

NACHI



ROBOT

Total Robot Catalog



FORM FOLLOWS FUNCTION

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 highspeed,high precision operations to lifting heavy loads used in a full range of assembly work and welding solutions.

NACHI'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.





LINEUP 3-4

HANDLING 5
Machine Loading, Picking
Loading, Palletizing
Assembling, Deburring/Polishing
Sealing

PALLETIZING 15

CLEAN-ROOM 17

WELDING 19





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WORLD SERVICE NETWORK

LINEUP

		HANDLING			
		MZ	CZ	EC	EZ
Process and application	Field				
Number of controlled axes		5 or 6 axes	6 axes	4 axes	4 or 6 axes
Payload capacity		1 to 25kg	10kg	6kg	2 to 3kg
Maximum reach		350 to 1,882mm	1,300mm	500 to 700mm	450 to 550mm
Page Number		5	7	9	9
Spot welding/ Seam welding	Automotive Automotive parts Metalworking				
Arc welding	Agricultural machinery Construction machinery				
Die casting	Automotive parts Plastics	●	●		
Resin molding	Electric and electronics	●	●		
Press operation handling					
Machine loading		●	●		
Deburring/Polishing		●			
Sealing	Automotive Automotive parts Machine tools Plastics	●	●		
General assembling	Pharmaceuticals and cosmetics Electric and electronics	●	●	●	●
Bolt tightening	Metalworking Chemistry	●	●	●	●
Picking, aligning, packaging	Medical equipment Foodstuffs Agricultural machinery	●	●	●	●
Shipping and receiving (palletizing)	Construction machinery	●	●		
Measuring, inspection, testing		●	●	●	●
Material handling		●	●	●	●
Glass substrate loading	Electric and electronics				

HANDLING		PALLETIZING	CLEAN-ROOM	WELDING
MC/MR	MC and SC Heavy Loader	LP/MC	SC-C/ST-C	SRA-H/SRA
				
6 or 7 axes	6 axes	4 or 5 or 6 axes	6 axes	6 axes
10 to 70kg	280 to 1000kg	130 to 500kg	133 to 400kg	100 to 250kg
1,260 to 2,050mm	2,771 to 3,972mm	2,771 to 3,756mm	2,654 to 3,623mm	1,634 to 3,383mm
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Compact handling robot

- Machine loading
- Picking
- Loading and assembling
- Deburring/Polishing
- Sealing



High speed/High precision compact robot

MZ SERIES

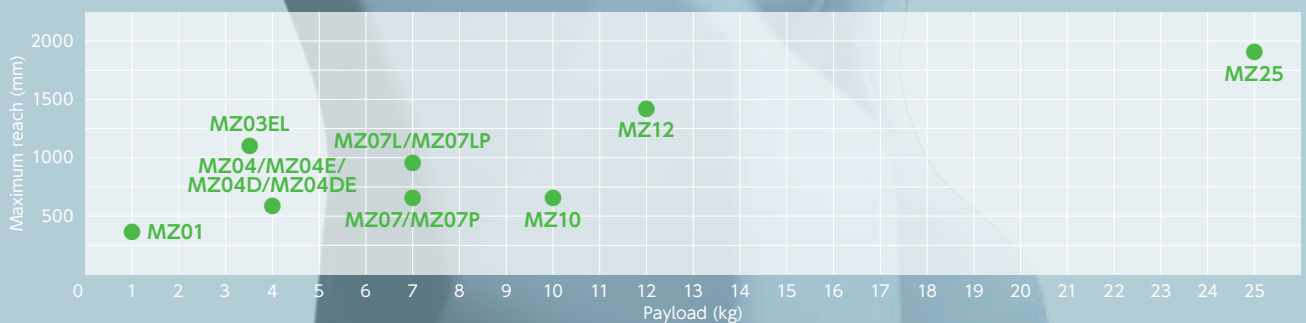
High speed/High precision compact robot available in dust and drain proof specifications, multiple installation orientations.

Large selection of payload from 1 to 25kg.

The internal wire routing for the tooling significantly increases cabling reliability so that operations in a narrow space are possible.

Wide operating range improves productivity and also high spec/performance applications such as vision sensor are available.

Meets various automation needs.



NEW
MZ01

High speed and high precision
1kg compact robot.

- Number of controlled axes 6 axes
- Payload 1kg
- Maximum reach 350mm



MZ07/MZ07L

Meets various automation
needs with various options.

- Number of controlled axes 5 or 6 axes
- Payload 7kg
- Maximum reach MZ07 : 723mm
MZ07L: 912mm



MZ03EL

Maximum reach 1,102mm with 3.5kg payload.
Compact long arm robot.

- Number of controlled axes 6 axes
- Payload 3.5kg
- Maximum reach 1,102mm



NEW
MZ10

Achieved 10 kg payload
with the same dimensions
and workspace as MZ07.

- Number of controlled axes 6 axes
- Payload 10kg
- Maximum reach 723mm



MZ04

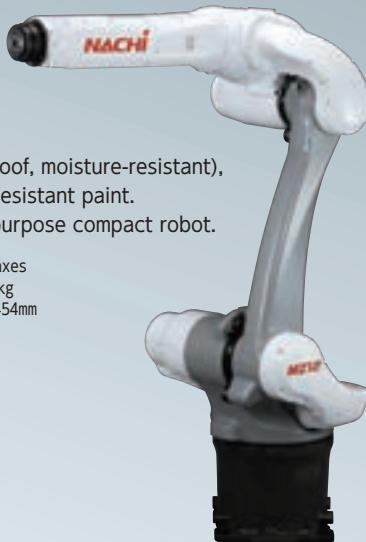
Downsizes facility with light-weight compact body.
Sophisticated and flowing form.
Design that dust does not pile up easily and easy
to eliminate dust.

- Number of controlled axes 6 axes
- Payload 4kg
- Maximum reach 541mm

MZ12

IP 67 equivalent (dust-proof, moisture-resistant),
with rust proof/coolant resistant paint.
Powerful and slim multi purpose compact robot.

- Number of controlled axes 6 axes
- Payload 12kg
- Maximum reach 1,454mm



NEW
MZ25

Supports various applications
with large operating range and
powerful wrist.

- Number of controlled axes 6 axes
- Payload 25kg
- Maximum reach 1,882mm



Picking



Deburring/Polishing



Machine loading



Mounting

Collaborative robot

Picking
Assembling support
Assembling
Machine loading

People-friendly collaborative robot

CZ10

Nachi's slim arm collaborative, CZ10 has several people-friendly functions and structures. Safety fences are not required and makes it easier to install a robot with various applications.



People-friendly design

People-friendly design with rounded arms and gap between joints.





CZ10

- Number of controlled axes 6 axes
- Payload 10kg
- Maximum reach 1,300mm



Functional safety, Intrinsic safety

Dual safety

1. Functional safety: Stops when detecting contact with person.
2. Intrinsic safety: Designed not to pinch person.



Easy Programming

Intuitive teaching by moving the robot arm by a hand.



Picking



Assembling support



Assembling



Machine loading

SCARA robot

SCARA robot

EC NEW SERIES

The EC06 series are simple structure robots with high-speed, high precision that meet for applications such as assembling, handling, and so on.

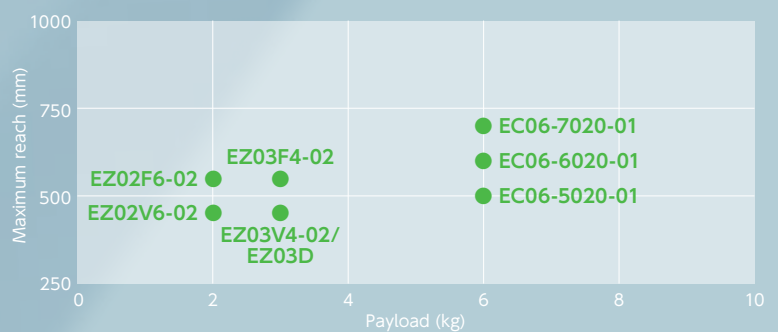
Maximum reach can be selected from 3 types; 500mm, 600mm, 700mm.

The tip axis is a hollow structure, therefore, tube/hose routing from the robot to the tool is simple.

Complex construction is significantly reduced as well.



- Number of controlled axes 4 axes
- Payload 6kg
- Maximum reach 500 to 700mm



WING SLICER Type robot

EZ SERIES

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.



EZ02

- Number of controlled axes 6 axes
- Payload 2kg
- Maximum reach 450 to 550mm



EZ03

- Number of controlled axes 4 axes
- Payload 3kg
- Maximum reach 450 to 550mm



Packing



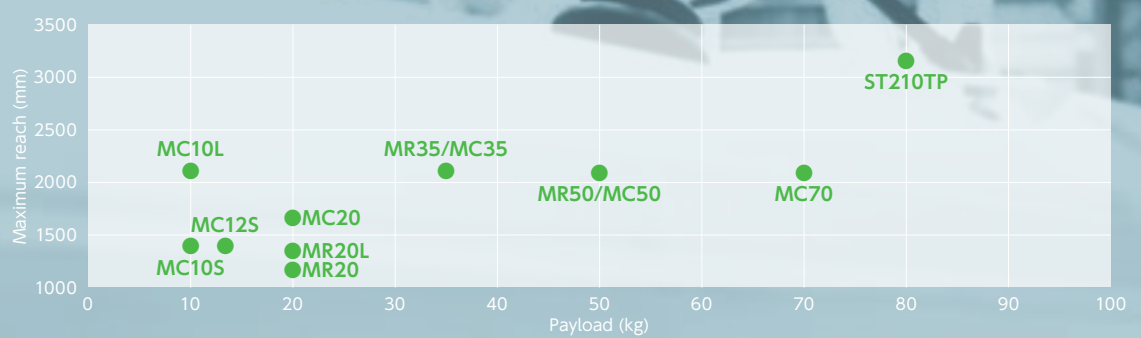
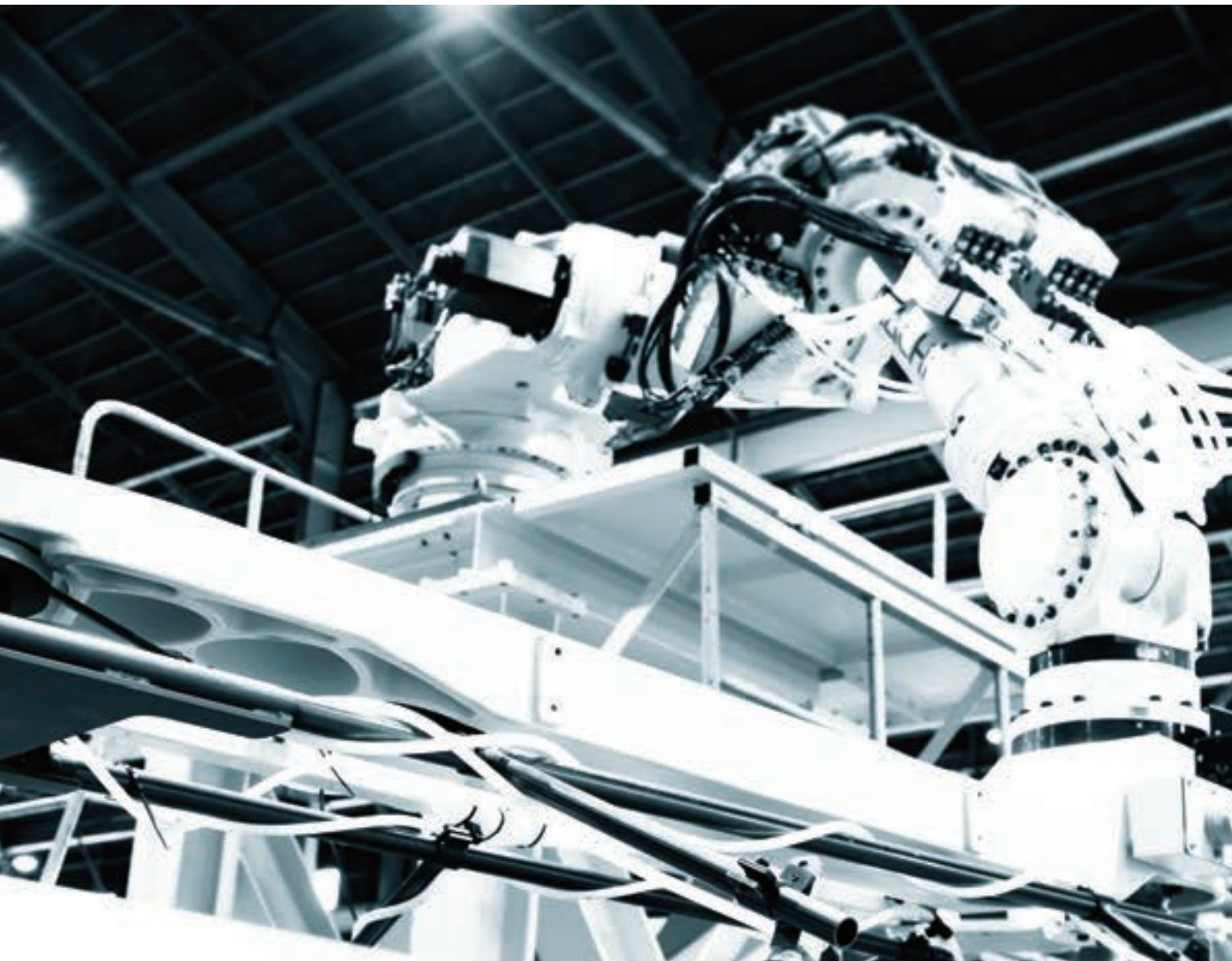
Inspection



