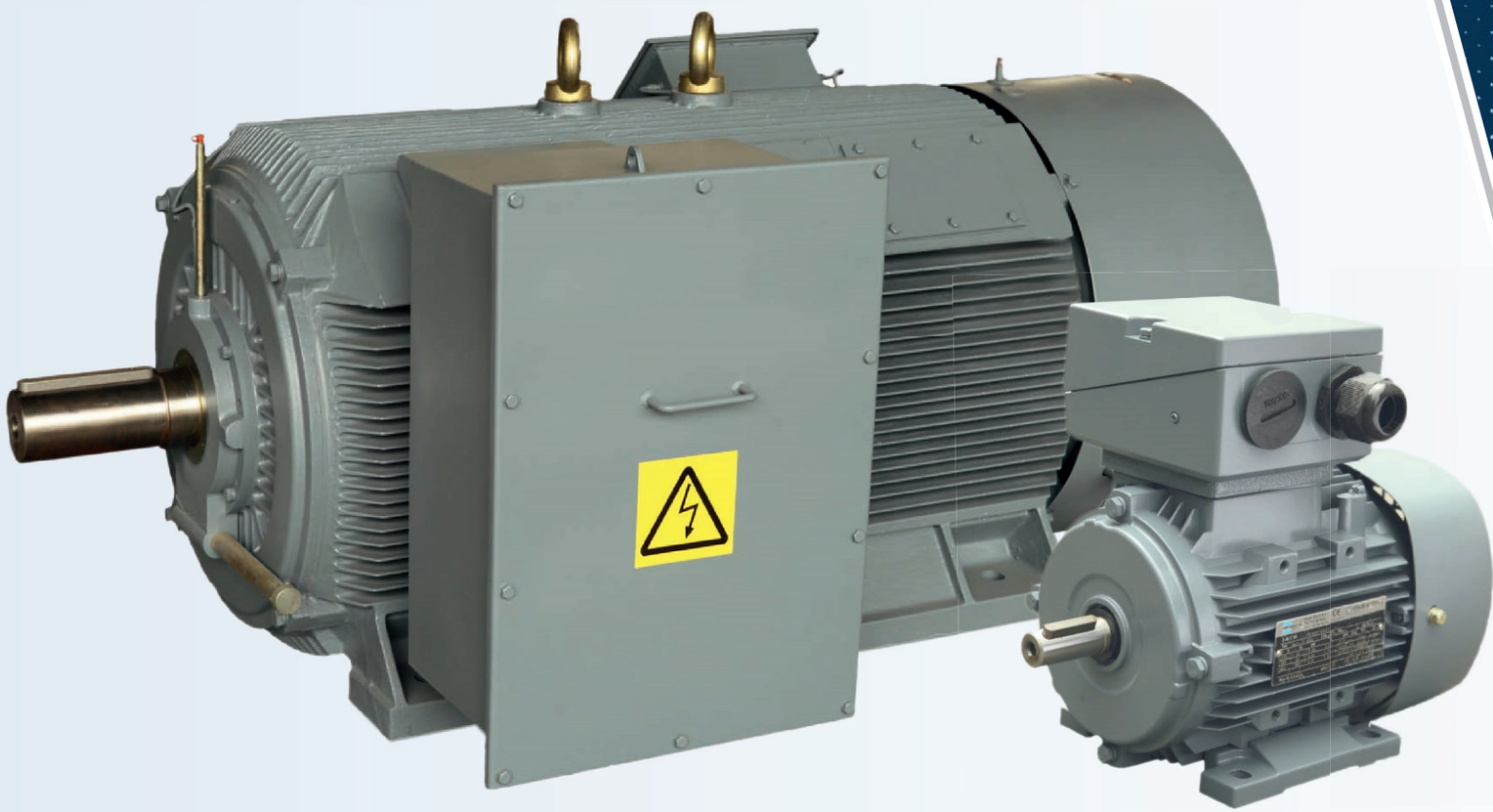
marathon™
Motors



MARATHON MOTORS

CAPABILITY PUBLICATION FOR LARGE IEC

REGAL™

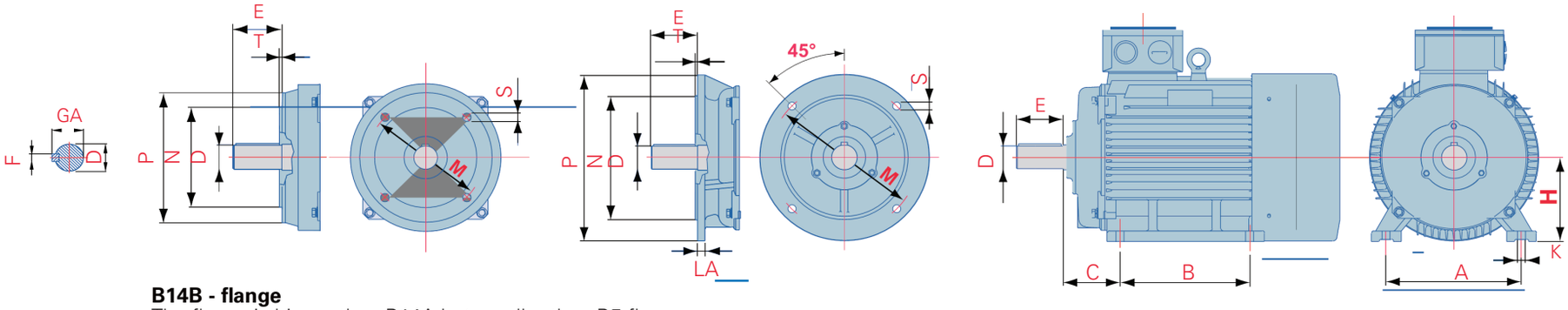
Table of Contents

BASIC DIMENSIONS

B14A - flange (“C” face)
The flange is smaller than the motor frame.
The holes are tapped.
Available for frame sizes 63 to 160 mm.

B5 - flange (“D” flange)
The flange is bigger than the motor frame.
The holes are not tapped.
B5 flanges are available for all motor sizes.

B3 - foot mounted motor



B14B - flange
The flange is bigger than B14A but smaller than B5 flange.
The holes are tapped. Available for frame sizes 63 to 160 mm.

SIZE	Shaft			
	Diameter D		Length E	
63 frame	11		23	
71 frame	14		30	
80 frame	19		40	
90 frame	24		50	
100 frame	28		60	
112 frame	28		60	
132 frame	39		80	
160 frame	42		110	
180 frame	48		110	
200 frame	55		110	
Poles	2p	4-8p	2p	4-8p
225 frame	55	60	110	140
250 frame	60	65	140	
280 frame	65	75	140	
315 frame	65	80	140	170
355 frame	75	95	140	170

B5 FLANGE (“D” flange)			
PCD M	Spigot N	Diameter P	Hole Dia S
115	95	140	10
130	110	160	10
165	130	200	14
165	130	200	12
215	180	250	14.5
215	180	250	14.5
265	230	300	14.5
300	250	350	18.5
300	250	350	18.5
350	300	400	18.5
400	350	450	18.5
500	450	550	18.5
500	450	550	18.5
600	550	660	24
740	680	800	24

B14A FLANGE (“C” face)			
PCD M	Spigot N	Diameter P	Hole Dia S
75	60	90	M5
85	70	105	M6
100	80	120	M6
115	85	140	M8
130	110	160	M8
130	110	160	M8
165	130	200	M10
215	180	250	M12

B14B FLANGE			
PCD M	Spigot N	Diameter P	Hole Dia S
100	80	120	M6
115	95	140	M8
130	110	160	M8
130	110	160	M8
165	130	200	M10
165	130	200	M10
210	180	215	M12
265	230	300	M12

BASIC DIMENSIONS

Standard three-phase electric motors must comply with the standard maximum overall dimensions as specified in the DIN 42 673 standard. It is important to keep these maximum overall dimensions in mind when designing the driven equipment so the possibility to replace a standard electric motors with another make is guaranteed where possible.

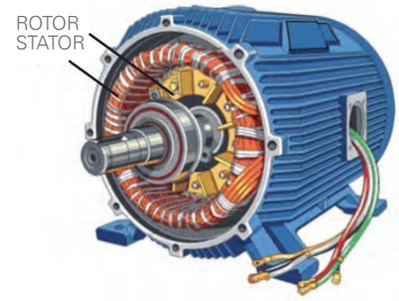
A sufficient space around the electric motor must be maintained to enable motor mounting and connection as well as to enable sufficient air cooling during the operation. The maximum overall dimensions are applicable on all standard three-phase squirrel cage TEFC electric motors. (TEFC ≈ Totally Enclosed Fan Cooled).

Please download drawings from the Drawing Generator on our website:
www.regalbeloit.eu

Frame	H	A	B	C	K	F		GA		DOWNLOAD DRAWINGS
63M	63	100	80	40	7 (M6)	4		12.5		
71M	71	112	90	45	7 (M6)	5		16		
80M	80	125	100	50	10 (M8)	6		21.5		Low Voltage Motors
90S	90	140	100	56	10 (M8)	8		27		
90L	90	140	125	56	10 (M8)	8		27		
100L	100	160	140	63	12 (M10)	8		31		
112M	112	190	140	70	12 (M10)	8		31		
132S	132	216	140	89	12 (M10)	10		41		
132M	132	216	178	89	12 (M10)	10		41		
160M	160	254	210	108	15 (M12)	12		45		
160L	160	254	254	108	15 (M12)	12		45		
180M	180	279	241	121	15 (M12)	14		51.5		
180L	180	279	279	121	15 (M12)	14		51.5		
200L	200	318	305	133	19 (M16)	16		59		
						2p	4-8p	2p	4-8p	Medium & High Voltage Motors
225S	225	356	311	149	19 (M16)	18		64		
225M	225	356	311	149	19 (M16)	16	18	59	64	
250M	250	406	349	168	24 (M20)	18	18	64	69	
280S	280	457	368	190	24 (M20)	18	20	69	79.5	
280M	280	457	419	190	24 (M20)	18	20	69	79.5	
315S	315	508	406	216	28 (M24)	18	22	69	85	
315M	315	508	457	216	28 (M24)	18	22	69	85	
315L	315	508	508	216	28 (M24)	18	22	69	85	
355M	355	610	560	254	28 (M24)	20	25	85	106	
355L	355	610	630	254	28 (M24)	20	25	85	106	

MOTOR PRINCIPLE

An electric motor is a commonly used device that transforms electrical energy into mechanical energy through the interactionof magnetic fields. The main two components of an electric motor are the stator and the rotor. There is a copper windings in the stator, which when energised creates a rotating magnetic field, which induces electric current in the rotor cage. This creates a magnetic field in the rotor and it is the interaction of the two magnetic fields, which makes the rotor to rotate.



The rotating magnetic field of the stator always rotates faster than the rotor. The rotor is not rotating synchronously with the rotating magnetic field in the stator (hence it is an asynchronous electric motor). The speed difference between the rotating magnetic field in the stator and the rotor speed is called 'slip'. It is the slip, which enables voltage to be generated in the rotor cage creating the rotor current.

The interaction of the magnetic field in the stator and the magnetic field in the rotor produce the torque which is the mechanical output on the shaft. Higher shaft load provides more slip, more slip generates more rotor current, more rotor current produces more torque. This is the typical principle of asynchronous squirrel-cage electric motors.

The rotating speed of an electric motor depends on the number of poles and the frequency of the supply. A single speed electric motor has 2, 4, 6, 8, etc. poles (1, 2, 3 or 4 pole-pairs respectively) and the mains supply frequency is 50Hz or 60Hz as standard.

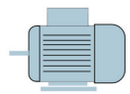
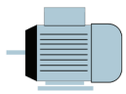
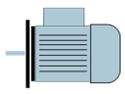
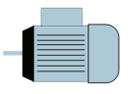
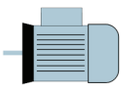
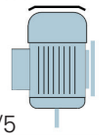
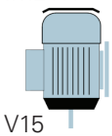
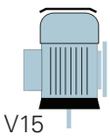
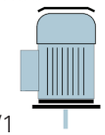
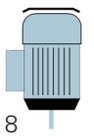
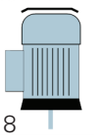
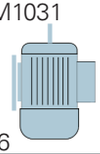
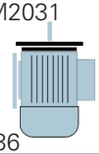
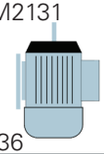
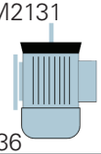
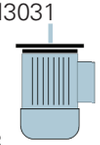
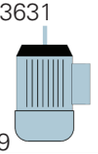
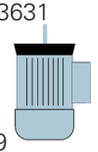
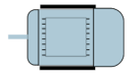
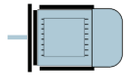
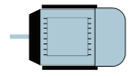
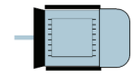
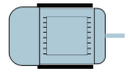
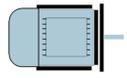
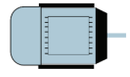
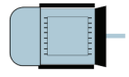
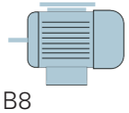
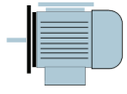
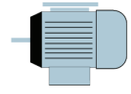
The more poles in an electric motor the lower the synchronous speed. The 2pole electric motor makes 50 revolutions per second, which is 3000rpm and a 4pole electric motor makes one half which is 1500rpm at 50Hz.

At 60Hz a 2pole electric motor makes 3600rpm and a 4pole electric motor 1800rpm. The following calculation is used to calculate the rotating speed of an electric motor:

$$\text{Asynchronous speed} = \frac{60 * f}{2p} - \text{slip} \quad \text{[rpm]}$$

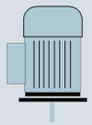
f - mains frequency ; 2p - pole pairs

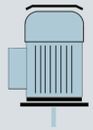
MOUNTING POSITIONS

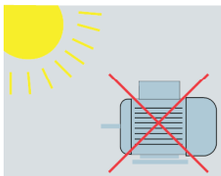
1st digit	IM1... Foot mounted	IM2... Foot & Flange mounted			IM3... Flange mounted		
2nd digit	IM10	IM20	IM21	IM21	IM30	IM36	IM36
3rd digit							
0	IM1001  B3	IM2001  B3/B5	IM2101  B3/B14A	IM2101  B3/B14B	IM3001  B5	IM3601  B14A	IM3601  B14B
1	IM1011  V5	IM2011  V15	IM2111  V15	IM2111  V15	IM3011  V1	IM3611  V18	IM3611  V18
3	IM1031  V6	IM2031  V36	IM2131  V36	IM2131  V36	IM3031  V3	IM3631  V19	IM3631  V19
5	IM1051  B6	IM2051 	IM2151 	IM2151 			
6	IM1061  B7	IM2061 	IM2161 	IM2161 			
7	IM1071  B8	IM2071 	IM2171 	IM2171 			

4th digit
1: Standard IEC shaft
2: 2nd shaft end
3: Conical shaft at DE
4: Special shaft end(s)

Vertical motors with shaft down are to be specified as

Motor without Canopy 

Motor with Canopy 

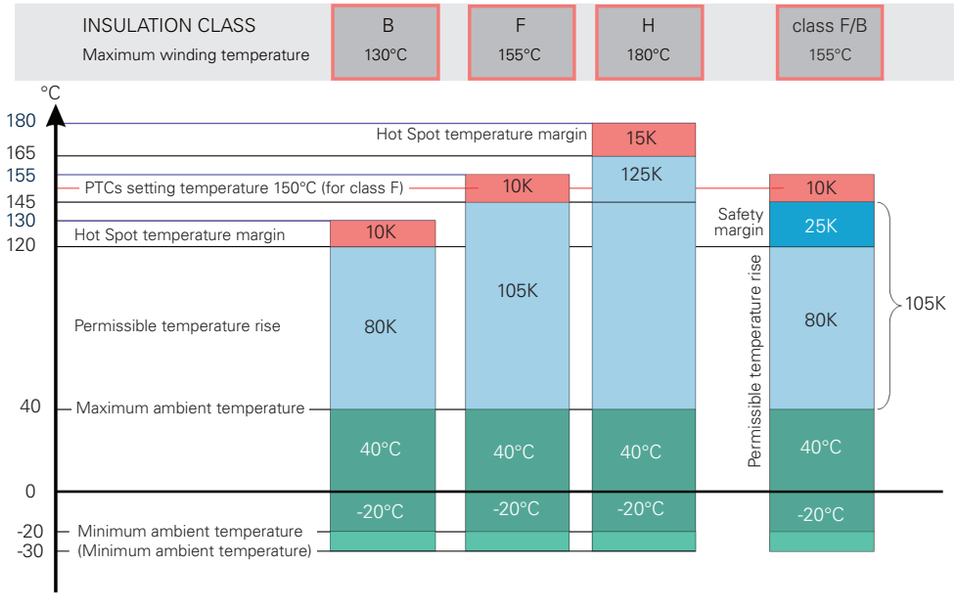


No motor should be exposed to direct sunlight!

The specified mounting is to be mentioned when ordering an electric motor. The actual motor mounting may influence the protection class and bearing design. Flange-mounted electric motors need further specification of the required pitch circle diameter of the fixing holes in the flange (FF or FT type of flange + Dimension M).
FF (Flange Free holes) - B5 flanges,
FT (Flange Tapped holes) - B14A & B14B flanges
The pitch circle diameter (M) is specified in the Standard

Abbreviated mounting positions:
IM B35 B3/B5
IM B34A B3/B14A
IM B34B B3/B14B

INSULATION (TEMPERATURE) CLASSES



Various insulation materials are used in electric motors and each has its own function.

- Wire insulation
- Slot and phase insulation materials (insulation between the winding and the stator lamination pack and phase insulation between the windings heads).
- Winding impregnation.
- Insulating sleeve used to cover wire/lead connections.
- Insulation of winding leads (between the winding and the terminal board).
- These materials are specified in thermal classes referenced as Y-A-E-B-F-H-C.
- Every thermal class has its own temperature limit. Each material of a specific class needs to retain its mechanical and electrical properties within the temperature limit.

The maximum permissible temperature rise of the winding is determined based on the thermal class temperature limits. The temperature of the winding increases as a result of the copper and iron losses in the electric motor during operation. The winding temperature rise is determined through measuring the winding resistance, which increases with increasing temperature. To allow for any Hot Spots in winding lower temperature limits are specified for the insulation materials.

Marathon produce motors with insulation class F with winding temperature rise in accordance with the class B (max 80K). This means that the motors have a temperature reserve of 25K. This reserve can be utilised for short-term overload, a higher ambient temperature (above 40°C), for supply voltage/frequency fluctuation etc.

DEGREE OF PROTECTION

	Degree of protection	Protection against mechanical particles		Protection against water
		accidental contact	solid foreign particles	
Open-circuit cooling	IP 23	against contact with fingers	against solid bodies larger than 12mmin diameter	against spraying water at up to 60° from the vertical
Totally enclosed fan cooled (TEFC)	IP 44	against contact with toolsor similar objects	against solid bodies larger than 1mmin diameter	against splashing water from all directions
	IP 54	complete protection against accidental contact	against harmful dust deposits	against water jets rom all directions
	IP 55			against non heavy seas,strong jets
	IP 56			against heavy seas,strong jets
	IP 65		against the in gress of dust	against water jets from all directions
	IP 67			against submersion for specific time andpressure
	IP 68			against continuous submersion under conditions specified by the manufacturer

Depending on the operating conditions and the environment, the most suitable degree of protection must be chosen to prevent any damage due to water, foreign objects or dust, and to prevent accidental contact with internal rotating parts or with live parts. The degrees of protection for electrical machines are designated by a code with two letters and two numerals and in some cases, an extra letter:

IP IP (International Protection). Protection against contact with live or moving parts and the ingress of foreign bodies and water (not oil!).

[0 to 6] The 1st numeral denotes the degree of protection against contact with live or moving parts and against the ingress of foreign bodies.

[0 to 8] The 2nd numeral denotes the degree of protection against the ingress of water W, S and M are extra letters for denoting special degrees of protection.

W for weather-protected machines; The extra letter W is inserted between the letters IP and the figures denoting the degree of protection, e.g. IPW23.

For special applications (such as open-circuit air cooled machines on ships' decks having the air inlets and outlets covered when not in use) an extra letter can be inserted after the figures denoting the degree of protection to indicate whether the protection against harmful water ingress with the machine stationary (letter S) or moving (letter M) has been certified or tested.

STANDARDS AND EUROPEAN DIRECTIVES

Standards

All electric motors featured in this catalogue meet the relevant IEC, EN, ISO, DIN and NEN standards. The most important standards are listed in the table below.

Description	EN-IEC	ISO	DIN
Nominal operation and properties	IEC 60034-1		
Degree of protection	IEC 60034-5		DIN 40050
Cooling method	IEC 60034-6		
Mountings	IEC 60034-7		
Direction of rotation & connection terminals marking	IEC 60034-8		
Noise	IEC 60034-9		
Voltage	IEC 60038		
Dimensions & tolerances	EN 50347		
Balancing		ISO 2373	DIN 45665
Energy Efficiency	IEC 60034-30		

ErP Directive 2009/125/EC Implementations Dates

- 16 Jun 2011: IE2 minimum efficiency for motors from 0.75 kW – 375 kW
- 01 Jan 2015: IE3 minimum efficiency for motors from 7.5 kW – 375 kW (IE2 motors can be used with frequency inverters)
- 01 Jan 2017: IE3 minimum efficiency for motors from 0.75 kW – 375 kW (IE2 motors can be used with frequency inverters)

EFFICIENCY

	IEC Motors	NEMA Motors
HIGH	"IE4* Supper Premium Efficiency"	
	"IE3 Premium Efficiency"	"NEMA Premium EISA 2007 from Dec 2010"
	"IE2 High Efficiency"	NEMA Energy Efficient EPAct
LOW	"IE1 Standard Efficiency"	

*IE4 is under development

ErP Regulation does not apply to:

(a) motors operating wholly immersed in a liquid
(b) motors completely integrated into a product
(c) motors specifically designed to operate:
  (i) at altitudes exceeding 1000 metres a.s.l. (soon to be changed to 4000 metres a.s.l.)
  (ii) where ambient temperatures exceed 40°C (soon to be changed to outside of -30°C to +60°C)
  (iii) in maximum operating temperature > 400°C
  (iv) where ambient temperatures < -15°C (any motor) or < 0°C for a motor with air cooling
  (v) where water coolant temperature < 5°C or > 25°C
  (vi) in potentially explosive atmospheres
(d) brake motors
(e) motors made solely for converter operation

ErP Regulation applies to:

Single speed, three-phase 50Hz or 50/60Hz induction motors
- have 2 to 6 poles
- have a rated voltage of Un up to 1000 V
- have a rated output Pn between 0.75 kW and 375 kW
- are rated on the basis of S1 continuous duty operation

MARINE AND OFFSHORE

The mechanical and electrical performance of the basic Marathon motors is adapted for marine and offshore application. Due to often aggressive "salty" environment, almost all sizes of HJN, HJA and DM-IP23 series can be supplied in Marine Execution for below deck as well as above deck applications. The electric motor windings are based on ambient temperatures of up to 50°C and relative air humidity up to 96%. These electric motors meet various criteria set out by a number of Marine Classification Societies and are suitable for "essential service" when supplied with a marine certificate.

The rating plate specifies the Marine Classification Society and the ambient temperature specified by the society's regulations (usually IEC92.301 C). Classification Society" logo and the date of production would be specified on the rating plate.
A 2.1 or 2.2 class certificate can, in most cases, be issued for marine motors.

EN 10204-2.1
The Declaration of Compliance 2.1 (factory declaration) is issued based on the electric motor serial number, invoice number and the customer order number. No testing is involved when issuing this document.

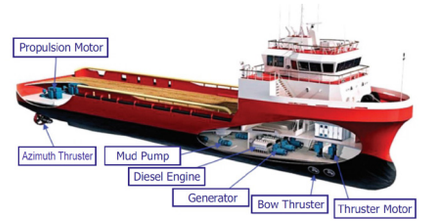
EN 10204-2.2
Test Certificate 2.2 (factory issued certificate) is issued based on the electric motor data set out in the Type Test Report (when the motor prototype have been tested) amended with certain other data (historical test data). The invoice number and the customer order number are also marked in the Test Certificate.
A number of motor serial numbers of the same type can be included in one Test Certificate.

EN 10204-3.1
The relevant no-load and full-load tests are carried out on specific electric motor when the Inspection Certificate 3.1 (inspection report) is issued. A request for Inspection Certificate 3.1 must be made at the point of the order placement. This test is also referred to as the "routine test" and provides a reasonable guarantee of the correct performance of the electric motor when the tested data comply with the Type Test data.
The invoice number and the customer order number are also marked in the Inspection Certificate. One Inspection Certificate is issued for each electric motor.

EN 10204-3.2
Inspection Certificate 3.2 is issued based on the test witnessed by an independent inspector (classified inspection report). The inspector (surveyor) can be appointed by the customer or by ourselves. In majority of the cases the surveyor would attend the testing in our approved test laboratory. External testing by certified laboratories have to be carried out in certain cases.

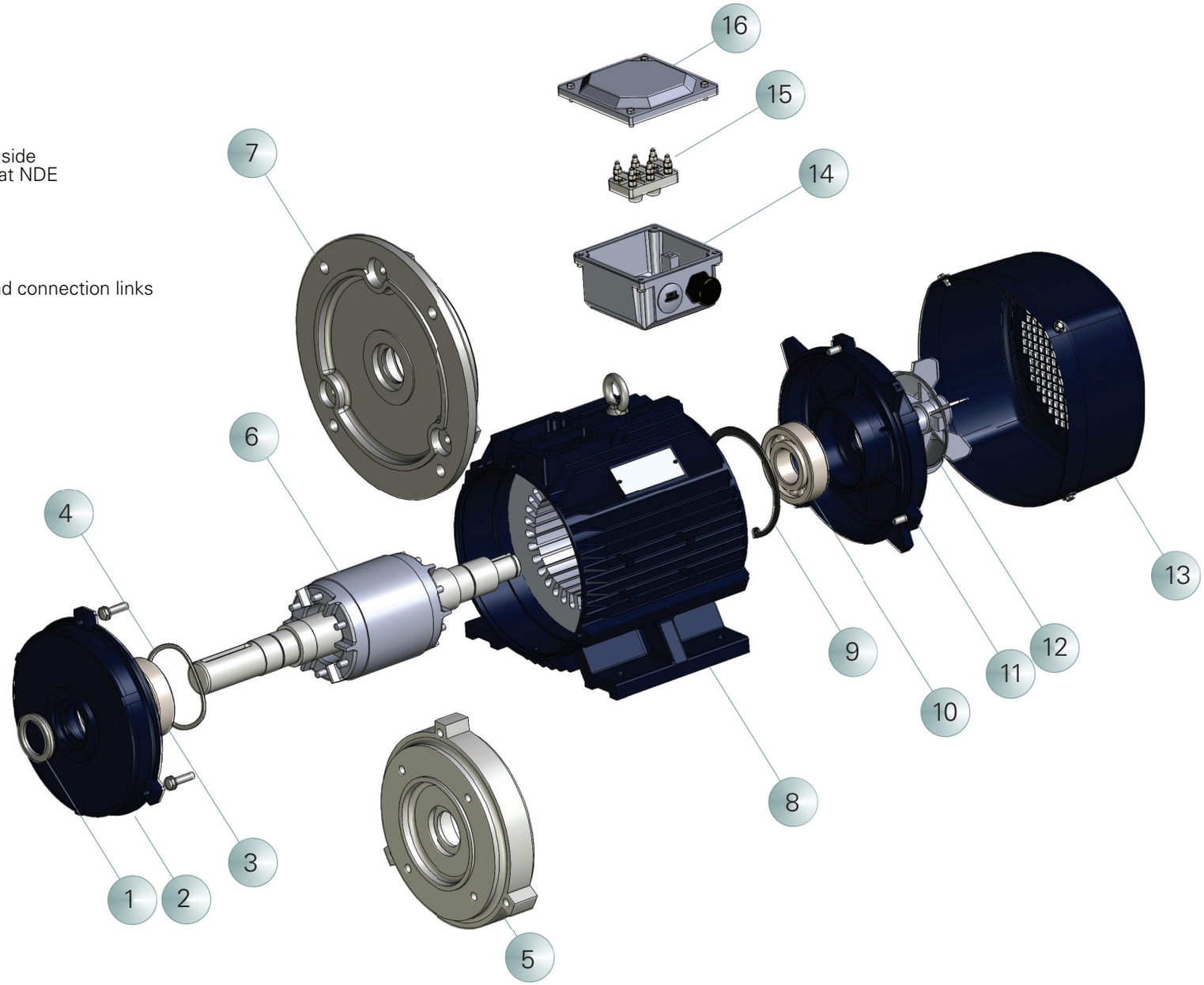
Type Approval Certificate
Marathon motors have been issued Type Approval by GL (Germanischer Lloyd), which covers HJN, HJA and DM-IP23 series. The tests are carried out in our approved test laboratory. This enables Marathon to supply electric motors for essential service quickly and with the relevant certificate.

GL Certificate



ELECTRIC MOTOR PARTS

1 - Shaft seal
2 - DE Endshield
3 - DE Bearing
4 - Wavy washer
5 - Flange (B14A)
6 - Rotor with shaft
7 - Flange (B5)
8 - Stator housing with stator inside
9 - Circlip for fixing the bearing at NDE
10 - NDE Bearing
11 - NDE Endshield
12 - Cooling fan
13 - Fan cover
14 - Terminal box
15 - Terminal block with 6 pins and connection links
16 - Terminal box lid



PAINT SPECIFICATION

Universal (standard paint finish)
Motor coating for non-special anti-corrosion requirements.
Motor coating for motors installed indoor and in general outdoor areas (max. temperature <150°C) with no industry gas concentration.

TH (optional paint finish available on request)
Motor coating for motors installed outdoor areas of tropical and humid environment with high humidity and temperature (max. temperature <150°C) and sunshine exposure as well as in areas with chemical gas pollution, but not severe industry gas concentration.

Surface Pre-treatment:

Universal

The surface of motor components must be clean, dry, de-greased, free of dirt and impurities, with roughness ≤25µm. If there is small defect on the surface, such as a small pit, then sanding of the surface is carried out and then the surface is filled with filler (G07-5 perchloroethylene filler) in max thickness ≤100µm. The filler is then sanded down after it has hardened and is cleaned.

TH

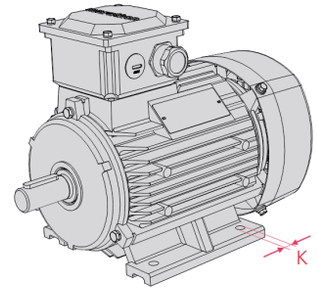
All outer parts made of cast iron and/or steel are sand blasted or ball blasted. Any surface imperfections such as burr, sand burning, welding slag etc is removed. The surface must be clean and smooth with no visual imperfections, like oxidation, rust, grease or dust deposits, etc. The surface of motor components must be clean, dry, de-greased, free of dirt and impurities. The primer paint must be dry before the intermediate and top coats are applied.

Anorrosion requirement	Thickness of primer (µm)	Primer Material	Thickness of intermediate coat (µm)	Intermediate coat Material	Thickness of top coat (µm)	Top coat Material	Total thickness (µm)
[Universal] Suitable for both indoor & outdoor installation Medium anti-corrosion protection	30-50	iron redepoxy resinester	n/a	n/a	20-50	polyure-thane paint	70-100
[TH] Installation in tropical and humid environment	35-50	epoxy zinc rich primer	35-50	epoxy mio barrier paint	30-50		120-150

FEET TIGHTENING TORQUE & BEARING SIZES

Frame-poles	Hole in the foot K [mm]	Bolt size
56	6	M5
63	7	M6
71	7	M6
80	10	M8
90	10	M8
100	12	M10
112	12	M10
132	12	M10
160	15	M12
180-2	15	M12
180-4/6/8	15	M12
200-2	19	M16
200-4/6/8	19	M16
225-2	19	M16
225-4/6/8	19	M16
250-2	24	M20
250-4/6/8	24	M20
280-2	24	M20
280-4/6/8	24	M20
315-2	28	M24
315-4/6/8	28	M24
355-2	28	M24
355-4/6/8	28	M24
400-2	35	M30
400-4/6/8	35	M30

Bolt Size	Grade<8.8 Tightening Torque Nm	"Grade≥8.8 Tightening Torque Nm"
M4	1.3 Nm	3 Nm
M5	2.6 Nm	5 Nm
M6	4.5 Nm	8 Nm
M8	10 Nm	20 Nm
M10	20 Nm	40 Nm
M12	34 Nm	70 Nm
M16	83 Nm	170 Nm
M20	160 Nm	340 Nm
M24	280 Nm	600 Nm
M30	570 Nm	1200 Nm



Bearing Sizes

These bearing sizes are listed for standard motor execution! Customer specific motors can be fitted with a different bearing arrangement (such as roller bearing at DE and/or insulated bearing at NDE). Always check the motor's nameplate for correct bearing. More information (such as re-lubrication periods) can be found in Maintenance Manual which is available for download in a number of different languages from our website.

Standard Bearing Sizes		
Frame-poles	DE	NDE
80	6204-2Z	6204-2Z
90-2.4	6205-2Z-C3	6205-2Z-C3
90-6	6205-2Z	6205-2Z
100	6206-2Z-C3	6206-2Z-C3
112	6306-2Z-C3	6306-2Z-C3
132	6308-2Z-C3	6308-2Z-C3
160	6309-2Z-C3	6309-2Z-C3
180	6311-2Z-C3	6311-2Z-C3
200	6312-2Z-C3	6312-2Z-C3
225	6313-2Z-C3	6313-2Z-C3
250	6314-2Z-C3	6314-2Z-C3
280-2	6314-C3	6314-C3
280-4.6.8	6317-C3	6317-C3

Standard Bearing Sizes		
Frame-poles	DE	NDE
315-2	6317-C3	6317-C3
315-4.6.8	6319-C3	6319-C3
355-2	6319-C3	6319-C3
355-4.6.8	6322-C3	6322-C3
400-2	6317-C3	6317-C3
400-4.6.8	6326-C3	6326-C3
450-2	6220-C3	6220M/C3 VLO241*
450-4.6.8	6328-C3	6328-C3
500-4.6.8	6330-C3	6330-C3
560-4.6.8	6334-C3	6330-C3

*2p-800kW and larger sizes have insulated bearing as standard

Low Voltage HJN Cast Iron Range - 2pole

IE2

Material	TYPE	Output		Frame	Speed		Rated current 50Hz			60Hz	Power Factor	Efficiency				Rated torque	Ratio			Weight
		50Hz kW	60Hz kW	Size	50Hz rpm	60Hz rpm	380V A	400V A	415V A	460V A	Cos φ	Class	100% Load %	75% Load %	50% Load %	Nm	Starting current	Starting torque	B/down torque	kg
3000/3600rpm, 2-pole, 50/60Hz, IP55, Insulation F/B																				
	HJN 80K-2	0.75	0.86	80M	2825	3395	1.78	1.69	1.62	1.68	0.83	IE2	77.4	77.4	76.1	2.5	6.26	2.66	2.80	16
	HJN 80G-2	1.1	1.27	80M	2825	3395	2.49	2.37	2.29	2.38	0.84	IE2	79.6	79.6	78.4	3.7	6.30	2.64	2.75	17
	HJN 90S-2	1.5	1.73	90S	2840	3405	3.34	3.17	3.06	3.31	0.84	IE2	81.3	81.1	78.1	5.0	6.97	2.77	2.98	23
	HJN 90L-2	2.2	2.53	90L	2840	3405	4.73	4.49	4.33	4.69	0.85	IE2	83.2	83.1	80.5	7.4	6.99	3.19	3.09	26
	HJN 100L-2	3	3.45	100L	2865	3475	6.19	5.88	5.67	5.88	0.87	IE2	84.6	84.6	84.2	10.0	7.50	3.43	3.13	34
	HJN 112M-2	4	4.6	112M	2865	3420	8.05	7.65	7.37	7.98	0.88	IE2	85.8	85.6	82.9	13.4	7.78	2.69	3.25	42
	HJN 132S-2	5.5	6.3	132S	2905	3490	10.9	10.4	10.0	10.3	0.88	IE2	87.0	87.0	85.1	18.1	7.81	2.23	3.08	59
	HJN 132SX-2	7.5	8.6	132S	2900	3480	14.7	14.0	13.5	13.9	0.88	IE2	88.1	87.9	86.4	24.7	7.73	2.27	3.22	62
	HJN 160M-2	11	12.7	160M	2940	3535	21.0	20.0	19.2	20.0	0.89	IE2	89.4	90.0	87.5	35.7	7.46	2.38	2.89	117
	HJN 160MX-2	15	17.3	160M	2940	3535	28.4	26.9	26.0	27.0	0.89	IE2	90.3	90.8	88.3	48.7	7.50	2.64	3.02	127
	HJN 160L-2	18.5	21.3	160L	2940	3535	34.4	32.6	31.5	32.7	0.9	IE2	90.9	91.3	88.8	60.1	7.50	2.86	3.14	149
	HJN 180M-2	22	24.5	180M	2950	3540	40.6	38.6	37.3	37.5	0.9	IE2	91.3	91.3	90.4	71.0	8.41	2.97	3.42	188
	HJN 200L-2	30	33.5	200L	2950	3540	55.1	52.3	50.4	50.8	0.9	IE2	92.0	92.1	91.0	97.1	7.28	2.47	3.12	230
	HJN 200LX-2	37	41.5	200L	2950	3540	67.5	64.2	61.8	62.6	0.9	IE2	92.5	92.7	91.8	120	7.76	2.59	3.26	245
	HJN 225M-2	45	52	225M	2965	3555	81.8	77.7	74.9	77.7	0.9	IE2	92.9	92.8	92.0	145	7.80	2.78	3.40	330
	HJN 250M-2	55	62	250M	2970	3560	99.5	94.5	91.2	94.5	0.9	IE2	93.2	92.8	91.5	177	7.80	2.79	3.48	445
	HJN 280S-2	75	84	280S	2970	3560	135	128	124	111	0.9	IE2	93.8	93.6	92.2	241	7.36	2.59	3.11	565
	HJN 280M-2	90	101	280M	2970	3560	160	152	146	132	0.91	IE2	94.1	93.8	92.4	289	7.80	3.22	3.24	645
	HJN 315S-2	110	127	315S	2975	3570	195	185	178	185	0.91	IE2	94.3	93.8	92.5	353	7.77	2.32	3.54	920
	HJN 315M-2	132	152	315M	2975	3570	233	221	213	221	0.91	IE2	94.6	94.3	93.2	424	7.89	2.43	3.33	970
	HJN 315L-2	160	184	315L	2975	3570	282	268	258	268	0.91	IE2	94.8	94.6	93.5	513	7.43	2.27	3.27	1170
	HJN 315LX-2	200	230	315L	2970	3560	352	334	322	334	0.91	IE2	95.0	94.8	93.9	643	8.00	3.05	3.84	1200
	HJN 355M-2	250	280	355M	2985	3580	444	422	407	411	0.9	IE2	95.0	94.5	93.3	800	6.77	2.07	3.14	1690
	HJN 355L-2	280	314	355L	2985	3580	498	473	456	461	0.9	IE2	95.0	94.4	93.1	896	6.50	2.00	2.50	1820
	HJN 355LX-2	315	353	355L	2980	3575	560	532	513	518	0.9	IE2	95.0	94.5	93.2	1009	7.27	2.38	3.28	1870
	HJN 355LY-2	355	398	355L	2980	3575	631	599	578	584	0.9	IE2	95	94.5	93.2	1138	8.0	2.2	2.5	1900

Aluminium motors

3x PTCs fitted as standard

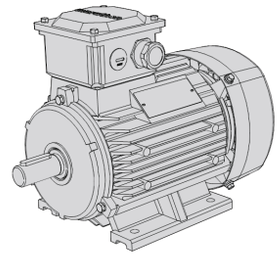
Low Voltage HJN Cast Iron Range - 4pole

IE2

Material	TYPE	Output		Frame	Speed		Rated current 50Hz			60Hz	Power Factor	Efficiency				Rated torque	Ratio			Weight
		50Hz kW	60Hz kW	Size	50Hz rpm	60Hz rpm	380V A	400V A	415V A	460V A	Cos φ	Class	100% Load %	75% Load %	50% Load %	Nm	Starting current	Starting torque	B/down torque	kg
1500/1750rpm, 4-pole, 50/60Hz, IP55, Insulation F/B																				
	HJN 80M-4	0.75	0.86	80M	1415	1690	1.91	1.81	1.75	1.81	0.75	IE2	79.6	78.7	75.3	5.1	5.84	3.11	3.27	19
	HJN 90S-4	1.1	1.3	90S	1395	1680	2.67	2.53	2.44	2.65	0.77	IE2	81.4	81.2	77.8	7.5	6.03	2.84	3.01	23
	HJN 90L-4	1.5	1.7	90L	1395	1680	3.48	3.31	3.19	3.46	0.79	IE2	82.8	82.6	78.9	10.2	6.21	3.11	2.98	29
	HJN 100L-4	2.2	2.5	100L	1425	1720	4.89	4.65	4.48	4.60	0.81	IE2	84.3	82.8	76.5	14.7	7.50	3.20	3.63	35
	HJN 100LX-4	3	3.5	100L	1425	1710	6.42	6.10	5.88	6.19	0.83	IE2	85.5	84.6	83.1	20.1	7.23	3.06	3.52	39
	HJN 112M-4	4	4.6	112M	1440	1715	8.56	8.13	7.84	8.49	0.82	IE2	86.6	86.3	83.9	26.7	7.05	2.21	2.99	45
	HJN 132S-4	5.5	6.3	132S	1450	1745	11.5	10.9	10.5	10.9	0.83	IE2	87.7	87.0	85.2	36.2	7.80	2.51	3.13	66
	HJN 132M-4	7.5	8.6	132M	1450	1745	15.3	14.5	14.0	14.5	0.84	IE2	88.7	87.5	86.0	49.4	7.81	2.58	3.07	80
	HJN 160M-4	11	12.7	160M	1465	1765	22.1	21.0	20.3	20.9	0.84	IE2	89.8	90.0	88.5	71.7	7.30	2.34	2.69	122
	HJN 160L-4	15	17.3	160L	1465	1765	29.6	28.1	27.1	28.2	0.85	IE2	90.6	90.5	89.0	97.7	7.69	2.42	2.64	140
	HJN 180M-4	18.5	21.3	180M	1470	1765	35.8	34.0	32.8	34.1	0.86	IE2	91.2	91.2	90.5	120	7.65	2.41	3.57	181
	HJN 180L-4	22	25.3	180L	1470	1765	42.4	40.3	38.9	40.1	0.86	IE2	91.6	91.6	90.9	143	7.74	2.62	3.34	196
	HJN 200L-4	30	34.5	200L	1470	1764	57.4	54.6	52.6	54.6	0.86	IE2	92.3	92.6	91.9	195	7.32	2.28	3.03	235
	HJN 225S-4	37	42.5	225S	1480	1775	69.7	66.2	63.8	66.2	0.87	IE2	92.7	92.6	91.9	240	7.31	2.51	3.10	306
	HJN 225M-4	45	52	225M	1480	1775	84.4	80.2	77.3	80.2	0.87	IE2	93.1	93.0	92.7	292	6.94	2.51	2.87	343
	HJN 250M-4	55	63	250M	1480	1775	103.0	98.0	94.0	98.0	0.87	IE2	93.5	93.5	92.8	355	7.22	2.18	3.07	455
	HJN 280S-4	75	86	280S	1480	1775	139	132	128	115	0.87	IE2	94.0	93.8	92.6	484	7.55	2.54	3.03	620
	HJN 280M-4	90	104	280M	1480	1775	167	159	153	138	0.87	IE2	94.2	94.0	92.8	581	7.75	2.71	3.02	695
	HJN 315S-4	110	127	315S	1480	1775	201	191	184	191	0.88	IE2	94.5	94.3	93.5	709	7.04	2.28	3.23	925
	HJN 315M-4	132	152	315M	1480	1775	241	229	220	229	0.88	IE2	94.7	94.4	93.5	851	6.67	2.07	3.13	1010
	HJN 315L-4	160	184	315L	1480	1775	287	273	264	273	0.89	IE2	94.9	94.6	93.7	1032	7.28	2.32	3.51	1080
	HJN 315LX-4	200	230	315L	1480	1775	359	341	329	341	0.89	IE2	95.1	94.8	93.9	1290	7.30	2.34	3.32	1200
	HJN 355M-4	250	288	355M	1485	1785	449	426	411	427	0.89	IE2	95.1	94.7	93.7	1608	7.88	2.27	3.47	1720
	HJN 355L-4	280	322	355L	1485	1785	497	472	455	472	0.9	IE2	95.1	94.7	93.8	1801	7.90	2.10	2.60	1830
	HJN 355LX-4	315	362	315L	1485	1785	559	531	512	531	0.9	IE2	95.1	94.7	93.8	2026	7.20	2.08	3.13	1920
	HJN 355LY-4	355	408	355L	1485	1785	630	599	577	598	0.9	IE2	95.1	94.8	93.9	2283	7.61	2.19	3.21	2050

