Robot Scara

XI série

New Horizontal Articulated Robot IX Series Achieves Class Top Performance and High Cost Performance

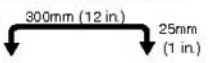
The IX Series achieved the best-in-class specification in every aspect—from high-speed performance and load capacity to positioning repeatability—after reviewing and redesigning all the components of the conventional IH Series robots. The IX Series also outdistances its rivals in user-friendliness, lineup and cost performance.

High-Performance

1. Highest Speed, Load Capacity and Accuracy in Its Class

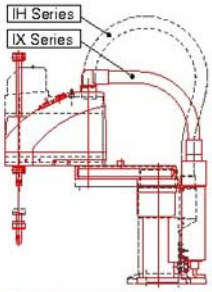
Standard cycle time: 0.44 sec (*1)
Positioning repeatability: ±0.01 mm/±0.005° (*2)
Maximum load capacity: 20 kg (*3)

*1 The standard cycle time refers to the time required to cycle back and forth over a vertical distance of 25 mm and horizontal distance of 300 mm (rough positioning).
*2 If the arm length is 700/800, the repeatability becomes ±0.015 mm/±0.005°.
*3 Based on an arm length of 700/800.



2. Compact and Rigid

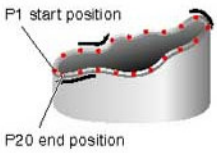
The IX Series is significantly smaller compared with the conventional IH Series robots.



The IX Series achieved enhanced rigidity in a lightweight body by comprising arm 1 using aluminum extruded material. This helped reduce the inertial load.

3. Markedly Improved Tracing Accuracy and Interpolation Function

The IX Series offers a markedly improved tracing accuracy as a result of higher controller processing speed and rigid robot construction.
The robot can also perform three-dimensional arc/pass motions to allow for easy, accurate dispensing operation.



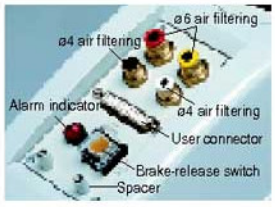
PATH	P1	P20

Path movement that consists of many points can be implemented with a single program line.

Easy

4. Greater Ease of Use

An easy-to-use D-sub/25-pin connector is provided on top of the robot for user wiring. The user can also connect two ø4 tubes and two ø6 tubes to meet various tubing needs.
The brake-release switch on the robot lets you release the brake even when the controller power is off (*1).
The alarm indicator alerts you on each error generated in the robot (*2).



*1 24 VDC power must be supplied regardless of whether or not the brake-release switch is used.
*2 The alarm indicator must be wired by the user.

