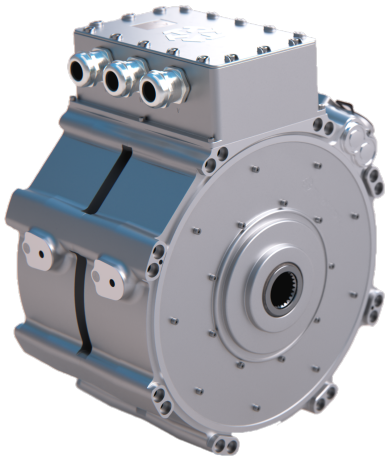
Turntide Axial Flux Motor D Series - AF400D



The Turntide Axial Flux Motor 400 Double stack (AF400D) offers exceptional power density, with one of the highest peak power and torque ratings in its class, at over 8 kW/kg and 15.5 Nm/kg at 800 V_{DC}.

The AF400D, with its short axial length, is well-suited for high-performance applications in a compact space claim. The unique magnetic topology coupled with electromagnetic, thermal, and manufacturing optimisation results in a breakthrough product offering with exceptional features. It offers smooth, quiet operation with low torque ripple while supporting inverter supply voltages of up to 850 V_{DC}.

Features

- **Peak efficiency** of 96% at continuous load, equivalent to the highest efficiency class of IE4
- **Indirect liquid cooling** using standard medium of water-ethylene-glycol for high power density
- **Through-shaft** female spline as per ISO 4156, enabling dual output system integration and through-torque transmission
- **Designed for operation** up to 850 VDC and peak overvoltage support up to 1 kV VDC
- **Low cogging and torque ripple**, allowing smooth system operation and low NVH characteristics
- **Axially stackable motor design platform**, enabling scaled torque and power levels
- **Product configuration** to provide flexibility in high voltage connections (glands or Amphenol Powerlok), top box orientation, stator turn-count, interface adaptors
- **Stator winding turn-count configuration options** allow the maximisation of the torque-speed performance envelope across different application voltage levels and current capabilities
- **Durable construction** with testing to ISO 16750 environmental standards
- **Ingress protection** rated to IP67 and IP6K9K

Applications

The AF400D delivers the same high torque and smooth operation as the AF400S across a 0 to 5,000 rpm operating range, while scaling performance to support double the continuous power (around 171 kW). This makes it well suited to higher-duty traction and power-dense applications, including medium-duty hybrid and fully electric commercial vehicles and demanding industrial systems.

Its scalable axial-flux design also supports off-highway, construction, and agricultural vehicles where both traction and auxiliary power are required, as well as industrial applications such as hydraulic pump drives, cooling fans, and combined traction-generation systems that benefit from high torque density and dependable performance.

