Brushless DC motors that operate at extremely high temperatures.

A brushless DC motor for operation in the path of hot air at 180°C requires more than special lubrication.

376mNm and 1700rpm on 24V. They seem like easy requirements for a brushless DC motor to achieve. But at 180°C continuous and 200°C intermittent? That is a little more difficult. The engineers at maxon motor are used to requests for motors that can operate in the high temperature environments of Australia. Particularly outdoor and enclosed environments like solar pumping, Traffic control and agriculture where ambient temperatures in the enclosure can soar well above 60°C. For this requirement the only modification is typically to use a thicker, high temperature lubrication for the ball bearings. In fact, most maxon brushless DC motors are rated from -40°C to +100°C as standard. For 200°C motors this is an entirely different ballpark. The design engineers for the motor must carefully design each component with a matching thermal expansion. Extensive finite element analysis, vigorous testing and physical inspection must then take place on every single assembly process. Plastics must be avoided, windings need encapsulation, cable insulation must be specifically selected for each environment, magnets need to be a carefully tested grade of Samarium-cobalt rare earth material that is sintered and again encapsulated. The entire construction is then double pass continuous flow laser welded….and tested again, and again. Pictured here is an example of such a motor that was recently delivered to a customer with the aforementioned features.

Contact maxon motor Australia for engineering assistance with your extreme environment application.
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brushless DC motor and gearhead that can work at high temperature.
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