

SCARA robot **IXA**





Fastest in the industry!

Introducing the new SCARA Robot IXA!

Industry Top

1 Fastest cycle time - **0.26s**

Standard cycle time

High-speed type
(IXA-NSN)

0.26s

0.12s
Faster

Standard type
(IXA-NNN)

0.38s

Continuous cycle time (duty 100%)

High-speed type
(IXA-NSN)

0.45s

0.10s
Faster

Standard type
(IXA-NNN)

0.55s

Operational conditions

- ▶ 2kg transport
- ▶ Horizontal movement 300mm/
Vertical movement 25mm

Horizontal movement



Vertical
movement

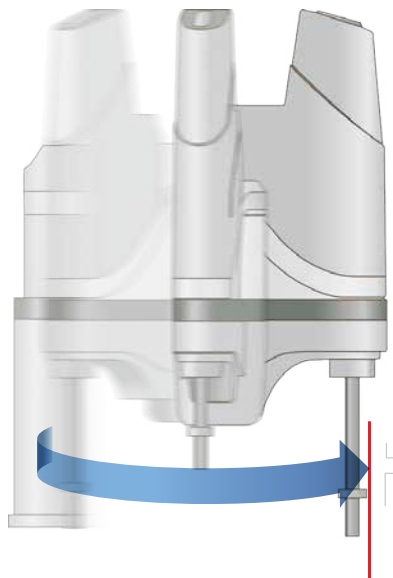
* The cycle times are measured under the operating conditions of an arch-motion shown above.

2 Achieves a lower price

Our new SCARA robot is even more affordable than previous models. It offers even better performance and functionality.

3 Low vibration and accurate positioning

Higher rigidity and optimized control results in significantly less vibration at the time of stopping.



Stops on a dime!

Operational conditions

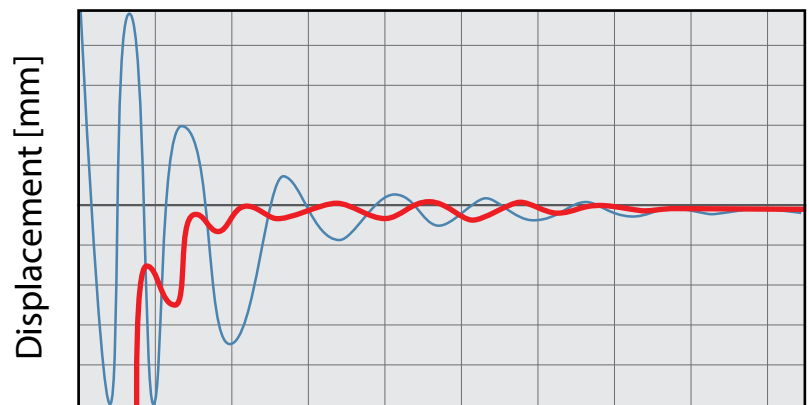
X direction

— IX (IX-NSN5016H)

Cyclotime 0.29s

— IXA (IXA-4NSN4518)

Cyclotime 0.26s



Time [s]

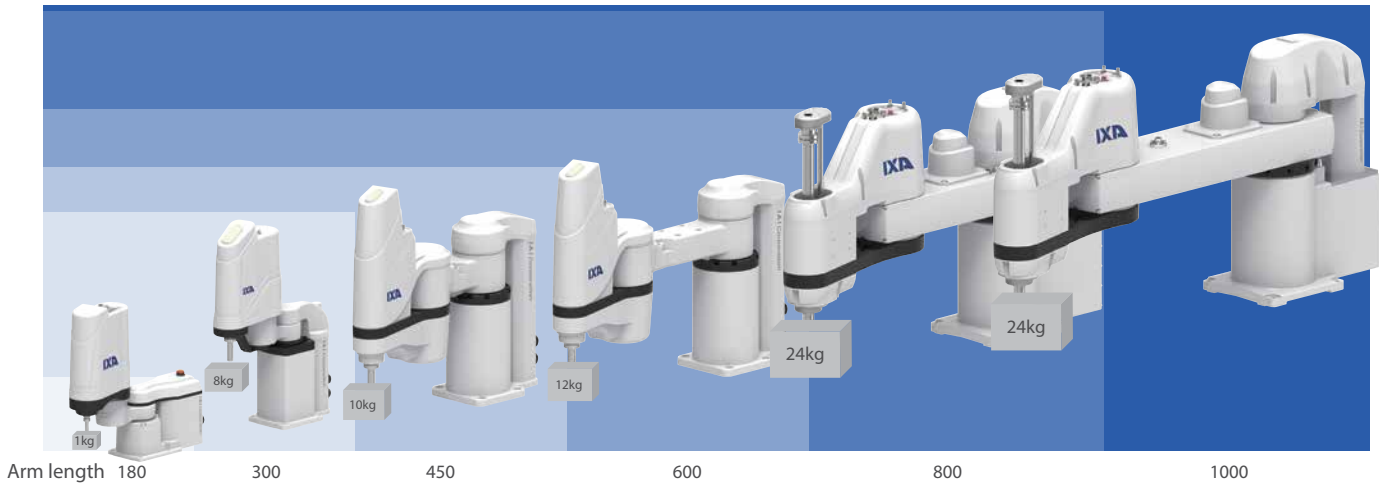
Payload: 2 kg



4 Extensive Lineup

You can choose from a lineup of arm lengths of 180 to 1000 to best suit your application. Refer to the separate catalog.

* Heavy duty and dust- & splash-proof types are also available.

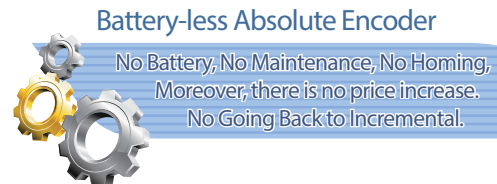


5 Equipped with battery-less absolute encoder as standard

Replacement of the battery is no longer necessary, saving the maintenance time.

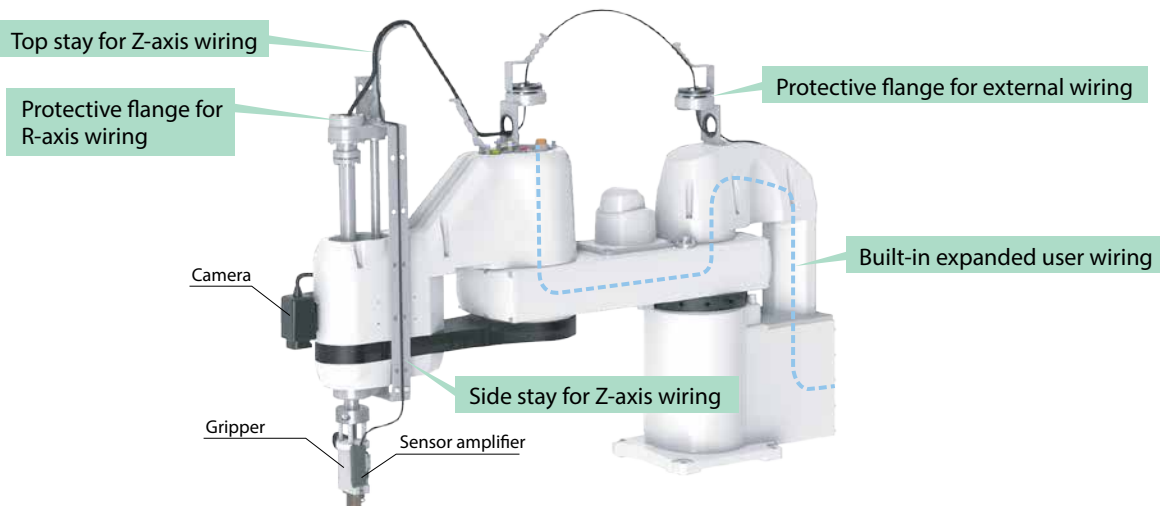
Advantages of Battery-less Absolute

- ▶ The machine will no longer stop due to battery error (voltage drop, etc.).
- ▶ There is no need to purchase replacement batteries.
- ▶ No tiresome battery replacement or absolute reset.



6 Full array of options for wiring and piping support

For arm lengths of 800mm/1000mm types, options can be selected according to user's application so that the wiring to the tool tip becomes easy.



7 Mechanical structure / features

Fully covered structure

The operating parts are covered for improved dust-proof rating.

Patent pending

Built-in cables

Cables are built in for reduced height and effective use of space.

Patent pending

Double arm structure*

Less vibration thanks to higher rigidity.
Shorter continuous cycle times thanks to better heat dissipation.

* Excluding arm length 180

8 Simulation Software

See IAI website for supported PC teaching software versions.

Without a SCARA robot, the robot operations can be confirmed using the XSEL PC teaching software.

In addition, cycle times can also be calculated.



Display of cycle times

No.	Point	Distance	Time	Speed	Accel.	Decel.
1	PA1	10	0.05	100	1000	1000
2	PA2	10	0.05	100	1000	1000
3	PA3	10	0.05	100	1000	1000
4	PA4	10	0.05	100	1000	1000
5	PA5	10	0.05	100	1000	1000
6	PA6	10	0.05	100	1000	1000
7	PA7	10	0.05	100	1000	1000
8	PA8	10	0.05	100	1000	1000
9	PA9	10	0.05	100	1000	1000
10	PA10	10	0.05	100	1000	1000
11	PA11	10	0.05	100	1000	1000
12	PA12	10	0.05	100	1000	1000
13	PA13	10	0.05	100	1000	1000
14	PA14	10	0.05	100	1000	1000
15	PA15	10	0.05	100	1000	1000
16	PA16	10	0.05	100	1000	1000
17	PA17	10	0.05	100	1000	1000
18	PA18	10	0.05	100	1000	1000
19	PA19	10	0.05	100	1000	1000
20	PA20	10	0.05	100	1000	1000
21	PA21	10	0.05	100	1000	1000
22	PA22	10	0.05	100	1000	1000
23	PA23	10	0.05	100	1000	1000
24	PA24	10	0.05	100	1000	1000
25	PA25	10	0.05	100	1000	1000
26	PA26	10	0.05	100	1000	1000
27	PA27	10	0.05	100	1000	1000
28	PA28	10	0.05	100	1000	1000
29	PA29	10	0.05	100	1000	1000
30	PA30	10	0.05	100	1000	1000
31	PA31	10	0.05	100	1000	1000
32	PA32	10	0.05	100	1000	1000
33	PA33	10	0.05	100	1000	1000
34	PA34	10	0.05	100	1000	1000
35	PA35	10	0.05	100	1000	1000
36	PA36	10	0.05	100	1000	1000
37	PA37	10	0.05	100	1000	1000
38	PA38	10	0.05	100	1000	1000
39	PA39	10	0.05	100	1000	1000
40	PA40	10	0.05	100	1000	1000
41	PA41	10	0.05	100	1000	1000
42	PA42	10	0.05	100	1000	1000
43	PA43	10	0.05	100	1000	1000
44	PA44	10	0.05	100	1000	1000
45	PA45	10	0.05	100	1000	1000
46	PA46	10	0.05	100	1000	1000
47	PA47	10	0.05	100	1000	1000
48	PA48	10	0.05	100	1000	1000
49	PA49	10	0.05	100	1000	1000
50	PA50	10	0.05	100	1000	1000
51	PA51	10	0.05	100	1000	1000
52	PA52	10	0.05	100	1000	1000
53	PA53	10	0.05	100	1000	1000
54	PA54	10	0.05	100	1000	1000
55	PA55	10	0.05	100	1000	1000
56	PA56	10	0.05	100	1000	1000
57	PA57	10	0.05	100	1000	1000
58	PA58	10	0.05	100	1000	1000
59	PA59	10	0.05	100	1000	1000
60	PA60	10	0.05	100	1000	1000
61	PA61	10	0.05	100	1000	1000
62	PA62	10	0.05	100	1000	1000
63	PA63	10	0.05	100	1000	1000
64	PA64	10	0.05	100	1000	1000
65	PA65	10	0.05	100	1000	1000
66	PA66	10	0.05	100	1000	1000
67	PA67	10	0.05	100	1000	1000
68	PA68	10	0.05	100	1000	1000
69	PA69	10	0.05	100	1000	1000
70	PA70	10	0.05	100	1000	1000
71	PA71	10	0.05	100	1000	1000
72	PA72	10	0.05	100	1000	1000
73	PA73	10	0.05	100	1000	1000
74	PA74	10	0.05	100	1000	1000
75	PA75	10	0.05	100	1000	1000
76	PA76	10	0.05	100	1000	1000
77	PA77	10	0.05	100	1000	1000
78	PA78	10	0.05	100	1000	1000
79	PA79	10	0.05	100	1000	1000
80	PA80	10	0.05	100	1000	1000
81	PA81	10	0.05	100	1000	1000
82	PA82	10	0.05	100	1000	1000
83	PA83	10	0.05	100	1000	1000
84	PA84	10	0.05	100	1000	1000
85	PA85	10	0.05	100	1000	1000
86	PA86	10	0.05	100	1000	1000
87	PA87	10	0.05	100	1000	1000
88	PA88	10	0.05	100	1000	1000
89	PA89	10	0.05	100	1000	1000
90	PA90	10	0.05	100	1000	1000
91	PA91	10	0.05	100	1000	1000
92	PA92	10	0.05	100	1000	1000
93	PA93	10	0.05	100	1000	1000
94	PA94	10	0.05	100	1000	1000
95	PA95	10	0.05	100	1000	1000
96	PA96	10	0.05	100	1000	1000
97	PA97	10	0.05	100	1000	1000
98	PA98	10	0.05	100	1000	1000
99	PA99	10	0.05	100	1000	1000
100	PA100	10	0.05	100	1000	1000

Trajectory of the robot tip can be shown as an animation.

9 Control functions by controller

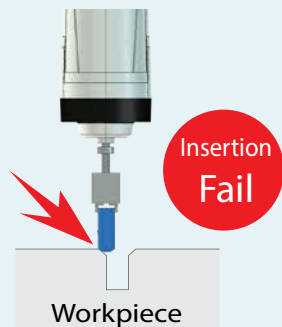
■ Compliance control

It controls the robot motion softly by sensing external forces and supports fitting of the workpiece by reducing the contact force at the time of insertion.

* Arm lengths of 180/800/1000 are not supported.

(Example) In case positional errors exist when inserting a pin into a part (workpiece).

Normal control
The pin collides with the chamfered part of the inserting hole, making insertion impossible.



Compliance control
The pin moves along the chamfered surface, enabling the pin to insert.



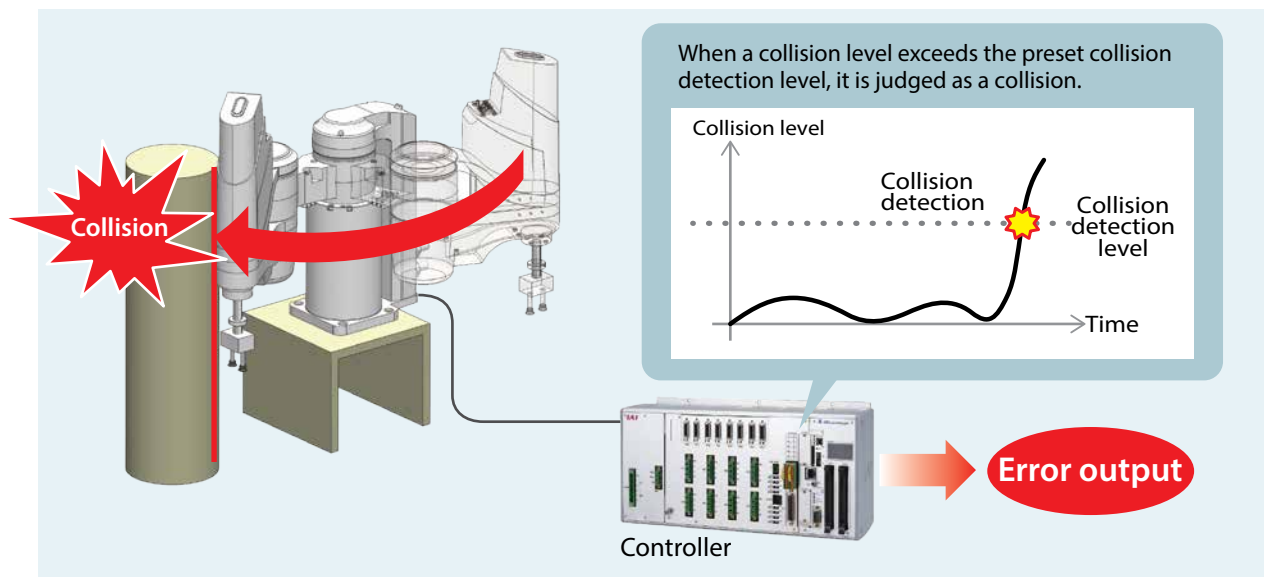
[Note]

- * Workpieces may not be inserted depending on the condition of use.
- * Inclination to the Z-axis cannot be traced.
- * Depending on the materials of the workpiece and the hole, damages may occur.

■ Collision detection function

If the SCARA robot detects a collision with an object, it stops the operation immediately. It reduces damages on the gripper, workpiece and robot when a collision occurs.

* Arm length of 180 is not supported.

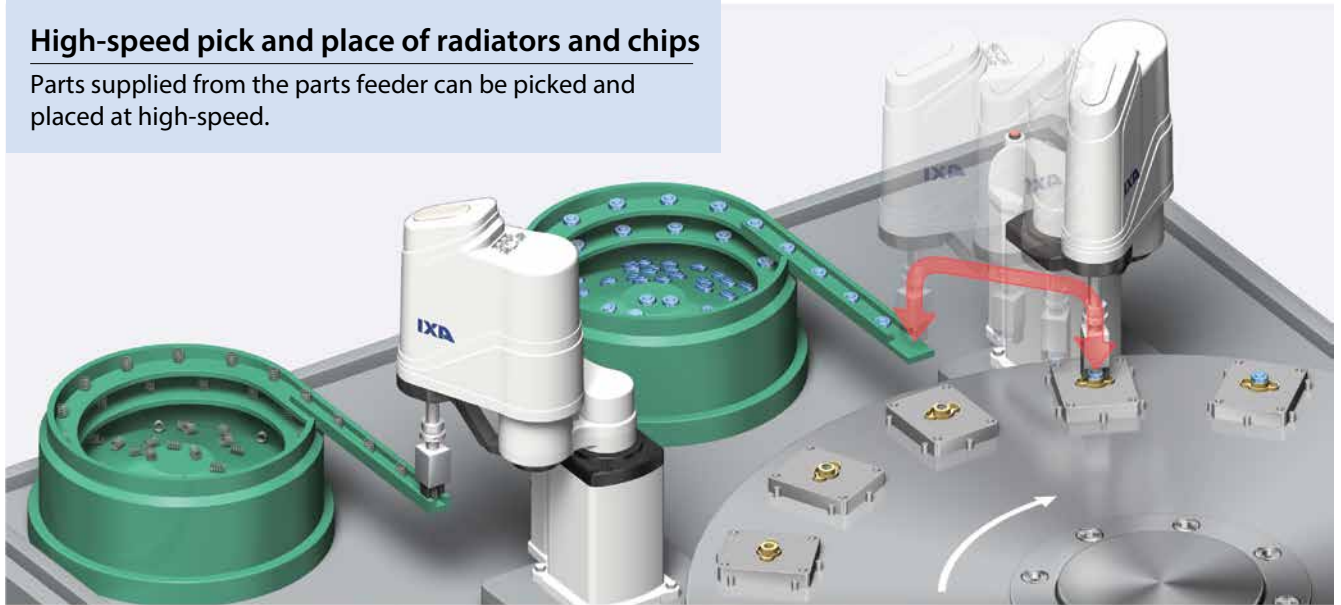


[Note]

- * It does not guarantee safety for the human body.
- * It is an auxiliary function to reduce damages on the peripheral devices or the like. This function will not prevent damage 100%.

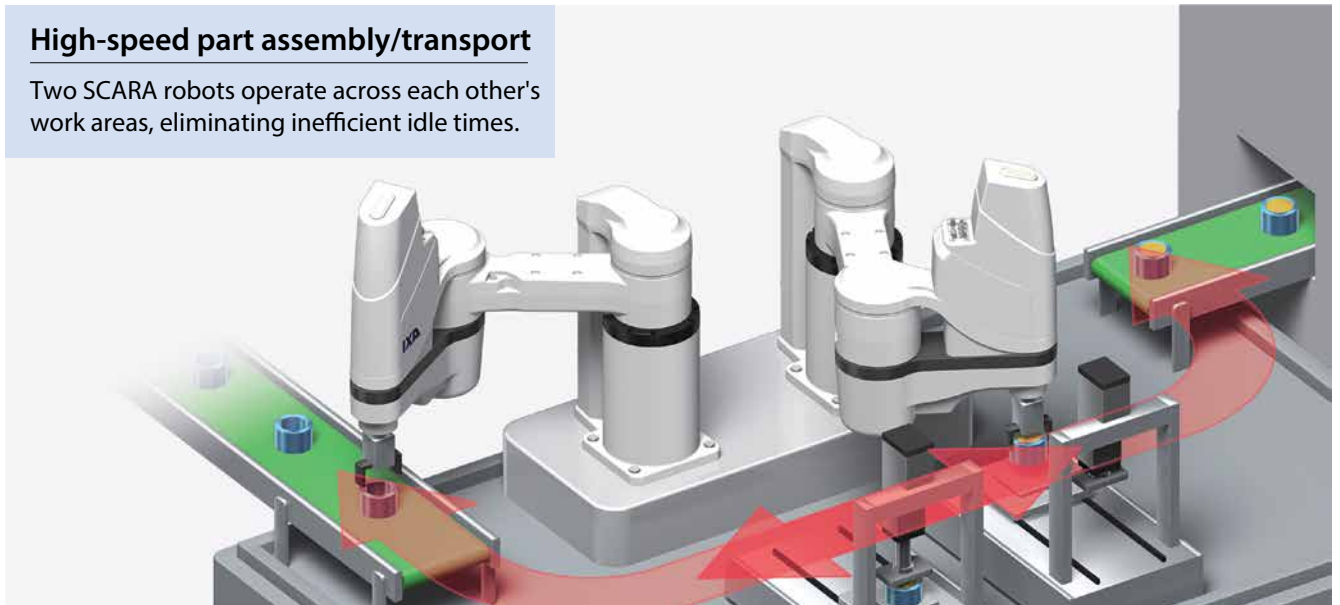
High-speed pick and place of radiators and chips

Parts supplied from the parts feeder can be picked and placed at high-speed.



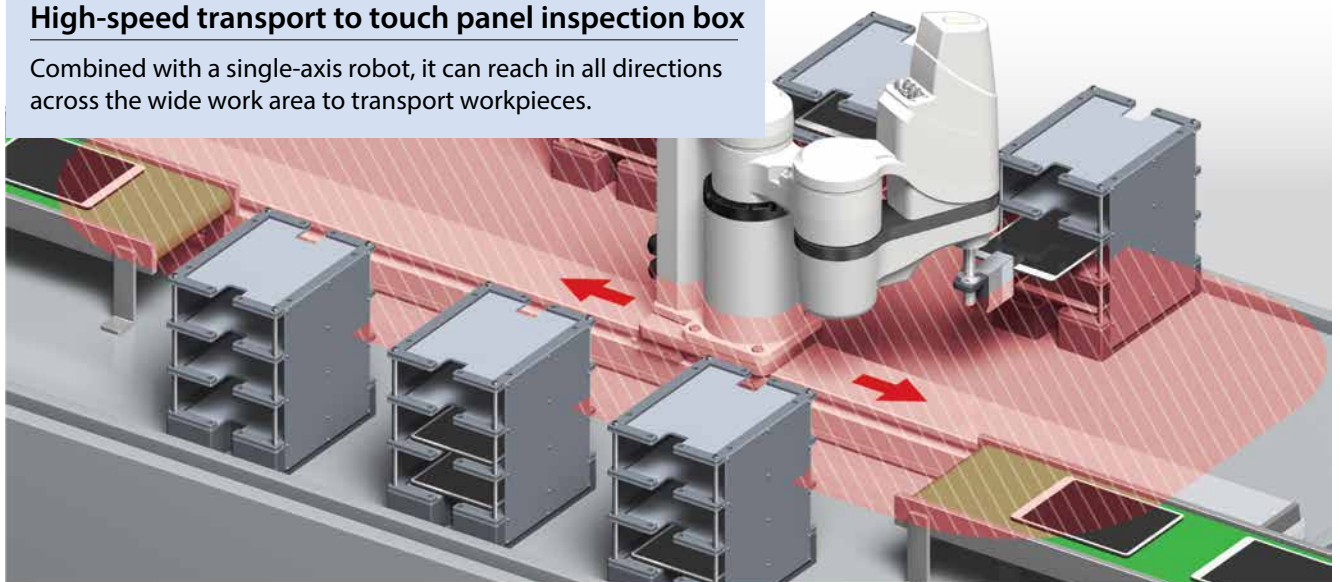
High-speed part assembly/transport

Two SCARA robots operate across each other's work areas, eliminating inefficient idle times.



High-speed transport to touch panel inspection box

Combined with a single-axis robot, it can reach in all directions across the wide work area to transport workpieces.



IXA	—		—		—	T2	—	
Series		Type		Cable Length		Applicable Controllers		Options
3NNN1805	3-axis standard type/arm length 180mm/vertical axis 50mm					T2	XSEL-RAX/SAX	LED Pilot lamp
4NNN1805	4-axis standard type/arm length 180mm/vertical axis 50mm							
3NNN3015	3-axis standard type/arm length 300mm/vertical axis 150mm							
4NNN3015	4-axis standard type/arm length 300mm/vertical axis 150mm							
3NNN4518	3-axis standard type/arm length 450mm/vertical axis 180mm							
4NNN4518	4-axis standard type/arm length 450mm/vertical axis 180mm							
3NNN4533	3-axis standard type/arm length 450mm/vertical axis 330mm							
4NNN4533	4-axis standard type/arm length 450mm/vertical axis 330mm							
3NNN6018	3-axis standard type/arm length 600mm/vertical axis 180mm							
4NNN6018	4-axis standard type/arm length 600mm/vertical axis 180mm							
3NNN6033	3-axis standard type/arm length 600mm/vertical axis 330mm							
4NNN6033	4-axis standard type/arm length 600mm/vertical axis 330mm							
4NNN8020	4-axis standard type/arm length 800mm/vertical axis 200mm							
4NNN8040	4-axis standard type/arm length 800mm/vertical axis 400mm							
4NNN10020	4-axis standard type/arm length 1000mm/vertical axis 200mm							
4NNN10040	4-axis standard type/arm length 1000mm/vertical axis 400mm							
3NSN3015	3-axis high-speed type/arm length 300mm/vertical axis 150mm							
4NSN3015	4-axis high-speed type/arm length 300mm/vertical axis 150mm							
3NSN4518	3-axis high-speed type/arm length 450mm/vertical axis 180mm							
4NSN4518	4-axis high-speed type/arm length 450mm/vertical axis 180mm							
3NSN4533	3-axis high-speed type/arm length 450mm/vertical axis 330mm							
4NSN4533	4-axis high-speed type/arm length 450mm/vertical axis 330mm							
3NSN6018	3-axis high-speed type/arm length 600mm/vertical axis 180mm							
4NSN6018	4-axis high-speed type/arm length 600mm/vertical axis 180mm							
3NSN6033	3-axis high-speed type/arm length 600mm/vertical axis 330mm							
4NSN6033	4-axis high-speed type/arm length 600mm/vertical axis 330mm							
4NSN8020	4-axis high-speed type/arm length 800mm/vertical axis 200mm							
4NSN8040	4-axis high-speed type/arm length 800mm/vertical axis 400mm							
4NSN10020	4-axis high-speed type/arm length 1000mm/vertical axis 200mm							
4NSN10040	4-axis high-speed type/arm length 1000mm/vertical axis 400mm							

* Only the standard type arm lengths of 300/450/600 can be selected.

N	None
5L	5m
10L	10m
<input type="checkbox"/> L	Specified length (1m increments), maximum length 15m

*Selectable options are different according to the type. Refer to the respective type page for details.

(Example) **IXA - 3 NNN 45 18 - 5L - T2 - LED**

Number of axes: 3

Type: Standard

Arm length: 450mm

Vertical axis stroke: 180mm

Cable length: 5m

Controller: XSEL-RAX/SAX

Option: Pilot lamp

Type	Model	Number of axes	Arm length(mm)		Vertical axis stroke(mm)	Standard cycle time (s)	Continuous cycle time (s)	Maximum payload(kg)	Reference page
			First arm	Second arm					
Standard type	IXA-3NNN1805	3 axes	80	100	50	0.26	0.45	1	▶P9
	IXA-4NNN1805	4 axes							▶P9
	IXA-3NNN3015	3 axes	120	180	150	0.38	0.55	3	▶P13
	IXA-4NNN3015	4 axes							▶P13
	IXA-3NNN4518	3 axes	200	250	180			3	▶P17
	IXA-4NNN4518	4 axes			▶P17				
	IXA-3NNN4533	3 axes			330				▶P17
	IXA-4NNN4533	4 axes			▶P17				
	IXA-3NNN6018	3 axes	350	250	180			6	▶P23
	IXA-4NNN6018	4 axes			▶P23				
	IXA-3NNN6033	3 axes			330				▶P23
	IXA-4NNN6033	4 axes			▶P23				
	IXA-4NNN8020	4 axes	400	400	200	0.43	0.79	21	▶P29
	IXA-4NNN8040	4 axes			400				▶P29
	IXA-4NNN10020	4 axes	600	600	200	0.45		21	▶P35
	IXA-4NNN10040	4 axes			400				▶P35
High-speed type	IXA-3NSN3015	3 axes	120	180	150	0.26	0.45	8	▶P41
	IXA-4NSN3015	4 axes							▶P41
	IXA-3NSN4518	3 axes	200	250	180			10	▶P45
	IXA-4NSN4518	4 axes			▶P45				
	IXA-3NSN4533	3 axes			330				▶P45
	IXA-4NSN4533	4 axes			▶P45				
	IXA-3NSN6018	3 axes	350	250	180			12	▶P51
	IXA-4NSN6018	4 axes			▶P51				
	IXA-3NSN6033	3 axes			330				▶P51
	IXA-4NSN6033	4 axes			▶P51				
	IXA-4NSN8020	4 axes	400	400	200	0.29	0.56	24	▶P57
	IXA-4NSN8040	4 axes			400				▶P57
	IXA-4NSN10020	4 axes	600	400	200	0.32	0.56	24	▶P63
	IXA-4NSN10040	4 axes			400				▶P63

IXA-4NNN1805

Arm Length
180
mm

IXA		NNN						18		05					T2	
Series		Number of axes		Type		Arm length		Vertical stroke					Cable length		Applicable controller	
		3	axes	NNN	Standard type	18	180mm	5	50mm				N	None	T2	XSEL-RAX/SAX
		4	axes										5L	5m		
													10L	10m		
													<input type="checkbox"/> L	Specified length (1m increments)		

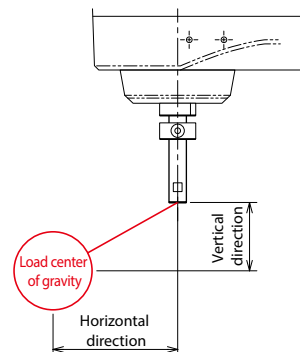


Item		Description	
		3-axis specification	4-axis specification
Max. payload (kg) (Note 1)		1	
Speed (Note 2)	Combined max. speed (mm/s)		2638
	Max. speed of individual axes	1st arm (deg/s)	540
		2nd arm (deg/s)	540
		Vertical axis (mm/s)	850
		Rotational axis (deg/s)	—
Push force (N) (Note 3)		Upper limit	40
		Lower limit	5
Arm length (mm)		180	
Individual arm length (mm)		1st arm	80
		2nd arm	100
Operation range of individual axes		1st arm (deg)	±125
		2nd arm (deg)	±145
		Vertical axis (mm)	50
		Rotational axis (deg)	—

Item		Description	
		3-axis specification	4-axis specification
Positioning repeatability (Note 4)	Within horizontal surface	±0.01mm	
	Vertical axis	±0.01mm	
	Rotational axis	—	±0.01 degrees
User wiring		10-core (9-core + shield) AWG25 (rated 30V/Max. 1A)	
User piping		Outer diameter Φ4, inner diameter Φ2.5, air tube 2 pcs. (max. usable pressure 0.6MPa)	
LED pilot lamp (Note 5)		Amber color LED, small pilot lamp 1 pc. (DC24V supply required)	
Brake release switch (Note 6)		Brake release switch for preventing vertical axis from dropping.	
Tip axis	Allowable torque	0.35 N · m	0.35 N · m
	Allowable load moment	0.5 N · m	
Ambient operational temperature and humidity		0-40℃, 20-85% RH or lower (non-condensing)	
Degree of protection		IP20	
Vibration- and impact-resistance		No impact or vibration should be applied.	
Noise (Note 7)		80 dB or lower	
International standard		CE marking, RoHS	
Motor type		AC servo motor	
Motor wattage	1st arm	50W	
	2nd arm	50W	
	Vertical axis	50W	
	Rotational axis	—	50W
Encoder type		Battery-less absolute	
Encoder pulse		16384 pulse/rev	

Number of axes	Tip axis allowable inertia moment
3-axis specification	0.004 kg · m ²
4-axis specification	

This represents the allowable inertia moment converted to the center of the SCARA robot tip axis (3-axis spec.: vertical axis, 4-axis spec.: rotational axis). Make sure that the offset value from center of the rotation of the tip axis to the tool center of gravity is within the guideline. If the tool center of gravity is far from the tip axis center, it is necessary to reduced speed and acceleration/deceleration appropriately. The overhang distance is limited depending on the payload and operating condition.



Horizontal direction	Vertical direction
30mm or less	20mm or less



- (1) Please refer to P69 for Notes 1 - 9.
- (2) The maximum set value for acceleration/deceleration varies depending on the weight of the object being transported, the travel distance, and the location. Overload errors may occur for continuous operations at the maximum setting value. For continuous operation, either lower the acceleration/deceleration values or refer to the duty ratio (guideline) and set a stop time after acceleration/deceleration.
- (3) If the motor is replaced, absolute reset must be performed. An adjustment jig will be required to perform an absolute reset on the rotational axis. Please refer to P80 for details.
- (4) A continuous operation cannot be performed for SCARA robots at 100% of speed and acceleration. Refer to the "Acceleration/Deceleration Setting Guidelines" for executable operating conditions.
- (5) When switching the arm system, the arm will once extend on a linear line. Be careful of interference with peripheral devices.

Name	Model number	Reference page
User cable	CB-IXA-USR□□□-CS	79
Flange	IX-FL-4	78

(Note) Please purchase separately.

Type	Cable code	3-axis specification	4-axis specification
Standard type	5L (5m)	✓	✓
	10L (10m)	✓	✓
Specified length	1L (1m) ~ 4L (4m)	✓	✓
	6L (6m) ~ 9L (9m)	✓	✓
	11L (11m)	✓	✓
	12L (12m)	✓	✓
	13L (13m)	✓	✓
	14L (14m)	✓	✓
	15L (15m)	✓	✓

(Note) Total amount of the following cables:
 [3-axis spec.] Motor cables:3, Encoder cables: 3, Brake cable: 1
 [4-axis spec.] Motor cables:4, Encoder cables: 4, Brake cable: 1

Item	Time
Standard cycle time	0.26 seconds
Continuous cycle time	0.45 seconds

The standard/continuous cycle time represents the time required when an operation is performed with a cycle operation setting at maximum speed, under the following conditions.

