

NACHI Robot

Total Robot Catalog

HANDLING

PALLETIZING

CLEAN-ROOM

WELDING

SPECIFICATION

NACHI-FUJIKOSHI's industrial robots are **making innovations manufacturing** throughout the

NACHI-FUJIKOSHI leveraged know-how from their hydraulic and machine tool divisions to become the first Japanese manufacturer of industrial robots in 1968.

Since then, NACHI-FUJIKOSHI has been introducing products built on its technological excellence and innovative strength to accurately respond to market demands. Currently NACHI-FUJIKOSHI has many partnerships with Automotive and General industries. Through these partnerships and the delivery of world class products NACHI-FUJIKOSHI has earned a high level of respect among these industries around the world. From high-speed, high precision operations to lifting heavy loads used in a full range of assembly work and welding solutions. NACHI-FUJIKOSHI's robots are innovating production facilities with their incredible speed. We will continue to evolve with customers to meet the challenge of the world's automation needs.



MZ04

in
world.



EZ03

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Icon key



Number of controlled axes



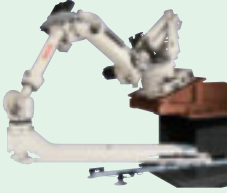
Payload capacity

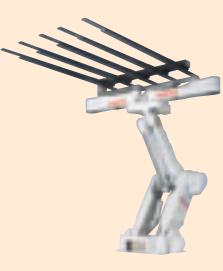


Maximum reach

NACHI'S FULL ROBOT SERIES LINEUP

NACHI's full robot series lineup supports worksites throughout the world of manufacturing with the latest in technology.

Process and application	HANDLING				
	EZ/ES	MZ	MC/MR	ST-TP	MC and SC Heavy Loader
	 ► P5-P6 Number of controlled axes: 4 or 6 axes Payload capacity: 2 to 12kg Maximum reach : 350 to 850mm	 ► P6 Number of controlled axes: 5 or 6 axes Payload capacity: 3.5 to 7kg Maximum reach : 541 to 1,102mm	 ► P7 Number of controlled axes: 6 or 7 axes Payload capacity: 10 to 70kg Maximum reach : 1,260 to 2,050mm	 ► P8-P9 Number of controlled axes: 6 or 7 axes Payload capacity: 80 to 100kg Maximum reach : 3,106mm	 ► P9-P10 Number of controlled axes: 6 axes Payload capacity: 280 to 700kg Maximum reach : 2,771 to 3,972mm
Spot and seam welding					●
Arc welding			●		
Die casting		●	●		●
Resin molding	●	●	●		●
Press operation handling		●	●	●	
Machine loading		●	●		●
Deburring and polishing	●	●	●		
Sealing	●	●	●		
General assembling	●	●	●		
Tightening nuts	●	●	●		
Picking, aligning, packaging	●	●	●		
Shipping and receiving (palletizing)	●		●		●
Measuring, inspection, testing	●	●	●		●
Material handling	●	●	●	●	●
Glass substrate loading					

PALLETIZING		CLEAN-ROOM		WELDING		Field
LP/MC470P/MC500P		ST-C/SC-C	SJ	SRA-H/SRA	NB/NV	
 ►P.11 Number of controlled axes: 4 or 5 or 6 axes Payload capacity: 130 to 500kg Maximum reach : 2,771 to 3,210mm		 ►P.12 Number of controlled axes: 6 axes Payload capacity: 133 to 400kg Maximum reach : 2,654 to 3,623mm	 ►P.12 Number of controlled axes: 4 or 5 axes Payload capacity: 25 to 120kg	 ►P.13-P14 Number of controlled axes: 6 axes Payload capacity: 100 to 250kg Maximum reach : 1,634 to 3,734mm	 ►P.15 Number of controlled axes: 6 axes Payload capacity: 4 to 6kg Maximum reach : 1,402 to 2,008mm	
				●		Automotive, automotive parts, metalworking, agricultural machinery, construction machinery
					●	
				●		Automotive parts, plastic, electric and electronics
				●		
	●			●		
				●		
				●		Automotive, automotive parts, machine tools, plastic, pharmaceuticals and cosmetics, electric and electronics, metalworking, chemistry, medical equipment, foodstuffs, agricultural machinery, construction machinery
				●		
●				●		
●	●			●		
	●		●			Electric and electronics

HANDLING

Machine loading, picking, loading, palletizing, assembling, deburring/polishing, and sealing

Solving your automation needs for assembly, loading, and other jobs with a lineup of high performance and highly functional product applications such as vision sensors and our FLEXhand series for our high-speed and high precision robots.

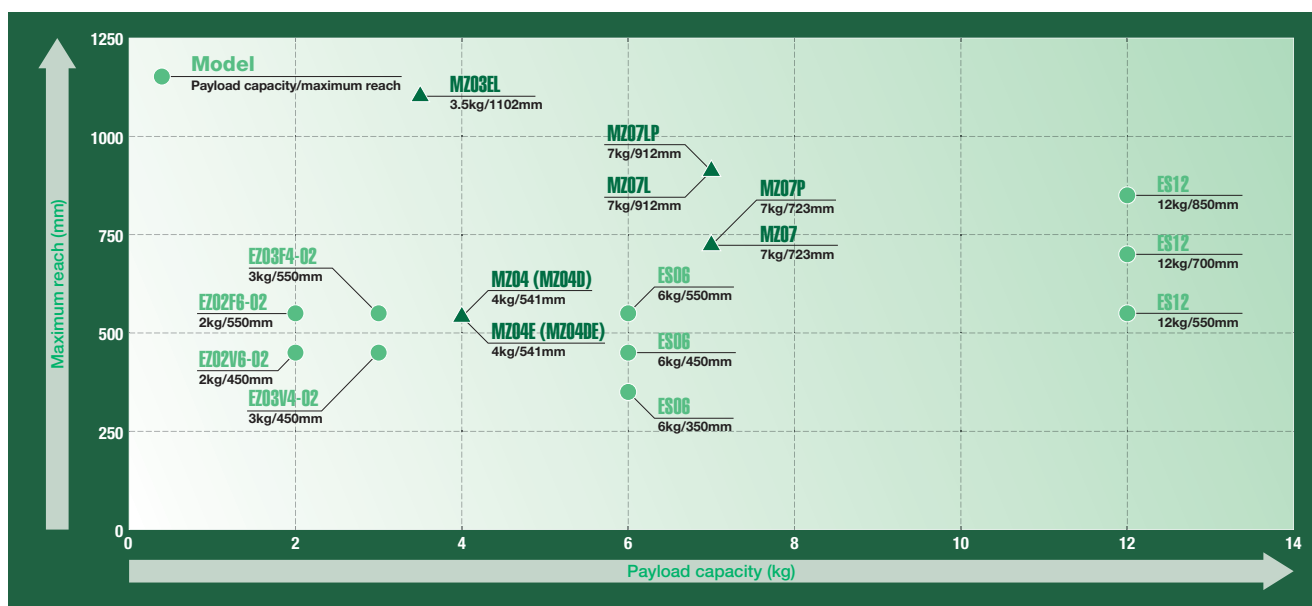
WING SLICER Type

EZ series

- EZ03V4-02
- EZ03F4-02
- EZ02V6-02
- EZ02F6-02



The EZ are high-speed, horizontally articulated robots equipped with a space-saving vertical first axis. They have a high speed, high accuracy structure that is excellent for applications such as assembly and handling. Cable routing is simplified by hollow construction to the end of the wrist, capable of housing wires internally. The internal wire routing for the tooling significantly increases cabling reliability. The SCARA family has multiple models with varying reach and payload to support a variety of equipment operations.



World's fastest lightweight compact robot

MZ Series

- ▲MZ03EL ▲MZ07
- ▲MZ04 ▲MZ07L
- ▲MZ04D ▲MZ07P
- ▲MZ04E ▲MZ07LP
- ▲MZ04DE



World's fastest lightweight compact robot, Dust-proof and drip-proof specifications, Multiple installation orientations provide flexibility to automate a variety of processes for an all-around compact high performance robot.

Hollow wrist construction with an internal path for wiring providing a streamlined profile for working in confined spaces.



HANDLING

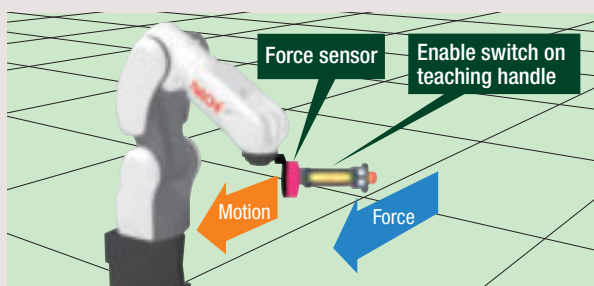
Options

Direct teaching

The robots can be moved directly with the teaching handle, by using the enable switch, mounted on the end of the robot. This is a function for teaching the robots operating positions.

You can easily move the robots through intuitive operations, without training and experience on the robot teach pendant. Diagonal movements that were not possible through the teach pendant's key operations are now possible.

*The direct teach and RMU (robot monitoring unit) options are required.



Powerful and compact multi-purpose robot

MC Series

- MC10S ● MC35
- MC10L ● MC50
- MC12S ● MC70
- MC20



High dust and water protection, combined with outstanding performance and a full range of functions to handle a variety of applications make these robots ideally suited for a variety of production environments.



Flexible motion "Arm" robot with 7-axes

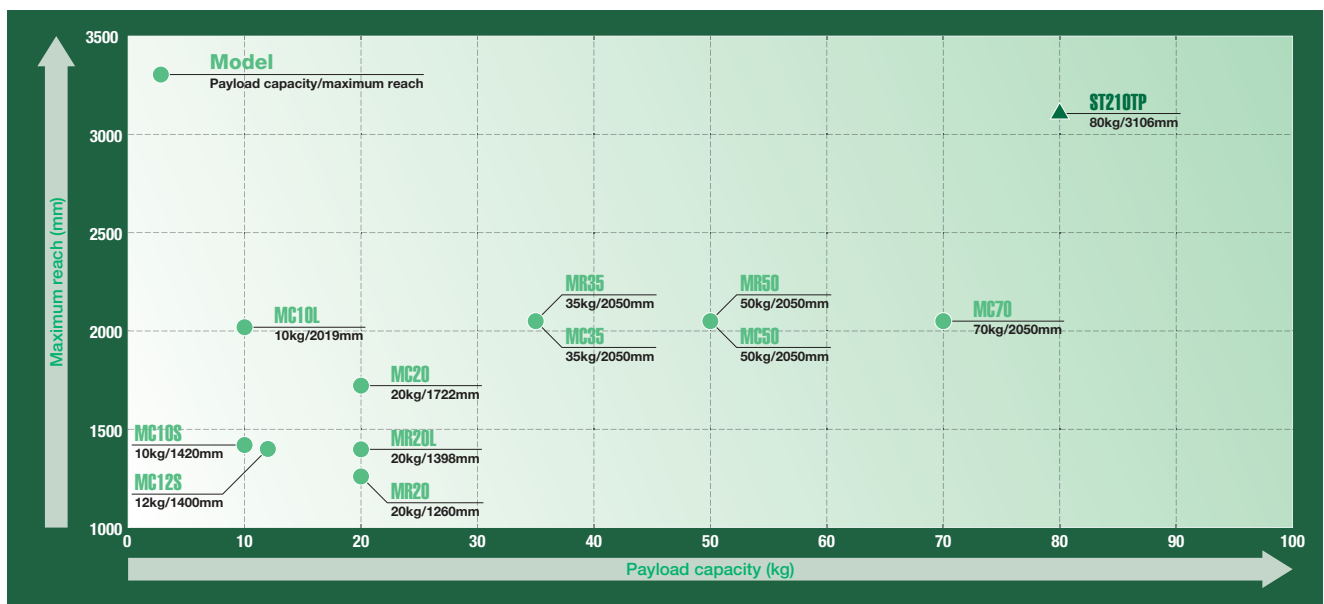
MR Series

- MR20 ● MR35
- MR20L ● MR50



With a programmable pose, this 7-axis arm design can handle complex motions to flexibly work in processes that other robots cannot.

