

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**'s 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.

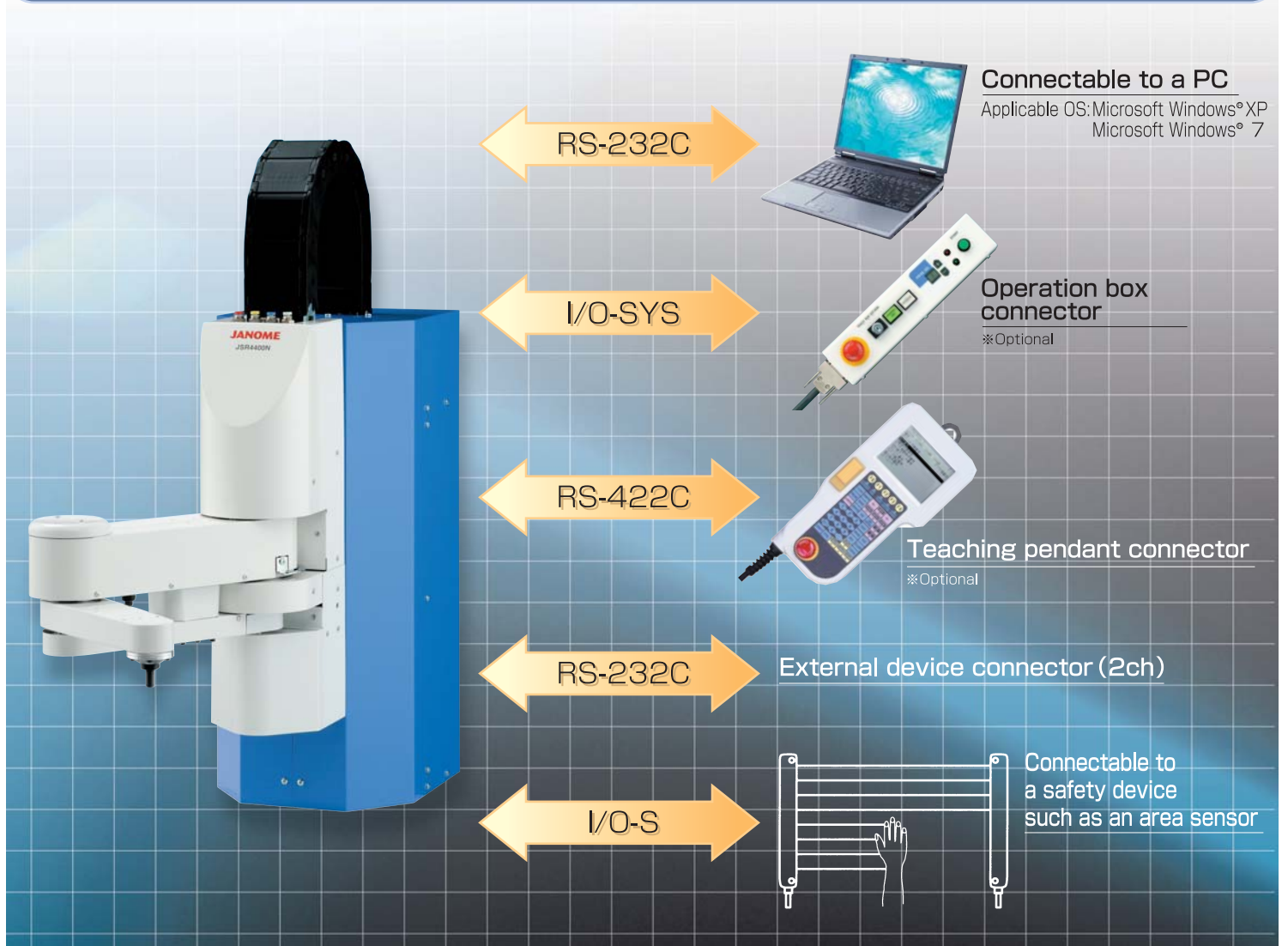
## ■ Simple sequencer

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.

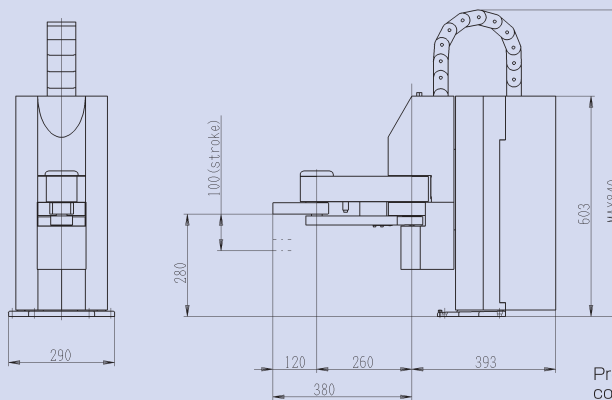
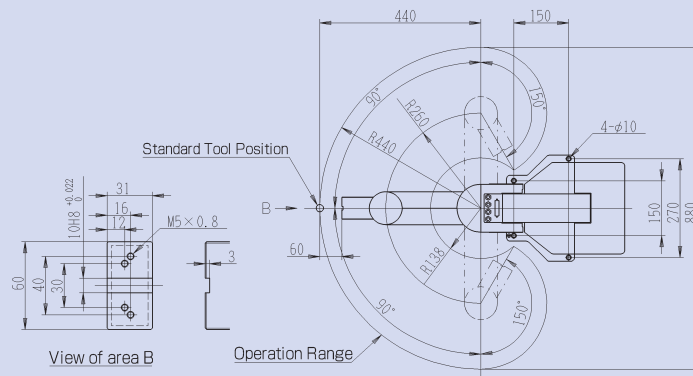
## Composition



