Material Handling and Assembly

Robotic Solutions for All Industries
even need multiple robot control, Yaskawa Motoman process-to-part or part-to-process approach, or you’re handling small or large parts, prefer a solution that can effectively with consumer products of all kinds. And, engineers have helped electronics manufacturers produce their products with unprecedented speed and efficiency. We’ve helped suppliers to manufacture heavy-duty parts with small, precision components with ease. And, we’ve enabled leading companies to go to market effectively with consumer products of all kinds. Whatever your requirements or challenges, we can configure a solution tailored to you.

Proven Impact

Material handling solutions from Yaskawa Motoman have delivered game-changing results for clients of all sizes. We’ve enabled Tier 1 automotive suppliers to manufacture heavy-duty parts with unprecedented speed and efficiency. We’ve helped electronics manufacturers produce their small, precision components with ease. And, we’ve enabled leading companies to go to market effectively with consumer products of all kinds. Whatever your requirements or challenges, we can configure the ideal solution.

Best-in-Class, Across the Board

Our industry-leading, high-speed robots include high-payload, extended-reach, ultra-maneuverable seven-axis and unique 15-axis dual-arm robots. With cutting-edge controllers, vision systems, peripherals and other best-in-class components, we can configure a solution tailored to you.

Committed to Customer Satisfaction

All Yaskawa Motoman solutions are backed by our unwavering commitment to provide exceptional customer service and to ensure your complete satisfaction. You can depend on unmatched quality, integrity and timely service, including 24/7 technical phone support from associates with 100+ years of combined robotics experience. Coupled with regional service technicians throughout the Americas, and support services to maximize robot productivity and longevity, Yaskawa Motoman solutions deliver both world-class performance and true peace of mind.

Easy Automation

Providing powerful, yet easy-to-use, technology for quick and easy implementation of a robot system is our goal. Specifically designed for those branching out into robotics, our Smart Series product line offers simple, intuitive robot programming methods, reducing robot execution complexity and operator training investment. Easily adaptable, these products make automation easy for demanding manufacturing requirements.

Engineered to Perfection

Our experienced application engineers specialize in conceptualizing advanced material handling solutions in innovative, uniquely effective ways. By combining ISO 9001-2015 certified project processes, advanced 3D modeling software and offline simulation tools, we ensure well-executed projects. In addition, critical components such as system safeguarding, application equipment and programming are an integral part of the solution. Leveraging our wide variety of standard components, we can build a solution to fit your specific requirements.

Solutions for Every Application and Industry

Our unique approach to material handling solutions is founded on two core principles: exceptional design and optimal configuration. We start with an industry-leading range of robots, controllers and accessories all engineered for maximum performance. Our specialists then work with customers to determine the best combination of components for their specific needs, including analyzing parts and processes. The combination of best-in-class offerings and expert consultation enables us to deliver outstanding solutions for companies of all sizes with remarkably diverse application needs. Whether you’re handling small or large parts, prefer a process-to-part or part-to-process approach, or even need multiple robot control, Yaskawa Motoman has the solution.
<table>
<thead>
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**TYPICAL APPLICATIONS**
- **ASSEMBLY**
- **MACH TENDING**
- **PART TRANSFERS**
- **PRESS TENDING**
- **FORGE TENDING**
- **PACKING**
- **PALLETIZING**
- **OTHER KITTING**

**Specifications**
- **COLLABORATIVE DELTA STYLE**
- **SCARA ROBOTS**
- **4- AND 5-AXIS ROBOTS**
- **SHELF-MOUNTED ROBOTS**
- **ACTUATOR-BASED**

**APPLICATIONS**
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**APPLICATIONS**

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**Notes**
- Contact Yaskawa Motoman for availability of XP robot models.
- Technical specifications subject to change without notice. Request detailed drawings for all design/engineering requirements.
- † Contact Yaskawa Motoman for various payload models.
Versatility and Power

Using a robot for machine tending applications can avoid the inconsistencies of manual handling and provide quality improvements for metal, polymer, ceramic and composite manufacturers. From boring to milling, grinding and more, automating machine tending tasks can help increase productivity and profitability.

