

ROBOT

Total Robot Catalog

Safety precautions

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



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.



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

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LINEUP

		HANDLING					HANDLING		PALLETIZING	CLEAN-ROOM	WELDING
		MZ	CZ	EC	EZ		MC/MR	MC and SC Heavy Loader	LP/MC	SC-C/ST-C	SRA-H/SRA
Process and application	Field										
Number of controlled axes		5 or 6 axes	6 axes	4 axes	4 or 6 axes		6 or 7 axes	6 axes	4 or 5 or 6 axes	6 axes	6 axes
Payload capacity		1 to 25kg	10kg	6kg	2 to 3kg		10 to 70kg	280 to 1000kg	130 to 500kg	133 to 400kg	100 to 250kg
Maximum reach		350 to 1,882mm	1,300mm	500 to 700mm	450 to 550mm		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
Page Number		5	7	9	9		11	13	15	17	19
Spot welding/ Seam welding	Automotive Automotive parts Metalworking						●	●			●
Arc welding	Agricultural machinery Construction machinery						●				
Die casting	Automotive parts	●	●				●				●
Resin molding	Plastics Electric and electronics	●	●				●	●			●
Press operation handling	Automotive Automotive parts Machine tools Plastics Pharmaceuticals and cosmetics Electric and electronics Metalworking Chemistry Medical equipment Foodstuffs Agricultural machinery Construction machinery							●			●
Machine loading		●	●				●	●			●
Deburring/Polishing		●					●				●
Sealing		●	●				●				●
General assembling		●	●	●	●		●				●
Bolt tightening		●	●	●	●		●				●
Picking, aligning, packaging		●	●	●	●		●				
Shipping and receiving (palletizing)		●	●				●	●	●		●
Measuring, inspection, testing		●	●	●	●		●	●			
Material handling		●	●	●	●		●	●	●		●
Glass substrate loading	Electric and electronics									●	

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 protection against dust and water, 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

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. Smooth surface design, easy to clean covers.

- 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.

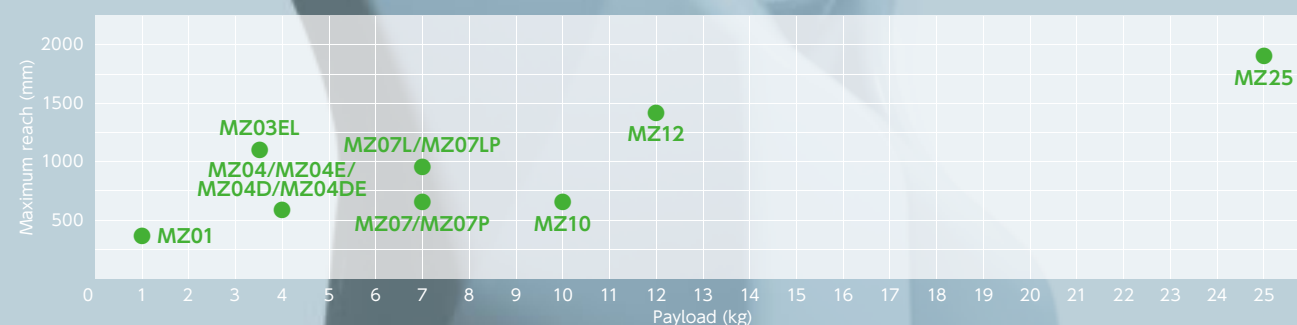
- Number of controlled axes 6 axes
- Payload 12kg
- Maximum reach 1,454mm



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



Inserting

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.



Awarded the certification by certification organization.
Safety certification :
Conforming to ISO 10218-1
Conforming to TS 15066

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. They meet the needs for applications such as assembling & handling.

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

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



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



WING SLICER Type robot

EZ **SERIES**

The EZ series robots are high-speed, horizontally articulated & 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 the hollow construction through the end of the wrist, capable of routing cables through.

The internal wire routing for the tooling significantly increases cabling reliability.

The Wing Slicer family has multiple models with varying reach and payload to support a variety of equipment operations.



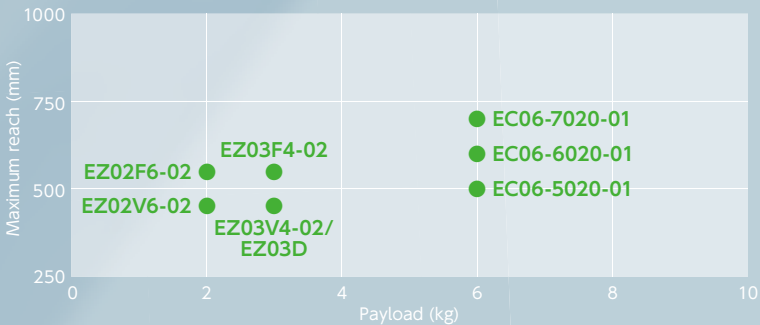
EZ03

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



EZ02

- Number of controlled axes 6 axes
- Payload 2kg
- 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

High rigid design with vibration dampening gives this robot its great speed. This newly developed specialized press arm attachment gives this robot a much larger reach that can be used for a press pitch of up to eight meters. Moves parts horizontally at high speed.

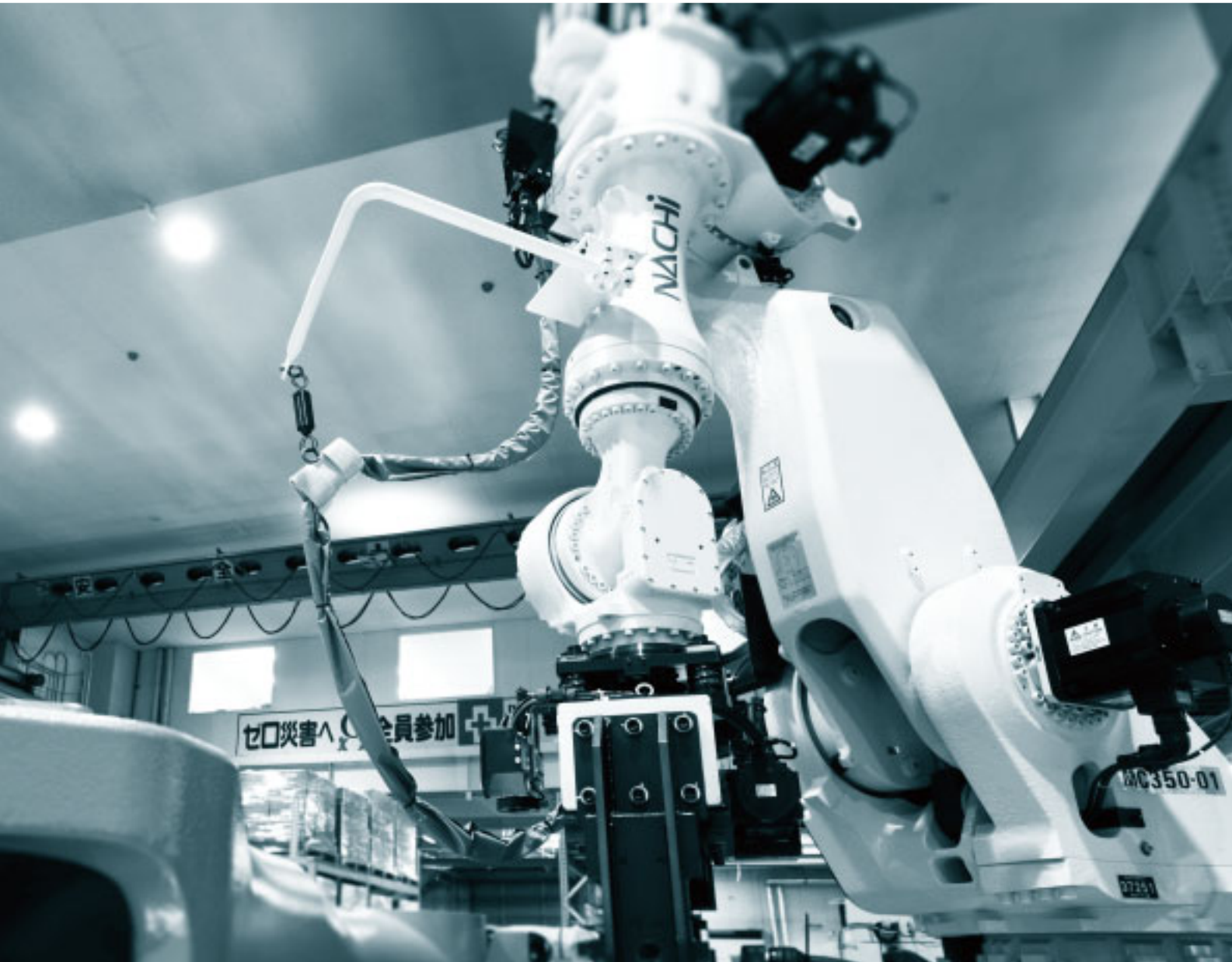
- Number of controlled axes 7 axes
- Payload 80kg
- Maximum reach 3,106mm



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.



