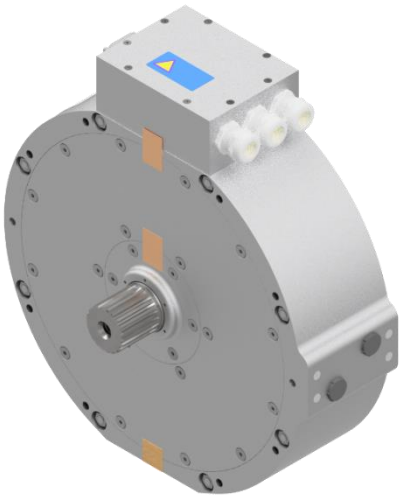
Turntide Axial Flux Motor AF140

The Turntide Axial Flux Motor 140 (AF140) offers exceptional power density, with one of the highest peak power ratings, in its class, at up to 7 kW/kg at 800V_{DC}.



With a peak efficiency of more than 95%, the AF140 is well-suited for high-performance demand in a compact space claim. It offers smooth, quiet operation with low torque ripple while supporting inverter supply voltages of up to 850V_{DC}.

Features

- 3-phase connection for easy interfacing with current inverter technology
- Short and compact motor length
- Customisation options for the top box and coolant port orientation
- Low cogging and low ripple torque give smooth, quiet operation in direct drive applications
- Compact design with flat front and back faces for mounting
- IP67-rated shaft seals (optional)
- Low inertia composite rotor with excellent dynamic stability
- Suitable for inverter supply voltages up to 850V_{DC}
- Liquid cooling using water/glycol for enhanced performance
- Integrated PT100 winding temperature sensors
- Sin/Cos resolver for out-of-the-box compatibility with most commercially available inverters
- Offered in 3,4,5 and 6-turn arrangements, allowing standard offerings to meet the customer-specific torque requirements

Applications



PUBLIC

TURNTIDE TECHNOLOGIES

Turntide Technologies designs and manufactures breakthrough electric motors, power electronics and energy storage solutions that optimize performance, reliability, and efficiency in all things that move.

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Details are correct at time of publishing

TTN-MAN-007
V3.0 – 01/01/2025

Specification

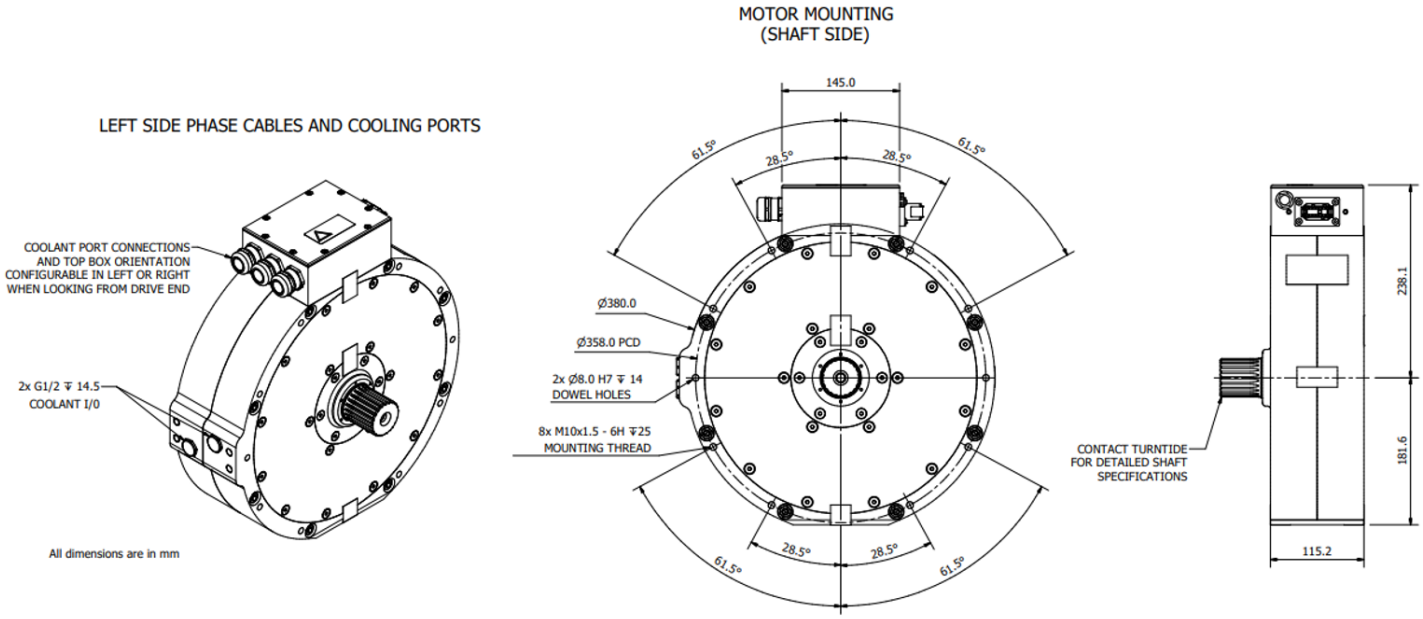
Voltage Level (V_{DC})	360		800	
Motor Speed	**3 turns**	**5 turns**	**3 turns**	**5 turns**
Max Speed (rpm)	5000			
Peak Performance (20 seconds)				
Peak Torque (Nm)	580	580	580	580
Peak Power (kW)	173	102	303	247
Continuous Performance (60 mins)				
Continuous Torque (Nm)	235	235	231	231
Continuous Power (kW)	64	39	80	81
Maximum Continuous Current (Arms)	238			
Coolant Flow rate				
Recommended Coolant Flow (l/min)	8			

Environmental			
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, (with optional shaft seal)

*Any temperature above 45°C ambient and 55°C coolant will require a derating in performance from the controller.

