

Due to the dedicated software application which incorporates the vector control technology for driving permanent magnet motors, the use together of the WEG CFW-11 frequency inverter and W22 Magnet motor is mandatory.

Applications

Cooling towers, bag filters, paper machines, paper coil winders, conveyors, pumps, looms, direct current (DC) motor replacements, extruders, compressors, fans, etc.



Characteristics of the W22 Magnet Motor

- Output: 3 to 315 kW
- Frame: 132S to 315S/M
- Speed: 3000, 1500 and 1000 rpm
- Voltage: 400 V
- Degree of protection: IP55
- Bearing seal:
- Vring (frames 132S to 200L)
- WSeal (from frame 225S/M and above)
- Insulation: F (ΔT 80K)
- Service factor: 1.0
- Thermal protection: PTC
- Insulated NDE bearing hub and AEGIS shaft grounding (from frames 225S/M and above)
- Mounting: B3T
- TEFC (IC 411) per IEC 60034-6
- Possibility of operation in overspeed
- Optional characteristics on request

Characteristics of the CFW11 Inverter

- Power supply: 380 to 480 V
- Sensorless vector control: it allows the CFW11 to control the speed motor from zero up to its rated speed
- Remote Operating Interface (HMI) with backlight, soft keys, graphic display and real time clock.
- Inductors incorporated on the DC Link to improve harmonic mitigation
- Communication protocol and accessories: Profibus, DeviceNet, CANopen, Ethernet / IP, Modbus-RTU and Profinet
- IP54 available as optional item up to 100A (55 kW)
- Adaptable to all kinds of load
- USB port
- FLASH memory

W22 Magnet Super Premium and Ultra Premium

The W22 Magnet motor line offers two efficiency levels: Super Premium (IE4) and Ultra Premium (IE5). The high technology utilised in permanent magnet motors results in innovation, efficiency and reliability.

W22 Magnet Super Premium

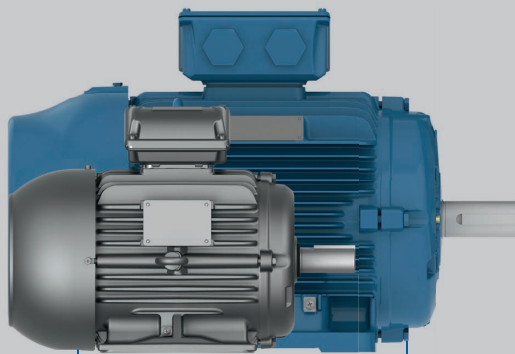
Greater power density - Reduced mass and volume

W22 Magnet Super Premium motors meet the IE4 efficiency levels according to IEC standard 60034-30-1.

The magnets inserted into the rotor ensure a significant reduction in electric losses, and thus the motor temperature, enabling smaller frame sizes to be utilised. Compared to induction motors of the same output and speed, the weight and volume of the equivalent W22 Magnet Super Premium motors is reduced by as much as 77% (refer to example below).

The W22 Magnet motors operate with lower temperature rise even at low speeds.

Volume reduction



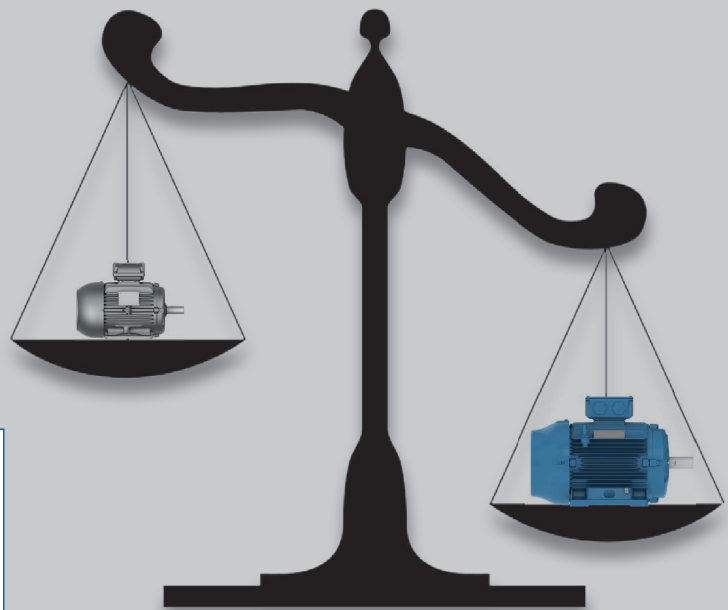
W22 Magnet Motor

Output: 30kW
Speed: 3000 rpm
Frame: 132M/L
Mass: 76 kg
Volume: 24 dm³

Induction Motor

Output: 30 kW
Speed: 3000 rpm
Frame: 200L
Mass: 265 kg
Volume: 72 dm³

Mass reduction



Output Power (kW)	Frame	
	W22 (Induction)	W22 Magnet
15	160M	132S
18,5	160L	132S
22	180M	132M
30	200L	132M/L
37	200L	160M
45	225S/M	160L
55	250S/M	180M
75	280S/M	200L
90	280S/M	225S/M
110	315S/M	225S/M
132	315S/M	225S/M
160	315S/M	250S/M
185	315S/M	250S/M
200	315L	280S/M
220	315L	280S/M
260	315L	280S/M
280	315L	315S/M
300	355M/L	315S/M
315	355M/L	315S/M

Frame size comparison between W22 Magnet IE4 and W22 Induction Motors.

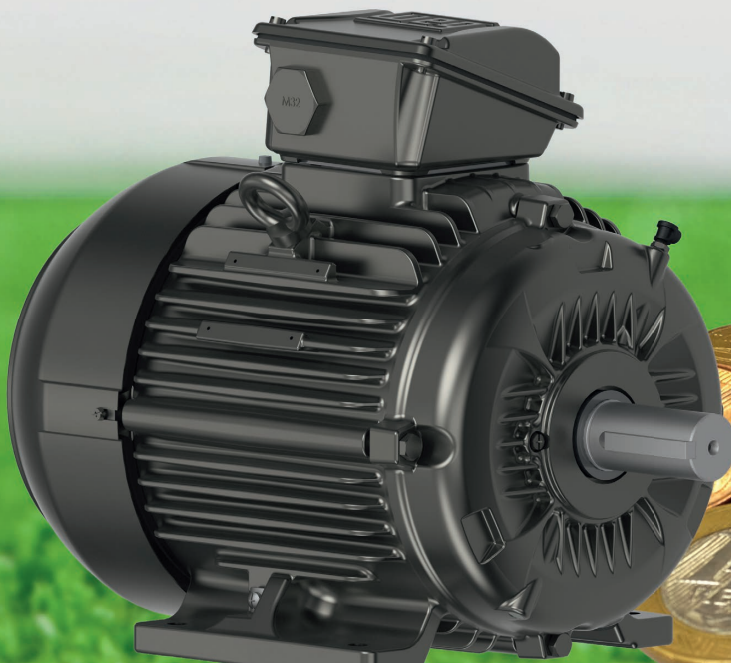
When replacing an IE2 induction motor with a W22 Magnet Ultra Premium, the energy saved in one year would power a 60 W light bulb for 20 years.