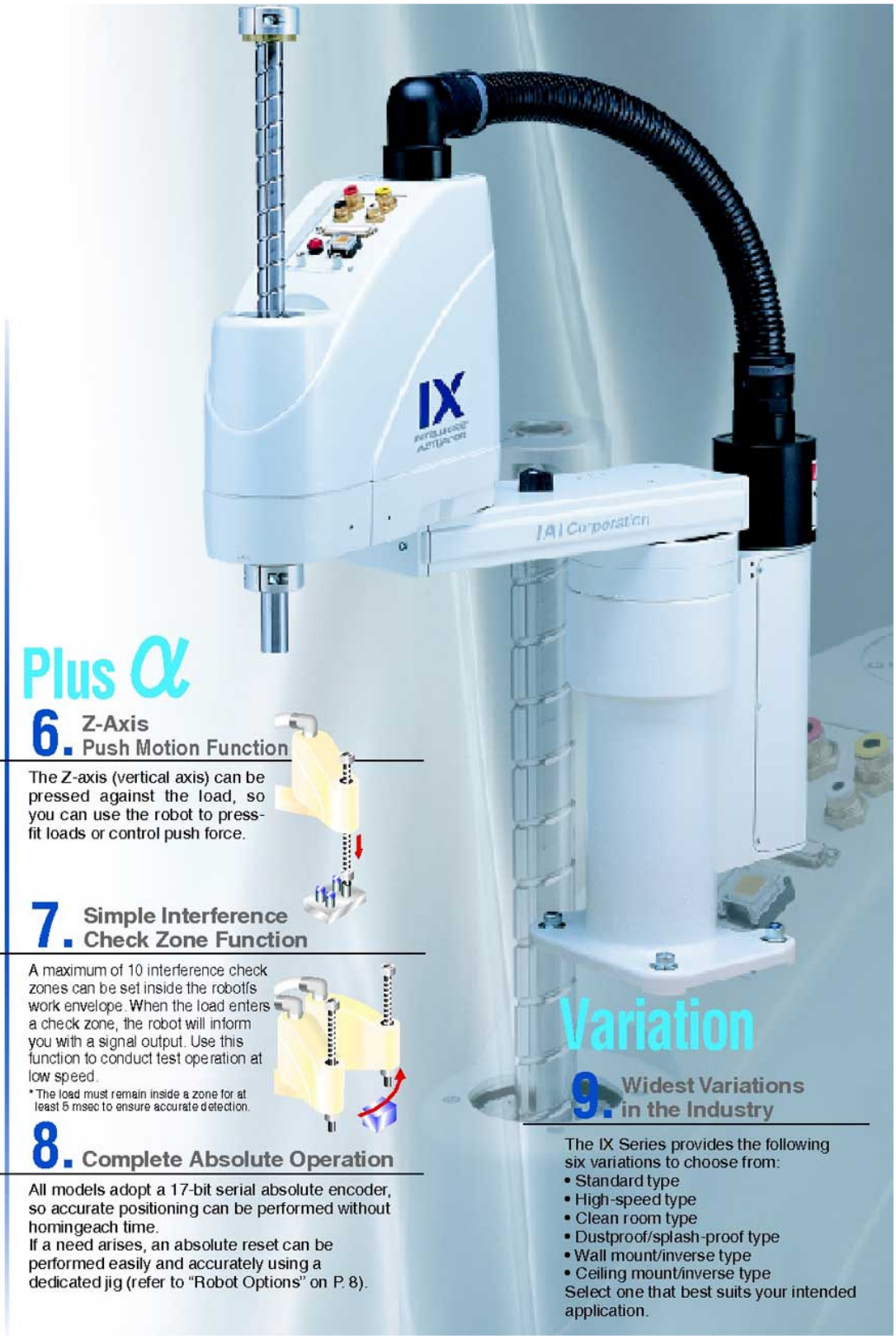
5. Easy Programming

The IX Series adopts Super SEL Language, a well-known command language used by IAI Cartesian robots. With Super SEL, complex operations can be programmed easily. You can create desired programs right away without much knowledge of robot language.

ROSIER Mécatronique
Tél.: 04 72 04 68 61 - Fax : 04 72 04 37 38 - contact@rosier.fr www.rosier.fr
MOTORISATION AXES LINÉAIRES COMMANDES D'AXES

Robot Scara

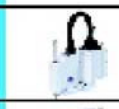
XI série



ROSIER Mécatronique
Tél.: 04 72 04 68 61 - Fax : 04 72 04 37 38 - contact@rosier.fr www.rosier.fr
MOTORISATION AXES LINÉAIRES COMMANDES D'AXES