Aluminium motors

3x PTCs fitted as standard



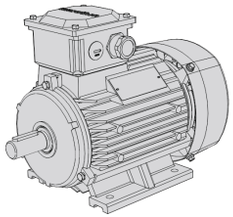
Low Voltage HJN Cast Iron Range - 6pole

IE2

Material	TYPE	Output		Frame	Speed		Rated current 50Hz			60Hz	Power Factor	Efficiency				Rated torque	Ratio			Weight
		50Hz kW	60Hz kW	Size	50Hz rpm	60Hz rpm	380V A	400V A	415V A	460V A	Cos φ	Class	100% Load %	75% Load %	50% Load %	Nm	Starting current	Starting torque	B/down torque	kg
	1000/1200rpm, 6-pole, 50/60Hz, IP55, Insulation F/B																			
	HJN 90S-6	0.75	0.86	90S	920	1100	2.09	1.98	1.91	2.07	0.72	IE2	75.9	75.6	72.1	7.8	4.27	2.22	2.72	24
	HJN 90L-6	1.1	1.27	90L	920	1100	2.93	2.78	2.68	2.91	0.73	IE2	78.1	77.8	74.8	11.4	5.03	2.93	3.06	26
	HJN 100L-6	1.5	1.73	100L	920	1130	3.76	3.57	3.44	3.58	0.76	IE2	79.8	79.3	77.2	15.6	6.03	2.64	3.43	34
	HJN 112M-6	2.2	2.53	112M	950	1125	5.38	5.11	4.92	5.33	0.76	IE2	81.8	81.5	78.8	22.3	5.83	2.78	3.23	41
	HJN 132S-6	3	3.45	132S	960	1160	7.20	6.84	6.59	6.84	0.76	IE2	83.3	83.1	80.6	29.8	6.64	2.26	3.06	58
	HJN 132M-6	4	4.6	132S	965	1165	9.45	8.98	8.66	8.98	0.76	IE2	84.6	84.0	81.2	39.6	7.69	2.44	3.32	71
	HJN 132MX-6	5.5	6.3	132M	965	1165	12.6	12.0	11.6	11.9	0.77	IE2	86.0	84.8	82.0	54.4	7.24	2.30	3.21	78
	HJN 160M-6	7.5	8.6	160M	970	1160	17.0	16.1	15.5	15.9	0.77	IE2	87.2	87.1	84.2	73.8	7.66	2.42	3.57	119
	HJN 160L-6	11	12.7	160L	970	1160	24.2	22.9	22.1	22.8	0.78	IE2	88.7	88.7	85.3	108.0	7.66	2.41	3.36	139
	HJN 180L-6	15	18	180L	975	1175	31.4	29.8	28.7	31.1	0.81	IE2	89.7	89.7	88.0	147.0	6.99	2.62	3.04	190
	HJN 200L-6	18.5	22	200L	980	1176	38.4	36.5	35.2	37.7	0.81	IE2	90.4	90.6	89.3	180	7.40	2.43	3.09	220
	HJN 200LX-6	22	27	200L	980	1176	45.4	43.1	40.6	45.2	0.81	IE2	90.9	91.3	90.6	214	7.54	2.68	3.08	230
	HJN 225M-6	30	36	225M	980	1175	59.2	56.2	54.2	56.2	0.84	IE2	91.7	91.6	90.9	292	7.80	2.86	3.12	324
	HJN 250M-6	37	45	250M	985	1180	70.9	67.4	64.9	67.4	0.86	IE2	92.2	92.2	91.9	359	6.23	2.01	2.68	415
	HJN 280S-6	45	54	280S	985	1180	85.8	81.5	78.5	70.9	0.86	IE2	92.7	92.6	91.4	436	7.51	2.63	3.01	555
	HJN 280M-6	55	66	280M	985	1180	104	99.0	96.0	86.0	0.86	IE2	93.1	93.0	91.8	533	7.40	2.72	2.95	640
	HJN 315S-6	75	86	315S	985	1180	142	135	129	135	0.86	IE2	93.7	93.5	92.5	727	6.53	2.00	2.85	861
	HJN 315M-6	90	104	315M	985	1180	169	161	155	161	0.86	IE2	94.0	93.7	92.7	872	6.60	2.04	2.71	940
	HJN 315L-6	110	127	315L	985	1180	206	196	189	196	0.86	IE2	94.3	94.0	93.0	1066	7.03	2.27	2.90	1110
	HJN 315LX-6	132	152	315L	985	1180	244	232	223	232	0.87	IE2	94.6	94.2	93.2	1279	7.20	2.32	2.91	1175
	HJN 355M-6	160	192	355M	985	1190	291	277	267	289	0.88	IE2	94.8	94.3	93.3	1551	6.75	1.93	3.06	1690
	HJN 355MA-6	180	207	355M	985	1190	328	311	300	311	0.88	IE2	94.8	94.5	93.5	1745	6.80	1.90	2.83	1770
	HJN 355MX-6	200	230	355M	985	1190	363	345	333	345	0.88	IE2	95.0	94.7	93.7	1939	7.09	1.99	3.05	1870
	HJN 355L-6	225	259	355L	985	1190	409	388	374	389	0.88	IE2	95.0	94.7	93.7	2181	7.10	2.00	2.95	1900
	HJN 355LX-6	250	288	355L	985	1190	454	432	416	432	0.88	IE2	95.0	94.7	93.7	2424	7.04	1.87	3.29	1980
	HJN 355LY-6	280	322	355L	985	1190	509	483	466	483	0.88	IE2	95.0	94.8	93.7	2715	7.00	1.90	2.50	2060

Aluminium motors

3x PTCs fitted as standard

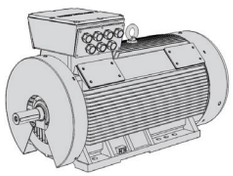


Large Low Voltage LVX Cast Iron Range - 2pole, 4pole, 6pole - Insulation System 1.5kV

Material	TYPE	Output		Frame	Speed		Voltage	Rated current 50Hz			60Hz	50Hz		Power Factor	Efficiency				Rated torque	Ratio			Inertia	Space Heaters	Weight
		50Hz kW	60Hz kW	Size	50Hz rpm	60Hz rpm		380V A	400V A	415V A	460V A	660V A	960V A	Cos φ	Class	100% Load %	75% Load %	50% Load %	Nm	Starting current	Starting torque	B/down torque	kgm²		kg
3000/3600rpm, 2-pole, 50/60Hz, IP55, Insulation F/B																									
	LVX(1.5kV) 355XB-2	400	460	355	2975	3570	380/660V, 400/690V 50Hz	706	671	647	671	407	389	0.9	n/a	95.6	95.6	88.9	1284	7.5	1.3	2	5.3	2x 110W	2180
	LVX(1.5kV) 355XC-2	450	518	355	2975	3570	380/660V, 400/690V 50Hz	793	753	726	753	457	437	0.9	n/a	95.8	95.8	89.1	1445	7.5	1.3	2	5.9	2x 110W	2340
	LVX(1.5kV) 355XD-2	500	575	355	2975	3570	380/660V, 400/690V 50Hz	881	837	807	837	507	485	0.9	n/a	95.8	95.8	89.1	1605	7.5	1.3	2	6.4	2x 110W	2520
	LVX(1.5kV) 400XA-2	560	644	400	2980	3570	380/660V, 400/690V 50Hz	990	940	906	940	570	545	0.9	n/a	95.5	95.5	88.8	1795	7.5	1.2	2.6	8.6	2x 110W	3200
	LVX(1.5kV) 400XB-2	630	725	400	2980	3570	380/660V, 400/690V 50Hz	1112	1057	1019	1057	640	613	0.9	n/a	95.6	95.6	88.9	2019	7.5	1.2	2.6	9.6	2x 110W	3490
	LVX(1.5kV) 400XC-2	710	n/a	400	2980	n/a	660V, 690V 50Hz					722	690	0.9	n/a	95.6	95.6	88.9	2275	7.5	1.2	2.6	11	2x 110W	3660
	LVX(1.5kV) 450XA-2	800	n/a	450	2985	n/a	660V, 690V 50Hz					814	778	0.9	n/a	95.6	95.6	88.9	2559	7.5	0.7	2	28.8	4x 110W	5000
	LVX(1.5kV) 450XB-2	900	n/a	450	2985	n/a	660V, 690V 50Hz					912	872	0.9	n/a	96.0	96.0	89.3	2879	7.5	0.7	2	32.5	4x 110W	5200
1500/1750rpm, 4-pole, 50/60Hz, IP55, Insulation F/B																									
	LVX(1.5kV) 355XB-4	400	460	355	1485	1785	380/660V, 400/690V 50Hz	730	693	668	693	420	402	0.87	n/a	95.7	95.7	89.0	2572	7	1.8	2	10.6	2x 110W	2300
	LVX(1.5kV) 355XC-4	450	518	355	1485	1785	380/660V, 400/690V 50Hz	820	779	751	779	472	452	0.87	n/a	95.8	95.8	89.1	2894	7	1.8	2	11.5	2x 110W	2460
	LVX(1.5kV) 355XD-4	500	575	355	1485	1785	380/660V, 400/690V 50Hz	912	866	835	866	525	502	0.87	n/a	95.8	95.8	89.1	3215	7.8	1.8	2	12.8	2x 110W	2720
	LVX(1.5kV) 400XA-4	560	644	400	1490	1785	380/660V, 400/690V 50Hz	996	946	912	946	573	548	0.89	n/a	96.0	96.0	89.3	3589	7	1.3	2.6	17.1	2x 110W	3360
	LVX(1.5kV) 400XB-4	630	725	400	1490	1785	380/660V, 400/690V 50Hz	1120	1064	1026	1064	645	617	0.89	n/a	96.0	96.0	89.3	4038	7	1.3	2.6	18.5	2x 110W	3430
	LVX(1.5kV) 400XC-4	710	817	400	1490	1785	380/660V, 400/690V 50Hz	1256	1197	1154	1197	725	694	0.89	n/a	96.2	96.2	89.5	4551	7	1.3	2.6	21.1	2x 110W	3620
	LVX(1.5kV) 450XA-4	800	920	450	1490	1785	660V, 690V 50Hz					842	805	0.87	n/a	95.6	95.6	88.9	5128	7.5	1.1	2	36.2	4x 110W	5200
	LVX(1.5kV) 450XB-4	900	1035	450	1490	1785	660V, 690V 50Hz					943	902	0.87	n/a	96.0	96.0	89.3	5768	7.5	1.1	2	40.3	4x 110W	5500
	LVX(1.5kV) 500XA-4	1000	1150	500	1490	1785	660V, 690V 50Hz					1053	1007	0.87	n/a	95.5	95.5	88.8	6409	7	0.7	2.2	60	2x 250W	6750
	LVX(1.5kV) 500XB-4	1120	1288	500	1490	1785	660V, 690V 50Hz					1165	1114	0.88	n/a	95.6	95.6	88.9	7179	7.5	0.7	2.2	68	2x 250W	7250
	LVX(1.5kV) 500XC-4	1250	1438	500	1490	1785	660V, 690V 50Hz					1298	1242	0.88	n/a	95.7	95.7	89.0	8012	8.5	0.7	2.5	78	2x 250W	7500
	LVX(1.5kV) 560XA-4	1400	1610	560	1490	1785	660V, 690V 50Hz					1440	1377	0.89	n/a	95.6	95.6	88.9	8973	6	0.9	2	82.5	2x 250W	8570
	LVX(1.5kV) 560XB-4	1500	1725	560	1490	1785	660V, 690V 50Hz					1545	1475	0.89	n/a	95.6	95.6	88.9	9614	6	0.9	2	91	2x 250W	8700
1000/1200rpm, 6-pole, 50/60Hz, IP55, Insulation F/B																									
	LVX(1.5kV) 355XB-6	315	362	355	990	1185	380/660V, 400/690V 50Hz	593	563	543	563	341	326	0.85	IE2	95.0	95.0	88.4	3039	6.5	1.8	2	13.5	2x 110W	2310
	LVX(1.5kV) 355XC-6	355	408	355	990	1185	380/660V, 400/690V 50Hz	666	635	612	635	383	368	0.85	IE2	95.0	95.0	88.4	3424	6.5	1.8	2	14.3	2x 110W	2490
	LVX(1.5kV) 355XD-6	400	460	355	990	1185	380/660V, 400/690V 50Hz	750	713	687	713	432	413	0.85	n/a	95.3	95.3	88.6	3859	6.5	1.8	2	15.4	2x 110W	2630
	LVX(1.5kV) 400XA-6	450	518	400	990	1185	380/660V, 400/690V 50Hz	832	790	761	790	479	458	0.86	n/a	95.6	95.6	88.9	4341	6.8	1.3	2.6	23.5	2x 110W	3660
	LVX(1.5kV) 400XB-6	500	575	400	990	1185	380/660V, 400/690V 50Hz	923	877	845	877	531	508	0.86	n/a	95.7	95.7	89.0	4823	6.8	1.3	2.6	26.4	2x 110W	3750
	LVX(1.5kV) 400XC-6	560	644	400	990	1185	380/660V, 400/690V 50Hz	1034	982	947	982	595	569	0.86	n/a	95.7	95.7	89.0	5402	6.8	1.3	2.6	28.8	2x 110W	3820
	LVX(1.5kV) 450XA-6	630	725	450	990	1185	380/660V, 400/690V 50Hz	1217	1156	1114	1156	701	670	0.83	n/a	94.8	94.8	88.2	6077	7	1.1	1.8	46.4	4x 110W	4800
	LVX(1.5kV) 450XB-6	710	817	450	990	1185	660V, 690V 50Hz					786	752	0.83	n/a	95.2	95.2	88.5	6849	7	1.1	1.8	50.2	4x 110W	5200
	LVX(1.5kV) 450XC-6	800	920	450	990	1185	660V, 690V 50Hz					883	845	0.83	n/a	95.5	95.5	88.8	7717	7	1.1	1.8	56.7	4x 110W	5600
	LVX(1.5kV) 500XA-6	900	1035	500	990	1185	660V, 690V 50Hz					980	938	0.84	n/a	95.6	95.6	88.9	8682	7	1	2.2	89	2x 250W	6750
	LVX(1.5kV) 500XB-6	1000	1150	500	990	1185	660V, 690V 50Hz					1089	1042	0.84	n/a	95.6	95.6	88.9	9646	7.5	1	2.2	98	2x 250W	7150
	LVX(1.5kV) 500XC-6	1120	1288	500	990	1185	660V, 690V 50Hz					1219	1166	0.84	n/a	95.7	95.7	89.0	10804	7.5	1	2.2	105	2x 250W	7250
	LVX(1.5kV) 560XA-6	1250	1438	560	995	1185	660V, 690V 50Hz					1345	1286	0.85	n/a	95.7	95.7	89.0	11997	6.5	0.8	1.8	105	2x 250W	8200
	LVX(1.5kV) 560XB-6	1400	1610	560	995	1185	660V, 690V 50Hz					1500	1436	0.85	n/a	96.0	96.0	89.3	13437	7	0.8	1.8	130	2x 250W	8500

Aluminium motors

Thermistors: winding 6x PT100; each bearing 1x PT100



Large Low Voltage LVX Cast Iron Range - 8pole, 10pole, 12pole - Insulation System 1.5kV

Material	TYPE	Output 50Hz kW	Output 60Hz kW	Frame Size	Speed 50Hz rpm	Speed 60Hz rpm	Voltage	Rated current 50Hz 380V A	400V A	415V A	460V A	60Hz 660V A	960V A	Power Factor Cos φ	Efficiency Class	100% Load %	75% Load %	50% Load %	Rated torque Nm	Ratio Starting current	Starting torque	B/down torque	Inertia kgm²	Space Heaters	Weight kg
750/900rpm, 8-pole, 50/60Hz, IP55, Insulation F/B																									
	LVX(1.5kV) 355XB-8	250	288	355	740	885	380/660V, 400/690V 50Hz	520	494	476	494	300	287	0.77	n/a	94.8	94.8	88.2	3226	6.5	1.6	2	14.3	2x 110W	2410
	LVX(1.5kV) 355XC-8	280	322	355	740	885	380/660V, 400/690V 50Hz	582	553	533	553	335	320	0.77	n/a	95.0	95.0	88.4	3614	6.5	1.8	2	15	2x 110W	2600
	LVX(1.5kV) 355XD-8	315	362	355	740	885	380/660V, 400/690V 50Hz	654	622	599	622	377	360	0.77	n/a	95.0	95.0	88.4	4065	6.5	1.8	2	15.9	2x 110W	2750
	LVX(1.5kV) 400XA-8	355	408	400	740	885	380/660V, 400/690V 50Hz	684	650	626	650	394	377	0.83	n/a	95.0	95.0	88.4	4581	6	1.2	2.4	24.2	2x 110W	3350
	LVX(1.5kV) 400XB-8	400	460	400	740	885	380/660V, 400/690V 50Hz	771	732	706	732	444	424	0.83	n/a	95.0	95.0	88.4	5162	6	1.2	2.4	26	2x 110W	3430
	LVX(1.5kV) 400XC-8	450	518	400	740	885	380/660V, 400/690V 50Hz	865	822	792	822	498	477	0.83	n/a	95.2	95.2	88.5	5807	6	1.2	2.4	29	2x 110W	3760
	LVX(1.5kV) 450XA-8	500	575	450	745	885	380/660V, 400/690V 50Hz	1064	1010	974	1010	613	586	0.76	n/a	94.0	94.0	87.4	6409	7	1.1	1.8	48.5	4x 110W	4900
	LVX(1.5kV) 450XB-8	560	644	450	745	885	380/660V, 400/690V 50Hz	1185	1125	1085	1125	682	652	0.76	n/a	94.5	94.5	87.9	7179	7	1.1	1.8	52.1	4x 110W	5300
	LVX(1.5kV) 500XA-8	630	725	500	740	885	380/660V, 400/690V 50Hz	1233	1176	1133	1176	712	681	0.81	n/a	95.5	95.5	88.8	8130	7	0.8	2.2	88	2x 250W	6750
	LVX(1.5kV) 500XB-8	710	817	500	740	885	380/660V, 400/690V 50Hz	1391	1325	1277	1325	803	768	0.81	n/a	95.5	95.5	88.8	9163	7	0.8	2.2	92	2x 250W	7000
	LVX(1.5kV) 500XC-8	800	920	500	740	885	380/660V, 400/690V 50Hz	1566	1491	1437	1491	904	864	0.81	n/a	95.6	95.6	88.9	10324	7	0.8	2.2	105	2x 250W	7250
	LVX(1.5kV) 560XA-8	900	1035	560	745	885	660V, 690V 50Hz					1020	974	0.81	n/a	95.5	95.5	88.8	11537	5.5	0.8	1.8	135	2x 250W	8000
	LVX(1.5kV) 560XB-8	1000	1150	560	745	885	660V, 690V 50Hz					1130	1079	0.81	n/a	95.7	95.7	89.0	12819	5.5	0.8	1.8	160	2x 250W	8500
600/720rpm, 10-pole, 50/60Hz, IP55, Insulation F/B																									
	LVX(1.5kV) 355XA-10	180	207	355	590	705	380/660V, 400/690V 50Hz	386	367	353	367	222	213	0.75	n/a	94.5	94.5	87.9	2914	5.5	1.2	1.8	15.6	2x 110W	2150
	LVX(1.5kV) 355XB-10	200	230	355	590	705	380/660V, 400/690V 50Hz	428	406	392	406	246	236	0.75	n/a	94.7	94.7	88.1	3237	5.5	1.2	1.8	17.8	2x 110W	2230
	LVX(1.5kV) 355XC-10	225	259	355	590	705	380/660V, 400/690V 50Hz	481	457	441	457	277	265	0.75	n/a	94.7	94.7	88.1	3642	5.5	1.2	1.8	19.4	2x 110W	2410
	LVX(1.5kV) 355XD-10	250	288	355	590	705	380/660V, 400/690V 50Hz	533	506	488	506	307	294	0.75	n/a	95.0	95.0	88.4	4047	5.5	1.2	1.8	21.3	2x 110W	2600
	LVX(1.5kV) 400XA-10	280	322	400	590	705	380/660V, 400/690V 50Hz	560	532	513	532	322	308	0.8	n/a	95.0	95.0	88.4	4532	5.5	1	2.3	25.6	2x 110W	3220
	LVX(1.5kV) 400XB-10	315	362	400	590	705	380/660V, 400/690V 50Hz	630	598	577	598	363	347	0.8	n/a	95.0	95.0	88.4	5099	5.5	1	2.3	26.9	2x 110W	3450
	LVX(1.5kV) 450XA-10	355	408	450	595	705	380/660V, 400/690V 50Hz	767	728	702	728	442	422	0.75	n/a	93.8	93.8	87.2	5698	6.5	0.9	1.8	42.5	4x 110W	5100
	LVX(1.5kV) 450XB-10	400	460	450	595	705	380/660V, 400/690V 50Hz	860	817	788	817	495	474	0.75	n/a	94.2	94.2	87.6	6420	6.5	0.9	1.8	46.2	4x 110W	5400
	LVX(1.5kV) 450XC-10	450	518	450	595	705	380/660V, 400/690V 50Hz	965	916	883	916	556	531	0.75	n/a	94.5	94.5	87.9	7223	6.5	0.9	1.8	50.2	4x 110W	5700
	LVX(1.5kV) 500XA-10	500	575	500	590	705	380/660V, 400/690V 50Hz	992	946	911	946	573	548	0.8	n/a	95.4	95.4	88.7	8093	7	1	2.2	98	2x 250W	6650
	LVX(1.5kV) 500XB-10	560	644	500	590	705	380/660V, 400/690V 50Hz	1112	1059	1021	1059	642	614	0.8	n/a	95.4	95.4	88.7	9064	7	1	2.2	110	2x 250W	6850
	LVX(1.5kV) 500XC-10	630	725	500	590	705	380/660V, 400/690V 50Hz	1249	1190	1147	1190	721	690	0.8	n/a	95.5	95.5	88.8	10197	7	1	2.2	125	2x 250W	7000
	LVX(1.5kV) 560XA-10	710	817	560	595	705	380/660V, 400/690V 50Hz	1384	1318	1270	1318	799	764	0.81	n/a	96.0	96.0	89.3	11396	6.5	0.8	1.8	83.5	2x 250W	6880
	LVX(1.5kV) 560XB-10	800	920	560	595	705	380/660V, 400/690V 50Hz	1560	1482	1428	1482	900	859	0.81	n/a	96.2	96.2	89.5	12840	6.5	0.8	1.8	85.3	2x 250W	7080
	LVX(1.5kV) 560XC-10	900	1035	560	595	705	660V, 690V 50Hz					1012	963	0.81	n/a	96.5	96.5	89.7	14445	6.5	0.8	1.8	90.4	2x 250W	7350
500/600rpm, 12-pole, 50/60Hz, IP55, Insulation F/B																									
	LVX(1.5kV) 355XA-12	132	152	355	490	585	380/660V, 400/690V 50Hz	304	289	278	289	175	167	0.71	n/a	93.0	93.0	86.5	2573	5	1	1.8	13.5	2x 110W	2145
	LVX(1.5kV) 355XB-12	160	184	355	490	585	380/660V, 400/690V 50Hz	368	350	337	350	212	203	0.71	n/a	93.0	93.0	86.5	3118	5	1	1.8	15.8	2x 110W	2210
	LVX(1.5kV) 355XC-12	180	207	355	490	585	380/660V, 400/690V 50Hz	414	393	379	393	239	228	0.71	n/a	93.0	93.0	86.5	3508	5	1	1.8	18.5	2x 110W	2410
	LVX(1.5kV) 400XA-12	200	230	400	490	585	380/660V, 400/690V 50Hz	437	415	400	415	252	241	0.74	n/a	94.0	94.0	87.4	3898	5.5	1	2	24.8	2x 110W	3220
	LVX(1.5kV) 400XB-12	225	259	400	490	585	380/660V, 400/690V 50Hz	490	466	449	466	282	270	0.74	n/a	94.2	94.2	87.6	4385	5.5	1	2	25.6	2x 110W	3450
	LVX(1.5kV) 450XA-12	250	288	450	495	585	380/660V, 400/690V 50Hz	556	528	509	528	320	306	0.73	n/a	93.6	93.6	87.0	4823	6	0.8	1.8	48.3	4x 110W	5400
	LVX(1.5kV) 450XB-12	280	322	450	495	585	380/660V, 400/690V 50Hz	620	589	568	589	357	341	0.73	n/a	94.0	94.0	87.4	5402	6	0.8	1.8	53.2	4x 110W	5800
	LVX(1.5kV) 450XC-12	315	362	450	495	585	380/660V, 400/690V 50Hz	696	660	637	660	400	383	0.73	n/a	94.3	94.3	87.7	6077	6	0.8	1.8	59.4	4x 110W	6200
	LVX(1.5kV) 500XA-12	355	408	500	490	585	380/660V, 400/690V 50Hz	746	709	683	709	430	411	0.76	n/a	95.1	95.1	88.4	6919	6	0.8	1.8	100	2x 250W	6500
	LVX(1.5kV) 500XB-12	400	460	500	490	585	380/660V, 400/690V 50Hz	840	798	769	798	484	463	0.76	n/a	95.2	95.2	88.5	7796	6	0.8	1.8	112	2x 250W	6750
	LVX(1.5kV) 500XC-12	450	518	500	490	585	380/660V, 400/690V 50Hz	944	897	864	897	544	520	0.76	n/a	95.3	95.3	88.6	8770	6	0.8	1.8	126	2x 250W	6950
	LVX(1.5kV) 560XA-12	500	575	560	495	585	380/660V, 400/690V 50Hz	1039	987	951	987	598	572	0.77	n/a	95.0	95.0	88.4	9646	6.5	0.8	1.8	135	2x 250W	6900
	LVX(1.5kV) 560XB-12	560	644	560	495	585	380/660V, 400/690V 50Hz	1163	1105	1065	1105	670	641	0.77	n/a	95.0	95.0	88.4	10804	6.5	0.8	1.8	152	2x 250W	7100
	LVX(1.5kV) 560XC-12	630	725	560	495	585	380/660V, 400/690V 50Hz	1305	1239	1194	1239	751	718	0.77	n/a	95.3	95.3	88.6	12155	6.5	0.8	1.8	172	2x 250W	7500

Thermistors: winding 6x PT100; each bearing 1x PT100

Large Low Voltage LVX Cast Iron Range - 2pole, 4pole, 6pole - Insulation System 3kV

Material	TYPE	Output 50Hz kW	Output 60Hz kW	Frame Size	Speed 50Hz rpm	Speed 60Hz rpm	Voltage	Rated current 50Hz 380V A	400V A	415V A	460V A	60Hz 660V A	60Hz 960V A	Power Factor Cos φ	Efficiency Class	Efficiency 100% Load %	Efficiency 75% Load %	Efficiency 50% Load %	Rated torque Nm	Ratio Starting current	Ratio Starting torque	Ratio B/down torque	Inertia kgm²	Space Heaters	Weight kg
3000/3600rpm, 2-pole, 50/60Hz, IP55, Insulation F/B																									
▨	LVX(3KV) 450X1-2	560	644	450	2980	3570	380/660V, 400/690V 50Hz	990	940	906	940	570	545	0.9	n/a	95.5	95.5	88.8	1795	7.5	1.2	2.6	17.7	2x 110W	3700
▨	LVX(3KV) 450X2-2	630	725	450	2980	3570	380/660V, 400/690V 50Hz	1113	1057	1019	1057	641	613	0.9	n/a	95.6	95.6	88.9	2019	7.5	1.2	2.6	21.4	2x 110W	4150
▨	LVX(3KV) 450X3-2	710	817	450	2980	3570	660V, 690V 50Hz					747	714	0.87	n/a	95.6	95.6	88.9	2275	7.5	1.2	2.6	25.1	2x 110W	4600
▨	LVX(3KV) 450XA-2	800	920	450	2985	3570	660V, 690V 50Hz					841	805	0.87	n/a	95.6	95.6	88.9	2559	7.5	0.7	2	28.8	4x 110W	5050
▨	LVX(3KV) 450XB-2	900	1035	450	2985	3570	660V, 690V 50Hz					947	905	0.87	n/a	95.6	95.6	88.9	2879	7.5	0.7	2	32.5	4x 110W	5500
1500/1750rpm, 4-pole, 50/60Hz, IP55, Insulation F/B																									
▨	LVX(3KV) 355XA-4	355	408	355	1485	1785	380/660V, 400/690V 50Hz	652	619	597	619	375	359	0.87	IE2	95.1	95.1	88.4	2283	7	1.8	2	9.8	2x 110W	2560
▨	LVX(3KV) 400X1-4	400	460	400	1485	1785	380/660V, 400/690V 50Hz	730	693	668	693	420	402	0.87	n/a	95.7	95.7	89	2572	7	1.8	2	10.6	2x 110W	2560
▨	LVX(3KV) 400X2-4	450	518	400	1485	1785	380/660V, 400/690V 50Hz	821	780	752	780	473	452	0.87	n/a	95.7	95.7	89	2894	7	1.8	2	11.6	2x 110W	2960
▨	LVX(3KV) 400X3-4	500	575	400	1485	1785	380/660V, 400/690V 50Hz	911	866	835	866	525	502	0.87	n/a	95.8	95.8	89.1	3215	7.8	1.8	2	12.8	2x 110W	3360
▨	LVX(3KV) 400X4-4	560	644	400	1490	1785	380/660V, 400/690V 50Hz	1007	957	922	957	580	555	0.88	n/a	96	96	89.3	3589	7	1.3	2.6	17.1	2x 110W	3760
▨	LVX(3KV) 450X1-4	630	725	450	1490	1785	380/660V, 400/690V 50Hz	1133	1076	1038	1076	652	624	0.88	n/a	96	96	89.3	4038	7	1.3	2.6	28	2x 110W	4600
▨	LVX(3KV) 450X2-4	710	817	450	1490	1785	380/660V, 400/690V 50Hz	1274	1211	1167	1211	734	702	0.88	n/a	96.2	96.2	89.5	4551	7	1.3	2.6	32.1	2x 110W	5050
▨	LVX(3KV) 450XA-4	800	920	450	1490	1785	660V, 690V 50Hz					841	805	0.87	n/a	95.6	95.6	88.9	5128	7.5	1.1	2	36.2	4x 110W	5500
▨	LVX(3KV) 450XB-4	900	1035	450	1490	1785	660V, 690V 50Hz					947	905	0.87	n/a	95.6	95.6	88.9	5768	7.5	1.1	2	40.3	4x 110W	5950
▨	LVX(3KV) 500XA-4	1000	1150	500	1490	1785	660V, 690V 50Hz					1053	1007	0.87	n/a	95.5	95.5	88.8	6409	7	0.7	2.2	60	2x 250W	7250
▨	LVX(3KV) 500XB-4	1120	1288	500	1490	1785	660V, 690V 50Hz					1165	1114	0.88	n/a	95.6	95.6	88.9	7179	7.5	0.7	2.2	68	2x 250W	7750
▨	LVX(3KV) 500XC-4	1250	1438	500	1490	1785	660V, 690V 50Hz					1298	1242	0.88	n/a	95.7	95.7	89	8012	8.5	0.7	2.5	78	2x 250W	8250
▨	LVX(3KV) 560XA-4	1400	1610	560	1490	1785	660V, 690V 50Hz					1439	1377	0.89	n/a	95.6	95.6	88.9	8973	6	0.9	2	82.5	2x 250W	9350
▨	LVX(3KV) 560XB-4	1500	1725	560	1490	1785	660V, 690V 50Hz					1542	1475	0.89	n/a	95.6	95.6	88.9	9614	6	0.9	2	91	2x 250W	9850
1000/1200rpm, 6-pole, 50/60Hz, IP55, Insulation F/B																									
▨	LVX(3KV) 355XB-6	315	362	355	990	1185	380/660V, 400/690V 50Hz	593	563	543	563	341	326	0.85	IE2	95	95	88.4	3039	6.5	1.8	2	13.5	2x 110W	2610
▨	LVX(3KV) 400X1-6	355	408	400	990	1185	380/660V, 400/690V 50Hz	668	635	612	635	385	368	0.85	IE2	95	95	88.4	3424	6.5	1.8	2	17.7	2x 110W	3050
▨	LVX(3KV) 400X2-6	400	460	400	990	1185	380/660V, 400/690V 50Hz	750	713	687	713	432	413	0.85	n/a	95.3	95.3	88.6	3859	6.5	1.8	2	20.6	2x 110W	3400
▨	LVX(3KV) 400XA-6	450	518	400	990	1185	380/660V, 400/690V 50Hz	841	799	770	799	484	463	0.85	n/a	95.6	95.6	88.9	4341	6.8	1.3	2.6	23.5	2x 110W	3750
▨	LVX(3KV) 400XB-6	500	575	400	990	1185	380/660V, 400/690V 50Hz	934	887	855	887	538	514	0.85	n/a	95.7	95.7	89	4823	6.8	1.3	2.6	26.4	2x 110W	4100
▨	LVX(3KV) 450X-6	560	644	450	990	1185	380/660V, 400/690V 50Hz	1034	982	947	982	595	569	0.86	n/a	95.7	95.7	89	5402	6.8	1.3	2.6	42.6	2x 110W	4800
▨	LVX(3KV) 450XA-6	630	725	450	990	1185	380/660V, 400/690V 50Hz	1217	1156	1114	1156	700	670	0.83	n/a	94.8	94.8	88.2	6077	7	1.1	1.8	46.4	4x 110W	5200
▨	LVX(3KV) 450XB-6	710	817	450	990	1185	660V, 690V 50Hz					786	752	0.83	n/a	95.2	95.2	88.5	6849	7	1.1	1.8	50.2	4x 110W	5600
▨	LVX(3KV) 500X-6	800	920	500	990	1185	660V, 690V 50Hz					883	845	0.83	n/a	95.5	95.5	88.8	7717	7	1.1	1.8	80	4x 110W	6650
▨	LVX(3KV) 500XA-6	900	1035	500	990	1185	660V, 690V 50Hz					980	938	0.84	n/a	95.6	95.6	88.9	8682	7	1	2.2	89	2x 250W	7150
▨	LVX(3KV) 500XB-6	1000	1150	500	990	1185	660V, 690V 50Hz					1089	1042	0.84	n/a	95.6	95.6	88.9	9646	7.5	1	2.2	98	2x 250W	7650
▨	LVX(3KV) 560X-6	1120	1288	560	990	1185	660V, 690V 50Hz					1219	1166	0.84	n/a	95.7	95.7	89	10804	7.5	1	2.2	90	2x 250W	7990
▨	LVX(3KV) 560XA-6	1250	1438	560	995	1185	660V, 690V 50Hz					1344	1286	0.85	n/a	95.7	95.7	89	11997	6.5	0.8	1.8	105	2x 250W	8500
▨	LVX(3KV) 560XB-6	1400	1610	560	995	1185	660V, 690V 50Hz					1501	1436	0.85	n/a	96	96	89.3	13437	7	0.8	1.8	130	2x 250W	9010

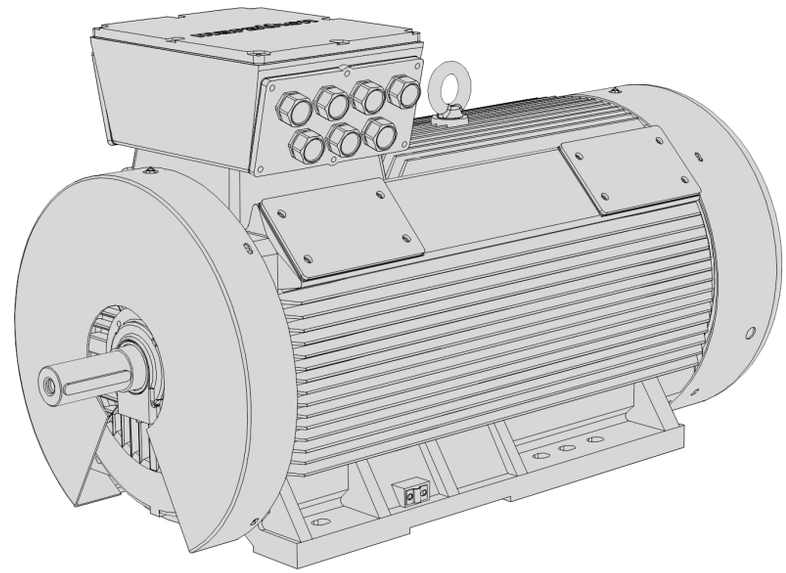
▨ Aluminium motors

Thermistors: winding 6x PT100; each bearing 1x PT100

Large Low Voltage LVX Cast Iron Range - 8pole - Insulation System 3kV

Material	TYPE	Output		Frame	Speed		Voltage	Rated current 50Hz			60Hz	50Hz		Power Factor	Efficiency				Rated torque	Ratio			Inertia	Space	Weight
		50Hz kW	60Hz kW	Size	50Hz rpm	60Hz rpm		380V A	400V A	415V A	460V A	660V A	960V A	Cos φ	Class	100% Load %	75% Load %	50% Load %	Nm	Starting current	Starting torque	B/down torque	kgm²	Heaters	kg
750/900rpm, 8-pole, 50/60Hz, IP55, Insulation F/B																									
	LVX(3KV) 355XB-8	250	288	355	740	885	380/660V, 400/690V 50Hz	520	494	476	494	300	287	0.77	n/a	94.8	94.8	88.2	3226	6.5	1.6	2	14.3	2x 110W	2710
	LVX(3KV) 400X-8	315	362	400	740	885	380/660V, 400/690V 50Hz	654	622	599	622	377	360	0.77	n/a	95	95	88.4	4065	6.5	1.8	2	22.4	2x 110W	3080
	LVX(3KV) 400XA-8	355	408	400	740	885	380/660V, 400/690V 50Hz	692	658	634	658	399	381	0.82	n/a	95	95	88.4	4581	6	1.2	2.4	24.2	2x 110W	3430
	LVX(3KV) 400XB-8	400	460	400	740	885	380/660V, 400/690V 50Hz	780	741	714	741	449	430	0.82	n/a	95	95	88.4	5162	6	1.2	2.4	26	2x 110W	3780
	LVX(3KV) 450X-8	450	518	450	740	885	380/660V, 400/690V 50Hz	865	822	792	822	498	477	0.83	n/a	95.2	95.2	88.5	5807	6	1.2	2.4	44.9	2x 110W	4800
	LVX(3KV) 450XA-8	500	575	450	745	885	380/660V, 400/690V 50Hz	1063	1010	974	1010	612	586	0.76	n/a	94	94	87.4	6409	7	1.1	1.8	48.5	4x 110W	5200
	LVX(3KV) 450XB-8	560	644	450	745	885	380/660V, 400/690V 50Hz	1185	1125	1085	1125	682	652	0.76	n/a	94.5	94.5	87.9	7179	7	1.1	1.8	52.1	4x 110W	5600
	LVX(3KV) 500XA-8	630	725	500	740	885	380/660V, 400/690V 50Hz	1237	1176	1133	1176	712	681	0.81	n/a	95.5	95.5	88.8	8130	7	0.8	2.2	88	2x 250W	7000
	LVX(3KV) 500XB-8	710	817	500	740	885	380/660V, 400/690V 50Hz	1395	1325	1277	1325	803	768	0.81	n/a	95.5	95.5	88.8	9163	7	0.8	2.2	92	2x 250W	7250
	LVX(3KV) 500XC-8	800	920	500	740	885	380/660V, 400/690V 50Hz	1570	1491	1437	1491	904	864	0.81	n/a	95.6	95.6	88.9	10324	7	0.8	2.2	105	2x 250W	7500
	LVX(3KV) 560XA-8	900	1035	560	745	885	660V, 690V 50Hz					1018	974	0.81	n/a	95.5	95.5	88.8	11537	5.5	0.8	1.8	135	2x 250W	8400
	LVX(3KV) 560XB1-8	1000	1150	560	745	885	660V, 690V 50Hz					1129	1079	0.81	n/a	95.7	95.7	89	12819	5.5	0.8	1.8	160	2x 250W	8800
	LVX(3KV) 560XB2-8	1120	1288	560	745	885	660V, 690V 50Hz					1264	1209	0.81	n/a	95.7	95.7	89	14357	5.5	0.8	1.8	189	2x 250W	9200