Comparison between 37kW 1500 rpm motors.

W22 Magnet Ultra Premium

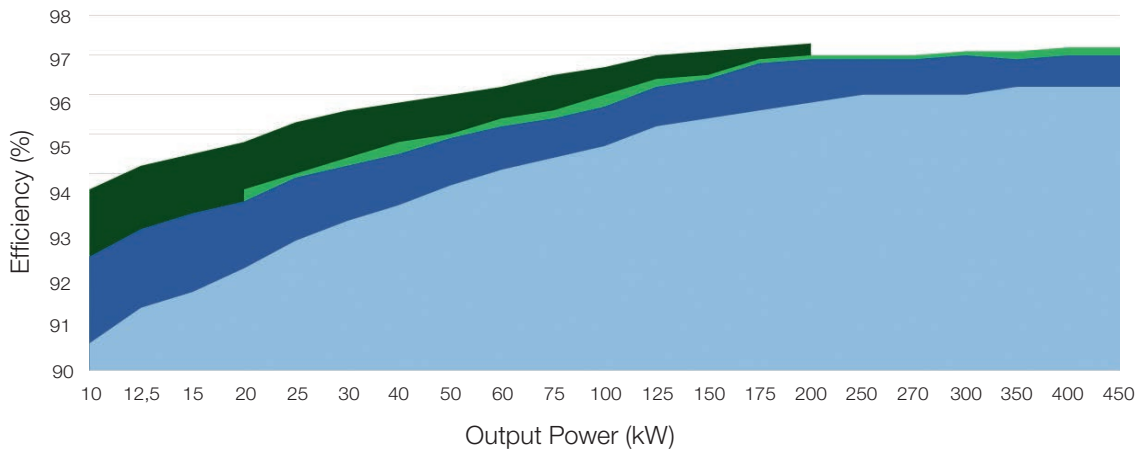
The highest efficiency level Interchangeability and high performance

W22 Magnet Ultra Premium motors offer the highest efficiency levels in the market and meet the envisaged levels for IE5 as defined in the IEC standard 60034-30-1:2014. With a loss reduction of 20% when compared to the Super Premium, W22 Magnet Ultra Premium motors feature the same frame size to kW ratio as equivalent induction motors, combining therefore interchangeability with existing installed motors and the benefit of improved product performance. W22 Magnet Ultra Premium is one more example of WEG technology providing to Industry high efficiency, quality, energy saving and lower overall cost of ownership.



Attributes and advantages of the W22 Magnet motor

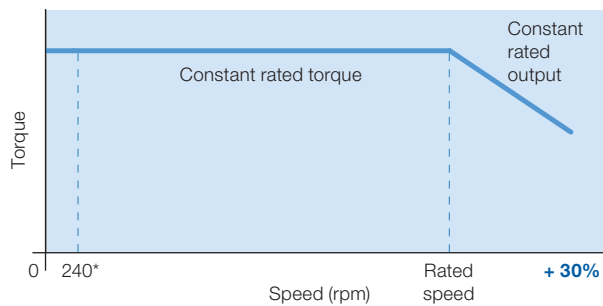
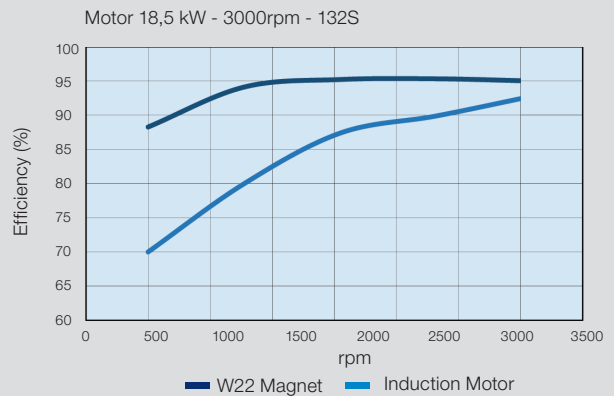
Efficiency Comparison - 1500 rpm



■ W22 Premium - IE3 ■ W22 Super Premium - IE4 ■ W22 Magnet Super Premium - IE4 ■ W22 Magnet Ultra Premium - IE5

Efficiency x Speed

W22 Magnet motors present superior efficiency regardless of speed or load, saving up to 30% in comparison to induction motors driven by frequency inverters.



*Continuous duty at speeds lower than 240rpm under request

Torque x Speed

W22 Magnet motors can operate over a wide speed range at constant torque, without the use of forced ventilation. This characteristic makes them ideal for applications requiring speed variation and constant torque, even at low speeds, without the need for an encoder.

W22 Magnet motors (1000 rpm and 1500 rpm) are able to operate at up to 30% above their rated speed without the necessity to utilise special components.

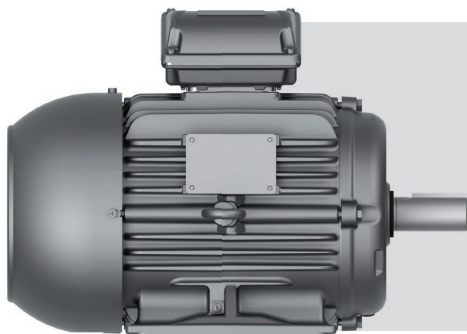
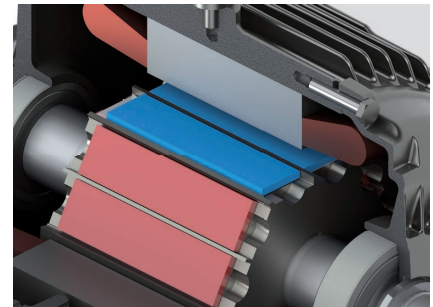
WISE Insulation System

Exclusive WISE insulation system (WEG Insulation System Evolution). Aiming at maximizing the durability and reliability of the motors when operated with a frequency inverter, WEG developed the WISE system, resulting in improvement of the materials in all productive stages related to the motor insulation system, such as wires, insulating films, impregnation system, impregnating material, cables and other components present in the process.

