Allied Motion
An Allient Company

Brushless DC Outer-Rotor Motors

KINETIMAX HPD - 062

62 mm diameter, 0.16 to 0.44 Nm continuous torque, up to 150 Watts

The KinetiMax HPD (High Power Density) Series motors are frameless, outer-rotor brushless DC motors designed as stator-rotor part sets. With an exceptional torque-to-weight ratio, these motors are ideal for weight-sensitive applications.

The large stator inner diameter (ID) accommodates larger ball bearings, while the clear aperture allows cabling to pass through the motor. Additionally, low cogging torque and high peak torque characteristics enhance performance in demanding servo applications. The HPD series provides flexible configuration options to deliver optimal performance tailored to your application's needs.

KEY FEATURES & BENEFITS

Efficiency:
Exceptional efficiency ranging from 81% to 91% across a broad speed-torque range, ensuring optimal performance near the nominal working point.

High Torque-to-Weight Ratio:
Delivers powerful torque while keeping weight to a minimum, critical in battery-operated and portable systems.

Torque Range:
Rated torque from 0.16 Nm to 0.44 Nm for diverse.

Multiple Voltage Options:
Winding selections available to match specific voltage requirements.

Battery Optimization:
High efficiency is ideal for battery-powered applications, maximizing operational timeper charge.

OPTIONS & ACCESSORIES

Frame Sizes & Stack Heights:
Available in six frame sizes with three different stack heights to suit various space and performance constraints.

Commutation Sensors:
Integrated Hall effect sensor board for precise commutation.

Thermal Monitoring:
Stator-mounted temperature sensor for thermal management and protection.

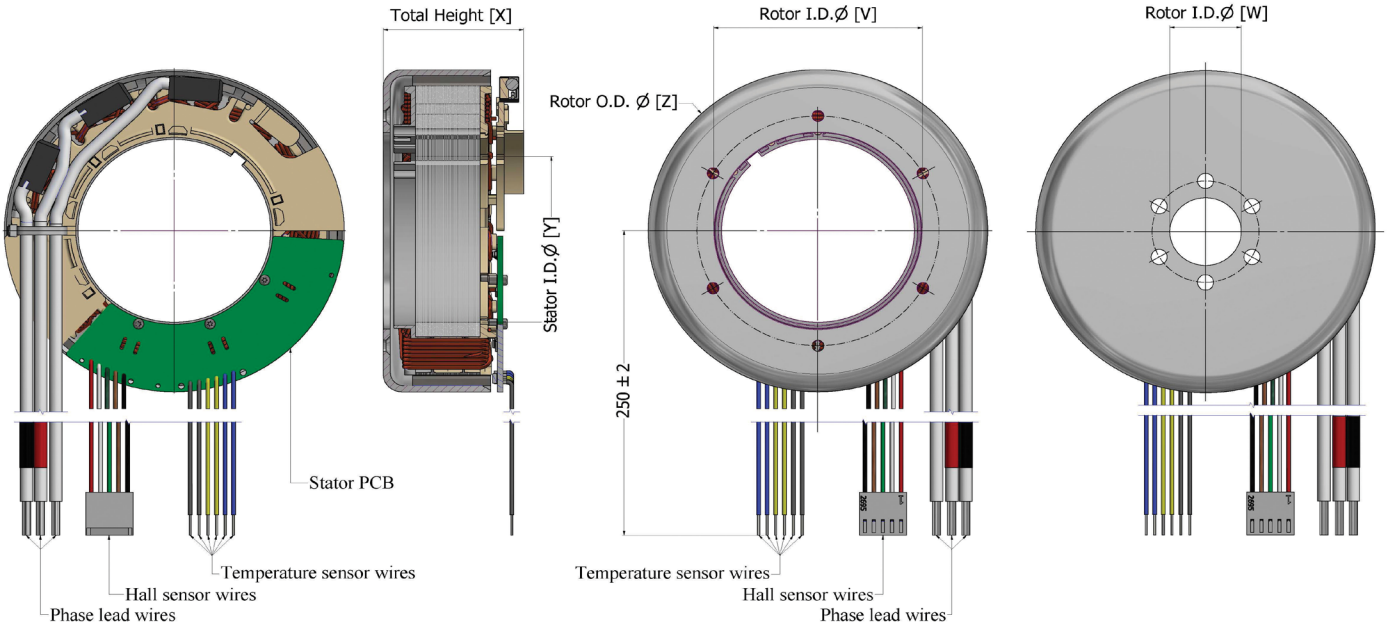
APPLICATIONS

The KinetiMax HPD Series motors are well-suited for a variety of high-performance applications:

