

SCARA Robot
Moving Area
JSR4400N
Series



Main Features of JSR4400N Series

The JSR4400N Series SCARA Robot's minimal power consumption is achieved by the combination of a pulse motor and a microchip drive circuit making it a very economical piece of machinery. It has a compact all-in-one structure with a built-in control box which takes up very little space. Furthermore, its hassle-free setup and easy robot teaching features will help you work more efficiently.

Economical

The JSR4400N Series SCARA robot enables a practical yet low-cost robotization of production lines.

Energy saving

Smooth movement has been achieved by the combination of a pulse motor and a micro step drive control. In addition to that, it has an eco-friendly function to keep the power consumption extremely low.

All-in-one structure

It has a compact original style employing all-in-one structure with a built-in control circuit. It can be run on 100V and 200V power source and easily set up just by plugging it in an outlet.

Simple teaching assures effective operations

The **JANOME** original software JR C-Points allows you to teach robots easily and quickly. Furthermore, a direct teaching method enables the direct setting of tool positions by releasing all the axes, saving time to input point data.

Large memory capacity

Its large memory can store 255 programs and up to 30,000 points of teaching data.

Flexible tool attachment

It comes equipped with 15 wirings for signals and 4 tubes for air piping ($\Phi 4$). Its original structure with no drive motor inside the tool axis gives you flexible choices to attach tools, while providing you wider room in the work area to handle the workpiece.

Substantial interface

It is supplied with four channels of interfaces: three RS-232C channels (one of them is for a PC) and one RS-422 channel for the teaching pendant. Plus, a connector for an area sensor interlock system and an I/O connector (Comprised of 25 inputs and 24 outputs as standard) are also available.

Simple sequencer

It has a built-in simple sequencer which functions independently.

Self-diagnosis function

The self-diagnosis function ensures you a quick and accurate response to any unexpected errors.

Software

Work Position Input

Before entering a work position, select JOG or MDI mode simply by pressing the button on the teaching pendant. **Clearly-displayed coordinate values** allow you to correct positions easily.

Work Position Setting Screen

Program 1	P 1
R X	0 mm
R Y	4.4 0 mm
Z	0 mm
R	0deg
High	
FUNC	POS JOG MDI DIRECT



Application Software Examples

Screw Tightening Software

Register screw tightening conditions, such as **Thread Pitch**, **Screw Length**, and **Rotate Speed**, then enter the "screw tightening position" and the screw tightening condition number for the point. The screw tightening program is now complete. You can set different tightening condition numbers to each point in order to create different screw tightening conditions in your program.

Tightening Condition Setting Screen

Tightening Condition 1	1/2
Type	Full Tightening(With Pickup)
Thread Pitch	0.5mm
Rotate Speed	600rpm
Screw Length	8mm
Check Precision	Normal
Float Amount	0.5mm
Time After Tightening	0.2sec
Feeder ESC Signal	NO
Point of Feeding	0.5sec
Screw Feed Time	NO
Stop After Feeding	NO
Error Restart	Next Point

Point Type Setting Screen

Program 28	P16 1/2
Point Dispense	
Start of Line Dispense	
Passing of Line Dispense	
CP Arc Point	
End of Line Dispense	
Wait Start Point	
PTP Point	
CP Start Point	
CP Passing Point	
CP Stop Point	
CP End Point	
PTP Evasion Point	

Point Setting Screen

Program 1	RX+23.2 RY+312.5 Z+25 R+12
Type	Point Dispense
Dispense Time	1.3sec
Pallet Routine Number	1
Work Adjustment Number	5
Condition Number	
Job before Moving	
Job while Moving	
Point Job Number	
PTP Condition Number	
Tool Number	
S.MARK	E.MARK J.EXEC P.EXEC

How to Create Application Software

You can create original application software for a variety of needs. For example, define a point type "Point Dispense" when creating the "Dispensing Application" software.

Point Type Definition Setting Screen

Point Type Definition	pointDispense
Protect Mode	Public
Base Type	PTP Point
Point Type Title	
Job before Moving	
Job while Moving	
Point Job	
Job while CP Moving	
Additional Function Number	
Point Setting Variables Definition	

Register the contents of the "point dispense" operation in the point type definition. [e.g. Start the dispenser (set #genOut1), wait for a dispense time (delay Dispense Time*100), and then stop the dispenser (reset #genOut1).]

