Japanese Products Corp.
Motion and Thermal Control Products

Slotless Brushless DC Motors

Custom Quality
What is a JPC slotless brushless DC (SBLDC) motor?

A JPC slotless brushless DC (SBLDC) motor consists of a stator winding positioned inside a laminated stator ring (without conventional teeth) and a permanent magnet motor. This provides more peripheral space for the stator winding. This also allows more magnet surface area and more air gap flux. Powerful rare earth magnets provide high torque to motor weight ratios. The absence of stator teeth enables more winding copper and power density which can develop more torque. It also eliminates torque cogging and minimizes audible noise.

We are experts in the design and fabrication of custom SBLDC motors and rotor/stator sets.

JPC offers a great deal of flexibility, responsiveness, and expertise in the design and fabrication of custom SBLDC motors. There are few restrictions on physical dimension choices since stator laminations are simple annular rings, economical to produce, and high energy magnets are readily available in arcs and slabs of all sizes. There is freedom to choose magnetic and mechanical air gaps, number of poles, pole spans, backiron thickness, magnetic densities, and copper fills, etc., for each specific application.

When others say they can’t, we say we can… and do!

Whether the issue is speed, power, weight, size, efficiency, noise, torque ripple, heat rise, etc., each or all are optimized to achieve custom performance with relatively short design and response time.

Tooling charges for custom prototypes are nominal. JPC has produced a wide range of sizes from 1” to over 10” in diameter, and basic tooling of many sizes is already available.

JPC rotor/stator sets enable simplified OEM designs. Bearings, housings and alignment problems are eliminated, thus providing cost-effective, reliable solutions.

As the energy product of magnets increases and costs decrease, and the manufacture of the stator can be more mechanized and cost-effective, the slotless motor technology will be the logical choice for many brushless DC motor applications.
Features

Zero-cogging and lower torque ripple
... no preferred rotor position due to absence of stator teeth.

High efficiencies
... more dense copper fill enables reduced stator resistance and winding losses.
... no stator tooth saturation and reduced core losses due to less stator iron.

Low noise levels
... no tooth lamination flux changes to generate electrical hum.

Low speed performance
... smooth, cogless, jitter-free direct drive operation down to a few degrees per minute.

High speed performance
... no high frequency teeth losses for increased efficiency.

Benefits

Basic frame sizes available
(frame no./nominal dia.)
1400/1.4”  3400/3.4”
1800/1.8”  4400/4.4”
2300/2.3”  5800/5.8”
Custom sizes available.

HP ranges (nominal)
Subfractional to 10 HP, and beyond

Torque Constants
Voltage Constants
... unlimited wide ranges, custom configured for each application: typically, \( K_T \)'s of 1 through 600 oz.-in/amp and \( K_e \)'s of 1 through 450 volts/1000 RPM.

Capabilities
Since 1926, Japanese Products Corporation (JPC) has been producing a diversified variety of custom specialty electric motors in the fractional and low integral HP ranges to the highest quality and reliability standards for military and industrial requirements. JPC’s overall specialty motor capabilities also include:

- Inner and Outer Rotor Brushless DC Motors
- AC induction and torque motors
- Conventional DC wound field and PM motors
- Gearmotors
- Fans and Blowers

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Specialty Electronic Motors
Call, fax, or write to us with your requirements