Including

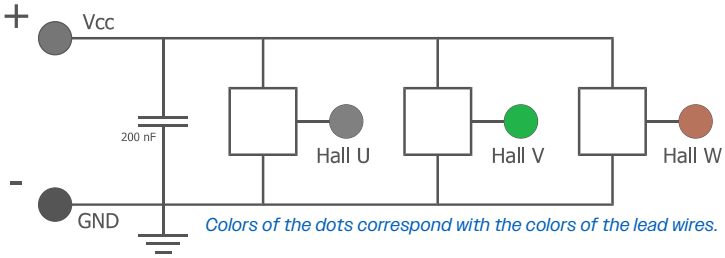
- Automated Guided Vehicles (AGVs)
- Robotics (arms, joints, end-effectors)
- Handheld hydraulic power tools
- Material handling systems
- Medical devices and equipment
- Rotary actuators and gimbals

DIMENSIONS



HALL SENSORS

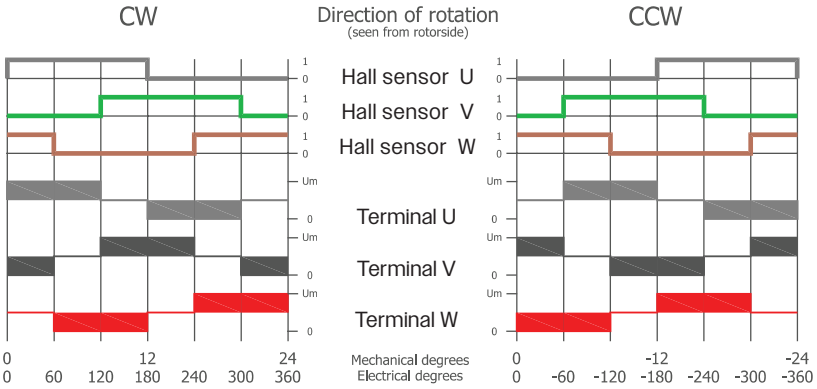
Connections/Specifications:



Colors of the dots correspond with the colors of the lead wires.

Specification Item	Value [typ.]
Supply Voltage [VCC]	3.0-32V
Supply Current	4.8 mA
Temperature Range	-40 °C+170 °C
Output Type	Open drain
Max Output Voltage	32 V
Max Output Current	25 mA

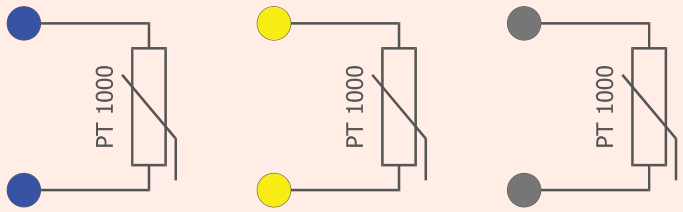
Switching Sequence:



The colors of the 3 Hall sensor signals correspond with the 3 colors of the Hall lead wires.
The colors of the 3 signals of the terminals U, V, W, correspond with the 3 colors of the motor lead wires.

TEMPERATURE SENSORS

Connections/Specifications:



Specification Item	Value [typ.]
Resistance at 0°C	1000 Ohm
Temperature Coefficient	+ 3850 ppm/K
Temperature Range	-40 °C/+175 °C
ΔT (1)	T.B.D.

Colors of the dots correspond with the colors of the lead wires, each wire color is used for a different motor phase.

(1) Due to the thermal coupling between the winding and sensor, the temperature measured by the sensor will be lower than the actual temperature of the winding.
Optional sensor types are possible after consulting the factory (PTC, NTC).

