IAI
Quality and Innovation

SCARA Robot for
Dust- & Splash-Proof Specification

IXA-4NSW/4NHW

www.IntelligentActuator.com

Max. Payload **47kg**

Max. Arm length **1,200mm**

SCARA Robot for Dust- & Splash-Proof Specification

IXA

Degree of protection

IP 6 5

Solid particle **Water**

(Summary) **dust-proof**

Dusts are totally shut out and do not ingress the main body. *IEC 60529

(Summary) **Protection against water jet**

Direct water jet from any direction shall have no harmful effects.*JIS C 0920

Standard cycle time

IXA-4NSW80□□

0.30s

Operating condition

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

Horizontal movement

Vertical movement

Bellows construction for upper and bottom parts

(for securing tightness / No air purge needed)

Maximum payload 47kg

Loading/Unloading for parts washing

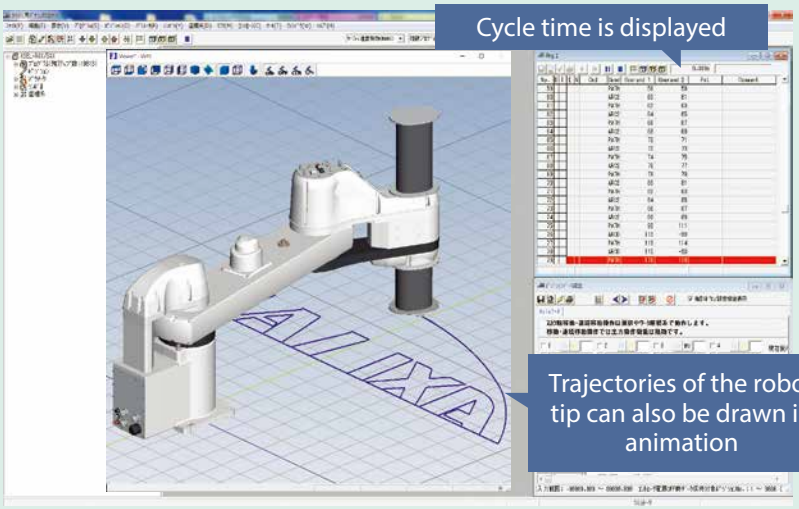
~Transport of workpiece~

Application videos are shown here ▶

Simulation software

You can simulate robot movements using PC-compatible XSEL teaching software without an actual SCARA robot.
In addition, cycle times can be calculated.

Visit IAI website for supported versions of the PC-compatible teaching software.



Model specification item / Product lineup

IXA — [Type] — [Cable length] — T2 — [Option]

Series: IXA
Type:

4NSW3015	4-axis/High-speed type/Dust- & Splash-proof spec./Arm length 300mm / Vertical axis 150mm
4NSW4518	4-axis/High-speed type/Dust- & Splash-proof spec./Arm length 450mm / Vertical axis 180mm
4NSW4533	4-axis/High-speed type/Dust- & Splash-proof spec./Arm length 450mm / Vertical axis 330mm
4NSW6018	4-axis/High-speed type/Dust- & Splash-proof spec./Arm length 600mm / Vertical axis 180mm
4NSW6033	4-axis/High-speed type/Dust- & Splash-proof spec./Arm length 600mm / Vertical axis 330mm
4NSW8020	4-axis/High-speed type/Dust- & Splash-proof spec./Arm length 800mm / Vertical axis 200mm
4NSW8040	4-axis/High-speed type/Dust- & Splash-proof spec./Arm length 800mm / Vertical axis 400mm
4NSW10020	4-axis/High-speed type/Dust- & Splash-proof spec./Arm length 1000mm / Vertical axis 200mm
4NSW10040	4-axis/High-speed type/Dust- & Splash-proof spec./Arm length 1000mm / Vertical axis 400mm
4NHW12040	4-axis/High-payload type/Dust- & Splash-proof spec./Arm length 1000mm / Vertical axis 400mm

Cable length:

N	No cable
5L	5m
10L	10m
□L	Specified length (every 1m), Max. 15m

Applicable controller:

T2	XSEL-RAX/SAX

Option:

COP	Resin cover with nickel plating

Type	Model	Number of axes	Arm length (mm*) 1st arm	Arm length (mm*) 2nd arm	Vertical axis stroke (mm)	Standard cycle time (s)	Continuous cycle time (s)	Max. payload (kg)	Reference page
High-speed type dust- & splash-proof spec	IXA-4NSW3015	4 axes	155	145	150	0.38	0.69	6	▶ P3
	IXA-4NSW4518		200	250	180	0.38	0.55	8	▶ P7
	IXA-4NSW4533				330				
	IXA-4NSW6018		350	250	180	0.38	0.57	10	▶ P13
	IXA-4NSW6033				330				
NEW	IXA-4NSW8020		400	400	200	0.30	0.60	21	▶ P19
NEW	IXA-4NSW8040				400				
NEW	IXA-4NSW10020		600	400	200	0.33	0.60	21	▶ P25
NEW	IXA-4NSW10040				400				
High-payload type dust- & splash-proof spec NEW	IXA-4NHW12040		800	400	400	0.61	0.72	47	▶ P31

IXA-4NSW3015

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

Model Specification Items

IXA	–	4	NSW	30	15	–		–	T2
Series		Number of axes	Type	Arm length	Vertical stroke		Cable length		Applicable controller

Number of axes	
4	4 axes

Type	
NSW	Dust/Splash Proof Specification, high-speed type

Arm length	
30	300mm

Vertical stroke	
15	150mm

Cable length	
N	Nil
5L	5m
10L	10m
□L	Specified length (1m increments)

Applicable controller	
T2	XSEL-RAX/SAX

CE RoHS 10

Horizontal | Vertical | Side | Celling

Option

Name	Model number	Reference page
User cable	CB-IXA-USR□□□-CS	41
Metal cap for user wiring	**IXA-MC-1**	40
Flange	**IX-FL-1**	40

(Note) Please purchase separately.

Cable length

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

(Note) Total amount of the following cables:
Motor cables:4, Encoder cables: 4, Brake cable: 1

POINT Selection Notes

(1) Please refer to P35 for Notes 1 - 8.

(2) The maximum set value for acceleration/deceleration varies depending on the weight of the object being transported, the travel distance, and the location. For continuous operation, either lower the acceleration/deceleration values or refer to the duty (guideline) and set a stop time after acceleration/deceleration.

(3) Do not directly splash jet on the bellows. Connect a Φ16 air tube at the bellows intake/exhaust joint to release its tip into clean air.

(4) A continuous operation cannot be performed for SCARA robots at 100% of speed and acceleration. Refer to the "Acceleration/Deceleration Setting Guidelines" for executable operating conditions.

(5) The cable joint part does not meet the IP rating of the SCARA robot. Place it in a clean and splash-free location.

Main specifications

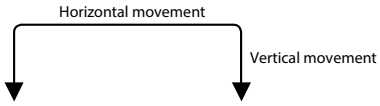
Item			Description 4-axis specification
Max. payload (kg) (Note 1)			6
Speed (Note 2)	Combined max. speed (mm/s)		5126
	Max. speed of individual axes	1st arm (deg/s)	690
		2nd arm (deg/s)	690
		Vertical axis (mm/s)	1500
		Rotational axis (deg/s)	1600
Push force (N) (Note 3)		Upper limit	98
		Lower limit	23
Arm length (mm)			300
Individual arm length (mm)		1st arm	155
		2nd arm	145
Operation range of individual axes		1st arm (deg)	±121
		2nd arm (deg)	±125
		Vertical axis (mm)	150
		Rotational axis (deg)	±360

Item		Description 4-axis specification
Positioning repeatability (Note 4)	Within horizontal surface	±0.01mm
	Vertical axis	±0.01mm
	Rotational axis	±0.005 degrees
User wiring		10-core (9-core + shield) AWG24 (rated 30V/Max. 1A)
User piping		Outer diameter Φ4, inner diameter Φ2.5, air tube 3 pcs. (max. usable pressure 0.6MPa)
Brake release switch (Note 5)		Brake release switch for preventing vertical axis from dropping.
Tip axis	Allowable torque	4.5 N·m
	Allowable load moment	7.1 N·m
Material of main parts		Refer to P37
Ambient operational temperature and humidity		0-40℃, 20-85% RH or lower (non-condensing)
Degree of protection		IP65 (except for bellows)
Air purge pressure (Note 6)		35kPa
Vibration- and impact-resistance		No impact or vibration should be applied.
Noise (Note 7)		80 dB or lower
International standard		CE marking, RoHS
Motor type		AC servo motor
Motor wattage	1st arm	600
	2nd arm	400
	Vertical axis	200
	Rotational axis	100
Encoder type		Battery-less absolute
Encoder pulse		16384 pulse/rev

Cycle time

Item	Time
Standard cycle time	0.38 seconds
Continuous cycle time	0.69 seconds

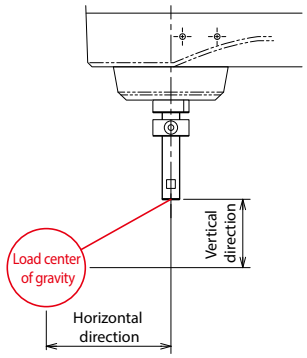
The standard/continuous cycle time represents the time required when an operation is performed with a cycle operation setting at maximum speed, under the following conditions.
2kg transport, vertical movement 25mm, horizontal movement 300mm (rough positioning arch motion)
[Standard cycle time]
The time required for maximum speed. This is a general guideline for high speed performance. Note that continuous operation is not possible under maximum speed operation.
[Continuous cycle time]
The cycle time for continuous operation.



Tip shaft allowable load inertia moment

Number of axes	Tip shaft allowable load inertia moment
4-axis specification	0.12 kg・m^2

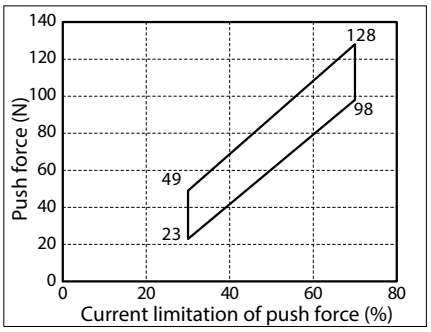
This represents allowable moment of inertia that is converted to the center of the SCARA robot spline Tip shaft (rotational axis).
Make sure that the offset dimension from the spline tip to the tool center of gravity is within the guideline values listed below.
When the tool center of gravity is offset from the spline tip center, speed and acceleration should be reduced to an appropriate level. The overhang distance is limited depending on the payload and operating condition.



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

Correlation between Push Force and Current Limitation (guideline)

Push force at the vertical axis tip (Note 3)



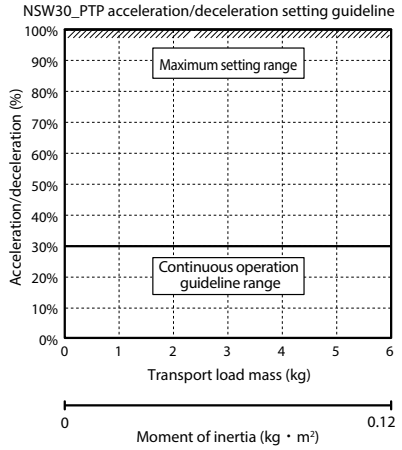
Acceleration/Deceleration Setting Guidelines

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

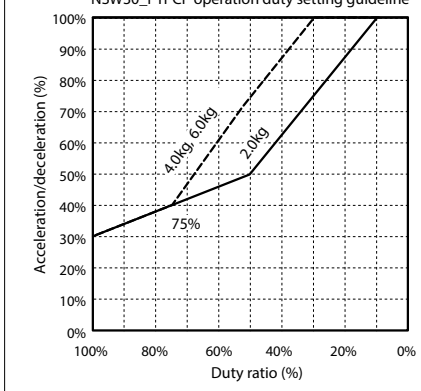
1) For a PTP operation, always use the WGHT command in the program to set the weight and moment of inertia. For the SCARA robot, the maximum acceleration/deceleration for each payload is set at 100%. When the payload differs, the operation time will also vary even at the same acceleration/deceleration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

■PTP Operation

NSW30_PTP acceleration/deceleration setting guideline



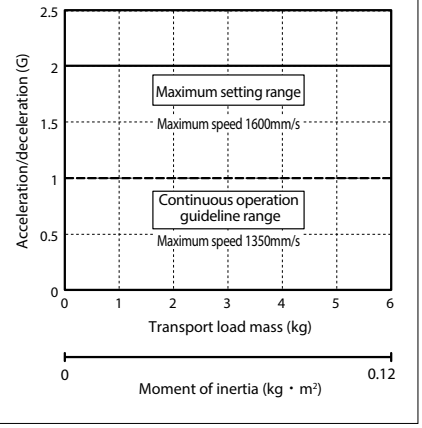
NSW30_PTPCP operation duty setting guideline



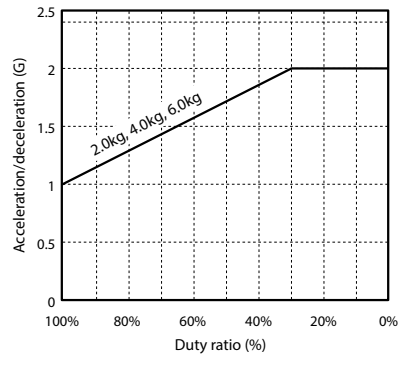
■CP Operation

Horizontal

NSW30_CP acceleration/deceleration setting guideline
Horizontal movement operation without vertical axis (Z-axis)

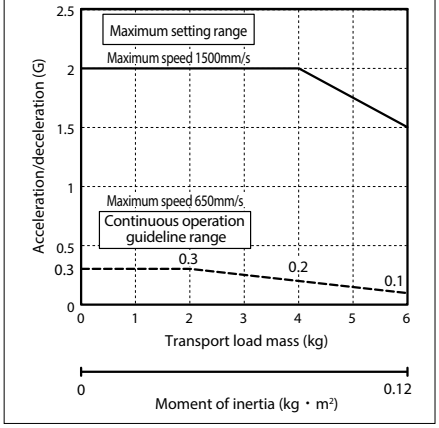


NSW30_CP operation duty setting guideline
Horizontal movement operation without vertical axis (Z-axis)

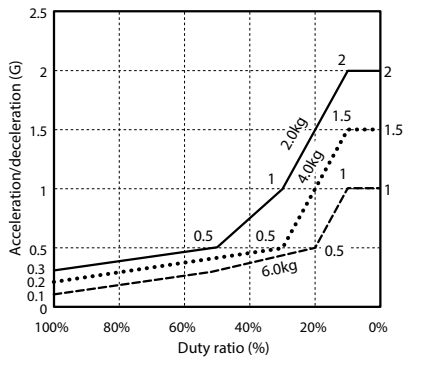


Vertical

NSW30_CP acceleration/deceleration setting guideline
Operation on vertical axis (Z-axis) only

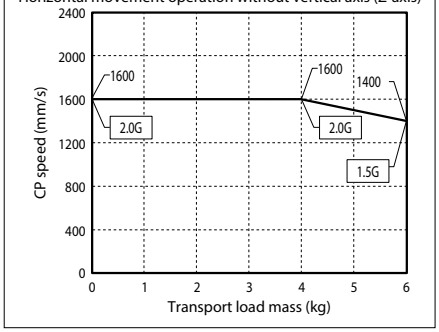


NSW30_CP operation duty setting guideline
Operation on vertical axis (Z-axis) only

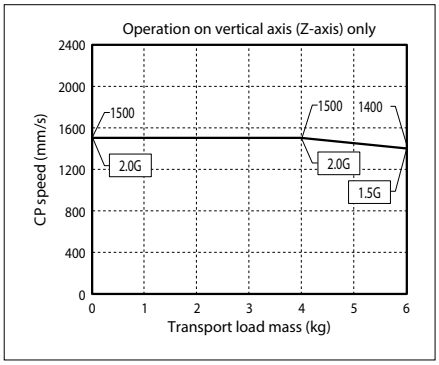


■CP operation: Acceleration/deceleration Limitations

Horizontal movement operation without vertical axis (Z-axis)



Operation on vertical axis (Z-axis) only



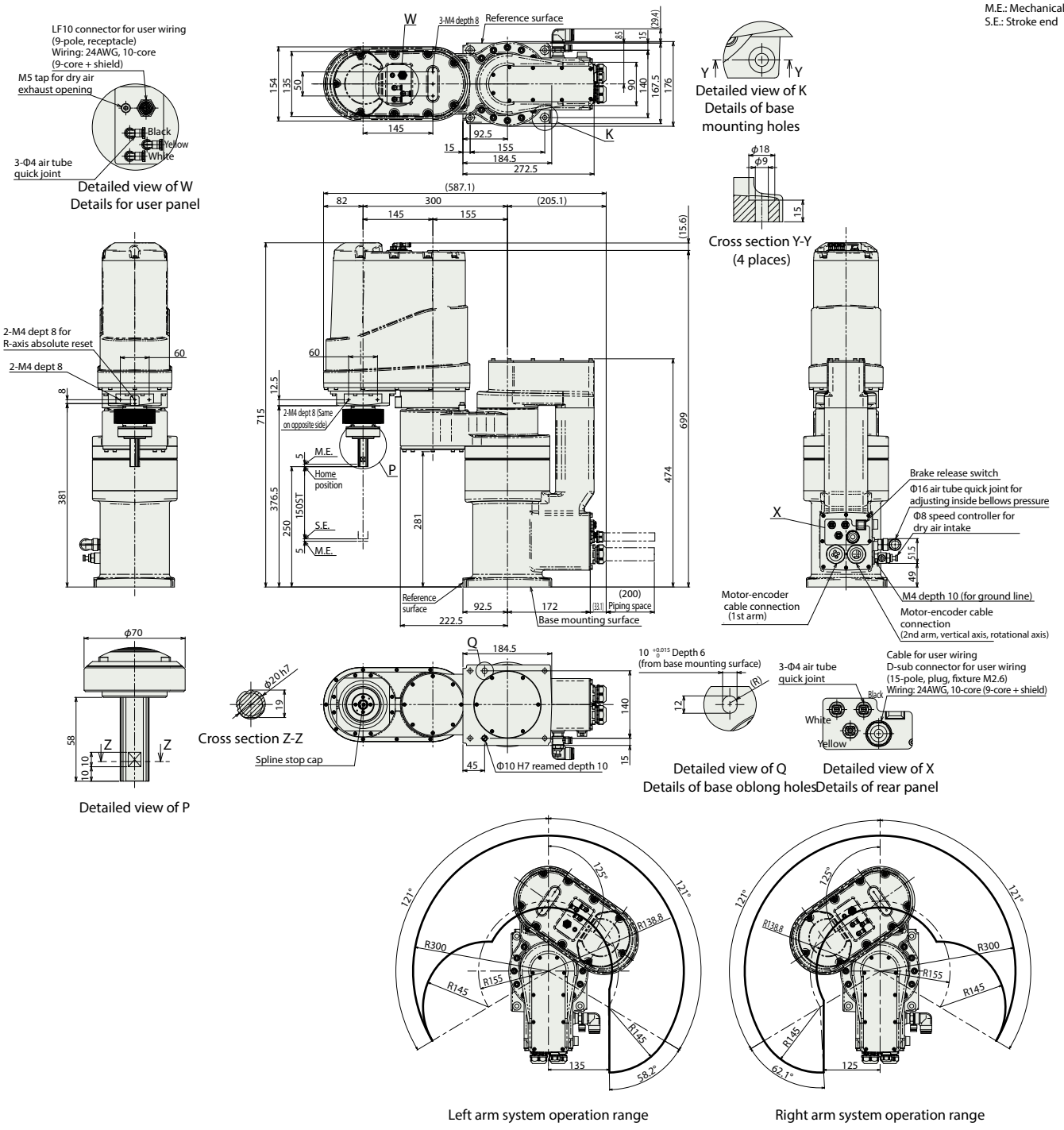
Dimensions

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

■IXA-4NSW3015

(Note) Refer to P36 (Note 8) for cable connections

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



■Mass

Item		Description
Mass	4-axis specification	48.0kg

Applicable controller

Please check the latest IXA catalog or the Controller Catalog.

(Note) Refer to the Controller section fo the lastest general catalog for network abbreviations such as DV and CC.

IXA-4NSW4518
IXA-4NSW4533

Dust/Splash-proof | Battery-less Absolute | Arm Length: 450 mm

Model Specification Items

IXA – 4 NSW 45 [ ] – [ ] – T2

Series	Number of axes		Type		Arm length		Vertical stroke	
IXA	4	4 axes	NSW	Dust/Splash Proof Specification, high-speed type	45	450mm	18	180mm
							33	330mm

Cable length	
N	Nil
5L	5m
10L	10m
□L	Specified length (1m increments)

Applicable controller	
T2	XSEL-RAX/SAX

CE RoHS 10

Horizontal | Vertical | Side | Celling

Option

Name	Model number	Reference page
User cable	CB-IXA-USR□□□-CS	41
Metal cap for user wiring	**IXA-MC-1**	40
Flange	**IX-FL-1**	40

(Note) Please purchase separately.

Cable length

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

(Note) Total amount of the following cables:
Motor cables:4, Encoder cables: 4, Brake cable: 1

POINT Selection Notes

(1) Please refer to P35 for Notes 1 - 8.

(2) The maximum set value for acceleration/deceleration varies depending on the weight of the object being transported, the travel distance, and the location. For continuous operation, either lower the acceleration/deceleration values or refer to the duty (guideline) and set a stop time after acceleration/deceleration.

(3) Do not directly splash jet on the bellows. Connect a Φ16 air tube at the bellows intake/exhaust joint to release its tip into clean air.

(4) A continuous operation cannot be performed for SCARA robots at 100% of speed and acceleration. Refer to the "Acceleration/Deceleration Setting Guidelines" for executable operating conditions.

(5) The cable joint part does not meet the IP rating of the SCARA robot. Place it in a clean and splash-free location.

Main specifications

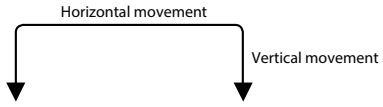
Item			Description
			4-axis specification
Max. payload (kg) (Note 1)			8
Speed (Note 2)	Combined max. speed (mm/s)		6981
	Max. speed of individual axes	1st arm (deg/s)	500
		2nd arm (deg/s)	700
		Vertical axis (mm/s)	1600
		Rotational axis (deg/s)	2000
Push force (N) (Note 3)		Upper limit	110
		Lower limit	25
Arm length (mm)			450
Individual arm length (mm)		1st arm	200
		2nd arm	250
Operation range of individual axes		1st arm (deg)	±137
		2nd arm (deg)	±133
		Vertical axis (mm)	180/330
		Rotational axis (deg)	±360

Item		Description
		4-axis specification
Positioning repeatability (Note 4)	Within horizontal surface	±0.01mm
	Vertical axis	±0.01mm
	Rotational axis	±0.005 degrees
User wiring		10-core (9-core + shield) AWG24 (rated 30V/Max. 1A)
User piping		Outer diameter Φ6, inner diameter Φ4, air tube 3 pcs. (max. usable pressure 0.6MPa)
Brake release switch (Note 5)		Brake release switch for preventing vertical axis from dropping.
Tip axis	Allowable torque	3.2 N・m
	Allowable load moment	9.6 N・m
Material of main parts		Refer to P38
Ambient operational temperature and humidity		0-40℃, 20-85% RH or lower (non-condensing)
Degree of protection		IP65 (except for bellows)
Air purge pressure (Note 6)		35kPa
Vibration- and impact-resistance		No impact or vibration should be applied.
Noise (Note 7)		80 dB or lower
International standard		CE marking, RoHS
Motor type		AC servo motor
Motor wattage	1st arm	600W
	2nd arm	400W
	Vertical axis	200W
	Rotational axis	100W
Encoder type		Battery-less absolute
Encoder pulse		16384 pulse/rev

Cycle time

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

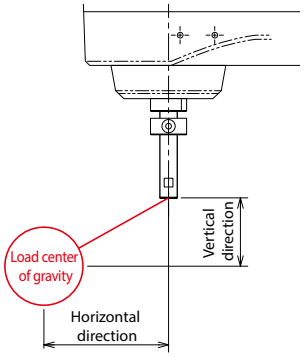
The standard/continuous cycle time represents the time required when an operation is performed with a cycle operation setting at maximum speed, under the following conditions.
2kg transport, vertical movement 25mm, horizontal movement 300mm (rough positioning arch motion)
[Standard cycle time]
The time required for maximum speed. This is a general guideline for high speed performance. Note that continuous operation is not possible under maximum speed operation.
[Continuous cycle time]
The cycle time for continuous operation.