Aluminium motors

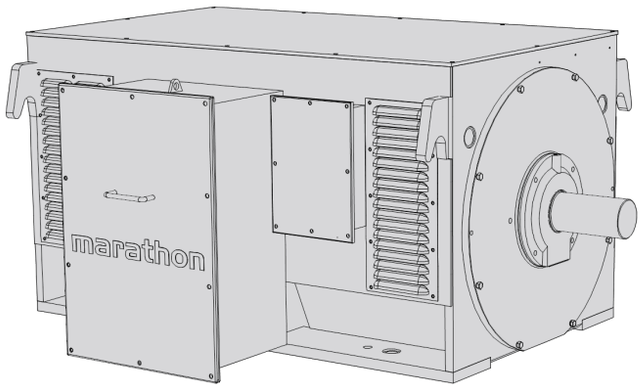


TYPE	Output kW	Frame Size	Speed 50Hz rpm	Speed 60Hz rpm	Current (at 50Hz) of Standard Line Voltages at 3kV A	at 3.3kV A	at 4.16kV A	at 5kV A	at 6kV A	at 6.6kV A	and at 60Hz at 4kV A	at 4.16kV A	at 6.6kV A	Power Factor Cos φ	Efficiency (at 50Hz) 100% Load %	75% Load %	50% Load %	60Hz 100% Load %	Rated torque Nm	Ratio Starting current	Starting torque	B/down torque	Weight Kg
1500rpm/1800rpm 4pole, IP23, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																							
HDP(SE)3551-4	185	355	1485	1782	45.1	41.0	32.6	27.1	22.6	20.5	34.0	32.7	20.6	0.85	92.8	92.4	91.0	92.3	1190	6.5	0.8	1.8	1560
HDP(SE)3552-4	200	355	1485	1782	48.6	44.2	35.1	29.2	24.3	22.1	36.7	35.3	22.2	0.85	93.1	92.7	91.3	92.6	1286	6.5	0.8	1.8	1650
HDP(SE)3553-4	220	355	1485	1782	53.4	48.5	38.5	32.0	26.7	24.3	40.3	38.7	24.4	0.85	93.3	92.9	91.5	92.8	1415	6.5	0.8	1.8	1780
HDP(SE)3554-4	250	355	1485	1782	60.6	55.1	43.7	36.4	30.3	27.5	45.7	43.9	27.7	0.85	93.4	93.0	91.6	92.9	1608	6.5	0.8	1.8	1900
HDP(SE)3555-4	280	355	1485	1782	67.0	60.9	48.3	40.2	33.5	30.5	50.5	48.6	30.6	0.86	93.5	93.1	91.7	93.0	1801	6.5	0.8	1.8	2070
HDP(SE)3556-4	315	355	1485	1782	75.3	68.5	54.3	45.2	37.7	34.2	56.8	54.6	34.4	0.86	93.6	93.2	91.8	93.1	2026	6.5	0.8	1.8	2320
HDP(SE)4001-4	355	400	1485	1782	84.7	77.0	61.1	50.8	42.3	38.5	63.9	61.4	38.7	0.86	93.8	93.4	92.0	93.3	2283	6.5	0.8	1.8	2250
HDP(SE)4002-4	400	400	1485	1782	95.2	86.6	68.7	57.1	47.6	43.3	71.8	69.0	43.5	0.86	94.0	93.6	92.2	93.5	2572	6.5	0.8	1.8	2320
HDP(SE)4003-4	450	400	1485	1782	106.9	97.2	77.1	64.1	53.5	48.6	80.6	77.5	48.9	0.86	94.2	93.8	92.4	93.7	2894	6.5	0.8	1.8	2450
HDP(SE)4004-4	500	400	1485	1782	117.3	106.6	84.6	70.4	58.6	53.3	88.4	85.0	53.6	0.87	94.3	93.9	92.5	93.8	3215	6.5	0.8	1.8	2530
HDP(SE)4005-4	560	400	1485	1782	131.1	119.2	94.5	78.7	65.5	59.6	98.8	95.0	59.9	0.87	94.5	94.1	92.7	94.0	3601	6.5	0.8	1.8	2630
HDP(SE)4501-4	630	450	1485	1782	147.0	133.6	106.0	88.2	73.5	66.8	110.8	106.6	67.2	0.87	94.8	94.4	93.0	94.3	4052	6.5	0.8	1.8	3390
HDP(SE)4502-4	710	450	1485	1782	165.3	150.3	119.2	99.2	82.7	75.1	124.7	119.9	75.5	0.87	95.0	94.6	93.2	94.5	4566	6.5	0.8	1.8	3490
HDP(SE)4503-4	800	450	1485	1782	186.1	169.2	134.2	111.7	93.0	84.6	140.3	134.9	85.0	0.87	95.1	94.7	93.3	94.6	5145	6.5	0.8	1.8	3600
HDP(SE)4504-4	900	450	1485	1782	209.1	190.1	150.8	125.5	104.6	95.1	157.7	151.6	95.6	0.87	95.2	94.8	93.4	94.7	5788	6.5	0.8	1.8	3750
HDP(SE)5001-4	1000	500	1485	1782	232.1	211.0	167.4	139.3	116.1	105.5	175.0	168.3	106.1	0.87	95.3	94.9	93.5	94.8	6431	6.5	0.7	1.8	5000
HDP(SE)5002-4	1120	500	1485	1782	256.8	233.4	185.2	154.1	128.4	116.7	193.6	186.1	117.3	0.88	95.4	95.0	93.6	94.9	7203	6.5	0.7	1.8	5250
HDP(SE)5003-4	1250	500	1485	1782	286.3	260.2	206.4	171.8	143.1	130.1	215.8	207.5	130.8	0.88	95.5	95.1	93.7	95.0	8039	6.5	0.7	1.8	5500
HDP(SE)5004-4	1400	500	1485	1782	320.3	291.2	231.0	192.2	160.1	145.6	241.5	232.2	146.3	0.88	95.6	95.2	93.8	95.1	9003	6.5	0.7	1.8	5750
HDP(SE)5601-4	1600	560	1485	1782	361.5	328.7	260.7	216.9	180.8	164.3	272.6	262.1	165.2	0.89	95.7	95.3	93.9	95.2	10290	6.5	0.6	1.8	6050
HDP(SE)5602-4	1800	560	1485	1782	406.3	369.4	293.0	243.8	203.2	184.7	306.3	294.5	185.7	0.89	95.8	95.4	94.0	95.3	11576	6.5	0.6	1.8	6350
HDP(SE)5603-4	2000	560	1485	1782	451.0	410.0	325.2	270.6	225.5	205.0	340.0	326.9	206.1	0.89	95.9	95.5	94.1	95.4	12862	6.5	0.6	1.8	6500
HDP(SE)6301-4	2240	630	1492	1790	504.6	458.7	363.9	302.7	252.3	229.3	380.4	365.8	230.5	0.89	96.0	95.6	94.2	95.5	14338	6.5	0.6	1.8	7550
HDP(SE)6302-4	2500	630	1492	1790	562.5	511.4	405.7	337.5	281.3	255.7	424.1	407.8	257.0	0.89	96.1	95.7	94.3	95.6	16002	6.5	0.6	1.8	7910
HDP(SE)6303-4	2800	630	1493	1792	629.4	572.2	453.9	377.6	314.7	286.1	474.5	456.3	287.6	0.89	96.2	95.8	94.4	95.7	17910	6.5	0.6	1.8	8300

"Standard Line" High Voltage motors are pre-designed standard motors available at reduced lead times.
They are available as **Standard Efficiency Motors** and also as **Higher Efficiency Motors.**
For different voltages, speeds and power outputs please contact the Marathon staff.

"Standard Line" Voltages							
50Hz:	3kV	3.3kV	4.16kV	5kV	6kV	6.6kV	10kV
60Hz:	4kV	4.16kV	6.6kV	13.8kV			

TYPE	Output	Frame Size	Speed		Current		Power Factor	Efficiency (at 50Hz)			60Hz	Rated torque	Ratio			Weight
	kW		50Hz rpm	60Hz rpm	50Hz 10kV A	60Hz 13.8kV A	Cos φ	100% Load %	75% Load %	50% Load %	100% Load %	Nm	Starting current	Starting torque	B/down torque	Kg
1500rpm/1800rpm 4pole, IP23, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																
HDP(SE)400A-4	185	400	1480	1776	13.7	10.0	0.86	90.7	90.3	88.9	90.2	1194	7.0	0.7	1.8	2480
HDP(SE)400B-4	200	400	1480	1776	14.5	10.6	0.86	92.5	92.1	90.7	92.0	1291	7.0	0.7	1.8	2550
HDP(SE)4001-4	220	400	1480	1776	15.9	11.6	0.86	92.8	92.4	91.0	92.3	1420	7.0	0.7	1.8	2640
HDP(SE)4002-4	250	400	1480	1776	18.1	13.2	0.86	92.5	92.1	90.7	92.0	1613	7.0	0.7	1.8	2750
HDP(SE)4003-4	280	400	1480	1776	20.2	14.7	0.86	93.2	92.8	91.4	92.7	1807	7.0	0.7	1.8	2870
HDP(SE)4004-4	315	400	1480	1776	22.7	16.6	0.86	93.0	92.6	91.2	92.5	2033	7.0	0.7	1.8	3000
HDP(SE)4501-4	355	450	1485	1782	25.5	18.6	0.86	93.3	92.9	91.5	92.8	2283	7.0	0.7	1.8	2850
HDP(SE)4502-4	400	450	1485	1782	28.7	20.9	0.86	93.5	93.1	91.7	93.0	2572	7.0	0.7	1.8	2950
HDP(SE)4503-4	450	450	1485	1782	32.2	23.4	0.86	93.9	93.5	92.1	93.4	2894	7.0	0.7	1.8	3100
HDP(SE)4504-4	500	450	1485	1782	35.7	26.0	0.86	94.0	93.6	92.2	93.5	3215	7.0	0.7	1.8	3250
HDP(SE)4505-4	560	450	1485	1782	39.9	29.1	0.86	94.2	93.8	92.4	93.7	3601	7.0	0.7	1.8	3400
HDP(SE)4506-4	630	450	1485	1782	44.8	32.6	0.86	94.4	94.0	92.6	93.9	4052	7.0	0.7	1.8	3590
HDP(SE)5001-4	710	500	1485	1782	49.6	36.1	0.87	95.0	94.6	93.2	94.5	4566	7.0	0.7	1.8	4530
HDP(SE)5002-4	800	500	1485	1782	55.8	40.7	0.87	95.1	94.7	93.3	94.6	5145	7.0	0.7	1.8	4660
HDP(SE)5003-4	900	500	1485	1782	62.0	45.2	0.88	95.2	94.8	93.4	94.7	5788	7.0	0.7	1.8	4820
HDP(SE)5004-4	1000	500	1485	1782	68.8	50.2	0.88	95.3	94.9	93.5	94.8	6431	7.0	0.7	1.8	5110
HDP(SE)5005-4	1120	500	1485	1782	77.0	56.1	0.88	95.4	95.0	93.6	94.9	7203	7.0	0.7	1.8	5400
HDP(SE)5601-4	1250	560	1485	1782	84.9	61.9	0.89	95.5	95.1	93.7	95.0	8039	7.0	0.7	1.8	5900
HDP(SE)5602-4	1400	560	1485	1782	94.9	69.1	0.89	95.7	95.3	93.9	95.2	9003	7.0	0.7	1.8	6200
HDP(SE)5603-4	1600	560	1485	1782	108.3	78.9	0.89	95.8	95.4	94.0	95.3	10290	7.0	0.7	1.8	6500
HDP(SE)6301-4	1800	630	1492	1790	121.8	88.7	0.89	95.9	95.5	94.1	95.4	11521	7.0	0.6	1.8	7580
HDP(SE)6302-4	2000	630	1493	1792	135.2	98.4	0.89	96.0	95.6	94.2	95.5	12793	7.0	0.6	1.8	7950
HDP(SE)6303-4	2240	630	1493	1792	151.2	110.1	0.89	96.1	95.7	94.3	95.6	14328	7.0	0.6	1.8	8330



Medium Voltage - Fabricated Frame HDP Range - Open Drip-proof IP23 IC01 - 6pole & 8pole — Standard Efficiency

TYPE	Output kW	Frame Size	Speed 50Hz rpm	Speed 60Hz rpm	Current (at 50Hz) of Standard Line Voltages at 3kV A	at 3.3kV A	at 4.16kV A	at 5kV A	at 6kV A	at 6.6kV A	and at 60Hz at 4kV A	at 4.16kV A	at 6.6kV A	Power Factor Cos φ	Efficiency (at 50Hz) 100% Load %	75% Load %	50% Load %	60Hz 100% Load %	Rated torque Nm	Ratio Starting current	Starting torque	B/down torque	Weight Kg
1000rpm/1200rpm 6pole, IP23, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																							
HDP(SE)3553-6	185	355	985	1182	46.9	42.6	33.8	28.1	23.4	21.3	35.4	34.0	21.4	0.82	92.6	92.2	90.8	92.1	1794	6.0	0.8	1.8	1860
HDP(SE)3554-6	200	355	985	1182	50.6	46.0	36.5	30.3	25.3	23.0	38.1	36.7	23.1	0.82	92.8	92.4	91.0	92.3	1939	6.0	0.8	1.8	1980
HDP(SE)3555-6	220	355	985	1182	55.5	50.5	40.0	33.3	27.8	25.2	41.9	40.3	25.4	0.82	93.0	92.6	91.2	92.5	2133	6.0	0.8	1.8	2070
HDP(SE)3556-6	250	355	985	1182	62.9	57.2	45.4	37.7	31.4	28.6	47.4	45.6	28.7	0.82	93.3	92.9	91.5	92.8	2424	6.0	0.8	1.8	2190
HDP(SE)4002-6	280	400	985	1182	69.4	63.1	50.1	41.7	34.7	31.6	52.4	50.3	31.7	0.83	93.5	93.1	91.7	93.0	2715	6.0	0.8	1.8	2810
HDP(SE)4003-6	315	400	985	1182	78.0	70.9	56.2	46.8	39.0	35.4	58.8	56.5	35.6	0.83	93.7	93.3	91.9	93.2	3054	6.0	0.8	1.8	2980
HDP(SE)4004-6	355	400	985	1182	87.7	79.7	63.2	52.6	43.8	39.8	66.1	63.6	40.1	0.83	93.9	93.5	92.1	93.4	3442	6.0	0.8	1.8	3170
HDP(SE)4005-6	400	400	985	1182	98.7	89.7	71.2	59.2	49.3	44.8	74.4	71.5	45.1	0.83	94.0	93.6	92.2	93.5	3878	6.0	0.8	1.8	3320
HDP(SE)4501-6	450	450	990	1188	109.3	99.4	78.8	65.6	54.7	49.7	82.4	79.3	50.0	0.84	94.3	93.9	92.5	93.8	4341	6.0	0.8	1.8	3170
HDP(SE)4502-6	500	450	990	1188	119.8	108.9	86.4	71.9	59.9	54.5	90.3	86.9	54.7	0.85	94.5	94.1	92.7	94.0	4823	6.0	0.8	1.8	3500
HDP(SE)4503-6	560	450	990	1188	133.9	121.7	96.6	80.3	66.9	60.9	101.0	97.1	61.2	0.85	94.7	94.3	92.9	94.2	5402	6.0	0.8	1.8	3750
HDP(SE)4504-6	630	450	990	1188	150.5	136.8	108.5	90.3	75.2	68.4	113.4	109.1	68.8	0.85	94.8	94.4	93.0	94.3	6077	6.0	0.8	1.8	3920
HDP(SE)5001-6	710	500	990	1188	169.2	153.8	122.0	101.5	84.6	76.9	127.6	122.7	77.3	0.85	95.0	94.6	93.2	94.5	6849	6.0	0.7	1.8	4520
HDP(SE)5002-6	800	500	990	1188	190.5	173.2	137.4	114.3	95.2	86.6	143.6	138.1	87.0	0.85	95.1	94.7	93.3	94.6	7717	6.0	0.7	1.8	4630
HDP(SE)5003-6	900	500	990	1188	214.1	194.6	154.4	128.4	107.0	97.3	161.4	155.2	97.8	0.85	95.2	94.8	93.4	94.7	8682	6.0	0.7	1.8	4770
HDP(SE)5004-6	1000	500	990	1188	237.6	216.0	171.3	142.6	118.8	108.0	179.1	172.2	108.6	0.85	95.3	94.9	93.5	94.8	9646	6.0	0.7	1.8	4920
HDP(SE)5601-6	1120	560	991	1189	262.7	238.8	189.5	157.6	131.4	119.4	198.1	190.5	120.0	0.86	95.4	95.0	93.6	94.9	10793	6.5	0.7	1.8	6030
HDP(SE)5602-6	1250	560	991	1189	292.9	266.3	211.2	175.7	146.5	133.1	220.8	212.3	133.8	0.86	95.5	95.1	93.7	95.0	12046	6.5	0.7	1.8	6280
HDP(SE)5603-6	1400	560	991	1189	327.7	297.9	236.3	196.6	163.9	149.0	247.1	237.6	149.7	0.86	95.6	95.2	93.8	95.1	13491	6.5	0.7	1.8	6440
HDP(SE)6301-6	1600	630	993	1192	374.1	340.1	269.8	224.5	187.1	170.1	282.1	271.2	171.0	0.86	95.7	95.3	93.9	95.2	15388	6.5	0.7	1.8	7400
HDP(SE)6302-6	1800	630	994	1193	420.5	382.2	303.2	252.3	210.2	191.1	317.0	304.8	192.1	0.86	95.8	95.4	94.0	95.3	17294	6.5	0.7	1.8	7750
HDP(SE)6303-6	2000	630	994	1193	466.7	424.3	336.6	280.0	233.4	212.1	351.9	338.3	213.3	0.86	95.9	95.5	94.1	95.4	19215	6.5	0.7	1.8	8100
750rpm/900rpm 8pole, IP23, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																							
HDP(SE)4003-8	220	400	740	888	58.4	53.1	42.1	35.1	29.2	26.6	44.1	42.4	26.7	0.78	92.9	92.5	91.1	92.4	2839	5.5	0.8	1.8	2780
HDP(SE)4004-8	250	400	740	888	65.5	59.5	47.2	39.3	32.7	29.8	49.4	47.5	29.9	0.79	93.0	92.6	91.2	92.5	3226	5.5	0.8	1.8	3130
HDP(SE)4005-8	280	400	740	888	73.2	66.5	52.8	43.9	36.6	33.3	55.2	53.1	33.4	0.79	93.2	92.8	91.4	92.7	3614	5.5	0.8	1.8	3410
HDP(SE)4501-8	315	450	740	888	81.1	73.8	58.5	48.7	40.6	36.9	61.2	58.8	37.1	0.8	93.4	93.0	91.6	92.9	4065	5.5	0.8	1.8	3130
HDP(SE)4502-8	355	450	740	888	91.3	83.0	65.9	54.8	45.7	41.5	68.9	66.2	41.7	0.8	93.5	93.1	91.7	93.0	4581	5.5	0.8	1.8	3350
HDP(SE)4503-8	400	450	740	888	102.7	93.4	74.1	61.6	51.3	46.7	77.4	74.5	46.9	0.8	93.7	93.3	91.9	93.2	5162	5.5	0.8	1.8	3430
HDP(SE)4504-8	450	450	740	888	114.0	103.6	82.2	68.4	57.0	51.8	85.9	82.6	52.1	0.81	93.8	93.4	92.0	93.3	5807	5.5	0.8	1.8	3650
HDP(SE)5001-8	500	500	740	888	126.0	114.5	90.9	75.6	63.0	57.3	95.0	91.3	57.6	0.81	94.3	93.9	92.5	93.8	6453	5.5	0.8	1.8	4310
HDP(SE)5002-8	560	500	740	888	139.2	126.6	100.4	83.5	69.6	63.3	105.0	100.9	63.6	0.82	94.4	94.0	92.6	93.9	7227	5.5	0.8	1.8	4570
HDP(SE)5003-8	630	500	740	888	156.5	142.2	112.8	93.9	78.2	71.1	118.0	113.4	71.5	0.82	94.5	94.1	92.7	94.0	8130	5.5	0.8	1.8	4910
HDP(SE)5004-8	710	500	740	888	176.2	160.1	127.0	105.7	88.1	80.1	132.8	127.7	80.5	0.82	94.6	94.2	92.8	94.1	9163	5.5	0.8	1.8	5190
HDP(SE)5601-8	800	560	740	888	193.5	176.0	139.6	116.1	96.8	88.0	145.9	140.3	88.4	0.84	94.7	94.3	92.9	94.2	10324	6.0	0.7	1.8	5920
HDP(SE)5602-8	900	560	740	888	217.5	197.7	156.9	130.5	108.8	98.9	164.0	157.7	99.4	0.84	94.8	94.4	93.0	94.3	11615	6.0	0.7	1.8	6180
HDP(SE)5603-8	1000	560	740	888	241.4	219.5	174.1	144.9	120.7	109.7	182.0	175.0	110.3	0.84	94.9	94.5	93.1	94.4	12905	6.0	0.7	1.8	6440
HDP(SE)6301-8	1120	630	744	893	270.1	245.6	194.8	162.1	135.1	122.8	203.7	195.8	123.4	0.84	95.0	94.6	93.2	94.5	14376	6.0	0.7	1.8	7780
HDP(SE)6302-8	1250	630	744	893	301.1	273.8	217.2	180.7	150.6	136.9	227.1	218.3	137.6	0.84	95.1	94.7	93.3	94.6	16045	6.0	0.7	1.8	8100
HDP(SE)6303-8	1400	630	744	893	336.9	306.3	243.0	202.2	168.5	153.2	254.0	244.3	154.0	0.84	95.2	94.8	93.4	94.7	17970	6.0	0.7	1.8	8380
HDP(SE)6304-8	1600	630	744	893	384.7	349.7	277.4	230.8	192.3	174.8	290.0	278.9	175.8	0.84	95.3	94.9	93.5	94.8	20538	6.0	0.7	1.8	8660

TYPE	Output	Frame Size	Speed		Current		Power Factor	Efficiency (at 50Hz)			60Hz	Rated torque	Ratio			Weight
	kW		50Hz rpm	60Hz rpm	50Hz 10kV A	60Hz 13.8kV A	Cos φ	100% Load %	75% Load %	50% Load %	100% Load %	Nm	Starting current	Starting torque	B/down torque	Kg
1000rpm/1200rpm 6pole, IP23, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																
HDP(SE)4503-6	315	450	990	1188	23.9	17.4	0.82	92.8	92.4	91.0	92.3	3039	6.0	0.7	1.8	3270
HDP(SE)4504-6	355	450	990	1188	26.5	19.3	0.83	93.1	92.7	91.3	92.6	3424	6.0	0.7	1.8	3400
HDP(SE)4505-6	400	450	990	1188	29.8	21.7	0.83	93.3	92.9	91.5	92.8	3859	6.0	0.7	1.8	3530
HDP(SE)4506-6	450	450	990	1188	33.5	24.4	0.83	93.5	93.1	91.7	93.0	4341	6.0	0.7	1.8	3680
HDP(SE)5001-6	500	500	995	1194	37.0	27.0	0.83	93.9	93.5	92.1	93.4	4799	6.0	0.7	1.8	4460
HDP(SE)5002-6	560	500	995	1194	40.9	29.8	0.84	94.1	93.7	92.3	93.6	5375	6.0	0.7	1.8	4630
HDP(SE)5003-6	630	500	995	1194	45.9	33.4	0.84	94.4	94.0	92.6	93.9	6047	6.0	0.7	1.8	4770
HDP(SE)5004-6	710	500	995	1194	51.6	37.6	0.84	94.6	94.2	92.8	94.1	6815	6.0	0.7	1.8	5000
HDP(SE)5005-6	800	500	995	1194	58.1	42.3	0.84	94.7	94.3	92.9	94.2	7678	6.0	0.7	1.8	5400
HDP(SE)5601-6	900	560	990	1188	64.4	46.9	0.85	94.9	94.5	93.1	94.4	8682	6.0	0.7	1.8	5700
HDP(SE)5602-6	1000	560	990	1188	71.4	52.0	0.85	95.1	94.7	93.3	94.6	9646	6.0	0.7	1.8	5930
HDP(SE)5603-6	1120	560	990	1188	79.8	58.2	0.85	95.3	94.9	93.5	94.8	10804	6.0	0.7	1.8	6180
HDP(SE)5604-6	1250	560	990	1188	88.0	64.1	0.86	95.4	95.0	93.6	94.9	12058	6.0	0.7	1.8	6430
HDP(SE)6301-6	1400	630	995	1194	98.2	71.5	0.86	95.7	95.3	93.9	95.2	13437	6.0	0.6	1.8	7420
HDP(SE)6302-6	1600	630	995	1194	112.1	81.7	0.86	95.8	95.4	94.0	95.3	15357	6.0	0.6	1.8	7780
HDP(SE)6303-6	1800	630	995	1194	126.0	91.8	0.86	95.9	95.5	94.1	95.4	17276	6.0	0.6	1.8	8100
750rpm/900rpm 8pole, IP23, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																
HDP(SE)500B-8	280	500	740	888	22.7	16.5	0.77	92.5	92.1	90.7	92.0	3614	6.0	0.7	1.8	4050
HDP(SE)5001-8	315	500	740	888	25.5	18.5	0.77	92.8	92.4	91.0	92.3	4065	6.0	0.7	1.8	4150
HDP(SE)5002-8	355	500	740	888	28.6	20.8	0.77	93.1	92.7	91.3	92.6	4581	6.0	0.7	1.8	4470
HDP(SE)5003-8	400	500	740	888	31.8	23.1	0.78	93.2	92.8	91.4	92.7	5162	6.0	0.7	1.8	4560
HDP(SE)5004-8	450	500	740	888	35.7	26.0	0.78	93.4	93.0	91.6	92.9	5807	6.0	0.7	1.8	4850
HDP(SE)5005-8	500	500	740	888	39.0	28.4	0.79	93.8	93.4	92.0	93.3	6453	6.0	0.7	1.8	4970
HDP(SE)5006-8	560	500	740	888	43.6	31.8	0.79	93.9	93.5	92.1	93.4	7227	6.0	0.7	1.8	5120
HDP(SE)5601-8	630	560	740	888	47.0	34.2	0.82	94.4	94.0	92.6	93.9	8130	6.0	0.7	1.8	5570
HDP(SE)5602-8	710	560	740	888	52.8	38.5	0.82	94.6	94.2	92.8	94.1	9163	6.0	0.7	1.8	5820
HDP(SE)5603-8	800	560	740	888	59.5	43.3	0.82	94.7	94.3	92.9	94.2	10324	6.0	0.7	1.8	6080
HDP(SE)5604-8	900	560	740	888	66.8	48.7	0.82	94.8	94.4	93.0	94.3	11615	6.0	0.7	1.8	6350
HDP(SE)6301-8	1000	630	744	893	73.2	53.3	0.83	95.0	94.6	93.2	94.5	12836	6.0	0.7	1.8	7800
HDP(SE)6302-8	1120	630	744	893	81.8	59.6	0.83	95.2	94.8	93.4	94.7	14376	6.0	0.7	1.8	8100
HDP(SE)6303-8	1250	630	745	894	91.2	66.5	0.83	95.3	94.9	93.5	94.8	16023	6.0	0.7	1.8	8400

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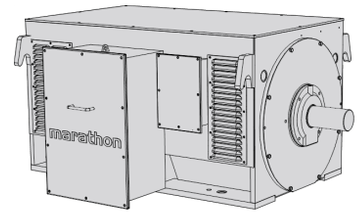
For different voltages, speeds and power outputs please contact the Marathon staff.

"Standard Line" Voltages							
50Hz:	3kV	3.3kV	4.16kV	5kV	6kV	6.6kV	10kV
60Hz:	4kV	4.16kV	6.6kV	13.8kV			



Medium Voltage - Fabricated Frame HDP Range - Open Drip-proof IP23 IC01 - 10pole & 12pole Standard Efficiency

TYPE	Output kW	Frame Size	Speed 50Hz rpm	Speed 60Hz rpm	Current (at 50Hz) of Standard Line Voltages at 3kV A	at 3.3kV A	at 4.16kV A	at 5kV A	at 6kV A	at 6.6kV A	and at 60Hz at 4kV A	at 4.16kV A	at 6.6kV A	Power Factor Cos φ	Efficiency (at 50Hz) 100% Load %	75% Load %	50% Load %	60Hz 100% Load %	Rated torque Nm	Ratio Starting current	Starting torque	B/down torque	Weight Kg
600rpm/720rpm 10pole, IP23, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																							
HDP(SE)4501-10	220	450	590	708	59.7	54.3	43.1	35.8	29.9	27.1	45.0	43.3	27.3	0.77	92.1	91.7	90.3	91.6	3561	5.5	0.8	1.8	2930
HDP(SE)4502-10	250	450	590	708	66.8	60.8	48.2	40.1	33.4	30.4	50.4	48.5	30.5	0.78	92.3	91.9	90.5	91.8	4047	5.5	0.8	1.8	3130
HDP(SE)4503-10	280	450	590	708	74.7	67.9	53.9	44.8	37.3	33.9	56.3	54.2	34.1	0.78	92.5	92.1	90.7	92.0	4532	5.5	0.8	1.8	3210
HDP(SE)4504-10	315	450	590	708	82.9	75.3	59.8	49.7	41.4	37.7	62.5	60.1	37.9	0.79	92.6	92.2	90.8	92.1	5099	5.5	0.8	1.8	3290
HDP(SE)4505-10	355	450	590	708	93.2	84.7	67.2	55.9	46.6	42.4	70.3	67.6	42.6	0.79	92.8	92.4	91.0	92.3	5746	5.5	0.8	1.8	3430
HDP(SE)5001-10	400	500	590	708	103.1	93.8	74.4	61.9	51.6	46.9	77.8	74.8	47.1	0.8	93.3	92.9	91.5	92.8	6475	5.5	0.8	1.8	4140
HDP(SE)5002-10	450	500	590	708	115.9	105.4	83.6	69.5	58.0	52.7	87.4	84.0	53.0	0.8	93.4	93.0	91.6	92.9	7284	5.5	0.8	1.8	4290
HDP(SE)5003-10	500	500	590	708	128.5	116.8	92.7	77.1	64.3	58.4	96.9	93.2	58.7	0.8	93.6	93.2	91.8	93.1	8093	5.5	0.8	1.8	4480
HDP(SE)5004-10	560	500	590	708	143.8	130.7	103.7	86.3	71.9	65.4	108.4	104.2	65.7	0.8	93.7	93.3	91.9	93.2	9064	5.5	0.8	1.8	4650
HDP(SE)5005-10	630	500	590	708	161.6	146.9	116.5	96.9	80.8	73.4	121.8	117.1	73.8	0.8	93.8	93.4	92.0	93.3	10197	5.5	0.8	1.8	4830
HDP(SE)5601-10	710	560	590	708	177.3	161.2	127.8	106.4	88.6	80.6	133.7	128.5	81.0	0.82	94.0	93.6	92.2	93.5	11492	6.0	0.7	1.8	6280
HDP(SE)5602-10	800	560	590	708	199.3	181.2	143.7	119.6	99.7	90.6	150.3	144.5	91.1	0.82	94.2	93.8	92.4	93.7	12949	6.0	0.7	1.8	6670
HDP(SE)5603-10	900	560	590	708	224.0	203.6	161.5	134.4	112.0	101.8	168.9	162.4	102.4	0.82	94.3	93.9	92.5	93.8	14568	6.0	0.7	1.8	7060
HDP(SE)6301-10	1000	630	594	713	251.3	228.4	181.2	150.8	125.6	114.2	189.5	182.2	114.8	0.82	93.4	93.0	91.6	92.9	16077	6.0	0.7	1.8	7800
HDP(SE)6302-10	1120	630	594	713	277.9	252.6	200.4	166.7	138.9	126.3	209.5	201.5	127.0	0.82	94.6	94.2	92.8	94.1	18007	6.0	0.7	1.8	8150
HDP(SE)6303-10	1250	630	594	713	309.5	281.3	223.2	185.7	154.7	140.7	233.3	224.4	141.4	0.82	94.8	94.4	93.0	94.3	20097	6.0	0.7	1.8	8430
HDP(SE)6304-10	1400	630	594	713	346.2	314.8	249.7	207.7	173.1	157.4	261.1	251.0	158.2	0.82	94.9	94.5	93.1	94.4	22508	6.0	0.7	1.8	8760
500rpm/600rpm 12pole, IP23, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearin																							
HDP(SE)4504-12	220	450	490	588	63.5	57.7	45.8	38.1	31.7	28.8	47.9	46.0	29.0	0.73	91.4	91.0	89.6	90.9	4288	5.5	0.8	1.8	3540
HDP(SE)4505-12	250	450	490	588	71.9	65.3	51.8	43.1	35.9	32.7	54.2	52.1	32.8	0.73	91.7	91.3	89.9	91.2	4872	5.5	0.8	1.8	3720
HDP(SE)5001-12	280	500	490	588	78.6	71.4	56.7	47.1	39.3	35.7	59.2	57.0	35.9	0.74	92.7	92.3	90.9	92.2	5457	5.5	0.8	1.8	4250
HDP(SE)5002-12	315	500	490	588	87.1	79.2	62.8	52.3	43.6	39.6	65.7	63.2	39.8	0.75	92.8	92.4	91.0	92.3	6139	5.5	0.8	1.8	4420
HDP(SE)5003-12	355	500	490	588	98.0	89.0	70.6	58.8	49.0	44.5	73.9	71.0	44.8	0.75	93.0	92.6	91.2	92.5	6919	5.5	0.8	1.8	4590
HDP(SE)5004-12	400	500	490	588	110.0	100.0	79.3	66.0	55.0	50.0	83.0	79.8	50.3	0.75	93.3	92.9	91.5	92.8	7796	5.5	0.8	1.8	4870
HDP(SE)5005-12	450	500	490	588	123.6	112.4	89.2	74.2	61.8	56.2	93.2	89.6	56.5	0.75	93.4	93.0	91.6	92.9	8770	5.5	0.8	1.8	5060
HDP(SE)5601-12	500	560	490	588	130.0	118.2	93.7	78.0	65.0	59.1	98.0	94.3	59.4	0.79	93.7	93.3	91.9	93.2	9745	6.0	0.7	1.8	5790
HDP(SE)5602-12	560	560	490	588	145.4	132.2	104.9	87.3	72.7	66.1	109.7	105.4	66.5	0.79	93.8	93.4	92.0	93.3	10914	6.0	0.7	1.8	6040
HDP(SE)5603-12	630	560	490	588	163.4	148.6	117.9	98.1	81.7	74.3	123.2	118.5	74.7	0.79	93.9	93.5	92.1	93.4	12279	6.0	0.7	1.8	6290
HDP(SE)6301-12	710	630	494	593	184.0	167.3	132.7	110.4	92.0	83.6	138.7	133.4	84.1	0.79	94.0	93.6	92.2	93.5	13726	6.0	0.7	1.8	7730
HDP(SE)6302-12	800	630	494	593	206.9	188.1	149.2	124.1	103.4	94.0	156.0	150.0	94.5	0.79	94.2	93.8	92.4	93.7	15466	6.0	0.7	1.8	8050
HDP(SE)6303-12	900	630	494	593	232.5	211.4	167.7	139.5	116.3	105.7	175.3	168.6	106.2	0.79	94.3	93.9	92.5	93.8	17399	6.0	0.7	1.8	8320
HDP(SE)6304-12	1000	630	494	593	258.1	234.6	186.1	154.8	129.0	117.3	194.6	187.1	117.9	0.79	94.4	94.0	92.6	93.9	19332	6.0	0.7	1.8	8590

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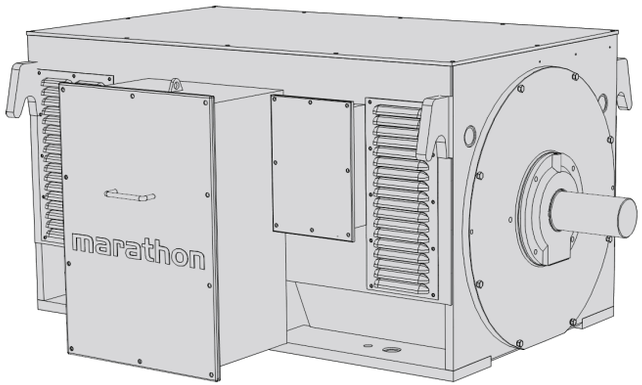
"Standard Line" Voltages							
50Hz:	3kV	3.3kV	4.16kV	5kV	6kV	6.6kV	10kV
60Hz:	4kV	4.16kV	6.6kV	13.8kV			

TYPE	Output	Frame Size	Speed		Current		Power Factor	Efficiency (at 50Hz)			60Hz	Rated torque	Ratio			Weight
	kW		50Hz rpm	60Hz rpm	50Hz 10kV A	60Hz 13.8kV A	Cos φ	100% Load %	75% Load %	50% Load %	100% Load %	Nm	Starting current	Starting torque	B/down torque	Kg
600rpm/720rpm 10pole, IP23, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																
HDP(SE)5002-10	250	500	595	714	21.2	15.4	0.74	92.2	91.8	90.4	91.7	4013	5.5	0.7	1.8	4100
HDP(SE)5003-10	280	500	595	714	23.6	17.2	0.74	92.4	92.0	90.6	91.9	4494	5.5	0.7	1.8	4240
HDP(SE)5004-10	315	500	595	714	26.5	19.3	0.74	92.6	92.2	90.8	92.1	5056	5.5	0.7	1.8	4400
HDP(SE)5005-10	355	500	595	714	29.4	21.5	0.75	92.8	92.4	91.0	92.3	5698	5.5	0.7	1.8	4620
HDP(SE)5006-10	400	500	595	714	33.1	24.1	0.75	93.0	92.6	91.2	92.5	6420	5.5	0.7	1.8	4850
HDP(SE)5601-10	450	560	590	708	36.2	26.4	0.77	93.2	92.8	91.4	92.7	7284	6.0	0.7	1.8	5540
HDP(SE)5602-10	500	560	590	708	40.1	29.2	0.77	93.4	93.0	91.6	92.9	8093	6.0	0.7	1.8	5870
HDP(SE)5603-10	560	560	590	708	44.3	32.3	0.78	93.5	93.1	91.7	93.0	9064	6.0	0.7	1.8	6280
HDP(SE)5604-10	630	560	590	708	49.8	36.3	0.78	93.7	93.3	91.9	93.2	10197	6.0	0.7	1.8	6680
HDP(SE)5605-10	710	560	590	708	56.0	40.8	0.78	93.9	93.5	92.1	93.4	11492	6.0	0.7	1.8	7050
HDP(SE)6301-10	800	630	594	713	61.2	44.6	0.8	94.3	93.9	92.5	93.8	12862	6.0	0.7	1.8	7800
HDP(SE)6302-10	900	630	593	712	68.7	50.1	0.8	94.5	94.1	92.7	94.0	14494	6.0	0.7	1.8	8120
HDP(SE)6303-10	1000	630	593	712	76.3	55.6	0.8	94.6	94.2	92.8	94.1	16105	6.0	0.7	1.8	8420
HDP(SE)6304-10	1120	630	593	712	85.4	62.2	0.8	94.7	94.3	92.9	94.2	18037	6.0	0.7	1.8	8780
500rpm/600rpm 12pole, IP23, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																
HDP(SE)5601-12	315	560	490	588	27.0	19.7	0.73	92.3	91.9	90.5	91.8	6139	6.0	0.7	1.8	5580
HDP(SE)5602-12	355	560	490	588	30.4	22.1	0.73	92.5	92.1	90.7	92.0	6919	6.0	0.7	1.8	5790
HDP(SE)5603-12	400	560	490	588	34.1	24.9	0.73	92.7	92.3	90.9	92.2	7796	6.0	0.7	1.8	6040
HDP(SE)5604-12	450	560	490	588	38.3	27.9	0.73	92.9	92.5	91.1	92.4	8770	6.0	0.7	1.8	6280
HDP(SE)5605-12	500	560	490	588	42.4	30.9	0.73	93.2	92.8	91.4	92.7	9745	6.0	0.7	1.8	6530
HDP(SE)6301-12	560	630	492	590	46.7	34.0	0.74	93.5	93.1	91.7	93.0	10870	6.0	0.7	1.8	7730
HDP(SE)6302-12	630	630	493	592	52.5	38.2	0.74	93.7	93.3	91.9	93.2	12204	6.0	0.7	1.8	8050
HDP(SE)6303-12	710	630	493	592	59.0	43.0	0.74	93.9	93.5	92.1	93.4	13754	6.0	0.7	1.8	8320
HDP(SE)6304-12	800	630	492	590	66.2	48.2	0.74	94.3	93.9	92.5	93.8	15528	6.0	0.7	1.8	8650

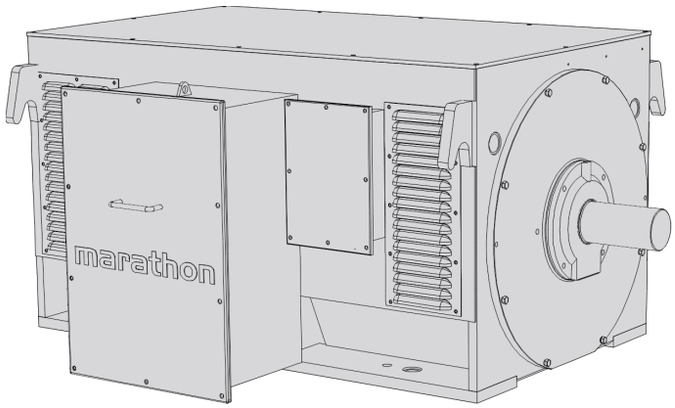


TYPE	Output kW	Frame Size	Speed 50Hz rpm	Speed 60Hz rpm	Current (at 50Hz) of Standard Line Voltages at 3kV A	at 3.3kV A	at 4.16kV A	at 5kV A	at 6kV A	at 6.6kV A	and at 60Hz at 4kV A	at 4.16kV A	at 6.6kV A	Power Factor Cos φ	Efficiency (at 50Hz) 100% Load %	75% Load %	50% Load %	60Hz 100% Load %	Rated torque Nm	Ratio Starting current	Starting torque	B/down torque	Weight Kg
1500rpm/1800rpm 4pole, IP23, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																							
HDP(HE)3551-4	185	355	1485	1782	44.8	40.7	32.3	26.9	22.4	20.4	33.8	32.5	20.5	0.85	93.5	92.6	90.5	93.0	1190	6.5	0.8	1.8	1560
HDP(HE)3552-4	200	355	1485	1782	48.3	43.9	34.9	29.0	24.2	22.0	36.4	35.0	22.1	0.85	93.7	92.8	90.7	93.2	1286	6.5	0.8	1.8	1650
HDP(HE)3553-4	220	355	1485	1782	53.0	48.2	38.2	31.8	26.5	24.1	40.0	38.4	24.2	0.85	94.0	93.1	91.0	93.5	1415	6.5	0.8	1.8	1780
HDP(HE)3554-4	250	355	1485	1782	60.0	54.6	43.3	36.0	30.0	27.3	45.3	43.5	27.4	0.85	94.3	93.4	91.3	93.8	1608	6.5	0.8	1.8	1900
HDP(HE)3555-4	280	355	1485	1782	66.3	60.3	47.8	39.8	33.2	30.1	50.0	48.1	30.3	0.86	94.5	93.6	91.5	94.0	1801	6.5	0.8	1.8	2070
HDP(HE)3556-4	315	355	1485	1782	74.4	67.6	53.6	44.6	37.2	33.8	56.1	53.9	34.0	0.86	94.8	93.9	91.8	94.3	2026	6.5	0.8	1.8	2320
HDP(HE)4001-4	355	400	1485	1782	83.6	76.0	60.3	50.2	41.8	38.0	63.1	60.6	38.2	0.86	95.0	94.1	92.0	94.5	2283	6.5	0.8	1.8	2250
HDP(HE)4002-4	400	400	1485	1782	94.1	85.6	67.9	56.5	47.1	42.8	71.0	68.2	43.0	0.86	95.1	94.2	92.1	94.6	2572	6.5	0.8	1.8	2320
HDP(HE)4003-4	450	400	1485	1782	105.7	96.1	76.2	63.4	52.8	48.0	79.7	76.6	48.3	0.86	95.3	94.4	92.3	94.8	2894	6.5	0.8	1.8	2450
HDP(HE)4004-4	500	400	1485	1782	115.9	105.4	83.6	69.6	58.0	52.7	87.4	84.1	53.0	0.87	95.4	94.5	92.4	94.9	3215	6.5	0.8	1.8	2530
HDP(HE)4005-4	560	400	1485	1782	129.6	117.8	93.4	77.7	64.8	58.9	97.7	93.9	59.2	0.87	95.6	94.7	92.6	95.1	3601	6.5	0.8	1.8	2630
HDP(HE)4501-4	630	450	1485	1782	145.5	132.2	104.9	87.3	72.7	66.1	109.7	105.5	66.5	0.87	95.8	94.9	92.8	95.3	4052	6.5	0.8	1.8	3390
HDP(HE)4502-4	710	450	1485	1782	163.6	148.7	118.0	98.2	81.8	74.4	123.3	118.6	74.8	0.87	96.0	95.1	93.0	95.5	4566	6.5	0.8	1.8	3490
HDP(HE)4503-4	800	450	1485	1782	184.3	167.6	132.9	110.6	92.2	83.8	139.0	133.6	84.2	0.87	96.0	95.1	93.0	95.5	5145	6.5	0.8	1.8	3600
HDP(HE)4504-4	900	450	1485	1782	207.2	188.3	149.4	124.3	103.6	94.2	156.2	150.2	94.7	0.87	96.1	95.2	93.1	95.6	5788	6.5	0.8	1.8	3750
HDP(HE)5001-4	1000	500	1485	1782	230.0	209.0	165.8	138.0	115.0	104.5	173.4	166.7	105.1	0.87	96.2	95.3	93.2	95.7	6431	6.5	0.7	1.8	5000
HDP(HE)5002-4	1120	500	1485	1782	254.4	231.2	183.4	152.6	127.2	115.6	191.8	184.4	116.2	0.88	96.3	95.4	93.3	95.8	7203	6.5	0.7	1.8	5250
HDP(HE)5003-4	1250	500	1485	1782	283.6	257.8	204.5	170.2	141.8	128.9	213.8	205.6	129.6	0.88	96.4	95.5	93.4	95.9	8039	6.5	0.7	1.8	5500
HDP(HE)5004-4	1400	500	1485	1782	317.6	288.7	229.0	190.6	158.8	144.4	239.5	230.2	145.1	0.88	96.4	95.5	93.4	95.9	9003	6.5	0.7	1.8	5750
HDP(HE)5601-4	1600	560	1485	1782	358.5	325.9	258.6	215.1	179.3	163.0	270.3	259.9	163.8	0.89	96.5	95.6	93.5	96.0	10290	6.5	0.6	1.8	6050
HDP(HE)5602-4	1800	560	1485	1782	402.9	366.3	290.6	241.8	201.5	183.2	303.8	292.1	184.1	0.89	96.6	95.7	93.6	96.1	11576	6.5	0.6	1.8	6350
HDP(HE)5603-4	2000	560	1485	1782	447.2	406.6	322.5	268.3	223.6	203.3	337.2	324.2	204.3	0.89	96.7	95.8	93.7	96.2	12862	6.5	0.6	1.8	6500
HDP(HE)6301-4	2240	630	1492	1790	500.4	454.9	360.9	300.2	250.2	227.5	377.2	362.7	228.6	0.89	96.8	95.9	93.8	96.3	14338	6.5	0.6	1.8	7550
HDP(HE)6302-4	2500	630	1492	1790	557.9	507.2	402.3	334.7	279.0	253.6	420.6	404.4	254.9	0.89	96.9	96.0	93.9	96.4	16002	6.5	0.6	1.8	7910
HDP(HE)6303-4	2800	630	1493	1792	624.8	568.0	450.6	374.9	312.4	284.0	471.1	452.9	285.5	0.89	96.9	96.0	93.9	96.4	17910	6.5	0.6	1.8	8300

"Standard Line" High Voltage motors are pre-designed standard motors available at reduced lead times.
They are available as **Standard Efficiency Motors** and also as **Higher Efficiency Motors.**
For different voltages, speeds and power outputs please contact the Marathon staff.