The compact robot arm greatly reduces the amount of space needed for installations.



Press operation handling robots

ST210TP

▲ST210TP-01 (with press arm)

▲ST210TP-02 (without press arm)

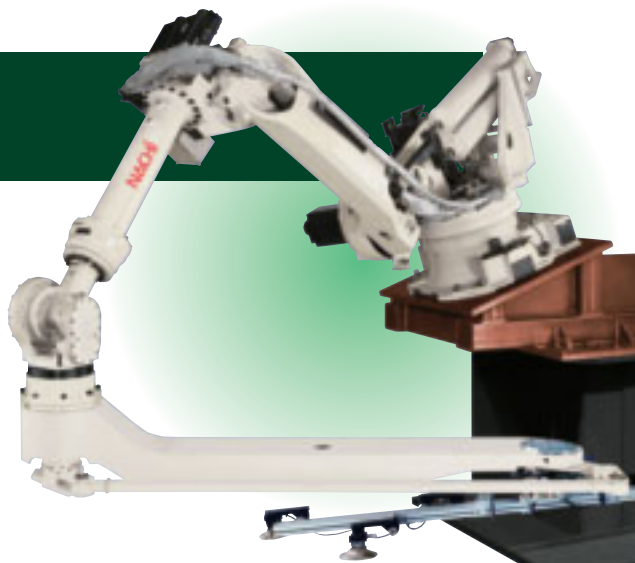
6,7

80
100

3106

Highly rigid design with vibration dampening give this robot its great speed.

Newly developed specialized press arm attachment gives this robot a much larger reach that can be used for a maximum eight meter press pitch. Moves parts horizontally at high speed.



Options

FLEXhand

FH360, FH150-F2, FH150-F3

Servo hand controlled as an additional axis by the robot controller. Capable of handling many shapes without changing the hand. This is an excellent tool for small-lot multiple item production.



FH360-02 (3 fingers)



FH150F2-01 (2 fingers)



FH150F3-01 (3 fingers)

Force sensor

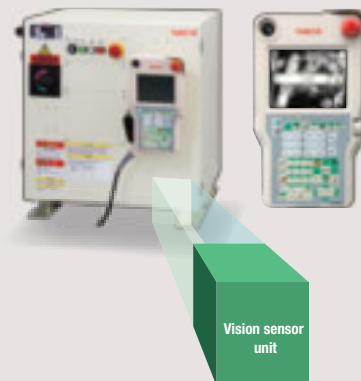
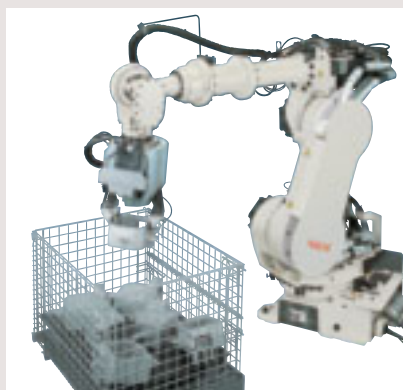
This function controls the robot by accurately detecting the applied force. This powerful tool makes it possible for robots to do delicate operations at high speed, such as following, pushing, loading (press fitting), detecting position and phase during assembly and production processes.



Vision sensor NV-Pro

Our vision sensor was developed in-house at NACHI. Excellent interfacing with robot because it is possible to check images, operations, and program the robot using the teach pendant.

Excellent for picking up parts that have not been positioned because robot is aware of part position in 2 or 3 dimensions. Can be equipped with functions to detect models of products (or detect abnormal products).



Vision sensor unit

Heavy loader robot

MC Heavy Loader Series

- MC280L ● MC400L
- MC350 ● MC600
- MC700

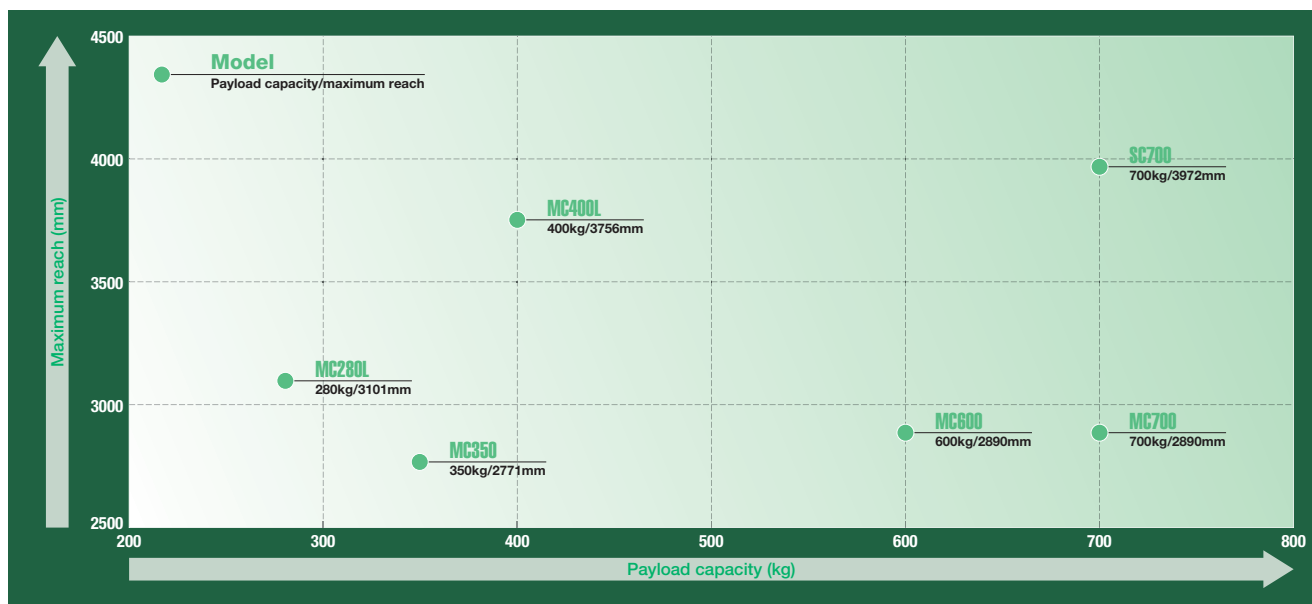


With high wrist torque and large operating envelope, these robots are opening up a new era of heavy loading robots.

Simple construction has no counterweights or parallel linkage on MC350 and MC280L models.

Compact arm design requires minimal installation space for a heavy payload robot.

Welding cables and hoses routed inside hollow arms provides excellent life.



Super heavy loader robot

SC Heavy Loader Series

● SC700



The SC heavy loader robots, with huge load capacity and reach, are excellent for jobs that require heavy lifting. Their large vertical stroke allows more flexible production lines by replacing conventional specialized machinery, such as auto body loaders, with robots.



HANDLING

Example application

Handling and transport

Robots load work pieces into machining centers and move parts between processes during parts manufacturing. A single robot can tend multiple machines by synchronizing the various cycle times. Selecting the right robot for the job means a compact operation with excellent maintainability.



Example application

Deburring and polishing

Robots de-burr cast parts and machined parts and grind welding beads. They maintain consistent quality without variations in polishing or left over burrs using our force control function.



Example application

Press operation handling

Robots load and unload presses. Frees workers from the dangerous job of handling the sharp edges of sheet metal parts. Helps increase productivity by quickly loading parts ranging in size from large to small.



PALLETIZING

Palletizing robots

By improving productivity, these robots handle manufacturing jobs and produce more parts in a shorter time. NACHI's palletizing robots help with intricate stacking work for shipping and receiving processes.

High-speed palletizing robot

LP Series

- LP130 ● LP180
- LP130F ● LP210



The LP series of specialized palletizing robots do large movements quickly. They can stack products, such as cardboard boxes, or products in bags, such as foodstuffs or chemicals, onto pallets at high speeds. Loaded with palletizing functions, they can handle a wide variety of stacking patterns.



Heavy loader palletizing robot

MC470P/MC500P



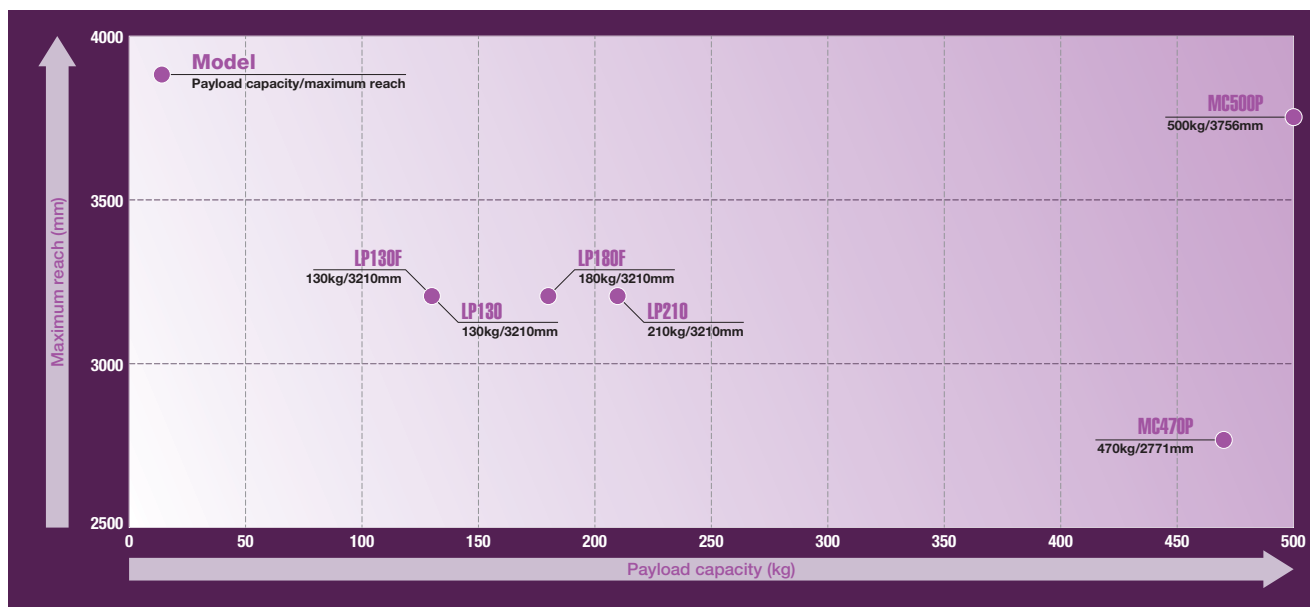
This robot has enough lifting power to handle jobs of loading and stacking beverages, bricks, plastic resins, concrete and other heavy goods.



Example application

Palletizing

Robots stack goods of various sizes in specified patterns on pallets. They help to automate a wide range of logistics operations with their high speeds and variety of stacking patterns.



CLEAN-ROOM

Clean-room Robots

Our series of clean-room robots suppress the dust created by arm movements and are designed to be used in clean rooms.

These high-performance loading robots support the heart of the flat panel display production process.

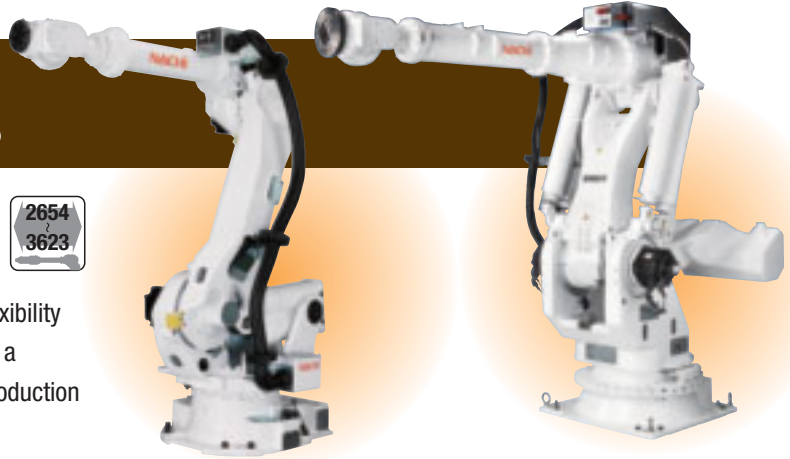
Clean-room loading robot

ST-C/SC-C Series

- ST133CF
- ST210CF
- ST166CF
- SC400LC



Six-axis articulated construction with excellent flexibility and a large reach make these robots excellent for a variety of loading work in large glass substrate production processes.