Tip shaft allowable load inertia moment

Number of axes	Tip shaft allowable load inertia moment
4-axis specification	0.12 kg・m^2

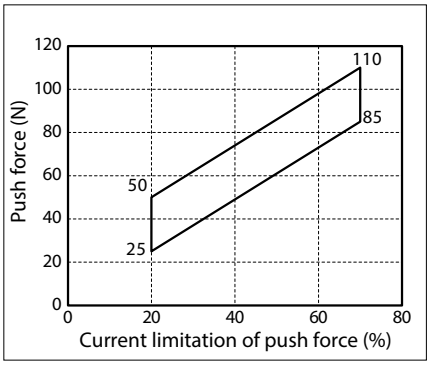
This represents allowable moment of inertia that is converted to the center of the SCARA robot spline Tip shaft (rotational axis).
Make sure that the offset dimension from the spline tip to the tool center of gravity is within the guideline values listed below.
When the tool center of gravity is offset from the spline tip center, speed and acceleration should be reduced to an appropriate level. The overhang distance is limited depending on the payload and operating condition.



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

Correlation between Push Force and Current Limitation (guideline)

Push force at the vertical axis tip (Note 3)



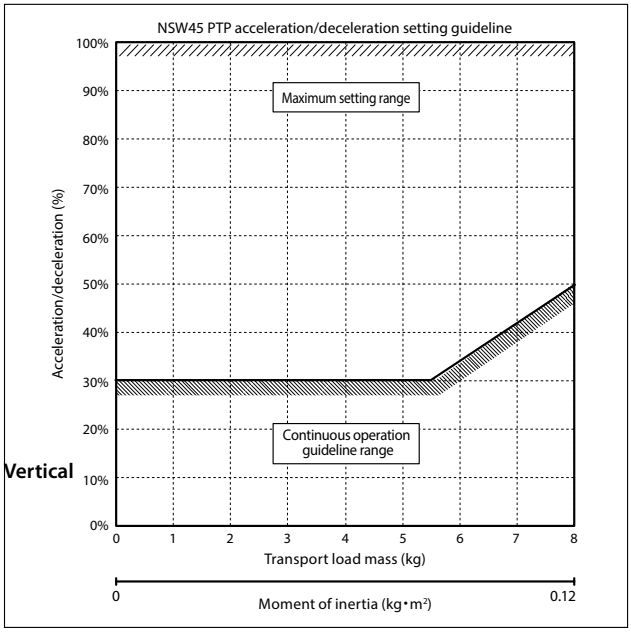
Acceleration/Deceleration Setting Guidelines

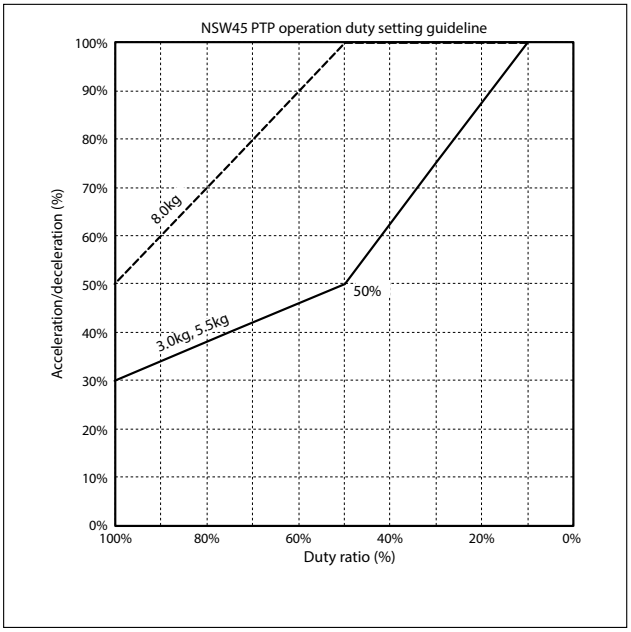
The SCARA Robot IXA cannot operate continuously at the maximum acceleration/deceleration or maximum speed specified in the catalog. To operate at the maximum acceleration/deceleration, set a stop time referring to the duty ratio setting guideline graph. If a continuous operation is required, do so within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

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

■ PTP Operation

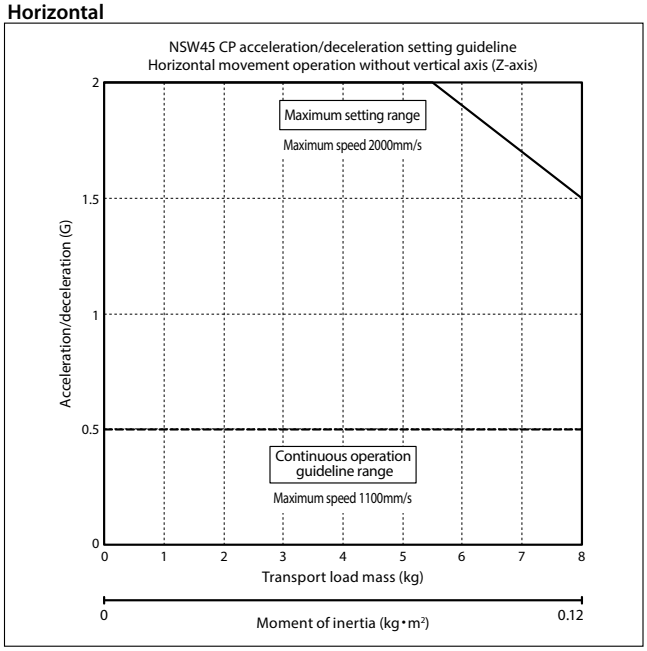
Vertical



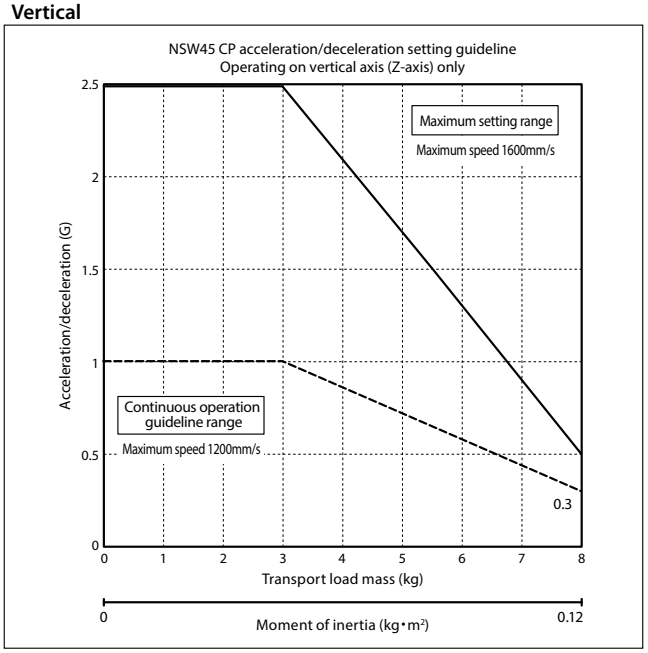


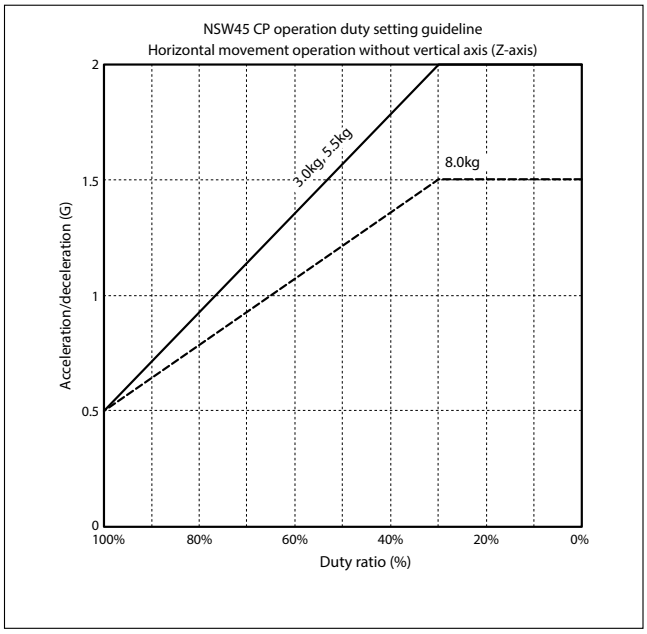
■CP Operation

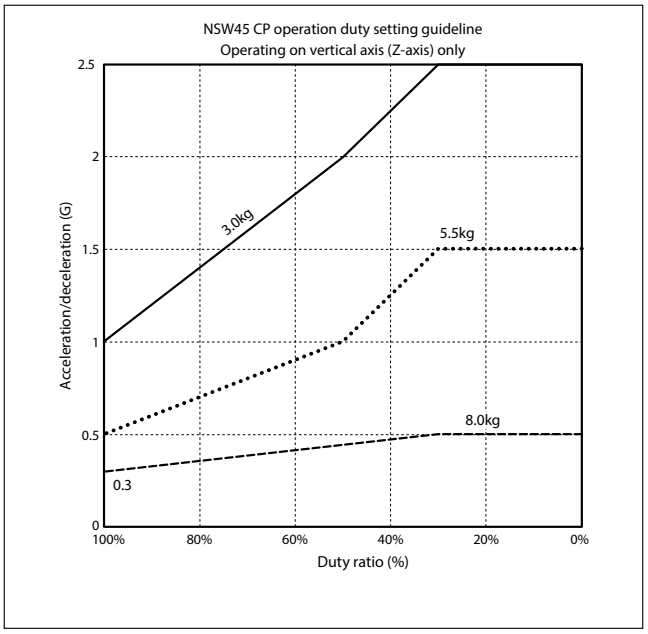
Horizontal



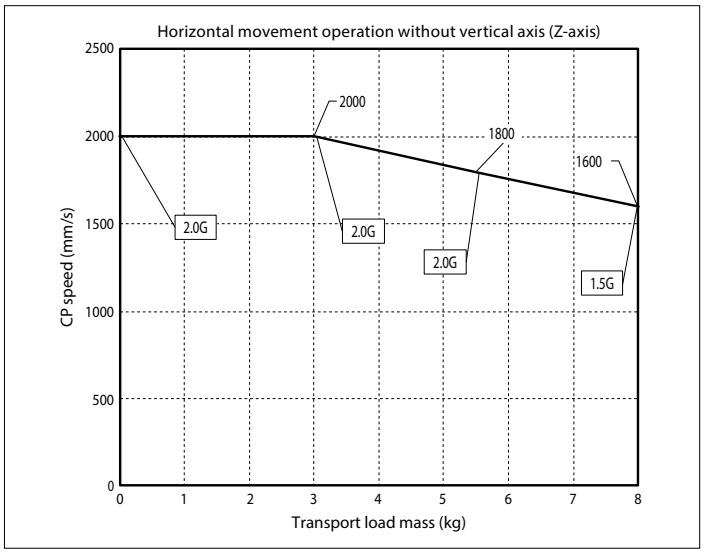
Vertical

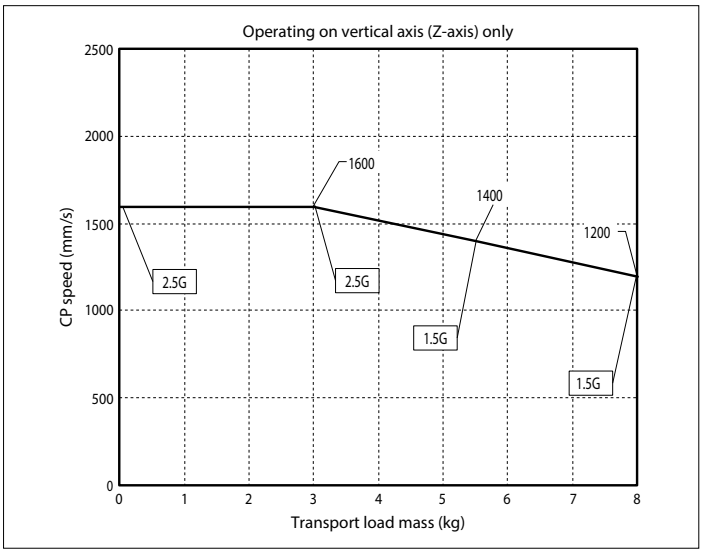






■CP operation: Acceleration/deceleration Limitations





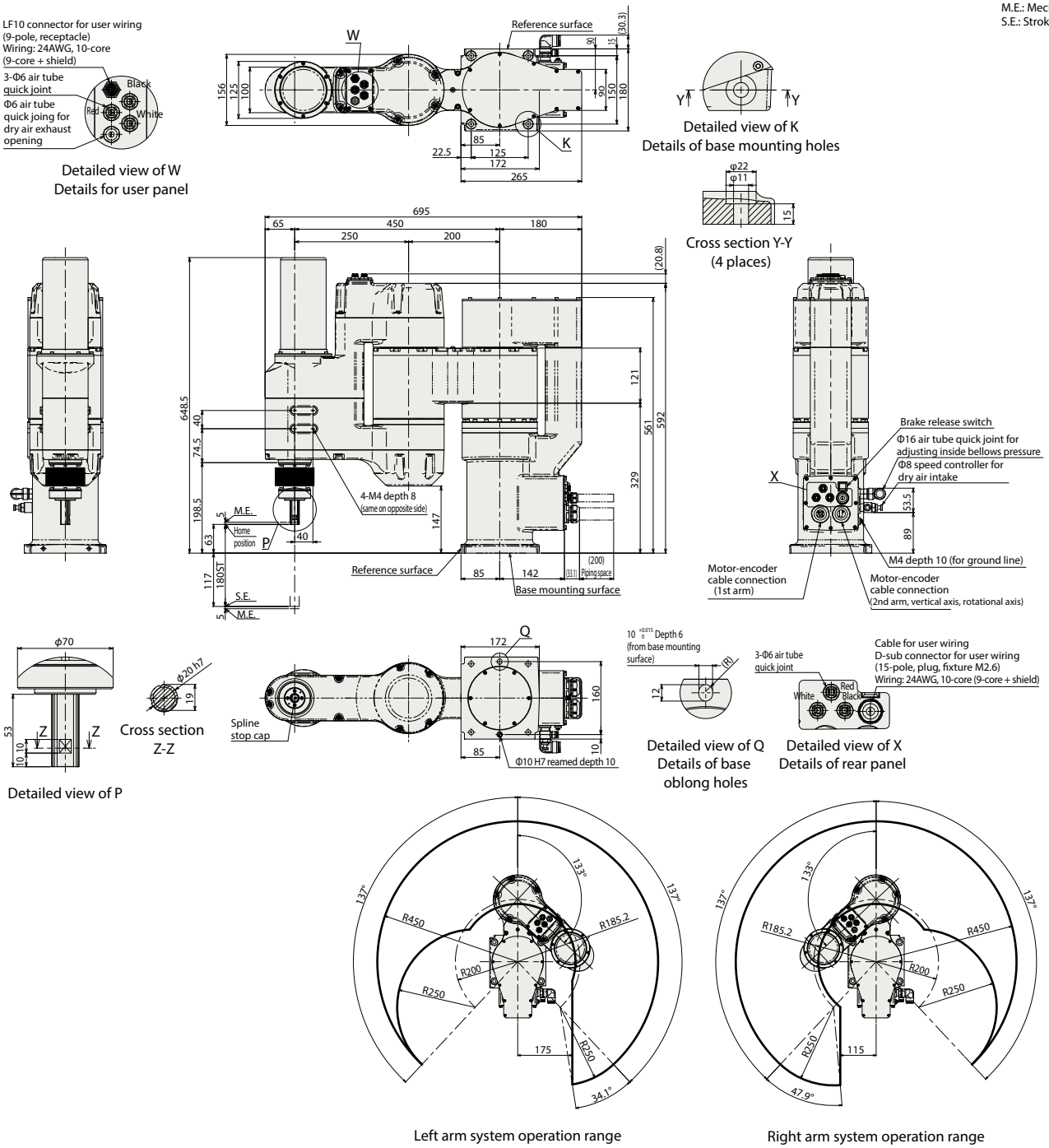
Dimensions

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

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

■IXA-4NSW4518

(Note) Refer to P36 (Note 8) for cable connections



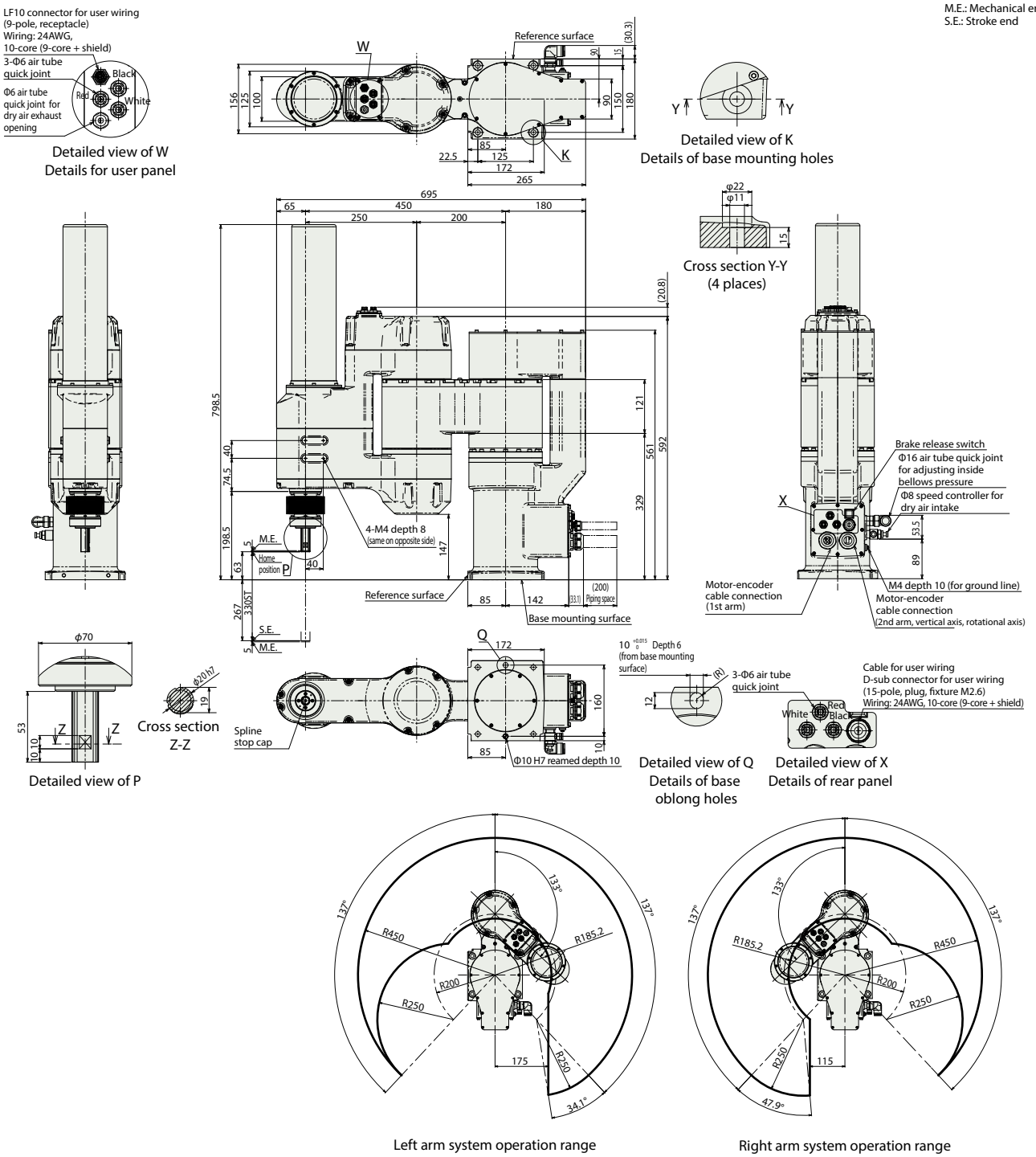
■Mass

Item		Description
Mass	4-axis specification	52.0kg

■IXA-4NSW4533

(Note) Refer to P36 (Note 8) for cable connections

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



■Mass

Item		Description
Mass	4-axis specification	53.0kg

Applicable controller

Please check the latest IXA catalog or the Controller Catalog.

(Note) Refer to the Controller section fo the lastest general catalog for network abbreviations such as DV and CC.

IXA-4NSW6018
IXA-4NSW6033

Dust/ Splash-proof | Battery-less Absolute | Arm Length: 600 mm

Model Specification Items

IXA	–	4	NSW	60		–		–	T2
Series		Number of axes	Type	Arm length	Vertical stroke		Cable length		Applicable controller

Number of axes	
4	4 axes

Type	
NSW	Dust/Splash Proof Specification, high-speed type

Arm length	
60	600mm

Vertical stroke	
18	180mm
33	330mm

Cable length	
N	Nil
5L	5m
10L	10m
□L	Specified length (1m increments)

Applicable controller	
T2	XSEL-RAX/SAX

Horizontal | Vertical | Side | Celling

Option

Name	Model number	Reference page
User cable	CB-IXA-USR□□□-CS	41
Metal cap for user wiring	**IXA-MC-1**	40
Flange	**IX-FL-1**	40

(Note) Please purchase separately.

Cable length

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

(Note) Total amount of the following cables:
Motor cables:4, Encoder cables: 4, Brake cable: 1

POINT Selection Notes

(1) Please refer to P35 for Notes 1 - 8.

(2) The maximum set value for acceleration/deceleration varies depending on the weight of the object being transported, the travel distance, and the location. For continuous operation, either lower the acceleration/deceleration values or refer to the duty (guideline) and set a stop time after acceleration/deceleration.

(3) Do not directly splash jet on the bellows. Connect a Φ16 air tube at the bellows intake/exhaust joint to release its tip into clean air.

(4) A continuous operation cannot be performed for SCARA robots at 100% of speed and acceleration. Refer to the "Acceleration/Deceleration Setting Guidelines" for executable operating conditions.

(5) The cable joint part does not meet the IP rating of the SCARA robot. Place it in a clean and splash-free location.

