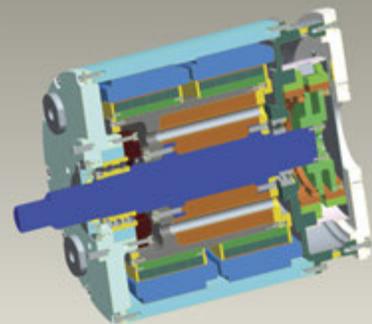
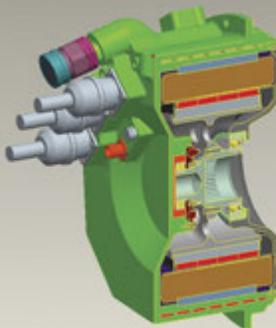
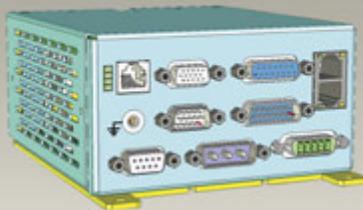


## Optimized Solutions

Custom-designed motion control, drive, and special duty motor systems to meet the most extreme performance, environmental, and application challenges



**KOLLMORGEN**®

*Because Motion Matters™*

# Applying Our Knowledge to Meet Your Motion Needs

**Optimize the  
Package,  
Performance  
and Features**

- We provide solutions that meet your needs, including the ability to get optimum performance for the smallest package size.
- Our products deliver superior quality, through-put, efficiency, and performance.

**Reduce  
Waste and  
Costs**

- We have thousands of proven designs upon which to build new solutions. Our application experience expedites the design cycle, which enables you to be fully operational sooner.
- Great value is delivered in the final product.

**Meet the Most  
Challenging  
Requirements**

- Designs are developed for manufacturability.
- Designing and manufacturing unique products are our core competency.
- We have the broadest capabilities in the industry.



## Compete and Win

Kollmorgen can translate your needs, from design to installation, into a custom motion solution that makes your end product more competitive  
– **driving market share and profitability for your company.**

For flexible production runs, from high volume to one piece, Kollmorgen provides on optimized solution that fits your needs – perfectly.



## Optimized Solutions

Whether it's modifying a product from our standard catalog or a white sheet design for a custom solution, you can rely on decades of Kollmorgen expertise to solve your motion challenges and help your machine stand out from the crowd.

### Modified Standard

Because our application expertise runs deep and our product portfolio is so broad, we can take any standard product and modify it a lot or a little to suit many needs – in a very rapid time frame. This approach ensures quality, performance and reliability by leveraging our proven track record.

Kollmorgen application engineers have a great deal of experience helping OEM engineers achieve their objectives : Typical motor modifications include shaft, housing, winding and through-bore alterations; feedback type; mounting and connectors; ruggedization (high-shock-and-vibration), vacuum-duty, radiation-hardened, explosion-proof. Typical drive modifications include housing, mounting and heat-sinking; connector type; I/O type- and count; field buses and motion buses; special cabling; ruggedization (high-shock-and-vibration).

### Custom Products

With motion as our core capability, we bring a significant history of innovation to today's engineering challenges. We leverage our design and engineering excellence and technical knowledge to deliver creative new solutions for virtually any need. Our vast experience also helps us deliver a custom product in a surprisingly short time. If you can conceive it, we can make it happen.

### Project Management

We follow a structured development process from initial concept to volume production. This enables us to provide a complete solution from design to implementation.

Our skilled engineering team is assigned to each project and ensures a high quality product designed and delivered on time, successfully taking the prototype to full production.

- Dedicated Resources & Equipment
- Real Time Customer Collaboration
- Validation of Performance, Cost & Manufacturability Before Volume Production

### Customer Visibility Throughout the Entire Process

A communicative and proactive approach keeps you updated and aware of what is required throughout, what it will cost, and what to expect for design testing

This not only puts you in charge of approving any modifications before installation, but ensures the product is up and running quickly, with minimal development time and maximum value.

