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* Materials and specifications are subject to change without notice.

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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.

QUALITY SYSTEM CERTIFICATION ISO 9001 DNV MGMT.SYS. RvA C 024

ENVIRONMENTAL SYSTEM CERTIFICATION ISO 14001 DNV MGMT.SYS. RvA C 024

ISO certified in Akashi Works.

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Printed in Japan

Kawasaki Robot

Kawasaki Robot RD/ZD/MD series

Palletizing Robot

RD/ZD/MD series

Japan & Asia

Kawasaki's high-speed palletizing robots can meet the demands for power and speed.

The food product, pharmaceutical, printed matter and various other industries are involved in multi-variety small-lot production in order to be able to address the diverse needs of their customers. In addition, there are also demands for the maintenance of product freshness and reductions in distribution inventories while "just-in-time" delivery has also become an essential condition.
The rationalization and automation of distribution are now a focus of attention as a means for responding to such demands. Palletizing and depalletizing, which are especially important factors, have given rise to demands for the development of flexible automated robot-based systems to ensure their rapid, precise and continuous implementation.
Kawasaki Heavy Industries produces a line of three different types of palletizing robots, including the RD80N with a maximum payload of 80 kg, model ZD130S/250S with a maximum payload of 130/250 kg and model MD400N/500N with a maximum payload of 400/500 kg. Each has a broad Work envelope coupled with high-speed action and demonstrates its effectiveness in accelerating speed and reinforcing performance.

■Broad operating range and high payload capacity

The RD80N is the most compact model, but possesses a wide range of movements. In addition, the RD80N stacks a maximum height of 2062.3 mm on 1,100 x 1,100 mm pallets.
The MD500N can handle with load capacities of up to 500 Kg , as well as handle multiple pallets (up to four stations when handling 1,100 x 1,100 mm pallets).

■Motion capacity worthy of our high-speed age

Kawasaki palletizing robots deliver the high-speed operation needed for distribution. When moving a vertical distance of 400 mm and a horizontal distance of 2,000 mm, the RD80N can perform 900 cycles per hour with loads of 80 Kg. In the same conditions the ZD130S is capable of performing 1,800 cycles with loads of 60 Kg, while the MD500N can do up to 600 cycles with loads of 500 Kg.

■No wasted action with the small installation space

RD80N has a turning radius of 397 mm, enabling it to cover a wide working area at high speed while occupying less space than a person. The MD500N features a unique new-type link mechanism for the upper and lower arms, allowing for a compact body without a counter weight.
"Cubic-S" which is an optional function to monitor the movement of robots can be used to limit the range of robot movements and make safety fence area smaller.

■Simple palletizing software K-SPARC (option)

Kawasaki's palletizing software K-SPARC allows layout planning and operations to be simulated on your computer. All you have to do is simply start up your computer and select the workpieces, pallets, and stacking patterns you want to use. You can also review layouts displayed on screen as well as simulate robots. With its enhanced usability, K-SPARC supports more pallet stacking patterns than conventional palletizing software, making it easier to teach robots.

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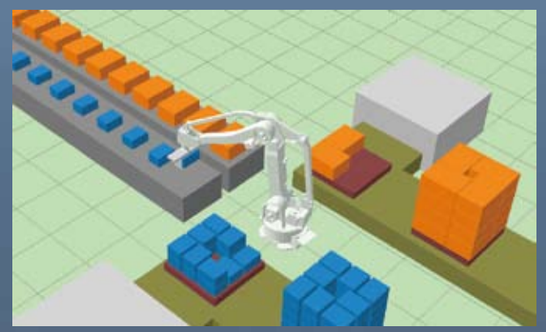
＊Fork-pockets for MD are an optional item.