SPECIFICATIONS

		KMF 062 01							
Winding Identification[3]		**C**	**D**	**E**	**F**	**G**	**H**	**J**	**K**
Nominal Supply Voltage DC Link	Volt	12	15	18	24	36	48	60	70
Rated Output Power[1]	Watt	89	89	77	82	89	90	86	77
Rated Speed	RPM	5354	5361	4613	4941	5364	5381	5155	4626
Rated Torque[1]	Nm	0.16							
Rated Line Current[1][4]	Arms	6.4	5.1	3.7	3.0	2.1	1.6	1.2	0.9
Max Efficiency	%	84							
No Load Speed (@ nominal voltage)	RPM	5658	5658	4900	5227	5658	5658	5445	4900
BEMF Constant Ke	V/kRPM	2.1	2.7	3.7	4.6	6.4	8.5	11.0	14.7
Motor Speed Constant Kv (=1/Ke)	RPM/V	471.5	377.2	272.2	217.8	157.2	117.9	90.7	68.1
Continuous Stall Torque[1]	Nm	0.20							
Continuous Stall Line Current (rms)[1]	Arms	8.1	6.5	4.7	3.7	2.7	2.0	1.6	1.2
Peak Torque	Nm	0.64							
Max. Demagnetization Line Current	A	68	54	39	31	23	17	13	10
Torque/Rms Line Current Kt[4]	Nm/Arms	0.025	0.031	0.043	0.054	0.074	0.099	0.129	0.172
Resistance (terminal-to-terminal)	mOhm	82	125	233	362	715	1196	2111	3553
Inductance (terminal-to-terminal)	µH	22	35	67	104	201	357	602	1070
Back EMF (@1000 RPM terminal-to-terminal)	Vrms	1.5	1.9	2.6	3.2	4.5	6.0	7.8	10.4
Thermal Resistance (stator/rotor to ambient)[1]	°C/W	4.43							
Thermal Resistance Winding-Housing	°C/W	3.88							
Max. Winding Temperature	°C	160							
Number of Pole Pairs		15							
Weight	kg	0.15							
Rotor Inertia - Large I.D.	kgm²*E-6	44							
Rotor Inertia - Small I.D.	kgm²*E-6	46							
Mechanical Time Constant	ms	5.8							
Electrical Time Constant	ms	0.3							
Motor Constant Km	Nm/ sqrt(W)	0.073							

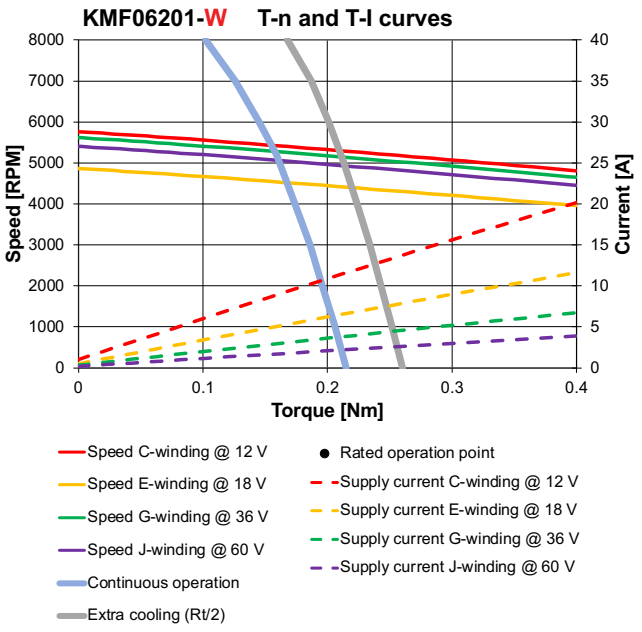
(1) Assuming the stator-rotor set is mounted on a bracket with an aluminium flange diameter 1.5 times rotor diameter.
(2) See the dimensions in the drawing (page 6).
(3) Windings C, D, G and H are delta connected, windings E, F, J and K are wye connected.
(4) Line currents are the AC currents running into the three terminals of the stator.

