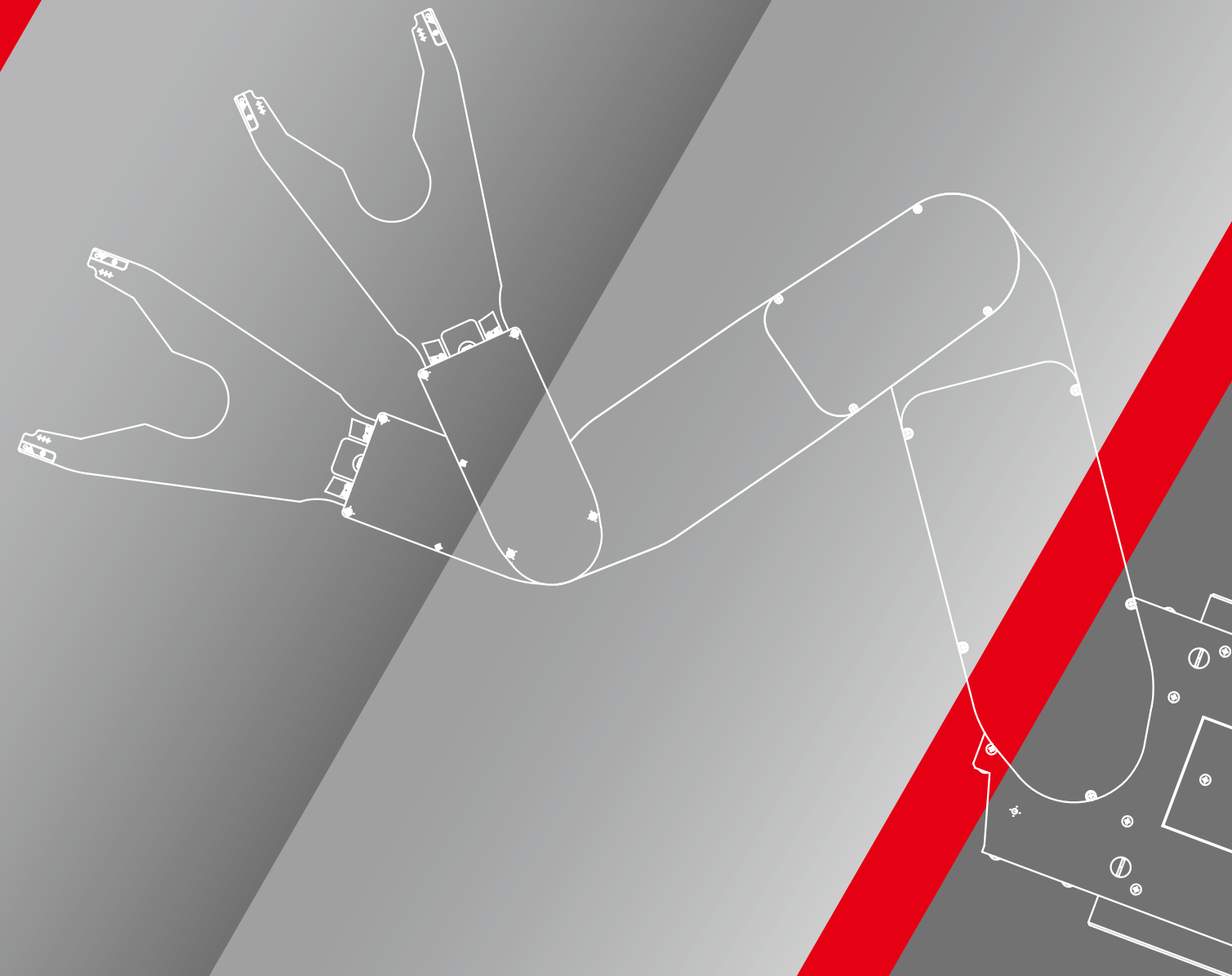


Kawasaki Robot Clean Robot



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Kawasaki Robot

CAUTIONS TO BE TAKEN TO ENSURE SAFETY

- For those persons involved with the operation / service of your system, including Kawasaki Robot, they must strictly observe all safety regulations at all times. They should carefully read the Manuals and other related safety documents.
- Products described in this catalogue are general industrial robots. Therefore, if a customer wishes to use the Robot for special purposes, which might endanger operators or if the Robot has any problems, please contact us. We will be pleased to help you.
- Be careful as Photographs illustrated in this catalogue are frequently taken after removing safety fences and other safety devices stipulated in the safety regulations from the Robot operation system.