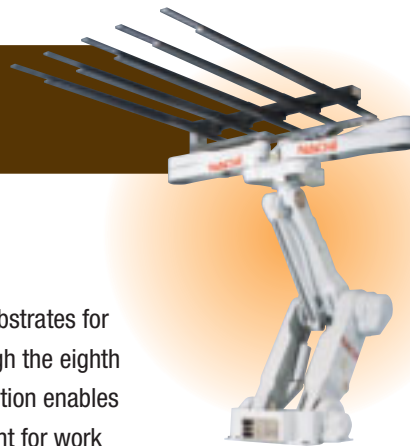
Robots for glass substrate loading

SJ Series

- SJ80C
- SJ120C



These robots have been loading large glass substrates for flat panel displays ranging from the fifth through the eighth generation. Our flexing and extending construction enables extremely clean performance, which is excellent for work in clean rooms where particle control is necessary.



8th generation
(2,200×2,500mm)

6th generation
(1,500×1,800mm)

5th generation
(1,100×1,300mm)

PALLETIZING

CLEAN-ROOM



WELDING

Spot welding, arc welding, and seam welding

Welding robots are the central element of automobile production, especially the auto body welding lines.

The performance, functionality, and reliability of the NACHI lineup of spot welding robots are supporting the world of manufacturing.



Spot welding robot with built-in cables

SRA-H Series

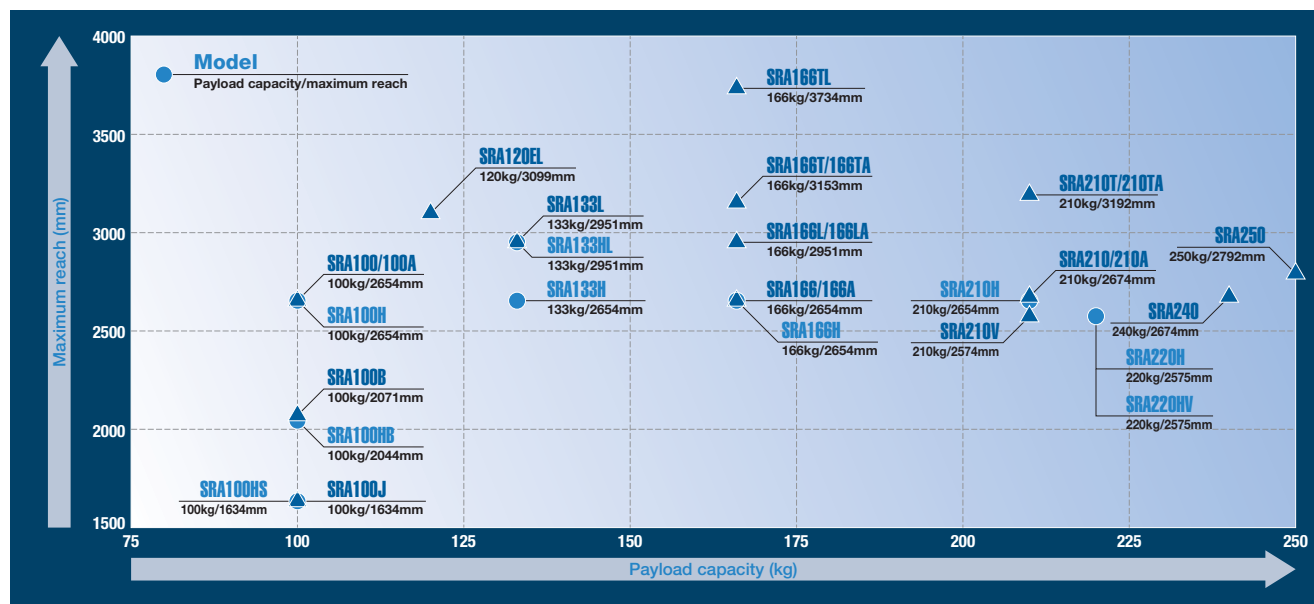
- SRA100HS
- SRA100HB
- SRA100H
- SRA133H
- SRA133HL
- SRA166H
- SRA210H
- SRA220H
- SRA220HV (Inverted mount)



The next generation of hollow arm construction spot welding robots.

Cables for welding gun are fully enclosed to increase cable reliability and improve rate of operation.

Provides a cleaner profile for installing directly in the assembly line and improves operational accuracy of offline programming, including welding cables.



Ultra-fast spot welding robot

SRA Series

- | | |
|--------------|-----------------------------|
| ▲SRA100J-01 | ▲SRA133L-01 |
| ▲SRA100B-01 | ▲SRA166L-01 |
| ▲SRA100-01 | ▲SRA166L-01A |
| ▲SRA100-01A | ▲SRA166T-01 (Shelf mount) |
| ▲SRA166-01 | ▲SRA166T-01A (Shelf mount) |
| ▲SRA166-01A | ▲SRA166TL-01 (Shelf mount) |
| ▲SRA210-01 | ▲SRA166TL-01A (Shelf mount) |
| ▲SRA210-01A | ▲SRA210T-01 (Shelf mount) |
| ▲SRA240-01 | ▲SRA210T-01A (Shelf mount) |
| ▲SRA250-01 | ▲SRA210V (Inverted mount) |
| ▲SRA120EL-01 | |



Floor mount



Shelf mount

The Ultimate Spot Welding Robot. Using higher speeds and vibration damping properties, we greatly improved productivity by shortening cycle times 30% (compared to our existing models) improvements were made in three areas, weight reduction, higher rigidity, and faster controls. The compact design allows for high density installation layouts and maintenance is streamlined making periodic inspections and parts replacement easy to do. The lighter weight and latest in motor drive controls have reduced power consumption by 15% over existing models reducing environmental impact.

Example application

Spot welding

Spot welding guns are mounted on robots and used to spot weld steel. They are used to assemble auto bodies, parts, and frames. Welding guns are controlled by the robots so weld spatter does not occur for high quality welds and high productivity in a clean and quiet environment.



Arc Welding Robot

NB/NV Series

● NB04
● NB04L

● NV06
● NV06L



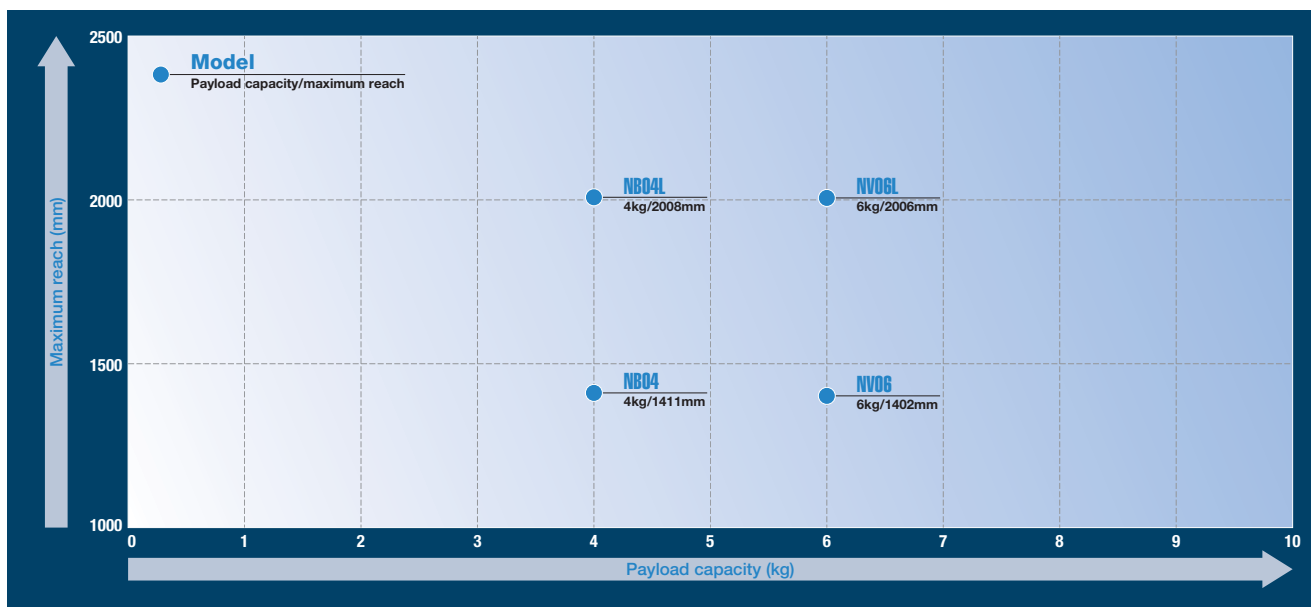
By housing the arc welding cable in the arm, these robots optimize layout by eliminating interference with peripheral equipment and they provide consistent wire feed.



Example application

Arc welding

Arc weld torches mounted on our robots are used to weld a variety of materials, from thin sheet metal to multiple layers of thick steel plate. These robots are used in producing ships, structural frames, auto components, houses and bridge parts.

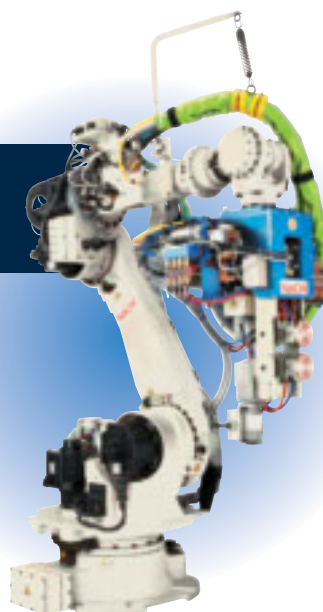


Seam welding robots

Robot seam welding package

Seam welders are mounted on robots

- Capable of seam welding on work surfaces in three dimensions
- Fast and consistent welding
- Equipped with various application functions such as electrode polishing, electrode wear compensation, and others



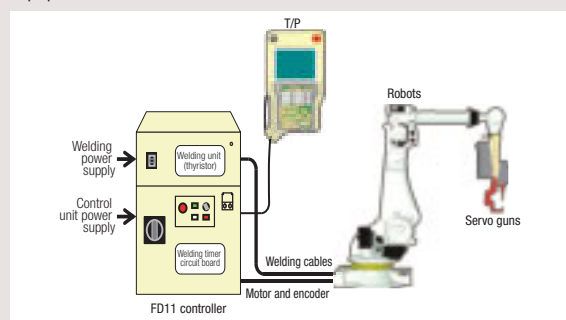
Options

Integrated timer

Weld timer integrated in controller

All-in-one package

Package includes robot, timer, servo gun, and peripheral equipment.



Slide

Slide controlled as an additional axis by the robot controller. Expands possibilities of automated systems and working envelope of robots.



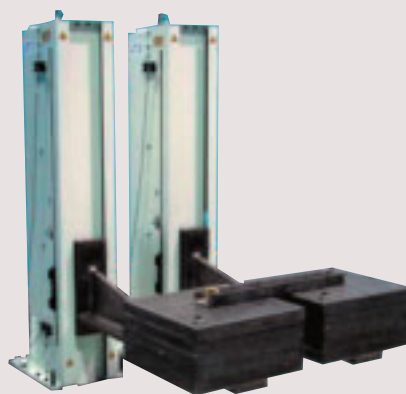
Revolving worktable TT2000/TT4000

Revolving table controlled as an additional axis by the robot controller. Full-circle revolving table holds heavy loads, such as fixtures, that helps streamline production processes with multi-operation configurations combining production of multiple types of products.



Lifter LF Series

Lifter is controlled by the robot controller for vertical movement. Each pillar can handle up to 580 kg. A maximum of 4 pillars coordinate simultaneously to lift heavy and long items.



CONTROLLER SUPPORT SOFTWARE

Introducing the intelligent robot controller based on Windows.

Robots and additional axis are easy to operate by using the teach pendant. Vision and force sensors, as well as networks, are managed in one place.