Assembling

Handling robot

- Machine loading
- Picking
- Loading
- Palletizing
- Assembling
- Deburring/polishing
- Sealing



Powerful and compact multi-purpose robot

MC SERIES

High dust-proof and moisture-resistant, 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.

- Number of controlled axes 6 axes
- Payload 10 to 70kg
- Maximum reach 1,400 to 2,050mm



Flexible motion "Arm" robot with 7-axes

MR SERIES

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.

- Number of controlled axes 7 axes
- Payload 20 to 50kg
- Maximum reach 1,260 to 2,050mm



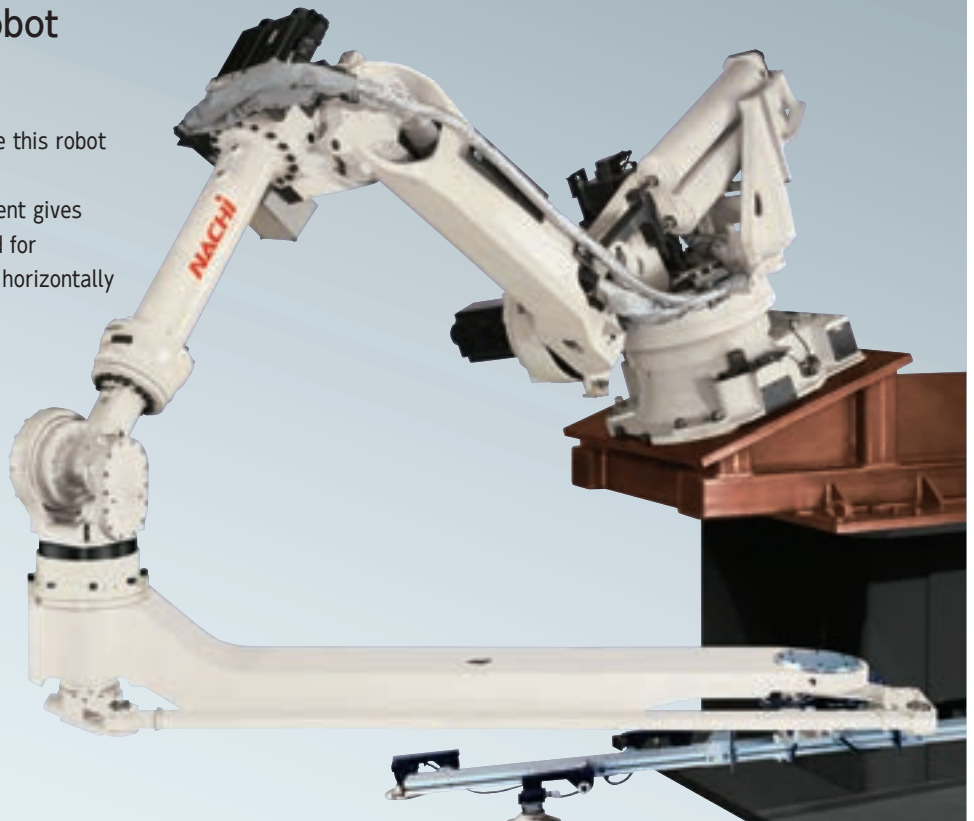
Press operation handling robot

ST210TP

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.

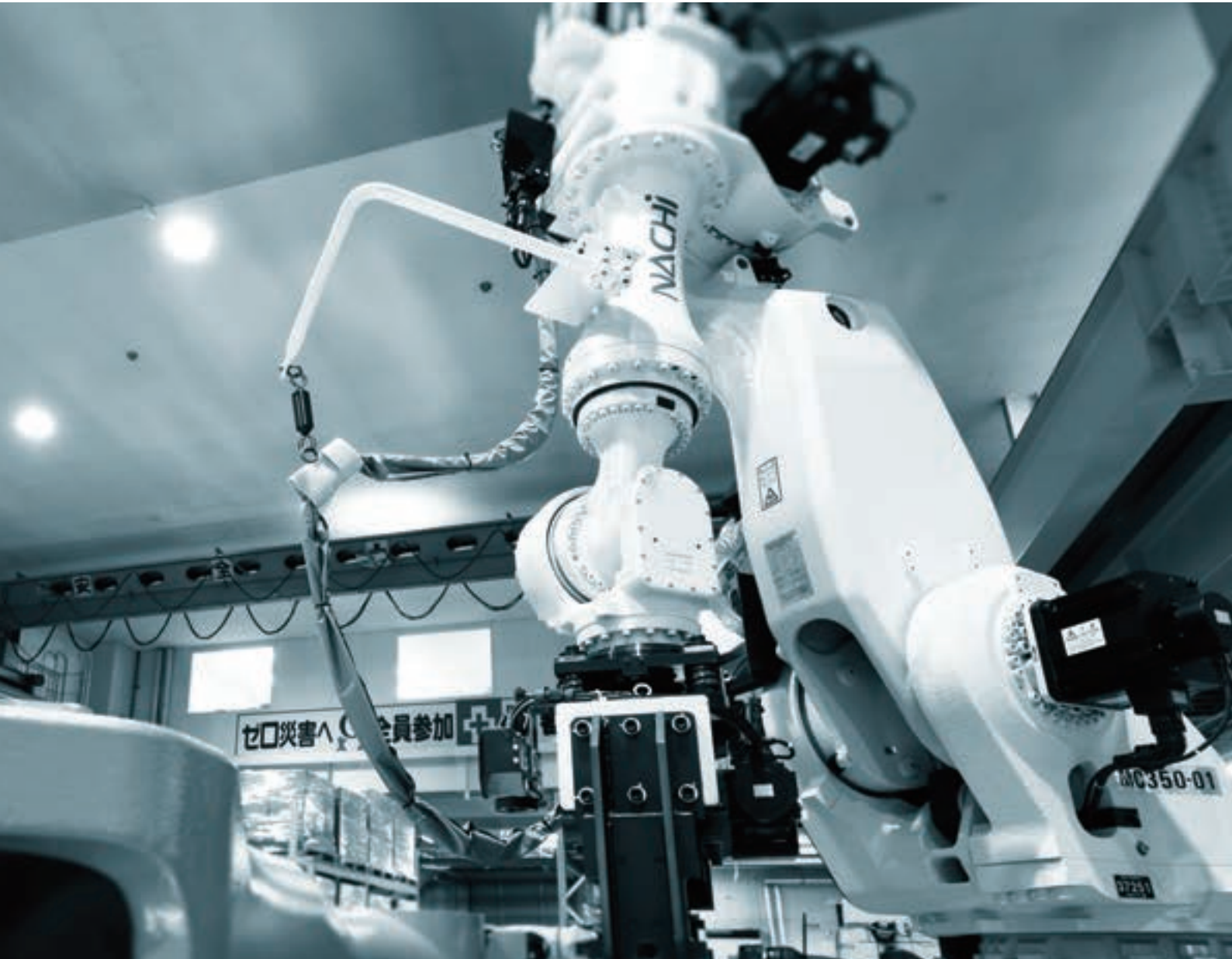
- Number of controlled axes 7 axes
- Payload 80kg
- Maximum reach 3,106mm



Heavy loader/Super heavy loader robot

Automobiles' body handling etc.

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



Heavy loader robot

MC HEAVY
LOADER
SERIES

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.