Super heavy loader robot

MC HEAVY
LOADER
SERIES

Tool cables and hoses routed inside the hollow arm 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

SC700DL

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



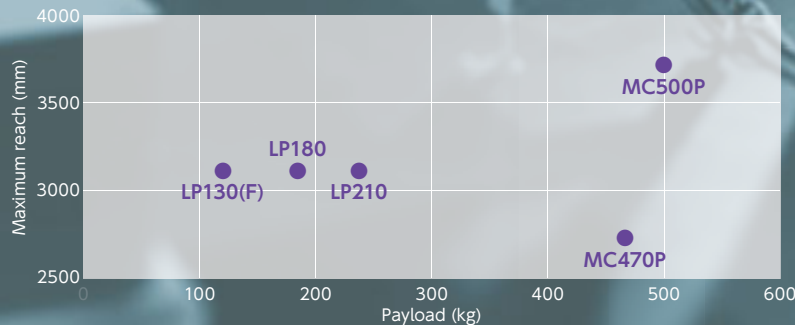
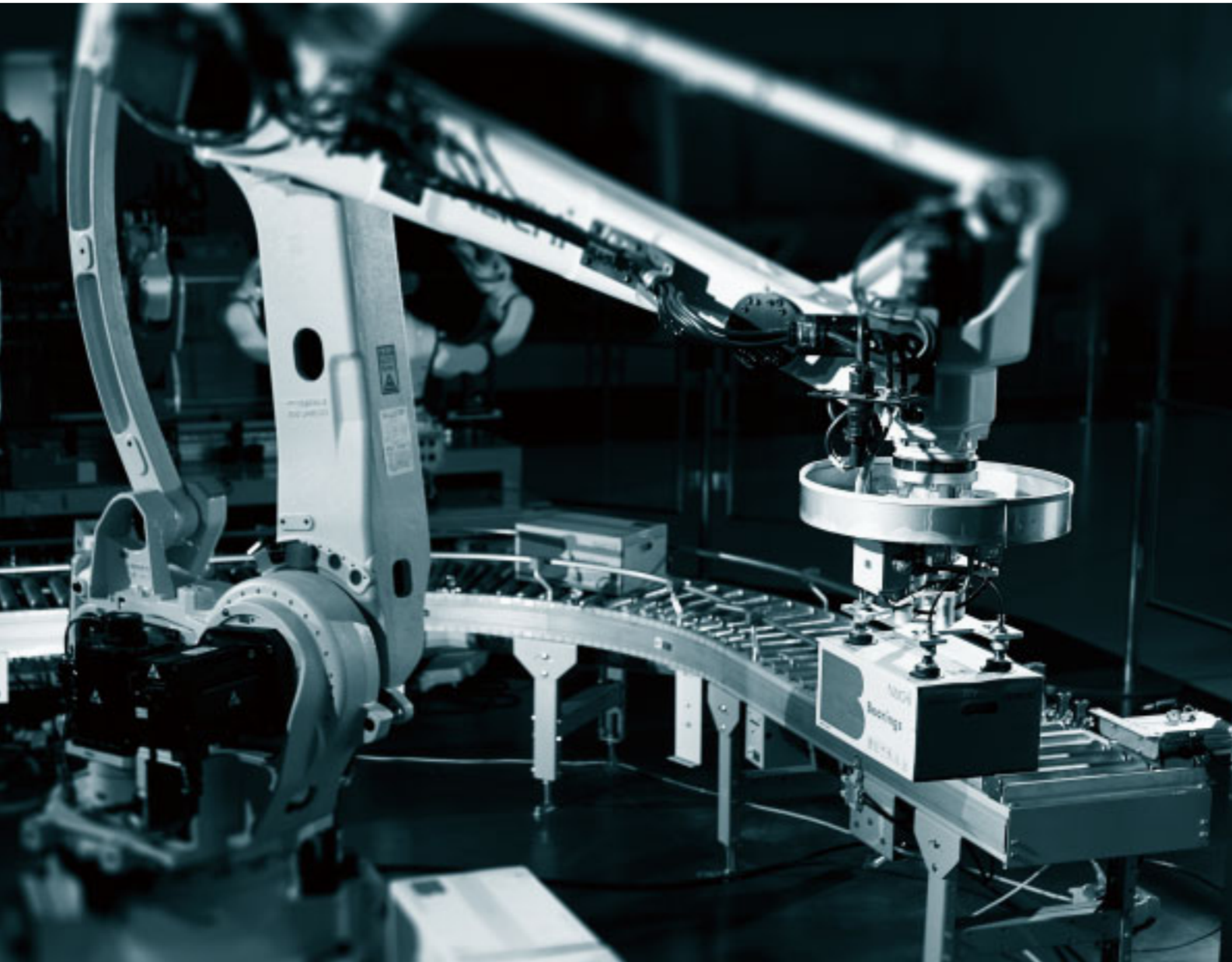
SC HEAVY
LOADER

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 lifters, with robots.

Palletizing robot

High-speed palletizing robot
Heavy loader palletizing robot

NACHI's palletizing robots help with intricate palletizing of boxes, crates and sacks for shipping and receiving processes.

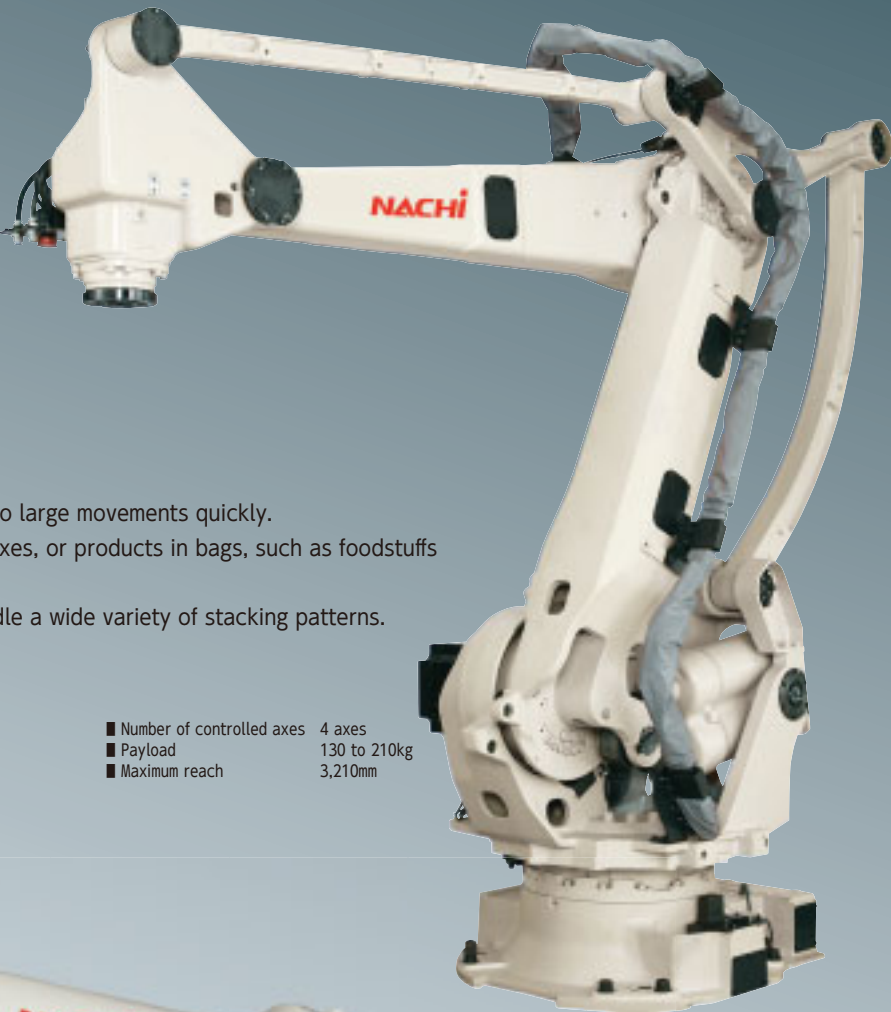


High-speed palletizing robot

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.

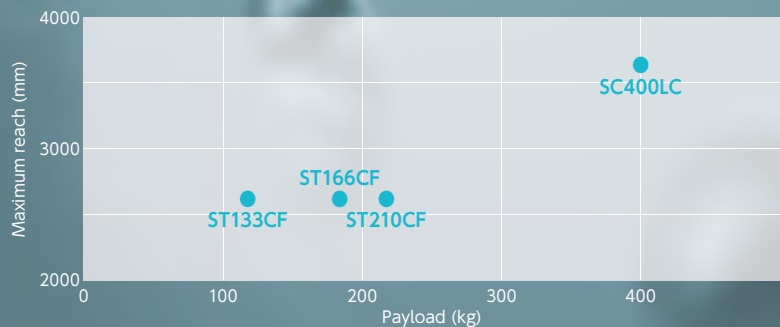
- Number of controlled axes 5 or 6 axes
- Payload 470 to 500kg
- Maximum reach 2,771 to 3,756mm



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*

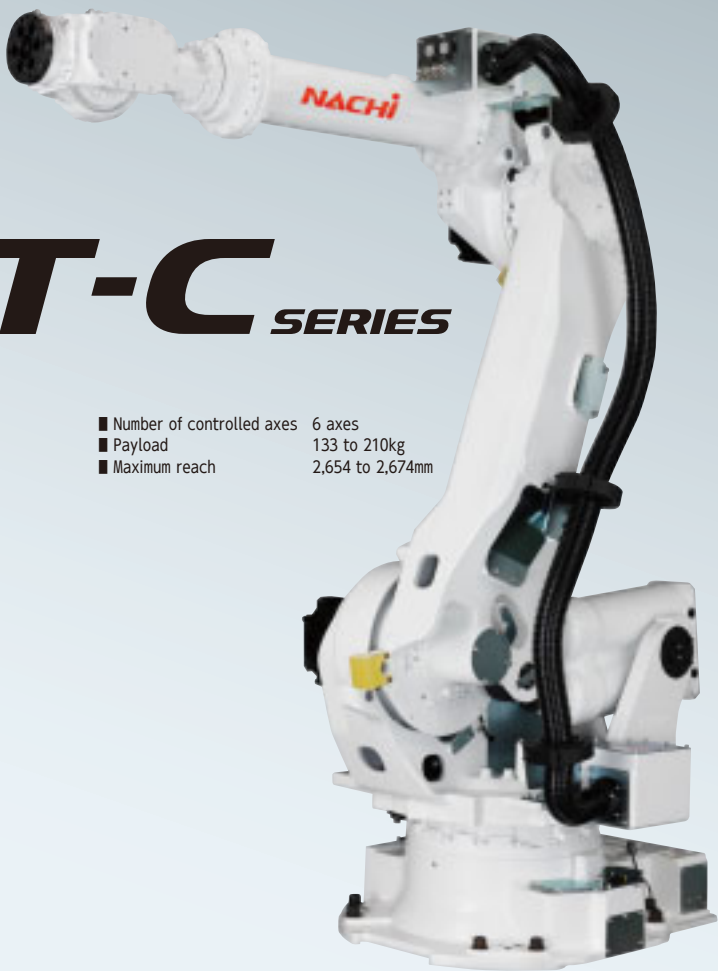
Six-axis articulated construction with excellent flexibility and a large reach make these robots excellent for a variety of loading work in large glass substrate production processes.