Motor Data Interface			
Thermal interface (Located in the end windings)	2x PT100	**Resolver**	1x LTN RE-15-1-K68 Single pole pair

Mass, Dimensions and Drawings			
Weight (kg)	43, Dry weight	**Depth (mm)**	115.2
Diameter (mm)	380	**Height (mm)**	419.7

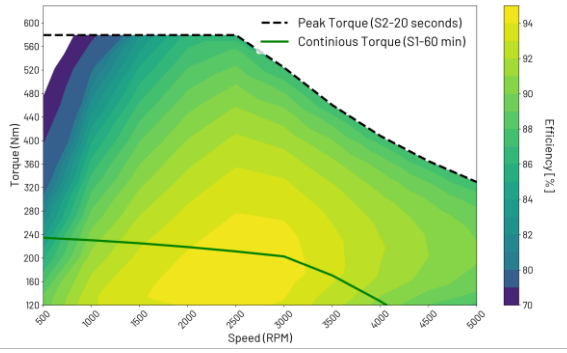


An example shaft is shown for reference. Turntide offers a range of pre-defined shaft geometries (Spline, Key or Smooth). Contact us for more information.

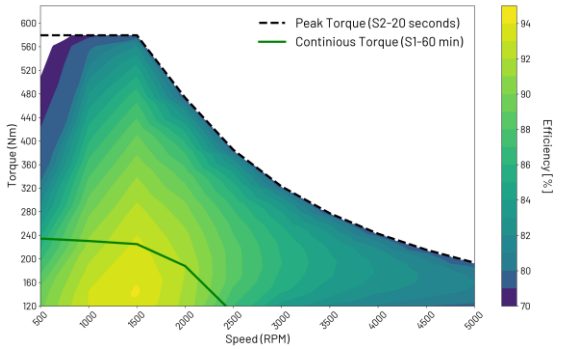
Peak overvoltage support 1kV

Performance Data Examples
360V_{DC} - 700V_{DC} - 800V_{DC}

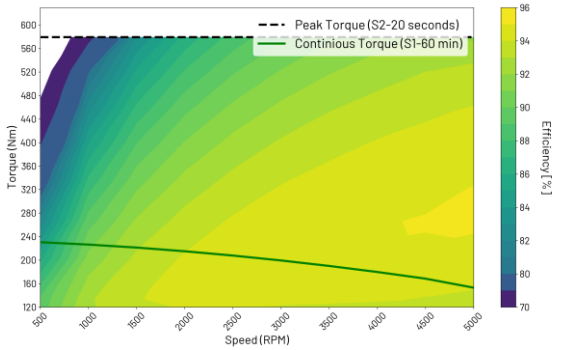
AF140 360V 03Turns



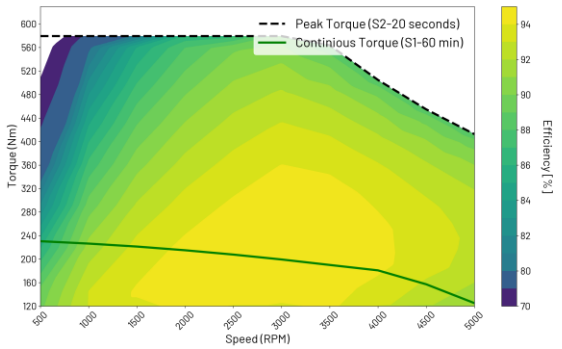
AF140 360V 05Turns



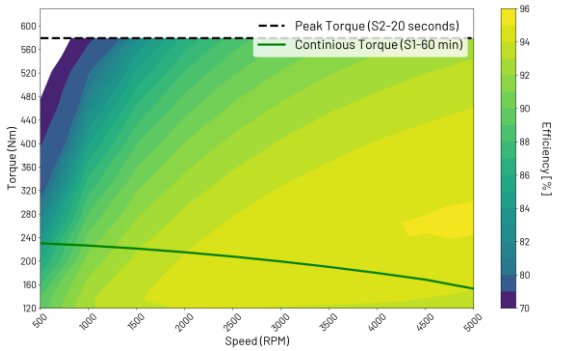
AF140 700V 03Turns



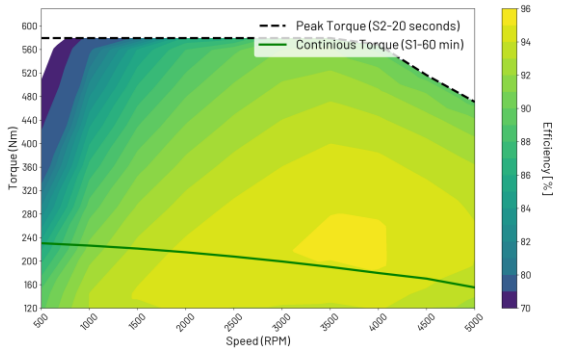
AF140 700V 05Turns



AF140 800V 03Turns



AF140 800V 05Turns



All values in the graphs are quoted for 45°C ambient with coolant at 55°C inlet temperature and 8 LPM flow rate. Efficiency will vary based on Voltages and Turn count.
Graph data is indicative of machine performance, performance may vary based on application and installation. Please do not hesitate to get in touch with us for further information.

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.