

NITTO SEIKO
SCREW DRIVING ROBOT SERIES

NITOMAN™ NEJIROBO™

F A S T E N I N G I N N O V A T I O N
f o r T H E F U T U R E



NITTO SEIKO CO., LTD.

INNOVATIVE DESIGN ALLOWS NEW PRODUCTION POSSIBILITIES.

**DOUBLE ARM SCREW ROBOT WILL OPEN
A NEW ERA FOR HYBRID ASSEMBLY**

**UNIQUE DESIGN ALLOWS FOR COMPLEX
APPLICATIONS, WHILE BEING EXTREMELY
FLEXIBLE TO COVER ANY FUTURE USES.**

Nitto Seiko, a pioneer in automated and robotic screw driving in Japan, has developed this unique double armed robot. This robot can be used for a wide range of assembly operations, as well as its built in fastening capabilities. All of our products are designed with 70 years of experience in assembly, control and fastening technology, creating superior products for manufacturing needs all over the world.



NITTO SEIKO

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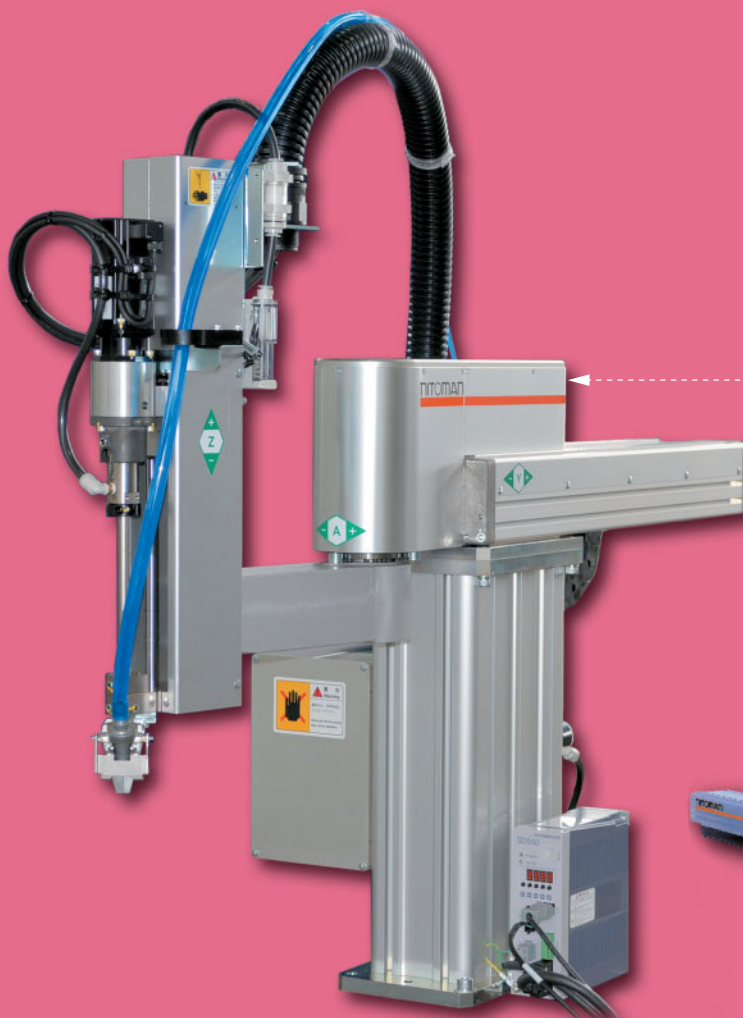
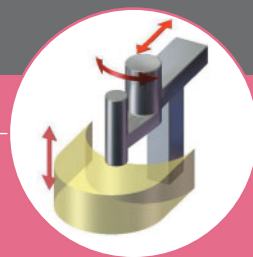
NITTO SEIKO

Linear Motion + Swivel Movement

Yθ

SPACE SAVING

Unique design utilizing a horizontal and rotary axis to maximize the work envelope will minimizing the robot footprint.

