

5 Considerations to Optimize Frameless Motors in Aerospace & Defense Applications



KOLLMORGEN



From design through deployment, a successful aerospace and defense program depends on efficient prototyping, cost-effective production and reliable supply. For these reasons, engineers prefer to specify motors that are readily available and affordable. Yet commercial off-the-shelf motors may not always meet the demands of stabilized platforms and actuators that must perform flawlessly under the most extreme conditions.



Higher shock loads. Optimized motor windings. A larger through-bore aspect ratio. How do you achieve these and other specialized motor attributes on a rapid development schedule, with assurance of meeting cost and supply requirements for a program that may be in service for decades?

With over 100 years of motion experience, Kollmorgen provides a wide range of high-performance motor packages with sizes, materials and options ideally suited for aerospace and defense programs. And building on our breadth of deep application expertise and agile manufacturing, we also offer thousands of standard modifications and fully custom options.

At Kollmorgen, modification for a perfect fit is our standard. Follow this simple process to achieve the exact motor specifications you need, whether through a standard product or a simple, cost-effective modification. **There's never a reason to settle for good enough. With Kollmorgen, you can engineer the exceptional.**

STEP 1

KNOW YOUR VOLTAGE RANGE.



A motor's form-factor, size, torque and speed must all be designed in relation to the available electrical supply.

Kollmorgen offers standard frameless motors with a vast range of capabilities in models that operate at 24 VDC all the way up to 650 VDC nominal / 900 VDC peak.



Frameless (KBM)



Frameless (TBM)

STEP 2

KNOW YOUR SIZE, TORQUE AND SPEED.

Within your voltage specification, look for a catalog motor that meets your size, torque and speed requirements.

Kollmorgen's frameless KBM series and TBM series:



SIZE

17 frame sizes

From 60 mm to 850 mm OD

Lamination stack lengths

From 11 mm to over 260 mm



TORQUE

Torque ranges

Measured in millinewton meters up to 13,000 Nm



SPEED

Speed options

From Earth rate to 20,000 rpm

If a catalog motor suits all your requirements, skip to **STEP 5**

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If not, go to **STEP 3**

STEP 3

SELECT FROM A WIDE RANGE OF STANDARD MODIFICATIONS.

Kollmorgen provides a number of standard mechanical, electrical and electro-magnetic modifications. See a few of the standard modifications below.



SPEED/TORQUE CAPABILITIES	STANDARD MODIFICATIONS
Winding gauges	#00 – #48 AWG (includes lead wire change)
Lamination stack lengths	3 – 5 stack lengths available depending on frame size
INSTALLATION FEATURES	
Rotor hub geometry	Round, hollow, flanged, keyway, flat Through-bores from 5 mm (0.2 in.) up to published maximum (refer to outline drawing)
Mounting	Customer-specified bolt-hole diameter and circumferential pattern
Lead length	Base model: 152 mm (6 in.) min. Customer-specified: 150 mm (5.9 in.) to 1200 mm (47 in.)
Lead colors	Base model: red, white, black Other colors, customer-specified
Thermal sensor	PTC or linear thermistor-type devices
MATERIALS	
Magnet materials	Magnet alloy variants and rare-earth alloy options
Rotor hub material	Stainless steel (magnetic), others as options
Stator housing	Thermally conductive material options

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If one or more of these standard modifications will meet your needs, skip to **STEP 5**