MC1000DL

■ Number of controlled axes	6 axes
■ Payload	1,000kg
■ Maximum reach	3,972mm

**MC600**

■ Number of controlled axes	6 axes
■ Payload	600kg
■ Maximum reach	2,890mm

**SC700**

■ Number of controlled axes	6 axes
■ Payload	700kg
■ Maximum reach	3,972mm



Super heavy loader robot

SC HEAVY
LOADER

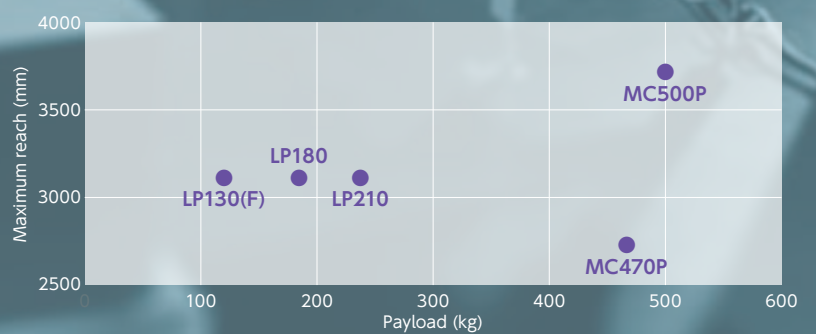
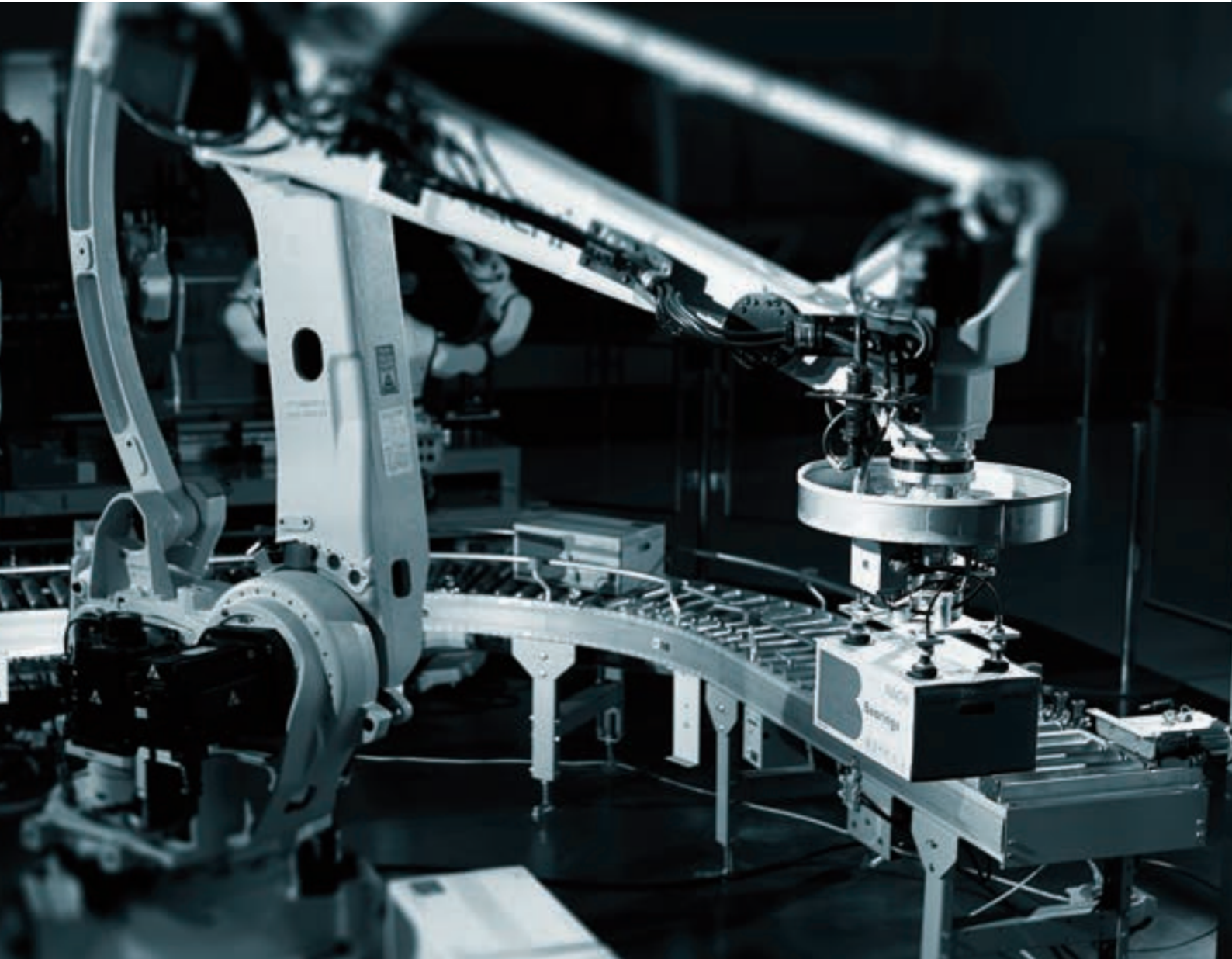
The SC heavy loader robots, with huge load capacity and reach, are excellent for jobs that require heavy lifting. Their large vertical stroke allows more flexible production lines by replacing conventional specialized machinery, such as auto body loaders, with robots.

Palletizing robot

High-speed palletizing robot

Heavy loader palletizing robot

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.

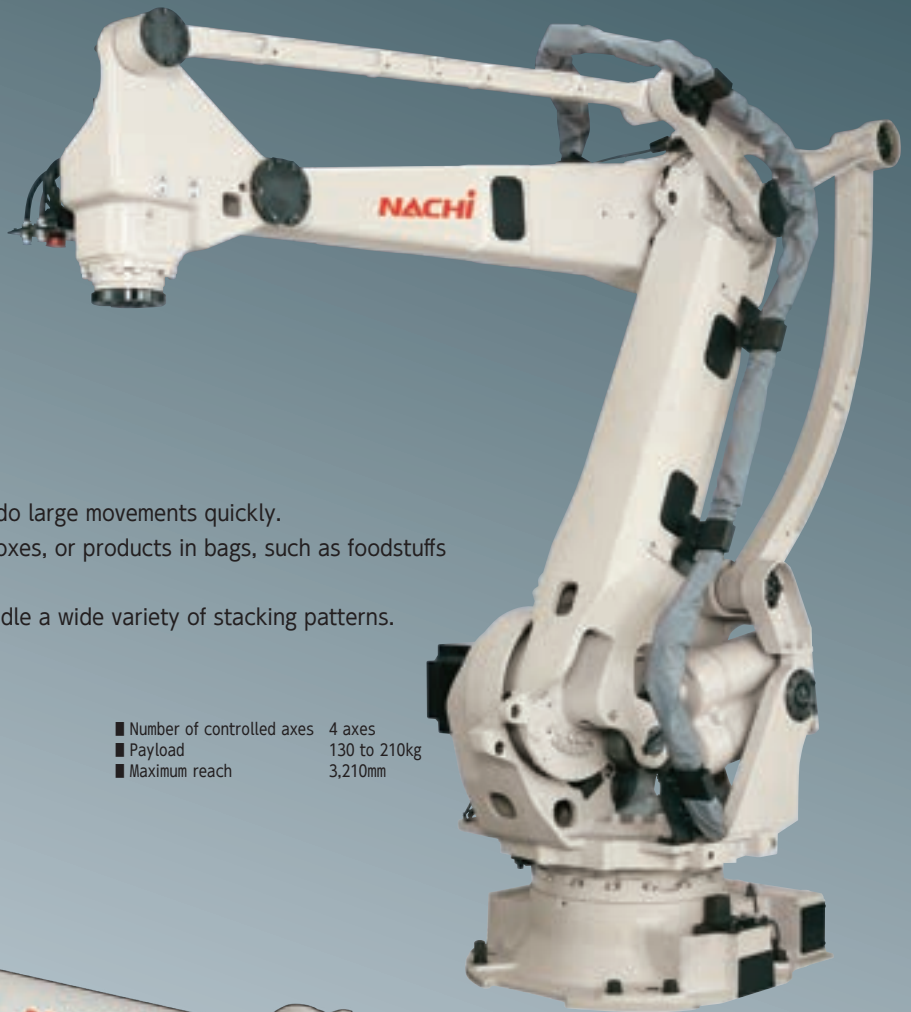


High-speed palletizing robot

LP SERIES

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.

■ Number of controlled axes	4 axes
■ Payload	130 to 210kg
■ Maximum reach	3,210mm



Heavy loader palletizing robot

MC SERIES

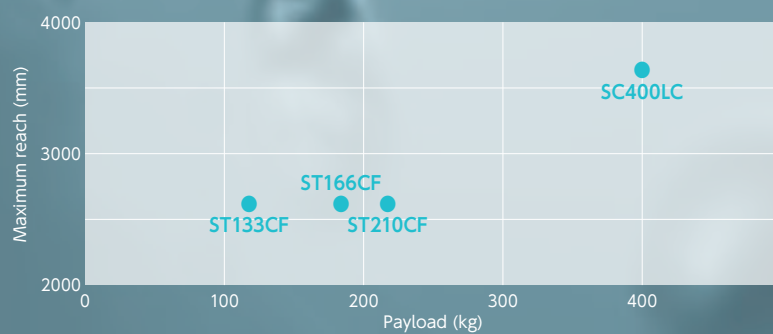
This robot has enough lifting power to handle jobs of loading and stacking beverages, bricks, plastic resins, concrete and other heavy goods.

■ Number of controlled axes	5 or 6 axes
■ Payload	470 to 500kg
■ Maximum reach	2,771 to 3,756mm

Clean-room robot

Clean-room loading

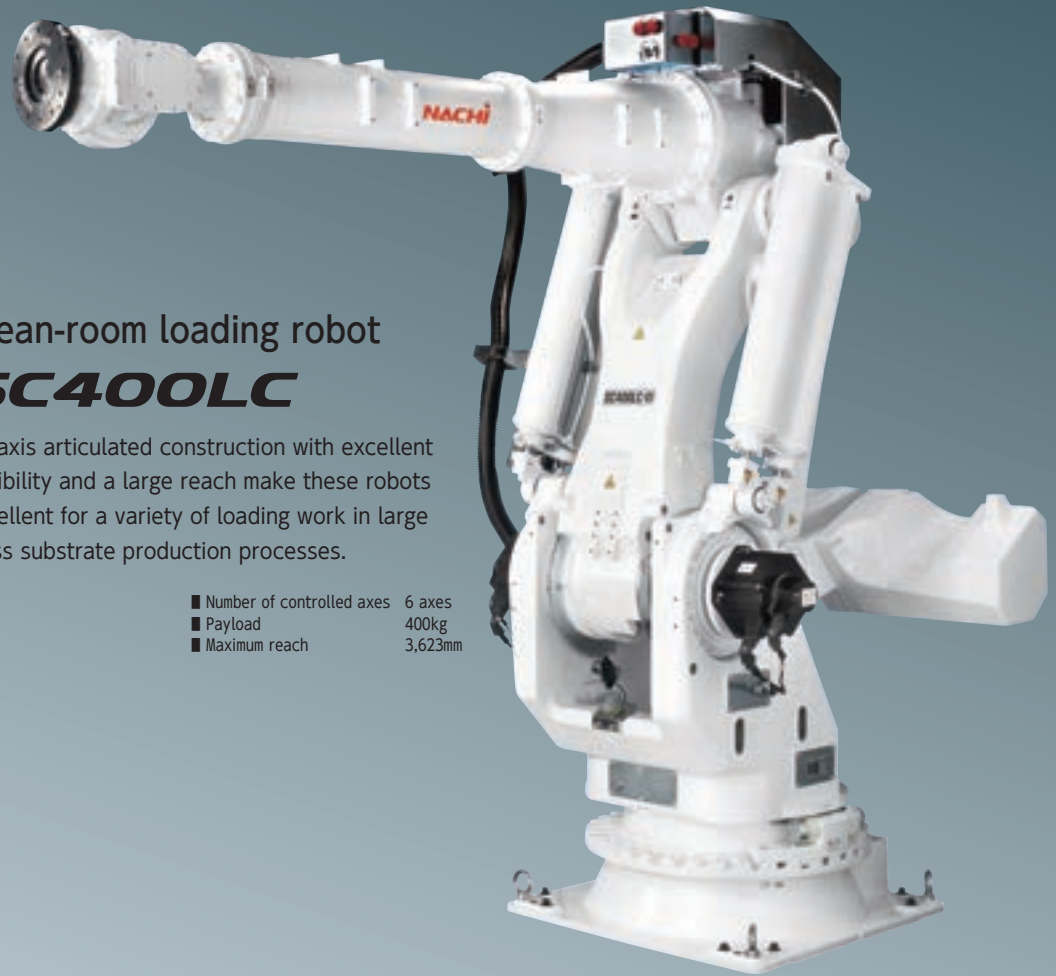
Our series of clean-room robots suppress the dust created by arm movements and are designed to be used in clean rooms. These high-performance loading robots support the heart of the flat panel display production process.



Clean-room loading robot **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.