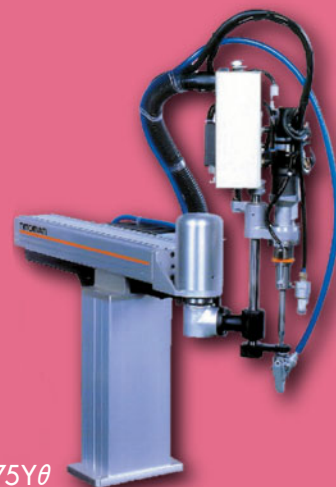


SR565Yθ-Z

AC servo Z-axis for optimal thrust control and quality screw driving

Applicable screw sizes:

M2-M5
(Max torque up to 3N·m)



SR375Yθ

SR565Yθ

Economical design using air cylinder for Z-axis. Suitable for applications that do not need thrust control.

Applicable screw sizes:

M2-M5
(Max torque up to 3N·m)

SR566Yθ-Z

Total length is 120mm shorter than SR565Yθ-Z. More compact type of robot.

Applicable screw sizes:

M2-M5
(Max torque up to 3N·m)

SR375Yθ

Compact type for small size work.

Applicable screw sizes:

M2-M5
(Max torque up to 3N·m)

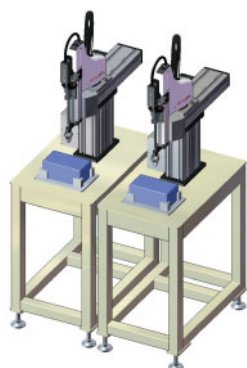
SR765Yθ

Applicable for high torque, able to fasten hex bolt.

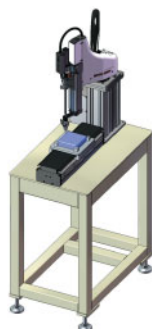
Applicable screw sizes:

M6-M8

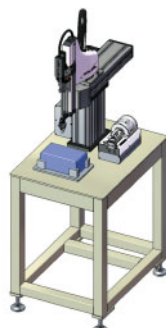
APPLICATION EXAMPLE



Best for cell type production



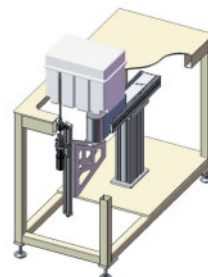
Optional "Y" axis slide fixture



Optional screw pick up type



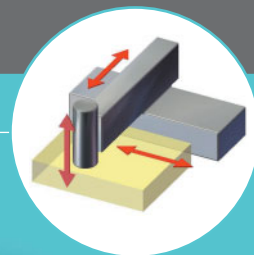
Tap inspection robot



Suitable for vertical fastening

MULTIPURPOSE

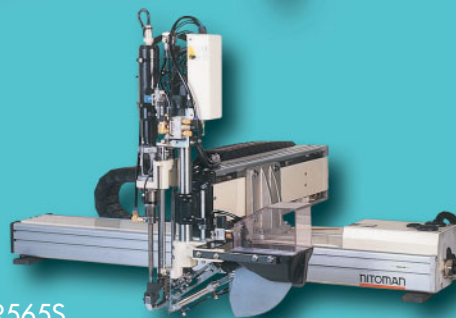
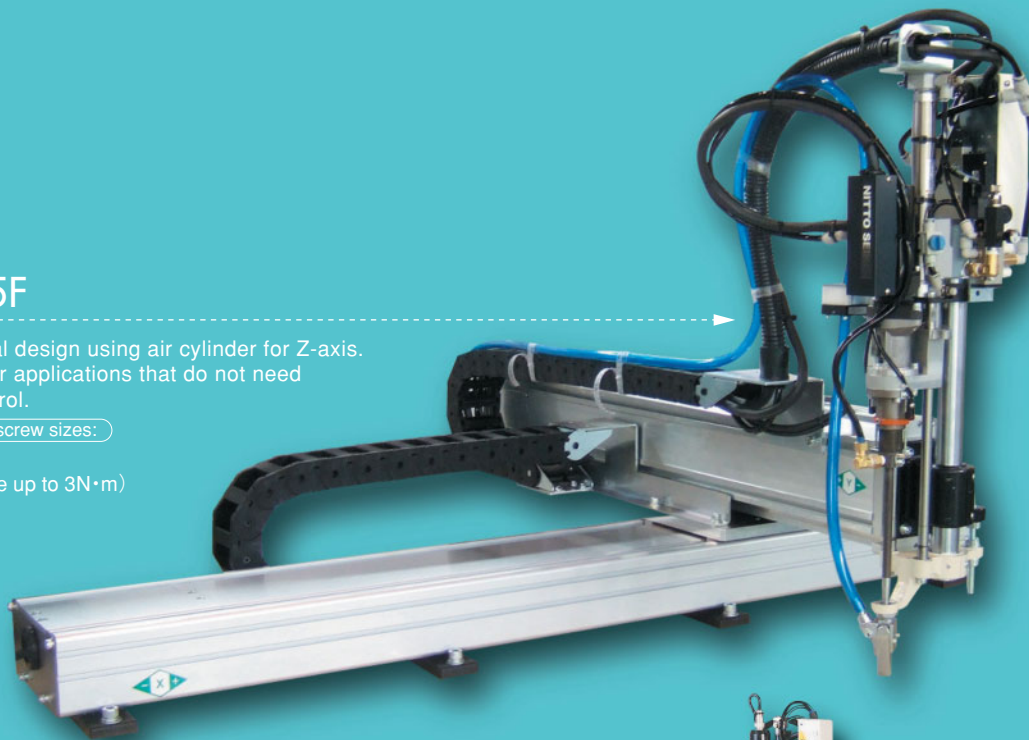
Suitable for many different types of assembly processes and applications.



SR565F

Economical design using air cylinder for Z-axis. Suitable for applications that do not need thrust control.

Applicable screw sizes:
M2-M5
(Max torque up to 3N·m)



SR565S

SR565F-Z

AC servo Z-axis for optimum thrust control for quality screwdriving.

Applicable screw sizes:
M2-M5
(Max torque up to 3N·m)

SR565S

Screw driver with intergrated feeder on board. Applicable for fasteners that are not blow feedable.

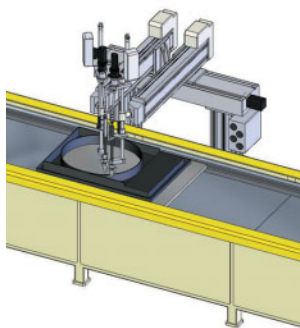
Applicable screw sizes:
M2-M5
(Max torque up to 3N·m)

SR565Z

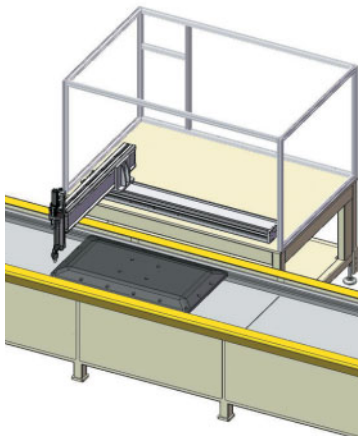
X axis and Z-axis combo robottype. Provides horizontal screw driving.

Applicable screw sizes:
M2-M5
(Max torque up to 3N·m)

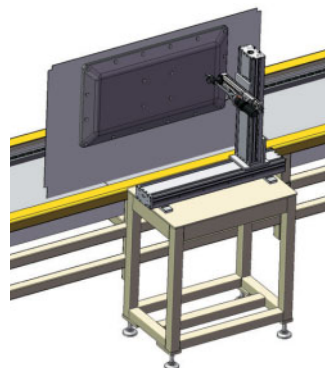
APPLICATION EXAMPLE



2 spindle screw driving on one robot



Screw driving robot for flat panel television



Horizontal screw driving robot

Yθ

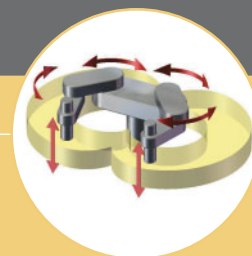
XY

Scara Type

DOUBLE ARM

HIGH SPEED

Design for double the operating efficiency & quality
A new standard in operating efficiency