"Standard Line" Voltages							
	50Hz:	3kV	3.3kV	4.16kV	5kV	6kV	6.6kV	10kV
	60Hz:	4kV	4.16kV	6.6kV	13.8kV			

TYPE	Output	Frame Size	Speed		Current		Power Factor	Efficiency (at 50Hz)			60Hz	Rated torque	Ratio			Weight
	kW		50Hz rpm	60Hz rpm	50Hz 10kV A	60Hz 13.8kV A	Cos φ	100% Load %	75% Load %	50% Load %	100% Load %	Nm	Starting current	Starting torque	B/down torque	Kg
1500rpm/1800rpm 4pole, IP23, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																
HDP(HE)400A-4	185	400	1480	1776	13.9	10.1	0.83	92.9	92.0	89.5	92.4	1194	7.0	0.7	1.8	2480
HDP(HE)400B-4	200	400	1480	1776	14.9	10.9	0.83	93.2	92.3	89.8	92.7	1291	7.0	0.7	1.8	2550
HDP(HE)4001-4	220	400	1480	1776	16.4	11.9	0.83	93.5	92.6	90.1	93.0	1420	7.0	0.7	1.8	2640
HDP(HE)4002-4	250	400	1480	1776	18.5	13.5	0.83	93.9	93.0	90.5	93.4	1613	7.0	0.7	1.8	2750
HDP(HE)4003-4	280	400	1480	1776	20.7	15.1	0.83	94.1	93.2	90.7	93.6	1807	7.0	0.7	1.8	2870
HDP(HE)4004-4	315	400	1480	1776	23.2	16.9	0.83	94.3	93.4	90.9	93.8	2033	7.0	0.7	1.8	3000
HDP(HE)4501-4	355	450	1485	1782	25.2	18.4	0.86	94.6	93.7	91.2	94.1	2283	7.0	0.7	1.8	2850
HDP(HE)4502-4	400	450	1485	1782	28.4	20.7	0.86	94.7	93.8	91.3	94.2	2572	7.0	0.7	1.8	2950
HDP(HE)4503-4	450	450	1485	1782	31.8	23.1	0.86	95.1	94.2	91.7	94.6	2894	7.0	0.7	1.8	3100
HDP(HE)4504-4	500	450	1485	1782	35.3	25.7	0.86	95.1	94.2	91.7	94.6	3215	7.0	0.7	1.8	3250
HDP(HE)4505-4	560	450	1485	1782	39.5	28.7	0.86	95.3	94.4	91.9	94.8	3601	7.0	0.7	1.8	3400
HDP(HE)4506-4	630	450	1485	1782	44.3	32.3	0.86	95.5	94.6	92.1	95.0	4052	7.0	0.7	1.8	3590
HDP(HE)5001-4	710	500	1485	1782	49.1	35.8	0.87	96.0	95.1	92.6	95.5	4566	7.0	0.7	1.8	4530
HDP(HE)5002-4	800	500	1485	1782	55.3	40.3	0.87	96.0	95.1	92.6	95.5	5145	7.0	0.7	1.8	4660
HDP(HE)5003-4	900	500	1485	1782	61.4	44.8	0.88	96.1	95.2	92.7	95.6	5788	7.0	0.7	1.8	4820
HDP(HE)5004-4	1000	500	1485	1782	68.2	49.7	0.88	96.2	95.3	92.8	95.7	6431	7.0	0.7	1.8	5110
HDP(HE)5005-4	1120	500	1485	1782	76.3	55.6	0.88	96.3	95.4	92.9	95.8	7203	7.0	0.7	1.8	5400
HDP(HE)5601-4	1250	560	1485	1782	84.1	61.3	0.89	96.4	95.5	93.0	95.9	8039	7.0	0.7	1.8	5900
HDP(HE)5602-4	1400	560	1485	1782	94.1	68.6	0.89	96.5	95.6	93.1	96.0	9003	7.0	0.7	1.8	6200
HDP(HE)5603-4	1600	560	1485	1782	107.4	78.3	0.89	96.6	95.7	93.2	96.1	10290	7.0	0.7	1.8	6500
HDP(HE)6301-4	1800	630	1492	1790	120.8	88.0	0.89	96.7	95.8	93.3	96.2	11521	7.0	0.6	1.8	7580
HDP(HE)6302-4	2000	630	1493	1792	134.0	97.6	0.89	96.8	95.9	93.4	96.3	12793	7.0	0.6	1.8	7950
HDP(HE)6303-4	2240	630	1493	1792	150.0	109.2	0.89	96.9	96.0	93.5	96.4	14328	7.0	0.6	1.8	8330



TYPE	Output kW	Frame Size	Speed 50Hz rpm	Speed 60Hz rpm	Current (at 50Hz) of Standard Line Voltages at 3kV A	at 3.3kV A	at 4.16kV A	at 5kV A	at 6kV A	at 6.6kV A	and at 60Hz at 4kV A	at 4.16kV A	at 6.6kV A	Power Factor Cos φ	Efficiency (at 50Hz) 100% Load %	75% Load %	50% Load %	60Hz 100% Load %	Rated torque Nm	Ratio Starting current	Starting torque	B/down torque	Weight Kg
1000rpm/1200rpm 6pole, IP23, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																							
HDP(HE)3553-6	185	355	985	1182	46.3	42.1	33.4	27.8	23.2	21.1	34.9	33.6	21.2	0.82	93.7	92.8	90.7	93.2	1794	6.0	0.8	1.8	1860
HDP(HE)3554-6	200	355	985	1182	49.9	45.4	36.0	30.0	25.0	22.7	37.7	36.2	22.8	0.82	94.0	93.1	91.0	93.5	1939	6.0	0.8	1.8	1980
HDP(HE)3555-6	220	355	985	1182	54.8	49.8	39.5	32.9	27.4	24.9	41.3	39.7	25.0	0.82	94.2	93.3	91.2	93.7	2133	6.0	0.8	1.8	2070
HDP(HE)3556-6	250	355	985	1182	62.2	56.5	44.8	37.3	31.1	28.3	46.9	45.1	28.4	0.82	94.4	93.5	91.4	93.9	2424	6.0	0.8	1.8	2190
HDP(HE)4002-6	280	400	985	1182	68.7	62.5	49.5	41.2	34.4	31.2	51.8	49.8	31.4	0.83	94.5	93.6	91.5	94.0	2715	6.0	0.8	1.8	2810
HDP(HE)4003-6	315	400	985	1182	77.0	70.0	55.6	46.2	38.5	35.0	58.1	55.9	35.2	0.83	94.8	93.9	91.8	94.3	3054	6.0	0.8	1.8	2980
HDP(HE)4004-6	355	400	985	1182	86.6	78.7	62.4	51.9	43.3	39.3	65.3	62.8	39.6	0.83	95.1	94.2	92.1	94.6	3442	6.0	0.8	1.8	3170
HDP(HE)4005-6	400	400	985	1182	97.5	88.7	70.3	58.5	48.8	44.3	73.5	70.7	44.6	0.83	95.1	94.2	92.1	94.6	3878	6.0	0.8	1.8	3320
HDP(HE)4501-6	450	450	990	1188	108.1	98.2	77.9	64.8	54.0	49.1	81.5	78.3	49.4	0.84	95.4	94.5	92.4	94.9	4341	6.0	0.8	1.8	3170
HDP(HE)4502-6	500	450	990	1188	118.4	107.7	85.4	71.1	59.2	53.8	89.3	85.8	54.1	0.85	95.6	94.7	92.6	95.1	4823	6.0	0.8	1.8	3500
HDP(HE)4503-6	560	450	990	1188	132.5	120.4	95.5	79.5	66.2	60.2	99.9	96.0	60.5	0.85	95.7	94.8	92.7	95.2	5402	6.0	0.8	1.8	3750
HDP(HE)4504-6	630	450	990	1188	148.9	135.4	107.4	89.3	74.4	67.7	112.3	107.9	68.0	0.85	95.8	94.9	92.8	95.3	6077	6.0	0.8	1.8	3920
HDP(HE)5001-6	710	500	990	1188	167.5	152.2	120.8	100.5	83.7	76.1	126.2	121.4	76.5	0.85	96.0	95.1	93.0	95.5	6849	6.0	0.7	1.8	4520
HDP(HE)5002-6	800	500	990	1188	188.7	171.5	136.1	113.2	94.3	85.8	142.3	136.8	86.2	0.85	96.0	95.1	93.0	95.5	7717	6.0	0.7	1.8	4630
HDP(HE)5003-6	900	500	990	1188	212.0	192.8	152.9	127.2	106.0	96.4	159.9	153.7	96.9	0.85	96.1	95.2	93.1	95.6	8682	6.0	0.7	1.8	4770
HDP(HE)5004-6	1000	500	990	1188	235.4	214.0	169.7	141.2	117.7	107.0	177.4	170.6	107.5	0.85	96.2	95.3	93.2	95.7	9646	6.0	0.7	1.8	4920
HDP(HE)5601-6	1120	560	991	1189	260.3	236.6	187.7	156.2	130.1	118.3	196.2	188.7	118.9	0.86	96.3	95.4	93.3	95.8	10793	6.5	0.7	1.8	6030
HDP(HE)5602-6	1250	560	991	1189	290.2	263.8	209.3	174.1	145.1	131.9	218.8	210.4	132.6	0.86	96.4	95.5	93.4	95.9	12046	6.5	0.7	1.8	6280
HDP(HE)5603-6	1400	560	991	1189	325.0	295.5	234.4	195.0	162.5	147.7	245.0	235.6	148.5	0.86	96.4	95.5	93.4	95.9	13491	6.5	0.7	1.8	6440
HDP(HE)6301-6	1600	630	993	1192	371.0	337.3	267.6	222.6	185.5	168.7	279.7	269.0	169.5	0.86	96.5	95.6	93.5	96.0	15388	6.5	0.7	1.8	7400
HDP(HE)6302-6	1800	630	994	1193	417.0	379.1	300.7	250.2	208.5	189.5	314.4	302.3	190.5	0.86	96.6	95.7	93.6	96.1	17294	6.5	0.7	1.8	7750
HDP(HE)6303-6	2000	630	994	1193	462.8	420.8	333.8	277.7	231.4	210.4	348.9	335.5	211.5	0.86	96.7	95.8	93.7	96.2	19215	6.5	0.7	1.8	8100
750rpm/900rpm 8pole, IP23, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																							
HDP(HE)4003-8	220	400	740	888	57.9	52.7	41.8	34.8	29.0	26.3	43.7	42.0	26.5	0.78	93.7	92.8	90.7	93.2	2839	5.5	0.8	1.8	2780
HDP(HE)4004-8	250	400	740	888	64.9	59.0	46.8	38.9	32.4	29.5	48.9	47.0	29.6	0.79	93.9	93.0	90.9	93.4	3226	5.5	0.8	1.8	3130
HDP(HE)4005-8	280	400	740	888	72.5	65.9	52.3	43.5	36.2	32.9	54.7	52.6	33.1	0.79	94.1	93.2	91.1	93.6	3614	5.5	0.8	1.8	3410
HDP(HE)4501-8	315	450	740	888	80.3	73.0	57.9	48.2	40.1	36.5	60.5	58.2	36.7	0.8	94.4	93.5	91.4	93.9	4065	5.5	0.8	1.8	3130
HDP(HE)4502-8	355	450	740	888	90.2	82.0	65.0	54.1	45.1	41.0	68.0	65.4	41.2	0.8	94.7	93.8	91.7	94.2	4581	5.5	0.8	1.8	3350
HDP(HE)4503-8	400	450	740	888	101.4	92.2	73.1	60.8	50.7	46.1	76.5	73.5	46.3	0.8	94.9	94.0	91.9	94.4	5162	5.5	0.8	1.8	3430
HDP(HE)4504-8	450	450	740	888	112.5	102.3	81.2	67.5	56.3	51.2	84.9	81.6	51.4	0.81	95.0	94.1	92.0	94.5	5807	5.5	0.8	1.8	3650
HDP(HE)5001-8	500	500	740	888	124.5	113.2	89.8	74.7	62.3	56.6	93.9	90.3	56.9	0.81	95.4	94.5	92.4	94.9	6453	5.5	0.8	1.8	4310
HDP(HE)5002-8	560	500	740	888	137.6	125.1	99.2	82.6	68.8	62.6	103.8	99.8	62.9	0.82	95.5	94.6	92.5	95.0	7227	5.5	0.8	1.8	4570
HDP(HE)5003-8	630	500	740	888	154.7	140.6	111.5	92.8	77.3	70.3	116.6	112.1	70.7	0.82	95.6	94.7	92.6	95.1	8130	5.5	0.8	1.8	4910
HDP(HE)5004-8	710	500	740	888	174.3	158.5	125.7	104.6	87.2	79.2	131.4	126.4	79.6	0.82	95.6	94.7	92.6	95.1	9163	5.5	0.8	1.8	5190
HDP(HE)5601-8	800	560	740	888	191.5	174.1	138.1	114.9	95.8	87.1	144.4	138.8	87.5	0.84	95.7	94.8	92.7	95.2	10324	6.0	0.7	1.8	5920
HDP(HE)5602-8	900	560	740	888	215.2	195.7	155.2	129.1	107.6	97.8	162.3	156.0	98.4	0.84	95.8	94.9	92.8	95.3	11615	6.0	0.7	1.8	6180
HDP(HE)5603-8	1000	560	740	888	238.9	217.2	172.3	143.3	119.5	108.6	180.1	173.2	109.2	0.84	95.9	95.0	92.9	95.4	12905	6.0	0.7	1.8	6440
HDP(HE)6301-8	1120	630	744	893	267.3	243.0	192.8	160.4	133.6	121.5	201.5	193.8	122.1	0.84	96.0	95.1	93.0	95.5	14376	6.0	0.7	1.8	7780
HDP(HE)6302-8	1250	630	744	893	298.3	271.2	215.1	179.0	149.2	135.6	224.9	216.3	136.3	0.84	96.0	95.1	93.0	95.5	16045	6.0	0.7	1.8	8100
HDP(HE)6303-8	1400	630	744	893	333.8	303.4	240.7	200.3	166.9	151.7	251.6	242.0	152.5	0.84	96.1	95.2	93.1	95.6	17970	6.0	0.7	1.8	8380
HDP(HE)6304-8	1600	630	744	893	381.1	346.4	274.8	228.6	190.5	173.2	287.3	276.2	174.1	0.84	96.2	95.3	93.2	95.7	20538	6.0	0.7	1.8	8660

TYPE	Output kW	Frame Size	Speed 50Hz rpm	Speed 60Hz rpm	Current 50Hz 10kV A	Current 60Hz 13.8kV A	Power Factor Cos φ	Efficiency (at 50Hz) 100% Load %	Efficiency (at 50Hz) 75% Load %	Efficiency (at 50Hz) 50% Load %	60Hz 100% Load %	Rated torque Nm	Ratio Starting current	Ratio Starting torque	Ratio B/down torque	Weight Kg
1000rpm/1200rpm 6pole, IP23, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																
HDP(HE)4503-6	315	450	990	1188	23.6	17.2	0.82	93.8	92.9	90.4	93.3	3039	6.0	0.7	1.8	3270
HDP(HE)4504-6	355	450	990	1188	26.2	19.1	0.83	94.4	93.5	91.0	93.9	3424	6.0	0.7	1.8	3400
HDP(HE)4505-6	400	450	990	1188	29.4	21.4	0.83	94.6	93.7	91.2	94.1	3859	6.0	0.7	1.8	3530
HDP(HE)4506-6	450	450	990	1188	33.1	24.1	0.83	94.7	93.8	91.3	94.2	4341	6.0	0.7	1.8	3680
HDP(HE)5001-6	500	500	995	1194	36.6	26.6	0.83	95.1	94.2	91.7	94.6	4799	6.0	0.7	1.8	4460
HDP(HE)5002-6	560	500	995	1194	40.4	29.5	0.84	95.2	94.3	91.8	94.7	5375	6.0	0.7	1.8	4630
HDP(HE)5003-6	630	500	995	1194	45.3	33.0	0.84	95.5	94.6	92.1	95.0	6047	6.0	0.7	1.8	4770
HDP(HE)5004-6	710	500	995	1194	51.0	37.2	0.84	95.6	94.7	92.2	95.1	6815	6.0	0.7	1.8	5000
HDP(HE)5005-6	800	500	995	1194	57.5	41.9	0.84	95.7	94.8	92.3	95.2	7678	6.0	0.7	1.8	5400
HDP(HE)5601-6	900	560	990	1188	63.7	46.4	0.85	95.9	95.0	92.5	95.4	8682	6.0	0.7	1.8	5700
HDP(HE)5602-6	1000	560	990	1188	70.8	51.5	0.85	96.0	95.1	92.6	95.5	9646	6.0	0.7	1.8	5930
HDP(HE)5603-6	1120	560	990	1188	79.1	57.6	0.85	96.2	95.3	92.8	95.7	10804	6.0	0.7	1.8	6180
HDP(HE)5604-6	1250	560	990	1188	87.1	63.5	0.86	96.3	95.4	92.9	95.8	12058	6.0	0.7	1.8	6430
HDP(HE)6301-6	1400	630	995	1194	97.4	70.9	0.86	96.5	95.6	93.1	96.0	13437	6.0	0.6	1.8	7420
HDP(HE)6302-6	1600	630	995	1194	111.2	81.0	0.86	96.6	95.7	93.2	96.1	15357	6.0	0.6	1.8	7780
HDP(HE)6303-6	1800	630	995	1194	125.1	91.1	0.86	96.6	95.7	93.2	96.1	17276	6.0	0.6	1.8	8100
750rpm/900rpm 8pole, IP23, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																
HDP(HE)500B-8	280	500	740	888	22.3	16.3	0.77	94.0	93.1	90.6	93.5	3614	6.0	0.7	1.8	4050
HDP(HE)5001-8	315	500	740	888	25.1	18.3	0.77	94.2	93.3	90.8	93.7	4065	6.0	0.7	1.8	4150
HDP(HE)5002-8	355	500	740	888	28.2	20.5	0.77	94.4	93.5	91.0	93.9	4581	6.0	0.7	1.8	4470
HDP(HE)5003-8	400	500	740	888	31.3	22.8	0.78	94.6	93.7	91.2	94.1	5162	6.0	0.7	1.8	4560
HDP(HE)5004-8	450	500	740	888	35.2	25.7	0.78	94.6	93.7	91.2	94.1	5807	6.0	0.7	1.8	4850
HDP(HE)5005-8	500	500	740	888	38.5	28.0	0.79	95.0	94.1	91.6	94.5	6453	6.0	0.7	1.8	4970
HDP(HE)5006-8	560	500	740	888	43.0	31.4	0.79	95.1	94.2	91.7	94.6	7227	6.0	0.7	1.8	5120
HDP(HE)5601-8	630	560	740	888	46.4	33.8	0.82	95.5	94.6	92.1	95.0	8130	6.0	0.7	1.8	5570
HDP(HE)5602-8	710	560	740	888	52.3	38.1	0.82	95.6	94.7	92.2	95.1	9163	6.0	0.7	1.8	5820
HDP(HE)5603-8	800	560	740	888	58.9	42.9	0.82	95.7	94.8	92.3	95.2	10324	6.0	0.7	1.8	6080
HDP(HE)5604-8	900	560	740	888	66.1	48.2	0.82	95.8	94.9	92.4	95.3	11615	6.0	0.7	1.8	6350
HDP(HE)6301-8	1000	630	744	893	72.5	52.8	0.83	96.0	95.1	92.6	95.5	12836	6.0	0.7	1.8	7800
HDP(HE)6302-8	1120	630	744	893	81.1	59.1	0.83	96.1	95.2	92.7	95.6	14376	6.0	0.7	1.8	8100
HDP(HE)6303-8	1250	630	745	894	90.4	65.8	0.83	96.2	95.3	92.8	95.7	16023	6.0	0.7	1.8	8400

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"Standard Line" Voltages								
	50Hz:	3kV	3.3kV	4.16kV	5kV	6kV	6.6kV	10kV
	60Hz:	4kV	4.16kV	6.6kV	13.8kV			

TYPE	Output kW	Frame Size	Speed 50Hz rpm	Speed 60Hz rpm	Current (at 50Hz) of Standard Line Voltages at 3kV A	at 3.3kV A	at 4.16kV A	at 5kV A	at 6kV A	at 6.6kV A	and at 60Hz at 4kV A	at 4.16kV A	at 6.6kV A	Power Factor Cos φ	Efficiency (at 50Hz) 100% Load %	75% Load %	50% Load %	60Hz 100% Load %	Rated torque Nm	Ratio Starting current	Starting torque	B/down torque	Weight Kg
600rpm/720rpm 10pole, IP23, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																							
HDP(HE)4501-10	220	450	590	708	59.1	53.8	42.6	35.5	29.6	26.9	44.6	42.9	27.0	0.77	93.0	92.1	90.0	92.5	3561	5.5	0.8	1.8	2930
HDP(HE)4502-10	250	450	590	708	66.2	60.2	47.7	39.7	33.1	30.1	49.9	48.0	30.2	0.78	93.2	92.3	90.2	92.7	4047	5.5	0.8	1.8	3130
HDP(HE)4503-10	280	450	590	708	74.0	67.2	53.3	44.4	37.0	33.6	55.8	53.6	33.8	0.78	93.4	92.5	90.4	92.9	4532	5.5	0.8	1.8	3210
HDP(HE)4504-10	315	450	590	708	82.0	74.5	59.1	49.2	41.0	37.3	61.8	59.4	37.5	0.79	93.6	92.7	90.6	93.1	5099	5.5	0.8	1.8	3290
HDP(HE)4505-10	355	450	590	708	91.8	83.5	66.2	55.1	45.9	41.7	69.2	66.6	42.0	0.79	94.2	93.3	91.2	93.7	5746	5.5	0.8	1.8	3430
HDP(HE)5001-10	400	500	590	708	101.7	92.5	73.4	61.0	50.9	46.2	76.7	73.7	46.5	0.8	94.6	93.7	91.6	94.1	6475	5.5	0.8	1.8	4140
HDP(HE)5002-10	450	500	590	708	114.4	104.0	82.5	68.7	57.2	52.0	86.3	83.0	52.3	0.8	94.6	93.7	91.6	94.1	7284	5.5	0.8	1.8	4290
HDP(HE)5003-10	500	500	590	708	126.9	115.3	91.5	76.1	63.4	57.7	95.7	92.0	58.0	0.8	94.8	93.9	91.8	94.3	8093	5.5	0.8	1.8	4480
HDP(HE)5004-10	560	500	590	708	142.0	129.1	102.4	85.2	71.0	64.5	107.0	102.9	64.9	0.8	94.9	94.0	91.9	94.4	9064	5.5	0.8	1.8	4650
HDP(HE)5005-10	630	500	590	708	159.5	145.0	115.0	95.7	79.8	72.5	120.3	115.7	72.9	0.8	95.0	94.1	92.0	94.5	10197	5.5	0.8	1.8	4830
HDP(HE)5601-10	710	560	590	708	175.2	159.3	126.4	105.1	87.6	79.6	132.1	127.0	80.1	0.82	95.1	94.2	92.1	94.6	11492	6.0	0.7	1.8	6280
HDP(HE)5602-10	800	560	590	708	197.0	179.1	142.1	118.2	98.5	89.6	148.5	142.8	90.0	0.82	95.3	94.4	92.3	94.8	12949	6.0	0.7	1.8	6670
HDP(HE)5603-10	900	560	590	708	221.4	201.3	159.7	132.9	110.7	100.6	166.9	160.5	101.2	0.82	95.4	94.5	92.4	94.9	14568	6.0	0.7	1.8	7060
HDP(HE)6301-10	1000	630	594	713	245.8	223.4	177.2	147.5	122.9	111.7	185.3	178.2	112.3	0.82	95.5	94.6	92.5	95.0	16077	6.0	0.7	1.8	7800
HDP(HE)6302-10	1120	630	594	713	275.0	250.0	198.3	165.0	137.5	125.0	207.3	199.3	125.6	0.82	95.6	94.7	92.6	95.1	18007	6.0	0.7	1.8	8150
HDP(HE)6303-10	1250	630	594	713	306.2	278.4	220.8	183.7	153.1	139.2	230.9	222.0	139.9	0.82	95.8	94.9	92.8	95.3	20097	6.0	0.7	1.8	8430
HDP(HE)6304-10	1400	630	594	713	342.6	311.5	247.1	205.6	171.3	155.7	258.3	248.4	156.6	0.82	95.9	95.0	92.9	95.4	22508	6.0	0.7	1.8	8760
500rpm/600rpm 12pole, IP23, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																							
HDP(HE)4504-12	220	450	490	588	62.8	57.1	45.3	37.7	31.4	28.5	47.3	45.5	28.7	0.73	92.4	91.5	89.4	91.9	4288	5.5	0.8	1.8	3540
HDP(HE)4505-12	250	450	490	588	71.1	64.6	51.3	42.7	35.5	32.3	53.6	51.6	32.5	0.73	92.7	91.8	89.7	92.2	4872	5.5	0.8	1.8	3720
HDP(HE)5001-12	280	500	490	588	77.6	70.5	55.9	46.5	38.8	35.3	58.5	56.2	35.4	0.74	93.9	93.0	90.9	93.4	5457	5.5	0.8	1.8	4250
HDP(HE)5002-12	315	500	490	588	85.9	78.1	61.9	51.5	42.9	39.0	64.8	62.3	39.3	0.75	94.1	93.2	91.1	93.6	6139	5.5	0.8	1.8	4420
HDP(HE)5003-12	355	500	490	588	96.6	87.8	69.7	58.0	48.3	43.9	72.8	70.0	44.1	0.75	94.3	93.4	91.3	93.8	6919	5.5	0.8	1.8	4590
HDP(HE)5004-12	400	500	490	588	108.5	98.6	78.2	65.1	54.3	49.3	81.8	78.7	49.6	0.75	94.6	93.7	91.6	94.1	7796	5.5	0.8	1.8	4870
HDP(HE)5005-12	450	500	490	588	122.1	111.0	88.0	73.2	61.0	55.5	92.0	88.5	55.8	0.75	94.6	93.7	91.6	94.1	8770	5.5	0.8	1.8	5060
HDP(HE)5601-12	500	560	490	588	128.4	116.7	92.6	77.0	64.2	58.3	96.8	93.1	58.7	0.79	94.9	94.0	91.9	94.4	9745	6.0	0.7	1.8	5790
HDP(HE)5602-12	560	560	490	588	143.6	130.5	103.6	86.2	71.8	65.3	108.3	104.1	65.6	0.79	95.0	94.1	92.0	94.5	10914	6.0	0.7	1.8	6040
HDP(HE)5603-12	630	560	490	588	161.4	146.7	116.4	96.8	80.7	73.4	121.7	117.0	73.7	0.79	95.1	94.2	92.1	94.6	12279	6.0	0.7	1.8	6290
HDP(HE)6301-12	710	630	494	593	181.9	165.3	131.2	109.1	90.9	82.7	137.1	131.9	83.1	0.79	95.1	94.2	92.1	94.6	13726	6.0	0.7	1.8	7730
HDP(HE)6302-12	800	630	494	593	204.5	185.9	147.5	122.7	102.3	93.0	154.2	148.3	93.4	0.79	95.3	94.4	92.3	94.8	15466	6.0	0.7	1.8	8050
HDP(HE)6303-12	900	630	494	593	229.8	208.9	165.7	137.9	114.9	104.5	173.3	166.6	105.0	0.79	95.4	94.5	92.4	94.9	17399	6.0	0.7	1.8	8320
HDP(HE)6304-12	1000	630	494	593	255.1	231.9	184.0	153.1	127.5	116.0	192.3	184.9	116.6	0.79	95.5	94.6	92.5	95.0	19332	6.0	0.7	1.8	8590

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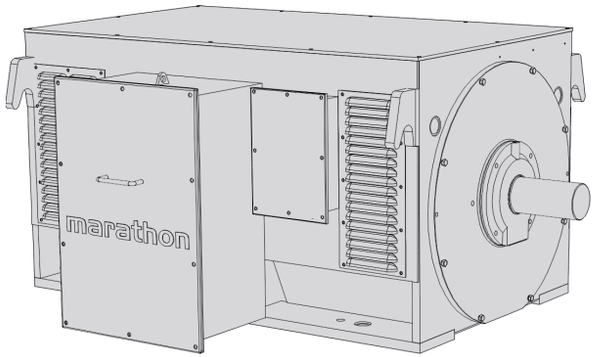
"Standard Line" Voltages							
	50Hz:	3kV	3.3kV	4.16kV	5kV	6kV	6.6kV	10kV
	60Hz:	4kV	4.16kV	6.6kV	13.8kV			

TYPE	Output kW	Frame Size	Speed		Current		Power Factor	Efficiency (at 50Hz)			60Hz	Rated torque	Ratio			Weight
			50Hz rpm	60Hz rpm	50Hz 10kV A	60Hz 13.8kV A	Cos φ	100% Load %	75% Load %	50% Load %	100% Load %	Nm	Starting current	Starting torque	B/down torque	Kg
600rpm/720rpm 10pole, IP23, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																
HDP(HE)5002-10	250	500	595	714	20.8	15.2	0.74	93.6	92.7	90.2	93.1	4013	5.5	0.7	1.8	4100
HDP(HE)5003-10	280	500	595	714	23.3	17.0	0.74	93.8	92.9	90.4	93.3	4494	5.5	0.7	1.8	4240
HDP(HE)5004-10	315	500	595	714	26.1	19.0	0.74	94.0	93.1	90.6	93.5	5056	5.5	0.7	1.8	4400
HDP(HE)5005-10	355	500	595	714	29.0	21.1	0.75	94.2	93.3	90.8	93.7	5698	5.5	0.7	1.8	4620
HDP(HE)5006-10	400	500	595	714	32.7	23.8	0.75	94.3	93.4	90.9	93.8	6420	5.5	0.7	1.8	4850
HDP(HE)5601-10	450	560	590	708	35.7	26.0	0.77	94.5	93.6	91.1	94.0	7284	6.0	0.7	1.8	5540
HDP(HE)5602-10	500	560	590	708	39.6	28.9	0.77	94.6	93.7	91.2	94.1	8093	6.0	0.7	1.8	5870
HDP(HE)5603-10	560	560	590	708	43.8	31.9	0.78	94.7	93.8	91.3	94.2	9064	6.0	0.7	1.8	6280
HDP(HE)5604-10	630	560	590	708	49.1	35.8	0.78	94.9	94.0	91.5	94.4	10197	6.0	0.7	1.8	6680
HDP(HE)5605-10	710	560	590	708	55.3	40.3	0.78	95.1	94.2	91.7	94.6	11492	6.0	0.7	1.8	7050
HDP(HE)6301-10	800	630	594	713	60.5	44.1	0.8	95.4	94.5	92.0	94.9	12862	6.0	0.7	1.8	7800
HDP(HE)6302-10	900	630	593	712	67.9	49.5	0.8	95.6	94.7	92.2	95.1	14494	6.0	0.7	1.8	8120
HDP(HE)6303-10	1000	630	593	712	75.5	55.0	0.8	95.6	94.7	92.2	95.1	16105	6.0	0.7	1.8	8420
HDP(HE)6304-10	1120	630	593	712	84.5	61.5	0.8	95.7	94.8	92.3	95.2	18037	6.0	0.7	1.8	8780
500rpm/600rpm 12pole, IP23, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																
HDP(HE)5601-12	315	560	490	588	26.6	19.4	0.73	93.7	92.8	90.3	93.2	6139	6.0	0.7	1.8	5580
HDP(HE)5602-12	355	560	490	588	29.9	21.8	0.73	93.9	93.0	90.5	93.4	6919	6.0	0.7	1.8	5790
HDP(HE)5603-12	400	560	490	588	33.6	24.5	0.73	94.1	93.2	90.7	93.6	7796	6.0	0.7	1.8	6040
HDP(HE)5604-12	450	560	490	588	37.8	27.5	0.73	94.2	93.3	90.8	93.7	8770	6.0	0.7	1.8	6280
HDP(HE)5605-12	500	560	490	588	41.8	30.5	0.73	94.5	93.6	91.1	94.0	9745	6.0	0.7	1.8	6530
HDP(HE)6301-12	560	630	492	590	46.1	33.6	0.74	94.7	93.8	91.3	94.2	10870	6.0	0.7	1.8	7730
HDP(HE)6302-12	630	630	493	592	51.8	37.7	0.74	94.9	94.0	91.5	94.4	12204	6.0	0.7	1.8	8050
HDP(HE)6303-12	710	630	493	592	58.3	42.4	0.74	95.1	94.2	91.7	94.6	13754	6.0	0.7	1.8	8320
HDP(HE)6304-12	800	630	492	590	65.5	47.7	0.74	95.3	94.4	91.9	94.8	15528	6.0	0.7	1.8	8650

