228

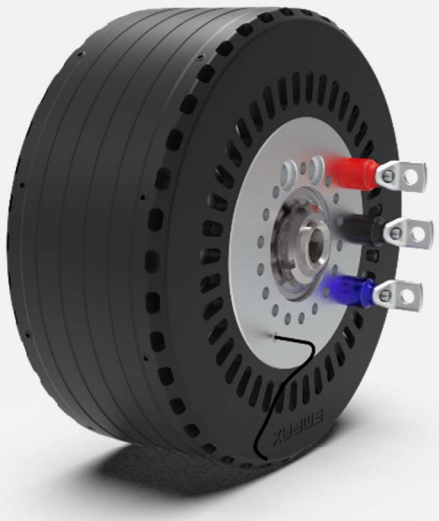
EMRAX 228 is a compact axial flux permanent magnet synchronous electric motor with high power/torque density.

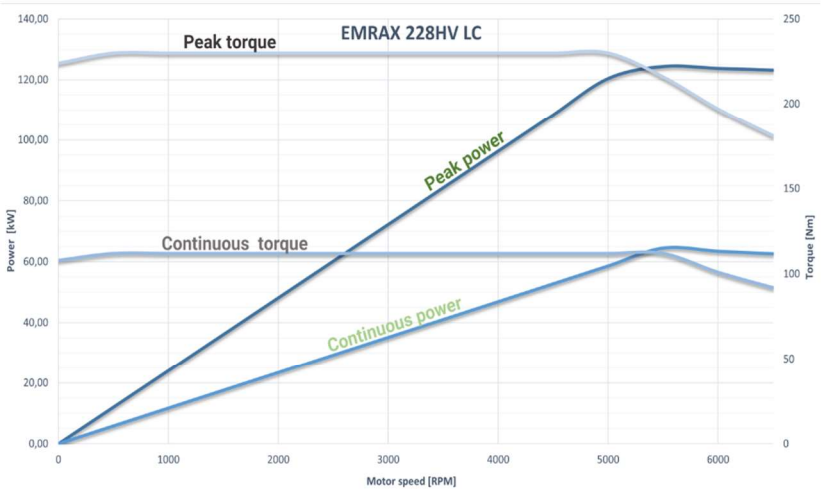
It offers the middle of the range performance and is a great fit for where high power output in a small package is needed. Contact us to find out about its typical applications!

EMRAX 228

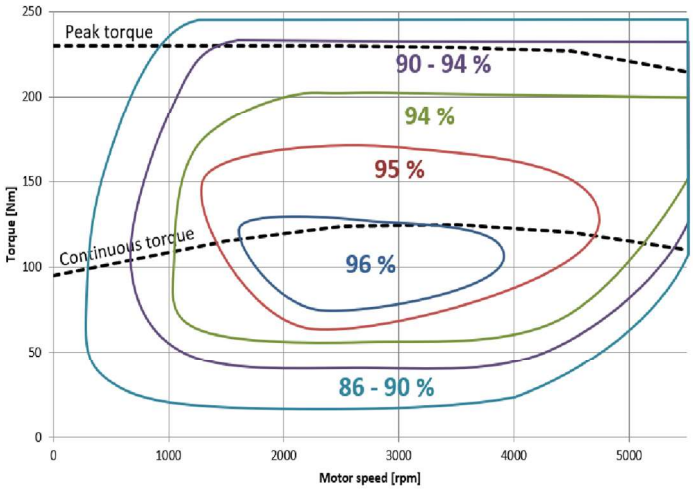
DIAMETER | LENGTH	228 mm | 86 mm
WEIGHT	12,9-13,5 kg
COOLING	air / water / combined
PEAK | CONTINUOUS POWER	124 kW | 75 kW*
PEAK | CONTINUOUS TORQUE	220 Nm | 130 Nm*
MAXIMUM SPEED	6500 RPM
OPERATING VOLTAGE	50 - 830 V
EFFICIENY	up to 96%*
POSITION SENSOR	resolver / encoder