Permanent Magnets

The W22 Magnet utilises powerful permanent magnets made from a combination of neodymium, iron and boron (NdFeB), and commonly referred to as rare-earths magnets. These magnets are some eighteen times stronger than traditional Ferrite Magnets.

In order to provide superior mechanical strength and corrosion resistance, the Neodymium/Iron/Boron magnets are covered with a protective epoxy coating.



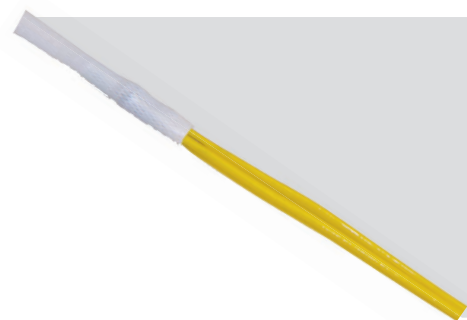
New W22 Platform

The new W22 Magnet incorporates the same innovative features of the highly successful W22 induction motor line:

- Frame structure that reduces air dispersion and improves the cooling
- Terminal box with greater internal space for easier cable management
- Solid feet that simplify the motor alignment and installation
- Robust cast iron construction providing high mechanical strength and low vibration levels

Endshields / Lubrication

The W22 Magnet motors are equipped with bearings offering an L10 life of up to 100,000 hours. All motors feature open bearings and endshields with grease nipples which permit re-lubrication and consequently a reduction in stoppages for maintenance.



Thermal Protection

W22 Magnet motors have PTC (Positive Temperature Coefficient) thermistors embedded in their windings which offer full protection against overheating produced by phase loss, overload and under or overvoltage.

Bearings

As W22 Magnet motors are supplied with long-life bearings, the maximum permissible radial loads differ from those of general purpose induction motors, as shown in the following table.

Axial loads are as per W22 general purpose induction motors on horizontal application. For vertical application, please consult WEG.

Frame	Maximum radial load – 100,000 hours – Fr (kN)					
	1000 rpm		1500 rpm		3000 rpm	
	L	L/2	L	L/2	L	L/2
132S	1,4	1,6	0,9	1	0,9	1
132M	1,4	1,6	0,9	1	0,9	1
132M/L	1,4	1,6	0,9	1	0,9	1
160M	1,9	2,1	1,2	1,4	1,2	1,4
160L	1,9	2,1	1,2	1,4	1,2	1,4
180M	2,5	2,8	1,7	1,9	1,7	1,9
180L	2,6	2,8	1,7	1,9	1,7	1,9
200M	3	3,3	2	2,2	2	2,2
200L	3	3,3	2	2,2	2	2,2
225S/M	4,4	4,9	2	2,2	2	2,2
250S/M	4,4	4,8	3	3,3	3	3,3
280S/M	4,4	4,8	2,7	2,9	2,7	2,9
315S/M	4,9	5,4	2,5	2,7	2,5	2,7