■ Number of controlled axes	6 axes
■ Payload	400kg
■ Maximum reach	3,623mm



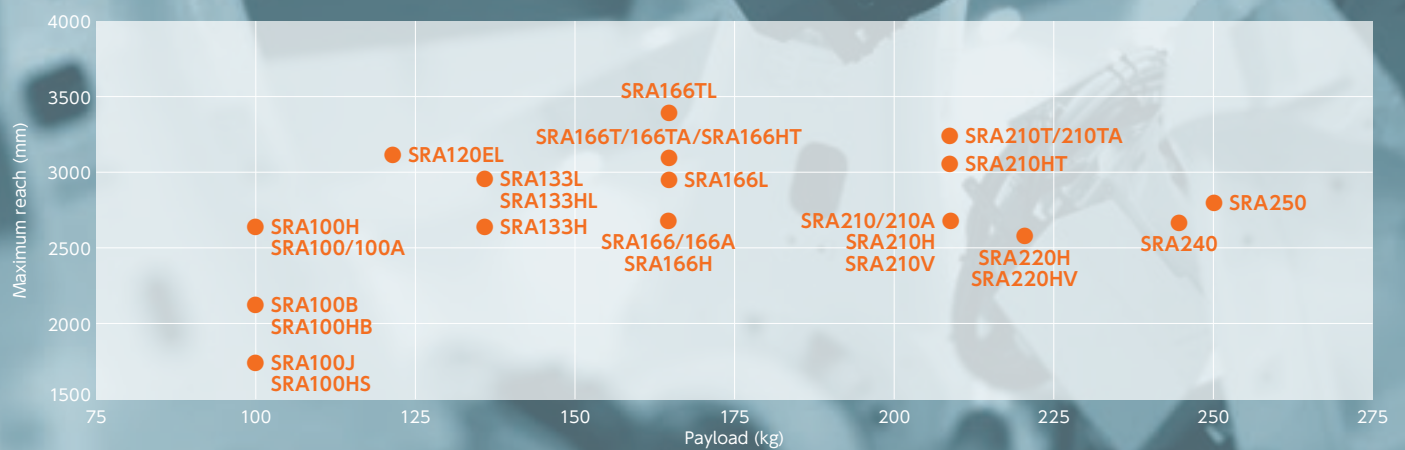
ST-C SERIES

■ Number of controlled axes	6 axes
■ Payload	133 to 210kg
■ Maximum reach	2,654 to 2,674mm



Spot welding robot

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

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.

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



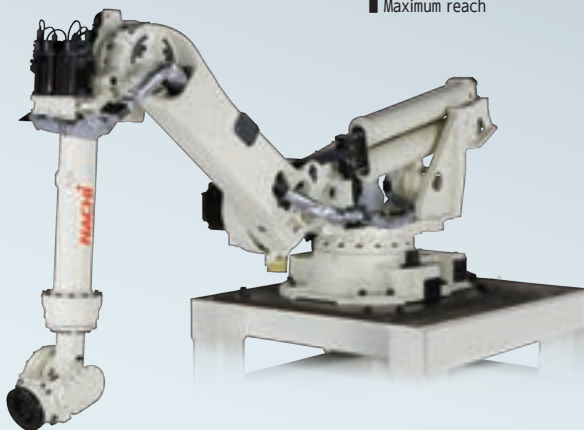
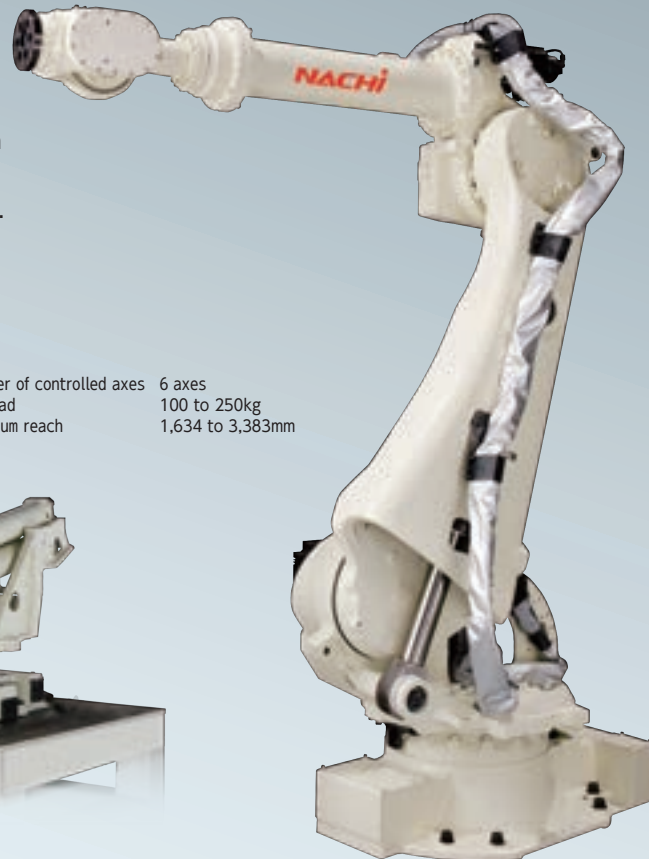
Ultra-fast spot welding robot

SRA SERIES

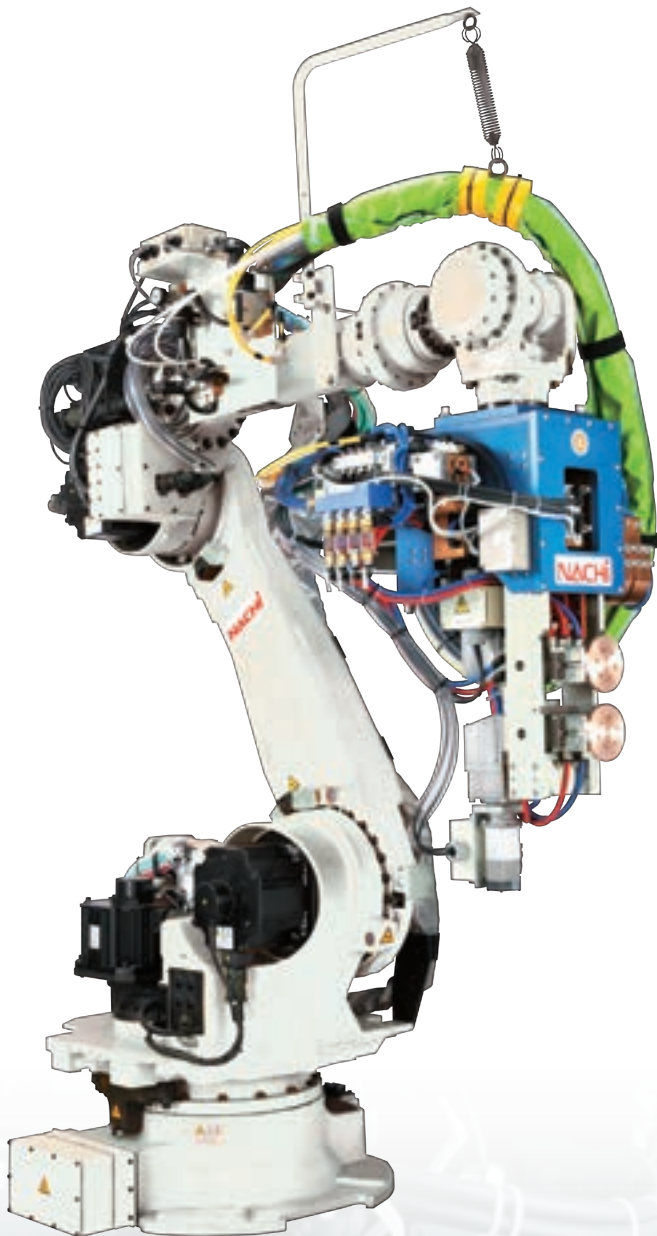
The Ultimate Spot Welding Robot. Using higher speeds and vibration damping properties, we greatly improved productivity by shortening cycle times 30% (compared to our existing models) improvements were made in three areas, weight reduction, higher rigidity, and faster controls.

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.

- Number of controlled axes 6 axes
- Payload 100 to 250kg
- Maximum reach 1,634 to 3,383mm

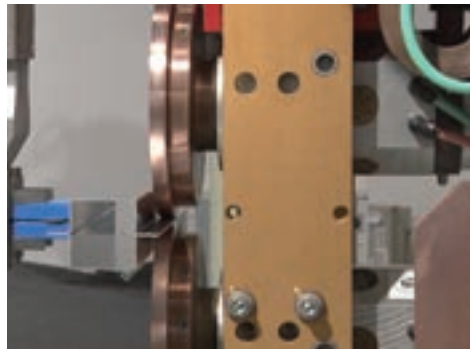


Seam welding package



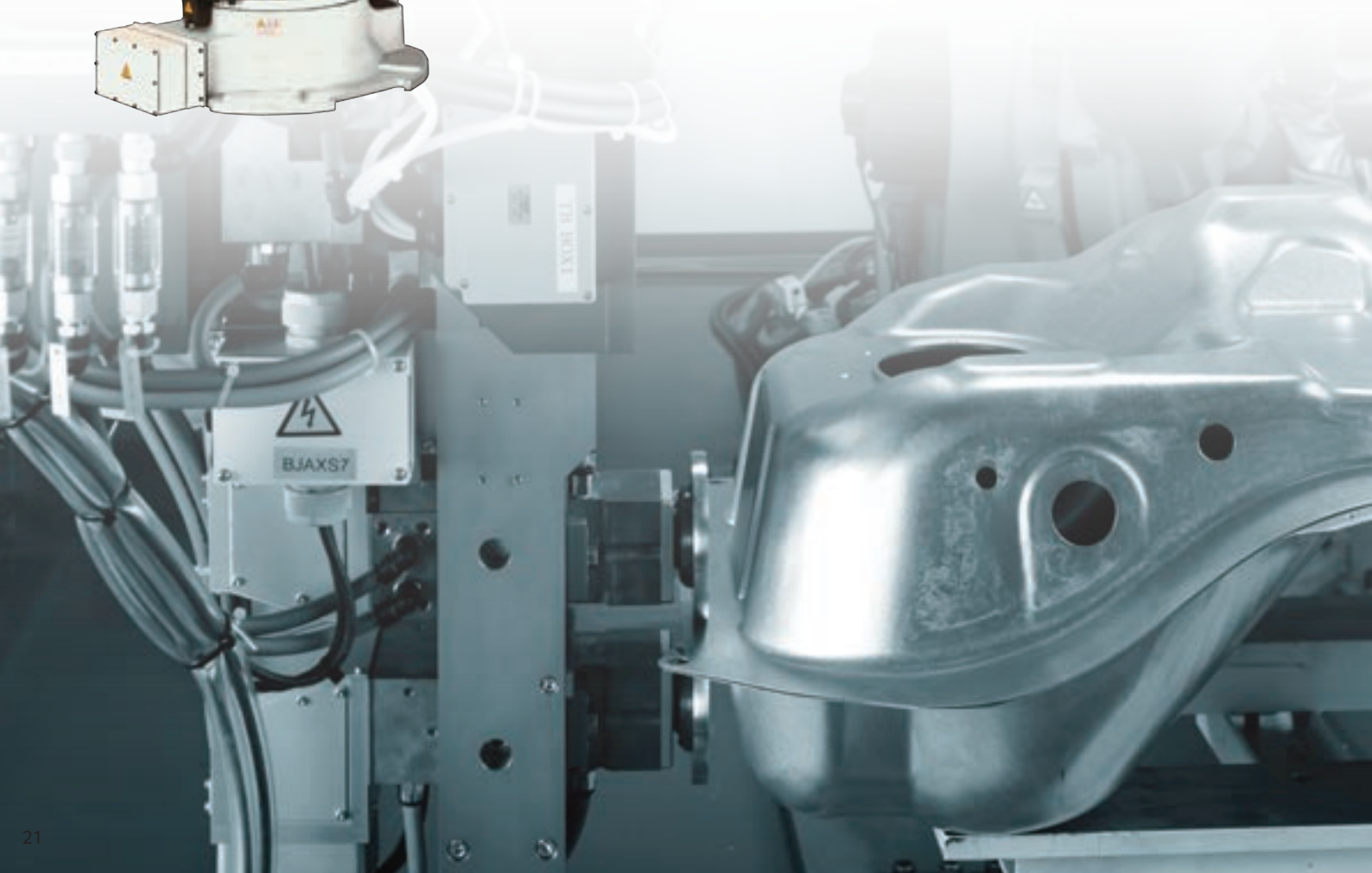
Robot seam welding package

- 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

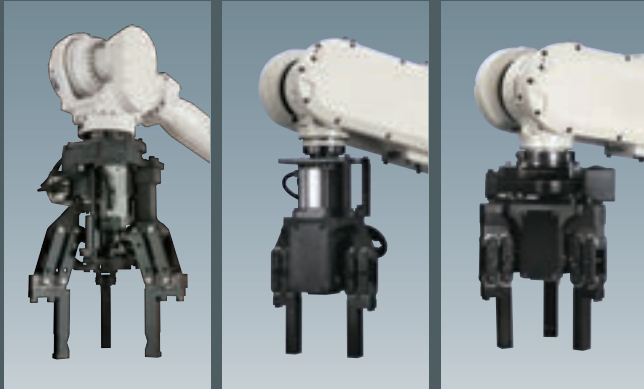


Seam welding?

