

Why Brushless DC?

Because of their construction, brushless DC motors have several advantages as compared to other electric motors. Because commutation is accomplished electronically, brushless DC motors are capable of very high speeds and torque without arcing. Brushless motors have a lower thermal resistance and are capable of operating in a wider temperature range. The lack of brushes allows them to have a broad closed-loop speed range. Also, brushless motors have a higher torque to inertia ratio, high starting energies, and high breakaway torques. These advantages give brushless DC motors sophisticated motion control capabilities.

Brushless DC motors have a higher power density than AC as well as brush DC motors. Efficiency is also better with brushless motors. Typically brushless motors have 5-10% better efficiency than typical AC induction motors and 8-12% better efficiency than brush DC motors. Because they have lower thermal resistance, are capable of operating in wider temperature ranges, have higher torque to inertia ratios, and have greater acceleration, smaller brushless DC motors can do the same job that their much larger counterparts would otherwise be used for. This results in an overall cost reduction.

Brushless DC motors have the same advantages as DC motors using brushes, but because commutation is accomplished electronically, they offer many advantages as compared to brush DC motors. Brushless motors have improved system reliability. No brushes means a maintenance reduction and no brush residue contamination to bearings or the environment. There is no arcing associated with brushes, and therefore, are safer in explosive environments. Brushless DC motors are also safer in contact with fluids than brush DC motors. Because there is no brush arcing or brush commutation, brushless motors are much quieter both electrically and audibly.