Robot Scara

XI série

		250 mm	350 mm	500 mm	600 mm	700 mm	800 mm	(sec)	Rated (kg)	Maximum (kg)	Vertical axis stroke Standard (mm)	Vertical axis stroke Optional (mm)	Model
Standard type NNN		3142 mm/s						0.46	1	3	150	-	IX-NNN2515
			3979 mm/s					0.53	1	3	150	-	IX-NNN3515
				6283 mm/s				0.44	2	10	200	300	IX-NNN5020(5030)
					7121 mm/s			0.52	2	10	200	300	IX-NNN6020(6030)
						6597 mm/s		0.50	5	20	200	400	IX-NNN7020(7040)
							7121 mm/s	0.52	5	20	200	400	IX-NNN8020(8040)
High-speed type NSN				4712 mm/s				0.29 to 0.30	1	3	160	-	IX-NSN5016
					5236 mm/s			0.38 to 0.39	1	3	160	-	IX-NSN6016
Dustproof splash-proof type NNW		3142 mm/s						0.51	1	3	150	-	IX-NNW2515
			3979 mm/s					0.59	1	3	150	-	IX-NNW3515
				6283 mm/s				0.49	2	10	200	300	IX-NNW5020(5030)
					7121 mm/s			0.55	2	10	200	300	IX-NNW6020(6030)
						6597 mm/s		0.52	5	20	200	400	IX-NNW7020(7040)
							7121 mm/s	0.52	5	20	200	400	IX-NNW8020(8040)
Wall-mount type TNN			3560 mm/s					0.49	1	3	150	-	IX-TNN3015
				3979 mm/s				0.53	1	3	150	-	IX-TNN3515
Wall-mount inverse type UNN			3560 mm/s					0.49	1	3	150	-	IX-UNN3015
				3979 mm/s				0.53	1	3	150	-	IX-UNN3515
Ceiling-mount type HNN				6283 mm/s				0.44	2	10	200	-	IX-HNN5020
					7121 mm/s			0.52	2	10	200	-	IX-HNN6020
						6597 mm/s		0.50	5	20	200	400	IX-HNN7020(7040)
							7121 mm/s	0.52	5	20	200	400	IX-HNN8020(8040)
Ceiling-mount inverse type INN				6283 mm/s				0.44	2	10	200	-	IX-INN5020
					7121 mm/s			0.52	2	10	200	-	IX-INN6020
						6597 mm/s		0.50	5	20	200	400	IX-INN7020(7040)
							7121 mm/s	0.52	5	20	200	400	IX-INN8020(8040)
Clean room type NNC		3142 mm/s						0.49	1	3	150	-	IX-NNC2515
			3979 mm/s					0.58	1	3	150	-	IX-NNC3515
				6283 mm/s				0.47	2	10	200	300	IX-NNC5020(5030)
					7121 mm/s			0.54	2	10	200	300	IX-NNC6020(6030)
						6597 mm/s		0.52	5	20	200	400	IX-NNC7020(7040)
							7121 mm/s	0.52	5	20	200	400	IX-NNC8020(8040)

1) The rated load capacity indicates the maximum load that can be carried at the maximum operating speed. The maximum load capacity indicates the maximum load that can be carried at a reduced acceleration rate.

ROSIER Mécatronique
Tél.: 04 72 04 68 61 - Fax : 04 72 04 37 38 - contact@rosier.fr www.rosier.fr
MOTORISATION AXES LINÉAIRES COMMANDES D'AXES

Robot Scara

XI série

IX Series Points to Note

<SCARA Type XI–NNN/NSN/NNW/TNN/UNN/HNN/INN/NNC>

(Note 1) Positioning repeatability

"Positioning repeatability" refers to the positioning accuracy of repeated movements to a pre-stored position. This is not the same as "absolute positioning accuracy."
The specified positioning repeatability is measured in an ambient temperature of 20˚C constant.

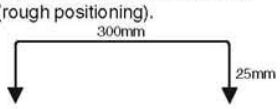
(Note 2) Maximum operating speed

The specified maximum operating speed represents the speed of PTP command operation. High-speed movement will be limited in CP command operation (interpolation operation).

(Note 3) Standard cycle time

"Standard cycle time" refers to the time required to cycle back and forth over a vertical distance of 25 mm and horizontal distance of 300 mm (rough positioning).

<Caution>
The specified cycle time is based on a 2-kg load (5-kg load if the arm length is 700/800) and the maximum operating speed.
The robot cannot operate continuously at the maximum speed.



(Note 4) Axis 3 push force

"Axis 3 push force" represents the push force applied by the tip of the vertical axis. The value under "Push action" indicates the maximum push force to be applied when a programmed push command is executed. The value under "Maximum thrust" indicates the maximum thrust in a normal positioning operation. When a push action is performed during a normal positioning operation, a force corresponding to three times the maximum thrust may apply momentarily. When performing a push action, be sure to use a programmed push command.

(Note 5) Axis 4 allowable inertial moment

"Axis 4 allowable inertial moment" indicates the allowable inertial moment of axis 4 (rotating axis) of the SCARA robot as calculated at the center of rotation.
The offset from the center of rotation of axis 4 to the tool gravity center must be within 40 mm. If the tool gravity center is further away from the center of axis 4, the speed and/or acceleration rate must be reduced as necessary.

