

Engineer the Exceptional

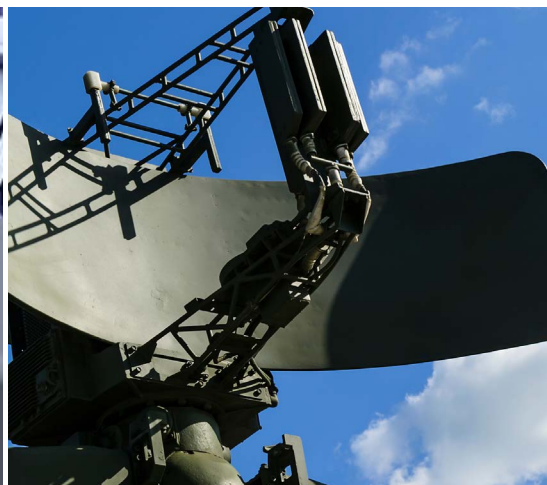
**KOLLMORGEN**  
A REGAL REYNOLD BRAND

# Engineer the Exceptional

To engineer advanced machines, robots and automation systems – and achieve lasting market success – you need a vision of where you want to go and a plan for getting there. You need the most dynamic technology and the collaborative expertise to put it to work. You need reliable supply and support in-region, for-region. You need Kollmorgen as your partner.



SURGICAL ROBOTS



AEROSPACE + DEFENSE



MEDICAL IMAGING



### More Ambitious

For more than 100 years, Kollmorgen has helped engineers bring big ideas to life — from the ocean depths to the surface of Mars, from factory floors to operating rooms and beyond. We believe in the power of motion and automation to build a better world.

### More Capable

Kollmorgen delivers the industry's highest-performing, most reliable motors, drives, linear actuators, AGV control solutions and automation platforms, with over a million standard and easily modifiable products to meet virtually any motion challenge.

### More Confident

We offer manufacturing facilities, distribution and engineering expertise in all major regions around the world, so you can bring a better machine to market faster and keep it profitable for decades to come.



COLLABORATIVE ROBOTS



METAL FORMING



FACTORY AUTOMATION



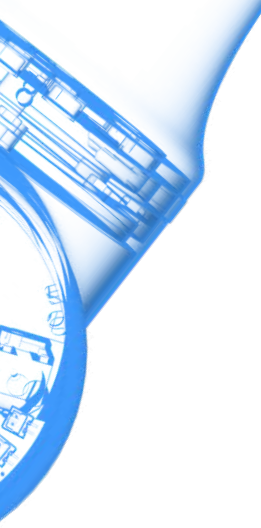
# More Ambitious Machines and Robots

## **YOU HAVE BIG IDEAS. SO DO YOUR COMPETITORS.**

You know the advantages in function and performance that your machine needs to deliver to win in your market. We know motion and how to help you reach your goals for power, torque, precision and fit.

Our products are designed and manufactured to the industry's highest standards of quality and reliability. And our engineers have the domain expertise to fully understand your unique application and ensure you have the ideal motion solutions.