RD80N

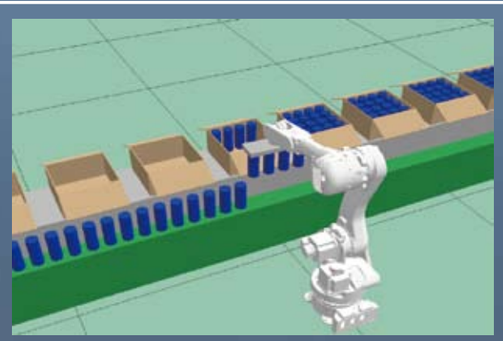
ZD130S/250S

MD400N/500N

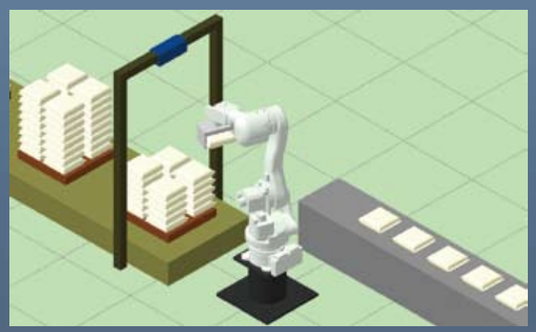
Application



Palletizing system



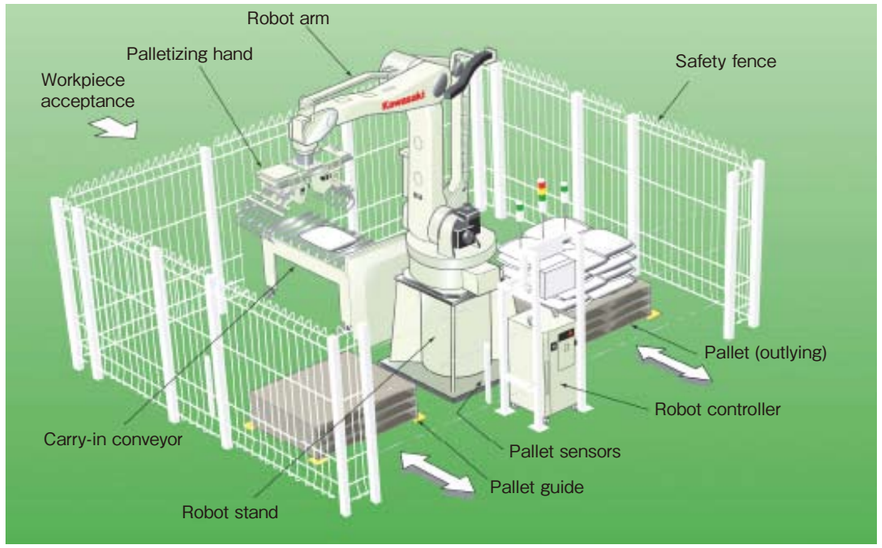
Packaging system



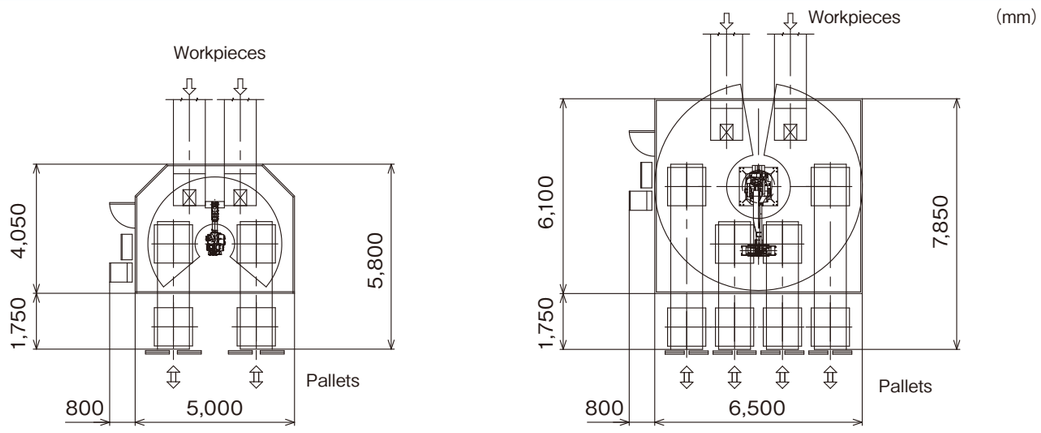
Depalletizing system

Palletize package cells

Kawasaki provides system configurations perfectly adapted to your needs.



■Sample layout for palletizing package cells

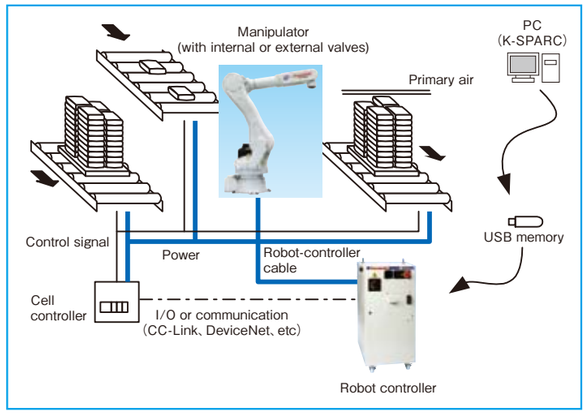


■Sample of palletizing package cells

Different workpieces sent from the same conveyor are segregated and palletized.