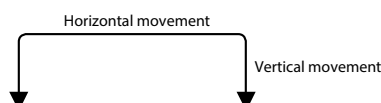
0.2kg transport, vertical movement 25mm, horizontal movement 100mm (rough positioning arch motion)

[Standard cycle time]

The time required for maximum speed. This is a general guideline for high speed performance. Note that continuous operation is not possible under maximum speed operation.

[Continuous cycle time]

The cycle time for continuous operation.

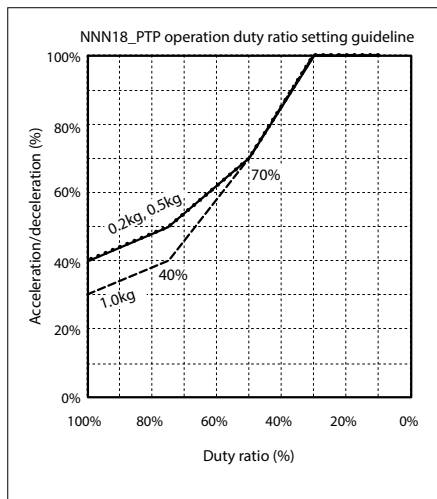
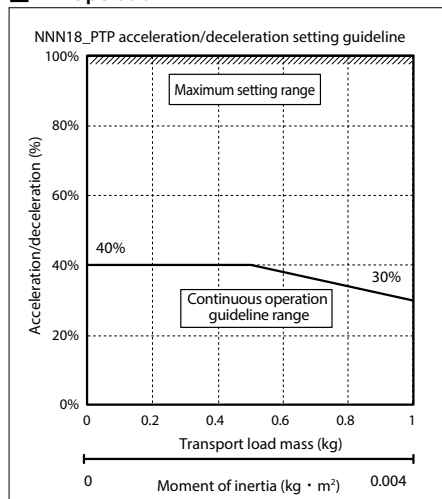


Acceleration/Deceleration Setting Guidelines

The SCARA Robot IXA cannot operate continuously at the maximum acceleration/deceleration or maximum speed specified in the catalog. To operate at the maximum acceleration/deceleration, set a stop time referring to the continuous operation duty ratio guideline graph. If a continuous operation is required, do so within the continuous operation guideline range shown in the acceleration/deceleration setting guideline graph.

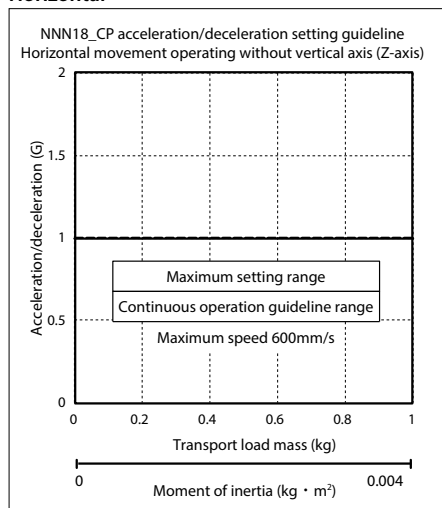
- 1) For a PTP operation, always use the WGHT command in the program to set the weight and moment of inertia. For the SCARA robot, the maximum acceleration/deceleration for each payload is set at 100%. When the payload differs, the operation time will also vary even at the same acceleration/deceleration or speed setting.
- 2) Adjust the acceleration/deceleration setting value by gradually increasing it from the continuous operation reference value.
- 3) If an overload error occurs, lower the acceleration/deceleration as required, or set a stop time by referring to the continuous operation duty ratio guideline.
- 4) Duty ratio (%) = (Operation time / (Operation time + Stop time)) x 100
- 5) When moving the robot horizontally at high speed, operate the vertical axis as close to the upward end as possible.
- 6) Set the moment of inertia and payload to the allowable value or lower.
- 7) The load mass represents the moment of inertia and weight at the center of rotation.
- 8) Operate the robot at an appropriate acceleration/deceleration according to the weight and moment of inertia for the 4-axis specification. Otherwise, the drive section may become prematurely unusable or damaged, or vibration may occur.
- 9) If the load moment of inertia is high, vibration may occur in the vertical axis, depending on the position of the vertical axis. In such a case, decrease the acceleration/deceleration for operation as required.

PTP Operation

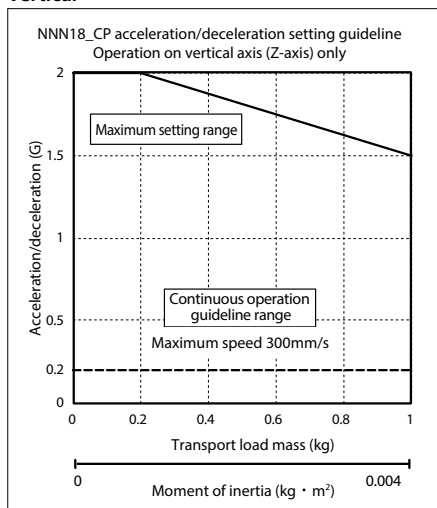


CP Operation

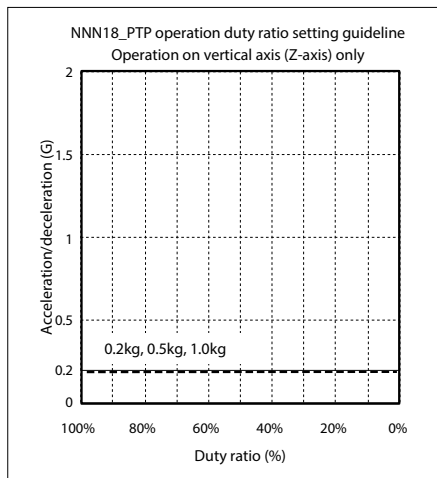
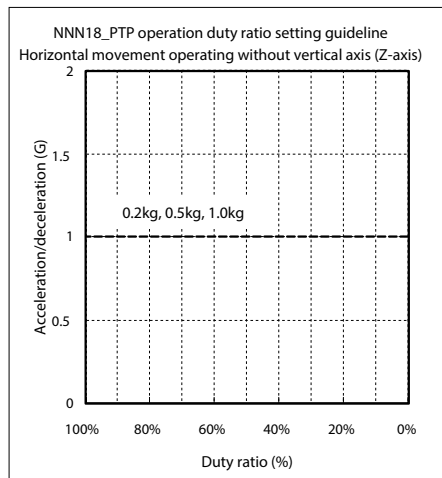
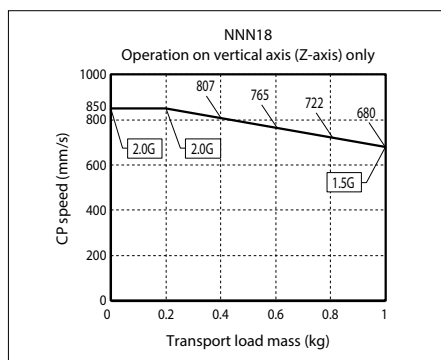
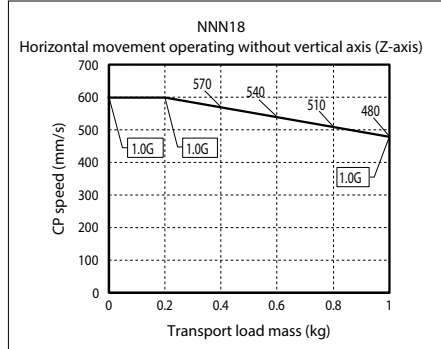
Horizontal



Vertical

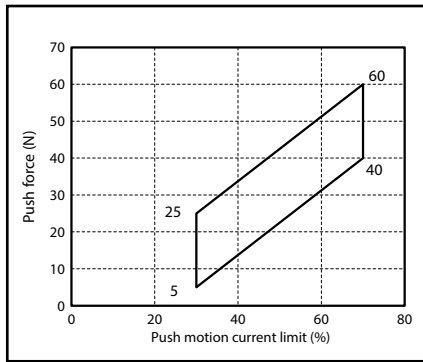


CP operation: Acceleration/deceleration Limitations



Correlation between push force and current limit (for reference)

Push force at the tip of the vertical axis (Note 3).



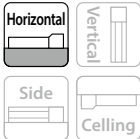
IXA-3NNN3015

IXA-4NNN3015

Battery-less Absolute
Arm Length: **300 mm**

Model Specification Items

IXA		NNN		30		15		T2	
Series		Type	Arm length	Vertical stroke		Cable length		Applicable controller	Option
3	3 axes	NNN	Standard type	30	300mm	15	150mm	T2	XSEL-RAX/SAX
4	4 axes								See below



Main specifications

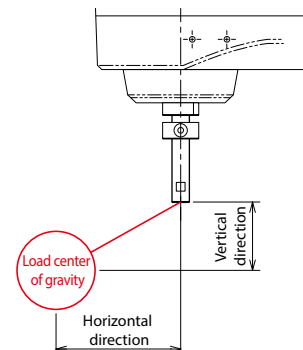
Item		Description	
		3-axis specification	4-axis specification
Max. payload (kg) (Note 1)		3	
Speed (Note 2)	Combined max. speed (mm/s)	5529	
	1st arm (deg/s)	660	
	2nd arm (deg/s)	660	
	Vertical axis (mm/s)	1400	
	Rotational axis (deg/s)	—	1600
Push force (N) (Note 3)	Upper limit	60	
	Lower limit	10	
Arm length (mm)		300	
Individual arm length (mm)	1st arm	120	
	2nd arm	180	
Operation range of individual axes	1st arm (deg)	±135	
	2nd arm (deg)	±142	
	Vertical axis (mm)	150	
	Rotational axis (deg)	—	±360

Item		Description	
		3-axis specification	4-axis specification
Positioning repeatability (Note 4)	Within horizontal surface	±0.01 mm	
	Vertical axis	±0.01 mm	
User wiring	Rotational axis	±0.005 degrees	
		10-core (9-core + shield) AWG24 (rated 30V/Max. 1A)	
User piping		Outer diameter Φ4, inner diameter Φ2.5, air tube 3 pcs. (max. usable pressure 0.6MPa)	
LED pilot lamp (Note 5)		Amber color LED, small pilot lamp 1 pc. (DC24V supply required)	
Brake release switch (Note 6)		Brake release switch for preventing vertical axis from dropping.	
Tip axis	Allowable torque	3.2 N · m	3.2 N · m
	Allowable load moment	4.5 N · m	
Ambient operational temperature and humidity		0-40°C, 20-85% RH or lower (non-condensing)	
Degree of protection		IP20	
Vibration- and impact-resistance		No impact or vibration should be applied.	
Noise (Note 7)		80 dB or lower	
International standard		CE marking, RoHS	
Motor type		AC servo motor	
Motor wattage	1st arm	400W	
	2nd arm	200W	
	Vertical axis	100W	
	Rotational axis	—	100W
Encoder type		Battery-less absolute	
Encoder pulse		16384 pulse/rev	

Tip axis allowable inertia moment

Number of axes	Tip axis allowable inertia moment
3-axis specification	0.06 kg · m ²
4-axis specification	

This represents the allowable inertia moment converted to the center of the SCARA robot tip axis (3-axis spec.: vertical axis, 4-axis spec.: rotational axis). Make sure that the offset value from center of the rotation of the tip axis to the tool center of gravity is within the guideline. If the tool center of gravity is far from the tip axis center, it is necessary to reduced speed and acceleration/deceleration appropriately. The overhang distance is limited depending on the payload and operating condition.



Horizontal direction	Vertical direction
150mm or less	100mm or less

Selection Notes



- Please refer to P69 for Notes 1 - 9.
- The maximum set value for acceleration/deceleration varies depending on the weight of the object being transported, the travel distance, and the location. Overload errors may occur for continuous operations at the maximum setting value. For continuous operation, either lower the acceleration/deceleration values or refer to the duty ratio (guideline) and set a stop time after acceleration/deceleration.
- If the motor is replaced, absolute reset must be performed. An adjustment jig will be required to perform an absolute reset on the rotational axis. Please refer to P80 for details.
- A continuous operation cannot be performed for SCARA robots at 100% of speed and acceleration. Refer to the "Acceleration/Deceleration Setting Guidelines" for executable operating conditions.
- When switching the arm system, the arm will once extend on a linear line. Be careful of interference with peripheral devices.

Option

Name	Model number	Reference page
LED pilot lamp	LED	77

Option

Name	Model number	Reference page
User cable	CB-IXA-USR <input type="checkbox"/> -CS	79
Flange	IX-FL-1	78

(Note) Please purchase separately.

Cable length

Type	Cable code	3-axis specification	4-axis specification
Standard type	5L (5m)	✓	✓
	10L (10m)	✓	✓
Specified length	1L (1m) ~ 4L (4m)	✓	✓
	6L (6m) ~ 9L (9m)	✓	✓
	11L (11m)	✓	✓
	12L (12m)	✓	✓
	13L (13m)	✓	✓
	14L (14m)	✓	✓
	15L (15m)	✓	✓

(Note) Total amount of the following cables:
[3-axis spec.] Motor cables:3, Encoder cables: 3, Brake cable: 1
[4-axis spec.] Motor cables:4, Encoder cables: 4, Brake cable: 1

Cycle time

Item	Time
Standard cycle time	0.38 seconds
Continuous cycle time	0.55 seconds

The standard/continuous cycle time represents the time required when an operation is performed with a cycle operation setting at maximum speed, under the following conditions.

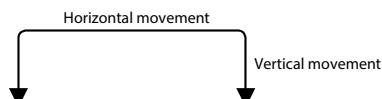
2kg transport, vertical movement 25mm, horizontal movement 300mm (rough positioning arch motion)

[Standard cycle time]

The time required for maximum speed. This is a general guideline for high speed performance. Note that continuous operation is not possible under maximum speed operation.

[Continuous cycle time]

The cycle time for continuous operation.



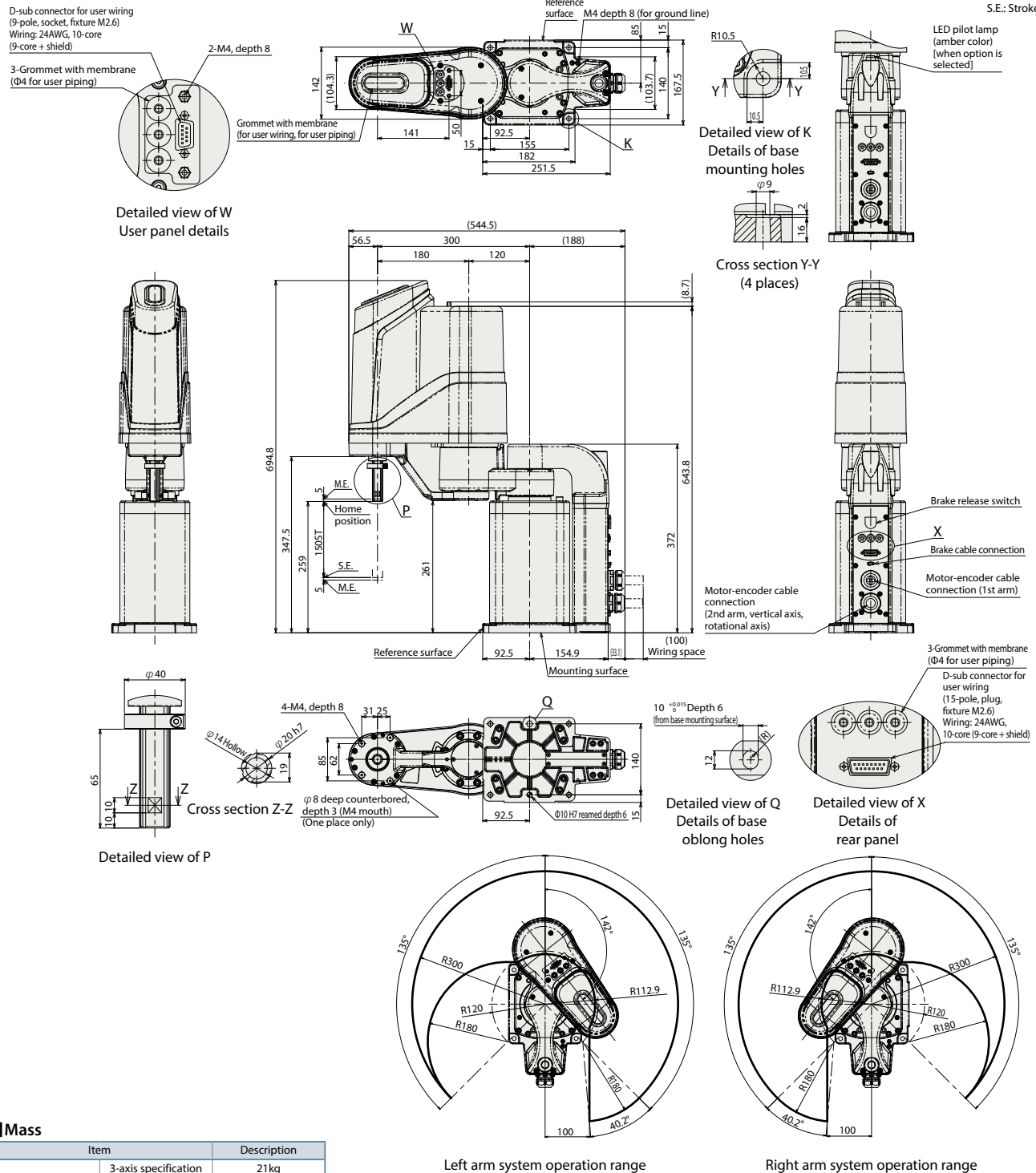
Dimensions

(Note) Refer to P70 (Note 9) for cable connections

CAD drawings can be downloaded from our website.
www.intelligentactuator.com



S.T: Stroke
M.E: Mechanical end
S.E: Stroke end



Mass

Item	Description
Mass	3-axis specification 21kg
	4-axis specification 22kg

Applicable controller

The actuator on this page can be operated by the controller indicated below.

Name	External view	Max. number of connectable axes	Power supply voltage	Control method													Max. number of positioning points	Reference page	
				Positioner	Pulse train	Program	Network* option												
DV	CC	CIE	PR				CN	ML	ML3	EC	EP	PRT	SSN	ECM					
XSEL-RAX/SAX	see page 81	8	3-phase AC200V	—	—	●	●	●	●	—	—	—	●	●	—	—	—	36666 (Depending on the type)	81

(Note) Contact IAI or the website for network abbreviations such as DV and CC.
(Note) Up to one SCARA robot + one 4-axis robot can be controlled.

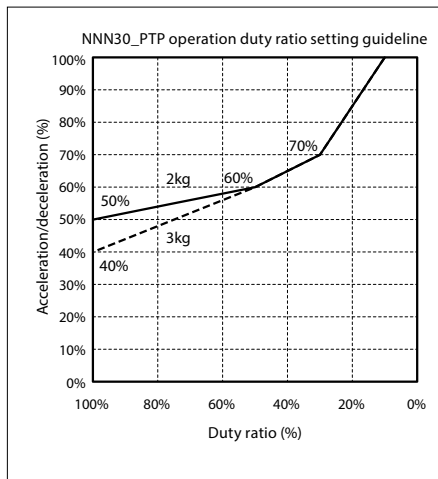
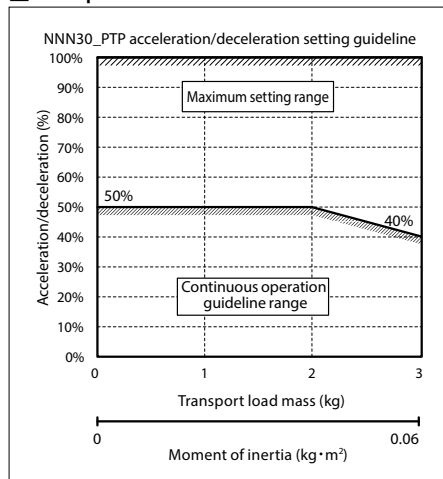
●: Available
—: Unavailable

Acceleration/Deceleration Setting Guidelines

The SCARA Robot IXA cannot operate continuously at the maximum acceleration/deceleration or maximum speed specified in the catalog. To operate at the maximum acceleration/deceleration, set a stop time referring to the continuous operation duty ratio guideline graph. If a continuous operation is required, do so within the continuous operation guideline range shown in the acceleration/deceleration setting guideline graph.

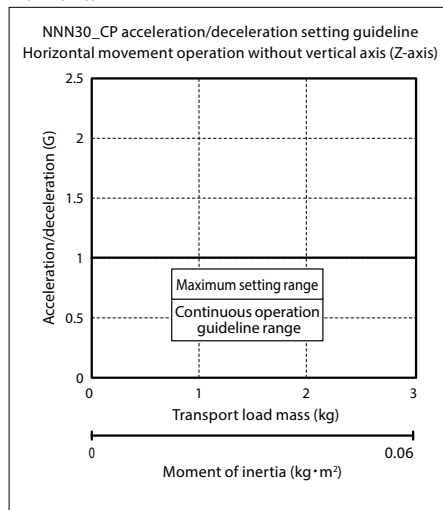
- 1) For a PTP operation, always use the WGHT command in the program to set the weight and moment of inertia. For the SCARA robot, the maximum acceleration/deceleration for each payload is set at 100%. When the payload differs, the operation time will also vary even at the same acceleration/deceleration or speed setting.
- 2) Adjust the acceleration/deceleration setting value by gradually increasing it from the continuous operation reference value.
- 3) If an overload error occurs, lower the acceleration/deceleration as required, or set a stop time by referring to the continuous operation duty ratio guideline.
- 4) Duty ratio (%) = (Operation time / (Operation time + Stop time)) x 100
- 5) When moving the robot horizontally at high speed, operate the vertical axis as close to the upward end as possible.
- 6) Set the moment of inertia and payload to the allowable value or lower.
- 7) The load mass represents the moment of inertia and weight at the center of rotation.
- 8) Operate the robot at an appropriate acceleration/deceleration according to the weight and moment of inertia for the 4-axis specification. Otherwise, the drive section may become prematurely unusable or damaged, or vibration may occur.
- 9) If the load moment of inertia is high, vibration may occur in the vertical axis, depending on the position of the vertical axis. In such a case, decrease the acceleration/deceleration for operation as required.

PTP Operation

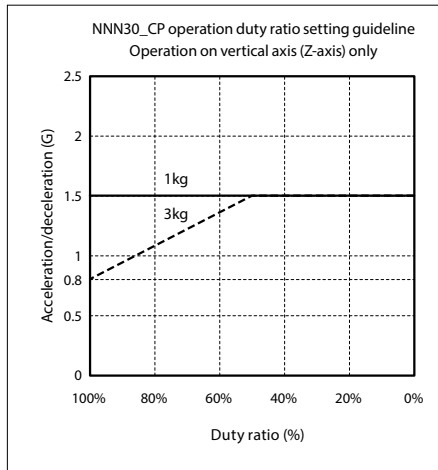
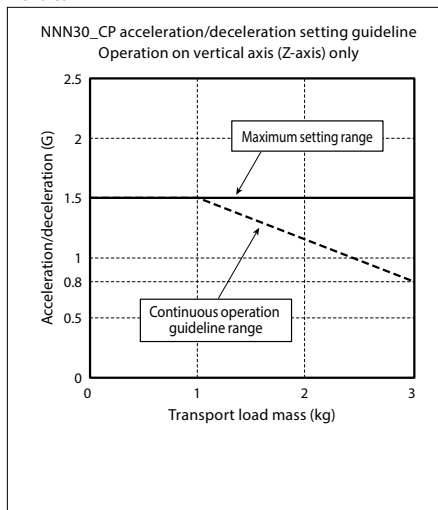


CP Operation

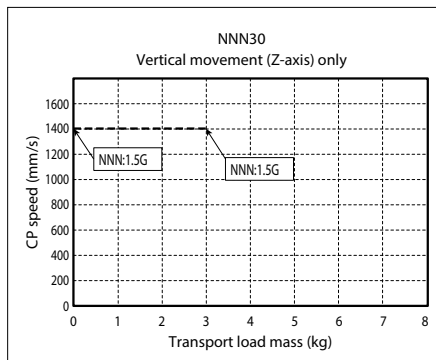
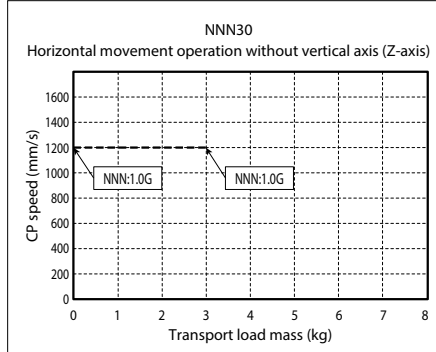
Horizontal



Vertical

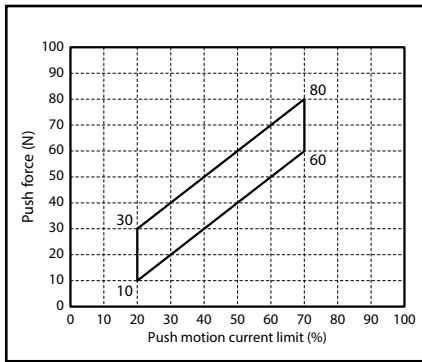


CP operation: Acceleration/deceleration Limitations



Correlation between push force and current limit (for reference)

Push force at the tip of the vertical axis (Note 3).



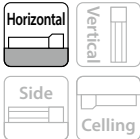
IXA-3NNN45
IXA-4NNN45

 Battery-less
Absolute

 Arm Length:
450
mm

Model Specification Items

IXA	—	NNN	45	—	—	T2	—
Series	Number of axes	Type	Arm length	Vertical stroke	Cable length	Applicable controller	Option
	3 3 axes	NNN	Standard type	45 450mm	18 180mm	T2	XSEL-RAX/SAX
	4 4 axes			33 330mm	5L 5m		See below
					10L 10m		
					<input type="checkbox"/> L Specified length (1m increments)		


Main specifications

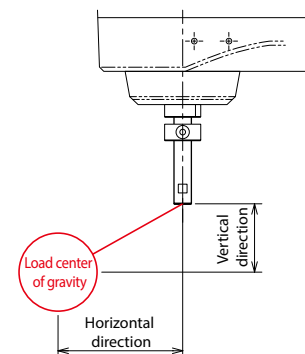
Item			Description	
			3-axis specification	4-axis specification
Max. payload (kg) (Note 1)			3	
Speed (Note 2)	Combined max. speed (mm/s)		7453	
	Max. speed of individual axes	1st arm (deg/s)	610	
		2nd arm (deg/s)	610	
		Vertical axis (mm/s)	1200	
		Rotational axis (deg/s)	—	2000
Push force (N) (Note 3)		Upper limit	55	
		Lower limit	10	
Arm length (mm)		450		
Individual arm length (mm)		1st arm	200	
		2nd arm	250	
Operation range of individual axes		1st arm (deg)	±137	
		2nd arm (deg)	±137	
		Vertical axis (mm)	180/330	
		Rotational axis (deg)	—	±360

Item		Description	
		3-axis specification	4-axis specification
Positioning repeatability (Note 4)	Within horizontal surface	±0.01mm	
	Vertical axis	±0.01mm	
	Rotational axis	—	±0.005 degrees
User wiring		10-core (9-core + shield) AWG24 (rated 30V/Max. 1A)	
User piping		Outer diameter Φ6, inner diameter Φ4, air tube 3 pcs. (max. usable pressure 0.6MPa)	
LED pilot lamp (Note 5)		Amber color LED, small pilot lamp 1 pc. (DC24V supply required)	
Brake release switch (Note 6)		Brake release switch for preventing vertical axis from dropping.	
Tip axis	Allowable torque	3.2 N · m	3.2 N · m
	Allowable load moment	8.3 N · m	—
Ambient operational temperature and humidity		0-40°C, 20-85% RH or lower (non-condensing)	
Degree of protection		IP20	
Vibration- and impact-resistance		No impact or vibration should be applied.	
Noise (Note 7)		80 dB or lower	
International standard		CE marking, RoHS	
Motor type		AC servo motor	
Motor wattage	1st arm	400W	
	2nd arm	200W	
	Vertical axis	100W	
	Rotational axis	—	100W
Encoder type		Battery-less absolute	
Encoder pulse		16384 pulse/rev	

Tip axis allowable inertia moment

Number of axes	Tip axis allowable inertia moment
3-axis specification	0.05 kg · m ²
4-axis specification	

This represents the allowable inertia moment converted to the center of the SCARA robot tip axis (3-axis spec.: vertical axis. 4-axis spec.: rotational axis). Make sure that the offset value from center of the rotation of the tip axis to the tool center of gravity is within the guideline. If the tool center of gravity is far from the tip axis center, it is necessary to reduced speed and acceleration/deceleration appropriately. The overhang distance is limited depending on the payload and operating condition.



Horizontal direction	Vertical direction
120mm or less	100mm or less

Selection Notes


- Please refer to P69 for Notes 1 - 9.
- The maximum set value for acceleration/deceleration varies depending on the weight of the object being transported, the travel distance, and the location. Overload errors may occur for continuous operations at the maximum setting value. For continuous operation, either lower the acceleration/deceleration values or refer to the duty ratio (guideline) and set a stop time after acceleration/deceleration.
- If the motor is replaced, absolute reset must be performed. An adjustment jig will be required to perform an absolute reset on the rotational axis. Please refer to P80 for details.
- A continuous operation cannot be performed for SCARA robots at 100% of speed and acceleration. Refer to the "Acceleration/Deceleration Setting Guidelines" for executable operating conditions.
- When switching the arm system, the arm will once extend on a linear line. Be careful of interference with peripheral devices.

Option

Name	Model number	Reference page
LED pilot lamp	LED	77

Option

Name	Model number	Reference page
User cable	CB-IXA-USR-□□□-CS	79
Flange	IX-FL-1	78

(Note) Please purchase separately.

Cable length

Type	Cable code	3-axis specification	4-axis specification
Standard type	5L(5m)	✓	✓
	10L(10m)	✓	✓
Specified length	1L(1m) ~ 4L(4m)	✓	✓
	6L(6m) ~ 9L(9m)	✓	✓
	11L(11m)	✓	✓
	12L(12m)	✓	✓
	13L(13m)	✓	✓
	14L(14m)	✓	✓
	15L(15m)	✓	✓

(Note) Total amount of the following cables:
[3-axis spec.] Motor cables:3, Encoder cables: 3, Brake cable: 1
[4-axis spec.] Motor cables:4, Encoder cables: 4, Brake cable: 1

Cycle time

Item	Time
Standard cycle time	0.38 seconds
Continuous cycle time	0.55 seconds

The standard/continuous cycle time represents the time required when an operation is performed with a cycle operation setting at maximum speed, under the following conditions.
2kg transport, vertical movement 25mm, horizontal movement 300mm (rough positioning arch motion)

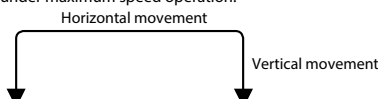
[Standard cycle time]

The time required for maximum speed. This is a general guideline for high speed performance.

Note that continuous operation is not possible under maximum speed operation.

[Continuous cycle time]

The cycle time for continuous operation.

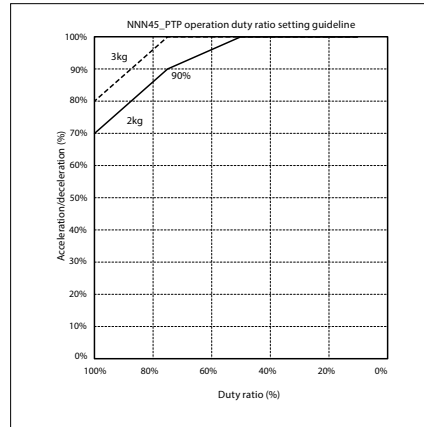
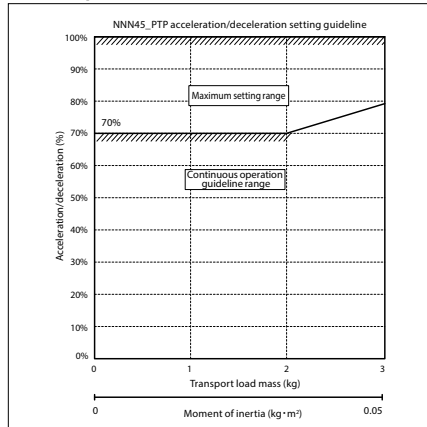


Acceleration/Deceleration Setting Guidelines

The SCARA Robot IXA cannot operate continuously at the maximum acceleration/deceleration or maximum speed specified in the catalog. To operate at the maximum acceleration/deceleration, set a stop time referring to the continuous operation duty ratio guideline graph. If a continuous operation is required, do so within the continuous operation guideline range shown in the acceleration/deceleration setting guideline graph.

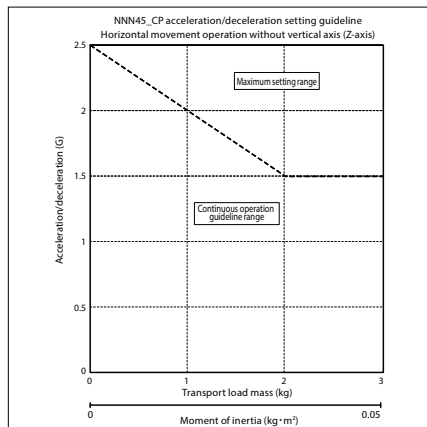
- 1) For a PTP operation, always use the WGHT command in the program to set the weight and moment of inertia. For the SCARA robot, the maximum acceleration/deceleration for each payload is set at 100%. When the payload differs, the operation time will also vary even at the same acceleration/deceleration or speed setting.
- 2) Adjust the acceleration/deceleration setting value by gradually increasing it from the continuous operation reference value.
- 3) If an overload error occurs, lower the acceleration/deceleration as required, or set a stop time by referring to the continuous operation duty ratio guideline.
- 4) Duty ratio (%) = (Operation time / (Operation time + Stop time)) × 100
- 5) When moving the robot horizontally at high speed, operate the vertical axis as close to the upward end as possible.
- 6) Set the moment of inertia and payload to the allowable value or lower.
- 7) The load mass represents the moment of inertia and weight at the center of rotation.
- 8) Operate the robot at an appropriate acceleration/deceleration according to the weight and moment of inertia for the 4-axis specification. Otherwise, the drive section may become prematurely unusable or damaged, or vibration may occur.
- 9) If the load moment of inertia is high, vibration may occur in the vertical axis, depending on the position of the vertical axis. In such a case, decrease the acceleration/deceleration for operation as required.