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



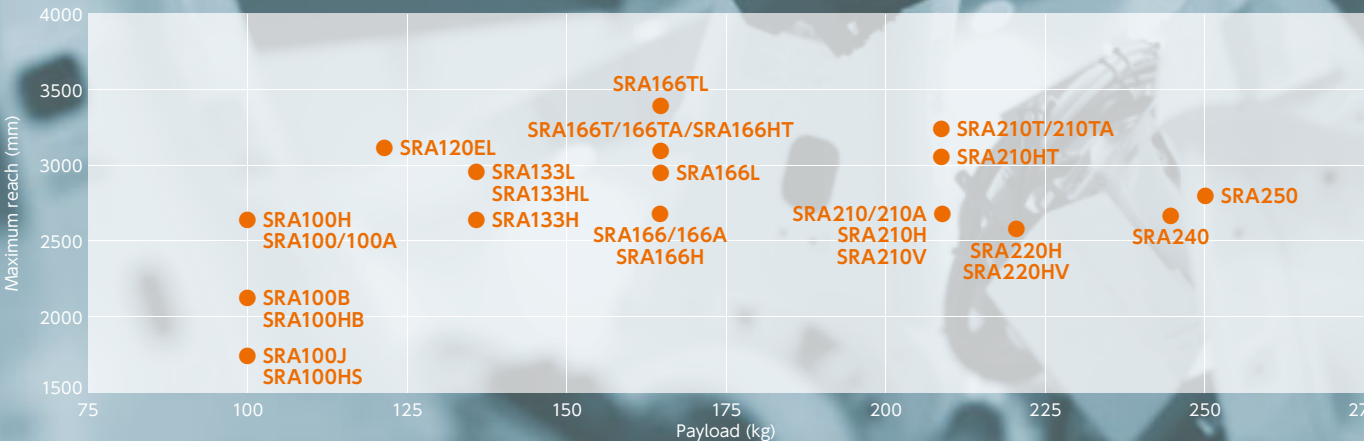
ST-C SERIES

- 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.

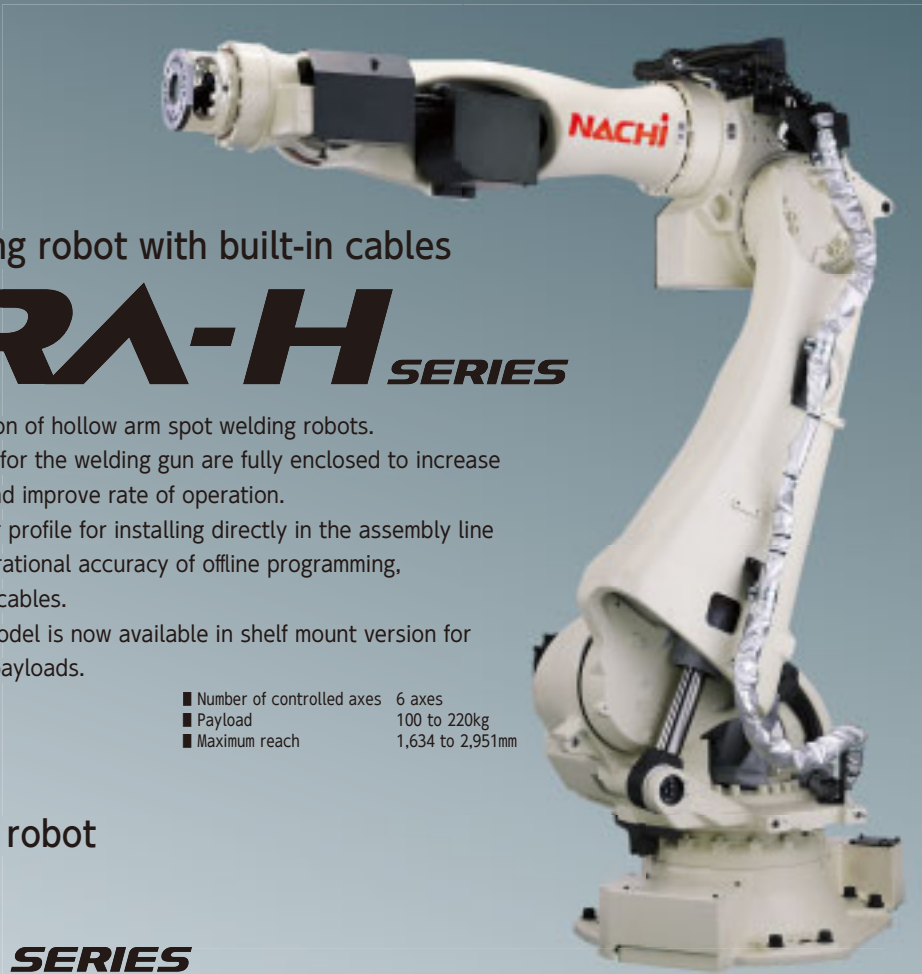


Spot welding robot with built-in cables

SRA-H SERIES

The next generation of hollow arm spot welding robots. Cables and hoses for the 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. This hollow arm model is now available in shelf mount version for 166 kg & 210 kg payloads.

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

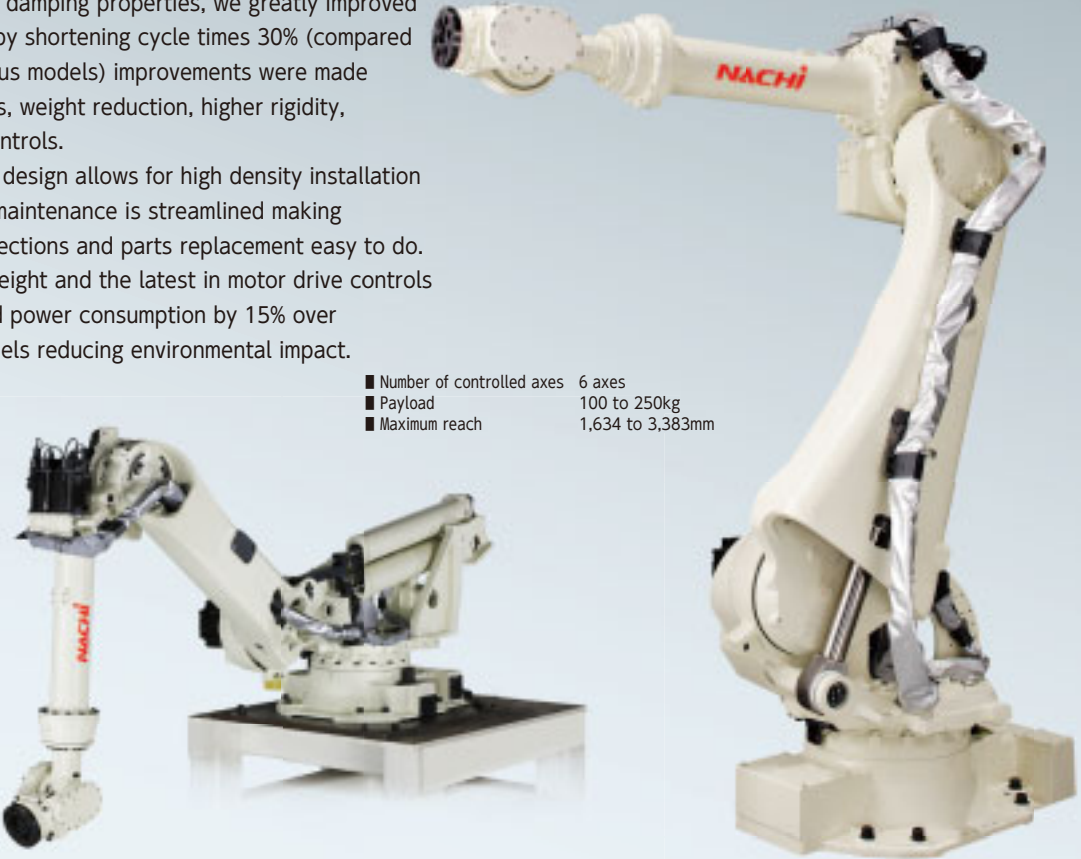


Ultra-fast spot welding robot

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 previous 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 the latest in motor drive controls have reduced power consumption by 15% over previous models reducing environmental impact.

