okura

Robot Palletizer

Ai Series

Innovation, Research and State of the Art Design result in a New, Highly Efficient and Reliable Robotic Palletizer

Standard speed and Ultra high speed models

Heavy payload model

Ai1800-W

Capacity: 500 cycles/hour
Payload: 350kg

Ultra high speed model

Ai1800

Capacity: 1720 cycles/hour
Payload: 160kg

Standard speed model

Ai700

Capacity: 700 cycles/hour
Payload: 140kg
160kg (with optional counter weight)

Model	Ai1800		Ai700
	Ai1800	Ai1800-W	
Motion System	Multi - Articulated, Polar Coordinate System		
Maximum Payload	160kg (352 lbs)	350kg (771 lbs)	140kg (308 lbs) 160kg (352 lbs) ∗with optional counter weight
Controlled Axis	4	4	4
Degree of Operation Range	R-axis: 360 degrees D-axis: 2300mm O-axis: 1518mm T-axis: 440 degrees		R-axis: 360 degrees D-axis: 2300mm O-axis: 1750mm T-axis: 440 degrees
Handling Rate	1720 cycles/hour	500 cycles/hour	700 cycles/hour
	The handling rate depends on layout and/or hand specifications		
Repeatability	±1mm		
Robot Weight	1295kg (2854 lbs)	1360kg (2998 lbs)	1335kg (2943 lbs) 140kg payload 1375kg (3031 lbs) 160kg payload
Pneumatic Consumption	180L/min (ANR)		
	300L/min (ANR) when equipped with a pallet dispenser		
Ambient Temperature	0 – 40°C		
Relative Humidity	35 – 85%		
Power	6.5kVA		2.5kVA
Color	Nittoko C25-80B (Japan Painting Industry)		

Controller

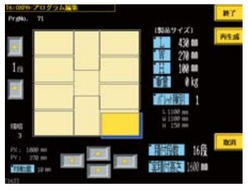
The Gen VII Controller Is Our Most Advanced Controller Ever!

The Okura Palletizing Software OXPA is integrated into the HMI of the controller. All screens for installation, operation and maintenance are user-friendly.

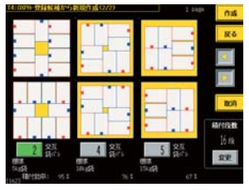
Built – in OXPA

Stacking programs can be created and edited directly on the controller.

New stacking programs can be created or existing stacking programs can be edited.
The stacking positions, product dimensions, number of layers, change of the stacking pattern, etc. can be edited directly on the touch screen of the controller.



Edit position



Change stacking pattern

Powerful Options

Internal PLC

The internal PLC of our robot controller has a range of 120 inputs and 96 outputs (3 I/O Boards) and has a maximum capacity of 4500 programming lines. It can be used to control peripheral equipment, exchange data with external control system, etc.

Control for additional axis

2 additional axes can be controlled. The optional axes can be used as C-axis (hand) or External peripheral axis (elevator, track, lifter table, shuttle etc.).

Robot on the shuttle.
The robot palletize to multiple locations

Easy to Connect

Exchange the data via USB

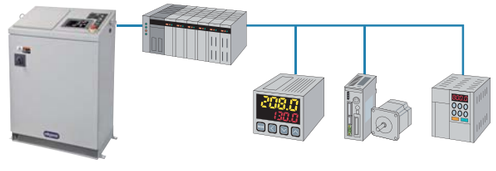
2 USB ports are located on the control panel. 1 port is for communication with a laptop and the other for data exchange via USB memory stick.

- Back up and Update OS program.
- The program can be uploaded from laptop to controller by USB cable using this port.
- Via this USB connection, stacking programs can be stored to and from USB memory, Memory backup and restore functions can be done, and system software can be transferred for upgrading the robot.

Connection to Field Bus

Field Buses such as Profibus DP, Profinet and Ethernet IP can be used.

It is adaptable for interfacing with external control device through Profibus DP, Profinet and Ethernet IP as customized design.



Safe and Green Robot

CE, UL and RoHS compliant

The new Ai1800, Ai1800-W and Ai700 robots and controllers all meet RoHS, CE and UL compliance. CE robots follow the Machinery Directive and the EMC Directive. Approved by TÜV.

