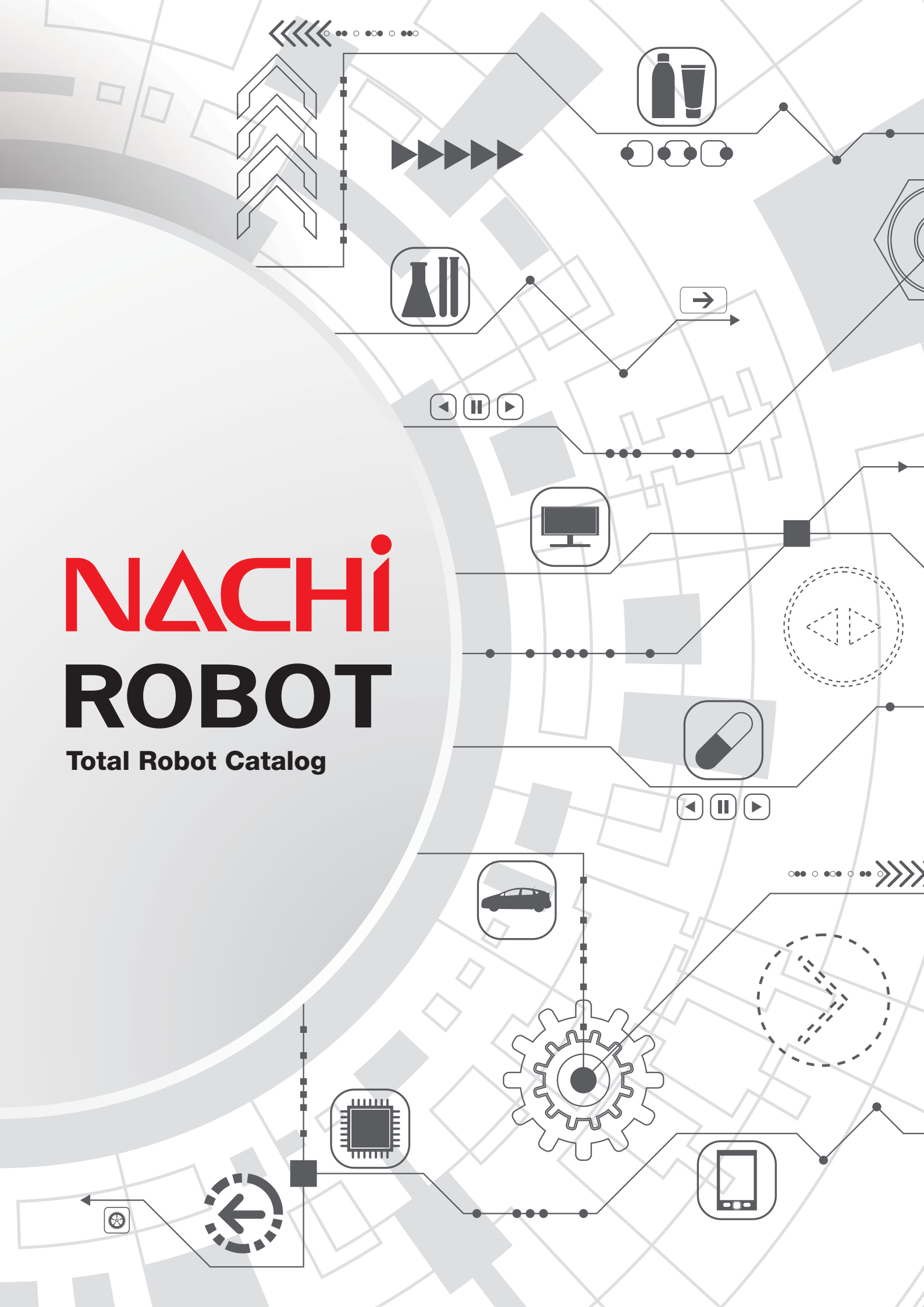


# NACHI

# ROBOT

Total Robot Catalog



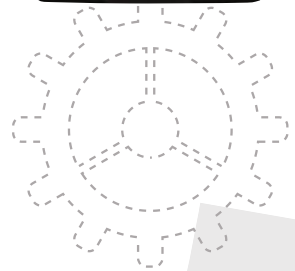
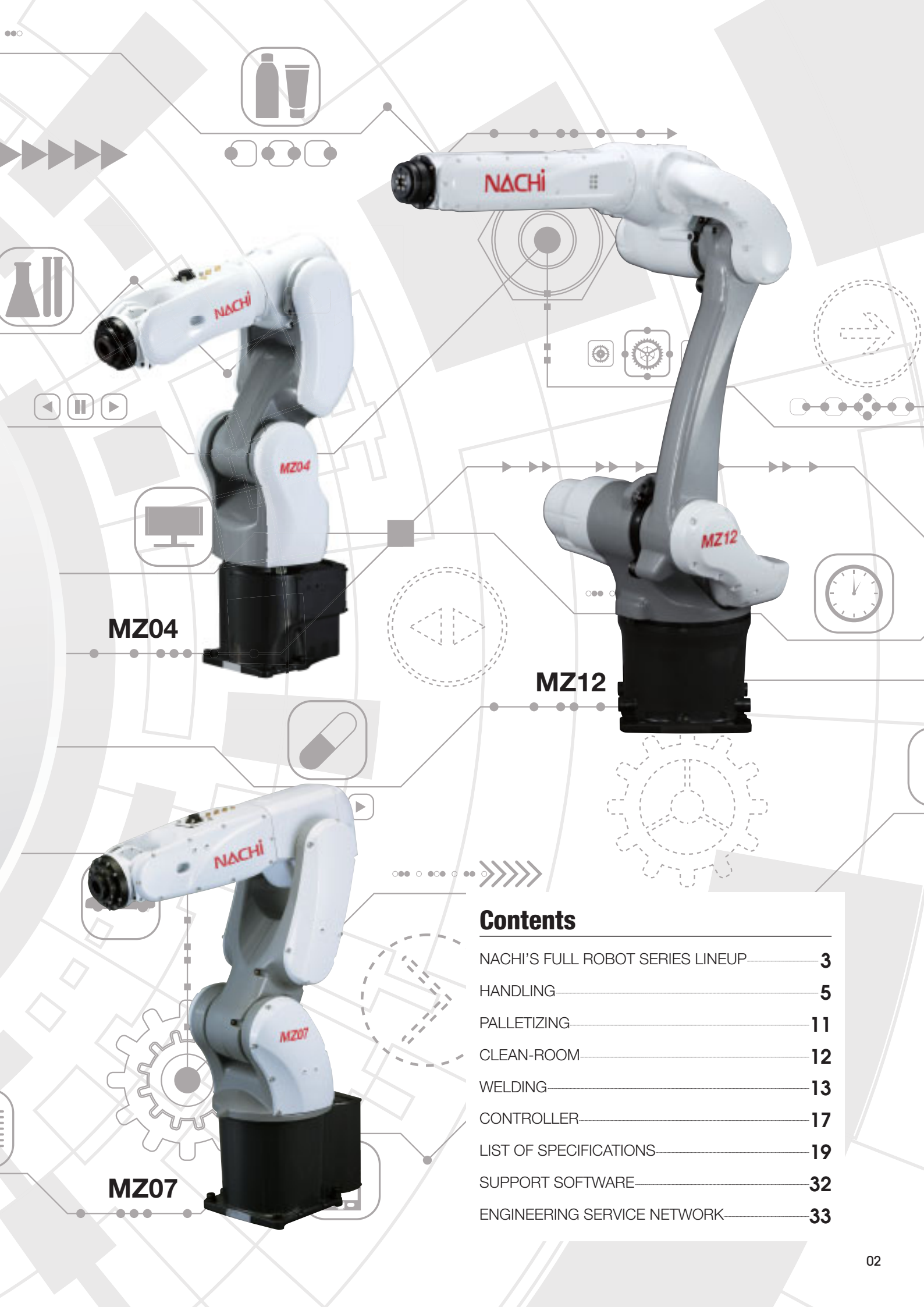


# NACHI-FUJIKOSHI's industrial robots are **making innovations in manufacturing** throughout the world.

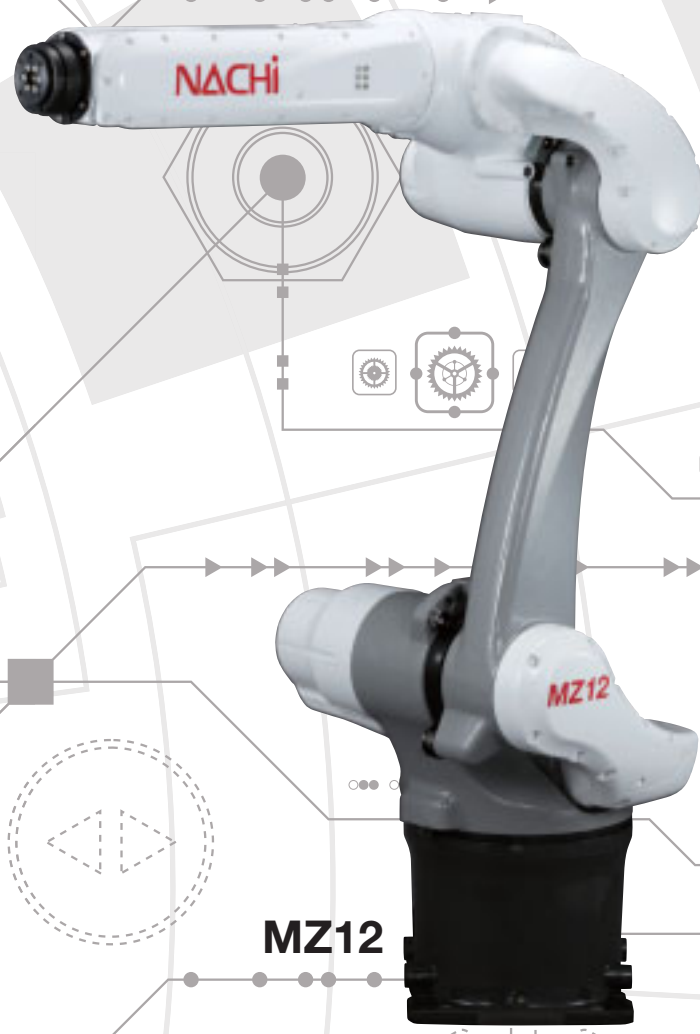
NACHI-FUJIKOSHI leveraged know-how from their hydraulic and machine tool divisions to become the first Japanese manufacturer of industrial robots in 1968.

