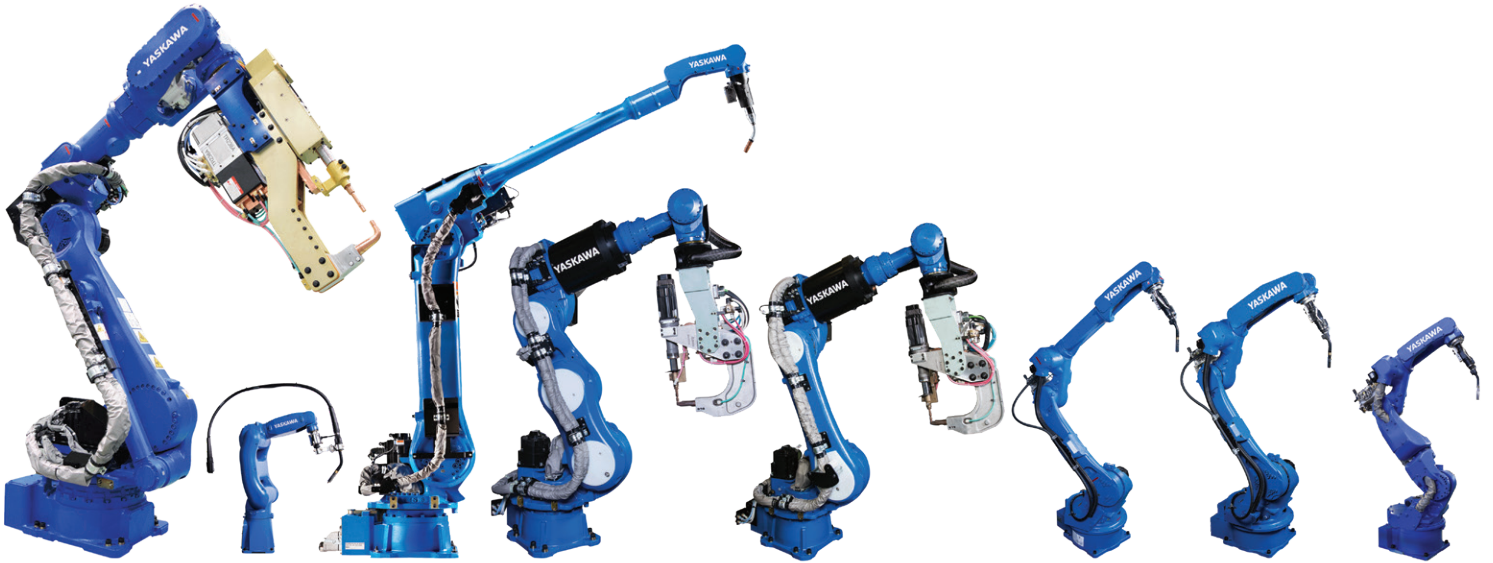


**YASKAWA**

# Robotic Welding

Solutions for All Industries





# A Legacy of Excellence

## OVER 100 YEARS OF INNOVATION

Yaskawa Motoman has created robotic arc welding solutions that seamlessly integrate robots, welding equipment, servo-controlled positioners, workcell safeguarding and software.

**The result:** turnkey and customized solutions that deliver unmatched speed, accuracy, reliability and versatility for customers spanning diverse industries.

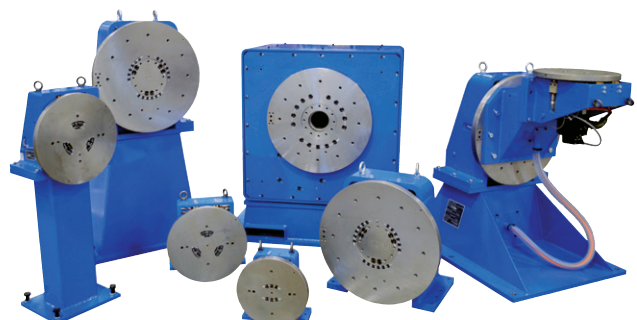
## Components for Every Application and Industry

Our unique approach to arc welding solutions is founded on two core principles: exceptional design and optimal configuration. We start with an industry-leading range of workcells, robots and positioners, all engineered for maximum performance, and regularly enhanced and expanded based on real customer results. Our specialists then work with customers to determine the best combination of components for their specific needs, from analyzing parts and processes, to considering details such as inertia characteristics, motor torque curve and bearing loading parameters for positioners.

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 producing 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.

## Proven Impact

Robotic welding solutions from Yaskawa Motoman have delivered game-changing results for clients of all sizes. We've enabled Tier 1 automotive suppliers to produce high-volume parts with unprecedented speed and efficiency. We've helped construction machinery manufacturers create their heaviest-duty parts with ease. And, we've equipped job shops with flexible, cost-effective solutions that adapt easily to shifting market needs. Whatever your requirements or challenges, we can configure the ideal solution.



## Engineered to Perfection

Our experienced application engineers specialize in conceptualizing advanced robotic welding solutions in innovative, uniquely effective ways. By combining ISO 9001-2015 certified project processes, advanced 3D modeling software and offline proprietary 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. In most cases, a pre-engineered ArcWorld® workcell is a perfect fit. If not, we can provide options such as modified workcells or custom solutions from our Automation Group, or we can refer you to an integration partner.

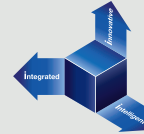
## Best-in-Class, Across the Board

Yaskawa Motoman positioners are designed for welding, built in the U.S. and life-tested for reliable performance. Our industry-leading high-speed robots include multiple payload, extended-reach and ultra-maneuverable seven-axis models for arc and spot welding. Innovative process features, such as a thru-arm torch and an integrated spot harness, provide improved cycle time and reduced downtime. Our advanced controller includes menu-driven welding software, digital weld interfaces and coordinated motion, as well as managing up to eight robots with a single controller and programming pendant.

Beyond our own components, we partner with leading companies to offer power sources, torches, spot guns and other key elements, creating solutions that are world-class from end to end.

## 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 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.



## *i<sup>3</sup>*-Mechatronics

Amid the rapidly changing manufacturing industry, Yaskawa strives to create value-added products that foster growth for our customers. This has led to the development of new three-dimensional solutions that intertwine smart technologies with the human element to maximize productivity, enabling the next generation of factory automation.

*i<sup>3</sup>*-Mechatronics, Yaskawa's vision of Industry 4.0, is an integrated, intelligent and innovative approach that combines classical mechatronics, information and communications technology with new digital solutions.

### Visualize Your Operations

A key component of *i<sup>3</sup>*-Mechatronics is **Yaskawa Cockpit™**, a state-of-the-art software platform that easily monitors, accumulates and visually delivers operational data in real time via an integrated approach, providing the ability to synchronize all factory and operational knowledge for data-driven optimized planning. Yaskawa Cockpit provides companies with the flexibility needed to oversee the health, status and performance of networked production environments.

Yaskawa Cockpit is one of the first robot management systems that is extensible; non-robot devices throughout the factory can be incorporated with Add-on Functions. All processed data can be forwarded to external resources for utilization of AI-based Big Data analytics using its standard Open Platform Communication Unified Architecture (OPC UA) interface which allows data to be shared throughout the extended enterprise or external systems.