Main specifications

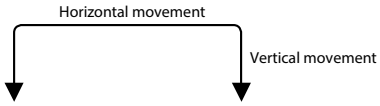
Item			Description
			4-axis specification
Max. payload (kg) (Note 1)			10
Speed (Note 2)	Combined max. speed (mm/s)		6039
	Max. speed of individual axes	1st arm (deg/s)	285
		2nd arm (deg/s)	700
		Vertical axis (mm/s)	1600
		Rotational axis (deg/s)	2000
Push force (N) (Note 3)		Upper limit	110
		Lower limit	25
Arm length (mm)			600
Individual arm length (mm)		1st arm	350
		2nd arm	250
Operation range of individual axes		1st arm (deg)	±137
		2nd arm (deg)	±133
		Vertical axis (mm)	180/330
		Rotational axis (deg)	±360

Item		Description
		4-axis specification
Positioning repeatability (Note 4)	Within horizontal surface	±0.01mm
	Vertical axis	±0.01mm
	Rotational axis	±0.005 degrees
User wiring		10-core (9-core + shield) AWG24 (rated 30V/Max. 1A)
User piping		Outer diameter Φ6, inner diameter Φ4, air tube 3 pcs. (max. usable pressure 0.6MPa)
Brake release switch (Note 5)		Brake release switch for preventing vertical axis from dropping.
Tip axis	Allowable torque	3.2 N·m
	Allowable load moment	9.6 N·m
Material of main parts		Refer to P38
Ambient operational temperature and humidity		0-40℃, 20-85% RH or lower (non-condensing)
Degree of protection		IP65 (except for bellows)
Air purge pressure (Note 6)		35kPa
Vibration- and impact-resistance		No impact or vibration should be applied.
Noise (Note 7)		80 dB or lower
International standard		CE marking, RoHS
Motor type		AC servo motor
Motor wattage	1st arm	750W
	2nd arm	400W
	Vertical axis	200W
	Rotational axis	100W
Encoder type		Battery-less absolute
Encoder pulse		16384 pulse/rev

Cycle time

Item	Time
Standard cycle time	0.38 seconds
Continuous cycle time	0.57 seconds

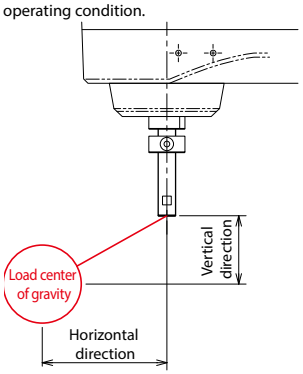
The standard/continuous cycle time represents the time required when an operation is performed with a cycle operation setting at maximum speed, under the following conditions.
2kg transport, vertical movement 25mm, horizontal movement 300mm (rough positioning arch motion)
[Standard cycle time]
The time required for maximum speed. This is a general guideline for high speed performance. Note that continuous operation is not possible under maximum speed operation.
[Continuous cycle time]
The cycle time for continuous operation.



Tip shaft allowable load inertia moment

Number of axes	Tip shaft allowable load inertia moment
4-axis specification	0.12 kg・m^2

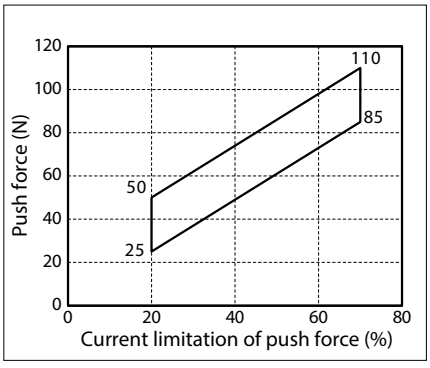
This represents allowable moment of inertia that is converted to the center of the SCARA robot spline Tip shaft (rotational axis).
Make sure that the offset dimension from the spline tip to the tool center of gravity is within the guideline values listed below.
When the tool center of gravity is offset from the spline tip center, speed and acceleration should be reduced to an appropriate level. The overhang distance is limited depending on the payload and operating condition.



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

Correlation between Push Force and Current Limitation (guideline)

Push force at the vertical axis tip (Note 3)

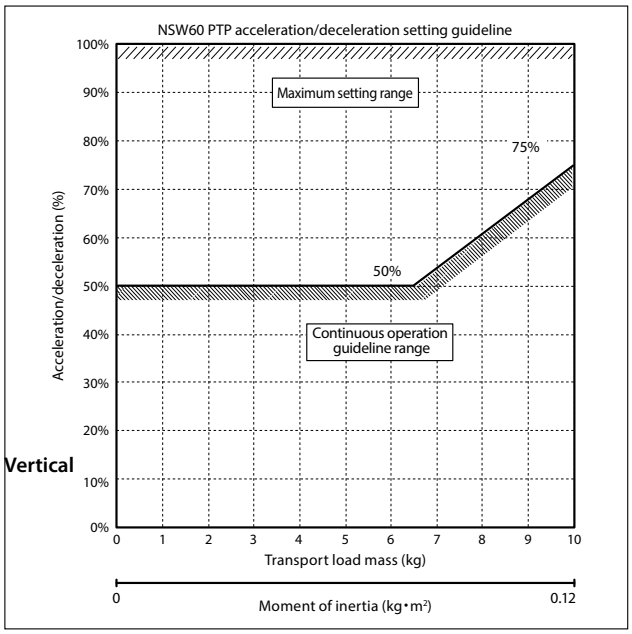


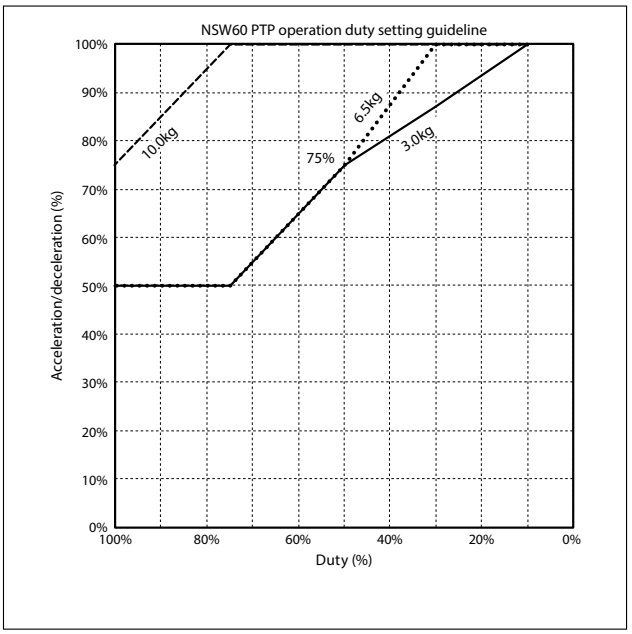
Acceleration/Deceleration Setting Guidelines

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

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

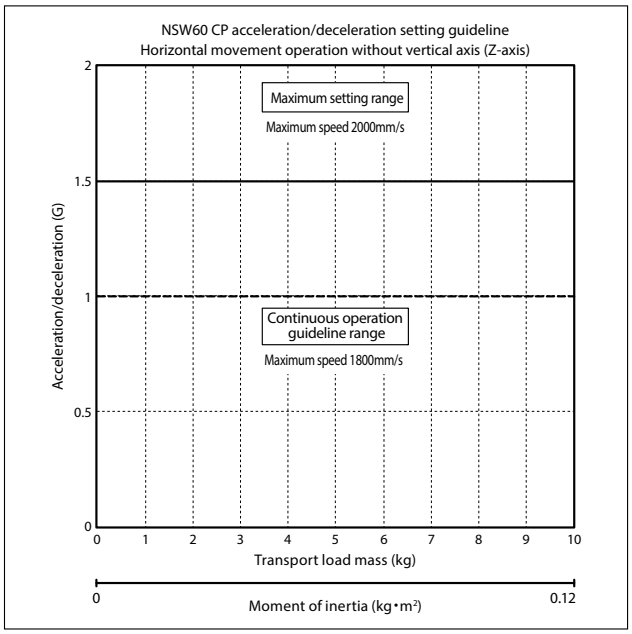
■ PTP Operation



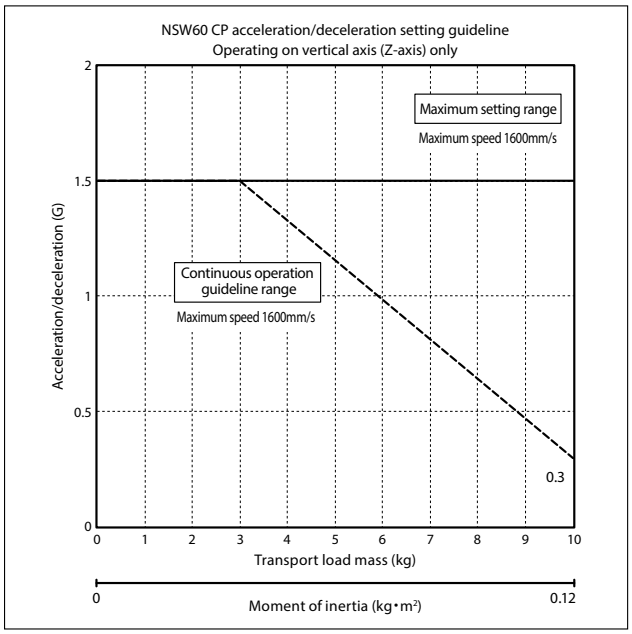


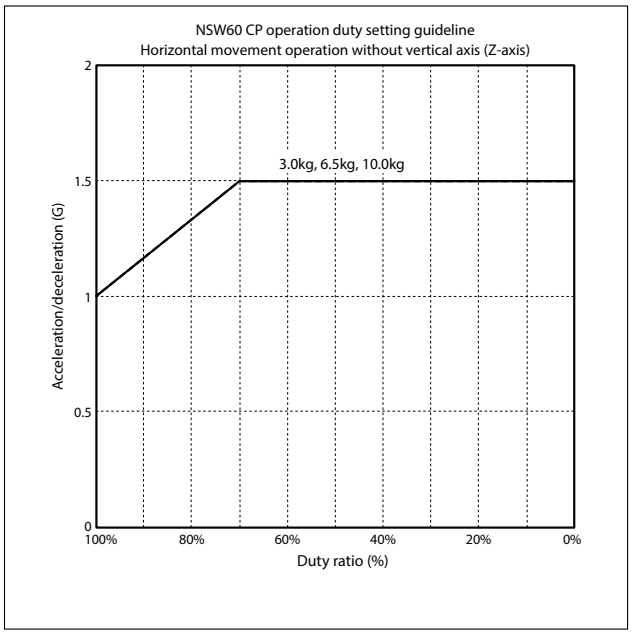
■CP Operation

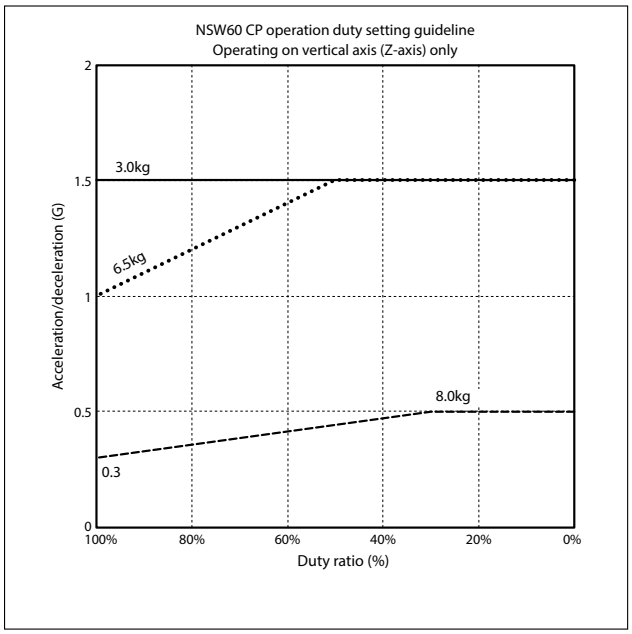
Horizontal



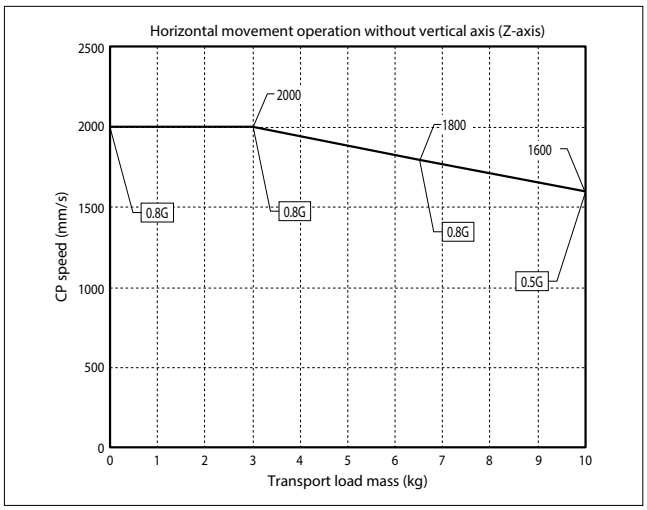
Vertical

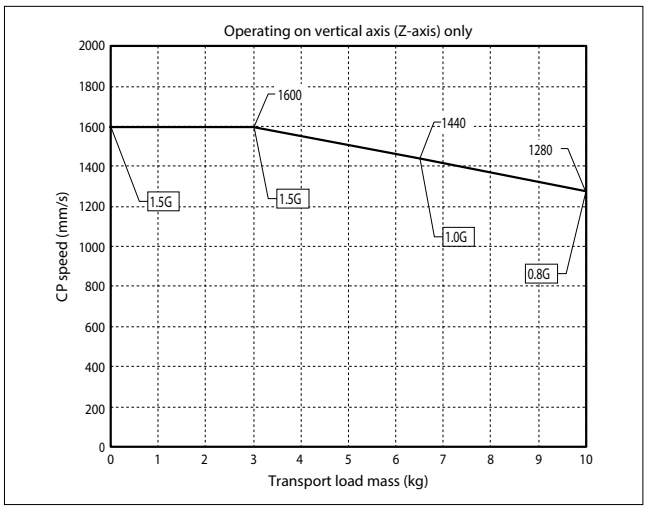






■CP operation: Acceleration/deceleration Limitations





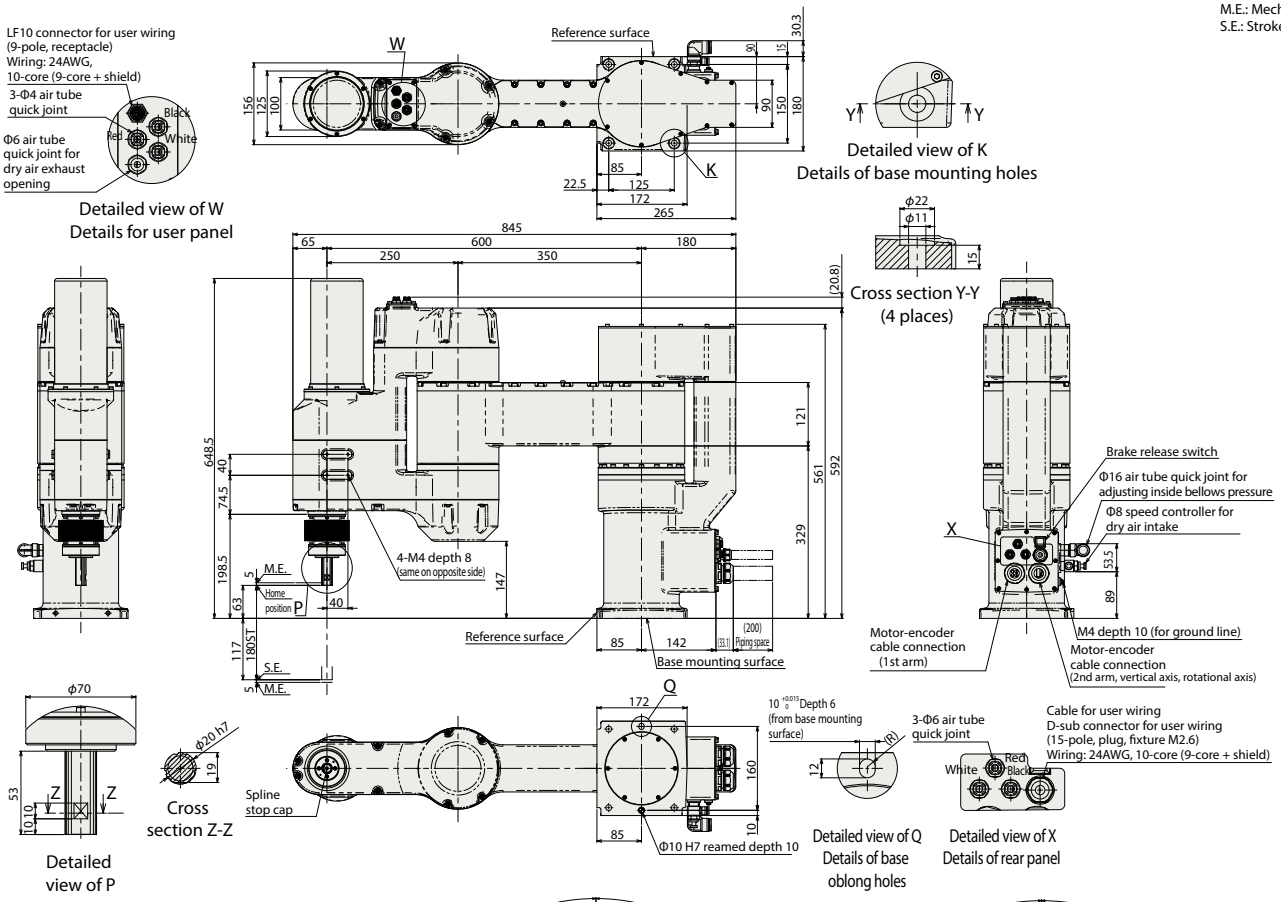
Dimensions

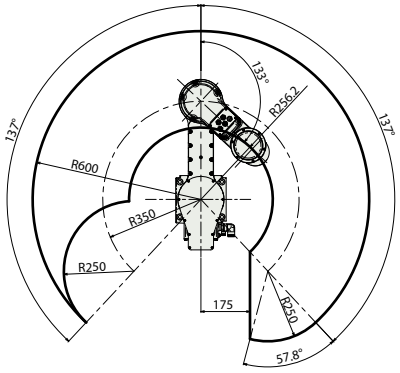
CAD drawings can be downloaded from our website.
www.intelligentactuator.com

■IXA-4NSW6018

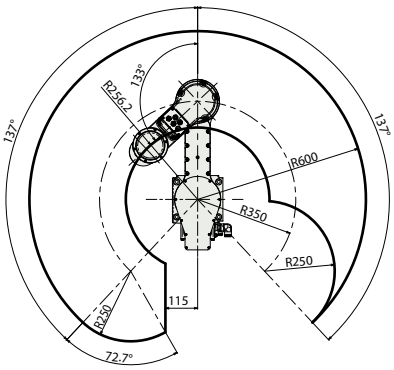
(Note) Refer to P36 (Note 8) for cable connections

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





Left arm system operation range



Right arm system operation range

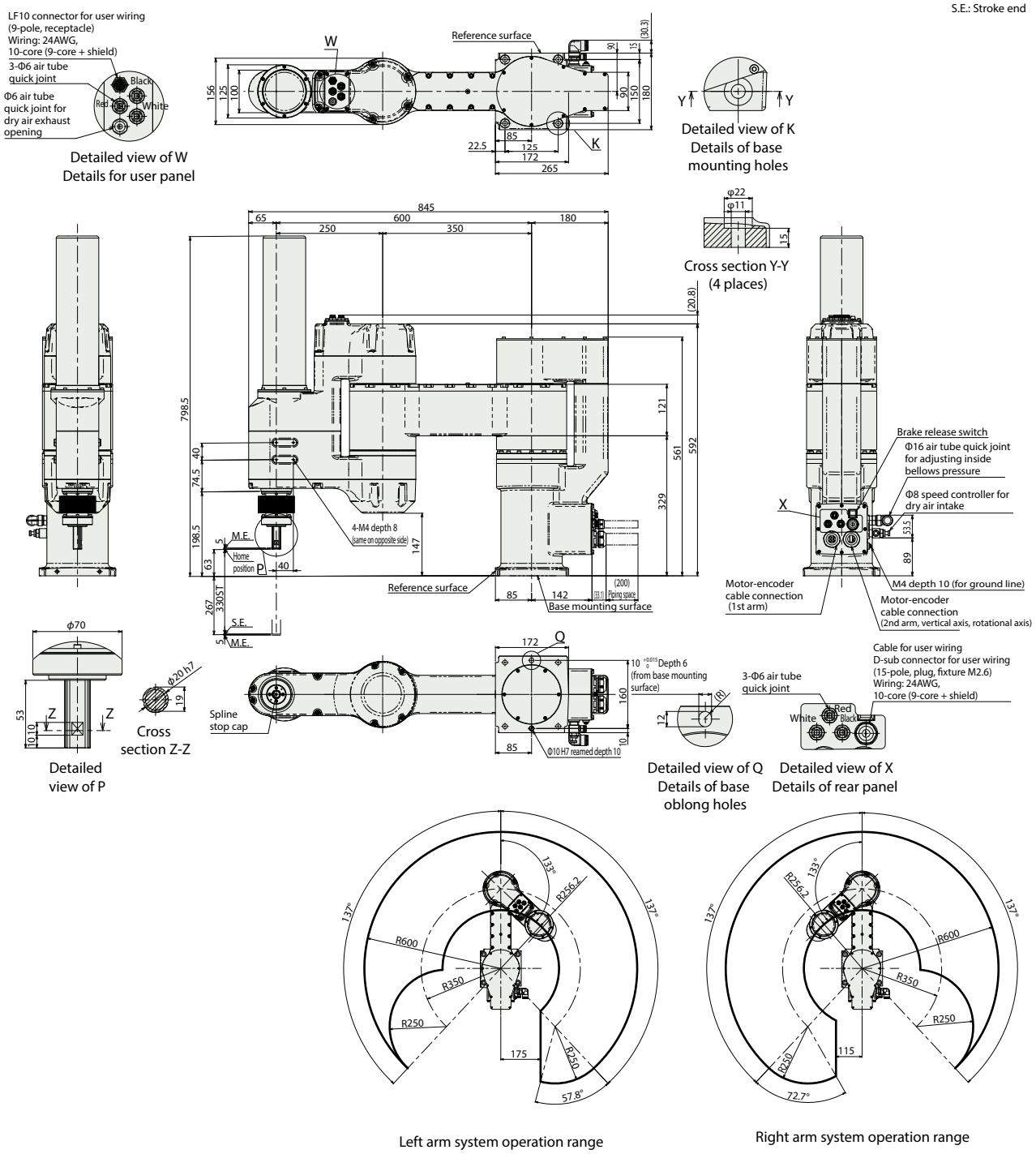
■Mass

Item		Description
Mass	4-axis specification	53.0kg

■IXA-4NSW6033

(Note) Refer to P36 (Note 8) for cable connections

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



■Mass

Item		Description
Mass	4-axis specification	54.0kg

Applicable controller

Please check the latest IXA catalog or the Controller Catalog.

(Note) Refer to the Controller section fo the lastest general catalog for network abbreviations such as DV and CC.

IXA-4NSW8020
IXA-4NSW8040

Dust/Splash-proof | Battery-less Absolute | Arm Length: 800 mm

■Model Specification Items

IXA	–	4	NSW	80		–		–	T2	–	
Series		Number of axes	Type	Arm length	Vertical stroke		Cable length		Applicable controller		Option

Number of axes	
4	4 axes

Type	
NSW	Dust/Splash Proof Specification, high-speed type

Arm length	
80	800mm

Vertical stroke	
20	200mm
40	400mm

Cable length	
N	Nil
5L	5m
10L	10m
□L	Specified length (1m increments)

Applicable controller	
T2	XSEL-SAX

Option
See below

CE RoHS 10

Horizontal | Vertical | Side | Ceiling

■Option

Name	Model number	Reference page
Resin cover with nickel plating	**COP**	40

■Other options

Name		Model number	Reference page
User cable		CB-IXA-USR□□□-CS	41
Flange		**IX-FL-1**	40
Metal cap for user wiring		**IXA-MC-1**	40
External wiring protecting flange		**IXA-PFL-EW-1**	41
Z-axis wiring side stay	Z-axis 200st	**IXAW-SST-ZW-1**	41
	Z-axis 400st	**IXAW-SST-ZW-2**	41
Z-axis wiring upper stay	Z-axis 200st	**IXA-TST-ZW-1**	41
	Z-axis 400st	**IXA-TST-ZW-2**	41

(Note) Please purchase separately.

■Cable length

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

(Note) Total amount of the following cables:
Motor cables:4, Encoder cables: 4, Brake cable: 1

POINT Selection Notes

(1) Please refer to P35 for Notes 1 - 8.

(2) The maximum set value for acceleration/deceleration varies depending on the weight of the object being transported, the travel distance, and the location. For continuous operation, either lower the acceleration/deceleration values or refer to the duty (guideline) and set a stop time after acceleration/deceleration.

(3) Do not directly splash jet on the bellows.

(4) A continuous operation cannot be performed for SCARA robots at 100% of speed and acceleration. Refer to the "Acceleration/Deceleration Setting Guidelines" for executable operating conditions.