(Note 6) Alarm indicator

The alarm indicator is located on top of arm 2 of the SCARA robot.
The alarm indicator can be wired in such a way that it will illuminate in a certain condition such as when the controller generates an error. To use the alarm indicator, the user must provide a circuit that responds to the controllerís I/O output signal to supply 24 VDC to the applicable LED terminal in the user wiring.

(Note 7) Brake-release switch

The brake-release switch is also located on top of the robotís arm 2 near the alarm indicator.
To release the brake, 24 VDC power must be supplied regardless of whether or not the brake-release switch is used. (Supply 24 VDC from a dedicated power supply separate from the 24 VDC power used for driving the I/Os.)

(Note 8) Cable length

The motor and encoder cables of the SCARA robot are directly connected to the robot.
The IX Series doesnít use a cable joint, so changing the cable length on the delivered robot will be difficult.
Select either 5 m (code 5L) or 10 m (10L) as the desired cable length when ordering.

(Note 9) Protection grade (protective structure)

This grade indicates the level of actuator protection against water and solid foreign matters.

IP65
- The actuator is protected against solid foreign matters to a degree where dust will not enter the actuator.
- The actuator is protected against water intrusion to a degree where the actuator will not be negatively affected by water injected at a given angle.

(Note 10) Air purge pressure

To use the dustproof/splash-proof type in an IP65 environment, air must be supplied from the air inlet located at side (or back) of the robot base (to perform air purge). The air purge pressure must conform to the common specification applicable to all robot types. (Supplied air must be clean, dry air of atmospheric pressure with a dew-point temperature of –20˚C or below.)

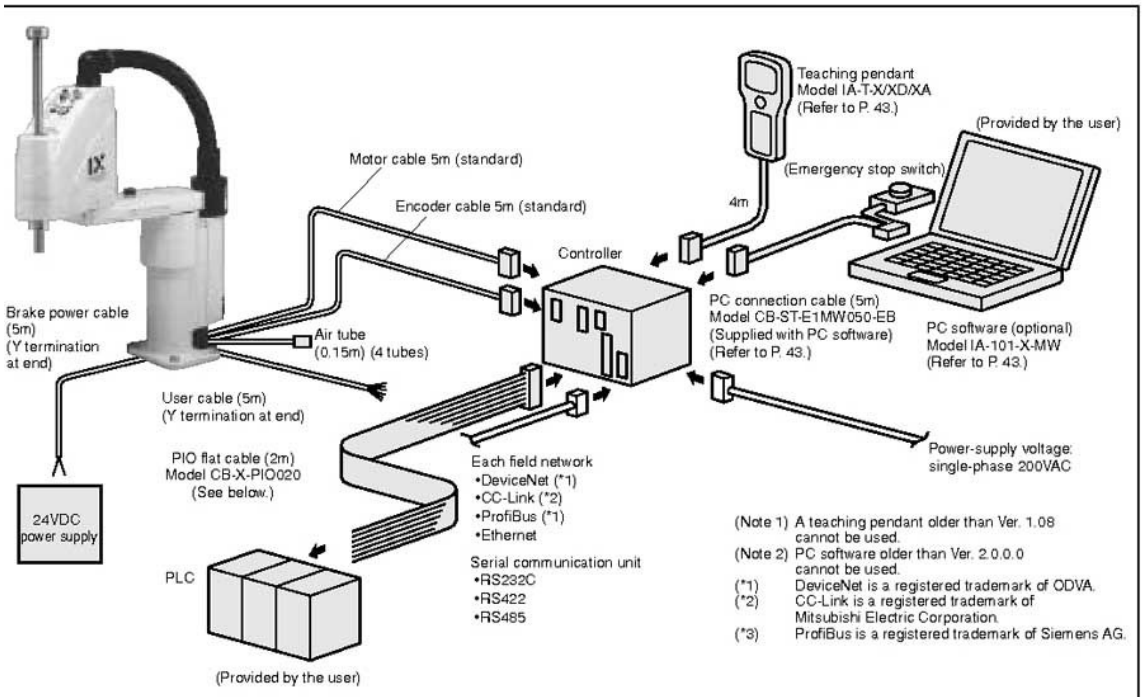
(Note 11) Internal vacuuming

To use the clean type in an environment of cleanliness class 10, the air inside the robot must be vacuumed from the air suction outlet located at side (or back) of the robot base.
The suction rate must conform to the common specification applicable to all robot types.

