IAI
Quality and Innovation

Ultra Compact SCARA Robot
Ultra Compact Cleanroom SCARA Robot

IX-NNN / NNC

Arm Length 120 mm / 150 mm / 180 mm

A Palm-Sized Unit Capable of Driving a Maximum Payload of 1 kg

New models of 180-mm arm length and cleanroom specification were added to the lineup, further extending the utility and applications of the IX-NNN/NNC series.

Features

Standard and cleanroom specifications are available in three arm lengths of 120 mm, 150 mm and 180 mm.

Optional connector-type cables for connection between the controller and actuator

The motor/encoder cables can be specified as connector types (optional) for added ease of handling and replacement.

Compact size ideal for installation in limited space

A maximum work envelope of 360 mm can be ensured in a small installation space of 47 (W) x 132 (D) mm, enabling substantial size reduction of your production line.

Ultra-compact size yet powerful - Offering rated and maximum load capacities of 0.2 kg and 1 kg, respectively (*1)

Despite their small size, a 0.2-kg load can be transferred at high speed. If the acceleration is reduced, a load of up to 1 kg can be transferred.

(*1) The rated load capacity indicates the maximum weight that can be operated at the maximum speed and rated continuous acceleration. The maximum load capacity indicates the maximum weight that can be transferred at lower speed and acceleration.

High-speed performance achieving a cycle time (*2) of 0.35 second

The dynamic performance and highly rigid body ensures outstanding high-speed performance that is among the best in its class.

(*2) The cycle time was measured on the IX-NNN1205 based on reciprocating movements over a horizontal distance of 100 mm and vertical distance of 25 mm, carrying a 0.2-kg load.

Model List

Arm length (mm)	Type	Load capacity		Model	Applicable page
		Rated (kg)	Maximum (kg)		
120	Standard specification	0.2	1.0	IX-NNN1205 -①-T2-②	→P2
	Cleanroom specification			IX-NNC1205 -①-T2-②	→P5
150	Standard specification			IX-NNN1505 -①-T2-②	→P3
	Cleanroom specification			IX-NNC1505 -①-T2-②	→P6
180	Standard specification			IX-NNN1805 -①-T2-②	→P4
	Cleanroom specification			IX-NNC1805 -①-T2-②	→P7

① and ② indicate the cable length and option(s), respectively.

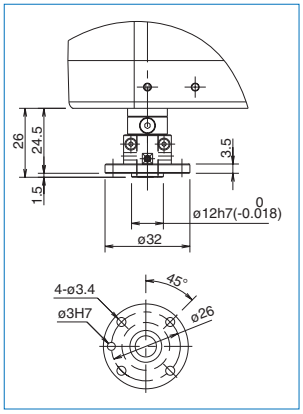
Maintenance Parts

Flange

Model : IX - FL - 4

Use this flange to install a load on the Z-axis shaft (weight: 12 g).

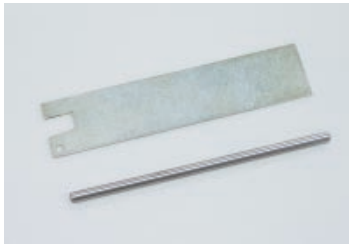
Applicable models:
IX-NNN1205/1505/1805
IX-NNC1205/1505/1805



Absolute Reset Adjustment Jig

Model: JG-5 (For arm length 120/150/180)

Use this adjustment jig to perform an absolute reset if the absolute data stored in the encoder was lost.



Absolute Data Backup Battery (Replacement Battery)

Model: AB-6 (For arm length 120/150/180)

This absolute data backup battery allows the current position to be retained even after the power is cut off. (One battery is shipped with the actuator as a standard accessory.)

Note on Use

If the load on the Z-axis is within the rated load capacity (0.2 kg), the Z-axis will not drop even after the power is cut off. If the rated load capacity is exceeded, however, the Z-axis may drop when the power is cut off or an emergency stop is actuated. If the Z-axis will be carrying a large load, specify a z-axis brake (optional).