PTP Operation

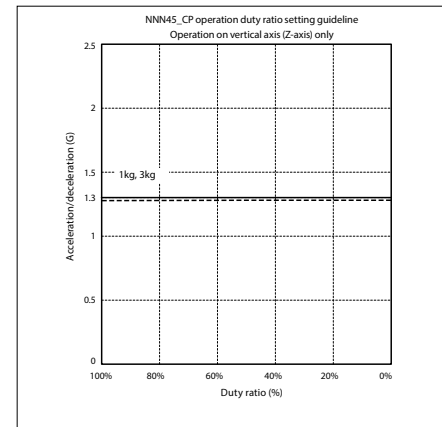
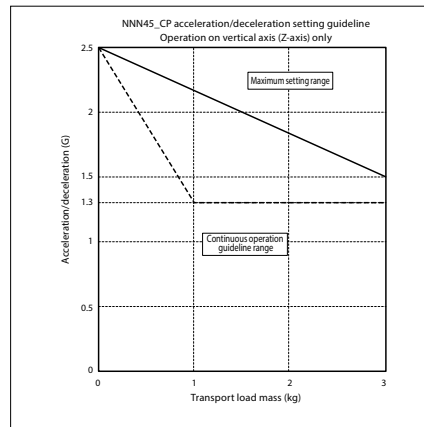


CP Operation

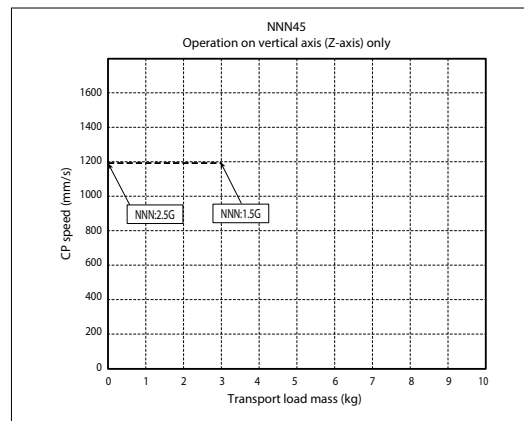
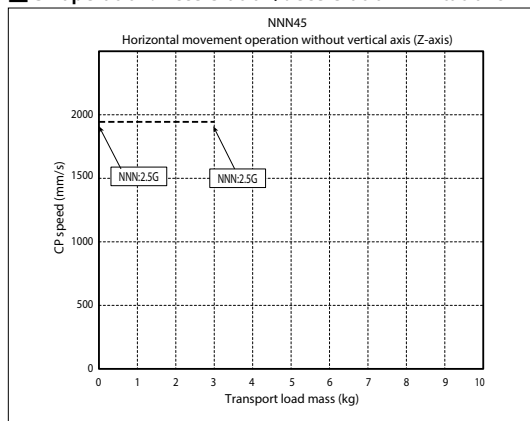
Horizontal



Vertical

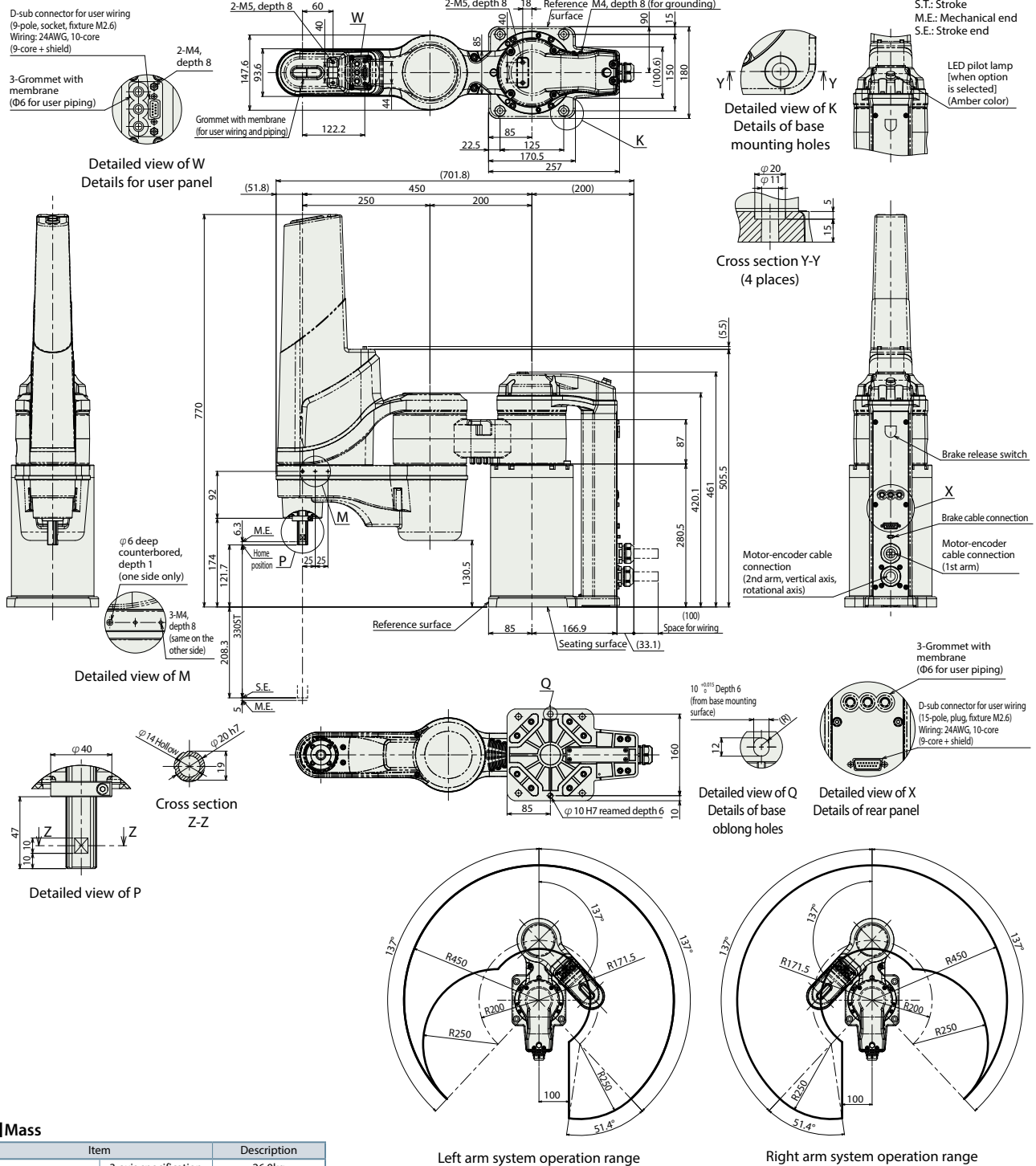


CP operation: Acceleration/deceleration Limitations



IXA-3NNN4533_4NNN4533

(Note) Refer to P70 (Note 9) for cable connections



Mass

Item	Description	
Mass	3-axis specification	26.0kg
	4-axis specification	27.5kg

Applicable controller

The actuator on this page can be operated by the controller indicated below.

Name	External view	Max. number of connectable axes	Power supply voltage	Control method														Max. number of positioning points	Reference page
				Positioner	Pulse train	Program	Network* option												
DV	CC	CIE	PR				CN	ML	ML3	EC	EP	PRT	SSN	ECM					
XSEL-RAX/SAX	see page 81	8	3-phase AC200V	—	—	●	●	●	●	—	—	—	●	●	—	—	—	36666 (Depending on the type)	81

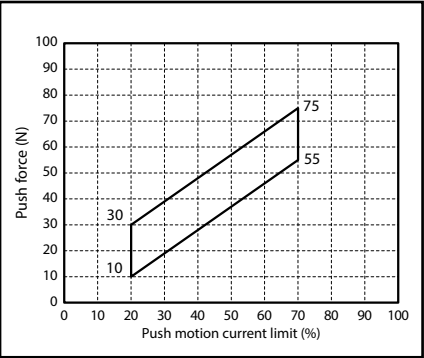
(Note) Contact IAI or the website for network abbreviations such as DV and CC.

(Note) Up to one SCARA robot + one 4-axis robot can be controlled.

●: Available
 —: Unavailable

Correlation between push force and current limit (for reference)

Push force at the tip of the vertical axis (Note 3).



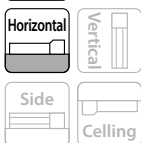
IXA-3NNN60

IXA-4NNN60

Battery-
less
AbsoluteArm Length:
600
mm

Model Specification Items

IXA	—	—	NNN	60	—	—	T2	—	—
Series	Number of axes	Type	Arm length	Vertical stroke	Cable length	Applicable controller	Option		
	3 axes	NNN	Standard type	60 600mm	18 180mm	T2 XSEL-RAX/SAX	See below		
	4 axes			33 330mm	5L 5m				
					10L 10m				
					<input type="checkbox"/> L Specified length (1m increments)				



Main specifications

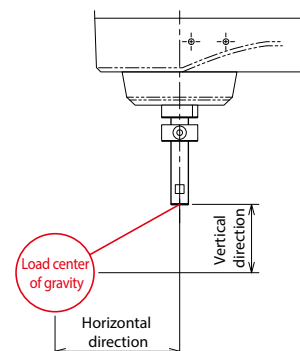
Item		Description	
		3-axis specification	4-axis specification
Max. payload (kg) (Note 1)		6	
Speed (Note 2)	Combined max. speed (mm/s)	5934	
	1st arm (deg/s)	400	
	2nd arm (deg/s)	400	
	Vertical axis (mm/s)	1600	
	Rotational axis (deg/s)	—	2000
Push force (N) (Note 3)	Upper limit	110	
	Lower limit	25	
Arm length (mm)		600	
Individual arm length (mm)	1st arm	350	
	2nd arm	250	
Operation range of individual axes	1st arm (deg)	±137	
	2nd arm (deg)	±140	
	Vertical axis (mm)	180/330	
	Rotational axis (deg)	—	±360

Item		Description	
		3-axis specification	4-axis specification
Positioning repeatability (Note 4)	Within horizontal surface	±0.01mm	
	Vertical axis	±0.01mm	
	Rotational axis	—	±0.005 degrees
User wiring		10-core (9-core + shield) AWG24 (rated 30V/Max. 1A)	
User piping		Outer diameter Φ6, inner diameter Φ4, air tube 3 pcs. (max. usable pressure 0.6MPa)	
LED pilot lamp (Note 5)		Amber color LED, small pilot lamp 1 pc. (DC24V supply required)	
Brake release switch (Note 6)		Brake release switch for preventing vertical axis from dropping.	
Tip axis	Allowable torque	3.2 N·m	3.2 N·m
	Allowable load moment	8.3 N·m	
Ambient operational temperature and humidity		0-40°C, 20-85% RH or lower (non-condensing)	
Degree of protection		IP20	
Vibration- and impact-resistance		No impact or vibration should be applied.	
Noise (Note 7)		80 dB or lower	
International standard		CE marking, RoHS	
Motor type		AC servo motor	
Motor wattage	1st arm	600W	
	2nd arm	200W	
	Vertical axis	200W	
	Rotational axis	—	100W
Encoder type		Battery-less absolute	
Encoder pulse		16384 pulse/rev	

Tip axis allowable inertia moment

Number of axes	Tip axis allowable inertia moment
3-axis specification	0.06 kg · m ²
4-axis specification	

This represents the allowable inertia moment converted to the center of the SCARA robot tip axis (3-axis spec.: vertical axis, 4-axis spec.: rotational axis). Make sure that the offset value from center of the rotation of the tip axis to the tool center of gravity is within the guideline. If the tool center of gravity is far from the tip axis center, it is necessary to reduced speed and acceleration/deceleration appropriately. The overhang distance is limited depending on the payload and operating condition.



Horizontal direction	Vertical direction
120mm or less	100mm or less

Selection Notes



- Please refer to P69 for Notes 1 - 9.
- The maximum set value for acceleration/deceleration varies depending on the weight of the object being transported, the travel distance, and the location. Overload errors may occur for continuous operations at the maximum setting value. For continuous operation, either lower the acceleration/deceleration values or refer to the duty ratio (guideline) and set a stop time after acceleration/deceleration.
- If the motor is replaced, absolute reset must be performed. An adjustment jig will be required to perform an absolute reset on the rotational axis. Please refer to P80 for details.
- A continuous operation cannot be performed for SCARA robots at 100% of speed and acceleration. Refer to the "Acceleration/Deceleration Setting Guidelines" for executable operating conditions.
- When switching the arm system, the arm will once extend on a linear line. Be careful of interference with peripheral devices.

Option

Name	Model number	Reference page
LED pilot lamp	LED	77

Option

Name	Model number	Reference page
User cable	CB-IXA-USR-□□-CS	79
Flange	IX-FL-1	78

(Note) Please purchase separately.

Cable length

Type	Cable code	3-axis specification	4-axis specification
Standard type	5L(5m)	✓	✓
	10L(10m)	✓	✓
	1L(1m) ~ 4L(4m)	✓	✓
Specified length	6L(6m) ~ 9L(9m)	✓	✓
	11L(11m)	✓	✓
	12L(12m)	✓	✓
	13L(13m)	✓	✓
	14L(14m)	✓	✓
	15L(15m)	✓	✓

(Note) Total amount of the following cables:

- [3-axis spec.] Motor cables:3, Encoder cables: 3, Brake cable: 1
 [4-axis spec.] Motor cables:4, Encoder cables: 4, Brake cable: 1

Cycle time

Item	Time
Standard cycle time	0.38 seconds
Continuous cycle time	0.55 seconds

The standard/continuous cycle time represents the time required when an operation is performed with a cycle operation setting at maximum speed, under the following conditions.
 2kg transport, vertical movement 25mm, horizontal movement 300mm (rough positioning arch motion)

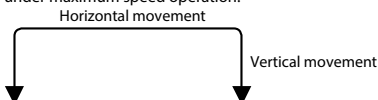
[Standard cycle time]

The time required for maximum speed. This is a general guideline for high speed performance.

Note that continuous operation is not possible under maximum speed operation.

[Continuous cycle time]

The cycle time for continuous operation.

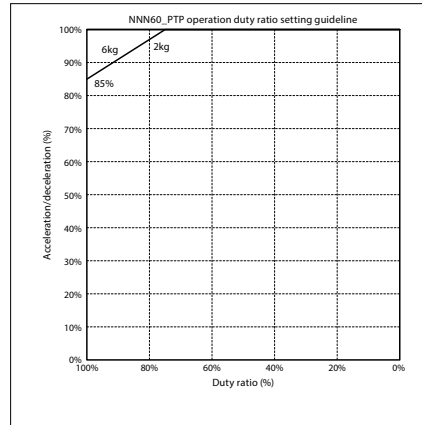
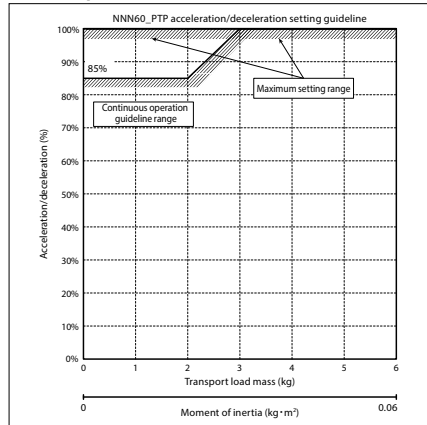


Acceleration/Deceleration Setting Guidelines

The SCARA Robot IXA cannot operate continuously at the maximum acceleration/deceleration or maximum speed specified in the catalog. To operate at the maximum acceleration/deceleration, set a stop time referring to the continuous operation duty ratio guideline graph. If a continuous operation is required, do so within the continuous operation guideline range shown in the acceleration/deceleration setting guideline graph.

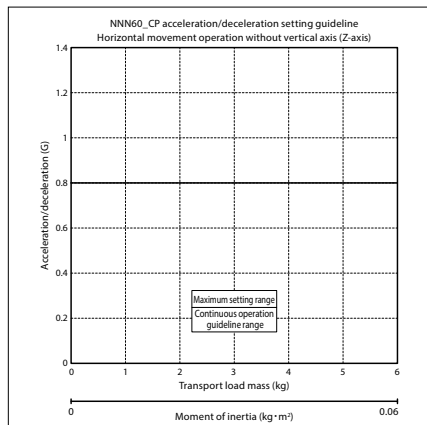
- 1) For a PTP operation, always use the WGHT command in the program to set the weight and moment of inertia. For the SCARA robot, the maximum acceleration/deceleration for each payload is set at 100%. When the payload differs, the operation time will also vary even at the same acceleration/deceleration or speed setting.
- 2) Adjust the acceleration/deceleration setting value by gradually increasing it from the continuous operation reference value.
- 3) If an overload error occurs, lower the acceleration/deceleration as required, or set a stop time by referring to the continuous operation duty ratio guideline.
- 4) Duty ratio (%) = (Operation time / (Operation time + Stop time)) × 100
- 5) When moving the robot horizontally at high speed, operate the vertical axis as close to the upward end as possible.
- 6) Set the moment of inertia and payload to the allowable value or lower.
- 7) The load mass represents the moment of inertia and weight at the center of rotation.
- 8) Operate the robot at an appropriate acceleration/deceleration according to the weight and moment of inertia for the 4-axis specification. Otherwise, the drive section may become prematurely unusable or damaged, or vibration may occur.
- 9) If the load moment of inertia is high, vibration may occur in the vertical axis, depending on the position of the vertical axis. In such a case, decrease the acceleration/deceleration for operation as required.

PTP Operation

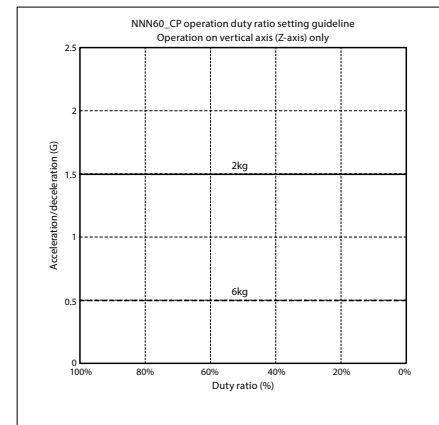
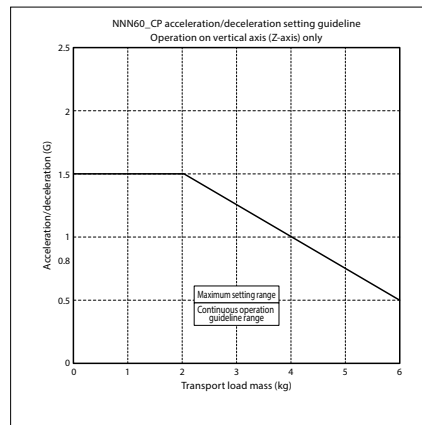


CP Operation

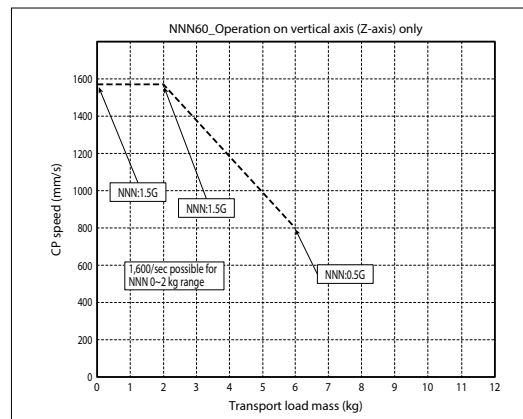
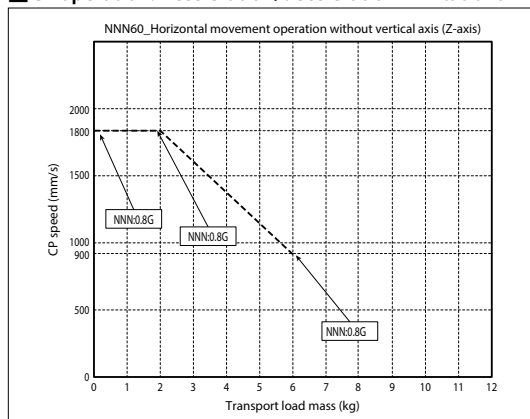
Horizontal



Vertical



CP operation: Acceleration/deceleration Limitations



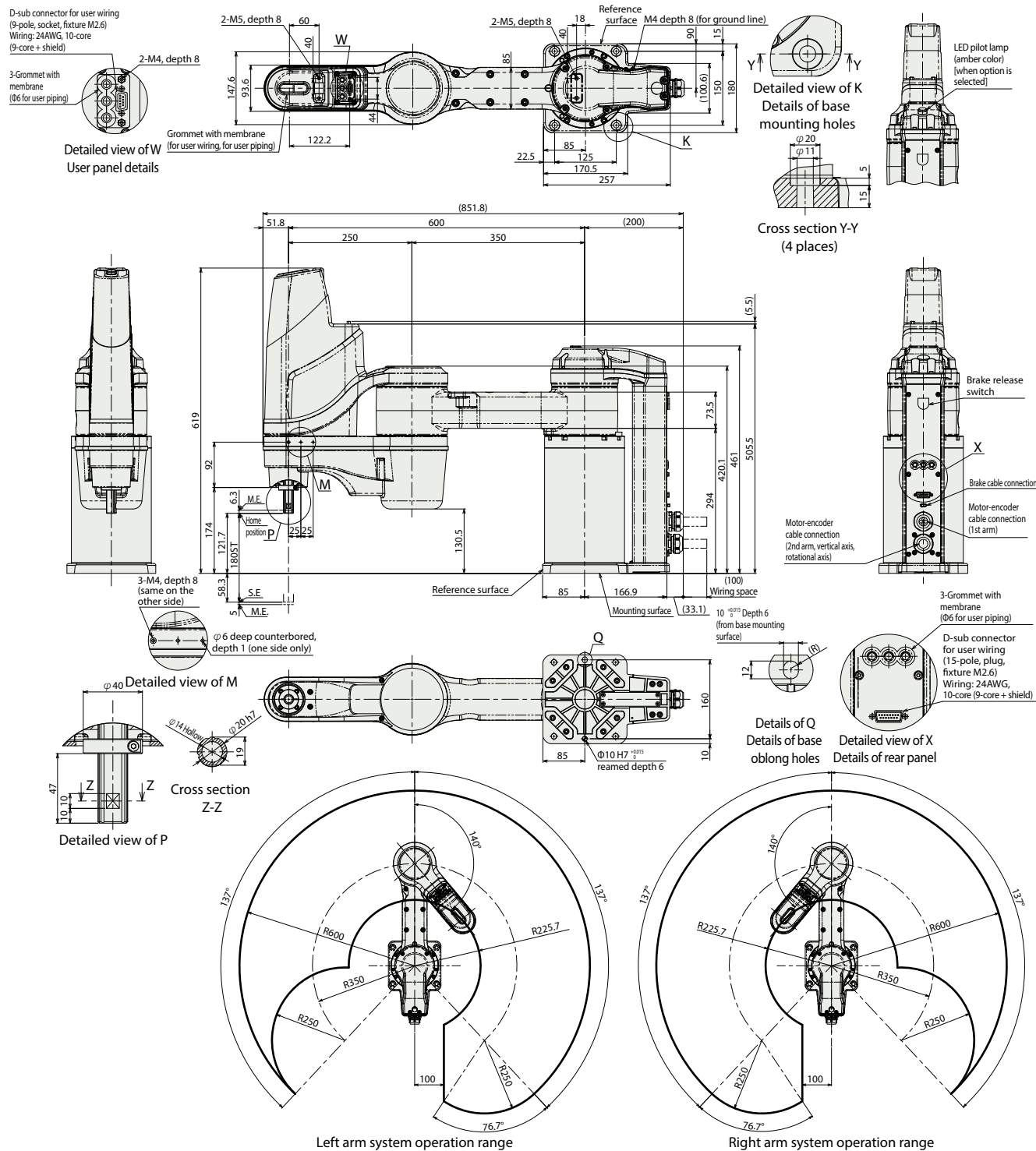
IXA-3NNN6018 4NNN6018

(Note) Refer to P70 (Note 9) for cable connections

CAD drawings can be downloaded from our website.
www.intelligentactuator.com



S.T.: Stroke
M.E.: Mechanical end
S.E.: Stroke end

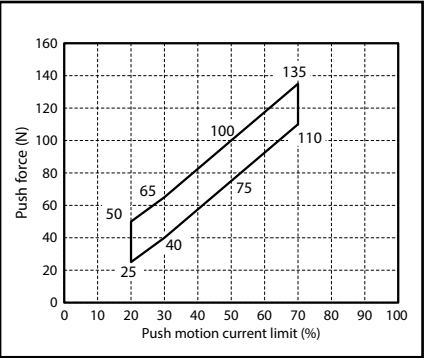


Mass

Item		Description
Mass	3-axis specification	30.5kg
	4-axis specification	32.0kg

Correlation between push force and current limit (for reference)

Push force at the tip of the vertical axis (Note 3).



IXA-4NNN8020

IXA-4NNN8040

Battery-less
AbsoluteArm Length:
800
mm

Model Specification Items

IXA		NNN		80		T2	
Series	Number of axes	Type		Arm length		Vertical stroke	
4	4 axes	NNN	Standard type	80	800mm	20	200mm
						40	400mm



Main specifications

Item	Description
Max. payload (kg) (Note 1)	21
Combined max. speed (mm/s)	9215
Speed (Note 2)	1st arm (deg/s) 350 2nd arm (deg/s) 620 Vertical axis (mm/s) 1700 Rotational axis (deg/s) 1200
Push force (N) (Note 3)	Upper limit 290 Lower limit 60
Arm length (mm)	800
Individual arm length (mm)	1st arm 400 2nd arm 400
Operation range of individual axes	1st arm (deg) ±137 2nd arm (deg) ±142 Vertical axis (mm) 200/400 Rotational axis (deg) ±360

Selection
Notes

- (1) Please refer to P69 for Notes 1 - 9.
- (2) The maximum set value for acceleration/deceleration varies depending on the weight of the object being transported, the travel distance, and the location. Overload errors may occur for continuous operations at the maximum setting value. For continuous operation, either lower the acceleration/deceleration values or refer to the duty ratio (guideline) and set a stop time after acceleration/deceleration.
- (3) If the motor is replaced, absolute reset must be performed. An adjustment jig will be required to perform an absolute reset on the rotational axis. Please refer to P80 for details.
- (4) A continuous operation cannot be performed for SCARA robots at 100% of speed and acceleration. Refer to the "Acceleration/Deceleration Setting Guidelines" for executable operating conditions.
- (5) When switching the arm system, the arm will once extend on a linear line. Be careful of interference with peripheral devices.

Option

Name	Model number	Reference page
Built-in extended user cable	EXC	77
Pilot lamp	LED	77

Option

Name	Model number	Reference page
User cable	CB-IXA-USR□□□-CS	79
Flange	IXA-FL-1	78
Protective flange for external wiring*1	IXA-PFL-EW-1	79
Protective flange for R-axis wiring	IXA-PFL-RW-1	79
Side stay for Z-axis wiring	Z-axis 200st IXA-SST-ZW-1	79
	Z-axis 400st IXA-SST-ZW-2	79
Upper stay for Z-axis wiring	Z-axis 200st IXA-TST-ZW-1	80
	Z-axis 400st IXA-TST-ZW-2	80
Solenoid valve set *1	IXA-SVP-1	80

*1 Protective flange for external wiring and solenoid valve set cannot be installed at the same time.
(Note) Please purchase separately.

Cable length

Type	Cable code	4-axis specification
Standard type	5L(5m) 10L(10m)	✓ ✓
	1L(1m) ~ 4L(4m) 6L(6m) ~ 9L(9m)	✓ ✓
Specified length	11L(11m) 12L(12m) 13L(13m) 14L(14m) 15L(15m)	✓ ✓ ✓ ✓ ✓

(Note) Total amount of the following cables:
[4-axis spec.] Motor cables:4, Encoder cables: 4, Brake cable: 1

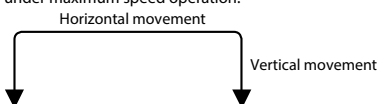
Cycle time

Item	Time
Standard cycle time	0.43 seconds
Continuous cycle time	0.79 seconds

The standard/continuous cycle time represents the time required when an operation is performed with a cycle operation setting at maximum speed, under the following conditions.
2kg transport, vertical movement 25mm, horizontal movement 300mm (rough positioning arch motion)
[Standard cycle time]

The time required for maximum speed. This is a general guideline for high speed performance.
Note that continuous operation is not possible under maximum speed operation.

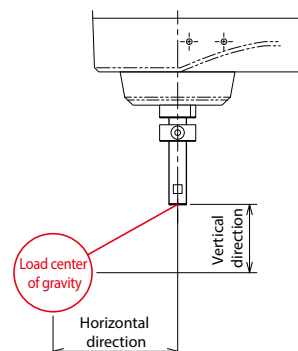
[Continuous cycle time]
The cycle time for continuous operation.



Tip axis allowable inertia moment

Number of axes	Tip axis allowable inertia moment
4-axis specification	0.3 kg · m ²

This represents the allowable inertia moment converted to the center of the SCARA robot tip axis (3-axis spec.: vertical axis, 4-axis spec.: rotational axis). Make sure that the offset value from center of the rotation of the tip axis to the tool center of gravity is within the guideline. If the tool center of gravity is far from the tip axis center, it is necessary to reduced speed and acceleration/deceleration appropriately. The overhang distance is limited depending on the payload and operating condition.



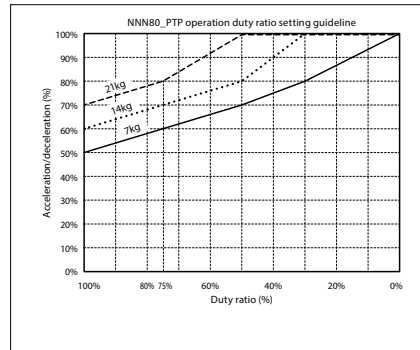
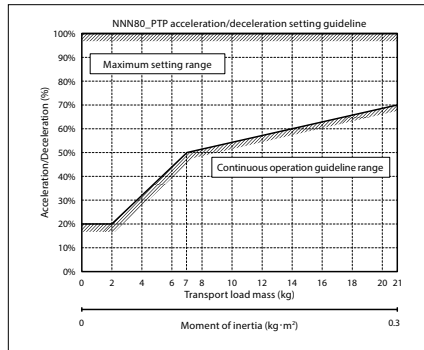
Horizontal direction	Vertical direction
200mm or less	150mm or less

Acceleration/Deceleration Setting Guidelines

The SCARA Robot IXA cannot operate continuously at the maximum acceleration/deceleration or maximum speed specified in the catalog. To operate at the maximum acceleration/deceleration, set a stop time referring to the continuous operation duty ratio guideline graph. If a continuous operation is required, do so within the continuous operation guideline range shown in the acceleration/deceleration setting guideline graph.

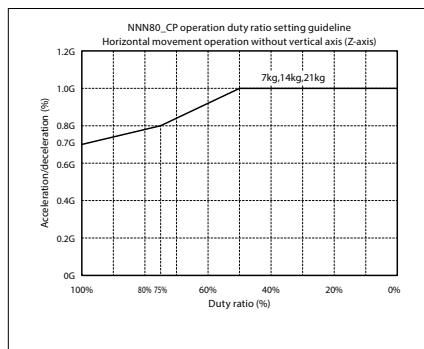
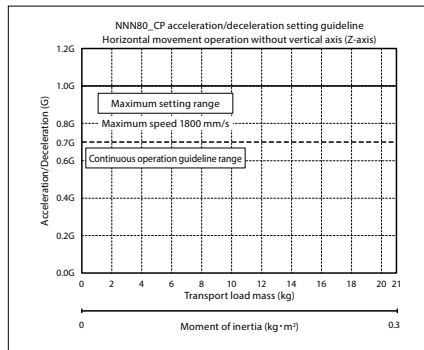
- 1) For a PTP operation, always use the WGT command in the program to set the weight and moment of inertia. For the SCARA robot, the maximum acceleration/deceleration for each payload is set at 100%. When the payload differs, the operation time will also vary even at the same acceleration/deceleration or speed setting.
- 2) Adjust the acceleration/deceleration setting value by gradually increasing it from the continuous operation reference value.
- 3) If an overload error occurs, lower the acceleration/deceleration as required, or set a stop time by referring to the continuous operation duty ratio guideline.
- 4) Duty ratio (%) = (Operation time / (Operation time + Stop time)) × 100
- 5) When moving the robot horizontally at high speed, operate the vertical axis as close to the upward end as possible.
- 6) Set the moment of inertia and payload to the allowable value or lower.
- 7) The load mass represents the moment of inertia and weight at the center of rotation.
- 8) Operate the robot at an appropriate acceleration/deceleration according to the weight and moment of inertia for the 4-axis specification. Otherwise, the drive section may become prematurely unusable or damaged, or vibration may occur.
- 9) If the load moment of inertia is high, vibration may occur in the vertical axis, depending on the position of the vertical axis. In such a case, decrease the acceleration/deceleration for operation as required.