Also, the various support software helps with production processes by providing information on robot conditions and safe operation.

FD Controller

Fast processing

High-speed CPU brings huge improvement to control performance such as cycle time, trajectory control, and internal processing time.

Teach pendant is compact and lightweight

Compact and lightweight with re-tooled key operations.

Touch screen is standard equipment making operations even easier.

Improved maintainability

Maintainability improved by integrating components revamping configuration. Faster parts replacement.

Outstanding functionality

Excellent software functions carried over from AX controller. Easily adapts to many various applications.

Full lineup of safety functions

Support for PL (Performance Level) d is standard. Compliant with American and European safety standards.

• Basic specifications for controller

Item	Specifications
Controllable axes	6
Maximum controllable axes	8
External dimensions (mm)	580(W)×542(D)×590(H)
Position reader	Absolute encoder
Programming system	Teaching playback
Operating panel	Mode switch (teach/playback), emergency stop button, motors on button, start button and stop button
Cable between robot and control panel	5m (controller cable specification)
User interface	User panel: On back, side and inside door
Protection rating	IP54
Power supply	3 ϕ 200-220VAC: Class-D grounding, breaker 40A, max. leakage 100mA
Ambient temperature/humidity	0 to 40 °C (50/60Hz) 20 to 85% (without condensation)
Robot monitoring function	PL d (Cat. 3)

• Controller options

Item	Specifications
Overseas compliance	North America: ANSI/RIA, Europe: CE
Power voltage converter (External dimensions)	AC380/400/420/440/460/480V (3 ϕ 50/60Hz) Class-D grounding, breaker 30A, max. leakage 100mA (580mm(W)×542mm(D)×1,180mm(H))
Cable between robot and control panel	Extension (total): 10m, 15m, 20m, 25m
External memory	USB memory (1 GB)
Additional axes	Gun, slider, jig and hand
Fieldbus	DeviceNet, PROFIBUS, FL-net, CC-Link and others. Maximum 4 channel can be installed.
Additional input/output signals	32/32 or 64/64 point
Output relay contact specifications	32 or 64 point
Analog input/output	2/4 point
Vision sensor	NV-Pro
Conveyer tracking function	Conveyer tracking control
Palletize function	Palletize and de-palletize
Robot language	JIS SLIM
PLC function	Software PLC IEC 1131-3

• Teach pendant display specifications

Item	Specifications
Display	5.7 inch VGA color LCD touch panel
Language	Japanese (Chinese, hiragana, katakana and alphanumeric characters) Option: English/Chinese/Korean
Enable SW	One-handed enable switch, three positions, (left hand side)
Optional functions	Axis operation key, value input key, selection/function key, motors on key, emergency stop
External memory interface	USB port
Cable length	8m. Option: extension (total) 15, 25m
Protection rating	IP65
External dimensions (mm)	170(W)×300(D)×65(T)
Weight	0.96 kg (exclude cable)



CFD controller (for MZ series only)

Compact cabinet

Just 369 mm wide. Can be stored inside robot riser.

Wide-variety of applications supported

- Supports addition of one axis (slide axis, jig axis, etc.)
- Vision sensor NV-Pro
- Force sensor applications
- Built in software PLC
- Protective box for controller (dust proof, drip proof)

• Basic specifications for controller

Item	Specifications
Controllable axes	6
Maximum controllable axes	7
External dimensions (mm)	369(W)×490(D)×186(H)
Protection rating	IP20
Power supply	Single phase/3 ϕ AC200-230V
Ambient temperature/humidity	0 to 40 °C (50/60Hz) 20 to 85% (without condensation)

• Controller options

Item	Specifications
Additional axes	One is possible.
External memory	USB memory (1 GB)
Fieldbus	DeviceNet, PROFIBUS, EtherCAT, CC-Link and others. EtherCAT and CC-Link are only compatible as a slave.
Digital I/O	Maximum 64/64 point
Vision sensor	NV-Pro
Robot monitoring function	SIL3, PL e



CFDL controller (for EZ series only)

Just 369 mm wide

Multi-controller CFDL can be placed within the support structure.

- It can control up to 4 robot unit.
- Emergency stop and operation switches are provided for each 4 unit independently. (they can work in synchronous manner too.)

• Basic specifications for controller

Item	Specifications		
Model	CFDL1-0000	CFDL2-0000	CFDL4-0000
Maximum controllable units	1	2	4
Maximum controllable axes	6 axes/unit		
Teach pendant	Option		
Operating switches	Emergency stop and mode switching		
Relay unit	8 point		
External dimensions (mm)	369(W)×490(D)×186(H)		369(W)×560(D)×263(H)
Protection rating	IP20		
Power supply	Single phase/3ϕ AC200-230V		
Ambient temperature/humidity	0 to 40 °C (50/60Hz) 20 to 85% (without condensation)		

• Controller options

Item	Specifications		
Model	CFDL1-0000	CFDL2-0000	CFDL4-0000
External memory	USB memory (1 GB)		
PCI option	2 slots	1 slot	
Fieldbus	DeviceNet, PROFIBUS, EtherCAT, CC-Link and others. EtherCAT and CC-Link are only compatible as a slave.		
Digital I/O	Maximum 64/64 point		
Software PLC	Yes		
Vision sensor	Yes		
Brake release	Brake release mode		
Overseas compliance	UL, CE, KCs		

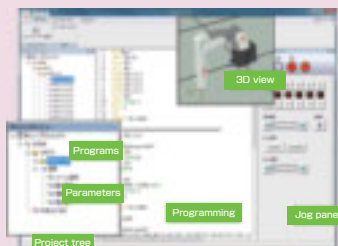


Easy to use functional configuration

Programming tool PC-based Teaching Tool

Standard

- Software for robot setting, programming and debugging.
 - User can manage setting and program files based on the project.
 - Exclusive editor for robot language
 - User can easily manage and input signal, position and parameter.
 - User can control the robot without teach pendant.



User task functions

Standard

- Possible to program processes in parallel with robot operations

Application example

- Time consuming calculations and robot operations are processed in parallel to reduce cycle times
- Various statuses are shown on the screen on the teach pendant

Graphic User Interface Flex-GUI

Options

- Customizable teach pendant screen menu.
- Works as a system operation console which can control peripheral devices.



Supports a variety of fieldbuses

Options

- DeviceNet (master and slave)
- EtherNet/IP (master and slave)
- EtherCAT (slave)
- CC-Link (master and slave)
- PROFIBUS (master and slave)
- PROFINET (slave)

DeviceNet and EtherNet/IP are registered trademarks of ODVA (Open DeviceNet Vendor Association, Inc.). EtherCAT is trademarks of Beckhoff Automation GmbH. CC-Link is a registered trademark of CC-Link Association (CC-Link Partner Association: CLPA). PROFIBUS and PROFINET are registered trademarks of PROFIBUS & PROFINET International.

Offline programming tools Robot simulator

Options

- Excellent for initial studies for installing robots
- Can be used as an operation instruction tool

FD on Desk Regular (option)

- Offline programming
- Working envelope & layout considerations
- Cycle time simulation
- PLC programming editing

FD on Desk Pro (option)

- Create programs from CAD
- Multiple control units supported



*The MZ series now has FD on Desk Light (CFD controller only) as standard equipment. (Functions are the same as FD on Desk Regular)

Robot Monitoring Unit RMU

Options

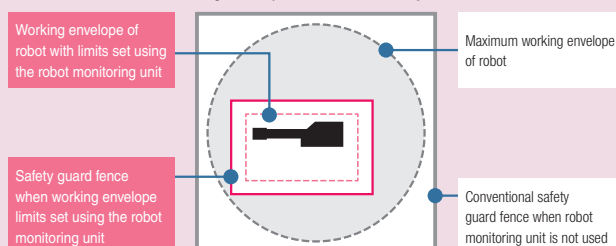
- Safety control unit monitors robot conditions (position and speed)
- Possible to reduce costs and space

Facilities are safer because the positions and speeds of robots are monitored

→Limit working envelope of robot

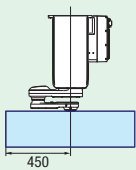
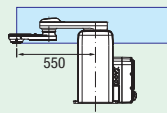
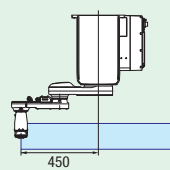
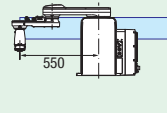
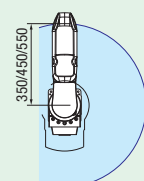
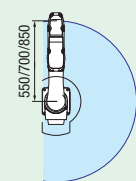
→Minimize size of safety fences

Working envelope of robot and safety fence



LIST OF SPECIFICATIONS

HANDLING

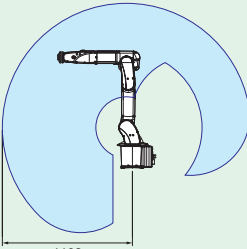
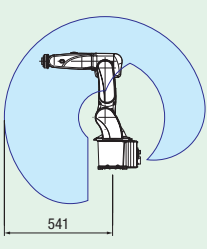
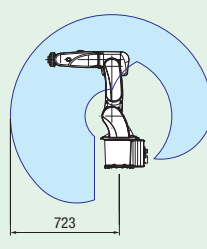
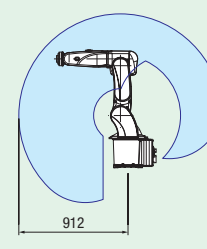
															
Model			EZ03V4-02		EZ03F4-02		EZ02V6-02		EZ02F6-02		ES06		ES12		
No. of axes			4		4		6		6		4		4		
Max. working envelope	Arm	J1	Swivel 1	250/150mm ³				250/150mm ⁴				±170°			
		J2	Horizontal	±170°								±145°		±145° ⁵	
		J7	Swivel 2	—								—			
		J3	Vertical	±180°		±145°		±180°		±145°		200/340mm		350/450mm	
	Wrist	J4	Rotation 2	±360°				±190°				±360°			
		J5	Bend	—				±110°				—			
		J6	Rotation 1	—				±360°				—			
Max. speed	Arm	J1	Swivel 1	1,400/1,200mm/s ³				1,200/1,000mm/s* ⁴				400°/s		420°/s ⁵	
		J2	Horizontal	450°/s								670°/s		450°/s	
		J7	Swivel 2	—								—			
		J3	Vertical	720°/s								2,400mm/s		2,800mm/s	
	Wrist	J4 ¹	Rotation 2	2,400°/s				1,200°/s				2,500°/s		2,400°/s	
		J5	Bend	—				720°/s				—			
		J6	Rotation 1	—				720°/s				—			
Maximum load	Wrist		3 kg (2 kg rated)				2kg (1 kg rated)				6 kg (3 kg rated)		12 kg (3 kg rated)		
	Load capacity on forearm		—				—				—				
	Upper of J3		—				—				—				
Allowable static load torque for wrist	J4	Rotation 2	—				—				—				
	J5	Bend	—				—				—				
	J6	Rotation 1	—				—				—				
Allowable moment of inertia for wrist	J4	Rotation 2	0.05kg·m ²				0.03kg·m ² (0.013kg·m ² rated)				0.12kg·m ²		0.3kg·m ²		
	J5	Bend	—				0.03kg·m ² (0.013kg·m ² rated)				—				
	J6	Rotation 1	—				0.01kg·m ² (0.001kg·m ² rated)				—				
Maximum reach			450mm		550mm		450mm		550mm		350/450/550mm		550/700/850mm		
Position repeatability			±0.014mm				±0.02mm				±0.012mm		±0.015mm		
Ambient temperature* ² /humidity			0 to 45°C/20 to 85%RH (without condensation)								0 to 40°C/45 to 85%RH (without condensation)				
Vibration			0.5 G or less (4.9m/s ²)												
Installation			Inverted mount		Floor mount		Inverted mount		Floor mount						
Dust proof, Drip proof			IP20 (OP : IP65)												
Weight			42kg		43kg		44kg		45kg		36/37kg		65/67/69kg		
Power consumption			0.4KVA												
Working envelope															

* Maximum speeds are maximum values, they will vary depending on the wrist load conditions and operating program.