Control Panel Specifications

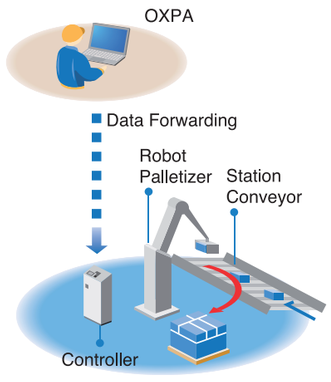
JIS Version

CE Version

	JIS Version		CE Version	
Model	**RC1300** Ai1800/Ai1800-W	**RC1200** Ai700	**RC1500-CE** Ai1800/Ai1800-W	**RC1600-CE** Ai700
Dimensions	800(W) × 640(D) × 1150(H) mm		960(W) × 640(D) × 1150(H) mm	
Weight	180kg (396 lbs)	175kg (385 lbs)	275kg (606 lbs)	250kg (551 lbs)
Power	Robot 6.5kVA	Robot 2.5kVA	Robot 6.5kVA	Robot 2.5kVA
	AC200V/AC220V ±5% 50/60Hz Triple-phase		AC380/400/415V ±10% 50/60Hz Triple-phase	
Color	Nittoko C25-70		RAL 7035	
Display	8.4 TFT touch screen			
Servo Control	Up to control 6 axis (control 2 optional axis)			
Ambient Temp	0 – 40°C			
Relative Humidity	35 – 85%			

Palletizing Software

New OXPA-QmV Palletizing Software



Offline Teaching

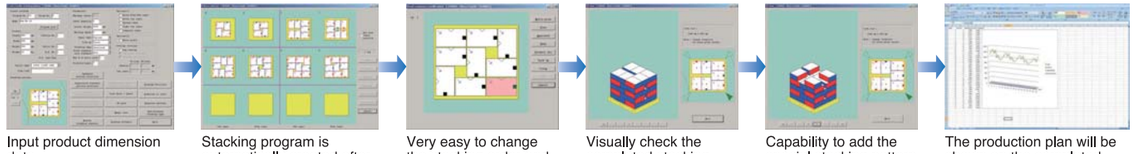
The stacking programs can be downloaded to the controller from remote location.

User-friendly

3D drawings for user friendly and visual software.
Windows based standard items are used (such as pull down lists, Pop up windows, etc.)
Clear Icons on buttons and selectors.
Communication between laptop and controller via USB cable or Ethernet, providing a faster upload and download.

More Features

Backup and restore stacking programs, download and upload system files.
Password protection for operator, production manager and system administrator.
Can create special patterns manually and register them.
New pattern creator built in to OXPA-QmV.



Input product dimension data.

Stacking program is automatically created after selecting a stacking pattern.

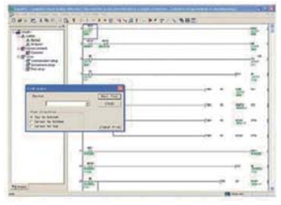
Very easy to change the stacking order and approach direction, and save this data.

Visually check the completed stacking pattern.

Capability to add the special stacking pattern to the top layer.

The production plan will be shown on the completed stacking pattern screen.

OXPA PLC Software



PLC as a Standard Feature

Okura robot palletizer control panels are supplied with a built-in PLC as a standard feature.

More Features

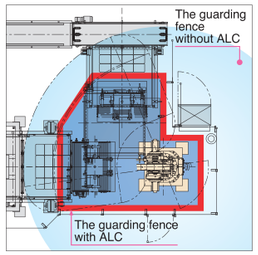
The maximum of programming lines is extended up to 4500 lines. PLC program can be created for larger installations.
The communication words between internal PLC and POD screen are extended and free configurable.
The communication words and bits to an external network (Profibus, Profinet, Ethernet IP) are extended (up to 96 words and 512 bits) and are now free configurable.
The download area has been extended up to 2999 random used datawords.
Faster PLC processing speed.