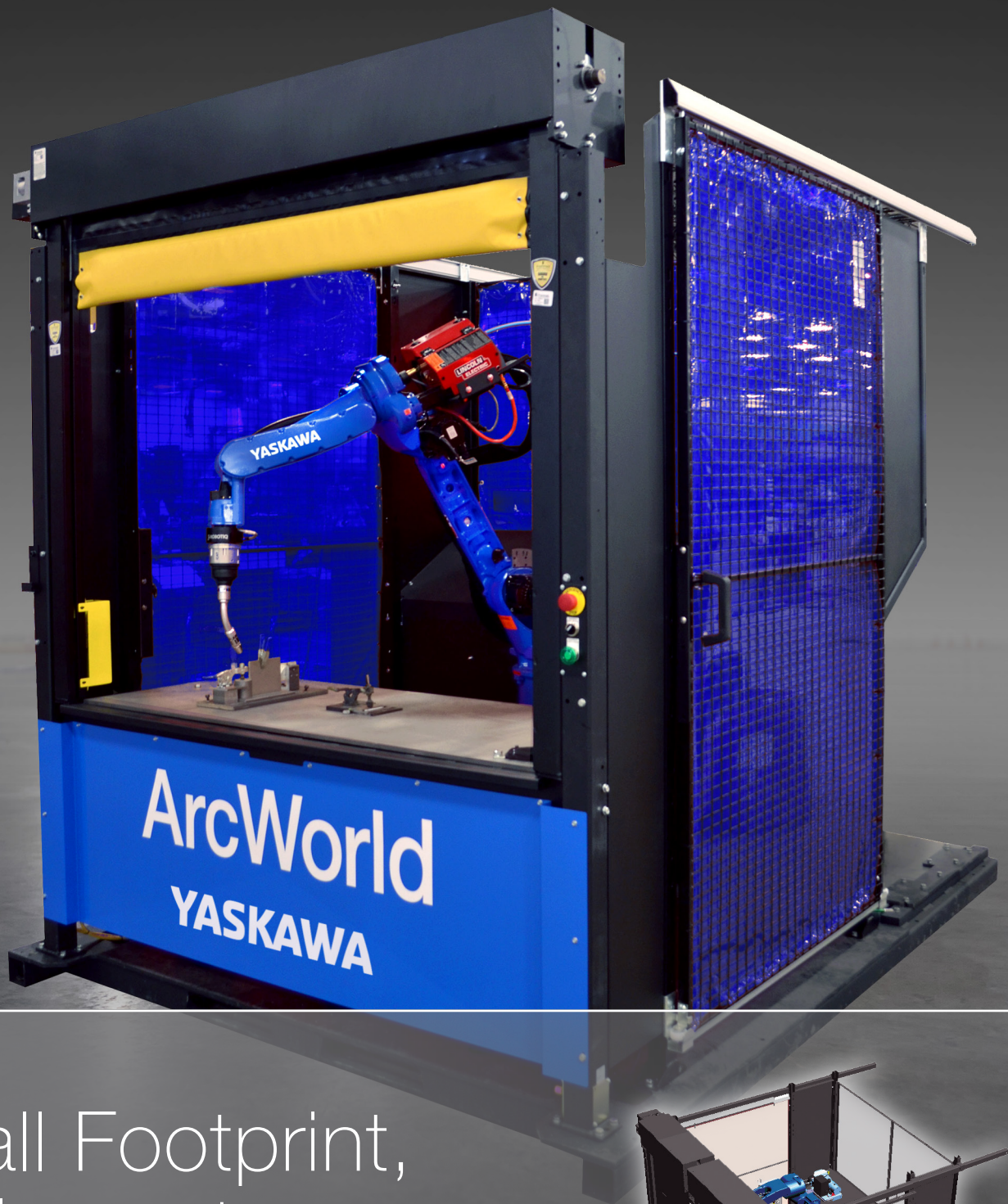
## Fully Integrated Arc Welding Solutions

Yaskawa Motoman can work with you to select the optimal robotic welding solution for your specific needs. As a starting point, this chart can help you identify key attributes and requirements.

CHARACTERISTICS	Compact Workcells				Medium Production Workcells			
	AW50	AW50S	AW52	AW52S	AW200	AW500	AW1000	AW1200
<b>Part Size</b>								
Less than 1 meter	■	■	■	■	■	■	■	■
1 to 3 meters	■	■			■			
Greater than 3 meters								
<b>Part Weight</b>								
Up to 500 kg	■	■	■	■	■	■	■	■
500 kg to 1,255 kg							■	■
1,256 kg to 2,355 kg								
Greater than 2,355 kg								
<b>Welding Stations</b>								
1 Station	■	■					■	■
2 Stations			■	■	■	■		
<b>Part Positioning</b>								
Table	■		■		■			
Turntable							■	■
H-Frame								
Ferris Wheel								
Headstock/Tailstock		HS only		HS only		■		
<b>Cell Loading</b>								
Overhead Robots								
Forklift/Hoist					■	■		
Track/Other Automation								
<b>Size of Robot</b>								
AR1440	■	■	■	■	■	■	■	■
AR2010							■	■
AR3120								
AR1440E			■	■	■	■		
Spot Welding Robots		■					■	■
<b>Number of Robots</b>								
1 Robot	■	■	■	■	■	■	■	
2 Robots								■
3 Robots								
Greater than 3 Robots								

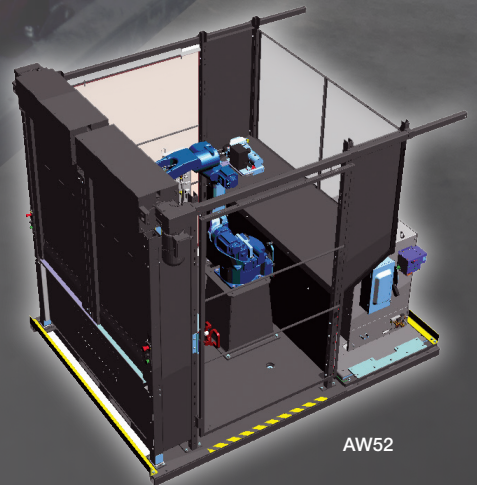


High-Volume Workcells			Large Workcells		Modified Workcells				
AW6000	AW6200	AW6300	AW2000	AW2200	AW4000	AW4200	AW4300	AW6400	AWV-6400
■	■	■	■	■	■	■	■		
■	■	■	■	■	■	■	■		
	■	■	■	■				■	■
■	■	■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■	■	■
■	■	■	■	■				■	■
			■	■					
■	■	■	■	■	■	■	■	■	■
			■	■					
			■	■					
					■	■	■		
■	■	■						■	■
			■	■					
									■
■	■	■	■	■				■	■
			■	■					■
■	■	■			■	■	■	■	■
■	■	■	■	■	■	■	■	■	■
			■	■					
■	■	■							
■	■		■	■	■	■			
■			■		■				
	■			■		■			
		■					■		
								■	■



## Small Footprint, Big Impact

These efficient ArcWorld workcells deliver powerful performance in a compact package. These mid-range workcells feature reduced floorspace and are ideal for low- to medium-volume fabrication, such as job shop and automotive component applications.



## Overview

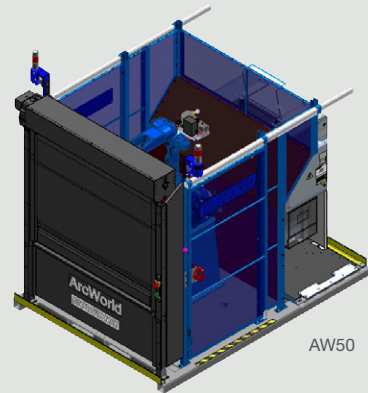
- Efficient, repetitive high-mix production
- Designed to handle small- to medium-sized parts
- Small footprint for efficient use of space
- Pre-assembled on a common base for quick setup and relocation
- Six- or seven-axis robots for maximum flexibility
- One part station for larger part size or two part stations for higher productivity
- Stationary table for lower cost or part positioner for greater flexibility
- Easy access to components for simplified maintenance and fast service

## AW50 | AW52 | AW50S | AW52S

Mid-range workcell, low- to medium-volume fabrication.

- Automotive-grade powered roll-up door for high-speed operation
- Power supplies and controller are mounted on sub-base which can be pulled out for servicing access
- “S” models feature one or two headstocks, allowing for part positioning during welding to increase efficiency and productivity
- High productivity without increased footprint or integration complexity

**Part Positioning:** Fixed or MH185



## Workcell Specifications

Cell	Guarding	Common Base	Number of Robots	Welding Stations	Positioner Type	Payload Capacity (kg)	Max Part Size (mm)
ArcWorld 50	Roll-up Door	Standard	1	1	Flat Table	250	1,650 x 685
ArcWorld 52	Roll-up Doors	Standard	1	2	Flat Table	250	775 x 685
ArcWorld 50S	Roll-up Door	Standard	1	1	Headstock	185	1,300 x 700
ArcWorld 52S	Roll-up Doors	Standard	1	2	Headstock	185	550 x 700



## Time Saving Options

Maximize the efficiency of your robotic weld cell with our time and money saving options. All of these valuable options are designed to work seamlessly in your new cell without expensive additional integration.