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**



**MZ12**








**MZ07**






## Contents

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# 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				
	MZ	EZ/ES	MC/MR	ST-TP	MC and SC Heavy Loader
	 <p>▶P.05 Number of controlled axes: 5 or 6 axes Payload capacity: 3.5 to 12kg Maximum reach: 541 to 1,454mm</p>	 <p>▶P.06 Number of controlled axes: 4 or 6 axes Payload capacity: 2 to 12kg Maximum reach: 350 to 850mm</p>	 <p>▶P.07 Number of controlled axes: 6 or 7 axes Payload capacity: 10 to 70kg Maximum reach: 1,260 to 2,050mm</p>	 <p>▶P.08 Number of controlled axes: 6 or 7 axes Payload capacity: 80 to 100kg Maximum reach: 3,106mm</p>	 <p>▶P.09 · P.10 Number of controlled axes: 6 axes Payload capacity: 280 to 1,000kg Maximum reach: 2,771 to 3,972mm</p>
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>▶P.11</p> <p>Number of controlled axes: 4 or 5 or 6 axes Payload capacity: 130 to 500kg Maximum reach: 2,771 to 3,756mm</p>	<p>▶P.12</p> <p>Number of controlled axes: 6 axes Payload capacity: 133 to 400kg Maximum reach: 2,654 to 3,623mm</p>	<p>▶P.12</p> <p>Number of controlled axes: 4 or 5 axes Payload capacity: 25 to 120kg</p>	<p>▶P.13 · P.14</p> <p>Number of controlled axes: 6 axes Payload capacity: 100 to 250kg Maximum reach: 1,634 to 3,734mm</p>	<p>▶P.15</p> <p>Number of controlled axes: 6 axes Payload capacity: 4 to 6kg Maximum reach: 1,402 to 2,008mm</p>		
			●			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

LINEUP

HANDLING

PALLETIZING

CLEAN-ROOM

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SUPPORT SOFTWARE

# 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.

World's fastest lightweight compact robot

## MZ Series

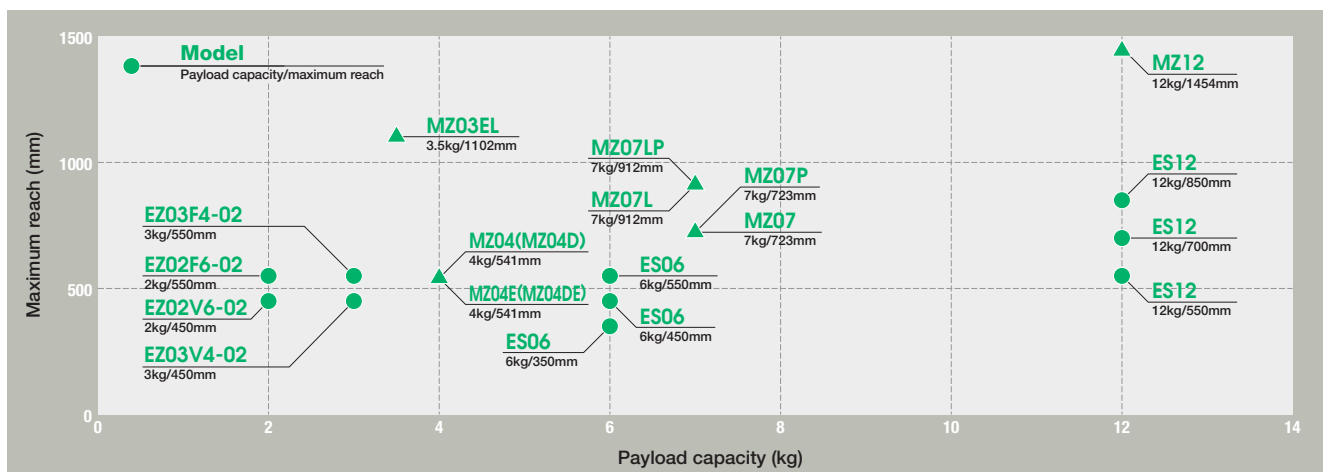
- ▲ MZ03EL
- ▲ MZ04
- ▲ MZ04D
- ▲ MZ04E
- ▲ MZ04DE
- ▲ MZ07
- ▲ MZ07L
- ▲ MZ07P
- ▲ MZ07LP
- ▲ MZ12

-  Number of controlled axes: 5 or 6 axes
-  Payload capacity: 3.5 to 12kg
-  Maximum reach: 541 to 1,454mm

The MZ series is the world's fastest lightweight compact robots. These robots are available in dust-proof and drip proof specifications, multiple installation orientations that provide flexibility to automate a variety of processes for an all-around compact high performance robot.




The hollow wrist construction for the MZ series, include an internal path for wiring, which provides a streamlined profile for working in confined spaces.

The MZ12, which has a vast workspace, is the latest addition to the MZ series. This high speed and precise robot was designed with advanced CAD tools for a very light-weight, but strong, rigid structure, which helps improve cycle time by 12%.








## WING SLICER Type EZ Series

- EZ03V4-02  Number of controlled axes: 4 or 6 axes
- EZ03F4-02  Payload capacity: 2 to 3kg
- EZ02V6-02  Maximum reach: 450 to 550mm
- 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.



## Space-saving, high-speed scara robot ES Series

- ES06  Number of controlled axes: 4 axes
- ES12  Payload capacity: 6 to 12kg
-  Maximum reach: 350 to 850mm

The ES SCARA series is known for high speed and precision due to the rigidity of the arm and servo control.



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# HANDLING

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

Powerful and compact multi-purpose robot

## MC Series

- MC10S      ● MC35
  - MC10L      ● MC50
  - MC12S      ● MC70
  - MC20
-  Number of controlled axes: 6 axes
  -  Payload capacity: 10 to 70kg
  -  Maximum reach: 1,400 to 2,050mm

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.

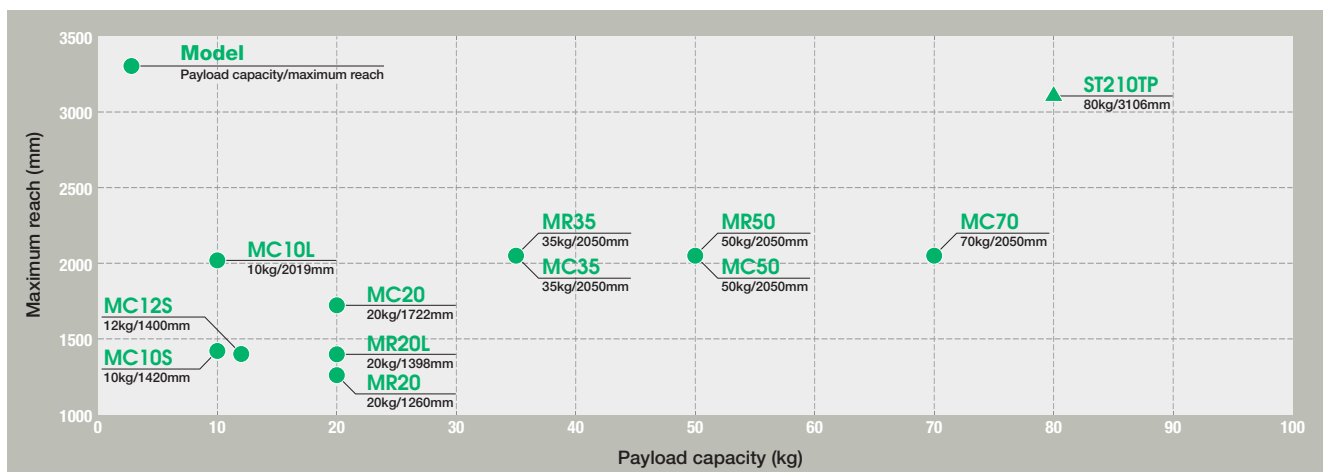
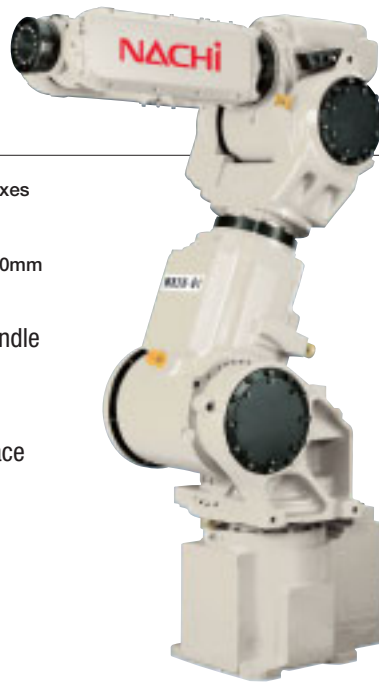


Flexible motion "Arm" robot with 7-axes

## MR Series

- MR20      ● MR35
  - MR20L      ● MR50
-  Number of controlled axes: 7 axes
  -  Payload capacity: 20 to 50kg
  -  Maximum reach: 1,260 to 2,050mm

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)

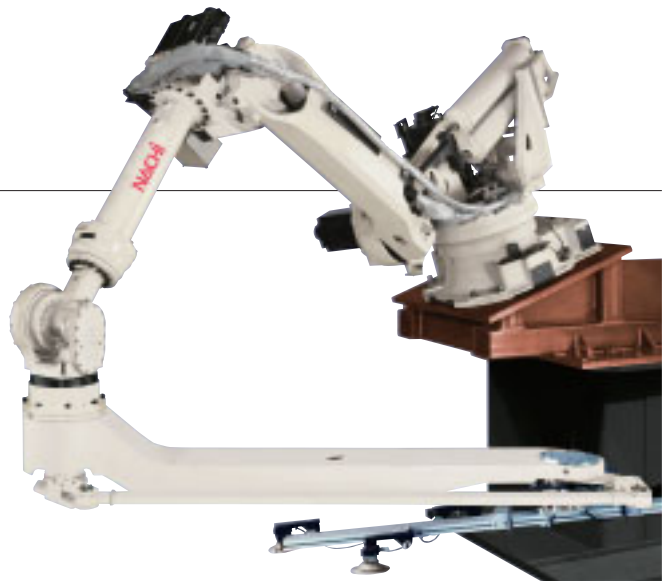
 Number of controlled axes: 6 or 7 axes

 Payload capacity: 80 to 100kg

 Maximum reach: 3,106mm

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

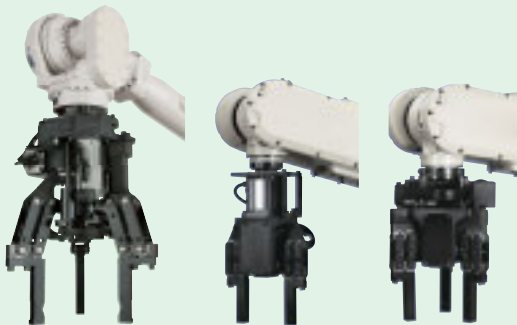
Newly developed specialized press arm attachment gives this robot a much larger reach that can be used for a maximum eight meter press pitch. Moves parts horizontally at high speed.