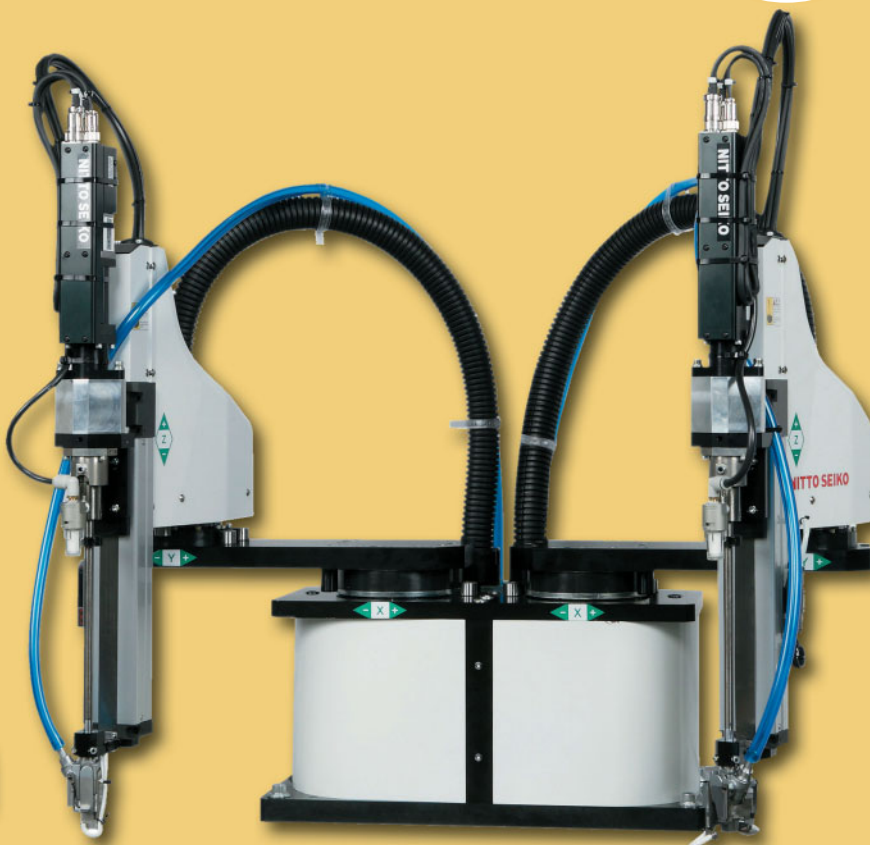


SR4100TW

Both arms feature thrust control screw driving

Applicable screw sizes:

M2-M5 (Max torque up to 3N·m)

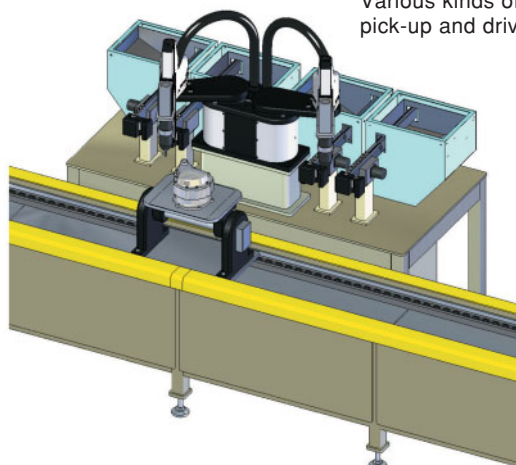


SCARA

Desktop

APPLICATION EXAMPLE

Various kinds of screws pick-up and drive system



Q1. Why is a double arm robot suitable for screw driving?