# External Dimensions

## 3 axes

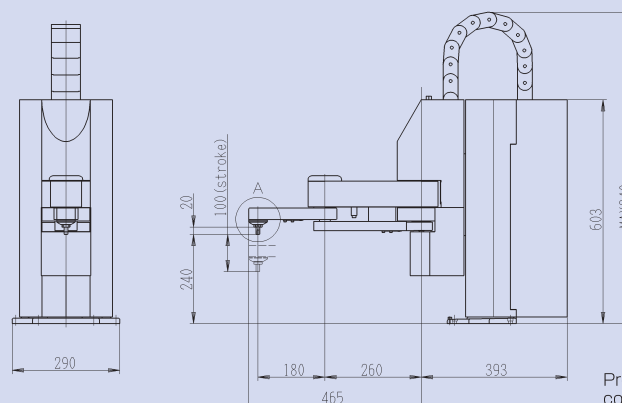
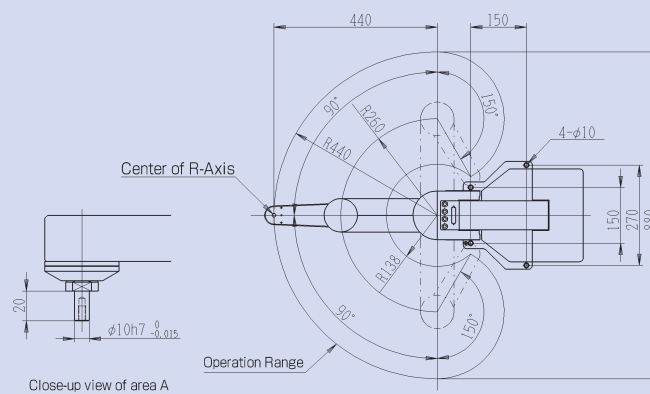
### JSR4403N



Protrusion parts such as switches and connectors are not included.

## 4 axes

### JSR4404N



Protrusion parts such as switches and connectors are not included.

# 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



Teaching Pendant (Optional)

## 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	
Screw Feed Time	0.5sec
Stop After Feeding	NO
Error Restart	Next Point

### ●Dispensing Software

Complete a dispensing program simply by entering work positions, such as "Point Dispense", "Start of Line Dispense", "Line Passing", and "End of Line Dispense." You can set "Dispense Time" to each "Point Dispense" point. You can change Dispense Conditions, such as "Device Mode", "Signal Operation" type (for dispenser), "Wait Time" (from Dispense ON to start shifting), "Up Amount" and "Up Speed" (at end dispensing), simply by setting and registering data.

### 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	

### ●Palletizing or Work Position Adjustment by Camera

By setting a "Pallet Number", you can repeat the same operation at different points. By setting a "Work Adjustment Number", you can easily adjust a position error between the standard position captured by the camera.

### 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	

### Point Job Setting Screen

Point Job	2/3
013	
014	Id DispenserSignalType==1
015	then
016	waitCondTime 500
017	Id #genIn1
018	timeUp
019	reset #genOut1
020	jump L1
021	endWait
022	endIf
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

## 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.

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).]

Register the "Common Setting Variables Definition" in the point type definition in order to set the "Dispense Time" at each point. The process is completed simply by entering necessary items, such as "Variable Type", "Variable Caption", and "Input Unit". Set "Enumeration Type" or "Numeric Type" as the "Variable Type". If you select the "Enumeration Type", you can select a value from the "Selection Item Caption" list. Furthermore, you can set the "Variable Caption", as well as variable names (identifiers), as a caption display.

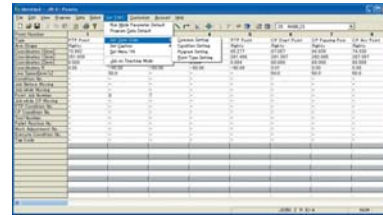
## Sequencer Function

You can create simple sequencer circuits, such as a self-holding circuit, non-cumulative timer, pulse output circuit, and counter. An additional sequencer is not necessary.

### Sequencer Command Setting Screen

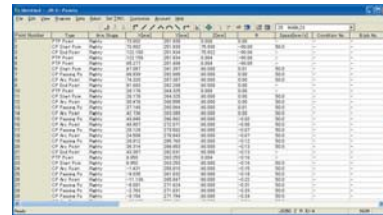
Sequencer 1	2/3
001	Id #genIn3
002	and #genIn3
003	out #genOut1
004	mps
005	Id #mv(1)
006	or #mv(2)
007	and #genIn2
008	out #genOut2
009	out #mv(3)
010	mrd
011	and #mv(3)
012	set #genOut3

## PC Software "JR C-Points" (Optional)



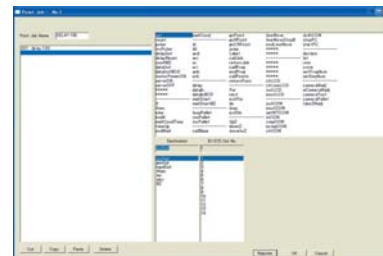
The JR C-Points is an enhanced version of JR Points, the PC software for desktop robots. Tried and tested simple programming methods for various applications remain. Furthermore, additional and enhanced compile function (robot language) and customizing functions are available.

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.

## 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



## ■ 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 <sup>2</sup> )			—	90
Maximum Speed (PTP) <sup>*1</sup>	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) <sup>*1</sup> (mm/sec)			750	750
Repeatability <sup>*2</sup>	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		
Teaching Pattern		● Programming by teaching pendant (optional) ● 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 <sup>*3</sup>		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 <sup>*4</sup>		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<sup>®</sup> XP/ Windows<sup>®</sup> 7. (Windows<sup>®</sup> is a registered trademark of Microsoft Corporation)

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

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