IX-NNN1205

Ultra Compact SCARA Robot: Standard Type, Arm Length 120mm, Vertical Axis 50mm

■Model specification items

IX	—	NNN1205	—	☐	—	T2	—	☐
Series		Type		Cable length		Applicable controller		Option(s)
		Standard type Arm length 120mm Vertical axis 50mm		3L: 3m (standard) 5L: 5m		XSEL-PX/QX		(Blank): No option B: Z-axis brake JY: Connector-type cable

Model/Specifications

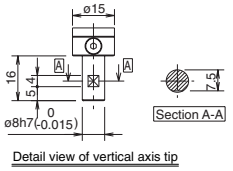
Model	Axis configuration		Arm length (mm)	Motor capacity (W)	Work envelope	Positioning repeatability (mm)	Maximum operating speed (Note 1)	Cycle time (sec) (Note 2)	Load capacity (kg) (Note 3)		Axis 3 push thrust (N)		Axis 4 allowable load	
									Rated	Maximum	Push motion (Note 4)	Maximum thrust (Note 4)	Allowable inertial moment (kg•m²) (Note 5)	Allowable torque (N•m)
IX-NNN1205-☐-T2-☐	Axis 1	Arm 1	45	12	±115°	±0.005 (XY)	2053mm/s (composite speed)	0.35	0.2	1.0	9.8	17.8	0.000386	0.13
	Axis 2	Arm 2	75	12	±145°									
	Axis 3	Vertical axis	–	12	50mm	±0.010	720mm/s							
	Axis 4	Rotating axis	–	60	±360°	±0.005	1800°/s							

Common Specifications

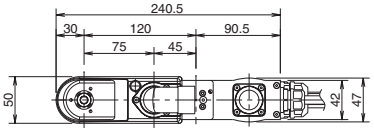
Encoder type	Absolute
User wiring	8-core, AWG26 cable with shield / Connector: SMP-08V-NC (JST)
User piping	Air tube (outer diameter ø3/inner diameter ø2) x 2 (normal working pressure 0.7MPa)
Alarm indicator (Note 6)	Small red LED indicator x 1 (24-VDC power supply required)

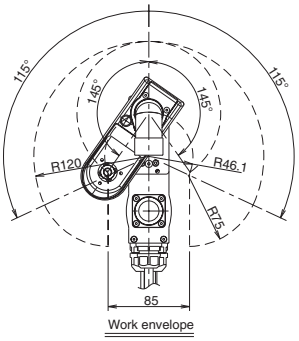
Ambient temperature/humidity	Temperature 0~40°C, humidity 20~85%RH or less (non-condensing)
Weight	2.7kg
Cable length	3L : 3m 5L : 5m

Dimensions

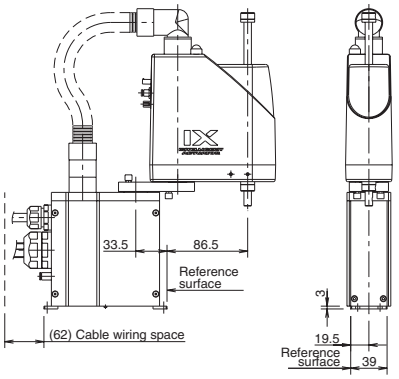


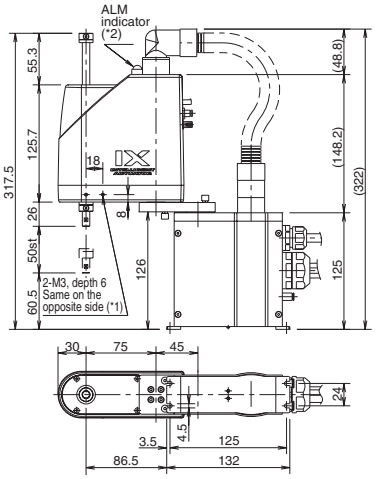
Detail view of vertical axis tip

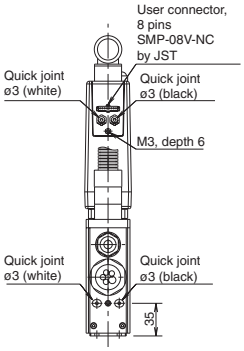




Work envelope







*1: The 2-M3, depth 6 extends through the arm.
If the mounting screw is too long, the tip of the screw will contact the internal mechanism parts. Exercise caution.
*2: For the ALM indicator to illuminate, the customer must provide a circuit that receives signals from the controller's I/O output and applies 24 VDC to the LED terminal in the user wiring connector.