(5) The cable joint part does not meet the IP rating of the SCARA robot. Place it in a clean and splash-free location.

Main specifications

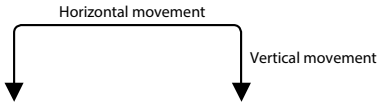
Item			Description
			4-axis specification
Max. payload (kg) (Note 1)			21
Speed (Note 2)	Combined max. speed (mm/s)		5724
	Max. speed of individual axes	1st arm (deg/s)	220
		2nd arm (deg/s)	380
		Vertical axis (mm/s)	2000/2800
		Rotational axis (deg/s)	1300
Push force (N) (Note 3)		Upper limit	350
		Lower limit	40
Arm length (mm)			800
Individual arm length (mm)		1st arm	400
		2nd arm	400
Operation range of individual axes		1st arm (deg)	±137
		2nd arm (deg)	±142
		Vertical axis (mm)	200/400
		Rotational axis (deg)	±360

Item		Description
		4-axis specification
Positioning repeatability (Note 4)	Within horizontal surface	±0.02mm
	Vertical axis	±0.01mm
	Rotational axis	±0.005 degrees
User wiring		10-core (9-core + shield) AWG24 (rated 30V/Max. 1A)
User piping		Outer diameter Φ6, inner diameter Φ4, air tube 3 pcs. (max. usable pressure 0.6MPa)
Brake release switch (Note 5)		Brake release switch for preventing vertical axis from dropping.
Tip axis	Allowable torque	11.3 N・m
	Allowable load moment	42 N・m
Material of main parts		Refer to P39
Ambient operational temperature and humidity		0-40℃, 20-85% RH or lower (non-condensing)
Degree of protection		IP65 (except for bellows)
Vibration- and impact-resistance		No impact or vibration should be applied.
Noise (Note 7)		85 dB or lower
International standard		CE marking, RoHS
Motor type		AC servo motor
Motor wattage	1st arm	1000W
	2nd arm	750W
	Vertical axis	600W
	Rotational axis	200W
Encoder type		Battery-less absolute
Encoder pulse		131072 pulse/rev

Cycle time

Item	Time
Standard cycle time	0.30 seconds
Continuous cycle time	0.60 seconds

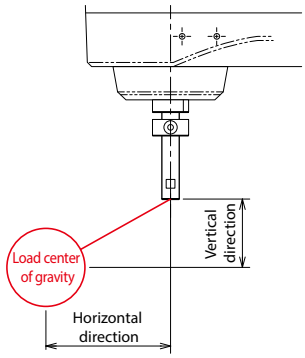
The standard/continuous cycle time represents the time required when an operation is performed with a cycle operation setting at maximum speed, under the following conditions.
2kg transport, vertical movement 25mm, horizontal movement 300mm (rough positioning arch motion)
[Standard cycle time]
The time required for maximum speed. This is a general guideline for high speed performance. Note that continuous operation is not possible under maximum speed operation.
[Continuous cycle time]
The cycle time for continuous operation.



Tip shaft allowable load inertia moment

Number of axes	Tip shaft allowable load inertia moment
4-axis specification	0.45 kg・m^2

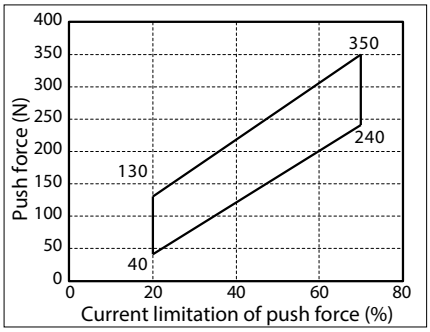
Make sure that the offset value from the spline tip to the horizontal and vertical direction dimensions is within the guideline values listed below. A large load offset may cause abnormal noise, vibration, failure and shorter life time. Adjust the speed, acceleration/deceleration or center of gravity. The overhang distance is limited depending on the payload and operating condition.



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

Correlation between Push Force and Current Limitation (guideline)

Push force at the vertical axis tip (Note 3)

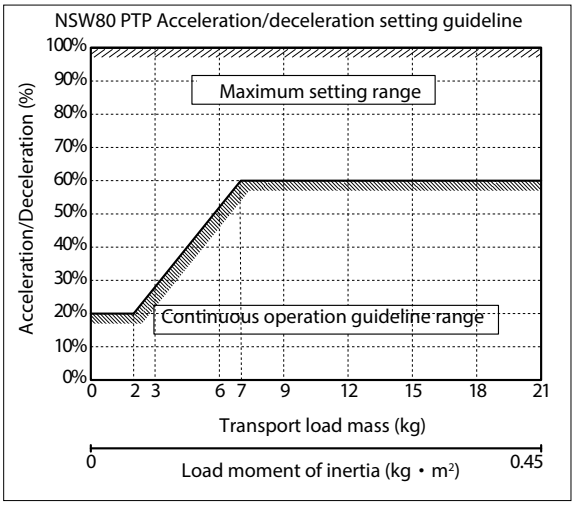


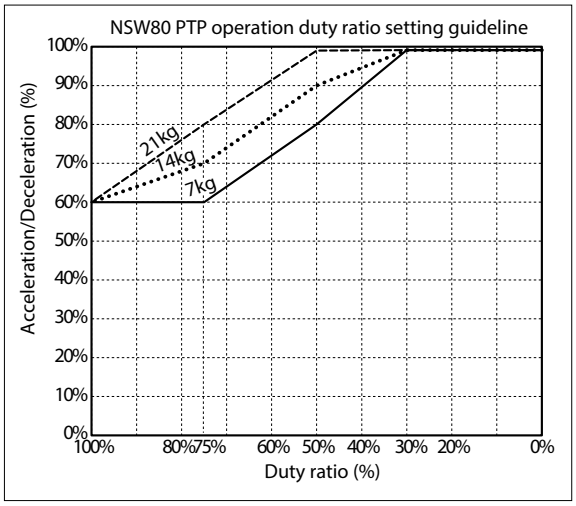
Acceleration/Deceleration Setting Guidelines

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

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

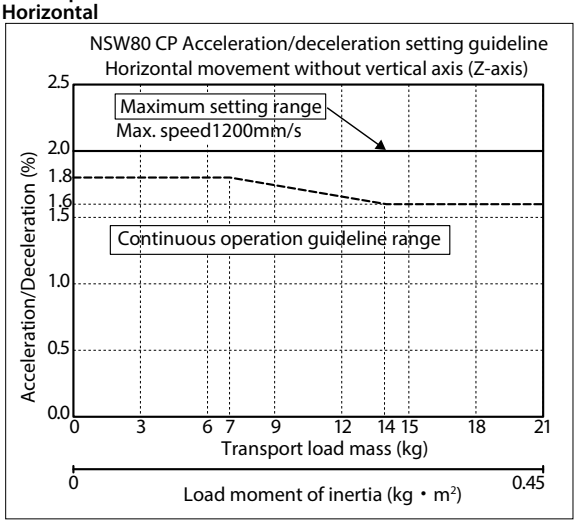
■ PTP Operation



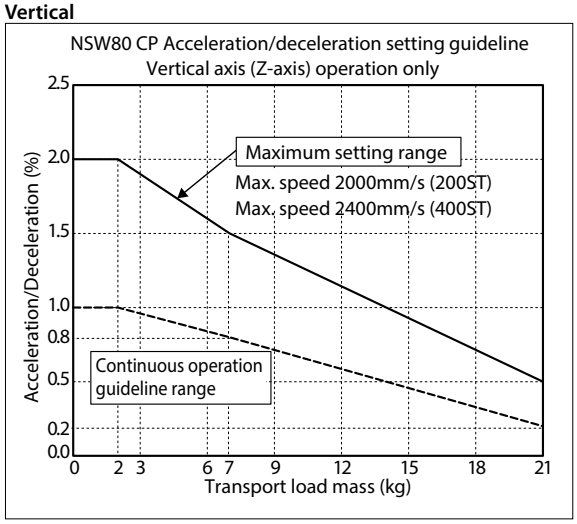


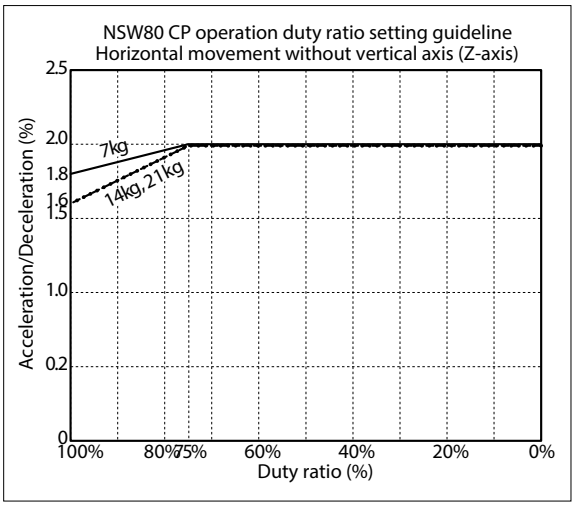
■ CP Operation

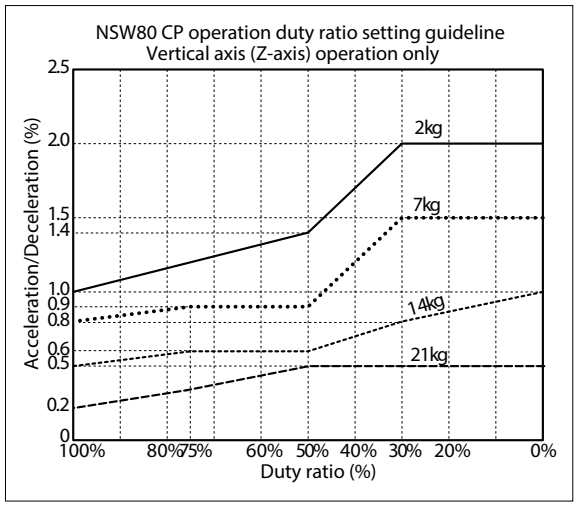
Horizontal



Vertical

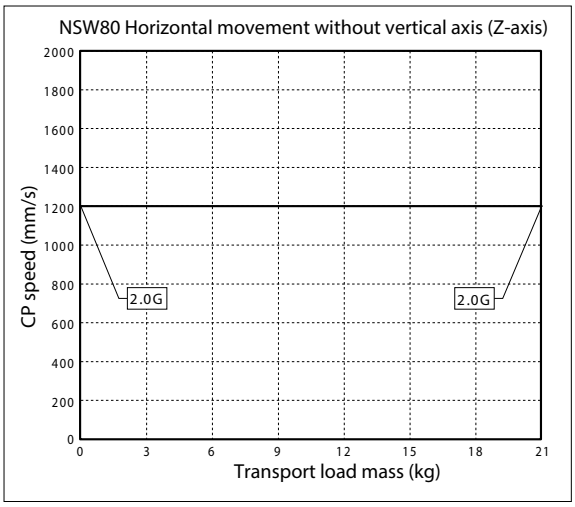




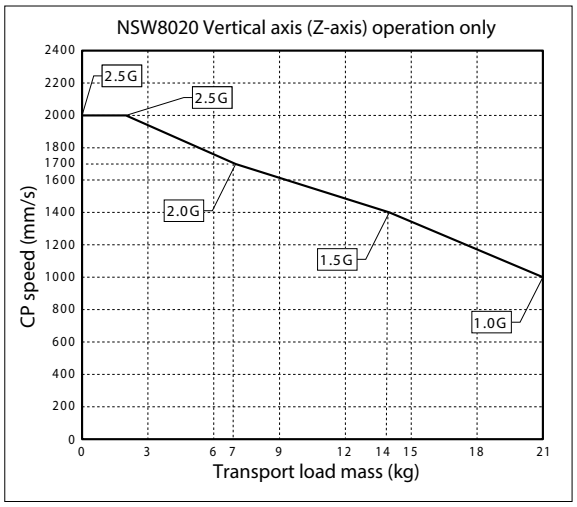


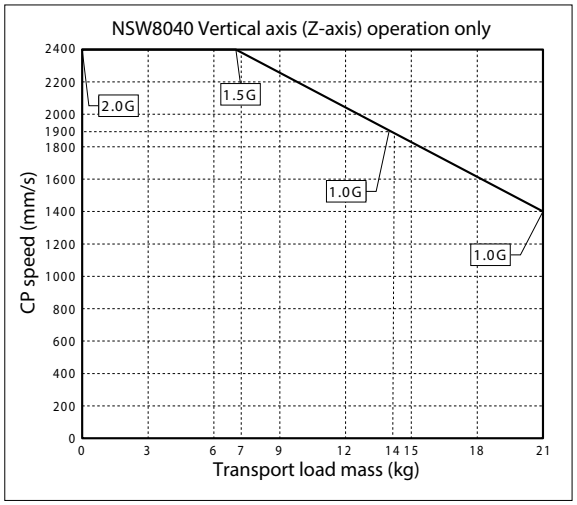
■CP operation: Acceleration/deceleration Limitations

Horizontal



Vertical





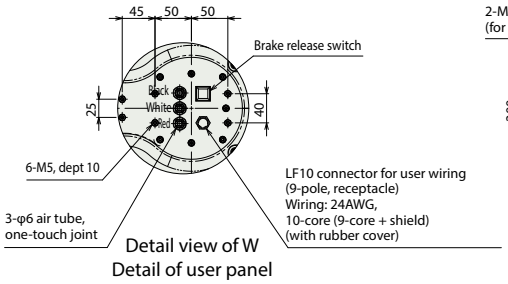
Dimensions

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

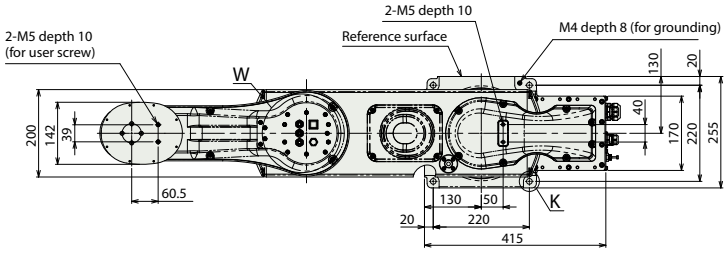
■IXA-4NSW8020

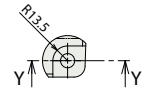
(Note) Refer to P36 (Note 8) for the cable connection.

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

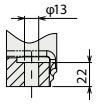


Detail view of W
Detail of user panel

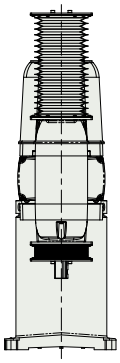


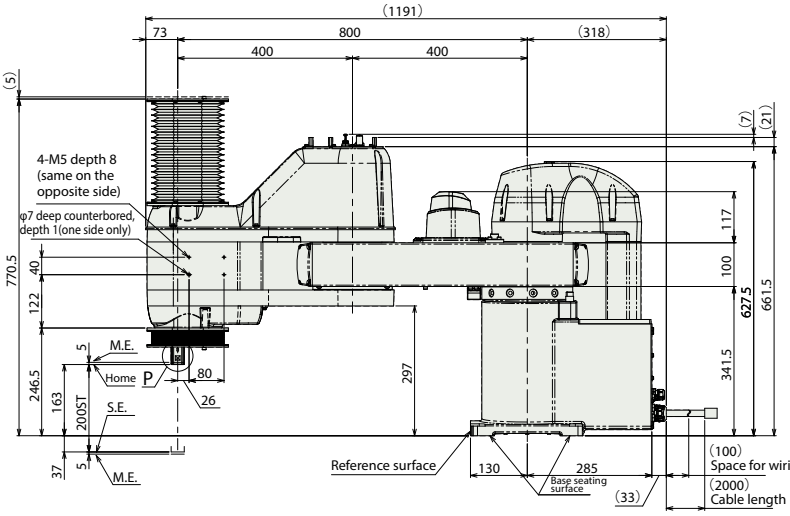


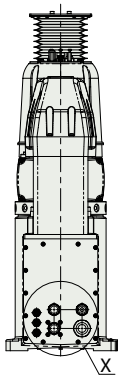
Detail view of K
Detail of base mounting hole

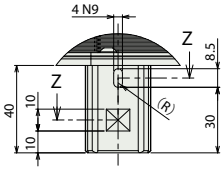


Cross section Y-Y
(4 places)

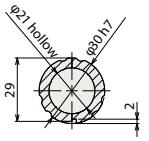




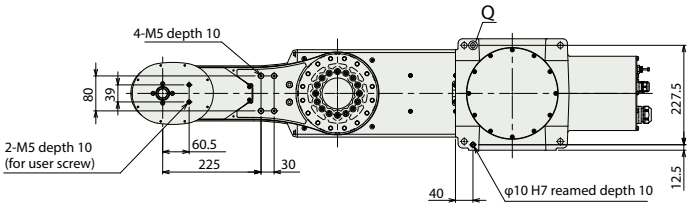


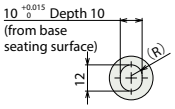


Detail view of P

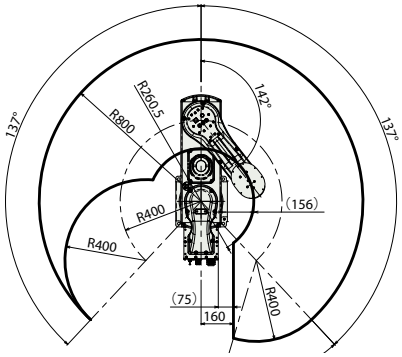


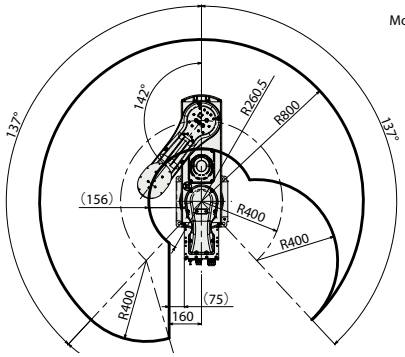
Cross section Z-Z

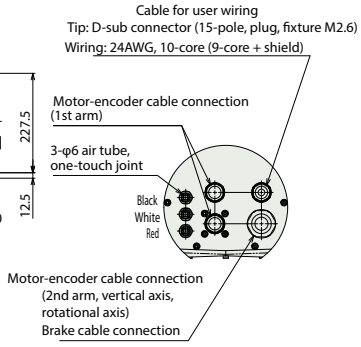




Detail view of Q
Base oblong detail







Detail view of X
Rear panel detail

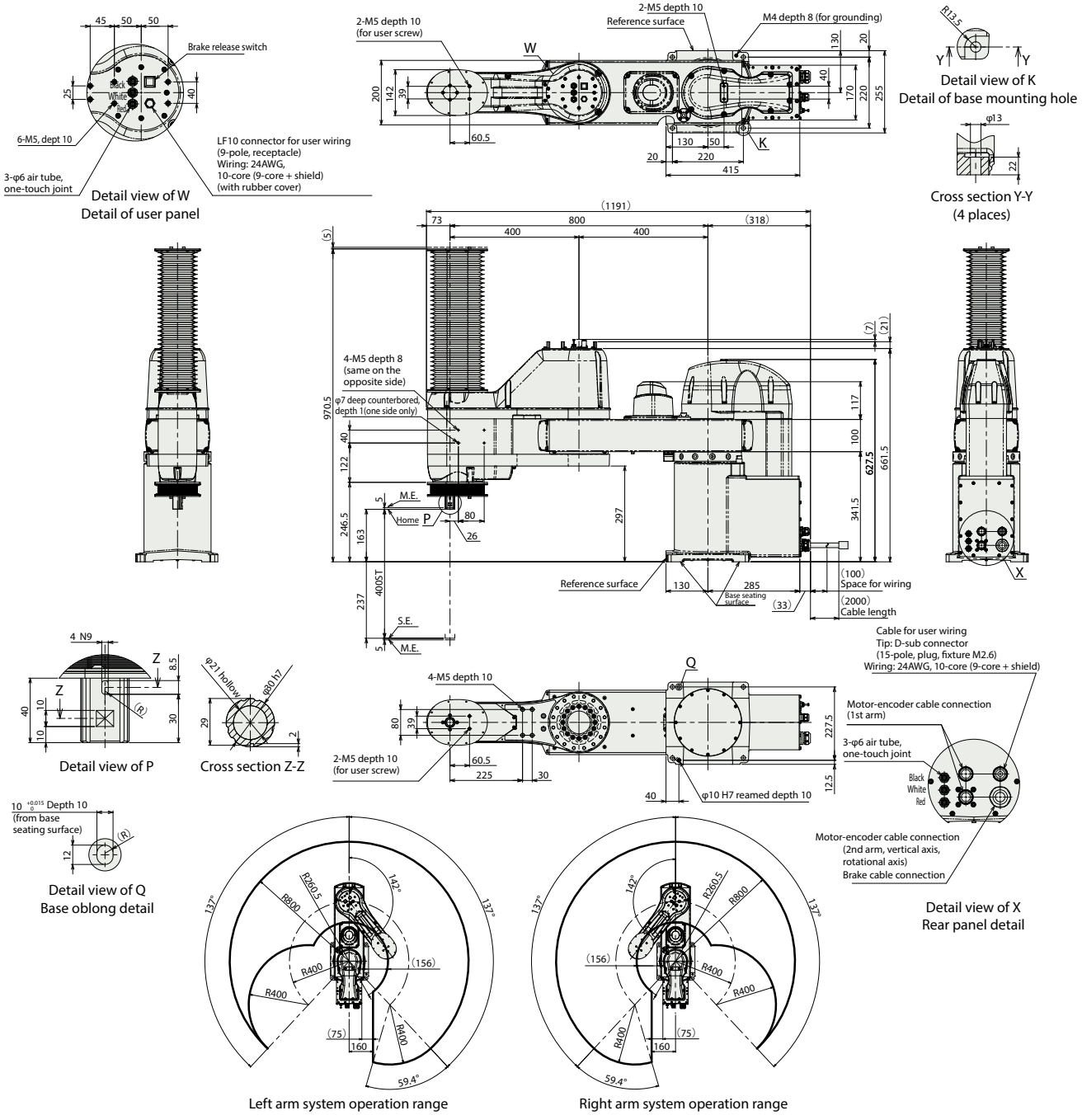
■Mass

Item		Description
Mass	4-axis specification	79.0kg

■IXA-4NSW8040

(Note) Refer to P36 (Note 8) for the cable connection.

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



■Mass

Item		Description
Mass	4-axis specification	80.0kg

Applicable controller

Please check the latest IXA catalog or the Controller Catalog.

(Note) Refer to the Controller section fo the lastest general catalog for network abbreviations such as DV and CC.

IXA-4NSW10020
IXA-4NSW10040

Dust/Splash-proof | Battery-less Absolute | Arm Length: 1000 mm

Model Specification Items

IXA	–	4	NSW	100		–		–	T2	–	
Series		Number of axes	Type	Arm length	Vertical stroke		Cable length		Applicable controller		Option

Number of axes	
4	4 axes

Type	
NSW	Dust/Splash Proof Specification, high-speed type

Arm length	
100	1000mm

Vertical stroke	
20	200mm
40	400mm

Cable length	
N	Nil
5L	5m
10L	10m
□L	Specified length (1m increments)

Applicable controller	
T2	XSEL-SAX

Option: See below

Horizontal | Vertical | Side | Ceiling

Option

Name	Model number	Reference page
Resin cover with nickel plating	**COP**	40

Other options

Name		Model number	Reference page
User cable		CB-IXA-USR□□□-CS	41
Flange		**IX-FL-1**	40
Metal cap for user wiring		**IXA-MC-1**	40
External wiring protecting flange		**IXA-PFL-EW-1**	41
Z-axis wiring side stay	Z-axis 200st	**IXAW-SST-ZW-1**	41
	Z-axis 400st	**IXAW-SST-ZW-2**	41
Z-axis wiring upper stay	Z-axis 200st	**IXA-TST-ZW-1**	41
	Z-axis 400st	**IXA-TST-ZW-2**	41

(Note) Please purchase separately.