Different workpieces sent from different conveyors are segregated and palletized.

■System configuration example



Simple palletizing software (Option)

K-SPARC

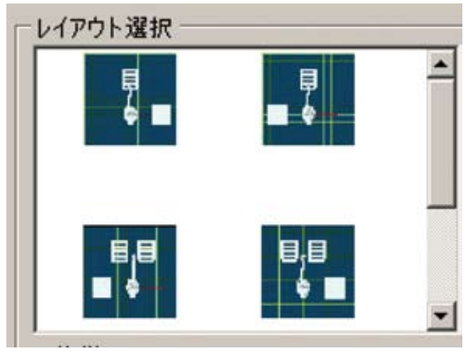
Kawasaki Robot Solutions
K-ROSET

This software lets you configure the pick and place positions of the workpieces by robots and register workpieces, pallets, and stacking patterns displayed on your computer's screen. It also allows you to easily create robot operation programs .

This optional software is one of the application programs for K-ROSET (Kawasaki's offline teaching software)

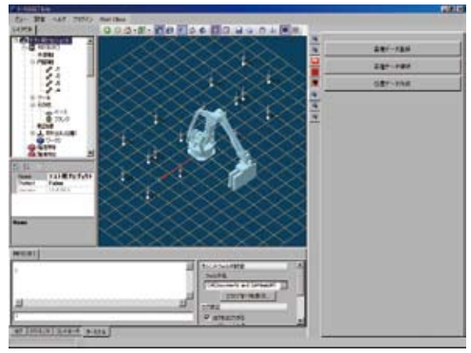
■Easy setup by layout selection

Support for up to two pick positions and four place positions of workpieces by robots
Simply select a layout and enter a distance!



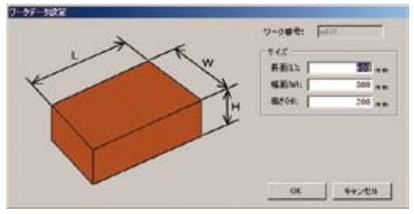
■K-ROSET functions can be used

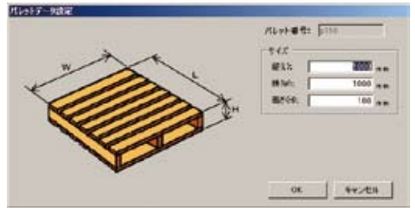
K-ROSET specify the layout by analyzing the installation positions automatically according to the robot types and place positions.
You can check for interference and measure cycle times by K-ROSET functions.



■Easy registration of item types

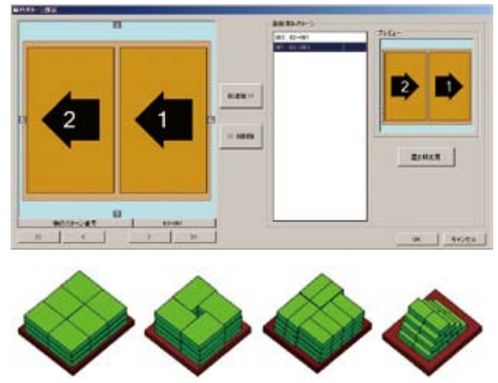
Item types are registered simply by entering data on your computer for workpieces, pallets, and stacking patterns.





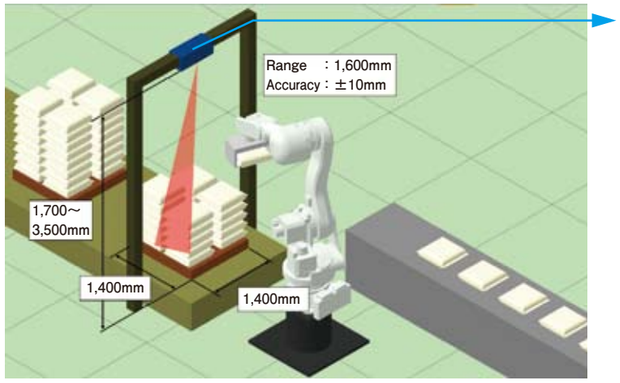
■Support for many kinds of stacking patterns

Approximately 100 types of base patterns can be configured for each stage .
The place position of workpieces can be specified.
Gaps can also be adjusted.