Point Job Setting Screen

Point Job	2/3
013	
014	Id DispenseSignalType==1
015	then
016	waitCondTime 500
017	Id #gen#n1
018	timeUp
019	reset #genOut1
020	jump L1
021	endWait
022	endf
023	delay DispenseTime*1000
024	reset #genOut1

Point Setting Variables Definition Setting Screen

Point Setting Variables Definition	DispenseTime
Variable Type	Numeric Type
Variable Caption	
TP Input Method	
Input Unit	sec
Decimal Figure	
Default Value	1
Maximum Value	9.99
Minimum Value	0.01

Operation Box (Optional)

An operation box including a start switch, a program change switch, and an emergency stop switch is available.



Applications

Dispensing



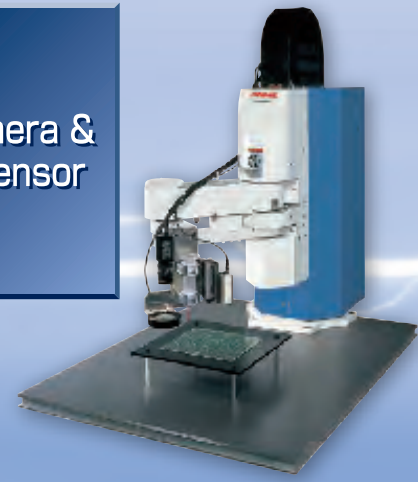
Soldering



Screw Tightening



CCD camera & Height Sensor



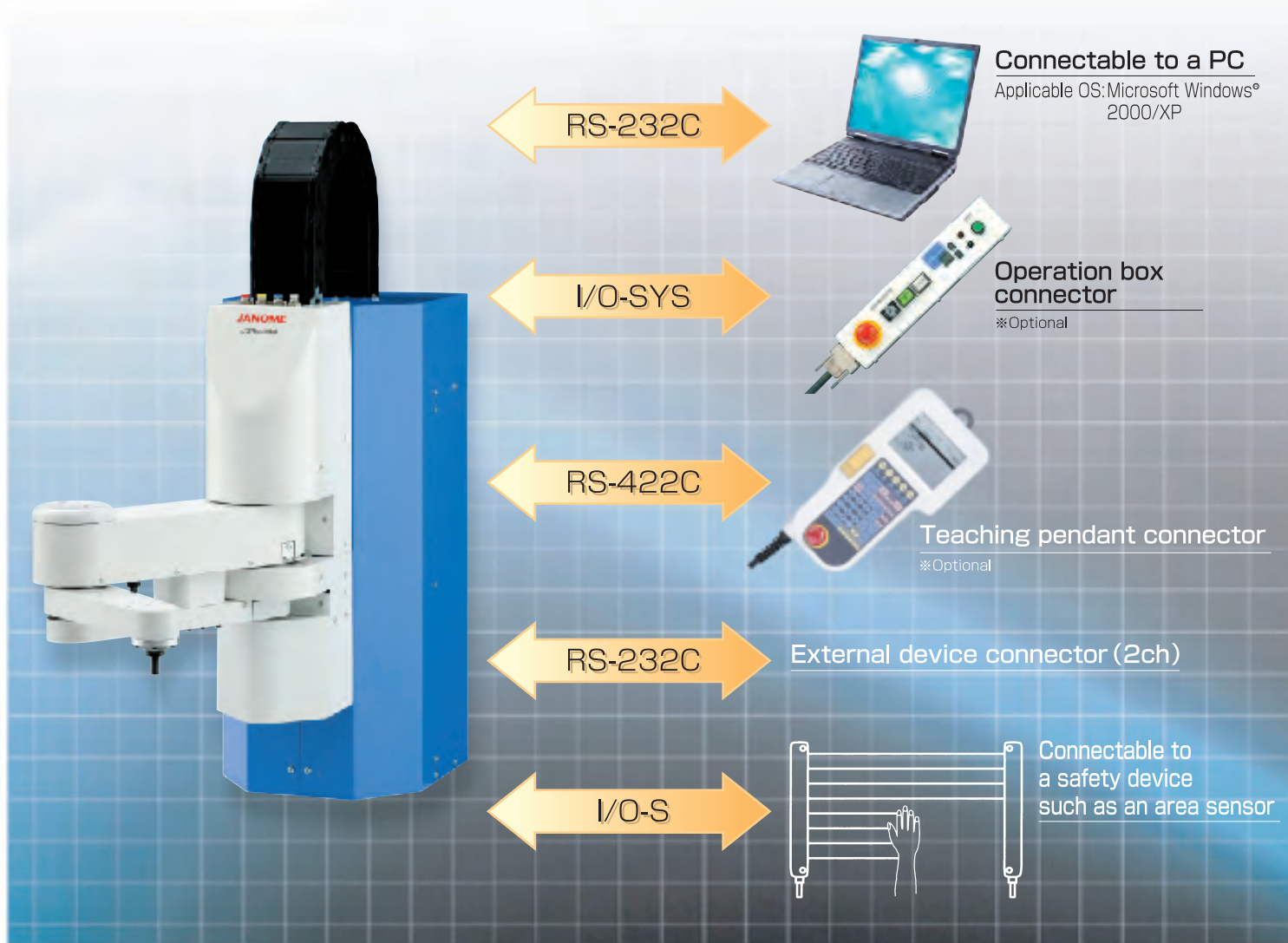
Pick & Place



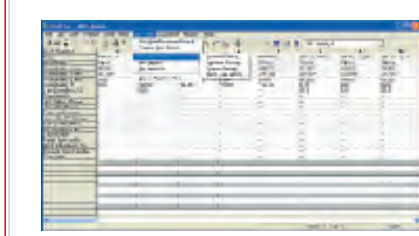
SCARA Robot & Electro Press combination



Composition

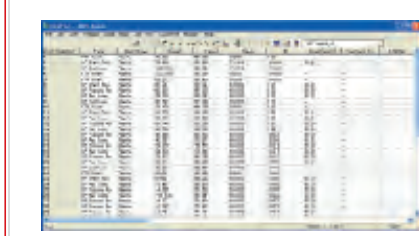


PC Software "JR C-Points" (Optional)

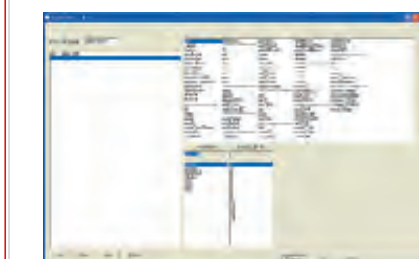


The JR C-Points is an enhanced version of JR Points, the PC software for desktop robots. Tried and tested simple programming methods for various applications remain. Furthermore, additional and enhanced compile function (robot language) and customizing functions are available.