## ●Options

### FLEXhand FH360/FH150-F2/FH150-F3

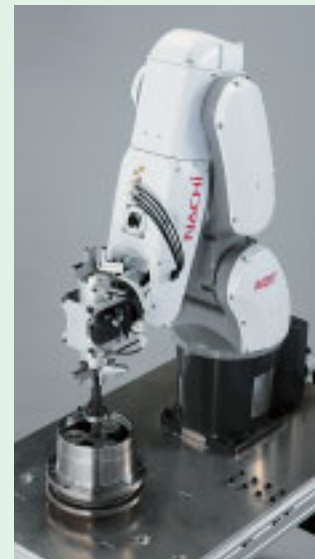
Servo hand controlled as an additional axis by the robot controller. Capable of handling many shapes without changing the hand. This is an excellent tool for small-lot multiple item production.



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

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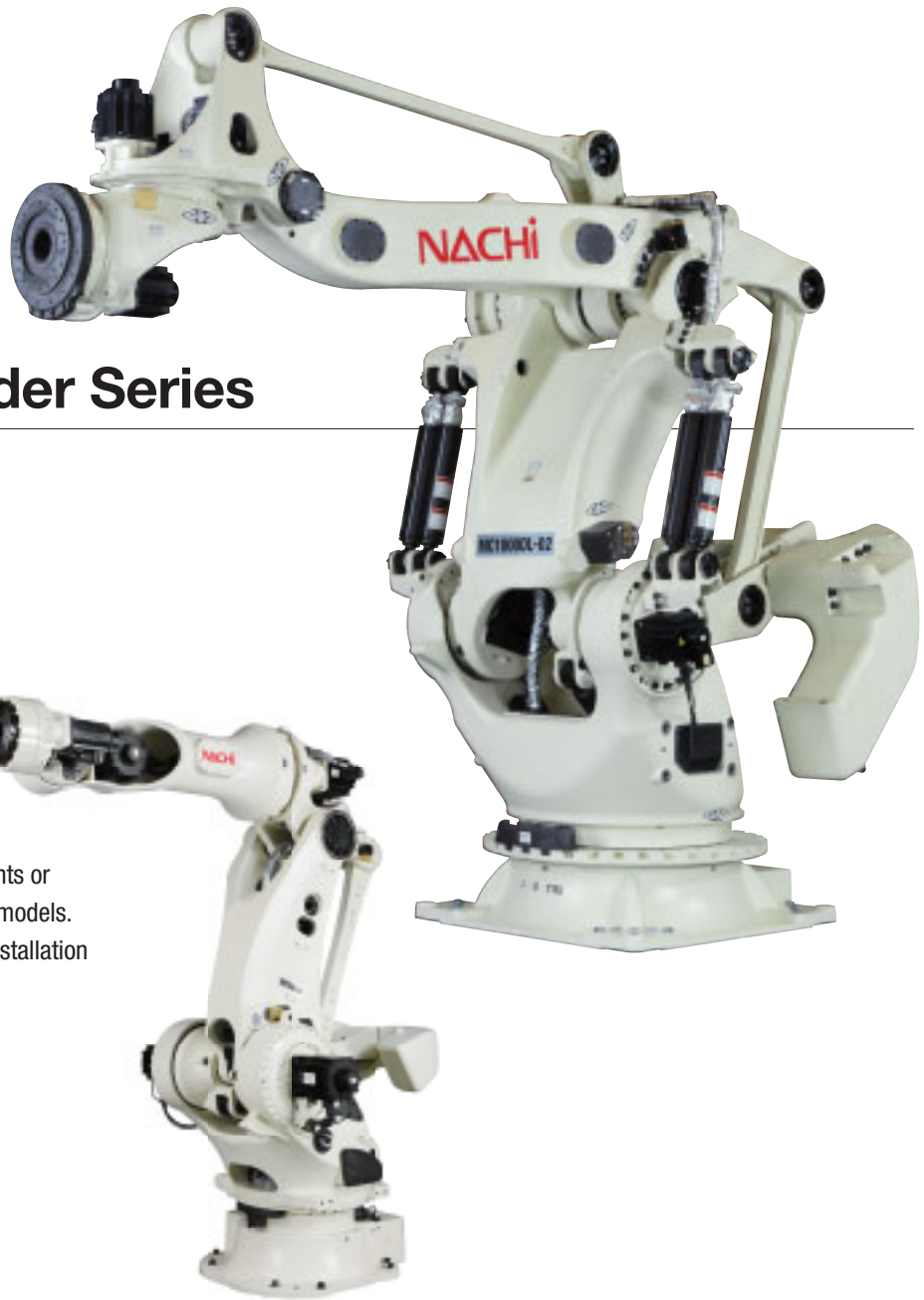
CONTROLLER

LIST OF SPECIFICATIONS

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# HANDLING



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



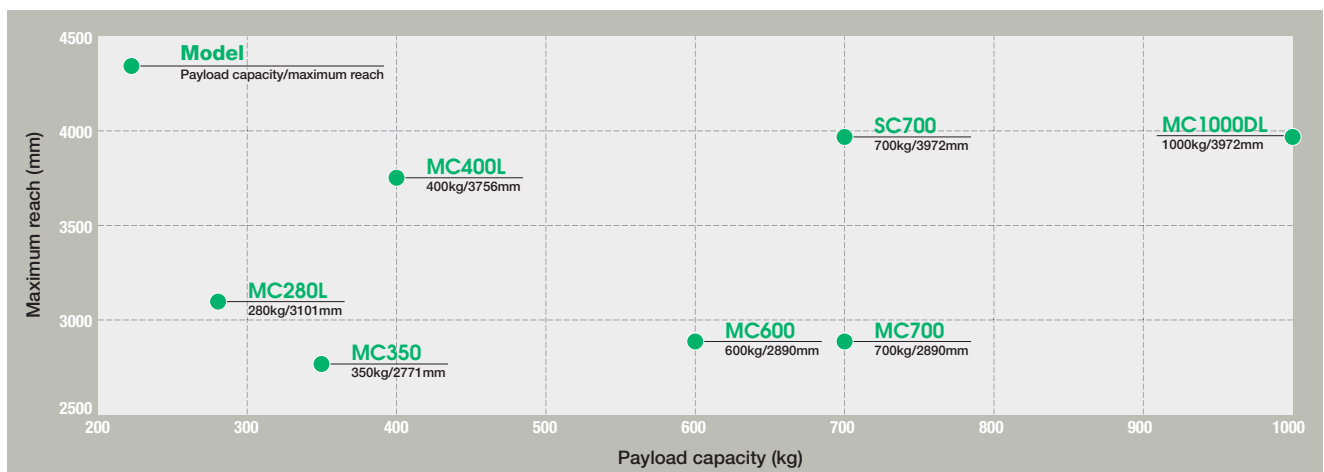
Heavy loader robot

## MC Heavy Loader Series

- MC280L      ● MC600
- MC350      ● MC700
- MC400L    ● MC1000DL

-  Number of controlled axes: 6 axes
-  Payload capacity: 280 to 1,000kg
-  Maximum reach: 2,771 to 3,972mm




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

-  Number of controlled axes: **6 axes**
-  Payload capacity: **700kg**
-  Maximum reach: **3,972mm**

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.



### 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.



#### 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.



#### 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.



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# 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
-  Number of controlled axes: 4 axes
  -  Payload capacity: 130 to 210kg
  -  Maximum reach: 3,210mm

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

- MC470P
  - MC500P
-  Number of controlled axes: 5 or 6 axes
  -  Payload capacity: 470 to 500kg
  -  Maximum reach: 2,771 to 3,756mm

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

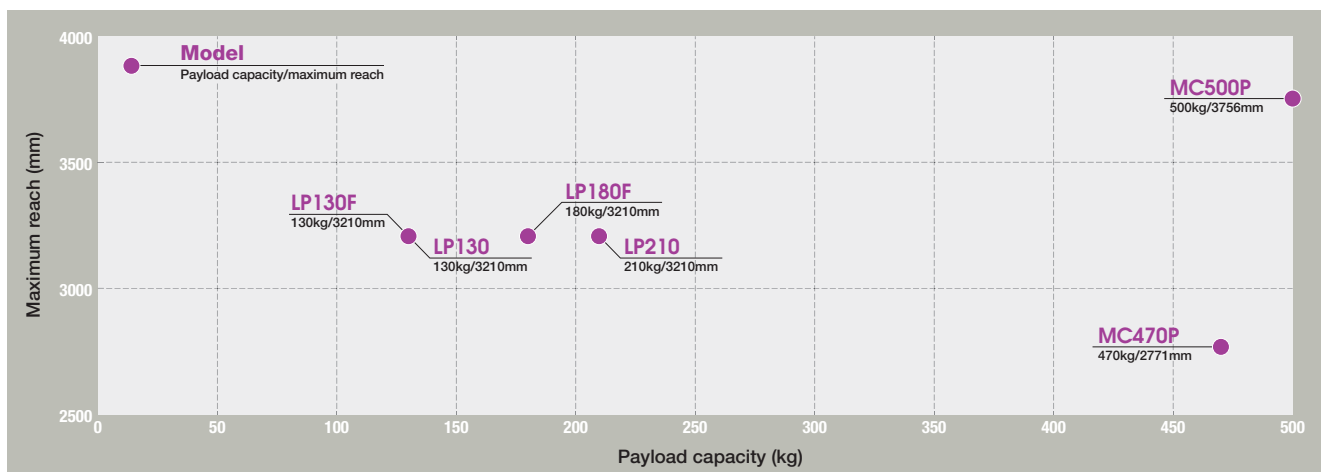


### Example application

#### 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.

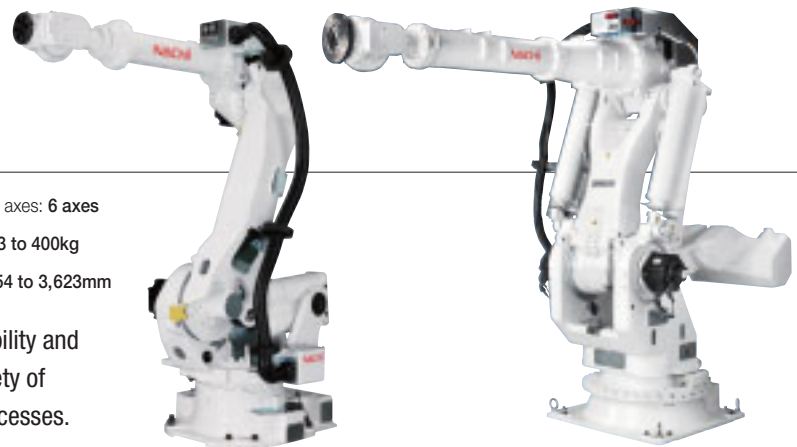
Clean-room loading robot

## ST-C/SC-C Series

- **ST133CF**
- **ST210CF**
- **ST166CF**
- **SC400LC**

-  Number of controlled axes: 6 axes
-  Payload capacity: 133 to 400kg
-  Maximum reach: 2,654 to 3,623mm

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.