### Engineering Excellence

What really sets us apart is our engineering expertise. With over 50 years of successfully designing custom motors, we are able to quickly assess, design and implement a solution that meets your needs.

Our engineers have an average tenure of 20 years, which means they have designed solutions for almost every unique and challenging situation. Their insightfulness and expertise will guide you through the development and implementation of an optimized motor solution.

We rely on the most advanced simulation tools to deliver the best products, designed to withstand the most unique and challenging environments:

- 3-D Modeling –ProE
- Finite Element Analysis
  - Electromagnetics
  - Structural (stress, vibration, fatigue)
  - Thermal
- Speed
- Infolytica
- Ansys
- Magneto

### Why You Should Partner with Kollmorgen

- Experienced application engineers help define a customer's needs and identify the optimal Kollmorgen products and technologies
- Products optimized or developed by cross-functional teams to meet customer needs
- Rapid prototyping
- Smooth transition from prototype designs to sustainable and cost effective manufacturing
- Industry-proven quality, performance, and delivery
- Proven technology building blocks mitigate risks of customization

# Capabilities to Meet Your Needs

Kollmorgen offers 5-day lead-time on nearly 1,000,000 COTS products, all with best-in-class performance and quality.

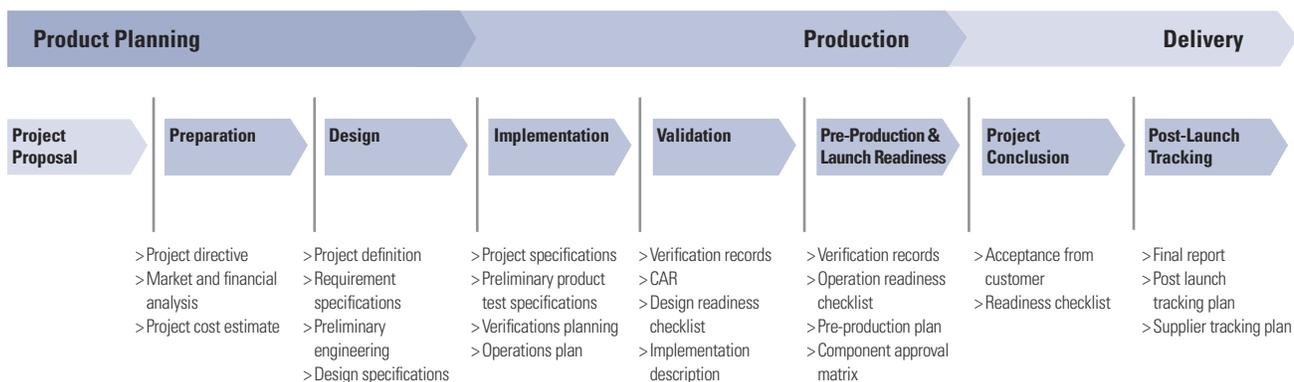
When COTS is not quite the best way to realize a totally optimized system, Kollmorgen can offer co-engineered solutions to meet your most difficult challenges and advance your competitive position. Drawing on a wealth of knowledge and expertise, our engineering support team will work alongside with you to build a solution that differentiates your machine and improves your bottom line.

Here are just few examples of how Kollmorgen delivers real value to companies likes yours:

What You Need	Why Motion Matters	Kollmorgen Co-Engineering Results
30% Increase in Throughput	<ul style="list-style-type: none"> <li>• Low inertia servo motors</li> <li>• High bandwidth servo loops</li> <li>• Simple, accurate, graphical programming tools</li> </ul>	Using the Kollmorgen Automation Suite™ graphical camming design tool, Pipe Network™ and low-inertia AKM servo motors, a major supplier of diabetic test labs increased throughput by more than 30% while improving accuracy and reducing scrap.
50% Increase in Accuracy and Quality	<ul style="list-style-type: none"> <li>• Low cogging frameless servo motor</li> <li>• Advanced observers and bi-quad filters</li> <li>• Fast control loop update rates (.67µs)</li> </ul>	Using our AKD servo drive, a next-generation CT scanning manufacturer achieved more than 50% improvement in velocity ripple to produce the most accurate and detailed medical images possible while overcoming an extremely high moment of inertia.
25% Increase in Reliability (Overall Equipment Effectiveness)	<ul style="list-style-type: none"> <li>• Innovative Cartridge Direct Drive Rotary™ DDR motor</li> <li>• Eliminating parts on the machine</li> <li>• No additional wearing components</li> </ul>	Using Kollmorgen’s award-winning Cartridge DDR servo motor technology, we eliminated more than 60 parts in a die-cutting machine and increased the OEE by 25% and throughput by 20%.
50% Reduction in Waste	<ul style="list-style-type: none"> <li>• Superior motor/drive system bandwidth</li> <li>• DDR technology:                             <ul style="list-style-type: none"> <li>– eliminates gearbox</li> <li>– 20X more accurate than geared solution</li> </ul> </li> </ul>	We helped a manufacturer of pharmaceutical packaging machines incorporate Housed DDR motors to increase the throughput by 35% and reduce scrap by more than 50% through more accurate alignment of the capsules.

## Optimized Solutions Process

Comprehensive design, manufacture and test capabilities ensure the end product meets the customer performance specifications and quality requirements. Our skilled engineering team works directly with each customer throughout the process, quickly taking the prototype to full production.



# Proven Design Capabilities

## Motor Solutions

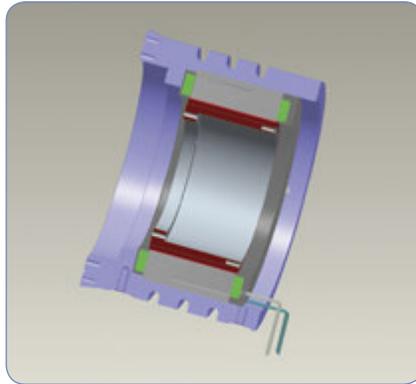
- Brushed, brushless and stepper motor building blocks used in frameless or housed configurations
- Designed for agency compliance (UL, CE, RoHS)
- Voltage ratings from 48 Vdc – 600 Vdc, with capabilities in 800 Vdc and up
- Continuous torques from 0.5 Nm – 29,000 Nm
- Proven performance and reliability in a customizable package

## Drive Solutions

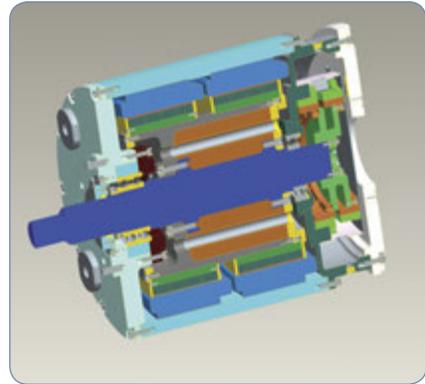
- Board-level or packaged solutions supporting single to multi-axis configurations
- Brushed or brushless servo drives, stepper, AC induction control
- Integrated controller and communications options
- Designed for agency approvals (UL 508C, EN 50178, EN 61000-6-6, EN 61800-3, CISPR 14-1, and others available)
- Proprietary technology and software can be embedded into the drive



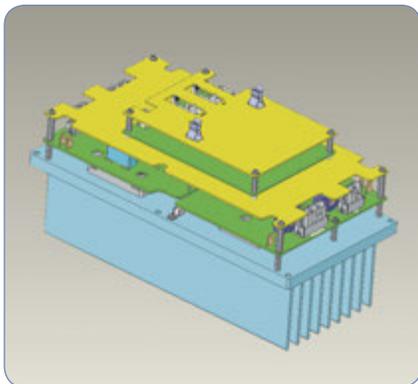
Medical diagnostics drive optimized for form-factor, I/O and EMC