Applicable Controller Specifications

Applicable controller	Feature	Maximum I/O points (input/output)	Power-supply voltage	Page
XSEL-PX	Able to control SCARA + 2 axes	192 points /192 points	Three-phase 200VAC	→P8
XSEL-QX	Conforming to safety category 4			

Caution

(Note 1) Based on PTP operation. In CP operation, the maximum speed is limited.
(Note 2) The cycle time is based on reciprocating movements over a horizontal distance of 100 mm and vertical distance of 25 mm, carrying a 0.2-kg load.
(Note 3) The rated load capacity indicates the maximum weight that can be operated at the maximum speed and rated continuous acceleration. The maximum load capacity indicates the maximum weight that can be transferred at lower speed and acceleration.
(Note 4) The value under "Push motion" indicates the thrust generated when a push command is executed from a program. The value under "Maximum thrust" indicates the maximum thrust during normal positioning operation.
(Note 5) An equivalent allowable inertial moment at the center of rotation of axis 4. The offset from the center of rotation of axis 4 to the gravity center of the tool must not exceed 17.5 mm.
(Note 6) For the ALM indicator to operate, the customer must provide a circuit that receives signals from an I/O output, etc., and applies 24 VDC to the LED terminal in the user wiring connector.

IX-NNN1505

Ultra Compact SCARA Robot: Standard Type, Arm Length 150mm, Vertical Axis 50mm

■Model specification items

IX	—	NNN1505	—	☐	—	T2	—	☐
Series		Type		Cable length		Applicable controller		Option(s)
		Standard type Arm length 150mm Vertical axis 50mm		3L: 3m (standard) 5L: 5m		XSEL-PX/QX		(Blank): No option B: Z-axis brake JY: Connector-type cable

Model/Specifications

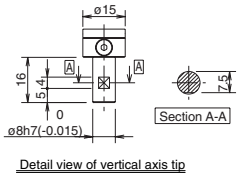
Model	Axis configuration		Arm length (mm)	Motor capacity (W)	Work envelope	Positioning repeatability (mm)	Maximum operating speed (Note 1)	Cycle time (sec) (Note 2)	Load capacity (kg) (Note 3)		Axis 3 push thrust (N)		Axis 4 allowable load	
									Rated	Maximum	Push motion (Note 4)	Maximum thrust (Note 4)	Allowable inertial moment (kg • m²) (Note 5)	Allowable torque (N • m)
IX-NNN1505-☐-T2-☐	Axis 1	Arm 1	75	12	±125°	±0.005 (XY)	2304mm/s (composite speed)	0.35	0.2	1.0	9.8	17.8	0.000386	0.13
	Axis 2	Arm 2	75	12	±145°									
	Axis 3	Vertical axis	–	12	50mm	±0.010	720mm/s							
	Axis 4	Rotating axis	–	60	±360°	±0.005	1800°/s							

Common Specifications

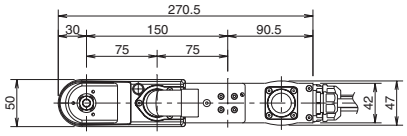
Encoder type	Absolute
User wiring	8-core, AWG26 cable with shield / Connector: SMP-08V-NC (JST)
User piping	Air tube (outer diameter ø3/inner diameter ø2) x 2 (normal working pressure 0.7MPa)
Alarm indicator (Note 6)	Small red LED indicator x 1 (24-VDC power supply required)

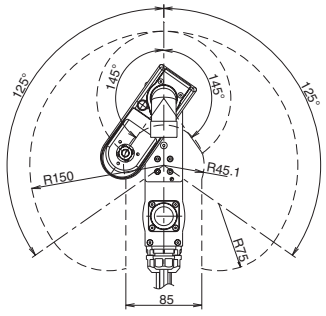
Ambient temperature/humidity	Temperature 0~40°C, humidity 20~85%RH or less (non-condensing)
Weight	2.7kg
Cable length	3L : 3m 5L : 5m