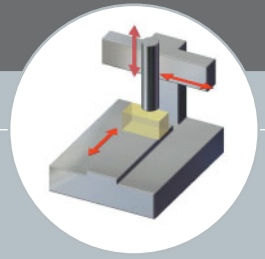
- Able to cut cycle time by screw driving 2 axes at the same time.
- Suitable for applications which require a simultaneous, opposing, torque pattern, like a flange or gasket.
- Suitable for low-volume, high variation products that are difficult for multi-spindle screw driving.
- Increase productivity through multiple size fasteners simultaneously.

Q2. Why scara type robot is good for screw driving?

- Scara design enables greater reach profiles and optimum space usage.
- High moving speeds allow for reduce cycle times for high volume applications.
- Compact design reduces overall cell size & footprint.

SMALL PART ASSEMBLY

High productivity in a small space with capability down to 1.2mm dia screw

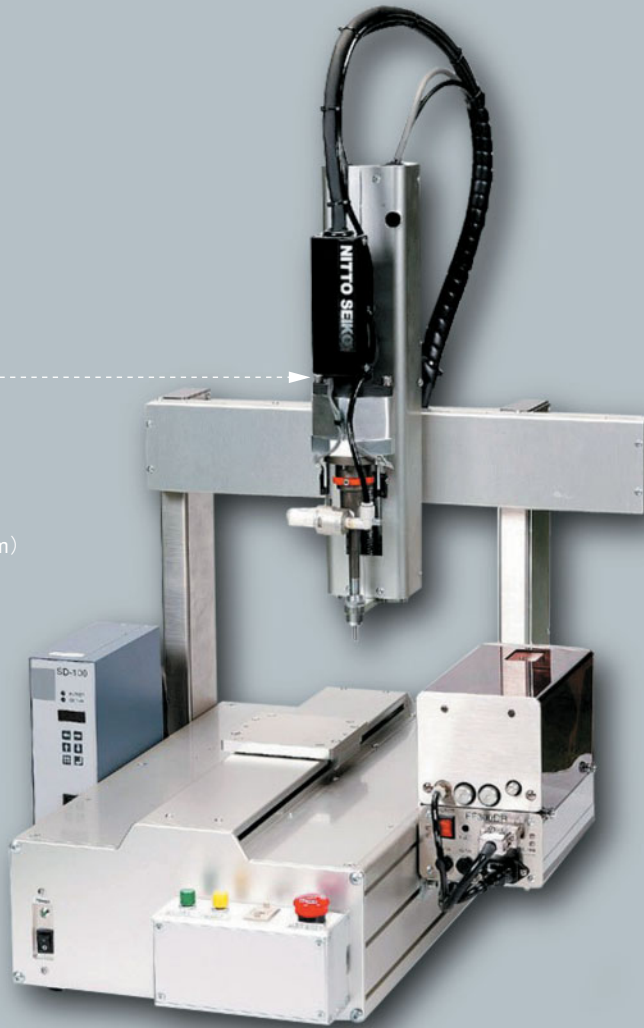


SR395DT TYPE-3

Pick-up type.
Suitable for screws with a head diameter larger than its length, which cannot be blow-fed.

Applicable screw sizes:

M1.2-M3 (Max torque up to 1.5N·m)



SR395DT TYPE-1

Includes air feed type feeder.

Applicable screw sizes:

M2-M3 (Max torque up to 1.5N·m)

SR395DT TYPE-2

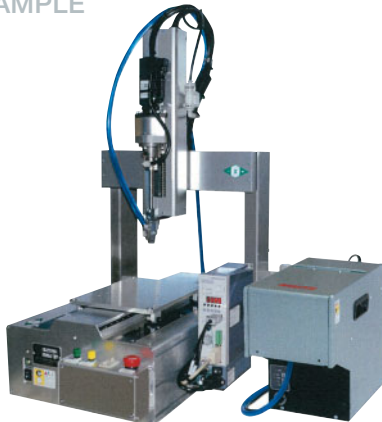
Optional servo Z-axis for thrust control applications.

