GB

IAI
Quality and Innovation

High-Power SCARA Robot
With Battery-less Absolute Encoder

IXA Series

www.iai-automation.com

www.intelligentactuator.de

One of the fastest in the industry !

Introducing the new SCARA Robot IXA !

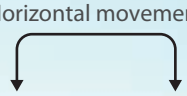
1 Industry top

Fastest cycle times

* The following measurements were taken during arch motion cycle operation under the following conditions and operation setting.

Operational conditions

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



Standard cycle time

High-speed type (IXA-NSN)	0.26s
Standard type (IXA-NNN)	0.38s

Continuous cycle time (duty 100%)

High-speed type (IXA-NSN)	0.45s
Standard type (IXA-NNN)	0.55s

2 Achieves a lower price

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

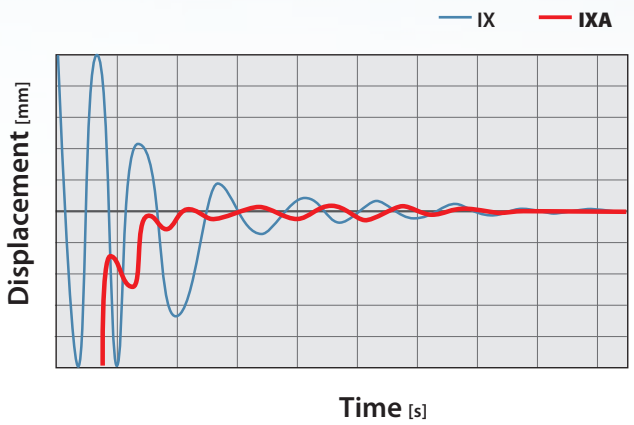
3 Low vibration, accurate positioning

Higher rigidity and optimized control mean significantly less vibration during Stopping.

Operational conditions		
Model	**IXA-4NSN4518**	IX-NSN5016H
Payload	2kg	
Cycle time	0.26s	0.29s

Stops on a dime

[X direction]

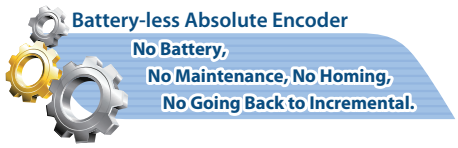


4 Equipped with a Battery-less Absolute Encoder as standard

There is no need to replace batteries and less maintenance.

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.**



5 Dust / Splash-proof specification suitable for environment

Compliant to degree of protection of IP65.

IP65	Solid particle	(Summary) Dust-proof * Dusts are totally shut out and do not ingress the main body.
	Water	(Summary) Protection against water jet * Direct water jet from any direction shall have no harmful effects.

*IEC 60529

Indication for the degree of protection

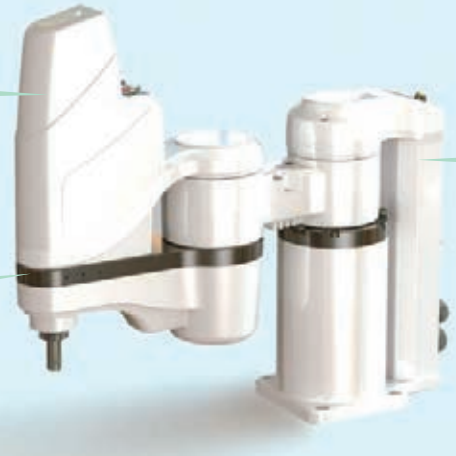
IP□□

First digit
Protection against human bodies and solid particles.

Second digit
Protection against water ingression

6 Mechanical structure / features

Standard / High-speed type



Fully covered structure

The operating part is covered for improved dust-proofing.

Patent pending

Double arm structure *

Improved rigidity for less vibration. Heat dissipation has been improved for shorter continuous cycle times.

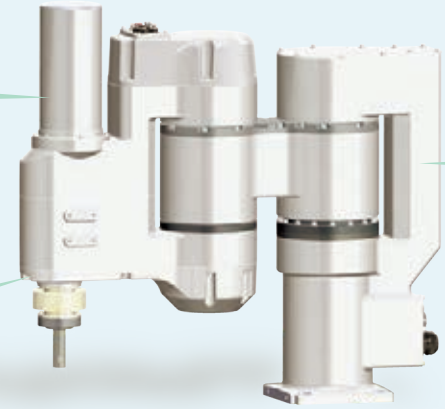
*** Excluding arm length 180mm**

Patent pending

Built-in cables

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

Dust / Splash-proof specification



Aluminum cover is used

When receiving direct water jet, the cover is not deformed, and water does not ingress inside. There is no swelling caused by coolant, either.

Double arm structure *

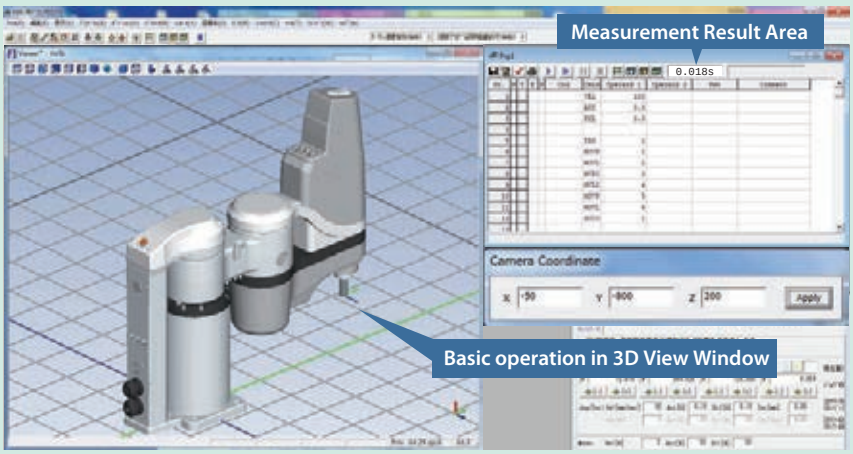
*** Excluding arm length 300mm**

Built-in cables

Coming soon

7 Simulation Software

You can check the motion of SCARA without a robot, if you use the PC software.
In addition, you can measure the cycle time easily.



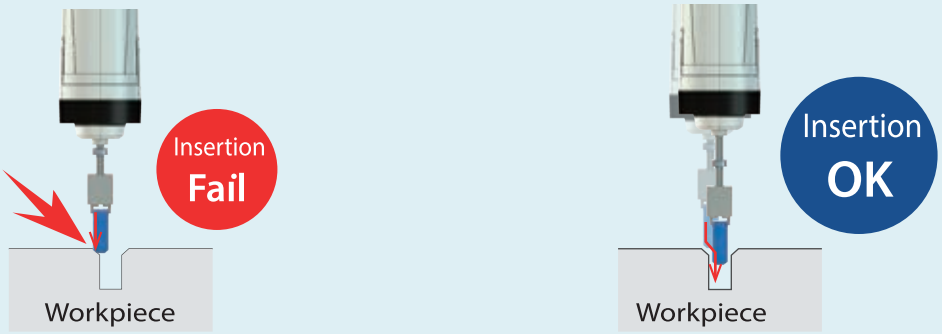
8 Control functions by Controller

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.

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

Normal control	Compliance control
The pin collides with the chamfered part of the inserting hole, making insertion impossible.	The pin moves along the chamfered surface, enabling the pin to insert.

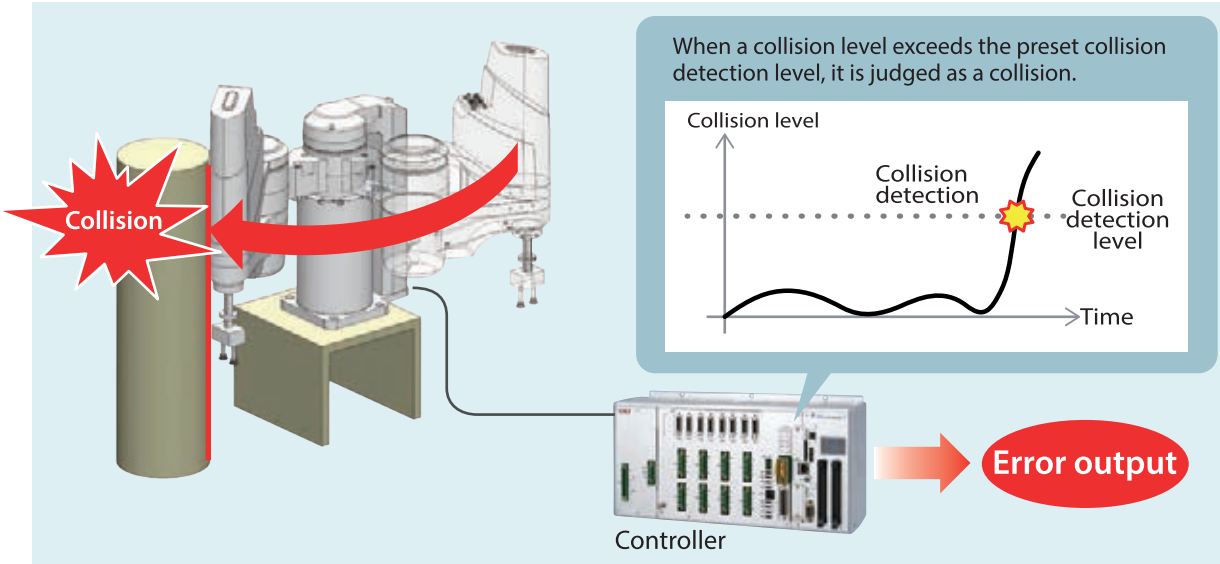


[Note]
* Workpieces may not be inserted depending on the condition of use.
* Inclination to the Z-axis cannot be traced.
* Depending on the materials of the workpiece and the hole, damages may occur.

* This is not applicable to the arm length of 180 and dust- and splash-proof specification.

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.

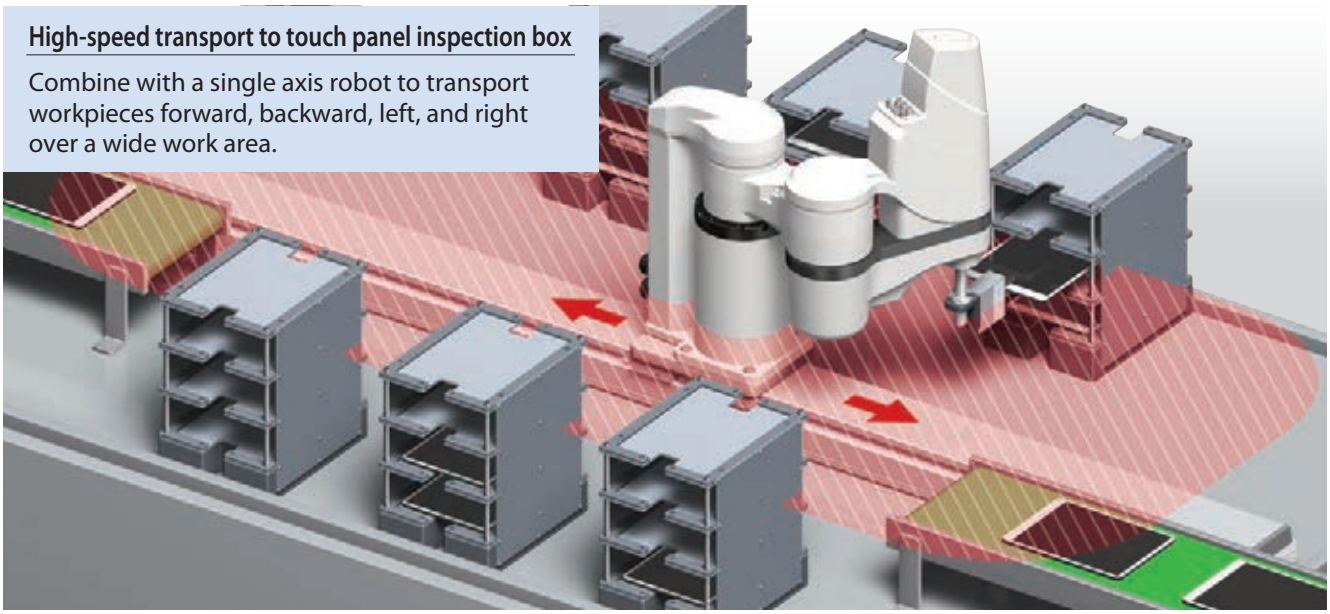


[Note]
* It does not guarantee safety for the human body.
* It is an auxiliary function to reduce damages on the peripheral devices or the like. This function will not prevent damage 100%.

* This is not applicable to the arm length of 180 and dust- and splash-proof specification.

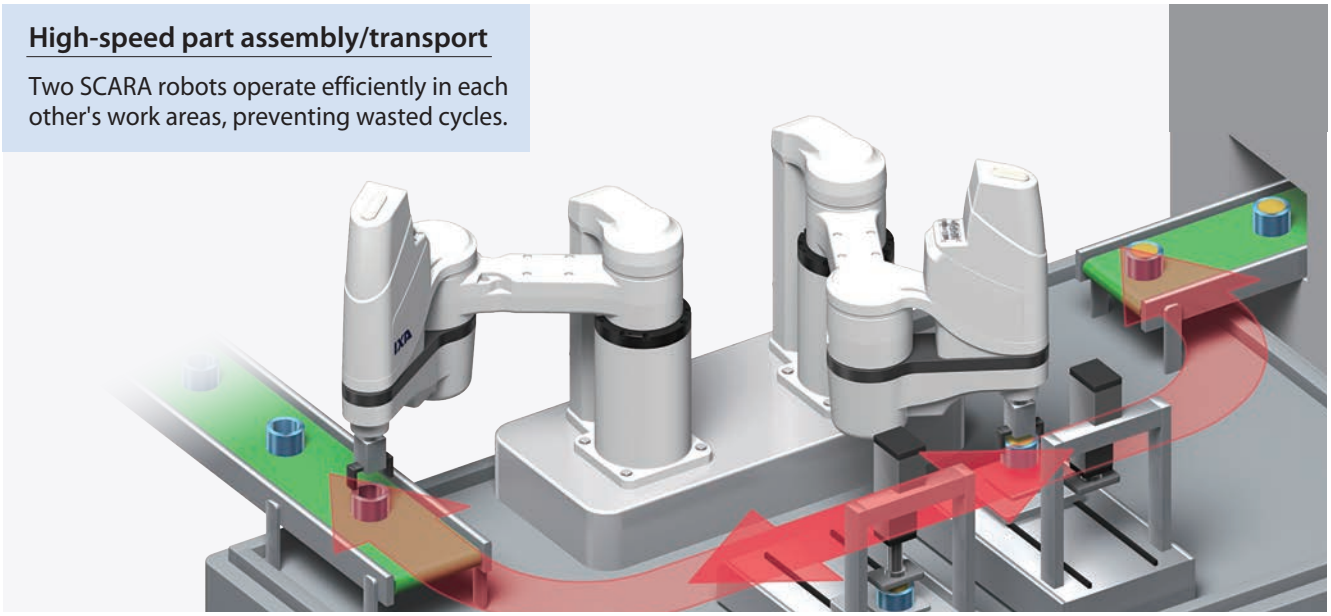
High-speed transport to touch panel inspection box

Combine with a single axis robot to transport workpieces forward, backward, left, and right over a wide work area.



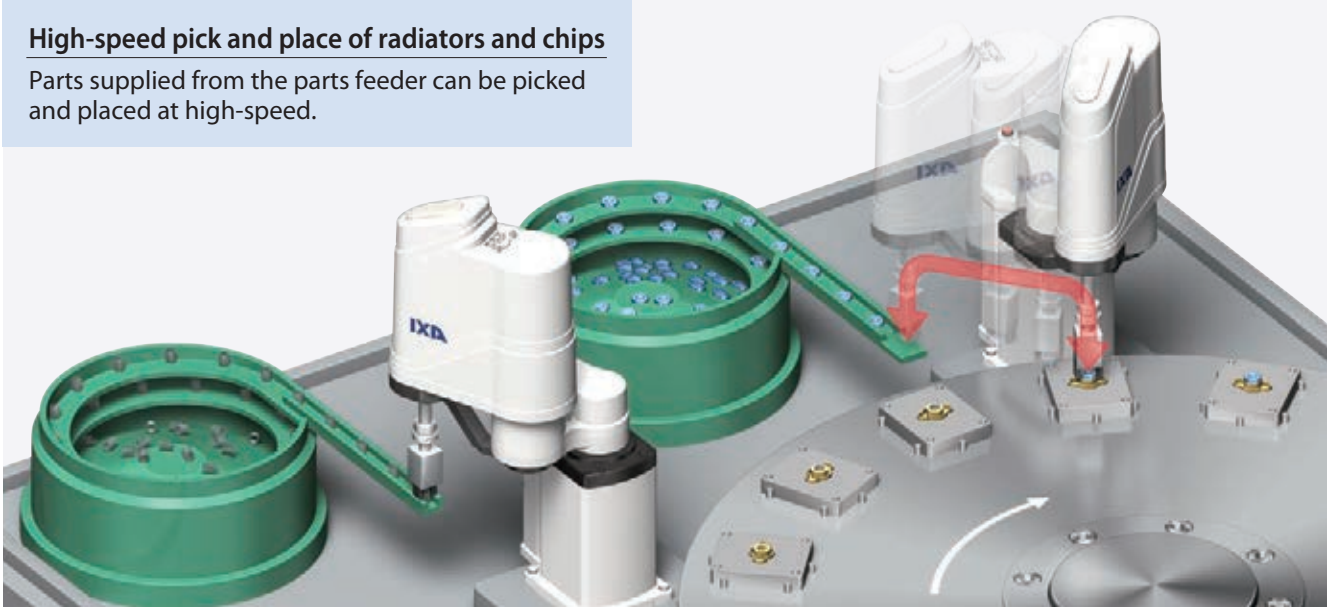
High-speed part assembly/transport

Two SCARA robots operate efficiently in each other's work areas, preventing wasted cycles.



High-speed pick and place of radiators and chips

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



Product Lineup

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	▶P6-1
	IXA-4NNN1805	4 axes							▶P6-1
	IXA-3NNN3015	3 axes	120	180	150	0.38	0.55	3	▶P7
	IXA-4NNN3015	4 axes							▶P7
	IXA-3NNN4518	3 axes	200	250	180			3	▶P9
	IXA-4NNN4518	4 axes							▶P9
	IXA-3NNN4533	3 axes			330				▶P9
	IXA-4NNN4533	4 axes							▶P9
	IXA-3NNN6018	3 axes	350	250	180			6	▶P11
	IXA-4NNN6018	4 axes							▶P11
	IXA-3NNN6033	3 axes			330				▶P11
	IXA-4NNN6033	4 axes							▶P11
High-speed type	IXA-3NSN3015	3 axes	120	180	150	0.26	0.45	8	▶P13
	IXA-4NSN3015	4 axes							▶P13
	IXA-3NSN4518	3 axes	200	250	180			10	▶P15
	IXA-4NSN4518	4 axes							▶P15
	IXA-3NSN4533	3 axes			330				▶P15
	IXA-4NSN4533	4 axes							▶P15
	IXA-3NSN6018	3 axes	350	250	180			12	▶P17
	IXA-4NSN6018	4 axes							▶P17
	IXA-3NSN6033	3 axes			330				▶P17
	IXA-4NSN6033	4 axes							▶P17
Coming soon Dust / splash-proof specification, high-speed type	IXA-4NSW3015	4 axes	155	145	150	0.38	0.69	6	▶P18-1
	IXA-4NSW4518	4 axes	200	250	180	0.38	0.55	8	▶P18-3
	IXA-4NSW4533				330				▶P18-3
	IXA-4NSW6018	4 axes	350	250	180	0.38	0.57	10	▶P18-5
	IXA-4NSW6033				330				▶P18-5

Model Specification Items and Options

IXA — [ ] — [ ] — **T2** — [ ]

Series: IXA | Type | Cable Length | Applicable Controllers: T2 | Options

3NNN1805	**3-axis** standard type/arm length **180mm**/vertical axis **50mm**
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**
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**
4NSW3015	**Dust-/Splash-proof spec., 4-axis** high-speed type/arm length **300mm**/vertical axis **150mm**
4NSW4518	**Dust-/Splash-proof spec., 4-axis** high-speed type/arm length **450mm**/vertical axis **180mm**
4NSW4533	**Dust-/Splash-proof spec., 4-axis** high-speed type/arm length **450mm**/vertical axis **330mm**
4NSW6018	**Dust-/Splash-proof spec., 4-axis** high-speed type/arm length **600mm**/vertical axis **180mm**
4NSW6033	**Dust-/Splash-proof spec., 4-axis** high-speed type/arm length **600mm**/vertical axis **330mm**

T2	XSEL-RAX/SAX

LED	Indicator

* Only available for the standard type with arm lengths of 300/450/600mm.