Robot Scara

XI série

IX Series System Configuration Drawing

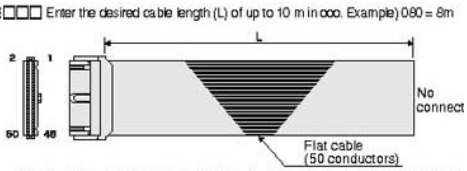


■ Robot Accessories

- Caution labels
- Positioning seals
- Eyebolts
- Service connectors

■ Controller Accessory

- PIO flat cable
  Model CB-X-PIO □□□



No.	Color	Wire	No.	Color	Wire	No.	Color	Wire
1	Brown 1	Flat cable	18	Gray 2	Flat cable	35	Green 4	Flat cable
2	Red 1		19	White 2		36	Blue 4	
3	Orange 1		20	Black 2		37	Purple 4	
4	Yellow 1		21	Brown 3		38	Gray 4	
5	Green 1		22	Red 3		39	White 4	
6	Blue 1		23	Orange 3		40	Black 4	
7	Purple 1		24	Yellow 3		41	Brown 5	
8	Gray 1		25	Green 3		42	Red 5	
9	White 1		26	Blue 3		43	Orange 5	
10	Black 1		27	Purple 3		44	Yellow 5	
11	Brown 2		28	Gray 3		45	Green 5	
12	Red 2		29	White 3		46	Blue 5	
13	Orange 2		30	Black 3		47	Purple 5	
14	Yellow 2		31	Brown 4		48	Gray 5	
15	Green 2		32	Red 4		49	White 5	
16	Blue 2		33	Orange 4		50	Black 5	
17	Purple 2		34	Yellow 4				

Robot Options

Name	Model	Description	Page
Absolute Data Storage Battery	AB-3	Battery for storing the encoder's absolute data	P8
Absolute Reset Adjustment Jig	JG-1~3	Jig needed to execute an absolute reset	
Flange	IX-FL-1~3	Flange used to install to the tip of the Z-axis	

Controller Options

Name			
Teaching Pendant	IA-T-X	Allows for input and editing of position data, programs, parameters, etc., as well as manual operations.	P43
Teaching Pendant (With Deadman Switch)	IA-T-XD	IA-T-X equipped with a deadman switch	
Teaching Pendant (ANSI)	IA-T-XA	CE/ANSI-compliant type	
PC Software (DOS/V)	IA-101-X-MW	Allows for input and editing of position data, programs, parameters, etc., as well as manual operations.	
PC Software (PC98)	IA-101-X-CW		

Robot Scara

XI série

Robot Options

Absolute Data Backup Battery

This battery is used to store the encoderís absolute data.
(Install the battery inside the rear cover of the SCARA robot.)

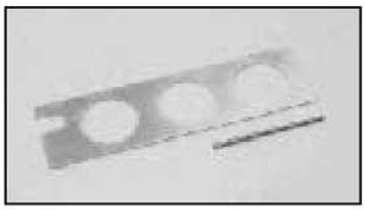
Model	Remarks
AB-3	Common to all models

AB-3

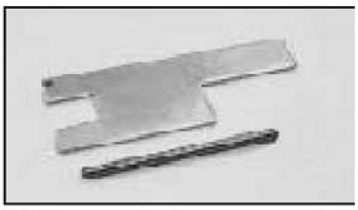
Absolute Reset Adjustment Jig

An appropriate adjustment jig is used to execute an absolute reset when the encoderís absolute data was lost.