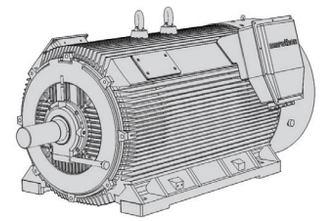


TYPE	Output kW	Frame Size	Speed 50Hz rpm	Speed 60Hz rpm	Current (at 50Hz) of Standard Line Voltages at 3kV A	at 3.3kV A	at 4.16kV A	at 5kV A	at 6kV A	at 6.6kV A	and at 60Hz at 4kV A	at 4.16kV A	at 6.6kV A	Power Factor Cos φ	Efficiency (at 50Hz) 100% Load %	75% Load %	50% Load %	60Hz 100% Load %	Rated torque Nm	Ratio Starting current	Starting torque	B/down torque	Weight Kg
3000rpm/3600rpm 2pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																							
HCM(SE)3551-2	185	355	2980	3576	45.1	41.0	32.6	27.1	22.6	20.5	34.0	32.7	20.6	0.84	93.9	93.5	92.1	93.4	593	7.0	0.7	2.0	1900
HCM(SE)3552-2	200	355	2980	3576	48.7	44.3	35.2	29.2	24.4	22.2	36.8	35.3	22.3	0.84	94.0	93.6	92.2	93.5	641	7.0	0.7	2.0	2000
HCM(SE)3553-2	220	355	2980	3576	53.5	48.6	38.6	32.1	26.8	24.3	40.3	38.8	24.5	0.84	94.2	93.8	92.4	93.7	705	7.0	0.7	2.0	2100
HCM(SE)3553-2	250	355	2980	3576	60.7	55.2	43.8	36.4	30.3	27.6	45.7	44.0	27.7	0.84	94.4	94.0	92.6	93.9	801	7.0	0.7	2.0	2200
HCM(SE)3555-2	280	355	2980	3576	66.2	60.2	47.8	39.7	33.1	30.1	49.9	48.0	30.3	0.86	94.6	94.2	92.8	94.1	897	7.0	0.7	2.0	2350
HCM(SE)4001-2	315	400	2980	3576	74.4	67.6	53.6	44.6	37.2	33.8	56.1	53.9	34.0	0.86	94.8	94.4	93.0	94.3	1009	7.0	0.7	2.0	2900
HCM(SE)4002-2	355	400	2980	3576	83.7	76.1	60.4	50.2	41.9	38.1	63.1	60.7	38.3	0.86	94.9	94.5	93.1	94.4	1138	7.0	0.7	2.0	3000
HCM(SE)4003-2	400	400	2980	3576	94.1	85.6	67.9	56.5	47.1	42.8	71.0	68.2	43.0	0.86	95.1	94.7	93.3	94.6	1282	7.0	0.7	2.0	3100
HCM(SE)4004-2	450	400	2980	3576	105.8	96.2	76.3	63.5	52.9	48.1	79.8	76.7	48.3	0.86	95.2	94.8	93.4	94.7	1442	7.0	0.7	2.0	3200
HCM(SE)4501-2	500	450	2982	3578	116.1	105.5	83.7	69.6	58.0	52.8	87.5	84.1	53.0	0.87	95.3	94.9	93.5	94.8	1601	7.0	0.7	2.0	3500
HCM(SE)4502-2	560	450	2982	3578	129.9	118.0	93.6	77.9	64.9	59.0	97.9	94.1	59.3	0.87	95.4	95.0	93.6	94.9	1793	7.0	0.7	2.0	3600
HCM(SE)4503-2	630	450	2982	3578	145.9	132.7	105.2	87.6	73.0	66.3	110.0	105.8	66.7	0.87	95.5	95.1	93.7	95.0	2018	7.0	0.7	2.0	3700
HCM(SE)4504-2	710	450	2982	3578	164.1	149.2	118.4	98.5	82.1	74.6	123.7	119.0	75.0	0.87	95.7	95.3	93.9	95.2	2274	7.0	0.7	2.0	3850
HCM(SE)5001-2	800	500	2982	3578	183.0	166.4	132.0	109.8	91.5	83.2	138.0	132.7	83.6	0.88	95.6	95.2	93.8	95.1	2562	7.0	0.7	2.0	5780
HCM(SE)5002-2	900	500	2982	3578	205.7	187.0	148.3	123.4	102.8	93.5	155.1	149.1	94.0	0.88	95.7	95.3	93.9	95.2	2882	7.0	0.7	2.0	6050
HCM(SE)5003-2	1000	500	2982	3578	228.0	207.3	164.5	136.8	114.0	103.7	171.9	165.3	104.2	0.88	95.9	95.5	94.1	95.4	3203	7.0	0.7	2.0	6320
HCM(SE)5004-2	1120	500	2982	3578	255.1	232.0	184.0	153.1	127.6	116.0	192.4	185.0	116.6	0.88	96.0	95.6	94.2	95.5	3587	7.0	0.7	2.0	6600
1500rpm/1800rpm 4pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																							
HCM(SE)3551-4	185	355	1485	1782	45.2	41.1	32.6	27.1	22.6	20.6	34.1	32.8	20.7	0.84	93.7	93.3	91.9	93.2	1190	6.5	0.8	2.0	1900
HCM(SE)3552-4	200	355	1485	1782	48.8	44.4	35.2	29.3	24.4	22.2	36.8	35.4	22.3	0.84	93.9	93.5	92.1	93.4	1286	6.5	0.8	2.0	2000
HCM(SE)3553-4	220	355	1485	1782	53.6	48.7	38.6	32.1	26.8	24.3	40.4	38.8	24.5	0.84	94.1	93.7	92.3	93.6	1415	6.5	0.8	2.0	2100
HCM(SE)3554-4	250	355	1485	1782	60.7	55.2	43.8	36.4	30.4	27.6	45.8	44.0	27.8	0.84	94.3	93.9	92.5	93.8	1608	6.5	0.8	2.0	2200
HCM(SE)3555-4	280	355	1485	1782	67.9	61.7	49.0	40.7	33.9	30.9	51.2	49.2	31.0	0.84	94.5	94.1	92.7	94.0	1801	6.5	0.8	2.0	2300
HCM(SE)4001-4	315	400	1485	1782	75.4	68.5	54.4	45.2	37.7	34.3	56.8	54.7	34.5	0.85	94.6	94.2	92.8	94.1	2026	6.5	0.8	2.0	3000
HCM(SE)4002-4	355	400	1485	1782	84.8	77.1	61.1	50.9	42.4	38.5	63.9	61.5	38.7	0.85	94.8	94.4	93.0	94.3	2283	6.5	0.8	2.0	3100
HCM(SE)4003-4	400	400	1485	1782	95.3	86.7	68.8	57.2	47.7	43.3	71.9	69.1	43.6	0.85	95.0	94.6	93.2	94.5	2572	6.5	0.8	2.0	3200
HCM(SE)4004-4	450	400	1485	1782	107.0	97.3	77.2	64.2	53.5	48.6	80.7	77.6	48.9	0.85	95.2	94.8	93.4	94.7	2894	6.5	0.8	2.0	3300
HCM(SE)4501-4	500	450	1485	1782	117.4	106.7	84.7	70.4	58.7	53.4	88.5	85.1	53.7	0.86	95.3	94.9	93.5	94.8	3215	6.5	0.8	2.0	3600
HCM(SE)4502-4	560	450	1485	1782	131.4	119.4	94.7	78.8	65.7	59.7	99.0	95.2	60.0	0.86	95.4	95.0	93.6	94.9	3601	6.5	0.8	2.0	3700
HCM(SE)4503-4	630	450	1485	1782	147.6	134.2	106.5	88.6	73.8	67.1	111.3	107.0	67.5	0.86	95.5	95.1	93.7	95.0	4052	6.5	0.8	2.0	3800
HCM(SE)4504-4	710	450	1485	1782	166.2	151.1	119.9	99.7	83.1	75.5	125.3	120.5	75.9	0.86	95.6	95.2	93.8	95.1	4566	6.5	0.8	2.0	3950
HCM(SE)5001-4	800	500	1488	1786	187.1	170.1	134.9	112.2	93.5	85.0	141.0	135.6	85.5	0.86	95.7	95.3	93.9	95.2	5134	6.5	0.8	2.0	5820
HCM(SE)5002-4	900	500	1488	1786	210.2	191.1	151.6	126.1	105.1	95.6	158.5	152.4	96.1	0.86	95.8	95.4	94.0	95.3	5776	6.5	0.8	2.0	6100
HCM(SE)5003-4	1000	500	1488	1786	233.4	212.1	168.3	140.0	116.7	106.1	175.9	169.2	106.6	0.86	95.9	95.5	94.1	95.4	6418	6.5	0.8	2.0	6280
HCM(SE)5004-4	1120	500	1488	1786	261.1	237.3	188.3	156.7	130.5	118.7	196.8	189.3	119.3	0.86	96.0	95.6	94.2	95.5	7188	6.5	0.8	2.0	6420
HCM(SE)5601-4	1250	560	1488	1786	287.7	261.6	207.5	172.6	143.9	130.8	216.9	208.6	131.5	0.87	96.1	95.7	94.3	95.6	8023	6.5	0.7	2.0	8020
HCM(SE)5602-4	1400	560	1488	1786	321.9	292.7	232.2	193.2	161.0	146.3	242.7	233.4	147.1	0.87	96.2	95.8	94.4	95.7	8985	6.5	0.7	2.0	8390
HCM(SE)5603-4	1600	560	1488	1786	367.2	333.8	264.8	220.3	183.6	166.9	276.8	266.2	167.8	0.87	96.4	96.0	94.6	95.9	10269	6.5	0.7	2.0	8750
HCM(SE)5604-4	1800	560	1488	1786	412.6	375.1	297.6	247.6	206.3	187.6	311.1	299.1	188.5	0.87	96.5	96.1	94.7	96.0	11552	6.5	0.7	2.0	9100

TYPE	Output kW	Frame Size	Speed 50Hz rpm	Speed 60Hz rpm	Current 50Hz 10kV A	Current 60Hz 13.8kV A	Power Factor Cos φ	Efficiency (at 50Hz) 100% Load %	75% Load %	50% Load %	60Hz 100% Load %	Rated torque Nm	Ratio Starting current	Ratio Starting torque	Ratio B/down torque	Weight Kg
3000rpm/3600rpm 2pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																
HCM(SE)4001-2	220	400	2980	3576	16.3	11.9	0.84	92.8	92.4	91.0	92.3	705	7.0	0.7	2.0	2900
HCM(SE)4002-2	250	400	2980	3576	18.5	13.5	0.84	93.0	92.6	91.2	92.5	801	7.0	0.7	2.0	3000
HCM(SE)4003-2	280	400	2980	3576	20.2	14.7	0.86	93.1	92.7	91.3	92.6	897	7.0	0.7	2.0	3100
HCM(SE)4004-2	315	400	2980	3576	22.7	16.5	0.86	93.3	92.9	91.5	92.8	1009	7.0	0.7	2.0	3200
HCM(SE)4501-2	355	450	2982	3578	25.5	18.6	0.86	93.5	93.1	91.7	93.0	1137	7.0	0.7	2.0	3500
HCM(SE)4502-2	400	450	2982	3578	28.6	20.9	0.86	93.8	93.4	92.0	93.3	1281	7.0	0.7	2.0	3600
HCM(SE)4503-2	450	450	2982	3578	32.2	23.4	0.86	93.9	93.5	92.1	93.4	1441	7.0	0.7	2.0	3700
HCM(SE)4504-2	500	450	2982	3578	35.3	25.7	0.87	94.0	93.6	92.2	93.5	1601	7.0	0.7	2.0	3850
HCM(SE)5001-2	560	500	2985	3582	39.5	28.7	0.87	94.2	93.8	92.4	93.7	1792	7.0	0.7	2.0	5500
HCM(SE)5002-2	630	500	2985	3582	44.3	32.3	0.87	94.4	94.0	92.6	93.9	2016	7.0	0.7	2.0	5780
HCM(SE)5003-2	710	500	2985	3582	49.8	36.3	0.87	94.6	94.2	92.8	94.1	2272	7.0	0.7	2.0	6050
HCM(SE)5004-2	800	500	2985	3582	55.4	40.3	0.88	94.8	94.4	93.0	94.3	2559	7.0	0.7	2.0	6320
HCM(SE)5005-2	900	500	2985	3582	62.2	45.3	0.88	95.0	94.6	93.2	94.5	2879	7.0	0.7	2.0	6600
1500rpm/1800rpm 4pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																
HCM(SE)4001-4	220	400	1482	1778	16.3	11.9	0.84	92.7	92.3	90.9	92.2	1418	6.5	0.8	2.0	3000
HCM(SE)4002-4	250	400	1482	1778	18.5	13.5	0.84	92.9	92.5	91.1	92.4	1611	6.5	0.8	2.0	3100
HCM(SE)4003-4	280	400	1482	1778	20.7	15.1	0.84	93.0	92.6	91.2	92.5	1804	6.5	0.8	2.0	3200
HCM(SE)4004-4	315	400	1482	1778	22.9	16.7	0.85	93.3	92.9	91.5	92.8	2030	6.5	0.8	2.0	3300
HCM(SE)4501-4	355	450	1485	1782	25.8	18.8	0.85	93.4	93.0	91.6	92.9	2283	6.5	0.8	2.0	3500
HCM(SE)4502-4	400	450	1485	1782	29.0	21.1	0.85	93.6	93.2	91.8	93.1	2572	6.5	0.8	2.0	3600
HCM(SE)4503-4	450	450	1485	1782	32.6	23.7	0.85	93.8	93.4	92.0	93.3	2894	6.5	0.8	2.0	3700
HCM(SE)4504-4	500	450	1485	1782	35.7	26.0	0.86	94.0	93.6	92.2	93.5	3215	6.5	0.8	2.0	3800
HCM(SE)4505-4	560	450	1485	1782	40.0	29.1	0.86	94.1	93.7	92.3	93.6	3601	6.5	0.8	2.0	3950
HCM(SE)5001-4	630	500	1488	1786	44.9	32.7	0.86	94.3	93.9	92.5	93.8	4043	6.5	0.8	2.0	5820
HCM(SE)5002-4	710	500	1488	1786	50.4	36.7	0.86	94.5	94.1	92.7	94.0	4557	6.5	0.8	2.0	6100
HCM(SE)5003-4	800	500	1488	1786	56.0	40.8	0.87	94.8	94.4	93.0	94.3	5134	6.5	0.8	2.0	6280
HCM(SE)5004-4	900	500	1488	1786	62.9	45.8	0.87	95.0	94.6	93.2	94.5	5776	6.5	0.8	2.0	6420
HCM(SE)5601-4	1000	560	1488	1786	69.8	50.8	0.87	95.1	94.7	93.3	94.6	6418	6.5	0.7	2.0	8020
HCM(SE)5602-4	1120	560	1488	1786	77.2	56.2	0.88	95.2	94.8	93.4	94.7	7188	6.5	0.7	2.0	8390
HCM(SE)5603-4	1250	560	1488	1786	86.0	62.6	0.88	95.4	95.0	93.6	94.9	8023	6.5	0.7	2.0	8750
HCM(SE)5604-4	1400	560	1488	1786	96.1	70.0	0.88	95.6	95.2	93.8	95.1	8985	6.5	0.7	2.0	9100

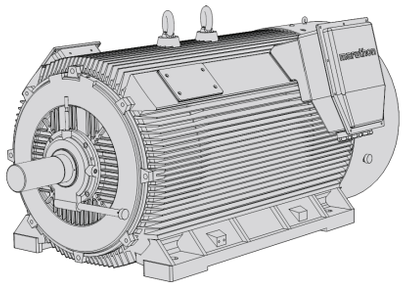
"Standard Line" High Voltage motors are pre-designed standard motors available at reduced lead times.
They are available as **Standard Efficiency Motors** and also as **Higher Efficiency Motors.**
For different voltages, speeds and power outputs please contact the Marathon staff.

"Standard Line" Voltages							
50Hz:	3kV	3.3kV	4.16kV	5kV	6kV	6.6kV	10kV
60Hz:	4kV	4.16kV	6.6kV	13.8kV			



TYPE	Output kW	Frame Size	Speed 50Hz rpm	Speed 60Hz rpm	Current (at 50Hz) of Standard Line Voltages at 3kV A	at 3.3kV A	at 4.16kV A	at 5kV A	at 6kV A	at 6.6kV A	and at 60Hz at 4kV A	at 4.16kV A	at 6.6kV A	Power Factor Cos φ	Efficiency (at 50Hz) 100% Load %	75% Load %	50% Load %	60Hz 100% Load %	Rated torque Nm	Ratio Starting current	Starting torque	B/down torque	Weight Kg
1000rpm/1200rpm 6pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																							
HCM(SE)3551-6	160	355	985	1182	41.2	37.5	29.7	24.7	20.6	18.7	31.1	29.9	18.8	0.80	93.4	93.0	91.6	92.9	1551	6.0	0.8	2.0	2200
HCM(SE)3552-6	185	355	985	1182	47.6	43.3	34.3	28.6	23.8	21.6	35.9	34.5	21.8	0.80	93.5	93.1	91.7	93.0	1794	6.0	0.8	2.0	2300
HCM(SE)3553-6	200	355	985	1182	51.4	46.7	37.1	30.8	25.7	23.4	38.8	37.3	23.5	0.80	93.6	93.2	91.8	93.1	1939	6.0	0.8	2.0	2400
HCM(SE)4001-6	220	400	988	1186	55.0	50.0	39.7	33.0	27.5	25.0	41.5	39.9	25.2	0.82	93.8	93.4	92.0	93.3	2127	6.0	0.8	2.0	2900
HCM(SE)4002-6	250	400	988	1186	62.5	56.8	45.1	37.5	31.2	28.4	47.1	45.3	28.6	0.82	93.9	93.5	92.1	93.4	2416	6.0	0.8	2.0	3000
HCM(SE)4003-6	280	400	988	1186	69.8	63.5	50.4	41.9	34.9	31.7	52.7	50.6	31.9	0.82	94.1	93.7	92.3	93.6	2706	6.0	0.8	2.0	3200
HCM(SE)4004-6	315	400	988	1186	78.4	71.3	56.5	47.0	39.2	35.6	59.1	56.8	35.8	0.82	94.3	93.9	92.5	93.8	3045	6.0	0.8	2.0	3400
HCM(SE)4501-6	355	450	988	1186	87.1	79.2	62.8	52.3	43.6	39.6	65.7	63.2	39.8	0.83	94.5	94.1	92.7	94.0	3431	6.0	0.8	2.0	3500
HCM(SE)4502-6	400	450	988	1186	98.0	89.1	70.7	58.8	49.0	44.6	73.9	71.1	44.8	0.83	94.6	94.2	92.8	94.1	3866	6.0	0.8	2.0	3600
HCM(SE)4503-6	450	450	988	1186	110.2	100.2	79.5	66.1	55.1	50.1	83.1	79.9	50.3	0.83	94.7	94.3	92.9	94.2	4350	6.0	0.8	2.0	3700
HCM(SE)4504-6	500	450	988	1186	122.2	111.1	88.1	73.3	61.1	55.5	92.1	88.6	55.8	0.83	94.9	94.5	93.1	94.4	4833	6.0	0.8	2.0	3820
HCM(SE)5001-6	560	500	990	1188	136.5	124.1	98.5	81.9	68.3	62.1	102.9	99.0	62.4	0.83	95.1	94.7	93.3	94.6	5402	6.0	0.8	2.0	5610
HCM(SE)5002-6	630	500	990	1188	153.4	139.5	110.7	92.1	76.7	69.7	115.7	111.2	70.1	0.83	95.2	94.8	93.4	94.7	6077	6.0	0.8	2.0	5790
HCM(SE)5003-6	710	500	990	1188	172.8	157.0	124.6	103.7	86.4	78.5	130.2	125.2	78.9	0.83	95.3	94.9	93.5	94.8	6849	6.0	0.8	2.0	6010
HCM(SE)5004-6	800	500	990	1188	194.4	176.8	140.2	116.7	97.2	88.4	146.6	141.0	88.8	0.83	95.4	95.0	93.6	94.9	7717	6.0	0.8	2.0	6230
HCM(SE)5601-6	900	560	990	1188	215.7	196.1	155.5	129.4	107.8	98.0	162.6	156.4	98.6	0.84	95.6	95.2	93.8	95.1	8682	6.0	0.7	2.0	7650
HCM(SE)5602-6	1000	560	990	1188	239.4	217.6	172.7	143.6	119.7	108.8	180.5	173.6	109.4	0.84	95.7	95.3	93.9	95.2	9646	6.0	0.7	2.0	7950
HCM(SE)5603-6	1120	560	990	1188	267.9	243.5	193.2	160.7	133.9	121.8	201.9	194.2	122.4	0.84	95.8	95.4	94.0	95.3	10804	6.0	0.7	2.0	8250
HCM(SE)5604-6	1250	560	990	1188	298.6	271.5	215.4	179.2	149.3	135.7	225.2	216.5	136.5	0.84	95.9	95.5	94.1	95.4	12058	6.0	0.7	2.0	8550
750rpm/900rpm 8pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																							
HCM(SE)4001-8	160	400	738	886	43.5	39.5	31.4	26.1	21.7	19.8	32.8	31.5	19.9	0.76	93.2	92.8	91.4	92.7	2070	5.5	0.8	2.0	3000
HCM(SE)4002-8	185	400	738	886	50.2	45.6	36.2	30.1	25.1	22.8	37.9	36.4	22.9	0.76	93.3	92.9	91.5	92.8	2394	5.5	0.8	2.0	3100
HCM(SE)4003-8	200	400	738	886	53.5	48.6	38.6	32.1	26.7	24.3	40.3	38.8	24.4	0.77	93.5	93.1	91.7	93.0	2588	5.5	0.8	2.0	3200
HCM(SE)4004-8	220	400	738	886	58.7	53.3	42.3	35.2	29.3	26.7	44.2	42.5	26.8	0.77	93.7	93.3	91.9	93.2	2847	5.5	0.8	2.0	3300
HCM(SE)4501-8	250	450	740	888	65.7	59.7	47.4	39.4	32.8	29.9	49.5	47.6	30.0	0.78	93.9	93.5	92.1	93.4	3226	5.5	0.8	2.0	3500
HCM(SE)4502-8	280	450	740	888	73.4	66.7	52.9	44.1	36.7	33.4	55.4	53.2	33.6	0.78	94.1	93.7	92.3	93.6	3614	5.5	0.8	2.0	3600
HCM(SE)4503-8	315	450	740	888	82.5	75.0	59.5	49.5	41.3	37.5	62.2	59.8	37.7	0.78	94.2	93.8	92.4	93.7	4065	5.5	0.8	2.0	3700
HCM(SE)4504-8	355	450	740	888	92.8	84.4	66.9	55.7	46.4	42.2	70.0	67.3	42.4	0.78	94.4	94.0	92.6	93.9	4581	5.5	0.8	2.0	3820
HCM(SE)5001-8	400	500	742	890	103.1	93.7	74.4	61.9	51.6	46.9	77.7	74.8	47.1	0.79	94.5	94.1	92.7	94.0	5148	5.5	0.8	2.0	5250
HCM(SE)5002-8	450	500	742	890	115.9	105.3	83.6	69.5	57.9	52.7	87.4	84.0	53.0	0.79	94.6	94.2	92.8	94.1	5792	5.5	0.8	2.0	5490
HCM(SE)5003-8	500	500	742	890	126.9	115.3	91.5	76.1	63.4	57.7	95.7	92.0	58.0	0.80	94.8	94.4	93.0	94.3	6435	5.5	0.8	2.0	5750
HCM(SE)5004-8	560	500	742	890	142.0	129.1	102.4	85.2	71.0	64.5	107.0	102.9	64.9	0.80	94.9	94.5	93.1	94.4	7208	5.5	0.8	2.0	6020
HCM(SE)5601-8	630	560	745	894	157.4	143.1	113.5	94.4	78.7	71.5	118.7	114.1	71.9	0.81	95.1	94.7	93.3	94.6	8076	5.5	0.7	2.0	7000
HCM(SE)5602-8	710	560	745	894	177.0	160.9	127.7	106.2	88.5	80.5	133.5	128.3	80.9	0.81	95.3	94.9	93.5	94.8	9101	5.5	0.7	2.0	7350
HCM(SE)5603-8	800	560	745	894	199.2	181.1	143.7	119.5	99.6	90.6	150.2	144.4	91.0	0.81	95.4	95.0	93.6	94.9	10255	5.5	0.7	2.0	7700
HCM(SE)5604-8	900	560	745	894	223.7	203.3	161.3	134.2	111.8	101.7	168.6	162.2	102.2	0.81	95.6	95.2	93.8	95.1	11537	5.5	0.7	2.0	8100

TYPE	Output	Frame Size	Speed		Current		Power Factor	Efficiency (at 50Hz)			60Hz	Rated torque	Ratio			Weight
	kW		50Hz rpm	60Hz rpm	50Hz 10kV A	60Hz 13.8kV A	Cos φ	100% Load %	75% Load %	50% Load %	100% Load %	Nm	Starting current	Starting torque	B/down torque	Kg
1000rpm/1200rpm 6pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																
HCM(SE)4501-6	220	450	985	1182	16.7	12.2	0.82	92.5	92.1	90.7	92.0	2133	6.0	0.8	2.0	3400
HCM(SE)4502-6	250	450	985	1182	19.0	13.8	0.82	92.7	92.3	90.9	92.2	2424	6.0	0.8	2.0	3500
HCM(SE)4503-6	280	450	985	1182	21.2	15.5	0.82	92.9	92.5	91.1	92.4	2715	6.0	0.8	2.0	3600
HCM(SE)4504-6	315	450	985	1182	23.8	17.4	0.82	93.1	92.7	91.3	92.6	3054	6.0	0.8	2.0	3700
HCM(SE)4505-6	355	450	985	1182	26.8	19.5	0.82	93.3	92.9	91.5	92.8	3442	6.0	0.8	2.0	3820
HCM(SE)5001-6	400	500	985	1182	30.1	21.9	0.82	93.5	93.1	91.7	93.0	3878	6.0	0.8	2.0	5450
HCM(SE)5002-6	450	500	988	1186	33.4	24.3	0.83	93.7	93.3	91.9	93.2	4350	6.0	0.8	2.0	5610
HCM(SE)5003-6	500	500	988	1186	37.0	27.0	0.83	93.9	93.5	92.1	93.4	4833	6.0	0.8	2.0	5790
HCM(SE)5004-6	560	500	990	1188	41.4	30.2	0.83	94.1	93.7	92.3	93.6	5402	6.0	0.8	2.0	6010
HCM(SE)5005-6	630	500	990	1188	46.5	33.9	0.83	94.3	93.9	92.5	93.8	6077	6.0	0.8	2.0	6230
HCM(SE)5601-6	710	560	992	1190	52.3	38.1	0.83	94.5	94.1	92.7	94.0	6835	6.0	0.7	2.0	7400
HCM(SE)5602-6	800	560	992	1190	58.8	42.8	0.83	94.7	94.3	92.9	94.2	7702	6.0	0.7	2.0	7650
HCM(SE)5603-6	900	560	992	1190	65.2	47.5	0.84	94.9	94.5	93.1	94.4	8664	6.0	0.7	2.0	7950
HCM(SE)5604-6	1000	560	992	1190	72.3	52.7	0.84	95.1	94.7	93.3	94.6	9627	6.0	0.7	2.0	8250
HCM(SE)5605-6	1120	560	992	1190	80.8	58.8	0.84	95.3	94.9	93.5	94.8	10782	6.0	0.7	2.0	8550
750rpm/900rpm 8pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																
HCM(SE)4501-8	220	450	740	888	18.3	13.4	0.75	92.4	92.0	90.6	91.9	2839	5.5	0.8	2.0	3600
HCM(SE)4502-8	250	450	740	888	20.8	15.1	0.75	92.6	92.2	90.8	92.1	3226	5.5	0.8	2.0	3700
HCM(SE)4503-8	280	450	740	888	22.6	16.5	0.77	92.8	92.4	91.0	92.3	3614	5.5	0.8	2.0	3820
HCM(SE)5001-8	315	500	742	890	25.4	18.5	0.77	93.0	92.6	91.2	92.5	4054	5.5	0.8	2.0	5250
HCM(SE)5002-8	355	500	742	890	28.6	20.8	0.77	93.2	92.8	91.4	92.7	4569	5.5	0.8	2.0	5490
HCM(SE)5003-8	400	500	742	890	31.3	22.8	0.79	93.4	93.0	91.6	92.9	5148	5.5	0.8	2.0	5750
HCM(SE)5004-8	450	500	742	890	35.2	25.6	0.79	93.5	93.1	91.7	93.0	5792	5.5	0.8	2.0	6020
HCM(SE)5601-8	500	560	745	894	39.0	28.4	0.79	93.7	93.3	91.9	93.2	6409	5.5	0.7	2.0	6650
HCM(SE)5602-8	560	560	745	894	43.6	31.8	0.79	93.9	93.5	92.1	93.4	7179	5.5	0.7	2.0	7000
HCM(SE)5603-8	630	560	745	894	48.3	35.2	0.80	94.1	93.7	92.3	93.6	8076	5.5	0.7	2.0	7350
HCM(SE)5604-8	710	560	745	894	54.3	39.6	0.80	94.3	93.9	92.5	93.8	9101	5.5	0.7	2.0	7700
HCM(SE)5605-8	800	560	745	894	61.1	44.5	0.80	94.5	94.1	92.7	94.0	10255	5.5	0.7	2.0	8100

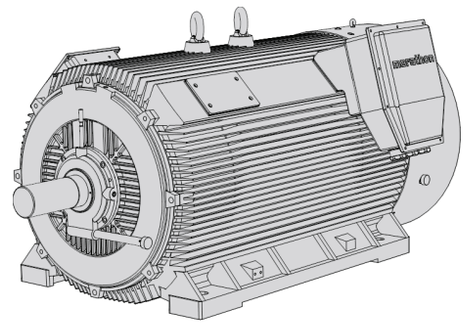


TYPE	Output kW	Frame Size	Speed 50Hz rpm	Speed 60Hz rpm	Current (at 50Hz) of Standard Line Voltages at 3kV A	at 3.3kV A	at 4.16kV A	at 5kV A	at 6kV A	at 6.6kV A	and at 60Hz at 4kV A	at 4.16kV A	at 6.6kV A	Power Factor Cos φ	Efficiency (at 50Hz) 100% Load %	75% Load %	50% Load %	60Hz 100% Load %	Rated torque Nm	Ratio Starting current	Starting torque	B/down torque	Weight Kg
3000rpm/3600rpm 2pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																							
HCM(HE)3551-2	185	355	2980	3576	45.0	40.9	32.5	27.0	22.5	20.5	34.0	32.7	20.6	0.84	94.1	93.5	91.7	93.6	593	7.0	0.7	2.0	1900
HCM(HE)3552-2	200	355	2980	3576	48.6	44.2	35.0	29.2	24.3	22.1	36.6	35.2	22.2	0.84	94.3	93.7	91.9	93.8	641	7.0	0.7	2.0	2000
HCM(HE)3553-2	220	355	2980	3576	53.4	48.5	38.5	32.0	26.7	24.3	40.3	38.7	24.4	0.84	94.4	93.8	92.0	93.9	705	7.0	0.7	2.0	2100
HCM(HE)3553-2	250	355	2980	3576	60.5	55.0	43.7	36.3	30.3	27.5	45.7	43.9	27.7	0.84	94.6	94.0	92.2	94.1	801	7.0	0.7	2.0	2200
HCM(HE)3555-2	280	355	2980	3576	66.2	60.2	47.7	39.7	33.1	30.1	49.9	48.0	30.2	0.86	94.7	94.1	92.3	94.2	897	7.0	0.7	2.0	2350
HCM(HE)4001-2	315	400	2980	3576	74.4	67.7	53.7	44.7	37.2	33.8	56.1	54.0	34.0	0.86	94.7	94.1	92.3	94.2	1009	7.0	0.7	2.0	2900
HCM(HE)4002-2	355	400	2980	3576	83.8	76.2	60.4	50.3	41.9	38.1	63.2	60.8	38.3	0.86	94.8	94.2	92.4	94.3	1138	7.0	0.7	2.0	3000
HCM(HE)4003-2	400	400	2980	3576	94.0	85.5	67.8	56.4	47.0	42.7	70.9	68.2	43.0	0.86	95.2	94.6	92.8	94.7	1282	7.0	0.7	2.0	3100
HCM(HE)4004-2	450	400	2980	3576	105.6	96.0	76.1	63.3	52.8	48.0	79.6	76.5	48.2	0.86	95.4	94.8	93.0	94.9	1442	7.0	0.7	2.0	3200
HCM(HE)4501-2	500	450	2982	3578	115.7	105.2	83.4	69.4	57.8	52.6	87.2	83.9	52.9	0.87	95.6	95.0	93.2	95.1	1601	7.0	0.7	2.0	3500
HCM(HE)4502-2	560	450	2982	3578	129.4	117.7	93.4	77.7	64.7	58.8	97.6	93.8	59.1	0.87	95.7	95.1	93.3	95.2	1793	7.0	0.7	2.0	3600
HCM(HE)4503-2	630	450	2982	3578	145.5	132.2	104.9	87.3	72.7	66.1	109.7	105.5	66.5	0.87	95.8	95.2	93.4	95.3	2018	7.0	0.7	2.0	3700
HCM(HE)4504-2	710	450	2982	3578	163.8	148.9	118.1	98.3	81.9	74.4	123.5	118.7	74.8	0.87	95.9	95.3	93.5	95.4	2274	7.0	0.7	2.0	3850
HCM(HE)5001-2	800	500	2982	3578	182.1	165.5	131.3	109.2	91.0	82.8	137.3	132.0	83.2	0.88	96.1	95.5	93.7	95.6	2562	7.0	0.7	2.0	5780
HCM(HE)5002-2	900	500	2982	3578	204.6	186.0	147.6	122.8	102.3	93.0	154.3	148.3	93.5	0.88	96.2	95.6	93.8	95.7	2882	7.0	0.7	2.0	6050
HCM(HE)5003-2	1000	500	2982	3578	227.1	206.5	163.8	136.3	113.6	103.2	171.2	164.6	103.8	0.88	96.3	95.7	93.9	95.8	3203	7.0	0.7	2.0	6320
HCM(HE)5004-2	1120	500	2982	3578	254.1	231.0	183.2	152.5	127.0	115.5	191.6	184.2	116.1	0.88	96.4	95.8	94.0	95.9	3587	7.0	0.7	2.0	6600
1500rpm/1800rpm 4pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																							
HCM(HE)3551-4	185	355	1485	1782	44.9	40.9	32.4	27.0	22.5	20.4	33.9	32.6	20.5	0.84	94.3	93.7	91.9	93.8	1190	6.5	0.8	2.0	1900
HCM(HE)3552-4	200	355	1485	1782	48.6	44.2	35.0	29.2	24.3	22.1	36.6	35.2	22.2	0.84	94.3	93.7	91.9	93.8	1286	6.5	0.8	2.0	2000
HCM(HE)3553-4	220	355	1485	1782	53.3	48.5	38.5	32.0	26.7	24.2	40.2	38.7	24.4	0.84	94.5	93.9	92.1	94.0	1415	6.5	0.8	2.0	2100
HCM(HE)3554-4	250	355	1485	1782	60.5	55.0	43.7	36.3	30.3	27.5	45.7	43.9	27.7	0.84	94.6	94.0	92.2	94.1	1608	6.5	0.8	2.0	2200
HCM(HE)3555-4	280	355	1485	1782	67.7	61.6	48.9	40.6	33.9	30.8	51.1	49.1	31.0	0.84	94.7	94.1	92.3	94.2	1801	6.5	0.8	2.0	2300
HCM(HE)4001-4	315	400	1485	1782	75.2	68.3	54.2	45.1	37.6	34.2	56.7	54.5	34.3	0.85	94.9	94.3	92.5	94.4	2026	6.5	0.8	2.0	3000
HCM(HE)4002-4	355	400	1485	1782	84.6	76.9	61.0	50.8	42.3	38.5	63.8	61.3	38.7	0.85	95.0	94.4	92.6	94.5	2283	6.5	0.8	2.0	3100
HCM(HE)4003-4	400	400	1485	1782	95.2	86.6	68.7	57.1	47.6	43.3	71.8	69.0	43.5	0.85	95.1	94.5	92.7	94.6	2572	6.5	0.8	2.0	3200
HCM(HE)4004-4	450	400	1485	1782	106.9	97.2	77.1	64.1	53.5	48.6	80.6	77.5	48.9	0.85	95.3	94.7	92.9	94.8	2894	6.5	0.8	2.0	3300
HCM(HE)4501-4	500	450	1485	1782	117.3	106.6	84.6	70.4	58.6	53.3	88.4	85.0	53.6	0.86	95.4	94.8	93.0	94.9	3215	6.5	0.8	2.0	3600
HCM(HE)4502-4	560	450	1485	1782	131.1	119.2	94.5	78.7	65.5	59.6	98.8	95.0	59.9	0.86	95.6	95.0	93.2	95.1	3601	6.5	0.8	2.0	3700
HCM(HE)4503-4	630	450	1485	1782	147.2	133.8	106.1	88.3	73.6	66.9	111.0	106.7	67.2	0.86	95.8	95.2	93.4	95.3	4052	6.5	0.8	2.0	3800
HCM(HE)4504-4	710	450	1485	1782	165.5	150.5	119.4	99.3	82.8	75.2	124.8	120.0	75.6	0.86	96.0	95.4	93.6	95.5	4566	6.5	0.8	2.0	3950
HCM(HE)5001-4	800	500	1488	1786	186.5	169.5	134.5	111.9	93.2	84.8	140.6	135.2	85.2	0.86	96.0	95.4	93.6	95.5	5134	6.5	0.8	2.0	5820
HCM(HE)5002-4	900	500	1488	1786	209.6	190.5	151.1	125.7	104.8	95.3	158.0	151.9	95.8	0.86	96.1	95.5	93.7	95.6	5776	6.5	0.8	2.0	6100
HCM(HE)5003-4	1000	500	1488	1786	232.6	211.5	167.8	139.6	116.3	105.7	175.4	168.6	106.3	0.86	96.2	95.6	93.8	95.7	6418	6.5	0.8	2.0	6280
HCM(HE)5004-4	1120	500	1488	1786	260.3	236.6	187.7	156.2	130.1	118.3	196.2	188.7	118.9	0.86	96.3	95.7	93.9	95.8	7188	6.5	0.8	2.0	6420
HCM(HE)5601-4	1250	560	1488	1786	286.8	260.8	206.9	172.1	143.4	130.4	216.3	207.9	131.1	0.87	96.4	95.8	94.0	95.9	8023	6.5	0.7	2.0	8020
HCM(HE)5602-4	1400	560	1488	1786	321.3	292.1	231.7	192.8	160.6	146.0	242.2	232.9	146.8	0.87	96.4	95.8	94.0	95.9	8985	6.5	0.7	2.0	8390
HCM(HE)5603-4	1600	560	1488	1786	366.8	333.4	264.5	220.1	183.4	166.7	276.5	265.9	167.6	0.87	96.5	95.9	94.1	96.0	10269	6.5	0.7	2.0	8750
HCM(HE)5604-4	1800	560	1488	1786	412.2	374.7	297.3	247.3	206.1	187.4	310.8	298.8	188.3	0.87	96.6	96.0	94.2	96.1	11552	6.5	0.7	2.0	9100

TYPE	Output kW	Frame Size	Speed 50Hz rpm	Speed 60Hz rpm	Current 50Hz 10kV A	Current 60Hz 13.8kV A	Power Factor Cos φ	Efficiency (at 50Hz) 100% Load %	Efficiency (at 50Hz) 75% Load %	Efficiency (at 50Hz) 50% Load %	60Hz 100% Load %	Rated torque Nm	Ratio Starting current	Ratio Starting torque	Ratio B/down torque	Weight Kg
3000rpm/3600rpm 2pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																
HCM(HE)4001-2	220	400	2980	3576	16.1	11.7	0.84	94.2	93.5	91.8	93.7	705	7.0	0.7	2.0	2900
HCM(HE)4002-2	250	400	2980	3576	18.2	13.3	0.84	94.4	93.7	92.0	93.9	801	7.0	0.7	2.0	3000
HCM(HE)4003-2	280	400	2980	3576	20.1	14.6	0.85	94.6	93.9	92.2	94.1	897	7.0	0.7	2.0	3100
HCM(HE)4004-2	315	400	2980	3576	22.6	16.4	0.85	94.8	94.1	92.4	94.3	1009	7.0	0.7	2.0	3200
HCM(HE)4501-2	355	450	2982	3578	25.1	18.3	0.86	95.0	94.3	92.6	94.5	1137	7.0	0.7	2.0	3500
HCM(HE)4502-2	400	450	2982	3578	28.2	20.5	0.86	95.2	94.5	92.8	94.7	1281	7.0	0.7	2.0	3600
HCM(HE)4503-2	450	450	2982	3578	31.7	23.1	0.86	95.4	94.7	93.0	94.9	1441	7.0	0.7	2.0	3700
HCM(HE)4504-2	500	450	2982	3578	35.1	25.6	0.86	95.5	94.8	93.1	95.0	1601	7.0	0.7	2.0	3850
HCM(HE)5001-2	560	500	2985	3582	38.9	28.3	0.87	95.6	94.9	93.2	95.1	1792	7.0	0.7	2.0	5500
HCM(HE)5002-2	630	500	2985	3582	43.7	31.9	0.87	95.6	94.9	93.2	95.1	2016	7.0	0.7	2.0	5780
HCM(HE)5003-2	710	500	2985	3582	49.2	35.9	0.87	95.7	95.0	93.3	95.2	2272	7.0	0.7	2.0	6050
HCM(HE)5004-2	800	500	2985	3582	54.8	39.9	0.88	95.8	95.1	93.4	95.3	2559	7.0	0.7	2.0	6320
HCM(HE)5005-2	900	500	2985	3582	61.6	44.9	0.88	95.9	95.2	93.5	95.4	2879	7.0	0.7	2.0	6600
1500rpm/1800rpm 4pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																
HCM(HE)4001-4	220	400	1482	1778	16.1	11.7	0.84	94.0	93.3	91.6	93.5	1418	6.5	0.8	2.0	3000
HCM(HE)4002-4	250	400	1482	1778	18.3	13.3	0.84	94.1	93.4	91.7	93.6	1611	6.5	0.8	2.0	3100
HCM(HE)4003-4	280	400	1482	1778	20.4	14.9	0.84	94.2	93.5	91.8	93.7	1804	6.5	0.8	2.0	3200
HCM(HE)4004-4	315	400	1482	1778	22.9	16.7	0.84	94.4	93.7	92.0	93.9	2030	6.5	0.8	2.0	3300
HCM(HE)4501-4	355	450	1485	1782	25.5	18.6	0.85	94.6	93.9	92.2	94.1	2283	6.5	0.8	2.0	3500
HCM(HE)4502-4	400	450	1485	1782	28.7	20.9	0.85	94.7	94.0	92.3	94.2	2572	6.5	0.8	2.0	3600
HCM(HE)4503-4	450	450	1485	1782	32.1	23.4	0.85	95.1	94.4	92.7	94.6	2894	6.5	0.8	2.0	3700
HCM(HE)4504-4	500	450	1485	1782	35.3	25.7	0.86	95.1	94.4	92.7	94.6	3215	6.5	0.8	2.0	3800
HCM(HE)4505-4	560	450	1485	1782	39.5	28.7	0.86	95.3	94.6	92.9	94.8	3601	6.5	0.8	2.0	3950
HCM(HE)5001-4	630	500	1488	1786	44.3	32.3	0.86	95.5	94.8	93.1	95.0	4043	6.5	0.8	2.0	5820
HCM(HE)5002-4	710	500	1488	1786	49.7	36.2	0.86	96.0	95.3	93.6	95.5	4557	6.5	0.8	2.0	6100
HCM(HE)5003-4	800	500	1488	1786	55.3	40.3	0.87	96.0	95.3	93.6	95.5	5134	6.5	0.8	2.0	6280
HCM(HE)5004-4	900	500	1488	1786	62.2	45.3	0.87	96.1	95.4	93.7	95.6	5776	6.5	0.8	2.0	6420
HCM(HE)5601-4	1000	560	1488	1786	69.8	50.8	0.86	96.2	95.5	93.8	95.7	6418	6.5	0.7	2.0	8020
HCM(HE)5602-4	1120	560	1488	1786	78.1	56.9	0.86	96.3	95.6	93.9	95.8	7188	6.5	0.7	2.0	8390
HCM(HE)5603-4	1250	560	1488	1786	86.1	62.7	0.87	96.4	95.7	94.0	95.9	8023	6.5	0.7	2.0	8750
HCM(HE)5604-4	1400	560	1488	1786	96.3	70.1	0.87	96.5	95.8	94.1	96.0	8985	6.5	0.7	2.0	9100

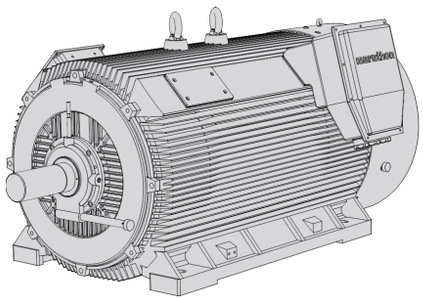
"Standard Line" High Voltage motors are pre-designed standard motors available at reduced lead times.
They are available as **Standard Efficiency Motors** and also as **Higher Efficiency Motors.**
For different voltages, speeds and power outputs please contact the Marathon staff.