Cable length

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

(Note) Total amount of the following cables:
Motor cables:4, Encoder cables: 4, Brake cable: 1

POINT Selection Notes

(1) Please refer to P35 for Notes 1 - 8.

(2) The maximum set value for acceleration/deceleration varies depending on the weight of the object being transported, the travel distance, and the location. For continuous operation, either lower the acceleration/deceleration values or refer to the duty (guideline) and set a stop time after acceleration/deceleration.

(3) Do not directly splash jet on the bellows.

(4) A continuous operation cannot be performed for SCARA robots at 100% of speed and acceleration. Refer to the "Acceleration/Deceleration Setting Guidelines" for executable operating conditions.

(5) The cable joint part does not meet the IP rating of the SCARA robot. Place it in a clean and splash-free location.

Main specifications

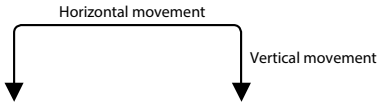
Item			Description
			4-axis specification
Max. payload (kg) (Note 1)			21
Speed (Note 2)	Combined max. speed (mm/s)		6492
	Max. speed of individual axes	1st arm (deg/s)	220
		2nd arm (deg/s)	380
		Vertical axis (mm/s)	2000/2800
		Rotational axis (deg/s)	1300
Push force (N) (Note 3)		Upper limit	350
		Lower limit	40
Arm length (mm)			1000
Individual arm length (mm)		1st arm	600
		2nd arm	400
Operation range of individual axes		1st arm (deg)	±137
		2nd arm (deg)	±142
		Vertical axis (mm)	200/400
		Rotational axis (deg)	±360

Item		Description
		4-axis specification
Positioning repeatability (Note 4)	Within horizontal surface	±0.025mm
	Vertical axis	±0.01mm
	Rotational axis	±0.005 degrees
User wiring		10-core (9-core + shield) AWG24 (rated 30V/Max. 1A)
User piping		Outer diameter Φ6, inner diameter Φ4, air tube 3 pcs. (max. usable pressure 0.6MPa)
Brake release switch (Note 5)		Brake release switch for preventing vertical axis from dropping.
Tip axis	Allowable torque	11.3 N・m
	Allowable load moment	42 N・m
Material of main parts		Refer to P39
Ambient operational temperature and humidity		0-40℃, 20-85% RH or lower (non-condensing)
Degree of protection		IP65 (except for bellows)
Vibration- and impact-resistance		No impact or vibration should be applied.
Noise (Note 7)		85 dB or lower
International standard		CE marking, RoHS
Motor type		AC servo motor
Motor wattage	1st arm	1000W
	2nd arm	750W
	Vertical axis	600W
	Rotational axis	200W
Encoder type		Battery-less absolute
Encoder pulse		131072 pulse/rev

Cycle time

Item	Time
Standard cycle time	0.33 seconds
Continuous cycle time	0.60 seconds

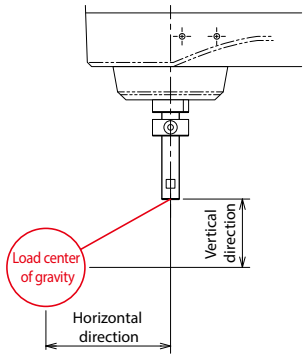
The standard/continuous cycle time represents the time required when an operation is performed with a cycle operation setting at maximum speed, under the following conditions.
2kg transport, vertical movement 25mm, horizontal movement 300mm (rough positioning arch motion)
[Standard cycle time]
The time required for maximum speed. This is a general guideline for high speed performance. Note that continuous operation is not possible under maximum speed operation.
[Continuous cycle time]
The cycle time for continuous operation.



Tip shaft allowable load inertia moment

Number of axes	Tip shaft allowable load inertia moment
4-axis specification	0.45 kg・m^2

Make sure that the offset value from the spline tip to the horizontal and vertical direction dimensions is within the guideline values listed below. A large load offset may cause abnormal noise, vibration, failure and shorter life time. Adjust the speed, acceleration/deceleration or center of gravity. The overhang distance is limited depending on the payload and operating condition.



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

Correlation between Push Force and Current Limitation (guideline)

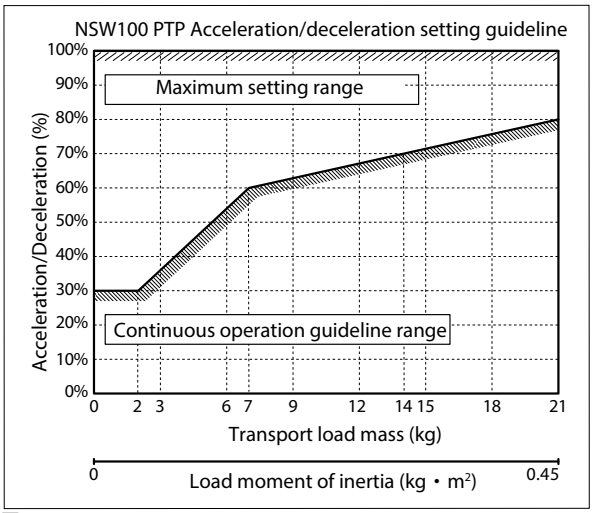
Push force at the vertical axis tip (Note 3)

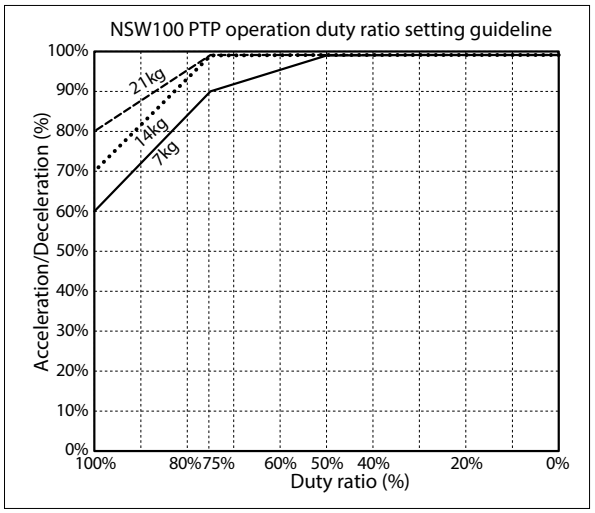
Acceleration/Deceleration Setting Guidelines

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

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

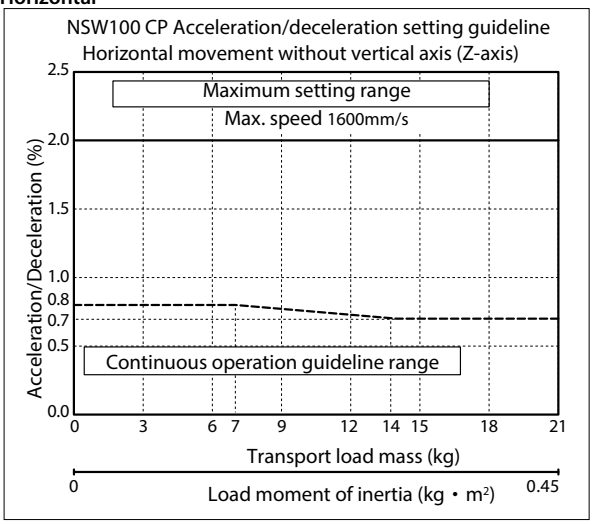
■ PTP Operation



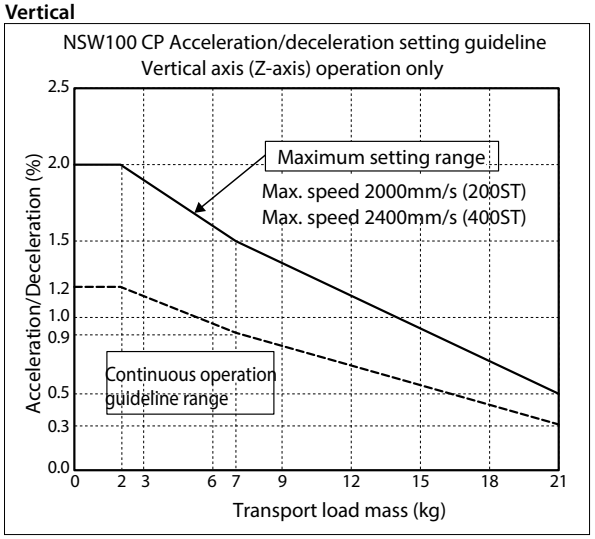


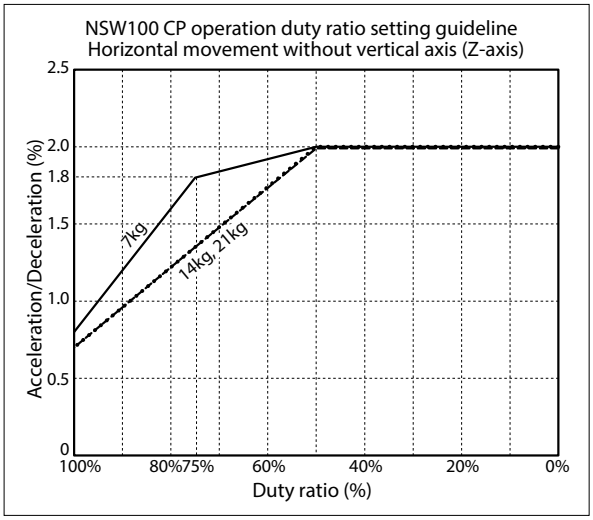
■ CP Operation

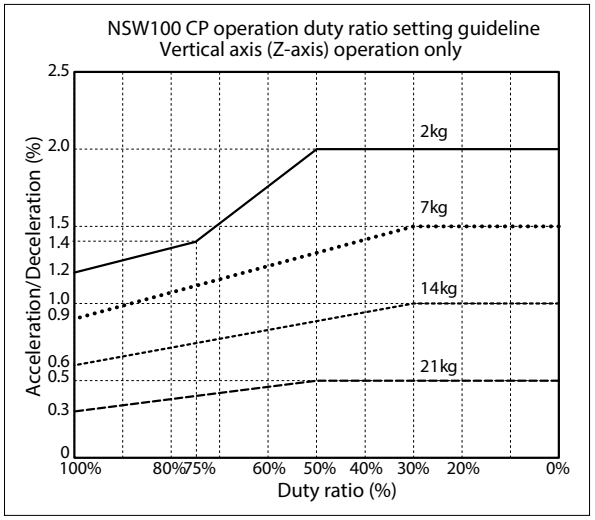
Horizontal



Vertical

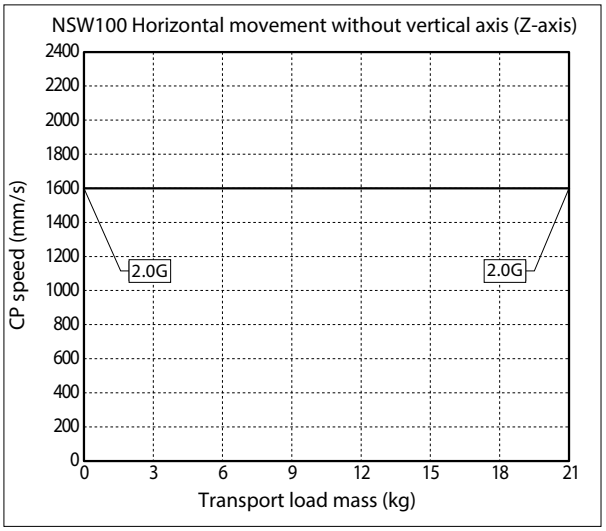




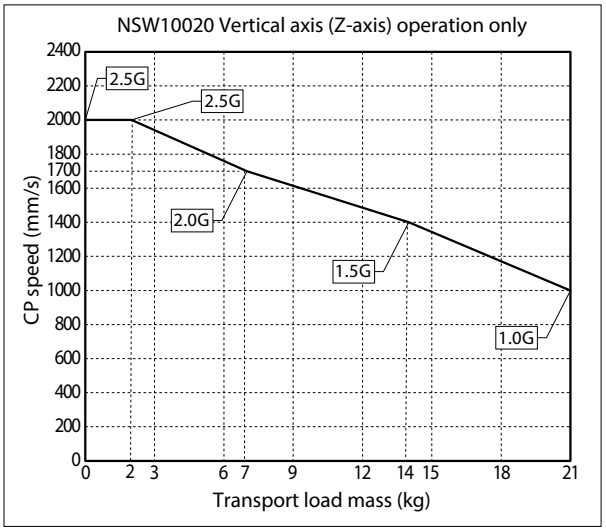


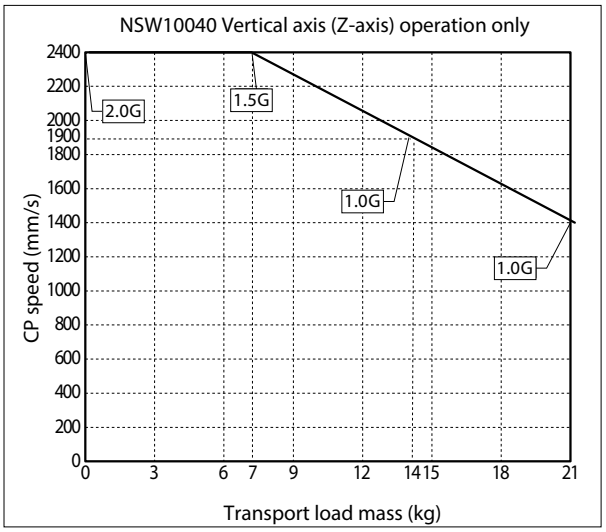
■ **CP operation: Acceleration/deceleration Limitations**

Horizontal



Vertical





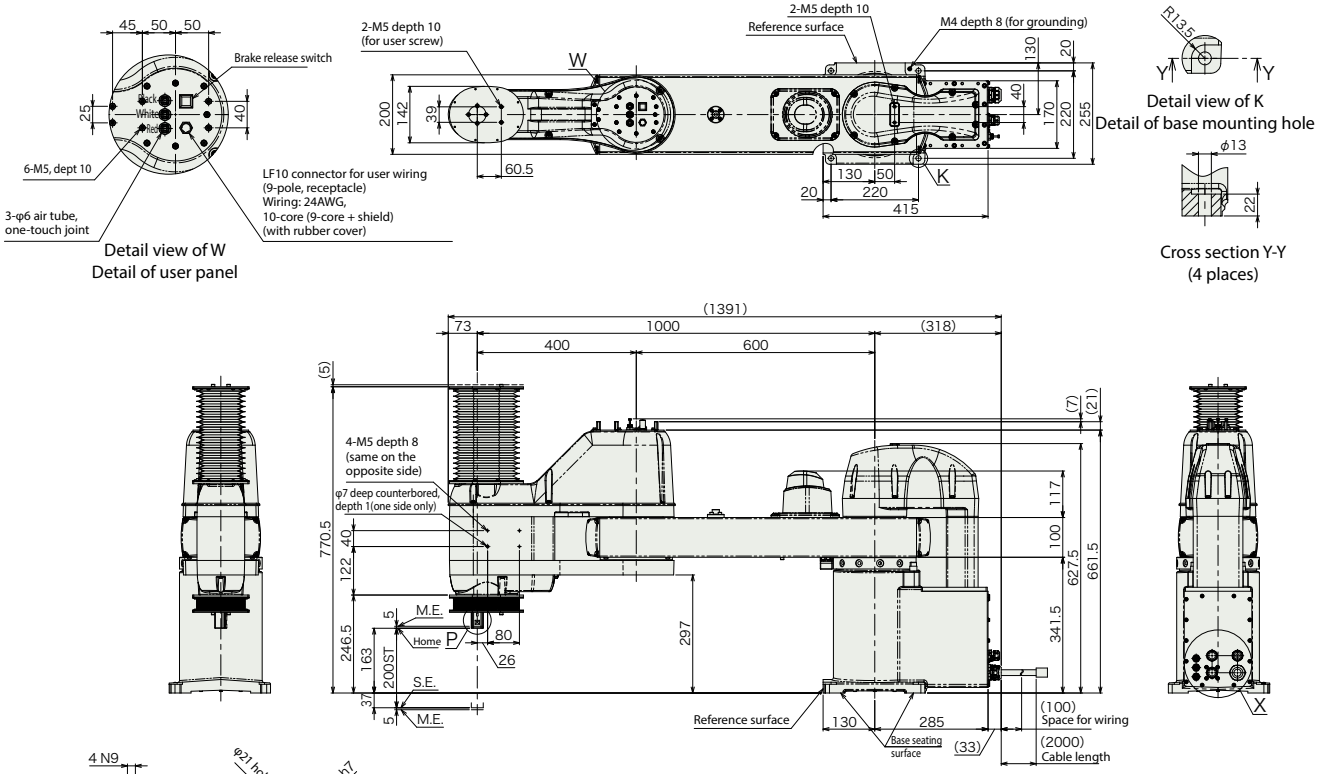
Dimensions

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

■IXA-4NSW10020

(Note) Refer to P36 (Note 8) for the cable connection.

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



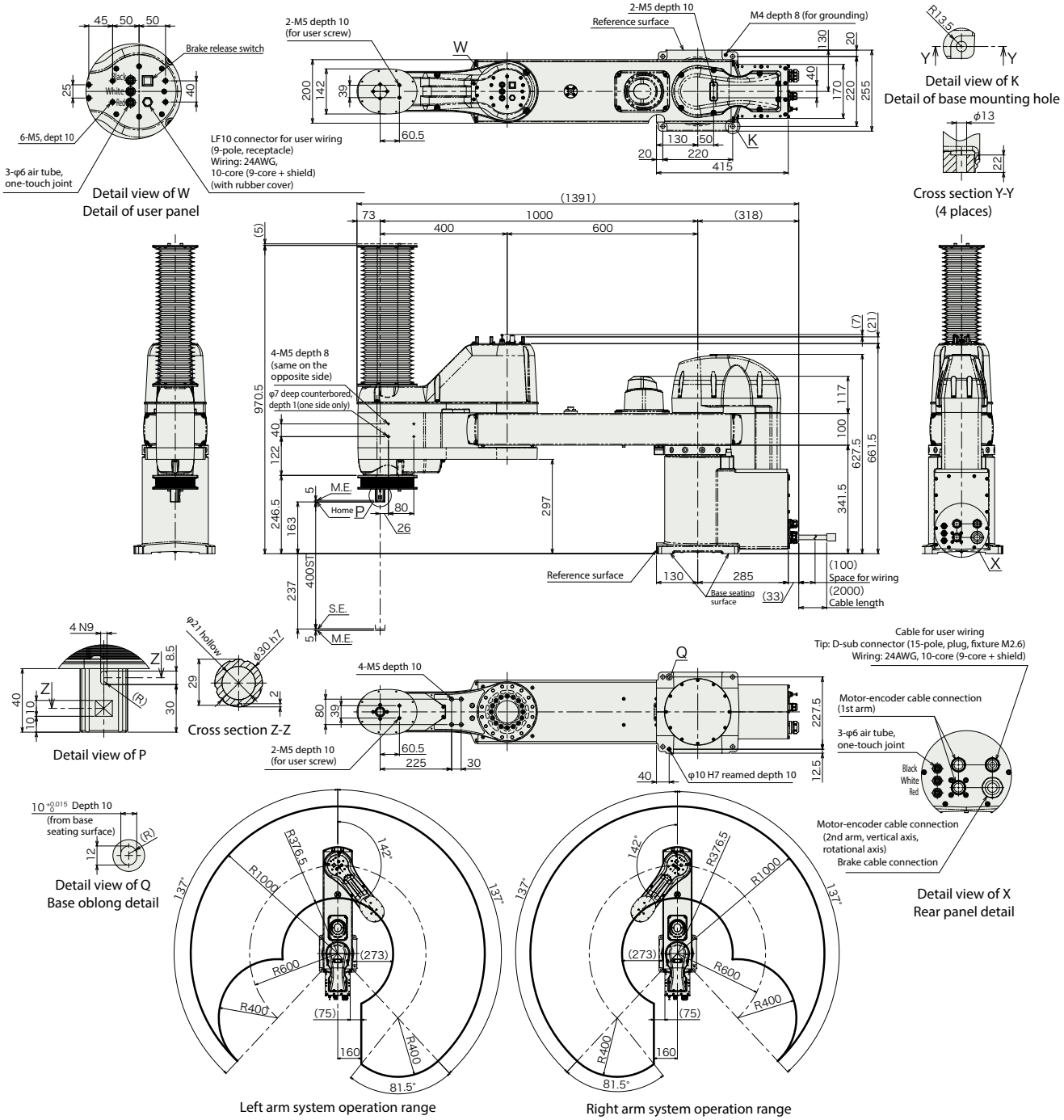
■Mass

Item		Description
Mass	4-axis specification	82.0kg

■IXA-4NSW10040

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

(Note) Refer to P36 (Note 8) for the cable connection.



■Mass

Item		Description
Mass	4-axis specification	83.0kg

Applicable controller

Please check the latest IXA catalog or the Controller Catalog.

(Note) Refer to the Controller section fo the lastest general catalog for network abbreviations such as DV and CC.

IXA-4NHW12040

Dust/Splash-proof | Battery-less Absolute | Arm Length: 1200 mm

Model Specification Items

IXA	–	4	NHW	120	40	–		–	T2	–	
Series		Number of axes	Type	Arm length	Vertical stroke		Cable length		Applicable controller		Option
		4: 4 axes	NHW: Dust/Splash Proof Specification, high-speed type	120: 1200mm	40: 400mm		N: Nil 5L: 5m 10L: 10m □L: Specified length (1m increments)		T2: XSEL-SAX		See below

Horizontal | Vertical | Side | Ceiling

Option

Name	Model number	Reference page
Resin cover with nickel plating	**COP**	40

Other options

Name		Model number	Reference page
User cable		CB-IXA-USR□□□-CS	41
Flange		**IX-FL-1**	40
Metal cap for user wiring		**IXA-MC-1**	40
External wiring protecting flange		**IXA-PFL-EW-1**	41
Z-axis wiring side stay	Z-axis 400st	**IXAW-SST-ZW-2**	41
Z-axis wiring upper stay	Z-axis 400st	**IXA-TST-ZW-2**	41

(Note) Please purchase separately.

Cable length

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

(Note) Total amount of the following cables:
Motor cables:4, Encoder cables: 4, Brake cable: 1

POINT Selection Notes

(1) Please refer to P35 for Notes 1 - 8.

(2) The maximum set value for acceleration/deceleration varies depending on the weight of the object being transported, the travel distance, and the location. For continuous operation, either lower the acceleration/deceleration values or refer to the duty (guideline) and set a stop time after acceleration/deceleration.

(3) Do not directly splash jet on the bellows.

(4) A continuous operation cannot be performed for SCARA robots at 100% of speed and acceleration. Refer to the "Acceleration/Deceleration Setting Guidelines" for executable operating conditions.

(5) The cable joint part does not meet the IP rating of the SCARA robot. Place it in a clean and splash-free location.