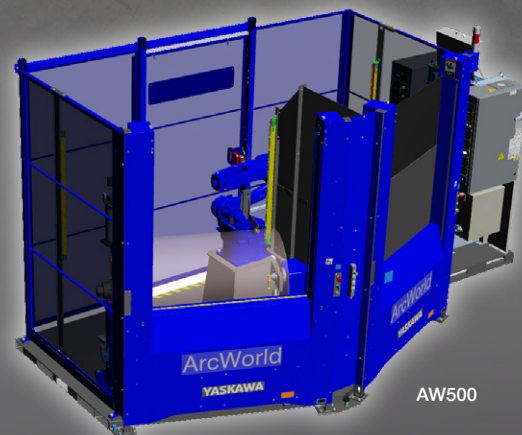
- Tip change boxes enable safe torch maintenance between cycles without entering the cell
- Multicolored light beacons signal cell status that is visible to anyone on your manufacturing floor
- Low wire and gas flow sensors prevent scrapped parts due to bad or incomplete welds
- A secondary enabling switch allows an additional user to safely enter the work area while teaching the robot
- Proface HMI operator station adds easy-to-use user interface with cell information, alarms and jobs
- Bulk wire kits provide no-friction conduit for reliable feeding of weld wire from drum to robot wire feeder
- Fume exhaust hoods connect easily to exhaust or filtration systems to protect from weld fumes





# Versatility that Gets the Job Done

With more robust capabilities than our compact ArcWorld workcells, these models are designed to be versatile workhorses that can deliver whatever your application demands. Whether you need dependable production of small- to medium-sized parts, or affordable wire-to-weld solutions for medium-volume welding applications, these proven models are a perfect choice.





## Overview

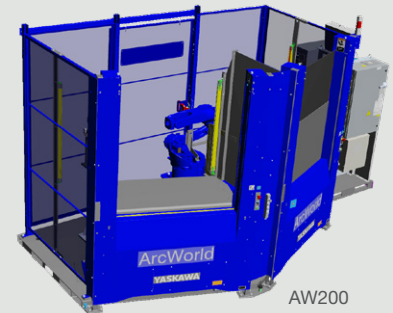
- Space efficient, two-station workcells for higher productivity
- Designed to handle small- to medium-sized parts
- Pre-assembled on a common base for quick setup and relocation
- Six- or seven-axis robots for maximum flexibility
- Robust positioning equipment for higher volume automotive production

## AW200 | AW500

**Affordable wire-to-weld solutions for small- to medium-sized parts produced at medium to high volumes.**

- Cost- and space-efficient workcell for contoured parts less than one meter long
- Electric door guard provides rapid operation with torque limited for safety
- Two stationary workstations, a centrally located operator station and a large work area enable optimal flexibility and efficiency
- Workstations can be tooled for different parts or can be used for sequential operations
- High robot utilization and no positioner index time contribute to optimal productivity

**Part Positioning:** Fixed or MHT185



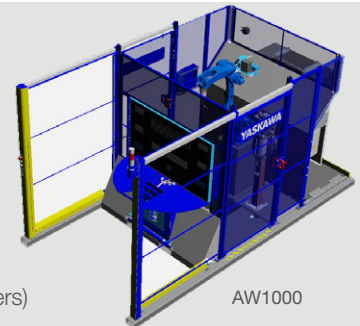
AW200

## AW1000 | AW1200

**Designed for light- to medium-volume production.**

- High-speed servo turntable with multiple payload and tabletop options
- Functional Safety Unit (FSU) with L-shaped light curtains for enhanced safety
- Available with one or two AR1440 robots for double productivity
- Optional fixture plates for quick change tooling

**Part Positioning:** MSR-series (355, 655, 1,055 kg payload capacities | 1,524, 1,828 mm tabletop diameters)



AW1000

## Workcell Specifications

Cell	Guarding	Common Base	Number of Robots	Welding Stations	Positioner Type	Payload Capacity (kg)	Max Part Size (mm)
AW200	Electric Door	Standard	1	2	Flat Table	500	1,300 x 600
AW500	Electric Door	Standard	1	2	Headstock / Tailstock	550	1,072 x 750
AW1000	Light Curtain	Standard	1	1	Turntable	355/655/1,055	1,000 x 650
AW1200	Light Curtain	Standard	2	1	Turntable	355/655/1,055	1,000 x 650



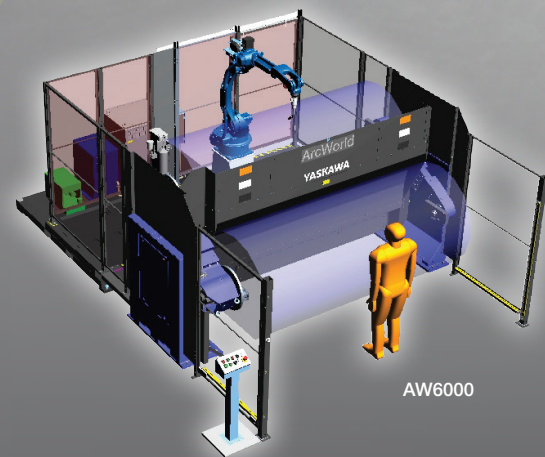
## Common Mounting Platform

The common controller assembly, featured on each ArcWorld, keeps all components easily accessible for setup or maintenance, and maintains familiarity from one ArcWorld model to another. Designed with a compact footprint on a portable base, this assembly includes the robot controllers, power and controls enclosures, welding power supplies, transformer and other accessories.



# Power to Perform

When your application demands higher performance at peak volumes, the ArcWorld 6000 family steps up to the challenge. These popular solutions feature an industry-leading blend of flexible configurations, space efficiency and high-performance positioner technology.



AW6000



## Overview

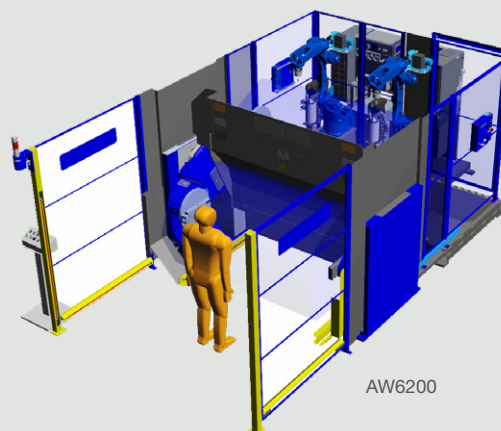
- A ferris wheel positioner is the most space-efficient method to index long parts
- Rapid station index times (3 to 5 seconds) for optimal throughput
- Various workcell configurations, including multiple robots and extended-reach options for maximum span width flexibility
- Multiple positioner payload capacities and spans with two profile configurations
- Common cell base provides elevated platform for safe programming environment and protection of routed cables
- Functional Safety Unit (FSU) prevents load station from moving when loading and allows axis jogging from operator station
- Manual jog capability for ergonomic part loading or part tacking
- Optional slip rings with air and Ethernet communication to automated fixturing for longer cable life on rotating tools
- Integrated weld grounds with high-amperage capacity for multiple robots

## AW6000 | AW6200 | AW6300

### High capacity positioner for heavy parts.

- Locking pins on robot and load station arms to prevent motion of part being welded while heavy parts are hoisted onto second load station
- The RM2-755 positioner features a sealed drive that eliminates most maintenance needs while expanding the life of the positioner
- The RM2-1255 positioner incorporates an easy-to-fill automatic lubricating device on the heavy-duty drive
- Our standard ferris wheel positioners offer tooling diameters up to 1.3 meters and spans up to 3 meters for part flexibility and optimized cycle time
- Higher capacity positioners available for larger parts

**Part Positioning:** RM2-series (755, 1,255 kg payload capacities)



## Workcell Specifications

Cell	Guarding	Common Base	Number of Robots	Welding Stations	Positioner Type	Payload Capacity (kg)	Max Part Size (m) Length x Dia
ArcWorld 6000	Light Curtain	Cell Base	1	1	Ferris Wheel	755/1,255	3.0 x 1.3
ArcWorld 6200	Light Curtain	Cell Base	2	1	Ferris Wheel	755/1,255	3.0 x 1.3
ArcWorld 6300	Light Curtain	Cell Base	3	1	Ferris Wheel	755/1,255	3.0 x 1.3

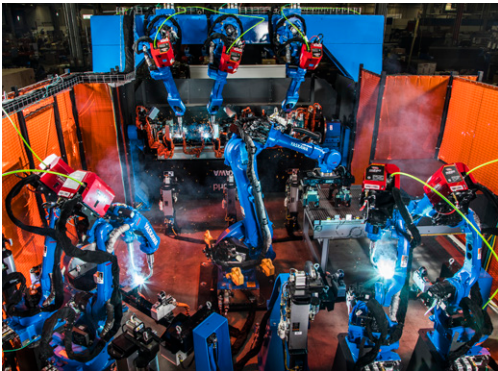


## Multiple Robot Control

The YRC1000, Yaskawa Motoman's patented multiple robot controller, allows coordination of up to eight robots (or 72 axes) using a single controller. This results in exceptional application flexibility, HyperProductivity® and lower integration costs. Controller modules reduce cost by eliminating processors and teach pendants for multiple robots. Integration cost is reduced due to a single control point for safety and PLC connections. FSU is included with single or multiple robot workcells.