Depalletizing package cell

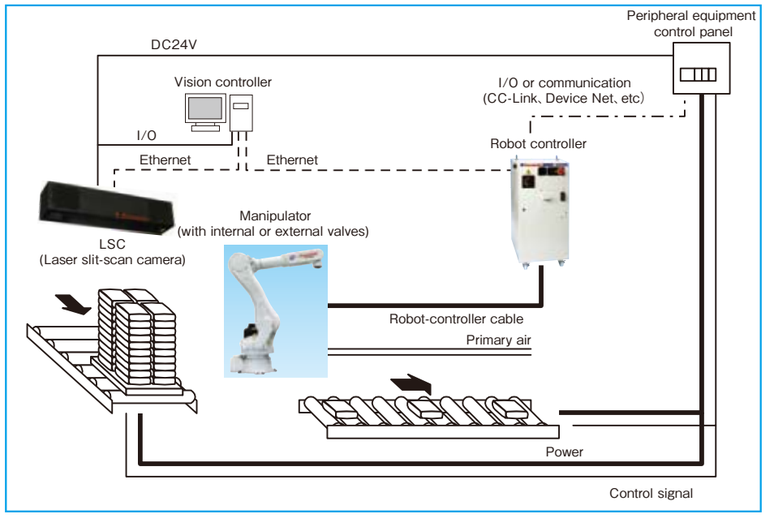
- Detects the 3-D position and posture of stacked bag packages.
- A single fixed camera can monitor wide stacking areas.
- Able to adjust to changes in peripheral lighting environments and workpiece surface conditions.
- No need for configuring the individual settings of each workpiece stacking pattern.
- Able to handle a combination of different types of workpieces at the same time.



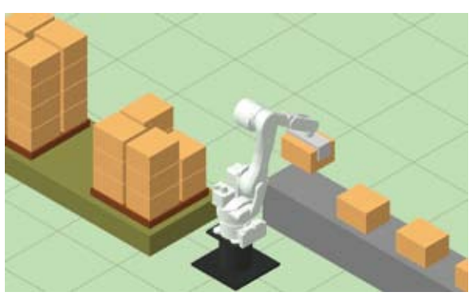
■LSC (Laser Slit-scan Camera)

Item	Specification
Measuring range	L1,400mm×W1,400mm×L1,800mm
Objective distance	1,700mm
Laser class	Class 3R
Dimension	L1,100mm×W125mm×H125mm
Mass	About 6.5kg

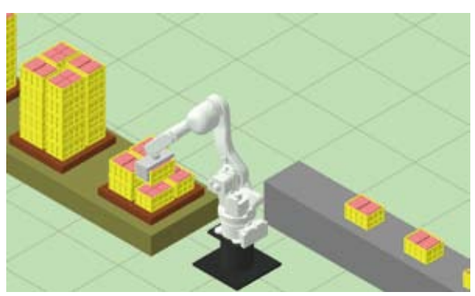
■System configuration example



■Other applications ※For these applications, the workpiece sizes and stacking patterns must be configured.



Depalletizing carton boxes



Depalletizing plastic containers

Robot motion monitoring safety function (Option)

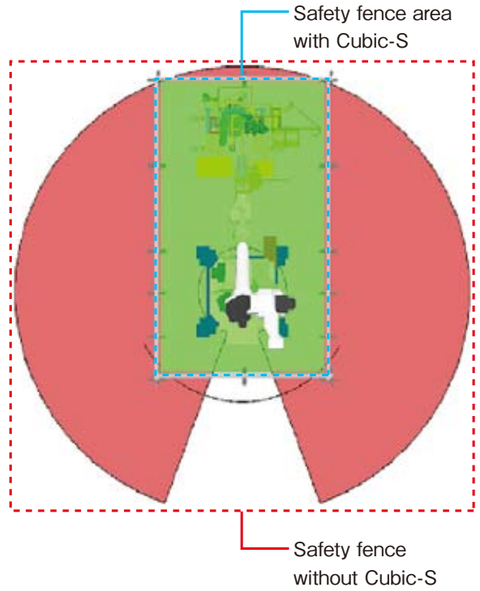
Cubic-S
Supervise Safety Smart

You can build an advanced and flexible robot safety system according to the motion condition by monitoring the movements of the robot.