Overview

- Solutions for a complete range of processes, including turning, milling, grinding, broaching and boring
- Standard and heavy payload capability for safe and consistent process automation
- Floor-, wall-, shelf-, tilt- or ceiling-mounted solutions for ergonomic workcell designs using minimum floorspace
- Extended reach work envelopes for increased work range with fewer robots
- Internal cable routing for maximum protection and lower maintenance costs
- Optional fully integrated vision systems for robot guidance, pass/fail, part alignment or verification

Featured Solution

MotoSight™ 2D is a powerful, yet cost-effective, combination of hardware and software designed to solve complex vision problems. Ideally suited for both vision guidance applications and inspection tasks, MotoSight 2D expertly meets the majority of vision requirements.

Common Machine Tending Robots

SEE FULL ROBOT LINE-UP ON PAGES 6-7

Cases for Automation

Large Production Runs – A robotic automation solution can reduce labor costs and allows talented employees to concentrate on higher-value, complex jobs.
Increase Productivity and Efficiency – Robots can deliver exceptional speed and precision, leading to reduced cycle times, increased production volume and less waste or rework.
Secondary Material Processing – Used frequently in common removal and cutting applications, high performance robots and patented robotic tools add versatility and streamline changeovers for low-volume, secondary operations such as deburring, grinding, finishing and polishing, as well as waterjet, ultrasonic, laser and plasma cutting.
Assembly

Overview
- Complete solutions for assembly operations, including part location, part identification, part sorting, feeding, fastening or joining, presence absence, error proofing and visual inspection
- Dual-arm robots with 15 axes and human-like motion, including the ability to maneuver in very tight spaces
- Actuator-driven, seven-axis robots with an unmatched level of flexibility
- High-performance, six-axis robots designed to shorten cycle time and increase throughput
- High-speed, four-axis SCARA robots require minimal mounting space
- 2D and 3D vision capability for operational efficiency
- Easily integrates with a variety of part feeding methods such as conveyors, bowls and flex feeders for production automation
- Extensive product line for dependable productivity combined with exceptional flexibility and scalability

Featured Solutions
A wide variety of end-effectors (or end-of-arm-tooling) enable the robot to grip parts or perform specialized tasks. Options for assembly vary from pneumatic or electric actuated grippers with custom fingers to tube-fed, torque-controlled screwdrivers for precise inserting and tightening of fasteners.

Common Assembly Robots
- Mm5mini
- MY5405P
- GP7
- MOTOmini GP12 GP50

Cases for Automation
- Safety-Critical Component Assembly – Tedious and time-consuming work for the assembly of safety-critical components, including seat belts, air bags and brake assemblies, is well-handled with robotic automation, ensuring fast, efficient production of high-quality parts.
- Final Stage Electronic Assembly – A standalone robotic system offers the highest accuracy and repeatability for the assembly of medical devices, consumer electronic devices and other commercial electronic assemblies.
- Wood Pallet Assembly – Robotic automation provides the flexibility needed to build custom, stringer or block pallets – in a variety of sizes – on the same system. This can alleviate worker fatigue, increase product quality and boost overall productivity.

Precision and Speed
High-speed, precision assembly and small part handling are simple when Yaskawa’s wide range of industrial robotic arms are on the job. Our solutions also help optimize cell space and improve dexterity, with outstanding range of motion and tooling simplification. Whether your application calls for part location, flexible feeding, fastening or joining – with or without visual inspection – Yaskawa Motoman can help.
Dedicated Solutions that Really Deliver

We understand the importance and challenges of part transfer. That’s why we developed a complete line of robots to support transfer of product payloads from 0.5 to 900 kg and to perform a wide range of operations, including handling parts of varied shape and size. For sophisticated applications, our 15-axis robots (with patented servo actuators and all cables routed through the arms) can perform independent operations with each arm simultaneously, delivering optimal efficiency and precision.

Featured Solutions

Precise handling enables Yaskawa robots to handle even extremely delicate and fragile parts quickly and securely. In addition, advanced sensing and programming capabilities mean that unevenly spaced components, different part sizes and layered parts are no problem.

When it comes to heavy-duty applications, Yaskawa Motoman can deliver the power to move your heaviest payloads – including single-robot capacities up to 900 kg. Or, add a lift assist option to expand a robot’s capacity for even heavier loads.