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If not, go to **STEP 4**

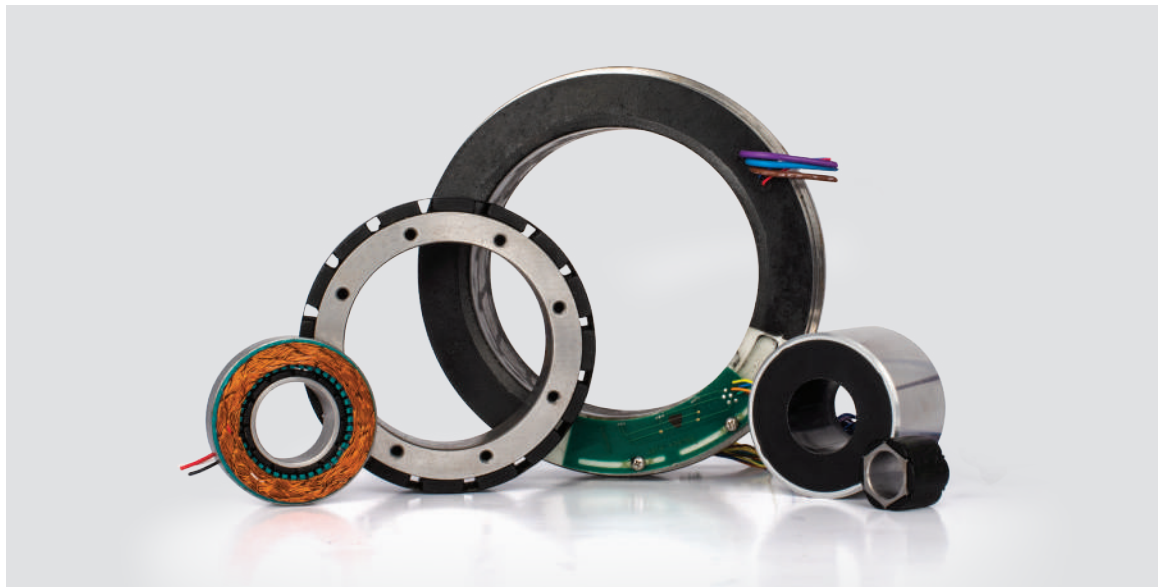
STEP

4

HAVE KOLLMORGEN CUSTOMIZE A MOTOR FOR YOUR APPLICATION ENVIRONMENT.

It's critical to know what your application really demands. Kollmorgen can meet the challenges of the most extreme military environments, including MIL-STD-810 requirements.

If your application demands motors that can withstand extremes of temperature, shock and vibration, sea and salt spray, humidity, vacuum or ionizing radiation, Kollmorgen can fully customize motors to meet the need.

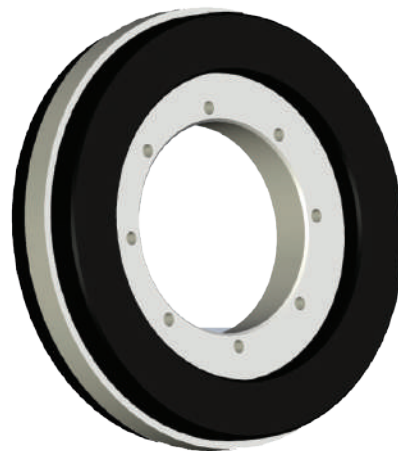


Example custom elements for extreme environments

Magnetic materials

Insulation systems

Leadscrew integration



Rotor banding

Slot fill

Feedback options

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Knowing that virtually anything is possible, go to **STEP 5**

STEP 5

GET STARTED.

Explore all of Kollmorgen's capabilities for aerospace and defense applications, and get started specifying the ideal motor for your project today.

- Learn more: kollmorgen.com/aerospace-and-defense
- Start designing: kollmorgen.com/designtools
- Connect with a Kollmorgen engineer: kollmorgen.com/contact-us



For Answers, Partner With Kollmorgen

Kollmorgen is more than a supplier. We're a partner, dedicated to your success. We give you direct engineer-to-engineer access to the designers who create our motion systems and who understand how to address specialized defense requirements. Our self-guided design tools help you model, choose and optimize products online. And with our global footprint of manufacturing, design, application and service centers, you always have access to dependable supply, co-engineering expertise, and personalized support that no other partner can provide. For superior motion performance in O/IR imaging systems, missile seeker heads, fin actuators, launch systems, remote weapon stations, radar stations and more, we can help you engineer the exceptional.

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