- Save Space by limiting the range of robot movements
- Safety function can be switched according to the state of safety signal input
- IEC61508 (SIL2) and ISO13849-1 (PLd/category 3) certification

■Save space

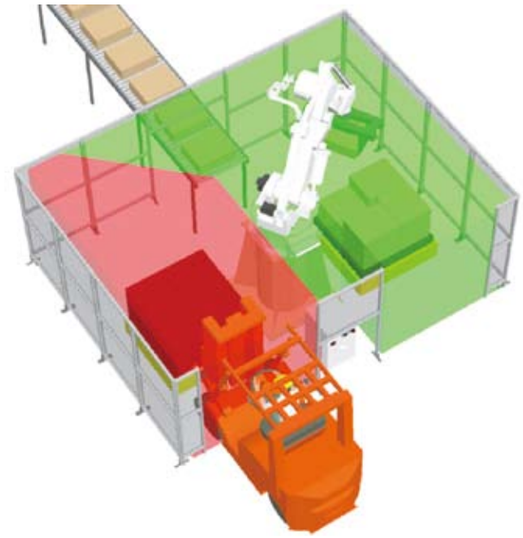
You can reduce the size of the safety fence area by limiting the range of robot movements to the minimum.



Reduced safety fence area

■Transporting workpieces during robot motion

You can limit the range of robot movements according to the human work area.