Dimensions

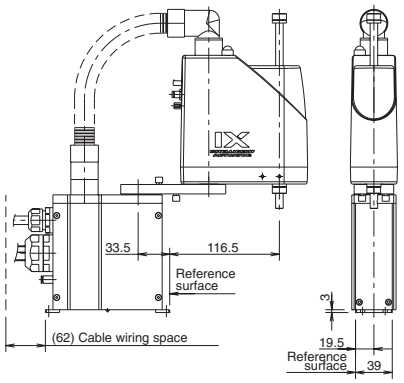


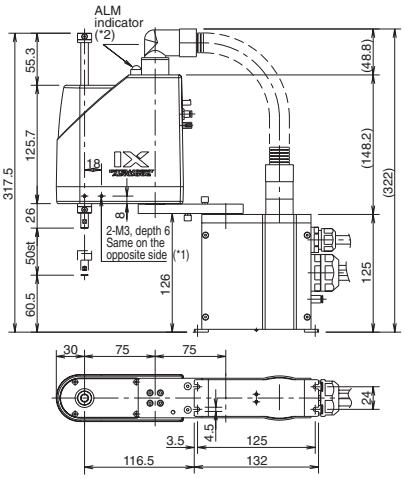
Detail view of vertical axis tip

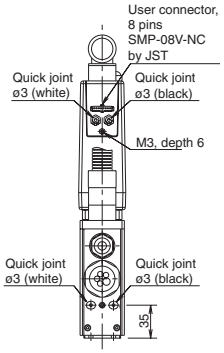




Work envelope







*1: The 2-M3, depth 6 extends through the arm.
If the mounting screw is too long, the tip of the screw will contact the internal mechanism parts. Exercise caution.
*2: For the ALM indicator to illuminate, the customer must provide a circuit that receives signals from the controller's I/O output and applies 24 VDC to the LED terminal in the user wiring connector.

Applicable Controller Specifications

Applicable controller	Feature	Maximum I/O points (input/output)	Power-supply voltage	Page
XSEL-PX	Able to control SCARA + 2 axes	192 points /192 points	Three-phase 200VAC	→P8
XSEL-QX	Conforming to safety category 4			

Caution

(Note 1) Based on PTP operation. In CP operation, the maximum speed is limited.
(Note 2) The cycle time is based on reciprocating movements over a horizontal distance of 100 mm and vertical distance of 25 mm, carrying a 0.2-kg load.
(Note 3) The rated load capacity indicates the maximum weight that can be operated at the maximum speed and rated continuous acceleration. The maximum load capacity indicates the maximum weight that can be transferred at lower speed and acceleration.
(Note 4) The value under "Push motion" indicates the thrust generated when a push command is executed from a program. The value under "Maximum thrust" indicates the maximum thrust during normal positioning operation.
(Note 5) An equivalent allowable inertial moment at the center of rotation of axis 4. The offset from the center of rotation of axis 4 to the gravity center of the tool must not exceed 17.5 mm.
(Note 6) For the ALM indicator to operate, the customer must provide a circuit that receives signals from an I/O output, etc., and applies 24 VDC to the LED terminal in the user wiring connector.

IX-NNN1805

Ultra Compact SCARA Robot: Standard Type, Arm Length 180mm, Vertical Axis 50mm

■Model specification items **IX** — **NNN1805** — □ — **T2** — □

Series	Type	Cable length	Applicable controller	Option(s)
IX	Standard type Arm length 180mm Vertical axis 50mm	3L: 3m (standard) 5L: 5m	XSEL-PX/QX	(Blank): No option B: Z-axis brake JY: Connector-type cable

Model/Specifications

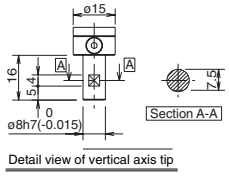
Model	Axis configuration		Arm length (mm)	Motor capacity (W)	Work envelope	Positioning repeatability (mm)	Maximum operating speed (Note 1)	Cycle time (sec) (Note 2)	Load capacity (kg) (Note 3)		Axis 3 push thrust (N)		Axis 4 allowable load	
									Rated	Maximum	Push motion (Note 4)	Maximum thrust (Note 4)	Allowable inertial moment (kg•m²) (Note 5)	Allowable torque (N•m)
IX-NNN1805-□-T2-□	Axis 1	Arm 1	105	12	±125°	±0.010 (XY)	2555mm/s (composite speed)	0.38	0.2	1.0	9.8	17.8	0.000386	0.13
	Axis 2	Arm 2	75	12	±145°									
	Axis 3	Vertical axis	–	12	50mm	±0.010	720mm/s							
	Axis 4	Rotating axis	–	60	±360°	±0.005	1800°/s							