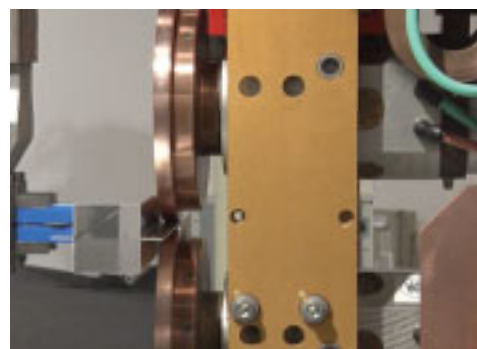
- Number of controlled axes 6 axes
- Payload 100 to 250kg
- Maximum reach 1,634 to 3,383mm



Seam welding package

Robot seam welding package

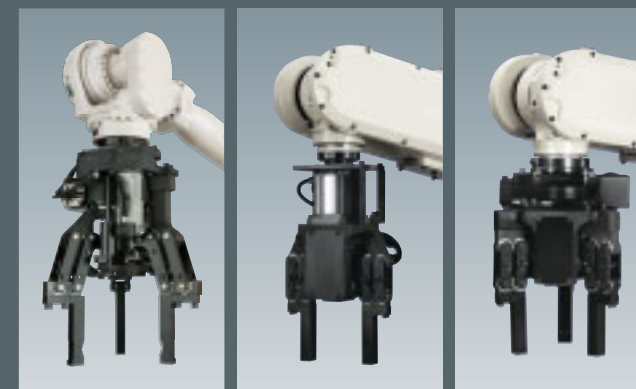
- Capable of seam welding on work surfaces in three dimensions
- Fast and consistent welding
- Equipped with various application functions such as electrode polishing, electrode wear compensation, and others



Seam welding?

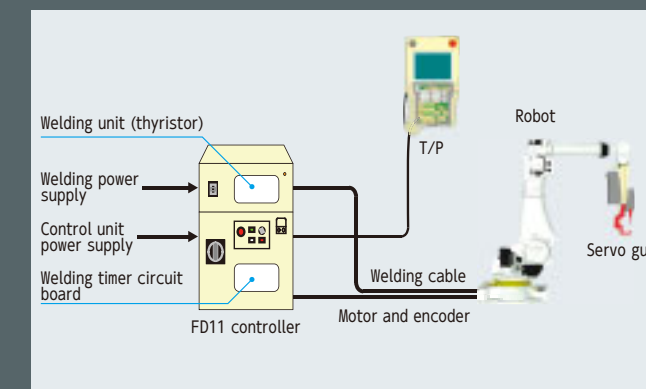
Seam welding is a welding technique for parts that need airtight joints such as automotive fuel tanks and has been attracting attention. Two roller electrodes rotate on the surface of materials supplying electric current and thus, continuous weld joint is formed. The continuity of arc welding and the 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.

OPTIONS



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.



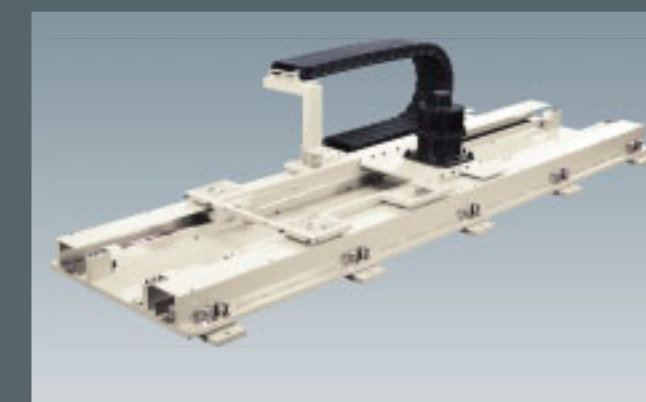
Integrated timer Weld timer integrated in controller

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



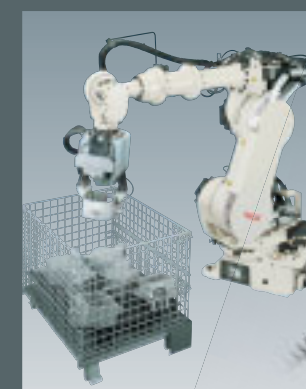
Force sensor

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.



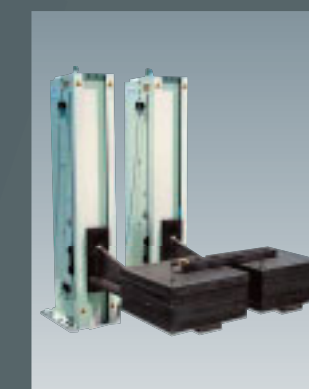
Slider

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.

CONTROLLERS

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	PLd (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, CC-Link, CC-Link IE Field 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
Conveyor tracking function	Conveyor tracking control
Palletize function	Palletize and de-palletize
Robot language	JIS SLIM
Robot monitoring function	PLe (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, PROFINET, FL-net, CC-Link, CC-Link IE Field, Ethercat, Ethernet IP and others.
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	PLd (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, CC-Link IE Field 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
Conveyor tracking function	Conveyor 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

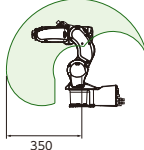
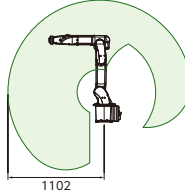
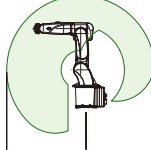
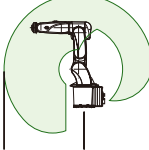
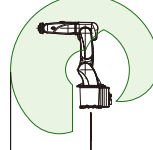
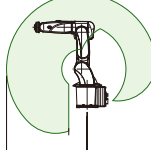
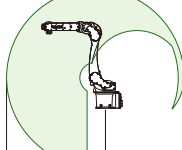
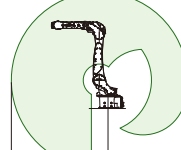
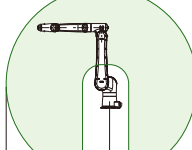
Multi-controller CFDL can be placed within the support structure.

- 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, PROFINET, FL-net, CC-Link, CC-Link IE Field, Ethercat, Ethernet IP and others.		
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		

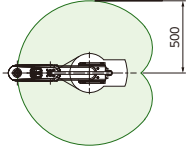
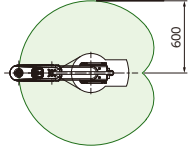
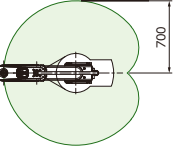
LIST OF SPECIFICATIONS

			MZ01	MZ03EL	MZ04 (MZ04D)	MZ04E (MZ04DE)		MZ07 (MZ07P)	MZ07L (MZ07LP)	MZ10	MZ12	MZ25	CZ10
													
No. of axes			6					6(5)		6			6
Max. working envelope	Arm	J1 Swivel 1	±170°					±170°		±170°			±170°
		J2 Horizontal	-90~+85°	-135~+80°	-145~+90°			-135~+80°		-135~+80°	-160~+90°	-150~+105°	-75~+225°
		J7 Swivel 2	-					-		-			-
	Wrist	J3 Vertical	-111~+175°	-155~+270°	-125~+280°			-136~+270°	-139~+270°	-136~+270°	-147~+210°	-161~+289°	-77~+227°
		J4 Rotation 2	±145°	±190°			±190°		±190°			±180°	
		J5 Bend	±125°	±120°			±120°		±140°			±145°	
Max. speed	Arm	J6 Rotation 1	±360°					±360°		±360°			±360°
		J1 Swivel 1	320° /s	300° /s	480° /s	200° /s		450° /s	300° /s		260° /s	210° /s	120° /s
		J2 Horizontal	320° /s	230° /s	460° /s	150° /s		380° /s	280° /s	250° /s	230° /s	185° /s	120° /s
	Wrist	J7 Swivel 2	-					-		-			-
		J3 Vertical	375° /s	360° /s	520° /s	190° /s		520° /s	360° /s		260° /s	270° /s	180° /s
		J4*1 Rotation 2	600° /s	550° /s	560° /s			550° /s		450° /s	470° /s	420° /s	180° /s
Maximum load	Wrist	J5 Bend	600° /s	550° /s	560° /s			550° /s		340° /s	470° /s	420° /s	180° /s
		J6 Rotation 1	600° /s	1,000° /s	900° /s			1000° /s		700° /s	700° /s	672° /s	180° /s
Allowable static load torque for wrist	Wrist	Wrist	1kg	3.5kg	4kg			7kg		10kg	12kg	25kg	10kg
		Load capacity on forearm	0.25kg	-			-		-			-	
Allowable moment of inertia for wrist	Wrist	J4 Rotation 2	0.9N・m	6.0N・m	8.86N・m			16.6N・m		17.9N・m	25N・m	52N・m	25.9N・m
		J5 Bend	0.9N・m	6.0N・m	8.86N・m			16.6N・m		17.9N・m	25N・m	52N・m	25.9N・m
		J6 Rotation 1	0.78N・m	2.9N・m	4.9N・m			9.4N・m		10.4N・m	9.8N・m	32N・m	5.9N・m
Maximum reach	Wrist	J4 Rotation 2	0.008kg・m²	0.12kg・m²	0.2kg・m²			0.47kg・m²		0.7kg・m²	2.4kg・m²	0.75kg・m²	
		J5 Bend	0.008kg・m²	0.12kg・m²	0.2kg・m²			0.47kg・m²		0.7kg・m²	2.4kg・m²	0.75kg・m²	
		J6 Rotation 1	0.006kg・m²	0.03kg・m²	0.07kg・m²			0.15kg・m²		0.2kg・m²	1.3kg・m²	0.08kg・m²	
Maximum reach		350mm	1,102mm	541mm			723mm	912mm	723mm	1,454mm	1,882mm	1,300mm	
Position repeatability		±0.02mm	±0.03mm	±0.02mm			±0.02mm	±0.03mm		±0.04mm	±0.05mm	±0.1mm	
Ambient temperature**/ humidity		0 to 40°C/20 to 85% RH (without condensation)	0 to 45°C/20 to 85% RH (without condensation)					0 to 45°C/20 to 85% RH (without condensation)					
Vibration		0.5 G or less					0.5 G or less						
Installation		Floor, wall, inverted, tilted mount				Floor, inverted mount		Floor, wall, inverted, tilted mount		Floor, inverted mount	Floor, inverted, tilted mount		Floor, inverted mount
Ingress protection		IP40 equivalent	IP67 equivalent	IP40 equivalent*3			IP67 equivalent		IP67 equivalent			IP54 equivalent	
Weight		10kg*4	39kg	26kg*4	25kg*4		36kg*4	38kg*4	36kg	150kg	250kg	61kg	
Power consumption		0.4KVA					0.4KVA		1.8KVA		2.55KVA	1.0KVA	
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)