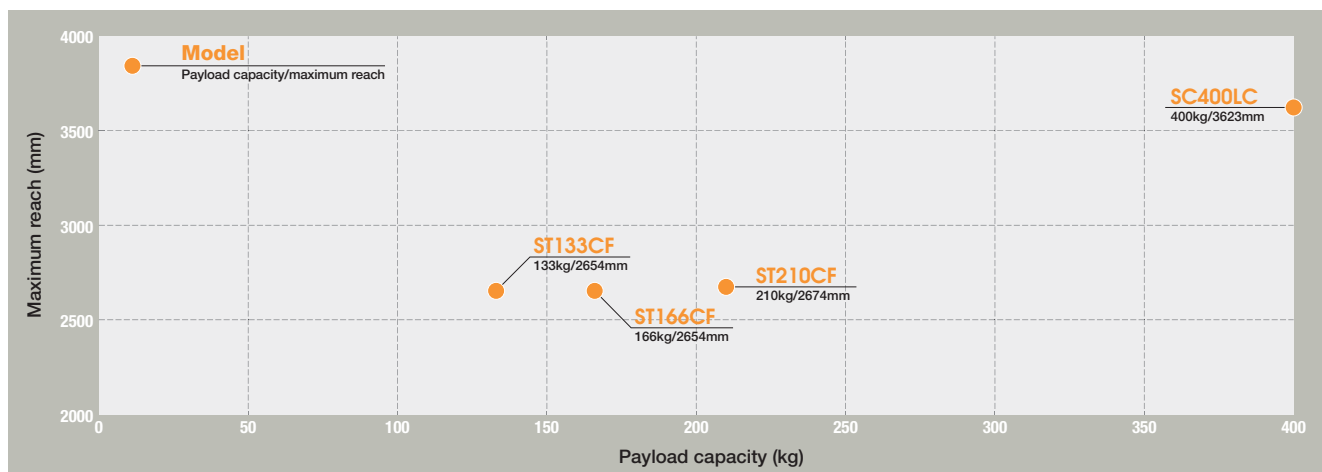
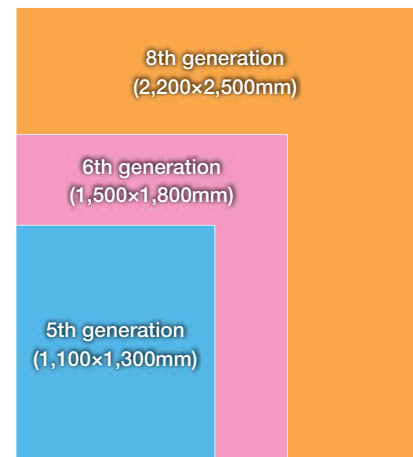
Robots for glass substrate loading

## SJ Series

- **SJ80C**
- **SJ120C**

-  Number of controlled axes: 4 or 5 axes
-  Payload capacity: 25 to 120kg

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.



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# 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.

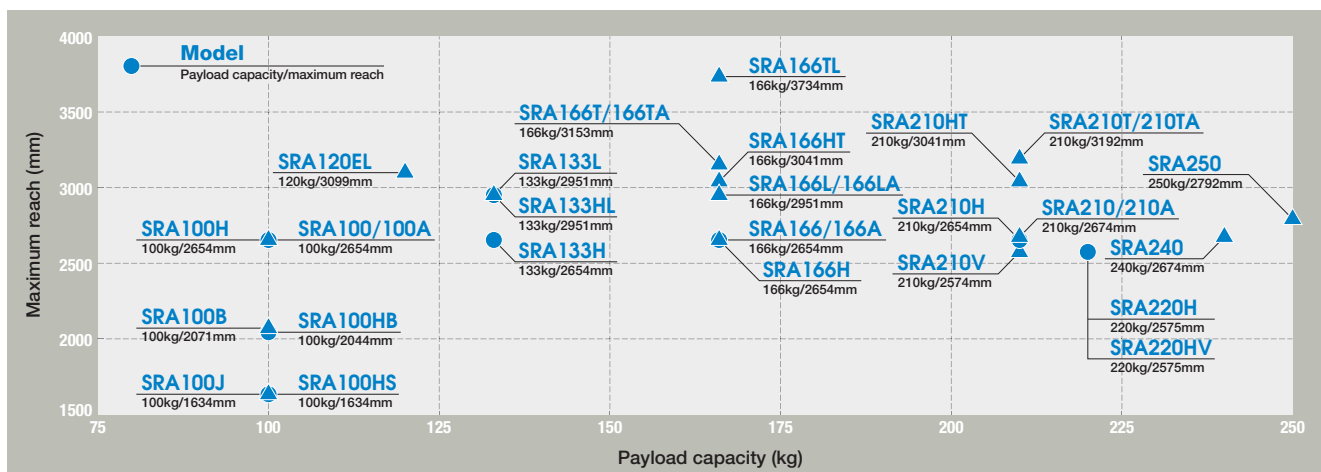
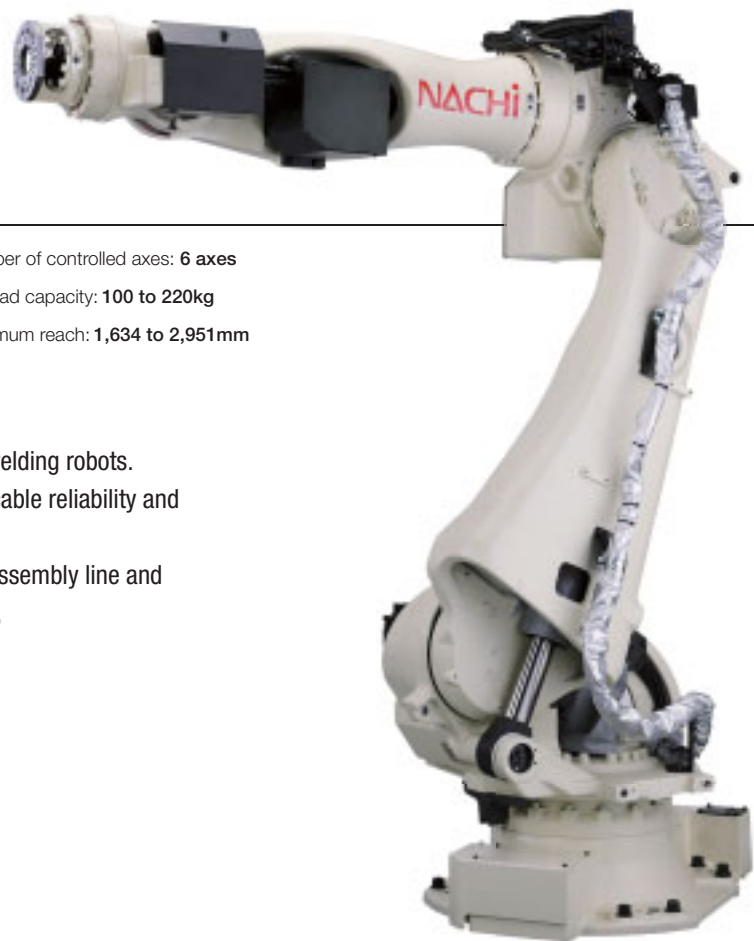
Spot welding robot with built-in cables

## SRA-H Series

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

- ☐ Number of controlled axes: 6 axes
- ☐ Payload capacity: 100 to 220kg
- ☐ Maximum reach: 1,634 to 2,951mm

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
- ▲ SRA100B-01
- ▲ SRA100-01
- ▲ SRA100-01A
- ▲ SRA166-01
- ▲ SRA166-01A
- ▲ SRA210-01
- ▲ SRA210-01A
- ▲ SRA240-01
- ▲ SRA250-01
- ▲ SRA120EL-01
- ▲ SRA133L-01
- ▲ SRA166L-01
- ▲ SRA166L-01A
- ▲ SRA166T-01(Shelf mount)
- ▲ SRA166T-01A(Shelf mount)
- ▲ SRA166TL-01(Shelf mount)
- ▲ SRA166TL-01A(Shelf mount)
- ▲ SRA166HT-01(Hollow arm & Shelf mount)
- ▲ SRA210T-01(Shelf mount)
- ▲ SRA210T-01A(Shelf mount)
- ▲ SRA210HT-01(Hollow arm & Shelf mount)
- ▲ SRA210V(Inverted mount)

-  Number of controlled axes: 6 axes
-  Payload capacity: 100 to 250kg
-  Maximum reach: 1,634 to 3,734mm

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.

The hollow arm version of the shelf mount for the 166 kg & 210 kg are now available.