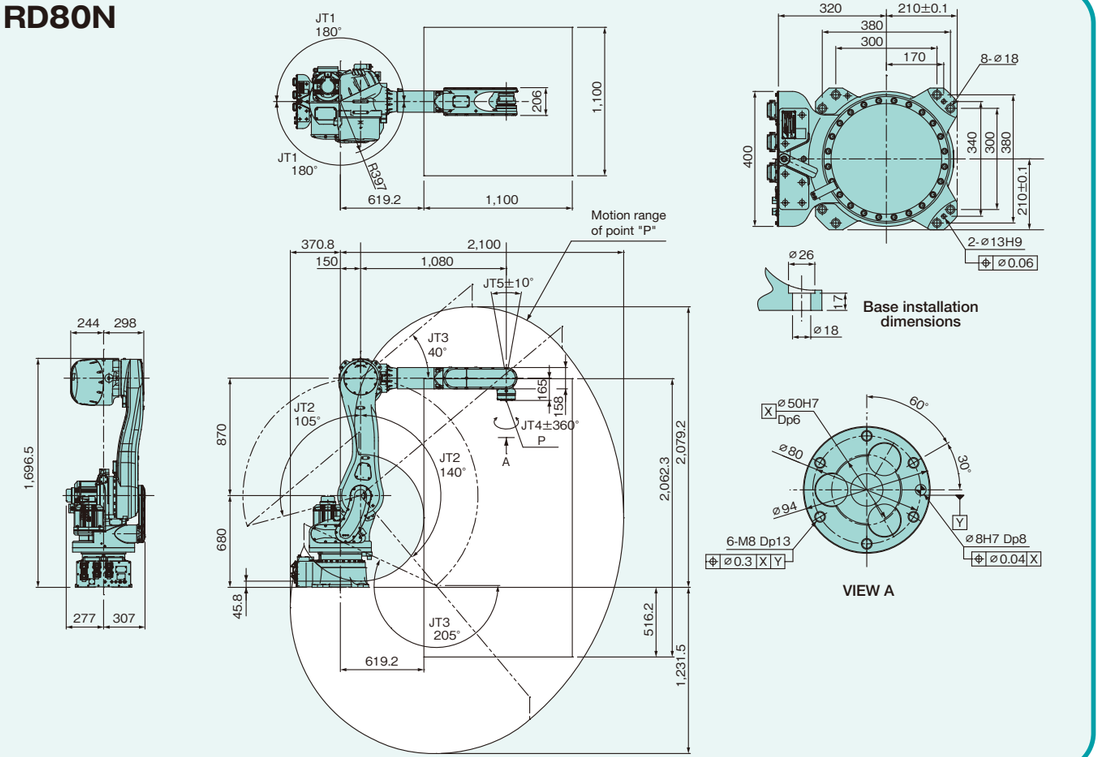


Reduced cycle time

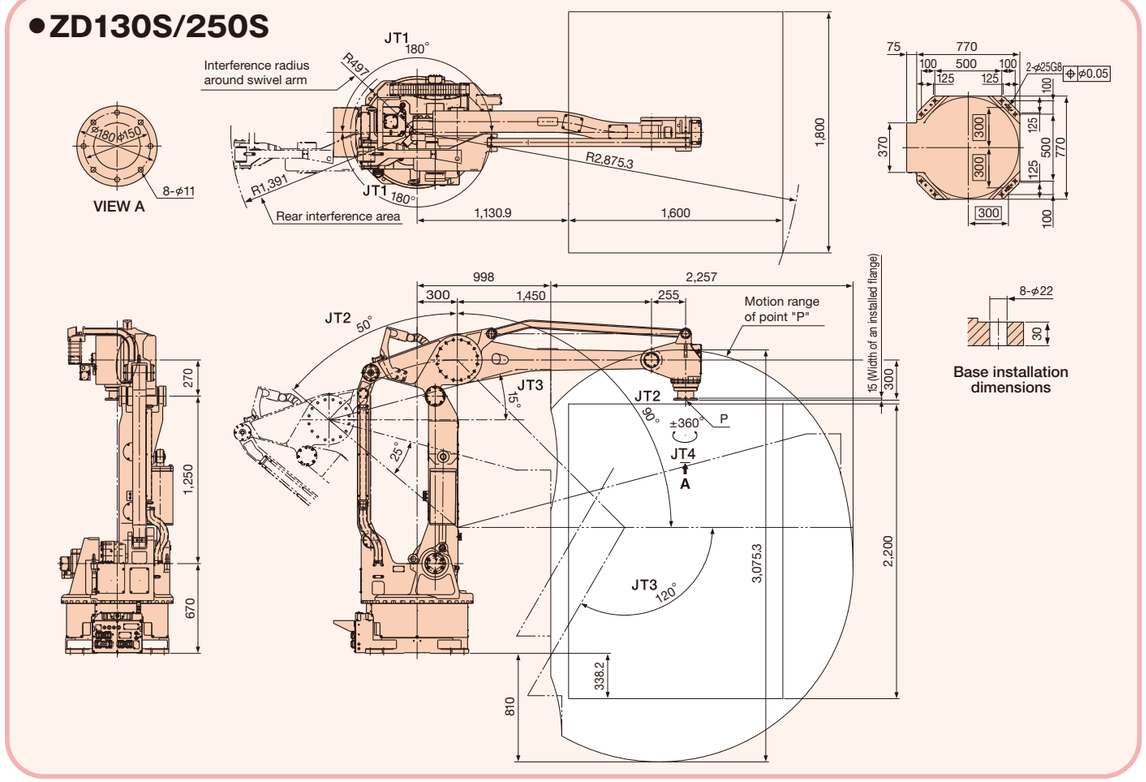
Item	Specification
Safety performance	IEC61508 (SIL2) ISO13849-1 (PLd/category3)
Monitoring the number of joints	Maximum 9 joints
Safety function	Motion area monitoring, Joint monitoring, Speed monitoring, Stand still monitoring, Tool orientation monitoring, Protective stop, Emergency stop, Safety status output
Safety input and output	Dual channel safety input 8CH Dual channel safety output 8CH ＊It is possible to allocate Safety Status Output Signals and Safety Input Signals of each Safety functions