1[N·m]=1/9.8[kgf·m]

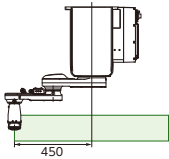
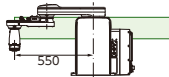
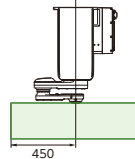
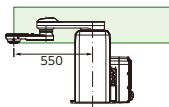
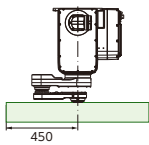
LIST OF SPECIFICATIONS

			EC06-5020-01	EC06-6020-01	EC06-7020-01
					
No. of axes			4		
Max. working envelope	J1	Swivel 1	±140°		
	J2	Swivel 2	±150°		
	J3	Vertical	200mm		
	J4	Rotation	±360°		
Max. speed	J1	Swivel 1	420° /s		
	J2	Swivel 2	720° /s		
	J3	Vertical	1,100mm/s		
	J4	Rotation	2660° /s		
Maximum Payload			6kg (3kg rated)		
Allowable moment of inertia for wrist	J4	Rotation	0.05kg·m² (0.01kg·m² rated)		
Maximum reach			500mm	600mm	700mm
Position repeatability			±0.02mm		
Ambient temperature*1/ humidity			0 to 40°C/20 to 80% RH (without condensation)		
Vibration			0.5 G or less (4.9m/s²)		
Installation			Floor mount		
Ingress protection			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
Ingress protection			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: Using at 1,000 m or lower sea level. Ambient temperature has limitations when allowable altitude is exceeded.

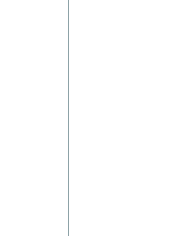
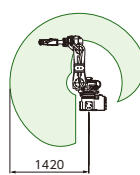
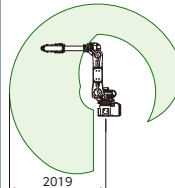
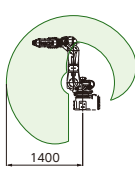
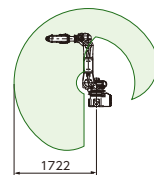
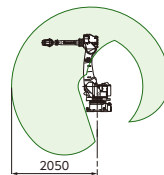
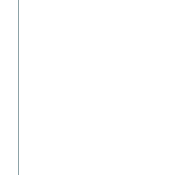
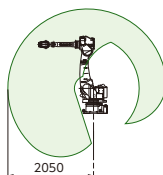
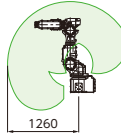
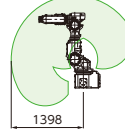
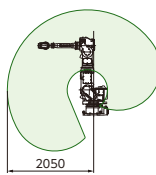
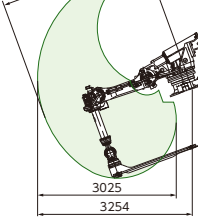
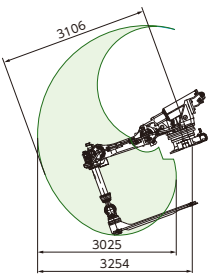
*2: There are two types of maximum operating envelopes: 250 mm and 150 mm. The 250 mm has a maximum speed of 1,200 mm/s. The 150 mm has a maximum speed of 1,000 mm/s.

*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.

1 [N·m]= 1/9.8[kgf·m]

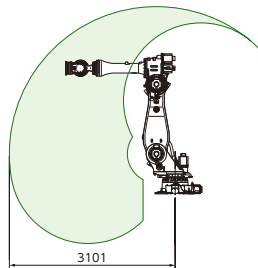
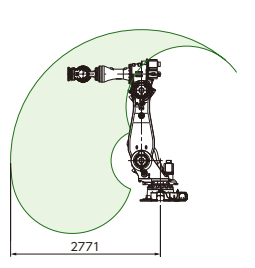
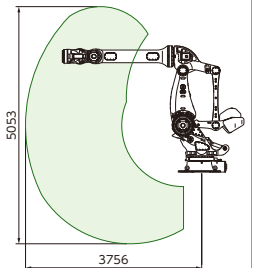
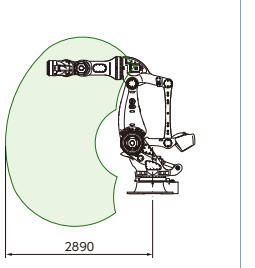
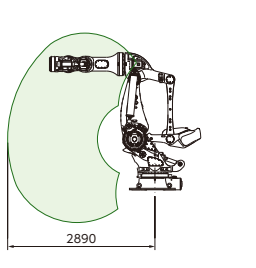
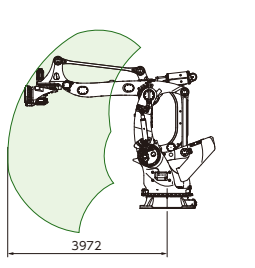
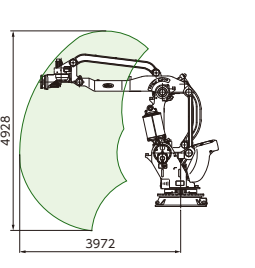
LIST OF SPECIFICATIONS

			MC10S	MC10L	MC12S	MC20	MC35	MC50		MC70	MR20	MR20L	MR35	MR50	ST210TP-01	
																
No. of axes			6							6	7				7	
Max. working envelope	Arm	J1 Swivel 1	±180°				±165°			±165°	±180°		±165°		±180°	
		J2 Horizontal	-145~+60°				-135~+80°			-135~+80°	-120~+55°				-35~+120°	
		J7 Swivel 2	-							-	±180°		±190°		±65°	
	Wrist	J3 Vertical	-148~+242°	-163~+242°	-154~+242°	-163~+242°	-146~+260°			-146~+260°	-166~+135°		-146~+140°		-96~+210°	
		J4 Rotation 2	±190°	±180°				±360°			±360°	±180°		±360°		±360°
		J5 Bend	±120°	±139°				±125°			±125°	±135°	±139°	±125°		±120°
Max. speed	Arm	J6 Rotation 1	±360°				±450°			±450°	±360°		±450°		±360°	
		J1 Swivel 1	200° /s	150° /s	200° /s	170° /s	185° /s	180° /s		175° /s	170° /s		180° /s	175° /s	110° /s	
		J2 Horizontal	170° /s				180° /s			145° /s	170° /s		175° /s	140° /s	90° /s	
	Wrist	J7 Swivel 2	-							-	170° /s		130° /s		(Press arm link) 120° /s	
		J3 Vertical	170° /s				190° /s	180° /s		165° /s	170° /s		180° /s	165° /s	95° /s	
		J4 Rotation 2	400° /s	360° /s	370° /s	360° /s	305° /s	255° /s		235° /s	250° /s	360° /s	305° /s	255° /s	130° /s	
Maximum load	J5 Bend	400° /s	360° /s	370° /s	360° /s	305° /s	255° /s		235° /s	250° /s	360° /s	305° /s	255° /s	130° /s		
	J6 Rotation 1	800° /s	600° /s	700° /s	600° /s	420° /s	370° /s		350° /s	300° /s	600° /s	420° /s	370° /s	250° /s		
Allowable static load torque for wrist	Wrist	10kg			12kg	20kg	35kg	50kg		70kg	20kg		35kg	50kg	80kg	
	Load capacity on forearm*1	-				15kg			15kg	-		15kg		30kg		
Allowable moment of inertia for wrist	J4 Rotation 2	22N·m	24.5N·m	28N·m	49N·m	160N·m	210N·m		300N·m	80.8N·m	49N·m	160N·m	210N·m	-		
	J5 Bend	22N·m	24.5N·m	28N·m	49N·m	160N·m	210N·m		300N·m	80.8N·m	49N·m	160N·m	210N·m	-		
	J6 Rotation 1	11N·m	12N·m	13N·m	23.5N·m	90N·m	130N·m		150N·m	44.1N·m	23.5N·m	90N·m	130N·m	-		
Maximum reach	J4 Rotation 2	0.7kg·m²	1.6kg·m²	1.3kg·m²	1.6kg·m²	16.0kg·m²	30.0kg·m²		30.0kg·m²	6.0kg·m²	1.6kg·m²	16.0kg·m²	30.0kg·m²	J7 axis rotation 80kg·m²		
	J5 Bend	0.7kg·m²	1.6kg·m²	1.3kg·m²	1.6kg·m²	16.0kg·m²	30.0kg·m²		30.0kg·m²	6.0kg·m²	1.6kg·m²	16.0kg·m²	30.0kg·m²			
	J6 Rotation 1	0.2kg·m²	0.7kg·m²	0.47kg·m²	0.8kg·m²	5.0kg·m²	12.0kg·m²		12.0kg·m²	2.3kg·m²	0.8kg·m²	5.0kg·m²	12.0kg·m²			
Maximum reach			1,420mm	2,019mm	1,400mm	1,722mm	2,050mm			2,050mm	1,260mm	1,398mm	2,050mm		3,106mm	
Position repeatability			±0.06mm				±0.07mm			±0.07mm	±0.06mm		±0.07mm		±0.3mm	
Ambient temperature*2/ humidity			0 to 45°C/20 to 85% RH (without condensation)							0 to 45°C/20 to 85% RH (without condensation)						
Vibration			0.5 G or less							0.5 G or less						
Installation			Floor, inverted mount		Floor, inverted, tilted mount	Floor, inverted mount	Floor mount (OP: inverted, wall, tilted)			Floor mount (OP: inverted, wall, tilted)	Floor, inverted mount		Floor mount (OP: inverted, wall, tilted)		Shelf mount (installed at 20° angle)	
Ingress protection			Wrist has IP67 and main body has IP65 equivalent	IP65 equivalent			Wrist: IP67 equivalent, main body: IP54 equivalent (OP: IP65/67 equivalent)			Wrist: IP67 equivalent, main body: IP54 equivalent (OP: IP65/67 equivalent)	IP65 equivalent		IP67 equivalent		-	
Weight			198kg	225kg	210kg	220kg	640kg			640kg	230kg		745kg		1,650kg	
Power consumption			1.5KVA	1.7KVA			5.0KVA			5.0KVA	1.0KVA		4.1KVA		7.0KVA	
Working envelope																