# Bigger and Better

When it comes to large parts (up to five meters and 6,300 kilograms) and heavy-deposition welding, only a truly heavy-duty solution will suffice. Our large ArcWorld workcells deliver maximum power for performance on a whole new scale, without sacrificing safety features and ease of integration that characterize our smaller workcells.



## Overview

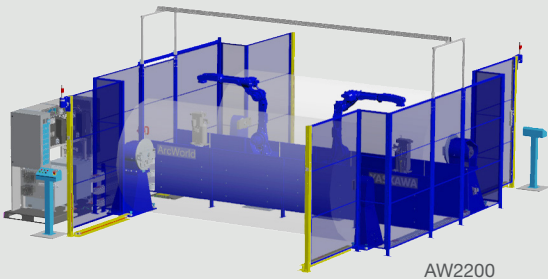
- Multiple positioners and robot options combine to deliver a modular solution ideal for heavy transportation, agriculture and construction equipment
- Opposing workstations take full advantage of robot reach and allow continuous welding during part loading
- Supports a variety of part spans (2-, 3-, 4-, 5-meter) with extended reach or multiple robot configurations
- Single-station configuration or “blank” stations without positioner(s) for customer-supplied tool
- MotoMount™ fixture mounting system eliminates laser or transit alignment procedures for fast positioner setup and improved equipment life
- Common equipment base with wireways eases setup and provides cable management

## AW2000 | AW2200

Designed for larger, heavier part production.

- Wire mesh safety fencing or solid panels for perimeter guarding
- Push-button operator station with manual job switch and 4-digit thumbwheel switch
- Coordinated motion software simplifies teaching of circumferential welds around contoured parts
- Optional light beacon, touch screen operator HMI and inside light curtains

**Part Positioning:** MHT-series (1,075, 3,000, 6,300 kg maximum payload)



## Workcell Specifications

Cell	Guarding	Common Base	Number of Robots	Welding Stations	Positioner Type	Payload Capacity (kg)	Max Part Size (m)
AW2000	Light Curtain	Cell Equipment	1	1 or 2	Blank, Fixed MHT	Up to 6,300	Up to 4.0
AW2200	Light Curtain	Cell Equipment	2	1 or 2	Blank, Fixed MHT	Up to 6,300	Up to 5.0



## Total Safety Environment

ArcWorld solutions are designed to comply with the ANSI/RIA R15.06-2012 standard. Our total safety environment features complete barrier guarding, dual-channel E-Stop functionality, tamper-resistant interlocks, single-point operator control, control-reliable integrated Functional Safety Unit (FSU), interlocked access door(s), arc flash protection and dual-channel light curtains for optimal safeguarding and peace of mind.

## Overview

- Innovative solutions designed for specific customer requirements at a cost-effective price
- Multiple robots can be positioned to minimize weld and cycle time, maximize output and reduce floorspace
- HyperProductivity includes the industry's fastest multiple robot control, high-speed positioners and leading-edge process technology
- Ergonomic configurations combine optimum load and program heights, multi-station part positioning and menu-driven weld interfaces to make the best use of employee time and effort
- Material handling robots can be integrated into arc welding workcells for improved ergonomics and productivity

## AW4000 | AW4200 | AW4300 | AW6400

### High-performance workcell with high-speed positioner.

- Double-ended headstock/tailstock positioners boost efficiency and productivity with part positioning on two stations simultaneously
- Coordinated motion provides the ability for the robot to weld contoured parts that are turning on the positioner

**Part Positioning:** MSR2S (500, 750 kg payload capacities), RM2-series

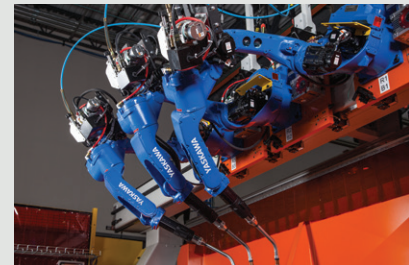


## AWV-6400

### Space-saving integrated overhead robot mounting structure.

- Ideal ergonomics with a single load/unload point, open access for programming and open rear floorspace for automatic unloading
- Multiple robot control provides coordination of robots and positioner axes from single teach pendant

**Part Positioning:** RM2 (1,555, 2,355 kg payload capacities)



## Workcell Specifications

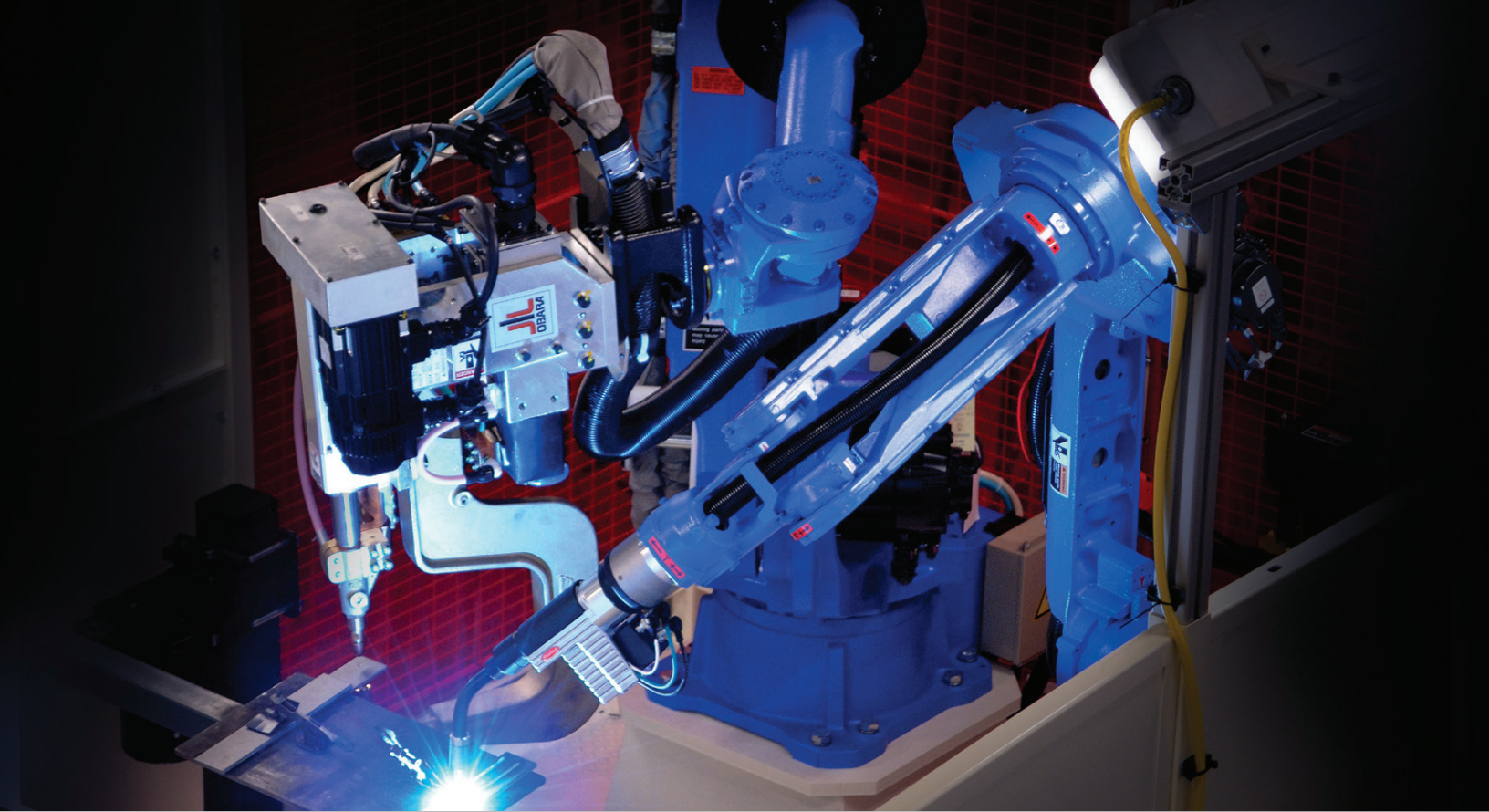
Cell	Guarding	Common Base	Number of Robots	Welding Stations	Positioner Type	Payload Capacity (kg)	Max Part Size (m) Length x Dia
ArcWorld 4000	Light Curtain	Cell Equipment	1	1	H-Frame	500 750	2.0 x 1.3 3.0 x 1.3
ArcWorld 4200	Light Curtain	Cell Equipment	2	1	H-Frame	500 750	2.0 x 1.3 3.0 x 1.3
ArcWorld 4300	Light Curtain	Cell Equipment	3	1	H-Frame	500 750	2.0 x 1.3 3.0 x 1.3
ArcWorld 6400	Light Curtain	Cell Equipment	4	1	Ferris Wheel	755/1,255 1,555 2,355	3.0 x 1.3 4.0 x 1.525 4.0 x 1.778
ArcWorld V-6400	Light Curtain	Cell Equipment	4	1	Ferris Wheel	1,555 2,355	4.0 x 1.525 4.0 x 1.778