N	None	10L	10m
5L	5m	□L:	Specified length (1m increm.), maximum length 15m

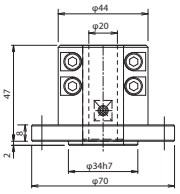
Description of options

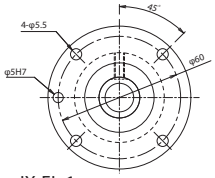
LED indicator (standard type only)

Model	LED	Description	Installation of an LED that can be turned on and off as required. (Standard configuration for high-speed type.)

Single unit option models

Series	Type		Flange	Metal cap for user wiring
IXA	NNN	1805	IX-FL-4	-
		3015	IX-FL-1	
		45□□		
		60□□		
	NSN	3015		
		45□□		
		60□□		
	NSW	3015		IXA-MC-1
		45□□		
		60□□		

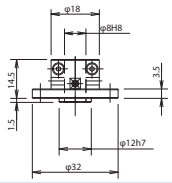


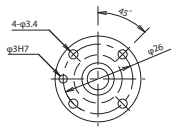


IX-FL-1

Metal cap for user wiring

A cap to cover the plug for user wiring that is located on the upper panel.





IX-FL-4

IXA-MC-1

(Example)

IXA - 3 NNN 45 18 - 5L - T2 - LED

- 3: Number of axes: 3
- NNN: Type: Standard
- 45: Arm length: 450mm
- 18: Vertical axis stroke: 180mm
- 5L: Cable length: 5m
- T2: Controller: XSEL-RAX/SAX
- LED: Option: Indicator

IXA - 3NNN1805 / 4NNN1805

Standard Type | Battery-less Absolute | Arm Length: 180 mm | Vertical Axis: 50 mm

■ Model Specification Items

IXA - ☐ NNN 18 05 - ☐ - T2

Series	Number of Axes	Type	Arm Length	Vertical Axis Stroke	Cable Length	Applicable Controllers
IXA	3: 3-axis 4: 4-axis	Standard type	18 : 180mm	5 : 50mm	N : No cable 5L : 5m 10L : 10m ☐L : Specified length (1m increments)	T2 : XSEL-RAX/SAX

* Does not include a controller.

CE RoHS

POINT Selection Notes

Please refer to P.19 for (Note 1) to (Note 9).

(Note 10) The maximum set value for acceleration/deceleration varies depending on the weight of the object being transported, the traverse distance, and the location. Operating continuously at the maximum set value could cause an overload error. For continuous operation, either lower the acceleration/deceleration value or refer to the duty (guideline) and set a stop time after acceleration/deceleration.

(Note 11) If the motor or controller is replaced, absolute reset must be performed. An adjustment jig (option model: JG-IXA2) will be required to perform absolute reset on the rotational axis (4th axis).

Model / Specifications

Model	Axis configuration		Arm length (mm)	Motor (W)	Operation range	Positioning repeatability (Note 1)	Maximum operation speed during PTP operation (Note 2)	Standard cycle time (s) (Note 3)	Continuous cycle time (s) (Note 3)	Payload (kg) (Note 4)	3rd axis (vertical axis) push force control range (N)*		4th axis allowable load	
											Upper limit (Note 5)	Lower limit (Note 5)	Allowable inertia moment (kg·m²) (Note 6)	Allowable torque (N·m)
[3-axis specification]	1-axis	1st arm	80	50	±125 degrees	±0.010mm	2638mm/s (composite speed) 540/540 deg/s (1st/2nd arm speed)	0.26	0.45	1	40.0	5.0	0.004	0.35
IXA-3NNN1805-① - T2	2-axis	2nd arm	100	50	±145 degrees									
[4-axis specification]	3-axis	Vertical axis	-	50	50mm	±0.010mm	850mm/s							
IXA-4NNN1805-① - T2	4-axis	Rotational axis	-	50	±360 degrees	±0.01 deg.	1600 deg/s							

Legend: ① Cable length

Note: The SCARA robot cannot operate continuously at 100% speed/acceleration. Refer to the Reference Data from P.20 for feasible operating conditions.
*Speed limitation applies to the push force. Contact IAI for details.

Cable Length

Type	Cable code
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)

[3-axis specification] · Motor cables: 3 · Encoder cables: 3 · Brake cable: 1
[4-axis specification] · Motor cables: 4 · Encoder cables: 4 · Brake cable: 1

Common Specifications

Item	Description
Encoder Type	Battery-less Absolute Encoder
User wiring	10-core (9-core + shield) AWG25 (rated 30V/max. 1A)
User piping	3 air tubes with ø4 outer diameter and ø2.5 inner diameter (max. operating pressure 0.6MPa)
Alarm indicator (Note 7)	1 small amber LED indicator (24 VDC supply required)
Brake release switch (Note 8)	Brake release switch for vertical axis fall prevention
Allowable load moment	0.5N·m
Ambient temp./humidity	Temperature: 0~40°C, Humidity: 20~85% RH or less (Non-condensing)
Ingress protection	IP20
Unit weight	3-axis specification: 5.8kg, 4-axis specification: 6.2kg
Noise (Note 9)	80dB or less

Single Unit Options

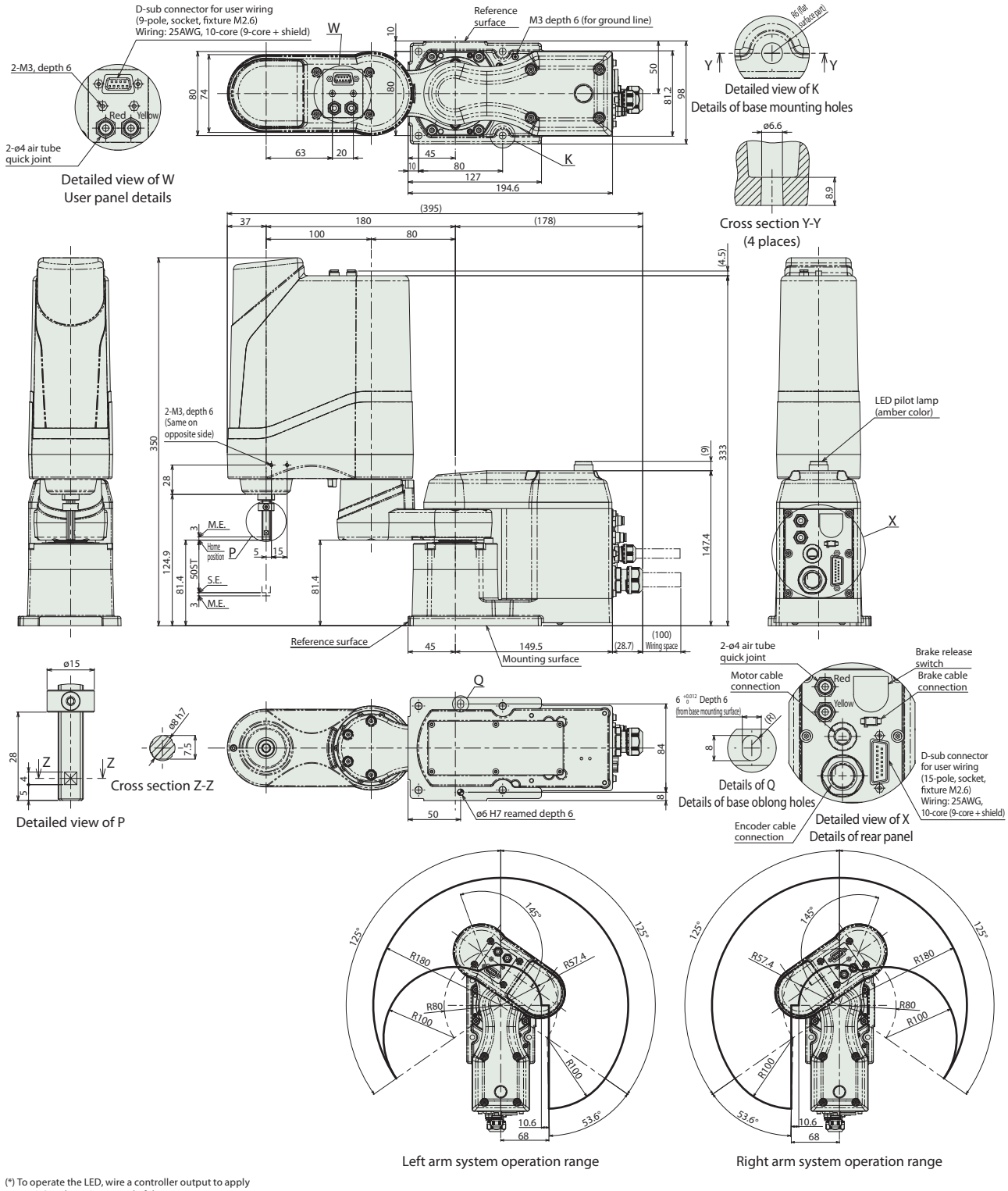
Name	Model name	Reference page
Flange	**IX-FL-4**	See P.6

(Note) Please purchase separately.

Dimensions

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

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



(*) To operate the LED, wire a controller output to apply 24VDC to the LED terminal of the user wiring.

Applicable Controllers

The IXA series actuators can be operated by the controllers indicated below. Please select the type depending on your intended use.

Name	External view	Max. number of connectable axes	Power supply voltage	Control method				Maximum number of positioning points	Reference page
				Positioner	Pulse-train	Program	Network * option		
XSEL-RAX/SAX		8	Three-phase 230VAC	–	–	●	DeviceNet, CC-Link, PROFIBUS, EtherNet/IP, EtherCAT	36666 (Depending on the type)	See P.24

IXA - 3NNN3015 / 4NNN3015

Standard Type | Battery-less Absolute | Arm Length: 300 mm | Vertical Axis: 150 mm

■ Model Specification Items

IXA - □ NNN 30 15 - [ ] - T2 - □

Series	Number of Axes	Type	Arm Length	Vertical Axis Stroke	Cable Length	Applicable Controllers	Options
IXA	3: 3-axis 4: 4-axis	Standard type	30 : 300mm	15 : 150mm	N : No cable 5L : 5m 10L : 10m □L : Specified length (1m increments)	T2 : XSEL-RAX/SAX	Refer to Options table below.

* Does not include a controller.

POINT Selection Notes

Please refer to P.19 for (Note 1) to (Note 9).

(Note 10) The maximum set value for acceleration/deceleration varies depending on the weight of the object being transported, the traverse distance, and the location. Operating continuously at the maximum set value could cause an overload error. For continuous operation, either lower the acceleration/deceleration value or refer to the duty (guideline) and set a stop time after acceleration/deceleration.

(Note 11) If the motor or controller is replaced, absolute reset must be performed. An adjustment jig (option model: JG-IXA1) will be required to perform absolute reset on the rotational axis (4th axis).

Model / Specifications

Model	Axis configuration		Arm length (mm)	Motor (W)	Operation range	Positioning repeatability (Note 1)	Maximum operation speed during PTP operation (Note 2)	Standard cycle time (s) (Note 3)	Continuous cycle time (s) (Note 3)	Payload (kg) (Note 4)	3rd axis (vertical axis) push force control range (N)*		4th axis allowable load	
											Upper limit (Note 5)	Lower limit (Note 5)	Allowable inertia moment (kg·m²) (Note 6)	Allowable torque (N·m)
[3-axis specification] IXA-3NNN3015-①-T2-②	1-axis	1st arm	120	400	±135 degrees	±0.010mm	5529mm/s (composite speed) 660/660 deg/s (1st/2nd arm speed)	0.38	0.55	3	60.0	10.0	0.06	3.2
	2-axis	2nd arm	180	200	±142 degrees									
[4-axis specification] IXA-4NNN3015-①-T2-②	3-axis	Vertical axis	-	100	150mm	±0.010mm	1400mm/s							
	4-axis	Rotational axis	-	100	±360 degrees	±0.005 deg.	1600 deg/s							

Legend: ① Cable length ② Options

Note: The SCARA robot cannot operate continuously at 100% speed/acceleration. Refer to the Reference Data from P.20 for feasible operating conditions.
*Speed limitation applies to the push force. Contact IAI for details.

Cable Length

Type	Cable code
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)

[3-axis specification] · Motor cables: 3 · Encoder cables: 3 · Brake cable: 1
[4-axis specification] · Motor cables: 4 · Encoder cables: 4 · Brake cable: 1

Common Specifications

Item	Description
Encoder Type	Battery-less Absolute Encoder
User wiring	10-core (9-core + shield) AWG24 (rated 30V/max. 1A)
User piping	3 air tubes with ø4 outer diameter and ø2.5 inner diameter (max. operating pressure 0.6MPa)
Alarm indicator (*) (Note 7)	1 small amber LED indicator (24 VDC supply required)
Brake release switch (Note 8)	Brake release switch for vertical axis fall prevention
Allowable load moment	4.5N·m
Ambient temp./humidity	Temperature: 0~40°C, Humidity: 20~85% RH or less (Non-condensing)
Ingress protection	IP20
Unit weight	3-axis specification: 21kg, 4-axis specification: 22kg
Noise (Note 9)	80dB or less

(*) An alarm indicator is equipped when the LED option is selected.

Options

Name	Model name	Reference page
Indicator	**LED**	See P.6

Single Unit Options

Name	Model name	Reference page
Flange	**IX-FL-1**	See P.6

(Note) Please purchase separately.

Dimensions

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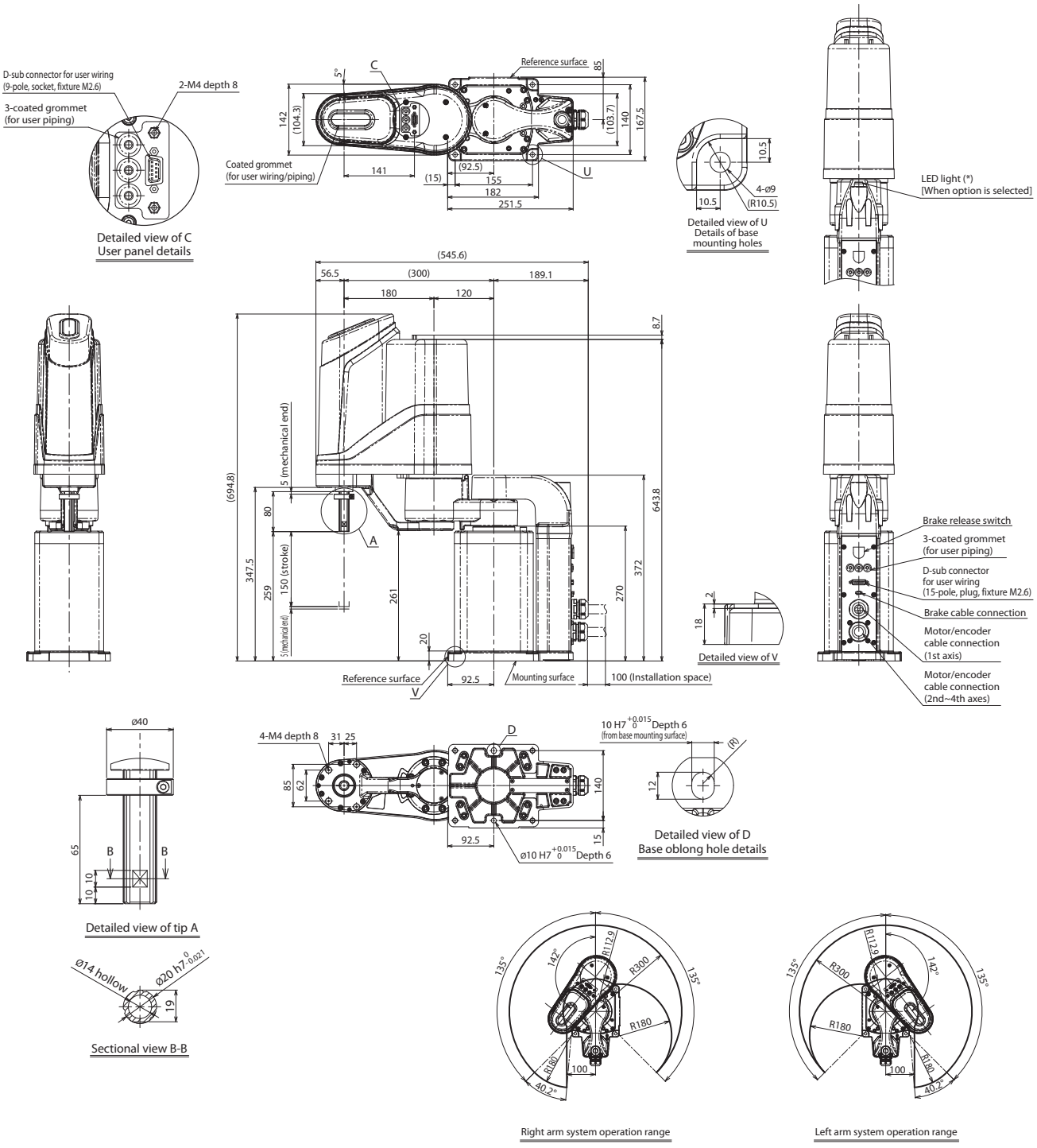

(*) To operate the LED, wire a controller output to apply 24VDC to the LED terminal of the user wiring.

Applicable Controllers

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Name	External view	Max. number of connectable axes	Power supply voltage	Control method				Maximum number of positioning points	Reference page
				Positioner	Pulse-train	Program	Network * option		
XSEL-RAX/SAX		8	Three-phase 230VAC	–	–	●	DeviceNet, CC-Link, PROFIBUS, EtherNet/IP, EtherCAT	36666 (Depending on the type)	See P.24

IXA - 3NNN4518 / 4NNN4518 3NNN4533 / 4NNN4533

Standard Type | Battery-less Absolute | Arm Length: 450 mm | Vertical Axis: 180/330 mm

■ Model Specification Items

IXA - [ ] NNN 45 [ ] - [ ] - T2 - [ ]

Series	Number of Axes	Type	Arm Length	Vertical Axis Stroke	Cable Length	Applicable Controllers	Options
	3: 3-axis 4: 4-axis	Standard type	45 : 450mm	18 : 180mm 33 : 330mm	N : No cable 5L : 5m 10L : 10m □L : Specified length (1m increments)	T2 : XSEL-RAX/SAX	Refer to Options table below.

* Does not include a controller.

CE RoHS

POINT Selection Notes

Please refer to P.19 for (Note 1) to (Note 9).

(Note 10) The maximum set value for acceleration/deceleration varies depending on the weight of the object being transported, the traverse distance, and the location. Operating continuously at the maximum set value could cause an overload error. For continuous operation, either lower the acceleration/deceleration value or refer to the duty (guideline) and set a stop time after acceleration/deceleration.

(Note 11) If the motor or controller is replaced, absolute reset must be performed. An adjustment jig (option model: JG-IXA1) will be required to perform absolute reset on the rotational axis (4th axis).

Model / Specifications

Model	Axis configuration		Arm length (mm)	Motor (W)	Operation range	Positioning repeatability (Note 1)	Maximum operation speed during PTP operation (Note 2)	Standard cycle time (s) (Note 3)	Continuous cycle time (s) (Note 3)	Payload (kg) (Note 4)	3rd axis (vertical axis) push force control range (N)*		4th axis allowable load	
											Upper limit (Note 5)	Lower limit (Note 5)	Allowable inertia moment (kg·m²) (Note 6)	Allowable torque (N·m)
[3-axis specification] IXA-3NNN4518- ① - T2 - ② [IXA-3NNN4533 - ① - T2 - ②]	1-axis	1st arm	200	400	±137 degrees	±0.010mm	7453mm/s (composite speed) 610/610 deg/s (1st/2nd arm speed)	0.38	0.55	3	55.0	10.0	0.05	3.2
	2-axis	2nd arm	250	200	±137 degrees									
[4-axis specification] IXA-4NNN4518- ① - T2 - ② [IXA-4NNN4533 - ① - T2 - ②]	3-axis	Vertical axis	-	100	180mm [330mm]	±0.010mm	1200mm/s							
	4-axis	Rotational axis	-	100	±360 degrees	±0.005 deg.	2000 deg/s							

Legend: ① Cable length ② Options

Note: • The SCARA robot cannot operate continuously at 100% speed/acceleration. Refer to the Reference Data from P.20 for feasible operating conditions.
• Values in [ ] are for models with vertical axis of 330mm. Other specifications are the same for both 180mm and 330mm vertical axis models.
* Speed limitation applies to the push force. Contact IAI for details.

