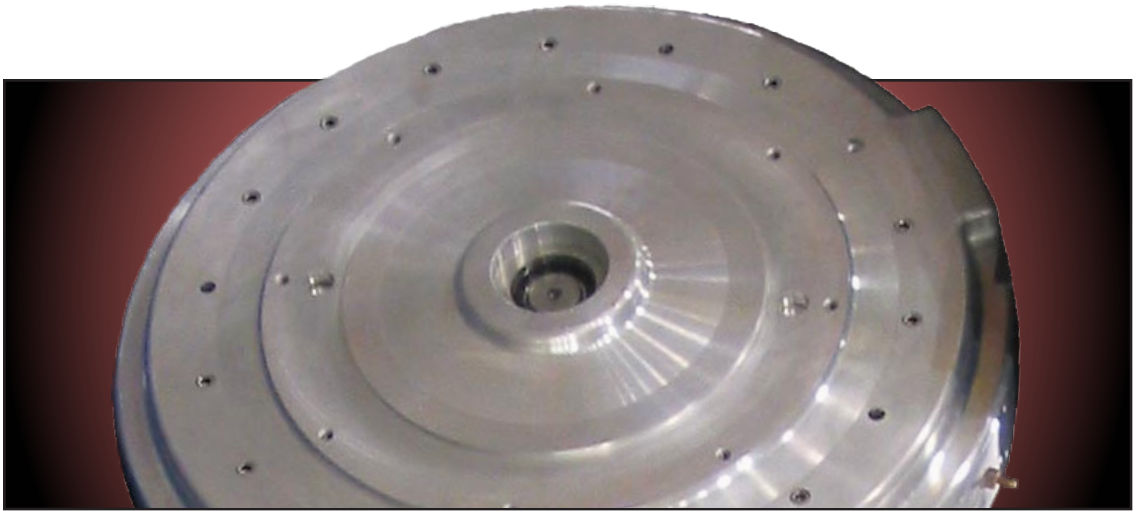
E813

Axial Flux BLDC Motor



The E813 motor is part of a permanent-magnet motor system designed for power generation applications where high system efficiency is important. Developed for a customer for use in high-efficiency distributed-power systems, the E813 was designed to give the competitive edge necessary in this relatively new and highly competitive field.

In addition to the E813, a number of other coil configurations have been studied in the same frame size – including multi-slice versions and high peak-torque versions – for a variety of industrial and military applications. The family of E813 motor designs currently under development with government and commercial partners will offer a broad range of possible system configurations for both high-efficiency and high-torque speed-servo applications.

The specifications provided here illustrate some of the E813's capabilities. Especially noteworthy is its high efficiency over a very large operating range. Low-speed, high-torque versions of this motor are currently under development for direct-drive position-servos for naval applications.

Contact a Lynx applications engineer to determine if there is an 813 mm SEMA design that can meet your needs.

Typical Applications

- Power Generation
- Servo Applications
- Precision Robotics
- Marine Propulsion
- Weapons Turrets
- Compressors / Blowers

Application Information

- Requires 3-phase PWM inverter, available through Lynx partners
- Performance ratings based on 130°C winding, 40°C ambient air
- Developed for use in high-efficiency PM synchronous distributed power generation units

Standard Features

- Brushless axial flux design
- Use of patented SEMA coil provides superior power density
- Ironless design eliminates cogging torque
- Extremely linear torque constant independent of speed

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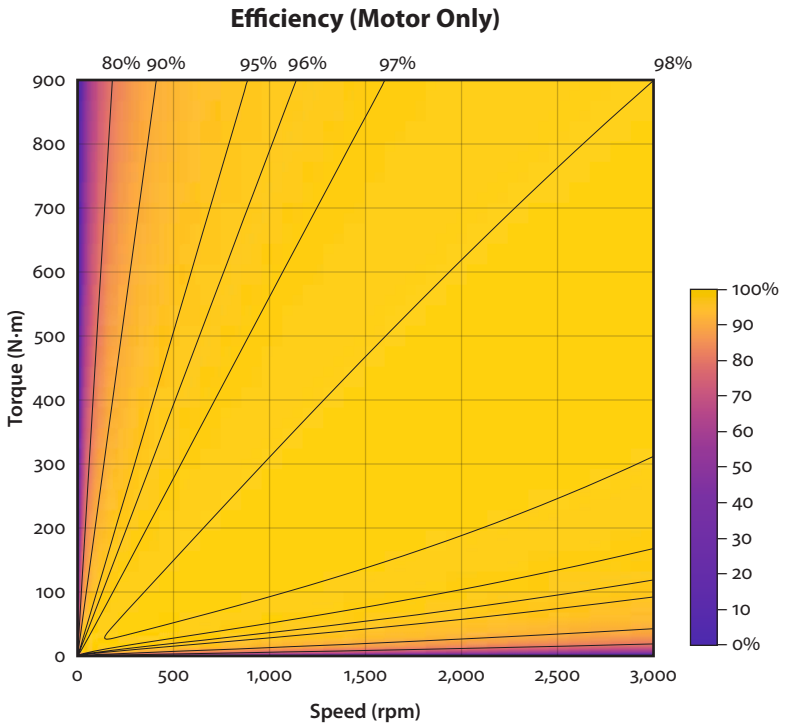
E813