Floor mount

Shelf mount

### 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.



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# WELDING

Spot welding, arc welding, and seam welding

Arc Welding Robot

## NB/NV Series

- NB04
  - NB04L
  - NV06
  - NV06L
- Number of controlled axes: 6 axes  
Payload capacity: 4 to 6kg  
Maximum reach: 1,402 to 2,008mm

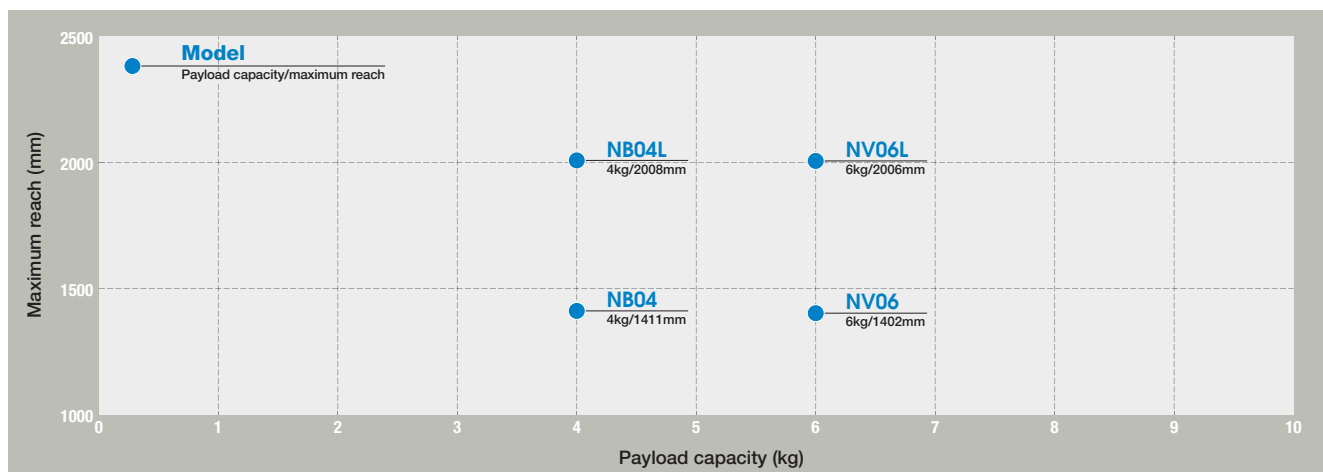
By housing the arc welding cable in the arm, these robots optimize layout by eliminating interference with peripheral equipment and they provide consistent wire feed.



### 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.

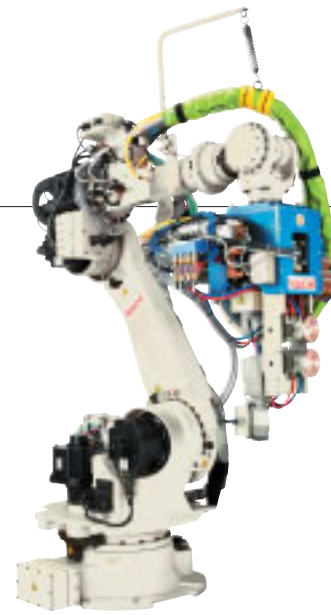


Seam welding robots

# 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

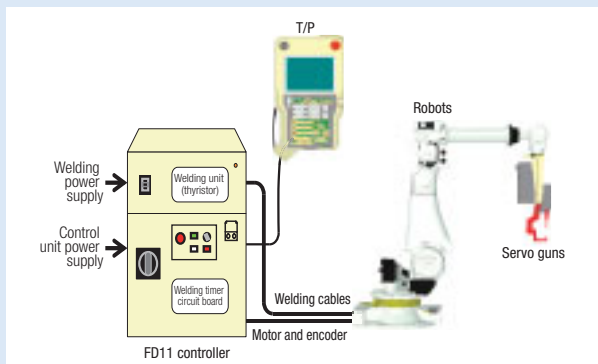


### ●Option

#### 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.



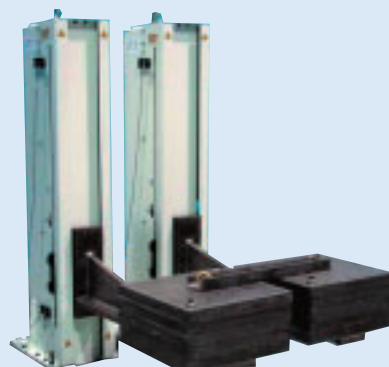
#### Revolving worktable TT2000/TT4000

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.



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# CONTROLLER

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.

## FD Controller (FD14)



The FD14 controller, used for large robots, is more compact in comparison to the FD11 controller.

### • Basic specifications for controller

Item	Specifications
Controllable axes	6
Maximum controllable axes	8
External dimensions (mm)	490(W)×680(D)×240(H)
Position reader	Absolute encoder
Programming system	Teaching playback
Operating panel	Mode switch (teach/playback), emergency stop button
Cable between robot and control panel	5m (controller cable specification)
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
Cable between robot and control panel	5m, 10m, 15m, 20m, 25m (with connector)
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	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

## FD Controller (FD11)



### 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)

\*Teach pendant specification is the same as FD14.

#### • 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

## 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/3 φ 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		



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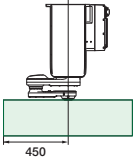
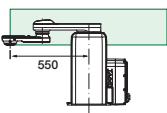
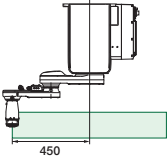
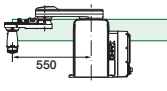
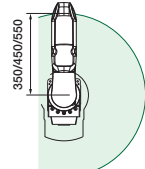
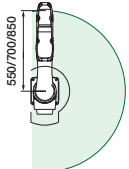
Model			MZ03EL	MZ04 (MZ04D)	MZ04E (MZ04DE)	MZ07 (MZ07P)	MZ07L (MZ07LP)	MZ12	
No. of axes			6			6(5)		6	
Max. working envelope	Arm	J1 Swivel 1	±170°						
		J2 Horizontal	-135~+80°	-145~+90°		-135~+80°		-160~+90°	
		J7 Swivel 2	-						
	Wrist	J3 Vertical	-155~+270°	-125~+280°		-136~+270°	-139~+270°	-147~+210°	
		J4 Rotation 2	±190°						
		J5 Bend	±120°						±140°
			±360°						
Max. speed	Arm	J1 Swivel 1	300°/s	480°/s	200°/s	450°/s	300°/s	260°/s	
		J2 Horizontal	230°/s	460°/s	150°/s	380°/s	280°/s	230°/s	
		J7 Swivel 2	-						
	Wrist	J3 Vertical	360°/s	520°/s	190°/s	520°/s	360°/s	260°/s	
		J4 <sup>1</sup> Rotation 2	550°/s	560°/s		550°/s		470°/s	
		J5 Bend	550°/s	560°/s		550°/s		470°/s	
			1,000°/s	900°/s	1000°/s		700°/s		
Maximum load	Wrist		3.5kg	4kg	7kg		12kg		
	Load capacity on forearm		-						
	Upper of J3		-						
Allowable static load torque for wrist	J4 Rotation 2	6.0N·m	8.86N·m		16.6N·m		25N·m		
	J5 Bend	6.0N·m	8.86N·m		16.6N·m		25N·m		
	J6 Rotation 1	2.9N·m	4.9N·m		9.4N·m		9.8N·m		
Allowable moment of inertia for wrist	J4 Rotation 2	0.12kg·m <sup>2</sup>	0.2kg·m <sup>2</sup>		0.47kg·m <sup>2</sup>		0.7kg·m <sup>2</sup>		
	J5 Bend	0.12kg·m <sup>2</sup>	0.2kg·m <sup>2</sup>		0.47kg·m <sup>2</sup>		0.7kg·m <sup>2</sup>		
	J6 Rotation 1	0.03kg·m <sup>2</sup>	0.07kg·m <sup>2</sup>		0.15kg·m <sup>2</sup>		0.2kg·m <sup>2</sup>		
Maximum reach			1,102mm	541mm	723mm	912mm	1,454mm		
Position repeatability			±0.03mm	±0.02mm	±0.02mm	±0.03mm	±0.04mm		
Ambient temperature <sup>*2</sup> /humidity			0 to 45°C/20 to 85% RH (without condensation)						
Vibration			0.5 G or less						
Installation			Floor, wall, inverted, tilted mount		Floor, inverted mount	Floor, wall, inverted, tilted mount		Floor, inverted, tilted mount	
Dust proof, Drip proof			IP67 equivalent	IP40 equivalent <sup>*3</sup>		IP67 equivalent			
Weight			39kg	26kg	25kg	30kg	32kg	150kg	
Power consumption			0.4KVA						1.8KVA
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: MZ04 and MZ04E have IP40 equivalence. MZ04D and MZ04DE have IP67 (dust proof and water proof) equivalence.



EZ03V4-02		EZ03F4-02		EZ02V6-02		EZ02F6-02		ES06		ES12	
											
4		6		4							
250/150mm <sup>*4</sup>		250/150mm <sup>*5</sup>		±170°		±145°		±145° <sup>*6</sup>			
±180°		±145°		±180°		±145°		200/340mm		350/450mm	
±360°		±180°		±180°		±145°		±360°			
-		±105°		-		-		-			
-		±360°		1,400/1,200mm/s <sup>*4</sup>		1,200/1,000mm/s <sup>*5</sup>		400°/s		420°/s <sup>*6</sup>	
450°/s		670°/s		-		-		670°/s		450°/s	
720°/s		2,400mm/s		2,400°/s		1,200°/s		2,400mm/s		2,800mm/s	
-		720°/s		-		720°/s		2,500°/s		2,400°/s	
-		-		-		-		-		-	
3 kg (2 kg rated)		2kg (1 kg rated)		6 kg (3 kg rated)		12 kg (3 kg rated)		-		-	
-		-		-		-		-		-	
-		-		-		-		-		-	
-		-		-		-		-		-	
-		-		-		-		-		-	
0.05kg·m <sup>2</sup>		0.03kg·m <sup>2</sup> (0.013kg·m <sup>2</sup> rated)		0.12kg·m <sup>2</sup>		0.3kg·m <sup>2</sup>		-		-	
-		0.03kg·m <sup>2</sup> (0.013kg·m <sup>2</sup> rated)		-		-		-		-	
-		0.01kg·m <sup>2</sup> (0.001kg·m <sup>2</sup> rated)		-		-		-		-	
450mm		550mm		450mm		550mm		350/450/550mm		550/700/850mm	
±0.014mm		±0.02mm		±0.012mm		±0.015mm		-		-	
0 to 45°C/20 to 85%RH (without condensation)		0 to 45°C/20 to 85%RH (without condensation)		0 to 40°C/45 to 85%RH (without condensation)		0 to 40°C/45 to 85%RH (without condensation)		-		-	
0.5 G or less (4.9m/s <sup>2</sup> )		0.5 G or less (4.9m/s <sup>2</sup> )		-		-		-		-	
Inverted mount		Floor mount		Inverted mount		Floor mount		-		-	
IP20		IP20		IP20		IP20		-		-	
42kg		43kg		44kg		45kg		36/37kg		65/67/69kg	
0.4KVA		0.4KVA		0.4KVA		0.4KVA		-		-	
											

\*4: 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.  
 \*5: 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.  
 \*6: Different in 850 mm arm.