PTP Operation

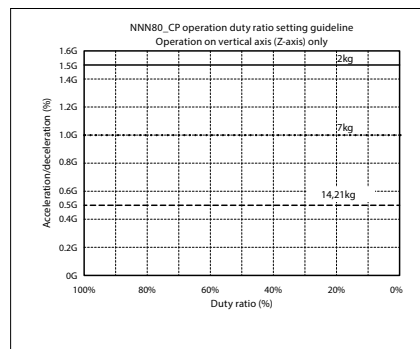
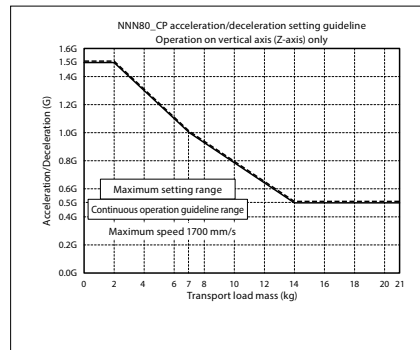


CP Operation

Horizontal

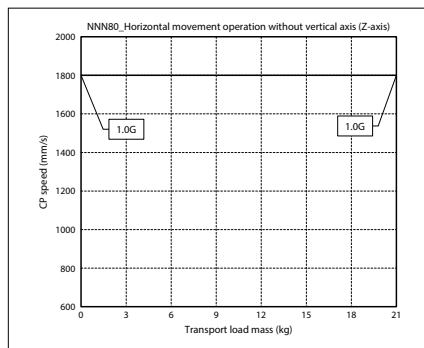


Vertical

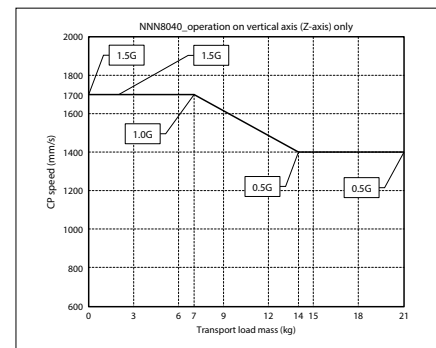
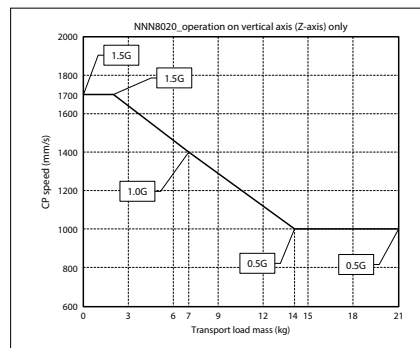


CP operation: Acceleration/deceleration Limitations

Horizontal



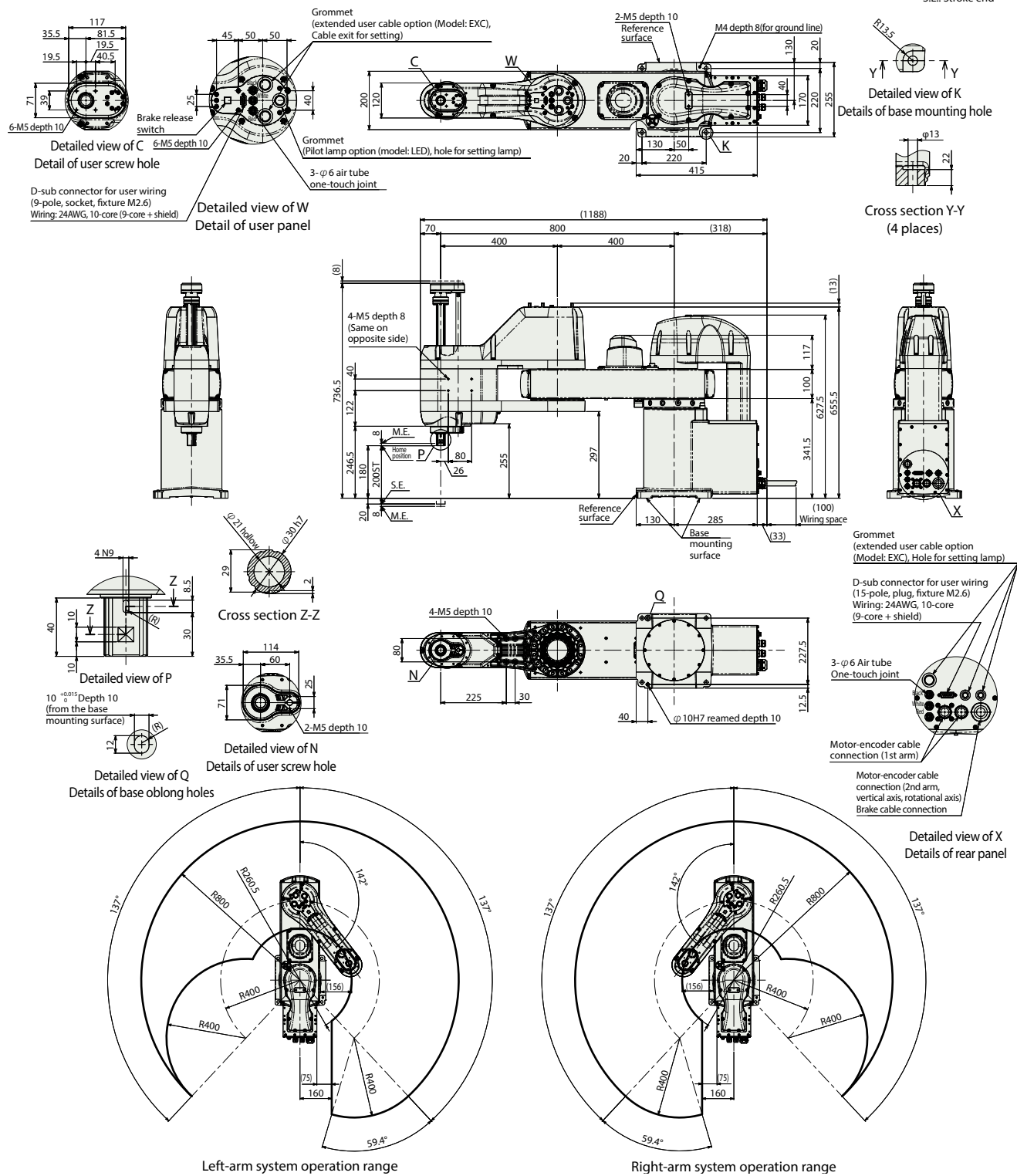
Vertical



IXA-4NNN8020

(Note) Refer to P70 (Note 9) for cable connections

S.T.: Stroke
M.E.: Mechanical end
S.E.: Stroke end

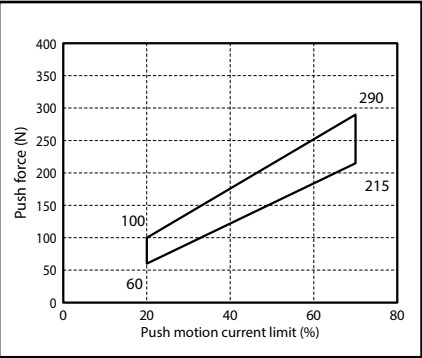


■ Mass

Item	Description
Mass	73.0kg

Correlation between push force and current limit (for reference)

Push force at the tip of the vertical axis (Note 3).



IXA-4NNN10020

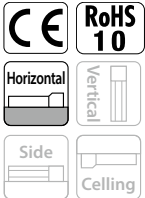
IXA-4NNN10040

Battery-less
Absolute

Arm Length:
1000
mm

Model Specification Items

IXA	—	—	NNN	100	—	—	T2	—	—
Series	Number of axes	Type	Arm length	Vertical stroke	Cable length	Applicable controller	Option		
4	4 axes	NNN	Standard type	100	20 200mm 40 400mm	N None 5L 5m 10L 10m <input type="checkbox"/> L Specified length (1m increments)	T2 XSEL-RAX/SAX	See below	



Main specifications

Item	Description
Max. payload (kg) (Note 1)	21
Combined max. speed (mm/s)	8936
Speed (Note 2)	1st arm (deg/s) 280 2nd arm (deg/s) 580 Vertical axis (mm/s) 1700 Rotational axis (deg/s) 1200
Push force (N) (Note 3)	Upper limit 290 Lower limit 60
Arm length (mm)	1000
Individual arm length (mm)	1st arm 600 2nd arm 400
Operation range of individual axes	1st arm (deg) ±137 2nd arm (deg) ±142 Vertical axis (mm) 200/400 Rotational axis (deg) ±360

Selection Notes



- Please refer to P69 for Notes 1 - 9.
- The maximum set value for acceleration/deceleration varies depending on the weight of the object being transported, the travel distance, and the location. Overload errors may occur for continuous operations at the maximum setting value. For continuous operation, either lower the acceleration/deceleration values or refer to the duty ratio (guideline) and set a stop time after acceleration/deceleration.
- If the motor is replaced, absolute reset must be performed. An adjustment jig will be required to perform an absolute reset on the rotational axis. Please refer to P80 for details.
- A continuous operation cannot be performed for SCARA robots at 100% of speed and acceleration. Refer to the "Acceleration/Deceleration Setting Guidelines" for executable operating conditions.
- When switching the arm system, the arm will once extend on a linear line. Be careful of interference with peripheral devices.

Option

Name	Model number	Reference page
Built-in extended user cable	EXC	77
Pilot lamp	LED	77

Option

Name	Model number	Reference page
User cable	CB-IXA-USR□□□-CS	79
Flange	IXA-FL-1	78
Protective flange for external wiring*1	IXA-PFL-EW-1	79
Protective flange for R-axis wiring	IXA-PFL-RW-1	79
Side stay for Z-axis wiring	Z-axis 200st IXA-SST-ZW-1	79
	Z-axis 400st IXA-SST-ZW-2	79
Upper stay for Z-axis wiring	Z-axis 200st IXA-TST-ZW-1	80
	Z-axis 400st IXA-TST-ZW-2	80
Solenoid valve set *1	IXA-SVP-1	80

*1 Protective flange for external wiring and solenoid valve set cannot be installed at the same time.
(Note) Please purchase separately.

Cable length

Type	Cable code	4-axis specification
Standard type	5L(5m) 10L(10m)	✓ ✓
Specified length	1L(1m) ~ 4L(4m) 6L(6m) ~ 9L(9m) 11L(11m) 12L(12m) 13L(13m) 14L(14m) 15L(15m)	✓ ✓ ✓ ✓ ✓ ✓ ✓

(Note) Total amount of the following cables:
[4-axis spec.] Motor cables:4, Encoder cables: 4, Brake cable: 1

Cycle time

Item	Time
Standard cycle time	0.45 seconds
Continuous cycle time	0.79 seconds

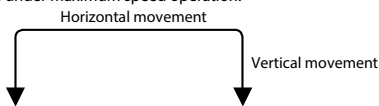
The standard/continuous cycle time represents the time required when an operation is performed with a cycle operation setting at maximum speed, under the following conditions.
2kg transport, vertical movement 25mm, horizontal movement 300mm (rough positioning arch motion)
[Standard cycle time]

The time required for maximum speed. This is a general guideline for high speed performance.
Note that continuous operation is not possible under maximum speed operation.

[Continuous cycle time]
The cycle time for continuous operation.

35

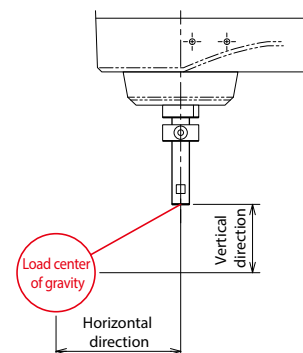
IXA-4NNN100□□



Tip axis allowable inertia moment

Number of axes	Tip axis allowable inertia moment
4-axis specification	0.3 kg · m ²

This represents the allowable inertia moment converted to the center of the SCARA robot tip axis (3-axis spec.: vertical axis, 4-axis spec.: rotational axis). Make sure that the offset value from center of the rotation of the tip axis to the tool center of gravity is within the guideline. If the tool center of gravity is far from the tip axis center, it is necessary to reduced speed and acceleration/deceleration appropriately. The overhang distance is limited depending on the payload and operating condition.



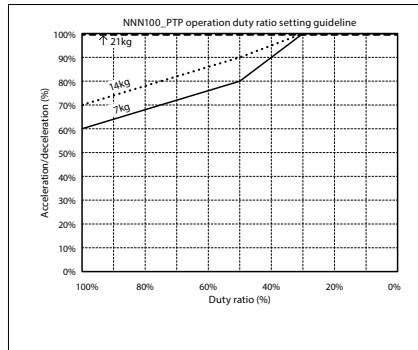
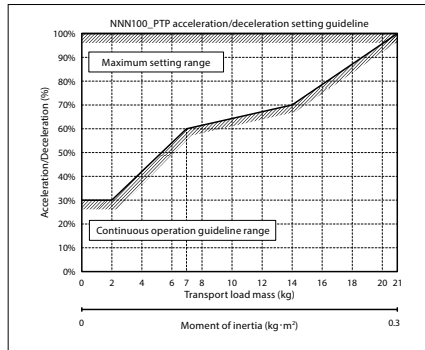
Horizontal direction	Vertical direction
200mm or less	150mm or less

Acceleration/Deceleration Setting Guidelines

The SCARA Robot IXA cannot operate continuously at the maximum acceleration/deceleration or maximum speed specified in the catalog. To operate at the maximum acceleration/deceleration, set a stop time referring to the continuous operation duty ratio guideline graph. If a continuous operation is required, do so within the continuous operation guideline range shown in the acceleration/deceleration setting guideline graph.

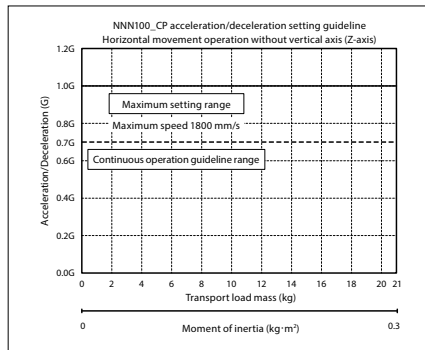
- 1) For a PTP operation, always use the WGH command in the program to set the weight and moment of inertia. For the SCARA robot, the maximum acceleration/deceleration for each payload is set at 100%. When the payload differs, the operation time will also vary even at the same acceleration/deceleration or speed setting.
- 2) Adjust the acceleration/deceleration setting value by gradually increasing it from the continuous operation reference value.
- 3) If an overload error occurs, lower the acceleration/deceleration as required, or set a stop time by referring to the continuous operation duty ratio guideline.
- 4) Duty ratio (%) = (Operation time / (Operation time + Stop time)) x 100
- 5) When moving the robot horizontally at high speed, operate the vertical axis as close to the upward end as possible.
- 6) Set the moment of inertia and payload to the allowable value or lower.
- 7) The load mass represents the moment of inertia and weight at the center of rotation.
- 8) Operate the robot at an appropriate acceleration/deceleration according to the weight and moment of inertia for the 4-axis specification. Otherwise, the drive section may become prematurely unusable or damaged, or vibration may occur.
- 9) If the load moment of inertia is high, vibration may occur in the vertical axis, depending on the position of the vertical axis. In such a case, decrease the acceleration/deceleration for operation as required.

PTP Operation

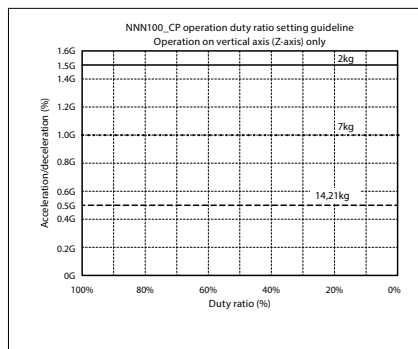
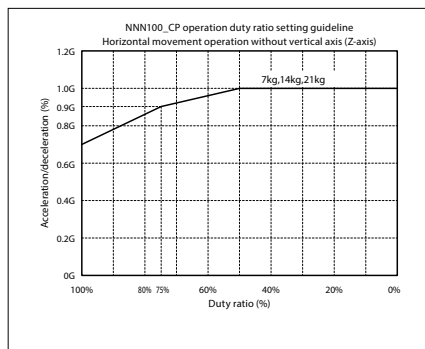
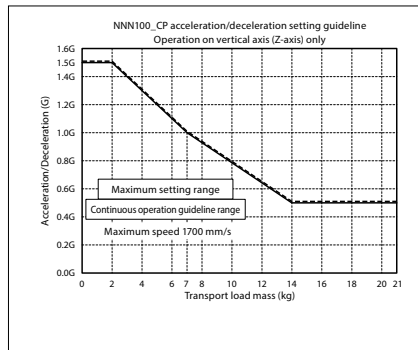


CP Operation

Horizontal

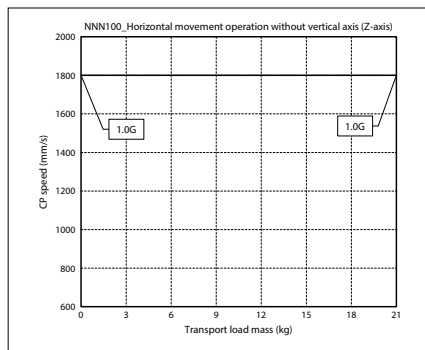


Vertical

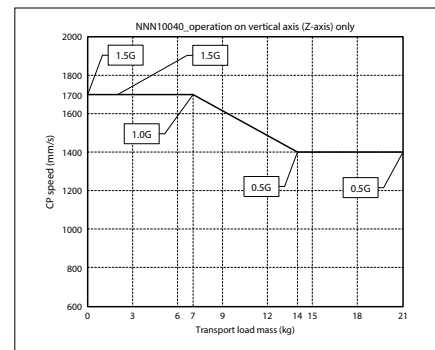
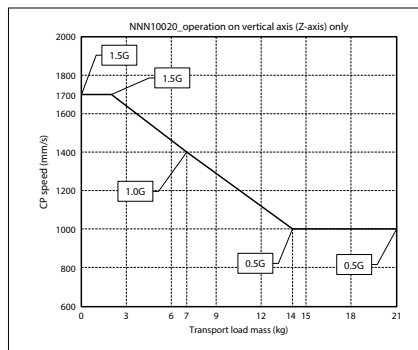


CP operation: Acceleration/deceleration Limitations

Horizontal



Vertical



(Note) Refer to P70 (Note 9) for cable connections

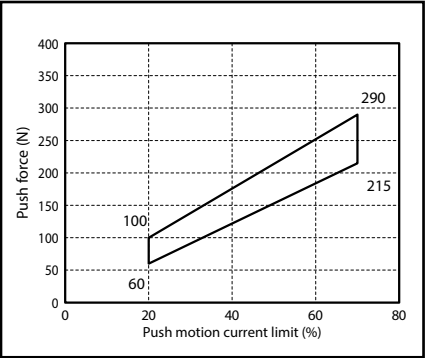
S.T.: Stroke
M.E.: Mechanical end
S.E.: Stroke end



Item	Description
Mass	76.0kg

Correlation between push force and current limit (for reference)

Push force at the tip of the vertical axis (Note 3).



IXA-3NSN3015

IXA-4NSN3015

 Battery-less
Absolute

 Arm Length:
300
mm

Model Specification Items

IXA		NSN		30		15		T2	
Series		Type		Arm length		Vertical stroke		Applicable controller	
	3	3 axes	NSN	High-speed type	30	300mm	15	150mm	T2
	4	4 axes							XSEL-RAX/SAX



Main specifications

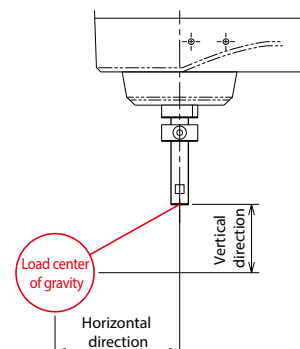
Item		Description	
		3-axis specification	4-axis specification
Max. payload (kg) (Note 1)		8	
Speed (Note 2)	Combined max. speed (mm/s)	6032	
	1st arm (deg/s)	720	
	2nd arm (deg/s)	720	
	Vertical axis (mm/s)	1600	
	Rotational axis (deg/s)	—	1600
Push force (N) (Note 3)	Upper limit	100	
	Lower limit	25	
Arm length (mm)		300	
Individual arm length (mm)	1st arm	120	
	2nd arm	180	
Operation range of individual axes	1st arm (deg)	±135	
	2nd arm (deg)	±142	
	Vertical axis (mm)	150	
	Rotational axis (deg)	—	±360

Item		Description	
		3-axis specification	4-axis specification
Positioning repeatability (Note 4)	Within horizontal surface	±0.01mm	
	Vertical axis	±0.01mm	
User wiring	Rotational axis	—	±0.005 degrees
		10-core (9-core + shield) AWG24 (rated 30V/Max. 1A)	
User piping		Outer diameter Φ4, inner diameter Φ2.5, air tube 3 pcs. (max. usable pressure 0.6MPa)	
LED pilot lamp (Note 5)		Amber color LED, small pilot lamp 1 pc. (DC24V supply required)	
Brake release switch (Note 6)		Brake release switch for preventing vertical axis from dropping.	
Tip axis	Allowable torque	3.2 N · m	3.2 N · m
	Allowable load moment	12 N · m	
Ambient operational temperature and humidity		0-40°C, 20-85% RH or lower (non-condensing)	
Degree of protection		IP20	
Vibration- and impact-resistance		No impact or vibration should be applied.	
Noise (Note 7)		80 dB or lower	
International standard		CE marking, RoHS	
Motor type		AC servo motor	
Motor wattage	1st arm	600W	
	2nd arm	400W	
	Vertical axis	150W	
	Rotational axis	—	100W
Encoder type		Battery-less absolute	
Encoder pulse		131072 pulse/rev	

Tip axis allowable inertia moment

Number of axes	Tip axis allowable inertia moment
3-axis specification	0.12 kg · m ²
4-axis specification	

This represents the allowable inertia moment converted to the center of the SCARA robot tip axis (3-axis spec.: vertical axis. 4-axis spec.: rotational axis). Make sure that the offset value from center of the rotation of the tip axis to the tool center of gravity is within the guideline. If the tool center of gravity is far from the tip axis center, it is necessary to reduced speed and acceleration/deceleration appropriately. The overhang distance is limited depending on the payload and operating condition.



Horizontal direction	Vertical direction
150mm or less	100mm or less

Selection Notes



- Please refer to P69 for Notes 1 - 9.
- The maximum set value for acceleration/deceleration varies depending on the weight of the object being transported, the travel distance, and the location. Overload errors may occur for continuous operations at the maximum setting value. For continuous operation, either lower the acceleration/deceleration values or refer to the duty ratio (guideline) and set a stop time after acceleration/deceleration.
- If the motor is replaced, absolute reset must be performed. An adjustment jig will be required to perform an absolute reset on the rotational axis. Please refer to P80 for details.
- A continuous operation cannot be performed for SCARA robots at 100% of speed and acceleration. Refer to the "Acceleration/Deceleration Setting Guidelines" for executable operating conditions.
- When switching the arm system, the arm will once extend on a linear line. Be careful of interference with peripheral devices.

Option

Name	Model number	Reference page
User cable	CB-IXA-USR <input type="checkbox"/> <input type="checkbox"/> -CS	79
Flange	IX-FL-1	78

(Note) Please purchase separately.

Cable length

Type	Cable code	3-axis specification	4-axis specification
Standard type	5L(5m)	✓	✓
	10L(10m)	✓	✓
	1L(1m) ~ 4L(4m)	✓	✓
Specified length	6L(6m) ~ 9L(9m)	✓	✓
	11L(11m)	✓	✓
	12L(12m)	✓	✓
	13L(13m)	✓	✓
	14L(14m)	✓	✓
	15L(15m)	✓	✓

(Note) Total amount of the following cables:
[3-axis spec.] Motor cables:3, Encoder cables: 3, Brake cable: 1
[4-axis spec.] Motor cables:4, Encoder cables: 4, Brake cable: 1

Cycle time

Item	Time
Standard cycle time	0.26 seconds
Continuous cycle time	0.45 seconds

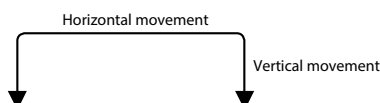
The standard/continuous cycle time represents the time required when an operation is performed with a cycle operation setting at maximum speed, under the following conditions.
2kg transport, vertical movement 25mm, horizontal movement 300mm (rough positioning arch motion)

[Standard cycle time]

The time required for maximum speed. This is a general guideline for high speed performance. Note that continuous operation is not possible under maximum speed operation.

[Continuous cycle time]

The cycle time for continuous operation.

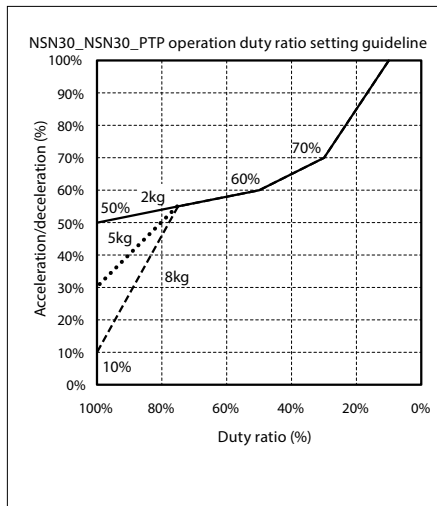
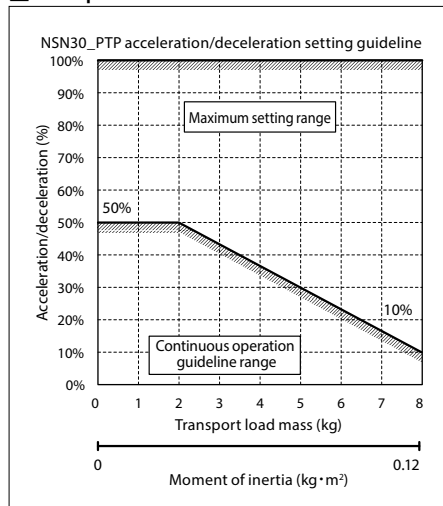


Acceleration/Deceleration Setting Guidelines

The SCARA Robot IXA cannot operate continuously at the maximum acceleration/deceleration or maximum speed specified in the catalog. To operate at the maximum acceleration/deceleration, set a stop time referring to the continuous operation duty ratio guideline graph. If a continuous operation is required, do so within the continuous operation guideline range shown in the acceleration/deceleration setting guideline graph.

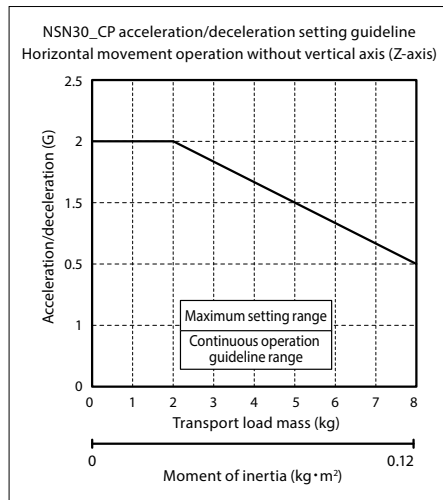
- 1) For a PTP operation, always use the WGHT command in the program to set the weight and moment of inertia. For the SCARA robot, the maximum acceleration/deceleration for each payload is set at 100%. When the payload differs, the operation time will also vary even at the same acceleration/deceleration or speed setting.
- 2) Adjust the acceleration/deceleration setting value by gradually increasing it from the continuous operation reference value.
- 3) If an overload error occurs, lower the acceleration/deceleration as required, or set a stop time by referring to the continuous operation duty ratio guideline.
- 4) Duty ratio (%) = (Operation time / (Operation time + Stop time)) × 100
- 5) When moving the robot horizontally at high speed, operate the vertical axis as close to the upward end as possible.
- 6) Set the moment of inertia and payload to the allowable value or lower.
- 7) The load mass represents the moment of inertia and weight at the center of rotation.
- 8) Operate the robot at an appropriate acceleration/deceleration according to the weight and moment of inertia for the 4-axis specification. Otherwise, the drive section may become prematurely unusable or damaged, or vibration may occur.
- 9) If the load moment of inertia is high, vibration may occur in the vertical axis, depending on the position of the vertical axis. In such a case, decrease the acceleration/deceleration for operation as required.

PTP Operation

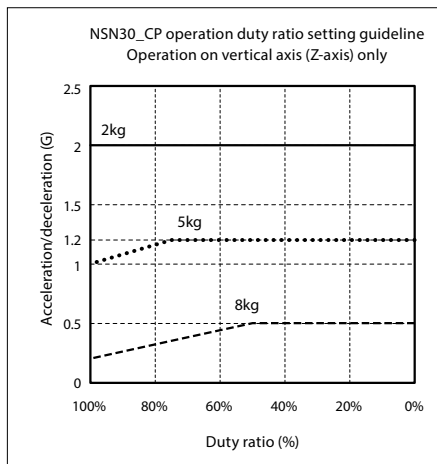
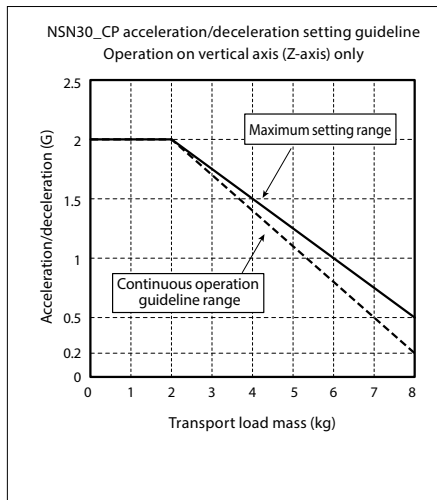


CP Operation

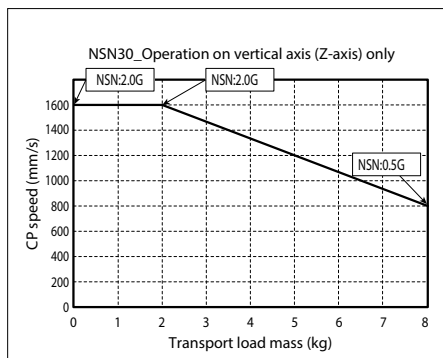
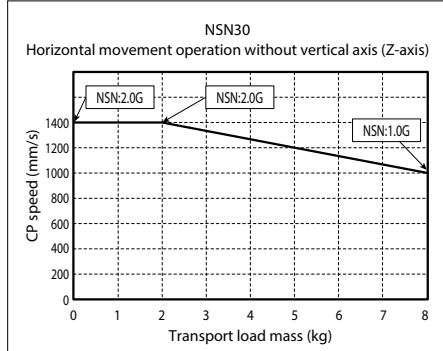
Horizontal



Vertical

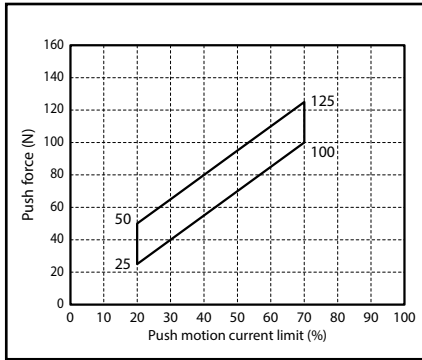


CP operation: Acceleration/deceleration Limitations



Correlation between push force and current limit (for reference)

Push force at the tip of the vertical axis (Note 3).



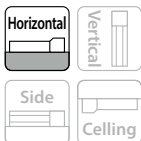
IXA-3NSN45

IXA-4NSN45

Battery-less Absolute
Arm Length: **450mm**

Model Specification Items

IXA		NSN		45				T2			
Series	Number of axes	Type		Arm length		Vertical stroke		Cable length		Applicable controller	
	3 3 axes	NSN	High-speed type	45	450mm	18	180mm	N	None	T2	XSEL-RAX/SAX
	4 4 axes					33	330mm	5L	5m		
								10L	10m		
								<input type="checkbox"/> L	Specified length (1m increments)		



Main specifications

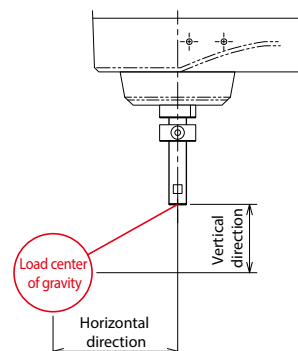
Item		Description	
		3-axis specification	4-axis specification
Max. payload (kg) (Note 1)		10	
Speed (Note 2)	Combined max. speed (mm/s)	8282	
	1st arm (deg/s)	610	
	2nd arm (deg/s)	800	
	Vertical axis (mm/s)	1600	
	Rotational axis (deg/s)	—	2000
Push force (N) (Note 3)	Upper limit	110	
	Lower limit	25	
Arm length (mm)		450	
Individual arm length (mm)	1st arm	200	
	2nd arm	250	
Operation range of individual axes	1st arm (deg)	±137	
	2nd arm (deg)	±137	
	Vertical axis (mm)	180/330	
	Rotational axis (deg)	—	±360

Item		Description	
		3-axis specification	4-axis specification
Positioning repeatability (Note 4)	Within horizontal surface	±0.01mm	
	Vertical axis	±0.01mm	
User wiring	Rotational axis	— ±0.005 degrees	
		10-core (9-core + shield) AWG24 (rated 30V/Max. 1A)	
User piping		Outer diameter Φ6, inner diameter Φ4, air tube 3 pcs. (max. usable pressure 0.6MPa)	
LED pilot lamp (Note 5)		Amber color LED, small pilot lamp 1 pc. (DC24V supply required)	
Brake release switch (Note 6)		Brake release switch for preventing vertical axis from dropping.	
Tip axis	Allowable torque	3.2 N · m	3.2 N · m
	Allowable load moment	8.3 N · m	
Ambient operational temperature and humidity		0-40°C, 20-85% RH or lower (non-condensing)	
Degree of protection		IP20	
Vibration- and impact-resistance		No impact or vibration should be applied.	
Noise (Note 7)		80 dB or lower	
International standard		CE marking, RoHS	
Motor type		AC servo motor	
Motor wattage	1st arm	600W	
	2nd arm	400W	
	Vertical axis	200W	
	Rotational axis	—	100W
Encoder type		Battery-less absolute	
Encoder pulse		131072 pulse/rev	

Tip axis allowable inertia moment

Number of axes	Tip axis allowable inertia moment
3-axis specification	0.12 kg · m ²
4-axis specification	

This represents the allowable inertia moment converted to the center of the SCARA robot tip axis (3-axis spec.: vertical axis, 4-axis spec.: rotational axis). Make sure that the offset value from center of the rotation of the tip axis to the tool center of gravity is within the guideline. If the tool center of gravity is far from the tip axis center, it is necessary to reduced speed and acceleration/deceleration appropriately. The overhang distance is limited depending on the payload and operating condition.



Horizontal direction	Vertical direction
180mm or less	100mm or less

Selection Notes



- Please refer to P69 for Notes 1 - 9.
- The maximum set value for acceleration/deceleration varies depending on the weight of the object being transported, the travel distance, and the location. Overload errors may occur for continuous operations at the maximum setting value. For continuous operation, either lower the acceleration/deceleration values or refer to the duty ratio (guideline) and set a stop time after acceleration/deceleration.
- If the motor is replaced, absolute reset must be performed. An adjustment jig will be required to perform an absolute reset on the rotational axis. Please refer to P80 for details.
- A continuous operation cannot be performed for SCARA robots at 100% of speed and acceleration. Refer to the "Acceleration/Deceleration Setting Guidelines" for executable operating conditions.
- When switching the arm system, the arm will once extend on a linear line. Be careful of interference with peripheral devices.

Option

Name	Model number	Reference page
User cable	CB-IXA-USR <input type="checkbox"/> <input type="checkbox"/> -CS	79
Flange	IX-FL-1	78

(Note) Please purchase separately.

Cable length

Type	Cable code	3-axis specification	4-axis specification
Standard type	5L(5m)	✓	✓
	10L(10m)	✓	✓
Specified length	1L(1m) ~ 4L(4m)	✓	✓
	6L(6m) ~ 9L(9m)	✓	✓
	11L(11m)	✓	✓
	12L(12m)	✓	✓
	13L(13m)	✓	✓
	14L(14m)	✓	✓
	15L(15m)	✓	✓

(Note) Total amount of the following cables:
[3-axis spec.] Motor cables:3, Encoder cables: 3, Brake cable: 1
[4-axis spec.] Motor cables:4, Encoder cables: 4, Brake cable: 1

Cycle time

Item	Time
Standard cycle time	0.26 seconds
Continuous cycle time	0.45 seconds

The standard/continuous cycle time represents the time required when an operation is performed with a cycle operation setting at maximum speed, under the following conditions.
2kg transport, vertical movement 25mm, horizontal movement 300mm (rough positioning arch motion)

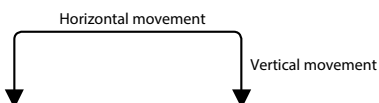
[Standard cycle time]

The time required for maximum speed. This is a general guideline for high speed performance.

Note that continuous operation is not possible under maximum speed operation.

[Continuous cycle time]

The cycle time for continuous operation.

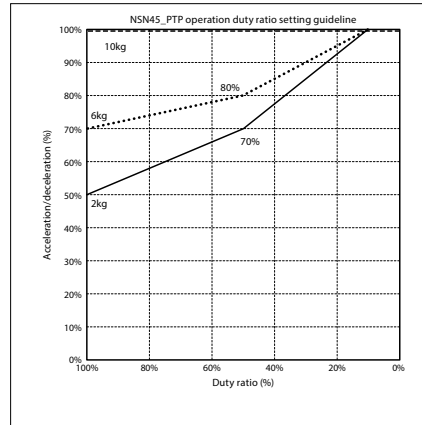
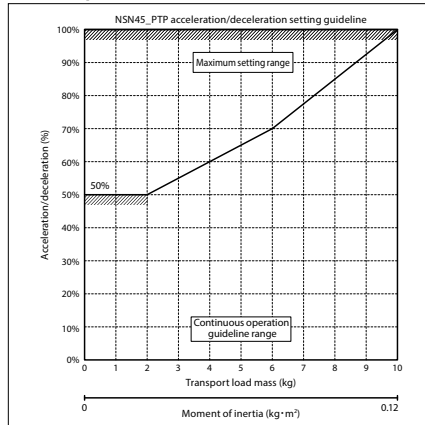


Acceleration/Deceleration Setting Guidelines

The SCARA Robot IXA cannot operate continuously at the maximum acceleration/deceleration or maximum speed specified in the catalog. To operate at the maximum acceleration/deceleration, set a stop time referring to the continuous operation duty ratio guideline graph. If a continuous operation is required, do so within the continuous operation guideline range shown in the acceleration/deceleration setting guideline graph.