## Customized Solutions from Yaskawa Motoman's Automation Group (AG)

Offering solutions for a wide range of budgets, AG is responsible for designing, building, testing and installing fully integrated, custom automation systems for arc, laser, plasma and spot welding applications. AG is your "one-stop-shop" for robots, fixtures, process expertise, controls, handling, safety, integration and installation.





# The World Leader in Robotic Welding

With over 450,000 robot units sold, Yaskawa is a world leader in robotic automation. There's a reason that nearly a quarter of all robotic arc welding applications in the world feature Yaskawa robots. Building on more than a century of expertise, we continue to deliver groundbreaking innovations in automation and robotics, enabling exceptional results for our customers across all industries and applications.



Motoman®  
AR1440

ARC WELDING Robots	AR700	AR900	AR1440	AR1730	AR2010	AR3120	AR1440E
Number of Axes	6	6	6	6	6	6	7
Payload (kg)	8	7	12	25	12	20	6
Horizontal Reach (mm)	727	927	1,440	1,730	2,010	3,124	1,440
Vertical Reach (mm)	1,312	1,693	2,511	3,089	3,649	5,622	2,487
Repeatability (mm)	±0.02	±0.03	±0.06	±0.06	±0.08	±0.15	±0.08
Mounting	F, W, C, T	F, W, C, T	F, W, C, T	F, W, C, T	F, W, C, T	F, W, C, T	F

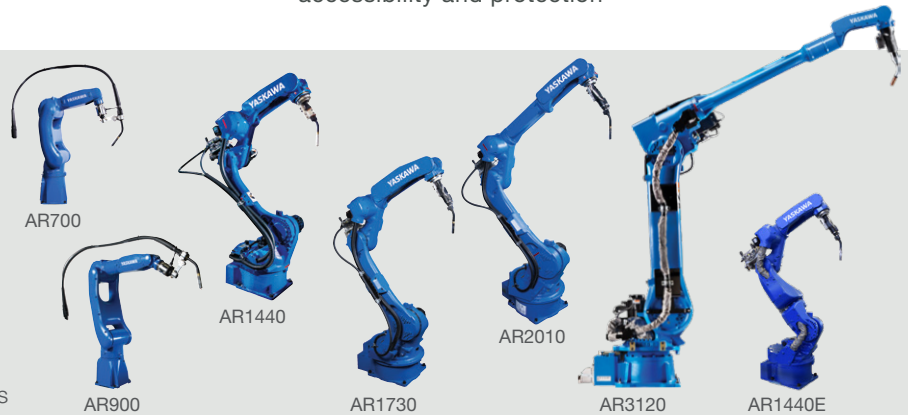
F = Floor W = Wall C = Ceiling S = Shelf T = Tilt

## Overview

- Yaskawa Motoman pioneered application-specific arc and spot welding robots to reduce process-related downtime
- Seven-axis robot models are available for maximum reach flexibility (including access under and around parts and within confined spaces), as well as reduced floorspace
- Variety of robot payloads and reach to support welding application flexibility
- Menu-driven welding software delivers maximum flexibility and optimal productivity, while ensuring high-quality output
- Slim robot profile allows several arms to work in close proximity for high-density applications
- Hollow arm models allow for thru-arm integration of weld cables for improved accessibility and protection

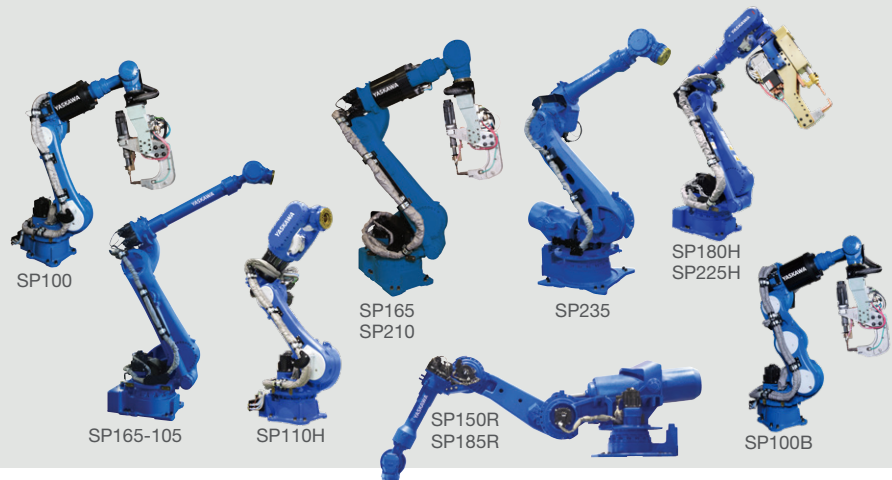
## Arc Welding Robots

- Versatile robots can be floor-, wall-, ceiling- or tilt-mounted, enhancing joint access
- Patented torch cable provides long life for high-flex, thru-arm robot design
- Double wrist support casting is strong, slim and allows symmetric access to weld joints
- AR-series have higher payload capacity and larger thru-hole wrists, along with higher speeds and improved uptime over previous models



## Spot Welding Robots

- Medium payload robots provide faster speeds and reduced footprint for integration into SpotWorld® solutions for Tier 1 production
- Higher payload robots feature compact gas spring to reduce profile and allow higher-density robot spacing
- Integrated spot harness provides process utilities, including weld power, water and air hoses, servo gun cabling, spare I/O and DeviceNet connection
- Hollow arm (H) models include aluminum-compatible weld harness



SPOT WELDING Robots	SP80	SP100	SP110H	SP150R SP185R	SP165 SP210	SP165-105	SP180H SP180H-110	SP225H	SP235	SP100B
Number of Axes	6	6	6	6	6	6	6	6	6	7
Payload (kg) *	80	100	110	150 185	165 210	105	180 110	225	235	100
Horizontal Reach (mm)	2,236	2,236	2,044	3,140	2,702	3,058	2,702	2,702	2,710	2,236
Vertical Reach (mm)	3,751	3,751	3,367	4,782	3,393	4,105	3,393	3,393	3,490	3,792
Repeatability (mm)	±0.07	±0.07	±0.2	±0.2	±0.2	±0.2	±0.2	±0.2	±0.2	±0.12
Mounting	F, W, C, T	F	F	S	F	F	F	F	F	F

F = Floor W = Wall C = Ceiling S = Shelf T = Tilt

\* Payload limited by spot harness





# Options for a Perfect Fit

Application-specific robots maximize uptime with features to reduce application-related downtime. Yaskawa Motoman has optimized integration of welding equipment to leverage features from various suppliers in a simple-to-use format with robust performance. This allows the world's best welding technology to be tailored to your application.

## Spot Welding Packages

Yaskawa Motoman has unique robot models to optimize high-density robot placement in automotive body shops. Superior Advanced Robot Motion (A.R.M.®) control software maximizes the performance of robot and servo gun motion. Digital interfaces to spot timers allow programming from robot teach pendant.