**TOGETHER, WE'LL MOVE YOUR BIG IDEAS TO THE FOREFRONT.**



### SUPERIOR MOTION PERFORMANCE

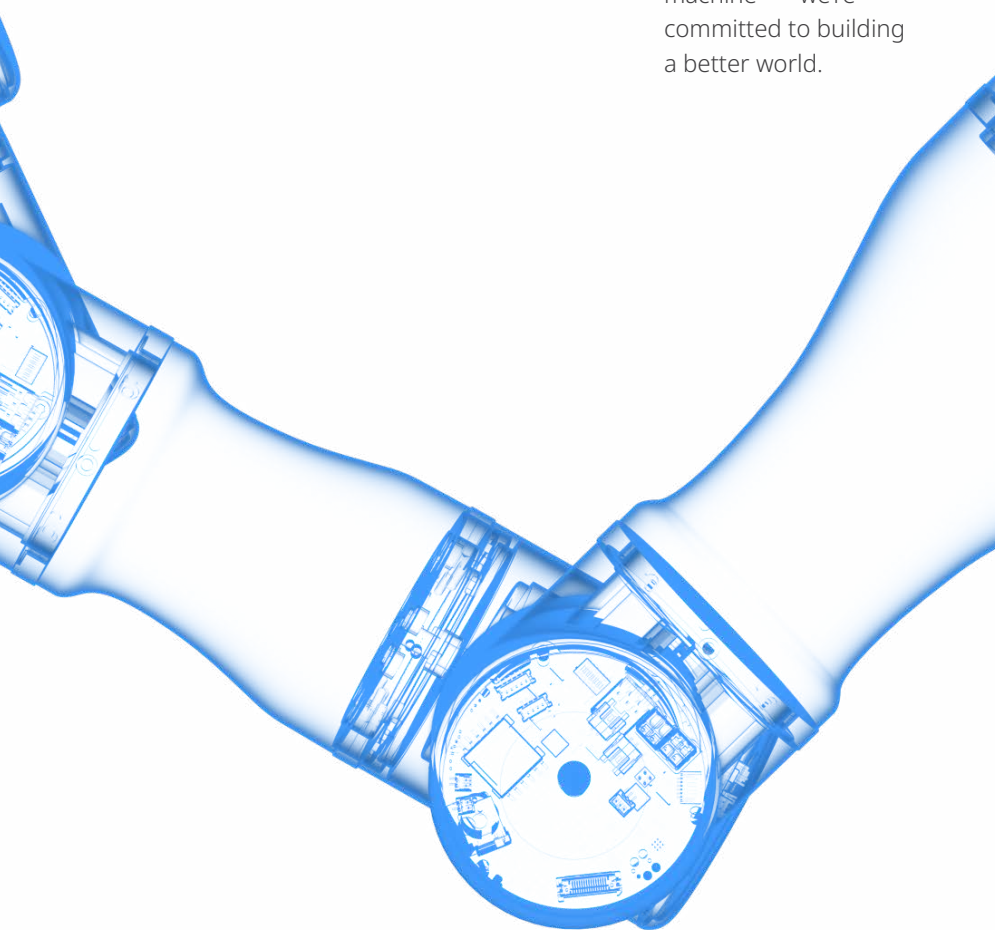
Kollmorgen motors and drives deliver unrivaled power density, torque, responsiveness, efficiency and control in a more compact footprint.

### DEEP MOTION EXPERTISE

We have been solving the most demanding motion challenges for more than 100 years and are ready to work with you, engineer-to-engineer, to solve yours.

### ENERGY-EFFICIENT + SUSTAINABLE

In all that we do — from lean manufacturing processes and optimized production capabilities to delivering energy efficient products that help you create a more sustainable machine — we're committed to building a better world.



### [CASE STUDY]

## HOURS, NOT DAYS

### Power, Precision and Simplicity for Metal Additive Manufacturing

Additive manufacturing and repair uses a solid-state process to fabricate and join metal parts without reaching the melting point. This saves significant energy, eliminates secondary processing steps, and avoids the stresses and other quality problems that plague melt-based processes.

However, there have traditionally been several limitations including maximum size, usable materials and excess waste. Through collaborative engineering, we helped create the machine control software, motion architecture and connectivity needed to synchronize X, Y, Z and A axes with the necessary power and precision.

The solution is revolutionizing the manufacturing industry — while offering the operational simplicity to get machinists up and running in a matter of hours rather than days.

# More Capable Performance

We believe you should never have to fit your machine to an available motion system. Instead, we design motion systems to fit your machine.

We offer the industry's broadest portfolio, including more than a million commercial off-the-shelf motion-control products ready for production and delivery wherever in the world you operate. With deep technical understanding and hands-on experience for each industry we serve, we design products to meet your torque, speed, power, fit and quality requirements without compromise.