Gen VII Controller Has Standard ALC (Area Limit Control) Built-in for CE/UL Controllers

With a new ALC configtool software all robot parameters can be configured and it is possible to predefine the overall robot operation area and separate control areas can be set up to 8. In conjunction with safety devices (such as light-guards, door-switches, buttons and pull strings) the monitoring of each zone can be activated or deactivated. With dual encoders, the device monitors the actual position of the robot at each moment. The ALC system has been proven and approved by TÜV for CE certification.

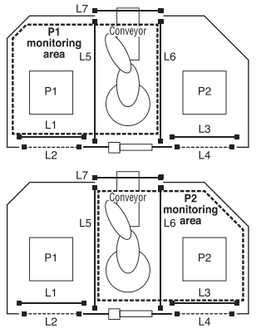
Compact Robot Installation Space.

After configuration, the data from the configuration software can be imported into the Oxpa-Qm program to check if all positions from all stacking programs are within the predefined robot operation area. If they are all OK, then the guarding fence can be moved closer to the robot to create a more compact robot installation.



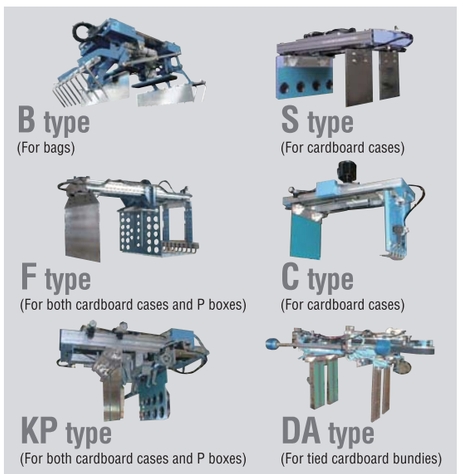
Predefined Robot Zones in the Operation Area.

This example shows 3 predefined robot zone areas (pallet P1, pickup, pallet P2). When the robot has completed the pallet on P1 and moved out of this zone area, then this zone becomes deactivated and the operator can go into this zone to discharge the full-loaded pallet. At the same time the robot can continue palletizing on active zone pallet P2. Lightguard systems prevent the operator from going into the activated robot zones. Other possible examples to use predefined zones are “fill up pallet stack” or “fill up slipsheet stack” while the robot is operating.



REMARKS: ALC is optional with JIS controller.