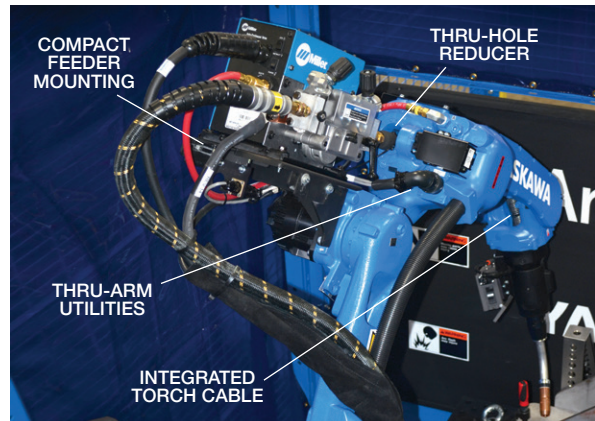
- Integrated spot harness improves wrist flexibility and reduces downtime, eliminating cable management issues and delivering maximum productivity with low cost of ownership
- Servo-controlled spot guns with DC spot timers are synchronized for reduced cycle time and optimized welding and part throughput
- Numerous spot welding functions to take advantage of servo gun control, including wire thickness detection, multi-step pressure file and tip wear compensation
- Options to enhance performance include tip dressers, tip changers, water flow sensors, utility service disconnects and tip wear tools





## Arc Welding Packages

- Miller, Lincoln, Fronius, SKS and OTC power source models with full-feature digital interfaces
- Air-cooled torch with X-, Y-, Z-compliant torch shock sensor (water-cooled option)
- Collision detection software to minimize torch impact absorbed by shock sensor
- Arm-mounted 4-roll wire feeder
- Optimized robot dress to manage weld cabling for long life
- Weld-in-Teach function for improved safety
- Teach pendant overlay with arc welding specific keys
- Built-in Ethernet communication with options for DeviceNet or analog interfaces



## Universal Weldcom Interface

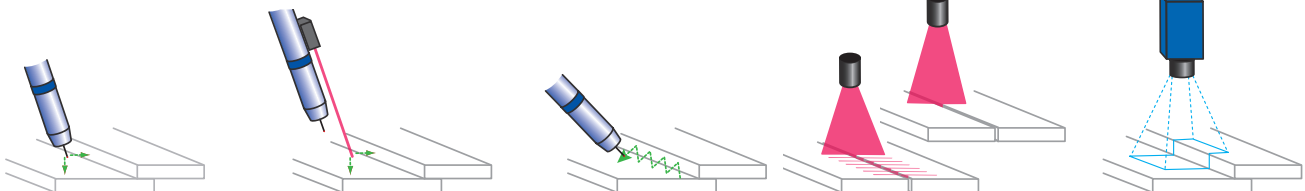
Yaskawa Motoman's exclusive Universal Weldcom Interface (UWI) offers a common platform for major brands of welding power sources. This user-friendly pendant application offers:

- Full utilization of your power source processes and the ability to define multiple processes locally for quick recall
- Live weld status display and the ability to easily edit voltage, current and speed parameters in the user interface or inline
- Graphic representations and help screens of start and end weld sequences, including slope parameters
- Specialized functions like dual pulse, arc monitor data enable, weld line shift, arc retry, arc restart and password protection
- Quick filtering of weld modes based on process type, wire specs and gas type
- Terminology defined by the power source manufacturer for weld settings and programs



## Sensing Technology

Adding sensors to robotic arc welding operations can improve precision, productivity and quality. Yaskawa Motoman offers a wide range of sensing technologies, ranging from cost-effective thru-wire touch sensors to cutting-edge laser and vision systems.



- **Thru-wire** touch-sensing enables cost-effective seam-finding and unrestricted joint access that is effective with all conductive metal.
- **AccuFast™** non-contact laser systems offer fast, accurate seam-finding that eliminates wire cutting and provides a cost-effective option between tactile and vision sensing solutions.
- **ComArc LV** thru-arc seam-tracking allows tracking while weaving and is compatible with multi-robot, multi-layer, and jigless configurations.
- **MotoEye™** laser finding and tracking is ideal for varied materials and lighting conditions, as well as capturing joint gap data and adapting in real time based on joint gap feedback.
- **MotoSight™** vision sensors combine user-friendly software and pendant interface programming with powerful capabilities, including fixture identification and error proofing.



# Built to Perform

Wide variety of servo positioners provide unmatched speed, accuracy, robustness and reliability. Using the same field-proven motor controls, they are manufactured to the same exacting standards as Yaskawa robots. We also lead in control technology with multi-tasking software that allows coordination between multiple robots, base axes and multi-axis positioners.

## Rotary Turntables



- Low inertia tabletop available in two diameters; positioner drive unit is available without tabletop for custom tooling or different diameters
- Metal arc screen divider creates a safety barrier, protecting the operator from arc flash
- MSR-655 and MSR-1055 models can be used with endless rotation software for continuous rotating applications with multiple programmable stop locations
- Positioner options include fixture plates to support quick change tools, DeviceNet signal slip ring with air for fixture utilities, ground brush and multi-station switch kits for continuous rotation, hard stops for reciprocating applications with heavy payloads

	MSR-355	MSR-655	MSR-1055
Payload Capacity per Side (kg)	355	655	1,055
180-deg Index Time (sec.)*	2.5	3.0	5.0
Thru-hole (mm)	75	120	120
Rated Load Inertia (kg•m <sup>2</sup> )	461	1,040	3,000
Table Diameter (mm)	1,524/1,829	1,524/1,829	1,524/1,829
Rotation	Reciprocating	Continuous	Continuous

\* Indexing time can be affected by application variables

## H-Frame Turntables



MSR2S-500

- Three servo-motor control
  - All axes can turn simultaneously while indexing
  - Operator can jog station axis while robot welds
- Ergonomic loading and programming heights
- MotoMount fixture mounting system for quick change and longer life
- Arc screen for flash protection and curved sides to block entry into workcell
- Long life carbon brushes provide high amperage (800 A) capacity required for multiple robots and pulsed welding

	MSR2S-500	MSR2S-750
Payload Capacity per Side (kg)	500	750
Fixture Length (m)	2.0	3.0
Max. Fixture Diameter (m)	1.3	1.3
180-deg Index Time (sec.)*	3.70	5.00
Tooling Axis Speed (rpm)	19.6	20.7
Tooling Axis Torque (N•m)	625	1,068
Tailstock Thru-hole (mm)	41	41
Load/Program Height (mm)	821/970	821/970
Weld Ground Capacity (Amps @ 100% Duty)	800	800

## Ferris Wheel Positioners

- Most space-efficient, two-station positioner design for parts 3 to 5 meters long
- The RM2-755 positioner features a sealed drive that eliminates most maintenance needs while expanding the life of the positioner
- The RM2-1255 positioner incorporates an easy-to-fill automatic lubricating device on the heavy-duty drive
- Ergonomic load height and angle of fixture can be varied to ease part loading
- MotoMount fixture mounting system for quick change and longer life
- Z-beam center support provides maximum clearance for fixture turning and overhead clearance on operator side for hoist access
- Three servo-motor control
  - All axes can turn simultaneously while indexing
  - Operator can jog station axis while robot welds
- Integrated high amperage (1,200/1,600 A) weld ground brushes
- Hollow tailstocks and optional slip rings with DeviceNet or Ethernet cabling and air for automated fixturing