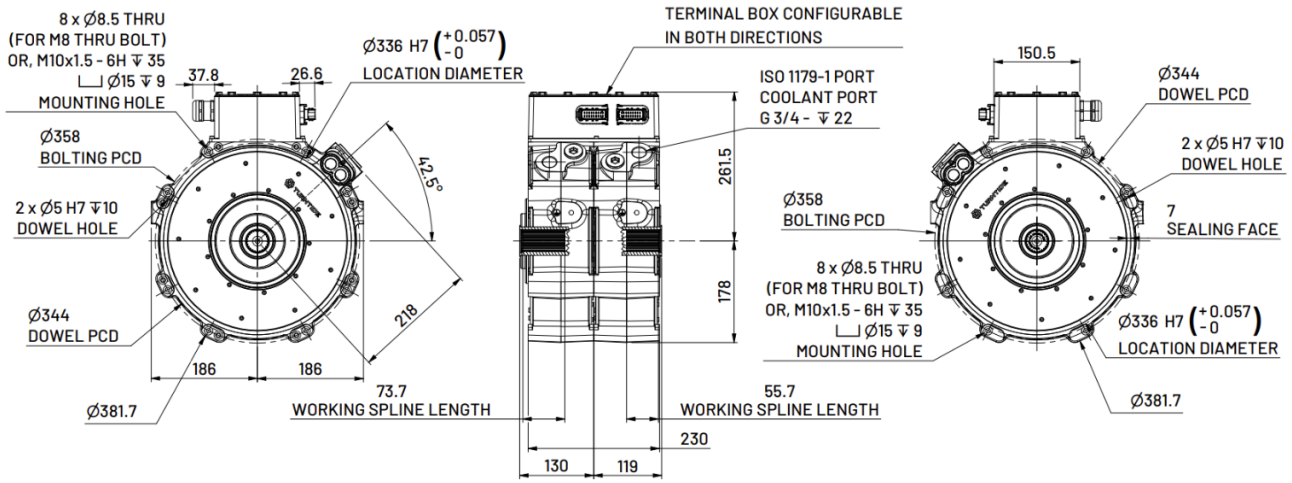


Specification

Performance	3 Turn, 720V_{DC}	3 Turn, 360V_{DC}
Motor Speed		
Maximum Speed (rpm)	5,000	5,000
Peak Performance (S2-20 seconds)		
Maximum Torque* (Nm)	1,242	1,242
Maximum Power* (kW)	644	426
Maximum Current (A_{rms})**	1,078	1,078
Continuous Performance (S1-60 mins)		
Continuous Maximum Torque* (Nm)	554	554
Continuous Maximum (Rated) Power* (kW)	171	145
Maximum Continuous Current (A_{rms})**	448	448

**These performance values have been rated at 45 °C ambient, 55 °C inlet coolant, 16 lpm flow rate. At coolant temperatures over 55 °C and/ or ambient over 45 °C derating may be required. DC Voltage, number of 3-phase sets, winding turns and switching frequency will affect the performance envelope and input current requirements. **Maximum current applies to a single inverter with 3 HV cables. In a dual 3-phase setup (6 HV cables), maximum current is split between both inverters. Please contact Turntide for further information.*

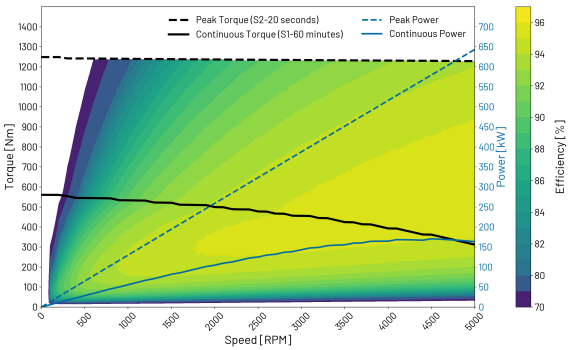
Operation Conditions			
Coolant Temperature Range	-20 °C to 85 °C	**Max Winding Temperature**	Up to 170 °C
Ambient Temperature Range	-20 °C to 90 °C		
Coolant Type	BS6580-1992 or equivalent	**IP Rating**	IP67 and IP6K9K
Sensor Output			
Temperature Sensor Type (Located in the end windings)	4x PT1000, (2x Bearing RTD optional)	**Resolver**	3 Phase: 1x TSY1040 (4PP) 6 Phase: 2xTSY1040 (4PP)
Mass, Dimensions and Drawings			
Dry Weight (kg)	80	**Depth (mm)**	230
Diameter (mm)	381.7	**Height (mm)**	439.5



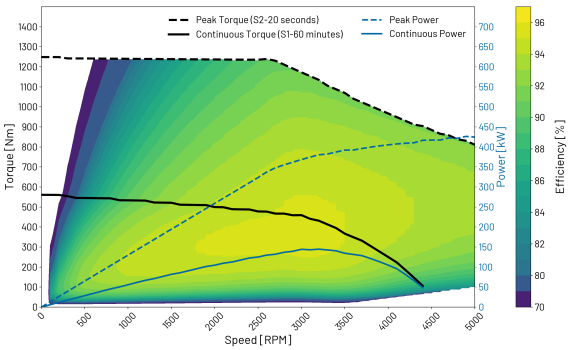
Shaft is a female spline, ISO 4156 (INT 25z x 1.5m x 30P x 5H). For alternative interface requirements, please contact Turntide for further information.

Performance Maps

TURNTIDE AF400D 720V 3 Turns



TURNTIDE AF400D 360V 3 Turns



Efficiency and performance are indicative only and may vary depending on voltage, motor configuration, application, and installation.

For more information on this product or Turntide's range of inverters, motors, batteries, pumps and fans, please visit our website or contact our team of experts at electrificationsales@turntide.com