● Motion range & dimensions

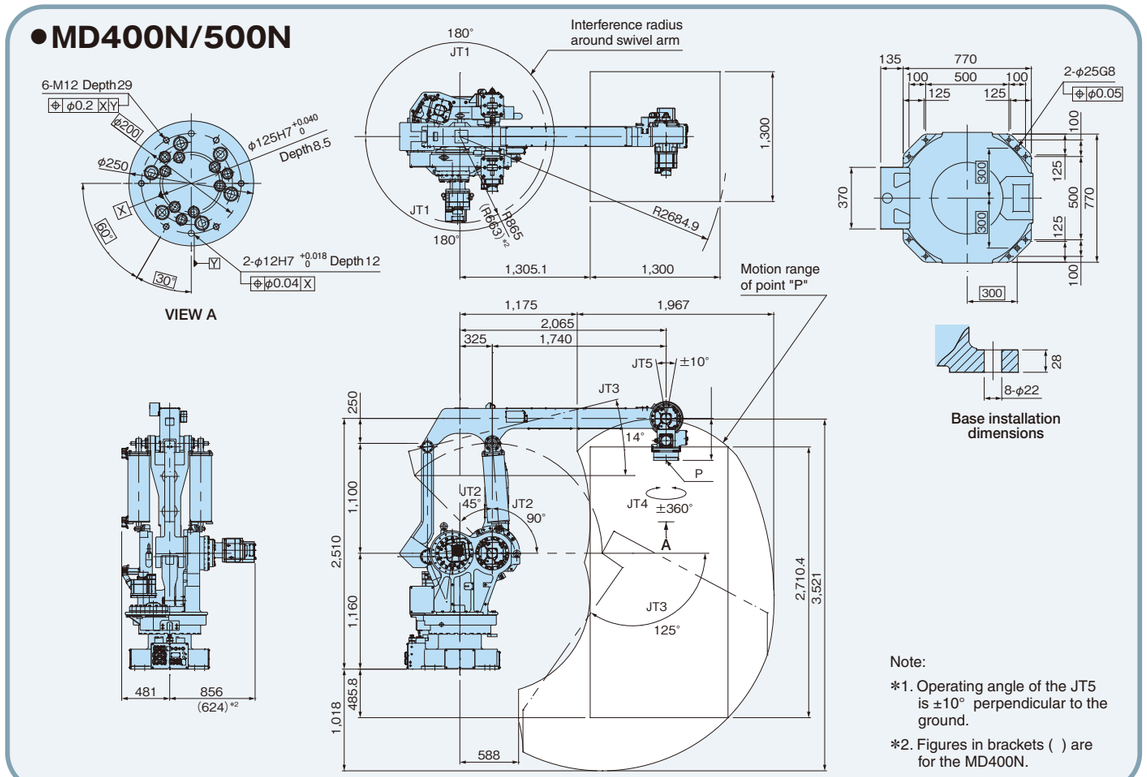
● RD80N



● ZD130S/250S



● MD400N/500N



Note:

*1. Operating angle of the JT5 is ±10° perpendicular to the ground.

*2. Figures in brackets ( ) are for the MD400N.

● Standard specifications

Model		RD80N	ZD130S	ZD250S	MD400N	MD500N
Arm type		Articulated type				
Degrees of freedom		5	4 (5 : option)		5 (6 : option)	
Max. payload		80	130	250	400	500
Max. stroke (°)	Arm rotation (JT1)	±180	±180		±180	
	Arm out-in (JT2)	+140～−105	+90～−50		+90～−45	
	Arm up-down (JT3)	+40～−205	+15～−120		+14～−125	
	Wrist swivel (JT4)	±360	±360		±360	
	Wrist compensation (JT5)	±10 ※1	—		±10 ※1	
Max. speed (°/s)	Arm rotation (JT1)	180	135	95	80	70
	Arm out-in (JT2)	180	110	95	70	65
	Arm up-down (JT3)	175	130	95	70	45
	Wrist swivel (JT4)	360	400	190	180	160
Working area (mm)	Width	1,100	1,800		1,300	
	Depth	1,100	1,600		1,300	
	Height	2,062.3	2,200		2,710.4	
Moment of inertia (kg·m²)		13.7	50	100	200	250
Palletizing capacity ※2 (Payload)		900 cycle/hour (80 kg)	1,500 cycle/hour (300 kg)	850 cycle/hour (250 kg)	740 cycle/hour (400 kg)	600 cycle/hour (500 kg)
Positional repeatability (mm)		±0.07	±0.5		±0.5	
Mass (kg)		540	1,350		2,650	2,680
Power requirements (kVA) ※3		4.5	10		10	
Matching controller		E22	E23		E24	

※1: operating angle of the JT5 is ±10 degrees perpendicular to the ground. ※2: Motion pattern (400mm up, 2,000mm horizontal, 400mm down in a to-and-fro motion)
※3: depends on the payload and motion patterns

Built-in PLC function

KLogic

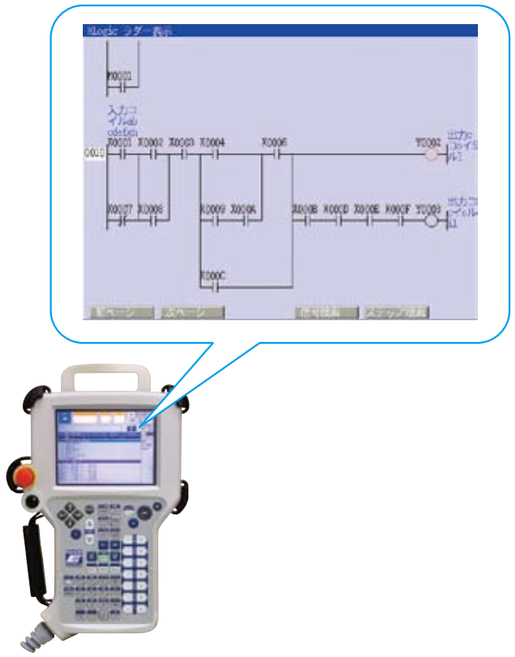
- Preinstalled PLC function in the controller
- Software function that requires no special hardware
- Teach pendant to be used as an operation panel
- Building peripheral equipment control system at the lowest cost

No need for an external PLC!

TP ladder editing function

KLadder

- Ladder program can be monitored from the TP.
- Ladder program can be edited from the TP.