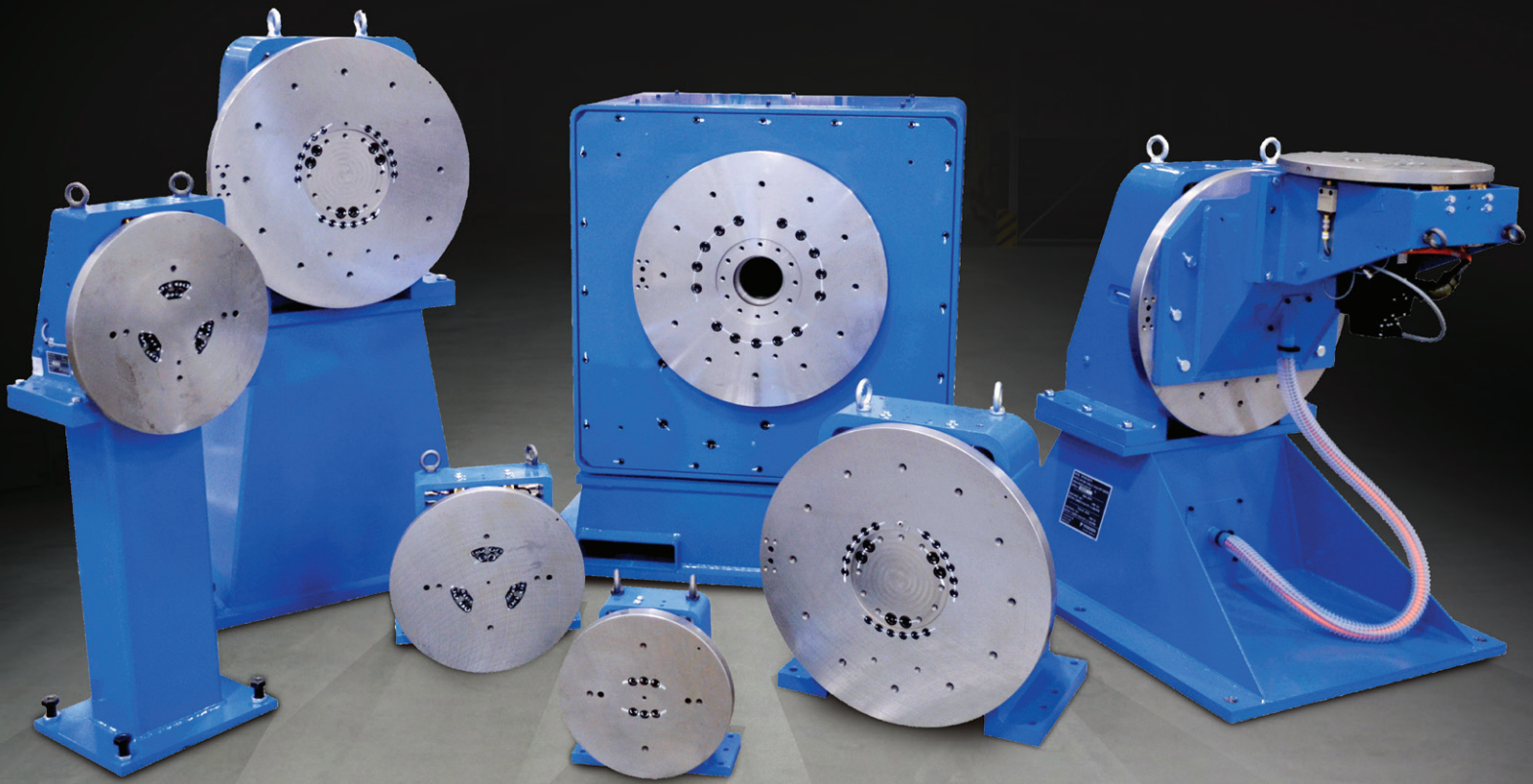


RM2-2355

	RM2-755	RM2-1255	RM2-1555	RM2-2355
Payload Capacity per Side (kg)	755	1,255	1,555	2,355
Fixture Length (m) (can be extended to 5 m)	2.0/3.0	2.0/3.0	3.0/3.5/4.0	3.0/3.5/4.0
Max. Fixture Diameter (m)	1.3	1.3	1.524	1.778
180-deg Index Time (sec.)*	2.25	3.53	5.1	7.0
Tooling Axis Speed (rpm)	32.7	21.6	21.6	21.6
Tooling Axis Torque (N•m)	957	3,260	3,260	3,260
Tailstock Thru-hole (mm)	41	41	41	41
Load/Program Height (mm)	894/1,476	894/1,476	1,075/1,765	1,018/1,823
Max Load Unbalance (kg)	250	300	1,050	800
Weld Ground Capacity (Amps @ 100% Duty)	1,200	1,600	1,600	1,600
Locking Pins on Trunnion Arms (optional)	No	No	Yes	Yes
Positioner Span (mm)	993	993	2,126	2,126

\* Indexing time can be affected by application variables

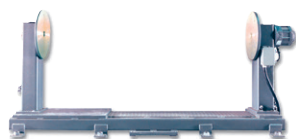




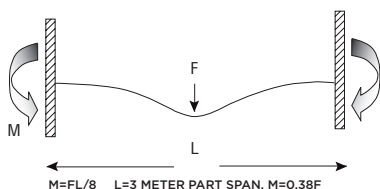
# Built to Work in Harmony

The YRC1000 controller allows multiple positioner stations to be easily programmed and coordinated with robot motion. Standard software functions include Parallel Start, Coordinated Motion, Twin Synchronous (multiple robots coordinated with station axis) and Master Tool Frame. Positioners are easily calibrated to the robot, and support software weaving and seam-tracking on rotating workpieces. Functional Safety Unit (FSU) provides integrated control-reliable safeguarding from positioner axes motion during part loading operations.

## TRADITIONAL

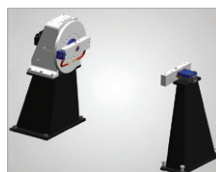


Machined Base  
Headstock/Tailstock

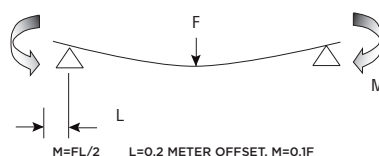


Fixed mount increases stress on headstock/tailstock

## MOTOMOUNT SOLUTION



Independent  
Headstock/Tailstock Mounting

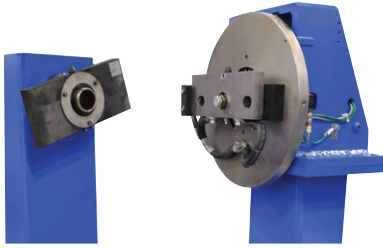


Reduces stress close to 7x or more as span goes beyond three meters

## MotoMount

The patented MotoMount fixture mounting system is designed to increase positioner life and improve weld repeatability while reducing implementation costs. MotoMount allows for simplified tooling using lower-precision mounting holes, while making fixture changeover faster and easier. By reducing stress and wear on positioner bearings, tooling repeatability is improved by up to 75%, and part warping from load stress is eliminated.

## Headstocks / Tailstocks



- Available as individual headstocks with rated payload, or combined with MotoMount for over twice the rated payload as headstock/tailstock
- MH units can be mounted at an angle or flat to create a rotary table
- Integrated high-amperage weld ground capacity for pulse welding and multiple robots
- Optional FSU is recommended to block motion on axes that are being loaded by operators
- Optional slip rings with DeviceNet communication and air are available for tailstock mounting

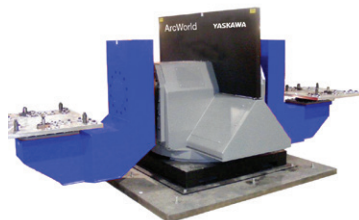
	MH185	MH555	MH1655	MH3155	MHTH605	MHTH905
Rated Load @ 152 mm Off-Center (kg)	185	555	1,655	3,155	605	905
Rated MHT Load @ CG Off-Center (kgf @ mm)	550 @ 50	1075 @ 80	3,000 @ 95	6,300 @ 90	1,717 @ 50	2,601 @ 50
Headstock Speed (rpm)	12.4	9.8	10.8	6.7	18.8	12.4
Overhang @ Rated Load (mm)	250	N/A	N/A	58	1,375	925
Load @ 500 mm Overhang (kgf)	75	175	500	1,344	1,578	1,578
Rated Load Inertia (kg•m <sup>2</sup> )	47	105	678	3,036	208	477
Rated Holding Torque (N•m)	268	1,125	2,826	4,622	842	1,276
Allowable Thrust (kgf)	400	800	2,000	3,000	800	800
Tailstock Thru-hole (mm)	45	40	40	45	N/A	N/A
Headstock Thru-hole (mm)	N/A	N/A	N/A	120	110	110
Rated Weld Current (Amps @ 100% Duty)	400	1,200	1,600	1,600	1,200	1,200

## Multi-Axis | Tilt-Rotate | Skyhook | Drop Center

Not all production parts fit nicely into a standard workcell. Heavy, long, boxy or tubular parts can be handled by matching the application need with the proper part positioner. And when the application calls for a unique welding setup, Yaskawa Motoman's wide range of positioners provide added flexibility that enables welding in the optimum position. Coordinated motion between the positioner and robot provides increased travel speeds while maintaining the highest weld standards. Representative designs are shown.