Motor Technical Data

W22 Magnet Super Premium IE4

Output		Frame	Full load torque (Nm)	Inertia J (kgm ²)	Weight (kg)	Service Factor	400 V						Frequency Inverter		
							Rated speed (rpm)	% of full load		Full load current In (A)	Parameters*				
kW	HP	Efficiency	Power factor	Ld	Lq	Ke		Code	Size						
3000 RPM															
15	20	132S	47,8	0,0223	52,0	1,00	3000	94,2	0,92	26,4	8,50	16,0	120	EUCFW110031T40FASWZ	B
18,5	25	132S	58,9	0,0303	54,0	1,00	3000	94,6	0,92	32,4	8,10	16,8	119	EUCFW110038T40FASWZ	C
22	30	132M	70,1	0,0336	56,0	1,00	3000	94,9	0,91	38,6	6,90	14,4	118	EUCFW110045T40FASWZ	C
30	40	132M/L	95,5	0,0565	76,0	1,00	3000	95,0	0,93	51,2	4,50	9,70	122	EUCFW110058T40FASWZ	C
37	50	160M	118	0,1616	132	1,00	3000	95,2	0,92	64,3	4,50	8,30	124	EUCFW110070T40FASWZ	D
45	60	160L	143	0,2149	159	1,00	3000	95,4	0,90	79,3	3,20	5,90	120	EUCFW110088T40FASWZ	D
55	75	180M	175	0,2252	170	1,00	3000	95,8	0,91	95,2	2,50	4,90	120	EUCFW110105T40SWZ	E
75	100	200L	239	0,3331	263	1,00	3000	96,3	0,95	124	2,10	3,78	135	EUCFW110142T40SWZ	E
90	125	225S/M	287	0,6999	381	1,00	3000	96,5	0,94	152	1,70	3,10	130	EUCFW110180T40SWZ	E
110	150	225S/M	350	0,7595	393	1,00	3000	96,8	0,94	185	1,40	2,50	133	EUCFW110211T40SWZ	E
132	175	225S/M	420	0,8786	419	1,00	3000	97,0	0,92	227	1,10	2,00	116	EUCFW110242T40SWZ	F
160	220	250S/M	510	1,29	505	1,00	3000	97,0	0,92	274	0,90	1,60	131	EUCFW110312T40SWZ	F
185	250	250S/M	589	1,45	535	1,00	3000	97,2	0,92	310	0,80	1,40	131	EUCFW110370T40SWZ	F
200	270	280S/M	637	2,25	717	1,00	3000	97,4	0,94	333	0,70	1,30	131	EUCFW110370T40SWZ	F
220	300	280S/M	701	2,42	740	1,00	3000	97,4	0,96	356	0,80	1,40	140	EUCFW110477T40SWZ	F
260	350	280S/M	828	2,99	807	1,00	3000	97,5	0,93	436	0,50	0,90	130	EUCFW110477T40SWZ	F
280	380	315S/M	892	4,58	1031	1,00	3000	97,5	0,95	462	0,60	1,00	140	EUCFW110515T40SWZ	G
300	400	315S/M	955	5,12	1085	1,00	3000	97,6	0,95	490	0,60	0,90	141	EUCFW110515T40SWZ	G
315	430	315S/M	1003	5,39	1112	1,00	3000	97,6	0,94	518	0,50	0,90	138	EUCFW110601T40SWZ	G
1500 RPM															
11	15	132S	70,1	0,0401	61,0	1,00	1500	93,6	0,92	19,5	23,4	48,9	228	EUCFW110024T40FAZ	B
15	20	132M	95,5	0,0467	68,0	1,00	1500	94,0	0,90	28,6	13,6	30,5	205	EUCFW110031T40FAZ	B
18,5	25	132M/L	118	0,0631	84,0	1,00	1500	94,4	0,93	32,2	14,6	31,4	237	EUCFW110038T40FAZ	C
22	30	160L	140	0,1921	149	1,00	1500	94,8	0,90	39,9	12,9	23,6	226	EUCFW110045T40FAZ	C
30	40	180L	191	0,2527	185	1,00	1500	95,0	0,93	51,4	9,70	19,0	243	EUCFW110058T40FAZ	C
37	50	180L	236	0,2726	193	1,00	1500	95,4	0,90	65,7	7,80	15,2	226	EUCFW110070T40FAZ	D
45	60	200M	287	0,3462	232	1,00	1500	95,6	0,91	78,5	7,70	13,9	245	EUCFW110088T40FAZ	D
55	75	200L	350	0,3985	256	1,00	1500	96,0	0,90	97,1	6,60	11,8	242	EUCFW110105T4SZ	E
75	100	225S/M	478	0,8488	412	1,00	1500	96,4	0,91	131	4,40	7,70	242	EUCFW110142T4SZ	E
90	125	250S/M	573	1,37	520	1,00	1500	96,5	0,90	160	3,00	5,30	246	EUCFW110180T4SZ	E
110	150	250S/M	701	1,49	542	1,00	1500	96,9	0,90	196	2,20	4,30	234	EUCFW110211T4SZ	E
132	175	250S/M	841	1,53	551	1,00	1500	97,0	0,90	250	2,30	3,90	226	EUCFW110312T4SZ	F
160	220	280S/M	1019	2,91	798	1,00	1500	97,0	0,92	273	2,10	3,60	255	EUCFW110312T4SZ	F
185	250	280S/M	1178	3,08	819	1,00	1500	97,0	0,90	322	1,80	3,20	248	EUCFW110370T4SZ	F
200	270	280S/M	1274	3,41	863	1,00	1500	97,1	0,90	347	1,60	2,90	246	EUCFW110370T4SZ	F
220	300	315S/M	1401	5,52	1125	1,00	1500	97,1	0,90	384	1,70	2,80	255	EUCFW110477T4SZ	F
260	350	315S/M	1656	6,33	1208	1,00	1500	97,2	0,90	459	1,40	2,40	251	EUCFW110515T4SZ	G
280	380	315S/M	1784	6,86	1262	1,00	1500	97,2	0,90	491	1,30	2,20	255	EUCFW110601T4SZ	G
1000 RPM															
7,5	10	132S	71,7	0,0434	63,0	1,00	1000	92,0	0,91	13,6	43,4	96,1	334	EUCFW110017T40FAZ	B
9,2	12,5	132M	87,9	0,0532	73,0	1,00	1000	92,2	0,95	16,0	41,6	89,8	357	EUCFW110017T40FAZ	B
11	15	132M/L	105	0,0565	76,0	1,00	1000	92,8	0,90	20,2	30,5	67,4	323	EUCFW110024T40FAZ	B
15	20	160L	143	0,2080	156	1,00	1000	93,2	0,91	27,0	27,8	51,0	345	EUCFW110031T40FAZ	B
18,5	25	180M	177	0,2252	169	1,00	1000	93,6	0,92	33,0	20,9	41,1	343	EUCFW110038T40FAZ	C
22	30	180L	210	0,2540	185	1,00	1000	93,9	0,91	39,6	17,8	34,9	337	EUCFW110045T40FAZ	C
30	40	200M	287	0,3331	227	1,00	1000	94,4	0,90	53,7	16,7	29,8	354	EUCFW110058T40FAZ	C
37	50	200L	354	0,3985	256	1,00	1000	94,7	0,90	66,5	13,8	24,6	354	EUCFW110070T40FAZ	D
45	60	225S/M	430	0,7893	400	1,00	1000	95,0	0,90	79,7	10,3	18,3	360	EUCFW110088T40FAZ	D
55	75	225S/M	526	0,9084	425	1,00	1000	95,5	0,90	98,3	8,30	14,9	354	EUCFW110105T4SZ	E
75	100	250S/M	717	1,53	549	1,00	1000	95,7	0,90	134	6,10	10,4	364	EUCFW110142T4SZ	E
90	125	280S/M	860	2,50	741	1,00	1000	96,2	0,90	159	4,40	7,80	344	EUCFW110180T4SZ	E
110	150	280S/M	1051	2,91	797	1,00	1000	96,2	0,90	193	4,20	7,30	360	EUCFW110211T4SZ	E
132	175	280S/M	1261	3,32	853	1,00	1000	96,4	0,90	232	3,70	6,40	362	EUCFW110242T4SZ	F
160	220	315S/M	1529	5,92	1168	1,00	1000	96,6	0,90	280	3,60	5,90	383	EUCFW110312T4SZ	F
185	250	315S/M	1768	6,59	1233	1,00	1000	96,8	0,90	330	2,90	4,90	364	EUCFW110370T4SZ	F
200	270	315S/M	1911	6,86	1260	1,00	1000	96,8	0,90	355	3,10	5,00	383	EUCFW110477T4SZ	F

* Parameters used to set up the motor with the drive:
 Ld - Direct axis inductance
 Lq - Quadrature axis inductance
 Ke - Generated voltage at 1000 rpm