Seam welding is a welding technique for parts that need airtight joints such as automotive fuel tanks and has been attracting attention. Two roller electrodes rotate on the surface of materials supplying electric current and thus, continuous weld joint is formed. The continuity of arc welding and the low cost of spot welding are compatible at a high level. NACHI was the only company in the world to successfully install a seam welder on a robot.

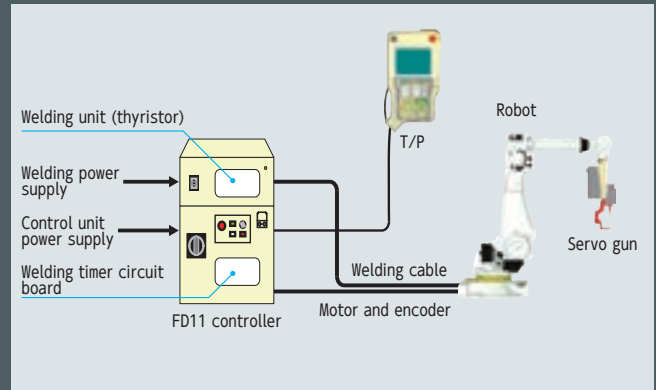


OPTION



FLEXhand

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.



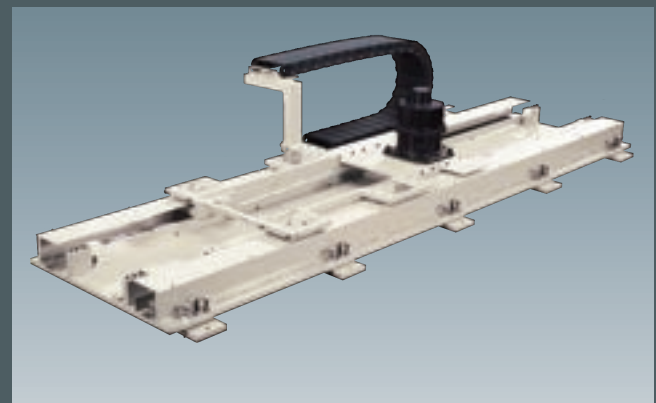
Integrated timer Weld timer integrated in controller

All-in-one package
Package includes robot, timer, servo gun, and peripheral equipment.



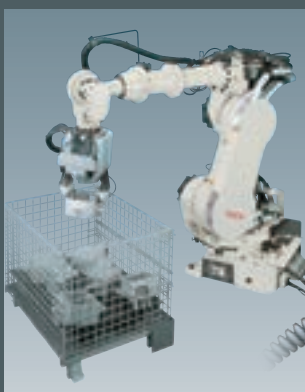
Force sensor

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.



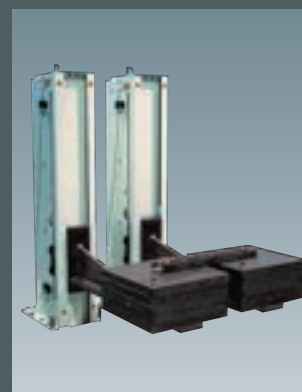
Slider

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



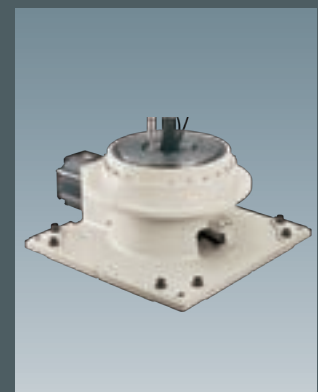
Vision sensor NV-Pro

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).



Lifter

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.



Rotary positioner table

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

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 FD18



Compact and small space installation
Contributes to space saving

Intake and exhaust with fans in front and back
Possible to install side by side

All cables come with connectors
Easy to replace controllers

Basic specifications for controller

Item	Specifications
Controllable axes	6
Maximum controllable axes	8
External dimensions (mm)	300(W)×600(D)×530(H) Casters(50mm), Switches/connectors not included
Position reader	Absolute encoder
Programming system	Teaching playback
Operating panel	Mode switch (teach/playback), emergency stop button
Cable between robot and control panel	2m, 5m, 10m, 15m, 20m, 25m(connector type) extension (total) 25m
User interface	User panel : On back
Additional slot	PCI×2 slots
PLC function	Software PLC IEC 1131-3
Protection rating	IP54 equivalent
Power supply	3φ 200-220VAC: Class-D grounding, breaker 40A, max. leakage 100mA
Ambient temperature/humidity	0 to 45° C (50/60Hz) 20 to 85% (without condensation)
Robot monitoring function	PL d (Cat. 3)

Controller options

Item	Specifications
Overseas compliance	North America: CSA/UL, Europe: CE
Power voltage converter	AC380/400/420/440/460/480V (3φ 50/60Hz) Class-D grounding, breaker 30A, max. leakage 100mA Transformer BOX dimensions (mm): W300×D600×H430 casters(90mm) Switches/connectors not included Controller and transformer BOX joint dimensions (mm): W300×D600×H960 casters(90mm) Switches/connectors not included
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	Additional compact I/O board: Maximum 14/10 point, Additional I/O board: Maximum 32/32 point
Output signals	Relay contact specifications 32 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
Robot monitoring function	PL e (Cat. 4)

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
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, 15m, 20m, 25m, 30m (connector type)
Protection rating	IP65 equivalent
External dimensions (mm)	163(W)×353(D)×74.5(T)
Weight	0.9kg

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/3φ 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, PLe

FD Controller FD11



Fast processing
significantly improved in control performance such as cycle time, trajectory control, and internal processing time.

Teach pendant is compact and lightweight
Compact and lightweight equipped with touch panel

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 equivalent
Power supply	3φ 200-220VAC: Class-D grounding, breaker 40A, max. leakage 100mA
Ambient temperature/humidity	0 to 45° 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 (3φ 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 equivalent
External dimensions (mm)	170(W)×300(D)×65(T)
Weight	0.96kg (exclude cable)

CFDL controller for EZ series only






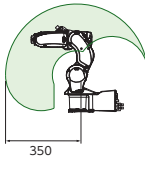
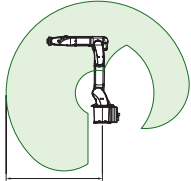
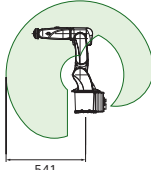
Just 369 mm wide
Multi-controller CFDL can be placed within the support structure.

- 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.)







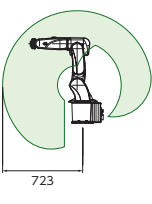
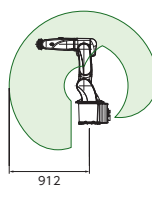
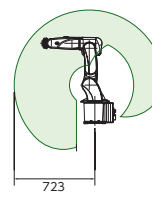
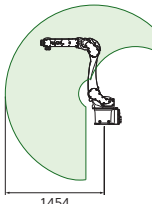
Basic specifications for controller			
Item	Specifications		
Model	CFDL1-0000	CFDL2-0000	CFDL4-0000
Maximum controllable units	1	2	4
Maximum controllable axes	6 axes/unit		
Teach pendant	Option		
Operating switches	Emergency stop and mode switching		
External dimensions (mm)	369(W)×490(D)×186(H)		369(W)×560(D)×263(H)
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 slots	1 slots
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		
Relay Unit	8 point		
Software PLC	Yes		
Vision sensor	Yes		
Brake release	Brake release mode		
Overseas compliance	UL, CE, KCS		

LIST OF SPECIFICATIONS


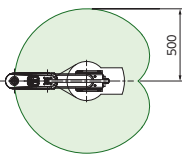
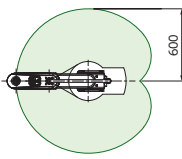
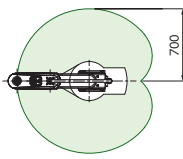
		MZ01	MZ03EL	MZ04 (MZ04D)	MZ04E (MZ04DE)	
						
No. of axes		6				
Max. working envelope	Arm	J1 Swivel 1	±170°			
		J2 Horizontal	-90~+85°	-135~+80°	-145~+90°	
		J7 Swivel 2	-			
	Wrist	J3 Vertical	-111~+175°	-155~+270°	-125~+280°	
		J4 Rotation 2	±145°	±190°		
		J5 Bend	±125°	±120°		
J6 Rotation 1	±360°					
Max. speed	Arm	J1 Swivel 1	320° /s	300° /s	480° /s	200° /s
		J2 Horizontal	320° /s	230° /s	460° /s	150° /s
		J7 Swivel 2	-			
	Wrist	J3 Vertical	375° /s	360° /s	520° /s	190° /s
		J4*1 Rotation 2	600° /s	550° /s	560° /s	
		J5 Bend	600° /s	550° /s	560° /s	
J6 Rotation 1	600° /s	1,000° /s	900° /s			
Maximum load	Wrist	1kg	3.5kg	4kg		
	Load capacity on forearm	0.25kg	-			
	Upper of J3	-				
Allowable static load torque for wrist	J4 Rotation 2	0.9N·m	6.0N·m	8.86N·m		
	J5 Bend	0.9N·m	6.0N·m	8.86N·m		
	J6 Rotation 1	0.78N·m	2.9N·m	4.9N·m		
Allowable moment of inertia for wrist	J4 Rotation 2	0.008kg·m ²	0.12kg·m ²	0.2kg·m ²		
	J5 Bend	0.008kg·m ²	0.12kg·m ²	0.2kg·m ²		
	J6 Rotation 1	0.006kg·m ²	0.03kg·m ²	0.07kg·m ²		
Maximum reach	350mm		1,102mm	541mm		
Position repeatability	±0.02mm		±0.03mm	±0.02mm		
Ambient temperature*2/ humidity	0 to 40°C/20 to 85% RH (without condensation)		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	
Dust proof, Drip proof	IP40 equivalent	IP67 equivalent	IP40 equivalent*3			
Weight	10kg*4	39kg	26kg*4	25kg*4		
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: MZ04 and MZ04E have IP40 equivalence. MZ04D and MZ04DE have IP67 (dust proof and water proof) equivalence.
 4: Wall mount Rear Connection Type: +4kg (MZ04 Series), +6kg (MZ07* Series) / Bottom Connection Type: +6kg (MZ04* Series), +8kg (MZ07* Series), +2.5kg (MZ01)