Cable Length

Type	Cable code
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)

[3-axis specification] · Motor cables: 3 · Encoder cables: 3 · Brake cable: 1
[4-axis specification] · Motor cables: 4 · Encoder cables: 4 · Brake cable: 1

Common Specifications

Item	Description
Encoder Type	Battery-less Absolute Encoder
User wiring	10-core (9-core + shield) AWG24
User piping	3 air tubes with ø6 outer diameter and ø4 inner diameter (max. operating pressure 0.6MPa)
Alarm indicator (*) (Note 7)	1 small amber LED indicator (24 VDC supply required)
Brake release switch (Note 8)	Brake release switch for vertical axis fall prevention
Allowable load moment	8.3N·m
Ambient temp./humidity	Temperature: 0~40°C, Humidity: 20~85% RH or less (Non-condensing)
Ingress protection	IP20
Unit weight	3-axis specification: 25.5kg, 4-axis specification: 27kg
Noise (Note 9)	80dB or less

(*) An alarm indicator is equipped when the LED option is selected.

Options

Name	Model name	Reference page
Indicator	**LED**	See P.6

Single Unit Options

Name	Model name	Reference page
Flange	**IX-FL-1**	See P.6

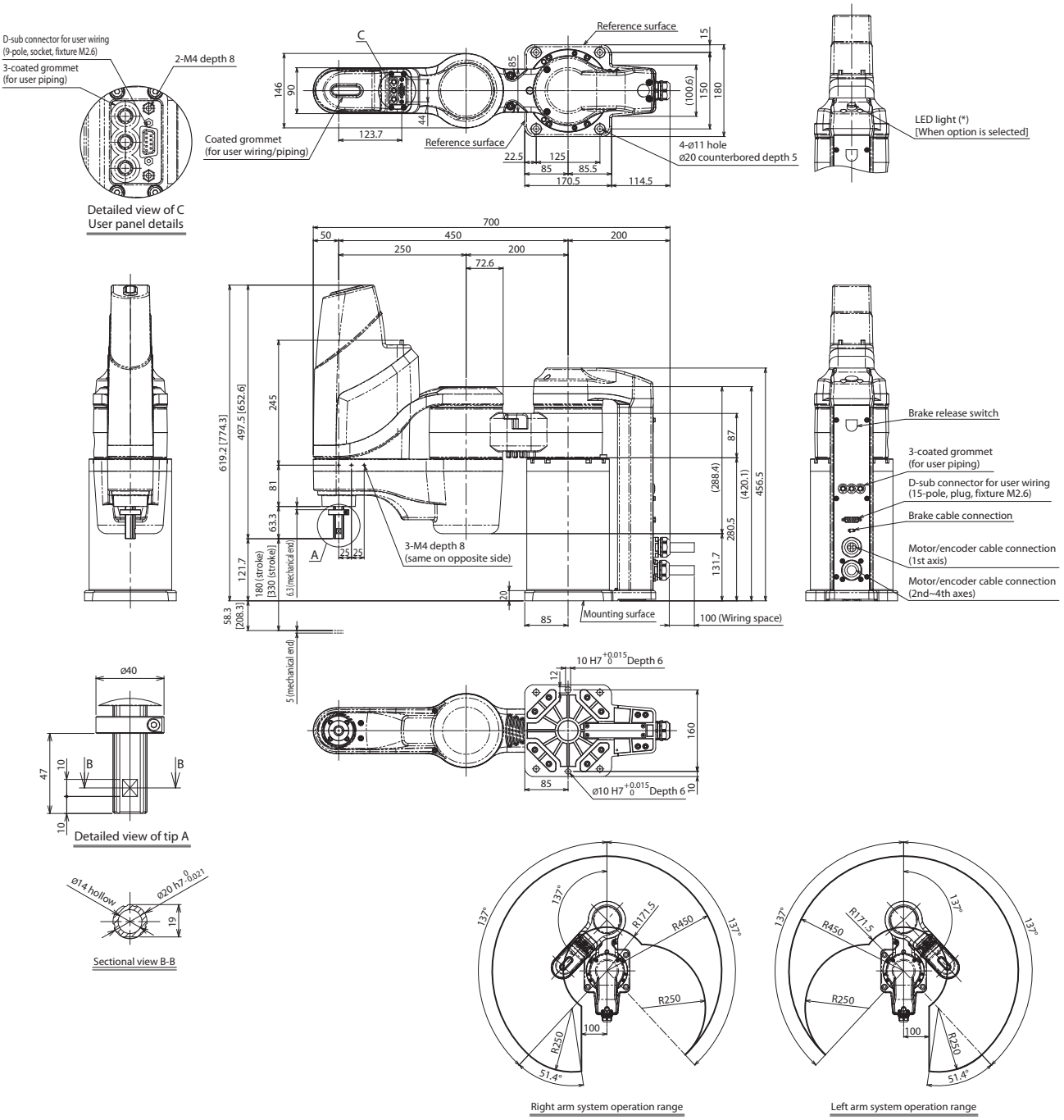
(Note) Please purchase separately.

Dimensions

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

2D CAD 3D CAD

* Values in [ ] are dimensions for vertical axis of 330mm.



(*) To operate the LED, wire a controller output to apply 24VDC to the LED terminal of the user wiring.

Applicable Controllers

The IXA series actuators can be operated by the controllers indicated below. Please select the type depending on your intended use.

Name	External view	Max. number of connectable axes	Power supply voltage	Control method				Maximum number of positioning points	Reference page
				Positioner	Pulse-train	Program	Network * option		
XSEL-RAX/SAX		8	Three-phase 230VAC	–	–	●	DeviceNet, CC-Link, PROFIBUS, EtherNet/IP, EtherCAT	36666 (Depending on the type)	See P.24

IXA - 3NNN6018 / 4NNN6018 3NNN6033 / 4NNN6033

Standard Type | Battery-less Absolute | Arm Length: 600 mm | Vertical Axis: 180/330 mm

■ Model Specification Items

IXA - □ NNN 60 □ - □ - T2 - □

Series	Number of Axes	Type	Arm Length	Vertical Axis Stroke	Cable Length	Applicable Controllers	Options
IXA	3: 3-axis 4: 4-axis	Standard type	60 : 600mm	18 : 180mm 33 : 330mm	N : No cable 5L : 5m 10L : 10m □L : Specified length (1m increments)	T2 : XSEL-RAX/SAX	Refer to Options table below.

* Does not include a controller.

CE RoHS

POINT Selection Notes

Please refer to P.19 for (Note 1) to (Note 9).

(Note 10) The maximum set value for acceleration/deceleration varies depending on the weight of the object being transported, the traverse distance, and the location. Operating continuously at the maximum set value could cause an overload error. For continuous operation, either lower the acceleration/deceleration value or refer to the duty (guideline) and set a stop time after acceleration/deceleration.

(Note 11) If the motor or controller is replaced, absolute reset must be performed. An adjustment jig (option model: JG-IXA1) will be required to perform absolute reset on the rotational axis (4th axis).

Model / Specifications

Model	Axis configuration		Arm length (mm)	Motor (W)	Operation range	Positioning repeatability (Note 1)	Maximum operation speed during PTP operation (Note 2)	Standard cycle time (s) (Note 3)	Continuous cycle time (s) (Note 3)	Payload (kg) (Note 4)	3rd axis (vertical axis) push force control range (N)*		4th axis allowable load	
											Upper limit (Note 5)	Lower limit (Note 5)	Allowable inertia moment (kg·m²) (Note 6)	Allowable torque (N·m)
[3-axis specification] IXA-3NNN6018- ① - T2 - ② [IXA-3NNN6033 - ① - T2 - ②]	1-axis	1st arm	350	600	±137 degrees	±0.010mm	5934mm/s (composite speed) 400/400 deg/s (1st/2nd arm speed)	0.38	0.55	6	110.0	25.0	0.06	3.2
	2-axis	2nd arm	250	200	±140 degrees									
[4-axis specification] IXA-4NNN6018- ① - T2 - ② [IXA-4NNN6033 - ① - T2 - ②]	3-axis	Vertical axis	-	200	180mm [330mm]	±0.010mm	1600mm/s							
	4-axis	Rotational axis	-	100	±360 degrees	±0.005 deg.	2000 deg/s							

Legend: ① Cable length ② Options

Note: • The SCARA robot cannot operate continuously at 100% speed/acceleration. Refer to the Reference Data from P.20 for feasible operating conditions.
• Values in [ ] are for models with vertical axis of 330mm. Other specifications are the same for both 180mm and 330mm vertical axis models.
* Speed limitation applies to the push force. Contact IAI for details.

Cable Length

Type	Cable code
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)

[3-axis specification] · Motor cables: 3 · Encoder cables: 3 · Brake cable: 1
[4-axis specification] · Motor cables: 4 · Encoder cables: 4 · Brake cable: 1

Common Specifications

Item	Description
Encoder Type	Battery-less Absolute Encoder
User wiring	10-core (9-core + shield) AWG24 (rated 30V/max 1A)
User piping	3 air tubes with ø6 outer diameter and ø4 inner diameter (max. operating pressure 0.6MPa)
Alarm indicator (*) (Note 7)	1 small amber LED indicator (24 VDC supply required)
Brake release switch (Note 8)	Brake release switch for vertical axis fall prevention
Allowable load moment	8.3N·m
Ambient temp./humidity	Temperature: 0~40°C, Humidity: 20~85% RH or less (Non-condensing)
Ingress protection	IP20
Unit weight	3-axis specification: 30.5kg, 4-axis specification: 32.0kg
Noise (Note 9)	80dB or less

(*) An alarm indicator is equipped when the LED option is selected.

Options

Name	Model name	Reference page
Indicator	**LED**	See P.6

Single Unit Options

Name	Model name	Reference page
Flange	**IX-FL-1**	See P.6

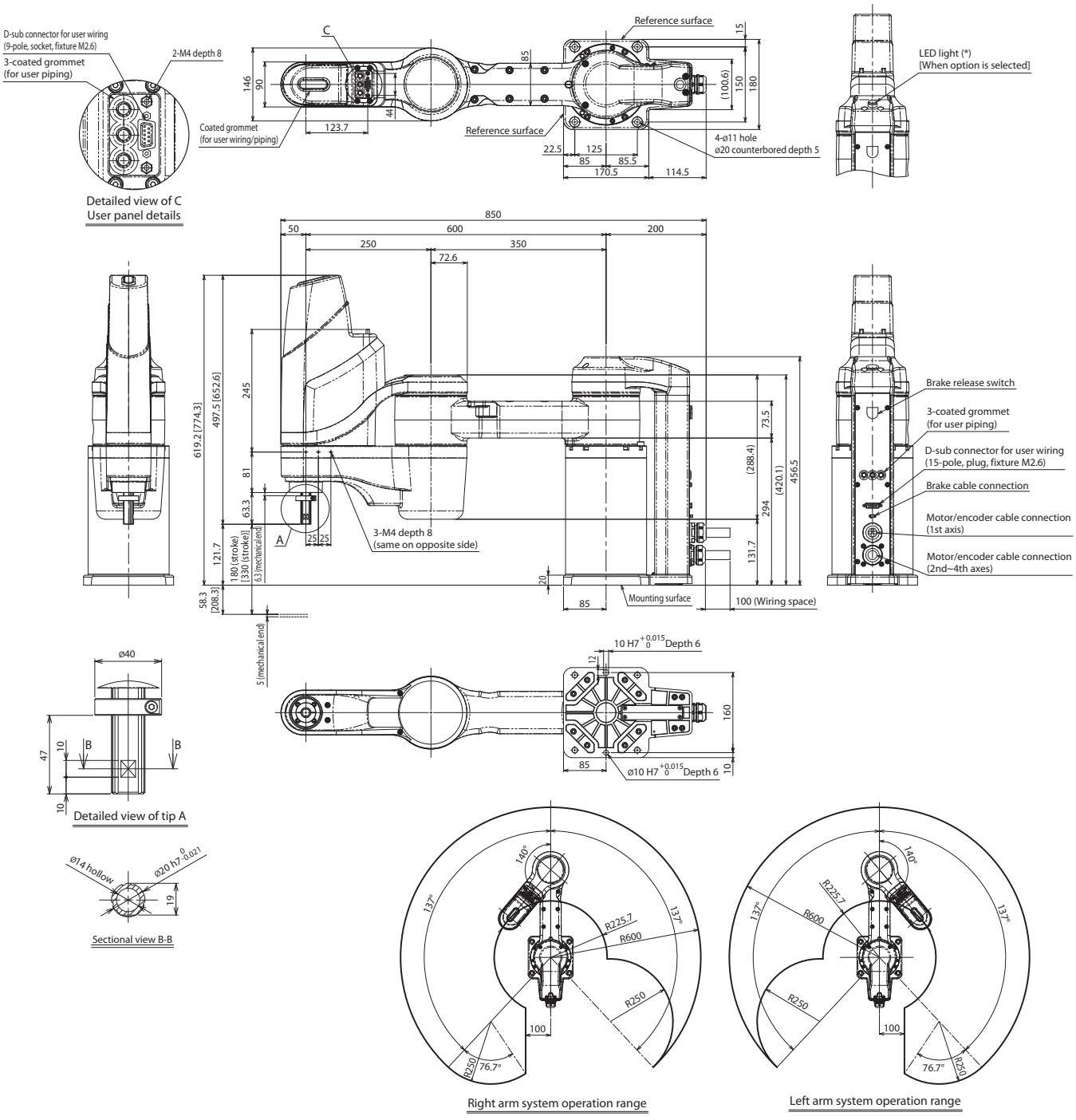
(Note) Please purchase separately.

Dimensions

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

2D CAD 3D CAD

* Values in [ ] are dimensions for vertical axis of 330mm.



(*) To operate the LED, wire a controller output to apply 24VDC to the LED terminal of the user wiring.

Applicable Controllers

The IXA series actuators can be operated by the controllers indicated below. Please select the type depending on your intended use.

Name	External view	Max. number of connectable axes	Power supply voltage	Control method				Maximum number of positioning points	Reference page
				Positioner	Pulse-train	Program	Network * option		
XSEL-RAX/SAX		8	Three-phase 230VAC	–	–	●	DeviceNet, CC-Link, PROFIBUS, EtherNet/IP, EtherCAT	36666 (Depending on the type)	See P.24

IXA - 3NSN3015 / 4NSN3015

High-Speed Type | Battery-less Absolute | Arm Length: 300 mm | Vertical Axis: 150 mm

■ Model Specification Items

IXA	-	☐	NSN	30	15	-	☐	-	T2
Series		Number of Axes: 3: 3-axis, 4: 4-axis	Type: High-speed type	Arm Length: 30 : 300mm	Vertical Axis Stroke: 15 : 150mm		Cable Length: N : No cable, 5L : 5m, 10L : 10m, ☐L : Specified length (1m increments)		Applicable Controllers: T2 : XSEL-RAX/SAX

* Does not include a controller.

CE RoHS

POINT Selection Notes

Please refer to P.19 for (Note 1) to (Note 9).

(Note 10) The maximum set value for acceleration/deceleration varies depending on the weight of the object being transported, the traverse distance, and the location. Operating continuously at the maximum set value could cause an overload error. For continuous operation, either lower the acceleration/deceleration value or refer to the duty (guideline) and set a stop time after acceleration/deceleration.

(Note 11) If the motor or controller is replaced, absolute reset must be performed. An adjustment jig (option model: JG-IXA1) will be required to perform absolute reset on the rotational axis (4th axis).

Model / Specifications

Model	Axis configuration		Arm length (mm)	Motor (W)	Operation range	Positioning repeatability (Note 1)	Maximum operation speed during PTP operation (Note 2)	Standard cycle time (s) (Note 3)	Continuous cycle time (s) (Note 3)	Payload (kg) (Note 4)	3rd axis (vertical axis) push force control range (N)*		4th axis allowable load	
											Upper limit (Note 5)	Lower limit (Note 5)	Allowable inertia moment ($kg \cdot m^2$) (Note 6)	Allowable torque (N·m)
[3-axis specification] IXA-3NSN3015-① - T2	1-axis	1st arm	120	600	±135 degrees	±0.010mm	6032mm/s (composite speed) 720/720 deg/s (1st/2nd arm speed)	0.26	0.45	8	100.0	25.0	0.12	3.2
	2-axis	2nd arm	180	400	±142 degrees									
[4-axis specification] IXA-4NSN3015-① - T2	3-axis	Vertical axis	-	150	150mm	±0.010mm	1600mm/s							
	4-axis	Rotational axis	-	100	±360 degrees	±0.005 deg.	1600 deg/s							

Legend: ① Cable length

Note: The SCARA robot cannot operate continuously at 100% speed/acceleration. Refer to the Reference Data from P.20 for feasible operating conditions.
* Speed limitation applies to the push force. Contact IAI for details.

Cable Length

Type	Cable code
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)

[3-axis specification] · Motor cables: 3 · Encoder cables: 3 · Brake cable: 1
[4-axis specification] · Motor cables: 4 · Encoder cables: 4 · Brake cable: 1

Common Specifications

Item	Description
Encoder Type	Battery-less Absolute Encoder
User wiring	10-core (9-core + shield) AWG24 (rated 30V/max 1A)
User piping	3 air tubes with ø4 outer diameter and ø2.5 inner diameter (max. operating pressure 0.6MPa)
Alarm indicator (Note 7)	1 small amber LED indicator (24 VDC supply required)
Brake release switch (Note 8)	Brake release switch for vertical axis fall prevention
Allowable load moment	12N·m
Ambient temp./humidity	Temperature: 0~40°C, Humidity: 20~85% RH or less (Non-condensing)
Ingress protection	IP20
Unit weight	3-axis specification: 26.5kg, 4-axis specification: 27.5kg
Noise (Note 9)	80dB or less

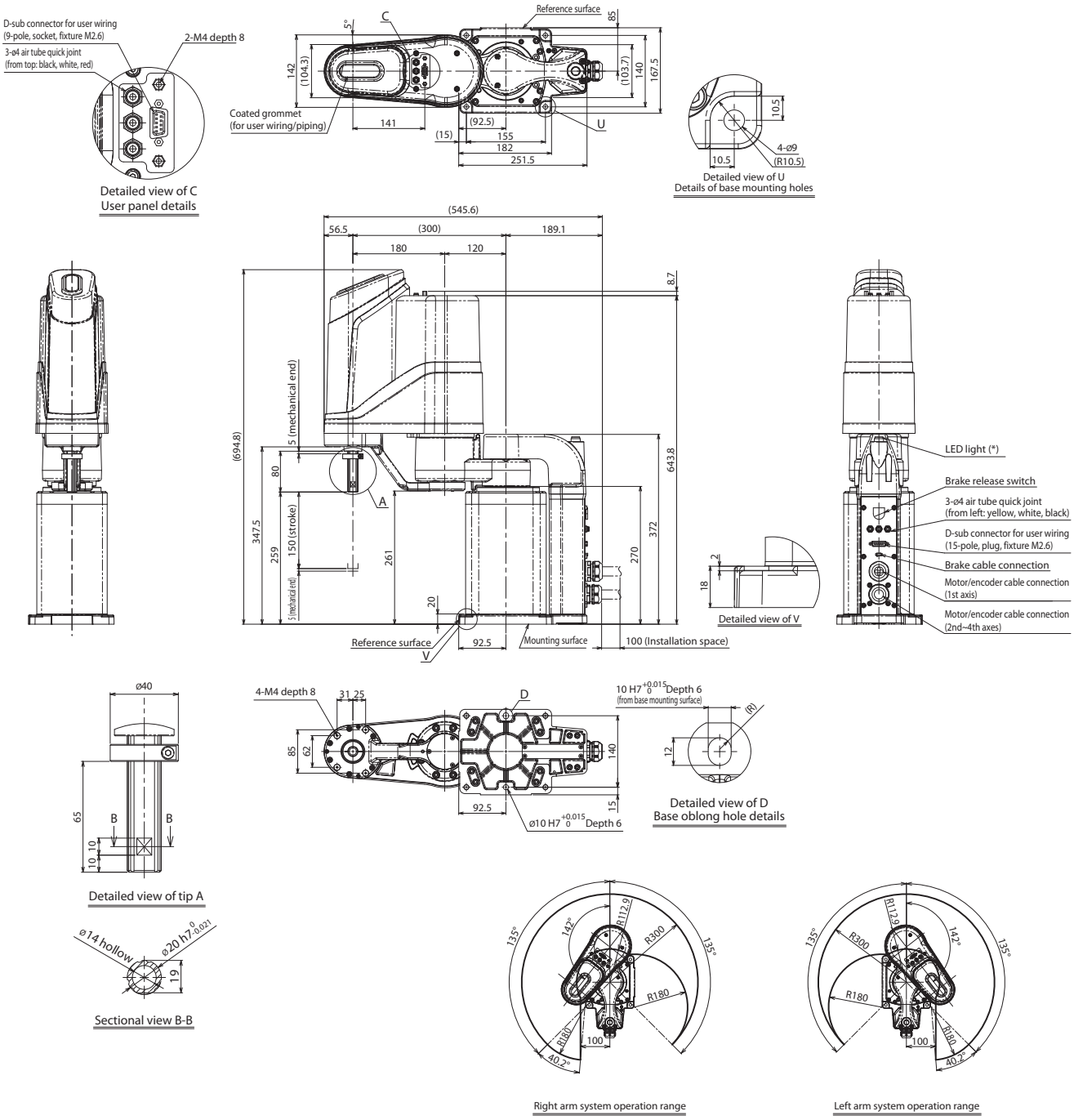
Single Unit Options

Name	Model name	Reference page
Flange	**IX-FL-1**	See P.6

(Note) Please purchase separately.