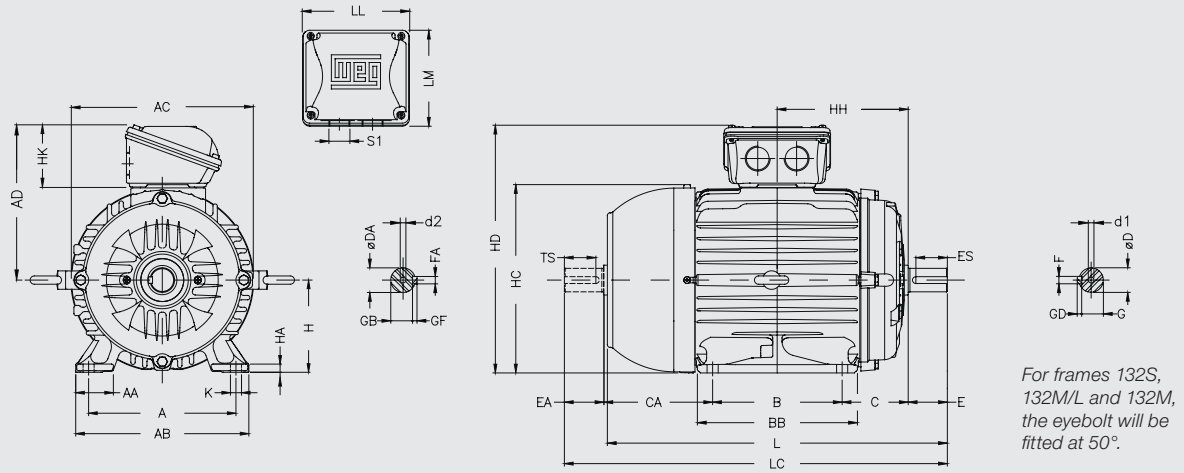
W22 Magnet Ultra Premium IE5

Output		Frame	Full load torque (Nm)	Inertia J (kgm ²)	Weight (kg)	Service Factor	400 V						Frequency Inverter		
							Rated speed (rpm)	% of full load		Full load current In (A)	Parameters*				
kW	HP							Efficiency	Power factor			Ld	Lq	Ke	Code
3000 RPM															
7,5	10	132S	23,9	0,0270	52,0	1,00	3000	94,0	0,96	12,5	11,6	25,3	126	EUCFW110017T40FASWZ	B
9,2	12,5	132M	29,3	0,0270	52,0	1,00	3000	94,5	0,96	15,4	11,6	25,0	122	EUCFW110017T40FASWZ	B
11	15	160M	35,0	0,0855	99,0	1,00	3000	94,5	0,94	19,0	9,80	17,9	123	EUCFW110024T40FASWZ	B
15	20	160M	47,8	0,1159	112	1,00	3000	95,0	0,93	24,7	7,10	12,9	128	EUCFW110031T40FASWZ	B
18,5	25	160L	58,9	0,1312	119	1,00	3000	95,8	0,93	32,2	6,10	11,1	118	EUCFW110038T40FASWZ	C
22	30	180M	70,1	0,1482	141	1,00	3000	95,8	0,93	36,5	4,50	8,80	127	EUCFW110045T40FASWZ	C
30	40	200M	95,5	0,2153	188	1,00	3000	96,2	0,93	51,5	3,70	6,50	121	EUCFW110058T40FASWZ	C
37	50	200L	118	0,2415	197	1,00	3000	96,4	0,92	64,1	3,10	5,40	120	EUCFW110070T40FASWZ	D
45	60	225S/M	143	0,4915	336	1,00	3000	96,4	0,94	75,9	2,30	4,10	125	EUCFW110088T40FASWZ	D
55	75	250S/M	175	0,9584	446	1,00	3000	96,6	0,96	92,7	1,30	2,20	108	EUCFW110105T40SWZ	E
75	100	280S/M	239	1,59	619	1,00	3000	96,9	0,96	121	1,20	2,00	134	EUCFW110142T40SWZ	E
90	125	280S/M	287	1,67	631	1,00	3000	97,1	0,94	146	1,00	1,80	131	EUCFW110180T40SWZ	E
110	150	315S/M	350	2,44	815	1,00	3000	97,1	0,91	191	1,00	1,70	124	EUCFW110211T40SWZ	E
132	175	315S/M	420	2,71	842	1,00	3000	97,1	0,95	227	1,00	1,70	137	EUCFW110242T40SWZ	F
160	220	315S/M	510	3,11	882	1,00	3000	97,2	0,95	290	0,90	1,50	116	EUCFW110312T40SWZ	F
1500 RPM															
5,5	7,5	132S	35,0	0,0369	59,0	1,00	1500	93,6	0,95	9,40	33,5	70,0	254	EUCFW110010T40FAZ	A
7,5	10	132M	47,8	0,0500	71,0	1,00	1500	94,2	0,97	12,5	24,5	54,1	260	EUCFW110013T40FAZ	A
9,2	12,5	132M	58,6	0,0565	76,0	1,00	1500	94,5	0,95	15,5	20,3	44,8	253	EUCFW110017T40FAZ	B
11	15	160M	70,1	0,1699	136	1,00	1500	94,8	0,95	18,7	19,4	35,6	258	EUCFW110024T40FAZ	B
15	20	160L	95,5	0,2080	157	1,00	1500	95,3	0,95	25,3	15,9	29,1	258	EUCFW110031T40FAZ	B
18,5	25	180M	118	0,2329	174	1,00	1500	95,6	0,94	31,2	11,7	23,1	254	EUCFW110038T40FAZ	C
22	30	180L	140	0,2627	190	1,00	1500	95,8	0,93	37,5	10,3	20,2	248	EUCFW110045T40FAZ	C
30	40	200L	191	0,3593	244	1,00	1500	96,0	0,93	50,8	8,00	14,5	254	EUCFW110058T40FAZ	C
37	50	225S/M	236	0,6702	374	1,00	1500	96,2	0,94	62,3	6,30	11,2	257	EUCFW110070T40FAZ	D
45	60	225S/M	287	0,8488	412	1,00	1500	96,5	0,96	74,0	5,30	9,50	257	EUCFW110088T40FAZ	D
55	75	250S/M	350	1,08	468	1,00	1500	96,7	0,92	94,1	4,50	7,60	256	EUCFW110105T4SZ	E
75	100	280S/M	478	2,09	686	1,00	1500	97,0	0,93	126	3,10	5,40	258	EUCFW110142T4SZ	E
90	125	280S/M	573	2,33	719	1,00	1500	97,1	0,92	153	2,70	4,70	255	EUCFW110180T4SZ	E
110	150	315S/M	701	4,05	977	1,00	1500	97,2	0,91	191	2,40	3,90	255	EUCFW110211T4SZ	E
132	175	315S/M	841	4,31	1004	1,00	1500	97,3	0,92	224	2,30	3,80	262	EUCFW110242T4SZ	F
1000 RPM															
3	4	132S	28,7	0,0270	51,6	1,00	1000	91,5	0,96	5,20	95,3	206,1	371	EUCFW110007T40FAZ	A
4	5,5	132M	38,2	0,0336	56,3	1,00	1000	92,0	0,93	7,10	69,1	154,7	356	EUCFW110010T40FAZ	A
5,5	7,5	132M/L	52,6	0,0467	68,5	1,00	1000	92,6	0,95	9,40	52,9	116,2	372	EUCFW110010T40FAZ	A
7,5	10	160M	71,7	0,1547	129	1,00	1000	93,3	0,96	12,8	47,2	86,5	385	EUCFW110017T40FAZ	B
9,2	12,5	160L	87,9	0,1776	139	1,00	1000	93,5	0,93	16,1	37,6	68,9	369	EUCFW110017T40FAZ	B
11	15	160L	105	0,2080	157	1,00	1000	94,0	0,94	19,0	33,1	60,7	375	EUCFW110024T40FAZ	B
15	20	180L	143	0,2252	171	1,00	1000	94,5	0,93	25,5	24,9	49,1	359	EUCFW110031T40FAZ	B
18,5	25	200M	177	0,3041	219	1,00	1000	95,0	0,92	31,9	21,1	37,9	370	EUCFW110038T40FAZ	C
22	30	200L	210	0,3311	228	1,00	1000	95,2	0,90	38,9	17,9	32,0	355	EUCFW110045T40FAZ	C
30	40	225S/M	287	0,7595	393	1,00	1000	95,5	0,93	51,1	12,0	21,4	380	EUCFW110058T40FAZ	C
37	50	250S/M	354	1,08	468	1,00	1000	95,8	0,91	64,3	9,50	16,2	322	EUCFW110070T40FAZ	D
45	60	280S/M	430	1,92	664	1,00	1000	96,0	0,91	78,3	7,00	12,3	375	EUCFW110088T40FAZ	D
55	75	280S/M	526	2,17	697	1,00	1000	96,2	0,92	94,5	6,30	11,1	377	EUCFW110105T4SZ	E
75	100	315S/M	717	3,64	937	1,00	1000	96,5	0,90	132	5,60	9,10	370	EUCFW110142T4SZ	E
90	125	315S/M	860	4,05	977	1,00	1000	96,6	0,90	157	5,10	8,40	375	EUCFW110180T4SZ	E
110	150	315S/M	1051	4,45	1018	1,00	1000	96,8	0,90	180	4,50	7,40	370	EUCFW110211T4SZ	E

