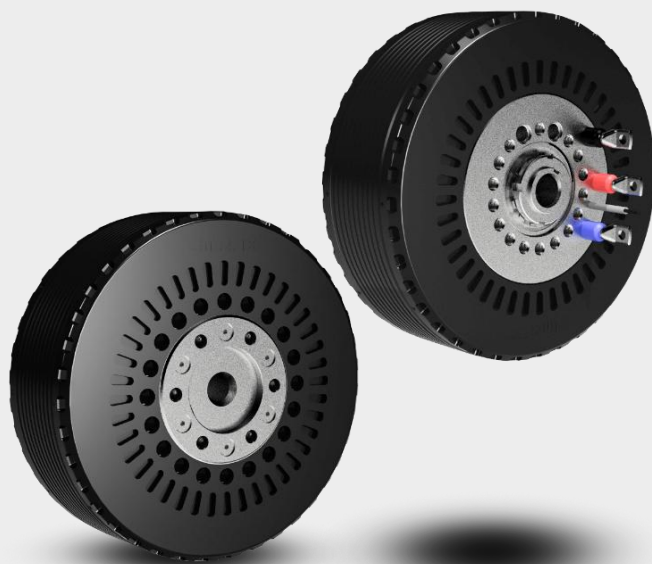


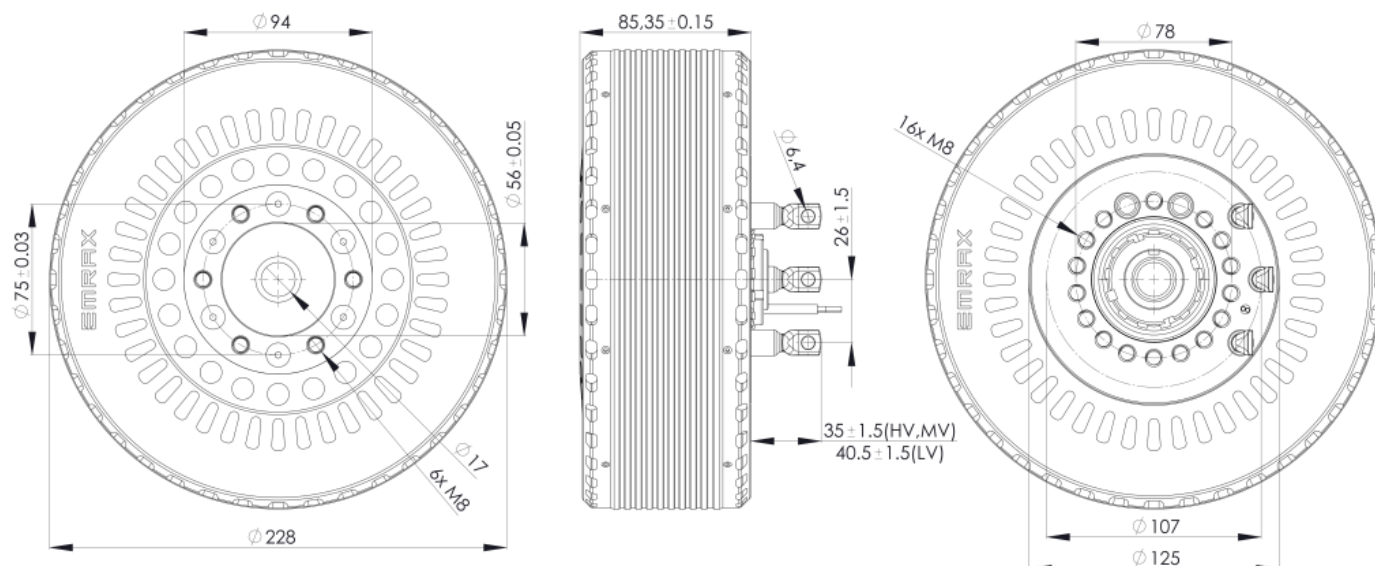
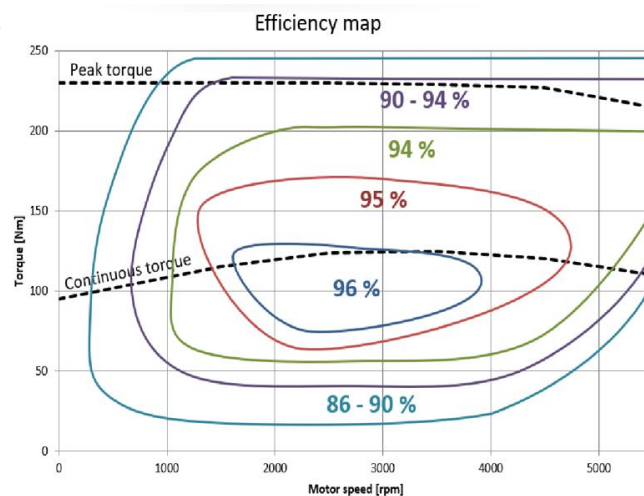
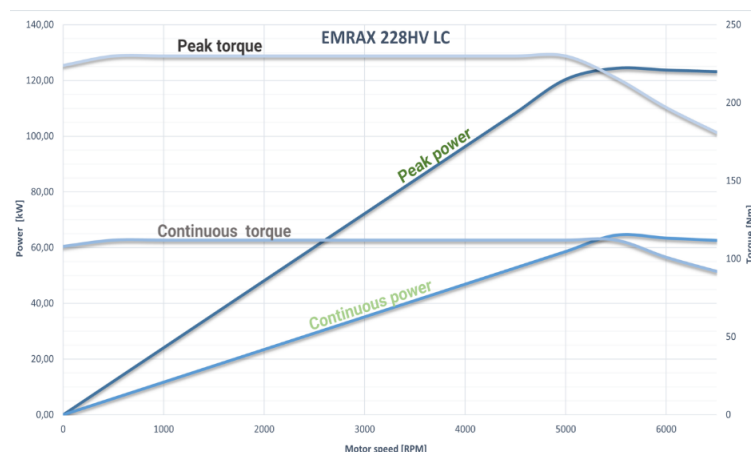
EMRAX 228