Common Specifications

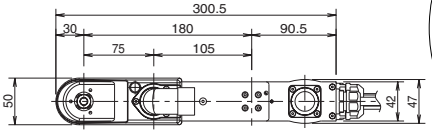
Encoder type	Absolute
User wiring	8-core, AWG26 cable with shield / Connector: SMP-08V-NC (JST)
User piping	Air tube (outer diameter ø3/inner diameter ø2) x 2 (normal working pressure 0.7MPa)
Alarm indicator (Note 6)	Small red LED indicator x 1 (24-VDC power supply required)

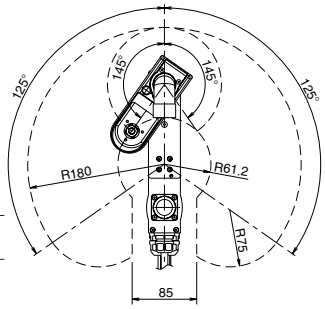
Ambient temperature/humidity	Temperature 0~40°C, humidity 20~85%RH or less (non-condensing)
Weight	3.0kg
Cable length	3L : 3m 5L : 5m

Dimensions

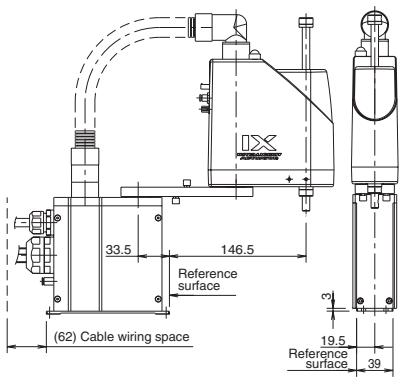


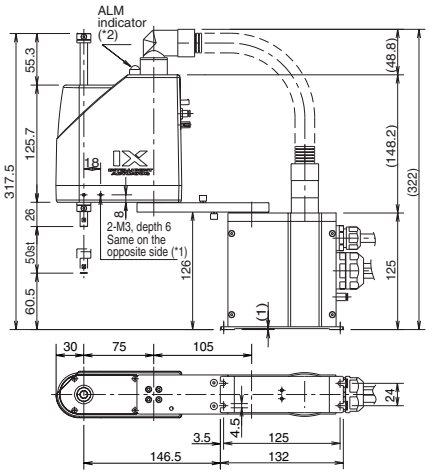
Detail view of vertical axis tip

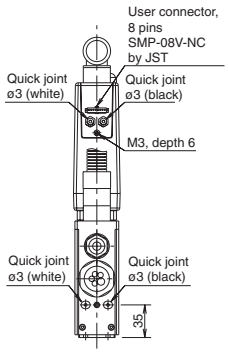




Work envelope







*1: The 2-M3, depth 6 extends through the arm.
If the mounting screw is too long, the tip of the screw will contact the internal mechanism parts. Exercise caution.
*2: For the ALM indicator to illuminate, the customer must provide a circuit that receives signals from the controller's I/O output and applies 24 VDC to the LED terminal in the user wiring connector.

Applicable Controller Specifications

Applicable controller	Feature	Maximum I/O points (input/output)	Power-supply voltage	Page
XSEL-PX	Able to control SCARA + 2 axes	192 points /192 points	Three-phase 200VAC	→P8
XSEL-QX	Conforming to safety category 4			

Caution

(Note 1) Based on PTP operation. In CP operation, the maximum speed is limited.
(Note 2) The cycle time is based on reciprocating movements over a horizontal distance of 100 mm and vertical distance of 25 mm, carrying a 0.2-kg load.
(Note 3) The rated load capacity indicates the maximum weight that can be operated at the maximum speed and rated continuous acceleration. The maximum load capacity indicates the maximum weight that can be transferred at lower speed and acceleration.
(Note 4) The value under "Push motion" indicates the thrust generated when a push command is executed from a program. The value under "Maximum thrust" indicates the maximum thrust during normal positioning operation.
(Note 5) An equivalent allowable inertial moment at the center of rotation of axis 4. The offset from the center of rotation of axis 4 to the gravity center of the tool must not exceed 17.5 mm.
(Note 6) For the ALM indicator to operate, the customer must provide a circuit that receives signals from an I/O output, etc., and applies 24 VDC to the LED terminal in the user wiring connector.