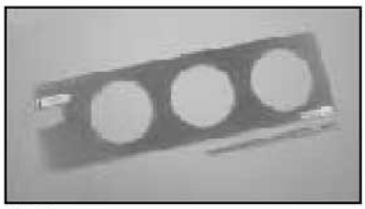
Model	Remarks
JG-1	Arm length 500/600
JG-2	Arm length 250/350
JG-3	Arm length 700/800



JG-1



JG-2

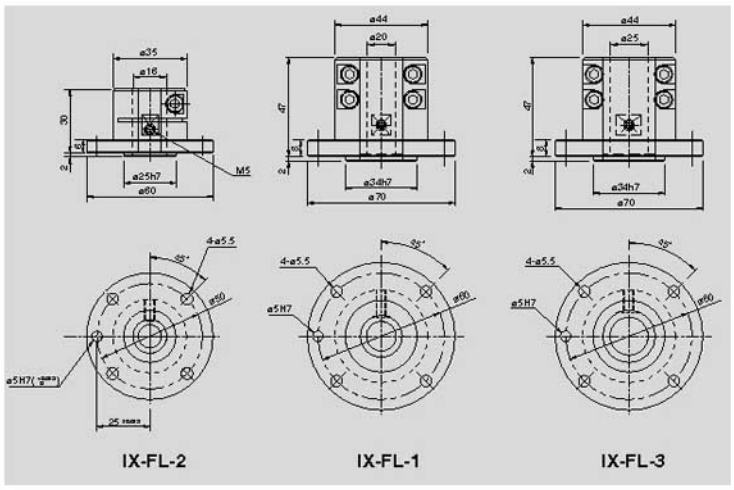


JG-3

Flange

Use an appropriate flange when mounting to the tip of the Z-axis arm.

Model	Remarks
IX-FL-1	Arm length 500/600
IX-FL-2	Arm length 250/350
IX-FL-3	Arm length 700/800



IX-FL-2 IX-FL-1 IX-FL-3

ROSIER Mécatronique
Tél.: 04 72 04 68 61 - Fax : 04 72 04 37 38 - contact@rosier.fr www.rosier.fr
MOTORISATION AXES LINÉAIRES COMMANDES D'AXES

Robot Scara

XI série

Unit Series Explanation of SCARA Robot Model Items

Refer to the opposite page for details on each model item (①through ⑧). The selection range for each item will vary depending on the robot type. For details, refer to the page corresponding to each model type.

		① Series		② Model		③ Cable length		④ Controller type		⑤ Standard PIO		⑥ Expansion I/O		⑦ I/O flat cable length		⑧ Power-supply voltage
1	SCARA robot, standard type	IX	–	NNN2515 NNN3515 NNN5020 NNN5030 NNN6020 NNN6030 NNN7020 NNN7040 NNN8020 NNN8040	–	5L 10L	–	KX JX	–	N1 N3 P1 P3 DV CC PR ET	–	EEE, etc.	–	2 3 5 0	–	2
2	SCARA robot, high-speed type		–	NSN5016 NSN6016	–		–		–		–		–		–	
3	SCARA robot, dustproof/ splash-proof type		–	NNW2515 NNW3515 NNW5020 NNW5030 NNW6020 NNW6030 NNW7020 NNW7040 NNW8020 NNW8040	–		–		–		–		–		–	
4	SCARA robot, wall-mount type (inverse type)		–	TNN3015 (UNN3015) TNN3515 (UNN3515)	–		–		–		–		–		–	
5	SCARA robot, ceiling-mount type (inverse type)		–	HNN5020 (INN5020) HNN6020 (INN6020) HNN7020 (INN7020) HNN7040 (INN7040) HNN8020 (INN8020) HNN8040 (INN8040)	–		–		–		–		–		–	
6	SCARA robot, clean room type		–	NNC2515 NNC3515 NNC5020 NNC5030 NNC6020 NNC6030 NNC7020 NNC7040 NNC8020 NNC8040	–		–		–		–		–		–	

ROSIER Mécatronique
Tél.: 04 72 04 68 61 - Fax : 04 72 04 37 38 - contact@rosier.fr www.rosier.fr
MOTORISATION AXES LINÉAIRES COMMANDES D'AXES

Robot Scara

XI série

Unlike other models, the SCARA robot is ordered as a combination of robot and controller.
Items ①through ③specify the SCARA robot.
Items ④through ⑧specify the controller.