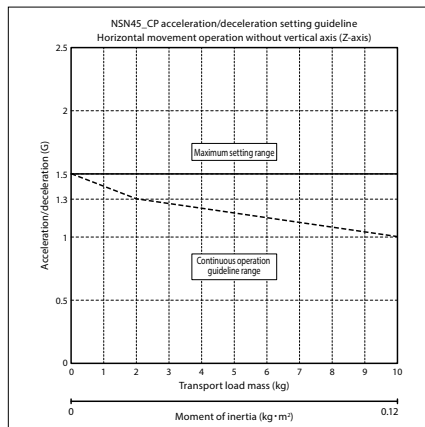
- 1) For a PTP operation, always use the WGHT command in the program to set the weight and moment of inertia. For the SCARA robot, the maximum acceleration/deceleration for each payload is set at 100%. When the payload differs, the operation time will also vary even at the same acceleration/deceleration or speed setting.
- 2) Adjust the acceleration/deceleration setting value by gradually increasing it from the continuous operation reference value.
- 3) If an overload error occurs, lower the acceleration/deceleration as required, or set a stop time by referring to the continuous operation duty ratio guideline.
- 4) Duty ratio (%) = (Operation time / (Operation time + Stop time)) × 100
- 5) When moving the robot horizontally at high speed, operate the vertical axis as close to the upward end as possible.
- 6) Set the moment of inertia and payload to the allowable value or lower.
- 7) The load mass represents the moment of inertia and weight at the center of rotation.
- 8) Operate the robot at an appropriate acceleration/deceleration according to the weight and moment of inertia for the 4-axis specification. Otherwise, the drive section may become prematurely unusable or damaged, or vibration may occur.
- 9) If the load moment of inertia is high, vibration may occur in the vertical axis, depending on the position of the vertical axis. In such a case, decrease the acceleration/deceleration for operation as required.

PTP Operation

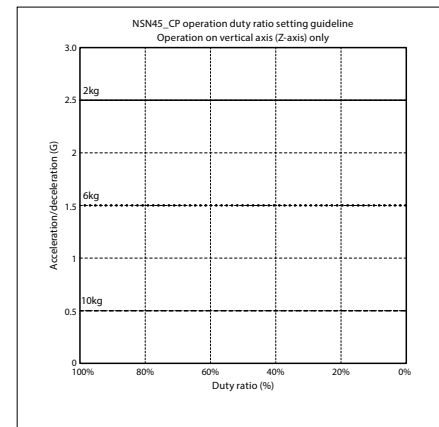
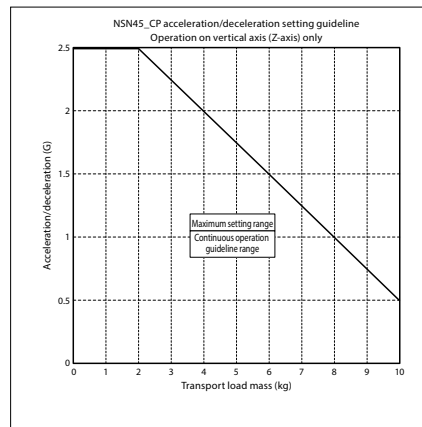


CP Operation

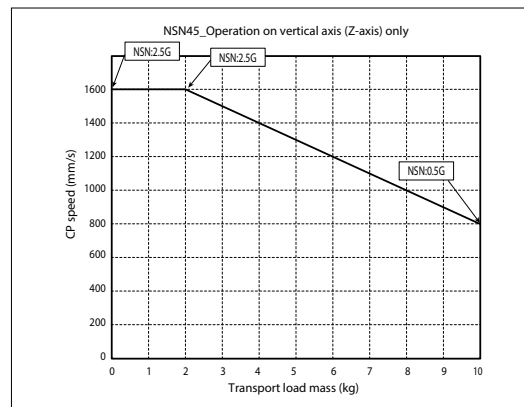
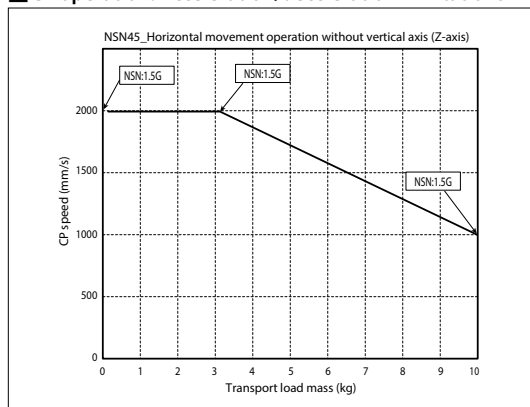
Horizontal



Vertical



CP operation: Acceleration/deceleration Limitations



IXA-3NSN4518_4NSN4518

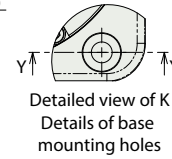
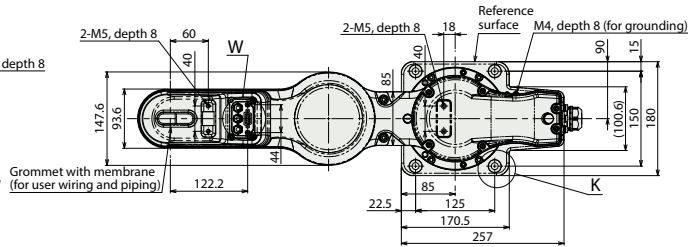
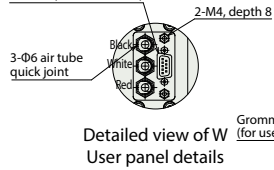
(Note) Refer to P70 (Note 9) for cable connections

CAD drawings can be downloaded from our website.
www.intelligentactuator.com

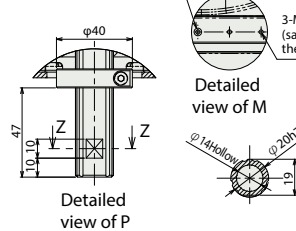
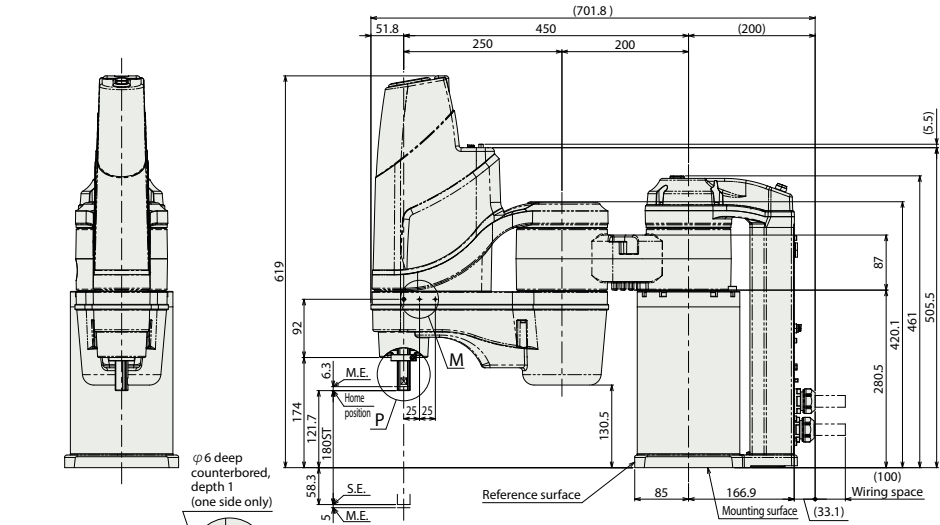
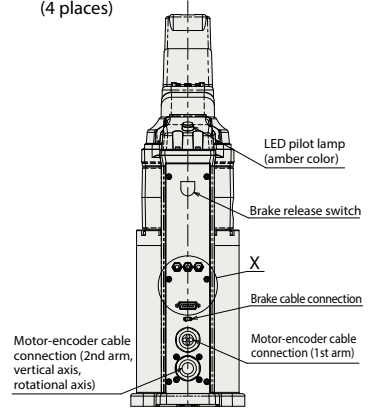


S.T.: Stroke
M.E.: Mechanical end
S.E.: Stroke end

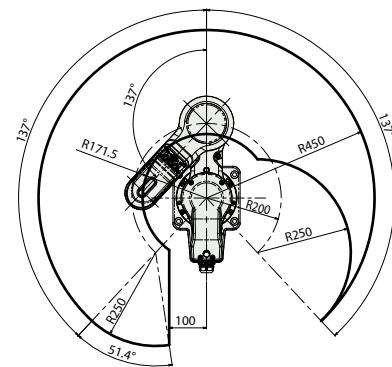
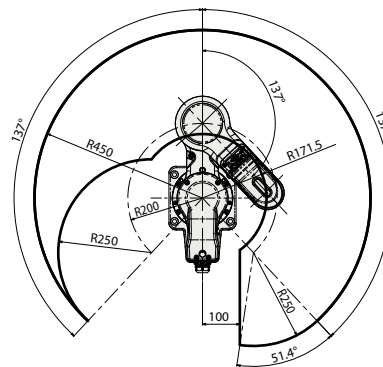
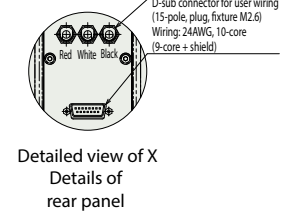
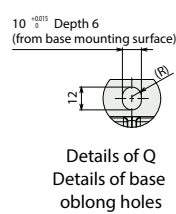
D-sub connector for user wiring
(9-pole, socket, fixture M2.6)
Wiring: 24AWG,
10-core (9-core + shield)



Cross section Y-Y
(4 places)



Cross section
Z-Z

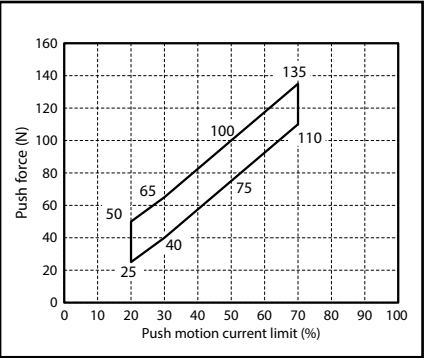


Mass

Item	Description
Mass	3-axis specification 31.0kg
	4-axis specification 32.5kg

Correlation between push force and current limit (for reference)

Push force at the tip of the vertical axis (Note 3).



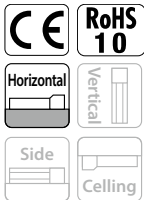
IXA-3NSN60

IXA-4NSN60

Battery-less Absolute
Arm Length: **600mm**

Model Specification Items

IXA	NSN	60	T2
Series	Number of axes 3 3 axes 4 4 axes	Type NSN High-speed type	Arm length 60 600mm
		Vertical stroke 18 180mm 33 330mm	Cable length N None 5L 5m 10L 10m L Specified length (1m increments)
			Applicable controller T2 XSEL-RAX/SAX



Main specifications

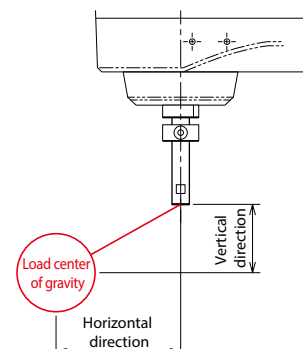
Item		Description	
		3-axis specification	4-axis specification
Max. payload (kg) (Note 1)		12	
Speed (Note 2)	Combined max. speed (mm/s)	6414	
	1st arm (deg/s)	300	
	2nd arm (deg/s)	750	
	Vertical axis (mm/s)	1600	
	Rotational axis (deg/s)	—	2000
Push force (N) (Note 3)	Upper limit	110	
	Lower limit	25	
Arm length (mm)		600	
Individual arm length (mm)	1st arm	350	
	2nd arm	250	
Operation range of individual axes	1st arm (deg)	±137	
	2nd arm (deg)	±140	
	Vertical axis (mm)	180/330	
	Rotational axis (deg)	—	±360

Item		Description	
		3-axis specification	4-axis specification
Positioning repeatability (Note 4)	Within horizontal surface	±0.01mm	
	Vertical axis	±0.01mm	
	Rotational axis	—	±0.005 degrees
User wiring		10-core (9-core + shield) AWG24 (rated 30V/Max. 1A)	
User piping		Outer diameter Φ6, inner diameter Φ4, air tube 3 pcs. (max. usable pressure 0.6MPa)	
LED pilot lamp (Note 5)		Amber color LED, small pilot lamp 1 pc. (DC24V supply required)	
Brake release switch (Note 6)		Brake release switch for preventing vertical axis from dropping.	
Tip axis	Allowable torque	3.2 N · m	3.2 N · m
	Allowable load moment	8.3 N · m	
Ambient operational temperature and humidity		0-40°C, 20-85% RH or lower (non-condensing)	
Degree of protection		IP20	
Vibration- and impact-resistance		No impact or vibration should be applied.	
Noise (Note 7)		80 dB or lower	
International standard		CE marking, RoHS	
Motor type		AC servo motor	
Motor wattage	1st arm	750W	
	2nd arm	400W	
	Vertical axis	200W	
	Rotational axis	—	100W
Encoder type		Battery-less absolute	
Encoder pulse		131072 pulse/rev	

Tip axis allowable inertia moment

Number of axes	Tip axis allowable inertia moment
3-axis specification	0.12 kg · m ²
4-axis specification	

This represents the allowable inertia moment converted to the center of the SCARA robot tip axis (3-axis spec.: vertical axis. 4-axis spec.: rotational axis). Make sure that the offset value from center of the rotation of the tip axis to the tool center of gravity is within the guideline. If the tool center of gravity is far from the tip axis center, it is necessary to reduced speed and acceleration/deceleration appropriately. The overhang distance is limited depending on the payload and operating condition.



Horizontal direction	Vertical direction
180mm or less	100mm or less

Selection Notes



- Please refer to P69 for Notes 1 - 9.
- The maximum set value for acceleration/deceleration varies depending on the weight of the object being transported, the travel distance, and the location. Overload errors may occur for continuous operations at the maximum setting value. For continuous operation, either lower the acceleration/deceleration values or refer to the duty ratio (guideline) and set a stop time after acceleration/deceleration.
- If the motor is replaced, absolute reset must be performed. An adjustment jig will be required to perform an absolute reset on the rotational axis. Please refer to P80 for details.
- A continuous operation cannot be performed for SCARA robots at 100% of speed and acceleration. Refer to the "Acceleration/Deceleration Setting Guidelines" for executable operating conditions.
- When switching the arm system, the arm will once extend on a linear line. Be careful of interference with peripheral devices.

Option

Name	Model number	Reference page
User cable	CB-IXA-USR- -CS	79
Flange	IX-FL-1	78

(Note) Please purchase separately.

Cable length

Type	Cable code	3-axis specification	4-axis specification
Standard type	5L(5m)	✓	✓
	10L(10m)	✓	✓
Specified length	1L(1m) ~ 4L(4m)	✓	✓
	6L(6m) ~ 9L(9m)	✓	✓
	11L(11m)	✓	✓
	12L(12m)	✓	✓
	13L(13m)	✓	✓
	14L(14m)	✓	✓
	15L(15m)	✓	✓

(Note) Total amount of the following cables:
[3-axis spec.] Motor cables:3, Encoder cables: 3, Brake cable: 1
[4-axis spec.] Motor cables:4, Encoder cables: 4, Brake cable: 1

Cycle time

Item	Time
Standard cycle time	0.26 seconds
Continuous cycle time	0.45 seconds

The standard/continuous cycle time represents the time required when an operation is performed with a cycle operation setting at maximum speed, under the following conditions.
2kg transport, vertical movement 25mm, horizontal movement 300mm (rough positioning arch motion)

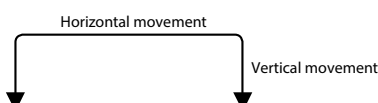
[Standard cycle time]

The time required for maximum speed. This is a general guideline for high speed performance.

Note that continuous operation is not possible under maximum speed operation.

[Continuous cycle time]

The cycle time for continuous operation.

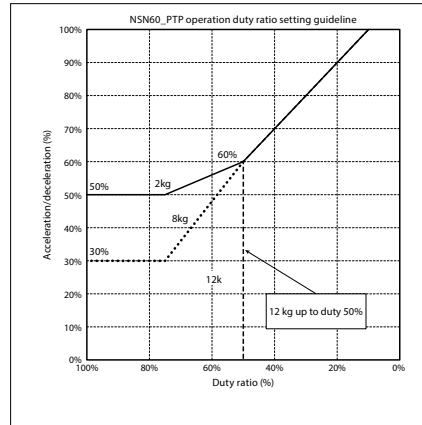
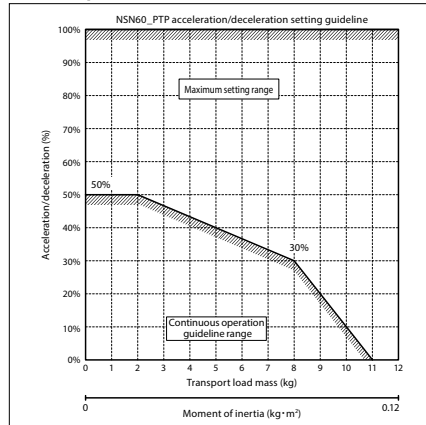


Acceleration/Deceleration Setting Guidelines

The SCARA Robot IXA cannot operate continuously at the maximum acceleration/deceleration or maximum speed specified in the catalog. To operate at the maximum acceleration/deceleration, set a stop time referring to the continuous operation duty ratio guideline graph. If a continuous operation is required, do so within the continuous operation guideline range shown in the acceleration/deceleration setting guideline graph.

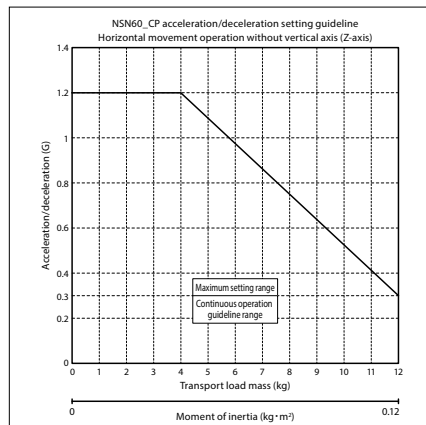
- 1) For a PTP operation, always use the WGH command in the program to set the weight and moment of inertia. For the SCARA robot, the maximum acceleration/deceleration for each payload is set at 100%. When the payload differs, the operation time will also vary even at the same acceleration/deceleration or speed setting.
- 2) Adjust the acceleration/deceleration setting value by gradually increasing it from the continuous operation reference value.
- 3) If an overload error occurs, lower the acceleration/deceleration as required, or set a stop time by referring to the continuous operation duty ratio guideline.
- 4) Duty ratio (%) = (Operation time / (Operation time + Stop time)) x 100
- 5) When moving the robot horizontally at high speed, operate the vertical axis as close to the upward end as possible.
- 6) Set the moment of inertia and payload to the allowable value or lower.
- 7) The load mass represents the moment of inertia and weight at the center of rotation.
- 8) Operate the robot at an appropriate acceleration/deceleration according to the weight and moment of inertia for the 4-axis specification. Otherwise, the drive section may become prematurely unusable or damaged, or vibration may occur.
- 9) If the load moment of inertia is high, vibration may occur in the vertical axis, depending on the position of the vertical axis. In such a case, decrease the acceleration/deceleration for operation as required.

PTP Operation

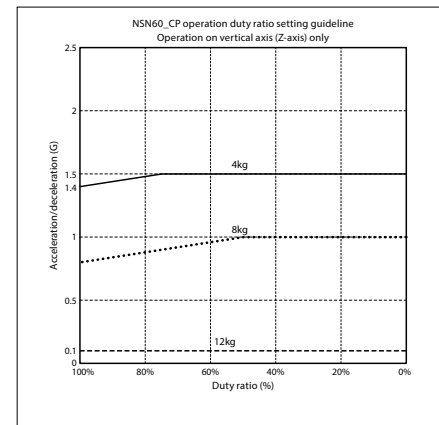
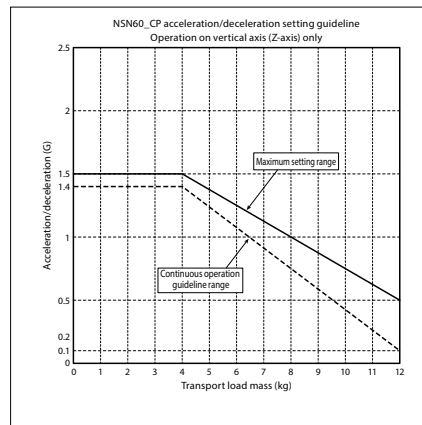


CP Operation

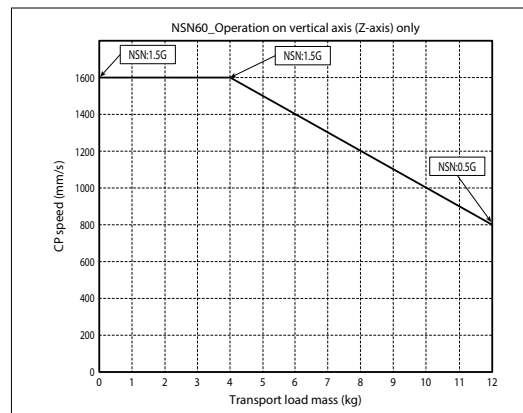
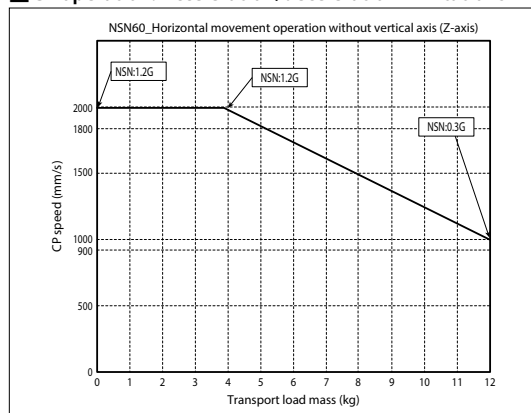
Horizontal



Vertical



CP operation: Acceleration/deceleration Limitations



IXA-3NSN6018 4NSN6018

(Note) Refer to P70 (Note 9) for cable connections

D-sub connector for user wiring
(9-pole, socket, fixture M2.6)
Wiring: 24AWG,
10-core (9-core + shield)

Wiring: 24AWG,
10-core (9-core + shield)
2-M4 dept 8
3-Ø6 air tube
quick joint

Detailed
view of W

Details for user panel

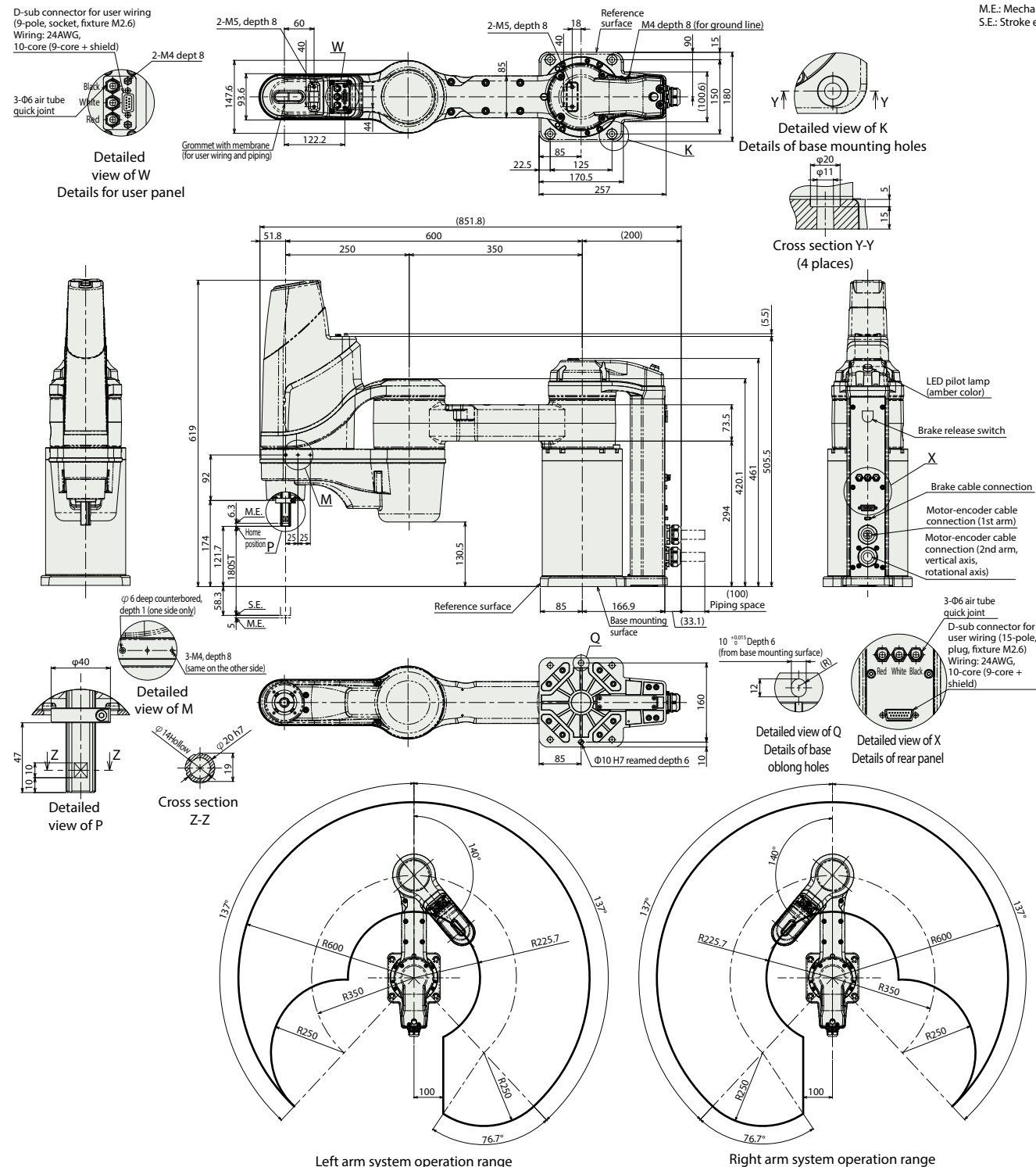
CAD drawings can be downloaded from our website.
www.intelligentactuator.com



2D CAD

3D CAD

S.T.: Stroke
M.E.: Mechanical end
S.F.: Stroke end



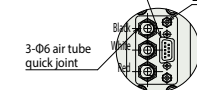
■ **Mass**

Item		Description
Mass	3-axis specification	31.5kg
	4-axis specification	33.0kg

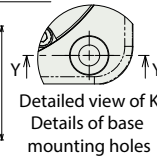
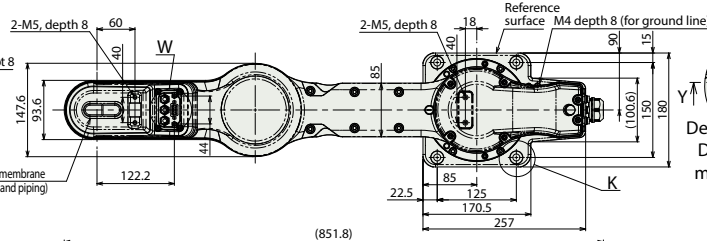
IXA-3NSN6033_4NSN6033

(Note) Refer to P70 (Note 9) for cable connections

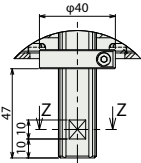
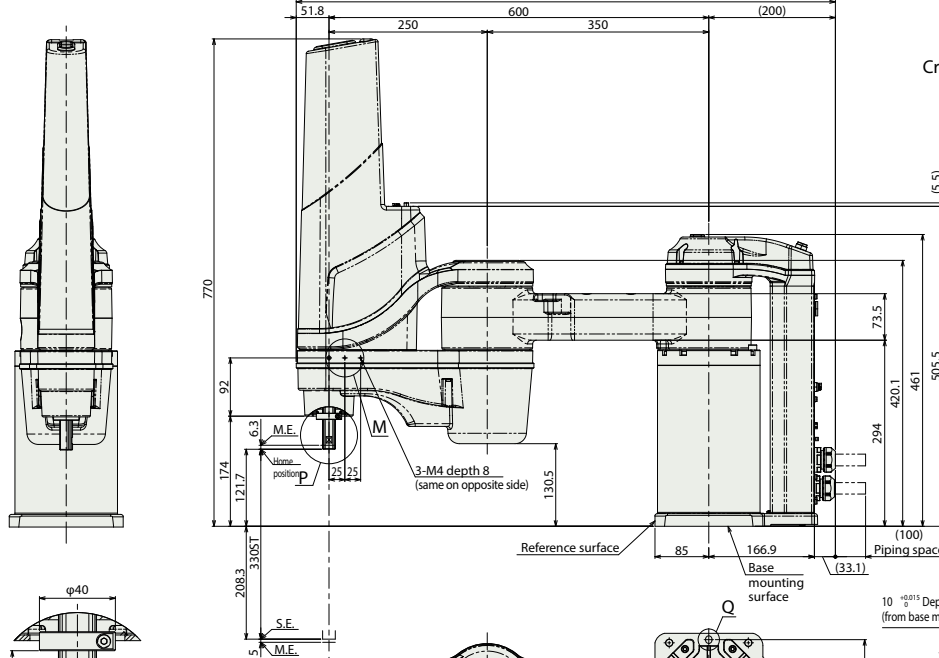
D-sub connector for user wiring
(9-pole, socket, fixture M2.6)
Wiring: 24AWG,
10-core (9-core + shield)



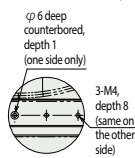
Detailed view of W
Details for user panel



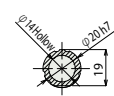
Cross section Y-Y
(4 places)



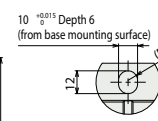
Detailed view of P



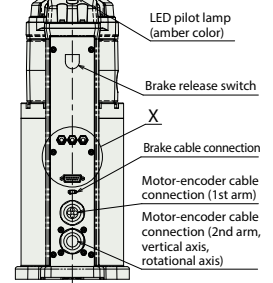
Detailed view of M



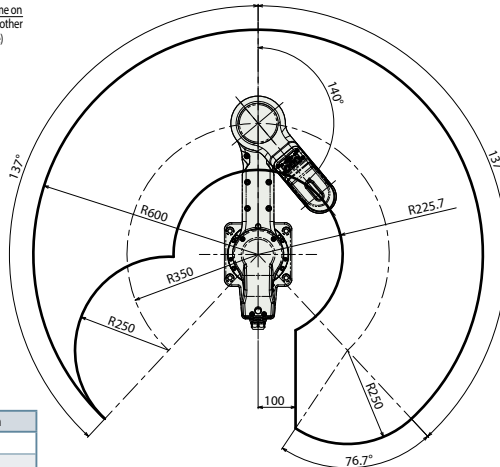
Cross section Z-Z



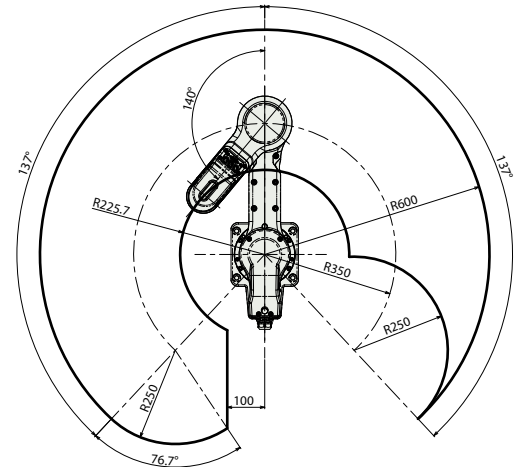
Detailed view of Q
Details of base oblong holes



Detailed view of X
Details of rear panel



Left arm system operation range



Right arm system operation range

Mass

Item	Description
Mass	3-axis specification 32.0kg
	4-axis specification 33.5kg

Applicable controller

The actuator on this page can be operated by the controllers indicated below.

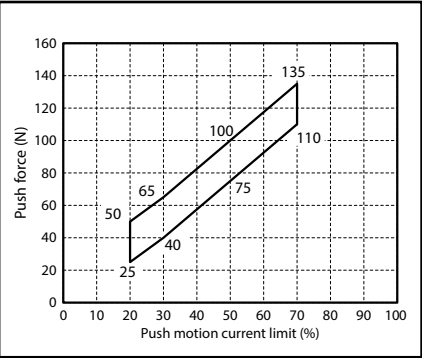
Name	External view	Max. number of connectable axes	Power supply voltage	Control method															Max. number of positioning points	Reference page
				Positioner	Pulse train	Program	Network* option													
DV	CC	CIE	PR				CN	ML	ML3	EC	EP	PRT	SSN	ECM						
XSEL-RAX4/SAX4 (for IXA)	see page 81	4	3-phase AC200V	—	—	●	●	●	●	—	—	—	●	●	—	—	—	36666	81	
XSEL-RAX3/SAX3 (for IXA)	see page 81	3		—	—	●	●	●	●	—	—	—	—	●	●	—	—	—	41250	81

(Note) Contact IAI or the website for network abbreviations such as DV and CC.

●: Available
—: Unavailable

Correlation between push force and current limit (for reference)

Push force at the tip of the vertical axis (Note 3).