1[N·m]=1/9.8[kgf·m]

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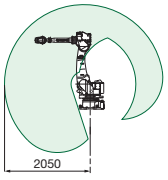
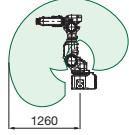
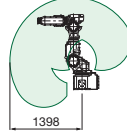
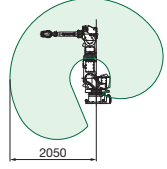
## HANDLING

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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°			
		J6 Rotation 1	±360°				±450°		
Max. speed	Arm	J1 Swivel 1	200°/s	150°/s	200°/s	170°/s	185°/s	180°/s	
		J2 Horizontal	170°/s				180°/s		
		J7 Swivel 2	-						
	Wrist	J3 Vertical	170°/s				190°/s	180°/s	
		J4 Rotation 2	400°/s	360°/s	370°/s	360°/s	305°/s	255°/s	
		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	
Maximum load	Wrist		10kg		12kg	20 (max. 22) kg		35kg	50kg
	Load capacity on forearm		-				15kg		
	Upper of J3		-						
Allowable static load torque for 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	
Allowable moment of inertia for wrist	J4	Rotation 2	0.7kg·m <sup>2</sup>	1.6kg·m <sup>2</sup>	1.3kg·m <sup>2</sup>	1.6kg·m <sup>2</sup>	16kg·m <sup>2</sup>	30kg·m <sup>2</sup>	
	J5	Bend	0.7kg·m <sup>2</sup>	1.6kg·m <sup>2</sup>	1.3kg·m <sup>2</sup>	1.6kg·m <sup>2</sup>	16kg·m <sup>2</sup>	30kg·m <sup>2</sup>	
	J6	Rotation 1	0.2kg·m <sup>2</sup>	0.7kg·m <sup>2</sup>	0.47kg·m <sup>2</sup>	0.8kg·m <sup>2</sup>	5kg·m <sup>2</sup>	12kg·m <sup>2</sup>	
Maximum reach			1,420mm	2,019mm	1,400mm	1,722mm	2,050mm		
Position repeatability			±0.06mm				±0.07mm		
Ambient temperature <sup>1</sup> /humidity			0 to 45°C/20 to 85% RH (without condensation)						
Vibration			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 <sup>2</sup>	6.0kg·m <sup>2</sup>	1.6kg·m <sup>2</sup>	16kg·m <sup>2</sup>	30kg·m <sup>2</sup>
30kg·m <sup>2</sup>	6.0kg·m <sup>2</sup>	1.6kg·m <sup>2</sup>	16kg·m <sup>2</sup>	30kg·m <sup>2</sup>
12kg·m <sup>2</sup>	2.3kg·m <sup>2</sup>	0.8kg·m <sup>2</sup>	5kg·m <sup>2</sup>	12kg·m <sup>2</sup>
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	
				

1[N·m]=1/9.8[kgf·m]

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Model		ST210TP-01	MC280L	MC350	MC400L	
No. of axes		7		6		
Max. working envelope	Arm	J1 Swivel 1	±180°			
		J2 Horizontal	-35~+120°	-100~+40°		-105~+60°
		J7 Swivel 2	±65°	-		
	Wrist	J3 Vertical	-96~+210°	-147~+130°	-180~+130°	-130~+30°
		J4 Rotation 2	±360°	±360°		±210°
		J5 Bend	±120°	±125°		±120°
		J6 Rotation 1	±360°		±360°*2	
Max. speed	Arm	J1 Swivel 1	110°/s			
		J2 Horizontal	90°/s	105°/s	95°/s	90°/s
		J7 Swivel 2	(Press arm link) 120°/s			-
	Wrist	J3 Vertical	95°/s	95°/s		90°/s
		J4 Rotation 2	130°/s	120°/s	110°/s	
		J5 Bend	130°/s	120°/s	110°/s	
		J6 Rotation 1	250°/s		180°/s	
Maximum load	Wrist		80kg	280kg	350kg	400kg
	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	3,450N·m	
	J5 Bend	-	1,921N·m	2,750N·m	3,450N·m	
	J6 Rotation 1	-	988N·m	1,235N·m	1,725N·m	
Allowable moment of inertia for wrist	J4 Rotation 2	-	400kg·m <sup>2</sup>		600kg·m <sup>2</sup>	
	J5 Bend	J7 axis rotation 80 kg·m <sup>2</sup>	400kg·m <sup>2</sup>		600kg·m <sup>2</sup>	
	J6 Rotation 1	-	250kg·m <sup>2</sup>		400kg·m <sup>2</sup>	
Maximum reach		3,106mm	3,101mm	2,771mm	3,756mm	
Position repeatability		±0.3mm	±0.2mm		±0.3mm	
Ambient temperature <sup>1)/humidity</sup>		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			IP54 equivalent	
Weight		1,650kg	1,660kg	1,620kg	3,050kg	
Power consumption		7.0KVA	9.0KVA	8.6KVA	19.3KVA	
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.

							
MC600		MC700		MC1000DL		SC700	
6							
±180°		-		±160°		±160°	
-105~+60°		-		-85~+45°		-85~+45°	
-140~+30°		-		-90~+45°		-90~+40°	
±210°		-		-9.7~+90°(+9.7°) <sup>3</sup>		-10~+90°	
±120°		-		±125° <sup>4</sup>		±125°	
±360° <sup>2</sup>		-		±9.7°		±10°	
90°/s	80°/s	80°/s	80°/s	45°/s	40°/s	45°/s	45°/s
90°/s	80°/s	80°/s	80°/s	40°/s	40°/s	30°/s	30°/s
90°/s	80°/s	80°/s	80°/s	40°/s	40°/s	30°/s	30°/s
110°/s	100°/s	100°/s	100°/s	20°/s <sup>5</sup>	20°/s	30°/s	30°/s
110°/s	100°/s	100°/s	100°/s	65°/s	65°/s	50°/s	50°/s
180°/s	160°/s	160°/s	160°/s	70°/s <sup>6</sup>	70°/s	30°/s	30°/s
600kg	700kg	700kg	700kg	1,000kg	1,000kg	700kg	700kg
Max. 50 kg	Max. 25 kg	Max. 25 kg	Max. 25 kg	-	-	-	-
3,450N·m		3,450N·m		21,000N·m		13,800N·m	
3,450N·m		3,450N·m		-		3,920N·m	
1,725N·m		1,725N·m		4,410N·m		2,940N·m	
600kg·m <sup>2</sup>		600kg·m <sup>2</sup>		5,200kg·m <sup>2</sup>		3,000kg·m <sup>2</sup>	
600kg·m <sup>2</sup>		600kg·m <sup>2</sup>		4,000kg·m <sup>2</sup>		1,800kg·m <sup>2</sup>	
400kg·m <sup>2</sup>		400kg·m <sup>2</sup>		1,740kg·m <sup>2</sup>		1,000kg·m <sup>2</sup>	
2,890mm		2,890mm		3,972mm		3,972mm	
±0.3mm		±0.3mm		±0.3mm		±0.5mm	
0 to 45°C/20 to 85% RH (without condensation)							
0.5 G or less							
Floor mount							
IP54 equivalent		IP54 equivalent		-		Wrist has IP67 and main body has IP54 equivalent	
2,850kg	3,300kg	3,300kg	3,300kg	9,000kg	9,000kg	7,000kg	7,000kg
19.3KVA		19.3KVA		19.0KVA		7.0KVA	
							
2890		2890		3972		3972	

\*3: Max motion range of axis 4 varies due to the wrist payload weight. Wrist load 300 kg <: -9.7~+90°, Wrist load 300 kg ≥: -9.7~+9.7°

\*4: In order to make axis 5 move, axis 4 must be in ±4° from ground level when payload is installed on the wrist.

\*5: Axis 4 speed achieves to this value when wrist payload is less than 300 kg and motion range is enough wide.

\*6: Axis 6 achieves to this value when motion range is ±120° (exceeding max motion range).

1[N·m]=1/9.8[kgf·m]

LINEUP

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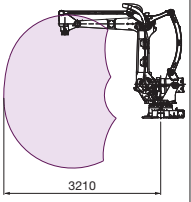
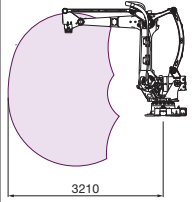
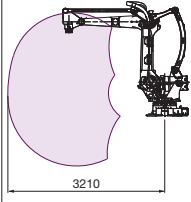
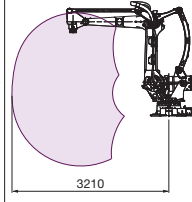
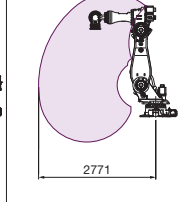
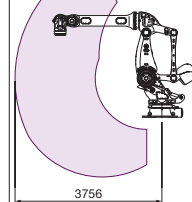
LIST OF SPECIFICATIONS

SUPPORT SOFTWARE

# LIST OF SPECIFICATIONS

## PALLETIZING

### LIST OF SPECIFICATIONS

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	-				-	
	Wrist	J3 Vertical	-117~+17°	-116~+17°	-117~+17°		-180~+35°	-130~+30°
		J4 Rotation 2	±360°				±360° <sup>2</sup>	-
		J5 Bend	-				±125° <sup>2</sup>	±120°
		J6 Rotation 1	-				±360°	Max. ±360° Value of initial settings: ±210° <sup>3</sup>
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	-				-	
	Wrist	J3 Vertical	115°/s		105°/s	100°/s	95°/s	90°/s
		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 <sup>2</sup>		69kg·m <sup>2</sup>	100kg·m <sup>2</sup>	400kg·m <sup>2</sup>	-	
	J5 Bend	-				400kg·m <sup>2</sup>	600kg·m <sup>2</sup>	
	J6 Rotation 1	-				250kg·m <sup>2</sup>	400kg·m <sup>2</sup>	
Maximum reach			3,210mm				2,771mm	3,756mm
Position repeatability			±0.3mm		±0.4mm		±0.2mm	±0.3mm
Ambient temperature <sup>1</sup> /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								
			3210	3210	3210	3210	2771	3756

\*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 ±5°. Axis 4 can move ±360° and axis 5 can move ±125° only when the encoder correction screen or software limit settings screen is open.