"Standard Line" Voltages							
50Hz:	3kV	3.3kV	4.16kV	5kV	6kV	6.6kV	10kV
60Hz:	4kV	4.16kV	6.6kV	13.8kV			



TYPE	Output kW	Frame Size	Speed 50Hz rpm	Speed 60Hz rpm	Current (at 50Hz) of Standard Line Voltages at 3kV A	at 3.3kV A	at 4.16kV A	at 5kV A	at 6kV A	at 6.6kV A	and at 60Hz at 4kV A	at 4.16kV A	at 6.6kV A	Power Factor Cos φ	Efficiency (at 50Hz) 100% Load %	75% Load %	50% Load %	60Hz 100% Load %	Rated torque Nm	Ratio Starting current	Starting torque	B/down torque	Weight Kg
1000rpm/1200rpm 6pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																							
HCM(HE)3551-6	160	355	985	1182	41.1	37.4	29.7	24.7	20.6	18.7	31.0	29.8	18.8	0.80	93.6	93.0	91.2	93.1	1551	6.0	0.8	2.0	2200
HCM(HE)3552-6	185	355	985	1182	47.4	43.1	34.2	28.5	23.7	21.6	35.8	34.4	21.7	0.80	93.8	93.2	91.4	93.3	1794	6.0	0.8	2.0	2300
HCM(HE)3553-6	200	355	985	1182	51.2	46.5	36.9	30.7	25.6	23.3	38.6	37.1	23.4	0.80	94.0	93.4	91.6	93.5	1939	6.0	0.8	2.0	2400
HCM(HE)4001-6	220	400	988	1186	54.8	49.8	39.5	32.9	27.4	24.9	41.3	39.7	25.0	0.82	94.3	93.7	91.9	93.8	2127	6.0	0.8	2.0	2900
HCM(HE)4002-6	250	400	988	1186	62.1	56.4	44.8	37.3	31.0	28.2	46.8	45.0	28.4	0.82	94.5	93.9	92.1	94.0	2416	6.0	0.8	2.0	3000
HCM(HE)4003-6	280	400	988	1186	69.4	63.1	50.0	41.6	34.7	31.5	52.3	50.3	31.7	0.82	94.7	94.1	92.3	94.2	2706	6.0	0.8	2.0	3200
HCM(HE)4004-6	315	400	988	1186	77.9	70.8	56.2	46.7	39.0	35.4	58.7	56.5	35.6	0.82	94.9	94.3	92.5	94.4	3045	6.0	0.8	2.0	3400
HCM(HE)4501-6	355	450	988	1186	86.6	78.7	62.4	51.9	43.3	39.3	65.3	62.8	39.6	0.83	95.1	94.5	92.7	94.6	3431	6.0	0.8	2.0	3500
HCM(HE)4502-6	400	450	988	1186	97.5	88.7	70.3	58.5	48.8	44.3	73.5	70.7	44.6	0.83	95.1	94.5	92.7	94.6	3866	6.0	0.8	2.0	3600
HCM(HE)4503-6	450	450	988	1186	109.4	99.4	78.9	65.6	54.7	49.7	82.5	79.3	50.0	0.83	95.4	94.8	93.0	94.9	4350	6.0	0.8	2.0	3700
HCM(HE)4504-6	500	450	988	1186	121.3	110.2	87.5	72.8	60.6	55.1	91.4	87.9	55.4	0.83	95.6	95.0	93.2	95.1	4833	6.0	0.8	2.0	3820
HCM(HE)5001-6	560	500	990	1188	135.7	123.3	97.8	81.4	67.8	61.7	102.3	98.4	62.0	0.83	95.7	95.1	93.3	95.2	5402	6.0	0.8	2.0	5610
HCM(HE)5002-6	630	500	990	1188	152.5	138.6	110.0	91.5	76.2	69.3	115.0	110.5	69.7	0.83	95.8	95.2	93.4	95.3	6077	6.0	0.8	2.0	5790
HCM(HE)5003-6	710	500	990	1188	171.5	155.9	123.7	102.9	85.7	78.0	129.3	124.3	78.4	0.83	96.0	95.4	93.6	95.5	6849	6.0	0.8	2.0	6010
HCM(HE)5004-6	800	500	990	1188	193.2	175.7	139.3	115.9	96.6	87.8	145.7	140.1	88.3	0.83	96.0	95.4	93.6	95.5	7717	6.0	0.8	2.0	6230
HCM(HE)5601-6	900	560	990	1188	214.6	195.1	154.7	128.7	107.3	97.5	161.8	155.5	98.0	0.84	96.1	95.5	93.7	95.6	8682	6.0	0.7	2.0	7650
HCM(HE)5602-6	1000	560	990	1188	238.2	216.5	171.8	142.9	119.1	108.3	179.6	172.7	108.8	0.84	96.2	95.6	93.8	95.7	9646	6.0	0.7	2.0	7950
HCM(HE)5603-6	1120	560	990	1188	266.5	242.2	192.2	159.9	133.2	121.1	200.9	193.2	121.8	0.84	96.3	95.7	93.9	95.8	10804	6.0	0.7	2.0	8250
HCM(HE)5604-6	1250	560	990	1188	297.1	270.1	214.2	178.3	148.5	135.0	224.0	215.4	135.7	0.84	96.4	95.8	94.0	95.9	12058	6.0	0.7	2.0	8550
750rpm/900rpm 8pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																							
HCM(HE)4001-8	160	400	738	886	43.4	39.4	31.3	26.0	21.7	19.7	32.7	31.5	19.8	0.76	93.4	92.8	91.0	92.9	2070	5.5	0.8	2.0	3000
HCM(HE)4002-8	185	400	738	886	50.1	45.5	36.1	30.1	25.1	22.8	37.8	36.3	22.9	0.76	93.5	92.9	91.1	93.0	2394	5.5	0.8	2.0	3100
HCM(HE)4003-8	200	400	738	886	53.3	48.5	38.5	32.0	26.7	24.2	40.2	38.7	24.4	0.77	93.7	93.1	91.3	93.2	2588	5.5	0.8	2.0	3200
HCM(HE)4004-8	220	400	738	886	58.6	53.2	42.2	35.1	29.3	26.6	44.2	42.5	26.8	0.77	93.9	93.3	91.5	93.4	2847	5.5	0.8	2.0	3300
HCM(HE)4501-8	250	450	740	888	65.6	59.6	47.3	39.3	32.8	29.8	49.4	47.5	30.0	0.78	94.1	93.5	91.7	93.6	3226	5.5	0.8	2.0	3500
HCM(HE)4502-8	280	450	740	888	73.3	66.6	52.8	44.0	36.6	33.3	55.2	53.1	33.5	0.78	94.3	93.7	91.9	93.8	3614	5.5	0.8	2.0	3600
HCM(HE)4503-8	315	450	740	888	82.2	74.8	59.3	49.3	41.1	37.4	62.0	59.6	37.6	0.78	94.5	93.9	92.1	94.0	4065	5.5	0.8	2.0	3700
HCM(HE)4504-8	355	450	740	888	92.5	84.1	66.7	55.5	46.2	42.0	69.7	67.1	42.3	0.78	94.7	94.1	92.3	94.2	4581	5.5	0.8	2.0	3820
HCM(HE)5001-8	400	500	742	890	102.7	93.3	74.1	61.6	51.3	46.7	77.4	74.4	46.9	0.79	94.9	94.3	92.5	94.4	5148	5.5	0.8	2.0	5250
HCM(HE)5002-8	450	500	742	890	115.4	104.9	83.2	69.2	57.7	52.5	87.0	83.7	52.7	0.79	95.0	94.4	92.6	94.5	5792	5.5	0.8	2.0	5490
HCM(HE)5003-8	500	500	742	890	126.1	114.6	90.9	75.7	63.0	57.3	95.1	91.4	57.6	0.80	95.4	94.8	93.0	94.9	6435	5.5	0.8	2.0	5750
HCM(HE)5004-8	560	500	742	890	141.1	128.2	101.7	84.6	70.5	64.1	106.4	102.3	64.5	0.80	95.5	94.9	93.1	95.0	7208	5.5	0.8	2.0	6020
HCM(HE)5601-8	630	560	745	894	156.6	142.3	112.9	93.9	78.3	71.2	118.1	113.5	71.5	0.81	95.6	95.0	93.2	95.1	8076	5.5	0.7	2.0	7000
HCM(HE)5602-8	710	560	745	894	176.5	160.4	127.3	105.9	88.2	80.2	133.0	127.9	80.6	0.81	95.6	95.0	93.2	95.1	9101	5.5	0.7	2.0	7350
HCM(HE)5603-8	800	560	745	894	198.6	180.6	143.2	119.2	99.3	90.3	149.7	144.0	90.8	0.81	95.7	95.1	93.3	95.2	10255	5.5	0.7	2.0	7700
HCM(HE)5604-8	900	560	745	894	223.2	202.9	161.0	133.9	111.6	101.5	168.3	161.8	102.0	0.81	95.8	95.2	93.4	95.3	11537	5.5	0.7	2.0	8100

TYPE	Output	Frame Size	Speed		Current		Power Factor	Efficiency (at 50Hz)			60Hz	Rated torque	Ratio			Weight
	kW		50Hz rpm	60Hz rpm	50Hz 10kV A	60Hz 13.8kV A	Cos φ	100% Load %	75% Load %	50% Load %	100% Load %	Nm	Starting current	Starting torque	B/down torque	Kg
1000rpm/1200rpm 6pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																
HCM(HE)4501-6	220	450	985	1182	16.5	12.1	0.82	93.6	92.9	91.2	93.1	2133	6.0	0.8	2.0	3400
HCM(HE)4502-6	250	450	985	1182	18.8	13.7	0.82	93.8	93.1	91.4	93.3	2424	6.0	0.8	2.0	3500
HCM(HE)4503-6	280	450	985	1182	21.0	15.3	0.82	94.0	93.3	91.6	93.5	2715	6.0	0.8	2.0	3600
HCM(HE)4504-6	315	450	985	1182	23.5	17.2	0.82	94.2	93.5	91.8	93.7	3054	6.0	0.8	2.0	3700
HCM(HE)4505-6	355	450	985	1182	26.5	19.3	0.82	94.4	93.7	92.0	93.9	3442	6.0	0.8	2.0	3820
HCM(HE)5001-6	400	500	985	1182	29.4	21.4	0.83	94.6	93.9	92.2	94.1	3878	6.0	0.8	2.0	5450
HCM(HE)5002-6	450	500	988	1186	33.1	24.1	0.83	94.7	94.0	92.3	94.2	4350	6.0	0.8	2.0	5610
HCM(HE)5003-6	500	500	988	1186	36.6	26.6	0.83	95.1	94.4	92.7	94.6	4833	6.0	0.8	2.0	5790
HCM(HE)5004-6	560	500	990	1188	40.9	29.8	0.83	95.2	94.5	92.8	94.7	5402	6.0	0.8	2.0	6010
HCM(HE)5005-6	630	500	990	1188	45.9	33.4	0.83	95.5	94.8	93.1	95.0	6077	6.0	0.8	2.0	6230
HCM(HE)5601-6	710	560	992	1190	51.7	37.6	0.83	95.6	94.9	93.2	95.1	6835	6.0	0.7	2.0	7400
HCM(HE)5602-6	800	560	992	1190	58.2	42.4	0.83	95.7	95.0	93.3	95.2	7702	6.0	0.7	2.0	7650
HCM(HE)5603-6	900	560	992	1190	64.5	47.0	0.84	95.9	95.2	93.5	95.4	8664	6.0	0.7	2.0	7950
HCM(HE)5604-6	1000	560	992	1190	71.6	52.2	0.84	96.0	95.3	93.6	95.5	9627	6.0	0.7	2.0	8250
HCM(HE)5605-6	1120	560	992	1190	80.0	58.3	0.84	96.2	95.5	93.8	95.7	10782	6.0	0.7	2.0	8550
750rpm/900rpm 8pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																
HCM(HE)4501-8	220	450	740	888	17.4	12.7	0.78	93.6	92.9	91.2	93.1	2839	5.5	0.8	2.0	3600
HCM(HE)4502-8	250	450	740	888	19.7	14.4	0.78	93.8	93.1	91.4	93.3	3226	5.5	0.8	2.0	3700
HCM(HE)4503-8	280	450	740	888	22.0	16.1	0.78	94.0	93.3	91.6	93.5	3614	5.5	0.8	2.0	3820
HCM(HE)5001-8	315	500	742	890	24.8	18.0	0.78	94.2	93.5	91.8	93.7	4054	5.5	0.8	2.0	5250
HCM(HE)5002-8	355	500	742	890	27.8	20.3	0.78	94.4	93.7	92.0	93.9	4569	5.5	0.8	2.0	5490
HCM(HE)5003-8	400	500	742	890	30.9	22.5	0.79	94.5	93.8	92.1	94.0	5148	5.5	0.8	2.0	5750
HCM(HE)5004-8	450	500	742	890	34.8	25.3	0.79	94.6	93.9	92.2	94.1	5792	5.5	0.8	2.0	6020
HCM(HE)5601-8	500	560	745	894	38.0	27.7	0.80	95.0	94.3	92.6	94.5	6409	5.5	0.7	2.0	6650
HCM(HE)5602-8	560	560	745	894	42.5	31.0	0.80	95.1	94.4	92.7	94.6	7179	5.5	0.7	2.0	7000
HCM(HE)5603-8	630	560	745	894	47.0	34.3	0.81	95.5	94.8	93.1	95.0	8076	5.5	0.7	2.0	7350
HCM(HE)5604-8	710	560	745	894	52.9	38.6	0.81	95.6	94.9	93.2	95.1	9101	5.5	0.7	2.0	7700
HCM(HE)5605-8	800	560	745	894	59.6	43.4	0.81	95.7	95.0	93.3	95.2	10255	5.5	0.7	2.0	8100

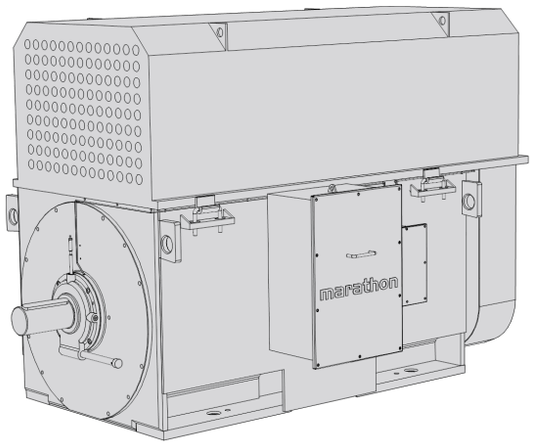


TYPE	Output kW	Frame Size	Speed 50Hz rpm	Speed 60Hz rpm	Current (at 50Hz) of Standard Line Voltages at 3kV A	at 3.3kV A	at 4.16kV A	at 5kV A	at 6kV A	at 6.6kV A	and at 60Hz at 4kV A	at 4.16kV A	at 6.6kV A	Power Factor Cos φ	Efficiency (at 50Hz) 100% Load %	75% Load %	50% Load %	60Hz 100% Load %	Rated torque Nm	Ratio Starting current	Starting torque	B/down torque	Weight Kg
1500rpm/1800rpm 4pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																							
HAA(SE)3551-4	185	355	1485	1782	45.1	41.0	32.6	27.1	22.6	20.5	34.0	32.7	20.6	0.85	92.8	92.4	91.0	92.3	1190	6.5	0.7	1.8	2150
HAA(SE)3552-4	200	355	1480	1776	48.7	44.3	35.2	29.2	24.4	22.2	36.8	35.3	22.3	0.85	92.9	92.5	91.1	92.4	1291	6.5	0.7	1.8	2210
HAA(SE)3553-4	220	355	1480	1776	53.6	48.7	38.6	32.1	26.8	24.3	40.4	38.8	24.5	0.85	93.0	92.6	91.2	92.5	1420	6.5	0.7	1.8	2300
HAA(SE)3554-4	250	355	1480	1776	60.8	55.3	43.8	36.5	30.4	27.6	45.8	44.1	27.8	0.85	93.1	92.7	91.3	92.6	1613	6.5	0.7	1.8	2390
HAA(SE)4002-4	280	400	1485	1782	67.2	61.1	48.5	40.3	33.6	30.6	50.7	48.7	30.7	0.86	93.2	92.8	91.4	92.7	1801	6.5	0.7	1.8	3090
HAA(SE)4003-4	315	400	1485	1782	75.6	68.7	54.5	45.3	37.8	34.3	57.0	54.8	34.5	0.86	93.3	92.9	91.5	92.8	2026	6.5	0.7	1.8	3190
HAA(SE)4004-4	355	400	1485	1782	85.0	77.2	61.3	51.0	42.5	38.6	64.1	61.6	38.8	0.86	93.5	93.1	91.7	93.0	2283	6.5	0.7	1.8	3290
HAA(SE)4005-4	400	400	1485	1782	95.5	86.8	68.9	57.3	47.8	43.4	72.0	69.3	43.7	0.86	93.7	93.3	91.9	93.2	2572	6.5	0.7	1.8	3400
HAA(SE)4006-4	450	400	1485	1782	107.2	97.5	77.3	64.3	53.6	48.7	80.9	77.8	49.0	0.86	93.9	93.5	92.1	93.4	2894	6.5	0.7	1.8	3510
HAA(SE)4502-4	500	450	1485	1782	119.0	108.2	85.8	71.4	59.5	54.1	89.8	86.3	54.4	0.86	94.0	93.6	92.2	93.5	3215	6.5	0.7	1.8	3800
HAA(SE)4503-4	560	450	1485	1782	133.0	120.9	95.9	79.8	66.5	60.5	100.3	96.5	60.8	0.86	94.2	93.8	92.4	93.7	3601	6.5	0.7	1.8	3890
HAA(SE)4504-4	630	450	1485	1782	149.3	135.8	107.7	89.6	74.7	67.9	112.6	108.3	68.2	0.86	94.4	94.0	92.6	93.9	4052	6.5	0.7	1.8	4030
HAA(SE)4505-4	710	450	1485	1782	168.0	152.7	121.1	100.8	84.0	76.3	126.6	121.8	76.8	0.86	94.6	94.2	92.8	94.1	4566	6.5	0.7	1.8	4140
HAA(SE)5001-4	800	500	1485	1782	186.7	169.7	134.6	112.0	93.3	84.9	140.8	135.3	85.3	0.87	94.8	94.4	93.0	94.3	5145	6.5	0.7	1.8	5340
HAA(SE)5002-4	900	500	1485	1782	209.8	190.7	151.3	125.9	104.9	95.4	158.2	152.1	95.9	0.87	94.9	94.5	93.1	94.4	5788	6.5	0.7	1.8	5500
HAA(SE)5003-4	1000	500	1485	1782	232.9	211.7	167.9	139.7	116.4	105.8	175.6	168.8	106.4	0.87	95.0	94.6	93.2	94.5	6431	6.5	0.7	1.8	5850
HAA(SE)5004-4	1120	500	1485	1782	260.5	236.8	187.9	156.3	130.3	118.4	196.4	188.9	119.0	0.87	95.1	94.7	93.3	94.6	7203	6.5	0.7	1.8	6120
HAA(SE)5601-4	1250	560	1485	1782	287.2	261.1	207.1	172.3	143.6	130.5	216.5	208.2	131.2	0.88	95.2	94.8	93.4	94.7	8039	6.5	0.6	1.8	7500
HAA(SE)5602-4	1400	560	1485	1782	321.3	292.1	231.7	192.8	160.6	146.0	242.2	232.9	146.8	0.88	95.3	94.9	93.5	94.8	9003	6.5	0.6	1.8	7600
HAA(SE)5603-4	1600	560	1485	1782	366.8	333.4	264.5	220.1	183.4	166.7	276.5	265.9	167.6	0.88	95.4	95.0	93.6	94.9	10290	6.5	0.6	1.8	7730
HAA(SE)6301-4	1800	630	1485	1782	412.2	374.7	297.3	247.3	206.1	187.4	310.8	298.8	188.4	0.88	95.5	95.1	93.7	95.0	11576	6.5	0.6	1.8	9400
HAA(SE)6302-4	2000	630	1485	1782	457.5	415.9	330.0	274.5	228.8	208.0	345.0	331.7	209.1	0.88	95.6	95.2	93.8	95.1	12862	6.5	0.6	1.8	9800
HAA(SE)6303-4	2240	630	1485	1782	511.9	465.4	369.2	307.1	255.9	232.7	385.9	371.1	233.9	0.88	95.7	95.3	93.9	95.2	14405	6.5	0.6	1.8	10300

"Standard Line" High Voltage motors are pre-designed standard motors available at reduced lead times.
They are available as **Standard Efficiency Motors** and also as **Higher Efficiency Motors.**
For different voltages, speeds and power outputs please contact the Marathon staff.

"Standard Line" Voltages							
50Hz:	3kV	3.3kV	4.16kV	5kV	6kV	6.6kV	10kV
60Hz:	4kV	4.16kV	6.6kV	13.8kV			

TYPE	Output kW	Frame Size	Speed 50Hz rpm	Speed 60Hz rpm	Current 50Hz 10kV A	Current 60Hz 13.8kV A	Power Factor Cos φ	Efficiency (at 50Hz) 100% Load %	75% Load %	50% Load %	60Hz 100% Load %	Rated torque Nm	Ratio Starting current	Ratio Starting torque	Ratio B/down torque	Weight Kg
1500rpm/1800rpm 4pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																
HAA(SE)4001-4	200	400	1485	1782	15.1	11.0	0.83	92.0	91.6	90.2	91.5	1286	7.0	0.7	1.8	2950
HAA(SE)4002-4	220	400	1485	1782	16.6	12.1	0.83	92.2	91.8	90.4	91.7	1415	7.0	0.7	1.8	3035
HAA(SE)4003-4	250	400	1485	1782	18.8	13.7	0.83	92.3	91.9	90.5	91.8	1608	7.0	0.7	1.8	3130
HAA(SE)4501-4	280	450	1485	1782	20.2	14.7	0.86	93.0	92.6	91.2	92.5	1801	7.0	0.7	1.8	3435
HAA(SE)4502-4	315	450	1485	1782	22.7	16.5	0.86	93.1	92.7	91.3	92.6	2026	7.0	0.7	1.8	3495
HAA(SE)4503-4	355	450	1485	1782	25.6	18.6	0.86	93.2	92.8	91.4	92.7	2283	7.0	0.7	1.8	3615
HAA(SE)4504-4	400	450	1485	1782	28.8	21.0	0.86	93.3	92.9	91.5	92.8	2572	7.0	0.7	1.8	3660
HAA(SE)4505-4	450	450	1485	1782	32.3	23.5	0.86	93.5	93.1	91.7	93.0	2894	7.0	0.7	1.8	3740
HAA(SE)4506-4	500	450	1485	1782	35.9	26.1	0.86	93.6	93.2	91.8	93.1	3215	7.0	0.7	1.8	3880
HAA(SE)5001-4	560	500	1485	1782	40.1	29.2	0.86	93.7	93.3	91.9	93.2	3601	7.0	0.7	1.8	5180
HAA(SE)5002-4	630	500	1485	1782	45.0	32.8	0.86	93.9	93.5	92.1	93.4	4052	7.0	0.7	1.8	5430
HAA(SE)5003-4	710	500	1485	1782	50.6	36.9	0.86	94.2	93.8	92.4	93.7	4566	7.0	0.7	1.8	5690
HAA(SE)5004-4	800	500	1485	1782	56.9	41.4	0.86	94.4	94.0	92.6	93.9	5145	7.0	0.7	1.8	5940
HAA(SE)5005-4	900	500	1485	1782	63.9	46.6	0.86	94.5	94.1	92.7	94.0	5788	7.0	0.7	1.8	6240
HAA(SE)5601-4	1000	560	1490	1788	70.2	51.1	0.87	94.6	94.2	92.8	94.1	6409	6.5	0.6	1.8	8610
HAA(SE)5602-4	1120	560	1490	1788	78.5	57.2	0.87	94.7	94.3	92.9	94.2	7179	6.5	0.6	1.8	9010
HAA(SE)5603-4	1250	560	1490	1788	87.5	63.7	0.87	94.8	94.4	93.0	94.3	8012	6.5	0.6	1.8	9510
HAA(SE)5604-4	1400	560	1490	1788	97.8	71.2	0.87	95.0	94.6	93.2	94.5	8973	6.5	0.6	1.8	9700
HAA(SE)6302-4	1600	630	1492	1790	111.7	81.3	0.87	95.1	94.7	93.3	94.6	10241	6.5	0.6	1.8	9900
HAA(SE)6303-4	1800	630	1492	1790	125.5	91.4	0.87	95.2	94.8	93.4	94.7	11521	6.5	0.6	1.8	10100
HAA(SE)6304-4	2000	630	1492	1790	139.3	101.5	0.87	95.3	94.9	93.5	94.8	12802	6.5	0.6	1.8	10300



TYPE	Output kW	Frame Size	Speed 50Hz rpm	Speed 60Hz rpm	Current (at 50Hz) of Standard Line Voltages at 3kV A	at 3.3kV A	at 4.16kV A	at 5kV A	at 6kV A	at 6.6kV A	and at 60Hz at 4kV A	at 4.16kV A	at 6.6kV A	Power Factor Cos φ	Efficiency (at 50Hz) 100% Load %	75% Load %	50% Load %	60Hz 100% Load %	Rated torque Nm	Ratio Starting current	Starting torque	B/down torque	Weight Kg
1000rpm/1200rpm 6pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																							
HAA(SE)355A-6	185	355	985	1182	47.0	42.7	33.9	28.2	23.5	21.4	35.4	34.1	21.5	0.82	92.4	92.0	90.6	91.9	1794	6.0	0.7	1.8	2280
HAA(SE)355B-6	200	355	985	1182	50.7	46.1	36.6	30.4	25.3	23.0	38.2	36.8	23.2	0.82	92.6	92.2	90.8	92.1	1939	6.0	0.7	1.8	2380
HAA(SE)4003-6	220	400	990	1188	55.6	50.6	40.1	33.4	27.8	25.3	42.0	40.3	25.4	0.82	92.8	92.4	91.0	92.3	2122	6.0	0.7	1.8	3100
HAA(SE)4004-6	250	400	990	1188	63.1	57.4	45.5	37.9	31.5	28.7	47.6	45.7	28.8	0.82	93.0	92.6	91.2	92.5	2412	6.0	0.7	1.8	3220
HAA(SE)4005-6	280	400	990	1188	70.4	64.0	50.8	42.3	35.2	32.0	53.1	51.1	32.2	0.82	93.3	92.9	91.5	92.8	2701	6.0	0.7	1.8	3350
HAA(SE)4006-6	315	400	990	1188	79.1	71.9	57.0	47.4	39.5	35.9	59.6	57.3	36.1	0.82	93.5	93.1	91.7	93.0	3039	6.0	0.7	1.8	3500
HAA(SE)4502-6	355	450	985	1182	87.8	79.9	63.4	52.7	43.9	39.9	66.2	63.7	40.1	0.83	93.7	93.3	91.9	93.2	3442	6.0	0.7	1.8	4210
HAA(SE)4503-6	400	450	985	1182	98.9	89.9	71.3	59.3	49.4	44.9	74.6	71.7	45.2	0.83	93.8	93.4	92.0	93.3	3878	6.0	0.7	1.8	4310
HAA(SE)4504-6	450	450	985	1182	110.9	100.8	80.0	66.5	55.4	50.4	83.6	80.4	50.7	0.83	94.1	93.7	92.3	93.6	4363	6.0	0.7	1.8	4540
HAA(SE)4505-6	500	450	985	1182	122.9	111.8	88.7	73.8	61.5	55.9	92.7	89.1	56.2	0.83	94.3	93.9	92.5	93.8	4848	6.0	0.7	1.8	4680
HAA(SE)5001-6	560	500	990	1188	135.9	123.6	98.0	81.5	68.0	61.8	102.5	98.5	62.1	0.84	94.4	94.0	92.6	93.9	5402	6.0	0.7	1.8	5100
HAA(SE)5002-6	630	500	990	1188	152.7	138.9	110.2	91.6	76.4	69.4	115.2	110.7	69.8	0.84	94.5	94.1	92.7	94.0	6077	6.0	0.7	1.8	5200
HAA(SE)5003-6	710	500	990	1188	171.6	156.0	123.7	103.0	85.8	78.0	129.4	124.4	78.4	0.84	94.8	94.4	93.0	94.3	6849	6.0	0.7	1.8	5340
HAA(SE)5004-6	800	500	990	1188	193.1	175.6	139.3	115.9	96.6	87.8	145.6	140.0	88.3	0.84	94.9	94.5	93.1	94.4	7717	6.0	0.7	1.8	5490
HAA(SE)5601-6	900	560	990	1188	214.5	195.0	154.7	128.7	107.3	97.5	161.7	155.5	98.0	0.85	95.0	94.6	93.2	94.5	8682	6.5	0.7	1.8	7050
HAA(SE)5602-6	1000	560	990	1188	238.1	216.4	171.7	142.9	119.0	108.2	179.5	172.6	108.8	0.85	95.1	94.7	93.3	94.6	9646	6.5	0.7	1.8	7250
HAA(SE)5603-6	1120	560	990	1188	266.4	242.2	192.1	159.8	133.2	121.1	200.8	193.1	121.7	0.85	95.2	94.8	93.4	94.7	10804	6.5	0.7	1.8	7450
HAA(SE)6301-6	1250	630	990	1188	293.5	266.8	211.7	176.1	146.8	133.4	221.3	212.8	134.1	0.86	95.3	94.9	93.5	94.8	12058	6.5	0.7	1.8	9600
HAA(SE)6302-6	1400	630	990	1188	328.4	298.6	236.8	197.0	164.2	149.3	247.6	238.1	150.1	0.86	95.4	95.0	93.6	94.9	13505	6.5	0.7	1.8	10100
HAA(SE)6303-6	1600	630	990	1188	374.9	340.8	270.4	225.0	187.5	170.4	282.7	271.8	171.3	0.86	95.5	95.1	93.7	95.0	15434	6.5	0.7	1.8	10500
750rpm/900rpm 8pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																							
HAA(SE)4003-8	185	400	740	888	49.3	44.9	35.6	29.6	24.7	22.4	37.2	35.8	22.6	0.78	92.5	92.1	90.7	92.0	2388	5.5	0.8	1.8	3230
HAA(SE)4004-8	200	400	740	888	53.2	48.4	38.4	31.9	26.6	24.2	40.1	38.6	24.3	0.78	92.7	92.3	90.9	92.2	2581	5.5	0.8	1.8	3400
HAA(SE)4005-8	220	400	740	888	58.4	53.1	42.1	35.1	29.2	26.6	44.1	42.4	26.7	0.78	92.9	92.5	91.1	92.4	2839	5.5	0.8	1.8	3560
HAA(SE)4502-8	250	450	740	888	65.5	59.5	47.2	39.3	32.7	29.8	49.4	47.5	29.9	0.79	93.0	92.6	91.2	92.5	3226	5.5	0.8	1.8	4110
HAA(SE)4503-8	280	450	740	888	73.2	66.5	52.8	43.9	36.6	33.3	55.2	53.1	33.4	0.79	93.2	92.8	91.4	92.7	3614	5.5	0.8	1.8	4350
HAA(SE)4504-8	315	450	740	888	82.2	74.7	59.3	49.3	41.1	37.3	62.0	59.6	37.5	0.79	93.4	93.0	91.6	92.9	4065	5.5	0.8	1.8	4610
HAA(SE)4505-8	355	450	740	888	92.5	84.1	66.7	55.5	46.2	42.0	69.7	67.1	42.3	0.79	93.5	93.1	91.7	93.0	4581	5.5	0.8	1.8	4850
HAA(SE)5001-8	400	500	740	888	102.7	93.4	74.1	61.6	51.3	46.7	77.4	74.5	46.9	0.8	93.7	93.3	91.9	93.2	5162	5.5	0.8	1.8	4970
HAA(SE)5002-8	450	500	740	888	115.4	104.9	83.2	69.2	57.7	52.5	87.0	83.7	52.7	0.8	93.8	93.4	92.0	93.3	5807	5.5	0.8	1.8	5140
HAA(SE)5003-8	500	500	740	888	127.7	116.1	92.1	76.6	63.8	58.0	96.3	92.6	58.4	0.8	94.2	93.8	92.4	93.7	6453	5.5	0.8	1.8	5330
HAA(SE)5004-8	560	500	740	888	142.7	129.7	102.9	85.6	71.4	64.9	107.6	103.5	65.2	0.8	94.4	94.0	92.6	93.9	7227	5.5	0.8	1.8	5520
HAA(SE)5601-8	630	560	740	888	156.5	142.2	112.8	93.9	78.2	71.1	118.0	113.4	71.5	0.82	94.5	94.1	92.7	94.0	8130	6.0	0.7	1.8	7300
HAA(SE)5602-8	710	560	740	888	176.2	160.1	127.0	105.7	88.1	80.1	132.8	127.7	80.5	0.82	94.6	94.2	92.8	94.1	9163	6.0	0.7	1.8	7525
HAA(SE)5603-8	800	560	740	888	198.3	180.2	143.0	119.0	99.1	90.1	149.5	143.7	90.6	0.82	94.7	94.3	92.9	94.2	10324	6.0	0.7	1.8	7750
HAA(SE)6301-8	900	630	740	888	217.5	197.7	156.9	130.5	108.8	98.9	164.0	157.7	99.4	0.84	94.8	94.4	93.0	94.3	11615	6.0	0.7	1.8	9140
HAA(SE)6302-8	1000	630	740	888	241.4	219.5	174.1	144.9	120.7	109.7	182.0	175.0	110.3	0.84	94.9	94.5	93.1	94.4	12905	6.0	0.7	1.8	9410
HAA(SE)6303-8	1120	630	740	888	270.1	245.6	194.8	162.1	135.1	122.8	203.7	195.8	123.4	0.84	95.0	94.6	93.2	94.5	14454	6.0	0.7	1.8	9910
HAA(SE)6304-8	1250	630	740	888	301.1	273.8	217.2	180.7	150.6	136.9	227.1	218.3	137.6	0.84	95.1	94.7	93.3	94.6	16132	6.0	0.7	1.8	10300

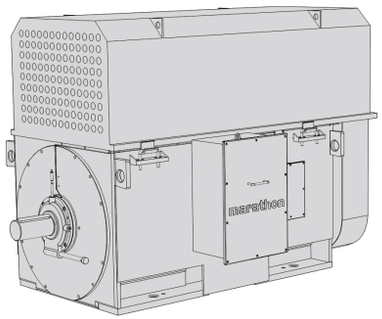
TYPE	Output kW	Frame Size	Speed 50Hz rpm	Speed 60Hz rpm	Current 50Hz 10kV A	Current 60Hz 13.8kV A	Power Factor Cos φ	Efficiency (at 50Hz) 100% Load %	75% Load %	50% Load %	60Hz 100% Load %	Rated torque Nm	Ratio Starting current	Ratio Starting torque	Ratio B/down torque	Weight Kg
1000rpm/1200rpm 6pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																
HAA(SE)4503-6	250	450	980	1176	18.5	13.5	0.84	93.0	92.6	91.2	92.5	2436	6.0	0.7	1.8	4990
HAA(SE)4504-6	280	450	980	1176	20.7	15.1	0.84	93.1	92.7	91.3	92.6	2729	6.0	0.7	1.8	5140
HAA(SE)4505-6	315	450	980	1176	23.2	16.9	0.84	93.2	92.8	91.4	92.7	3070	6.0	0.7	1.8	5300
HAA(SE)4506-6	355	450	980	1176	26.2	19.1	0.84	93.3	92.9	91.5	92.8	3459	6.0	0.7	1.8	5520
HAA(SE)5001-6	400	500	995	1194	29.8	21.7	0.83	93.5	93.1	91.7	93.0	3839	6.5	0.7	1.8	5010
HAA(SE)5002-6	450	500	995	1194	32.7	23.8	0.85	93.6	93.2	91.8	93.1	4319	6.5	0.7	1.8	5160
HAA(SE)5003-6	500	500	995	1194	36.2	26.4	0.85	93.7	93.3	91.9	93.2	4799	6.5	0.7	1.8	6350
HAA(SE)5004-6	560	500	995	1194	40.6	29.5	0.85	93.8	93.4	92.0	93.3	5375	6.5	0.7	1.8	5540
HAA(SE)5005-6	630	500	995	1194	45.5	33.2	0.85	94.0	93.6	92.2	93.5	6047	6.5	0.7	1.8	5750
HAA(SE)5601-6	710	560	995	1194	50.5	36.8	0.86	94.4	94.0	92.6	93.9	6815	6.5	0.7	1.8	8260
HAA(SE)5602-6	800	560	995	1194	56.8	41.4	0.86	94.6	94.2	92.8	94.1	7678	6.5	0.7	1.8	8780
HAA(SE)5603-6	900	560	995	1194	63.7	46.4	0.86	94.8	94.4	93.0	94.3	8638	6.5	0.7	1.8	9330
HAA(SE)5604-6	1000	560	995	1194	70.5	51.4	0.86	95.2	94.8	93.4	94.7	9598	6.5	0.7	1.8	9820
HAA(SE)6301-6	1120	630	995	1194	78.9	57.5	0.86	95.3	94.9	93.5	94.8	10750	6.0	0.6	1.8	9400
HAA(SE)6302-6	1250	630	995	1194	88.0	64.1	0.86	95.4	95.0	93.6	94.9	11997	6.0	0.6	1.8	9900
HAA(SE)6303-6	1400	630	995	1194	98.4	71.7	0.86	95.5	95.1	93.7	95.0	13437	6.0	0.6	1.8	10400
HAA(SE)6304-6	1600	630	995	1194	112.4	81.8	0.86	95.6	95.2	93.8	95.1	15357	6.0	0.6	1.8	10900
750rpm/900rpm 8pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																
HAA(SE)4501-8	200	450	745	894	16.9	12.3	0.74	92.4	92.0	90.6	91.9	2564	5.5	0.7	1.8	4960
HAA(SE)4502-8	220	450	745	894	18.6	13.5	0.74	92.5	92.1	90.7	92.0	2820	5.5	0.7	1.8	5080
HAA(SE)5001-8	250	500	745	894	19.4	14.1	0.80	92.9	92.5	91.1	92.4	3205	6.0	0.7	1.8	5100
HAA(SE)5002-8	280	500	745	894	21.7	15.8	0.80	93.0	92.6	91.2	92.5	3589	6.0	0.7	1.8	5250
HAA(SE)5003-8	315	500	745	894	24.4	17.8	0.80	93.2	92.8	91.4	92.7	4038	6.0	0.7	1.8	5420
HAA(SE)5004-8	355	500	745	894	27.4	20.0	0.80	93.4	93.0	91.6	92.9	4551	6.0	0.7	1.8	5570
HAA(SE)5005-8	400	500	745	894	30.8	22.5	0.80	93.6	93.2	91.8	93.1	5128	6.0	0.7	1.8	5720
HAA(SE)5006-8	450	500	745	894	34.7	25.3	0.80	93.7	93.3	91.9	93.2	5768	6.0	0.7	1.8	5880
HAA(SE)5007-8	500	500	745	894	38.5	28.0	0.80	93.8	93.4	92.0	93.3	6409	6.0	0.7	1.8	6040
HAA(SE)5602-8	560	560	745	894	42.0	30.6	0.82	93.9	93.5	92.1	93.4	7179	6.0	0.7	1.8	8160
HAA(SE)5603-8	630	560	745	894	47.2	34.4	0.82	94.0	93.6	92.2	93.5	8076	6.0	0.7	1.8	8640
HAA(SE)5604-8	710	560	745	894	53.1	38.7	0.82	94.2	93.8	92.4	93.7	9101	6.0	0.7	1.8	8800
HAA(SE)6301-8	800	630	742	890	59.0	43.0	0.83	94.3	93.9	92.5	93.8	10296	6.0	0.7	1.8	9020
HAA(SE)6302-8	900	630	742	890	66.2	48.3	0.83	94.5	94.1	92.7	94.0	11584	6.0	0.7	1.8	9350
HAA(SE)6303-8	1000	630	742	890	73.5	53.6	0.83	94.6	94.2	92.8	94.1	12871	6.0	0.7	1.8	9700
HAA(SE)6304-8	1120	630	742	890	82.3	59.9	0.83	94.7	94.3	92.9	94.2	14415	6.0	0.7	1.8	10500

TYPE	Output kW	Frame Size	Speed 50Hz rpm	Speed 60Hz rpm	Current (at 50Hz) of Standard Line Voltages at 3kV A	at 3.3kV A	at 4.16kV A	at 5kV A	at 6kV A	at 6.6kV A	and at 60Hz at 4kV A	at 4.16kV A	at 6.6kV A	Power Factor Cos φ	Efficiency (at 50Hz) 100% Load %	75% Load %	50% Load %	60Hz 100% Load %	Rated torque Nm	Ratio Starting current	Starting torque	B/down torque	Weight Kg
600rpm/720rpm 10pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																							
HAA(SE)4501-10	185	450	585	702	51.8	47.1	37.3	31.1	25.9	23.5	39.0	37.5	23.7	0.75	91.7	91.3	89.9	91.2	3020	5.5	0.8	1.8	3980
HAA(SE)4502-10	200	450	585	702	55.8	50.8	40.3	33.5	27.9	25.4	42.1	40.5	25.5	0.75	91.9	91.5	90.1	91.4	3265	5.5	0.8	1.8	4120
HAA(SE)4503-10	220	450	585	702	61.3	55.7	44.2	36.8	30.6	27.9	46.2	44.4	28.0	0.75	92.1	91.7	90.3	91.6	3591	5.5	0.8	1.8	4260
HAA(SE)4504-10	250	450	585	702	69.5	63.2	50.1	41.7	34.8	31.6	52.4	50.4	31.8	0.75	92.3	91.9	90.5	91.8	4081	5.5	0.8	1.8	4440
HAA(SE)4505-10	280	450	585	702	77.7	70.6	56.0	46.6	38.8	35.3	58.6	56.3	35.5	0.75	92.5	92.1	90.7	92.0	4571	5.5	0.8	1.8	4620
HAA(SE)5001-10	315	500	585	702	86.0	78.1	62.0	51.6	43.0	39.1	64.8	62.3	39.3	0.76	92.8	92.4	91.0	92.3	5142	5.5	0.8	1.8	5000
HAA(SE)5002-10	355	500	585	702	96.7	87.9	69.7	58.0	48.3	43.9	72.9	70.1	44.2	0.76	93.0	92.6	91.2	92.5	5795	5.5	0.8	1.8	5140
HAA(SE)5003-10	400	500	585	702	108.6	98.7	78.3	65.1	54.3	49.3	81.9	78.7	49.6	0.76	93.3	92.9	91.5	92.8	6530	5.5	0.8	1.8	5320
HAA(SE)5004-10	450	500	585	702	122.0	110.9	88.0	73.2	61.0	55.5	92.0	88.5	55.8	0.76	93.4	93.0	91.6	92.9	7346	5.5	0.8	1.8	5480
HAA(SE)5601-10	500	560	590	708	131.8	119.8	95.1	79.1	65.9	59.9	99.4	95.6	60.2	0.78	93.6	93.2	91.8	93.1	8093	6.0	0.7	1.8	6900
HAA(SE)5602-10	560	560	590	708	147.5	134.1	106.3	88.5	73.7	67.0	111.2	106.9	67.4	0.78	93.7	93.3	91.9	93.2	9064	6.0	0.7	1.8	7075
HAA(SE)5603-10	630	560	590	708	165.7	150.7	119.5	99.4	82.9	75.3	125.0	120.1	75.7	0.78	93.8	93.4	92.0	93.3	10197	6.0	0.7	1.8	7270
HAA(SE)5604-10	710	560	590	708	186.4	169.4	134.4	111.8	93.2	84.7	140.5	135.1	85.2	0.78	94.0	93.6	92.2	93.5	11492	6.0	0.7	1.8	7500
HAA(SE)6301-10	800	630	590	708	204.3	185.7	147.3	122.6	102.2	92.9	154.0	148.1	93.4	0.8	94.2	93.8	92.4	93.7	12949	6.0	0.7	1.8	8710
HAA(SE)6302-10	900	630	590	708	229.6	208.7	165.6	137.8	114.8	104.4	173.1	166.5	104.9	0.8	94.3	93.9	92.5	93.8	14568	6.0	0.7	1.8	9310
HAA(SE)6303-10	1000	630	590	708	254.8	231.7	183.8	152.9	127.4	115.8	192.1	184.8	116.5	0.8	94.4	94.0	92.6	93.9	16186	6.0	0.7	1.8	9710
HAA(SE)6304-10	1120	630	590	708	284.8	258.9	205.4	170.9	142.4	129.5	214.7	206.5	130.2	0.8	94.6	94.2	92.8	94.1	18129	6.0	0.7	1.8	10100
500rpm/600rpm 12pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																							
HAA(SE)4504-12	185	450	490	588	55.4	50.4	40.0	33.2	27.7	25.2	41.8	40.2	25.3	0.7	91.8	91.4	90.0	91.3	3606	5.5	0.8	1.8	4280
HAA(SE)4505-12	200	450	490	588	59.8	54.3	43.1	35.9	29.9	27.2	45.1	43.3	27.3	0.7	92.0	91.6	90.2	91.5	3898	5.5	0.8	1.8	4430
HAA(SE)5001-12	220	500	490	588	63.8	58.0	46.0	38.3	31.9	29.0	48.1	46.2	29.1	0.72	92.2	91.8	90.4	91.7	4288	5.5	0.8	1.8	5030
HAA(SE)5002-12	250	500	490	588	72.2	65.7	52.1	43.3	36.1	32.8	54.5	52.4	33.0	0.72	92.5	92.1	90.7	92.0	4872	5.5	0.8	1.8	5200
HAA(SE)5003-12	280	500	490	588	80.7	73.4	58.2	48.4	40.4	36.7	60.9	58.5	36.9	0.72	92.7	92.3	90.9	92.2	5457	5.5	0.8	1.8	5410
HAA(SE)5004-12	315	500	490	588	90.7	82.5	65.4	54.4	45.4	41.2	68.4	65.8	41.5	0.72	92.8	92.4	91.0	92.3	6139	5.5	0.8	1.8	5630
HAA(SE)5601-12	355	560	490	588	99.3	90.3	71.6	59.6	49.6	45.1	74.9	72.0	45.4	0.74	93.0	92.6	91.2	92.5	6919	6.0	0.7	1.8	6920
HAA(SE)5602-12	400	560	490	588	111.5	101.4	80.4	66.9	55.8	50.7	84.1	80.8	51.0	0.74	93.3	92.9	91.5	92.8	7796	6.0	0.7	1.8	7100
HAA(SE)5603-12	450	560	490	588	125.3	113.9	90.4	75.2	62.7	57.0	94.5	90.8	57.3	0.74	93.4	93.0	91.6	92.9	8770	6.0	0.7	1.8	7290
HAA(SE)5604-12	500	560	490	588	138.8	126.2	100.1	83.3	69.4	63.1	104.6	100.6	63.4	0.74	93.7	93.3	91.9	93.2	9745	6.0	0.7	1.8	7480
HAA(SE)6301-12	560	630	490	588	151.2	137.4	109.0	90.7	75.6	68.7	114.0	109.6	69.1	0.76	93.8	93.4	92.0	93.3	10914	6.0	0.7	1.8	9490
HAA(SE)6302-12	630	630	490	588	169.9	154.5	122.5	101.9	84.9	77.2	128.1	123.2	77.6	0.76	93.9	93.5	92.1	93.4	12279	6.0	0.7	1.8	9690
HAA(SE)6303-12	710	630	490	588	191.3	173.9	137.9	114.8	95.6	86.9	144.2	138.7	87.4	0.76	94.0	93.6	92.2	93.5	13838	6.0	0.7	1.8	9910
HAA(SE)6304-12	800	630	490	588	215.1	195.5	155.1	129.0	107.5	97.8	162.2	155.9	98.3	0.76	94.2	93.8	92.4	93.7	15592	6.0	0.7	1.8	10250

"Standard Line" High Voltage motors are pre-designed standard motors available at reduced lead times.
They are available as **Standard Efficiency Motors** and also as **Higher Efficiency Motors.**
For different voltages, speeds and power outputs please contact the Marathon staff.