IX-NNC1205

Ultra Compact SCARA Robot: Cleanroom Type, Arm Length 120mm, Vertical Axis 50mm

■Model specification items

IX	—	NNC1205	—	☐	—	T2	—	☐
Series		Type		Cable length		Applicable controller		Option(s)
		Cleanroom type Arm length 120mm Vertical axis 50mm		3L: 3m (standard) 5L: 5m		XSEL-PX/QX		(Blank): No option B: Z-axis brake JY: Connector-type cable

* Refer to the cover for the details of model specification items.

Model/Specifications

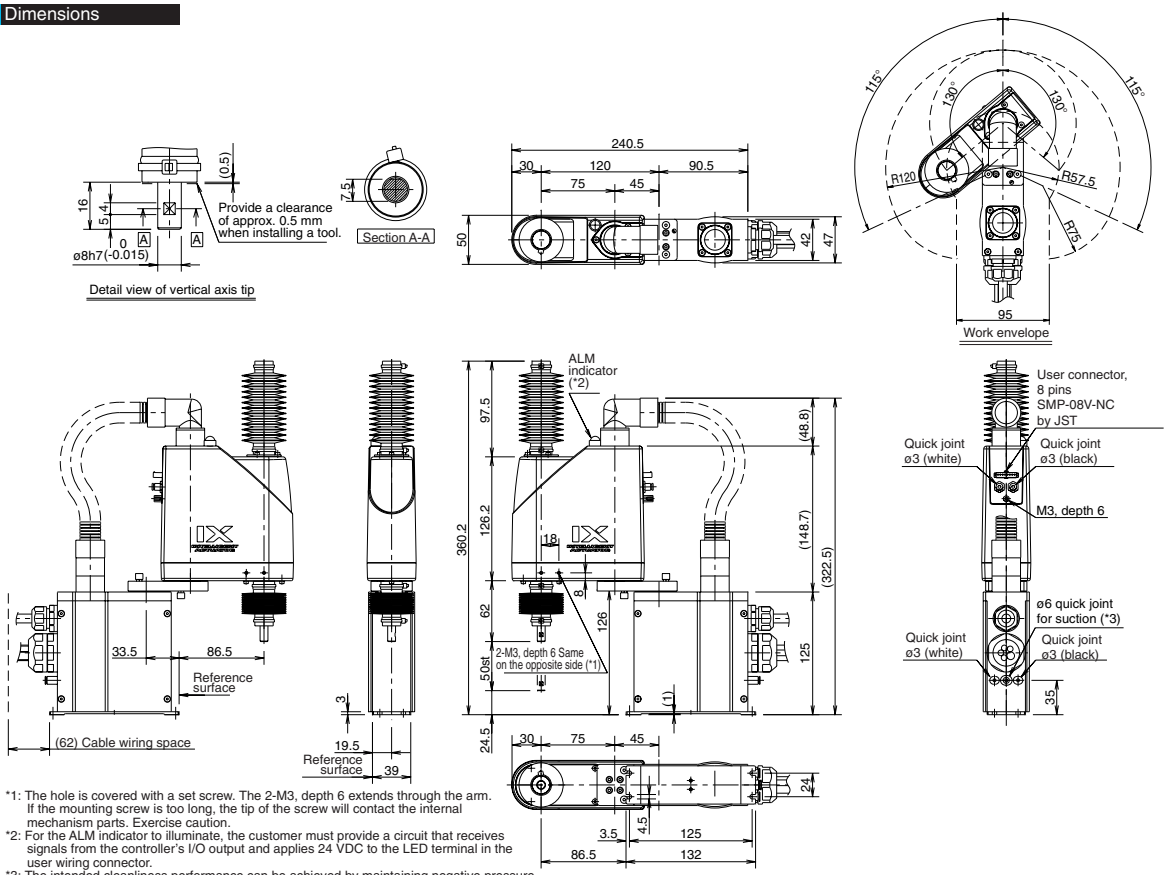
Model	Axis configuration		Arm length (mm)	Motor capacity (W)	Work envelope	Positioning repeatability (mm)	Maximum operating speed (Note 1)	Cycle time (sec) (Note 2)	Load capacity (kg) (Note 3)		Axis 3 push thrust (N)		Axis 4 allowable load	
									Rated	Maximum	Push motion (Note 4)	Maximum thrust (Note 4)	Allowable inertial moment (kg • m²) (Note 5)	Allowable torque (N • m)
IX-NNC1205-☐-T2-☐	Axis 1	Arm 1	45	12	±115°	±0.005 (XY)	2053mm/s (composite speed)	0.38	0.2	1.0	9.8	17.8	0.000386	0.13
	Axis 2	Arm 2	75	12	±130°									
	Axis 3	Vertical axis	–	12	50mm	±0.010	720mm/s							
	Axis 4	Rotating axis	–	60	±360°	±0.005	1800°/s							