Tilt-Rotate



Double-Ended Skyhook



Double-Ended Tilting Headstock



Drop Center



Tilt-Rotate - Low Profile



Skyhook - Large Capacity





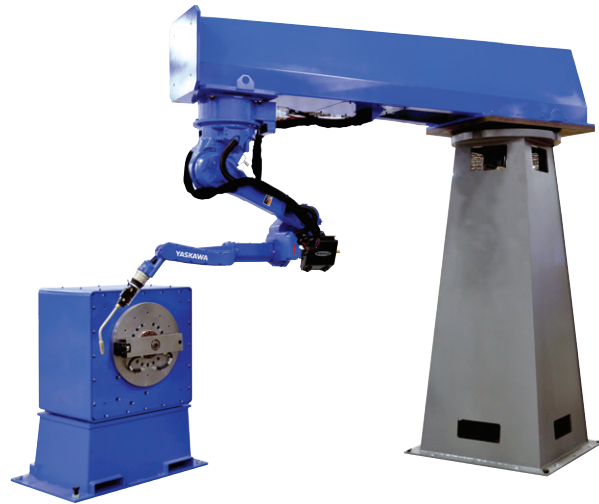
# Moving Down the Line

Moving the robot greatly increases the working range and application flexibility. Yaskawa Motoman delivers this advantage through a range of versatile transporter configurations. Our MotoSweep™ radial gantry is ideal for freeing up floorspace and allows the robot to be suspended directly over or on either side of a part. MotoRail™ linear transporters can be floor-mounted or suspended to reduce floorspace and can extend long distances. YRC1000 software can coordinate the motion of up to three base axes (X, Y, Z) for each robot with part positioners. It can also support multiple robots on transporter axes, along with part positioner(s), in a single workcell.



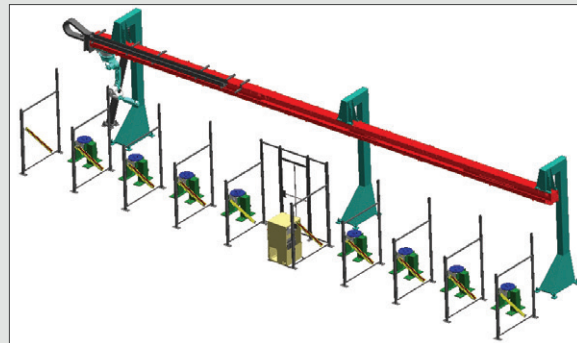
## MotoSweep | MotoSweep HD

- Supports ceiling- or wall-mounted robot to reach large parts or parts that require deep access into weld joints
- Rotating base is covered and not exposed to weld spatter like floor tracks
- Radial motion is coordinated with linear motion of robot and rotating motion of part positioner(s)
- Heavy-duty version can support a robot with 200-kg payload capacity or robot with 3-m reach on a long boom
- Optional bulk wire delivery packages for welding applications



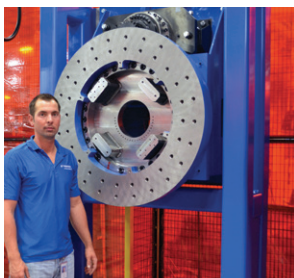
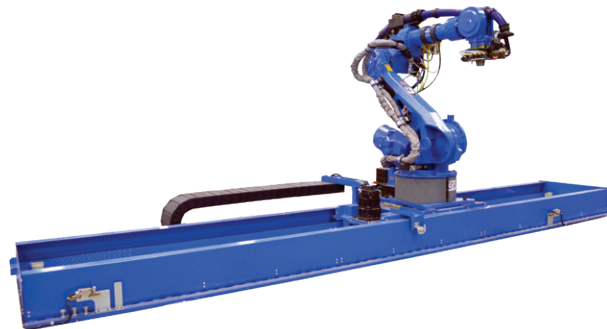
## MotoRail 7

- Suspended track with ceiling- or wall-mounted robot(s) provides open floorspace underneath to accommodate loading of large parts
- Six-axis robot mounted on seventh-axis rail provides additional range of motion and improves cycle time
- Available with wide range of robots including heavy-payload robots



## Floor Tracks

- Wide variety of payload capacities and travel speeds available
- Robot motion coordinated with linear travel and part positioner(s)
- Options include multiple carriages on a single track, or larger carriages to carry robot controller or process equipment



## Gantry and HD Drive Modules

Heavy-duty turning unit used in the MotoSweep HD can be integrated with heavy-fixture positioning solutions, creating a low-profile solution with the torque and load capacity to move very large pieces.

A gantry solution features a robot mounted on a moving overhead track. This expands the robot's range to reach very large parts. Yaskawa Motoman's gantry solutions incorporate coordinated motion control across all axes, resulting in a uniquely flexible, variable length solution.



# 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.

TECHNICAL SUPPORT | FIELD SERVICE | PARTS | TRAINING | REPAIR and RETROFIT | LIFE CYCLE MANAGEMENT

## **YASKAWA** SUPPORT SERVICES

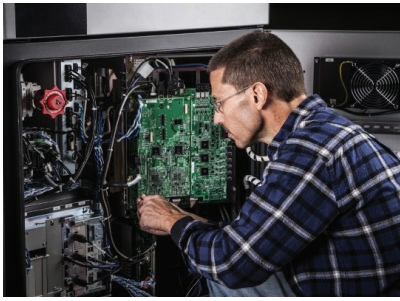
One robot or hundreds, Yaskawa Motoman is committed to every customer.



### 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





## Field Service

*Experience minimal downtime*

- 24/7 dispatch
- 99.95% first time fix rate
- Grease analysis and torque sampling



## Parts

*Maintain operational success*

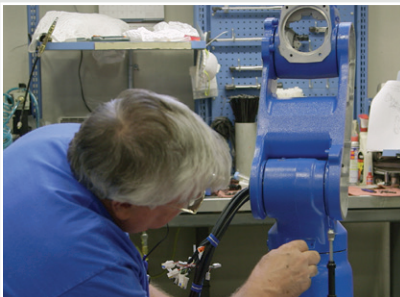
- Over \$30m of inventory
- 90% first pass fill rate
- 24/7 emergency parts availability



## 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



## 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.



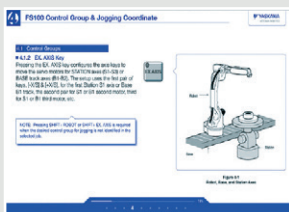
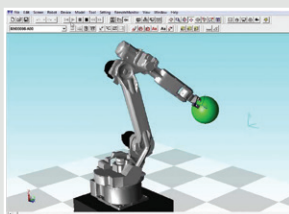
### Hardware

#### 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

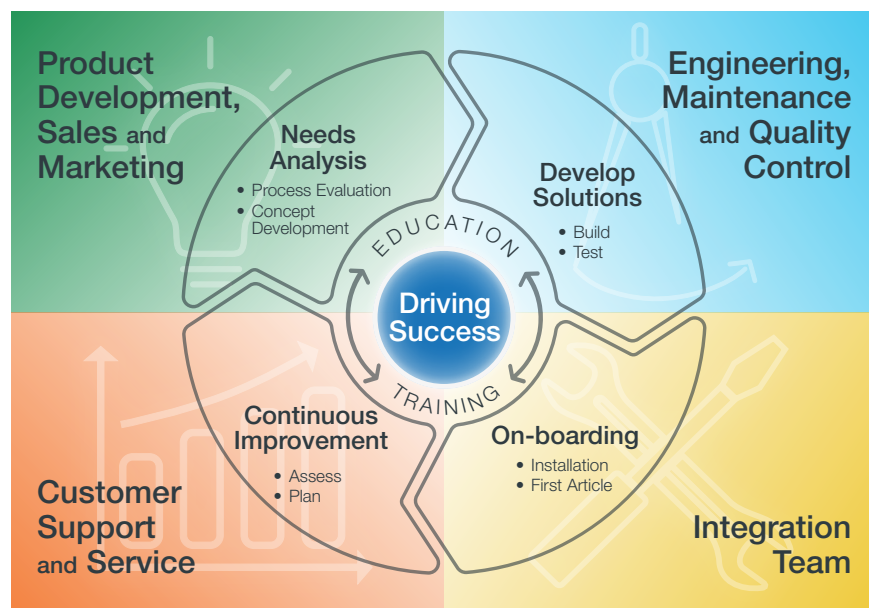
- **Train-the-Trainer Program** is designed specifically for educational institutions to provide students with a Yaskawa industrial robotics credential. It provides training, resources and tools for instructors to teach a robotics credentialing course.
- **MERIT (Motoman Endorsed Robotics Instructor 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.



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 arc welding solutions, we offer a comprehensive range of material handling solutions for applications including machine tending, assembly, part transfer, picking, packing, palletizing and more. 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

[yaskawa-motoman.com](http://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/UNLOAD, MACHINE TENDING, PART TRANSFER, PRESS TENDING AND SORTING. PLEASE CONSULT YASKAWA MOTOMAN TO CONVERT ROBOT MODEL FROM PRIMARY APPLICATION.