"Standard Line" Voltages							
	50Hz:	3kV	3.3kV	4.16kV	5kV	6kV	6.6kV	10kV
	60Hz:	4kV	4.16kV	6.6kV	13.8kV			

TYPE	Output kW	Frame Size	Speed 50Hz rpm	Speed 60Hz rpm	Current 50Hz 10kV A	Current 60Hz 13.8kV A	Power Factor Cos φ	Efficiency (at 50Hz) 100% Load %	75% Load %	50% Load %	60Hz 100% Load %	Rated torque Nm	Ratio Starting current	Ratio Starting torque	Ratio B/down torque	Weight Kg
600rpm/720rpm 10pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																
HAA(SE)5003-10	220	500	595	714	17.7	12.9	0.78	92.0	91.6	90.2	91.5	3531	5.5	0.7	1.8	4910
HAA(SE)5004-10	250	500	595	714	20.0	14.6	0.78	92.3	91.9	90.5	91.8	4013	5.5	0.7	1.8	4990
HAA(SE)5005-10	280	500	595	714	22.4	16.3	0.78	92.5	92.1	90.7	92.0	4494	5.5	0.7	1.8	5130
HAA(SE)5006-10	315	500	595	714	25.3	18.5	0.78	92.0	91.6	90.2	91.5	5056	5.5	0.7	1.8	5290
HAA(SE)5601-10	355	560	595	714	28.0	20.4	0.79	92.6	92.2	90.8	92.1	5698	5.5	0.7	1.8	7240
HAA(SE)5602-10	400	560	595	714	31.5	23.0	0.79	92.8	92.4	91.0	92.3	6420	5.5	0.7	1.8	7590
HAA(SE)5603-10	450	560	595	714	35.4	25.8	0.79	93.0	92.6	91.2	92.5	7223	5.5	0.7	1.8	7980
HAA(SE)5604-10	500	560	595	714	39.1	28.5	0.79	93.5	93.1	91.7	93.0	8025	5.5	0.7	1.8	8350
HAA(SE)5605-10	560	560	595	714	43.7	31.8	0.79	93.7	93.3	91.9	93.2	8988	5.5	0.7	1.8	8750
HAA(SE)6301-10	630	630	595	714	48.4	35.2	0.80	94.0	93.6	92.2	93.5	10112	6.0	0.7	1.8	8700
HAA(SE)6302-10	710	630	595	714	54.5	39.7	0.80	94.1	93.7	92.3	93.6	11396	6.0	0.7	1.8	9000
HAA(SE)6303-10	800	630	595	714	61.3	44.7	0.80	94.2	93.8	92.4	93.7	12840	6.0	0.7	1.8	9320
HAA(SE)6304-10	900	630	595	714	68.9	50.2	0.80	94.3	93.9	92.5	93.8	14445	6.0	0.7	1.8	9720
HAA(SE)6305-10	1000	630	595	714	76.4	55.6	0.80	94.5	94.1	92.7	94.0	16050	6.0	0.7	1.8	10150
500rpm/600rpm 12pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																
HAA(SE)5601-12	250	560	495	594	21.2	15.4	0.74	92.2	91.8	90.4	91.7	4823	5.5	0.7	1.8	6690
HAA(SE)5602-12	280	560	495	594	23.6	17.2	0.74	92.4	92.0	90.6	91.9	5402	5.5	0.7	1.8	6940
HAA(SE)5603-12	315	560	495	594	26.5	19.3	0.74	92.6	92.2	90.8	92.1	6077	5.5	0.7	1.8	7300
HAA(SE)5604-12	355	560	495	594	29.8	21.7	0.74	92.8	92.4	91.0	92.3	6849	5.5	0.7	1.8	7580
HAA(SE)5605-12	400	560	495	594	33.6	24.4	0.74	93.0	92.6	91.2	92.5	7717	5.5	0.7	1.8	7860
HAA(SE)6301-12	450	630	495	594	37.7	27.4	0.74	93.2	92.8	91.4	92.7	8682	6.0	0.7	1.8	9220
HAA(SE)6302-12	500	630	495	594	41.8	30.4	0.74	93.4	93.0	91.6	92.9	9646	6.0	0.7	1.8	9500
HAA(SE)6303-12	560	630	495	594	46.7	34.0	0.74	93.5	93.1	91.7	93.0	10804	6.0	0.7	1.8	9720
HAA(SE)6304-12	630	630	495	594	52.5	38.2	0.74	93.7	93.3	91.9	93.2	12155	6.0	0.7	1.8	9920
HAA(SE)6305-12	710	630	495	594	59.0	43.0	0.74	93.9	93.5	92.1	93.4	13698	6.0	0.7	1.8	10150

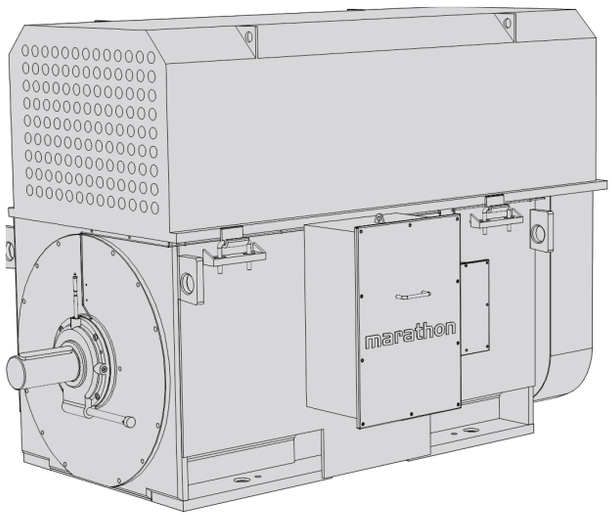


TYPE	Output kW	Frame Size	Speed 50Hz rpm	Speed 60Hz rpm	Current (at 50Hz) of Standard Line Voltages at 3kV A	at 3.3kV A	at 4.16kV A	at 5kV A	at 6kV A	at 6.6kV A	and at 60Hz at 4kV A	at 4.16kV A	at 6.6kV A	Power Factor Cos φ	Efficiency (at 50Hz) 100% Load %	75% Load %	50% Load %	60Hz 100% Load %	Rated torque Nm	Ratio Starting current	Starting torque	B/down torque	Weight Kg
1500rpm/1800rpm 4pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																							
HAA(HE)3551-4	185	355	1485	1782	44.7	40.6	32.2	26.8	22.3	20.3	33.7	32.4	20.4	0.85	93.8	93.1	91.4	93.3	1190	6.5	0.7	1.8	2150
HAA(HE)3552-4	200	355	1480	1776	48.2	43.8	34.7	28.9	24.1	21.9	36.3	34.9	22.0	0.85	94.0	93.3	91.6	93.5	1291	6.5	0.7	1.8	2210
HAA(HE)3553-4	220	355	1480	1776	52.9	48.1	38.1	31.7	26.4	24.0	39.9	38.3	24.2	0.85	94.2	93.5	91.8	93.7	1420	6.5	0.7	1.8	2300
HAA(HE)3554-4	250	355	1480	1776	60.0	54.5	43.2	36.0	30.0	27.3	45.2	43.5	27.4	0.85	94.4	93.7	92.0	93.9	1613	6.5	0.7	1.8	2390
HAA(HE)4002-4	280	400	1485	1782	66.5	60.5	48.0	39.9	33.3	30.2	50.2	48.2	30.4	0.86	94.2	93.5	91.8	93.7	1801	6.5	0.7	1.8	3090
HAA(HE)4003-4	315	400	1485	1782	74.5	67.7	53.7	44.7	37.3	33.9	56.2	54.0	34.1	0.86	94.6	93.9	92.2	94.1	2026	6.5	0.7	1.8	3190
HAA(HE)4004-4	355	400	1485	1782	83.9	76.3	60.5	50.3	41.9	38.1	63.3	60.8	38.3	0.86	94.7	94.0	92.3	94.2	2283	6.5	0.7	1.8	3290
HAA(HE)4005-4	400	400	1485	1782	0.9	0.9	0.7	0.6	0.5	0.4	0.7	0.7	0.4	86	94.9	94.2	92.5	94.4	2572	6.5	0.7	1.8	3400
HAA(HE)4006-4	450	400	1485	1782	105.9	96.3	76.4	63.5	52.9	48.1	79.8	76.8	48.4	0.86	95.1	94.4	92.7	94.6	2894	6.5	0.7	1.8	3510
HAA(HE)4502-4	500	450	1485	1782	117.7	107.0	84.8	70.6	58.8	53.5	88.7	85.3	53.8	0.86	95.1	94.4	92.7	94.6	3215	6.5	0.7	1.8	3800
HAA(HE)4503-4	560	450	1485	1782	131.5	119.5	94.8	78.9	65.8	59.8	99.1	95.3	60.1	0.86	95.3	94.6	92.9	94.8	3601	6.5	0.7	1.8	3890
HAA(HE)4504-4	630	450	1485	1782	147.6	134.2	106.5	88.6	73.8	67.1	111.3	107.0	67.5	0.86	95.5	94.8	93.1	95.0	4052	6.5	0.7	1.8	4030
HAA(HE)4505-4	710	450	1485	1782	166.2	151.1	119.9	99.7	83.1	75.5	125.3	120.5	75.9	0.86	95.6	94.9	93.2	95.1	4566	6.5	0.7	1.8	4140
HAA(HE)5001-4	800	500	1485	1782	184.7	167.9	133.2	110.8	92.4	84.0	139.3	133.9	84.4	0.87	95.8	94.9	92.7	95.3	5145	6.5	0.7	1.8	5340
HAA(HE)5002-4	900	500	1485	1782	207.6	188.7	149.7	124.6	103.8	94.4	156.5	150.5	94.9	0.87	95.9	95.0	92.8	95.4	5788	6.5	0.7	1.8	5500
HAA(HE)5003-4	1000	500	1485	1782	230.4	209.5	166.2	138.3	115.2	104.7	173.7	167.0	105.3	0.87	96.0	95.1	92.9	95.5	6431	6.5	0.7	1.8	5850
HAA(HE)5004-4	1120	500	1485	1782	258.1	234.6	186.1	154.8	129.0	117.3	194.6	187.1	117.9	0.87	96.0	95.1	92.9	95.5	7203	6.5	0.7	1.8	6120
HAA(HE)5601-4	1250	560	1485	1782	284.5	258.6	205.1	170.7	142.2	129.3	214.5	206.2	130.0	0.88	96.1	95.2	93.0	95.6	8039	6.5	0.6	1.8	7500
HAA(HE)5602-4	1400	560	1485	1782	318.3	289.3	229.5	191.0	159.1	144.7	240.0	230.7	145.4	0.88	96.2	95.3	93.1	95.7	9003	6.5	0.6	1.8	7600
HAA(HE)5603-4	1600	560	1485	1782	363.4	330.3	262.0	218.0	181.7	165.2	273.9	263.4	166.0	0.88	96.3	95.4	93.2	95.8	10290	6.5	0.6	1.8	7730
HAA(HE)6301-4	1800	630	1485	1782	408.4	371.2	294.5	245.0	204.2	185.6	307.9	296.0	186.6	0.88	96.4	95.5	93.3	95.9	11576	6.5	0.6	1.8	9400
HAA(HE)6302-4	2000	630	1485	1782	453.7	412.5	327.2	272.2	226.9	206.2	342.1	328.9	207.3	0.88	96.4	95.5	93.3	95.9	12862	6.5	0.6	1.8	9800
HAA(HE)6303-4	2240	630	1485	1782	507.7	461.5	366.1	304.6	253.8	230.8	382.7	368.0	232.0	0.88	96.5	95.6	93.4	96.0	14405	6.5	0.6	1.8	10300

"Standard Line" High Voltage motors are pre-designed standard motors available at reduced lead times.
They are available as **Standard Efficiency Motors** and also as **Higher Efficiency Motors.**
For different voltages, speeds and power outputs please contact the Marathon staff.

"Standard Line" Voltages							
50Hz:	3kV	3.3kV	4.16kV	5kV	6kV	6.6kV	10kV
60Hz:	4kV	4.16kV	6.6kV	13.8kV			

TYPE	Output kW	Frame Size	Speed		Current		Power Factor	Efficiency (at 50Hz)			60Hz	Rated torque	Ratio			Weight
			50Hz rpm	60Hz rpm	50Hz 10kV A	60Hz 13.8kV A	Cos φ	100% Load %	75% Load %	50% Load %	100% Load %	Nm	Starting current	Starting torque	B/down torque	Kg
1500rpm/1800rpm 4pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																
HAA(HE)4001-4	200	400	1485	1782	14.9	10.9	0.83	93.1	92.2	89.9	92.6	1286	7.0	0.7	1.8	2950
HAA(HE)4002-4	220	400	1485	1782	16.4	11.9	0.83	93.4	92.5	90.2	92.9	1415	7.0	0.7	1.8	3035
HAA(HE)4003-4	250	400	1485	1782	18.6	13.5	0.83	93.6	92.7	90.4	93.1	1608	7.0	0.7	1.8	3130
HAA(HE)4501-4	280	450	1485	1782	20.0	14.6	0.86	94.0	93.1	90.8	93.5	1801	7.0	0.7	1.8	3435
HAA(HE)4502-4	315	450	1485	1782	22.4	16.3	0.86	94.3	93.4	91.1	93.8	2026	7.0	0.7	1.8	3495
HAA(HE)4503-4	355	450	1485	1782	25.3	18.4	0.86	94.3	93.4	91.1	93.8	2283	7.0	0.7	1.8	3615
HAA(HE)4504-4	400	450	1485	1782	28.4	20.7	0.86	94.4	93.5	91.2	93.9	2572	7.0	0.7	1.8	3660
HAA(HE)4505-4	450	450	1485	1782	31.9	23.2	0.86	94.8	93.9	91.6	94.3	2894	7.0	0.7	1.8	3740
HAA(HE)4506-4	500	450	1485	1782	35.4	25.8	0.86	94.8	93.9	91.6	94.3	3215	7.0	0.7	1.8	3880
HAA(HE)5001-4	560	500	1485	1782	39.1	28.5	0.87	95.0	94.1	91.8	94.5	3601	7.0	0.7	1.8	5180
HAA(HE)5002-4	630	500	1485	1782	43.9	32.0	0.87	95.2	94.3	92.0	94.7	4052	7.0	0.7	1.8	5430
HAA(HE)5003-4	710	500	1485	1782	49.2	35.9	0.87	95.7	94.8	92.5	95.2	4566	7.0	0.7	1.8	5690
HAA(HE)5004-4	800	500	1485	1782	55.5	40.4	0.87	95.7	94.8	92.5	95.2	5145	7.0	0.7	1.8	5940
HAA(HE)5005-4	900	500	1485	1782	62.3	45.4	0.87	95.8	94.9	92.6	95.3	5788	7.0	0.7	1.8	6240
HAA(HE)5601-4	1000	560	1490	1788	69.2	50.4	0.87	95.9	95.0	92.7	95.4	6409	6.5	0.6	1.8	8610
HAA(HE)5602-4	1120	560	1490	1788	77.4	56.4	0.87	96.0	95.1	92.8	95.5	7179	6.5	0.6	1.8	9010
HAA(HE)5603-4	1250	560	1490	1788	86.3	62.9	0.87	96.1	95.2	92.9	95.6	8012	6.5	0.6	1.8	9510
HAA(HE)5604-4	1400	560	1490	1788	96.6	70.4	0.87	96.2	95.3	93.0	95.7	8973	6.5	0.6	1.8	9700
HAA(HE)6302-4	1600	630	1492	1790	109.0	79.4	0.88	96.3	95.4	93.1	95.8	10241	6.5	0.6	1.8	9900
HAA(HE)6303-4	1800	630	1492	1790	122.5	89.2	0.88	96.4	95.5	93.2	95.9	11521	6.5	0.6	1.8	10100
HAA(HE)6304-4	2000	630	1492	1790	136.0	99.0	0.88	96.5	95.6	93.3	96.0	12802	6.5	0.6	1.8	10300



TYPE	Output kW	Frame Size	Speed 50Hz rpm	Speed 60Hz rpm	Current (at 50Hz) of Standard Line Voltages at 3kV A	at 3.3kV A	at 4.16kV A	at 5kV A	at 6kV A	at 6.6kV A	and at 60Hz at 4kV A	at 4.16kV A	at 6.6kV A	Power Factor Cos φ	Efficiency (at 50Hz) 100% Load %	75% Load %	50% Load %	60Hz 100% Load %	Rated torque Nm	Ratio Starting current	Starting torque	B/down torque	Weight Kg
1000rpm/1200rpm 6pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																							
HAA(HE)355A-6	185	355	985	1182	46.2	42.0	33.3	27.7	23.1	21.0	34.9	33.5	21.1	0.82	93.9	93.2	91.5	93.4	1794	6.0	0.7	1.8	2280
HAA(HE)355B-6	200	355	985	1182	49.9	45.3	36.0	29.9	24.9	22.7	37.6	36.2	22.8	0.82	94.1	93.4	91.7	93.6	1939	6.0	0.7	1.8	2380
HAA(HE)4003-6	220	400	990	1188	55.0	50.0	39.7	33.0	27.5	25.0	41.5	39.9	25.2	0.82	93.8	93.1	91.4	93.3	2122	6.0	0.7	1.8	3100
HAA(HE)4004-6	250	400	990	1188	62.4	56.7	45.0	37.5	31.2	28.4	47.1	45.3	28.5	0.82	94.0	93.3	91.6	93.5	2412	6.0	0.7	1.8	3220
HAA(HE)4005-6	280	400	990	1188	69.7	63.4	50.3	41.8	34.8	31.7	52.5	50.5	31.8	0.82	94.3	93.6	91.9	93.8	2701	6.0	0.7	1.8	3350
HAA(HE)4006-6	315	400	990	1188	78.2	71.1	56.4	46.9	39.1	35.6	59.0	56.7	35.8	0.82	94.5	93.8	92.1	94.0	3039	6.0	0.7	1.8	3500
HAA(HE)4502-6	355	450	985	1182	86.7	78.9	62.6	52.0	43.4	39.4	65.4	62.9	39.6	0.83	94.9	94.2	92.5	94.4	3442	6.0	0.7	1.8	4210
HAA(HE)4503-6	400	450	985	1182	97.6	88.8	70.4	58.6	48.8	44.4	73.6	70.8	44.6	0.83	95.0	94.3	92.6	94.5	3878	6.0	0.7	1.8	4310
HAA(HE)4504-6	450	450	985	1182	109.6	99.6	79.0	65.8	54.8	49.8	82.6	79.5	50.1	0.83	95.2	94.5	92.8	94.7	4363	6.0	0.7	1.8	4540
HAA(HE)4505-6	500	450	985	1182	121.5	110.5	87.6	72.9	60.8	55.2	91.6	88.1	55.5	0.83	95.4	94.7	93.0	94.9	4848	6.0	0.7	1.8	4680
HAA(HE)5001-6	560	500	990	1188	134.3	122.1	96.9	80.6	67.2	61.1	101.3	97.4	61.4	0.84	95.5	94.6	92.4	95.0	5402	6.0	0.7	1.8	5100
HAA(HE)5002-6	630	500	990	1188	151.0	137.3	108.9	90.6	75.5	68.6	113.8	109.5	69.0	0.84	95.6	94.7	92.5	95.1	6077	6.0	0.7	1.8	5200
HAA(HE)5003-6	710	500	990	1188	169.8	154.4	122.5	101.9	84.9	77.2	128.0	123.1	77.6	0.84	95.8	94.9	92.7	95.3	6849	6.0	0.7	1.8	5340
HAA(HE)5004-6	800	500	990	1188	191.1	173.8	137.8	114.7	95.6	86.9	144.1	138.6	87.3	0.84	95.9	95.0	92.8	95.4	7717	6.0	0.7	1.8	5490
HAA(HE)5601-6	900	560	990	1188	212.3	193.0	153.1	127.4	106.1	96.5	160.0	153.9	97.0	0.85	96.0	95.1	92.9	95.5	8682	6.5	0.7	1.8	7050
HAA(HE)5602-6	1000	560	990	1188	235.9	214.4	170.1	141.5	117.9	107.2	177.8	171.0	107.8	0.85	96.0	95.1	92.9	95.5	9646	6.5	0.7	1.8	7250
HAA(HE)5603-6	1120	560	990	1188	263.9	239.9	190.3	158.3	131.9	119.9	198.9	191.3	120.6	0.85	96.1	95.2	93.0	95.6	10804	6.5	0.7	1.8	7450
HAA(HE)6301-6	1250	630	990	1188	290.8	264.3	209.7	174.5	145.4	132.2	219.2	210.8	132.9	0.86	96.2	95.3	93.1	95.7	12058	6.5	0.7	1.8	9600
HAA(HE)6302-6	1400	630	990	1188	325.3	295.8	234.6	195.2	162.7	147.9	245.3	235.8	148.7	0.86	96.3	95.4	93.2	95.8	13505	6.5	0.7	1.8	10100
HAA(HE)6303-6	1600	630	990	1188	371.4	337.7	267.9	222.9	185.7	168.8	280.0	269.3	169.7	0.86	96.4	95.5	93.3	95.9	15434	6.5	0.7	1.8	10500
750rpm/900rpm 8pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																							
HAA(HE)4003-8	185	400	740	888	48.8	44.4	35.2	29.3	24.4	22.2	36.8	35.4	22.3	0.78	93.5	92.8	91.1	93.0	2388	5.5	0.8	1.8	3230
HAA(HE)4004-8	200	400	740	888	52.7	47.9	38.0	31.6	26.3	23.9	39.7	38.2	24.1	0.78	93.7	93.0	91.3	93.2	2581	5.5	0.8	1.8	3400
HAA(HE)4005-8	220	400	740	888	57.8	52.6	41.7	34.7	28.9	26.3	43.6	41.9	26.4	0.78	93.9	93.2	91.5	93.4	2839	5.5	0.8	1.8	3560
HAA(HE)4502-8	250	450	740	888	64.8	58.9	46.7	38.9	32.4	29.5	48.9	47.0	29.6	0.79	94.0	93.3	91.6	93.5	3226	5.5	0.8	1.8	4110
HAA(HE)4503-8	280	450	740	888	72.4	65.8	52.2	43.4	36.2	32.9	54.6	52.5	33.1	0.79	94.2	93.5	91.8	93.7	3614	5.5	0.8	1.8	4350
HAA(HE)4504-8	315	450	740	888	81.3	73.9	58.6	48.8	40.6	37.0	61.3	58.9	37.1	0.79	94.4	93.7	92.0	93.9	4065	5.5	0.8	1.8	4610
HAA(HE)4505-8	355	450	740	888	91.3	83.0	65.9	54.8	45.7	41.5	68.9	66.2	41.7	0.79	94.7	94.0	92.3	94.2	4581	5.5	0.8	1.8	4850
HAA(HE)5001-8	400	500	740	888	101.4	92.2	73.1	60.8	50.7	46.1	76.5	73.5	46.3	0.8	94.9	94.0	91.8	94.4	5162	5.5	0.8	1.8	4970
HAA(HE)5002-8	450	500	740	888	114.0	103.6	82.2	68.4	57.0	51.8	85.9	82.6	52.1	0.8	95.0	94.1	91.9	94.5	5807	5.5	0.8	1.8	5140
HAA(HE)5003-8	500	500	740	888	126.2	114.7	91.0	75.7	63.1	57.4	95.2	91.5	57.7	0.8	95.3	94.4	92.2	94.8	6453	5.5	0.8	1.8	5330
HAA(HE)5004-8	560	500	740	888	141.1	128.2	101.7	84.6	70.5	64.1	106.4	102.3	64.5	0.8	95.5	94.6	92.4	95.0	7227	5.5	0.8	1.8	5520
HAA(HE)5601-8	630	560	740	888	154.7	140.6	111.5	92.8	77.3	70.3	116.6	112.1	70.7	0.82	95.6	94.7	92.5	95.1	8130	6.0	0.7	1.8	7300
HAA(HE)5602-8	710	560	740	888	174.3	158.5	125.7	104.6	87.2	79.2	131.4	126.4	79.6	0.82	95.6	94.7	92.5	95.1	9163	6.0	0.7	1.8	7525
HAA(HE)5603-8	800	560	740	888	196.2	178.4	141.5	117.7	98.1	89.2	147.9	142.2	89.6	0.82	95.7	94.8	92.6	95.2	10324	6.0	0.7	1.8	7750
HAA(HE)6301-8	900	630	740	888	215.2	195.7	155.2	129.1	107.6	97.8	162.3	156.0	98.4	0.84	95.8	94.9	92.7	95.3	11615	6.0	0.7	1.8	9140
HAA(HE)6302-8	1000	630	740	888	238.9	217.2	172.3	143.3	119.5	108.6	180.1	173.2	109.2	0.84	95.9	95.0	92.8	95.4	12905	6.0	0.7	1.8	9410
HAA(HE)6303-8	1120	630	740	888	267.3	243.0	192.8	160.4	133.6	121.5	201.5	193.8	122.1	0.84	96.0	95.1	92.9	95.5	14454	6.0	0.7	1.8	9910
HAA(HE)6304-8	1250	630	740	888	298.3	271.2	215.1	179.0	149.2	135.6	224.9	216.3	136.3	0.84	96.0	95.1	92.9	95.5	16132	6.0	0.7	1.8	10300

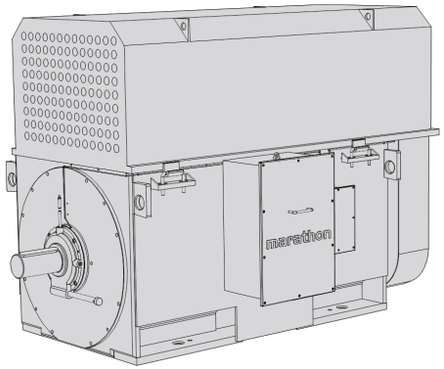
TYPE	Output kW	Frame Size	Speed 50Hz rpm	Speed 60Hz rpm	Current 50Hz 10kV A	Current 60Hz 13.8kV A	Power Factor Cos φ	Efficiency (at 50Hz) 100% Load %	75% Load %	50% Load %	60Hz 100% Load %	Rated torque Nm	Ratio Starting current	Ratio Starting torque	Ratio B/down torque	Weight Kg
1000rpm/1200rpm 6pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																
HAA(HE)4503-6	250	450	980	1176	18.8	13.7	0.82	93.6	92.7	90.4	93.1	2436	6.0	0.7	1.8	4990
HAA(HE)4504-6	280	450	980	1176	21.0	15.3	0.82	93.9	93.0	90.7	93.4	2729	6.0	0.7	1.8	5140
HAA(HE)4505-6	315	450	980	1176	23.5	17.2	0.82	94.2	93.3	91.0	93.7	3070	6.0	0.7	1.8	5300
HAA(HE)4506-6	355	450	980	1176	26.5	19.3	0.82	94.2	93.3	91.0	93.7	3459	6.0	0.7	1.8	5520
HAA(HE)5001-6	400	500	995	1194	29.1	21.2	0.84	94.4	93.5	91.2	93.9	3839	6.5	0.7	1.8	5010
HAA(HE)5002-6	450	500	995	1194	32.7	23.8	0.84	94.5	93.6	91.3	94.0	4319	6.5	0.7	1.8	5160
HAA(HE)5003-6	500	500	995	1194	36.2	26.4	0.84	94.9	94.0	91.7	94.4	4799	6.5	0.7	1.8	6350
HAA(HE)5004-6	560	500	995	1194	40.5	29.5	0.84	95.0	94.1	91.8	94.5	5375	6.5	0.7	1.8	5540
HAA(HE)5005-6	630	500	995	1194	45.4	33.1	0.84	95.3	94.4	92.1	94.8	6047	6.5	0.7	1.8	5750
HAA(HE)5601-6	710	560	995	1194	50.6	36.8	0.85	95.4	94.5	92.2	94.9	6815	6.5	0.7	1.8	8260
HAA(HE)5602-6	800	560	995	1194	56.9	41.4	0.85	95.5	94.6	92.3	95.0	7678	6.5	0.7	1.8	8780
HAA(HE)5603-6	900	560	995	1194	63.9	46.5	0.85	95.7	94.8	92.5	95.2	8638	6.5	0.7	1.8	9330
HAA(HE)5604-6	1000	560	995	1194	70.9	51.6	0.85	95.8	94.9	92.6	95.3	9598	6.5	0.7	1.8	9820
HAA(HE)6301-6	1120	630	995	1194	78.3	57.1	0.86	96.0	95.1	92.8	95.5	10750	6.0	0.6	1.8	9400
HAA(HE)6302-6	1250	630	995	1194	87.3	63.6	0.86	96.1	95.2	92.9	95.6	11997	6.0	0.6	1.8	9900
HAA(HE)6303-6	1400	630	995	1194	97.6	71.1	0.86	96.3	95.4	93.1	95.8	13437	6.0	0.6	1.8	10400
HAA(HE)6304-6	1600	630	995	1194	111.4	81.2	0.86	96.4	95.5	93.2	95.9	15357	6.0	0.6	1.8	10900
750rpm/900rpm 8pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																
HAA(HE)4501-8	200	450	745	894	16.6	12.1	0.75	93.0	92.1	89.8	92.5	2564	5.5	0.7	1.8	4960
HAA(HE)4502-8	220	450	745	894	18.2	13.2	0.75	93.3	92.4	90.1	92.8	2820	5.5	0.7	1.8	5080
HAA(HE)5001-8	250	500	745	894	19.9	14.5	0.77	94.0	93.1	90.8	93.5	3205	6.0	0.7	1.8	5100
HAA(HE)5002-8	280	500	745	894	22.3	16.2	0.77	94.2	93.3	91.0	93.7	3589	6.0	0.7	1.8	5250
HAA(HE)5003-8	315	500	745	894	24.7	18.0	0.78	94.5	93.6	91.3	94.0	4038	6.0	0.7	1.8	5420
HAA(HE)5004-8	355	500	745	894	27.8	20.3	0.78	94.4	93.5	91.2	93.9	4551	6.0	0.7	1.8	5570
HAA(HE)5005-8	400	500	745	894	30.9	22.5	0.79	94.5	93.6	91.3	94.0	5128	6.0	0.7	1.8	5720
HAA(HE)5006-8	450	500	745	894	34.8	25.3	0.79	94.6	93.7	91.4	94.1	5768	6.0	0.7	1.8	5880
HAA(HE)5007-8	500	500	745	894	38.5	28.0	0.79	95.0	94.1	91.8	94.5	6409	6.0	0.7	1.8	6040
HAA(HE)5602-8	560	560	745	894	42.5	31.0	0.80	95.1	94.2	91.9	94.6	7179	6.0	0.7	1.8	8160
HAA(HE)5603-8	630	560	745	894	47.0	34.3	0.81	95.5	94.6	92.3	95.0	8076	6.0	0.7	1.8	8640
HAA(HE)5604-8	710	560	745	894	52.9	38.6	0.81	95.6	94.7	92.4	95.1	9101	6.0	0.7	1.8	8800
HAA(HE)6301-8	800	630	742	890	58.2	42.4	0.83	95.7	94.8	92.5	95.2	10296	6.0	0.7	1.8	9020
HAA(HE)6302-8	900	630	742	890	65.4	47.6	0.83	95.8	94.9	92.6	95.3	11584	6.0	0.7	1.8	9350
HAA(HE)6303-8	1000	630	742	890	72.5	52.8	0.83	96.0	95.1	92.8	95.5	12871	6.0	0.7	1.8	9700
HAA(HE)6304-8	1120	630	742	890	81.1	59.1	0.83	96.1	95.2	92.9	95.6	14415	6.0	0.7	1.8	10500

TYPE	Output kW	Frame Size	Speed 50Hz rpm	Speed 60Hz rpm	Current (at 50Hz) of Standard Line Voltages at 3kV A	at 3.3kV A	at 4.16kV A	at 5kV A	at 6kV A	at 6.6kV A	and at 60Hz at 4kV A	at 4.16kV A	at 6.6kV A	Power Factor Cos φ	Efficiency (at 50Hz) 100% Load %	75% Load %	50% Load %	60Hz 100% Load %	Rated torque Nm	Ratio Starting current	Starting torque	B/down torque	Weight Kg
600rpm/720rpm 10pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																							
HAA(HE)4501-10	185	450	585	702	51.2	46.6	36.9	30.7	25.6	23.3	38.6	37.1	23.4	0.75	92.7	92.0	90.3	92.2	3020	5.5	0.8	1.8	3980
HAA(HE)4502-10	200	450	585	702	55.2	50.2	39.8	33.1	27.6	25.1	41.7	40.1	25.2	0.75	92.9	92.2	90.5	92.4	3265	5.5	0.8	1.8	4120
HAA(HE)4503-10	220	450	585	702	60.6	55.1	43.7	36.4	30.3	27.6	45.7	44.0	27.7	0.75	93.1	92.4	90.7	92.6	3591	5.5	0.8	1.8	4260
HAA(HE)4504-10	250	450	585	702	68.8	62.5	49.6	41.3	34.4	31.3	51.8	49.9	31.4	0.75	93.3	92.6	90.9	92.8	4081	5.5	0.8	1.8	4440
HAA(HE)4505-10	280	450	585	702	76.8	69.9	55.4	46.1	38.4	34.9	57.9	55.7	35.1	0.75	93.5	92.8	91.1	93.0	4571	5.5	0.8	1.8	4620
HAA(HE)5001-10	315	500	585	702	84.9	77.1	61.2	50.9	42.4	38.6	64.0	61.5	38.8	0.76	94.0	93.1	90.9	93.5	5142	5.5	0.8	1.8	5000
HAA(HE)5002-10	355	500	585	702	95.3	86.7	68.7	57.2	47.7	43.3	71.9	69.1	43.6	0.76	94.3	93.4	91.2	93.8	5795	5.5	0.8	1.8	5140
HAA(HE)5003-10	400	500	585	702	107.2	97.4	77.3	64.3	53.6	48.7	80.8	77.7	49.0	0.76	94.5	93.6	91.4	94.0	6530	5.5	0.8	1.8	5320
HAA(HE)5004-10	450	500	585	702	120.5	109.5	86.9	72.3	60.2	54.8	90.8	87.3	55.0	0.76	94.6	93.7	91.5	94.1	7346	5.5	0.8	1.8	5480
HAA(HE)5601-10	500	560	590	708	130.1	118.3	93.8	78.1	65.1	59.2	98.1	94.3	59.5	0.78	94.8	93.9	91.7	94.3	8093	6.0	0.7	1.8	6900
HAA(HE)5602-10	560	560	590	708	145.6	132.4	105.0	87.4	72.8	66.2	109.8	105.6	66.5	0.78	94.9	94.0	91.8	94.4	9064	6.0	0.7	1.8	7075
HAA(HE)5603-10	630	560	590	708	163.6	148.8	118.0	98.2	81.8	74.4	123.4	118.6	74.8	0.78	95.0	94.1	91.9	94.5	10197	6.0	0.7	1.8	7270
HAA(HE)5604-10	710	560	590	708	184.2	167.5	132.8	110.5	92.1	83.7	138.9	133.5	84.2	0.78	95.1	94.2	92.0	94.6	11492	6.0	0.7	1.8	7500
HAA(HE)6301-10	800	630	590	708	201.9	183.6	145.6	121.2	101.0	91.8	152.3	146.4	92.3	0.8	95.3	94.4	92.2	94.8	12949	6.0	0.7	1.8	8710
HAA(HE)6302-10	900	630	590	708	227.0	206.3	163.7	136.2	113.5	103.2	171.1	164.5	103.7	0.8	95.4	94.5	92.3	94.9	14568	6.0	0.7	1.8	9310
HAA(HE)6303-10	1000	630	590	708	251.9	229.0	181.7	151.1	126.0	114.5	189.9	182.6	115.1	0.8	95.5	94.6	92.4	95.0	16186	6.0	0.7	1.8	9710
HAA(HE)6304-10	1120	630	590	708	281.8	256.2	203.2	169.1	140.9	128.1	212.5	204.3	128.8	0.8	95.6	94.7	92.5	95.1	18129	6.0	0.7	1.8	10100
500rpm/600rpm 12pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																							
HAA(HE)4504-12	185	450	490	588	54.8	49.8	39.5	32.9	27.4	24.9	41.3	39.7	25.0	0.7	92.8	92.1	90.4	92.3	3606	5.5	0.8	1.8	4280
HAA(HE)4505-12	200	450	490	588	59.1	53.8	42.6	35.5	29.6	26.9	44.6	42.9	27.0	0.7	93.0	92.3	90.6	92.5	3898	5.5	0.8	1.8	4430
HAA(HE)5001-12	220	500	490	588	62.9	57.2	45.4	37.7	31.4	28.6	47.4	45.6	28.7	0.72	93.5	92.6	90.4	93.0	4288	5.5	0.8	1.8	5030
HAA(HE)5002-12	250	500	490	588	71.3	64.8	51.4	42.8	35.7	32.4	53.8	51.7	32.6	0.72	93.7	92.8	90.6	93.2	4872	5.5	0.8	1.8	5200
HAA(HE)5003-12	280	500	490	588	79.7	72.5	57.5	47.8	39.9	36.2	60.1	57.8	36.4	0.72	93.9	93.0	90.8	93.4	5457	5.5	0.8	1.8	5410
HAA(HE)5004-12	315	500	490	588	89.5	81.3	64.5	53.7	44.7	40.7	67.5	64.9	40.9	0.72	94.1	93.2	91.0	93.6	6139	5.5	0.8	1.8	5630
HAA(HE)5601-12	355	560	490	588	97.9	89.0	70.6	58.7	49.0	44.5	73.8	71.0	44.7	0.74	94.3	93.4	91.2	93.8	6919	6.0	0.7	1.8	6920
HAA(HE)5602-12	400	560	490	588	110.1	100.1	79.4	66.1	55.0	50.0	83.0	79.8	50.3	0.74	94.5	93.6	91.4	94.0	7796	6.0	0.7	1.8	7100
HAA(HE)5603-12	450	560	490	588	123.7	112.5	89.2	74.2	61.9	56.2	93.3	89.7	56.5	0.74	94.6	93.7	91.5	94.1	8770	6.0	0.7	1.8	7290
HAA(HE)5604-12	500	560	490	588	137.2	124.7	98.9	82.3	68.6	62.4	103.4	99.4	62.7	0.74	94.8	93.9	91.7	94.3	9745	6.0	0.7	1.8	7480
HAA(HE)6301-12	560	630	490	588	149.4	135.8	107.8	89.7	74.7	67.9	112.7	108.3	68.3	0.76	94.9	94.0	91.8	94.4	10914	6.0	0.7	1.8	9490
HAA(HE)6302-12	630	630	490	588	167.9	152.7	121.1	100.8	84.0	76.3	126.6	121.7	76.7	0.76	95.0	94.1	91.9	94.5	12279	6.0	0.7	1.8	9690
HAA(HE)6303-12	710	630	490	588	189.1	171.9	136.3	113.4	94.5	85.9	142.5	137.1	86.4	0.76	95.1	94.2	92.0	94.6	13838	6.0	0.7	1.8	9910
HAA(HE)6304-12	800	630	490	588	212.6	193.3	153.3	127.5	106.3	96.6	160.3	154.1	97.1	0.76	95.3	94.4	92.2	94.8	15592	6.0	0.7	1.8	10250

"Standard Line" High Voltage motors are pre-designed standard motors available at reduced lead times.
They are available as **Standard Efficiency Motors** and also as **Higher Efficiency Motors.**
For different voltages, speeds and power outputs please contact the Marathon staff.