Dimensions

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



(*) To operate the LED, wire a controller output to apply 24VDC to the LED terminal of the user wiring.

Applicable Controllers

The IXA series actuators can be operated by the controllers indicated below. Please select the type depending on your intended use.

Name	External view	Max. number of connectable axes	Power supply voltage	Control method				Maximum number of positioning points	Reference page
				Positioner	Pulse-train	Program	Network * option		
XSEL-RAX3/SAX3		3	Three-phase 230VAC	–	–	●	DeviceNet, CC-Link, PROFIBUS, EtherNet/IP, EtherCAT	41250 (Depending on the type)	See P.24
XSEL-RAX4/SAX4		4						36666 (Depending on the type)	

IXA - 3NSN4518 / 4NSN4518 3NSN4533 / 4NSN4533

High-Speed Type | Battery-less Absolute | Arm Length: 450 mm | Vertical Axis: 180/330 mm

■ Model Specification Items

IXA	-	☐	NSN	45	☐	-	☐	-	T2
Series		Number of Axes	Type	Arm Length	Vertical Axis Stroke		Cable Length		Applicable Controllers
		3: 3-axis 4: 4-axis	High-speed type	45 : 450mm	18 : 180mm 33 : 330mm		N : No cable 5L : 5m 10L : 10m ☐L : Specified length (1m increments)		T2 : XSEL-RAX/SAX

* Does not include a controller.

CE RoHS

POINT Selection Notes

Please refer to P.19 for (Note 1) to (Note 9).

(Note 10) The maximum set value for acceleration/deceleration varies depending on the weight of the object being transported, the traverse distance, and the location. Operating continuously at the maximum set value could cause an overload error. For continuous operation, either lower the acceleration/deceleration value or refer to the duty (guideline) and set a stop time after acceleration/deceleration.

(Note 11) If the motor or controller is replaced, absolute reset must be performed. An adjustment jig (option model: JG-IXA1) will be required to perform absolute reset on the rotational axis (4th axis).

Model / Specifications

Model	Axis configuration		Arm length (mm)	Motor (W)	Operation range	Positioning repeatability (Note 1)	Maximum operation speed during PTP operation (Note 2)	Standard cycle time (s) (Note 3)	Continuous cycle time (s) (Note 3)	Payload (kg) (Note 4)	3rd axis (vertical axis) push force control range (N)*		4th axis allowable load	
											Upper limit (Note 5)	Lower limit (Note 5)	Allowable inertia moment (kg·m²) (Note 6)	Allowable torque (N·m)
[3-axis specification] IXA-3NSN4518-①-T2 [IXA-3NSN4533-①-T2]	1-axis	1st arm	200	600	±137 degrees	±0.010mm	8282 mm/s (composite speed) 610/800 deg/s (1st/2nd arm speed)	0.26	0.45	10	110.0	25.0	0.12	3.2
	2-axis	2nd arm	250	400	±137 degrees									
[4-axis specification] IXA-4NSN4518-①-T2 [IXA-4NSN4533-①-T2]	3-axis	Vertical axis	-	200	180mm [330mm]	±0.010mm	1600mm/s							
	4-axis	Rotational axis	-	100	±360 degrees	±0.005 deg.	2000 deg/s							

Legend: ① Cable length

Note: • The SCARA robot cannot operate continuously at 100% speed/acceleration. Refer to the Reference Data from P.20 for feasible operating conditions.
• Values in [ ] are for models with vertical axis of 330mm. Other specifications are the same for both 180mm and 330mm vertical axis models.
* Speed limitation applies to the push force. Contact IAI for details.

Cable Length

Type	Cable code
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)

[3-axis specification] · Motor cables: 3 · Encoder cables: 3 · Brake cable: 1
[4-axis specification] · Motor cables: 4 · Encoder cables: 4 · Brake cable: 1

Common Specifications

Item	Description
Encoder Type	Battery-less Absolute Encoder
User wiring	10-core (9-core + shield) AWG24 (rated 30V/max 1A)
User piping	3 air tubes with ø6 outer diameter and ø4 inner diameter (max. operating pressure 0.6MPa)
Alarm indicator (Note 7)	1 small amber LED indicator (24 VDC supply required)
Brake release switch (Note 8)	Brake release switch for vertical axis fall prevention
Allowable load moment	8.3N·m
Ambient temp./humidity	Temperature: 0~40°C, Humidity: 20~85% RH or less (Non-condensing)
Ingress protection	IP20
Unit weight	3-axis specification: 31.0kg, 4-axis specification: 32.5kg
Noise (Note 9)	80dB or less

Single Unit Options

Name	Model name	Reference page
Flange	**IX-FL-1**	See P.6

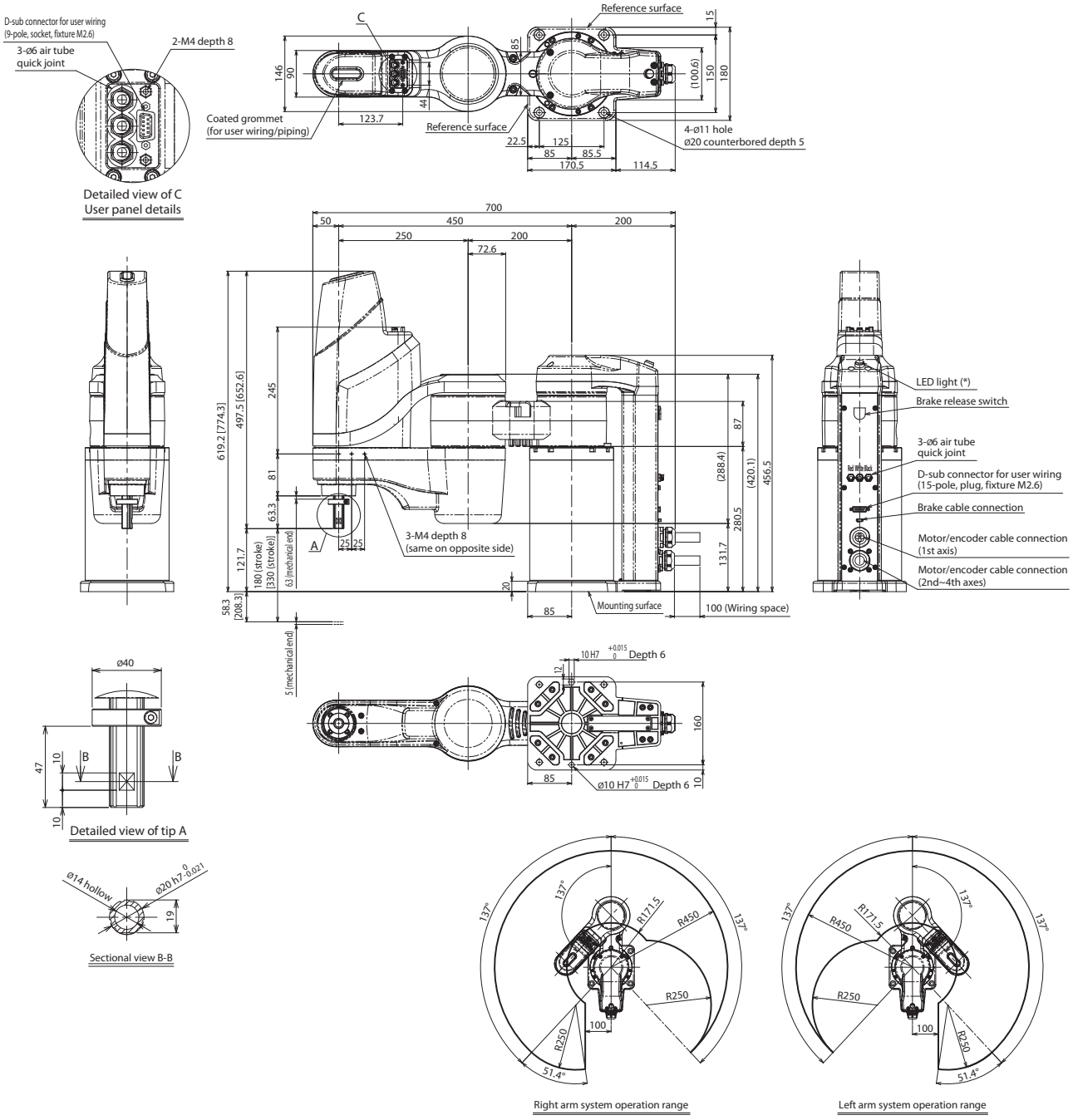
(Note) Please purchase separately.

Dimensions

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

2D CAD 3D CAD

* Values in [ ] are dimensions for vertical axis of 330mm.



(*) To operate the LED, wire a controller output to apply 24VDC to the LED terminal of the user wiring.

Applicable Controllers

The IXA series actuators can be operated by the controllers indicated below. Please select the type depending on your intended use.

Name	External view	Max. number of connectable axes	Power supply voltage	Control method				Maximum number of positioning points	Reference page
				Positioner	Pulse-train	Program	Network * option		
XSEL-RAX3/SAX3		3	Three-phase 230VAC	–	–	●	DeviceNet, CC-Link, PROFIBUS, EtherNet/IP, EtherCAT	41250 (Depending on the type)	See P.24
XSEL-RAX4/SAX4		4						36666 (Depending on the type)	

IXA - 3NSN6018 / 4NSN6018 3NSN6033 / 4NSN6033

High-Speed Type | Battery-less Absolute | Arm Length: 600 mm | Vertical Axis: 180/330 mm

■ Model Specification Items

IXA - [ ] NSN 60 [ ] - [ ] - T2

Series	Number of Axes	Type	Arm Length	Vertical Axis Stroke	Cable Length	Applicable Controllers
	3: 3-axis 4: 4-axis	High-speed type	60 : 600mm	18 : 180mm 33 : 330mm	N : No cable 5L : 5m 10L : 10m □L : Specified length (1m increments)	T2 : XSEL-RAX/SAX

* Does not include a controller.

CE RoHS

POINT Selection Notes

Please refer to P.19 for (Note 1) to (Note 9).

(Note 10) The maximum set value for acceleration/deceleration varies depending on the weight of the object being transported, the traverse distance, and the location. Operating continuously at the maximum set value could cause an overload error. For continuous operation, either lower the acceleration/deceleration value or refer to the duty (guideline) and set a stop time after acceleration/deceleration.

(Note 11) If the motor or controller is replaced, absolute reset must be performed. An adjustment jig (option model: JG-IXA1) will be required to perform absolute reset on the rotational axis (4th axis).

Model / Specifications

Model	Axis configuration		Arm length (mm)	Motor (W)	Operation range	Positioning repeatability (Note 1)	Maximum operation speed during PTP operation (Note 2)	Standard cycle time (s) (Note 3)	Continuous cycle time (s) (Note 3)	Payload (kg) (Note 4)	3rd axis (vertical axis) push force control range (N)*		4th axis allowable load	
											Upper limit (Note 5)	Lower limit (Note 5)	Allowable inertia moment (kg·m²) (Note 6)	Allowable torque (N·m)
[3-axis specification] IXA-3NSN6018- ① - T2 [IXA-3NSN6033 - ① - T2]	1-axis	1st arm	350	750	±137 degrees	±0.010mm	6414 mm/s (composite speed)	0.26	0.45	12	110.0	25.0	0.12	3.2
	2-axis	2nd arm	250	400	±140 degrees		300/750 deg/s (1st/2nd arm speed)							
[4-axis specification] IXA-4NSN6018- ① - T2 [IXA-4NSN6033 - ① - T2]	3-axis	Vertical axis	-	200	180mm [330mm]	±0.010mm	1600mm/s							
	4-axis	Rotational axis	-	100	±360 degrees	±0.005 deg.	2000 deg/s							

Legend: ① Cable length

Note: • The SCARA robot cannot operate continuously at 100% speed/acceleration. Refer to the Reference Data from P.20 for feasible operating conditions.
• Values in [ ] are for models with vertical axis of 330mm. Other specifications are the same for both 180mm and 330mm vertical axis models.
* Speed limitation applies to the push force. Contact IAI for details.

Cable Length

Type	Cable code
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)

[3-axis specification] · Motor cables: 3 · Encoder cables: 3 · Brake cable: 1
[4-axis specification] · Motor cables: 4 · Encoder cables: 4 · Brake cable: 1

Common Specifications

Item	Description
Encoder Type	Battery-less Absolute Encoder
User wiring	10-core (9-core + shield) AWG24 (rated 30V/max 1A)
User piping	3 air tubes with ø6 outer diameter and ø4 inner diameter (max. operating pressure 0.6MPa)
Alarm indicator (Note 7)	1 small amber LED indicator (24 VDC supply required)
Brake release switch (Note 8)	Brake release switch for vertical axis fall prevention
Allowable load moment	8.3N·m
Ambient temp./humidity	Temperature: 0~40°C, Humidity: 20~85% RH or less (Non-condensing)
Ingress protection	IP20
Unit weight	3-axis specification: 31.5kg, 4-axis specification: 33.0kg
Noise (Note 9)	80dB or less

Single Unit Options

Name	Model name	Reference page
Flange	**IX-FL-1**	See P.6

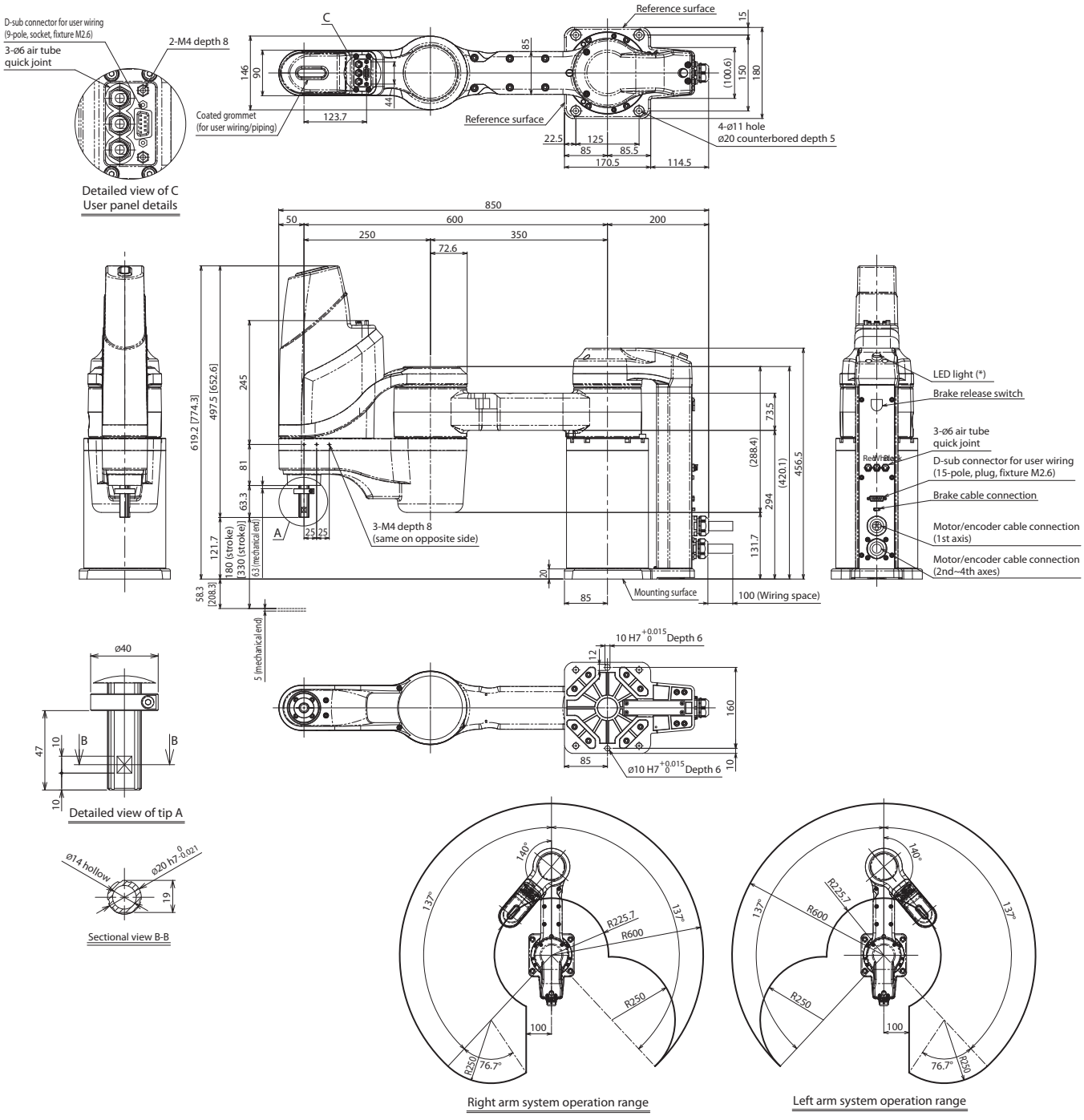
(Note) Please purchase separately.

Dimensions

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

2D CAD 3D CAD

* Values in [ ] are dimensions for vertical axis of 330mm.



(*) To operate the LED, wire a controller output to apply 24VDC to the LED terminal of the user wiring.

Applicable Controllers

The IXA series actuators can be operated by the controllers indicated below. Please select the type depending on your intended use.

Name	External view	Max. number of connectable axes	Power supply voltage	Control method				Maximum number of positioning points	Reference page
				Positioner	Pulse-train	Program	Network * option		
XSEL-RAX3/SAX3		3	Three-phase 230VAC	–	–	●	DeviceNet, CC-Link, PROFIBUS, EtherNet/IP, EtherCAT	41250 (Depending on the type)	See P.24
XSEL-RAX4/SAX4		4						36666 (Depending on the type)	

IXA - 4NSW3015

Dust/Splash-proof | Battery-less Absolute | Arm Length: 300 mm | Vertical Axis: 150 mm

■ Model Specification Items

IXA	-	4	NSW	30	15	-		-	T2
Series		Number of Axes	Type	Arm Length	Vertical Axis Stroke		Cable Length		Applicable Controllers
		4: 4-axis	Dust-/splash-proof high-speed type	30 : 300mm	15 : 150mm		N : No cable 5L : 5m 10L : 10m □L : Specified length (1m increments)		T2 : XSEL-RAX/SAX

* Does not include a controller.

Coming soon

* Please contact IAI for availability and further details.

POINT Selection Notes

Please refer to P.19 for (Note 1) to (Note 9).

(Note 10) The maximum set value for acceleration/deceleration varies depending on the weight of the object being transported, the traverse distance, and the location. Operating continuously at the maximum set value could cause an overload error. For continuous operation, either lower the acceleration/deceleration value or refer to the duty (guideline) and set a stop time after acceleration/deceleration.

(Note 11) Do not attempt to apply direct water jet on the bellows. Connect an air tube with ø16 to the air supply and exhaust bellows joint and release the tube end to a space in clean air with no humidity.