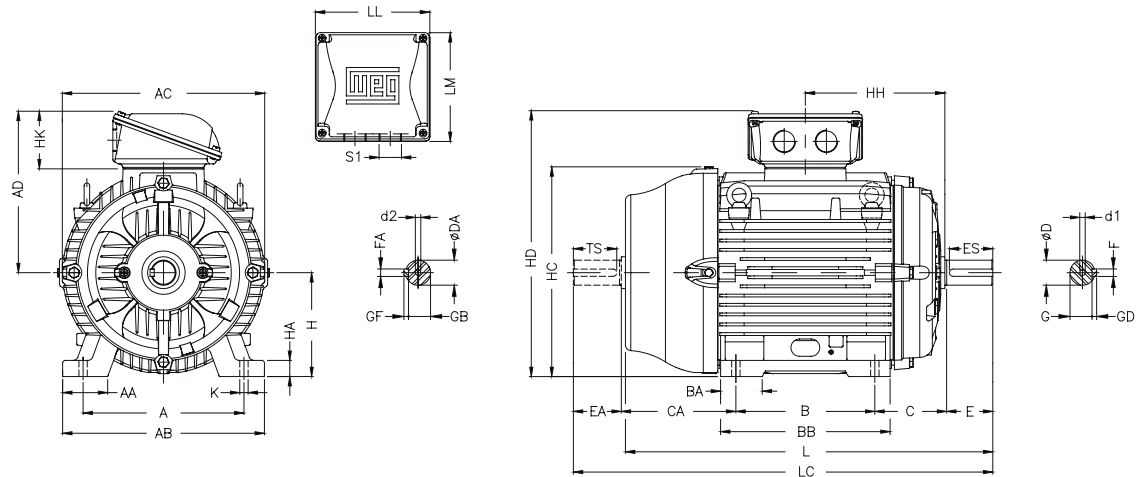
* Parameters used to set up the motor with the drive:
 Ld - Direct axis inductance
 Lq - Quadrature axis inductance
 Ke - Generated voltage at 1000 rpm

Motor Mechanical Data

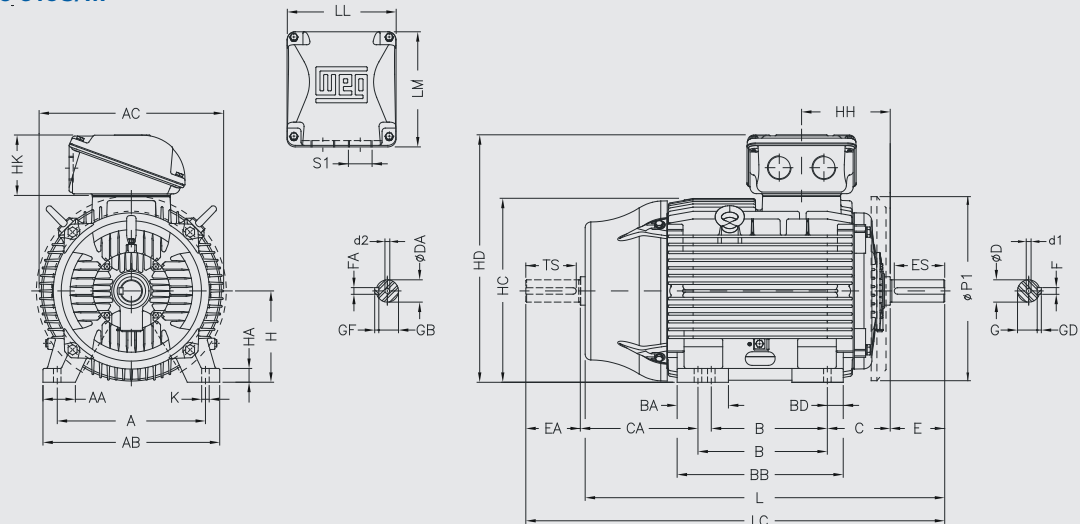
Frame 132M/L



Frames 160M to 200L



Frames 225 to 315S/M



Frame	A	AA	AB	AC	AD	B	BA	BB	BD	C	CA	Shaft											
												D	DA	E	EA	ES	F	FA	G	GB	GD	GF	TS
132S	216	51	248	271	218	140	-	187		89	150	38k6	28j6	80	60	63	10	8	33	24	8	7	45
132M						178		225															
132M/L																							
160M	254	64	308	329	264	210	63	254		108	174	42k6	42k6				12	12	37	37		8	
160L						254		298															
180M	279	78	350	360	279	241	70	294		121	200	48k6	48k6	110	110	80	14	14	42.5	42.5	9	9	80
180L						279		332															
200M	318	82	385	402	317	267	82	332		133	222	55m6					16	16	49	49	10	10	
200L						305		370															
225S/M	356	80	436	455	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	100	557	599	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	530	406/457	184	621	70	216	494/443	65m6(*)	60m6(*)	140(*)	140(*)	125(*)	18(*)	18(*)	58(*)	53(*)	11(*)	11(*)	125(*)