"Standard Line" Voltages							
	50Hz:	3kV	3.3kV	4.16kV	5kV	6kV	6.6kV	10kV
	60Hz:	4kV	4.16kV	6.6kV	13.8kV			

TYPE	Output kW	Frame Size	Speed 50Hz rpm	Speed 60Hz rpm	Current 50Hz 10kV A	Current 60Hz 13.8kV A	Power Factor Cos φ	Efficiency (at 50Hz) 100% Load %	75% Load %	50% Load %	60Hz 100% Load %	Rated torque Nm	Ratio Starting current	Ratio Starting torque	Ratio B/down torque	Weight Kg
600rpm/720rpm 10pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																
HAA(HE)5003-10	220	500	595	714	18.4	13.4	0.74	93.2	92.3	90.0	92.7	3531	5.5	0.7	1.8	4910
HAA(HE)5004-10	250	500	595	714	20.9	15.2	0.74	93.5	92.6	90.3	93.0	4013	5.5	0.7	1.8	4990
HAA(HE)5005-10	280	500	595	714	23.0	16.7	0.75	93.8	92.9	90.6	93.3	4494	5.5	0.7	1.8	5130
HAA(HE)5006-10	315	500	595	714	25.8	18.8	0.75	94.0	93.1	90.8	93.5	5056	5.5	0.7	1.8	5290
HAA(HE)5601-10	355	560	595	714	28.3	20.6	0.77	94.2	93.3	91.0	93.7	5698	5.5	0.7	1.8	7240
HAA(HE)5602-10	400	560	595	714	31.8	23.2	0.77	94.3	93.4	91.1	93.8	6420	5.5	0.7	1.8	7590
HAA(HE)5603-10	450	560	595	714	35.7	26.0	0.77	94.5	93.6	91.3	94.0	7223	5.5	0.7	1.8	7980
HAA(HE)5604-10	500	560	595	714	39.1	28.5	0.78	94.6	93.7	91.4	94.1	8025	5.5	0.7	1.8	8350
HAA(HE)5605-10	560	560	595	714	43.8	31.9	0.78	94.7	93.8	91.5	94.2	8988	5.5	0.7	1.8	8750
HAA(HE)6301-10	630	630	595	714	48.5	35.3	0.79	94.9	94.0	91.7	94.4	10112	6.0	0.7	1.8	8700
HAA(HE)6302-10	710	630	595	714	54.6	39.7	0.79	95.1	94.2	91.9	94.6	11396	6.0	0.7	1.8	9000
HAA(HE)6303-10	800	630	595	714	61.3	44.6	0.79	95.4	94.5	92.2	94.9	12840	6.0	0.7	1.8	9320
HAA(HE)6304-10	900	630	595	714	68.8	50.1	0.79	95.6	94.7	92.4	95.1	14445	6.0	0.7	1.8	9720
HAA(HE)6305-10	1000	630	595	714	76.4	55.7	0.79	95.6	94.7	92.4	95.1	16050	6.0	0.7	1.8	10150
500rpm/600rpm 12pole, IP55, class F/B, ambient temperature -20°C to +40°C, up to 1000m above sea level, protection 6xPT100 in winding & 1xPT100 in each bearing																
HAA(HE)5601-12	250	560	495	594	21.2	15.4	0.73	93.4	92.5	90.2	92.9	4823	5.5	0.7	1.8	6690
HAA(HE)5602-12	280	560	495	594	23.6	17.2	0.73	93.7	92.8	90.5	93.2	5402	5.5	0.7	1.8	6940
HAA(HE)5603-12	315	560	495	594	26.5	19.3	0.73	94.0	93.1	90.8	93.5	6077	5.5	0.7	1.8	7300
HAA(HE)5604-12	355	560	495	594	29.9	21.8	0.73	93.9	93.0	90.7	93.4	6849	5.5	0.7	1.8	7580
HAA(HE)5605-12	400	560	495	594	33.6	24.5	0.73	94.1	93.2	90.9	93.6	7717	5.5	0.7	1.8	7860
HAA(HE)6301-12	450	630	495	594	37.3	27.2	0.74	94.2	93.3	91.0	93.7	8682	6.0	0.7	1.8	9220
HAA(HE)6302-12	500	630	495	594	41.3	30.1	0.74	94.5	93.6	91.3	94.0	9646	6.0	0.7	1.8	9500
HAA(HE)6303-12	560	630	495	594	46.1	33.6	0.74	94.7	93.8	91.5	94.2	10804	6.0	0.7	1.8	9720
HAA(HE)6304-12	630	630	495	594	51.8	37.7	0.74	94.9	94.0	91.7	94.4	12155	6.0	0.7	1.8	9920
HAA(HE)6305-12	710	630	495	594	58.3	42.4	0.74	95.1	94.2	91.9	94.6	13698	6.0	0.7	1.8	10150



ALL QUOTATIONS ARE OFFERED AND ALL PURCHASE ORDERS ARE ACCEPTED BY SELLER SUBJECT ONLY TO THESE TERMS AND CONDITIONS.

1. DEFINITIONS:
"Buyer" means the entity to which Seller is selling Products or Services under a Contract.
"Contract" means the agreement between Buyer and Seller governing the sale of Products and/or Services by Seller to Buyer. These Terms and Conditions, the Quotation (if one is issued by Seller), any purchase order acknowledgement (if one is issued by Seller), and Buyer's purchase order (except to the extent that it conflicts with these Terms and Conditions, the Quotation, and/or the order acknowledgement) constitute the Contract. "Products" means the equipment, parts, materials, supplies, and other goods that Seller has agreed to supply under the Contract. References in these Terms and Conditions to the purchase and sale of Products may mean, where applicable, the licensing of Software loaded on or provided with the Products.
"Quotation" means Seller's statement identifying the Products and Services, together with any quantity, price, delivery schedule, and/or other terms and conditions (in addition to or different from these Terms and Conditions), offered by Seller for sale to Buyer. A Quotatio n that incorporates these Terms and Conditions by reference shall be deemed to include these Terms and Conditions, whether or not Seller provides a complete copy of these Terms and Conditions to Buyer with the Quotation, with a purchase order acknowledgement, or with an invoice. Where there is a conflict between these Terms and Conditions and other provisions of the Quotation, the latter shall control.
"Services" means the services that Seller has agreed to provide under the Contract.
"Software" means software loaded on or provided with the Products.
"Seller" means the Regal entity – whether Regal Beloit Corporation ("RBC") or an RBC subsidiary – supplying Products and/or providing Services under the Contract.
"Terms and Conditions" means these "Terms and Conditions of Sale."

2. CONTRACT FORMATION:
No agreement or understanding, oral or written, purporting to modify these Terms and Conditions shall be binding on Seller unless it is made in writing, specifically stating that it is a modification of these Terms and Conditions and it is signed by Seller's authorized representative. No course of dealing, usage of trade, or course of performance shall be relevant to explain or supplement any of these Terms and Conditions. If these Terms and Conditions are deemed an offer, Buyer's acceptance of Seller's offer is expressly limited to acceptance of these Terms and Conditions. Fulfillment of Buyer's order does not constitute acceptance of any of Buyer's terms and conditions and does not modify or amend these Terms and Conditions. Buyer's purchase order for the purchase of Products and/or for the performance of Services shall constitute Buyer's assent to these Terms and Conditions. Any terms and conditions contained in Buyer's purchase order or other form of communication from Buyer that are additional to or different from these Terms and Conditions, shall be deemed rejected by Seller, unless expressly accepted in writing by Seller's authorized representative. Alternatively, if these Terms and Conditions are deemed to be a response to, an acceptance of, or a written confirmation of, Buyer's offer, whether provided in the form of a purchase order or otherwise, Seller's acceptance is expressly conditioned upon Buyer's assent to these Terms and Conditions. Buyer's acceptance of Products tendered to Buyer by Seller shall constitute Buyer's express assent to all of the terms and conditions contained in these Terms and Conditions. All proposals, negotiations and representations, if any, made prior to or with reference hereto are hereby superseded by these Terms and Conditions. References in this Section to "these Terms and Conditions" shall be deemed to mean these Terms and Conditions and Seller's Quotation, if Seller has issued a Quotation.

3. ACCEPTANCE OF PURCHASE ORDERS:
No Buyer purchase order shall be binding on Seller until accepted in writing by Seller, and Seller shall have no liability to Buyer with respect to purchase orders that are not accepted. Shipment against a purchase order shall be deemed to constitute Seller's acceptance thereof, subject to these Terms and Conditions. All purchase orders shall be subject to these Terms and Conditions, whether or not the purchase orders so state. Purchase orders accepted by Seller may not be cancelled or modified by Buyer without the prior written consent of Seller.

4. QUOTATIONS:
Quotations shall expire and shall be void thirty (30) days from date of the Quotation, unless otherwise specified in the Quotation. The Quotation may be modified or withdrawn by Seller at any time before Seller's receipt of Buyer's conforming acceptance.

5. PRICES; PRICE CHANGES:
(a) Products. The price of the Products sold pursuant to the Contract shall be as set forth in the Quotation. If price is not specified in the Quotation, price shall be based upon Seller's prices in effect at the time of shipment. Published prices are for Products of Seller's current standard design and constructed of standard materials. Variation from the standard design and/or materials requires special pricing. Seller reserves the right at any time, and without incurring any obligation, to discontinue the manufacture of any model, to withdraw products from sale, to make changes in design, and/or to add improvements to products. Price also shall be based on freight rates in effect at the time of shipment. Where applicable, in the event of an increase in the applicable freight rates before the shipment of Products, such changes will be for the account of Buyer. Price advances, discounts, extras and other terms and conditions are subject to change without notice. Unless otherwise provided in the Quotation, price is based on delivery in accordance with the "Delivery" section below. Prices include Seller's standard packing.
(b) Services. Services prices are based on normal business hours (8 AM to 5 PM Monday through Friday). Overtime and Saturday hours will be billed at one and one half (1.5) times the normal business hour hourly rate. Sunday hours will be billed at two (2) times the normal business hours hourly rate; holiday hours will be billed at three (3) times the normal business hours hourly rate.

6. TAXES, DUTIES AND FEES:
Seller shall be responsible for taxes measured on Seller's net income based upon performance of, or payment for, work under the Contract ("Seller Taxes"). Buyer shall be responsible for all other taxes, duties, fees or other charges of any kind (including, but not limited to any manufacturer's tax, retailers' occupation tax, use tax, sales tax, excise tax, duty, custom, inspection or testing fee, value added tax, or any other tax, fee or charge of any nature whatsoever) imposed by any governmental authority against Buyer, Seller or Seller's suppliers and/or contractors, based upon the Contract between Seller and Buyer. In the event Seller is required to pay any such tax, fee or charge, regardless whether such tax, fee or charge is imposed before or after Seller's delivery of the Products and/or Buyer's payment under the Contract, Buyer shall reimburse Seller therefor. In lieu of such reimbursement, Buyer shall provide Seller, at the time the order is submitted, with an exemption certificate or other document acceptable to the authority imposing such tax, fee or charge. If Seller's prices include any taxes, duties or fees (other than Seller Taxes), any change in such taxes, duties and/or fees shall be the basis for a price adjustment.

7. TERMS OF PAYMENT:
(a) Terms. Terms of payment are cash in full, without set-off or discount, in U.S. dollars, and by wire transfer, no later than thirty (30) days from date of invoice.
(b) Payment Default. If Buyer defaults in any payment when due, or in the event that any voluntary or involuntary bankruptcy or insolvency proceedings involving Buyer are initiated by or against Buyer, then the whole Contract price shall immediately become due and payable upon demand, or Seller, at its option and without prejudice to its other lawful remedies, may defer delivery or cancel the Contract. Where delivery is deferred and Seller does not demand immediate payment of the full Contract price, pro-rata payments shall become due as shipments are made.
(c) Buyer Financial Condition. If, during the period of performance of the Contract, the financial condition of Buyer is determined by Seller not to justify the terms of payment specified, Seller may demand full or partial payment in advance before proceeding with the work, or satisfactory security or guarantees that invoices will be promptly paid when due, or, at its option, without prejudice to other lawful remedies, may defer delivery or cancel the Contract.
(d) Delay. If delivery is delayed by Buyer, which delay must be consented to by Seller, Seller may store the Products in accordance with subsection 8(e) "Storage" below and Seller may submit a new estimate of cost for completion based on prevailing conditions. Payments shall become due from the date on which Seller is prepared to deliver the Products and storage shall be the Buyer's risk and expense as provided in subsection 8(g) "Storage" below. If manufacture is delayed by Buyer for any cause, a partial payment based upon the proportion of the order completed shall become due from the date on which Seller is notified of the delay.
(e) Late Payment Charge. Buyer shall pay a late payment charge on all amounts not paid in full when due at the rate of one and one half percent (1.5%) per month or at the maximum legally permissible rate, whichever is lower.
(f) Exceptions. Supplement A to these Terms and Conditions lists Seller business units for which payment terms vary from payment terms set forth in this Section 7.

8. EDELIVERY; TITLE TRANSFER; RISK OF LOSS/DAMAGE:
(a) Delivery – U.S. Buyer. For sales in the U.S. that do not involve export from the U.S., Seller shall deliver Products to Buyer EXW Seller's U.S. point of shipment (Incoterms® 2010). The point of shipment shall be the shipping dock of Seller's factory, warehouse or other facility that Seller designates as its discretion as point of shipment from time to time.
(b) Sales Involving Exports from U.S.
(1) Delivery – U.S. Buyer; Subsequent Drop Shipment to Location Outside U.S. For sales, in the U.S. to a U.S. Buyer, which involve drop shipment at Buyer's request and/or on Buyer's behalf, to a location outside the U.S., Seller shall deliver the Products to Buyer EXW Seller's U.S. point of shipment (Incoterms® 2010). The point of shipment shall be the shipping dock of Seller's factory, warehouse or other facility that Seller designates at its discretion as its point of shipment from time to time. Buyer is responsible for all transportation charges incurred after delivery of the Products to the carrier or Buyer at the point of shipment and shall reimburse Seller for any transit insurance or freight pre-paid for the Products by Seller. Buyer shall bear the risk of loss and/or damage in transportation. Buyer is responsible for filing any export documents required for export from the U.S.
(2) Delivery – Non-U.S. Buyer; Routed Export Transactions. For sales in the U.S. to a non-U.S. Buyer, Seller shall deliver Products to Buyer's freight forwarder EXW Seller's U.S. point of shipment (Incoterms® 2010). The point of shipment shall be the shipping dock of Seller's factory, warehouse or other facility that Seller designates at its discretion as its point of shipment from time to time. In a "Routed Export Transaction," as defined in the U.S. Census regulations, 15 CFR Section 30.3, where Buyer is a non-U.S. entity, Buyer shall authorize Buyer's designated freight forwarder or Seller to facilitate the export of the Products from the U.S. and to prepare and file export documentation with respect to such export transaction (hereafter, to "Facilitate the Export"). If Buyer authorizes its designated freight forwarder to Facilitate the Export, Buyer's freight forwarder shall provide Seller with a copy of the final export documentation and proof of filing. If Buyer authorizes Seller to Facilitate the Export, Buyer shall cause Buyer's freight forwarder to provide Seller the information needed by Seller to Facilitate the Export. Buyer shall give timely notice to Seller identifying whom it has designated to Facilitate the Export.
(c) Delivery Dates. Delivery dates are approximate, are not guaranteed and are based upon prompt receipt by Seller from Buyer of all necessary shipping and other information. Seller may deliver in advance of the delivery schedule. Seller reserves the right to make delivery in installments, with all installments to be separately invoiced and paid for by Buyer when due per invoice, without regard to subsequent deliveries. Delivery of the Products to a commercial carrier at the shipping point shall constitute delivery to Buyer.
(d) Title Transfer. Title to Products shall pass to Buyer upon the earlier of delivery of the Products to the carrier or Buyer at the point of shipment in accordance with subsection (a) above, except that, for Routed Export Transactions, title shall transfer to Buyer upon delivery to Buyer's designated freight forwarder. Subject to applicable law, Seller, upon notice to Buyer, may retain title to the Products until such time as Seller receives payment in full from Buyer. Title to Software shall not pass to Buyer and is subject to the applicable license.
(e) Risk of Loss/Damage. Risk of loss and/or damage shall pass to Buyer upon delivery in accordance with subsection (a) above, except that, for Routed Export Transactions, risk of loss and/or damage shall pass upon delivery of the Products to Buyer's designated freight forwarder.
(f) Delivery by Seller's Carrier. Where the parties agree that delivery shall be made at a location other than Seller's point of shipment, where Seller will deliver using its carrier or Seller's privately owned or leased trucks, unloading at the agreed location shall constitute delivery to Buyer. Freight and handling charges by Seller may not reflect actual freight charges prepaid to the carrier by Seller due to incentive discounts earned by Seller based upon Seller's aggregate volume of freight tendered to a carrier or when a carrier must be used which charges a rate which is different than the rate upon which Seller's freight and handling charges were based. When shipments are delivered in Seller's privately owned or leased trucks, Buyer will be charged an amount approximating the prevailing common carrier rate.
(g) Storage. In the event that Buyer is unable to accept delivery of the Products at time of shipment, Seller shall invoice Buyer for the full purchase price as if shipment had been made and: (i) if Seller is able to store such Products in its own facilities, Buyer will pay Seller the reasonable handling and storage charges for the period of such

storage, or (ii) if Seller is unable to store such goods at its own facility, Seller reserves the right to arrange handling and storage in a suitable bonded warehouse for Buyer at Buyer's expense. In cases where handling and storage become necessary, it shall be Buyer's responsibility to notify Seller when shipment is to be made. Seller will make necessary arrangements for shipment at Buyer's expense.

9. EXCUSABLE DELAYS; FORCE MAJEURE:

(a) Excuse of Performance. Seller shall not be liable for any ordinary, incidental, or consequential loss or damage as a result of Seller's delay in or failure of delivery, or installation of Products or performance of Services due to (i) any cause beyond Seller's reasonable control, (ii) an act of God, act of Buyer, embargo or other government act, authority, regulation or request, fire, theft, accident, strike, slowdown or other labor disturbance, war, armed conflict, act or threat of terrorism, riot, epidemic, delay in transportation, or (iii) inability to obtain necessary labor, materials, components, or facilities. Should any of the aforementioned events occur, Seller, at its option, may cancel Buyer's order with respect to any undelivered Products or incomplete Services or extend the delivery date for a period equal to the time lost because of delay. Notice of such election shall be given promptly to Buyer. In the event Seller elects to so cancel the Contract, Seller shall be released of and from all liability for failure to deliver the Products or to perform the Services, including, but not limited to, any and all claims on behalf of Buyer for lost profits, or any other claim of any nature which Buyer might have. If shipping or progress of the work is delayed or interrupted by Buyer, directly or indirectly, Buyer shall pay Seller for all additional charges resulting therefrom.

(b) Allocation. If Seller determines that its ability to meet the demand for products, including the Products, or to obtain labor, materials, components or facilities is hindered, limited or made impracticable due to causes set forth in subsection (a) above, Seller may allocate its available supply of products, including the Products, among itself and its purchasers on such basis as Seller determines to be equitable without liability for any failure of performance which may result therefrom.

10. LIMITED WARRANTY.

(a) Scope and Period.

(1) Products. Seller warrants that the Products shall be delivered free from defects in material, workmanship and title and shall conform to Seller's specification agreed upon in a written and signed agreement by Buyer and Seller, if applicable, for the Products. This warranty shall expire twelve (12) months from first use of the Product or eighteen (18) months from date of manufacture of the Product, whichever occurs first.

(2) Repaired and/or Replaced Products and/or Parts of Products. Seller warrants that the repaired or replaced Products or parts of Products shall be delivered free from defects in material, workmanship and title. In the case of repaired or replaced Products or parts of Products comprising warranty remedies for Products, this warranty shall expire upon expiration of the warranty period applicable to the Products originally supplied by Seller. In the case of other repaired or replaced Products or parts of Products, this warranty shall expire twelve (12) months from the date of repair or manufacture of the Products or parts of the Products.

(3) Services. Seller warrants that the Services shall be performed in a competent and diligent manner in accordance with any mutually agreed specification. This warranty shall expire ninety (90) days from the date of completion of such Services.

(4) Software. Seller warrants that the Software shall execute, at time of delivery, in accordance with the specification agreed upon in a written and signed agreement by Buyer (as licensee) and Seller (as licensor) when properly installed in the Products. The warranty shall expire six (6) months from date of manufacture of the first Product in which the Software is loaded.

(5) Applicability. This warranty shall apply to any Products and/or Software bought, acquired, and/or used by an entity that, or person who, acquires the Products and/or Software from Buyer (a "Transferee"), except that any claim made against Seller pursuant to this warranty shall be made by Buyer only. Seller shall not be bound by this Section 10 to satisfy a claim under this Section made against Seller by a Transferee, whether such Transferee is a direct or indirect Transferee of Buyer, Buyer shall provide any Transferee of a Product or Software written conspicuous notice of Sections 10 and 11 hereof.

(6) Exceptions. Supplement B to these Terms and Conditions lists Seller Products, parts, Services and Software for which Seller's warranties vary from the warranties set forth in this subsection 10(a).

(b) Remedies.

(1) Products. If, prior to expiration of the warranty period set forth in subsection 10(a) (1), above, any Products shall be proved to Seller's satisfaction to be defective or nonconforming with the warranty set forth therein, Seller will repair or replace such defective Products or components thereof, FCA Seller's factory, warehouse or other facility that Seller designates at its discretion as point of shipment from time to time (Incoterms® 2010), or will refund or provide Buyer with a credit in the amount of the purchase price paid therefor by Buyer, at Seller's sole option. Buyer's exclusive remedy and Seller's sole obligation under this warranty shall be limited to such repair or replacement, FCA factory, warehouse or other facility that Seller designates at its discretion as point of shipment from time to time (Incoterms® 2010), or refund or credit by Seller, and shall be conditioned upon Seller's receiving written notice of any defect and/or nonconformance within a reasonable period of time, but in no event more than thirty (30) days, after it was discovered or by reasonable care should have been discovered. All claims not made in writing and received by Seller within such thirty (30) day period shall be deemed waived. In no event shall Seller's liability for such defective or nonconforming Products exceed the purchase price paid by Buyer for such Products. With prior approval from Seller, Buyer shall return the alleged defective Product or part, freight prepaid, for Seller's inspection, and no other Products shall be returned to any Seller office, factory, warehouse, authorized service center or other facility, without Seller's written consent. (2) Repaired and/or Replacement Products and/or Parts of Products. If prior to the expiration of the applicable warranty period set forth in subsection 10(a)

(2) above, any replacement Products and/or parts of Products shall be proved to Seller's satisfaction to be defective or nonconforming with the warranty set forth therein, the remedy set forth in subsection 10(b)(1) above shall apply to such replacement Products and/or parts of Products.

(3) Services. If, prior to expiration of the warranty period set forth in subsection 10(a) (3), above, any Services shall be proved to Seller's satisfaction to be nonconforming with the warranty set forth therein, Seller will re-perform such nonconforming Services. If the Services cannot be re-performed, Seller, at its option, shall refund or credit monies paid by Buyer for such nonconforming Services.

(4) Software. If, prior to expiration of the warranty period set forth in subsection 10(a)(4) above, (i) Buyer provides, in writing, a complete description of the claimed nonconformance in the Software, and (ii) the Software is proven to Seller's satisfaction to be so nonconforming with the warranty set forth therein, Seller will correct the nonconformance by, at its option: (i) modifying or making available to Buyer instructions for modifying the program causing such nonconformance, or (ii) making available a corrected or replacement program FCA Seller's factory, warehouse or other facility that Seller designates at its discretion as point of shipment from time to time (Incoterms® 2010).

(c) Exclusions - The warranties set forth in this Section 10 do not cover:

(1) shipping expenses to and from Seller's office, factory, warehouse, authorized service center or other destination designated by Seller for repair or replacement of defective Products or any tax, duty, custom, inspection or testing fee, or any other charge of any nature related thereto;

(2) costs of removing defective Products from, and/or disassembling, equipment in which Products are assembled or reinstalling Products and/or reassembling such equipment, or testing repaired or replaced Products and/or the equipment;

(3) field service travel and living costs and expenses;

(4) Products subjected to abuse, neglect, negligence, misuse, misapplication, accident, damages by circumstances beyond Seller's control, improper installation (if by anyone other than Seller), improper operation (including, but not limited to, operation in excess of rated capacity or otherwise not in accordance with installation, maintenance, or operating instructions or requirements) improper maintenance, improper storage, and/or any other than normal use or service;

(5) Products maintained, serviced, repaired or altered by anyone other than Seller or Seller's authorized service agencies;

(6) Products and/or parts not manufactured by Seller; for Products furnished by Seller, but manufactured by others, Seller will assign to Buyer the written warranty, if any, of the manufacturer, if assignment is reasonably practicable; however, Seller does not adopt or guarantee or represent that the manufacturer will comply with any of the terms of the warranty of such manufacturer; but, in no event shall Seller's obligations be greater than those provided under Seller's warranty set forth in this Section 10; and/or

(7) failures of the Software to be interruption-free or error-free or to meet Buyer's or any other party's requirements; and, problems caused by use of the Software in conjunction with third-party software, hardware, or products.

(d) DISCLAIMER: THE FOREGOING WARRANTIES ARE IN LIEU OF ALL OTHER EXPRESS AND IMPLIED WARRANTIES, ARISING BY OPERATION OF LAW OR OTHERWISE, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHETHER OR NOT THE PURPOSE OR USE HAS BEEN DISCLOSED TO SELLER IN SPECIFICATIONS, DRAWINGS, OR OTHERWISE AND WHETHER OR NOT SELLER'S PRODUCTS ARE SPECIFCIALLY DESIGNED AND/OR MANUFACTURED BY SELLER FOR BUYER'S USE OR PURPOSE. NO EMPLOYEE, REPRESENTATIVE, OR AGENT OF SELLER OTHER THAN AN OFFICER OF SELLER IS AUTHORIZED TO ALTER OR MODIFY ANY PROVISION OF THIS SECTION 10 OR TO MAKE ANY GUARANTEE, WARRANTY, OR REPRESENTATION, EXPRESS OR IMPLIED, ORALLY OR IN WRITING, WHICH IS CONTRARY TO THE FOREGOING. Except where Buyer and Seller agree in a written and signed agreement upon the specifications applicable to the Products, Software, and/or Services, any description of the Products, Software, and/or Services, whether in writing or made orally by Seller or Seller's agents, specifications, samples, models, bulletins, drawings, diagrams, engineering sheets or similar materials used in connection with Buyer's order are for the sole purpose of identifying the Products and shall not be construed as an express or implied warranty. Any suggestions by Seller or Seller's agents regarding use, application or suitability of the Products shall not be construed as an express or implied warranty unless confirmed to be such in writing by Seller's authorized officer.

11. LIMITATIONS OF REMEDY AND LIABILITY:

(a) Breach of Warranty Claims. Buyer's only remedy for breach of any warranty under the Contract, other than the warranty provided under Section 13 "Intellectual Property Indemnity," shall be the applicable remedy set forth in Section 10 "Limited Warranty" above. Seller's total liability for any and all breach of warranty claims under the Contract shall not exceed the purchase price allocable to the Product, Software or Service or part thereof which gives rise to the claim.

(b) Other Claims. Seller's liability for any claim other than a breach of warranty claim under Section 10 "Limited Warranty," whether in contract, negligence, tort, strict liability, indemnity or otherwise for any loss or damage arising out of, connected with, or resulting from the Contract or the performance or breach thereof, or from the design, manufacture, sale, delivery, resale, repair, replacement, installation, technical direction of installation, inspection, operation or use of any Products covered by or furnished under the Contract or from Services rendered under the Contract, shall in no case (except as provided in Section 13 "Intellectual Property Indemnity") exceed five percent (5%) of the purchase price allocable to the Products or part thereof or Services giving rise to the claim.

(c) Consequential Damage Disclaimer. SELLER SHALL NOT BE LIABLE FOR AND DISCLAIMS ALL CONSEQUENTIAL, INCIDENTAL, CONTINGENT, SPECIAL OR PUNITIVE DAMAGES WHATSOEVER. Seller shall not be liable for lost profits or revenues, loss of use of the Products, Software or any related equipment or systems, cost of capital, cost of substitute products, cost of facilities or services, business interruption, downtime, shutdown, or slowdown costs, any other types of economic loss, penalties, special or punitive damages, and claims of Buyer's customers for any such damages.

(d) Expiration of Claims. All claims against Seller arising out of or related to the Contract or the performance or breach thereof shall expire unless made and presented to Seller in writing by Buyer before expiration of the applicable warranty period.

(e) Precedence. The limitations of this Section shall apply regardless of whether a claim is based in contract, tort (including negligence), warranty, strict liability, intellectual property, or otherwise, and shall take precedence over any conflicting terms and conditions, except where the limitations of liability of such conflicting terms limit Seller's liability further.

12. INDEMNITY:

(a) Third party claims. Each of Buyer and Seller (each an "Indemnified Party" and an "Indemnifying Party") shall indemnify the other party from and against claims brought by a third party, for bodily injury or damage to the third party's tangible property, to the extent such injury and/or damage is caused by the negligence of the Indemnifying Party, provided that the Indemnified Party gives the Indemnifying Party prompt notice of any such claim and all necessary information and assistance so that the Indemnifying Party, at its option, may defend or settle such claim and the Indemnified Party does not take any adverse posi¬tion in connection with such claim. In the event that the injury

or damage is caused by joint or concurrent negligence of Buyer and Seller, the loss or expense shall be borne by each party in proportion to its degree of negligence. For purposes of Seller's indemnity obligations hereunder, Products shall not be considered third party property and the facility in which a Product or Software is used and/or the Services are performed shall not be considered third party property.

(b) Indemnity by Buyer for Third Party Warranty Claims. If Buyer supplies Products or Services to a third party, uses Products or Services at a facility owned by a third party, and/or transfers Products and/or Software to a third party, Buyer shall indemnify and defend Seller from and against any and all claims by, and liability to, any such third party in excess of the limitations set forth in Sections 10 "Limited Warranty" and 11 "Limitations of Remedy and Liabilities." For purposes of this subsection (b), "Seller" means Seller, its affiliates, suppliers, contractors, licensors and their employees.

13. INTELLECTUAL PROPERTY INDEMNITY:

Seller war¬rants that, to the best of its knowledge, Products, Services and/or Software furnished hereund er, and any part thereof, (each a "Delivered Item") shall be delivered free of any rightful claim of any third party not affiliated with Buyer for infringement of any U.S. patent, any trademark registered in the U.S. Patent and Trademark Office and/or any copyright registered in the U.S. Copyright Office. Seller will, at its own expense, defend or settle any suits that may be instituted against Buyer for alleged infringement by the Delivered Item of any U.S. patent, any trademark registered in the U.S. Patent and Trademark Office and/or any copyright registered in the U.S. Copyright Office provided that: (a) such alleged infringement consists of the use of the Delivered Item for (i) any of the purposes for which Buyer informed Seller such Delivered Items would be used, or (ii) if Buyer did not so inform Seller, any of the purposes for which Buyer reasonably believed such Delivered Items would be used; (b) Buyer shall have made all payments for such Delivered Items then due hereunder; (c) Buyer shall give Seller immediate notice in writing of any such suit and transmit to Seller immediately upon receipt of all processes and papers served upon Buyer; (d) Buyer does not take any position adverse to Seller in connection with such claim; and (e) Buyer shall permit Seller through Seller's counsel, either in the name of Buyer or in the name of Seller, to defend such suit(s) and give all needed information, assistance and authority to enable Seller to do so.

In case of a final award of damages in any such suit, Seller will pay such award but will not be responsible for any compromise or settlement made without its written consent. In case the Delivered Item itself is in such suit held to infringe any valid patent issued in the United States and/or a trademark and/or copyright registered in the United States, and its use is enjoined, or in the event of a settlement or compromise approved by Seller which shall preclude future use of the Delivered Item, Seller shall, at its own expense and at its sole option, either: (a) procure rights to continue using such Delivered Item; (b) modify the Delivered Item to render it non-infringing; (c) replace the Delivered Item with a non-infringing Product and/or Software; or (d) refund the purchase price paid by Buyer for the Delivered Item after return of the Delivered Item to Seller (less reasonable depreciation for any period of use). Notwithstanding the foregoing, Seller shall not be held responsible for claims of infringement of any patents covering the use of the Delivered Item in combination with other goods or materials not furnished by Seller.

The foregoing states the entire liability of Seller for intellectual property infringement, and IN NO EVENT SHALL SELLER BE LIABLE FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES ATTRIBUTABLE TO AN INTELLECTUAL PROPERTY INFRINGEMENT. Buyer, at its own expense, shall defend Seller against, and/or settle, (a) any patent, trademark, copyright or other intellectual property infringement claim pertaining to a Delivered Item furnished by Seller to Buyer manufactured in accordance with designs, drawings or other descriptions proposed or furnished by Buyer; and (b) any claim against Seller of contributory infringement resulting from the use or resale by Buyer of a Delivered Item sold hereunder. Buyer shall indemnify Seller for any award against Seller or settlement by Seller regarding any such claims and attorneys' fees and defense costs incurred in defense of such claims.

14. SOFTWARE LICENSE:

(a) License Grant: Seller grants Buyer a nonexclusive, royalty-free, perpetual, limited license to use the Software in the U.S. and solely in conjunction with (a) the operation of the Products purchased and sold under the Contract and/or other product meeting Seller's specifications; and (b) any other purpose agreed upon in a written and signed agreement between Buyer and Seller.

(b) Scope of License: Upon Seller's prior written approval, Buyer may make a reasonable number of copies of Software as necessary for backup, configuration, installation, and restoration of the Products. Also upon Seller's prior written approval, Buyer may authorize a third-party contractor or service provider to exercise these rights on Buyer's behalf and for Buyer's benefit. Buyer may transfer possession of Software and its media to another party only in conjunction with the transfer of the Products on which the Software is loaded and only upon agreement of the other party to the terms and conditions of the Contract. Upon such transfer, Buyer shall destroy all Buyer's copies of Software and related documentation. All licenses and grants pursuant to the Contract shall immediately terminate once Buyer no longer rightfully owns or possesses the Products. No other rights under this license are granted. Upon Seller's request, Buyer shall provide Seller with written notice of any such transfer providing the name, address, and contact information of the subsequent Buyer within 15 days of such transfer.

(c) Use Restrictions: Buyer shall not (a) copy, display, transfer, adapt, modify, or distribute in any form the Software except as set forth in the Contract or in Seller documentation provided by Seller to Buyer with the Software; (b) reverse engineer, disassemble, decompile, or otherwise translate the Software's object code, unless expressly permitted by applicable law without the possibility of contractual waiver; or (c) sublicense or lease the Software or any copy thereof except with the transfer of the Products on which the Software is loaded. Except as provided under the terms of Seller's standard escrow agreement between Seller and Buyer, if applicable, Buyer shall not to make available to any party, without prior written consent from Seller or its authorized agent, source code for the Software. Buyer shall not, directly or indirectly, export or re-export, or knowingly permit the export or re-export of, the Products, or any technical information about the Products, to any country for which the United States Export Administration Act, any regulation thereunder, or any similar United States law or regulation, requires an export license or other United States Government approval, unless Buyer obtains the appropriate export license and obtains written approval from Seller.

(d) Maintenance and Support: Seller may offer to Buyer the option to purchase from Seller annual Software maintenance and support services under the terms and conditions of Seller's then-standard maintenance and support agreement. Buyer may renew this maintenance term at Seller's then-current maintenance rates. In the event Buyer purchases additional Software licenses, maintenance fees for such licenses shall be prorated to be coterminous with Buyer's existing maintenance period. In no event shall Seller be responsible for providing maintenance services for a period during which maintenance coverage is lapsed.

15. SECURITY AGREEMENT AND FINANCING STATEMENTS:

As security for payment of the purchase price under the Contract, Buyer hereby irrevocably grants Seller a security interest in the Products purchased by Buyer, together with all accessories, attachments and replacement parts and all substitutions, replacements and proceeds thereof to secure payment of the purchase price and of all monies which may be due under the Contract. Buyer hereby authorizes Seller to file all financing statements, any amendments and continuations thereof, or any other documents necessary or reasonably required, for the perfection and protection of a security interest under applicable law, and to deliver notice to prior holders of security interests, of Seller's security interest in the Products to protect its interest.

16. INSURANCE:

Until payment in full of the purchase price, Buyer shall maintain insurance covering all Products sold by Seller to Buyer in such amounts and against such risks as is customary by companies engaged in the same or similar business and similarly located, and shall, upon Seller's request, furnish evidence of such insurance satisfactory to Seller.

17. DRAWINGS; OTHER DESIGN DATA:

All specifications, drawings, designs, data, information, ideas, methods, product samples, tools, gages, dies, fixtures, patterns and/or inventions made, conceived, developed or acquired by Seller in connection with procuring and/or executing the Contract will vest in and inure to Seller's sole benefit notwithstanding any charges therefor which may have been or may be imposed by Seller on Buyer. Buyer shall not give, loan, exhibit, sell or transfer to any person who is not a Buyer employee and authorized to receive such information, or to any organization or entity, any drawing, photograph, specification or product sample furnished by Seller or reproduction thereof which may enable such person, organization or entity to furnish similar products or parts therefor.

18. RETURN OF PRODUCTS:

No Product or part shall be returned to Seller without written authorization and shipping instructions first having been obtained from Seller.

19. ASSIGNMENT AND SUBCONTRACTING:

None of Buyer's rights under the Contract shall be assigned by Buyer to any other person, whether by operation of law or otherwise, without Seller's prior written approval. Seller may, without the necessity of obtaining Buyer's prior written consent, assign the Contract or subcontract the production of all or any portion of the Products and/or performance of the Services.

20. CANCELLATION:

No purchase order submitted to Seller may be cancelled by Buyer without the prior written consent of Seller, which consent will at all times be conditioned on Buyer's agreement to pay Seller's cancellation charge. For a finished Product that, in Seller's judgment, is readily resalable to others, the cancellation charge shall be 15% of the invoice price of the Product. For all other cancellations, the cancellation charge shall amount to all cost and expenses incurred by Seller and arising out of or in connection with Buyer's purchase order plus reasonable profit. In no event shall the cancellation charge be less than 10% of the invoice price of the Product or more than the invoice price.

21. HIGH RISK APPLICATION USE DISCLAIMER:

PRODUCTS AND SERVICES SOLD BY SELLER ARE NOT INTENDED FOR USE IN CONNECTION WITH ANY NUCLEAR FACILITY OR ACTIVITY, CRITICAL SAFETY SYSTEM, MEDICAL DEVICE, MILITARY DEVICE, SATELLITE, AVIATION EQUIPMENT, AIR TRAFFIC CONTROL EQUIPMENT, OR OTHER HIGH RISK APPLICATIONS (COLLECTIVELY, "HIGH RISK APPLICATIONS"). SELLER SHALL NOT USE OR PERMIT OTHERS TO USE PRODUCTS OR SERVICES FOR SUCH HIGH RISK APPLICATIONS WITHOUT SELLER'S PRIOR WRITTEN CONSENT. IF SO USED WITHOUT SELLER'S PRIOR WRITTEN CONSENT, SELLER DISCLAIMS ALL LIABILITY FOR ANY DAMAGE, INJURY OR CONTAMINATION, AND BUYER SHALL INDEMNIFY AND HOLD SELLER, ITS OFFICERS, AGENTS, EMPLOYEES, SUCCESSORS, ASSIGNS AND CUSTOMERS HARMLESS FROM AND AGAINST ANY AND ALL SSUCH LIABILITY. SELLER'S CONSENT, IF ANY, WILL BE CONDITIONED UPON ADDITIONAL TERMS AND CONDITIONS ACCEPTABLE TO SELLER.

22. GOVERNING LAW; VENUE:

These Terms and Conditions and the Contract shall be governed by and construed in accordance with the laws of the State of Wisconsin. Seller and Buyer irrevocably submit to the exclusive jurisdiction of the state courts located in Rock County, State of Wisconsin and the federal courts located in the State of Wisconsin, and Seller and Buyer waive any objection to venue or forum non conveniens, for the resolution of any dispute relating to these Terms and Conditions or the Contract. The rights and obligations of Seller and Buyer shall not be governed by the provisions of the United Nations Convention on Contracts for the Internal Sale of Goods.

23. EXPORT/IMPORT:

Buyer shall comply, in the receipt and use of the Products and the Software, with all applicable import and export control laws, regulations, orders and requirements of the jurisdictions in which the Seller and Buyer are established or from which Products and Software are provided. Buyer shall not transfer, release, import, or export Products and/or or Software in violation of such applicable laws, regulations or other legal requirements. Buyer shall provide a completed end-user certification in a form satisfactory to Seller upon Seller's request.

24. ATTORNEYS' FEES:

Buyer agrees to pay all of Seller's costs and expenses of collection and related litigation, including but not limited to attorneys' fees and costs.

25. SALVATORY CLAUSE:

The invalidity, in whole or in part, of any of the provisions of these Terms and Conditions, shall not affect the enforceability of any of the other provisions thereof.

26. APPLICABILITY:

These Terms and Conditions as stated herein are applicable as of the date of this printing and until such time as changed by Seller.

REGAL™

marathon™

Marathon Electric Motors
100 E. Randolph Street, PO Box 8003
Wausau, WI 54401-8003
Phone: (715) 675-3311

www.marathonelectric.com

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