SPECIFICATIONS

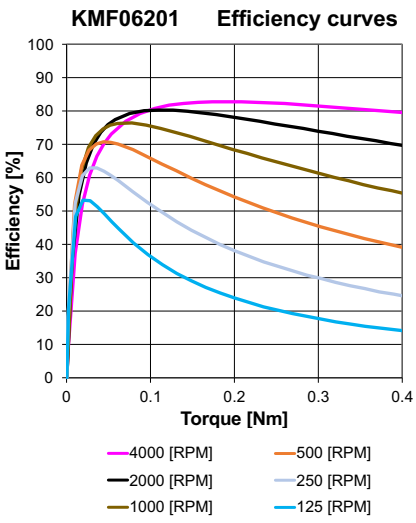
		KMF 062 01							
Winding Identification[3]		**C**	**D**	**E**	**F**	**G**	**H**	**J**	**K**
Cogging Torque (typical, peak to peak)	Nm	0.004							
Drag Torque	Nm	0.006							
Viscous Damping	Nm/RPM	2.4E-06							
Thermal Time Constant of Winding Only	s	18							
Adiabatic Heating of Winding at Peak Torque	K/s	12							
Rotor Inner Diameter [V] [2]	mm	38							
Rotor Inner Diameter [W] [2]	mm	16							
Rotor Outer Diameter [Z] [2]	mm	61.9							
Stator Inner Diameter [Y] [2]	mm	32.0							
Total Height [X] [2]	mm	23.1							
Motor Lead Wire AWG Size		16	16	16	16	20	20	20	20

(1) Assuming the stator-rotor set is mounted on a bracket with an aluminium flange diameter 1.5 times rotor diameter.
(2) See the dimensions in the drawing (page 6).
(3) Windings C, D, G and H are delta connected, windings E, F, J and K are wye connected.
(4) Line currents are the AC currents running into the three terminals of the stator.

PERFORMANCE



Supply current is the DC current taken from the DC power supply by the drive. The torque-speed curves and torque-current curves are made assuming a FOC drive is used.



SPECIFICATIONS

		KMF 062 02							
Winding Identification[3]		**C**	**D**	**E**	**F**	**G**	**H**	**J**	**K**
Nominal Supply Voltage DC Link	Volt	15	18	24	36	48	60	72	72
Rated Output Power[1]	Watt	115	110	106	129	124	116	106	78
Rated Speed	RPM	3462	3318	3189	3874	3713	3479	3186	2344
Rated Torque[1]	Nm	0.32							
Rated Line Current[1][4]	Arms	6.7	5.4	3.9	3.1	2.2	1.7	1.3	1.0
Max Efficiency	%	84							
No Load Speed (@ nominal voltage)	RPM	3702	3554	3419	4103	3948	3702	3419	2565
BEMF Constant Ke	V/kRPM	4.1	5.1	7.0	8.8	12.2	16.2	21.1	28.1
Motor Speed Constant Kv (=1/Ke)	RPM/V	246.8	197.4	142.5	114.0	82.3	61.7	47.5	35.6
Continuous Stall Torque[1]	Nm	0.38							
Continuous Stall Line Current (rms)[1]	Arms	8.0	6.4	4.6	3.7	2.7	2.0	1.5	1.2
Peak Torque	Nm	1.29							
Max. Demagnetization Line Current	A	71	57	41	33	24	18	14	10
Torque/Rms Line Current Kt[4]	Nm/Arms	0.047	0.059	0.082	0.103	0.142	0.190	0.246	0.328
Resistance (terminal-to-terminal)	mOhm	118	182	340	531	1046	1754	3102	5228
Inductance (terminal-to-terminal)	µH	41	63	122	190	365	648	1094	1945
Back EMF (@1000 RPM terminal-to-terminal)	Vrms	2.9	3.6	5.0	6.2	8.6	11.5	14.9	19.9
Thermal Resistance (stator/rotor to ambient)[1]	°C/W	3.93							
Thermal Resistance Winding-Housing	°C/W	1.94							
Max. Winding Temperature	°C	160							
Number of Pole Pairs		15							
Weight	kg	0.22							
Rotor Inertia - Large I.D.	kgm²*E-6	62							
Rotor Inertia - Small I.D.	kgm²*E-6	64							
Mechanical Time Constant	ms	3.2							
Electrical Time Constant	ms	0.3							
Motor Constant Km	Nm/ sqrt(W)	0.115							

(1) Assuming the stator-rotor set is mounted on a bracket with an aluminium flange diameter 1.5 times rotor diameter.
(2) See the dimensions in the drawing (page 6).
(3) Windings C, D, G and H are delta connected, windings E, F, J and K are wye connected.
(4) Line currents are the AC currents running into the three terminals of the stator.