## KOLLMORGEN AUTOMATION SUITE™

Accelerate development, increase throughput, minimize scrap and maximize overall equipment effectiveness with our premier machine automation solution.

## 2G MOTION SYSTEM

Our 2G motion system delivers maximum performance and safety, with the highest torque in the most compact motor size. Engineers will also enjoy integrated functional safety capabilities and dual-axis drive capability.

## AKD2G SERVO DRIVES

Get unrivaled power density and control in compact single- and dual-axis models, featuring expandable I/O, removable memory, on-drive SafeMotion™ functions and the industry's first drive-resident graphical display.



## [CASE STUDY]

# 62 MICROSECONDS

Precise Diagnosis for Better Patient Care

## KOLLMORGEN ESSENTIALS MOTION SYSTEM

Get the motion control performance you need with unmatched value, fast delivery, and simple setup. The Kollmorgen Essentials line offers complete systems designed to help machine designers meet diverse motion needs confidently and affordably.

### AKM2G SERVO MOTORS

Get more torque in a smaller package. With AKM2G, you can achieve substantial performance improvements without changing the motor mounting or compromising on your machine footprint.



### TBM2G FRAMELESS SERVO MOTORS

Embedded directly into your machine or robot design, TBM2G motors deliver exceptional torque density in the most compact axial design, with a large ID thru-bore and the ability to sustain full performance at up to 150°C winding temperature.



## STEPPER MOTORS

Get versatility and reliability in an affordable solution that delivers all the torque you need across the speed range.

## WASHDOWN, FOOD GRADE + HYGIENIC MOTORS

Our washdown motors include the AKMH hygienic series, designed to maintain the highest standard of machine cleanliness and reduce the possibility of devastating recalls.

## ADDITIONAL PRODUCTS

- SERVO DRIVES
- STEPPER DRIVES
- LINEAR ACTUATORS
- AGV SYSTEMS
- CABLES AND ACCESSORIES

In CT scanners and MRI machines, microns and microseconds make the difference between blurs and artifacts versus the image clarity needed for accurate diagnosis.

Kollmorgen motion systems provide the acceleration, torque and precision required, for example, to enable a 320-slice CT scanner to produce a detailed 3D model of the heart, coordinating with ECG data to capture images only while the heart is at rest between beats.

Direct drive motors capable of moving massive imaging gantries eliminate transmission complexity, compliance and backlash. Unique software filters compensate for secondary motion in the frame of the machine and prevent the massive gantry from accelerating/decelerating past its target position due to inertia. With servo drives perfectly matched to the motor, servo loops close in as little as 62 microseconds to enable exceptional image clarity.

# More Capable Performance

In addition to offering more than a million commercial off-the-shelf products, Kollmorgen has the unique ability to configure and customize products for an ideal fit in your application.

For our competitors, a custom project means requiring you to take on excessive risk with high startup costs. Time-consuming development cycles. Design and sales engineers who aren't fully committed to your project's immediate or long-term success.

By partnering with Kollmorgen, you eliminate all of these concerns.

We can rapidly prototype your modified design, then ramp up production quickly to meet your needs at any scale. Because our products are designed with these modifications in mind, incremental costs are minimal. And we have the industry's most experienced engineers, including many who have been contributing to Kollmorgen's proven 100+ year heritage for decades.



## [CASE STUDY]

### 90% COGGING REDUCTION

Smooth Operation for High-Precision Cutting

**A SAMPLING OF MOTOR  
MODIFICATIONS**

STACK LENGTHS  
ENCODER OPTIONS  
THERMAL SENSORS

ROTOR HUB GEOMETRIES  
THRU-BORE DIAMETER  
ENVIRONMENTAL SEALING

SPECIAL WINDINGS + GAUGES  
MOUNTING DIMENSIONS + PATTERNS  
DUAL/SINGLE HYBRID CABLES + CONNECTORS



Since the early 1980s, Kollmorgen has worked with a major manufacturer of laser cutting machines to collaboratively engineer new motion control solutions that meet the advancing needs of customers in aerospace, automotive, medical device, electronics and other fast-moving industries.