is a compact axial flux permanent magnet synchronous electric motor with high power/torque density. It offers the middle of the range performance and is a great fit for where high-power output in a small package is needed. Contact us to find out about its typical applications! *****IMPORTANT NOTICE: EMRAX is transitioning to NEXT-GENERATION electric motors, and the current EMRAX 188, 208, 228, 268 and 348 models will gradually be out of production. Envelope dimensions remain the same, while the outer diameter is only slightly larger — 4% for the smallest motor and 2% for the largest.**

DIAMETER LENGTH	228 mm 86 mm
WEIGHT	12,9-13,5 kg
COOLING	air / liquid / combined
PEAK CONTINUOUS POWER	124 kW 75 kW*
PEAK CONTINUOUS TORQUE	220 Nm 130 Nm*
MAXIMUM SPEED	6500 RPM
OPERATING VOLTAGE	50 - 830 V
EFFICIENCY	up to 96%*
POSITION SENSOR	resolver / encoder



*Subject to motor configuration, drive cycle, thermal conditions, and controller capability.



	EMRAX 228 High Voltage (HV)			EMRAX 228 Medium Voltage (MV)			EMRAX 228 Low Voltage (LV)		
AC = Air Cooled LC = Liquid Cooled CC = Combined Cooled (Air + Liquid) ¹	AC	LC	CC	AC	LC	CC	AC	LC	CC
Ingress protection	IP21	IP66	IP21	IP21	IP66	IP21	IP21	IP66	IP21
Cooling specifications	ambient air 20°C 20 m/s	min. 6 l/min, max. 50°C T _{amb} ≤ 30°C	AC+LC	ambient air 20°C 20 m/s	min. 6 l/min, max. 50°C T _{amb} ≤ 30°C	AC+LC	ambient air 20°C 20 m/s	min. 6 l/min, max. 50°C T _{amb} ≤ 30°C	AC+LC
Maximum motor temperature [°C]	integrated temperature sensor / rotor surface / integrated parts absolute limit 100/80/120								
Motor connection type	UVW or 2x UVW ²								
Voltage required for peak power [V _{DC}] ³	830			630			250		
Motor peak efficiency [%]	96%								
Peak power S2 30s [kW]	104 kW at 4500 RPM ⁴			124 kW at 5500 RPM			124 kW at 5500 RPM		
Continuous power S1 [kW]	48	68	75	48	68	75	48	68	75
Peak torque [Nm]	220								
Continuous torque [Nm]	83	118	130	83	118	130	83	118	130
Limiting speed [RPM]	6500								
K _V constant at no load [RPM/V _{DC}]	10,14			15,53			40,30		
K _V constant at nominal load [RPM/V _{DC}]	7,85			12,05			30,94		
K _V constant at peak load [RPM/V _{DC}]	5,65			8,68			21,91		
K _T constant [Nm/ A _{RMS}]	0,98			0,64			0,24		
Peak motor current [A _{RMS}]	235			360			920		
Continuous motor current (LC) [A _{RMS}]	120			180			470		
Internal phase resistance at 25 °C [mΩ] ⁵	16,09			6,95			1,36		
L _D /L _Q inductance of 1 phase [μH]	175/180			75,1/77,3			10,2/10,5		
K _e constant [V _{RMS} /RPM]	0,06881			0,04474			0,01767		
PM Flux Linkage [Vs]	0,06411			0,04200			0,01547		
Temperature sensor on the stator windings	KTY 81/210								
Number of pole pairs	10								
Winding configuration	star								
Rotor Inertia LC/AC and CC [kg*m²]	0,0398/0,0393								
Bearing configuration	6206 3206								
Weight [kg]	12,9	13,5	13,2	12,9	13,5	13,2	12,9	13,5	13,2