MZ07 (MZ07P)		MZ07L (MZ07LP)		MZ10	MZ12	MZ25	CZ10
							
6(5)				6		6	
				±170°		±170°	
-135~+80°				-135~+80°	-160~+90°	-150~+105°	-75~+225°
				-		-	
-136~+270°	-139~+270°	-136~+270°	-147~+210°	-161~+289°	-77~+227°		
		±190°				±180°	
		±120°		±140°		±145°	
		±360°				±170°	
		±360°				±360°	
450° /s	300° /s		260° /s		210° /s	120° /s	
380° /s	280° /s		250° /s		230° /s	185° /s	
						-	
520° /s	360° /s		260° /s		270° /s	180° /s	
550° /s		450° /s		470° /s		420° /s	
550° /s		340° /s		470° /s		420° /s	
1000° /s		700° /s		700° /s		672° /s	
7kg		10kg		12kg		25kg	
						-	
						-	
16.6N·m		17.9N·m		25N·m		52N·m	
16.6N·m		17.9N·m		25N·m		52N·m	
9.4N·m		10.4N·m		9.8N·m		32N·m	
		0.47kg·m ²		0.7kg·m ²		2.4kg·m ²	
		0.47kg·m ²		0.7kg·m ²		2.4kg·m ²	
		0.15kg·m ²		0.2kg·m ²		1.3kg·m ²	
723mm	912mm	723mm	1,454mm	1,882mm	1,300mm		
±0.02mm	±0.03mm		±0.04mm		±0.05mm		
0 to 45°C/20 to 85% RH (without condensation)							
0.5 G or less							
Floor, wall, inverted, tilted mount		Floor, inverted mount		Floor, inverted, tilted mount		Floor, inverted mount	
IP67 equivalent							
36kg*4		38kg*4		36kg		150kg	
		0.4KVA		1.8KVA		2.55KVA	
61kg		1.0KVA		250kg		61kg	
							
723		912		723		1454	
						1882	
						1300	



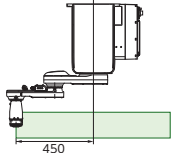
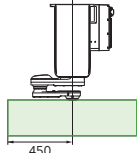
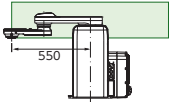
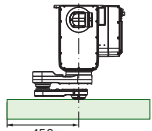
1[N·m]=1/9.8[kgf·m]

LIST OF SPECIFICATIONS

		EC06-5020-01	EC06-6020-01	EC06-7020-01
				
No. of axes		4		
Max. working envelope	J1 Swivel 1	$\pm 140^\circ$		
	J2 Swivel 2	$\pm 150^\circ$		
	J3 Vertical	200mm		
	J4 Rotation	$\pm 360^\circ$		
Max. speed	J1 Swivel 1	$420^\circ /s$		
	J2 Swivel 2	$720^\circ /s$		
	J3 Vertical	1,100mm/s		
	J4 Rotation	$2660^\circ /s$		
Maximum Payload		6kg (3kg rated)		
Allowable moment of inertia for wrist	J4 Rotation	$0.05\text{kg}\cdot\text{m}^2$ ($0.01\text{kg}\cdot\text{m}^2$ rated)		
Maximum reach		500mm	600mm	700mm
Position repeatability		$\pm 0.02\text{mm}$		
Ambient temperature*1/ humidity		0 to $40^\circ\text{C}/20$ to 80% RH (without condensation)		
Vibration		0.5 G or less ($4.9\text{m}/\text{s}^2$)		
Installation		Floor mount		
Dust proof, Drip proof		IP20		
Weight		17kg	17kg	18kg
Power consumption		0.5KVA		
Working envelope				

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

		EZ02V6-02	EZ02F6-02	EZ03V4-02	EZ03F4-02	EZ03D
						
No. of axes		6			4	
Max. working envelope	J1 Vertical	250/150mm*2		250/150mm*3		225/125mm*4
	J2 Swivel 1	±170°			±170°	
	J3 Swivel 2	±180°	±145°	±180°	±145°	±180°
	J4 Rotation	±180°			±360°	
	J5 Rotation	±105°			-	
	J6 Rotation	±360°			-	
Max. speed	J1 Vertical	1,200/1,000mm/s*2		1,400/1,200mm/s*3		1,100/900mm/s*4
	J2 Swivel 1	450° /s			450° /s	
	J3 Swivel 2	720° /s			720° /s	
	J4 Rotation	1,200° /s			2,400° /s	
	J5 Rotation	720° /s			-	
	J6 Rotation	720° /s			-	
Maximum Payload		2kg (1kg rated)			3kg (2kg rated)	
Allowable moment of inertia for wrist	J4 Rotation	0.03kg·m ² (0.013kg·m ² rated)			0.05kg·m ²	
	J5 Rotation	0.03kg·m ² (0.013kg·m ² rated)			-	
	J6 Rotation	0.01kg·m ² (0.001kg·m ² rated)			-	
Maximum reach		450mm	550mm	450mm	550mm	450mm
Position repeatability		±0.02mm			±0.014mm	
Ambient temperature*1/ humidity		0 to 45°C/20 to 85% RH (without condensation)				
Vibration		0.5 G or less (4.9m/s ²)				
Installation		Inverted mount	Floor mount	Inverted mount	Floor mount	Inverted mount
Dust proof, Drip proof		IP20				IP65 equivalent
Weight		44kg	46kg	42kg	43kg	50kg
Power consumption		0.4KVA			0.6KVA	
Working envelope						

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

1[N·m] = 1/9.8[kgf·m]






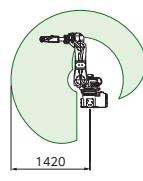
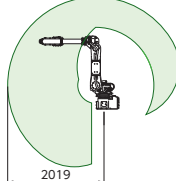
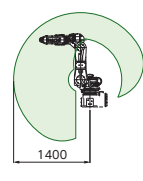
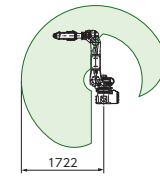
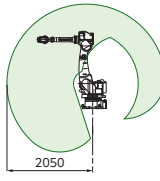
*1: Using at 1,000 m or lower sea level. Ambient temperature has limitations when allowable altitude is exceeded.

*2: 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.





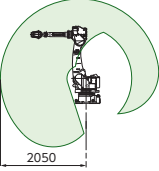
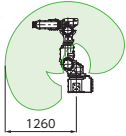
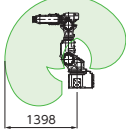
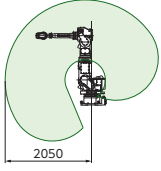
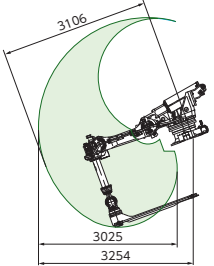
*3: There are two types of maximum operating envelopes: 250 mm and 150 mm. The 250 mm has a maximum speed of 1,400 mm/s. The 150 mm has a maximum speed of 1,200 mm/s.

*4: There are two types of maximum operating envelopes: 225 mm and 125 mm. The 225 mm has a maximum speed of 1,200 mm/s. The 125 mm has a maximum speed of 900 mm/s.

LIST OF SPECIFICATIONS




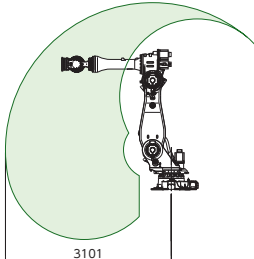
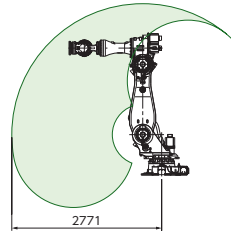
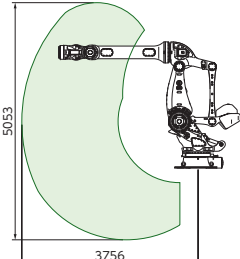
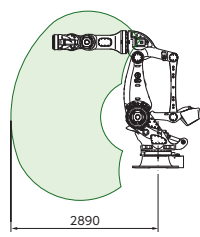
		MC10S	MC10L	MC12S	MC20	MC35	MC50	
								
No. of axes		6						
Max. working envelope	Arm	J1 Swivel 1	±180°				±165°	
		J2 Horizontal	-145~+60°				-135~+80°	
		J7 Swivel 2	-					
	Wrist	J3 Vertical	-148~+242°	-163~+242°	-154~+242°	-163~+242°	-146~+260°	
		J4 Rotation 2	±190°	±180°		±360°		
		J5 Bend	±120°	±139°		±125°		
		J6 Rotation 1				±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	
Maximum load	Wrist		10kg		12kg	20kg	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 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						
Installation		Floor, inverted mount		Floor, inverted, tilted mount	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	ST210TP-01
						
	6	7				7
	±165°	±180°			±165°	±180°
	-135~+80°	-120~+55°				-35~+120°
	-	±180°			±190°	±65°
	-146~+260°	-166~+135°			-146~+140°	-96~+210°
	±360°	±180°			±360°	±360°
	±125°	±135°	±139°		±125°	±120°
	±450°	±360°			±450°	±360°
	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	130° /s
	235° /s	250° /s	360° /s	305° /s	255° /s	130° /s
	350° /s	300° /s	600° /s	420° /s	370° /s	250° /s
	70kg	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	J7 axis rotation 80kg·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		3,106mm
	±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)		Shelf mount (installed at 20° angle)
	Wrist: IP67 equivalent, main body: IP54 equivalent (OP: IP65/67 equivalent)	IP65 equivalent		IP67 equivalent		-
	640kg	230kg		745kg		1,650kg
	5.0KVA	1.0KVA		4.1KVA		7.0KVA
						

1 [N·m] = 1/9.8 [kgf·m]




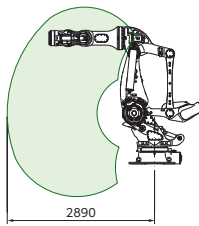
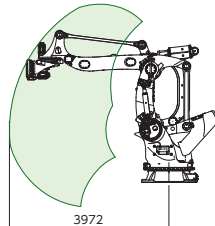
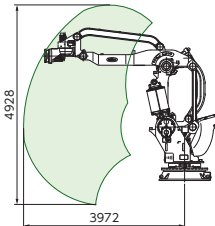
LIST OF SPECIFICATIONS

		MC280L	MC350	MC400L	MC600	
						
No. of axes		6				
Max. working envelope	Arm	J1 Swivel 1	±180°			
		J2 Horizontal	-100~+40°	-105~+60°		
		J7 Swivel 2	-			
	Wrist	J3 Vertical	-147~+130°	-180~+130°	-130~+30°	-140~+30°
		J4 Rotation 2	±360°		±210°	
		J5 Bend	±125°		±120°	
Max. speed	Arm	J1 Swivel 1	105° /s		90° /s	
		J2 Horizontal	105° /s	95° /s	90° /s	
		J7 Swivel 2	-			
	Wrist	J3 Vertical	95° /s		90° /s	
		J4 Rotation 2	120° /s	110° /s		
		J5 Bend	120° /s	110° /s		
Maximum load	Wrist	280kg	350kg	400kg	600kg	
	Load capacity on forearm	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 ²		600kg·m ²		
	J5 Bend	400kg·m ²		600kg·m ²		
	J6 Rotation 1	250kg·m ²		400kg·m ²		
Maximum reach	3,101mm	2,771mm	3,756mm	2,890mm		
Position repeatability	±0.2mm			±0.3mm		
Ambient temperature*/humidity	0 to 45°C/20 to 85% RH (without condensation)					
Vibration	0.5 G or less					
Installation	Floor mount					
Dust proof, Drip proof	-					
Weight	1,660kg	1,620kg	3,400kg	3,300kg		
Power consumption	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.