Main specifications

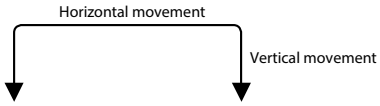
Item			Description 4-axis specification
Max. payload (kg) (Note 1)			47
Speed (Note 2)	Combined max. speed (mm/s)		8098
	Max. speed of individual axes	1st arm (deg/s)	260
		2nd arm (deg/s)	380
		Vertical axis (mm/s)	1200
		Rotational axis (deg/s)	920
Push force (N) (Note 3)		Upper limit	570
		Lower limit	70
Arm length (mm)			1200
Individual arm length (mm)		1st arm	800
		2nd arm	400
Operation range of individual axes		1st arm (deg)	±137
		2nd arm (deg)	±142
		Vertical axis (mm)	400
		Rotational axis (deg)	±360

Item		Description 4-axis specification
Positioning repeatability (Note 4)	Within horizontal surface	±0.05mm
	Vertical axis	±0.02mm
	Rotational axis	±0.01 degrees
User wiring		10-core (9-core + shield) AWG24 (rated 30V/Max. 1A)
User piping		Outer diameter Φ6, inner diameter Φ4, air tube 3 pcs. (max. usable pressure 0.6MPa)
Brake release switch (Note 5)		Brake release switch for preventing vertical axis from dropping.
Tip axis	Allowable torque	15 N・m
	Allowable load moment	42 N・m
Material of main parts		Refer to P39
Ambient operational temperature and humidity		0-40℃, 20-85% RH or lower (non-condensing)
Degree of protection		IP65 (except for bellows)
Vibration- and impact-resistance		No impact or vibration should be applied.
Noise (Note 7)		85 dB or lower
International standard		CE marking, RoHS
Motor type		AC servo motor
Motor wattage	1st arm	1000W
	2nd arm	750W
	Vertical axis	600W
	Rotational axis	200W
Encoder type		Battery-less absolute
Encoder pulse		131072 pulse/rev

Cycle time

Item	Time
Standard cycle time	0.61 seconds
Continuous cycle time	0.72 seconds

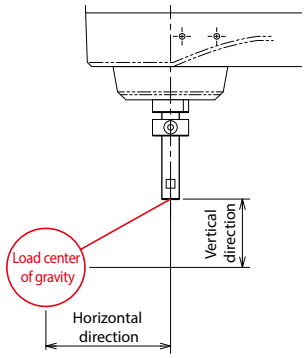
The standard/continuous cycle time represents the time required when an operation is performed with a cycle operation setting at maximum speed, under the following conditions.
2kg transport, vertical movement 25mm, horizontal movement 300mm (rough positioning arch motion)
[Standard cycle time]
The time required for maximum speed. This is a general guideline for high speed performance. Note that continuous operation is not possible under maximum speed operation.
[Continuous cycle time]
The cycle time for continuous operation.



Tip shaft allowable load inertia moment

Number of axes	Tip shaft allowable load inertia moment
4-axis specification	0.5 kg・m^2

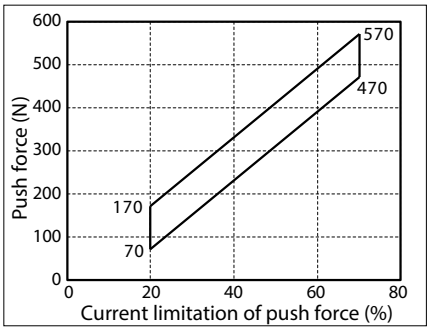
Make sure that the offset value from the spline tip to the horizontal and vertical direction dimensions is within the guideline values listed below. A large load offset may cause abnormal noise, vibration, failure and shorter life time. Adjust the speed, acceleration/deceleration or center of gravity. The overhang distance is limited depending on the payload and operating condition.



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

Correlation between Push Force and Current Limitation (guideline)

Push force at the vertical axis tip (Note 3)



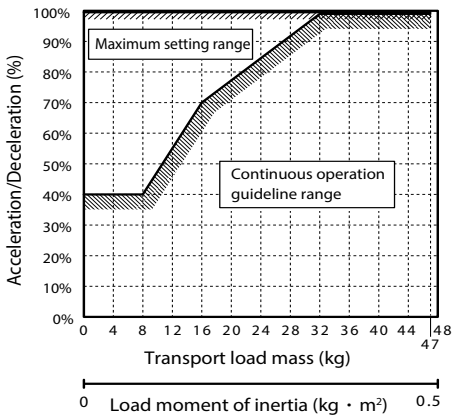
Acceleration/Deceleration Setting Guidelines

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

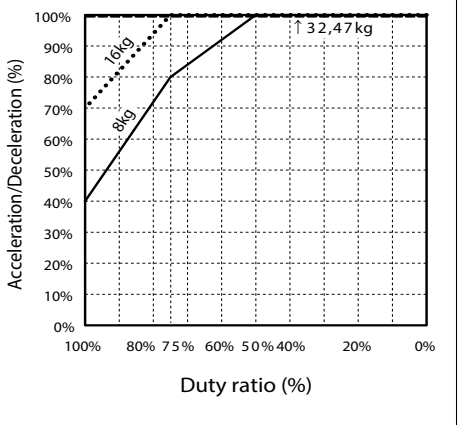
1) For a PTP operation, always use the WGHT command in the program to set the weight and moment of inertia. For the SCARA robot, the maximum acceleration/deceleration for each payload is set at 100%. When the payload differs, the operation time will also vary even at the same acceleration/deceleration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

■ PTP Operation

NHW120 PTP Acceleration/deceleration setting guideline



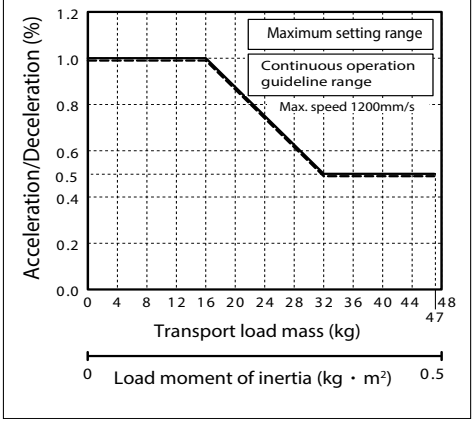
NHW120 PTP operation duty ratio setting guideline



■ CP Operation

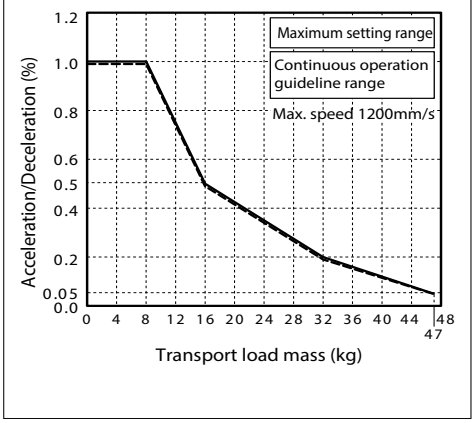
Horizontal

NHW120 CP Acceleration/deceleration setting guideline
Horizontal movement without vertical axis (Z-axis)

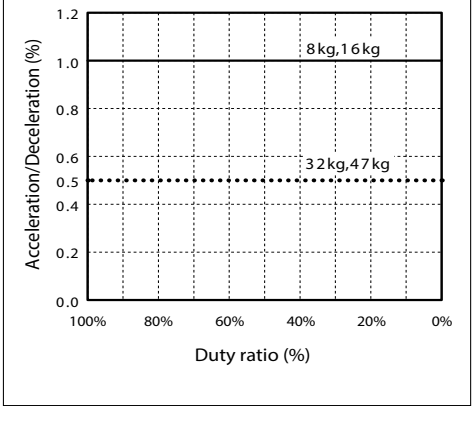


Vertical

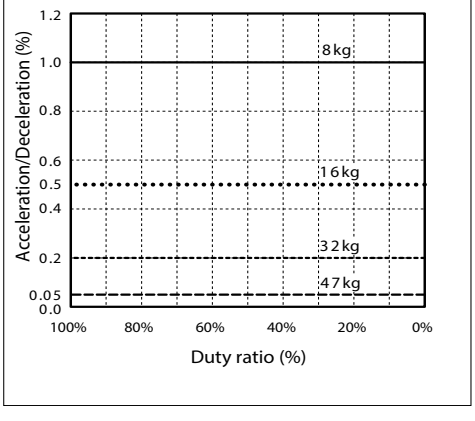
NHW120 CP Acceleration/deceleration setting guideline
Vertical axis (Z-axis) operation only



NHW120 CP operation duty ratio setting guideline
Horizontal movement without vertical axis (Z-axis)



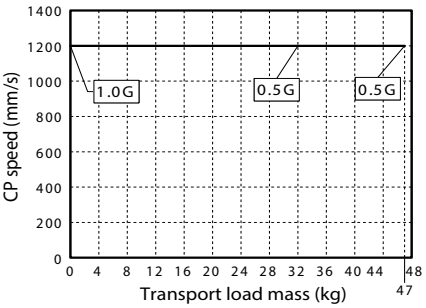
NHW120 CP operation duty ratio setting guideline
Vertical axis (Z-axis) operation only



■ CP operation: Acceleration/deceleration Limitations

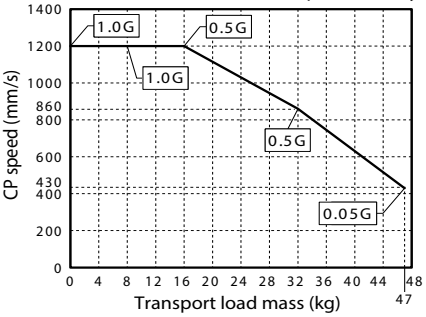
Horizontal

NHW120 Horizontal movement without vertical axis (Z-axis)



Vertical

NHW120 Vertical axis (Z-axis) operation only

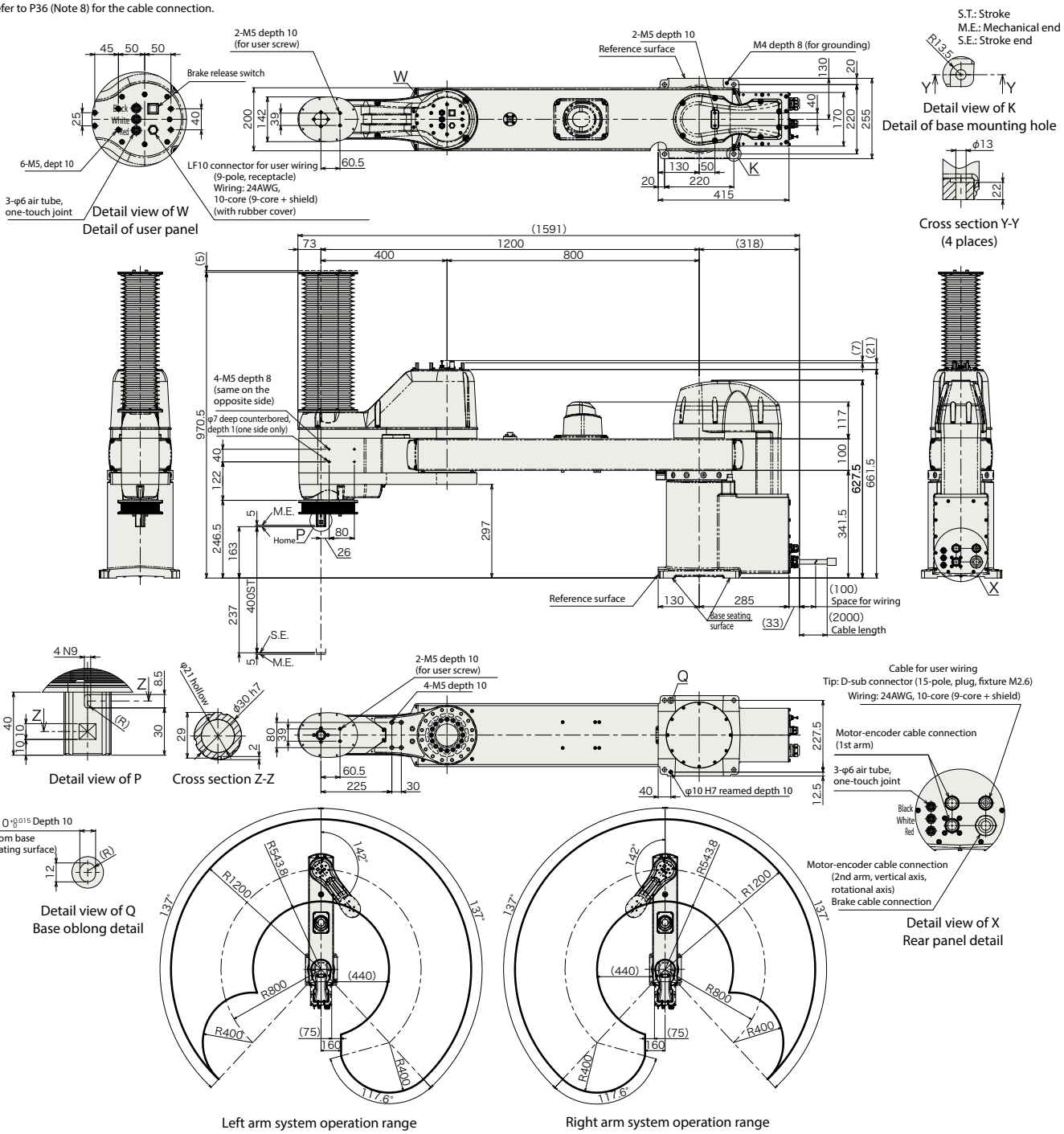


Dimensions

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

■IXA-4NHW12040

(Note) Refer to P36 (Note 8) for the cable connection.



■Mass

Item		Description
Mass	4-axis specification	88.0kg

Applicable controller

Please check the latest IXA catalog or the Controller Catalog.

(Note) Refer to the Controller section fo the lastest general catalog for network abbreviations such as DV and CC.

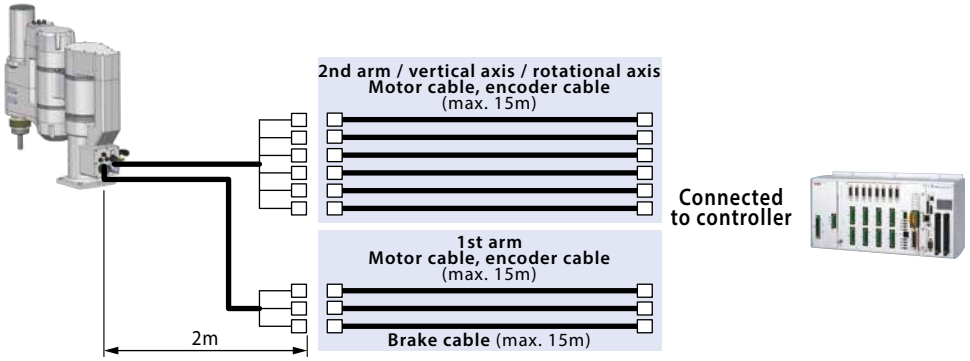
Precautions

(Note 1) **Payload**	The payload is the maximum weight that can be carried. The optimal acceleration automatically sets the weight of the load and the moment of inertia in the program. A heavier load will cause a lower acceleration to be configured.
(Note 2) **Maximum operation speed during PTP operation**	The value of the maximum operation speed in the specifications is for PTP command operation. For CP operation commands (interpolation operation), there are limitations on operations at high speed.
(Note 3) **Vertical axis push force control range**	The vertical axis push force control range is for the push force of the vertical axis tip. This will be the push force when there is no load (nothing mounted) on the vertical axis. Continuous push operation is not possible. The upper limit is the push force when the push force setting value is 70%. The lower limit is the push force when the setting value is 30% for the 4NSW3015 and 20% for other types. Allow some tolerance on the actual push force.
(Note 4) **Positioning repeatability**	This represents the ability to reproduce the same positioning result when an operation is repeated at the same speed, acceleration/deceleration, and arm system, between the operation start position and the target position (The value is for JIS B 8432 Ambient temperature 20°C constant). This is NOT the absolute positioning accuracy. Note that when the arm system is switched while starting from multiple positions to the target position, or when the operation conditions (such as operation speed or acceleration/deceleration setting) are changed, the value may fall outside of the positioning repeatability specification value.
(Note 5) **Brake release switch**	The alarm lamp is installed on the following places. * Arm length 300/450/600: Rear part of the 1st axis (J1) base * Arm length 800/1000/1200: User panel To operate it, use an I/O output signal of the controller and build a circuit to apply 24VDC to the LED terminal in the user wiring.
(Note 6) **Air purge pressure**	Depending on operating conditions of the Z-axis, the bellows may be damaged or twisted. For prevention, use a speed controller and adjust its valve to supply air into the main body gradually. Air purge for the arm lengths of 800/1000/1200 is not necessary.
(Note 7) **Noise**	This is the value measured when all axes are operating at maximum speed. Noise may change depending on operating conditions and the surrounding reverberation environment. (JIS B 6195)
Operation range	When switching the arm system, the arms extend once in a straight line. Beware of potential interference with the peripheral devices

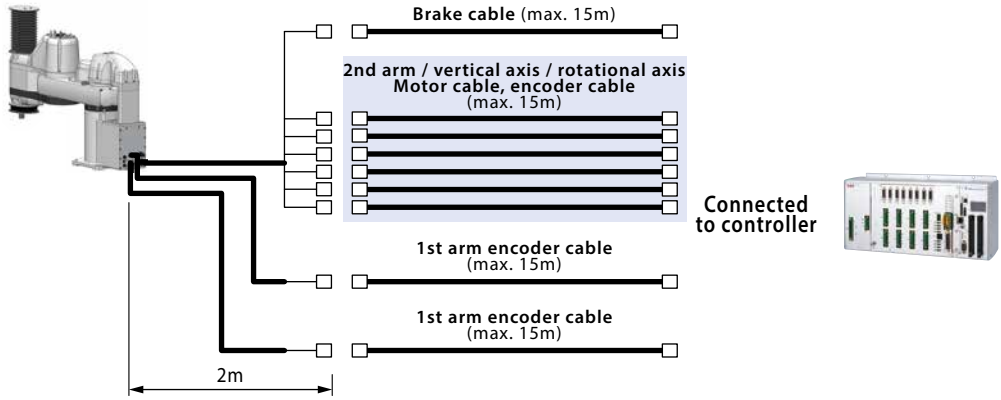
(Note 8) Cables

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

Arm length 300/450/600

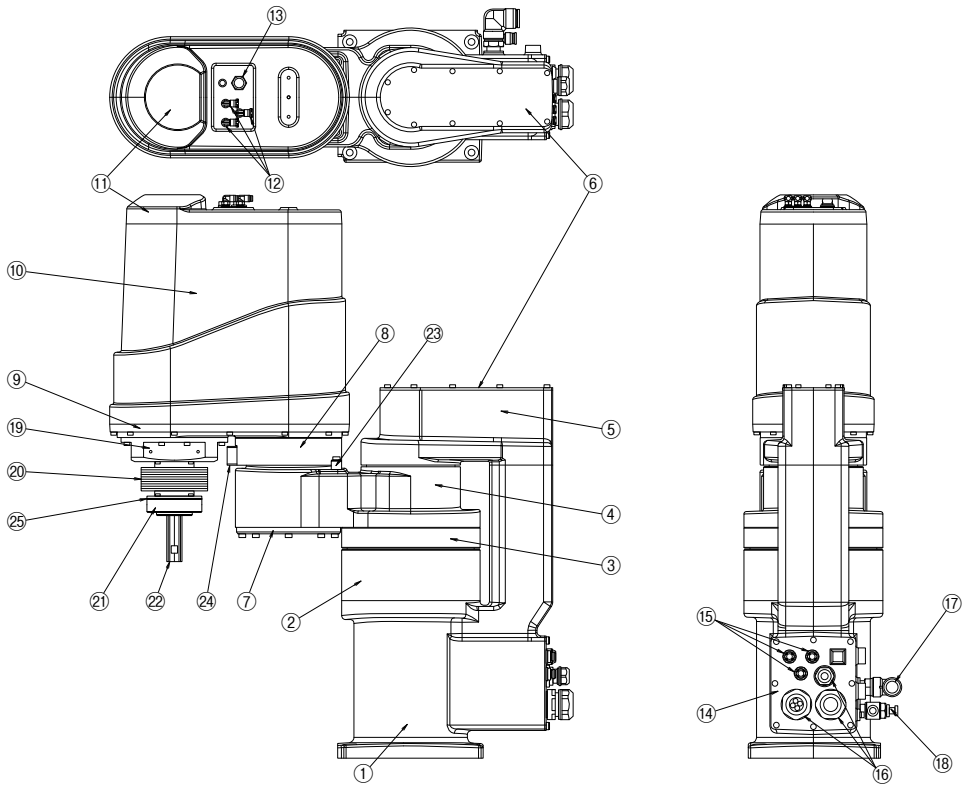


Arm length 800/1000/1200



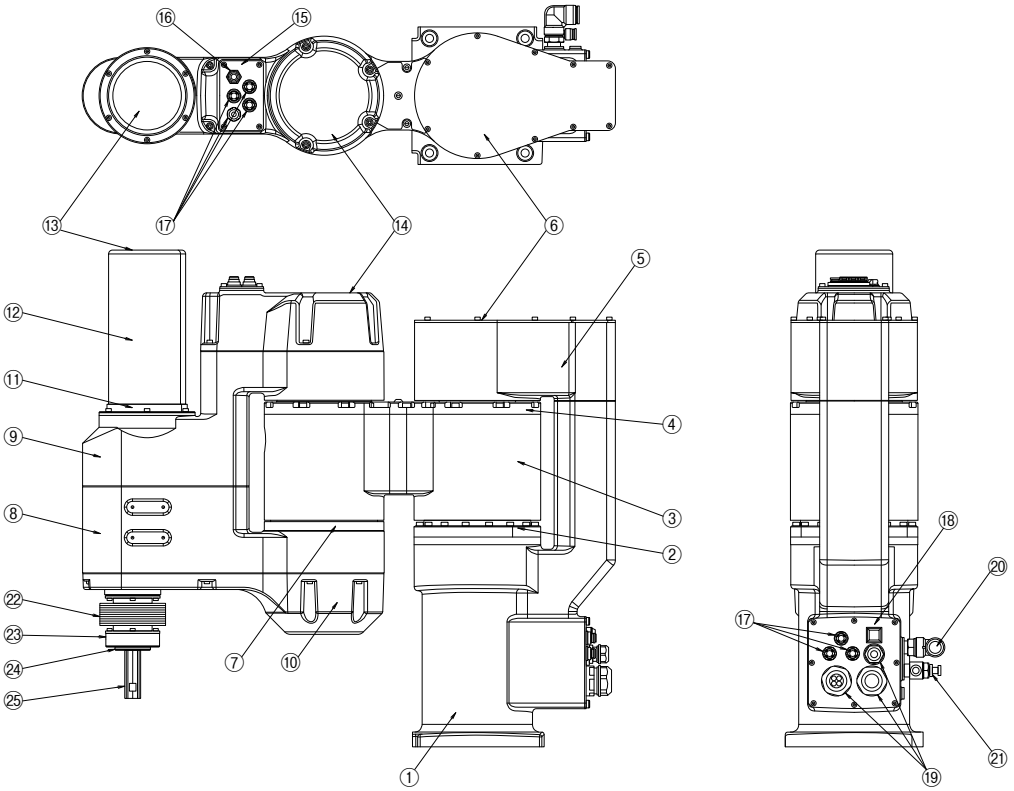
IXA Dust/Splash Proof Main Materials

IXA-4NSW3015



	No.	Name	Material	Surface treatment
Exterior components	①	J1 Base	Aluminum casting	Design surface coating
	②	J1 Base flange	Aluminum	Design surface coating
	③	J1 Flange cover	Carbon steel	Low temperature black chrome plating
	④	J1 Arm	Aluminum casting	Design surface coating
	⑤	J1Joint bracket	Aluminum casting	Design surface coating
	⑥	J1 JB cover	Stainless steel	Design surface coating
	⑦	J2 Under cover	Aluminum	White alumite
	⑧	J2 OS housing	Aluminum	Black alumite
	⑨	J2 Main arm	Aluminum casting	Design surface coating
	⑩	J2 Arm cover	Aluminum casting	Design surface coating
	⑪	J2 Spline cover	Aluminum casting	Design surface coating
	⑫	Quick joint elbow	Resin (PBT, POM), Nickel plated brass	
	⑬	Round metal connector	Zinc nickel plated, Rubber (CR)	
	⑭	External wiring panel	Stainless steel	
	⑮	Quick joint, Partition union pea	Resin (PBT, POM), Rubber (NBR), Nickel plated brass	
	⑯	Cable ground	Resin (nylon 66), Rubber (NBR)	
		Cable sheath	Vinyl chloride (PVC)	
	⑰	Quick joint elbow	Resin (PBT, POM), Nickel plated brass	
	⑱	Speed controller	Resin (PBT, POM), Nickel plated brass	
	⑲	Bellows flange	Aluminum	Black alumite
	⑳	Bellows	Urethan	
	㉑	Bearing case B	Aluminum	White alumite
	㉒	Ball screw spline	High carbon chromium bearing steel	Low temperature black chrome plating
	㉓	Stopper ring	Stainless steel	
	㉔	Movable stopper	Carbon steel	Low temperature black chrome plating
	㉕	Plate A (bellows)	Stainless steel	
	Exterior bolt and screw		Stainless steel	
	External gasket (O-ring, packing)		Rubber (NBR)	
	Exterior oil seal		Rubber (FKM)	