*1: For the 5-axis specifications (MZ07P and MZ07LP), the configuration does not have the J4 axis. *2: Using at 1,000 m or lower sea level. Ambient temperature has limitations when allowable altitude is exceeded.

*3: There are two types of maximum operating envelopes: 250 mm and 150 mm. The 250 mm has a maximum speed of 1,400 mm/s. The 150 mm has a maximum speed of 1,200 mm/s.

*4: There are two types of maximum operating envelopes: 250 mm and 150 mm. The 250 mm has a maximum speed of 1,200 mm/s. The 150 mm has a maximum speed of 1,000 mm/s. *5: Different in 850 mm arm.

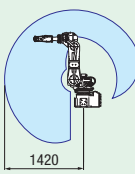
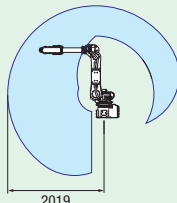
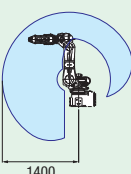
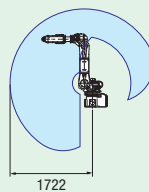
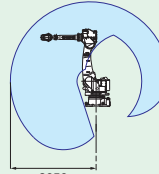
				
MZ03EL	MZ04 (MZ04D)	MZ04E (MZ04DE)	MZ07 (MZ07P)	MZ07L (MZ07LP)
6			6 (5)	
±170°				
−135〜+80°	−145〜+90°		−135〜+80°	
—				
−155〜+270°	−125〜+280°		−136〜+270°	−139〜+270°
±190°				
±120°				
±360°				
300°/s	480°/s	200°/s	450°/s	300°/s
230°/s	460°/s	150°/s	380°/s	280°/s
—				
360°/s	520°/s	190°/s	520°/s	360°/s
550°/s	560°/s		550°/s	
550°/s	560°/s		550°/s	
1,000°/s	900°/s		1000°/s	
3.5kg	4kg		7kg	
—				
—				
6.0N·m	8.86N·m		16.6N·m	
6.0N·m	8.86N·m		16.6N·m	
2.9N·m	4.9N·m		9.4N·m	
0.12kg·m ²	0.2kg·m ²		0.47kg·m ²	
0.12kg·m ²	0.2kg·m ²		0.47kg·m ²	
0.03kg·m ²	0.07kg·m ²		0.15kg·m ²	
1,102mm	541mm		723mm	912mm
±0.03mm	±0.02mm		±0.02mm	±0.03mm
0 to 45°C/20 to 85% RH (without condensation)				
0.5 G or less				
Floor, wall, inverted, tilted mount		Floor, inverted mount	Floor, wall, inverted, tilted mount	
IP67 equivalent	IP40 equivalent ⁶		IP67 equivalent	
39kg	26kg	25kg	30kg	32kg
0.4KVA				
				
1102	541		723	912

*6: MZ04 and MZ04E have IP40 equivalence. MZ04D and MZ04DE have IP67 (dust proof and water proof) equivalence.

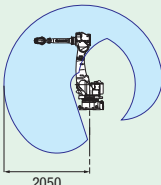
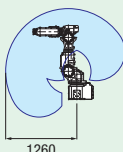
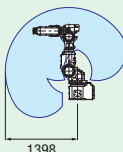
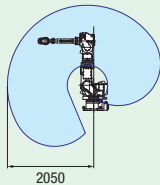
1[N·m]=1/9.8[kgf·m]

LIST OF SPECIFICATIONS

HANDLING

								
Model			MC10S	MC10L	MC12S	MC20	MC35	MC50
No. of axes			6					
Max. working envelope	Arm	J1 Swivel 1	±180°				±165°	
		J2 Horizontal	−145~+60°				−135~+80°	
		J7 Swivel 2	—					
	Wrist	J3 Vertical	−148~+242°	−163~+242°	−154~+242°	−163~+242°	−146~+260°	
		J4 Rotation 2	±190°	±180°			±360°	
		J5 Bend	±120°	±139°			±125°	
Max. speed	Arm	J6 Rotation 1	±360°				±450°	
		J1 Swivel 1	200°/s	150°/s	200°/s	170°/s	185°/s	180°/s
		J2 Horizontal	170°/s				180°/s	
	Wrist	J7 Swivel 2	—					
		J3 Vertical	170°/s				190°/s	180°/s
		J4 Rotation 2	400°/s	360°/s	370°/s	360°/s	305°/s	255°/s
Maximum load	Wrist	J5 Bend	400°/s	360°/s	370°/s	360°/s	305°/s	255°/s
		J6 Rotation 1	800°/s	600°/s	700°/s	600°/s	420°/s	370°/s
		Upper of J3	—					
Allowable static load torque for wrist	Wrist	Wrist	10kg		12kg	20 (max. 22) kg	35kg	50kg
		Load capacity on forearm	—				15kg	
		Upper of J3	—					
Allowable moment of inertia for wrist	Wrist	J4 Rotation 2	22N·m	24.5N·m	28N·m	49N·m	160N·m	210N·m
		J5 Bend	22N·m	24.5N·m	28N·m	49N·m	160N·m	210N·m
		J6 Rotation 1	11N·m	12N·m	13N·m	23.5N·m	90N·m	130N·m
Maximum reach	Wrist	J4 Rotation 2	0.7kg·m ²	1.6kg·m ²	1.3kg·m ²	1.6kg·m ²	16kg·m ²	30kg·m ²
		J5 Bend	0.7kg·m ²	1.6kg·m ²	1.3kg·m ²	1.6kg·m ²	16kg·m ²	30kg·m ²
		J6 Rotation 1	0.2kg·m ²	0.7kg·m ²	0.47kg·m ²	0.8kg·m ²	5kg·m ²	12kg·m ²
Maximum reach			1,420mm	2,019mm	1,400mm	1,722mm	2,050mm	
Position repeatability			±0.06mm				±0.07mm	
Ambient temperature ^{*1} /humidity			0 to 45°C/20 to 85% RH (without condensation)					
Vibration			0.5 G or less				0.5 G or less	
Installation			Floor, inverted mount				Floor mount (OP: inverted, wall, tilted)	
Dust proof, Drip proof			Wrist has IP67 and main body has IP65 equivalent	IP65 equivalent			Wrist: IP67 equivalent, main body: IP54 equivalent (OP: IP65/67 equivalent)	
Weight			198Kg	225Kg	210Kg	220Kg	640Kg	
Power consumption			1.5KVA	1.7KVA			5.0KVA	
Working envelope								

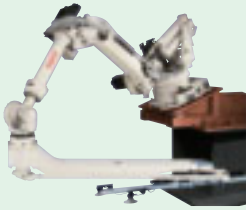
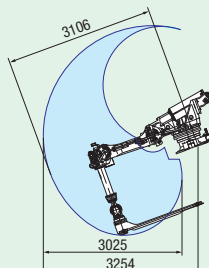
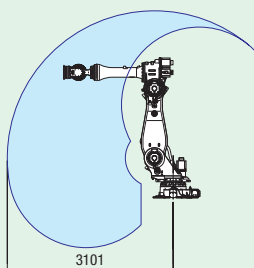
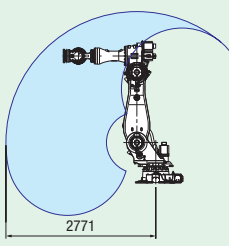
*1: Using at 1,000 m or lower sea level. Ambient temperature has limitations when allowable altitude is exceeded.

					
MC70	MR20	MR20L	MR35	MR50	
6	7				
±165°	±180°		±165°		
−135~+80°	−120~+55°				
—	±180°		±190°		
−146~+260°	−166~+135°		−146~+140°		
±360°	±180°		±360°		
±125°	±135°	±139°	±125°		
±450°	±360°		±450°		
175°/s	170°/s		180°/s	175°/s	
145°/s	170°/s		175°/s	140°/s	
—	170°/s		130°/s		
165°/s	170°/s		180°/s	165°/s	
235°/s	250°/s	360°/s	305°/s	255°/s	
235°/s	250°/s	360°/s	305°/s	255°/s	
350°/s	300°/s	600°/s	420°/s	370°/s	
70kg	20 (max. 30) kg	20kg	35kg	50kg	
15kg	—		15kg		
—					
300N·m	80.8N·m	49N·m	160N·m	210N·m	
300N·m	80.8N·m	49N·m	160N·m	210N·m	
150N·m	44.1N·m	23.5N·m	90N·m	130N·m	
30kg·m ²	6.0kg·m ²	1.6kg·m ²	16kg·m ²	30kg·m ²	
30kg·m ²	6.0kg·m ²	1.6kg·m ²	16kg·m ²	30kg·m ²	
12kg·m ²	2.3kg·m ²	0.8kg·m ²	5kg·m ²	12kg·m ²	
2,050mm	1,260mm	1,398mm	2,050mm		
±0.07mm	±0.06mm		±0.07mm		
0 to 45°C/20 to 85% RH (without condensation)					
0.5 G or less					
Floor mount (OP: inverted, wall, tilted)	Floor, inverted mount		Floor mount (OP: inverted, wall, tilted)		
Wrist: IP67 equivalent, main body: IP54 equivalent (OP: IP65/67 equivalent)	IP65 equivalent		IP67 equivalent		
640Kg	230Kg		745Kg		
5.0KVA	1.0KVA		4.1KVA		
 2050	 1260	 1398	 2050		

1[N·m]=1/9.8[kgf·m]

LIST OF SPECIFICATIONS

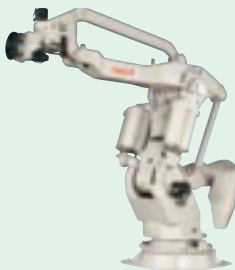
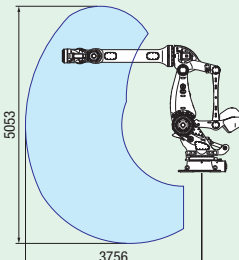
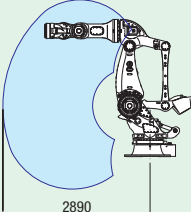
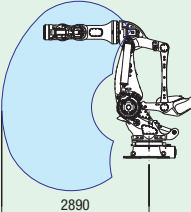
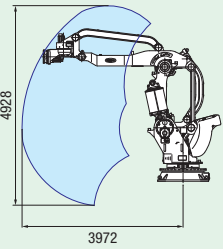
HANDLING

						
Model				ST210TP-01	MC280L	MC350
No. of axes				7	6	
Max. working envelope	Arm	J1	Swivel 1	±180°	±180°	
		J2	Horizontal	−35~+120°	−100~+40°	
		J7	Swivel 2	±65°	—	
		J3	Vertical	−96~+210°	−147~+130°	−180~+130°
	Wrist	J4	Rotation 2	±360°	±360°	
		J5	Bend	±120°	±125°	
J6		Rotation 1	±360°	±360°		
Max. speed	Arm	J1	Swivel 1	110°/s	105°/s	
		J2	Horizontal	90°/s	105°/s	95°/s
		J7	Swivel 2	(Press arm link) 120°/s	—	
		J3	Vertical	95°/s	95°/s	
	Wrist	J4	Rotation 2	130°/s	120°/s	110°/s
		J5	Bend	130°/s	120°/s	110°/s
J6		Rotation 1	250°/s	200°/s	180°/s	
Maximum load	Wrist		80kg	280kg	350kg	
	Load capacity on forearm		30kg	25kg	50kg	
	Upper of J3		—	—		
Allowable static load torque for wrist	J4	Rotation 2	—	1,921N·m	2,750N·m	
	J5	Bend	—	1,921N·m	2,750N·m	
	J6	Rotation 1	—	988N·m	1,235N·m	
Allowable moment of inertia for wrist	J4	Rotation 2	J7 axis rotation 80 kg·m ²	400kg·m ²		
	J5	Bend		400kg·m ²		
	J6	Rotation 1		250kg·m ²		
Maximum reach				3,106mm	3,101mm	2,771mm
Position repeatability				±0.3mm	±0.2mm	
Ambient temperature ^{*1} /humidity				0 to 45°C/20 to 85% RH (without condensation)		
Vibration				0.5 G or less		
Installation				Shelf mount (installed at 20° angle)	Floor mount	
Dust proof, Drip proof				Wrist has IP67 and main body has IP54 equivalent		
Weight				1,650kg	1,660kg	1,620kg
Power consumption				7.0KVA	9.0KVA	8.6KVA
Working envelope						

*1: Using at 1,000 m or lower sea level. Ambient temperature has limitations when allowable altitude is exceeded.