	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°)*3	-10~+90°
	±120°	±125°*4	±125°
	±360°*2	±9.7°	±10°
	80°/s	45°/s	45°/s
	80°/s	40°/s	30°/s
	-	-	-
	80°/s	40°/s	30°/s
	100°/s	20°/s*5	30°/s
	100°/s	65°/s	50°/s
	160°/s	70°/s	30°/s
	700kg	1,000kg	700kg
	25kg	-	-
	-	-	-
	3,450N·m	21,000N·m	13,800N·m
	3,450N·m	-	3,920N·m
	1,725N·m	4,410N·m	2,940N·m
	600kg·m ²	5,200kg·m ²	3,000kg·m ²
	600kg·m ²	4,000kg·m ²	1,800kg·m ²
	400kg·m ²	1,740kg·m ²	1,000kg·m ²
	2,890mm	3,972mm	3,972mm
	±0.3mm		±0.5mm
	0 to 45°C/20 to 85% RH (without condensation)		
	0.5 G or less		
	Floor mount		
	-		
	3,320kg	9,000kg	7,000kg
	9.3KVA	19.0KVA	7.0KVA
			




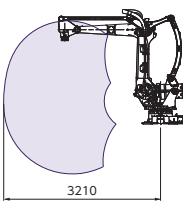
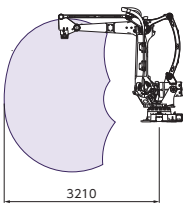
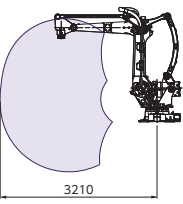
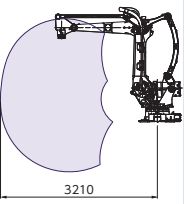
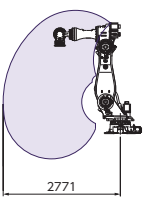
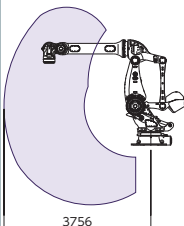
*3: Max motion range of axis 4 varies due to the wrist payload weight. Wrist load 300 kg <: -9.7°~+90°. Wrist load 300 kg ≥: -9.7°~+9.7°

*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.

1[N·m]=1/9.8[kgf·m]

LIST OF SPECIFICATIONS

		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~+40.7°	-95~+41°		-100~+40°	-105~+60°
		J7 Swivel 2	-				-	
	Wrist	J3 Vertical	-117~+17°	-116.9~+17.2°	-117~+17°		-180~+35°	-130~+30°
		J4 Rotation 2	±360°				±360° *2	-
		J5 Bend	-				±125° *2	±120°
						±360°		
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
						180° /s	180° /s	
Maximum load	Wrist	130kg		180kg	210kg	470kg	500kg	
	Load capacity on forearm	25kg				30kg	25kg	
	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*/humidity		0 to 45°C/20 to 85% RH (without condensation)						
Vibration		0.5 G or less						
Installation		Floor mount						
Dust proof, Drip proof		-						
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.




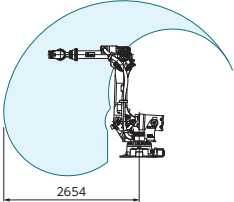
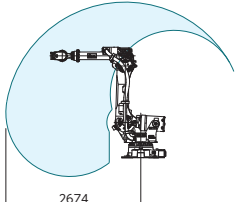
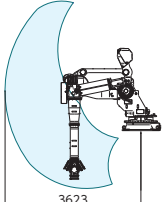
*2: Software limits the downward vertical range of axis 5 to ±5°.

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.






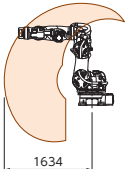
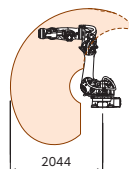
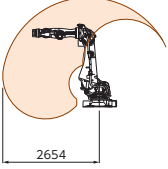
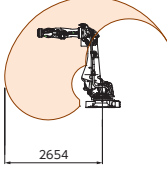
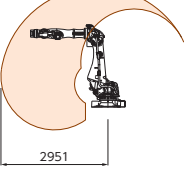
1[N·m] = 1/9.8[kgf·m]

		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
Maximum load	Wrist	133kg	166kg	210kg	400kg	
	Load capacity on forearm		70kg		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			1,160kg	3,800kg	
Power consumption	4.2KVA			-		
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]

LIST OF SPECIFICATIONS




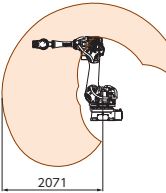
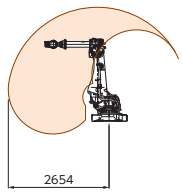
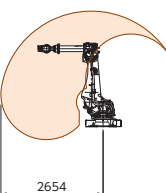
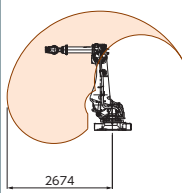
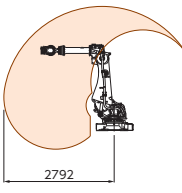
		SRA100HS	SRA100HB	SRA100H	SRA133H	SRA133HL	
							
No. of axes		6					
Max. working envelope	Arm	J1 Swivel 1	±180°				
		J2 Horizontal	-120~+60°		-80~+60°		
		J7 Swivel 2	-				
	Wrist	J3 Vertical	-125~+90°	-151~+90°	-146.5~+150°		-133.4~+150°
		J4 Rotation 2	±210°				
		J5 Bend	±125°				
Max. speed	Arm	J1 Swivel 1	136° /s	125° /s	120° /s	115° /s	
		J2 Horizontal	115° /s		110° /s	105° /s	
		J7 Swivel 2	-				
	Wrist	J3 Vertical	160° /s	121° /s	118° /s	113° /s	
		J4 Rotation 2	210° /s	225° /s	210° /s		
		J5 Bend	175° /s				
Maximum load	Wrist	100kg		133kg			
	Load capacity on forearm	20kg					
	Upper of J3	-					
Allowable static load torque for wrist	J4 Rotation 2	830N·m	650N·m	830N·m			
	J5 Bend	830N·m	650N·m	830N·m			
	J6 Rotation 1	441N·m	315N·m	441N·m			
Allowable moment of inertia for wrist	J4 Rotation 2	85kg·m ²					
	J5 Bend	85kg·m ²					
	J6 Rotation 1	45kg·m ²					
Maximum reach	1,634mm	2,044mm	2,654mm		2,951mm		
Position repeatability	±0.1mm					±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	IP54 equivalent						
Weight	690kg	750kg	1,040kg		1,070kg		
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.

	SRA166H	SRA210H	SRA220H	SRA220HV-01	SRA100J-01
					
	6				
	±180°		±165°		±180°
	-80~+60°				-120~+60°
	-				-
	-146.5~+150°		-154~+150°		-125~+90°
	±210°				±360°
	±125°		±130°		±135°
	±210°				±360°
	120° /s	115° /s		136° /s	
	110° /s	105° /s		115° /s	
	-				-
	115° /s	113° /s		160° /s	
	175° /s	130° /s		240° /s	
	171° /s	130° /s		233° /s	
	280° /s	205° /s		351° /s	
	166kg	210kg	220kg		100kg
	20kg				25kg
	-				-
	960N·m	1337N·m		580N·m	
	960N·m	1337N·m		580N·m	
	520N·m	720N·m		290N·m	
	100kg·m ²	200kg·m ²	141.1kg·m ²		45kg·m ²
	100kg·m ²	200kg·m ²	141.1kg·m ²		45kg·m ²
	50kg·m ²	155kg·m ²	79.0kg·m ²		22.7kg·m ²
	2.654mm		2,575mm		1,634mm
	±0.1mm	±0.15mm		±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
	7.0KVA				
					

1 [N·m] = 1/9.8 [kgf·m]

LIST OF SPECIFICATIONS



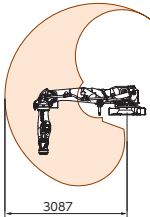
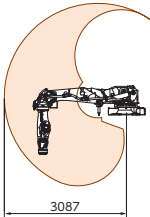
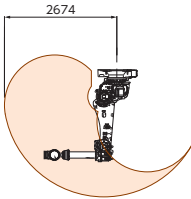
		SRA100B-01	SRA100-01 (100-01A)	SRA166-01 (166-01A)	SRA210-01 (210-01A)	SRA240-01	SRA250-01	
								
No. of axes		6	6		6			
Max. working envelope	Arm	J1 Swivel 1	±180°	±180°	±180°			
		J2 Horizontal	-120~+60°	-80~+60°	-80~+60°			
		J7 Swivel 2	-	-	-			
	Wrist	J3 Vertical	-150~+180°	-146.5~+150°	-146.5~+150°		-140~+150°	
		J4 Rotation 2	±360°	±360 (±210)°	±360 (±210)°		±360°	
		J5 Bend	±135°	±135 (±120)°	±135 (±120)°	±130 (±120)°	±130°	
J6 Rotation 1	±360°	±360 (±205)°	±360 (±205)°		±360°			
Max. speed	Arm	J1 Swivel 1	136° /s	136° /s	125° /s	115° /s	105° /s	100° /s
		J2 Horizontal	110° /s	135° /s	115° /s	105° /s	90° /s	
		J7 Swivel 2	-	-	-			
	Wrist	J3 Vertical	130° /s	135° /s	121° /s	113° /s	100° /s	95° /s
		J4 Rotation 2	240° /s	240° /s	180° /s	140° /s	130° /s	125° /s
		J5 Bend	233° /s	233° /s	173° /s	133° /s	125° /s	
J6 Rotation 1	351° /s	351° /s	260° /s	200° /s	195° /s	190° /s		
Maximum load	Wrist	100kg	100kg	166kg	210kg	240kg	250kg	
	Load capacity on forearm	25kg	45kg (15kg)		20kg			
	Upper of J3	-	-	-				
Allowable static load torque for wrist	J4 Rotation 2	580N·m	580N·m	951N·m	1,337N·m			
	J5 Bend	580N·m	580N·m	951N·m	1,337N·m			
	J6 Rotation 1	290N·m	290N·m	490N·m	720N·m			
Allowable moment of inertia for wrist	J4 Rotation 2	45kg·m ²	60kg·m ²	88.9kg·m ²	141.1kg·m ²		225.4kg·m ²	
	J5 Bend	45kg·m ²	60kg·m ²	88.9kg·m ²	141.1kg·m ²		225.4kg·m ²	
	J6 Rotation 1	22.7kg·m ²	30kg·m ²	45kg·m ²	79.0kg·m ²		196kg·m ²	
Maximum reach	2,071mm	2,654mm	2,654mm	2,674mm		2,792mm		
Position repeatability	±0.1mm	±0.1mm	±0.1mm	±0.15mm	±0.2mm			
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	690kg	960 (1,060kg)		990 (1,090kg)		990kg	1,030kg	
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.

