

For aerospace and defense, tested to MIL-STD-810F and RTCA DO160F

Description

In today's military market, there are many applications where rugged industrial products are utilized to provide the functionality and reliability needed to meet or exceed the requirements in the field. Moog Component Group's brushless DC motors, resolvers and blowers are not only field proven in many diverse and challenging applications, they have also been fully tested to MIL-STD-810C / F as well as RTCA DO160F in actual hardware. Moog Components Group's select BN Silencer® series brushless motors, Matrix™ series DB motors, resolvers and blowers are most fully representative of the commercially available standard catalog units, to a military standard test plan and has documented the suitability of these products to meet the environmental requirements for many military applications.

The brushless DC motors selected for these tests are representative of our entire line of standard BN series motor frame sizes that incorporate identical design, process and material standards. Following these standards, Components Group engineering would expect similar results from our complete line of BN series motors and we consider these commercially available designs suitable for a wide range of military and aerospace applications.

Standard Options Available

1. Mechanical Options

- a. Shaft Options, i.e., diameter / length (0-6"), precision tolerances, dual shaft extensions, flats, keyways, threads, splines / pinions, tapers, grooves, chamfers, fillets, steps, holes, hollow core, material, finish, hardness (For unhusd parts sets, similar machining modifications apply to rotor core mounting configuration)
- b. End Cap Options, i.e., mounting boss diameter / depth, flange mounting, bolt circle diameter, material, finish
- c. Housing Options, i.e., mounting boss diameter, bolt circle diameter, frameless, material, finish
- d. Electrical Interface Options, i.e., flying leads, custom wire harnesses, connectors, terminals, shielding
- e. Environmental Options, i.e., high / low temperature, IP ratings, autoclavable, conformal coatings, potting encapsulating, radiation hardened, EMI / RFI mitigation, low outgassing, RoHS / Non RoHS compliance
- f. Special printing, marking, labeling
- g. *Bearing and bearing lube options

2. Electromagnetic Options

- a. Motor Winding Options; (Km 1.0 to 100 oz.-in. / sq.rt. watt)
- b. Sensored, sensorless
- c. Hi-pot
- d. *Wire
- e. *Brush
- f. *Magnet



Typical Applications

- Missile fin actuation
- Blower applications for electronics cooling
- Gas turbine pumps
- Flight surface actuators
- UAV flight control
- Radar platforms
- Military vehicle brake systems and cab heating

Benefits

- Utilizes standard designs
- Lower hardware costs
- Quick delivery
- Documented results define hardware's environmental capabilities
- Lowers risk and helps assure reliability
- ITAR exempt
- Complies with DFAR specialty metals 252.225-7009 and 252.225-7014

Commercial Off-The-Shelf Brushless DC Motors, Resolvers, Blowers and Fans

Standard Options Available, *Continued*

3. Accessories

- a. Temp sensing
- b. Pulleys
- c. Flywheels
- d. Integral and external drives (2,000 watts max.)
- e. Resolvers
- f. *Encoders
- g. *Gear heads
- h. *Clutches and brakes

4. Avionics Specific Options

- a. Contact Options, i.e., brush, brushless, hairspring, flex-lead
- b. Electrical Performance, i.e., input voltage (1 to 120 volt), current, power, null voltage, phase shift, accuracy (+/-2' to +/- 2 degrees, to 15 inches on multi-speed units), transformation ratio (up to 5)
- c. Mechanical Performance, i.e., low friction, end-play, limited rotation features

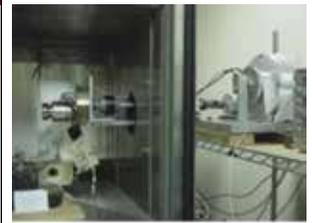
5. Blower Specific Options

- a. Speed control – via - PWM, DC voltage, temperature, closed loop, open loop or other standard interface

** All commercially available components can be incorporated into our standard catalog products.*

Environment Method MIL-STD 810C / F Test Summary

Category	Method	Status
High Temperature	MIL-STD 810C, 501.1, Procedure I	Passed
Low Temperature	810C, 502.1, Procedure I	Passed
Temperature Shock	810C, 503.1, Procedure I	Passed
Temperature Altitude	810C, 504.1, Procedure 1, Category 5	Passed
Humidity	810C, 507.1, Procedure I	Passed
Salt Fog	810C, 509.1, Procedure I	Passed
Dust	810C, 510.1, Procedure I MIL-STD-810F, 510.4, Procedure I	Passed
Explosive Atmosphere	810C, 511.1, Procedure I	Passed
Vibration	MIL-STD-810F, Procedure I, Category 12	Passed
Shock	810C, 516.2, Procedure I, 15 g, 11 ms Saw Tooth 810F, 516.5 Procedure I, 30 g 10.2 ms Saw Tooth	Passed



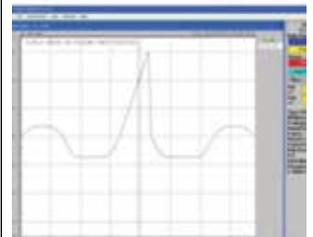
Environmental Temperature Testing



Vibration Testing



Vibration Testing



Shock Test Plot



Sand and Dust Testing

In addition to the full line of BN series brushless DC motors, Components Group has a complete line of commercially available brush type and brushless resolvers that are compliant to MIL-STD-810F and are proven performers in the field.

Summary

MIL-STD-810C / F testing has demonstrated that Moog Components Group's commercially available BN series brushless motors, Matrix™ series DB motors, resolvers and blowers are suitable for many military applications. Complete test reports are available upon request. Contact an applications engineer to discuss ways to add low cost, effective solutions into your next application.

Specifications and information are subject to change without prior notice.
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