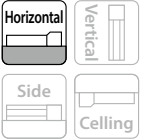
IXA-4NSN8020

IXA-4NSN8040

Battery-less Absolute
Arm Length: 800 mm

Model Specification Items

IXA	NSN	80	T2	
Series	Number of axes	Type	Arm length	Vertical stroke
4	4 axes	NSN High-speed type	80 800mm	20 200mm 40 400mm
			Cable length	Applicable controller
			N None 5L 5m 10L 10m <input type="checkbox"/> L Specified length (1m increments)	T2 XSEL-SAX
				Option
				See below



Main specifications

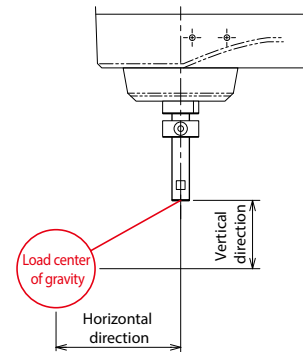
Item	Description
Max. payload (kg) (Note 1)	24
Combined max. speed (mm/s)	5864
Speed (Note 2)	1st arm (deg/s) 230 2nd arm (deg/s) 380
Max. speed of individual axes	Vertical axis 200ST 2000 (mm/s) 400ST 2800 Rotational axis (deg/s) 1300
Push force (N) (Note 3)	Upper limit 350 Lower limit 40
Arm length (mm)	800
Individual arm length (mm)	1st arm 400 2nd arm 400
Operation range of individual axes	1st arm (deg) ±137 2nd arm (deg) ±142 Vertical axis (mm) 200/400 Rotational axis (deg) ±360

Item	Description
Positioning repeatability (Note 4)	Within horizontal surface ±0.02mm Vertical axis ±0.01mm Rotational axis ±0.005 degrees
User wiring	10-core (9-core + shield) AWG24 (rated 30V/Max. 1A)
User piping	Outer diameter Φ6, inner diameter Φ4, air tube 3 pcs. (max. usable pressure 0.6MPa)
LED pilot lamp (Note 5)	Amber color LED, small pilot lamp 1 pc. (DC24V supply required)
Brake release switch (Note 6)	Brake release switch for preventing vertical axis from dropping.
Tip axis	Allowable torque 11.3 N · m Allowable load moment 48 N · m
Ambient operational temperature and humidity	0-40°C, 20-85% RH or lower (non-condensing)
Degree of protection	IP20
Vibration- and impact-resistance	No impact or vibration should be applied.
Noise (Note 7)	85 dB or lower
International standard	CE marking, RoHS
Motor type	AC servo motor
Motor wattage	1st arm 1000W 2nd arm 750W Vertical axis 600W Rotational axis 200W
Encoder type	Battery-less absolute
Encoder pulse	131072 pulse/rev

Tip axis allowable inertia moment

Number of axes	Tip axis allowable inertia moment
4-axis specification	0.45 kg · m ²

This represents the allowable inertia moment converted to the center of the SCARA robot tip axis (3-axis spec.: vertical axis. 4-axis spec.: rotational axis). Make sure that the offset value from center of the rotation of the tip axis to the tool center of gravity is within the guideline. If the tool center of gravity is far from the tip axis center, it is necessary to reduced speed and acceleration/deceleration appropriately. The overhang distance is limited depending on the payload and operating condition.



Horizontal direction	Vertical direction
200mm or less	150mm or less

Selection Notes



- Please refer to P69 for Notes 1 - 9.
- The maximum set value for acceleration/deceleration varies depending on the weight of the object being transported, the travel distance, and the location. Overload errors may occur for continuous operations at the maximum setting value. For continuous operation, either lower the acceleration/deceleration values or refer to the duty ratio (guideline) and set a stop time after acceleration/deceleration.
- If the motor is replaced, absolute reset must be performed. An adjustment jig will be required to perform an absolute reset on the rotational axis. Please refer to P80 for details.
- A continuous operation cannot be performed for SCARA robots at 100% of speed and acceleration. Refer to the "Acceleration/Deceleration Setting Guidelines" for executable operating conditions.
- When switching the arm system, the arm will once extend on a linear line. Be careful of interference with peripheral devices.

Option

Name	Model number	Reference page
Built-in extended user cable	EXC	77

Option

Name	Model number	Reference page
User cable	CB-IXA-USR□□□-CS	79
Flange	IXA-FL-1	78
Protective flange for external wiring*1	IXA-PFL-EW-1	79
Protective flange for R-axis wiring	IXA-PFL-RW-1	79
Side stay for Z-axis wiring	Z-axis 200st IXA-SST-ZW-1 Z-axis 400st IXA-SST-ZW-2	79
Upper stay for Z-axis wiring	Z-axis 200st IXA-TST-ZW-1 Z-axis 400st IXA-TST-ZW-2	80
Solenoid valve set *1	IXA-SVP-1	80

*1 Protective flange for external wiring and solenoid valve set cannot be installed at the same time. (Note) Please purchase separately.

Cable length

Type	Cable code	4-axis specification
Standard type	5L(5m)	✓
	10L(10m)	✓
Specified length	1L(1m) ~ 4L(4m)	✓
	6L(6m) ~ 9L(9m)	✓
	11L(11m)	✓
	12L(12m)	✓
	13L(13m)	✓
	14L(14m)	✓
	15L(15m)	✓

(Note) Total amount of the following cables:
[4-axis spec.] Motor cables:4, Encoder cables: 4, Brake cable: 1

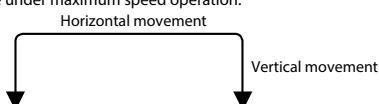
Cycle time

Item	Time
Standard cycle time	0.29 seconds
Continuous cycle time	0.56 seconds

The standard/continuous cycle time represents the time required when an operation is performed with a cycle operation setting at maximum speed, under the following conditions.
2kg transport, vertical movement 25mm, horizontal movement 300mm (rough positioning arch motion) [Standard cycle time]

The time required for maximum speed. This is a general guideline for high speed performance. Note that continuous operation is not possible under maximum speed operation.

[Continuous cycle time]
The cycle time for continuous operation.

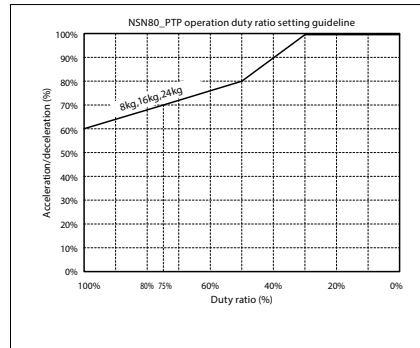
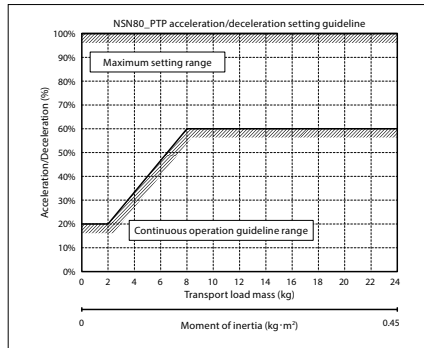


Acceleration/Deceleration Setting Guidelines

The SCARA Robot IXA cannot operate continuously at the maximum acceleration/deceleration or maximum speed specified in the catalog. To operate at the maximum acceleration/deceleration, set a stop time referring to the continuous operation duty ratio guideline graph. If a continuous operation is required, do so within the continuous operation guideline range shown in the acceleration/deceleration setting guideline graph.

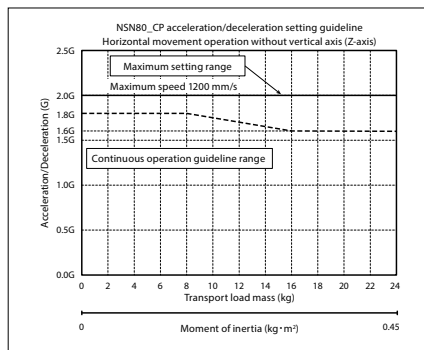
- 1) For a PTP operation, always use the WGH command in the program to set the weight and moment of inertia. For the SCARA robot, the maximum acceleration/deceleration for each payload is set at 100%. When the payload differs, the operation time will also vary even at the same acceleration/deceleration or speed setting.
- 2) Adjust the acceleration/deceleration setting value by gradually increasing it from the continuous operation reference value.
- 3) If an overload error occurs, lower the acceleration/deceleration as required, or set a stop time by referring to the continuous operation duty ratio guideline.
- 4) Duty ratio (%) = (Operation time / (Operation time + Stop time)) × 100
- 5) When moving the robot horizontally at high speed, operate the vertical axis as close to the upward end as possible.
- 6) Set the moment of inertia and payload to the allowable value or lower.
- 7) The load mass represents the moment of inertia and weight at the center of rotation.
- 8) Operate the robot at an appropriate acceleration/deceleration according to the weight and moment of inertia for the 4-axis specification. Otherwise, the drive section may become prematurely unusable or damaged, or vibration may occur.
- 9) If the load moment of inertia is high, vibration may occur in the vertical axis, depending on the position of the vertical axis. In such a case, decrease the acceleration/deceleration for operation as required.

PTP Operation

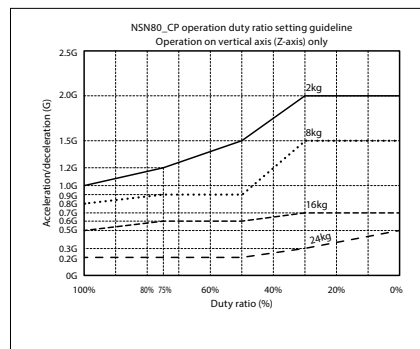
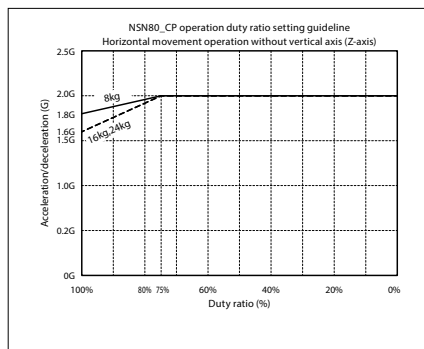
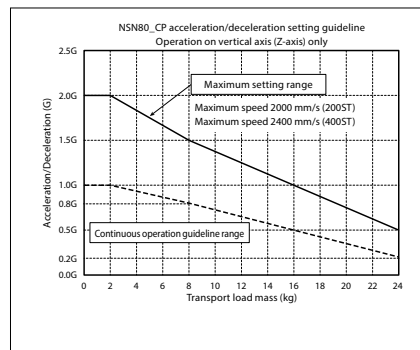


CP Operation

Horizontal

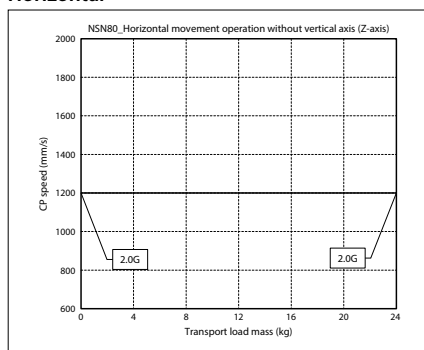


Vertical

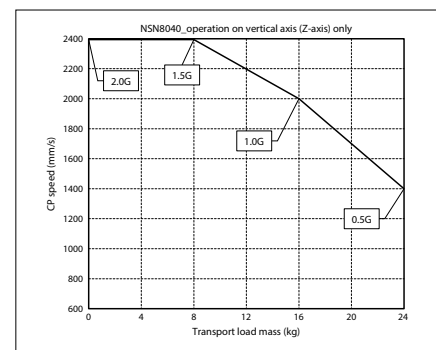
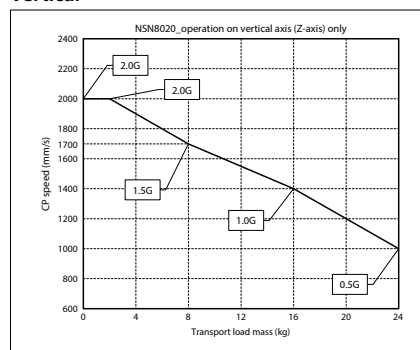


CP operation: Acceleration/deceleration Limitations

Horizontal



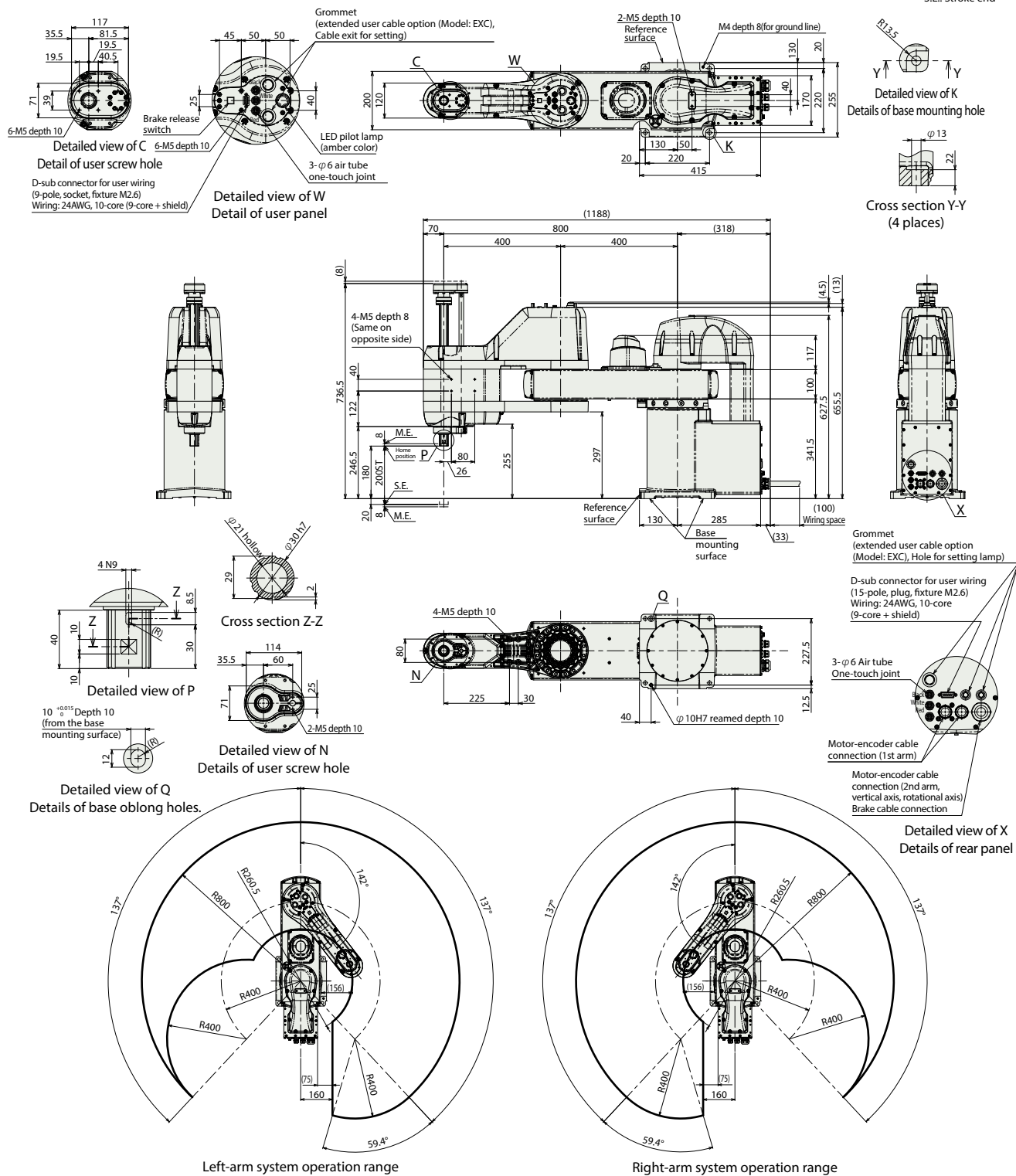
Vertical



IXA-4NSN8020

(Note) Refer to P70 (Note 9) for cable connections

S.T.: Stroke
M.E.: Mechanical end
S.E.: Stroke end

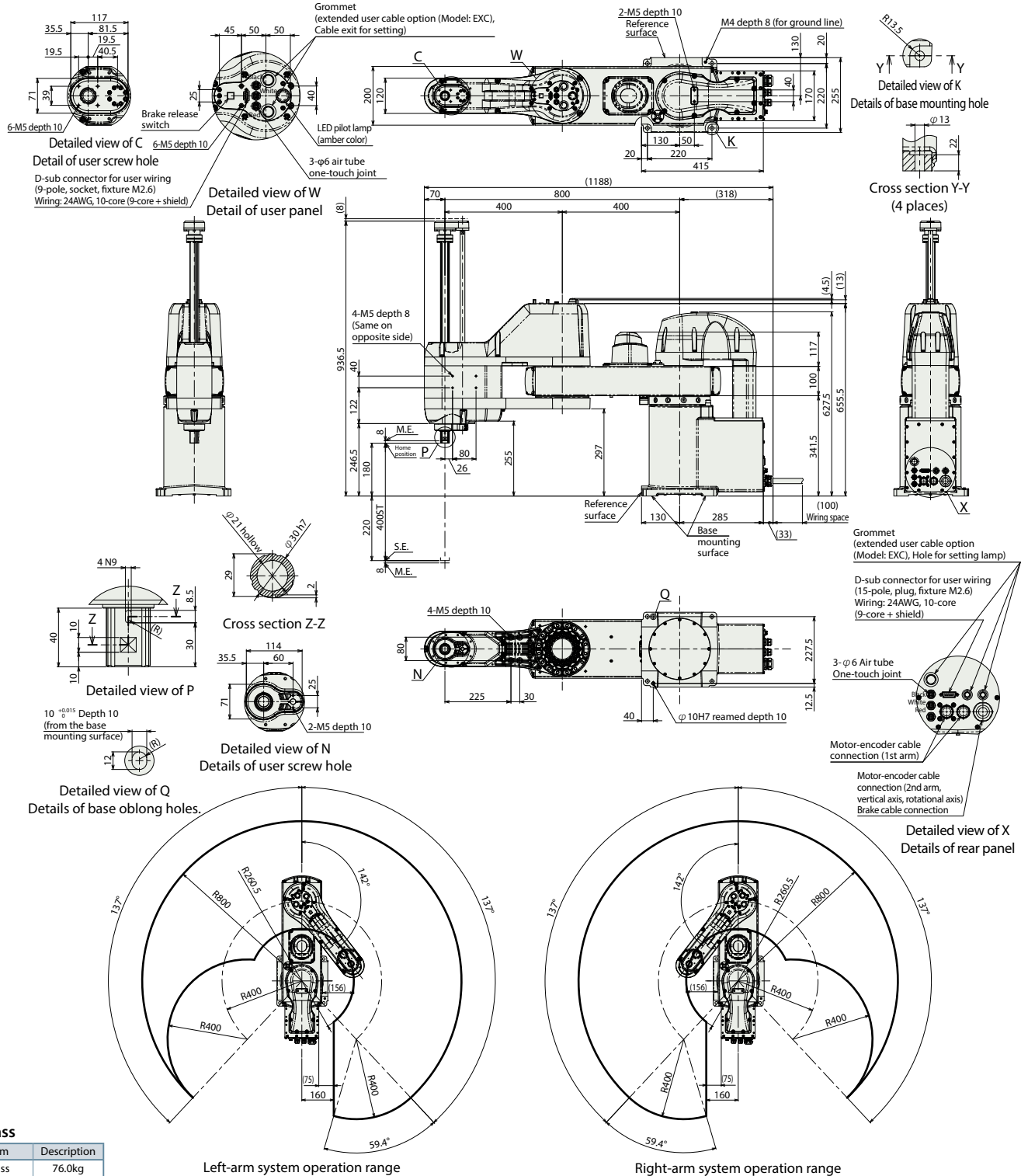


Mass

Item	Description
Mass	75.0kg

IXA-4NSN8040

(Note) Refer to P70 (Note 9) for cable connections



Mass

Item	Description
Mass	76.0kg

Applicable controller

The actuator on this page can be operated by the controller indicated below.

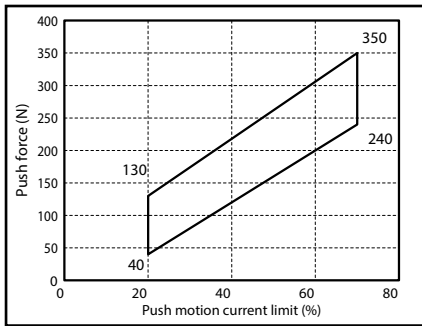
Name	External view	Max. number of connectable axes	Power supply voltage	Control method													Max. number of positioning points	Reference page	
				Positioner	Pulse train	Program	Network* option												
DV	CC	CIE	PR				CN	ML	ML3	EC	EP	PRT	SSN	ECM					
XSEL-SAX4 (for IXA)	see page 81	4	3-phase AC200V	—	—	●	●	●	●	—	—	—	●	●	—	—	—	36666	81

(Note) Contact IAI or the website for network abbreviations such as DV and CC.

●: Available
 —: Unavailable

Correlation between push force and current limit (for reference)

Push force at the tip of the vertical axis (Note 3).



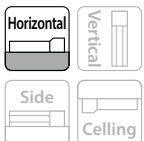
IXA-4NSN10020

IXA-4NSN10040

Battery-
less
AbsoluteArm Length:
1000
mm

Model Specification Items

IXA	NSN	100	T2	
Series	Number of axes	Type	Arm length	Vertical stroke
4	4 axes	NSN High-speed type	100 1000mm	20 200mm 40 400mm
			Cable length	
			N None	
			5L 5m	
			10L 10m	
			<input type="checkbox"/> L Specified length (1m increments)	
			Applicable controller	Option
			T2 XSEL-SAX	See below



Main specifications

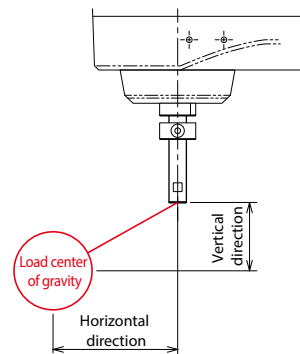
Item	Description
Max. payload (kg) (Note 1)	24
Combined max. speed (mm/s)	6667
Speed (Note 2)	1st arm (deg/s) 230 2nd arm (deg/s) 380
Max. speed of individual axes	Vertical axis 200ST 2000 (mm/s) 400ST 2800 Rotational axis (deg/s) 1300
Push force (N) (Note 3)	Upper limit 350 Lower limit 40
Arm length (mm)	1000
Individual arm length (mm)	1st arm 600 2nd arm 400
Operation range of individual axes	1st arm (deg) ±137 2nd arm (deg) ±142 Vertical axis (mm) 200/400 Rotational axis (deg) ±360

Item	Description
Positioning repeatability (Note 4)	Within horizontal surface ±0.025mm Vertical axis ±0.01mm Rotational axis ±0.005 degrees
User wiring	10-core (9-core + shield) AWG24 (rated 30V/Max. 1A)
User piping	Outer diameter Φ6, inner diameter Φ4, air tube 3 pcs. (max. usable pressure 0.6MPa)
LED pilot lamp (Note 5)	Amber color LED, small pilot lamp 1 pc. (DC24V supply required)
Brake release switch (Note 6)	Brake release switch for preventing vertical axis from dropping.
Tip axis	Allowable torque 7.6 N·m Allowable load moment 42 N·m
Ambient operational temperature and humidity	0-40°C, 20-85% RH or lower (non-condensing)
Degree of protection	IP20
Vibration- and impact-resistance	No impact or vibration should be applied.
Noise (Note 7)	85 dB or lower
International standard	CE marking, RoHS
Motor type	AC servo motor
Motor wattage	1st arm 1000W 2nd arm 750W Vertical axis 600W Rotational axis 200W
Encoder type	Battery-less absolute
Encoder pulse	131072 pulse/rev

Tip axis allowable inertia moment

Number of axes	Tip axis allowable inertia moment
4-axis specification	0.45 kg · m ²

This represents the allowable inertia moment converted to the center of the SCARA robot tip axis (3-axis spec.: vertical axis. 4-axis spec.: rotational axis). Make sure that the offset value from center of the rotation of the tip axis to the tool center of gravity is within the guideline. If the tool center of gravity is far from the tip axis center, it is necessary to reduced speed and acceleration/deceleration appropriately. The overhang distance is limited depending on the payload and operating condition.



Horizontal direction	Vertical direction
200mm or less	150mm or less

Selection Notes	(1) Please refer to P69 for Notes 1 - 9.
	(2) The maximum set value for acceleration/deceleration varies depending on the weight of the object being transported, the travel distance, and the location. Overload errors may occur for continuous operations at the maximum setting value. For continuous operation, either lower the acceleration/deceleration values or refer to the duty ratio (guideline) and set a stop time after acceleration/deceleration.
	(3) If the motor is replaced, absolute reset must be performed. An adjustment jig will be required to perform an absolute reset on the rotational axis. Please refer to P80 for details.
	(4) A continuous operation cannot be performed for SCARA robots at 100% of speed and acceleration. Refer to the "Acceleration/Deceleration Setting Guidelines" for executable operating conditions.
	(5) When switching the arm system, the arm will once extend on a linear line. Be careful of interference with peripheral devices.

Option

Name	Model number	Reference page
Built-in extended user cable	EXC	77

Option

Name	Model number	Reference page
User cable	CB-IXA-USR-□□-CS	79
Flange	IXA-FL-1	78
Protective flange for external wiring*1	IXA-PFL-EW-1	79
Protective flange for R-axis wiring	IXA-PFL-RW-1	79
Side stay for Z-axis wiring	Z-axis 200st IXA-SST-ZW-1	79
	Z-axis 400st IXA-SST-ZW-2	79
Upper stay for Z-axis wiring	Z-axis 200st IXA-TST-ZW-1	80
	Z-axis 400st IXA-TST-ZW-2	80
Solenoid valve set *1	IXA-SVP-1	80

*1 Protective flange for external wiring and solenoid valve set cannot be installed at the same time. (Note) Please purchase separately.

Cable length

Type	Cable code	4-axis specification
Standard type	5L(5m)	✓
	10L(10m)	✓
	1L(1m) ~ 4L(4m)	✓
	6L(6m) ~ 9L(9m)	✓
Specified length	11L(11m)	✓
	12L(12m)	✓
	13L(13m)	✓
	14L(14m)	✓
	15L(15m)	✓

(Note) Total amount of the following cables:
[4-axis spec.] Motor cables:4, Encoder cables: 4, Brake cable: 1

Cycle time

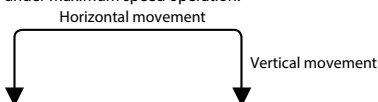
Item	Time
Standard cycle time	0.32 seconds
Continuous cycle time	0.56 seconds

The standard/continuous cycle time represents the time required when an operation is performed with a cycle operation setting at maximum speed, under the following conditions.
2kg transport, vertical movement 25mm, horizontal movement 300mm (rough positioning arch motion) [Standard cycle time]

The time required for maximum speed. This is a general guideline for high speed performance. Note that continuous operation is not possible under maximum speed operation.

[Continuous cycle time]

The cycle time for continuous operation.

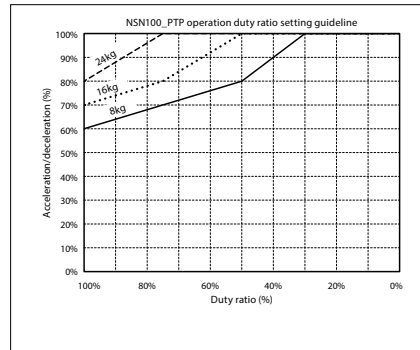
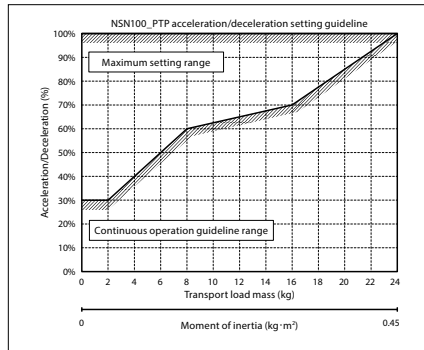


Acceleration/Deceleration Setting Guidelines

The SCARA Robot IXA cannot operate continuously at the maximum acceleration/deceleration or maximum speed specified in the catalog. To operate at the maximum acceleration/deceleration, set a stop time referring to the continuous operation duty ratio guideline graph. If a continuous operation is required, do so within the continuous operation guideline range shown in the acceleration/deceleration setting guideline graph.

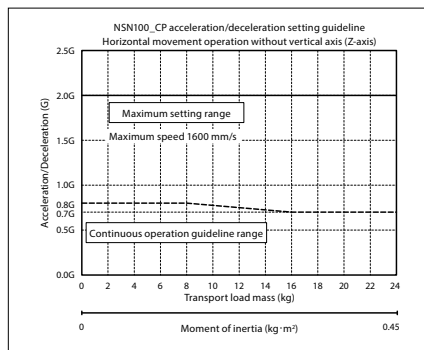
- 1) For a PTP operation, always use the WGH command in the program to set the weight and moment of inertia. For the SCARA robot, the maximum acceleration/deceleration for each payload is set at 100%. When the payload differs, the operation time will also vary even at the same acceleration/deceleration or speed setting.
- 2) Adjust the acceleration/deceleration setting value by gradually increasing it from the continuous operation reference value.
- 3) If an overload error occurs, lower the acceleration/deceleration as required, or set a stop time by referring to the continuous operation duty ratio guideline.
- 4) Duty ratio (%) = (Operation time / (Operation time + Stop time)) × 100
- 5) When moving the robot horizontally at high speed, operate the vertical axis as close to the upward end as possible.
- 6) Set the moment of inertia and payload to the allowable value or lower.
- 7) The load mass represents the moment of inertia and weight at the center of rotation.
- 8) Operate the robot at an appropriate acceleration/deceleration according to the weight and moment of inertia for the 4-axis specification. Otherwise, the drive section may become prematurely unusable or damaged, or vibration may occur.
- 9) If the load moment of inertia is high, vibration may occur in the vertical axis, depending on the position of the vertical axis. In such a case, decrease the acceleration/deceleration for operation as required.

PTP Operation

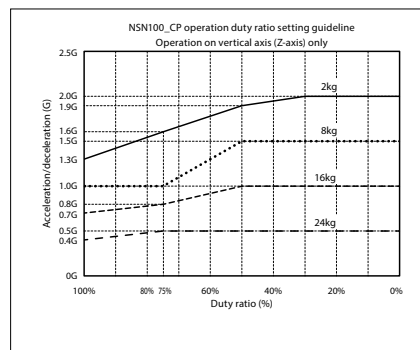
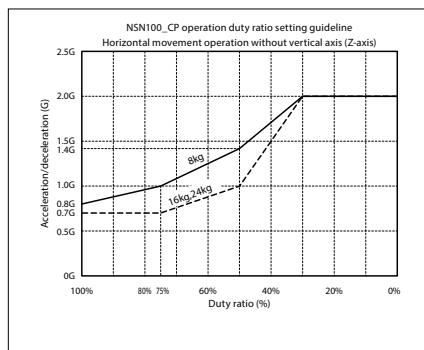
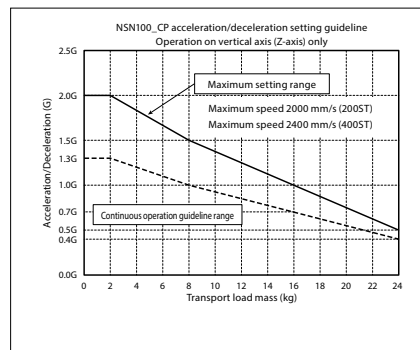


CP Operation

Horizontal

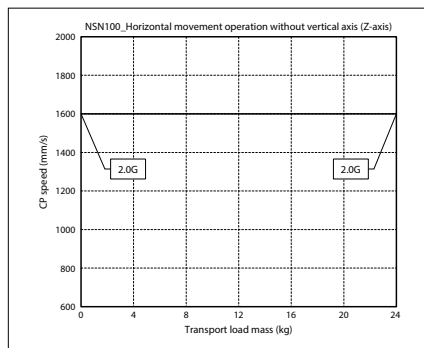


Vertical

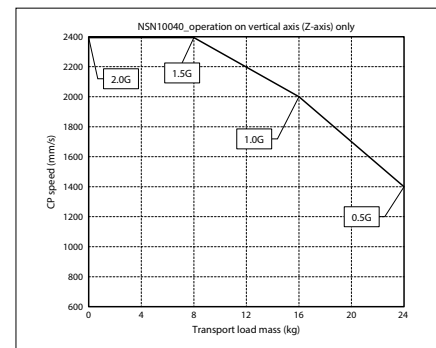
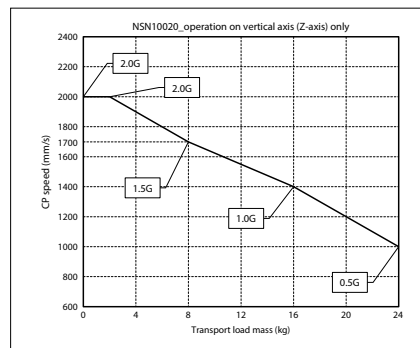


CP operation: Acceleration/Deceleration Limitations

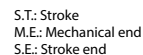
Horizontal



Vertical



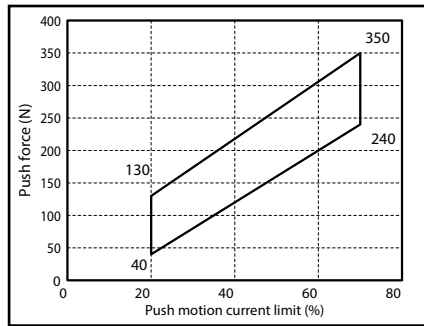
(Note) Refer to P70 (Note 9) for cable connections



Item	Description
Mass	78.0kg

Correlation between push force and current limit (for reference)

Push force at the tip of the vertical axis (Note 3).



Precautions

(Note 1) Payload

The payload is the maximum weight that can be carried.
The optimal acceleration is automatically set by setting the weight of the load and the moment of inertia in the program.
A heavier load will cause a lower acceleration to be configured.

(Note 2) Maximum operation speed during PTP operation

The value of the maximum operation speed in the specifications is for PTP command operation.
For CP operation commands (interpolation operation), there are limitations on operations at high speed.

(Note 3) 3rd axis push force control range

Max speed for push mode is 10mm/s. Push force is the force during push mode with limited speed of max 10mm/s or less.
The 3rd axis push force control range is the push force of the vertical axis tip.
This will be the push force when there is no load (nothing mounted) on the 3rd axis.
The upper limit of the push force setting is 70% rated current.
The lower limit of the push force setting is 30% for □NNN1805 and 4NSW3015, and 20% for other types.

(Note 4) Positioning repeatability

This represents the ability to reproduce the same positioning result when an operation is repeated at the same speed, acceleration/deceleration, and arm system, between the operation start position and the target position (The value is for JIS B 8432 Ambient temperature 20°C constant).
This is not absolute positioning accuracy.
Note that when the arm system is switched while starting from multiple positions to the target position, or when the operation conditions (such as operation speed or acceleration/deceleration setting) are changed, the value may fall outside of the positioning repeatability specification value.

(Note 5) Alarm pilot lamp

The alarm pilot lamp is installed on the 1st axis (J1) base upper part of the SCARA robot.
This is optional for the standard type NNN except for arm length of 180. (Option code LED)
It does not support dust- and splash-proof specification.
It is used to turn on the light when a controller error occurs.
To operate it, use an I/O output signal of the controller and build a circuit to apply 24VDC to the LED terminal in the user wiring.

(Note 6) Brake release switch

The brake release switch is installed on the rear of the 1st axis (J1) base.
24V DC power must be supplied to the controller to release the brake, regardless of whether the brake release switch is used or not.

(Note 7) Noise

This is the value measured when all axes are operating at maximum speed.
Noise may change depending on operating conditions and the surrounding reverberation environment. (JIS B 6195)

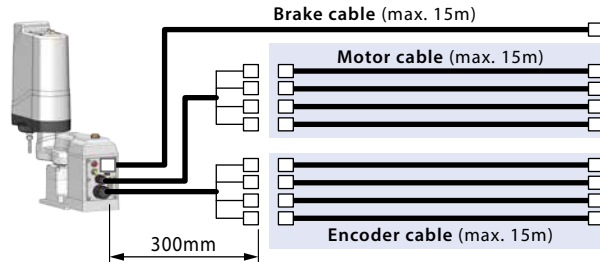
(Note 8) Operation range

When switching the arm system, the arms extend once in a straight line. Beware of potential interference with the peripheral devices

(Note 9) Cables

Connections of the motor cables, encoder cables and brake cables are as shown below.