*2: The initial settings are ±210°. When passing cable through the hollow part of the 6th axis, use a range of ±210°.

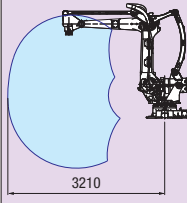
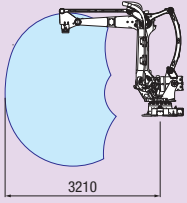
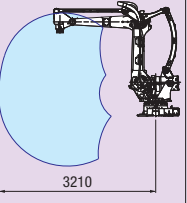
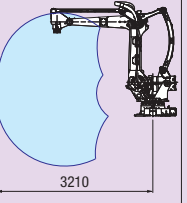
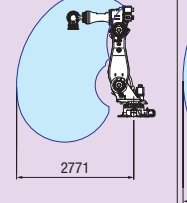
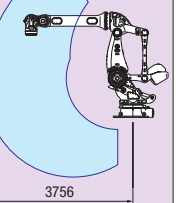
When a cable is not passed through, the operating envelope can be extended to a maximum of ±360°, depending on the usage conditions.

			
MC400L	MC600	MC700	SC700
6			
±180°			±160°
−105~+60°			−85~+45°
—			—
−130~+30°	−140~+30°		−90~+40°
±210°			−10~+90°
±120°			±125°
±360° ²			±10°
90°/s		80°/s	45°/s
90°/s		80°/s	30°/s
—			—
90°/s		80°/s	30°/s
110°/s		100°/s	30°/s
110°/s		100°/s	50°/s
180°/s		160°/s	30°/s
400kg	600kg	700kg	700kg
50kg	Max. 50 kg	Max. 25 kg	—
—			—
3,450N·m			13,800N·m
3,450N·m			3,920N·m
1,725N·m			2,940N·m
600kg·m ²			3,000kg·m ²
600kg·m ²			1,800kg·m ²
400kg·m ²			1,000kg·m ²
3,756mm	2,890mm		3,972mm
±0.3mm			±0.5mm
0 to 45°C/20 to 85% RH (without condensation)			
0.5 G or less			
Floor mount			
IP54 equivalent			Wrist has IP67 and main body has IP54 equivalent
3,050kg	2,850kg	3,300kg	7,000kg
19.3KVA	19.3KVA	19.3KVA	7.0KVA
			

1 [N·m] = 1/9.8 [kgf·m]

LIST OF SPECIFICATIONS

PALLETIZING/CLEAN-ROOM

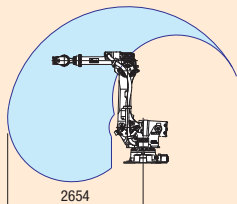
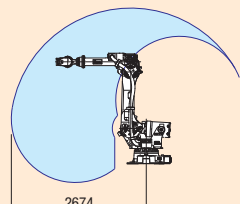
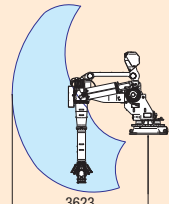
															
Model				LP130-01		LP130F		LP180-01		LP210		MC470P		MC500P	
No. of axes				4								6		5	
Max. working envelope	Arm	J1	Swivel 1	±180°								±180°		±180°	
		J2	Horizontal	-95~+41°		-94.5~+40°		-95~+41°				-100~+40°		-105~+60°	
		J7	Swivel 2	-								-			
		J3	Vertical	-117~+17°		-116~+17°		-117~+17°				-180~+35°		-130~+30°	
	Wrist	J4	Rotation 2	±360°								±360° ²		-	
		J5	Bend	-								±125° ²		±120°	
J6		Rotation 1	-								±360°		Max. ±360° Value of initial settings: ±210° ³		
Max. speed	Arm	J1	Swivel 1	130°/s		145°/s		115°/s		105°/s		105°/s		90°/s	
		J2	Horizontal	115°/s				100°/s				95°/s		90°/s	
		J7	Swivel 2	-								-			
		J3	Vertical	115°/s				105°/s		100°/s		95°/s		90°/s	
	Wrist	J4	Rotation 2	400°/s		535°/s		360°/s		300°/s		110°/s		-	
		J5	Bend	-								110°/s		110°/s	
		J6	Rotation 1	-								180°/s		180°/s	
		Maximum load	Wrist		130kg				180kg		210kg		470kg		500kg
Load capacity on forearm			25kg								30kg		Max. 25 kg		
Upper of J3			-								-				
Allowable static load torque for wrist	J4	Rotation 2	-								2,750N·m		-		
	J5	Bend	-								2,750N·m		3,450N·m		
	J6	Rotation 1	-								0N·m		1,725N·m		
Allowable moment of inertia for wrist	J4	Rotation 2	50kg·m ²				69kg·m ²		100kg·m ²		400kg·m ²		-		
	J5	Bend	-								400kg·m ²		600kg·m ²		
	J6	Rotation 1	-								250kg·m ²		400kg·m ²		
Maximum reach			3,210mm								2,771mm		3,756mm		
Position repeatability			±0.3mm				±0.4mm				±0.2mm		±0.3mm		
Ambient temperature ¹ /humidity			0 to 45°C/20 to 85% RH (without condensation)												
Vibration			0.5 G or less												
Installation			Floor mount												
Dust proof, Drip proof			IP54 equivalent								Wrist has IP67 and main body has IP54 equivalent		IP54 equivalent		
Weight			1,150kg								1,620kg		3,000kg		
Power consumption			6.2KVA								8.6KVA		9.7KVA		
Working envelope															

*1: Using at 1,000 m or lower sea level. Ambient temperature has limitations when allowable altitude is exceeded.

*2: Software limits the downward vertical range of axis 5 to $\pm 5^\circ$. Axis 4 can move $\pm 360^\circ$ and axis 5 can move $\pm 125^\circ$ only when the encoder correction screen or software limit settings screen is open.

*3: The initial settings are $\pm 210^\circ$. When passing cable through the hollow part of the 6th axis, use a range of $\pm 210^\circ$. When a cable is not passed through, the operating envelope can be extended to a maximum of $\pm 360^\circ$, depending on the usage conditions.

1 [N·m] = 1/9.8 [kgf·m]

							
Model				ST133CF	ST166CF	ST210CF	SC400LC
No. of axes				6			
Max. working envelope	Arm	J1	Swivel 1	±165°			±150°
		J2	Horizontal	-80~+60°			-25~ +105°
		J7	Swivel 2	-			
	Wrist	J3	Vertical	-137~+150°			-25~+120°
		J4	Rotation 2	±360°			±300°
		J5	Bend	±135°		±130°	±120°
			±360°				
Max. speed	Arm	J1	Swivel 1	130°/s	110°/s	100°/s	80°/s
		J2	Horizontal	130°/s	110°/s	90°/s	68°/s
		J7	Swivel 2	-			
	Wrist	J3	Vertical	130°/s	110°/s	95°/s	80°/s
		J4	Rotation 2	230°/s	170°/s	130°/s	90°/s
		J5	Bend	230°/s	170°/s	130°/s	90°/s
			305°/s	260°/s	200°/s	145°/s	
Maximum load	Wrist		133kg	166kg	210kg	400kg	
	Load capacity on forearm		70kg		Max. 70 kg	10kg	
	Upper of J3		-			30kg	
Allowable static load torque for wrist	J4	Rotation 2	745N·m	951N·m	1,337N·m	1,960N·m	
	J5	Bend	745N·m	951N·m	1,337N·m	1,960N·m	
	J6	Rotation 1	411N·m	490N·m	720N·m	980N·m	
Allowable moment of inertia for wrist	J4	Rotation 2	60.9kg·m ²	88.9kg·m ²	141.1kg·m ²	200kg·m ²	
	J5	Bend	60.9kg·m ²	88.9kg·m ²	141.1kg·m ²	200kg·m ²	
	J6	Rotation 1	30.2kg·m ²	45.0kg·m ²	79.0kg·m ²	147kg·m ²	
Maximum reach			2,654mm		2,674mm	3,623mm	
Position repeatability			±0.2mm		±0.3mm	±0.5mm	
Ambient temperature ¹ /humidity				10 to 45°C/20 to 85% RH (without condensation)			
Vibration				0.5 G or less			
Installation				Floor mount		Shelf mount	
Dust proof, Drip proof				-			
Weight				1,120kg		3,800kg	
Power consumption				4.2KVA		6.7KVA	
Clean rating ²				Class 6			
Working envelope							

*1: Using at 1,000 m or lower sea level. Ambient temperature has limitations when allowable altitude is exceeded.

*2: Clean rating complies with ISO 14644-1

1[N·m]=1/9.8[kgf·m]

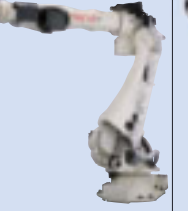
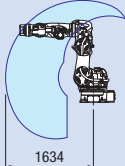
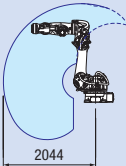
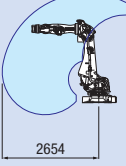
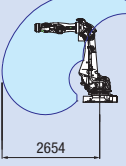
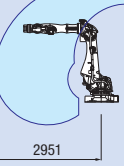
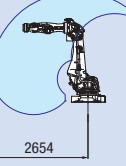
PALLETIZING

CLEAN-ROOM

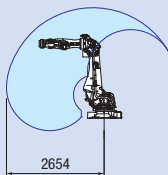
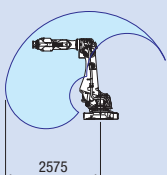
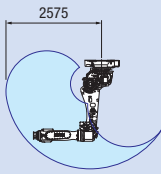
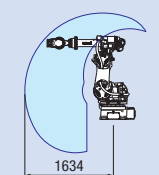
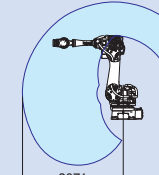
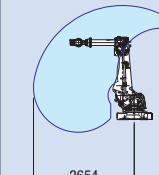
LIST OF SPECIFICATIONS

LIST OF SPECIFICATIONS

WELDING

								
Model			SRA100HS	SRA100HB	SRA100H	SRA133H	SRA133HL	SRA166H
No. of axes			6					
Max. working envelope	Arm	J1 Swivel 1	±180°					
		J2 Horizontal	-120~+60°		-80~+60°			
		J7 Swivel 2	—					
	Wrist	J3 Vertical	-125~+90°	-151~+90°	-146.5~+150°		-133.4~+150°	-146.5~+150°
		J4 Rotation 2	±210°					
		J5 Bend	±125°					
Max. speed	Arm	J6 Rotation 1	±210°					
		J1 Swivel 1	136°/s		125°/s	120°/s	115°/s	120°/s
		J2 Horizontal	115°/s		110°/s		105°/s	110°/s
	Wrist	J7 Swivel 2	—					
		J3 Vertical	160°/s		121°/s	118°/s	113°/s	115°/s
		J4 Rotation 2	210°/s	225°/s	210°/s		175°/s	
Maximum load	Wrist	J5 Bend	175°/s					
		J6 Rotation 1	310°/s	315°/s	310°/s		280°/s	
		J7 Swivel 2	—					
Allowable static load torque for wrist	Wrist	J1 Swivel 1	100kg		133kg		166kg	
		J2 Horizontal	20kg					
		J7 Swivel 2	—					
Allowable moment of inertia for wrist	Wrist	J3 Vertical	160°/s		121°/s	118°/s	113°/s	115°/s
		J4 Rotation 2	210°/s	225°/s	210°/s		175°/s	
		J5 Bend	175°/s					
Allowable moment of inertia for wrist	Wrist	J6 Rotation 1	310°/s	315°/s	310°/s		280°/s	
		J7 Swivel 2	—					
		J1 Swivel 1	100kg		133kg		166kg	
Maximum reach			1,634mm	2,044mm	2,654mm		2,951mm	2,654mm
Position repeatability			±0.1mm				±0.15mm	±0.1mm
Ambient temperature ^{*1} /humidity			0 to 45°C/20 to 85% RH (without condensation)					
Vibration			0.5 G or less					
Installation			Floor mount					
Dust proof, Drip proof			IP54 equivalent					
Weight			690kg	750kg	1,040kg		1,070kg	1,100kg
Power consumption			7.0KVA					
Working envelope								

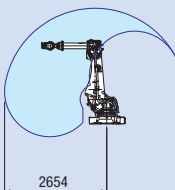
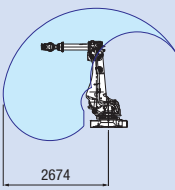
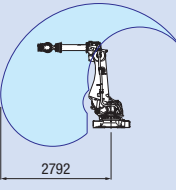
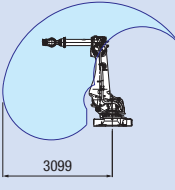
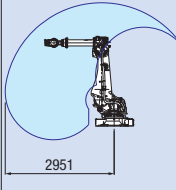
*1: Using at 1,000 m or lower sea level. Ambient temperature has limitations when allowable altitude is exceeded.