The main screen is the plural point data setting screen. You can create a program simply by entering necessary items, such as the point type, work position, line speed, pallet number, and work adjustment numbers.



You can select a horizontal display or vertical display for point alignments. You can also check the points using a graphic display. Coordinate data edited by spreadsheets such as Microsoft Excel can be downloaded easily using the Copy & Paste function. You can also convert drawings into coordinate values and download them onto a PC using CAD data (DXF file).



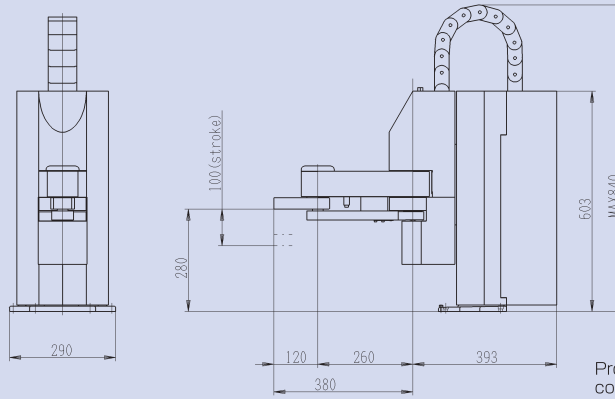
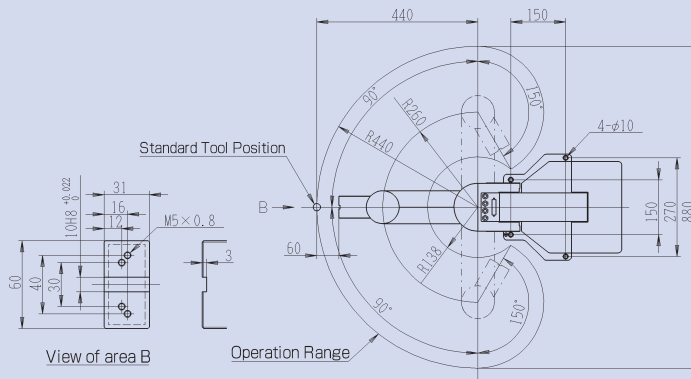
You can enter and edit a point job easily by selecting the desired command from the job command list. Using the compile function, you can also read the point job data from text files. You can use setting variables to set values as teaching parameters as well as local variables, global variables, and keep variables. As one of the

robotic features, various special commands, such as the "waitCondTime" command to wait for an input signal (timeouts are available until receiving the input signal), are available.