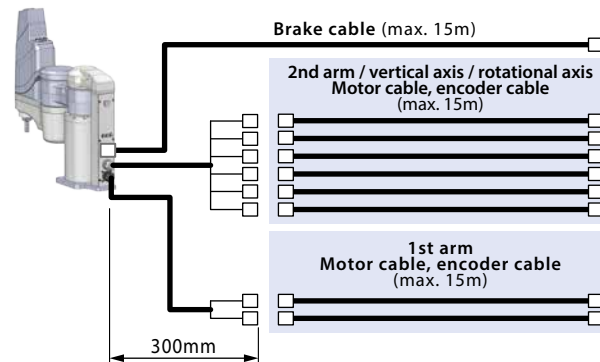
Standard type
Arm length 180



Connected to controller



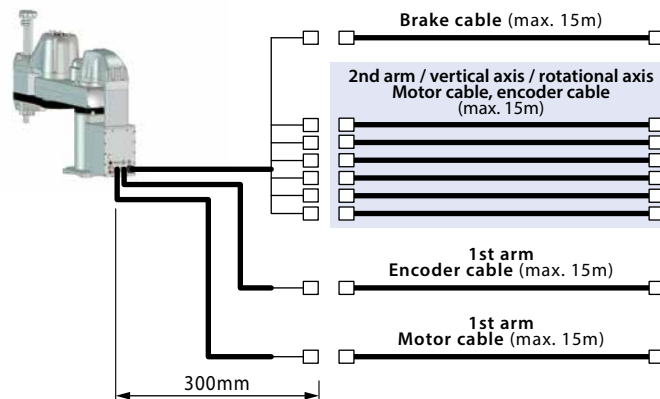
Standard high-speed type
except for arm length 180



Connected to controller



Standard high-speed type
Arm length 800/1000

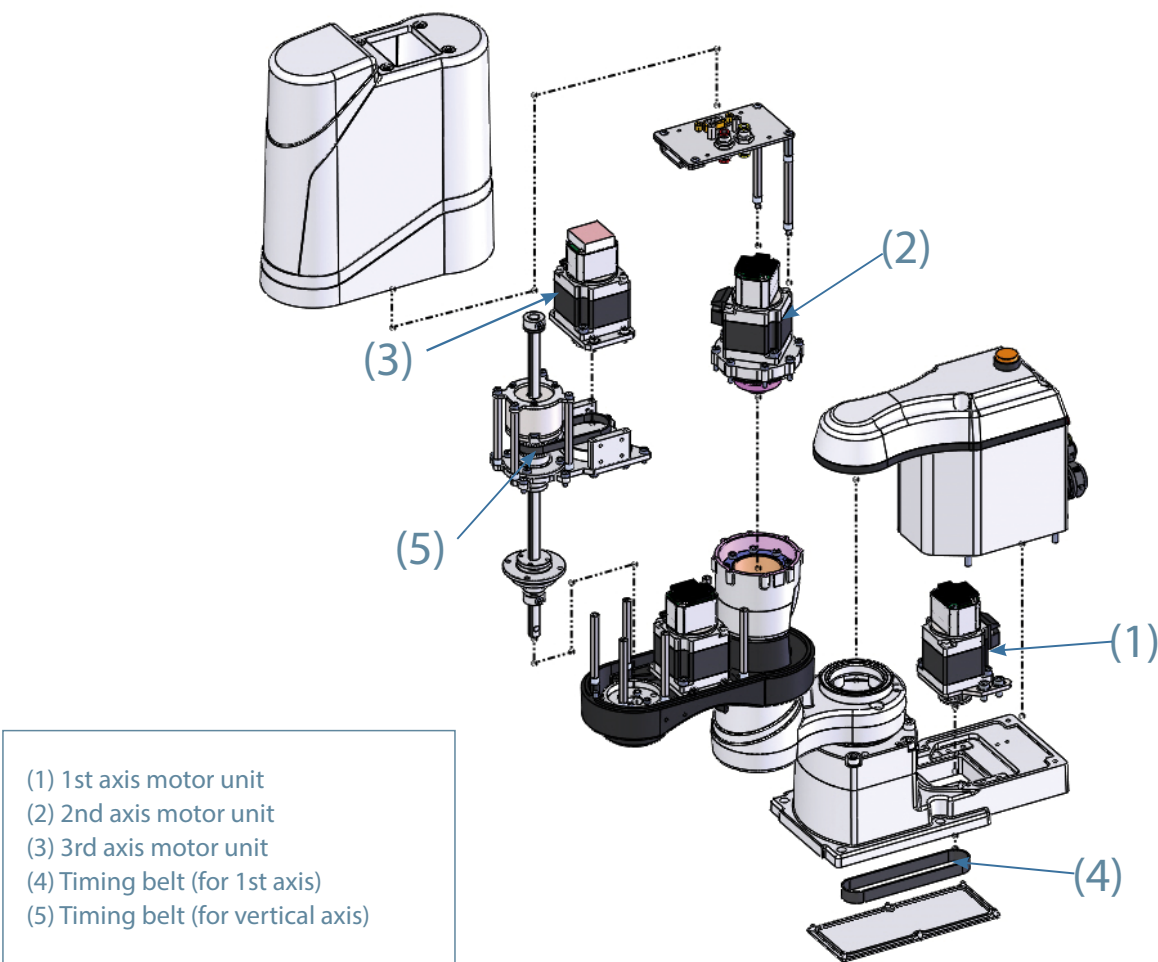


Connected to controller



IXA Maintenance Part Schematic Drawing

IXA-□NNN1805



IXA Maintenance Part List

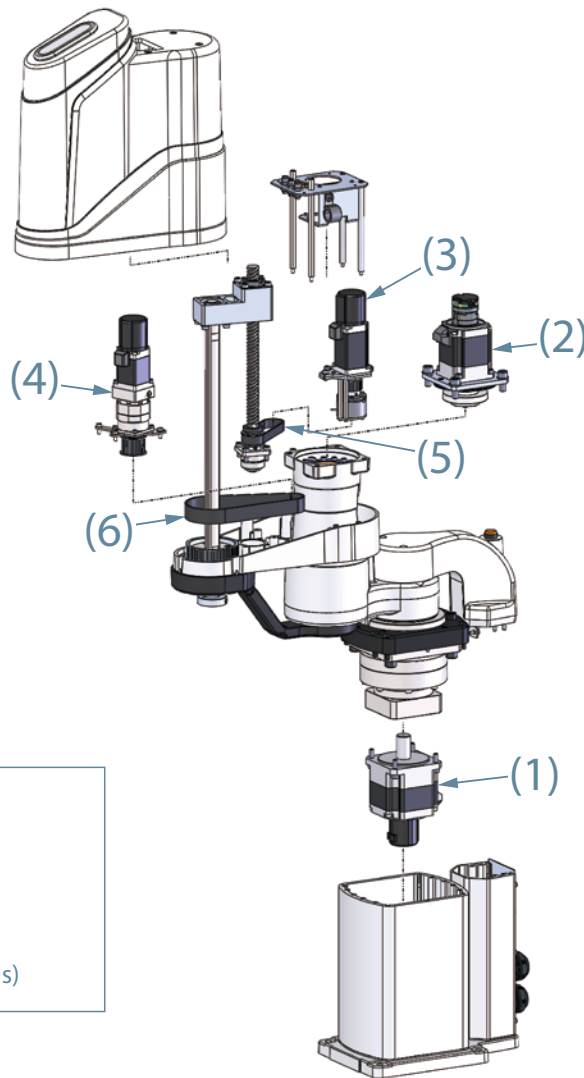
Numbers in the table correspond to those in the schematic drawing.

Type	Motor axis No.	Model	Remarks
IXA-□NNN1805	(1) 1st axis	M-IXA-N18-1-PU	With pulley
	(2) 2nd axis	M-IXA-N18-2	
	(3) 3rd axis	M-IXA-N18-3-PU	With pulley
Type	(4) Timing belt (for 1st axis)	(5) Timing belt (for vertical axis)	
IXA-□NNN1805	TB-IXA-18-1	TB-IXA-18-3	

* The timing belt of the 4th axis (rotational axis) cannot be replaced by the customer.

IXA Maintenance Part Schematic Drawing

IXA-□NNN3015
IXA-□NSN3015



- (1) 1st axis motor unit
- (2) 2nd axis motor unit
- (3) 3rd axis motor unit
- (4) 4th axis motor unit
- (5) Timing belt (for 1st axis)
- (6) Timing belt (for vertical axis)

IXA Maintenance Part List

Numbers in the table correspond to those in the schematic drawing.

Type	Motor axis No.	Model	Remarks
IXA-□NNN3015	(1) 1st axis	M-IXA-N30-1	
	(2) 2nd axis	M-IXA-N30-2	
	(3) 3rd axis	M-IXA-N30-3-PU	With pulley
	(4) 4th axis	M-IXA-N30-4	
IXA-□NSN3015	(1) 1st axis	M-IXA-S30-1	
	(2) 2nd axis	M-IXA-S30-2	
	(3) 3rd axis	M-IXA-S30-3-PU	With pulley
	(4) 4th axis	M-IXA-S30-4	
Type	(5) Timing belt (for vertical axis)	(6) Timing belt (for rotational axis)	
IXA-□NNN3015	TB-IXA-30-3	TB-IXA-30-4	
IXA-□NSN3015			

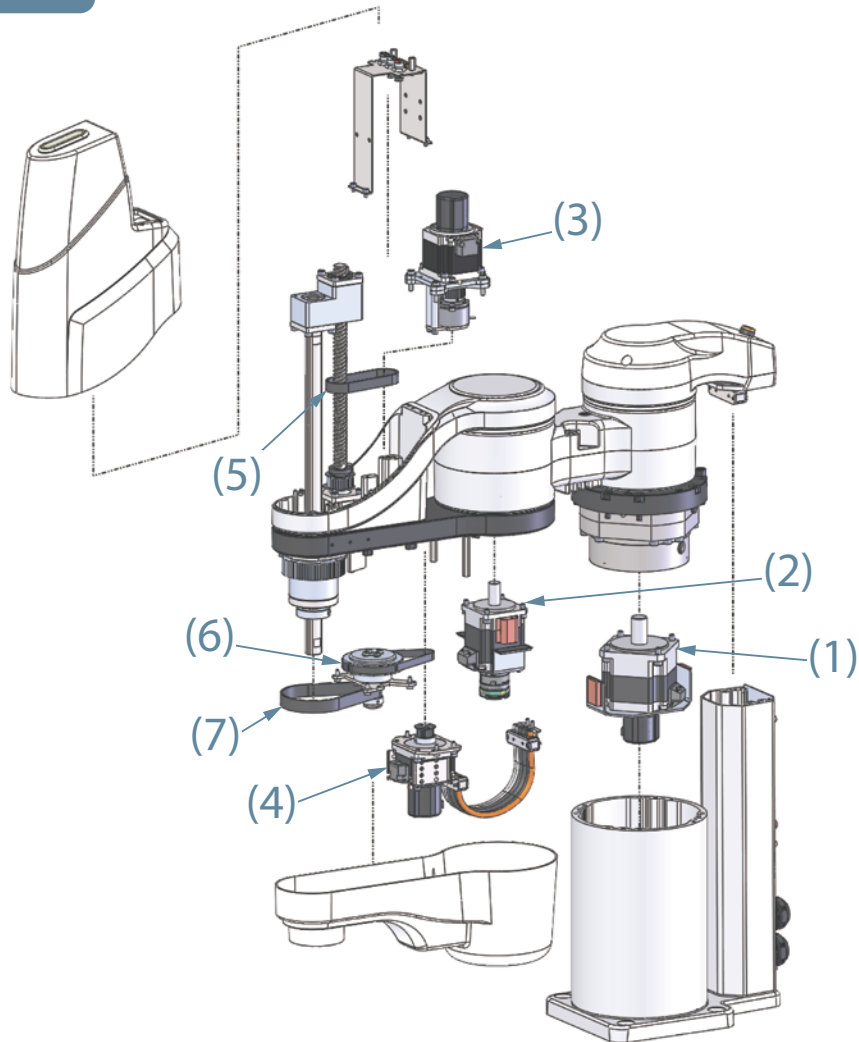
IXA Maintenance Part Schematic Drawing

IXA-□NNN45□□

IXA-□NSN45□□

IXA-□NNN60□□

IXA□NSN60□□



- (1) 1st axis motor unit
- (2) 2nd axis motor unit
- (3) 3rd axis motor unit
- (4) 4th axis motor unit
- (5) Timing belt (for vertical axis)
- (6) Timing belt (for rotational axis, 1st stage)
- (7) Timing belt (for rotational axis, 2nd stage)

IXA Maintenance Part List

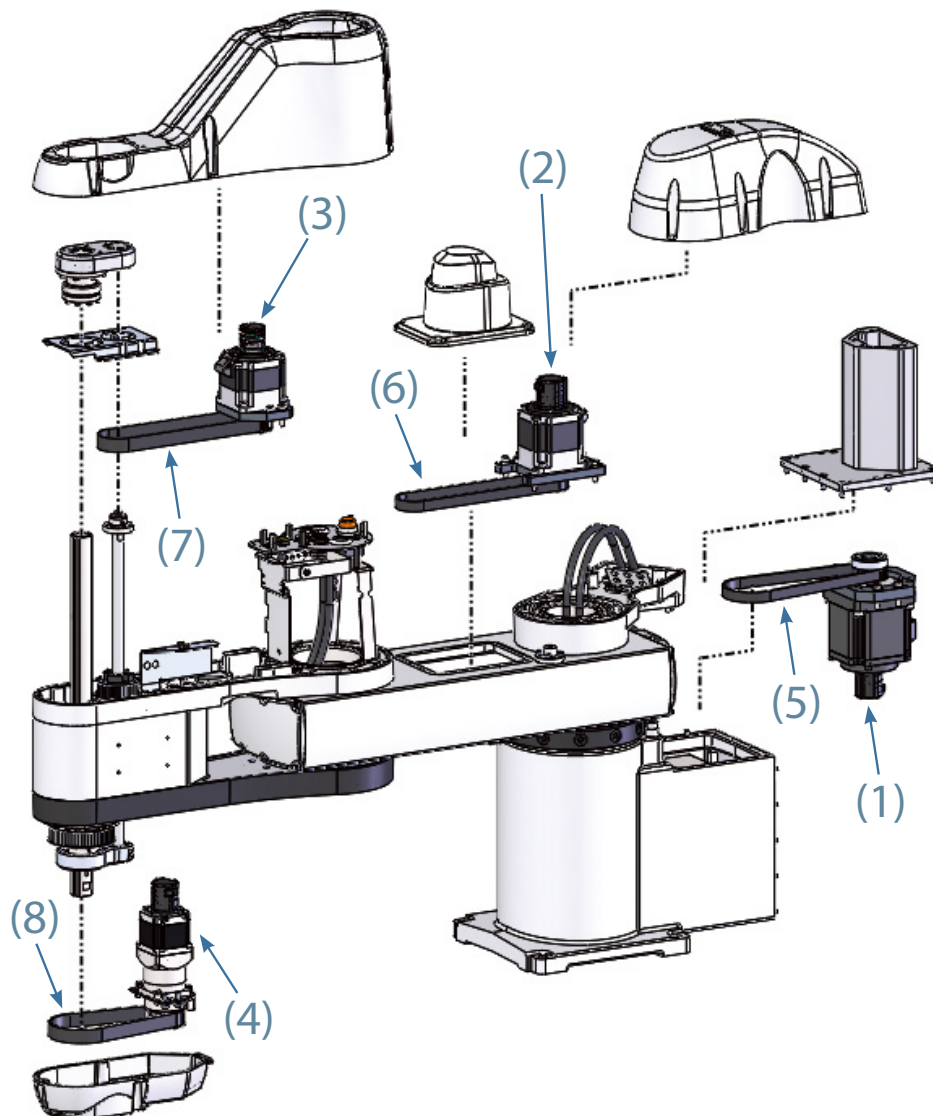
Numbers in the table correspond to those in the schematic drawing.

Type	Motor axis No.	Model	Remarks
IXA-□NNN45□□	(1) 1st axis	M-IXA-N45-1	
	(2) 2nd axis	M-IXA-N45-2	
	(3) 3rd axis	M-IXA-N45-3-PU	These with pulley that do not have V1 code at the end of the serial number. (ex.) Serial No. B00567400
		M-IXA-N45-3-PU-V1	Those with pulley that have V1 code at the end of the serial number. (ex.) Serial No. B00534640 V1
	(4) 4th axis	M-IXA-N45-4-PU	With pulley
IXA-□NSN45□□	(1) 1st axis	M-IXA-S45-1	
	(2) 2nd axis	M-IXA-S45-2	
	(3) 3rd axis	M-IXA-S45-3-PU	These with pulley that do not have V1 code at the end of the serial number. (ex.) Serial No. B00567400
		M-IXA-S45-3-PU-V1	Those with pulley that have V1 code at the end of the serial number. (ex.) Serial No. B00534640 V1
	(4) 4th axis	M-IXA-S45-4-PU	With pulley
IXA-□NNN60□□	(1) 1st axis	M-IXA-N60-1	
	(2) 2nd axis	M-IXA-N60-2	
	(3) 3rd axis	M-IXA-N60-3-PU	These with pulley that do not have V1 code at the end of the serial number. (ex.) Serial No. B00567400
		M-IXA-N60-3-PU-V1	Those with pulley that have V1 code at the end of the serial number. (ex.) Serial No. B00534640 V1
	(4) 4th axis	M-IXA-N60-4-PU	With pulley
IXA-□NSN60□□	(1) 1st axis	M-IXA-S60-1	
	(2) 2nd axis	M-IXA-S60-2	
	(3) 3rd axis	M-IXA-S60-3-PU	These with pulley that do not have V1 code at the end of the serial number. (ex.) Serial No. B00567400
		M-IXA-S60-3-PU-V1	Those with pulley that have V1 code at the end of the serial number. (ex.) Serial No. B00534640 V1
	(4) 4th axis	M-IXA-S60-4-PU	With pulley

Type	(5) Timing belt (for vertical axis)	(6) Timing belt (for rotational axis, 1st stage)	(7) Timing belt (for rotational axis, 2nd stage)
IXA-□NNN45□□	TB-IXA-4560-3	TB-IXA-4560-4-1	TB-IXA-4560-4-2
IXA-□NNN60□□			
IXA-□NSN45□□			
IXA-□NSN60□□			

IXA Maintenance Part Schematic Drawing

IXA-4NNN80□□
IXA-4NSN80□□
IXA-4NNN100□□
IXA-4NSN100□□



- (1) 1st axis motor unit (2) 2nd axis motor unit (3) 3rd axis motor unit
(4) 4th axis motor unit (5) Timing belt for 1st axis
(6) Timing belt for 2nd axis (7) Timing belt for 3rd axis
(8) Timing belt for 4th axis

IXA Maintenance Part List

Numbers in the table correspond to those in the schematic drawing.

Motor model number for replacement

Type	Motor axis No.	Model	Remarks
IXA-4NNN80□□	(1) 1st axis	M-IXA-N80-1-PU	With pulley
	(2) 2nd axis	M-IXA-N80-2-PU	With pulley
	(3) 3rd axis	M-IXA-N80-3-PU	With pulley
	(4) 4th axis	M-IXA-N80-4	
IXA-4NNN100□□	(1) 1st axis	M-IXA-N100-1-PU	With pulley
	(2) 2nd axis	M-IXA-N100-2-PU	With pulley
	(3) 3rd axis	M-IXA-N100-3-PU	With pulley
	(4) 4th axis	M-IXA-N100-4	
IXA-4NSN80□□	(1) 1st axis	M-IXA-S80-1-PU	With pulley
	(2) 2nd axis	M-IXA-S80-2-PU	With pulley
	(3) 3rd axis	M-IXA-S80-3-PU	With pulley
	(4) 4th axis	M-IXA-S80-4	
IXA-4NSN100□□	(1) 1st axis	M-IXA-S100-1-PU	With pulley
	(2) 2nd axis	M-IXA-S100-2-PU	With pulley
	(3) 3rd axis	M-IXA-S100-3-PU	With pulley
	(4) 4th axis	M-IXA-S100-4	

Timing belt model number for replacement

Type	(5) Timing belt (for 1st axis)	(6) Timing belt (for 2nd axis)	(7) Timing belt (for vertical axis)	(8) Timing belt (for rotational axis)
IXA-4NNN80□□	TB-IXA-80-1-N	TB-IXA-80-2-N	TB-IXA-80100-3-N	TB-IXA-80100-4
IXA-4NNN100□□	TB-IXA-100-1-N	TB-IXA-100-2-N		
IXA-4NSN80□□	TB-IXA-80100-1-S	TB-IXA-80-2-S	TB-IXA-80100-3-S	
IXA-4NSN100□□		TB-IXA-100-2-S		

Options and Maintenance parts

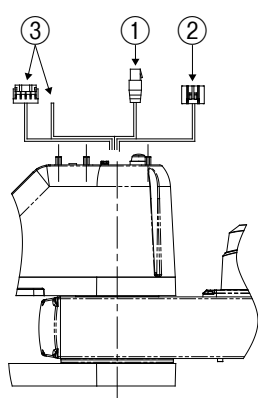
Options

Built-in extended user cable specification (arm length 800/1000 only)

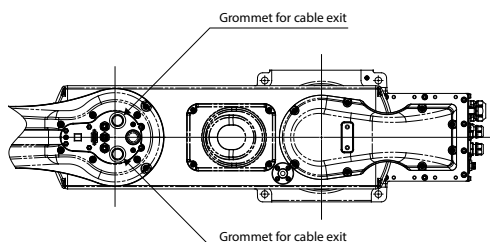
Model EXC

Description The following cables (1) to (3) are built in the SCARA robot body.
The body mass increases by 0.5 kg.

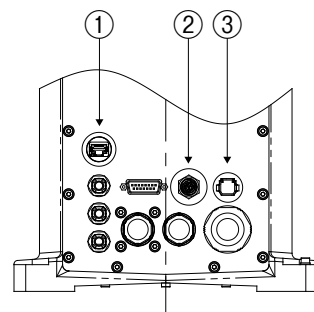
	Cable type	Connector		Application example
		User panel side	Rear panel side	
①	Ethernet cable	TM21CP- 88P(03) (Hirose Electric)	09_45_1561 (HARTING)	Vision camera, etc.
②	10-core composite cable	7-core: DF11-8DS-2C (Hirose Electric)	LF10WBRB-12P (Hirose Electric)	Solenoid valve power cable (supports solenoid valve set option) Vision camera power, etc.
		5-core: No connector		
③	13-core composite cable	DF62C-24S-2.2C (Hirose Electric)	DF62P-24EP-2.2C (Hirose Electric)	Power and signal lines Electric gripper (RCP4-GR series)



User panel side



Rear panel side



① Ethernet cable

Color	Signal	Pin No.
Blue	—	4
White	—	5
Orange	—	6
White	—	3
Green	—	2
White	—	1
Brown	—	8
White	—	7
—	SHIELD	BODY

Sheath Shield

② 10-core composite cable

Color	Signal	Pin No.
Red	SV1a	1
White	SV1b	2
Black	SV2a	3
Blue	SV2b	4
Green	SV3a	5
Yellow	SV3b	6
Brown-purple	COM	7
—	—	8

Color	Signal	Pin No.
Red	24V(+)	—
Black	GND	—
Green/Yellow	FG	—

Sheath

③ 13-core composite cable

Color	Signal	Pin No.
Red	A	3
White	VMM	5
Black	/A	4
Brown	B	10
Yellow	VMM	9
Green	/B	15
Yellow	A	1
White	/A	6
Red	B	11
Green	/B	16
Black	Vcc	21
Brown	GND	7
Blue	VPS	18
—	SHIELD	24

Single wire Soldered Shield Soldered Single wire

LED pilot lamp (standard type only)

Model LED

Description Installation of an LED that can be turned on and off as required.

Single unit options and maintenance parts

Series	Type	Type		Single unit option				Maintenance parts
				Flange	Metal cap for user wiring	User cable	Wiring/piping options	Absolute reset adjusting jig
IXA	Standard type	NNN	1805	IX-FL-4	-	CB-IXA-USR□□□-CS	-	JG-IXA2
	High speed type	NNN NSN	3015	IX-FL-1				JG-IXA1
			45□□				IXA-FL-1	
			60□□					
			80□□					
			100□□					

*Wiring/piping options

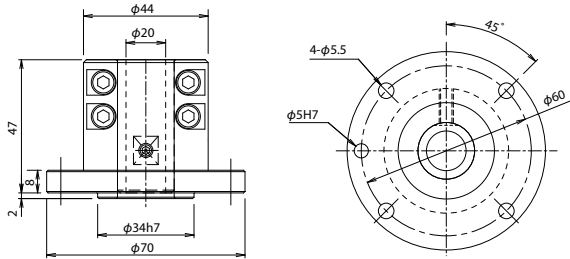
Name	Model
Protective flange for external wiring	IXA-PLF-EW-1
Protective flange for R-axis wiring	IXA-PLF-RW-1
Side stay for Z-axis wiring	(Z-axis) 200ST IXA-SST-ZW-1
	(Z-axis) 400ST IXA-SST-ZW-2
Upper stay for Z-axis wiring	(Z-axis) 200ST IXA-TST-ZW-1
	(Z-axis) 400ST IXA-TST-ZW-2
Solenoid valve set	IXA-SVP-1

Flange

Used to attach an object at the vertical arm tip.

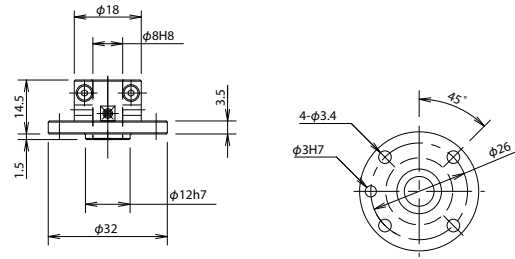
Single unit model number **IX-FL-1**

(Single unit mass 0.21kg/material aluminum)



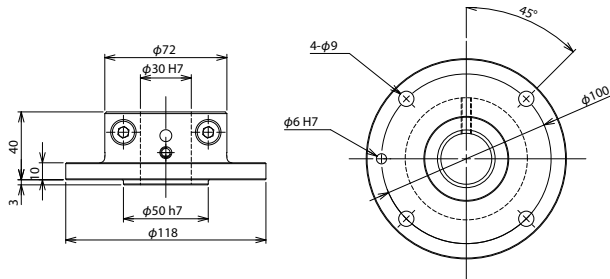
Single unit model number **IX-FL-4**

(Single unit mass 0.02kg/material aluminum)



Single unit model number **IXA-FL-1**

(Single unit mass 2.0kg/material steel)



Upper stay for Z-axis wiring

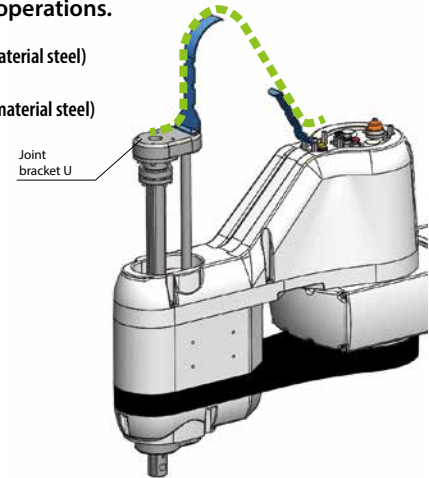
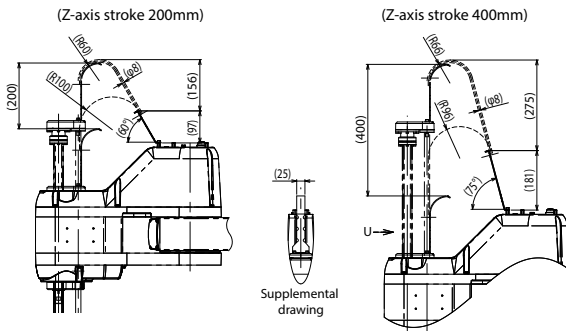
This is an auxiliary stay for wiring between the user panel and joint bracket U for Z-axis operations.

Single unit model number **IXA-TST-ZW-1**

(Z-axis stroke 200mm) (Single unit mass 0.2kg/material steel)

IXA-TST-ZW-2

(Z-axis stroke 400mm) (Single unit mass 0.25kg/material steel)

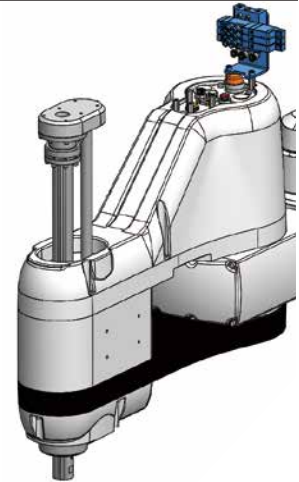
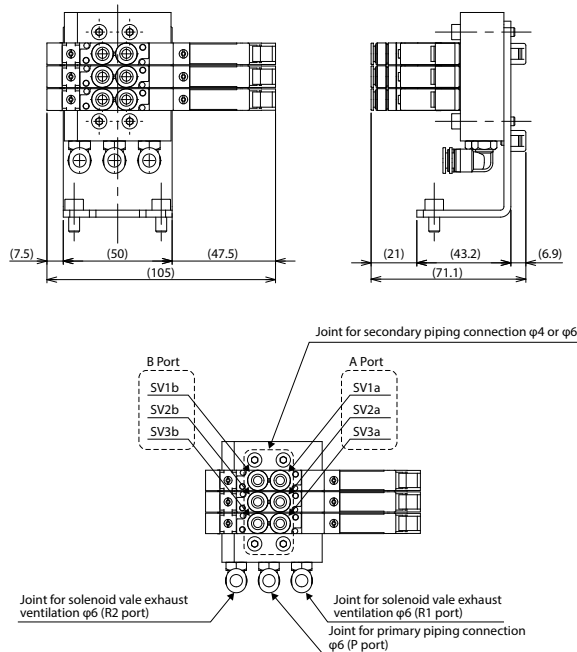


Solenoid valve set

This is an optional solenoid valve when installing an air chuck at the tip.
When the robot built-in cable is used for power supply to the solenoid valve, select the built-in extended user cable (option: EXC).

Single unit model number **IXA-SVP-1**

(Single unit mass 0.5kg)



Mode	F10M3Fstn.1-3 F10T3-FJ-CP5 DC24V
Maker	Koganei
Number of positions	3 positions
Number of ports	5
Valve function	Closed center
Fluid to be used	Air
Operation method	Internal pilot type
Acoustic conductance	0.93 dm ³ /(s·bar)
Effective sectional area (Cv value)	4.6mm ² (0.25)
Piping connecting diameter	φ4 and φ6 dual joint
Pressure range for use	0.2~0.6MPa
Rated voltage	DC24V
Lubrication	Not necessary

Absolute reset adjusting jig

An adjusting jig to perform absolute resetting when the encoder absolute data is lost.

Single unit model number **JG-IXA1**

Single unit model number **JG-IXA2**

Single unit model number **JG-IXA4**




X-SEL

SCARA Robot Program Controller



List of Models

Multi-axis program controller enabling SCARA robot to operate.

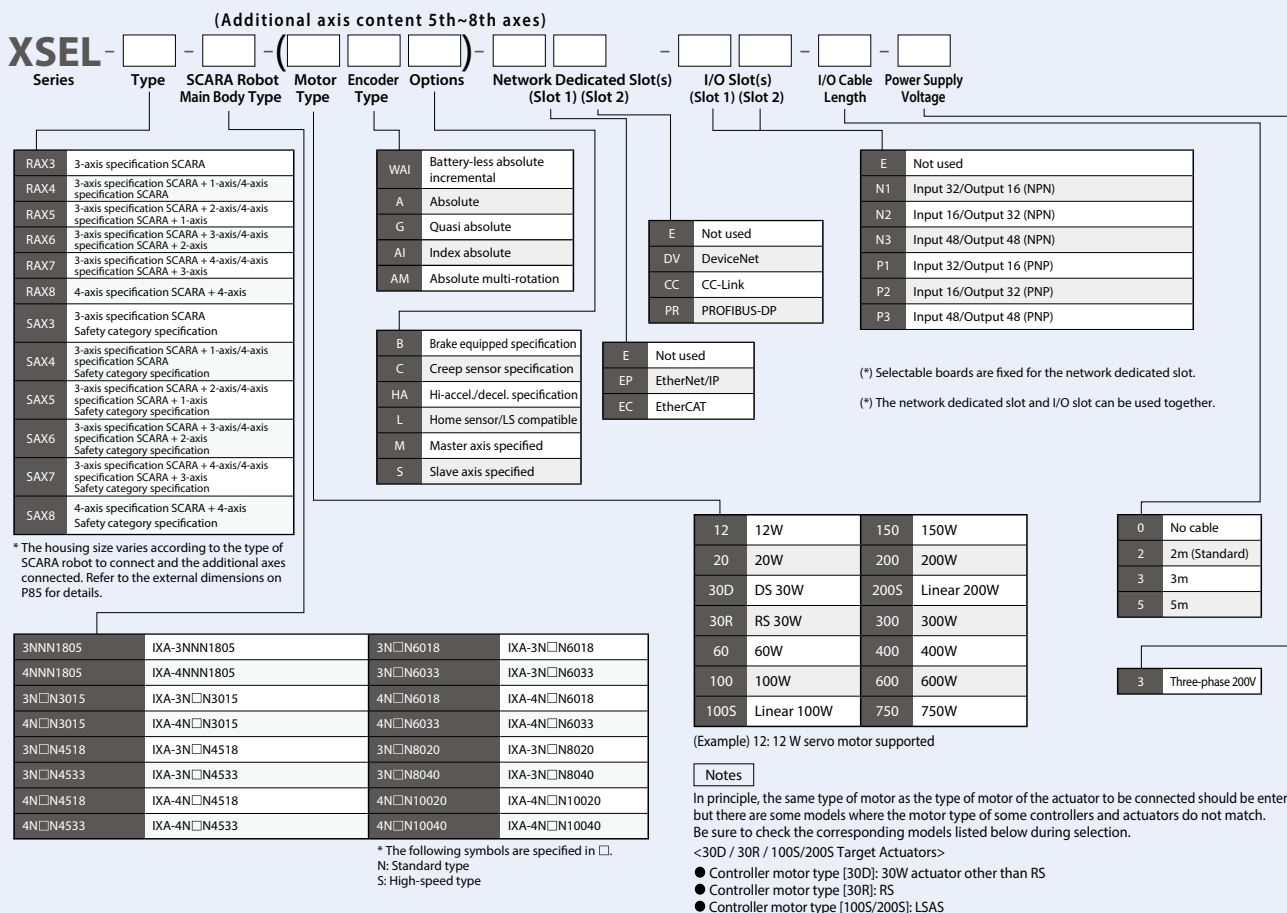
Type name		RAX	SAX
Connectable axes		SCARA 1 unit/ single-axis and cartesian	
External view			
Type		Standard specification	Safety category compliant
Max. number of controlled axes		8 axes	
No. of positions		(3-axis specification) Maximum 41,250 positions, (4-axis specification) Maximum 36,666 positions * Varies depending on the number of axes. Refer to the specification table (P84) for more information.	
Number of programs		255	
Number of program steps		20,000	
Max. output of connected axes		Three-phase 2,400W/three-phase 2550W (high capacity type)	
Motor input power supply voltage		Three-phase 200V/230 VAC ±10%	
Control power supply voltage		Single phase 200V/230VAC ±10%	
Safety category (*1)		B	Safety category 4 compatible
International standard		CE	
ROBO Cylinder control function (*2)		Able to control up to 32 additional axes (only IAI controllers compatible with MECHATROLINK-III)	
Communication port	Ethernet	Equipped as standard: 10/100/1000BASE-T (RJ-45)	
	USB2.0	Equipped as standard: USB2.0 (Mini-B)	
	General-purpose RS-232C communication port	1 channel (maximum 230.4kbps)	

(*1) To comply with the safety category, the customer will need to install a safety circuit external to the controller.