					
SRA210H	SRA220H	SRA220HV-01	SRA100J-01	SRA100B-01	SRA100-01(100-01A)
6			6	6	6
±180°		±165°	±180°	±180°	±180°
-80~+60°			-120~+60°	-120~+60°	-80~+60°
—			—	—	—
-146.5~+150°	-154~+150°		-125~+90°	-150~+180°	-146.5~+150°
±210°			±360°	±360°	±360°
±125°	±130°		±135°	±135°	±135°
±210°			±360°	±360°	±360°
115°/s			136°/s	136°/s	136°/s
105°/s			115°/s	110°/s	135°/s
—			—	—	—
113°/s			160°/s	130°/s	135°/s
130°/s			240°/s	240°/s	240°/s
130°/s			233°/s	233°/s	233°/s
205°/s			351°/s	351°/s	351°/s
210kg	220kg		100kg	100kg	100kg
20kg	20 (max. 45) kg		25 (max. 45) kg	25 (max. 45) kg	45 (max. 90) kg
—			—	—	—
1337N·m			580N·m	580N·m	580N·m
1337N·m			580N·m	580N·m	580N·m
720N·m			290N·m	290N·m	290N·m
200kg·m ²	141.1kg·m ²		45kg·m ²	45kg·m ²	60kg·m ²
200kg·m ²	141.1kg·m ²		45kg·m ²	45kg·m ²	60kg·m ²
155kg·m ²	79.0kg·m ²		22.7kg·m ²	22.7kg·m ²	30kg·m ²
2,654mm	2,575mm		1,634mm	2,071mm	2,654mm
±0.15mm			±0.1mm	±0.1mm	±0.1mm
0 to 45°C/20 to 85% RH (without condensation)					
0.5 G or less					
Floor mount		Inverted mount	Floor mount		
IP54 equivalent			Wrist has IP67 and main body has IP54 equivalent		
1,100kg			670kg	690kg	960kg
7.0KVA					
					

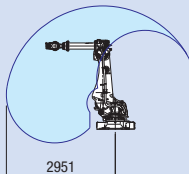
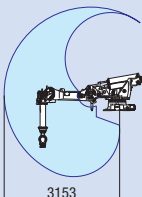
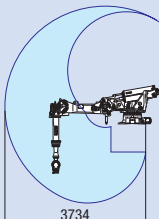
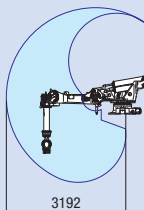
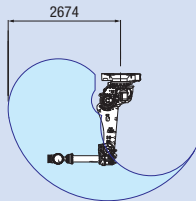
1 [N·m] = 1/9.8 [kgf·m]

LIST OF SPECIFICATIONS

WELDING

															
Model				SRA166-01 (166-01A)		SRA210-01 (210-01A)		SRA240-01		SRA250-01		SRA120EL-01		SRA133L-01	
No. of axes				6								6			
Max. working envelope	Arm	J1	Swivel 1	±180°								±180°			
		J2	Horizontal	-80~+60°								-80~+60°			
		J7	Swivel 2	—								—			
		J3	Vertical	-146.5~+150°						-140~+150°		-127.7~+150°		-133.4~+150°	
	Wrist	J4	Rotation 2	±360 (±210)°				±360°				±360°			
		J5	Bend	±135 (±120)°		±130 (±120)°		±130°				±135°			
J6		Rotation 1	±360 (±205)°				±360°				±360°				
Max. speed	Arm	J1	Swivel 1	125°/s		115°/s		105°/s		100°/s		115°/s		125°/s	
		J2	Horizontal	115°/s		105°/s		90°/s				105°/s		115°/s	
		J7	Swivel 2	—								—			
		J3	Vertical	121°/s		113°/s		100°/s		95°/s		113°/s		121°/s	
	Wrist	J4	Rotation 2	180°/s		140°/s		130°/s		125°/s		140°/s			
		J5	Bend	173°/s		133°/s		125°/s				173°/s			
J6		Rotation 1	260°/s		200°/s		195°/s		190°/s		260°/s				
Maximum load	Wrist		166kg		210kg		240kg		250kg		120kg		133kg		
	Load capacity on forearm		45 (max. 90) kg				20 (max. 45) kg				45 (max. 90) kg				
	Upper of J3		—								—				
Allowable static load torque for wrist	J4	Rotation 2	951N·m		1,337N·m						687N·m		800N·m		
	J5	Bend	951N·m		1,337N·m						687N·m		800N·m		
	J6	Rotation 1	490N·m		720N·m						353N·m		400N·m		
Allowable moment of inertia for wrist	J4	Rotation 2	88.9kg·m ²		141.1kg·m ²				225.4kg·m ²		60kg·m ²		76kg·m ²		
	J5	Bend	88.9kg·m ²		141.1kg·m ²				225.4kg·m ²		60kg·m ²		76kg·m ²		
	J6	Rotation 1	45kg·m ²		79.0kg·m ²				196kg·m ²		30kg·m ²		38kg·m ²		
Maximum reach			2,654mm		2,674mm				2,792mm		3,099mm		2,951mm		
Position repeatability			±0.15mm				±0.2mm				±0.15mm				
Ambient temperature ^{*1} /humidity			0 to 45°C/20 to 85% RH (without condensation)												
Vibration			0.5 G or less												
Installation			Floor mount												
Dust proof, Drip proof			Wrist has IP67 and main body has IP54 equivalent												
Weight			960/1,060kg		990/1,090kg		990kg		1,030kg		985kg		980kg		
Power consumption			7.0KVA												
Working envelope															

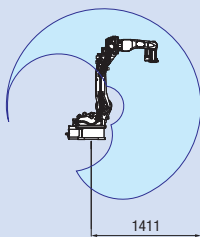
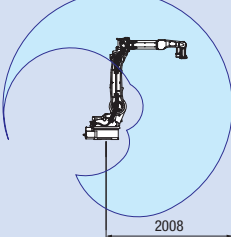
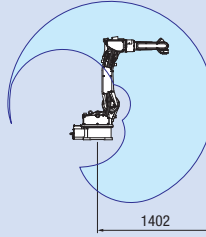
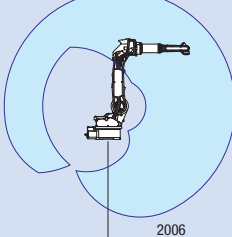
*1: Using at 1,000 m or lower sea level. Ambient temperature has limitations when allowable altitude is exceeded.

				
SRA166L-01 (166L-01A)	SRA166T-01 (166T-01A)	SRA166TL-01 (166TL-01A)	SRA210T-01 (210T-01A)	SRA210V
6	6			6
±180°	±180°			±165°
-80~+60°	-65~+120°			-80~+60°
—	—			—
-133.4~+150°	-106~+210°	-90~+210°	-106~+210°	-146.5~+150°
±360°	±360 (±210) °	±360°	±360 (±210) °	±360°
±135°	±135 (±120) °	±135°	±130 (±120) °	±130°
±360°	±360 (±205) °			±360°
115°/s	110°/s	105°/s	100°/s	115°/s
105°/s	110°/s	90°/s		105°/s
—	—			—
113°/s	115°/s		100°/s	113°/s
140°/s	180°/s	140°/s	140°/s	140°/s
173°/s	173°/s		133°/s	133°/s
260°/s	260°/s		200°/s	200°/s
166kg	166kg		210kg	210kg
45 (max. 90) kg	45 (max. 90) kg			45 (max. 90) kg
—	—			—
951N·m	951N·m		1,337N·m	1,337N·m
951N·m	951N·m		1,337N·m	1,337N·m
490N·m	490N·m		720N·m	720N·m
88.9kg·m ²	88.9kg·m ²		141.1kg·m ²	141.1kg·m ²
88.9kg·m ²	88.9kg·m ²		141.1kg·m ²	141.1kg·m ²
45.0kg·m ²	45.0kg·m ²		79.0kg·m ²	79.0kg·m ²
2,951mm	3,153mm	3,734mm	3,192mm	2,574mm
±0.15mm	±0.1mm	±0.15mm		±0.15mm
0 to 45°C/20 to 85% RH (without condensation)				
0.5 G or less				
Floor mount	Shelf mount			Inverted mount
Wrist has IP67 and main body has IP54 equivalent				
980kg	1,210 (1,310) kg	1,240kg	1,250 (1,350) kg	990kg
7.0KVA	7.0KVA	7.0KVA		7.0KVA
				
2951	3153	3734	3192	2674

1[N·m]=1/9.8[kgf·m]

LIST OF SPECIFICATIONS

WELDING

											
Model				NB04		NB04L		NV06		NV06L	
No. of axes				6							
Max. working envelope	Arm	J1	Swivel 1	±170°				±170°			
		J2	Horizontal	−155°~+90°		−155°~+100°		−155°~+90°		−155°~+100°	
		J7	Swivel 2	—				—			
	Wrist	J3	Vertical	−170°~+180°		−170°~+190°		−170°~+190°		−170°~+260°	
		J4	Rotation 2	±155°				±180°			
		J5	Bend	−45°~+225°				−50°~+230°			
Max. speed	Arm	J6	Rotation 1	±205°				±360°			
		J1	Swivel 1	210°/s		195°/s		210°/s		195°/s	
		J2	Horizontal	210°/s		200°/s		210°/s		200°/s	
	Wrist	J7	Swivel 2	—							
		J3	Vertical	210°/s		200°/s		210°/s		200°/s	
		J4	Rotation 2	420°/s							
Maximum load	Wrist	J5	Bend	420°/s							
		J6	Rotation 1	600°/s				620°/s			
		Load capacity on forearm	10kg		20kg		10kg		20kg		
Allowable static load torque for wrist	Upper of J3	—									
		J4	Rotation 2	10.1N・m				11.8N・m			
		J5	Bend	10.1N・m				9.8N・m			
Allowable moment of inertia for wrist	J6	Rotation 1	2.94N・m				5.9N・m				
		J4	Rotation 2	0.38kg・m ²				0.30kg・m ²			
		J5	Bend	0.38kg・m ²				0.25kg・m ²			
Maximum reach	J6	Rotation 1	0.03kg・m ²				0.06kg・m ²				
		1,411mm		2,008mm		1,402mm		2,006mm			
		±0.08mm									
Position repeatability				0 to 45°C/20 to 85% RH (without condensation)							
Ambient temperature ^{*1} /humidity				0.5 G or less							
Vibration				Floor, inverted, wall mount							
Installation				154kg							
Weight				277kg		144kg		273kg			
Power consumption				2.4KVA		1.5KVA		2.4KVA			
Working envelope											

*1: Using at 1,000 m or lower sea level. Ambient temperature has limitations when allowable altitude is exceeded.

1 [N·m] = 1/9.8 [kgf·m]

Robot systems

System products

NACHI's system engineering team puts its wealth of experience to work for you, providing system solutions that are easy to use along with high-cost performance.

Peripheral devices for the robot

NACHI provides proven highly-reliable robot application devices.