External Dimensions

3 axes

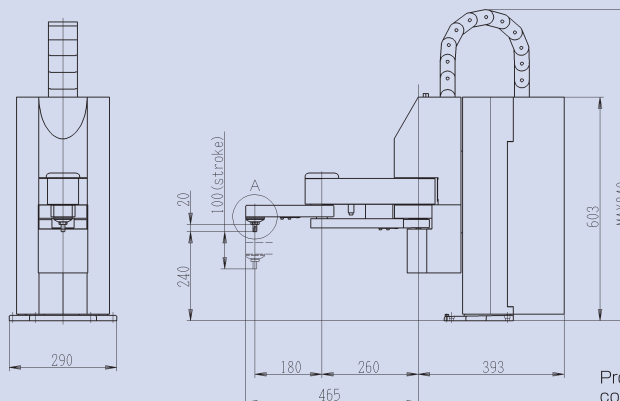
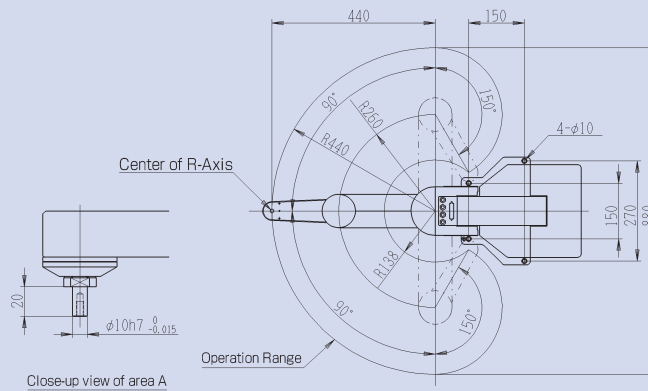
JSR4403N



Protrusion parts such as switches and connectors are not included.

4 axes

JSR4404N



Protrusion parts such as switches and connectors are not included.

Specifications

Item		Model	JSR4403N	JSR4404N
Axis			3 (synchronous control)	4 (synchronous control)
Arm Length	J1 Arm (mm)		260	260
	J2 Arm (mm)		180	180
	J1 + J2 (mm)		440	440
Operation Range	J1 Arm (°)		±90	±90
	J2 Arm (°)		±150	±150
	Z-Axis (mm)		100	100
	R-Axis (°)		—	±360
Maximum Portable Weight (kg)			5	5
Acceptable Moment of Inertia (kg·cm ²)			—	90
Maximum Speed (PTP) ^{*1}	J1 and J2 combined (mm/sec)		1,450 (when carrying a 1kg workpiece)	1,450 (when carrying a 1kg workpiece)
	Z-Axis (mm/sec)		320	320
	R-Axis (°/sec)		—	1,000
Maximum Speed (CP) ^{*1} (mm/sec)			750	750
Repeatability ^{*2}	X- and Y- Axis (mm)		±0.02	±0.02
	Z-Axis (mm)		±0.01	±0.01
	R-Axis (°)		—	±0.02
Machine Weight (kg)			39	40
Drive Method			5-phase pulse motor (positioning watch by encoder)	
Control Method			PTP (Point To Point) control, CP (Continuous Path) control	
Interpolating Function			3-dimensional line and arc interpolating	
Teaching Method			Remote teaching (JOG) / Manual Data Input (MDI) / Direct teaching	
Teaching System			JANOME's original software JR C-Points: Simple and broad-use teaching system ● Simple: Easy teaching just by registering positions and parameters Optional system programs are available for basic operations and various applications ● Broad-use: User-oriented programming such as I/O control, teaching by point job ● Programming by teaching pendant (optional)	
Teaching Pattern			● Off line teaching using optional JR C-Points (PC software) via PC ● On line teaching using optional JR C-Points (PC software) via PC	
Program Capacity			255 programs	
Data Memory Capacity ^{*3}			Maximum 30,000 points	
Simple Sequencer			Maximum 1,000 steps	
Interface for Interlock			For area sensor and interlock signals	
External Serial Interface			RS422 1ch (for teaching pendant) RS232C 1ch (for PC: COM1) RS232C 2ch (for external devices: COM2, COM3)	
External Input/Output ^{*4}			I/O-SYS Input: 17 / output: 16 I/O-1 Input: 8 / Output: 8 (4-relay contact)	
Tool Wiring and Piping			15 wires for signals, 4 air pipes: φ4	
Power Supply			AC90~132V / AC180~250V (single phase)	
Power Capacity			200VA	
Ambient Temperature			0~40°C	
Relative Humidity			20~90% (non condensing)	
Storage Temperature			-10~+60°C	

*1: Maximum speed cannot be achieved under the maximum portable weight setting

*2: Repeatability was measured at a constant temperature, so absolute precision is not guaranteed.

*3: The point data capacity will be reduced if the additional function data setting / point job data / sequencer data increases, due to the shared data storage area.

*4: NPN / PNP can be chosen before shipment.

● JANOME original software JR C-Points is compatible with Windows® 2000/XP. (Windows® is a registered trademark of Microsoft Corporation)

● The specifications may be modified without prior notice to improve quality.

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