(*2) Synchronous control is not available.

Model

[XSEL-RAX/SAX Type]



Non-Connectable Actuators (Additional Axes)

Linear servo actuators (other than LSAS Series), RCS2-□□5N (incremental specification), RCS2-SRA7BD/SRGS7BD/SRGD7BD, NS-SXM□/SZM□ (incremental specification only for both), RCS3-CT□, RCS2-RA13R (with load cell), RCS3-RA□R, DD/DDA (high resolution specification).

Limitations on Additional Axis Connection

For SCARA controllers, there is a limit to the total motor wattage of the additional axis actuator motor that can be connected besides SCARA robots. Make sure that it does not exceed the "total wattage and max. number of connectable axes" in the following table.

SCARA robot model		Number of additional axes connectable to XSEL-RAX/SAX and total W	
		Total wattage	Number of connectable axes
Standard type	IXA-3NNN1805	1500W or less in total (1 axis maximum 750W)	Maximum 4 axes (5th to 8th axes)
	IXA-3NNN3015		
	IXA-3NNN45□□	600W or less in total (1 axis maximum 700W)	
	IXA-3NNN60□□		
	IXA-4NNN1805		
	IXA-4NNN3015	600W or less in total (1 axis maximum 600W)	
	IXA-4NNN45□□		
	IXA-4NNN60□□		Maximum 3 axes (6th to 8th axes)
	IXA-4NNN80□□		
IXA-4NNN100□□			
High-speed type	IXA-3NSN3015/4NSN3015	Cannot be connected	
	IXA-3NSN45□□/4NSN45□□		
	IXA-3NSN60□□/4NSN60□□		
	IXA-4NSN80□□		
	IXA-4NSN100□□		

(Note)

* Additional axes cannot be connected to high-speed type SCARA robots (including Dust/Splash Proof Specification).

* When an additional axis is added to the standard type, the controller will be that for an 8-axis cabinet.

An additional axis cannot be connected as the 4th axis to a SCARA robot (IXA-3NNN□□□) to 3-axis specification.

It can be connected to 5th - 8th axes of the XSEL controller.

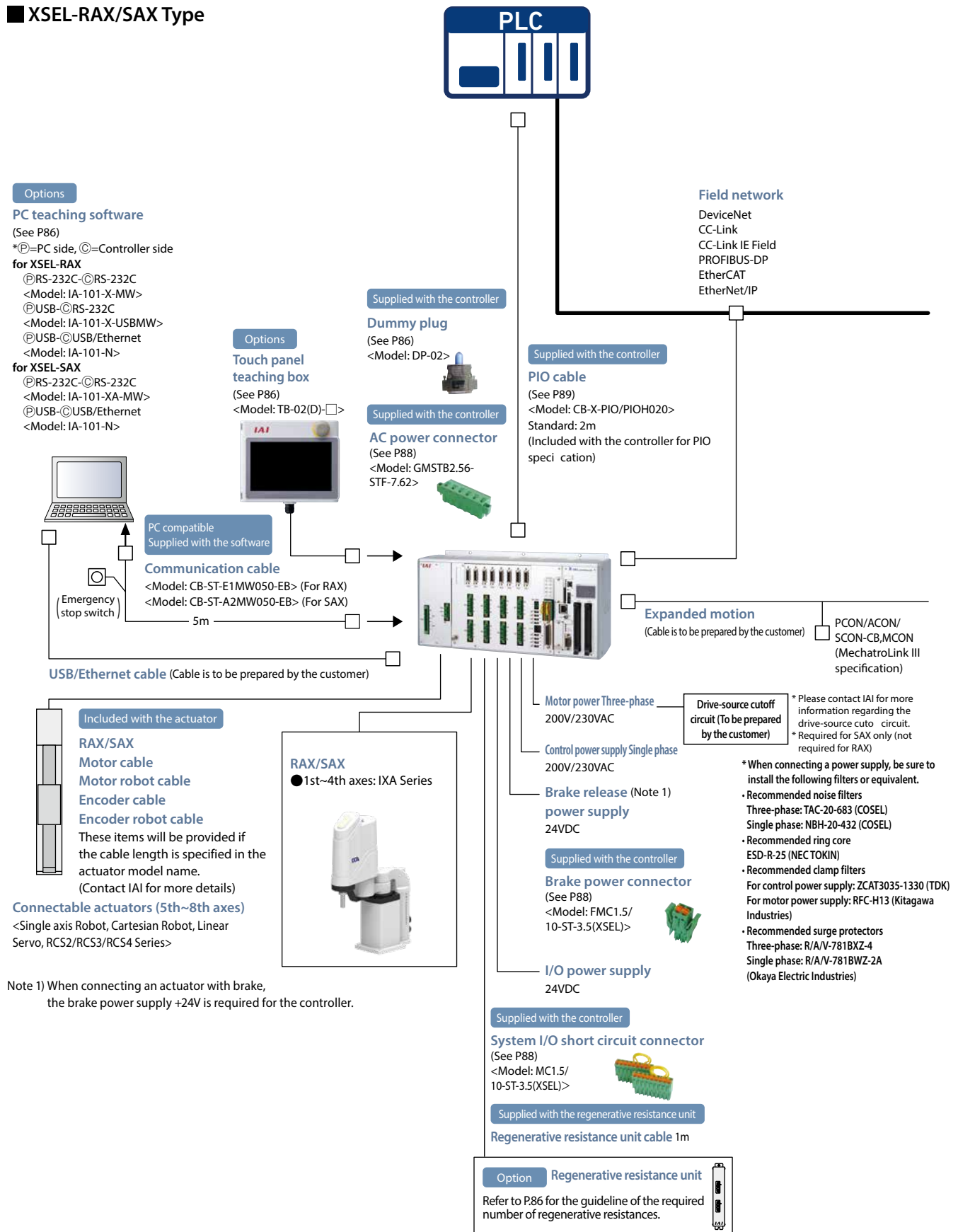
■ Calculating the connectable actuator wattage when connecting a direct drive motor (DD/DDA) to the additional axis.

When connecting a DD/DDA motor series, calculate the wattage based on the "Output value for the controller wattage calculation," and select a number of units that is less than the maximum number of connectable units. Also, make sure that the total wattage of DD/DDA series and non-DD/DDA series is less than 1600W.

Actuator type	Applicable driver output (W)	DD/DDDA motor Maximum number of connectable actuators (unit)	Controller wattage Output value for calculation (W)
LT18S/LT18CS	200	8	200
LT18S/LT18CS	600	2	600

System Configuration

XSEL-RAX/SAX Type



*To configure the safety category (SIO1389-1) compliant system using the XSEL-SAX, contact IAI or the website.

Specifications Table

Controller type	RAX type	SAX type
Compatible motor output	12W~750W	
Number of controlled axes	1st~4th axis: SCARA robot, 5th~8th axis: Additional axes	
Max. output of connected axes	[Three-phase] Up to 2400W	[Three-phase] Up to 2400W/3-phase 2550W (Note 1)
Control power input	Single phase 200/230VAC $\pm 10\%$	
Power frequency	50/60Hz	
Insulation resistance	10M Ω or more (Between the power supply terminal and I/O terminal, and between the external terminal batch and case, at 500VDC)	
Withstand voltage	1500 VAC (1 min)	
Power capacity (max)	5094VA (at max. output of connected axes)	
Position detection method	Incremental, absolute, battery-less absolute	
Safety circuit configuration	Duplication not possible	Duplication allowed
Drive-source cutoff method	Internal relay cut-off	External safety circuit
Emergency stop input	B contact input (Internal power supply)	B contact input (External power supply, duplication possible)
Enable input	B contact input (Internal power supply)	B contact input (External power supply, duplication possible)
Speed setting	Lower limit 1mm/s~ Upper limit depends on the actuator specification	
Acceleration/deceleration setting	Lower limit 0.01G~ Upper limit depends on the actuator specification	
Programming language	Super SEL language	
Number of programs	255 programs	
Number of program steps	20,000 steps (total)	
No. of multi-tasking programs	16 programs	
Number of positions	Varies by the number of controlled axes 3-axis: 41,250, 4-axis: 36,666, 5-axis: 33,000, 6-axis: 30,000, 7-axis: 27,500, 8-axis: 25,384	
Data recording element	Flash ROM + non-volatile RAM (FRAM): system battery (button battery) not required	
Data input method	Teaching pendant or PC compatible software	
Standard I/O	I/O 48-point PIO board (NPN/PNP), I/O 96-point PIO board (NPN/PNP) 2 boards attachable	
Expansion I/O	None	
Serial communication function	Teaching port (D-sub25 pin), USB port (Mini-B) 1ch RS232C port (D-sub 9 pin), Ethernet (RJ-45)	
RC gateway function	None	
Fieldbus communication function	DeviceNet, CC-Link, PROFIBUS-DP, EtherNet/IP, EtherCAT * EP and CIE cannot be connected at the same time.	
Clock function	Retention time: about 10 days Charging time: about 100 hours	
Regenerative resistance	Built-in 1k Ω /20W regenerative resistance (Can be expanded by external regenerative resistance unit connection)	
Absolute battery	AB-5 (built-in controller) * Additional axes for absolute specification only	
Protection function	Motor overcurrent, overload, motor driver temperature check, overload check, encoder disconnection detection, soft limit over, system malfunction, absolute battery error, etc.	
Ambient operating temperature, humidity and ambience	0 ~ 40°C, 85% RH or less (non-condensing), avoid corrosive gas and excessive dust	
Safety category	B	Compliant with Category 4 is possible.
Overseas standards	CE	CE, UL

* For the power supply capacity etc., please refer to the operation manual or contact IAI.

(Note 1) The following SCARA robots are supported.

- IXA-4NSN80□□
- IXA-4NSN100□□

External Dimensions

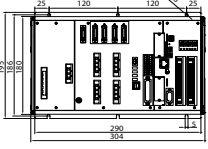
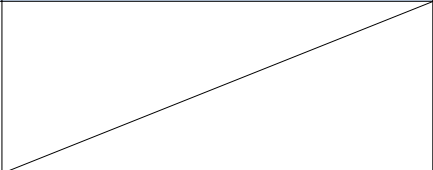
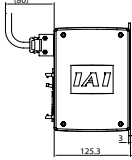
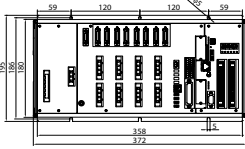
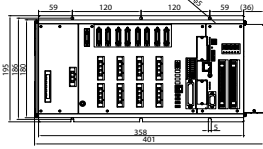
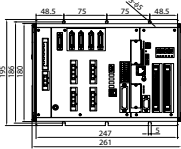
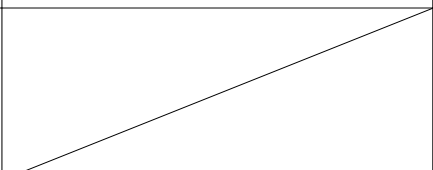
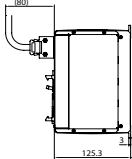
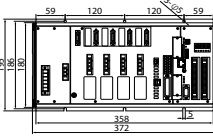
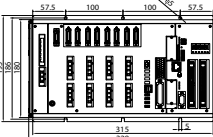
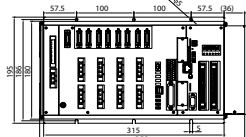
* Notes for order placement

The following controllers of IXA SCARA robots are a cabinet for 8 axes.

* High-speed type with 3-axis and 4-axis specification (NSN)

* Standard type with 4-axis specification IXA-4NNN60□□/4NNN80□□/4NNN100□□

* When an additional axis is added to the standard type (NNN) of 3-axis and 4-axis specifications.

	Controller Specification		Front View		Side View
			Battery-less absolute/Incremental specification /Quasi absolute specification/Index absolute specification	Absolute specification/ Absolute multi-rotation specification	
RAX	Three-phase specification	4-axis specification			
		5~8-axis specification			
SAX	Three-phase specification	4-axis specification			
		4-axis specification (High capacity type [Note 1])			
		5~8-axis specification			

* If absolute specification is included for more than 1 connected single actuator, the external dimensions will be that of the absolute specification.

(Note 1) High capacity types are SCARA robots listed below.

· IXA-4NSN80□□

· IXA-4NSN100□□

Options

Regenerative resistance unit

Model **RESU-1** (Standard specification)
RESUD-1 (DIN rail mounting specification)

Specification

Model	RESU-1	RESUD-1
Unit mass	Approx. 0.4kg	
Built-in generative resistance value	235Ω 80W	
Mounting method	Screw mount	DIN rail mount
Supplied cable	CB-ST-REU010	

Description

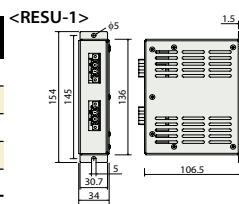
The regenerative resistance unit converts to heat the regenerative current generated when the motor decelerates. A regenerative resistor is also installed inside the controller. However, if the load is large on the vertical axis, the capacity becomes insufficient, so an external regenerative resistance unit will be required.

<When connecting a single-axis robot>

Installation standard It will be determined by the total motor capacity of the connected axes.

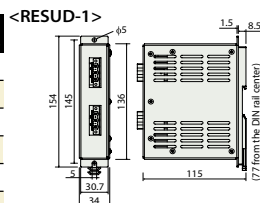
Horizontal use

Total motor capacity	Required number of regenerative resistance units
~100W	0 unit
~600W	1 unit
~1200W	2 units
~1800W	3 units
~2400W	4 units



Vertical use

Total motor capacity	Required number of regenerative resistance units
~100W	0 unit
~600W	1 unit
~1000W	2 units
~1400W	3 units
~2000W	4 units
~2400W	5 units



<When connecting a SCARA robot>

Guideline for installation standard

Model	Required number of regenerative resistance units
1805	0 unit
3015	2 units
45□□	
60□□	
80□□	
100□□	7 units
3015	3 units
45□□	
60□□	
80□□	
100□□	7 units

* The above required number is when one SCARA robot is used. When connecting a single-axis robot as an additional axis, add the regenerative resistance for the single-axis robot.

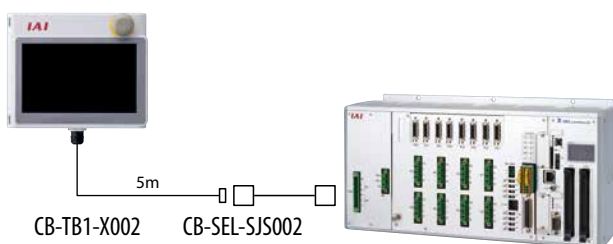
(Ex.) When operating IXA-3NNN3015 and ISB-MXM (200W).
 IXA-3NNN3015.....2 units are required
 ISB-MXM (200W)....1 unit is required
 Therefore, a total of 3 regenerative resistance units are required.

Touch panel teaching box

Features A teaching device equipped with functions such as position teaching, trial operation and monitoring.

Model **TB-02(D)-□**

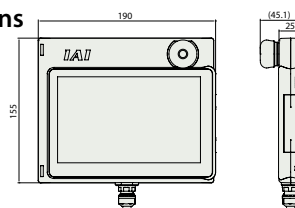
Configuration



Specification

Rated voltage	24V DC
Power consumption	3.6W or less (less than 150mA)
Ambient operating temperature	0 to 40°C
Ambient operating humidity	20~85% RH (non-condensing)
Degree of protection	IP20
Mass	470g (for TB-02 main unit only)

External dimensions

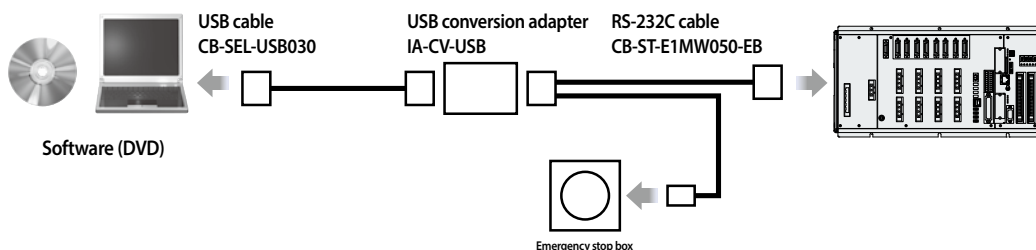


PC teaching software

for XSEL-RAX (Software + connecting cable + USB cable + USB conversion adaptor)

Model **IA-101-X-USBMW**

Features This optional item is an RS-232C cable attached with a USB converting adaptor, which enables use of the USB port of a PC.



Supported Windows versions: 7/8/8.1/10



PC Compatible Software

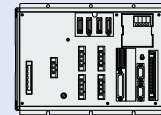
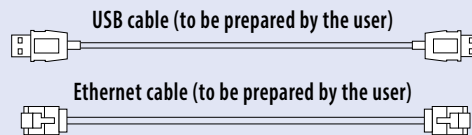
■ For XSEL-RAX/SAX (software)

Model **IA-101-N**

Features PC compatible teaching software only (DVD-ROM).
When connecting the controller and the PC using a USB or Ethernet cable, purchase only the software. A cable of the following specification is to be prepared by the customer.

Description Software (DVD-ROM), compatible Windows: 7/8/8.1/10/11

	Controller side connector	Maximum cable length
USB cable specification	USB Mini-B	5m
Ethernet cable specification	10/100/1000BASE-T (RJ-45)	5m



Notes

When operating the actuator by USB connection, be sure to install a stop switch to the system I/O connector.
If an emergency switch is not available, use the emergency stop-equipped model "IA-101-X-USBMW".

PC Compatible Software

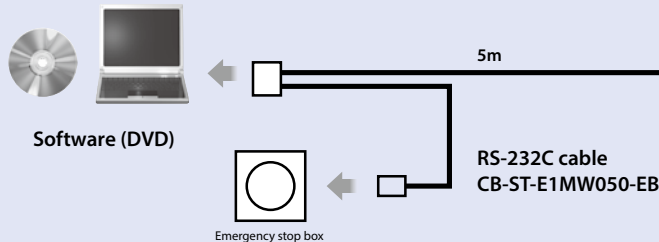
■ For XSEL-RAX (software + connection cable)

Model **IA-101-X-MW**

Features Start up supporting software that has program/position input, test operation and monitoring functions.
Debugging functions are considerably improved, reducing start up time.

Description Software (CD-ROM), compatible Windows: 7/8/8.1/10/11

(Accessories) PC connection cable 5m + Emergency stop box (Model: CB-ST-E1 MW050-EB)



Notes

* When using a controller that is compliant with the Safety Category 4, use IA-101-XA-MW.
* Cannot be used for the XSEL-SAX type.
* Note that the model number for cable only is CB-ST-E1MW050, and that comes with an emergency stop box as a set is CB-ST-E1MW050-EB.

Supported Windows versions: 7/8/8.1/10/11



Safety category 4 compliant PC software (for XSEL-SAX only)

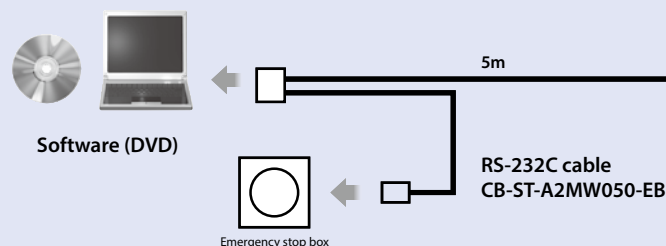
■ For XSEL-RAX/SAX (software + connection cable) * Compliant to safety category 4

Model **IA-101-XA-MW**

Features Start up supporting software that has program/position input, test operation and monitoring functions.
Debugging functions are considerably improved, reducing start up time.
The PC connection cable has a duplex circuit for emergency stop, which is compliant with the safety category 4.

Description Software (CD-ROM), compatible Windows: 7/8/8.1/10/11

(Accessories) PC connection cable 5m + Emergency stop box (Model: CB-ST-A2MW050-EB)



Notes

* Note that the model number for cable only is CB-ST-A2MW050, and that comes with an emergency stop box as a set is CB-ST-A2MW050-EB.
When a teaching tool is not used, attach a dummy plug DP-2, that is supplied with the controller, on the teaching connector.

Supported Windows versions: 7/8/8.1/10/11



Expansion I/O board

Single part for exchanging I/O slot.

Part name	Detail	I/O slot	Model number for single part
PIO board	Input 32/Output 16 (NPN)	N1	IAIO3202-NP1
	Input 32/Output 16 (PNP)	P1	IAIO3202-PN1
	Input 16/Output 32 (NPN)	N2	IAIO3202-NP2
	Input 16/Output 32 (PNP)	P2	IAIO3202-PN2
Multi-point I/O board	Input 48/Output 48 (NPN)	N3	IAIO3204-NP1
	Input 48/Output 48 (PNP)	P3	IAIO3204-PN1

Maintenance parts

These parts are normally included with the controller, but if you need to order due to loss, etc., purchase them separately.

AC power connector

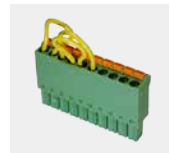
Model **GMSTB2.56-STF-7.62**



System I/O short circuit connector

Model **FMC1.5/10-ST-3.5(XSEL)**

Two pieces are necessary for the main unit.



Dummy plug

Model **DP-2**



Absolute data retaining battery

Model **AB-5**

Necessary when connecting absolute type actuator.



Brake power connector

Model **FMC1.5/2-ST-3.5-RF**



Network connector

for DeviceNet

Model **SMSTB2.5/5-ST-5.08AU(DV)**



for CC-Link
Terminal resistor with 110Ω/130Ω

Model **MSTB2.5/5-STF-5.08AU**



Maintenance parts

To purchase a replacement cable, use the model name listed below. Please contact IAI for more details about additional axis connection cables.

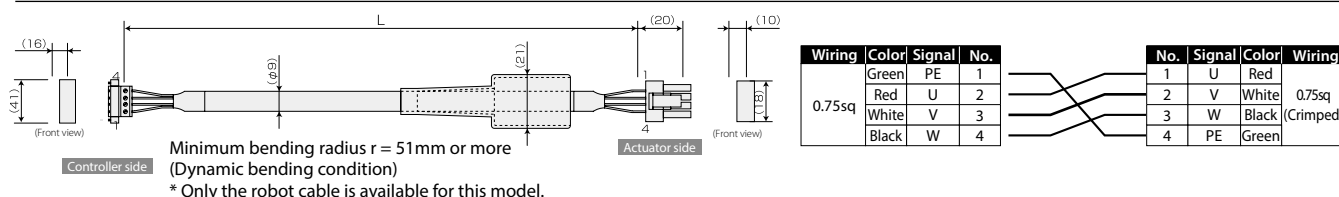
Table of applicable cables

Product model			Motor robot cable	Encoder robot cable	Brake cable
①	IXA	□NNN18	CB-X-MA□□□	CB-X1-PA□□□	CB-IXA-BK□□□-1
②		□NNN30			
③		□NNN45			
④		□NNN60			CB-IXA-BK□□□-2
⑤		□NS□30			
⑥		□NS□45			
⑦		□NS□60			

Product model		PIO flat cable
⑧	XSEL-RAX/SAX	CB-X-PIO□□□
		Flat cable for multi-point PIO
		CB-X-PIOH□□□

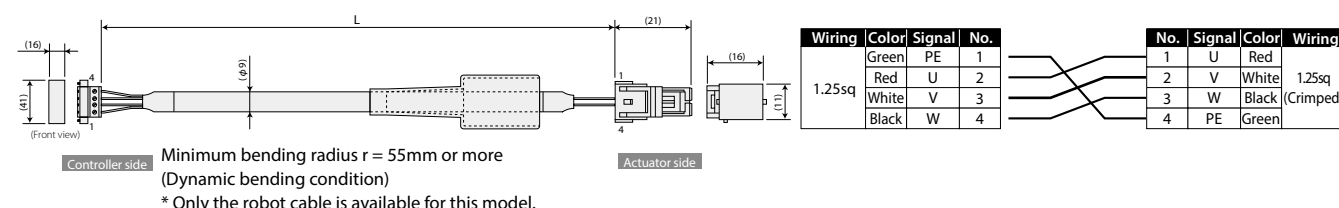
Model: **CB-X-MA**□□□

* Please indicate the cable length (L) in □□□, (e.g. 050 = 5m), maximum 15m



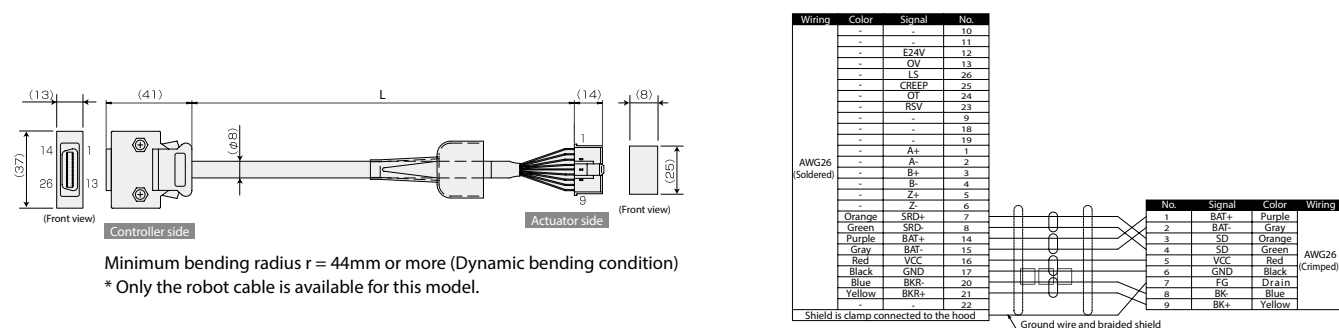
Model: **CB-XMC-MA**□□□

* Please indicate the cable length (L) in □□□, (e.g. 080 = 8m), maximum 15m



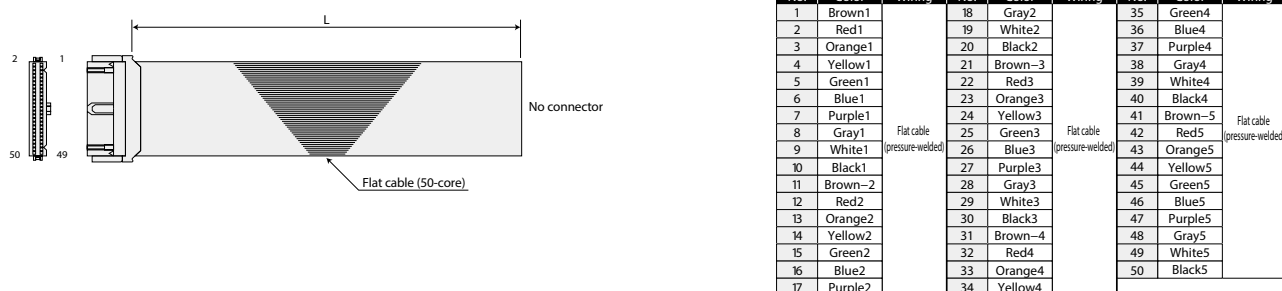
Model: **CB-X1-PA**□□□

* Please indicate the cable length (L) in □□□, (e.g. 050 = 5m), maximum 15m



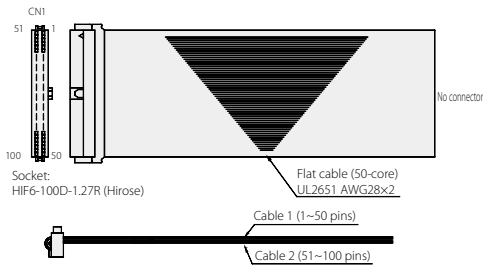
Model: **CB-X-PIO**□□□

* Please indicate the cable length (L) in □□□, (e.g. 080 = 8m), maximum 10m



Model: **CB-X-PIOH** □ □ □

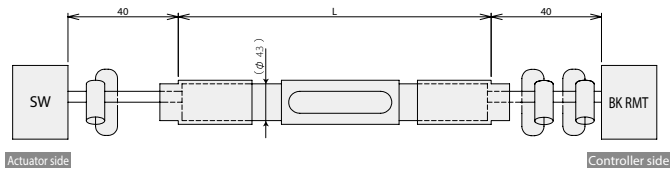
* Please indicate the cable length (L) in □ □ □, (e.g. 080 = 8m), maximum 10m



Cable 1				Cable 2			
Pin No.	Color	Port No.	Function	Pin No.	Color	Port No.	Function
1	Brown-1	—	External power supply 24VDC for pin No. 2-25, 51-74	51	Brown-1	300	Alarm output
2	Red-1	000	Program start	52	Red-1	301	Ready output
3	Orange-1	001	General-purpose input	53	Orange-1	302	Emergency stop output
4	Yellow-1	002	General-purpose input	54	Yellow-1	303	General-purpose output
5	Green-1	003	General-purpose input	55	Green-1	304	General-purpose output
6	Blue-1	004	General-purpose input	56	Blue-1	305	General-purpose output
7	Purple-1	005	General-purpose input	57	Purple-1	306	General-purpose output
8	Gray-1	006	General-purpose input	58	Gray-1	307	General-purpose output
9	White-1	007	Program designation (PRG No.1)	59	White-1	308	General-purpose output
10	Black-1	008	Program designation (PRG No.2)	60	Black-1	309	General-purpose output
11	Brown-2	009	Program designation (PRG No.3)	61	Brown-2	310	General-purpose output
12	Red-2	010	Program designation (PRG No.4)	62	Red-2	311	General-purpose output
13	Orange-2	011	Program designation (PRG No.5)	63	Orange-2	312	General-purpose output
14	Yellow-2	012	Program designation (PRG No.6)	64	Yellow-2	313	General-purpose output
15	Green-2	013	Program designation (PRG No.7)	65	Green-2	314	General-purpose output
16	Blue-2	014	General-purpose input	66	Blue-2	315	General-purpose output
17	Purple-2	015	General-purpose input	67	Purple-2	316	General-purpose output
18	Gray-2	016	General-purpose input	68	Gray-2	317	General-purpose output
19	White-2	017	General-purpose input	69	White-2	318	General-purpose output
20	Black-2	018	General-purpose input	70	Black-2	319	General-purpose output
21	Brown-3	019	General-purpose input	71	Brown-3	320	General-purpose output
22	Red-3	020	General-purpose input	72	Red-3	321	General-purpose output
23	Orange-3	021	General-purpose input	73	Orange-3	322	General-purpose output
24	Yellow-3	022	General-purpose input	74	Yellow-3	323	General-purpose output
25	Green-3	023	General-purpose input	75	Green-3	—	External power supply (V for pin No. 2-25, 51-74)
26	Blue-3	—	External power supply 24VDC for pin No. 27-50, 76-99	76	Blue-3	324	General-purpose output
27	Purple-3	024	General-purpose input	77	Purple-3	325	General-purpose output
28	Gray-3	025	General-purpose input	78	Gray-3	326	General-purpose output
29	White-3	026	General-purpose input	79	White-3	327	General-purpose output
30	Black-3	027	General-purpose input	80	Black-3	328	General-purpose output
31	Brown-4	028	General-purpose input	81	Brown-4	329	General-purpose output
32	Red-4	029	General-purpose input	82	Red-4	330	General-purpose output
33	Orange-4	030	General-purpose input	83	Orange-4	331	General-purpose output
34	Yellow-4	031	General-purpose input	84	Yellow-4	332	General-purpose output
35	Green-4	032	General-purpose input	85	Green-4	333	General-purpose output
36	Blue-4	033	General-purpose input	86	Blue-4	334	General-purpose output
37	Purple-4	034	General-purpose input	87	Purple-4	335	General-purpose output
38	Gray-4	035	General-purpose input	88	Gray-4	336	General-purpose output
39	White-4	036	General-purpose input	89	White-4	337	General-purpose output
40	Black-4	037	General-purpose input	90	Black-4	338	General-purpose output
41	Brown-5	038	General-purpose input	91	Brown-5	339	General-purpose output
42	Red-5	039	General-purpose input	92	Red-5	340	General-purpose output
43	Orange-5	040	General-purpose input	93	Orange-5	341	General-purpose output
44	Yellow-5	041	General-purpose input	94	Yellow-5	342	General-purpose output
45	Green-5	042	General-purpose input	95	Green-5	343	General-purpose output
46	Blue-5	043	General-purpose input	96	Blue-5	344	General-purpose output
47	Purple-5	044	General-purpose input	97	Purple-5	345	General-purpose output
48	Gray-5	045	General-purpose input	98	Gray-5	346	General-purpose output
49	White-5	046	General-purpose input	99	White-5	347	General-purpose output
50	Black-5	047	General-purpose input	100	Black-5	—	External power supply (V for pin No. 27-50, 76-99)

Model: **CB-IXA-BK** □ □ □ -1

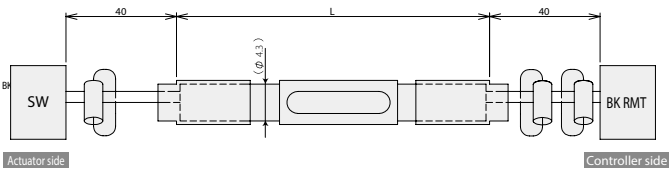
* Please indicate the cable length (L) in □ □ □, (e.g. 050 = 5m), maximum 15m



Connector	Identification	Signal	Pin No.	Pin No.	Signal	Identification	Connector
SW	Red	BK3	1	A2	BK3	Red	BK RMT
	White	COM	2	A3	COM	White	
	—	—	3	Remaining	—	—	

Model: **CB-IXA-BK** □ □ □ -2

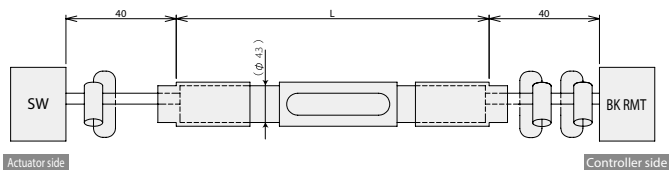
* Please indicate the cable length (L) in □ □ □, (e.g. 050 = 5m), maximum 15m



Connector	Identification	Signal	Pin No.	Pin No.	Signal	Identification	Connector
SW	Red	BK4	1	B2	BK4	Red	
	White	COM	2	A3	COM	White	
	—	—	3	Remaining	—	—	

Model: **CB-IXA-BK** □ □ □ -3

* Please indicate the cable length (L) in □ □ □, (e.g. 050 = 5m), maximum 15m



Connector	Identification	Signal	Pin No.	Pin No.	Signal	Identification	Connector
SW	Red	BK5	1	A4	BK5	Red	
	White	COM	2	A3	COM	White	
	—	—	3	Remaining	—	—	

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The information contained in this product brochure
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