Offline program system

Robot operations can be simulated before installation to check performance. Creating an operation program beforehand allows the robot to be directly installed in the assembly line.



Offline programming

Post-installation service

From setup through startup

NACHI's skilled technicians provide support during the installation process, from setup to connection, teaching, movement, and supervision, until the line is fully operational.

Quick response to emergency calls

NACHI's specialized technicians are "on-call" to immediately respond to customer emergencies.

Reliable support from remote locations

Robots can be operated remotely when placed online, allowing specialized service professionals to provide accurate support to worldwide locations.

The right parts when you need them

Our service locations always have important maintenance parts in stock. We can deliver the parts you need quickly.

Periodic inspections

As a trusted and reliable partner, NACHI performs periodic inspections to extend the life of your robot.

Overhauls

NACHI provides a selection of services suited to the conditions of your robot and performs overhauls to ensure that your robot is always in the best condition. NACHI can also provide temporary replacement robots to keep your line operating during repairs.



Overhauls

Training

Robot training course

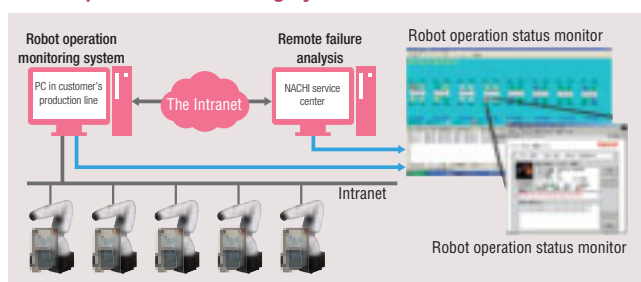
NACHI provides a curriculum to train operators about robot operations, daily inspections, basic maintenance, and safety regulations.



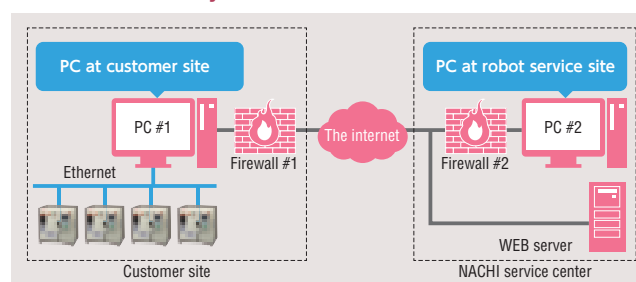
Centralized robot monitoring system (AX controller only)

The centralized robot monitoring system offers monitoring of multiple robots connected by a network. The system supports preventative maintenance by collecting statistical data, operation history, and maintenance support data to keep the robots operating smoothly.

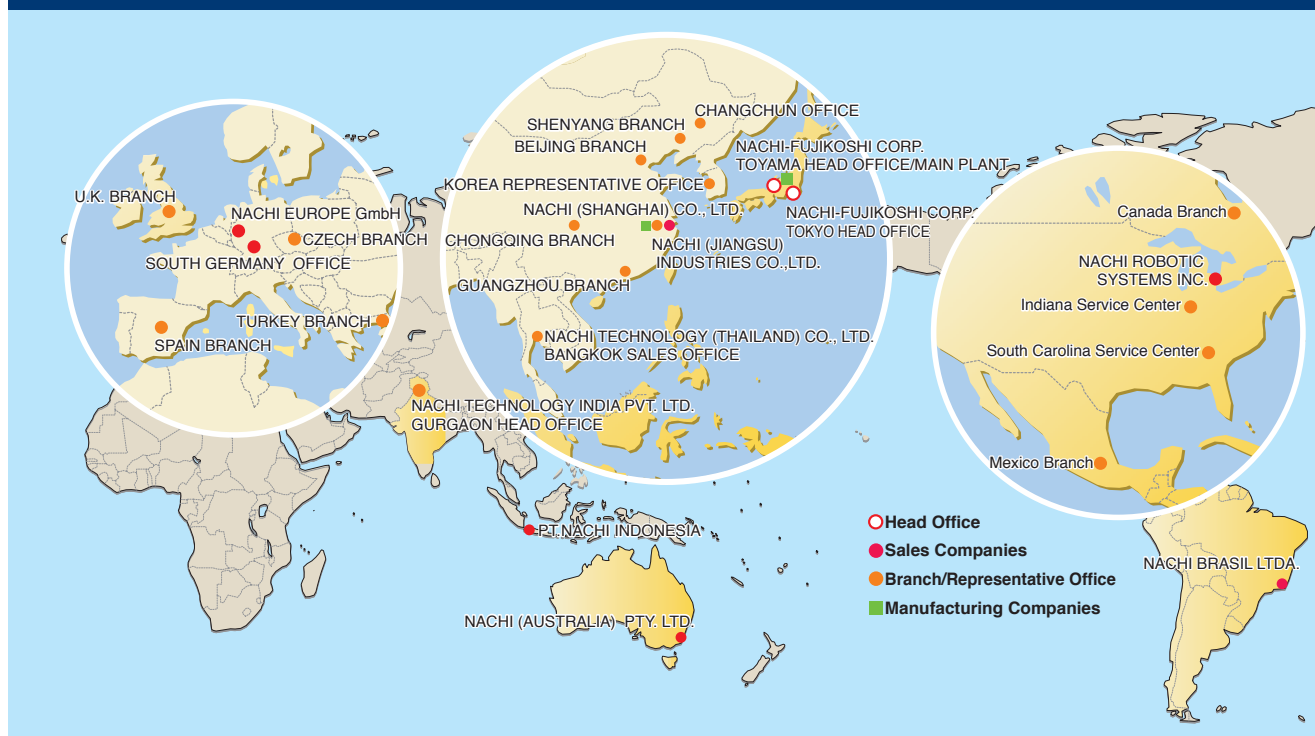
Robot operation monitoring system



Remote failure analysis



World Service Network



Overseas subsidiaries

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Head office

TOYAMA PLANT

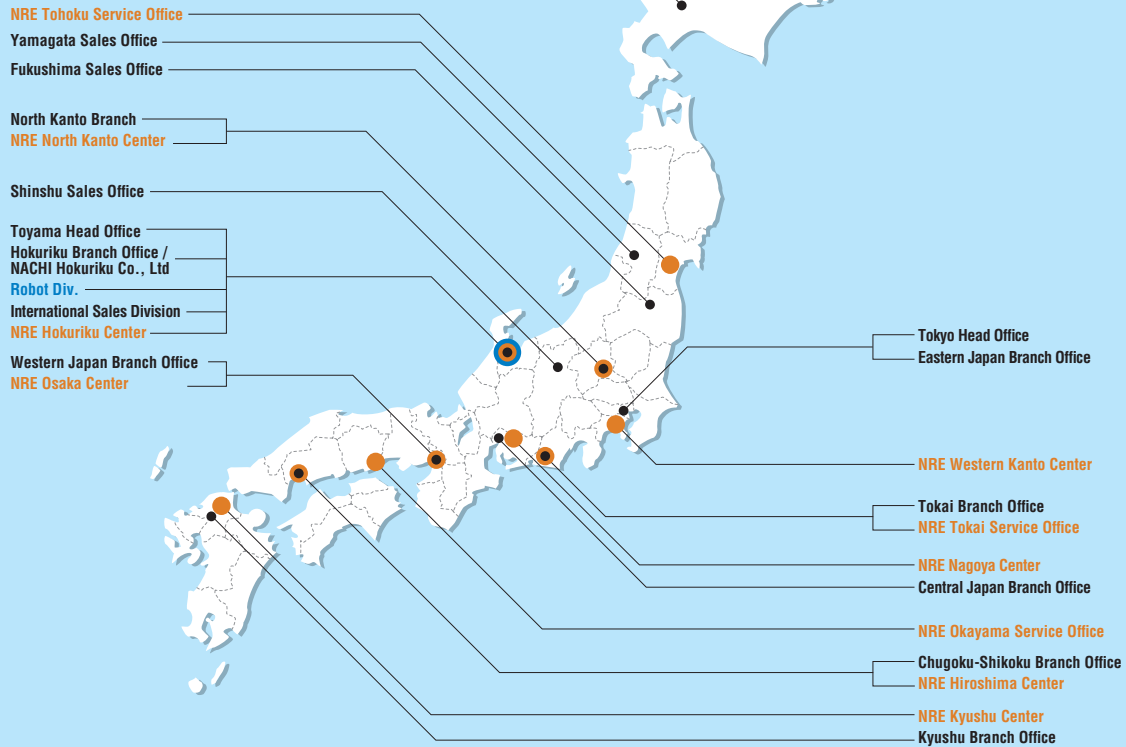
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Sales and Service Network in Japan

- Sales Center
- Service Center
- Manufacturing and Development Center



Sales Centers in Japan

NACHI-FUJIKOSHI CORP. <http://www.nachi-fujikoshi.co.jp/>

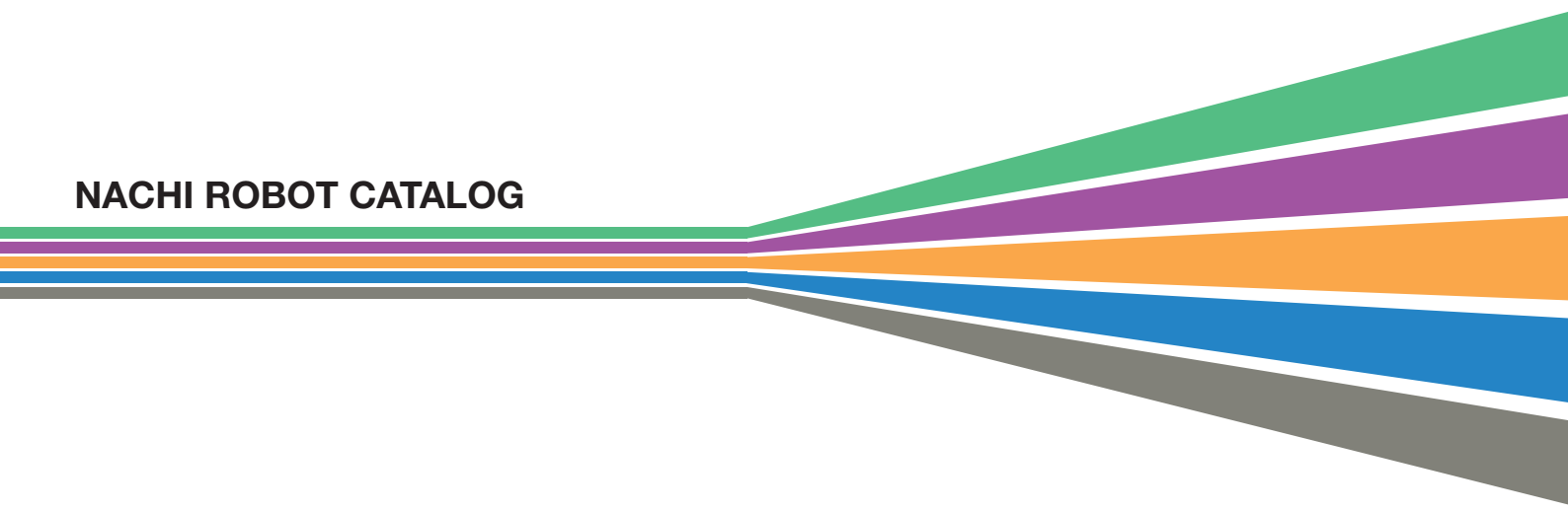
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NACHI ROBOT CATALOG



Safety precautions

- Before using any robot, review all documentation including operating instructions and other attached documents. Familiarize yourself with the contents in order to ensure proper robot operation.
- When a robot is to be used for an application where robot operation may directly threaten the life or cause physical harm to personnel, a careful examination of its intended use is required. Contact a NACHI-FUJIKOSHI sales representative to provide details of the intended use. Obtain proper training prior to operating robot.
- Photos used in this document show the robots without safety fences, equipment, and devices that are required to comply with the applicable laws and regulations for ensuring safety. These photos are only provided to illustrate what is being described.
- The external appearances, specifications, etc. of the products portrayed in this catalog are subject to change without notice due to improvements in performance.

CATALOG NO.	R7001E-13
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