MotoSight 3D BinPick is an easy-to-use hardware and software solution that enables quick and precise recognition of randomly placed parts in bins. Each part is located and its orientation determined, before accurately being presented for the next step in the processing sequence.

Common Part Transfer Robots

Overview

- Flexible handling robots can transfer directly robot-to-robot to eliminate set-down and pick-up time as well as fixturing costs
- Dual-arm robots can transfer directly arm-to-arm for reduced handling and simplified orientation, resulting in improved cycle time
- Robotic handling of large, heavy or odd-shaped parts improves worker safety and ergonomics
- Robot(s) can be synchronized with conveyor systems for precise part handling
- Ideal for a variety of application needs:
  - Simple, repetitive pick and place tasks
  - Complex operations such as sorting and part identification
  - Multi-step processes

Cases for Automation

Delicate Parts – Ideal for precise handling of fragile goods such as glass tubes or sintered metal parts, robots can accommodate unevenly spaced components, different part sizes and part stacking in layers, greatly reducing cycle time.

Injection Molding and Blow Molding – Highly flexible robot systems can efficiently pick and place newly-formed plastic goods from molding machines into a case for conveyor transfer, eliminating downtime and increasing productivity.

Large, Heavy Part Transfer Handling – Particularly suited for large objects, including castings and weldments up to 900 kg, Yaskawa robots facilitate the easy and safe transfer of heavy parts from one assembly line to another, reducing direct labor costs and maximizing throughput.

Dedicated Solutions that Really Deliver

GP8
GP50
GP250
MH900
GP110
GP180
SDA10
GP100
MH1000

Part Transfer
Press Tending

Overview

- Power and durability for heavy-duty press tending and stamping applications
- Robotic automation for quick changeover without sacrificing accuracy, flexibility or operational efficiency
- Patented multiple robot control for precisely coordinated motion and streamlined completion of multi-stage processes
- Elimination of manual press loading and repetitive lifting for significantly improved operator safety

Featured Solutions

PH-series robots feature specialized reducers optimized for high-frequency handling operations and increased vibration ratings enabling them to stand up to the rigors of press forming. Versatile mounting options can add flexibility, save floorspace and maximize performance. Shelf-mounted robots offer a wide range of motion and reduced overall height, making them a good fit for reaching into presses and other machines. Robots can also be mounted on a moving seventh axis for increased versatility and range.

Common Press Tending Robots

See full robot line-up on pages 6-7

Durability that Delivers

For press tending or stamping applications with high duty cycles, our press handling robots are ideal. Designed with heavy-duty drive systems that can deliver in the most demanding applications, these robots also have higher vibration ratings to tolerate the tough conditions often encountered in press rooms.

Cases for Automation

Fully Automatic Press Brake Operation – From small to large parts, robots are ideal for demanding press brake applications, providing consistency, eliminating bottlenecks and enabling “lights out” manufacturing. Various gripper options and flexible regrip/ orientation stations make difficult positioning simple during the bending sequence. Infeed magazines, outfeed pallets, conveyors and other peripherals can be integrated to create a complete solution.

Forming and Press Tending Operation – Designed for part variations and frequent die changes, robotic systems can optimize production while improving worker safety. Automatic tool change, high-speed part shuttles and robot-to-robot part transfer offer increased flexibility, while various robot mounting configurations can accommodate nearly any system layout.

Stacking and Racking – Robots can easily automate end-of-line press automation and quickly load finished parts into racks, bins, pallets or conveyors, optimizing production. 2D and 3D vision systems for location and inspection further enhance end-of-line processes, increasing quality and reducing programming time.
High Performance When the Heat is On

Our toughest industrial robots are designed for high performance under the most intense conditions, enabling automation of numerous casting and foundry processes. Robots can perform die lubrication, sand core processing and even ladling of molten metal. When conditions are most challenging, Yaskawa Motoman solutions continue to deliver.