Applicable screw sizes:

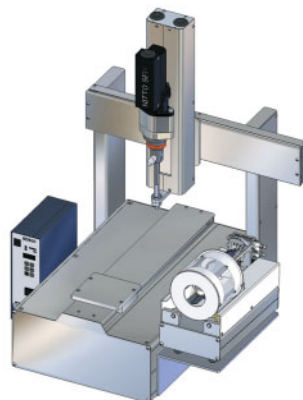
M2-M3 (Max torque up to 1.5N·m)

※Desktop type uses stepping motor with encoder that will not lose synchronism

APPLICATION EXAMPLE



The most commonly used screw feeding type with standalone screw feeder.



With Drum Feeder.
Both blow-feed and pick-up type available.

NITTO SEIKO, EXPERTS IN FASTENING TECHNOLOGY, OFFERS YOU A WIDE RANGE OF SOLUTIONS.

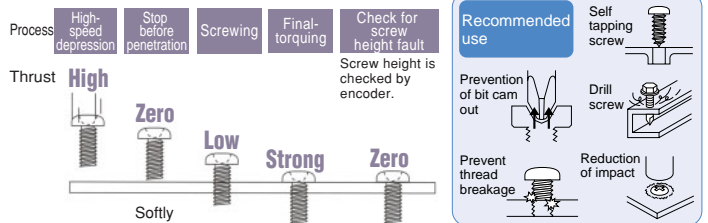
Screw driving is often key to a high quality assembly process. Because manual assembly has multiple variations, based on part condition, automating a manual process can be difficult. As a world class manufacturer of fastener, producing more than 30 billion fasteners per year, NITTO SEIKO brings more experience and knowledge of the entire fastening processes than any of our competitors. NITTO SEIKO is your first choice for a reliable assembly system.

1 THRUST VARIABLE CONTROL

The ability to control the downward thrust is key to reliable high quality screw driving. Eliminates problems such as bit cam-out, floating screws, bending or breaking work pieces, normally associated with too much / too low downward thrust.



Optimum thrust control effectively prevents to damage to internal threads and cam-out.



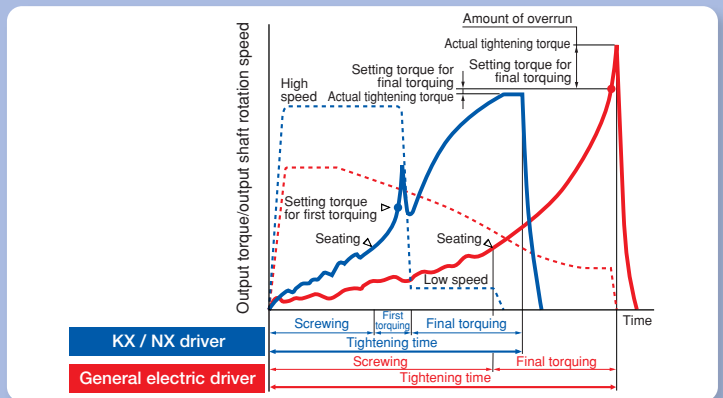
2 HIGH PRECISION AC SERVO DRIVERS

Standard Nitto Seiko KX series drivers feature fully programmable current control, with torque and angle monitoring. Optionally, our NX series drivers feature the same programmability, while adding a torque transducer for direct display and logging of torque output.



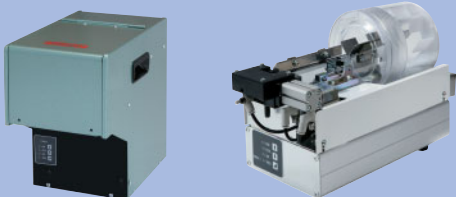
KX Driver
(SD550 series)

NX Driver
(SD550T series)



3 PRECISION MICRO-SCREW FASTENING

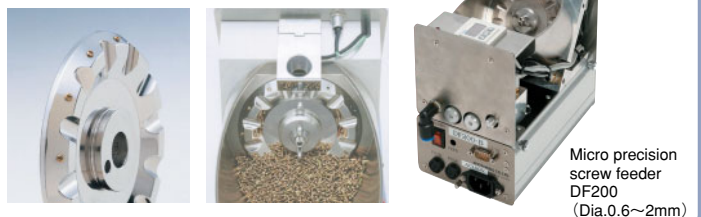
Nitto Seiko offers a complete line of feeders and screw drivers for screws as small as 0.6mm diameter.