As one example, Kollmorgen designed a customized motor winding that works with a specialized magnet material to substantially increase the power of an existing cutting

machine without changing the machine's footprint — meeting a customer's extreme high-throughput requirements.

Building on that achievement, we helped engineer a lower-cost version using ironcore instead of ironless motors — significantly reducing costs to reach new markets. Key to that success was our development of a new algorithm to reduce the inherent cogging of ironcore motors by 90%. This version of the machine soon became the company's biggest seller.

# More Confident Engineering

Design machines, robots and vehicles with confidence.

We'll take your custom motion system from initial concept through design and into volume production in a surprisingly short time. Throughout, we'll keep you apprised of what's required, what it will cost, and what to expect. You're always in charge of modification approvals, while we ensure a smooth transition from prototypes to sustainable and cost-effective manufacturing.



Our structured development process is designed to help you meet your most difficult challenges and advance your competitive position.

## INITIAL DESIGN

### Establish Requirements

Power, torque, speed,  
footprint

Quality + environmental  
EMC + other constraints

## ENGINEERING SUPPORT

### Select, Size, Configure

Online 3D models,  
dimensions, specs

Kollmorgen  
Developer Network

Live engineering  
support

## FAST-TURN PROTOTYPING

### Accelerate Development

Extensive product  
modifications

Responsive design +  
manufacturing

Global delivery within  
weeks

## THE KOLLMORGEN DIFFERENCE

**Trusted reliability.** Best-in-class Kollmorgen products have been proven in the harshest environments, the heaviest operating conditions, and in the most delicate to the most powerful tasks.

**Global supply, expertise and support.** With our global footprint of manufacturing, design, application and service centers — coupled with industry-leading quality and compliance programs — you always have access to dependable supply, collaborative engineering expertise and personalized support.

**Continuous progress.** We stay on top of the emerging trends and needs in every industry we serve. We seek out the most talented people and the most promising technologies. We continuously invest in research and development to bring people, ideas and opportunities together to drive real progress.

### ITERATIVE DESIGN

Revise + Refine  
Breadth of products  
Rapid modification  
Upward + downward mechanical scalability

### FINAL DESIGN

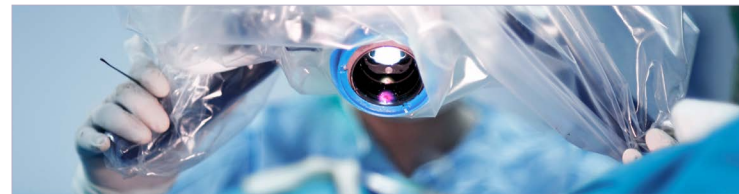
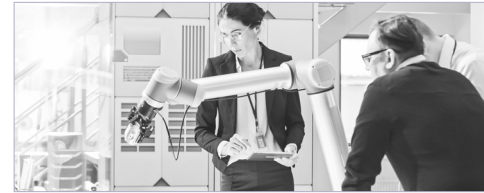
Ensure Production Readiness  
Confirm technical agreement  
Document final design  
Obtain necessary certifications

### PRODUCTION

Ramp Up Production Quickly  
Lean manufacturing  
Repeatable processes  
Quality + inventory control

### LONG-TERM REGIONAL SUPPORT

Maintain Supply + Quality  
Scale up or down as needed  
Comply with global requirements  
Manage costs + delivery schedules



## About Kollmorgen

Kollmorgen has more than 100 years of motion experience, proven in the industry's highest-performing, most reliable motors, drives, linear actuators, AGV control solutions and automation platforms. We deliver breakthrough solutions that are unmatched in performance, reliability and ease of use, giving machine builders an irrefutable marketplace advantage.

[www.kollmorgen.com](http://www.kollmorgen.com)

**KOLLMORGEN**

A REGAL REXNORD BRAND

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