*1: This value changes by placement and load conditions of a wrist.
*2: 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]

LIST OF SPECIFICATIONS

			MC280L	MC350	MC400L	MC600		MC700	MC1000DL	SC700DL	
											
No. of axes			6					6			
Max. working envelope	Arm	J1 Swivel 1	±180°					±180°	±160°	±160°	
		J2 Horizontal	-100~+40°		-105~+60°			-105~+60°	-85~+45°	-85~+45°	
		J7 Swivel 2	-		-			-	-	-	
	Wrist	J3 Vertical	-147~+130°	-180~+130°	-130~+30°	-140~+30°		-140~+30°	-90~+45°	-90~+40°	
		J4 Rotation 2	±360°		±210°			±210°	-9.7~+90° (+9.7°)*4	-10~+90°	
		J5 Bend	±125°		±120°			±120°	±125°*5	±125°	
Max. speed	Arm	J6 Rotation 1	±360°		±360°*1			±360°*1	±9.7°	±10°	
		J1 Swivel 1	105°/s		90°/s			80°/s	45°/s	45°/s	
		J2 Horizontal	105°/s	95°/s	90°/s			80°/s	40°/s	30°/s	
	Wrist	J7 Swivel 2	-					-	-	-	
		J3 Vertical	95°/s		90°/s			80°/s	40°/s	30°/s	
		J4 Rotation 2	120°/s	110°/s			100°/s	20°/s*6	30°/s		
Maximum load	J5 Bend	120°/s	110°/s			100°/s	65°/s	50°/s			
	J6 Rotation 1	200°/s	180°/s			160°/s	70°/s	30°/s			
Allowable static load torque for wrist	Wrist	280kg	350kg	400kg	600kg		700kg	1,000kg	700kg		
	Load capacity on forearm*2	25kg	50kg				25kg	-	-		
Allowable moment of inertia for wrist	J4 Rotation 2	1,921N·m	2,750N·m	3,450N·m			3,450N·m	21,000N·m	13,800N·m		
	J5 Bend	1,921N·m	2,750N·m	3,450N·m			3,450N·m	-	3,920N·m		
	J6 Rotation 1	988N·m	1,235N·m	1,725N·m			1,725N·m	4,410N·m	2,940N·m		
Maximum reach	J4 Rotation 2	400.0kg·m²		600.0kg·m²			600.0kg·m²	5,200.0kg·m²	3,000.0kg·m²		
	J5 Bend	400.0kg·m²		600.0kg·m²			600.0kg·m²	4,000.0kg·m²	1,800.0kg·m²		
	J6 Rotation 1	250.0kg·m²		400.0kg·m²			400.0kg·m²	1,740.0kg·m²	1,000.0kg·m²		
Position repeatability		3,101mm	2,771mm	3,756mm	2,890mm		2,890mm	3,972mm	3,972mm		
Ambient temperature*3/humidity		±0.2mm				±0.3mm	±0.3mm			±0.5mm	
Vibration		0 to 45°C/20 to 85% RH (without condensation)				0 to 45°C/20 to 85% RH (without condensation)					
Installation		0.5 G or less				0.5 G or less					
Ingress protection		Floor mount				Floor mount					
Weight		-				-					
Power consumption		1,660kg				1,620kg	3,400kg	3,300kg	3,320kg	9,000kg	7,000kg
		9.0KVA				8.6KVA	19.3KVA	9.3KVA	19.0KVA	7.0KVA	
Working envelope											

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

*2: This value changes by placement and load conditions of a wrist.

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

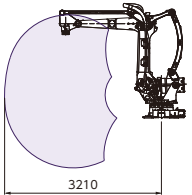
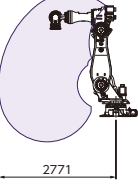
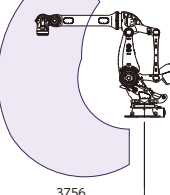
*4: Max motion range of axis 4 varies due to the wrist payload weight. Wrist load 300 kg <: -9.7°~+90°, Wrist load 300 kg ≥: -9.7°~+9.7°

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

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

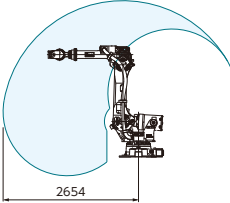
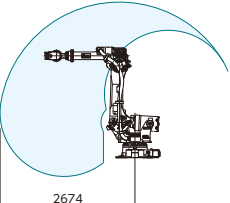
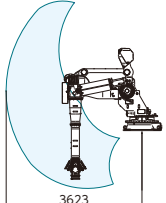
1[N·m]=1/9.8[kgf·m]

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° *1	-
		J5 Bend	-					±125° *1	±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*2	25kg					30kg	25kg	
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	50.0kg·m ²		69.0kg·m ²	100.0kg·m ²	400.0kg·m ²	-		
	J5 Bend	-					400.0kg·m ²	600.0kg·m ²	
	J6 Rotation 1	-					250.0kg·m ²	400.0kg·m ²	
Maximum reach			3,210mm					2,771mm	3,756mm
Position repeatability			±0.3mm		±0.4mm		±0.2mm	±0.3mm	
Ambient temperature*3/ humidity			0 to 45°C/20 to 85% RH (without condensation)						
Vibration			0.5 G or less						
Installation			Floor mount						
Ingress protection			IP50 equivalent	-	IP50 equivalent		-		
Weight			1,150kg					1,620kg	3,000kg
Power consumption			6.2KVA					8.6KVA	9.7KVA
Working envelope									

*1: 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.
*2: This value changes by placement and load conditions of a wrist.
*3: Using at 1,000 m or lower sea level. Ambient temperature has limitations when allowable altitude is exceeded.

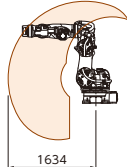
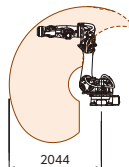
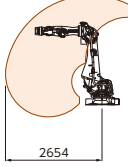
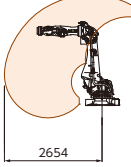
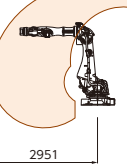
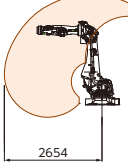
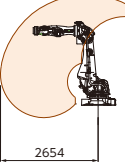
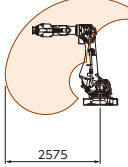
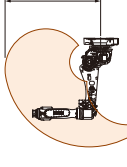
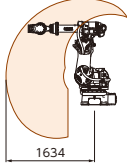
1[N·m] = 1/9.8[kgf·m]