Frame	H	HA	HC	HD	HH	HK	K	L	LC	LL	LM	S1	d1	d2	Bearings	
															D.E.	N.D.E.
132S	132	20	266	354	159	80	12	452	519	140	133	2xM32x1.5	M12	M10	6308 - ZZ	6207 - ZZ
132M					178			557								
132M/L					191			582								
160M	160	22	327	432	213	101	14.5	598	712	198.5	190	2xM40x1.5	M16	M16	6309 - C3	6209 - Z-C3
160L					235			756								
180M	180	28	363	467	241.5	119.5	18.5	664	782	230	220	2xM50x1.5	M20	M20	6311 - C3	6211 - Z-C3
180L					260.5			820								
200M	200	30	405	526.5	266.5	153	24	729	842	269	285	2xM63x1.5	M20	M20	6312 C3	6212 Z-C3
200L								880								
225S/M	225	34	453	606	212	176	28	856(*)	974(*)	379	382					
								886	1034							
250S/M	250	43	493	646	214	147	24	965	1113	314	312					
280S/M	280	42	580	727	266	176	28	1071	1223	314	312					
315S/M	315	48	664	864	264	176	28	1244(*)	1392(*)	379	382					
								1274	1426						6319 C3	6316 C3

Notes:

(*) Dimension applicable to 3000 rpm motors.



Attributes and advantages of the CFW11 Frequency Inverter

The CFW11 is a variable-speed drive with state-of-the-art technology and dedicated software application to operate the W22 Magnet motors. It presents excellent static and dynamic performance, precise control of torque, speed, position and high overload capacity, enabling greater productivity, quality and electrical energy saving in the processes in which it is used.

The CFW11 frequency inverter features a special software application for sensorless drive and control of permanent magnet motors with a special control strategy named “Maximum Torque per Ampere”. This control combines the components of alignment torque with reluctance torque, resulting in an excellent high-efficiency drive system. Other functions and advantages of the CFW11 are described below:

Oriented Start-up

Main parameters grouped in a logical sequence to simplify and speed up the configuration of the system.

Multi-Speed

Up to eight preset speeds.

PID controller (Overlapped to the Speed Control)

Process variable control by means of the motor speed variation.

Electronic Potentiometer

It allows setting the speed reference via digital inputs.

“S” Ramp

Reduction of mechanical shocks during accelerations/ decelerations.

Skip Speed Function

It prevents the motor from operating permanently at speed values in which the mechanical system goes into resonance, causing vibration or excessive noise.

Smart Motor Overload Protection

Based on curves that simulate the motor heating and cooling in cases of overload, according to IEC 60947-4-2 and UL 508C.

It allows setting the motor thermal class.

Smart Inverter Overload Protection

It protects the IGBTs and the rectifier diodes of the inverter in case of overload.

Ride-Through

It allows recovering the inverter, with no locking by undervoltage, when a drop in the supply line occurs.

Operating Interface (HMI)

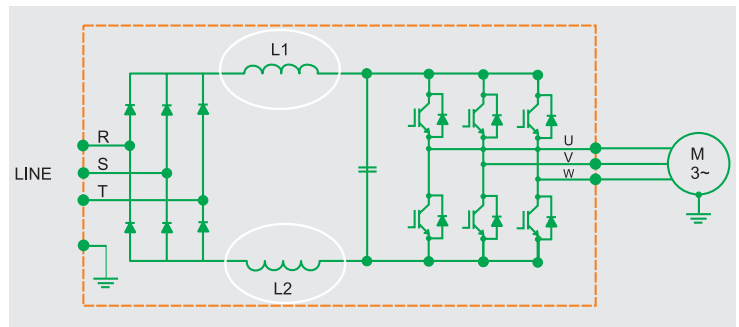
The navigation is similar to the logic used in cell phones, with the option of sequential access to the parameters or by means of groups (Menu) using the function access keys on the display (soft-keys). It may be installed on panel doors or machine consoles, and it has IP56 degree of protection.



Operating interface (HMI): HMI - 01.

Built-In DC Link Reactor

- Allows the VSD to be installed in any network (there is no minimum impedance restriction)
- Typical power factor (PF) for rated condition: 0.94 for models with three-phase supply 0.70 for models with single-phase supply
- Displacement power factor = 0.94
- Meets the 61000-3-12 standard, related to low order current harmonics in the network



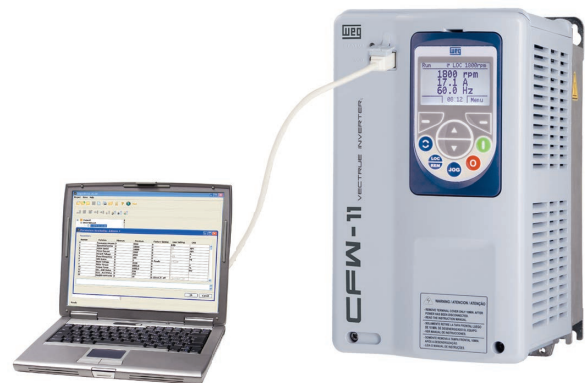
Space Saving

Reduced size and side-by-side mounting.

SoftPLC Function

Available in the standard version of the CFW11, this software function adds to the inverter the functionalities of a PLC (Programmable Logic Controller), allowing the creation of your own software applications.

- Free software applications: USB connection to the inverter
- SuperDrive G2: programming, backup and online monitoring with Trace function included.
- Trace Function: tool for diagnosis, record and view of the inverter parameters.
- WLP: used with Soft-PLC to develop software applications with ladder programming language.
- The software applications are available for download at www.weg.net.
- PLC11 Module (Optional): It gives the CFW11 PLC (Programmable Logic Controller) and positioning functions. Programmed in ladder language, it may be configured as master or slave of a CANopen network, and it is available in two versions: PLC11-01 or PLC11-02 (see details on the CFW-11 brochure).



Safe Torque Off (STO) Module of Safety Stop (Optional)

- According to EN954-1 / Protection category 3 (under certification).
- Additional board with two safety relays (SRB2) and cable for interconnection with the power circuit.