Model / Specifications

Model	Axis configuration		Arm length (mm)	Motor (W)	Operation range	Positioning repeatability (Note 1)	Maximum operation speed during PTP operation (Note 2)	Standard cycle time (s) (Note 3)	Continuous cycle time (s) (Note 3)	Payload (kg) (Note 4)	3rd axis (vertical axis) push force control range (N)*		4th axis allowable load	
											Upper limit (Note 5)	Lower limit (Note 5)	Allowable inertia moment (kg·m²) (Note 6)	Allowable torque (N·m)
IXA-4NSW3015-①-T2	1-axis	1st arm	155	600	±121 degrees	±0.010mm	5126mm/s (composite speed)	0.38	0.69	6	98.0	23.0	0.12	4.5
	2-axis	2nd arm	145	400	±125 degrees		690/690 deg/s (1st/2nd arm speed)							
	3-axis	Vertical axis	-	200	150mm	±0.010mm	1500mm/s							
	4-axis	Rotational axis	-	100	±360 degrees	±0.005 deg.	1600 deg/s							

Legend: ① Cable length

Note: The SCARA robot cannot operate continuously at 100% speed/acceleration. Refer to the Reference Data from P.20 for feasible operating conditions.
* Speed limitation applies to the push force. Contact IAI for details.

Cable Length

Type	Cable code
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)

· Motor cables: 4 · Encoder cables: 4 · Brake cable: 1

Common Specifications

Item	Description
Encoder Type	Battery-less Absolute Encoder
User wiring	10-core (9-core + shield) AWG24 (rated 30V/max 1A)
User piping	3 air tubes with ø4 outer diameter and ø2.5 inner diameter (max. operating pressure 0.6MPa)
Alarm indicator (Note 7)	No alarm lamp
Brake release switch (Note 8)	Brake release switch for vertical axis fall prevention
Allowable load moment	7.1N·m
Ambient temp./humidity	Temperature: 0~40°C, Humidity: 20~85% RH or less (Non-condensing)
Ingress protection	IP65 (except for bellows)
Air purge pressure	35kPa
Unit weight	48.0kg
Noise (Note 9)	80dB or less

Single Unit Options

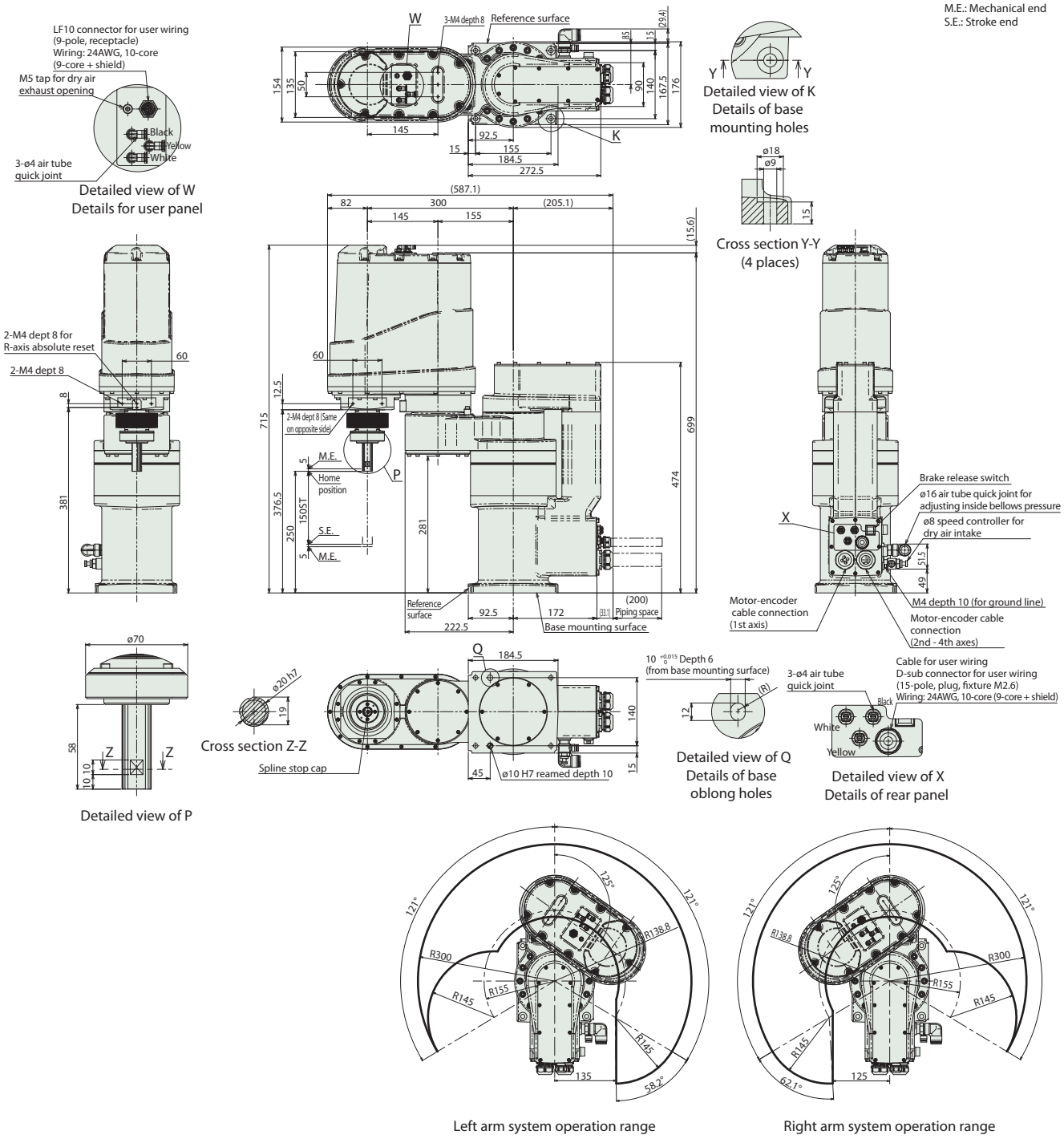
Name	Model name	Reference page
Flange	**IX-FL-1**	See P.6
Metal cap for user wiring	**IXA-MC-1**	See P.6

(Note) Please purchase separately.

Dimensions

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

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



Left arm system operation range

Right arm system operation range

Applicable Controllers

The IXA series actuators can be operated by the controllers indicated below. Please select the type depending on your intended use.

Name	External view	Max. number of connectable axes	Power supply voltage	Control method				Maximum number of positioning points	Reference page
				Positioner	Pulse-train	Program	Network * option		
XSEL-RAX4/SAX4		4	Three-phase 230VAC	–	–	●	DeviceNet, CC-Link, PROFIBUS, EtherNet/IP, EtherCAT	36666 (Depending on the type)	See P.24

IXA - 4NSW4518 / 4NSW4533

Dust/Splash-proof | Battery-less Absolute | Arm Length: 450 mm | Vertical Axis: 180/330 mm

■ Model Specification Items

IXA - 4 NSW 45 [ ] - [ ] - T2

Series	Number of Axes	Type	Arm Length	Vertical Axis Stroke	Cable Length	Applicable Controllers
IXA	4: 4-axis	NSW: Dust-/splash-proof high-speed type	45 : 450mm	18 : 180mm 33 : 330mm	N : No cable 5L : 5m 10L : 10m □L : Specified length (1m increments)	T2 : XSEL-RAX/SAX

* Does not include a controller.

Coming soon

* Please contact IAI for availability and further details.

POINT Selection Notes

Please refer to P.19 for (Note 1) to (Note 9).

(Note 10) The maximum set value for acceleration/deceleration varies depending on the weight of the object being transported, the traverse distance, and the location. Operating continuously at the maximum set value could cause an overload error. For continuous operation, either lower the acceleration/deceleration value or refer to the duty (guideline) and set a stop time after acceleration/deceleration.

(Note 11) Do not attempt to apply direct water jet on the bellows. Connect an air tube with ø16 to the air supply and exhaust bellows joint and release the tube end to a space in clean air with no humidity.

Model / Specifications

Model	Axis configuration		Arm length (mm)	Motor (W)	Operation range	Positioning repeatability (Note 1)	Maximum operation speed during PTP operation (Note 2)	Standard cycle time (s) (Note 3)	Continuous cycle time (s) (Note 3)	Payload (kg) (Note 4)	3rd axis (vertical axis) push force control range (N)*		4th axis allowable load	
											Upper limit (Note 5)	Lower limit (Note 5)	Allowable inertia moment (kg·m²) (Note 6)	Allowable torque (N·m)
IXA-4NSW4518- ① - T2 [IXA-4NSW4533 - ① - T2]	1-axis	1st arm	200	600	±137 degrees	±0.010mm	6981mm/s (composite speed) 500/700 deg/s (1st/2nd arm speed)	0.38	0.55	8	110.0	25.0	0.12	3.2
	2-axis	2nd arm	250	400	±133 degrees									
	3-axis	Vertical axis	-	200	180mm [330mm]	±0.010mm	1600mm/s							
	4-axis	Rotational axis	-	100	±360 degrees	±0.005 deg.	2000 deg/s							

Legend: ① Cable length

Note: • The SCARA robot cannot operate continuously at 100% speed/acceleration. Refer to the Reference Data from P.20 for feasible operating conditions.
• Values in [ ] are for models with vertical axis of 330mm. Other specifications are the same for both 180mm and 330mm vertical axis models.
* Speed limitation applies to the push force. Contact IAI for details.

Cable Length

Type	Cable code
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)

· Motor cables: 4 · Encoder cables: 4 · Brake cable: 1

Common Specifications

Item	Description
Encoder Type	Battery-less Absolute Encoder
User wiring	10-core (9-core + shield) AWG24 (rated 30V/max 1A)
User piping	3 air tubes with ø6 outer diameter and ø4 inner diameter (max. operating pressure 0.6MPa)
Alarm indicator (Note 7)	No alarm lamp
Brake release switch (Note 8)	Brake release switch for vertical axis fall prevention
Allowable load moment	9.6N·m
Ambient temp./humidity	Temperature: 0~40°C, Humidity: 20~85% RH or less (Non-condensing)
Ingress protection	IP65 (except for bellows)
Air purge pressure	35kPa
Unit weight	52.0kg
Noise (Note 9)	80dB or less

Single Unit Options

Name	Model name	Reference page
Flange	**IX-FL-1**	See P.6
Metal cap for user wiring	**IXA-MC-1**	See P.6

(Note) Please purchase separately.

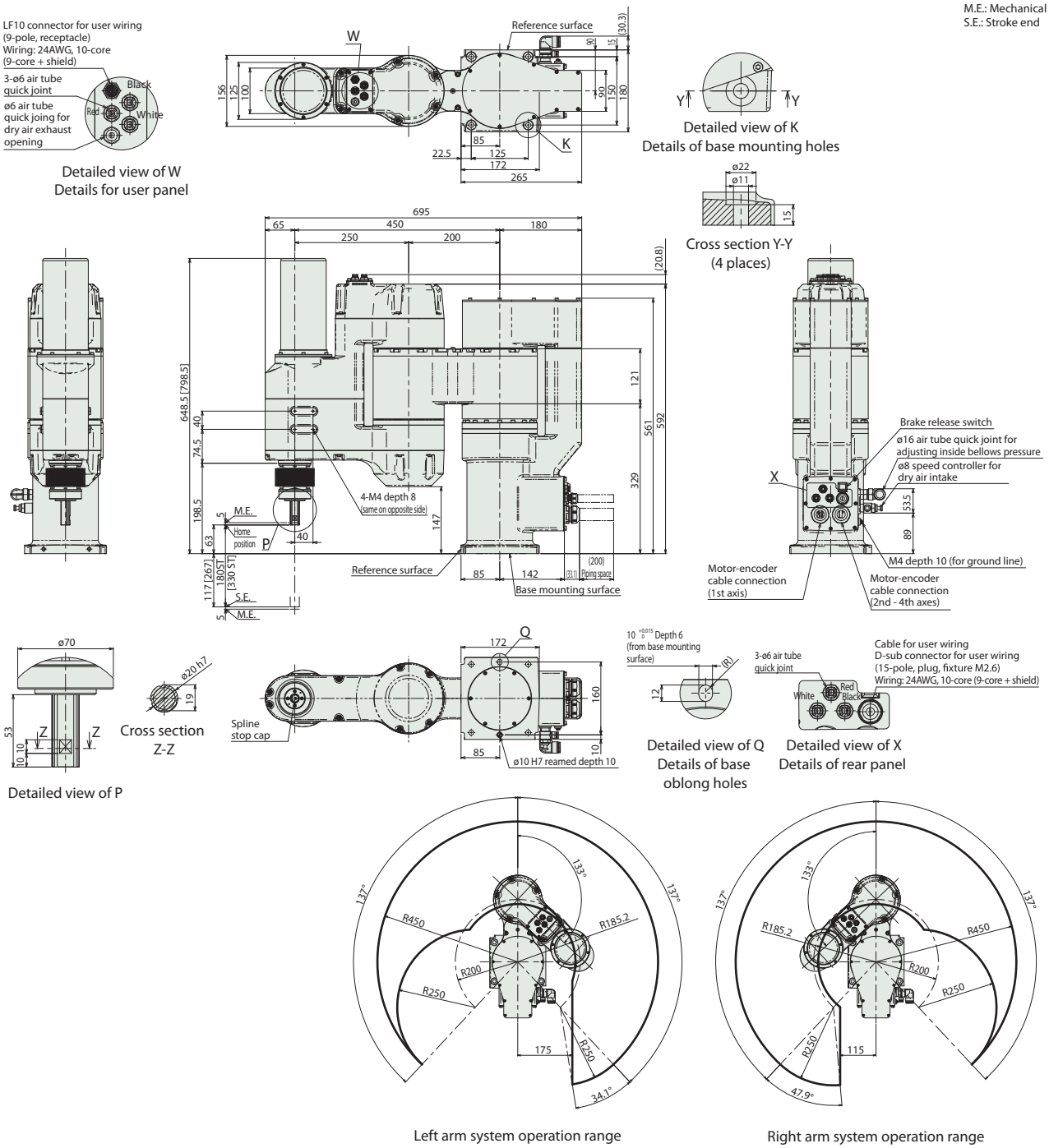
Dimensions

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

2D CAD 3D CAD

* Values in [ ] are dimensions for vertical axis of 330mm.

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



Applicable Controllers

The IXA series actuators can be operated by the controllers indicated below. Please select the type depending on your intended use.

Name	External view	Max. number of connectable axes	Power supply voltage	Control method				Maximum number of positioning points	Reference page
				Positioner	Pulse-train	Program	Network * option		
XSEL-RAX4/SAX4		4	Three-phase 230VAC	–	–	●	DeviceNet, CC-Link, PROFIBUS, EtherNet/IP, EtherCAT	36666 (Depending on the type)	See P.24

IXA - 4NSW6018 / 4NSW6033

Dust/Splash-proof | Battery-less Absolute | Arm Length: 600 mm | Vertical Axis: 180/330 mm

■ Model Specification Items

IXA - 4 NSW 60 [ ] - [ ] - T2

Series	Number of Axes	Type	Arm Length	Vertical Axis Stroke	Cable Length	Applicable Controllers
	4: 4-axis	Dust-/splash-proof high-speed type	60 : 600mm	18 : 180mm 33 : 330mm	N : No cable 5L : 5m 10L : 10m □L : Specified length (1m increments)	T2 : XSEL-RAX/SAX

* Does not include a controller.

CE RoHS

Coming soon

* Please contact IAI for availability and further details.

POINT Selection Notes

Please refer to P.19 for (Note 1) to (Note 9).

(Note 10) The maximum set value for acceleration/deceleration varies depending on the weight of the object being transported, the traverse distance, and the location. Operating continuously at the maximum set value could cause an overload error. For continuous operation, either lower the acceleration/deceleration value or refer to the duty (guideline) and set a stop time after acceleration/deceleration.

(Note 11) Do not attempt to apply direct water jet on the bellows. Connect an air tube with ø16 to the air supply and exhaust bellows joint and release the tube end to a space in clean air with no humidity.

Model / Specifications

Model	Axis configuration		Arm length (mm)	Motor (W)	Operation range	Positioning repeatability (Note 1)	Maximum operation speed during PTP operation (Note 2)	Standard cycle time (s) (Note 3)	Continuous cycle time (s) (Note 3)	Payload (kg) (Note 4)	3rd axis (vertical axis) push force control range (N)*		4th axis allowable load	
											Upper limit (Note 5)	Lower limit (Note 5)	Allowable inertia moment (kg·m²) (Note 6)	Allowable torque (N·m)
IXA-4NSW6018-①-T2 [IXA-4NSW6033-①-T2]	1-axis	1st arm	350	750	±137 degrees	±0.010mm	6039mm/s (composite speed)	0.38	0.57	10	110.0	25.0	0.12	3.2
	2-axis	2nd arm	250	400	±133 degrees		285/700 deg/s (1st/2nd arm speed)							
	3-axis	Vertical axis	-	200	180mm [330mm]	±0.010mm	1600mm/s							
	4-axis	Rotational axis	-	100	±360 degrees	±0.005 deg.	2000 deg/s							

Legend: ① Cable length

Note: • The SCARA robot cannot operate continuously at 100% speed/acceleration. Refer to the Reference Data from P.20 for feasible operating conditions.
• Values in [ ] are for models with vertical axis of 330mm. Other specifications are the same for both 180mm and 330mm vertical axis models.
* Speed limitation applies to the push force. Contact IAI for details.

Cable Length

Type	Cable code
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)

· Motor cables: 4 · Encoder cables: 4 · Brake cable: 1

Common Specifications

Item	Description
Encoder Type	Battery-less Absolute Encoder
User wiring	10-core (9-core + shield) AWG24 (rated 30V/max 1A)
User piping	3 air tubes with ø6 outer diameter and ø4 inner diameter (max. operating pressure 0.6MPa)
Alarm indicator (Note 7)	No alarm lamp
Brake release switch (Note 8)	Brake release switch for vertical axis fall prevention
Allowable load moment	9.6N·m
Ambient temp./humidity	Temperature: 0~40°C, Humidity: 20~85% RH or less (Non-condensing)
Ingress protection	IP65 (except for bellows)
Air purge pressure	35kPa
Unit weight	53.0kg
Noise (Note 9)	80dB or less

Single Unit Options

Name	Model name	Reference page
Flange	**IX-FL-1**	See P.6
Metal cap for user wiring	**IXA-MC-1**	See P.6

(Note) Please purchase separately.

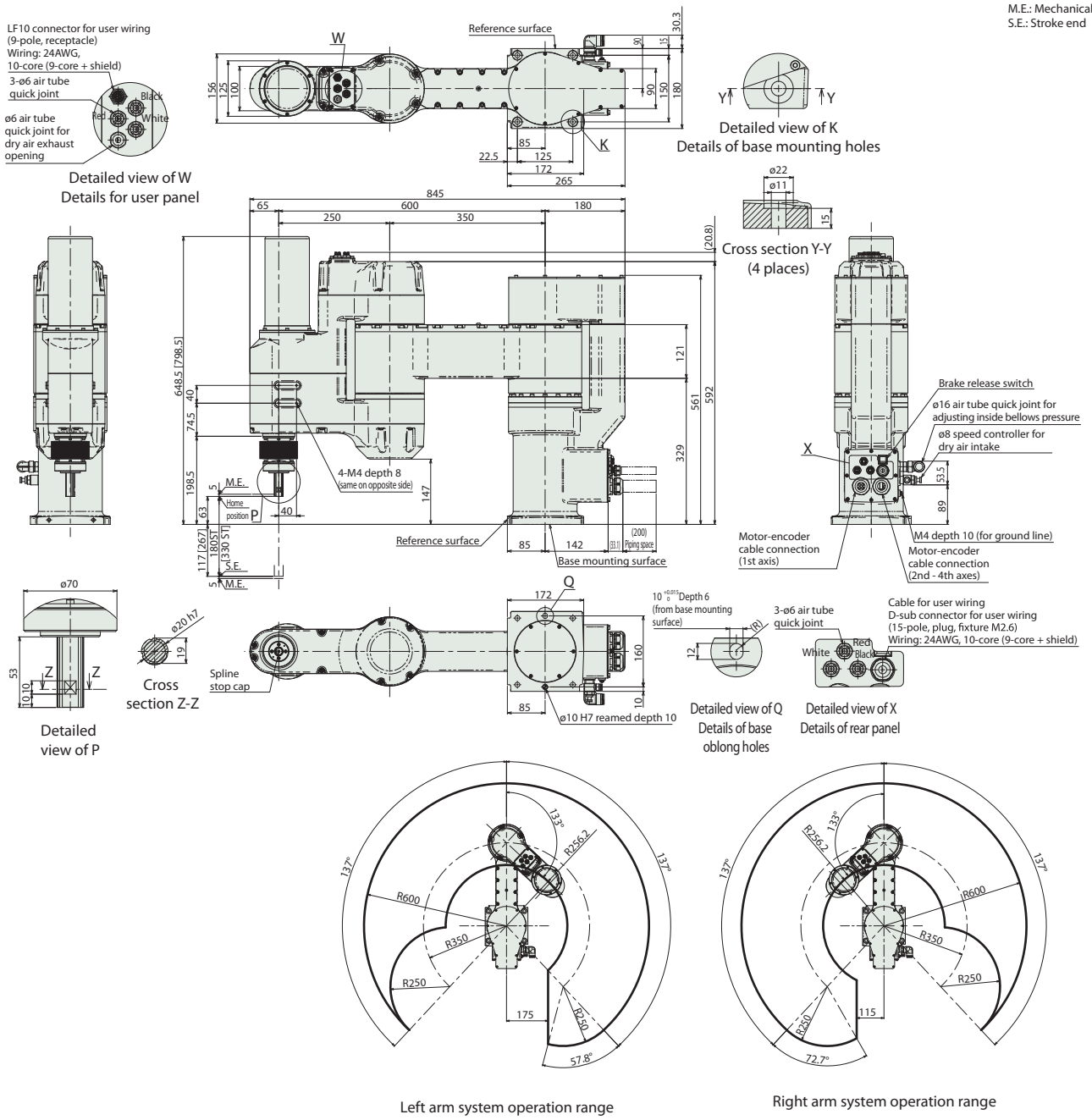
Dimensions

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

2D CAD 3D CAD

* Values in [ ] are dimensions for vertical axis of 330mm.