Overview

- Solutions to withstand common foundry hazards, including coolants, die lubrication, airborne particles (metal spits and grit) and severe heat
- IP67-rated wrist is standard on most Yaskawa robots, offering protection against dust and the effects of water immersion
- Optional XP package provides additional ingress protection for the robot body, allowing it to reliably function when wash-down is required
- For the harshest conditions, specialized jackets are available for further protection against heat and chemicals

Featured Solutions

XP “Extra Protection” Package increases the body protection rating – typically to IP65 – to protect the robot and to ensure long life in harsh environments. Select models are available with anti-corrosive paint for further protection against heat and chemicals.

High durability robot jackets offer increased protection from the most severe environments. Designed with optimal materials and active cooling, these jackets keep the robot functioning reliably in extreme temperatures or where corrosive chemicals are used.

Cases for Automation

- Ladling - Engineered to deliver the same quantity and quality every time, robots skim dross and ladle molten metal, increasing yields and improving worker safety.
- Extracting – Easily equipped and programmed to remove castings, robots reliably perform to reduce process variation while increasing consistency and speed.
- Degating – Robotic automation can be used for loading, unloading and removing excess material from the casting, improving casting output and quality while providing a safer working environment.

Common Die Cast and Forge Robots

See full robot line-up on Pages 8-9
Pick, Pack, Palletize

Featured Solutions

PalletSolver® software features powerful pattern-generation tools that facilitate quick changeover of patterns or products without halting production for manual programming. With PalletSolver, palletizing is simple and quick, allowing for maximum efficiency and uptime.

MotoPick™ is the state-of-the-art software solution that combines high-speed vision, simultaneous line tracking of up to two lines per robot, and built-in, user-friendly scheduling algorithms to task multiple robots for synchronized picking operations.

Cases for Automation

High-Speed Sorting and Product Placement – Fast and reliable delta robots can efficiently complete primary packaging needs, such as sortation and orientation, in preparation for downstream operations.

Control Flexibility – Through the use of MLX300 and conveyor tracking, Yaskawa robots seamlessly integrate into existing automation components, minimizing integration time.

Automated Palletizing – Palletizing can be one of the most effective parts of your packaging line to automate. Dedicated palletizing robots with payloads ranging from 50 to 800 kg, work tirelessly, eliminating inconsistencies and worker injuries.

Overview

• Select models available with NSF-H1 certified food grade lubricants for use in food-processing environments
• Robotic solutions for a wide variety of industries, including food and beverage, warehouse and distribution, industrial products and more
• MotoSight 2D and 3D vision solutions add intelligence to your packaging line by enabling robotic identification, picking, inspection and sortation with minimal human involvement
• Fully integrated, turnkey robotic systems customized to your unique requirements are available through Yaskawa Motoman or our expert strategic partners
• High-speed picking, sorting or part transfer with both high cycle and accuracy rates, for a wide range of payloads

• A wide variety of robots with robust payload capacities can automate repetitive processes that require speed and precision, such as layer-forming and palletizing/depalletizing applications
• Easy-to-use, simple-to-integrate software options:
  - MotoSight software for vision-guided applications
  - PalletSolver software for case or bag palletization
• Conveyor tracking technology enables robots to accurately monitor, pick up, place and manipulate objects on moving conveyors in a coordinated fashion
• The MLX300 Software Option enables robot programming and control in a standard PLC programming environment

End-to-End Automation

Whether your application calls for picking, packing, end-of-line palletizing, container unloading, warehouse inbound depalletizing or outbound mixed pallets, we offer a complete line of robots to pick from. With 4 to 15 degrees of freedom and payload capacities ranging from 0.5 to 900 kg, our robots allow you to pick single cases or entire layers for palletizing or depalletizing tasks.

Common Pick, Pack, Palletize Robots

SEE FULL ROBOT LINE-UP ON PAGES 6-7
The Smart Choice for Easy Automation

Specifically designed for manufacturers branching out into robotics, Yaskawa Motoman’s Smart Series suite of products allows quick and easy implementation of a robot system. Unlike traditional, more complex, robot execution which requires significant upfront investment in training, Smart Series technology provides simple, intuitive robot programming methods for novice programmers. Easily adaptable to changing manufacturing requirements, these products can readily be redeployed.

Faster, Efficient Operations

Our versatile robotic solutions minimize errors and reduce costs for sortation, order picking and loading/unloading in warehouse and distribution environments. Robust Robot Operating System (ROS) support speeds integration of robots and vision systems with existing warehouse management software and automation.