Standard Hand



Robot Palletizer References


Crates palletizing

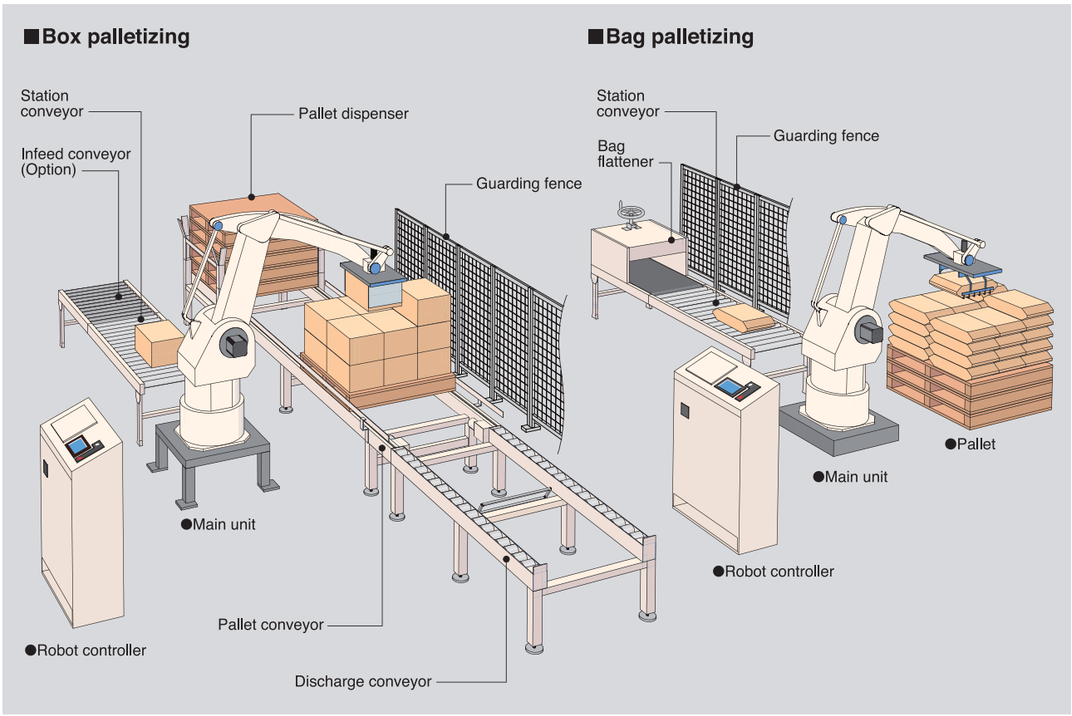

Pail palletizing


With 6 palletizing positions


Shrink package palletizing

A Variety of Peripheral Equipment to Compose the Most Adequate System for Your Need!

Reference for System Configuration



Infeed conveyor

The conveyor keeps supply of work pieces to station conveyor with consistent gap.

Bag flattener

Even uneven bag shape can be formed well-balanced and palletized nicely after coming through bag flattener.

Station conveyor

Work accurately stops at stopper so that robot catch and pick up the work properly.

Pallet dispenser

The pallet dispenser stocks pallets and sends it to robot when necessary.

Pallet conveyor

The conveyor sends pallet to robot and holds its position accurately.

Discharge conveyor

Loaded pallet is safely sent to the conveyor for discharge.

Pallet accumulation conveyor

Fully loaded pallets are kept stored on the conveyor under no pressure.

Guarding fence

Covering whole robot operation range with the fence to secure operator’s safety.

Signal tower

The lamp installed on the fence indicates operation status, either normal auto-run or under any abnormality.

Robot Specifications

Higher Payload

The handling weight of the Ai1800 robot is 160kg, whilst the Ai700 can handle up to 160kg simply by adding some counter weights. The Ai1800-W is able to handle up to 350kg of payload.

Large Operation Range

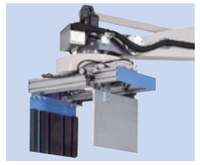
Having 360 degrees of rotation angle (R-axis), robot can accommodate 6 pallets in its operation range.

R-axis Hollow Gear Reducer

With new design in robot cable accrossing through hollow shaft of R-axis reducer, replacement of inner harness becomes a lot easier.
Due to the larger size of hollow shaft, ball bearing for R-axis table is not used and it results in less maintenance.

Increased T-axis Inertia

The maximum T-axis inertia is increased from 30kgm² to 50kgm².



Harting Connector

More industrial and easy to connect Harting connectors are used with the Ai-series.

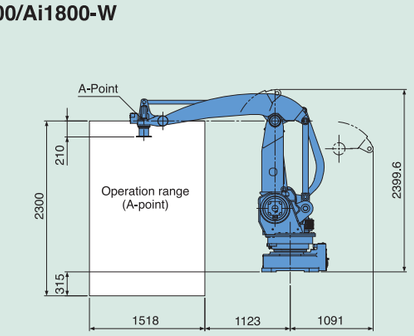
Grease Leak Chamber for D-axis and O-axis

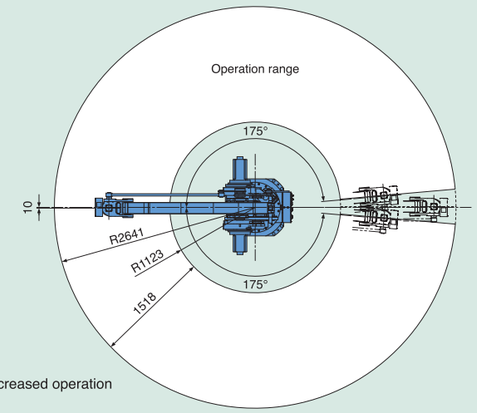
The chamber prevents grease penetration into servo motor.