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



Left arm system operation range

Right arm system operation range

Applicable Controllers

The IXA series actuators can be operated by the controllers indicated below. Please select the type depending on your intended use.

Name	External view	Max. number of connectable axes	Power supply voltage	Control method				Maximum number of positioning points	Reference page
				Positioner	Pulse-train	Program	Network * option		
XSEL-RAX4/SAX4		4	Three-phase 230VAC	–	–	●	DeviceNet, CC-Link, PROFIBUS, EtherNet/IP, EtherCAT	36666 (Depending on the type)	See P.24

Precautions

(Note 1) 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 (when ambient temperature is a constant 20°C). 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 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) Standard cycle time Continuous cycle time

The standard/continuous cycle time represents the time required when an operation is performed under the setting of the fastest cycle operation and the following conditions.

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

[Standard cycle time]
The time required for maximum speed operation. 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.

(Note 4) 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.

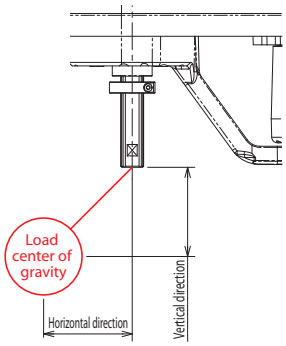
(Note 5) 3rd axis push force control range

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 is the push force when the push force setting value (driver parameter No. 38) is 70%.
The lower limit is the push force when the parameter setting value is 30% for NNN1805 and 4NSW3015, and 20% for other types.
Speed limitation applies to the push force. Contact IAI for details.

(Note 6) 4th axis allowable inertia moment

The 4th axis allowable inertia moment is the allowable inertia moment value for the center of rotation conversion of the 4th axis (rotational axis) of the SCARA robot.
Make sure that the offset amount from the center of rotation of the 4th axis to the center of gravity of the tool is within the values listed below.
If the center of gravity of the tool is located away from the center of the 4th axis, the acceleration/deceleration will need to be appropriately reduced.

Model	Horizontal direction	Vertical direction
IXA-□NNN1805	30mm or less	20mm or less
IXA-□NNN3515 / IXA-□NSN3515	150mm or less	100mm or less
IXA-□NNN45□□ / IXA-□NNN60□□	120mm or less	
IXA-□NSN45□□ / IXA-□NSN60□□	180mm or less	
IXA-4NSW3515 / IXA-4NSW45□□ / IXA-4NSW60□□	120mm or less	



(Note 7) Alarm indicator

The alarm indicator is installed on the 1st axis (J1) base upper part on the SCARA robot.
For standard type NNN, this is an option. (Option model LED)
It can be used for such applications as lighting when a controller error occurs. To operate it, use the I/O output signal from your controller to build a circuit that adds 24VDC to the LED terminal in the user wiring.

(Note 8) Brake release switch

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

(Note 9) 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.

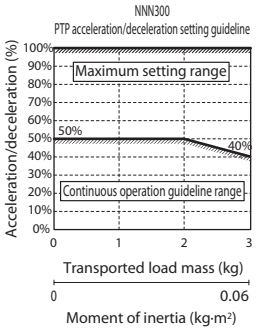
SCARA Robot IXA Acceleration/Deceleration Setting Guidelines

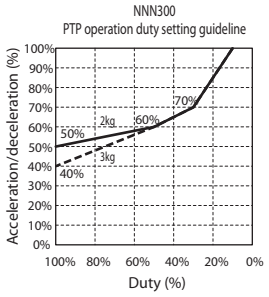
SCARA Robot IXA cannot operate continuously under the maximum acceleration/deceleration or maximum speed listed in the catalog.
To operate under the maximum acceleration/deceleration, refer to the continuous operation duty guideline graph and set a stop time.
If continuous operation is required, do so under acceleration/deceleration settings within the continuous operation guideline range listed in the acceleration/deceleration setting guideline graph.

(Notes)
1) For PTP operation, always use WGHT commands in the program to set the weight and moment of inertia prior to operation.
SCARA high speed compatible products set the maximum acceleration/deceleration for operation at each payload as 100%.
If the payload differs even at the same acceleration/deceleration or speed setting, the operation time will also differ.
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 adjust by referring to the continuous operation duty guideline and setting a stop time.
4) Duty (%) = (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 rising edge as possible.
6) Set the moment of inertia and payload to the allowable value or lower.
7) The transported load shows the moment of inertia and weight at the center of rotation of the 4th axis.
8) Use a robot that maintains 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 be created.
9) If the load moment of inertia is high, vibration may occur in the vertical axis, depending on the position of the vertical axis. If vibration occurs, decrease the acceleration/deceleration as required prior to use.

● For standard type: arm length 300

PTP operation / acceleration/deceleration setting guidelines

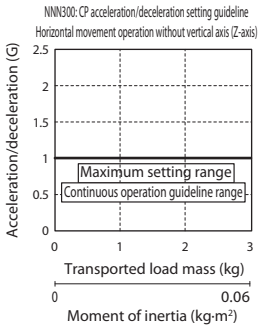




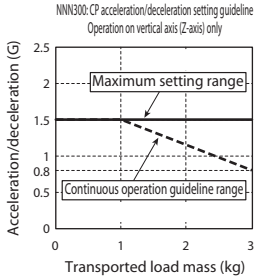
CP operation / acceleration/deceleration setting guidelines

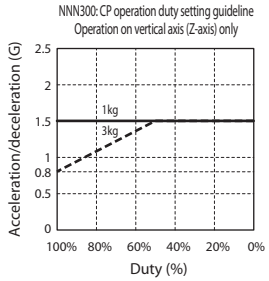
Refer to "Acceleration/Deceleration Limitations" (P.23) for information on the maximum speed.

● Horizontal



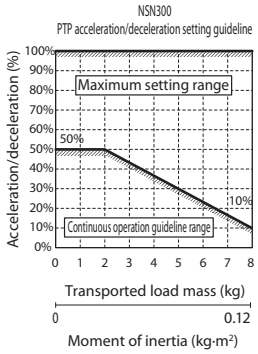
● Vertical

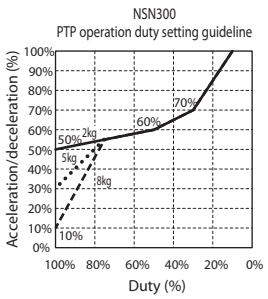




● For high-speed type: arm length 300

PTP operation / acceleration/deceleration setting guidelines

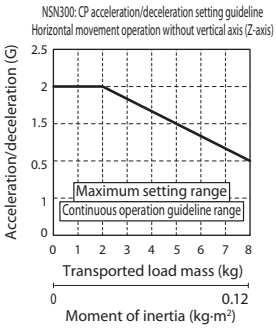




CP operation / acceleration/deceleration setting guidelines

Refer to "Acceleration/Deceleration Limitations" (P.23) for information on the maximum speed.

● Horizontal



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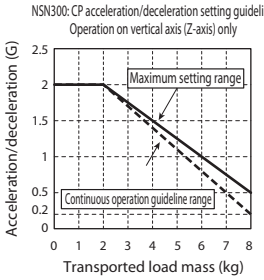
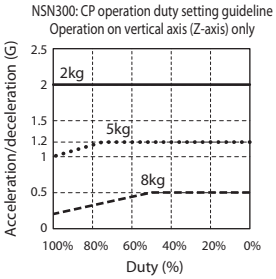
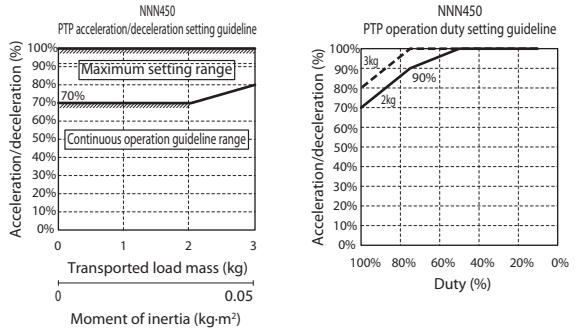




SCARA Robot IXA Acceleration/Deceleration Setting Guidelines

● For standard type: arm length 450

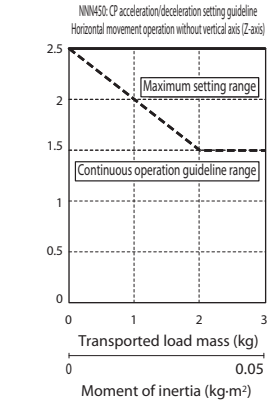
PTP operation / acceleration/deceleration setting guidelines



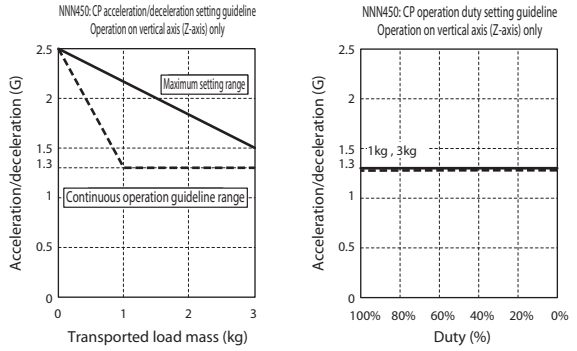
CP operation / acceleration/deceleration setting guidelines

Refer to "Acceleration/Deceleration Limitations" (P.23) for information on the maximum speed.

● Horizontal

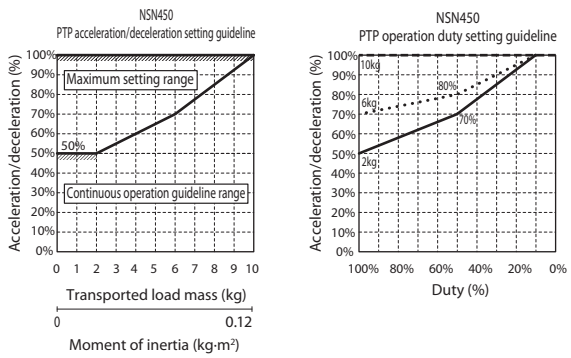


● Vertical



● For high-speed type: arm length 450

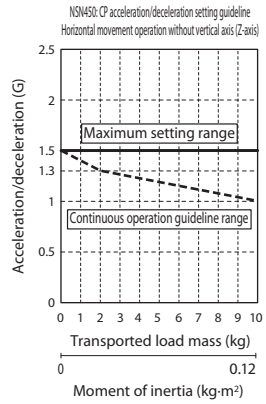
PTP operation / acceleration/deceleration setting guidelines



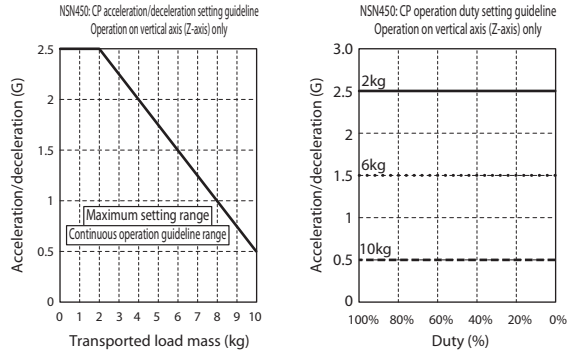
CP operation / acceleration/deceleration setting guidelines

Refer to "Acceleration/Deceleration Limitations" (P.23) for information on the maximum speed.

● Horizontal

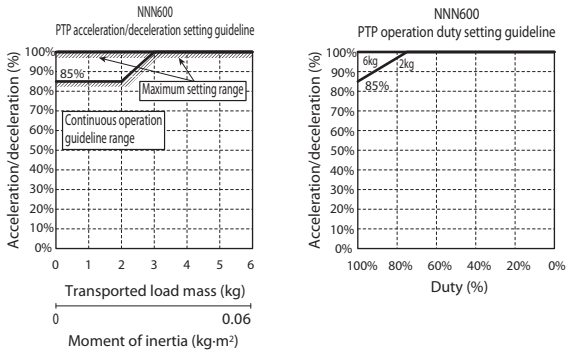


● Vertical



● For standard type: arm length 600

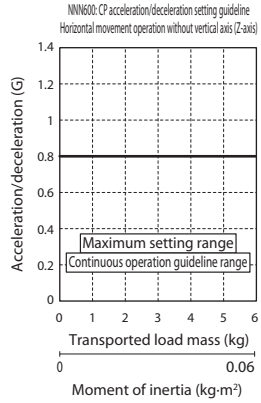
PTP operation / acceleration/deceleration setting guidelines



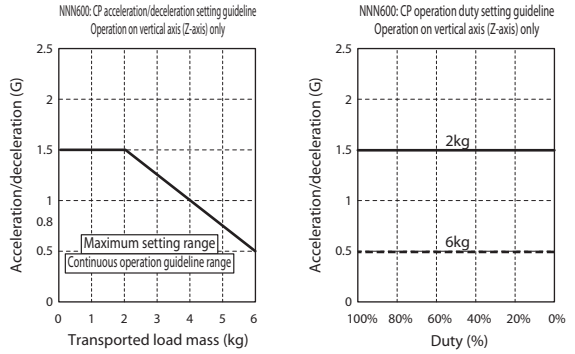
CP operation / acceleration/deceleration setting guidelines

Refer to "Acceleration/Deceleration Limitations" (P.23) for information on the maximum speed.

● Horizontal

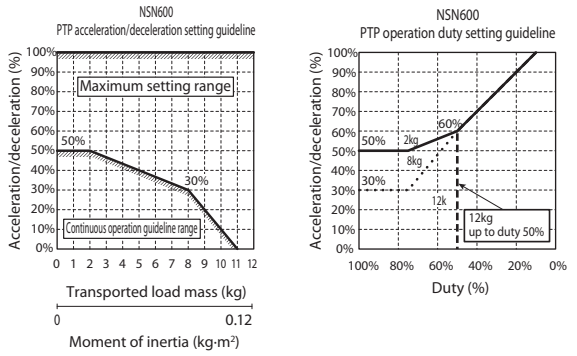


● Vertical



● For high-speed type: arm length 600

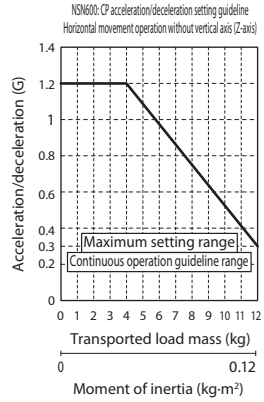
PTP operation / acceleration/deceleration setting guidelines



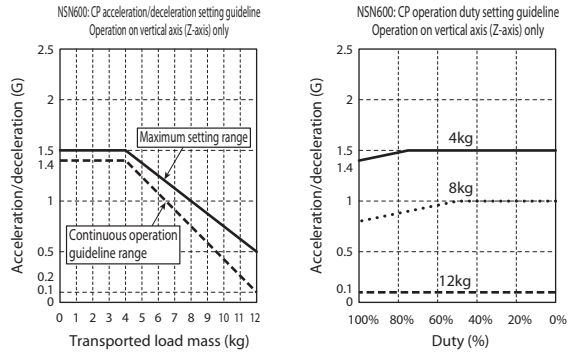
CP operation / acceleration/deceleration setting guidelines

Refer to "Acceleration/Deceleration Limitations" (P.23) for information on the maximum speed.

● Horizontal



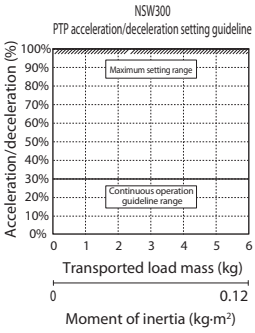
● Vertical

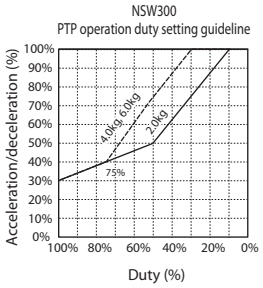


SCARA Robot IXA Acceleration/Deceleration Setting Guidelines

● For dust/splash-proof type: arm length 300

PTP operation / acceleration/deceleration setting guidelines

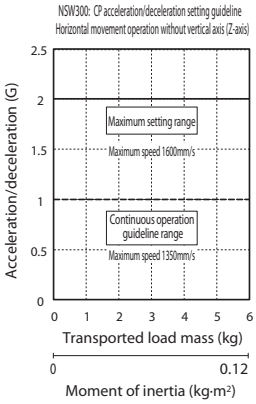


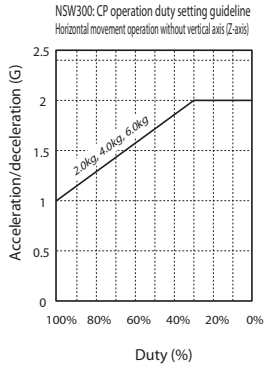


CP operation / acceleration/deceleration setting guidelines

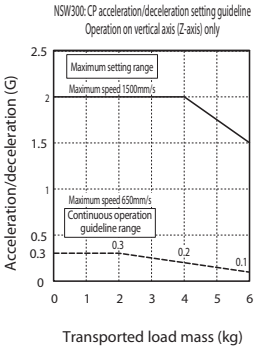
Refer to "Acceleration/Deceleration Limitations" (P.23) for information on the maximum speed.

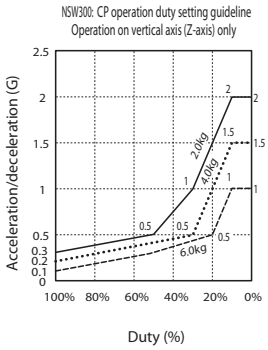
● Horizontal





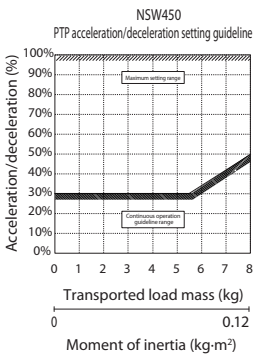
● Vertical

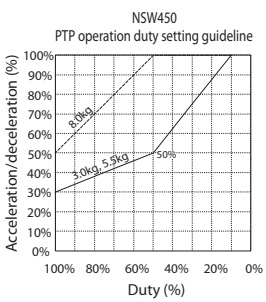




● For dust/splash-proof type: arm length 450

PTP operation / acceleration/deceleration setting guidelines

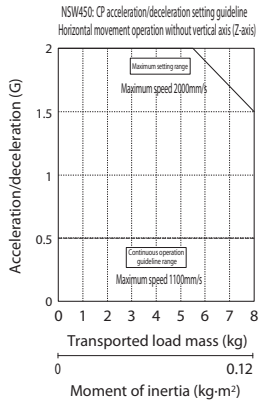


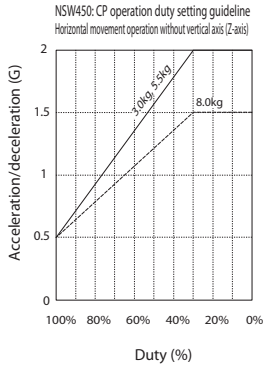


CP operation / acceleration/deceleration setting guidelines

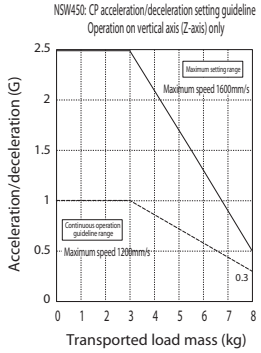
Refer to "Acceleration/Deceleration Limitations" (P.23) for information on the maximum speed.