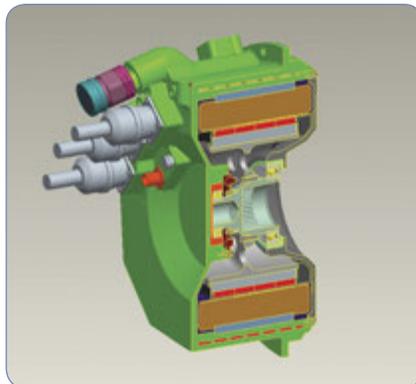
Frameless direct drive rotary motor with water cooling features



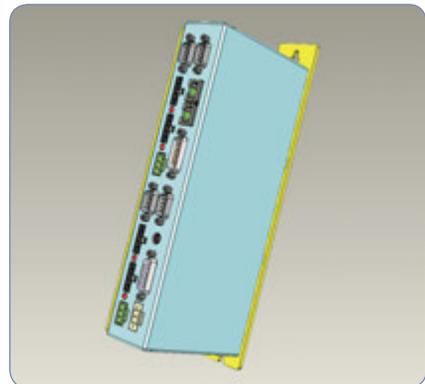
Custom submersible motor



2-axis drive for high-power robotics, optimized for form-factor and communications interface



200 kW electric starter/generator



4-axis stepper drive using SynqNet

## Motors and Electronics

Optimized for	Application
Reliability, weight	Implantable heart pumps, military, remote equipment
Precision	Pick and place, satellite tracking, film processing
Package size	Medical imaging, ground based telescopes, aircraft instrumentation, collaborative robotics
Smooth operation	Medical respirators, high precision robotics, printing and textile machines
Harsh environments	Deep sea, outer space, high shock and vibration, extreme temperatures

# Kollmorgen COTS Motors for Special Duty



Every day Kollmorgen pushes the boundaries of motion to deliver optimized solutions that satisfy even the most demanding application requirements in the harshest of environments.

We've been working with the biggest names in harsh and hazardous environments in Industry, Automation, Aerospace & Defense, Exploration, Nuclear, Medical and Robotics for nearly 60 years.

We are on Mars and the Moon, and on-, in-, and at the bottom of the oceans: In fact, Kollmorgen motors powered the legendary ROV Jason Jr. at a depth of 3,784 meters (12,415 feet) to explore the interior of Titanic for the first time since it sank in 1912.

Kollmorgen continues to collaborate with leading innovators with the same enthusiasm and acumen: Kollmorgen knows that motion matters and represents endless possibilities for innovation. Our engineering expertise and engineering capabilities enable us to deliver superior performing solutions for these demanding environments.

## Goldline® S Series Submersible Servo Motors



These brushless servo motors incorporate pressure compensation technology to allow underwater operation up to 20,000 ft while withstanding extreme environments. They feature stainless steel and aluminum nickel bronze housings or an anodized aluminum housing for lighter overall weight. All shafts are stainless steel and sealed with an externally serviceable O-ring seal. The S Series is fully tooled for cost-effective volume production.

- Choice of stainless steel and aluminum nickel bronze housings or an anodized aluminum housing for lighter overall weight
- Stainless steel shaft with externally serviceable seal
- SEACON connectors
- Pressure compensated: 10,000 psi
- Designed to withstand severe shock and extreme environments

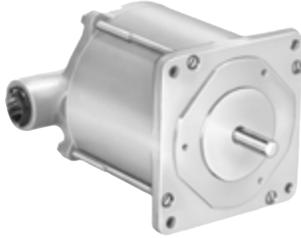
## EKM Series Brushless AC Servo Motors



These enhanced, high-performance motors are Mil-Spec 810E rated and IP67 sealed, and comes standard with a stainless steel and chemical-agent-resistant paint, for duty in harsh environmental conditions.