FF503H (Dia. 2~5mm)

FF311DR (Dia. 1.2~3mm)

No Jamming ! No Sticking !
Disk presents screw



Micro precision screw feeder DF200 (Dia. 0.6~2mm)

4 TURN-KEY SCREWDRIVING SOLUTION

Fully integrated package includes the robot, robot controller, spindle, screw driving motor and controller, feeder and operating pendant. All equipment is designed and manufactured by Nitto Seiko, so you have a single point of contact for support. Start driving screws within minutes of mounting the robot.



Specifications of robot

Model	SR375Yθ	SR565Yθ (H) SR765Yθ	SR566Yθ-Z	SR565 (F,S,Z)	SR565F-Z	SR395DT				SR4100TW
						Type-1	Type-2	Type-3		
								B	D	
Number of axis to be controlled	Two axes, simultaneously	Two axes, simultaneously	Three axes, simultaneously	Two axes, simultaneously	Three axes, simultaneously	Two axes	Three axes			Six axes, simultaneously
Fastening torque control function	—	—	○	—	○	—	○	—	○	○
Method of supplying screw	Blow feed or Picking up	Blow feed or Picking up		Blow feed or Picking up*3		Blow feed		Picking up		Blow feed or Picking up
Driver motor	KX driver	KX driver		KX driver		KX driver				
Tightening stroke	50, 100mm	100 [150] mm	75, 125 [175] mm	100 [150] mm		50mm	75mm		75, 125 [175] mm	
Screw holding system	Vacuum tube suction system	Vacuum tube suction system		Vacuum tube suction system		Vacuum tube suction system				
Fault detections	Faulty torque (faulty screw tightening)	Faulty torque (faulty screw tightening)		Faulty torque (faulty screw tightening)		Faulty torque (faulty screw tightening)				
	Low screw (in screw feeder)	Low screw (in screw feeder)		Low screw (in screw feeder)		Low screw (in screw feeder)				
	Faulty screw height (proximity sensor)	Faulty screw height (proximity sensor)	Faulty screw height (Z axis encoder count)	Faulty screw height (proximity sensor)	Faulty screw height (Z axis encoder count)	Faulty screw height (Z axis encoder count)			Faulty screw height (Z axis encoder count)	
Work envelope	Y-axis:100, 200, 300mm	Y-axis:200, 300, 400, 500mm		X-axis:200~800mm (by 100mm unit)		X-axis:190mm	X-axis:305mm			
	Radius R:150mm	Radius R: 200, 250, 300mm*1	Radius R: 265, 315mm	Y-axis:200, 300, 400, 500mm		Y-axis:335mm				
	θ-axis:180°	θ-axis:180°		θ-axis:180°						
Worktable size	—	—		—		160×160mm (X × Y)				
Maximum moving speed	Y-axis:500mm/sec.	Y-axis:1200mm/sec.*2		X-axis:1200mm/sec.		X-axis:600mm/sec.				
	θ-axis:270°/sec.	θ-axis:360°/sec.		Y (Z) -axis:1200mm/sec.		Y-axis:600mm/sec.				
Locating accuracy	±0.05mm	±0.05mm		±0.05mm		±0.01mm				
Air pressure	0.4~0.5 MPa	0.4~0.5 MPa		0.4~0.5 MPa		0.4~0.5 MPa				
Machine weight	Approximately 20kg	Approximately 36kg	Approximately 37kg	Approximately 60kg		—				
Outside dimensions	D × H	—		—		565×485mm				
	W	—		—		385mm	500mm	565mm		
Screw feeder	FF503H	FF503H		FF503H		FF503H	DF200	FF311DR		
Controller	RC75-T3	RC5500-S		RC5500-S		RC755-T□				

Inside of [] is the option.