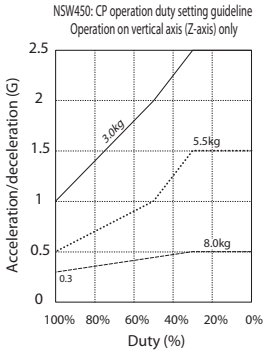
● Horizontal





● Vertical

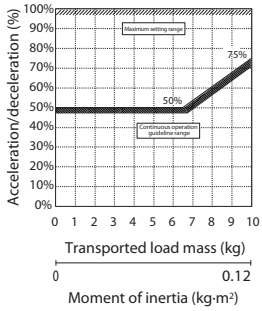




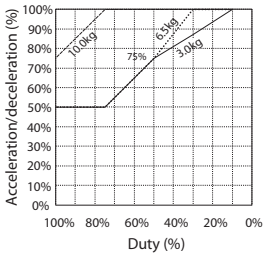
● For dust/splash-proof type: arm length 600

PTP operation / acceleration/deceleration setting guidelines

NSW600
PTP acceleration/deceleration setting guideline



NSW600
PTP operation duty setting guideline

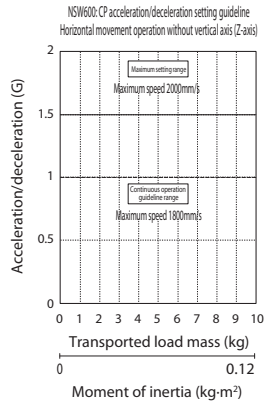


CP operation / acceleration/deceleration setting guidelines

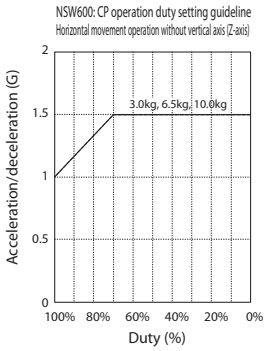
Refer to "Acceleration/Deceleration Limitations" (P.23) for information on the maximum speed.

● Horizontal

NSW600: CP acceleration/deceleration setting guideline
Horizontal movement operation without vertical axis (Z-axis)

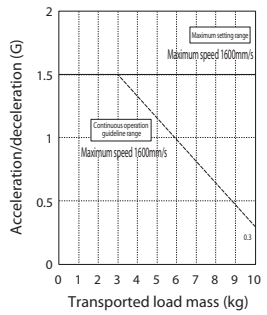


NSW600: CP operation duty setting guideline
Horizontal movement operation without vertical axis (Z-axis)

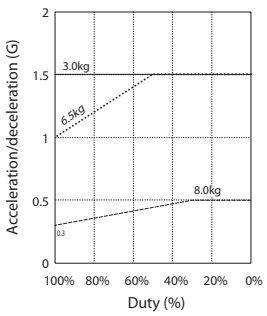


● Vertical

NSW600: CP acceleration/deceleration setting guideline
Operation on vertical axis (Z-axis) only



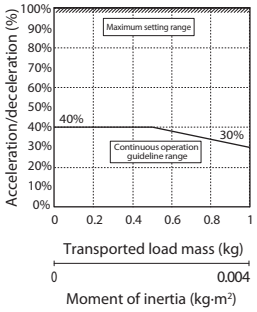
NSW600: CP operation duty setting guideline
Operation on vertical axis (Z-axis) only



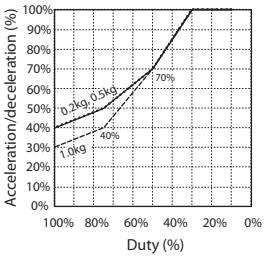
● For standard type: arm length 180

PTP operation / acceleration/deceleration setting guidelines

NNN180
PTP acceleration/deceleration setting guideline



NNN180
PTP operation duty setting guideline

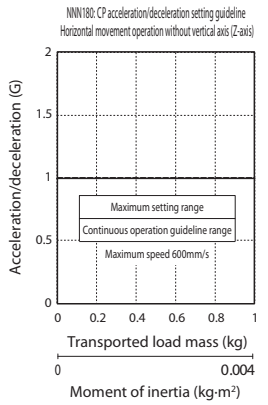


CP operation / acceleration/deceleration setting guidelines

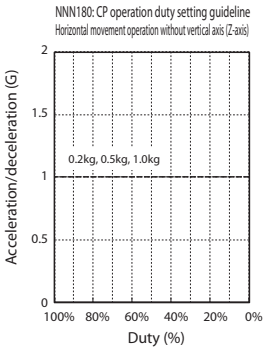
Refer to "Acceleration/Deceleration Limitations" (P.23) for information on the maximum speed.

● Horizontal

NNN180: CP acceleration/deceleration setting guideline
Horizontal movement operation without vertical axis (Z-axis)

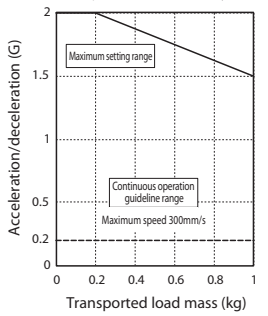


NNN180: CP operation duty setting guideline
Horizontal movement operation without vertical axis (Z-axis)

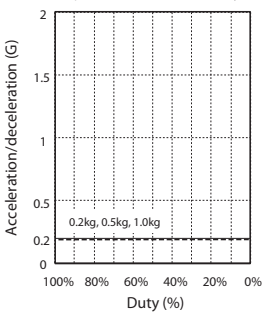


● Vertical

NNN180: CP acceleration/deceleration setting guideline
Operation on vertical axis (Z-axis) only



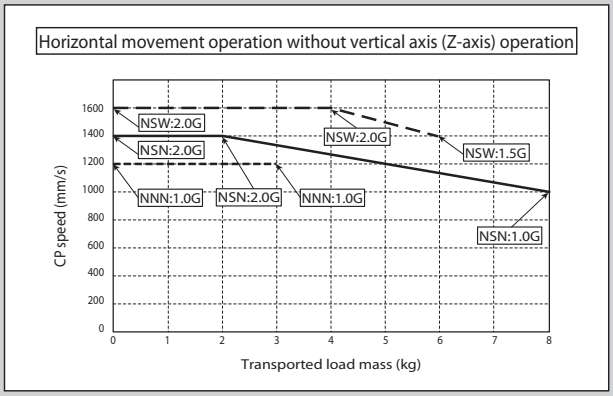
NNN180: CP operation duty setting guideline
Operation on vertical axis (Z-axis) only

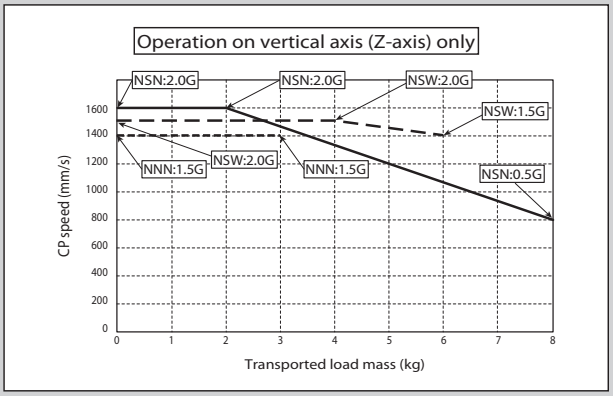


SCARA Robot IXA Acceleration/Deceleration Setting Guidelines

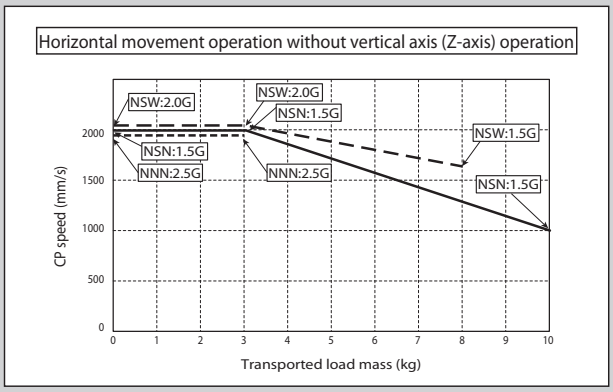
CP Operation: Acceleration/Deceleration Limitations

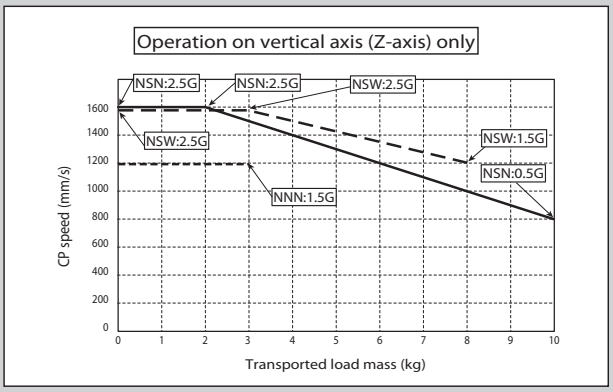
● For arm length 300



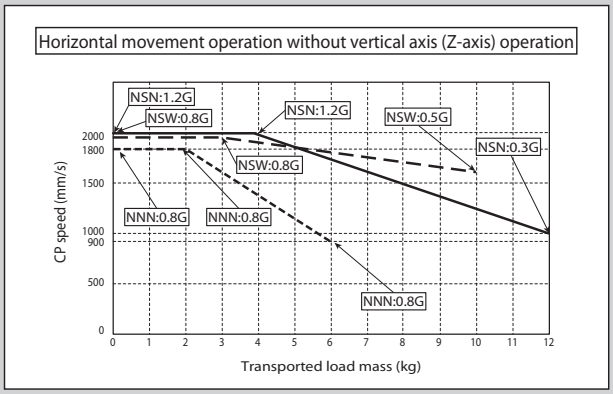


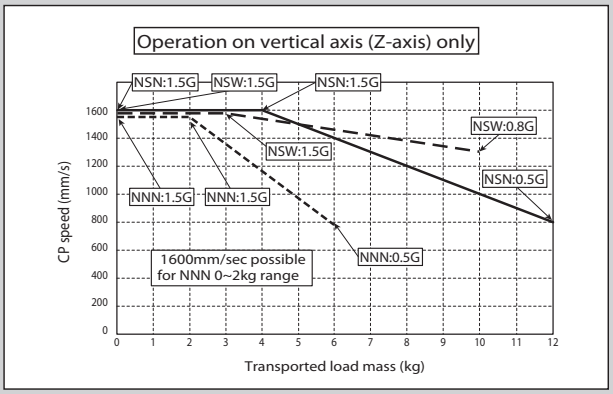
● For arm length 450



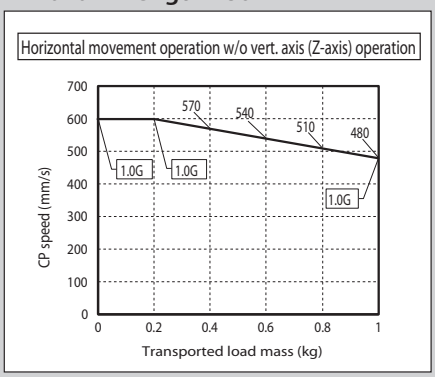


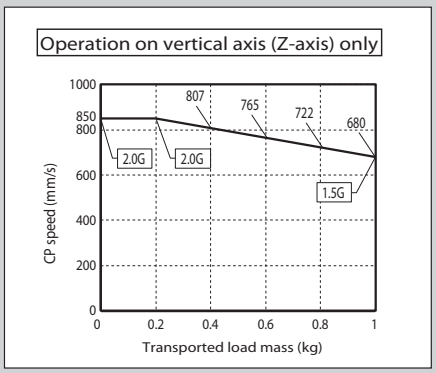
● For arm length 600





● For arm length 180





X-SEL

SCARA Robot Program Controller

List of Models

Multi-axis program controller enabling SCARA robot operation.

Type name		RAX	SAX
Connectable axes		1 SCARA unit: single-axis and cartesian	
External view			
Type		Standard specification	Safety category compliant
Max. number of controlled axes		8-axis	
No. of positions		(3-axis specification) Maximum 41250 positions, (4-axis specification) Maximum 36666 positions * Varies depending on the number of axes. Refer to the specification table (P.27) for more information.	
Number of programs		255	
Number of program steps		20000	
Total number of connectable W		Three-phase 2400W	
Motor input power supply voltage		Three-phase 230VAC ±10%	
Control power supply voltage		Single phase 230VAC ±10%	
Safety category (*1)		B	Safety category 4 compatible
Safety standard		CE compliant	
RoboCylinder 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]

(Additional axis content 5th~8th axes)

XSEL - [ ] - [ ] - ([ ] [ ] [ ]) - [ ] [ ] - [ ] [ ] - [ ] - [ ]

Series	Type	SCARA Robot Main Body Type	Motor Type	Encoder Type	Options	Network Dedicated Slot(s) (Slot 1) (Slot 2)	I/O Slot(s) (Slot 1) (Slot 2)	I/O Cable Length	Power Supply Voltage

RAX3	3-axis SCARA specification
RAX4	3-axis SCARA + 1-axis specification / 4-axis SCARA specification
RAX5	3-axis SCARA + 2-axis specification / 4-axis SCARA + 1-axis specification (*)
RAX6	3-axis SCARA + 3-axis specification / 4-axis SCARA + 2-axis specification (*)
RAX7	3-axis SCARA + 4-axis specification / 4-axis SCARA + 3-axis specification (*)
RAX8	4-axis SCARA + 4-axis specific. (*)
SAX3	3-axis SCARA global specification (safety category compliant)
SAX4	3-axis SCARA + 1-axis global specification / 4-axis SCARA global specification (safety category compliant)
SAX5	3-axis SCARA + 2-axis global specific. 4-axis SCARA + 1-axis global specific. (safety category compliant) (*)
SAX6	3-axis SCARA + 3-axis global specific. / 4-axis SCARA + 2-axis global specific. (safety category compliant) (*)
SAX7	3-axis SCARA + 4-axis global specific. / 4-axis SCARA + 3-axis global specific. (safety category compliant) (*)
SAX8	4-axis SCARA + 4-axis global specfic. (safety category compliant) (*)

* The housing size varies according to the type of SCARA robot to connect and the additional axes connected. Refer to the external dimensions on P.28 for more information.

(*) Soon available

WAI	Battery-less absolute incremental
A	Absolute
G	Quasi absolute
AI	Index absolute
AM	Absolute multi-rotation

B	Brake equipped specification
C	Creep sensor specification
HA	Hi-accel./decel. specification
L	Home sensor/LS compatible
M	Master axis specified
S	Slave axis specified

E	Not used
DV	DeviceNet
CC	CC-Link
PR	PROFIBUS-DP

E	Not used
EP	EtherNet/IP
EC	EtherCAT

E	Not used
N1	Input 32/Output 16 (NPN)
N2	Input 16/Output 32 (NPN)
N3	Input 48/Output 48 (NPN)
P1	Input 32/Output 16 (PNP)
P2	Input 16/Output 32 (PNP)
P3	Input 48/Output 48 (PNP)

(*) Selectable boards are fixed for the network dedicated slot.

(*) The network dedicated slot and I/O slot can be used together.

12	12W	150	150W
20	20W	200	200W
30D	30W for RCS2	300	300W
30R	30W for RS	400	400W
60	60W	600	600W
100	100W	750	750W

(Example) 12: 12 W servo motor supported

0	No cable
2	2m (Standard)
3	3m
5	5m

3	Three-phase 230V

3N□N3015	IXA-3N□N3015	3N□N6018	IXA-3N□N6018
4N□N3015	IXA-4N□N3015	3N□N6033	IXA-3N□N6033
3N□N4518	IXA-3N□N4518	4N□N6018	IXA-4N□N6018
3N□N4533	IXA-3N□N4533	4N□N6033	IXA-4N□N6033
4N□N4518	IXA-4N□N4518		
4N□N4533	IXA-4N□N4533		

* The following symbols are specified in □.
N: Standard type
S: High-speed type

Notes

In principle, the same type of motor as the type of motor of the actuator to be connected should be entered, but there are some models where the motor type of some controllers and actuators do not match.
Be sure to check the corresponding models listed below during selection.

<30D / 30R Target Actuators>

- Controller motor type [30D]: 30W actuator other than RS (e.g. RCS2-SA6 / RCS2-R□4)
- Controller motor type [30R]: RS

Non-Connectable Actuators (Additional Axes)

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)

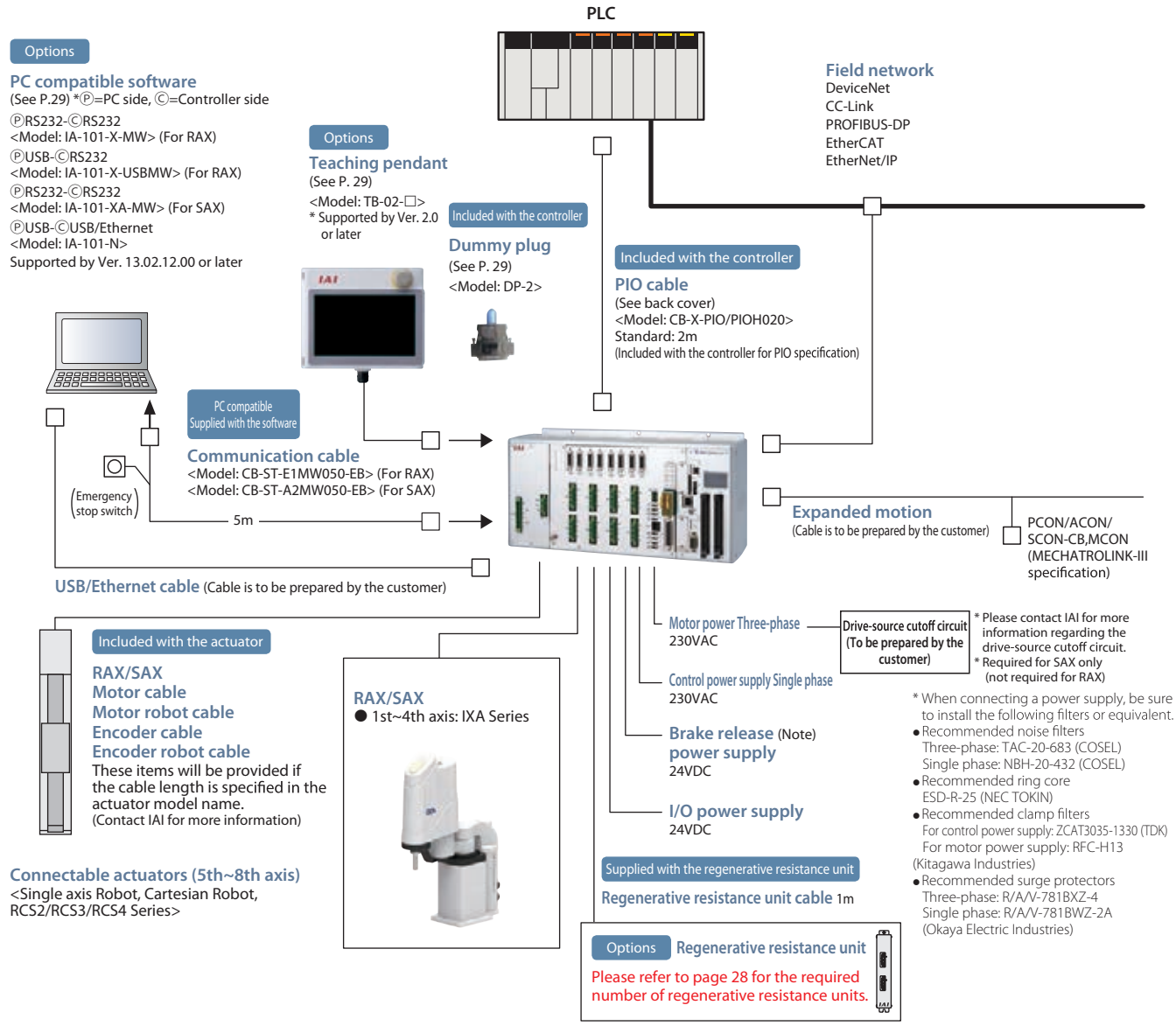
Limitations on Additional Axis Connection

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 wattage	
		For 4-axis housing	For 8-axis housing
Standard type	IXA-3NNN3015	Cannot be connected	4 axes (5th~8th axis) / Total wattage of 700W or less
	IXA-3NNN45□□		
	IXA-3NNN60□□		
	IXA-4NNN3015		4 axes (5th~8th axis) / Total wattage of 600W or less
	IXA-4NNN45□□		
	IXA-4NNN60□□		3 axes (6th~8th axis) / Total wattage of 600W or less
High-speed type	IXA-3NSN3015	Cannot be connected	Cannot be connected
	IXA-3NSN45□□		
	IXA-3NSN60□□		
	IXA-4NSN3015		
	IXA-4NSN45□□		
	IXA-4NSN60□□		

System Configuration

■ XSEL-RAX/SAX Type



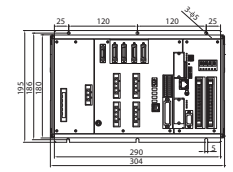
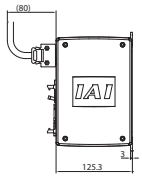
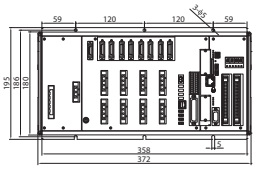
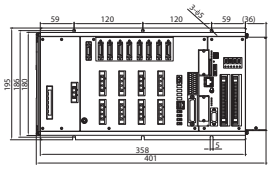
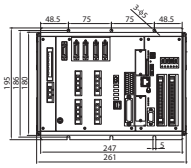
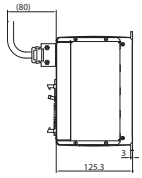
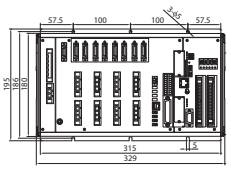
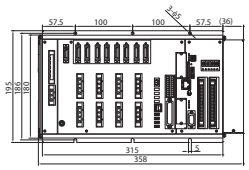
(Note) When connecting an actuator with brake, the brake power supply +24V is required for the controller.