Actual performance depends on installation details and operating conditions. Contact EMRAX for application-specific guidance.

¹ CC motors require both liquid cooling and sufficient airflow to achieve the specified performance and cannot be operated as air-cooled motors only. All EMRAX motors require adequate airflow (approximately 0.4 m³/min per 1 kW of power) and must not be completely enclosed. For cooling and installation requirements, refer to the EMRAX Motor Manual.

² All values given are for a standard 3 phase UVW version, please consult EMRAX on 2x UVW values. 2*R_{1UVW}=R_{2UVW}

³ All motors are tested up to 833 VDC maximum voltage.

⁴ HV versions operate below the limiting speed due to the 830 V_{DC} voltage limitation.

⁵ Phase-to-phase resistance measured at 25 °C and divided by 2.

	EMRAX 228 Low Voltage (LV) + 43%			EMRAX 228 Low Voltage (LV) + 100%			EMRAX 228 High Voltage (HV) + 42%		
AC = Air Cooled LC = Liquid Cooled CC = Combined Cooled (Air + Liquid) ¹	AC	LC	CC	AC	LC	CC	AC	LC	CC
Ingress protection	IP21	IP66	IP21	IP21	IP66	IP21	IP21	IP66	IP21
Cooling specifications	ambient air 20°C 20 m/s	min. 6 l/min, max. 50°C T _{amb} ≤ 30°C	AC+LC	ambient air 20°C 20 m/s	min. 6 l/min, max. 50°C T _{amb} ≤ 30°C	AC+LC	ambient air 20°C 20 m/s	min. 6 l/min, max. 50°C T _{amb} ≤ 30°C	AC+LC
Maximum motor temperature [°C]	integrated temperature sensor / rotor surface / integrated parts absolute limit 100/80/120								
Motor connection type	UVW or 2x UVW ²								
Voltage required for peak power [V _{DC}] ³	360			500			830		
Motor peak efficiency [%]	96%								
Peak power S2 30 s [kW]	124 kW at 5500 RPM			124 kW at 5500 RPM			73 kW at 3200 RPM ⁶		
Continuous power S1 [kW]	48	68	75	48	68	75	38	54	59
Peak torque [Nm]	220								
Continuous torque [Nm]	83	118	130	83	118	130	81	115	127
Limiting speed [RPM]	6500								
K _V constant at no load [RPM/V _{DC}]	28,19			20,15			7,13		
K _V constant at nominal load [RPM/V _{DC}]	21,64			15,47			5,51		
K _V constant at peak load [RPM/V _{DC}]	15,32			10,96			3,96		
K _T constant [Nm/A _{RMS}]	0,34			0,47			1,33		
Peak motor current [A _{RMS}]	650			460			165		
Continuous motor current (LC) [A _{RMS}]	330			240			85		
Internal phase resistance at 25 °C [mΩ] ⁵	2,55			5,31			33,17		
L _D /L _Q inductance of 1 phase [μH]	20,8/21,4			40,8/42			350/360		
K _e constant [V _{RMS} /RPM]	0,02538			0,03660			0,09850		
PM Flux Linkage [Vs]	0,02211			0,03095			0,08933		
Temperature sensor on the stator windings	KTY 81/210								
Number of pole pairs	10								
Winding configuration	star								
Rotor Inertia [kg*m²]	0,0398/0,0393								
Bearing configuration	6206 3206								
Weight [kg]	12,9	13,5	13,2	12,9	13,5	13,2	12,9	13,5	13,2

Actual performance depends on installation details and operating conditions. Contact EMRAX for application-specific guidance.

⁶ HV+42% versions operate below the limiting speed due to the 830 V_{DC} voltage limitation.