Dimension and Operating Range

■Ai1800/Ai1800-W

Unit: mm

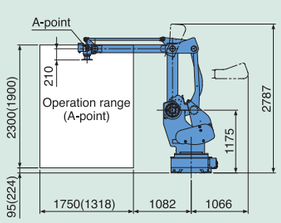


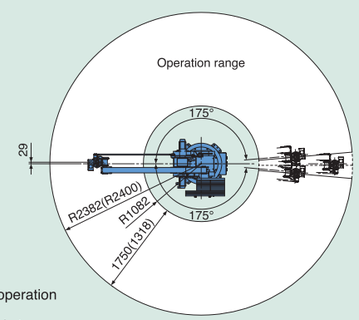


* The standard operation range of R-axis is ±175°. The R-axis can be increased operation range if the R-axis limit switch is turned OFF.

■Ai700

Unit: mm





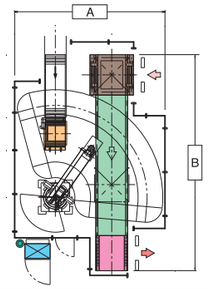
* The standard operation range of R-axis is ±175°. The R-axis can be increased operation range if the R-axis limit switch is turned OFF.
* The values in the Parentheses show compact operation range with a mechanical stopper (only for JIS version).

Standard Layout

Automatic Pallet Supply Layout

One pallet layout

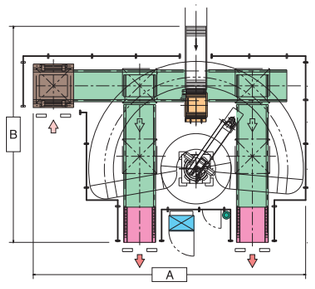
■No. P01111



Model	A	B
Ai1800	4600	6900
Ai1800 Space-saving	4300	6200
Ai700	5000	7200
Ai700 Space-saving	4200	6450

Two pallet layout

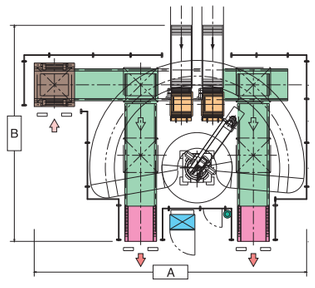
■No. P08112



Model	A	B
Ai1800	8300	6900
Ai1800 Space-saving	7795	6500
Ai700	8930	7200
Ai700 Space-saving	7700	6600

Two pallet layout

■No. P10212

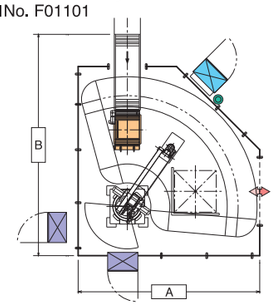


Model	A	B
Ai1800	8300	6900
Ai1800 Space-saving	7795	6500
Ai700	8930	7200
Ai700 Space-saving	7700	6600

Floor Placement Layout

One pallet layout

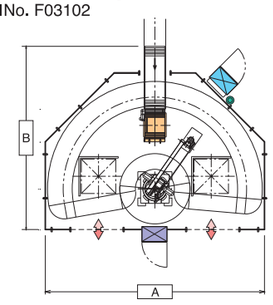
■No. F01101



Model	A	B
Ai1800	4600	5850
Ai1800 Space-saving	4300	5650
Ai700	5000	5850
Ai700 Space-saving	4200	5450

Two pallet layout

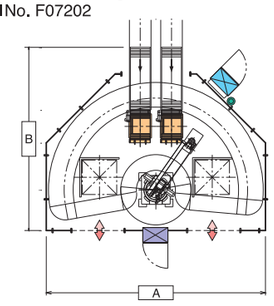
■No. F03102



Model	A	B
Ai1800	6600	5850
Ai1800 Space-saving	6000	5650
Ai700	7400	5850
Ai700 Space-saving	6000	5450

Two pallet layout

■No. F07202



Model	A	B
Ai1800	6600	5850
Ai1800 Space-saving	6000	5650
Ai700	7400	5850
Ai700 Space-saving	6000	5450

Abbreviations: Primary air supply location; Station conveyor; Controller; Pallet dispenser; Pallet conveyor; Discharge conveyor; Pallet; Full-loaded pallet; Works

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■ The specifications are subject to change without notice.

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