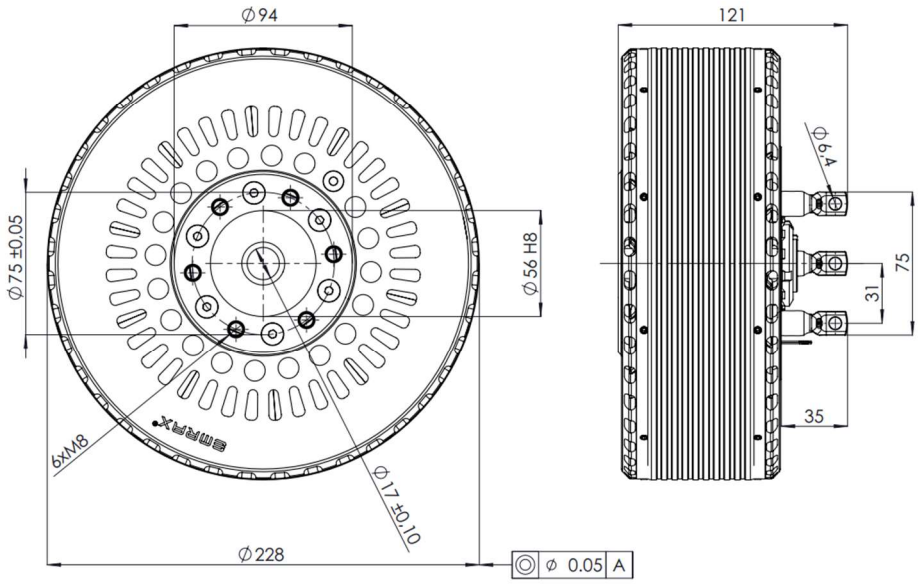
*Subject to motor configuration, drive cycle, thermal conditions, and controller capability.

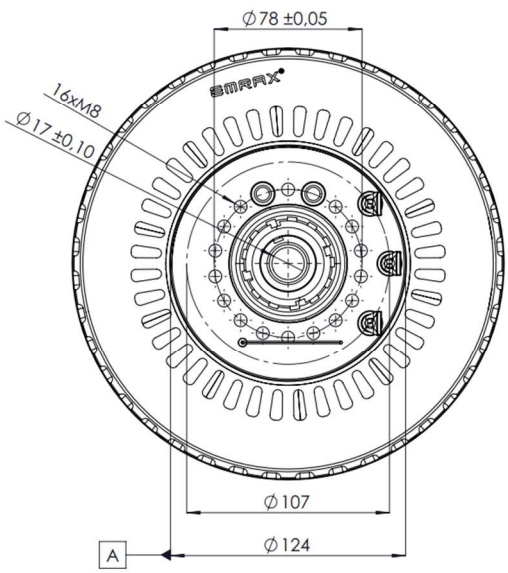




Efficiency map







	EMRAX 228 High Voltage			EMRAX 228 Medium Voltage			EMRAX 228 Low Voltage		
AC = Air cooled LC = Liquid cooled CC = Combined cooled (Air + liquid)	AC	LC	CC	AC	LC	CC	AC	LC	CC
Ingress protection	IP21	IP66	IP21	IP21	IP66	IP21	IP21	IP66	IP21
Cooling specifications	ambient air 20ºC 20 m/s	min. 6 l/min, max. 50°C T_{amb}≤ 30°C	AC+LC*	ambient air 20ºC 20 m/s	min. 6 l/min, max. 50°C T_{amb}≤ 30°C	AC+LC*	ambient air 20ºC 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 100/100/120								
Motor connection type	UVW or 2x UVW			UVW or 2x UVW			UVW or 2x UVW		
Voltage required for peak power [V_{DC}]**	830			630			250		
Motor peak efficiency [%]	96%								
Peak power S2 2min [kW]	104 kW at 4500 RPM			124 kW at 5500 RPM			124 kW at 5500 RPM		
Continuous power S1 (kW)	55	64	75	55	64	75	55	64	75
Peak torque [Nm]	220								
Continuous torque [Nm]	96	112	130	96	112	130	96	112	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}]	0,94			0,61			0,24		
Peak motor current [A_{RMS}]	235			360			920		
Continuous motor current [A_{RMS}]	120			180			470		
Internal phase resistance at 25 °C [mΩ]***	15,48			7,06			1,35		
L_D inductance of 1 phase [µH]	225,5			96,5			15,0		
Induced voltage [V_{RMS}/RPM]	0,07348			0,04793			0,01840		
Magnetic flux – axial [V_S]	0,05728			0,03737			0,01434		
Temperature sensor on the stator windings	KTY 81/210								
Number of pole pairs	10								
Winding configuration	star								
Rotor Inertia [kg*m²]	0,02521								
Bearing configuration	6206 | 3206								
Weight [kg]	12,9	13,5	13,2	12,9	13,5	13,2	12,9	13,5	13,2