- Ideal for a variety of inspection, machine tending and other handling applications.
- Simplified, efficient technology without losing powerful functionality.
- High-performance, industrial robots.
- Variety of gripper, sensor and vision options.
- Easy-to-use; minimal robot experience required.
- World-class customer support.

Smart Series products include MotoMini, GP7, GP8, GP12 and HC100DT robots, along with the intuitive Smart Pendant and ultra-compact YRC1000micro controller. Available through authorized Smart Series distributors.
Control and Programming

Overview
- Core software offering superior reliability, proven through use in manufacturing plants worldwide
- Adaptable technology to meet the needs of diverse applications, ranging from handling to painting, welding and more
- Patented multiple robot control – up to 8 robots/72 axes with coordinated motion between devices – enables higher productivity and lower integration costs
- Streamlined development, training and support for plant personnel to ensure a smooth system installation and ongoing operation at peak efficiency
- Comprehensive set of user-friendly, standard software functions allows for efficient programming in a variety of application environments

Featured Solution
MotoSim® EG-VRC is a comprehensive software package that provides accurate 3D simulation of robot cells. This powerful simulation software can be used to optimize robot and equipment placement, as well as performing collision detection, reach modeling and cycle calculations. MotoSim also enables accurate offline programming of complex systems.

Controllers
The YRC1000 is compact, fast and precise. It is built to a global standard and does not require a transformer for input voltages ranging from 380VAC to 480VAC. The YRC1000 features integrated machine and functional safety for simplified setup.

The smallest robot controller in its class, the ultra-compact YRC1000micro minimizes installation space and optimizes performance with power and precision. Ideal for factories with high-density layouts, the YRC1000micro can be installed in a vertical or horizontal position, or in a 19-inch rack.

Small, powerful and open, the FS100 controller is designed for packaging, small parts handling and assembly applications. Its open software architecture enables OEMs, machine builders and system integrators to develop customized software solutions.

Programming
Ideal for novice robot programmers, Smart Pendant supports powerful controller functionality while providing simplified programming and fast, efficient implementation of a robot system. Built-in, patented Smart Frame technology eliminates the use of coordinate frames; the robot adapts to the user.

The Standard Pendant is an ergonomic, lightweight teach pendant with intuitive features for efficient robot command. Its touchscreen user interface enables quick and simple robot programming. A convenient USB connection allows service staff to directly comment for remote service purposes.

The MLX300 Software Option enables the operator to control and program Yaskawa robots in a standard PLC programming environment; knowledge of specialized robotic programming language is not required. System design and environment is simplified due to reduced I/O boards, hardware and networking requirements.

Command and Control
Regardless of your comfort level with industrial robots, we have a solution to fit your needs. Whether you are an experienced robot user, depend on an expert PLC staff, or are just starting to explore ways to handle parts robotically, we offer options to put you firmly in control.
Make the Most of Your Investment

Yaskawa Motoman is committed to complete customer satisfaction at every stage of the project life cycle. Our Yaskawa Support Services team nurtures long-term customer relationships through a wide range of solutions that help maximize uptime, accelerate ROI and ensure long-term performance.

Field Service
Experience minimal downtime
- 24/7 dispatch
- 99.95% first time fix rate
- Grease analysis and torque sampling

Parts
Maintain operational success
- Over $30m of inventory
- 90% first pass fill rate
- 24/7 emergency parts availability

Training
Empower employees with the knowledge they need
- IACET accreditation
- 13,400 square feet of classroom space with 60+ dedicated robots
- 2:1 student-to-robot ratio
- Remote and on-site training available

Repair and Retrofit
Dramatically increase productivity
- Certified pre-owned robots
- Extend the life of your robot through rebuilds, upgrades and retrofits
- Each option comes with a 1-year warranty

Life Cycle Management
Optimize ROI and system throughput
- Regional Technical Managers strategically located throughout the country
- Preventative and predictive maintenance planning
- Complete line modernizations

One robot or hundreds, Yaskawa Motoman is committed to every customer.