Controller E22/E23/E24

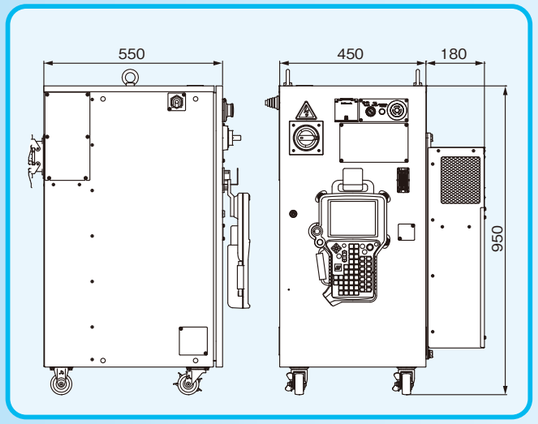
The E-Controller, with unprecedented quality and compact size, was created in response to customer demand.
Kawasaki's collaboration of past achievements and experience has led to the development of the most technically advanced controller available. This industry leading design provides increased performance and easy operation that exceeds expectations.

E23

Teach pendant

- Large, colour LCD touch screen display.
- The arrangement of keys has been optimised through extensive studies of operator hand movements.
- Equipped with deadman switches.

● External view & dimensions (mm)



Features for the E controller

1. Compact

By reducing the controller's footprint and overall volume, high-density layouts are more easily achieved in the E controller.

2. User-friendly operation system

The operation system has now fully matured into a more user-friendly design. An operator can switch on the motors and activate the cycle start all from the teach pendant, allowing for a more convenient system control. Two information screens can be displayed simultaneously, providing access to different types of information (for example, positional information and signal information).

3. An abundance of functions

A large variety of unique functions support a wide range of applications. These functions can be combined and easily configured into a system to suit a particular application. With the Kawasaki "AS Language", which is equipped standard, you have sophisticated robot motion and sequence control.

4. Using the latest technologies

The enhanced CPU capacity has resulted in more accurate trajectory control, faster program execution, and quicker saving and loading of files, as well as other advantages. In addition, the memory has been expanded to allow for higher program storage capacity. A USB port is available as a standard external storage conduit.

5. Easier maintenance

With modular components and fewer cables, Kawasaki has developed a controller that is compact, and easy to maintain. A host of maintenance functions are available, including the DIAG function for self-diagnostics, a maintenance support function that can handle not only hardware errors but also application errors, a Web server that allows remote diagnostics, and more.

6. Highly expandable

With an additional amplifier installed the system can accept up to two external axes, and adding an expansion board enables the system to control up to sixteen external axes. The system is compatible with a large number of field buses for controlling peripheral devices. The Kawasaki KLogic software sequencer function, which can be edited on the teach pendant, can be combined with user-customizable interface panels to achieve a highly sophisticated system.

● Specifications

Model		Standard		Option
		E22/E24	E23	
Dimensions (mm)		W630×D550×H950		
Structure		Enclosed structure/Indirect cooling system		
Number of controlled axes		5	4	Max 15 axes. (expandable inside cabinet up to 7 axes. Externally expandable beyond 8 axes.)
Drive system		Full digital servo system		
Coordinate systems		Joint, Base, Tool		Fixed tool point
Types of motion control		Joint/Linear/Circular Interpolated motion		
Programming		Point to point teaching or language based programming		
Memory capacity (MB)		8		
General purpose signals	External operation	Motor power off, Hold		
	Input (Channels)	32		Max. 128
	Output (Channels)	32		Max. 128
Operation panel		E-Stop switch, teach/repeat switch, control power light, (Cycle start, motor-on, hold/run, and error reset are activated from the teach pendant.)		Cycle start switch, motor-on switch, hold/run switch, error light, error reset switch
Cable length	Robot-controller (m)	5		10、15
	Teach pendant (m)	5		10、15
Mass (kg)		110		
Power requirements		AC200-220V ±10%, 50/60Hz, 3Φ		
		Class-D earth connection (Earth connection dedicated to robots), leakage current: Maximum 100mA		
Environmental condition	Ambient temperature (℃)	0~45		
	Relative humidity (%)	35~85 (No dew, nor frost allowed)		
Body color		Munsell 10GY9/1 equivalent		
Teach pendant		TFT color LCD display with touch-panel, E-Stop switch, teach lock switch, Dead man's switch		
Auxiliary storage unit				USB Memory
Interface		USB, Ethernet (100BASE-TX), RS232C		