①Series

Indicate the name of each series.

②Model

Indicate the model type (standard, high-speed, dustproof/ splash-proof, wall-mount or ceiling-mount), arm length and Z-axis length.

NNN	Standard type	UNN	Wall-mount type (inverse type)
NSN	High-speed type	HNN	Ceiling-mount type
NNW	Dustproof/splash-proof type	INN	Ceiling-mount type (inverse type)
TNN	Wall-mount type		

③Cable length

Indicate the length of the cable connecting the robot and the controller.
Select either 5L (5 m) or 10L (10 m).
Unlike a single-axis robot, the IX Series doesnít adopt a joint cable.
The cable comes out directly from the robot.

④Controller type

Select a dedicated controller (KX or JX type) for the SCARA robot.
* Only the KX type may be specified if the arm length is 500 or longer.

⑤Standard PIO specification

Indicate the specification of the controllerís standard I/O slot.
* N3 and P3 are dedicated options for the JX controller and cannot be specified for the KX controller.

N1 : [NPN standard PIO] An NPN PIO board with 32 input points and 16 output points is installed (standard).
N3 : [NPN multipoint PIO] An NPN multipoint PIO board with 48 input points and 48 output points is installed (dedicated option for the JX controller).
P1 : [PNP standard PIO] A PNP PIO board with 32 input points and 16 output points is installed.
P3 : [PNP multipoint PIO] A PNP multipoint PIO board with 48 input points and 48 output points is installed (dedicated option for the JX controller).
DV : [DeviceNet connection specification] A DeviceNet connection board with a maximum of 256 input points and 256 output points is installed.
CC : [CC-Link connection specification] A CC-Link connection board with a maximum of 256 input points and 256 output points is installed.
PR : [ProfiBus connection specification] A ProfiBus connection board with a maximum of 256 input points and 256 output points is installed.
ET : [Ethernet connection specification] An Ethernet connection board offering data communication capability is installed.

⑥Expansion I/O specification

Indicate the specification of the controllerís expansion slot.
An expansion board can be installed in slot 1, 2 or 3 of the KX controller, or in slot 1 of the JX controller.
Use a three-digit code (EEE) to specify the slot type. In the case of the JX controller having only one expansion slot, specify the slot using the first digit and leave "E" in the remaining two digits (□EE).
* C, N3, P3, SA, SB and SC are dedicated options for the KX controller and cannot be specified for the JX controller.

E : [Unused] Expansion board is not used.
C : [CC-Link connection specification] A CC-Link connection board with 16 input points and 16 output points is installed (dedicated option for the KX controll
N1 : [NPN expansion PIO] An NPN PIO board with 32 input points and 16 output points is installed.
N2 : [NPN expansion PIO] An NPN PIO board with 16 input points and 32 output points is installed.
N3 : [NPN multipoint PIO] An NPN multipoint PIO board with 48 input points and 48 output points is installed (dedicated option for the KX controller).
P1 : [PNP expansion PIO] A PNP PIO board with 32 input points and 16 output points is installed.
P2 : [PNP expansion PIO] A PNP PIO board with 16 input points and 32 output points is installed.
P3 : [PNP expansion PIO] A PNP PIO board with 48 input points and 48 output points is installed (dedicated option for the KX controller).
SA : [Expansion SIO type A] An RS232C communication board is installed (dedicated option for the KX controller).
SB : [Expansion SIO type B] An RS422 communication board is installed (dedicated option for the KX controller).
SC : [Expansion SIO type C] An RS485 communication board is installed (dedicated option for the KX controller).

⑦I/O flat cable length

Indicate the length of the cable used for transmitting signals between the controller and the PLC.
One cable is supplied with one I/O board installed in the standard slot or each expansion slot.
2: 2m
3: 3m
5: 5m
0: None (Specify this number if you have installed a network board instead of a standard I/O board.)

⑧Power-supply voltage

Indicate the main power-supply voltage for the controller.
The power-supply voltage is fixed to single-phase 200 VAC for a SCARA controller.