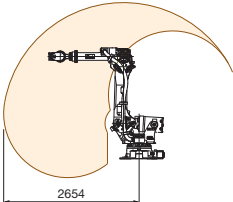
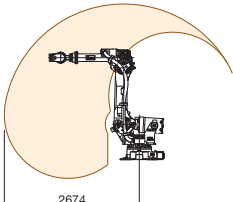
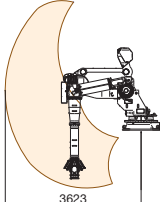
\*3: The initial settings are ±210°. When passing cable through the hollow part of the 6th axis, use a range of ±210°. When a cable is not passed through, the operating envelope can be extended to a maximum of ±360°, depending on the usage conditions.

1[N·m]=1/9.8[kgf·m]



CLEAN-ROOM

LIST OF SPECIFICATIONS

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°	
J6 Rotation 1		±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	
J6 Rotation 1		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 <sup>2</sup>	88.9kg·m <sup>2</sup>	141.1kg·m <sup>2</sup>	200kg·m <sup>2</sup>		
	J5 Bend	60.9kg·m <sup>2</sup>	88.9kg·m <sup>2</sup>	141.1kg·m <sup>2</sup>	200kg·m <sup>2</sup>		
	J6 Rotation 1	30.2kg·m <sup>2</sup>	45.0kg·m <sup>2</sup>	79.0kg·m <sup>2</sup>	147kg·m <sup>2</sup>		
Maximum reach			2,654mm		2,674mm	3,623mm	
Position repeatability			±0.2mm		±0.3mm	±0.5mm	
Ambient temperature <sup>*1</sup> /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		1,160kg	3,800kg	
Power consumption			4.2KVA		6.7KVA		
Clean rating <sup>*2</sup>			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]

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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°					
			±210°					
Max. speed	Arm	J1 Swivel 1	136°/s		125°/s	120°/s	115°/s	120°/s
		J2 Horizontal	115°/s			110°/s	105°/s	110°/s
		J7 Swivel 2	-					
	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					
			310°/s	315°/s	310°/s		280°/s	
Maximum load	Wrist		100kg			133kg		166kg
	Load capacity on forearm		20kg					
	Upper of J3		-					
Allowable static load torque for wrist	J4 Rotation 2	830N·m	650N·m	830N·m		960N·m		
	J5 Bend	830N·m	650N·m	830N·m		960N·m		
	J6 Rotation 1	441N·m	315N·m	441N·m		520N·m		
Allowable moment of inertia for wrist	J4 Rotation 2	85kg·m <sup>2</sup>			100kg·m <sup>2</sup>		100kg·m <sup>2</sup>	
	J5 Bend	85kg·m <sup>2</sup>			100kg·m <sup>2</sup>		100kg·m <sup>2</sup>	
	J6 Rotation 1	45kg·m <sup>2</sup>			50kg·m <sup>2</sup>		50kg·m <sup>2</sup>	
Maximum reach			1,634mm	2,044mm	2,654mm		2,951mm	2,654mm
Position repeatability			±0.1mm				±0.15mm	±0.1mm
Ambient temperature <sup>1)</sup> /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								

<sup>1)</sup> 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		6		6			
±180°		±165°		±180°		±180°		±180°		±180°			
-80~+60°		-80~+60°		-120~+60°		-120~+60°		-120~+60°		-80~+60°			
-		-		-		-		-		-			
-146.5~+150°		-154~+150°		-125~+90°		-150~+180°		-150~+180°		-146.5~+150°			
±210°		±210°		±360°		±360°		±360°		±360°			
±125°		±130°		±135°		±135°		±135°		±135°			
±210°		±210°		±360°		±360°		±360°		±360°			
115°/s		115°/s		136°/s		136°/s		136°/s		136°/s			
105°/s		105°/s		115°/s		110°/s		110°/s		135°/s			
-		-		-		-		-		-			
113°/s		113°/s		160°/s		130°/s		130°/s		135°/s			
130°/s		130°/s		240°/s		240°/s		240°/s		240°/s			
130°/s		130°/s		233°/s		233°/s		233°/s		233°/s			
205°/s		205°/s		351°/s		351°/s		351°/s		351°/s			
210kg		220kg		100kg		100kg		100kg		100kg			
20kg		20 (max. 45) kg		25 (max. 45) kg		25 (max. 45) kg		25 (max. 45) kg		45 (max. 90) kg			
-		-		-		-		-		-			
1337N·m		1337N·m		580N·m		580N·m		580N·m		580N·m			
1337N·m		1337N·m		580N·m		580N·m		580N·m		580N·m			
720N·m		720N·m		290N·m		290N·m		290N·m		290N·m			
200kg·m <sup>2</sup>		141.1kg·m <sup>2</sup>		45kg·m <sup>2</sup>		45kg·m <sup>2</sup>		45kg·m <sup>2</sup>		60kg·m <sup>2</sup>			
200kg·m <sup>2</sup>		141.1kg·m <sup>2</sup>		45kg·m <sup>2</sup>		45kg·m <sup>2</sup>		45kg·m <sup>2</sup>		60kg·m <sup>2</sup>			
155kg·m <sup>2</sup>		79.0kg·m <sup>2</sup>		22.7kg·m <sup>2</sup>		22.7kg·m <sup>2</sup>		22.7kg·m <sup>2</sup>		30kg·m <sup>2</sup>			
2,654mm		2,575mm		1,634mm		2,071mm		2,071mm		2,654mm			
±0.15mm		±0.15mm		±0.1mm		±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				IP54 equivalent				Wrist has IP67 and main body has IP54 equivalent					
1,100kg				1,100kg				670kg		690kg		960kg	
7.0KVA													
													
2654		2575		2575		1634		2071		2654			

1[N·m]=1/9.8[kgf·m]

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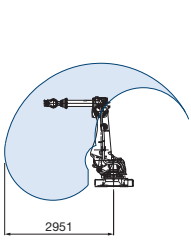
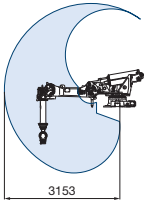
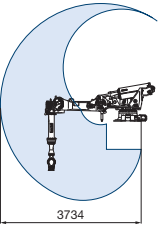
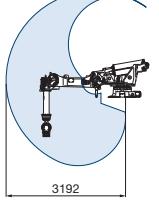
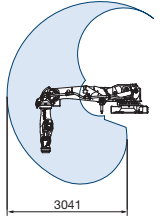
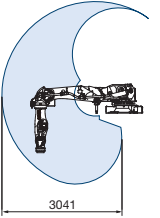
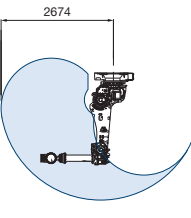
## WELDING

### LIST OF SPECIFICATIONS



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	-				-	
	Wrist	J3 Vertical	-146.5~+150°			-140~+150°	-127.7~+150°	-133.4~+150°
		J4 Rotation 2	±360(±210)°			±360°	±360°	
		J5 Bend	±135(±120)°	±130(±120)°	±130°	±135°		
Maximum load			45 (max. 90) kg		20 (max. 45) kg		45 (max. 90) kg	
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	-				-	
	Wrist	J3 Vertical	121°/s	113°/s	100°/s	95°/s	113°/s	121°/s
		J4 Rotation 2	180°/s	140°/s	130°/s	125°/s	140°/s	
		J5 Bend	173°/s	133°/s	125°/s		173°/s	
Allowable static load torque for wrist			490N-m		720N-m		353N-m	
Allowable moment of inertia for wrist	J4 Rotation 2	88.9kg-m <sup>2</sup>	141.1kg-m <sup>2</sup>		225.4kg-m <sup>2</sup>	60kg-m <sup>2</sup>	76kg-m <sup>2</sup>	
	J5 Bend	88.9kg-m <sup>2</sup>	141.1kg-m <sup>2</sup>		225.4kg-m <sup>2</sup>	60kg-m <sup>2</sup>	76kg-m <sup>2</sup>	
	J6 Rotation 1	45kg-m <sup>2</sup>	79.0kg-m <sup>2</sup>		196kg-m <sup>2</sup>	30kg-m <sup>2</sup>	38kg-m <sup>2</sup>	
Maximum reach			2,654mm	2,674mm	2,792mm		3,099mm	2,951mm
Position repeatability			±0.15mm		±0.2mm		±0.15mm	
Ambient temperature <sup>1)</sup> /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								

<sup>1)</sup> 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)		SRA166HT-01		SRA210HT-01		SRA210V	
													
6						6						6	
±180°						±180°						±165°	
-80~+60°						-65~+120°						-80~+60°	
-						-						-	
-133.4~+150°		-106~+210°		-90~+210°		-106~+210°		-112~+210°				-146.5~+150°	
±360°		±360(±210)°		±360°		±360(±210)°		±210°				±360°	
±135°		±135(±120)°		±135°		±130(±120)°		±125°				±130°	
±360°				±360(±205)°				±210°				±360°	
115°/s		110°/s		105°/s		100°/s		120°/s		115°/s		115°/s	
105°/s		110°/s				90°/s		110°/s		105°/s		105°/s	
-						-						-	
113°/s		115°/s				100°/s		115°/s		113°/s		113°/s	
140°/s		180°/s		140°/s		140°/s		175°/s		130°/s		140°/s	
173°/s		173°/s				133°/s		171°/s		130°/s		133°/s	
260°/s		260°/s				200°/s		280°/s		205°/s		200°/s	
166kg		166kg				210kg		166kg		210kg		210kg	
45 (max. 90) kg				45 (max. 90) kg						20kg		45 (max. 90) kg	
-						-						-	
951N·m		951N·m		951N·m		1,337N·m		960N·m		1,337N·m		1,337N·m	
951N·m		951N·m		951N·m		1,337N·m		960N·m		1,337N·m		1,337N·m	
490N·m		490N·m		490N·m		720N·m		520N·m		720N·m		720N·m	
88.9kg·m <sup>2</sup>		88.9kg·m <sup>2</sup>		88.9kg·m <sup>2</sup>		141.1kg·m <sup>2</sup>		100kg·m <sup>2</sup>		200kg·m <sup>2</sup>		141.1kg·m <sup>2</sup>	
88.9kg·m <sup>2</sup>		88.9kg·m <sup>2</sup>		88.9kg·m <sup>2</sup>		141.1kg·m <sup>2</sup>		100kg·m <sup>2</sup>		200kg·m <sup>2</sup>		141.1kg·m <sup>2</sup>	
45.0kg·m <sup>2</sup>		45.0kg·m <sup>2</sup>		45.0kg·m <sup>2</sup>		79.0kg·m <sup>2</sup>		50kg·m <sup>2</sup>		155kg·m <sup>2</sup>		79.0kg·m <sup>2</sup>	
2,951mm		3,153mm		3,734mm		3,192mm		3,041mm				2,574mm	
±0.15mm		±0.1mm		±0.15mm		±0.1mm		±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						IP54 equivalent						Wrist has IP67 and main body has IP54 equivalent	
980kg		1,210 (1,310)kg		1,240kg		1,250 (1,350)kg		1,160kg				990kg	
7.0KVA													
													