Parameter	Symbol	SI	English
Continuous Ratings			
Supply Voltage (DC bus)	V_s	**850** V_{DC}	**850** V_{DC}
Voltage (line to line)	V_{L-L}	**574** $V_{AC\ (pk-pk)}$	**574** $V_{AC\ (pk-pk)}$
Speed	S	**2,750** rpm	**2,750** rpm
Torque	T_c	**450** N·m	**332** lbf·ft
Current	I	**119** A_{rms}	**119** A_{rms}
Power	P_{out}	**130** kW	**174** hp
Peak Ratings			
Peak Torque [1]	T_{pk}	**900** N·m	**664** lbf·ft
Peak Current [1]	I_{pk}	**238** A	**238** A
Motor Constants			
Torque Constant	K_T	**3.78** N·m/A	**2.79** lbf·ft/A
Back EMF Constant (phase to neutral)	K_E	**209** V_{rms}/krpm	**209** V_{rms}/krpm
Electrical Time Constant	τ_e	**1.66** µs	**1.66** µs
Electrical Aspects			
Resistance (cold, per phase)	R	**26.5** mΩ	**26.5** mΩ
Inductance (per phase)	L	**44** µH	**44** µH
Mechanical Aspects			
Inertia (rotor only)	J_r	**9.16** kg·m²	**6.76** lbf·ft·s²
Mass (entire motor)	m	**295** kg	**650** lb
Number of Poles	—	**28** poles	**28** poles
Motor Diameter (actual)	AC	**813** mm	**32** in.

1 Peak ratings are based on operational capabilities of existing inverter. Higher peak torques are possible using a different controller. Contact a Lynx engineer for details.



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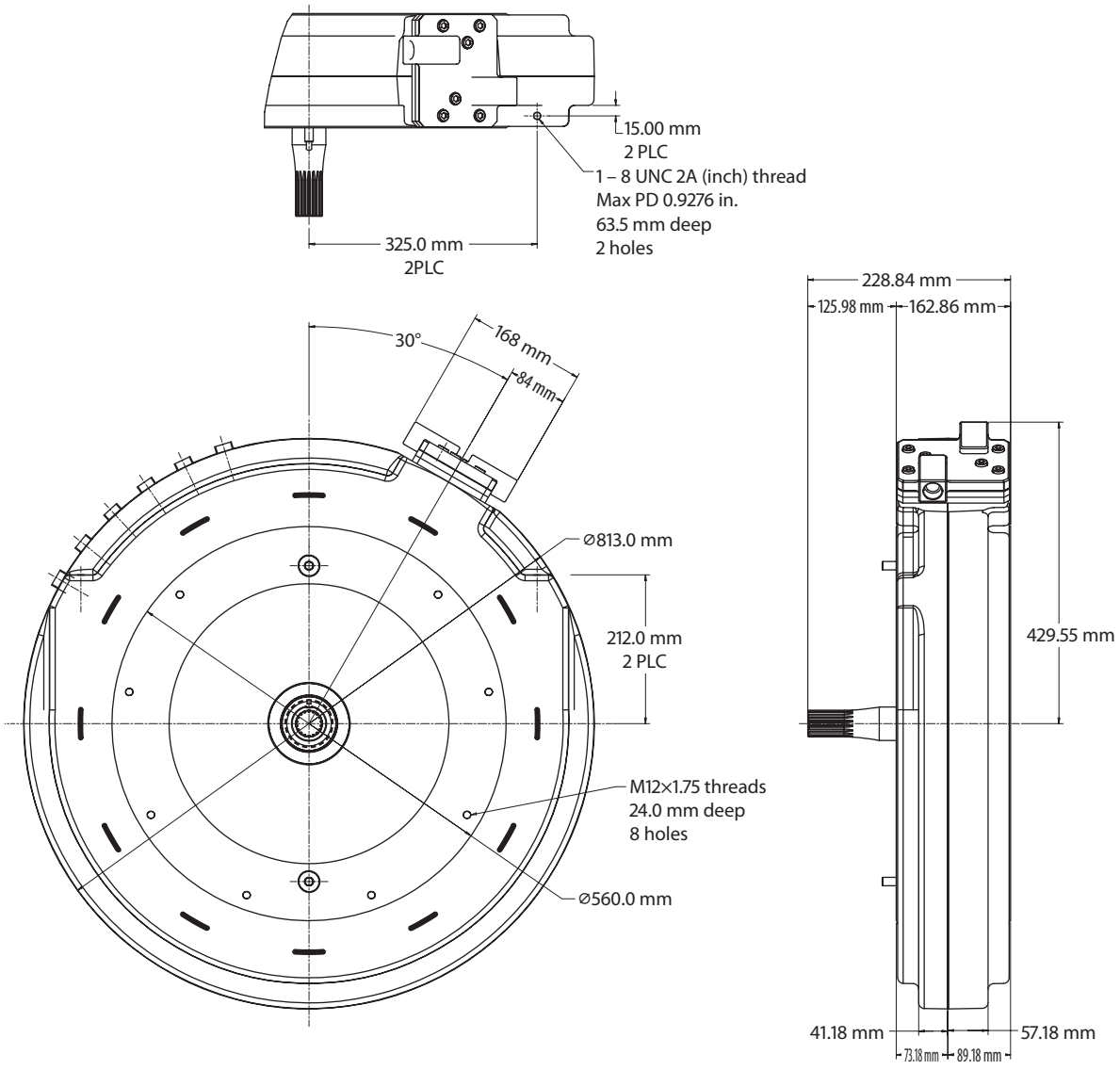

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