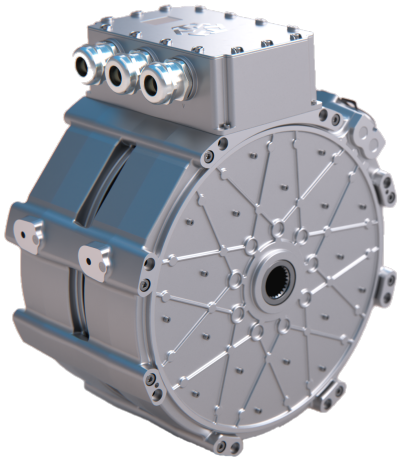
# Turntide Axial Flux Motor D Series - AF430D



The Turntide Axial Flux Motor 430 Double stack (AF430D) offers exceptional power density, with one of the highest peak power and torque ratings in its class, at over 6.9 kW/kg and 18.8 Nm/kg at 800 $V_{DC}$.

The AF430D, 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 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 AF430D delivers the same strong low-speed torque and smooth operation as the AF430S across a 0 to 3,700 rpm range, while scaling performance to support double the power (around 197 kW). This makes it well suited to larger generators, backup and brownout power systems, and energy-intensive industrial applications, including industrial compressors.
Its scalable design also supports hybrid and fully electric medium- and heavy-duty commercial vehicles, as well as off-highway, construction and agricultural vehicles, where both traction and auxiliary power are required. Industrial fans and pumps can also benefit from its high torque density and dependable performance.

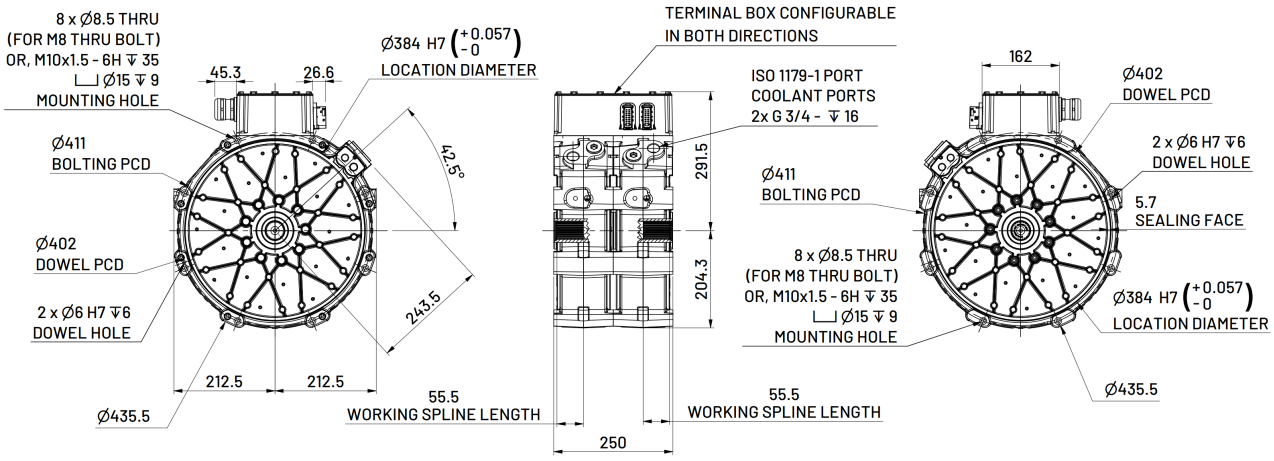


# Specification

| Performance | 3 Turn, 720$V_{DC}$ | 3 Turn, 360$V_{DC}$ |
|---|---|---|
| **Motor Speed** | | |
| **Maximum Speed (rpm)** | 3,700 | 3,700 |
| **Peak Performance (S2-20 seconds)** | | |
| **Maximum Torque* (Nm)** | 1981.6 | 1981.6 |
| **Maximum Power* (kW)** | 734 | 442 |
| **Maximum Current** ($A_{rms}$)** | 1196 | 1196 |
| **Continuous Performance (S1-60 mins)** | | |
| **Continuous Maximum Torque* (Nm)** | 818 | 818 |
| **Continuous Maximum (Rated) Power* (kW)** | 197 | 164 |
| **Maximum Continuous Current** ($A_{rms}$)** | 470 | 470 |

*These performance values have been rated at 45 °C ambient, 55 °C inlet coolant, 24 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.

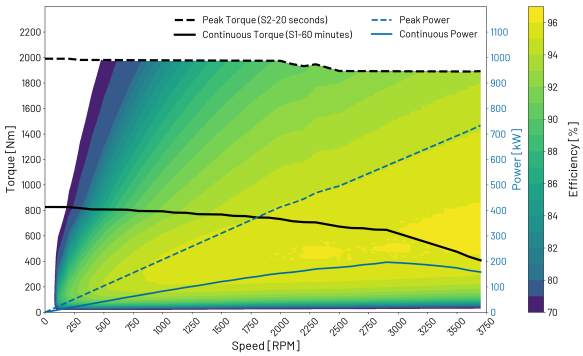
| Operation Conditions | | | |
|---|---|---|---|
| **Coolant Temperature Range** | -20 °C to 85 °C | **Max Winding Temperature** | Up to 170 °C |
| **Ambient Temperature Range** | -20 °C to 90 °C | | |
| **Coolant Type** | BS6580-1992 or equivalent | **IP Rating** | IP67 and IP6K9K |
| **Sensor Output** | | | |
| **Temperature Sensor Type** (Located in the end windings) | 4x PT1000, (2x Bearing RTD optional) | **Resolver** | 3 Phase: 1x TSY1040 (4PP)<br>6 Phase: 2xTSY1040 (4PP) |
| **Mass, Dimensions and Drawings** | | | |
| **Dry Weight (kg)** | 105 | **Depth (mm)** | 250 |
| **Diameter (mm)** | 435.5 | **Height (mm)** | 495.8 |



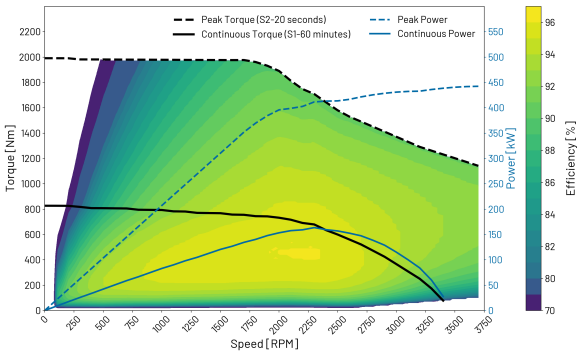

Shaft is a female spline, ISO 4156 (INT 25z x 1.5m x 30P x 5H). For alternative interface requirements, please contact Turntide for further information.

## Performance Maps

TURNTIDE AF430D 720V 3 Turns




TURNTIDE AF430D 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