SPECIFICATIONS

		KMF 062 02							
Winding Identification[3]		**C**	**D**	**E**	**F**	**G**	**H**	**J**	**K**
Cogging Torque (typical, peak to peak)	Nm	0.008							
Drag Torque	Nm	0.013							
Viscous Damping	Nm/RPM	4.7E-06							
Thermal Time Constant of Winding Only	s	13							
Adiabatic Heating of Winding at Peak Torque	K/s	14							
Rotor Inner Diameter [V] [2]	mm	38							
Rotor Inner Diameter [W] [2]	mm	16							
Rotor Outer Diameter [Z] [2]	mm	61.9							
Stator Inner Diameter [Y] [2]	mm	32.0							
Total Height [X] [2]	mm	29.1							
Motor Lead Wire AWG Size		16	16	16	16	20	20	20	20

(1) Assuming the stator-rotor set is mounted on a bracket with an aluminium flange diameter 1.5 times rotor diameter.
(2) See the dimensions in the drawing (page 6).
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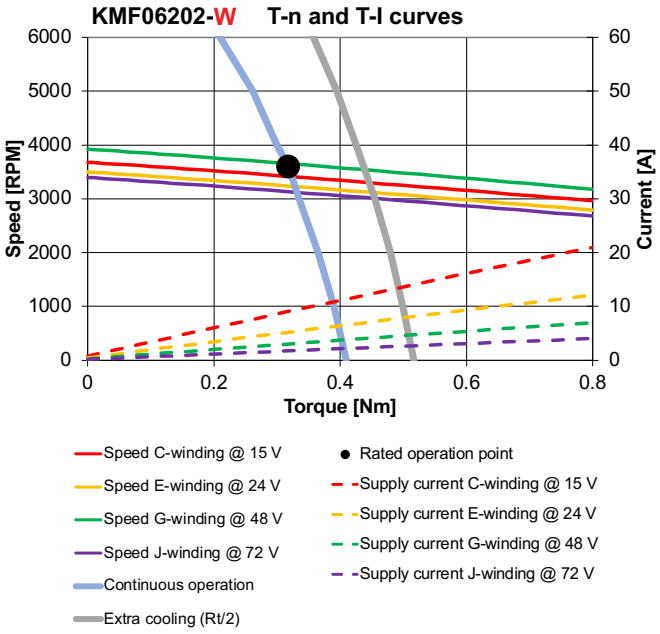
(4) Line currents are the AC currents running into the three terminals of the stator.

PERFORMANCE



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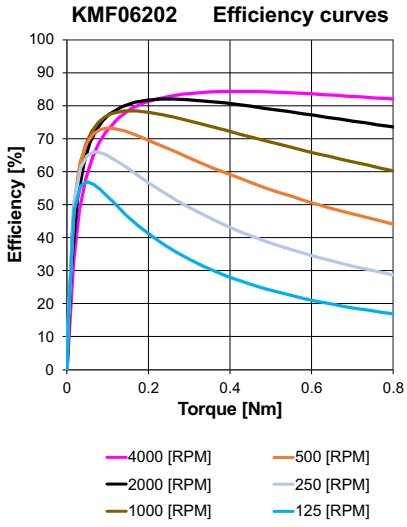