*1 : Radius R of SR765Yθ is only 300mm.

*3 : SR565S include screw driving robot and Screw feeder.

*2 : Maximum moving speed of SR565Yθ is 1000mm/sec.

Specifications of robot controller

Model	RC5500-S	RC755-T□*8	RC75-T3
Supply voltage	Single phase AC200~230V 50/60Hz	Single phase AC200~230V 50/60Hz [Single phase AC100~115V 50/60Hz]	Single phase AC200~230V 50/60Hz [Single phase AC100~115V 50/60Hz]
Number of axis to be controlled	Six axes, max	Three axes, max	Two axes, max
Robot movement	PTP control, Closed loop control	PTP control, Open-loop control (X,Y axis) PTP control, Semi-closed loop control (Z axis)	PTP control, Semi-closed loop control
Position feedback	Absolute encoder system (Battery backup: approximately five years)	Incremental value encoder system	Incremental value encoder system
Serial port	RS-232C (for teaching pendant) Ethernet (100BASE-TX) RS-422 / RS-485	RS-422 (for teaching pendant)	RS-422 (for teaching pendant)
Memory	SRAM (Battery backup: approximately five years)	Flash memory backup	Flash memory backup
External input*4 *6	Standard user port, 16 points [Additional 64 external points available]	Standard user port, 16 points [Additional 32 external points available]	Standard user port, 16 points [Additional 32 external points available]
External output*4 *6	Standard user port, 16 points [Additional 64 external points available]	Standard user port, 16 points [Additional 32 external points available]	Standard user port, 16 points [Additional 32 external points available]
Field network	[CC-Link, DeviceNet, Ethernet]	[CC-Link, Ethernet]	[CC-Link, Ethernet]
Teaching method	MDI, Remote teaching, Direct teaching	MDI, Remote teaching, Direct teaching	MDI, Remote teaching, Direct teaching
Point control	Work area : 40 points*5 × 100 types*5 Fixed area : 40 points Palletized area : 200 points × 3 groups (Not applicable for Yθ type robot)	Max. : 1000 points	Max. : 1000 points
Point work information	Two (Four*5) sets for each point (Moving pattern, Driving CH and Others)	Nine sets for each point (Moving pattern, Driving CH and Others)	Nine sets for each point (Moving pattern, Driving CH and Others)
Programming language	Ladder diagram & Textual language (About 40k steps)	Ladder diagram (Total: 16K Steps, 13K are used to system)	Ladder diagram (Total: 16K Steps, 13K are used to system)
Robot program	Special motion language	—	—
Outside dimensions (W×H×D)	200 (250*5) × 450 × 420mm (Not include a Rubber foot)	SR395DT (Build in a machine)	170×210×270mm
Weight	Approximately 20kg	—	Approximately 6.5Kg
Teaching pendant	Handy type touch panel (with Key switch, Emergency switch and Dead-man's switch) Pendant can be used as manual control panel	Handy type touch panel (with Emergency switch and Dead-man's switch) Pendant can be used as manual control panel	Handy type touch panel (with Emergency switch and Dead-man's switch) Pendant can be used as manual control panel
PC software	[MPE720 Ver.7]*7	[GX Developer or GX Works (Ver.2 or later)]*9	[GX Developer or GX Works (Ver.2 or later)]*9

Inside of [] is the option.

*4 External I/O might be used to system programming, which depend on some device specification.

*5 It depends on the specification.

*6 PNP type also available.

*7 MPE720 Ver.7 is a software provided by YASUKAWA ELECTRIC CO.

*8 Indicated □ is specify the model type. T1 : Type-1, Type-3B T2 : Type-2, Type-3D

*9 GX Developer and GX Works are softwares provided by MITSUBISHI ELECTRIC CO.

Feel free to contact us for any special specification.

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