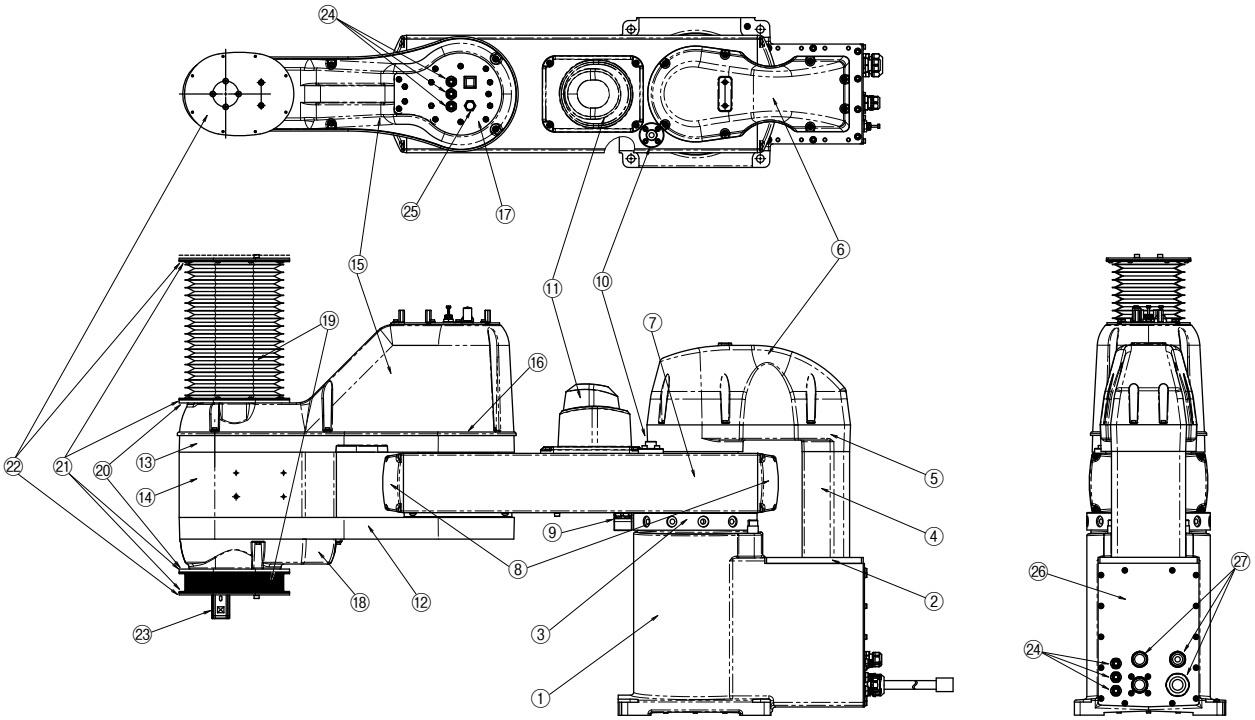
IXA-4NSW45□□/4NSW60□□



	No.	Name	Material	Surface treatment
Exterior components	①	J1 Base	Aluminum casting	Design surface coating
	②	J1 Base flange	Aluminum	Black alumite
	③	J1 Arm L / L-600	Aluminum casting	Design surface coating
	④	J1 Arm U / U-600	Aluminum	Design surface coating
	⑤	J1 Joint bracket	Aluminum casting	Design surface coating
	⑥	J1 JB cover	Stainless steel	Design surface coating
	⑦	J2 Intermediate flange	Aluminum	Black alumite
	⑧	J2 Main frame	Aluminum casting	Design surface coating
	⑨	J2 Joint bracket	Aluminum casting	Design surface coating
	⑩	J2 Cover L	Aluminum casting	Design surface coating
	⑪	J2 ZR DC flange	Aluminum	Design surface coating
	⑫	ZR Dust cover	Aluminum extruded round pipe	Design surface coating
	⑬	ZR DC cap	Aluminum	Design surface coating
	⑭	J2 Cover U	Aluminum casting	Design surface coating
	⑮	J2 U ser panel	Stainless steel	Design surface coating
	⑯	Round metal connector	Zinc nickel plated, Rubber (CR)	
	⑰	Quick joint, Partition union pea	Resin (PBT, POM), Rubber (NBR), Nickel plated brass	
	⑱	External wiring panel	Stainless steel	Design surface coating
	⑲	Cable ground	Resin (nylon 66), Rubber (NBR)	
		Cable sheath	Vinyl chloride (PVC)	
	⑳	Quick joint elbow	Resin (PBT, POM), Nickel plated brass	
	㉑	Speed controller	Resin (PBT, POM), Nickel plated brass	
	㉒	Bellows	Urethan	
	㉓	Bearing case B	Aluminum	White alumite
	㉔	Set color	Aluminum	White alumite
	㉕	Ball spline	High carbon chromium bearing steel	Low temperature black chrome plating
Exterior bolt and screw			Stainless steel	
Gaskets (O-ring, packing)			Rubber (NBR)	
Oil seal			Rubber (FKM)	

IXA Dust/Splash Proof Main Materials

IXA-4NSW80/4NSW100/4NHW12040



	No.	Name	Material	Surface treatment
Exterior components	①	J1 Base	Aluminum cast	Design surface coating
	②	J1 Base flange	Aluminum	White alumite
	③	J1 Reinforce flange	Aluminum	Black alumite
	④	J1 Cable box	Aluminum	Design surface coating
	⑤	J1Joint bracket	Aluminum casting	Design surface coating
	⑥	J1 JB cover	Resign (ABS)	Design surface coating (plating)
	⑦	J1 Arm	Aluminum	Design surface coating
	⑧	J1 arm end cover	Resign (ABS)	Design surface coating (plating)
	⑨	J1 stopper block	Stainless cast steel	
	⑩	Bolt adapter	Carbon steel	Trivalent chromium
	⑪	J2 motor cover	Resign (ABS)	Design surface coating (plating)
	⑫	J2 Main arm	Aluminum casting	Design surface coating
	⑬	J2 sub arm	Aluminum casting	Design surface coating
	⑭	J2 cover M	Aluminum	Design surface coating
	⑮	J2 Arm cover U	Resign (ABS)	Design surface coating (plating)
	⑯	J2 arm cover spac	Aluminum	White alumite
	⑰	J2 user panel	Aluminum	White alumite
	⑱	J2 Arm cover L	Resign (ABS)	Design surface coating (plating)
	⑲	Bellows	Urethan	
	⑳	Bellows base plate U/L	Aluminum	White alumite
	㉑	Bellows fixed plate	Stainless steel	
	㉒	Bellows top plate U/L	Aluminum	White alumite
	㉓	Ball spine	High carbon chromium bearing steel	Low temperature black chrome plating
	㉔	One-touch joint partition union pea	Resin (PBT, POM), Nickel plated brass	
	㉕	VCP cap	Vinyl chloride (PVC)	
	㉖	External wiring panel	Aluminum	White alumite
	㉗	Cable ground	Resin (nylon 66), Rubber (NBR)	
		Cable sheath	Vinyl chloride (PVC)	
	Exterior bolt and screw		Stainless steel	
	External gasket (O-ring, packing)		Rubber (NBR)	
	Exterior oil seal		1st axis: Rubber (FKM) / 2nd axis: Rubber (NBR)	

* [ ] applies in the case an optional COP (resign cover nickel plating specification) is selected.

Options

Options

Resin cover with nickel plating specification

Model **COP**

Description This option is to change the resign cover to nickel plating.
There is a concern where painting peels off depending on the environment of use, such as splashing liquid other than water on the robot.
Use of a resign cover with liquid-resistant plating will improve corrosion resistance.
* Refer to the "main parts materials" on P39 for the nickel plating part.

Other options

Series	Type	Type		Single unit option			
				Flange	Metal cap for user wiring	User cable	Wiring/piping options
IXA	High-speed type dust- & splash-proof spec	NSW	3015	IX-FL-1	IXA-MC-1	CB-IXA-USR□□□-CS	—
			30□□				
			45□□				
			60□□				
			80□□	IXA-FL-1			*
			100□□				
	High-payload type dust- & splash-proof spec	NHW	12040				

*Wiring/piping options

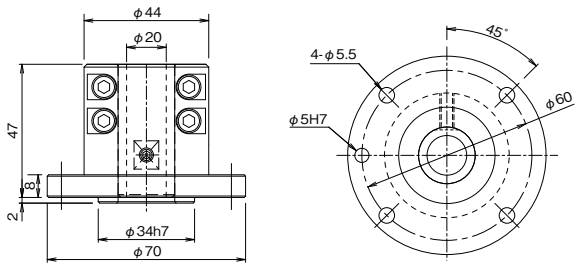
Name		Model
Protective flange for external wiring		IXA-PFL-EW-1
Side stay for Z-axis wiring	(Z-axis) 200ST	IXAW-SST-ZW-1
	(Z-axis) 400ST	IXAW-SST-ZW-2
Upper stay for Z-axis wiring	(Z-axis) 200ST	IXA-TST-ZW-1
	(Z-axis) 400ST	IXA-TST-ZW-2

Flange

Used to attach an object at the vertical arm tip.

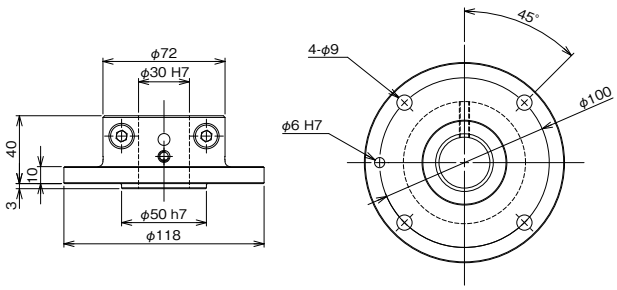
Single unit model number **IX-FL-1**

(Single unit mass 0.21kg/material aluminum)



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

(Single unit mass 2.0kg/material steel)



Metal cap for user wiring

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

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

(Single unit mass: 0.01kg, Material: zinc alloy (nickel plating)

Options

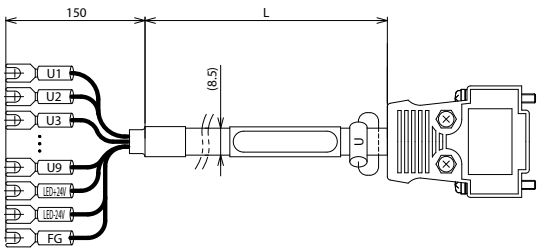
User cable

This user cable is connected to the D-sub connector for user wiring at the rear panel.

Single unit model number **CB-IXA-USR□□□-CS**

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

[Controller side] [Actuator side]



Tube code	Color	Signal	Pin No.
U1	Blue	U1	1
U2	White	U2	2
U3	Yellow	U3	3
U4	White	U4	4
U5	Green	U5	5
U6	White	U6	6
U7	Red	U7	7
U8	White	U8	8
U9	Purple	U9	9
—	—	—	10~13
LED+24V	Blue	LED+24V	14
LED+24V	Brown	LED+24V	15
FG	Black	FG	—

(White)

Pin No.	Signal	Signal	Tube code
1	U1	3	U
2	U2	5	
3	U3	4	
4	U4	10	
5	U5	9	
6	U6	15	
7	U7	1	
8	U8	6	
9	U9	11	
10~13	—	16	
14	LED+24V	21	
15	LED+24V	7	

Braided shield is clamped to the hood.

Single wire Soldered Braided Sheath

* Pins No. 14 and 15 are not used for the dust- & splash-proof specification.

Protective flange for external wiring

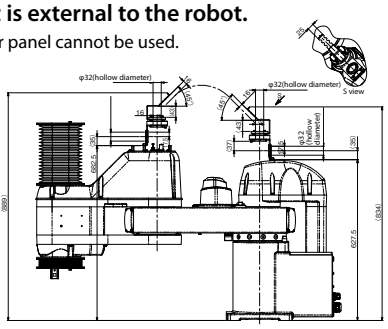
The flange is used to protect the wire that is external to the robot.

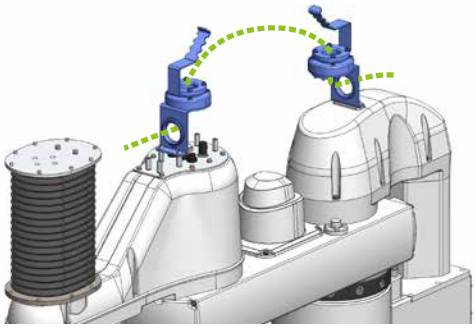
* When this option is used, the D-sub connector for user panel cannot be used.

Single unit model number **IXA-PLF-EW-1**

(Single unit mass 0.6kg/material aluminum, steel)

(Note) The model code represents one piece of a flange.
Please place an order for required quantity.





Side stay for Z-axis wiring

This Side Stay is for wiring at the Z-axis side without using the hollow part.

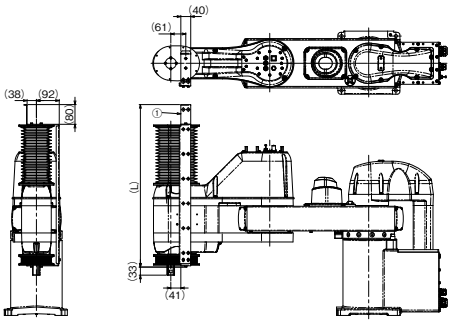
Single unit model number

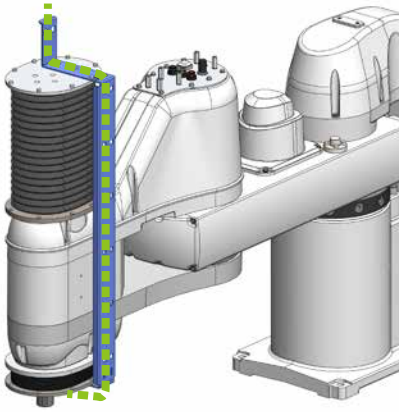
IXA-SST-ZW-1

(Z-axis stroke 200mm)
(Single unit mass 0.8kg / material steel)

IXA-SST-ZW-2

(Z-axis stroke 400mm)
(Single unit mass 0.9kg / material steel)



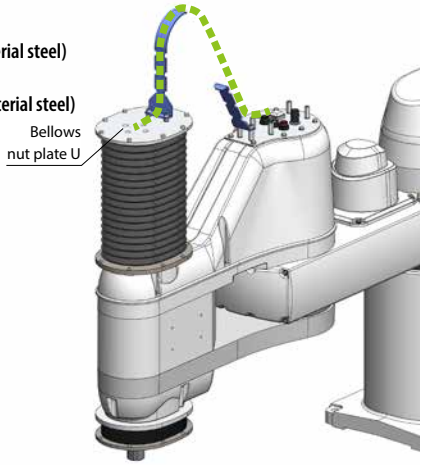


Upper stay for Z-axis wiring

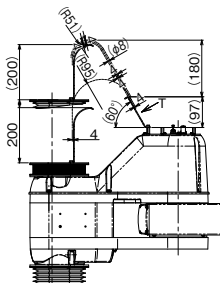
This is an auxiliary stay for wiring between the user panel and joint bracket U for Z·

Single unit model number **IXA-TST-ZW-1** **(Z-axis stroke 200mm) (Single unit mass 0.2kg/material steel)**

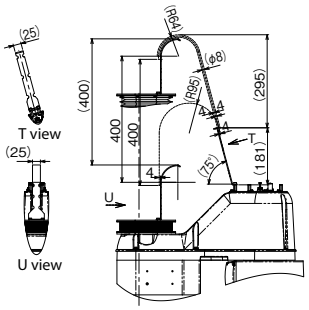
IXA-TST-ZW-2 **(Z-axis stroke 400mm) (Single unit mass 0.25kg/material steel)**



(Z-axis stroke 200mm)

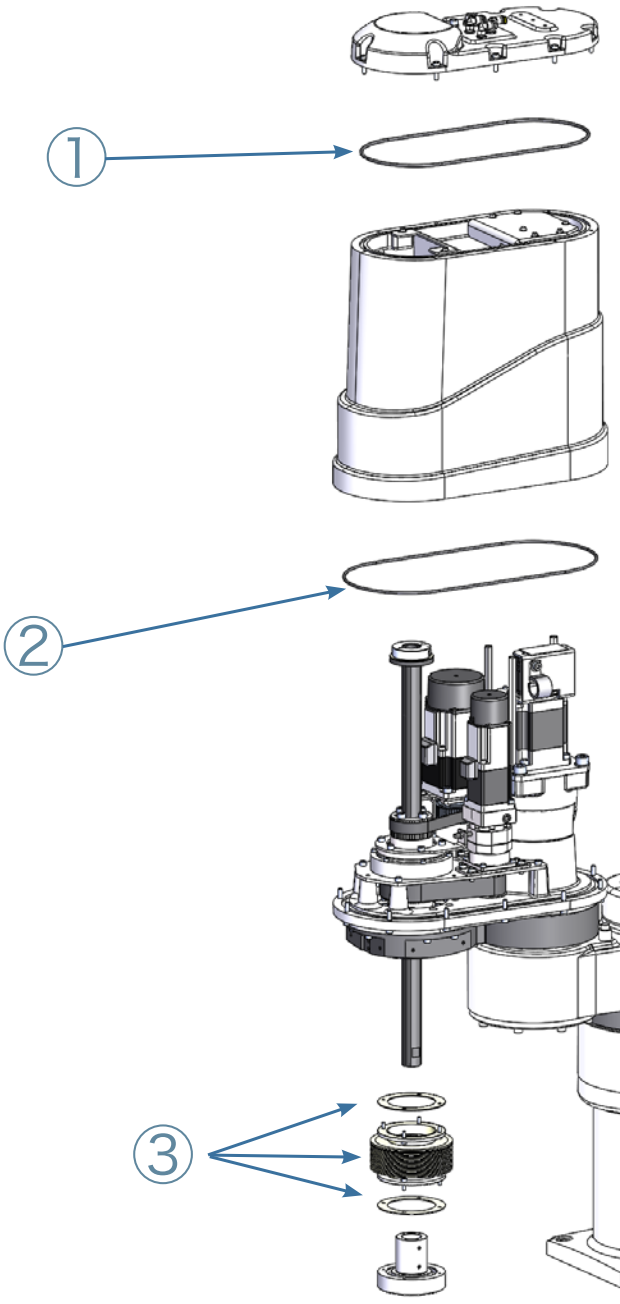


(Z-axis stroke 400mm)



Maintenance parts schematic drawing

IXA-4NSW3015



① O-ring (J2 axis spline cover)
② O-ring (J2 axis arm cover)
③ Bellows maintenance ASSY

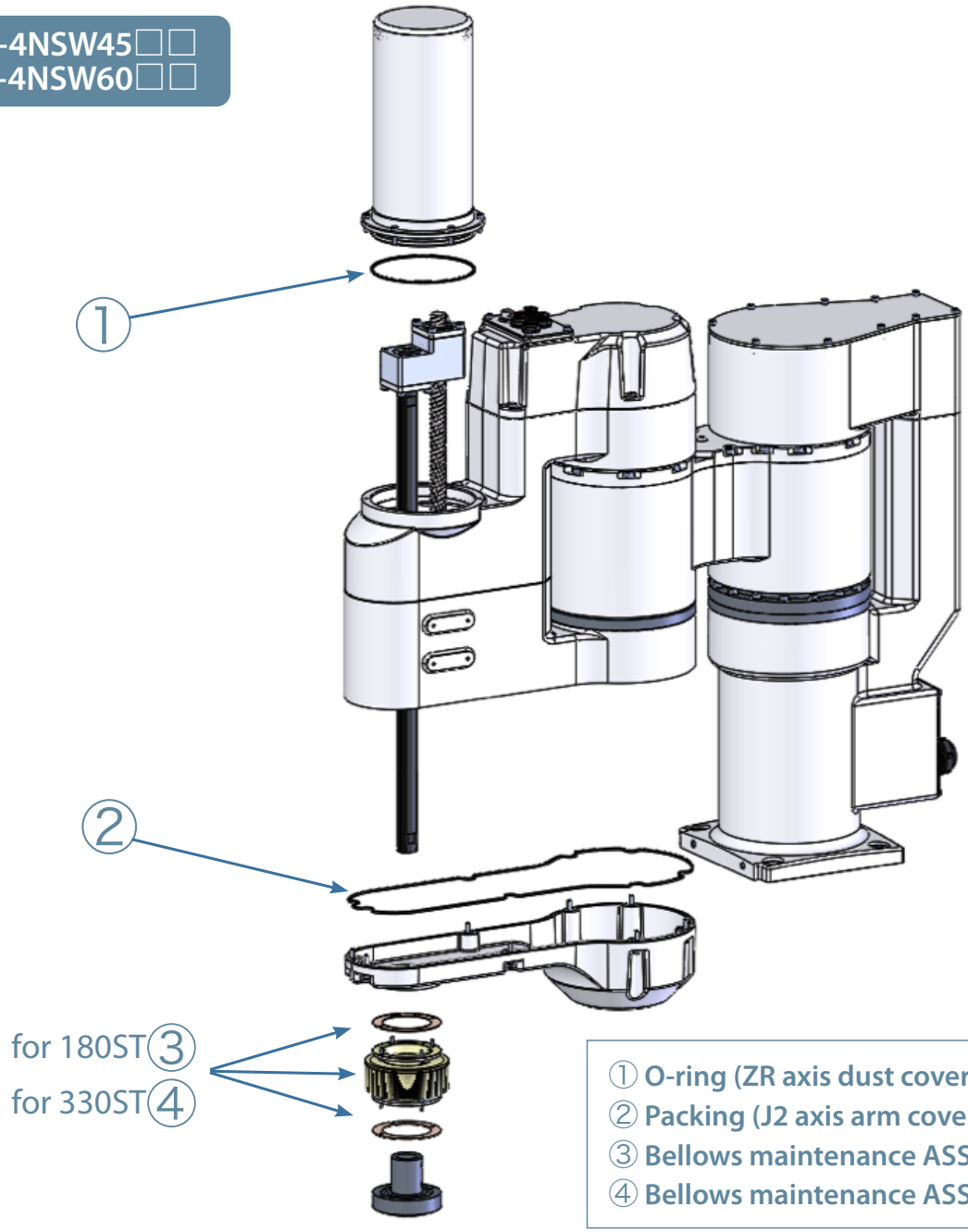
IXA maintenance parts model list

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

No.	Part name	Model	Remarks
①	O-ring (J2 axis spline cover)	IXAW-OR1-30-2	
②	O-ring (J2 axis arm cover)	IXAW-OR2-30-2	
③	Bellows maintenance ASSY	IXAW-JBA-304560-180	

Maintenance parts schematic drawing

IXA-4NSW45□□
IXA-4NSW60□□



① O-ring (ZR axis dust cover)
② Packing (J2 axis arm cover L)
③ Bellows maintenance ASSY (for 180ST)
④ Bellows maintenance ASSY (for 330ST)