*Combined cooled motor (CC) requires cooling specifications from air and liquid cooled motors, to reach its specifications. It cannot only be cooled as an air-cooled motor.
Every EMRAX motor requires sufficient air circulation. The motors should not be completely enclosed in any condition. Please check EMRAX motor manual to learn more.
Performance in your application will depend on your installation details and boundary conditions. Please contact us to learn more.
**All motors are tested for 833V maximum voltage.
***Measured Phase to Phase, then divided by 2.

HV option is operating at speeds lower than its limiting, due to 830 V voltage limitations.

All values given are for a standard 3 phase UVW version, please consult EMRAX on 2x UVW values. 2*R1UVW=R2UVW

	EMRAX 228 LV + 43%			EMRAX 228 LV + 100%			EMRAX 228 HV + 42%		
AC = Air cooled LC = Liquid cooled CC = Combined cooled (Air + liquid)	AC	LC	CC	AC	LC	CC	AC	LC	CC
Ingress protection	IP21	IP66	IP21	IP21	IP66	IP21	IP21	IP66	IP21
Cooling specifications	ambient air 20ºC 20 m/s	min. 6 l/min, max. 50°C T_{amb}≤ 30°C	AC+LC*	ambient air 20ºC 20 m/s	min. 6 l/min, max. 50°C T_{amb}≤ 30°C	AC+LC*	ambient air 20ºC 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 100/100/120								
Motor connection type	UVW or 2x UVW			UVW or 2x UVW			UVW or 2x UVW		
Voltage required for peak power [V_{DC}]**	360			500			830		
Motor peak efficiency [%]	96%								
Peak power S2 2min [kW]	124 kW at 5500 RPM			124 kW at 5500 RPM			73 kW at 3200 RPM		
Continuous power S1 (kW)	55	64	75	55	64	75	44	52	60
Peak torque [Nm]	220								
Continuous torque [Nm]	96	112	130	96	112	130	96	112	130
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			0,48			1,34		
Peak current [A_{RMS}]	650			460			165		
Continuous current [A_{RMS}]	330			240			85		
Internal phase resistance at 25 °C [mΩ]***	2,53			5,14			33,15		
L_D inductance of 1 phase [µH]	29,0			57,5			467,5		
Induced voltage [V_{RMS}/RPM]	0,02631			0,03705			0,10434		
Magnetic flux – axial [V_S]	0.02051			0,02889			0,08135		
Temperature sensor on the stator windings	KTY 81/210								
Number of pole pairs	10								
Winding configuration	star								
Rotor Inertia [kg*m²]	0,02521								
Bearing configuration	6206 | 3206								
Weight [kg]	12,9	13,5	13,2	12,9	13,5	13,2	12,9	13,5	13,2

*Combined cooled motor (CC) requires cooling specifications from air and liquid cooled motors, to reach its specifications. It cannot only be cooled as an air-cooled motor.
Every EMRAX motor requires sufficient air circulation. The motors should not be completely enclosed in any condition. Please check EMRAX motor manual to learn more.
Performance in your application will depend on your installation details and boundary conditions. Please contact us to learn more.
**All motors are tested for 833V maximum voltage.
***Measured Phase to Phase, then divided by 2.

Values given are for a standard 3 phase UVW version, please consult EMRAX on 2x UVW values. 2*R1UVW=R2UVW

HV+42% options is operating at speeds lower than its limiting, due to voltage limitations.