SPECIFICATIONS

		KMF 062 03							
Winding Identification[3]		**C**	**D**	**E**	**F**	**G**	**H**	**J**	**K**
Nominal Supply Voltage DC Link	Volt	18	24	36	42	60	72	72	72
Rated Output Power[1]	Watt	132	142	154	143	148	133	100	73
Rated Speed	RPM	2898	3107	3385	3145	3244	2910	2186	1598
Rated Torque[1]	Nm	0.44							
Rated Line Current[1][4]	Arms	6.4	5.1	3.7	3.0	2.1	1.6	1.2	0.9
Max Efficiency	%	85							
No Load Speed (@ nominal voltage)	RPM	3106	3314	3587	3348	3452	3106	2391	1793
BEMF Constant Ke	V/kRPM	5.8	7.2	10.0	12.5	17.4	23.2	30.1	40.1
Motor Speed Constant Kv (=1/Ke)	RPM/V	172.6	138.1	99.6	79.7	57.5	43.1	33.2	24.9
Continuous Stall Torque[1]	Nm	0.54							
Continuous Stall Line Current (rms)[1]	Arms	8.0	6.4	4.6	3.7	2.7	2.0	1.5	1.2
Peak Torque	Nm	1.93							
Max. Demagnetization Line Current	A	75	60	43	34	25	19	14	11
Torque/Rms Line Current Kt[4]	Nm/Arms	0.068	0.085	0.117	0.147	0.203	0.271	0.352	0.470
Resistance (terminal-to-terminal)	mOhm	154	238	447	699	1376	2313	4094	6903
Inductance (terminal-to-terminal)	µH	60	93	179	280	538	956	1613	2867
Back EMF (@1000 RPM terminal-to-terminal)	Vrms	4.1	5.1	7.1	8.9	12.3	16.4	21.3	28.4
Thermal Resistance (stator/rotor to ambient)[1]	°C/W	3.53							
Thermal Resistance Winding-Housing	°C/W	1.29							
Max. Winding Temperature	°C	160							
Number of Pole Pairs		15							
Weight	kg	0.29							
Rotor Inertia - Large I.D.	kgm²*E-6	80							
Rotor Inertia - Small I.D.	kgm²*E-6	83							
Mechanical Time Constant	ms	2.7							
Electrical Time Constant	ms	0.4							
Motor Constant Km	Nm/ sqrt(W)	0.143							

(1) Assuming the stator-rotor set is mounted on a bracket with an aluminium flange diameter 1.5 times rotor diameter.
(2) See the dimensions in the drawing (page 6).
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(4) Line currents are the AC currents running into the three terminals of the stator.

SPECIFICATIONS

		KMF 062 03							
Winding Identification[3]		**C**	**D**	**E**	**F**	**G**	**H**	**J**	**K**
Cogging Torque (typical, peak to peak)	Nm	0.011							
Drag Torque	Nm	0.015							
Viscous Damping	Nm/RPM	7.0E-06							
Thermal Time Constant of Winding Only	s	11							
Adiabatic Heating of Winding at Peak Torque	K/s	15							
Rotor Inner Diameter [V] [2]	mm	38							
Rotor Inner Diameter [W] [2]	mm	16							
Rotor Outer Diameter [Z] [2]	mm	61.9							
Stator Inner Diameter [Y] [2]	mm	32.0							
Total Height [X] [2]	mm	35.0							
Motor Lead Wire AWG Size		16	16	16	16	20	20	20	20

(1) Assuming the stator-rotor set is mounted on a bracket with an aluminium flange diameter 1.5 times rotor diameter.
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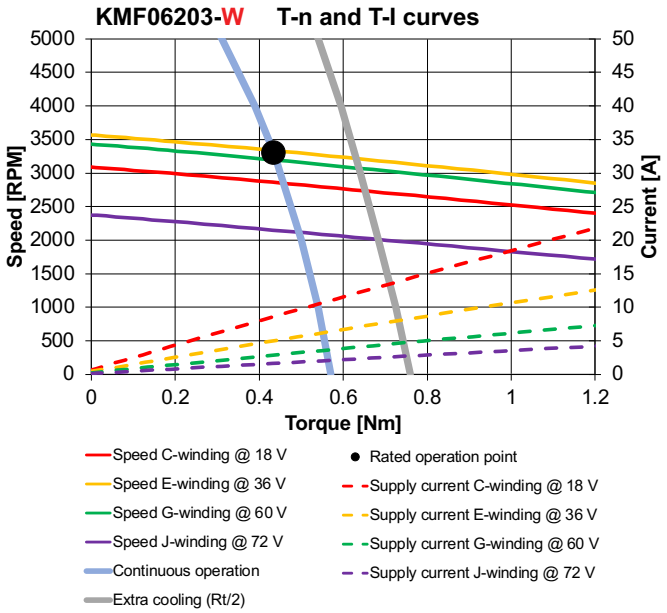
PERFORMANCE