		ST133CF	ST166CF	ST210CF	SC400LC
					
No. of axes		6			
Max. working envelope	J1 Swivel 1	±165°			±150°
	J2 Horizontal	-80~+60°			-25~+105°
	J7 Swivel 2	-			
	J3 Vertical	-137~+150°			-25~+120°
	J4 Rotation 2	±360°			±300°
	J5 Bend	±135°		±130°	±120°
Max. speed	J6 Rotation 1	±360°			
	J1 Swivel 1	130° /s	110° /s	100° /s	80° /s
	J2 Horizontal	130° /s	110° /s	90° /s	68° /s
	J7 Swivel 2	-			
	J3 Vertical	130° /s	110° /s	95° /s	80° /s
	J4 Rotation 2	230° /s	170° /s	130° /s	90° /s
Maximum load	J5 Bend	230° /s	170° /s	130° /s	90° /s
	J6 Rotation 1	305° /s	260° /s	200° /s	145° /s
Allowable static load torque for wrist	Wrist	133kg	166kg	210kg	400kg
	Load capacity on forearm*1	70kg			30kg
Allowable moment of inertia 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
Maximum reach	J4 Rotation 2	60.9kg·m²	88.9kg·m²	141.1kg·m²	200.0kg·m²
	J5 Bend	60.9kg·m²	88.9kg·m²	141.1kg·m²	200.0kg·m²
	J6 Rotation 1	30.2kg·m²	45.0kg·m²	79.0kg·m²	147.0kg·m²
Position repeatability		2,654mm		2,674mm	3,623mm
Ambient temperature*2/ humidity		10 to 45°C/20 to 85% RH (without condensation)			
Vibration		0.5 G or less			
Installation		Floor mount			Shelf mount
Ingress protection		-			
Weight		1,120kg		1,160kg	3,800kg
Power consumption		4.2KVA			-
Clean rating*3		Class 6			
Working envelope					

*1: This value changes by placement and load conditions of a wrist.
*2: Using at 1,000 m or lower sea level. Ambient temperature has limitations when allowable altitude is exceeded.
*3: Clean rating complies with ISO 14644-1

1[N·m] = 1/9.8[kgf·m]

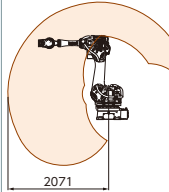
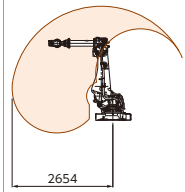
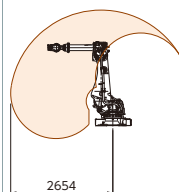
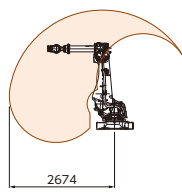
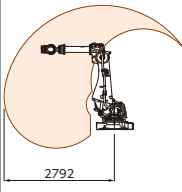
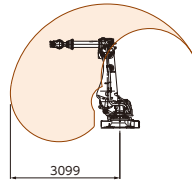
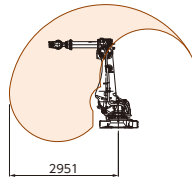
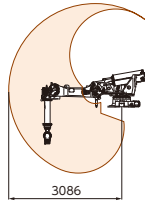
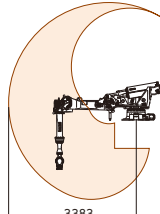
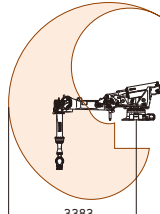
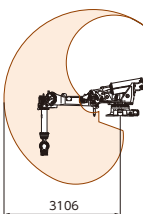
LIST OF SPECIFICATIONS

			SRA100HS	SRA100HB	SRA100H	SRA133H	SRA133HL		SRA166H	SRA210H	SRA220H	SRA220HV－01	SRA100J－01
													
No. of axes			6						6				
Max. working envelope	Arm	J1 Swivel 1	±180°						±180°			±165°	±180°
		J2 Horizontal	－120～+60°		－80～+60°				－80～+60°			－120～+60°	
		J7 Swivel 2	－						－			－	
	Wrist	J3 Vertical	－125～+90°	－151～+90°	－146.5～+150°		－133.4～+150°		－146.5～+150°		－154～+150°		－125～+90°
		J4 Rotation 2	±210°						±210°			±360°	
		J5 Bend	±125°						±125°		±130°		±135°
Max. speed	Arm	J6 Rotation 1	±210°						±210°			±360°	
		J1 Swivel 1	136° /s		125° /s	120° /s	115° /s		120° /s	115° /s		136° /s	
		J2 Horizontal	115° /s			110° /s	105° /s		110° /s	105° /s		115° /s	
	Wrist	J7 Swivel 2	－						－			－	
		J3 Vertical	160° /s		121° /s	118° /s	113° /s		115° /s	113° /s		160° /s	
		J4 Rotation 2	210° /s	225° /s	210° /s				175° /s	130° /s		240° /s	
Maximum load	J5 Bend	175° /s						171° /s	130° /s		233° /s		
	J6 Rotation 1	310° /s	315° /s	310° /s				280° /s	205° /s		351° /s		
Allowable static load torque for wrist	Wrist	100kg			133kg				166kg	210kg	220kg		100kg
	Load capacity on forearm*1	20kg						20kg		20kg/Max.45kg		25kg/Max.45kg	
	J4 Rotation 2	830N·m	650N·m	830N·m				960N·m	1337N·m		580N·m		
Allowable moment of inertia for wrist	J5 Bend	830N·m	650N·m	830N·m				960N·m	1337N·m		580N·m		
	J6 Rotation 1	441N·m	315N·m	441N·m				520N·m	720N·m		290N·m		
	J4 Rotation 2	85.0kg·m ²						100.0kg·m ²	200.0kg·m ²	141.1kg·m ²		45.0kg·m ²	
Maximum reach	J5 Bend	85.0kg·m ²						100.0kg·m ²	200.0kg·m ²	141.1kg·m ²		45.0kg·m ²	
	J6 Rotation 1	45.0kg·m ²						50.0kg·m ²	155.0kg·m ²	79.0kg·m ²		22.7kg·m ²	
Position repeatability			1,634mm	2,044mm	2,654mm		2,951mm		2,654mm		2,575mm		1,634mm
Ambient temperature*2/ humidity			0 to 45°C/20 to 85% RH (without condensation)						0 to 45°C/20 to 85% RH (without condensation)				
Vibration			0.5 G or less						0.5 G or less				
Installation			Floor mount						Floor mount			Inverted mount	Floor mount
Ingress protection			IP54 equivalent						IP54 equivalent			Wrist has IP67 and main body has IP54 equivalent	
Weight			690kg	750kg	1,040kg		1,070kg		1,100kg			670kg	
Power consumption			7.0KVA						7.0KVA				
Working envelope													

*1: This value changes by placement and load conditions of a wrist.
*2: 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]

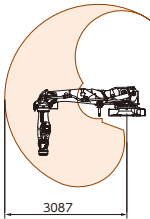
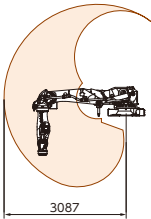
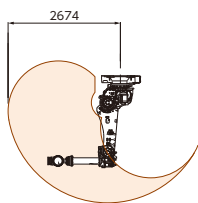
LIST OF SPECIFICATIONS

			SRA100B-01	SRA100-01 (100-01A)	SRA166-01 (166-01A)	SRA210-01 (210-01A)	SRA240-01	SRA250-01		SRA120EL-01	SRA133L-01	SRA166L-01	SRA166T-01 (166T-01A)	SRA166TL-01	SRA210T-01 (210T-01A)
															
No. of axes			6	6	6					6			6		
Max. working envelope	Arm	J1 Swivel 1	±180°	±180°	±180°					±180°			±180°		
		J2 Horizontal	-120~+60°	-80~+60°	-80~+60°					-80~+60°			-65~+120°		
		J7 Swivel 2	-	-	-					-			-		
	Wrist	J3 Vertical	-150~+180°	-146.5~+150°	-146.5~+150°			-140~+150°		-127.7~+150°	-133.4~+150°		-106~+210°	-90~+210°	-106~+210°
		J4 Rotation 2	±360°	±360 (±210)°	±360 (±210)°			±360°			±360°		±360(±210)°	±360°	±360(±210)°
		J5 Bend	±135°	±135 (±120)°	±135 (±120)°	±130 (±120)°	±130°			±135°			±135(±120)°	±135°	±130(±120)°
J6 Rotation 1		±360°	±360 (±205)°	±360 (±205)°			±360°			±360°		±360 (±205)°			
Max. speed	Arm	J1 Swivel 1	136° /s	136° /s	125° /s	115° /s	105° /s	100° /s		115° /s	125° /s	115° /s	110° /s	105° /s	100° /s
		J2 Horizontal	110° /s	135° /s	115° /s	105° /s	90° /s			105° /s	115° /s	105° /s	110° /s	90° /s	
		J7 Swivel 2	-	-	-					-			-		
	Wrist	J3 Vertical	130° /s	135° /s	121° /s	113° /s	100° /s	95° /s		113° /s	121° /s	113° /s	115° /s		100° /s
		J4 Rotation 2	240° /s	240° /s	180° /s	140° /s	130° /s	125° /s			140° /s		180° /s	140° /s	140° /s
		J5 Bend	233° /s	233° /s	173° /s	133° /s	125° /s				173° /s		173° /s		133° /s
J6 Rotation 1		351° /s	351° /s	260° /s	200° /s	195° /s	190° /s			260° /s		260° /s		200° /s	
Maximum load	Wrist		100kg	100kg	166kg	210kg	240kg	250kg		120kg	133kg	166kg	166kg		210kg
	Load capacity on forearm*1		25kg/Max.45kg	45kg/Max.90kg (15kg/Max.60kg)			20kg/Max.45kg			45kg/Max.90kg			45kg/Max.90kg (15kg/Max.60kg)		
Allowable static load torque for wrist	J4 Rotation 2	580N·m	580N·m	951N·m	1,337N·m				687N·m	800N·m	951N·m	951N·m		1,337N·m	
	J5 Bend	580N·m	580N·m	951N·m	1,337N·m				687N·m	800N·m	951N·m	951N·m		1,337N·m	
	J6 Rotation 1	290N·m	290N·m	490N·m	720N·m				353N·m	400N·m	490N·m	490N·m		720N·m	
Allowable moment of inertia for wrist	J4 Rotation 2	45.0kg·m ²	60.0kg·m ²	88.9kg·m ²	141.1kg·m ²		225.4kg·m ²		60.0kg·m ²	76.0kg·m ²	88.9kg·m ²	88.9kg·m ²		141.1kg·m ²	
	J5 Bend	45.0kg·m ²	60.0kg·m ²	88.9kg·m ²	141.1kg·m ²		225.4kg·m ²		60.0kg·m ²	76.0kg·m ²	88.9kg·m ²	88.9kg·m ²		141.1kg·m ²	
	J6 Rotation 1	22.7kg·m ²	30.0kg·m ²	45.0kg·m ²	79.0kg·m ²		196.0kg·m ²		30.0kg·m ²	38.0kg·m ²	45.0kg·m ²	45.0kg·m ²		79.0kg·m ²	
Maximum reach			2,071mm	2,654mm	2,654mm	2,674mm		2,792mm		3,099mm	2,951mm		3,086mm	3,383mm	3,106mm
Position repeatability			±0.06mm							±0.06mm			±0.08mm		
Ambient temperature*2/ humidity			0 to 45°C/20 to 85% RH (without condensation)							0 to 45°C/20 to 85% RH (without condensation)					
Vibration			0.5 G or less							0.5 G or less					
Installation			Floor mount							Floor mount			Shelf mount		
Ingress protection			Wrist has IP67 and main body has IP54 equivalent							Wrist has IP67 and main body has IP54 equivalent					
Weight			690kg	960 (1,060kg)		990 (1,090kg)	990kg	1,030kg		985kg	980kg		1,210 (1,310)kg	1,240kg	1,250(1,350)kg
Power consumption			7.0KVA							7.0KVA					
Working envelope															