2951		3153		3734		3192		3041		3041		2674	

1[N·m]=1/9.8[kgf·m]

LINEUP

HANDLING

PALLETIZING

CLEAN-ROOM

WELDING

CONTROLLER

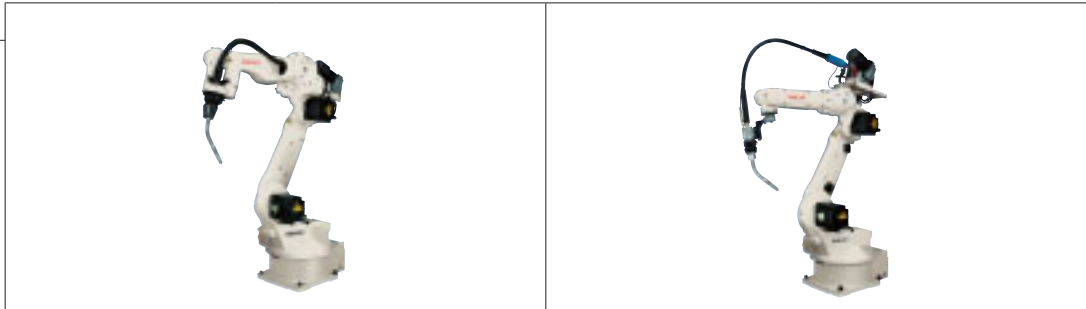
LIST OF SPECIFICATIONS

SUPPORT SOFTWARE

# LIST OF SPECIFICATIONS

## WELDING

### LIST OF SPECIFICATIONS



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°	
	J6 Rotation 1	±205°		±360°		
Max. speed	Arm	J1 Swivel 1	210°/s	195°/s	210°/s	195°/s
		J2 Horizontal	210°/s	200°/s	210°/s	200°/s
		J7 Swivel 2	-			
	Wrist	J3 Vertical	210°/s	200°/s	210°/s	200°/s
		J4 Rotation 2	420°/s			
		J5 Bend	420°/s			
	J6 Rotation 1	600°/s		620°/s		
Maximum load	Wrist		4kg		6kg	
	Load capacity on forearm		10kg	20kg	10kg	20kg
	Upper of J3		-			
Allowable static load torque for wrist	J4 Rotation 2	10.1N·m		11.8N·m		
	J5 Bend	10.1N·m		9.8N·m		
	J6 Rotation 1	2.94N·m		5.9N·m		
Allowable moment of inertia for wrist	J4 Rotation 2	0.38kg·m <sup>2</sup>		0.30kg·m <sup>2</sup>		
	J5 Bend	0.38kg·m <sup>2</sup>		0.25kg·m <sup>2</sup>		
	J6 Rotation 1	0.03kg·m <sup>2</sup>		0.06kg·m <sup>2</sup>		
Maximum reach			1,411mm	2,008mm	1,402mm	2,006mm
Position repeatability			±0.08mm			
Ambient temperature <sup>1)</sup> /humidity			0 to 45°C/20 to 85% RH (without condensation)			
Vibration			0.5 G or less			
Installation			Floor, inverted, wall mount			
Weight			154kg	277kg	144kg	273kg
Power consumption			1.5KVA	2.4KVA	1.5KVA	2.4KVA
Working envelope						

<sup>1)</sup> 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]



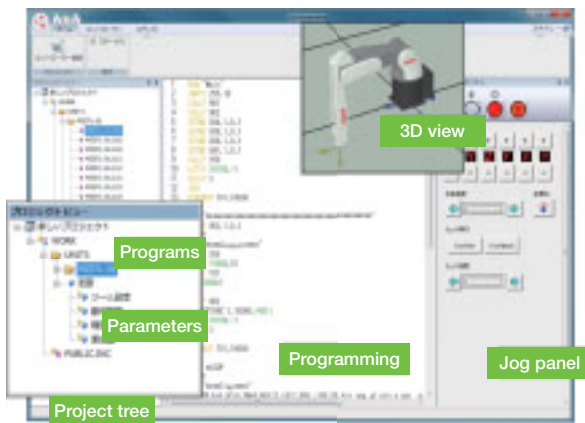
# SUPPORT SOFTWARE

A number of software features are available that make the robot easier to use by having readily available access to the robot system.

## 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.



## 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)

## 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.



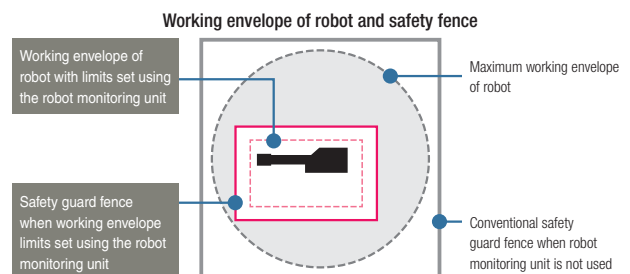
## Robot Monitoring Unit **RMU**

### 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



## 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.

LINEUP

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PALLETIZING

CLEAN-ROOM

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# ENGINEERING NETWORK SERVICE

## 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

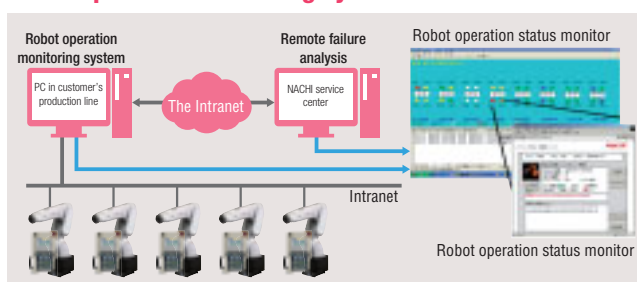
NACHI provides a curriculum to train operators about robot operations, daily inspections, basic maintenance, and safety regulations.



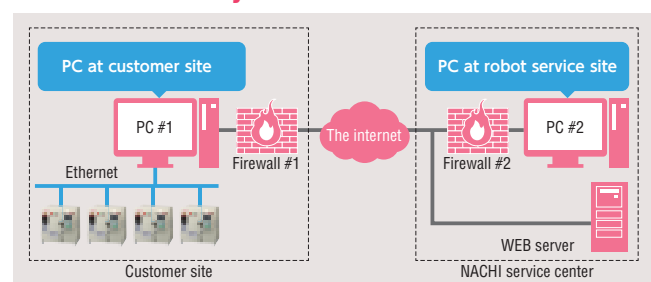
## Centralized robot monitoring system (AX controller only)

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.

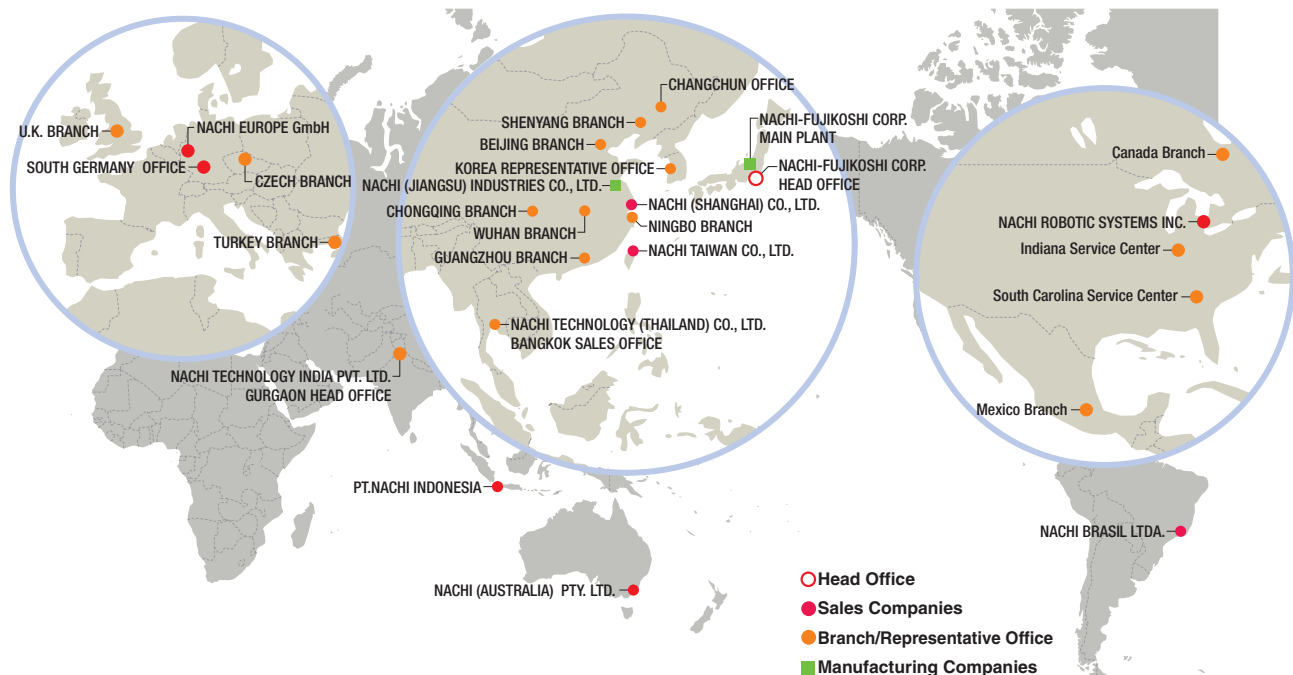
### Robot operation monitoring system



### Remote failure analysis



# World Service Network



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# NACHI ROBOT CATALOG

**NACHI**  
NACHI-FUJIKOSHI CORP.

## 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-15

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