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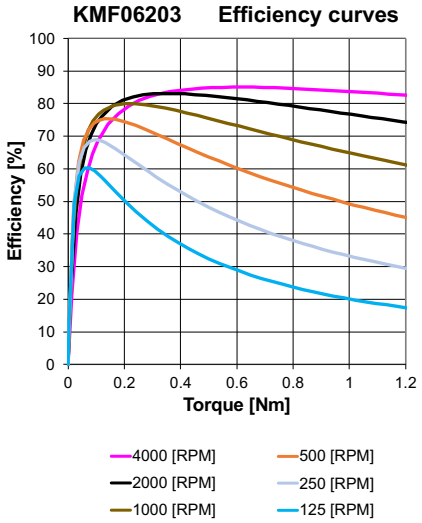
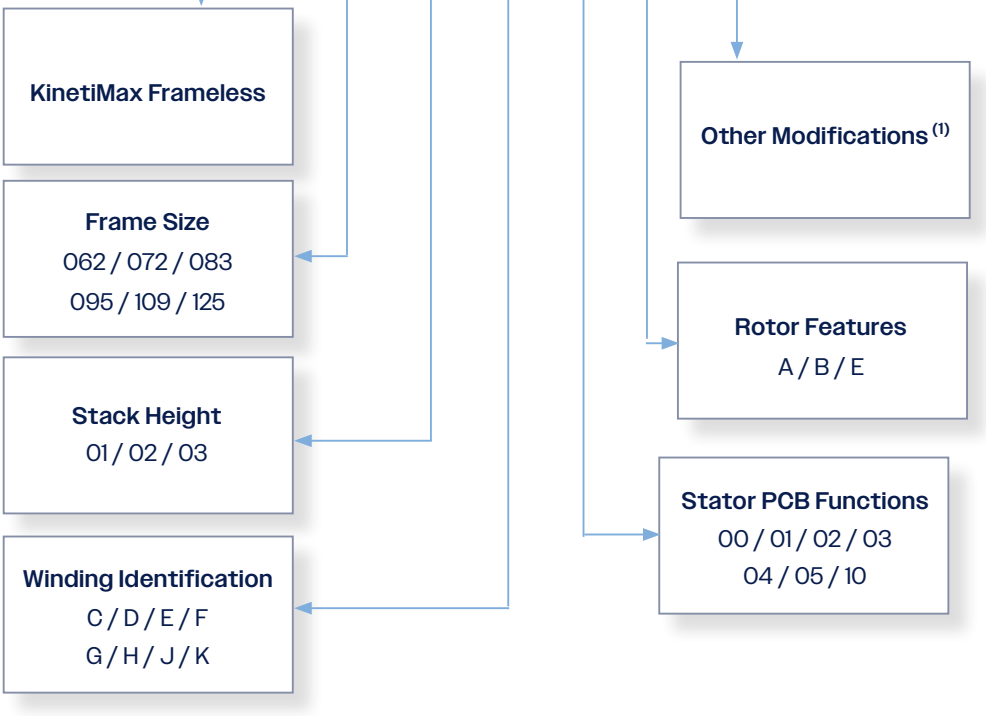


COMMERCIAL PART NUMBERING KMF HPD STATOR-ROTOR SETS

KMF xxx yy-W zz R-vv



ZZ	Stator PCB functions
00	No PCB
01	PCB with 3 Hall sensors
02	PCB with 1 temperature sensor only
03	PCB with 3 Hall sensors and 1 temperature sensor
04	PCB with 3 temperature sensors only
05	PCB with 3 Hall sensors and 3 temperature senors
10	Starting with 1 are custom PCB's

R	Rotor features
A	Large bore hole, G40 balancing class
B	Small bore hole, G40 balancing class
E	Custom rotor or balancing

(1) ***Other modifications*** are meant custom added parts to stator or rotor like a stator bracket, other leadwires with connector or a rotor nave/shaft etc.