*1: This value changes by placement and load conditions of a wrist.
*2: 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]

LIST OF SPECIFICATIONS

		SRA166HT-01	SRA210HT-01	SRA210V
				
No. of axes		6		6
Max. working envelope	J1 Swivel 1	±180°		±165°
	J2 Horizontal	-65~+120°		-80~+60°
	J7 Swivel 2	-		-
	J3 Vertical	-112~+210°		-146.5~+150°
	J4 Rotation 2	±210°		±360°
	J5 Bend	±125°		±130°
Max. speed	J6 Rotation 1	±210°		±360°
	J1 Swivel 1	120° /s	115° /s	115° /s
	J2 Horizontal	110° /s	105° /s	105° /s
	J7 Swivel 2	-		-
	J3 Vertical	115° /s	113° /s	113° /s
	J4 Rotation 2	175° /s	130° /s	140° /s
Maximum load	J5 Bend	171° /s	130° /s	133° /s
	J6 Rotation 1	280° /s	205° /s	200° /s
	Wrist Load capacity on forearm*1	166kg	210kg	210kg
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	100.0kg·m²	200.0kg·m²	141.1kg·m²
	J5 Bend	100.0kg·m²	200.0kg·m²	141.1kg·m²
	J6 Rotation 1	50.0kg·m²	155.0kg·m²	79.0kg·m²
Maximum reach		3,087mm		2,674mm
Position repeatability		±0.08mm		±0.15mm
Ambient temperature*2/humidity		0 to 45°C/20 to 85% RH (without condensation)		
Vibration		0.5 G or less		
Installation		Shelf mount		Inverted mount
Ingress protection		IP54 equivalent		Wrist has IP67 and main body has IP54 equivalent
Weight		1,160kg		990kg
Power consumption		7.0KVA		
Working envelope				

*1: This value changes by placement and load conditions of a wrist.
*2: 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]

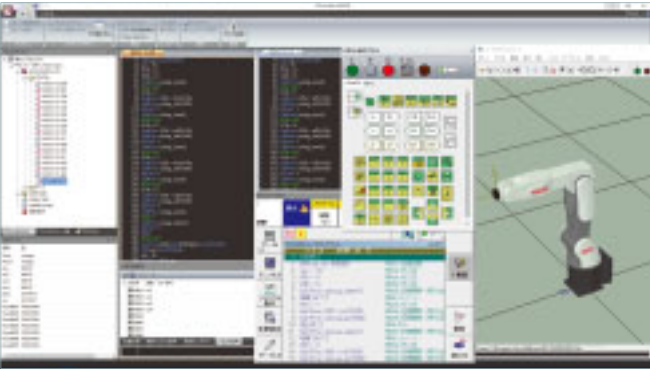
SUPPORT SOFTWARE

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		○		×		×	×
Multiple controller operation		○		×		×	×
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

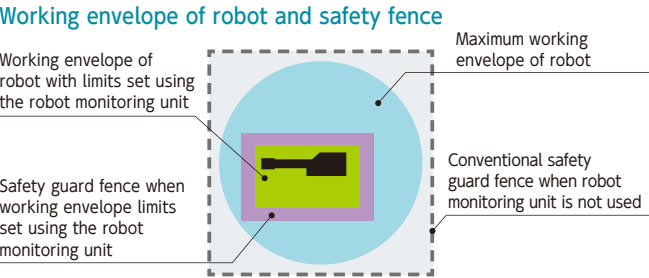
Graphic User Interface Flex Gui Options

- 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



Supports a variety of fieldbuses Options

- DeviceNet (master and slave)
- EtherNet/IP (master and slave)
- EtherCAT (slave)
- CC-Link, CC-Link IE Field (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

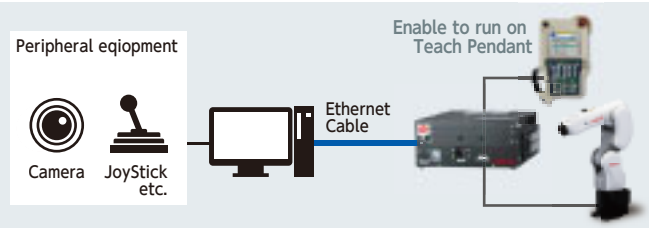
Robot training course

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



Open-NR-IF

Development makes the system design with various devices easier.

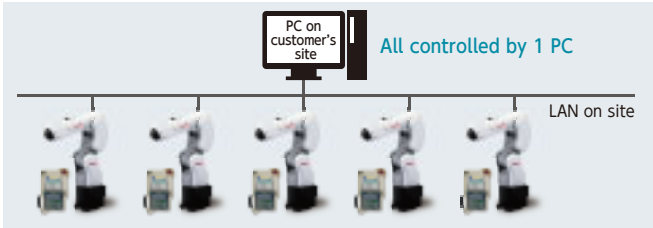


Monitoring function of robot operation

- 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.

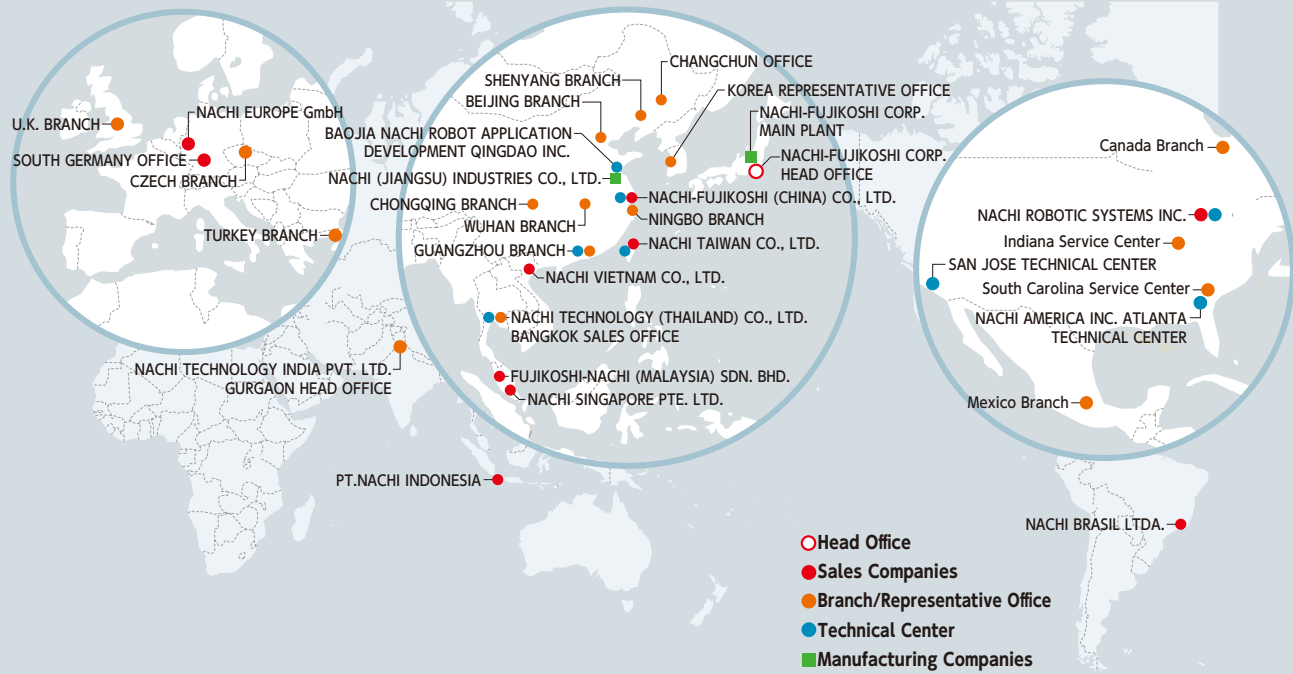


Application example

- 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.

WORLD SERVICE NETWORK



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