ISO certified in Akashi Works.

Kawasaki, the world's leading manufacturer of clean robots, offers optimum solutions for the future of your business.

Kawasaki Heavy Industries made Japan's first industrial robot in 1969, and has led the robot industry ever since. In 1995 Kawasaki began to manufacture clean robots, starting with the development of clean robots used exclusively for semiconductor and LCD manufacturing process equipment. Today our innovative lineup features a number of groundbreaking handling systems.

Kawasaki holds more than 100 patents in the field of robotics and automation, and has shipped more than 150,000 robots worldwide. The company has established global procurement, production, and after-sales service systems capable of not only supplying high quality clean robots and peripheral equipment, but also providing customers with the engineering they need for the automation systems used in the clean industry.

As a world leader in the manufacture of clean handling systems, Kawasaki can deliver optimum solutions adapted to the future needs of your business, including low-particle environments needed for fine technology and next generation 450 mm wafers.

Horizontal Articulated Arm NTS series



Single robot that can be used with up to 3 FOUPs.
(option for 4 FOUPs)



NTS20

Kawasaki Clean Robots - Full Lineup



Features

Can be used with up to 3 FOUPs with no track (option for up to 4 FOUPs).

Single robot that can access all the EFEMs, and can be used with between 2 to 3 FOUPs without a track. Adding the special option enables the robot to be used with 4 FOUPs.

Unique structure meets the standards for ISO Class 1.

Smooth operation

The specially designed drive system enables the robot to move incredibly smoothly and deliver high precision.

Compliant with SEMI-F47 standard.

Compliant with SEMI-S2 standard. Sufficient consideration given to the environment and personal safety.

Equipped with a collision detection function to lessen the damage caused by collisions.

Specifications

Model		NTS10	NTS20
Structure		Horizontal articulated type	
Degree of freedom (axes)		4	5
Motion range	θ1 axis (rotation JT2) (°)	340	
	Z axis (up-down JT3) (mm)	470	
	θ2 axis (rotation JT4) (°)	340	
	H1 axis (rotation JT6) (°)	340	
	H2 axis (rotation JT7) (°)	-	340
Maximum reach (mm)		1,065	
Repeatability (mm)		±0.1 (Wafer Center)	
Cleanliness*1		ISO Class 1	

*1: Measured in our clean booth

Horizontal Articulated Arm

NT series “Robot for the Common Platform”



Single robot that can be used with up to 4 FOUPs.
(option for 5 FOUPs)

Features

Can be used with up to 4 FOUPs with no track (option for up to 5 FOUPs). Single robot that can access all the EFEMs, and can be used with between 2 to 4 FOUPs without a track. Adding the special option enables the robot to be used with 5 FOUPs.

High throughput
The throughput of the standard robot is 280 WPH (with aligner) and 400 WPH (without aligner). The optional special gripper increases the throughput to 700 WPH.

Unique structure meets the standards for ISO Class 1.

Smooth operation
The specially designed drive system enables the robot to move incredibly smoothly and deliver high precision.

450 mm wafer compatible
The same robot currently being used for 300 mm wafers can also be used for 450 mm wafers.

In addition to handling wafers, the NT series robots can also be used for solar panels, LCDs, and organic EL panels.

Optional self-diagnosis and full-automatic programming functions are available.

Compliant with SEMI-F47 standard. Instantaneous response to problems such as a drop in voltage, and automatic resumption of operation when voltage is restored.

Compliant with SEMI-S2 standard. Sufficient consideration given to the environment and personal safety.

Equipped with a collision detection function to lessen the damage caused by collisions.