- 0.43 to 53 Nm continuous stall torque (3.8 to 467 lb-in)
- Speeds up to 8000 RPM meet high speed requirements
- Custom windings, shaft variations, and fail-safe brakes available
- 480 Vac High Voltage Insulation
- Rugged resolver feedback for extreme environments
- Operating temperature range of -51° C to 54° C
- Shock and Vibration tested per MIL-STD-810E, Methods 516.4 & 514.4, Procedure 1
- International Standard Mount available

## MX Series Hazardous Duty Motors



The explosion-proof MX Series provides hazardous-duty stepper motors suitable for use in Class 1, Division 1, Group D locations. They are available in NEMA 34 and 42 frame sizes (90 and 110 mm), and provide minimum holding torques from 1.27 to 9.82 N-m (180 to 1390 oz-in).

- MX09 models: NEMA 34 (90 mm) motors available in three stack lengths with minimum torque ratings from 1.27 to 3.88 N-m (180 to 550 oz-in)
- MX11 models: NEMA 42 (110 mm) motors available in 2 stack lengths with minimum torque ratings from 6.0 to 9.82 N-m (850 to 1390 oz-in)
- Speeds up to 3,000 rpm provide for velocity demands of most high torque applications

## Hazardous Duty Synchronous Motors



These synchronous motors are available in UL Listed versions suitable for use in Class I, Division 1, Group D hazardous locations. They provide torque up to 1,500 oz-in (1059 N-cm) and are available in NEMA 42 and 66 frame sizes (110 mm and 170 mm).

- Motor torque up to 1,500 oz-in (1059 N-cm)
- 72 rpm at 60 Hz, 60 rpm at 50 Hz
- 120 and 240 volt AC versions
- UL Listed and CE Certified versions
- UL Listed versions meet Class I, Division 1, Group D requirements
- UL Listed versions have a conduit connection
- CE Certified versions: CE 0081 Ex II 2G Ex d IIC T5
- CE Certified versions have an integral 10 ft (3 M) cable

## EP Series Explosion-Proof Motors



These permanent magnet DC (PMDC) motors are SCRrated and adhere to NEMA standards. They are available in a variety of DC voltages, from 1/4 to 3/4 HP.

- Patented anti-cog magnets for smooth low speed operation
- Polyester-impregnated armature for electrical and mechanical integrity
- High overcurrent capacity and dynamic braking
- Rugged, fused commutator
- TEFC and TENV configurations
- Long life, constant force brush springs with field-replaceable brushes
- Gasketed conduit box with large wiring compartment
- Large sealed bearings, standard
- Class H insulation

## EB Series High-Performance Explosion-Proof Servo Motors



Based on our 230 VAC B and M Series, the Kollmorgen EB Series provides a high-performance explosion-proof servo motor suitable for applications where flammable vapors or gases create a potentially hazardous environment. These motors have been tested and proven capable of withstanding an internal explosion without bursting or allowing ignition to reach outside the motor frame.