Table of Specifications

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	
Control power input	Single phase 230VAC ±10%	
Power frequency	50/60Hz	
Insulation resistance	10MΩ 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	1mm/s~ Upper limit depends on the actuator specification	
Acceleration/deceleration setting	0.01G~ Upper limit depends on the actuator specification	
Programming language	Super SEL language	
Number of programs	255 programs	
Number of program steps	20000 steps (total)	
No. of multi-tasking programs	16 programs	
Number of positions	Varies by the number of controlled axes 3-axis: 41250, 4-axis: 36666, 5-axis: 33000, 6-axis: 30000, 7-axis: 27500, 8-axis: 25384	
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 (EtherNet/IP, EtherCAT and DeviceNet, CC-Link, and PROFIBUS-DP can be installed at the same time)	
Clock function	Retention time: about 10 days Charging time: about 100 hours	
Regenerative resistor	Built-in 1kΩ/20W regenerative resistor (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℃, 85% RH or less (non-condensing), avoid corrosive gas and excessive dust	

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

External Dimensions

Controller Specification			Front View: Battery-less absolute/Incremental specification /Quasi absolute specification/Index absolute specification	Front View: Absolute specification/ Absolute multi-rotation specification	Side View
RAX	Three-phase specification	4-axis specification			 (Battery-less absolute/ Incremental specification/ Quasi absolute specification/ Index absolute specification)
		5~8-axis specification			
SAX	Three-phase specification	4-axis specification			 (Absolute specification /Absolute multi-rotation specification)
		5~8-axis specification			

* If absolute specification is included for at least 1 connected single actuator, the external dimensions will be that of the absolute specification.
** Controllers for standard type with arm length of 600mm (IXA-4NNN60☐☐) or with additional connected axes and controllers for high-speed type will have the controller size of the 5~8-axis specification.

Options

■ Regenerative resistance unit

Model

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

Specification

Model	RESU-1	RESUD-1
Unit weight	About 0.4kg	
Built-in regenerative resistance value	235Ω 80W	
Unit mounting method	Screw mount	DIN rail mount
Attached cable	CB-ST-REU010	

Description

Unit that converts the regenerative current generated during motor deceleration to heat. Although the controller is equipped with a regenerative resistor inside, an additional external regenerative resistance unit may be necessary if the load in the vertical axis is large and the capacity is insufficient.

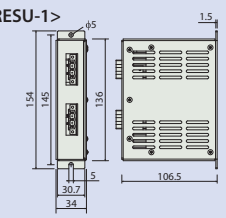
<When connecting a single axis robot>

Installation criteria Determined by the total motor wattage of connected axes.

Horizontal specification

Total motor wattage	Required number of regenerative resistors
~100W	0
~600W	1
~1200W	2
~1800W	3
~2400W	4

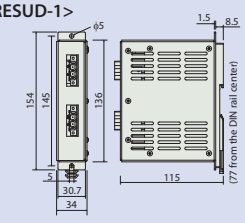
<RESU-1>



Vertical specification

Total motor wattage	Required number of regenerative resistors
~100W	0
~600W	1
~1000W	2
~1400W	3
~2000W	4
~2400W	5

<RESUD-1>



<When connecting a SCARA robot>

Estimated installation criteria

Model		Required number of regenerative resistance units
NNN	3015	2
	45☐☐	
	60☐☐	
NSN	3015	3
	45☐☐	
	60☐☐	4

* The required number is for a single SCARA robot. When connecting a single axis robot as an additional axis, be sure to add regenerative resistors for the single axis robot.

Examples: When operating IXA-3NNN3015 and ISB-MXM (200W).
IXA-3NNN3015 ····· 2 units required
ISB-MXM (200W): 1 unit required
Therefore, 3 regenerative resistance units are required.

■ Absolute data backup battery

Model **AB-5** * Only for additional axes with absolute specification

Features Absolute data storage battery for operating an actuator of the absolute specification.

■ Dummy plug

Model **DP-2**

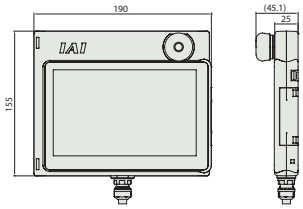
Features A dummy plug to be attached to the teaching connector when a PC or teaching pendant is not connected.

Touch Panel Teaching Pendant

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

■ Model **TB-02-□**

■ External dimensions



■ Specifications

Rated voltage	24V DC
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0 to 40°C
Ambient operating humidity	20~85% RH (non-condensing)
Environmental resistance	IP20
Weight	470g (TB-02 unit only)

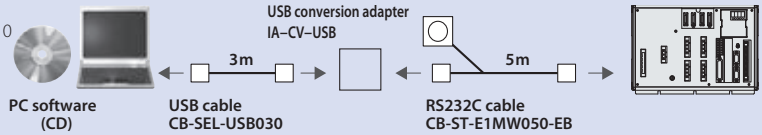
USB PC Software Kit (For XSEL-RAX)

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

Features This type has a USB adapter mounted on the RS232C cable to allow the use on a PC's USB port.

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

(Accessories) PC connection cable 5m + emergency stop box + USB adapter + USB cable 3m



PC Software

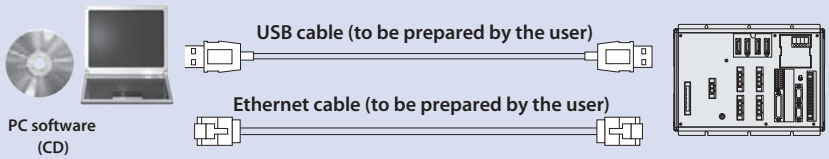
Model **IA-101-N**

Features PC software (CD-ROM) without PC connection cables.
If you want to connect both the controller and PC side with a USB cable or Ethernet cable, only the software needs to be purchased. A cable that meets the following specifications is to be prepared by the customer.

Notes
When operating the actuator by USB connection, be sure to connect the 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".

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

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



PC Software Kit (For XSEL-RAX)

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

PC Software Kit Compatible with Safety Category 4 (For XSEL-SAX only)

Model **IA-101-XA-MW(-EB)***

* IA-101-XA-MW-EB: model set with emergency stop box

Maintenance Parts

When placing an order for the replacement cable, please use the model name shown below. **(* Please contact IAI for more details.)**

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			CB-IXA-BK□□□-3
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□□□

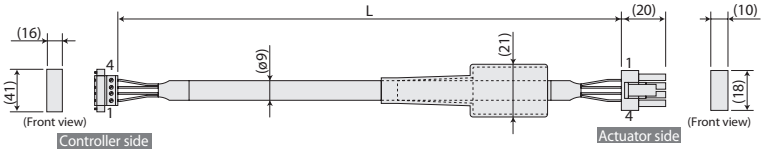
Motor robot cable (*)

(*) The alternative EU motor robot cable CB-XEU-MA□□□ (with round plastic connector) is not connectable to IXA SCARA robot.

Model: CB-X-MA□□□

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

(Fig.: Motor robot cable CB-X-MA□□□ with plastic connector)



Wire	Color	Signal	No.
0.75sq	Green	PE	1
	Red	U	2
	White	V	3
	Black	W	4

No.	Signal	Color	Wire
1	U	Red	0.75sq (crimped)
2	V	White	
3	W	Black	
4	PE	Green	

Minimum bending R: r = 51 mm or more (for movable use)
* Only robot cable is available for this model.

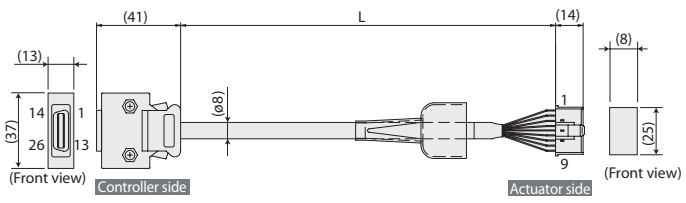
Encoder robot cable (*)

(*) The alternative EU encoder robot cable CB-XEU1-PA□□□ (with round metal connector) is not connectable to IXA SCARA robot.

Model: CB-X1-PA□□□

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

(Fig.: Encoder robot cable CB-X1-PA□□□ with plastic connector)



Wire	Color	Signal	No.
AWG26 (soldered)	—	—	10
	—	—	11
	—	E24V	12
	—	OV	13
	—	LS	26
	—	CREEP	25
	—	OT	24
	—	RSV	23
	—	—	9
	—	—	18
	—	—	19
	—	A+	1
	—	A-	2
	—	B+	3
	—	B-	4
	—	Z+	5
	—	Z-	6
	Orange	SRD+	7
	Green	SRD-	8
	Purple	BAT+	14
	Gray	BAT-	15
	Red	VCC	16
	Black	GND	17
	Blue	BKR-	20
	Yellow	BKR+	21
	—	—	22

The shield is clamped to the hood

Braided ground & shield wire

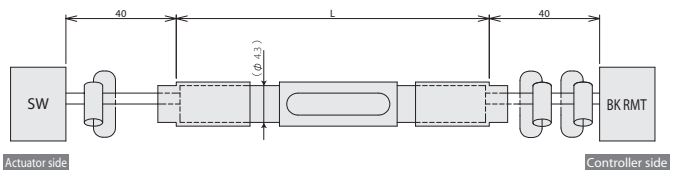
No.	Signal	Color	Wire
1	BAT+	Purple	AWG26 (crimped)
2	BAT-	Gray	
3	SD	Orange	
4	SD	Green	
5	VCC	Red	
6	GND	Black	
7	FG	Ground	
8	BK-	Blue	
9	BK+	Yellow	

Minimum bend radius R: r = 44mm or larger (for movable use)
* Only robot cable is available for this model.

Brake cable (for IXA-□NNN18/□NNN30/□NNN45)

Model: CB-IXA-BK□□□-1

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



Connector	Identification	Signal	Pin No.
SW	Red	BK3	1
	White	COM	2
	–	–	3

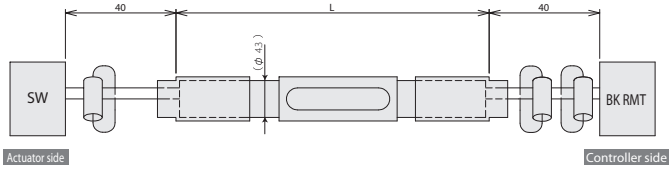
Sheath

Pin No.	Signal	Identification	Connector
A2	BK3	Red	BK RMT
A3	COM	White	
Remaining	–	–	

Brake cable (For IXA-□NNN60)

Model: CB-IXA-BK□□□-2

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



Connector	Identification	Signal	Pin No.
SW	Red	BK4	1
	White	COM	2
	–	–	3

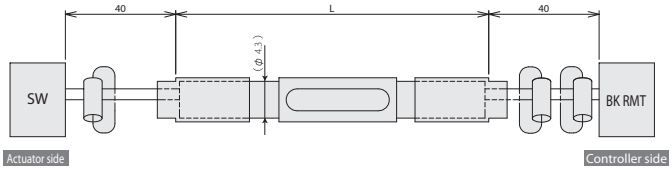
Pin No.	Signal	Identification	Connector
B2	BK4	Red	BK RMT
A3	COM	White	
Remaining	–	–	

Sheath

Brake cable (For IXA-□NSN30/□NSN45/□NSN60)

Model: CB-IXA-BK□□□-3

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



Connector	Identification	Signal	Pin No.
SW	Red	BK5	1
	White	COM	2
	–	–	3

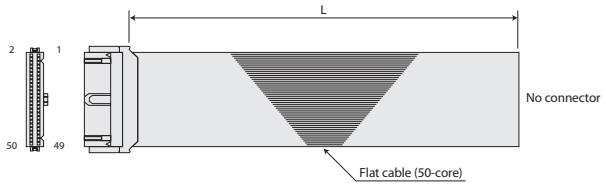
Pin No.	Signal	Identification	Connector
A4	BK5	Red	BK RMT
A3	COM	White	
Remaining	–	–	

Sheath

PIO flat cable

Model: CB-X-PIO□□□

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

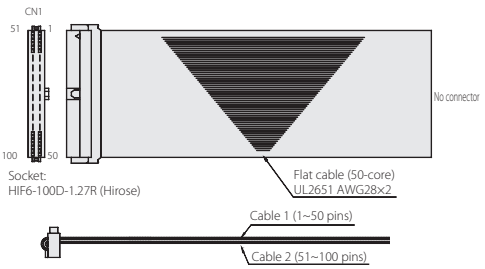


No.	Color	Wiring	No.	Color	Wiring	No.	Color	Wiring
1	Brown1	Flat cable (pressure-welded)	18	Gray2	Flat cable (pressure-welded)	35	Green4	Flat cable (pressure-welded)
2	Red1		19	White2		36	Blue4	
3	Orange1		20	Black2		37	Purple4	
4	Yellow1		21	Brown−3		38	Gray4	
5	Green1		22	Red3		39	White4	
6	Blue1		23	Orange3		40	Black4	
7	Purple1		24	Yellow3		41	Brown−5	
8	Gray1		25	Green3		42	Red5	
9	White1		26	Blue3		43	Orange5	
10	Black1		27	Purple3		44	Yellow5	
11	Brown−2		28	Gray3		45	Green5	
12	Red2		29	White3		46	Blue5	
13	Orange2		30	Black3		47	Purple5	
14	Yellow2		31	Brown−4		48	Gray5	
15	Green2		32	Red4		49	White5	
16	Blue2		33	Orange4		50	Black5	
17	Purple2		34	Yellow4				

Multipoint PIO flat cable

Model: CB-X-PIOH□□□

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



Cable 1										Cable 2									
Category	Pin No.	Color	Port No.	Function	Category	Pin No.	Color	Port No.	Function	Category	Pin No.	Color	Port No.	Function	Category	Pin No.	Color	Port No.	Function
–	1	Brown-1	–	External power supply 24VDC for pin No. 2~25, 51~74	–	26	Blue-3	–	External power supply 24VDC for pin No. 27~50, 76~99		51	Brown-1	300	Alarm output		76	Blue-3	324	General-purpose output
Input	2	Red-1	000	Program start	Input	27	Purple-3	024	General-purpose input	Output	52	Red-1	301	Ready output	Output	77	Purple-3	325	General-purpose output
	3	Orange-1	001	General-purpose input		28	Gray-3	025	General-purpose input		53	Orange-1	302	Emergency stop output		78	Gray-3	326	General-purpose output
	4	Yellow-1	002	General-purpose input		29	White-3	026	General-purpose input		54	Yellow-1	303	General-purpose output		79	White-3	327	General-purpose output
	5	Green-1	003	General-purpose input		30	Black-3	027	General-purpose input		55	Green-1	304	General-purpose output		80	Black-3	328	General-purpose output
	6	Blue-1	004	General-purpose input		31	Brown-4	028	General-purpose input		56	Blue-1	305	General-purpose output		81	Brown-4	329	General-purpose output
	7	Purple-1	005	General-purpose input		32	Red-4	029	General-purpose input		57	Purple-1	306	General-purpose output		82	Red-4	330	General-purpose output
	8	Gray-1	006	General-purpose input		33	Orange-4	030	General-purpose input		58	Gray-1	307	General-purpose output		83	Orange-4	331	General-purpose output
	9	White-1	007	Program designation (PRG No.1)		34	Yellow-4	031	General-purpose input		59	White-1	308	General-purpose output		84	Yellow-4	332	General-purpose output
	10	Black-1	008	Program designation (PRG No.2)		35	Green-4	032	General-purpose input		60	Black-1	309	General-purpose output		85	Green-4	333	General-purpose output
	11	Brown-2	009	Program designation (PRG No.4)		36	Blue-4	033	General-purpose input		61	Brown-2	310	General-purpose output		86	Blue-4	334	General-purpose output
	12	Red-2	010	Program designation (PRG No.8)		37	Purple-4	034	General-purpose input		62	Red-2	311	General-purpose output		87	Purple-4	335	General-purpose output
	13	Orange-2	011	Program designation (PRG No.10)		38	Gray-4	035	General-purpose input		63	Orange-2	312	General-purpose output		88	Gray-4	336	General-purpose output
	14	Yellow-2	012	Program designation (PRG No.20)		39	White-4	036	General-purpose input		64	Yellow-2	313	General-purpose output		89	White-4	337	General-purpose output
	15	Green-2	013	Program designation (PRG No.40)		40	Black-4	037	General-purpose input		65	Green-2	314	General-purpose output		90	Black-4	338	General-purpose output
	16	Blue-2	014	General-purpose input		41	Brown-5	038	General-purpose input		66	Blue-2	315	General-purpose output		91	Brown-5	339	General-purpose output
	17	Purple-2	015	General-purpose input		42	Red-5	039	General-purpose input		67	Purple-2	316	General-purpose output		92	Red-5	340	General-purpose output
	18	Gray-2	016	General-purpose input		43	Orange-5	040	General-purpose input		68	Gray-2	317	General-purpose output		93	Orange-5	341	General-purpose output
	19	White-2	017	General-purpose input		44	Yellow-5	041	General-purpose input		69	White-2	318	General-purpose output		94	Yellow-5	342	General-purpose output
	20	Black-2	018	General-purpose input		45	Green-5	042	General-purpose input		70	Black-2	319	General-purpose output		95	Green-5	343	General-purpose output
	21	Brown-3	019	General-purpose input		46	Blue-5	043	General-purpose input		71	Brown-3	320	General-purpose output		96	Blue-5	344	General-purpose output
	22	Red-3	020	General-purpose input		47	Purple-5	044	General-purpose input		72	Red-3	321	General-purpose output		97	Purple-5	345	General-purpose output
	23	Orange-3	021	General-purpose input		48	Gray-5	045	General-purpose input		73	Orange-3	322	General-purpose output		98	Gray-5	346	General-purpose output
	24	Yellow-3	022	General-purpose input		49	White-5	046	General-purpose input		74	Yellow-3	323	General-purpose output		99	White-5	347	General-purpose output
	25	Green-3	023	General-purpose input		50	Black-5	047	General-purpose input	–	75	Green-3	–	External power supply 0V for pin No. 2~25, 51~74	–	100	Black-5	–	External power supply 0V for pin No. 27~50, 76~99

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