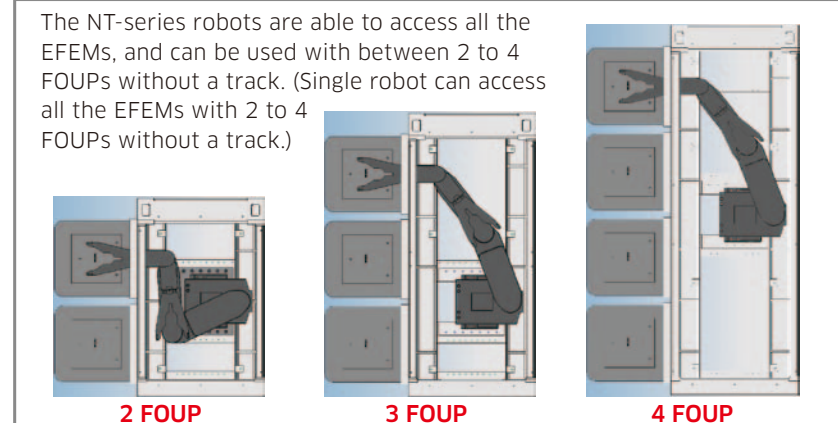


Specifications

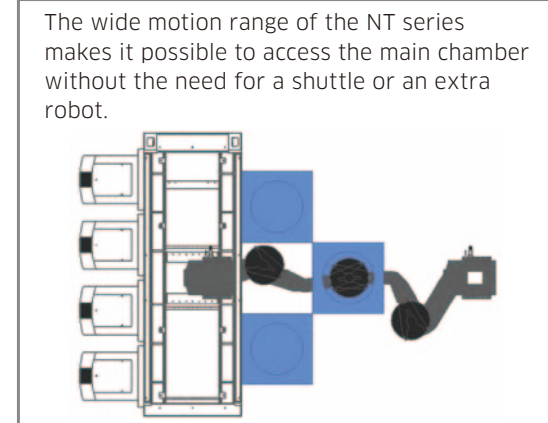
Model	NT410	NT420	NT510	NT520	NT620
Structure	Horizontal articulated type				
Degree of freedom (axes)	4	5	4		5
Motion range	θ1 axis (rotation JT2) (°)	340			
	Z axis (up-down JT3) (mm)	400	470		600
	θ2 axis (rotation JT4) (°)	340			
	H1 axis (rotation JT6) (°)	340 (380)*2			
	H2 axis (rotation JT7) (°)	-	340	-	380
Maximum reach (mm)	1,230	1,280	1,230	1,280	1,250.7
Repeatability (mm)	±0.1 (Wafer Center)				
Cleanliness *1	ISO Class 1				

*1: Measured in our clean booth *2: As option

Layout example



Application example



Horizontal Articulated Arm

TT series



Features

All the features of the NT series have been carried over to the TT series, including the ability to access up to 4 FOUPs.

Unique structure meets the standards for ISO Class 1.

Kawasaki's unique and highly rigid telescopic mechanism delivers high-speed handling in high and low positions.

Compliant with SEMI-F47 standard. Instantaneous response to problems such as a drop in voltage, and automatic resumption of operation when voltage is restored.

Compliant with SEMI-S2 standard. Sufficient consideration given to the environment and personal safety.

Specifications

Model	TT220	
Structure	Telescopic horizontal articulated type	
Degree of freedom (axes)	5	
Motion range	θ1 axis (rotation JT2) (°)	340
	Z axis (up-down JT3) (mm)	740
	θ2 axis (rotation JT4) (mm)	340
	H1 axis (rotation JT6) (°)	340 (380)*2
	H2 axis (rotation JT7) (°)	340 (380)*2
Maximum reach (mm)	1,230	
Repeatability (mm)	±0.1 (Wafer Center)	
Cleanliness*1	ISO Class 1	

*1: Measured in our clean booth *2: As option

SCARA type

Vacuum robot for wafer handling



High-speed, low-vibration SCARA type vacuum robot for wafer handling
Please contact a Kawasaki representative for details.

Horizontal Articulated Arm

NX series



NX510
2 links, single arm

NX520
2 links, double arm

Features

Can be used with 2 or 3 FOUPs without a track.*1

Realizes a minimum sweep diameter of 508 mm, leaving plenty of space to make the necessary replacements for conventional track type robots.

Unique structure meets the standards for ISO Class 1.

Arm structure exhibits high rigidity, and can freely access wafer stages with a narrow pitch as well as FOUPs in arbitrary positions.

Realizes high throughput (up to 200 WPH, 2-wrist, continuous operation from the FOUP to the Aligner to the Stage).

High linearity and incredibly precise positioning.

Compliant with SEMI-F47 standard. Instantaneous response to problems such as a drop in voltage, and automatic resumption of operation when voltage is restored.

Compliant with SEMI-S2 standard. Sufficient consideration given to the environment and personal safety.

Equipped with a collision detection function to lessen the damage caused by collisions.

*1: There are some conditions for 3FOUP.



Specifications

Model	NX510	NX520
Structure	Horizontal articulated type	
Degree of freedom (axes)	4	5
Link	2	
Motion range	θ axis (rotation JT2) (°)	330
	Z axis (up-down JT3) (mm)	440
	X axis (In/Out JT4) (mm)	832
	W Axis (Lower) (rotation JT6) (°)	336
	W Axis (Upper) (rotation JT7) (°)	-
Repeatability (mm)	±0.1 (Wafer Center)	
Cleanliness*2	ISO Class 1	

*2: Measured in our clean booth

Horizontal Articulated Arm

NS series



NS410/NS510

Single arm

NS411

Single arm with FLIP

NS420

Double arm

NS511

Drip-proof specification with FLIP

Features

The long term field operation of many NS series robots prove they have the reliability and high level of performance needed for wafer handling.