Technical Support
Just a call away
- 24/7 expert coverage
- Highly skilled technicians; 100+ years combined experience
- Online self-troubleshooting including FAQs and how-to videos
Leaving a Legacy

In a time of rapid industry growth, enabling sustainable workforce development and providing competitive career pathways for students are both vital and challenging. Yaskawa Motoman is committed to addressing these critical needs with innovative products, curriculum, training certification and services for education and industry.

Hardware

STEM Robotics Platform
- Designed for education and training programs in advanced manufacturing and robotics
- Ideal for classrooms, labs, and training centers
- Teach robotics with the same equipment used in factories

MotoSim Touch
- PC-based offline programming environment and robotics simulation tool
- Designed specifically for K-16 schools, training organizations, and educational research institutions
- Simulates a fully functional production environment

Software

MotoSim
- Comprehensive software enables accurate 3D simulation of robot cells
- Optimize robot and equipment placement with virtual testing
- Collision detection, reach modeling, and cycle calculations

Yaskawa Academy Learning Management System (LMS)
- Online training tool for skill-based robotics education
- Curriculum designed for classroom, lab, manufacturing training, and industrial certification programs
- Accessible via standard browsers for secure, 24/7 access

Certification

Yaskawa Academy offers two certification programs
- Train-the-Trainer Program is designed specifically for educational institutions to provide students with a Yaskawa industrial robotic credential. It provides training, resources, and tools for instructors to teach a robotics credentialing course.
- MERIT (Motoman Endorsed Robotics Instructor Training) is designed for instructors of educational institutions and to support workforce development certification with industry. This program enables instructors to deliver the same curriculum and instructional model as Yaskawa Academy to local manufacturers.

We Enable Real-World Success Stories

Yaskawa Motoman’s commitment to excellence extends beyond simply delivering exceptional products, user education and customer support. Our passion for providing high-quality, innovative automation solutions is rooted in our desire to help our customers be competitive leaders in their industries and markets.

While we work with a number of Motoman Strategic Partners for individual application needs, our Automation Group (AG) is a single source for robots, application process expertise, controls, programming, handling systems and safety solutions that can be integrated with legacy systems. With a large staff of experienced engineers, the AG team can design, build, test, and install fully integrated, custom automation solutions.

Software

MotoSim Touch
- PC-based offline programming environment and robotics simulation tool
- Designed specifically for K-16 schools, training organizations, and educational research institutions
- Simulates a fully functional production environment

Driving customer success is at the core of every discipline within our company and spans the complete project life cycle. First, we thoroughly evaluate application needs to understand your unique requirements and challenges. This analysis drives the development of a configured solution specifically for your application. Next, we complete installation and training, with a strong focus on ensuring a positive on-boarding experience. Support doesn’t end with installation – our goal is always total customer satisfaction, ensured by a dedicated AG Project Manager who oversees and coordinates all project details.

The life cycle continues with world-class support, post-installation review and continuous improvement recommendations to sustain your cycle of success.

With Yaskawa Motoman, you can count on a committed partner with a proven track record of industry-leading innovations. In addition to our material handling solutions, we are a world leader in fully integrated welding workcells, best-in-class arc and spot welding robots, and high-performance part positioners. Whether you need standard products or a fully customized solution, Yaskawa Motoman is the ideal partner to achieve your goals – and drive your long-term success.
YASKAWA

yaskawa-motoman.com

100 Automation Way | Miamisburg, OH 45342 | 937.847.6200

YASKAWA ROBOTS CAN BE USED FOR A WIDE VARIETY OF APPLICATIONS INCLUDING ARC AND SPOT WELDING, ASSEMBLY AND KITTING, CUTTING (LASER, PLASMA, ULTRASONIC, WATERJET), DISPENSING, INSPECTION, MATERIAL REMOVAL, PAINTING AND STEM EDUCATION. THESE ROBOTS CAN ALSO BE USED FOR HANDLING APPLICATIONS SUCH AS PICKING, PACKING, PALLETIZING, INJECTION MOLDING, LOAD SHEETS, PARTS TRANSFER, PRESS TENDING AND SORTING. PLEASE CONSULT YASKAWA MOTOMAN TO CONVERT ROBOT MODEL FROM PRIMARY APPLICATION.