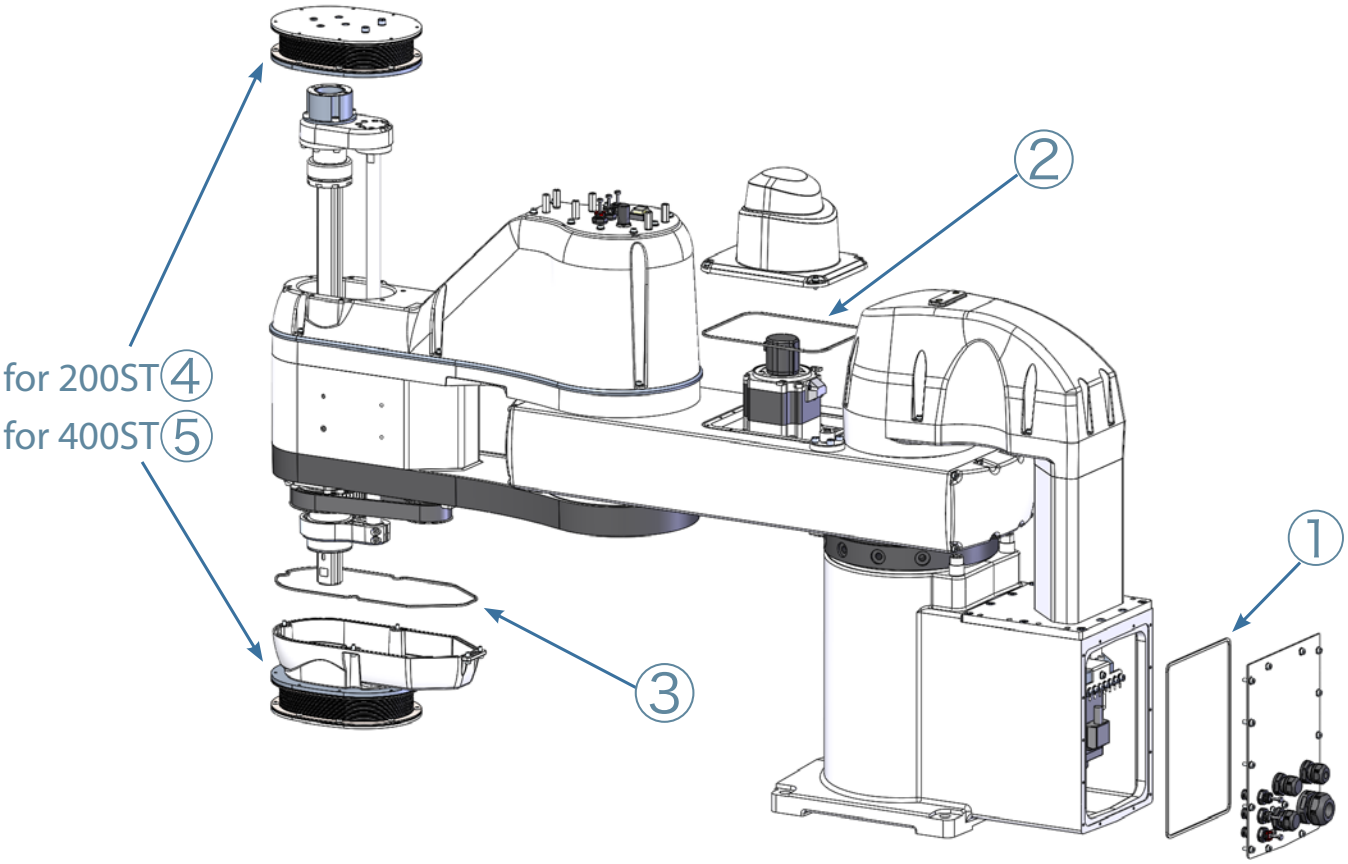
IXA maintenance parts model list

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

No.	Part name	Model	Remarks
①	O-ring (ZR axis dust cover)	IXAW-OR-4560-34	
②	Packing (J2 axis arm cover L)	IXAW-PK-4560-2	
③	Bellows maintenance ASSY	IXAW-JBA-304560-180	for Z-axis stroke 180mm
④	Bellows maintenance ASSY	IXAW-JBA-4560-330	for Z-axis stroke 330mm

Maintenance parts schematic drawing

IXA-4NSW80□□
IXA-4NSW100□□
IXA-4NHW12040



① Packing (external wiring panel)
② Packing (J2 axis arm cover)
③ Packing (J2 arm cover)
④ Bellows maintenance ASSY (for 200ST)
⑤ Bellows maintenance ASSY (for 400ST)

IXA maintenance parts model list

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

No.	Part name	Model	Remarks
①	Packing (external wiring panel)	IXAW-PK1-80100120	
②	Packing (J2 axis arm cover)	IXAW-PK2-80100120-2	
③	Packing (J2 arm cover)	IXAW-PK3-80100120-2	
④	Bellows maintenance ASSY	IXAW-JBA-80100120-200	for Z-axis stroke 200mm
⑤	Bellows maintenance ASSY	IXAW-JBA-80100120-400	for Z-axis stroke 400mm

X-SEL

SCARA Robot Program Controller

CE RoHS 10

Model

XSEL - [ ] - [ ] - [ ][ ] - [ ][ ] - [ ] - 3

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

Type

RAX4	3-axis speci cation SCARA + 1-axis/4-axis specification SCARA
SAX4	3-axis speci cation SCARA + 1-axis/4-axis specification SCARA Safety category specification

SCARA Robot Main Body Type

4NSW3015	IXA-4NSW3015
4NSW4518	IXA-4NSW4518
4NSW4533	IXA-4NSW4533
4NSW6018	IXA-4NSW6018
4NSW6033	IXA-4NSW6033
4NSW8020	IXA-4NSW8020
4NSW8040	IXA-4NSW8040
4NSW10020	IXA-4NSW10020
4NSW10040	IXA-4NSW10040
4NHW12040	IXA-4NHW12040

Network Dedicated Slot(s) (Slot 1)

E	Not used
EP	EtherNet/IP
EC	EtherCAT

Network Dedicated Slot(s) (Slot 2)

E	Not used
DV	DeviceNet
CC	CC-Link
CIE	CC-Link IE Field
PR	PROFIBUS-DP

*EP and CIE cannot be connected at the same time.

I/O Slot(s) (Slot 1) (Slot 2)

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)

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

I/O Cable Length

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

Power Supply Voltage

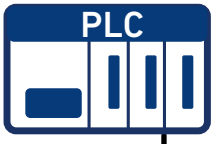
3	Three-phase 200V

Limitations on Additional Axis Connection

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

System Configuration

■XSEL-RAX/SAX Type



Field network
DeviceNet
CC-Link
CC-Link IE Field
PROFIBUS-DP
EtherCAT
EtherNet/IP

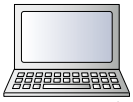
Options
PC dedicated teaching software
(See P. 48)
*Ⓟ=PC side,Ⓒ=Controller side
for XSEL-RAX
ⓅRS-232C–ⒸRS-232C
〈Model：IA-101-X-MW〉
ⓅUSB–ⒸRS-232C
〈Model：IA-101-X-USBMW〉
ⓅUSB–ⒸUSB/Ethernet
〈Model：IA-101-N〉
for XSEL-SAX
ⓅRS-232C–ⒸRS-232C
〈Model：IA-101-XA-MW〉
ⓅUSB–ⒸUSB/Ethernet
〈Model：IA-101-N〉

Options
Teaching pendant
(See P. 47)
〈Model：TB-02-□〉

Included with the controller
Dummy plug
(See P. 49)
〈Model：DP-2〉

Included with the controller
AC power connector
(See P. 49)
〈Model：GMSTB2.56-STF-7.62〉
〈Model：PC4/6-STF-7.62〉
for High capacity type controller

Included with the controller
PIO cable
(See P. 49)
〈Model：CB-X-PIO/PIOH020〉
Standard: 2m
(Included with the controller for PIO specification)



Included in the PC dedicated teaching software

Communication cable
〈Model：CB-ST-A2MW050-EB〉(for SAX)
〈Model：CB-ST-E1MW050-EB〉(for RAX)

Emergency stop switch

5m

USB/Ethernet cable (Cable is to be prepared by the customer)

Expanded motion
(Cable is to be prepared by the customer)

PCON/ACON/
SCON-CB
(MECHATROLINK-III specification)

Motor power Three-phase
AC200V／230V

Drive-source cutoff circuit
(To be prepared by the customer)

*Please contact IAI for more information regarding the drive-source cutoff circuit.

Control power supply Single phase
AC200V／230V

Brake release power supply
DC24V

*When connecting a power supply, be sure to install the following filters or equivalent
- Recommended noise filters
  Three-phase: TAC-20-683 (COSEL)
  Single phase: NBH-20-432 (COSEL)
  Please use the following three-phase noise filter for arm lengths 800/1000/1200:
  [Three-phase NF3030C-SV (Soshin Electric)]
- Recommended ring core
  ESD-R-25(NEC TOKIN)
- Recommended clamp filters
  For control power supply: ZCAT3035-1330 (TDK)
  For motor power supply: RFC-H13(Kitagawa Industries)
  Please use the following clamp filter for motor power supply for arm lengths 800/1000/1200: [E04SR401938 for motor power supply (SEIWA)]
- Recommended surge protectors
  Three-phase: R/A/V-781BXZ-4
  Single phase: R/A/V-781BWZ-2A(Okaya Electric Industries)

Included with the controller
Brake power connector
(See P. 49)
〈Model：FMC1.5/2-ST-3.5-RF〉

I/O power supply
DC24V

Included with the controller
System I/O short circuit connector
(See P. 49)
〈Model：FMC1.5/10-ST-3.5(XSEL)〉

Supplied with the regenerative resistance unit
Regenerative resistance unit cable 1m

Options **Regenerative resistance unit**
Refer to P.47 for the guideline of the required number of regenerative resistances.

●IXA Series

Specifications Table

Controller type	RAX type	SAX type
Compatible motor output	100W～1000W	
Number of controlled axes	1 to 4 axes: SCARA robot	
Max. output of connected axes	3-phase 2400W	3-phase 2400W / 3-phase 3600W（Arm length 800/1000/1200）
Control power input	Single phase AC200/230V ±10%	
Power frequency	50/60Hz	
Insulation resistance	10MΩor more (Between the power supply terminal and I/O terminal, and between the external terminal batch and case, at 500VDC)	
Withstand voltage	AC1500V (1 min)	
Power capacity (max)	4NSW3015：4259.1VA 4NSW45 □□：3998.9VA 4NSW60 □□：4160.3VA	4NSW3015：4259.1VA 4NSW45 □□：3998.9VA 4NSW60 □□：4160.3VA 4NSW80 □□：9315.2VA 4NSW100 □□：9315.2VA 4NHW12040：8388.8VA
Position detection method	Battery-less absolute	
Safety circuit conÿguration	Duplication not possible	Duplication allowed
Drive-source cutoff method	Internal relay cut-o	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	20,000 steps (total)	
No. of multi-tasking programs	16 programs	
Number of positions	36,666	
Data recording element	Flash ROM + non-volatile RAM (FRAM): system battery (button battery) not required	
Data input method	by teaching pendant or PC-compatible teaching 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 communica tion function	Teaching port (D-sub25 pin), USB port (Mini-B) 1ch RS232C port (D-sub 9 pin), Ethernet (RJ-45)	
Extended motion control function	Connectable up to 32 axes for the controllers that are compatible with MECHATROLINK-III of SCON-CA/CB, PCON-CB, ACON-CB, DCON-CB and MCON-C.	
Field network communication function	DeviceNet, CC-Link, CC-Link IE Field, PROFIBUS-DP, EtherNet/IP, EtherCAT	
Clock function	Retention time: about 10 days Charging time: about 100 hours	
Regenerative resistance	Built-in 1k /20W regenerative resistance (Can be expanded by external regenerative resistance unit connection)	
Protection function	Motor overcurrent, overload, motor driver temperature check, overload check, encoder disconnection de tection, soft limit over, system malfunction, absolute battery error, etc.	
Ambient operating temperature, humidity and ambience	0~40℃ , 5%-85%RH (Non-condensing, Non-freezing) , avoid corrosive gas and excessive dust	

The power source capacity and heat quantity

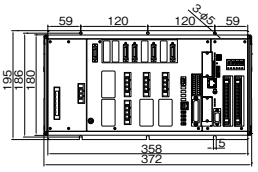
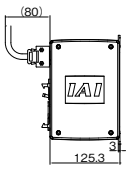
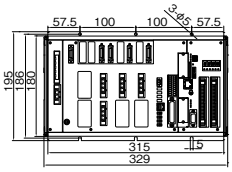
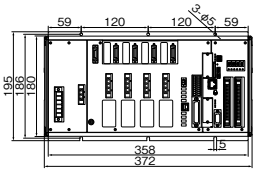
Calculate the power source capacity and heat quantity using the formula below.Refer to the instruction manual (MJ0359) for the power source capacity, power consumption and output loss of a SCARA robot.

Rated power capacity [VA] = Sum of motor power capacities [VA] + power consumption of the controller part [VA]
Heat quantity [W] = Sum of output loss [W] + (sum of internal consumption [VA] x 0.7 (efficiency) x 0.6 (power factor)

External Dimensions

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

CAD drawings can be downloaded from our website.
www.intelligentactuator.com
2D CAD

SCARA robot type	controller		Front View	Side View
	Type	Specification		
NSW3015 NSW45□□ NSW60□□	RAX	Three-phase specification		
	SAX	Three-phase specification		
NSW80□□ NSW100□□ NHW12040		Three-phase specification (high capacity type)		

Options

Regenerative resistance unit

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

Specifications

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

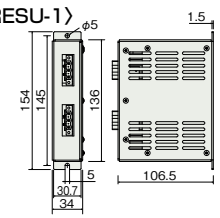
Description

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

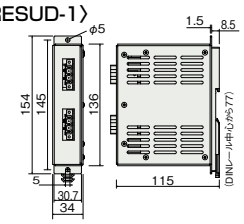
Installation criteria

Model		Required number of regenerative resistance units
NSW	3015	3pcs
	45□□	
	60□□	4pcs
	80□□	7pcs
	100□□	
NHW	12040	10pcs

〈RESU-1〉



〈RESUD-1〉

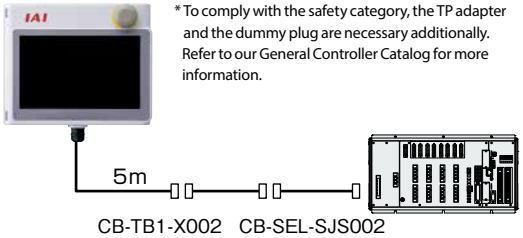


Touch Panel Teaching Pendant

Model **TB-02(D)-□**

Features

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



* To comply with the safety category, the TP adapter and the dummy plug are necessary additionally. Refer to our General Controller Catalog for more information.

Please contact IAI for the current supported versions

Specifications

Rated voltage	24V DC
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0 to 40℃
Ambient operating humidity	5%RH - 85%RH (non-condensing)
Environmental resistance	IP20
Weight	470g (TB-02 unit only)

PC dedicated teaching software

* Please purchase through your distributor and a download link will be sent to your valid email address.

Please contact IAI for the current supported versions

■for XSEL-RAX/SAX(Software)

Model **IA-101-N**

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

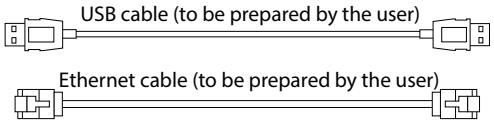
Description Software (Dwnload only), compatible Windows: 7/8/8.1/10

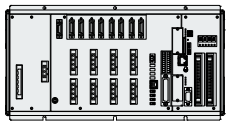
Notes

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

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

PC software
(Download Only)





■for XSEL-RAX(Software+Connection cable+Emergency Stop box)

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

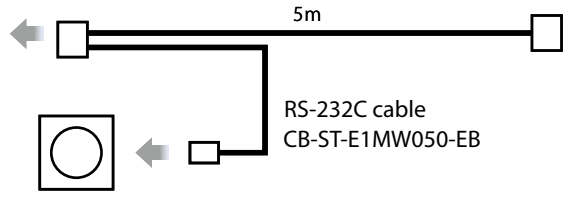
Description Software (Dwnload only), compatible Windows: 7/8/8.1/10

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

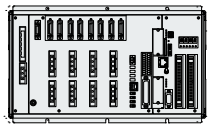
Notes

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

PC software
(Download Only)



Emergency stop box



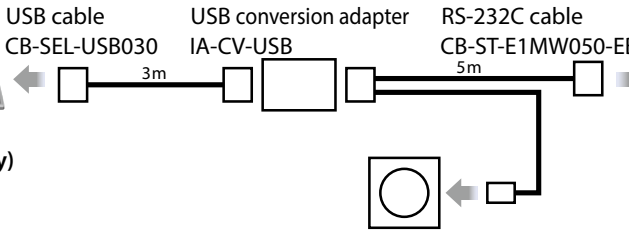
Compatible Windows : 7/8/8.1/10

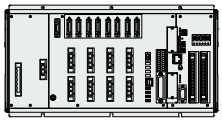
■for XSEL-RAX(Software+Connection cable+USB cable+USB conversion adapter+Emergency Stop box)

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.

PC software
(Download Only)





Compatible Windows : 7/8/8.1/10

■for XSEL-SAX(Software+Connection cable+Emergency Stop box) * Compliant with Safety Category 4.

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

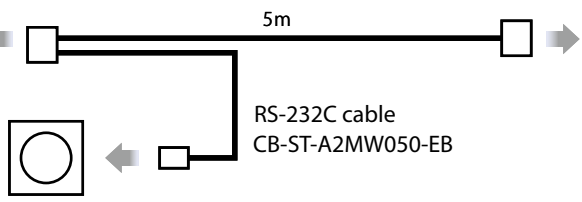
Features Start up supporting software that has program/position input, test operation and monitoring functions. Debugging functions are considerably improved, reducing start up time. The PC connection cable has a duplex circuit for emergency stop, which is compliant with the safety category 4.

Notes

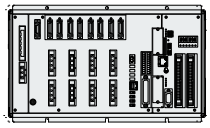
* Note that the model number for cable only is CB-ST-A2MW050, and that comes with a emergency stop box as a set is CB-ST-A2MW050-EB.

When a teaching tool is not used, attach a dummy plug DP-2, that is supplied with the controller, on the teaching connector.

PC software
(Download Only)



Emergency stop box



Compatible Windows : 7/8/8.1/10

Maintenance parts

These parts are included in the controller. If lost, individual parts can be purchased.

AC power connector

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

AC power connector

Model **PC4/6-STF-7.62**

for XSEL-SAX (high capacity type) controller

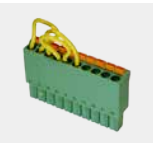
Dummy plug

Model **DP-2**

System I/O short circuit connector

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

Two are necessary for the main unit.



Brake power connector

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

Network connector

for DeviceNet

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

for CC-Link

Terminal resistance with 110Ω / 130Ω

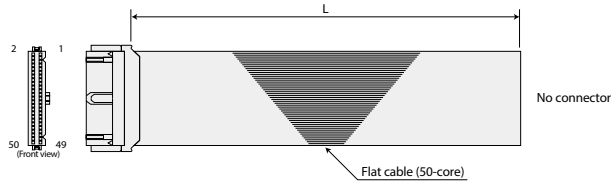
Model **MSTB2.5/5-STF-5.08AU**

NPN/PNP specification PIO flat cable

Supplied when I/O slot "N1/P1" or "N2/P2" and I/O cable length is specified.

Model: CB-X-PIO□□□

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



XG4M-5030-T(OMRON)

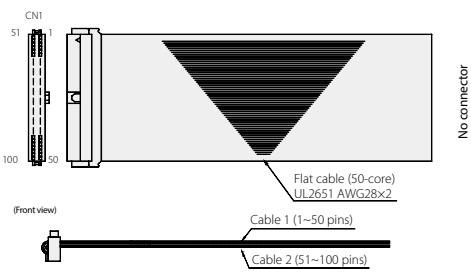
No.	Color	Wiring	No.	Color	Wiring	No.	Color	Wiring
1	Brown1	Flat cable (crimped)	18	Gray2	Flat cable (crimped)	35	Green4	Flat cable (crimped)
2	Red1		19	White2		36	Blue4	
3	Orange1		20	Black2		37	Purple4	
4	Yellow1		21	Brown−3		38	Gray4	
5	Green1		22	Red3		39	White4	
6	Blue1		23	Orange3		40	Black4	
7	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				

NPN/PNP specification multi-point PIO flat cable

Supplied when I/O slot "N3/P3" and cable length is specified.

Model: CB-X-PIOH□□□

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



HIF6-100D1.27R(HIROSE)

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

Maintenance parts

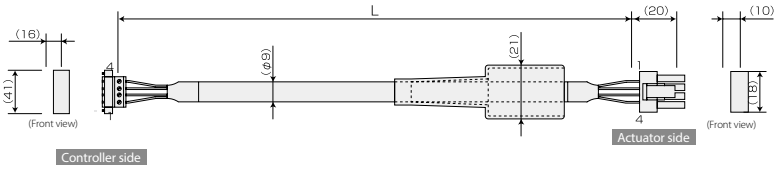
When ordering a cable for maintenance after purchase, refer to the model code below.
A cable model search system is recommended!
URL:https://www.iai-robot.co.jp/cablesearch/search.aspx

Table of applicable cables

Product model		Motor robot cable	Encoder robot cable	Brake cable
IXA	4NSW3015 4NSW45 □□ 4NSW60 □□	CB-X-MA □□□	CB-X1-PA □□□	CB-IXA-BK □□□ -3
	4NSW80 □□ 4NSW100 □□ 4NHW12040	CB-X-MA □□□ (1st Axis : CB-XMC-MA □□□)		

Model: CB-X-MA□□□

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



GIC2.5/4-STF-7.62 (Phoenix)

Wiring	Color	Signal	
0.75sq	Green	PE	1
	Red	U	2
	White	V	3
	Black	W	4

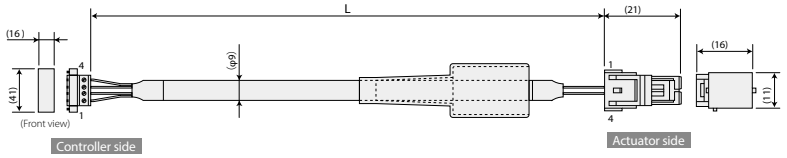
SLP-04V (JST)

	Signal	Color	Wiring
1	U	Red	0.75sq (Crimped)
2	V	White	
3	W	Black	
4	PE	Green	

Minimum bending radius r = 51mm or more (Dynamic bending condition)
* Only the robot cable is available for this model.

Model: CB-XMC-MA□□□

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



GIC2.5/4-STF-7.62 (Phoenix)

Wiring	Color	Signal	No.
1.25sq	Green	PE	1
	Red	U	2
	White	V	3
	Black	W	4

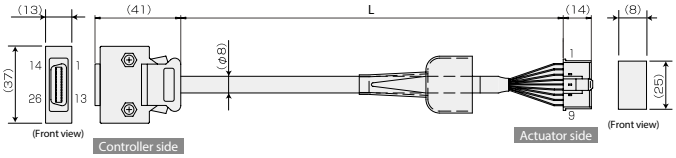
YLP-04V (JST)

No.	Signal	Color	Wiring
1	U	Red	1.25sq (Crimped)
2	V	White	
3	W	Black	
4	PE	Green	

Minimum bending radius r = 55mm or more (Dynamic bending condition)
* Only the robot cable is available for this model.

Model: CB-X1-PA□□□

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



Minimum bending radius r = 44mm or more (Dynamic bending condition)
* Only the robot cable is available for this model.

10126-3000PE (Sumitomo 3M)

Wiring	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

Shield is clamp connected to the hood

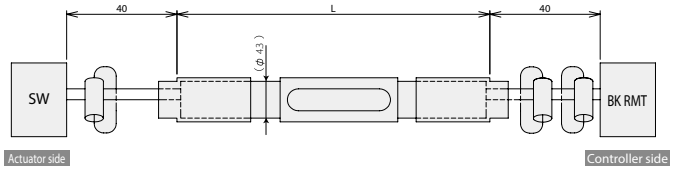
XMP-09V (JST)

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

Ground wire and braided shield

Model: CB-IXA-BK□□□-3

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



DF3-3S-2C (HIROSE)

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

1-1827862-5 (AMP)

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

Sheath

Catalog No. CE0400-1A (2022OCT)

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