Compliant with SEMI-F47 standard. Instantaneous response to problems such as a drop in voltage, and automatic resumption of operation when voltage is restored.

Compliant with SEMI-S2 standard. Sufficient consideration given to the environment and personal safety.

Equipped with a collision detection function to lessen the damage caused by collisions.

The flip enables the NS411 to handle wafers at both horizontal and vertical angles.

The NS511 is a ceiling mounted type designed for use in a wet (chemical liquid) environment. It features a wide motion range with a reach of over 900 mm.

A track may also be used.



Specifications

Model	NS410	NS411	NS420	NS510	NS511	
Structure	Horizontal articulated type					
Degree of freedom (axes)	3	4	4	3	4	
Motion range	Y axis (travel: JT1) (mm)	2 FOUP:660 / 3 FOUP:1,070 / 4 FOUP:1,670			-	
	θ axis (rotation JT2) (°)	380	325		473	
	Z axis (up-down JT4) (mm)	380			440	
	X axis (up-down JT3) (mm)	710	798	X1 : 646.8 / X2 : 646.8	598	816.5
	F axis (rotation JT5) (°)	-	156	-	-	200
Repeatability (mm)	±0.1 mm (Wafer Center)					
Cleanliness*1	ISO Class 2				ISO Class 5	

*1: Measured in our clean booth

Vertical articulated arm

R series



Features

A compact 6-axis high-performance robot.

Ideal for handling in clean rooms.

The 3-freedom movement at the wrist allows for operation along a 3-dimensional curve trajectory. The position of the wafer and glass substrate can be freely changed from a horizontal to a vertical or oblique position.

Specifications

Model	RC005L	
Max. payload (kg)	5	
Degree of freedom (axes)	6	
Motion range	Arm rotation (JT1) (°)	±165
	Arm out-in (JT2) (°)	+135 - -80
	Arm down-up (JT3) (°)	+118 - -172
	Wrist swivel (JT4) (°)	±360
	Wrist bend (JT5) (°)	±145
	Wrist twist (JT6) (°)	±360
Repeatability (mm)	±0.03	
Mass (kg)	37	
Cleanliness*1	ISO Class 5	

*1: Measured in our clean booth



Controller

Features

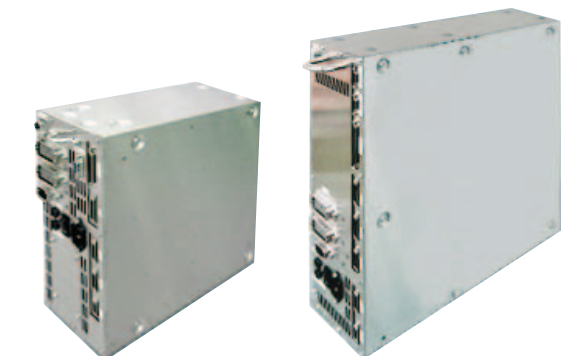
Compact packaging. Meets all the SEMI-F47 standards.

Ethernet communication port installed as standard enables a high level of communication.

Allows for flexible processing of various kinds of software.

Uniform servo amplifiers for all the axes.

Compliant with SEMI-S2 safety standards.



D60 controller

D61 controller

Specifications

Controller Model	D60	D61
Dimensions (mm)	for NT, NTS, NS, NX	W320 × H300 × D130
	for TT	W395 × H300 × D130
Degree of freedom (axes)	maximum 7	
Drive system	Full digital servo system	
Type of Control	Teach mode	Joint (operating) mode / Base coordinate system
	Repeat mode	Joint interpolation, Linear interpolation, Offset linear interpolation
Teaching method	Manual, semi-automatic, full-automatic teaching	
External signals	Emergency stop, safety fence, external hold	
Communi-cations*1	Hardware	RS232C × 1
	Software	Ethernet
Power requirement	Voltage	Single phase, AC200-220 V ±10%, 50/60 Hz
	Standard	SEMI-F47
Ambient temperature (°C)	for operation: 5 - 40	
Options	Teaching device	Teach pendant, operation box.
	Input signal*1 (channels)	16
	Output signal*1 (channels)	8
Matching robot arm	NT, NTS, TT, NS, NX series	

*1: Please consult with us for customized communication commands.