CFW11 Frequency Inverter Technical Data

Power supply		Tolerance: -15% to +10V%		
		Frequency: 50/60 Hz (48 Hz to 62 Hz)		
		Maximum of 60 connections per hour		
		Typical efficiency above or equal to 97%		
		Power factor (valid for rated condition)	≥ 0.94 for models with three-phase power supply and ≥ 0.70 for models with single-phase power supply	
		Overvoltages according to category III (EM 61010/UL 508C)		
		Transient voltages according to category III		
Power supply	Three-phase	380...480 V AC / 3,6...720 A ND – 3.6...560 A HD		
		Referential values, valid for WEG three-phase, 4-pole induction motors and power supply of 220 V AC or 440 V AC. The sizing must be done according to the rated current of the motor used		
Overload duty		Normal = Normal Overload Duty (ND): 110% of the rated output current for one minute or 150% of the rated output current for three seconds every ten minutes. Heavy = Heavy Overload Duty: 150% of the rated output current for one minute or 200% of the rated output current for three seconds every ten minutes.		
Control		Method	Control types: vector with or without encoder for W22 Magnet, PWM SVM and regulators (current, flux and speed) in software	
		Digital inputs: 6 - bidirectional, isolated, 24 V DC, programmable functions		
		Digital outputs: 3 x relay with reverser contact (240 V AC/1 A)		
		Analog Inputs: 1 (-10 to +10 V DC or 0/4 to 20 mA) 11 bits + signal ; 1 (0 to 10 V or 0/4 to 20 mA) 12 bits		
		Analog outputs: 2 isolated (0 to 10 V or 0/4 to 20 mA) 11 bits		
		Flash memory card: included in the standard product (slot 5)		
		Function expansion (optional)	Inputs and outputs: slot 1	
			Communication networks: WEG (slot 3): CAN (CANopen; DeviceNet); Profibus-DP; RS232 and RS485 (Modbus) Anybus-DC (slot 4): DeviceNet; Profibus-DP; EtherNet/IP; RS232 and RS485 (Modbus)	
			Incremental encoder input: slot 2	
			PLC: slot 1, 2 and 3	
		Power supply capacity 24 V DC (+/- 20 %), 500 mA		
Power	Minimum	Not necessary; without restrictions		
	Incorporated DC link inductor	2 inductors symmetrically connected with voltage drop equivalent to 6% for all three-phase models. Models with single-phase power supply, drop equivalent to 2%		
Environment	Operating temperature	-10...50 °C, for frames A, B, C and D (limited to 60°) -10...45 °C for frames E, F and G (except for model CFW110720..., 720 A, frame G: -10...40 °C) (limited to 55 °C for frames E, F and G and 50 °C for model CFW110720...) -10...40 °C for frames 1, 2 and 3 IP 54 (limited to 50 °C) For operation up to the temperature limit, the rated output current must be derated by 2% for each degree Celsius above the rated temperature		
	Degree of protection	IP20: Frames A, B, C, F, G without upper cover and without conduit kit and Frame E without NEMA 1; IP21 kit: Frames A, B and C with upper cover and without conduit kit; Nema 1/IP20: Frame D without IP21 kit and Frame E with NEMA 1 kit; Nema 1/IP21: Frames A, B, C with upper cover and conduit kit and frame D with IP21 kit; IP54: Frames 1, 2 and 3; IP00: special DC Hardware (Frames F and G)		
	Altitude	Altitude: 1,000 m. For applications above 1,000 m up to 4,000 m, the rated output current must be derated by 1 % for each 100 above 1,000 m		
Software		WEG Ladder Programmer - WLP (free download at www.weg.net) SuperDrive G2 with Trace function (free download at www.weg.net) Soft-PLC function (included in the standard product)		
Connection to computer (desktop or notebook)		USB port incorporated to the standard product (communication with WLP and SuperDrive software applications) Standard USB connector Rev. 2.0 (basic speed), B-type plug; Shielded interconnection cable		
Standards		Electromagnetic Compatibility (EMC): EN 61800 (part 3), EN 61000 (parts 4-2, 4-3, 4-4, 4-5, 4-6), CISPR11, EN 55011		
		Electrical, mechanical and safety construction: EN 60204-1, EN61800-5-1, UL 508C, UL 840, EN 50178, EN 60146 (IEC 146), EN 61800-2, EN 60529, UL 50		
HMI - Human Machine Interface		It enables access to/change of all the parameters. LCD Option of external mounting		
Braking modes		With resistor	Available in the standard product for frames A, B, C and D Available as optional item for frames E, F and G	
Braking resistor		External	Not supplied	
		Internal	Not supplied	

CFW11 Frequency Inverter Mechanical Data

Standard version				
Size	Dimensions mm (in)			Weight kg (lb) 380-480 Vac
	Height (H)	Width (W)	Depth (D)	
A	270	145	227	10
B	316	190	227	10.4
C	405	220	293	20.5
D	550	300	305	32.6
E	675	335	358	65
F	1234	430	360	140
G	1264	535	426	215



W22 Magnet Drive System Applications

Pumps and Ventilation Systems

W22 Magnet motors are widely used in pumps and ventilation systems which operate under variable load conditions, benefitting from the speed variation capability of these motors which ensures their use at the best duty point. The size and weight reduction of the W22 Magnet Super Premium IE4 motor also presents an important advantage in ventilation systems, where their design permits more compact installations to be achieved.

Extruders, Looms and Wiredrawing Machines

By working together with the CFW11 frequency inverter, the W22 Magnet motor offers precise speed control. Therefore, it is perfectly suited to drive continuous processing machines such as extruders, looms and wiredrawing machines. They offer precise constant torque control even at low speeds, fully satisfying the requirements of these demanding applications.

Compressors

W22 Magnet permanent magnet motors are particularly suited for compressor applications, due to their constructional features, flexibility and efficiency. In the case of the Super Premium IE4 design, their reduced size and ability to operate without the need for forced ventilation means that equipment enclosures can also be reduced.

Conveyors

On conveyor applications, W22 Magnet motors stand out due to their capacity to offer high starting torques. Their low operating temperatures allow more starts per hour without oversizing of the motor or use of forced ventilation.

Bag Filters

The W22 Magnet enables a reduction of up to 55% in energy consumption when used in bag filter applications. This reduction is possible due to the high efficiency of the motor combined with the speed control provided by the CFW11. The W22 Magnet is essential for application in exhaust systems, where it permits operations at low speeds without the need for forced ventilation. In addition to the reduction in energy consumption, the useful life of the filtering elements is extended and the wear of the pipes is reduced.

Paper Coil Winders

W22 Magnet motors are also highly recommended for applications within the paper and cellulose industry, for example, paper coil winders. Variable speed, precise control and high and constant torques are essential requirements for these applications, therefore the use of W22 Magnet motors, together with the CFW11, offers the perfect solution to meet these demands.



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