SRA120EL-01		SRA133L-01		SRA166L-01		SRA166T-01 (166T-01A)		SRA166TL-01		SRA210T-01 (210T-01A)	
											
6						6					
±180°						±180°					
-80~+60°						-65~+120°					
-						-					
-127.7~+150°		-133.4~+150°		-106~+210°		-90~+210°		-106~+210°		-106~+210°	
±360°		±360°		±360(±210)°		±360°		±360(±210)°		±360(±210)°	
±135°		±135°		±135(±120)°		±135°		±135°		±130(±120)°	
±360°		±360°		±360°		±360 (±205)°		±360 (±205)°		±360 (±205)°	
115° /s		125° /s		115° /s		110° /s		105° /s		100° /s	
105° /s		115° /s		105° /s		110° /s		90° /s		90° /s	
-						-					
113° /s		121° /s		113° /s		115° /s		115° /s		100° /s	
		140° /s				180° /s		140° /s		140° /s	
		173° /s						173° /s		133° /s	
		260° /s						260° /s		200° /s	
120kg		133kg		166kg		166kg		166kg		210kg	
		45kg						45kg (15kg)			
-						-					
687N·m		800N·m		951N·m		951N·m		951N·m		1,337N·m	
687N·m		800N·m		951N·m		951N·m		951N·m		1,337N·m	
353N·m		400N·m		490N·m		490N·m		490N·m		720N·m	
60kg·m ²		76kg·m ²		88.9kg·m ²		88.9kg·m ²		88.9kg·m ²		141.1kg·m ²	
60kg·m ²		76kg·m ²		88.9kg·m ²		88.9kg·m ²		88.9kg·m ²		141.1kg·m ²	
30kg·m ²		38kg·m ²		45.0kg·m ²		45.0kg·m ²		45.0kg·m ²		79.0kg·m ²	
3,099mm		2,951mm		3,086mm		3,383mm		3,383mm		3,106mm	
		±0.15mm				±0.1mm				±0.15mm	
0 to 45°C/20 to 85% RH (without condensation)											
0.5 G or less											
Floor mount						Shelf mount					
Wrist has IP67 and main body has IP54 equivalent											
985kg		980kg		1,210 (1,310)kg		1,240kg		1,240kg		1,250(1,350)kg	
7.0KVA											
											
3099		2951		3086		3383		3383		3106	

1[N·m] = 1/9.8[kgf·m]

LIST OF SPECIFICATIONS

		SRA166HT-01	SRA210HT-01	SRA210V
				
No. of axes		6		6
Max. working envelope	Arm	J1 Swivel 1	±180°	±165°
		J2 Horizontal	-65~+120°	-80~+60°
		J7 Swivel 2	-	-
	Wrist	J3 Vertical	-112~+210°	-146.5~+150°
		J4 Rotation 2	±210°	±360°
		J5 Bend	±125°	±130°
Max. speed	Arm	J1 Swivel 1	120° /s	115° /s
		J2 Horizontal	110° /s	105° /s
		J7 Swivel 2	-	-
	Wrist	J3 Vertical	115° /s	113° /s
		J4 Rotation 2	175° /s	130° /s
		J5 Bend	171° /s	130° /s
Maximum load	Wrist	166kg	210kg	210kg
	Load capacity on forearm	20kg		45kg
	Upper of J3	-		-
Allowable static load torque for wrist	J4 Rotation 2	960N·m	1,337N·m	1,337N·m
	J5 Bend	960N·m	1,337N·m	1,337N·m
	J6 Rotation 1	520N·m	720N·m	720N·m
Allowable moment of inertia for wrist	J4 Rotation 2	100kg·m ²	200kg·m ²	141.1kg·m ²
	J5 Bend	100kg·m ²	200kg·m ²	141.1kg·m ²
	J6 Rotation 1	50kg·m ²	155kg·m ²	79.0kg·m ²
Maximum reach		3,087mm		2,674mm
Position repeatability		±0.1mm	±0.15mm	±0.15mm
Ambient temperature*/humidity		0 to 45°C/20 to 85% RH (without condensation)		
Vibration		0.5 G or less		
Installation		Shelf mount		Inverted mount
Dust proof, Drip proof		IP54 equivalent		Wrist has IP67 and main body has IP54 equivalent
Weight		1,160kg		990kg
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.

1[N·m]=1/9.8[kgf·m]

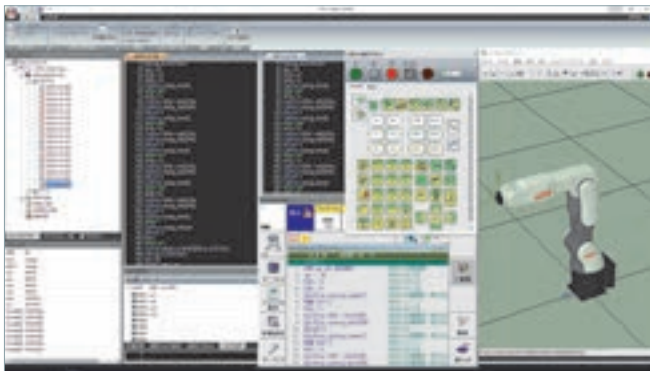
SUPPORT SOFTWARE

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

FD on Desk II (Simulation Software for PC)

Simulation and offline programming product for NACHI robots

- FD on Desk II Pro Options
- FD on Desk II Regular Options
- FD on Desk II Light Standard *CFD controller only



Grade	Pro		Regular		Light	Trial version (Demo Licence)
Type No.	FDONDESK2-PRO	FDONDESK2-PRO-D	FDONDESK2-REG	FDONDESK2-REG-D	-	-
Licence certification	Licence file	USB dongle	Licence file	USB dongle	Actual Robot Controller required	ASK
CFD	Offline mode	○	○	○	○	△
	Monitor mode	○	○	○	○	×
	View mode	○	○	○	○	×
FD	Offline mode	○	○	○	△	△
	Monitor mode	○	○	○	△	×
	View mode	○	○	○	△	×
Program generation function from CAD	○	○	×	×	×	×
Applied to plural control	○	○	×	×	×	×
Save shape file	○	○	○	○	○	×

○ : Usableness
 △ : Enable to use in operator level BEGINNER. (Applied to MZ, ES and EZ)
 × : Unusableness

User task functions Standard

Possible to program processes in parallel with robot operations

- 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

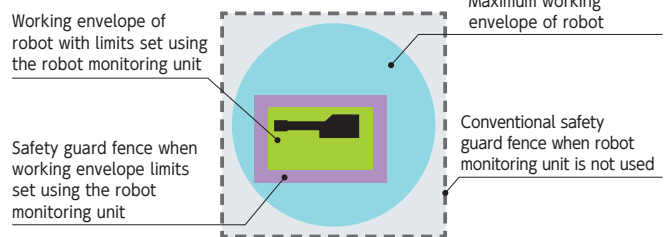
- Customizable teach pendant screen menu.
- Works as a system operation console which can control peripheral devices.



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

Working envelope of robot and safety fence



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 Vender 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.

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.



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

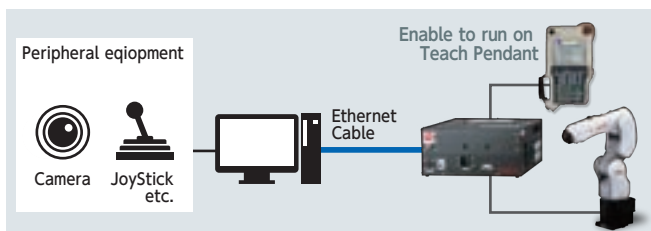
Robot training course

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



Open-NR-IF

Open-NR-IF develop environment makes the system design with various devices easier.

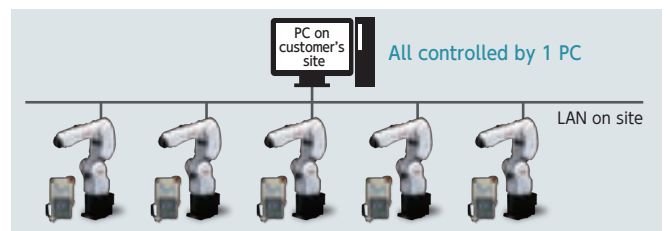


Monitoring function of robot operation

- Indication of robot move command
- Acquisition of robot status (Input/output signals, Variables, Shift Values)

Open-NR-IF application example (FD controller software)

Open-NR-IF supports C-Language and LabVIEW* to generate Code.

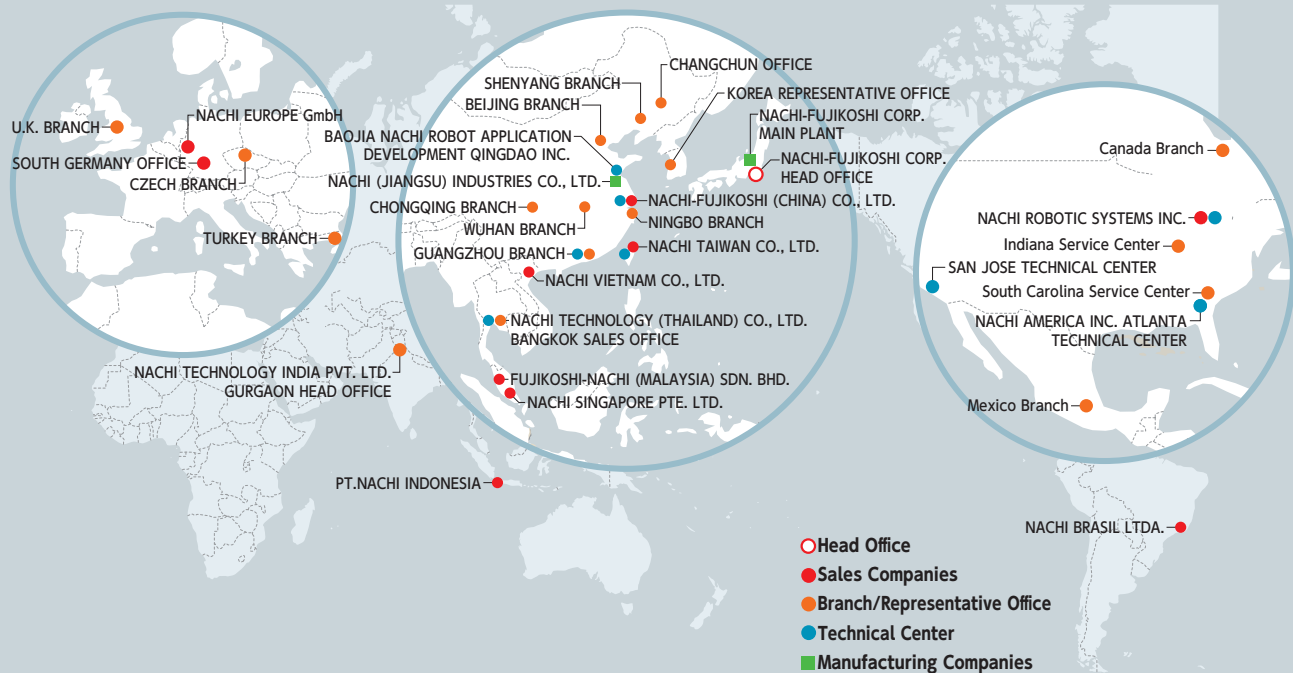


Application example

- Real-time observation
- Preventive maintenance
- Concentrated observation software
- LabVIEW* image processing

*LabVIEW is a registered trademark of National Instruments in US for US and other countries.

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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.

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