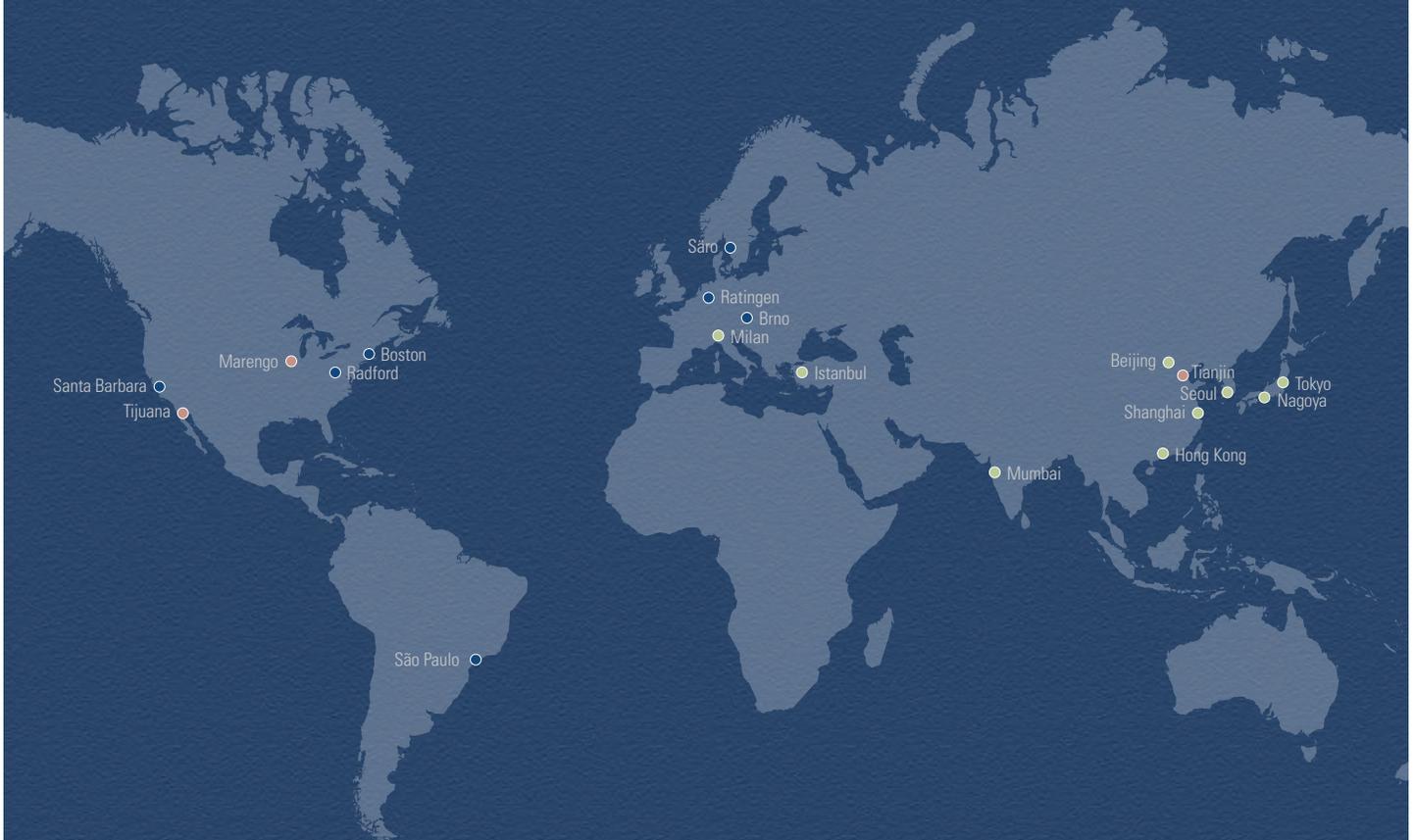
- 230 VAC explosion-proof (Class I, Division 1, Groups C and D)
- Tested and proven capable of withstanding an internal explosion without bursting or allowing ignition to reach outside the motor frame

## About Kollmorgen

Kollmorgen is a leading provider of motion systems and components for machine builders. Through world-class knowledge in motion, industry-leading quality and deep expertise in linking and integrating standard and custom products, Kollmorgen delivers breakthrough solutions that are unmatched in performance, reliability and ease-of-use, giving machine builders an irrefutable marketplace advantage.

**For assistance with your application needs in North America, contact us at: 540-633-3545, [support@kollmorgen.com](mailto:support@kollmorgen.com) or visit [www.kollmorgen.com](http://www.kollmorgen.com) for a global contact list.**

- Application Centers
- Global Design & Manufacturing
- Global Manufacturing



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