Common Specifications

Encoder type	Absolute
User wiring	8-core, AWG26 cable with shield / Connector: SMP-08V-NC (JST)
User piping	Air tube (outer diameter ø3/inner diameter ø2) x 2 (normal working pressure 0.7MPa)
Alarm indicator (Note 6)	Small red LED indicator x 1 (24-VDC power supply required)
Suction pipe joint	Quick pipe joint, accepting tube of outer diameter ø6

Suction rate	90NL/min
Cleanliness level	Conforming to class 10
Ambient temperature/humidity	Temperature 0~40°C, humidity 20~85%RH or less (non-condensing)
Weight	2.8kg
Cable length	3L : 3m 5L : 5m

Dimensions



*1: The hole is covered with a set screw. The 2-M3, depth 6 extends through the arm. If the mounting screw is too long, the tip of the screw will contact the internal mechanism parts. Exercise caution.
*2: For the ALM indicator to illuminate, the customer must provide a circuit that receives signals from the controller's I/O output and applies 24 VDC to the LED terminal in the user wiring connector.
*3: The intended cleanliness performance can be achieved by maintaining negative pressure inside the robot via suction from the suction joint. (Dust will generate if internal air is not suctioned.)

Applicable Controller Specifications

Applicable controller	Feature	Maximum I/O points (input/output)	Power-supply voltage	Page
XSEL-PX	Able to control SCARA + 2 axes	192 points /192 points	Three-phase 200VAC	→ P8
XSEL-QX	Conforming to safety category 4			

Caution

(Note 1) Based on PTP operation. In CP operation, the maximum speed is limited.
(Note 2) The cycle time is based on reciprocating movements over a horizontal distance of 100 mm and vertical distance of 25 mm, carrying a 0.2-kg load.
(Note 3) The rated load capacity indicates the maximum weight that can be operated at the maximum speed and rated continuous acceleration. The maximum load capacity indicates the maximum weight that can be transferred at lower speed and acceleration.
(Note 4) The value under "Push motion" indicates the thrust generated when a push command is executed from a program. The value under "Maximum thrust" indicates the maximum thrust during normal positioning operation.
(Note 5) An equivalent allowable inertial moment at the center of rotation of axis 4. The offset from the center of rotation of axis 4 to the gravity center of the tool must not exceed 17.5 mm.
(Note 6) For the ALM indicator to operate, the customer must provide a circuit that receives signals from an I/O output, etc., and applies 24 VDC to the LED terminal in the user wiring connector.

IX-NNC1505

Ultra Compact SCARA Robot: Cleanroom Type, Arm Length 150mm, Vertical Axis 50mm

■Model specification items **IX** — **NNC1505** — □ — **T2** — □

Series	Type	Cable length	Applicable controller	Option(s)
IX	Cleanroom type Arm length 150mm Vertical axis 50mm	3L: 3m (standard) 5L: 5m	XSEL-PX/QX	(Blank): No option B: Z-axis brake JY: Connector-type cable

* Refer to the cover for the details of model specification items.

Model/Specifications

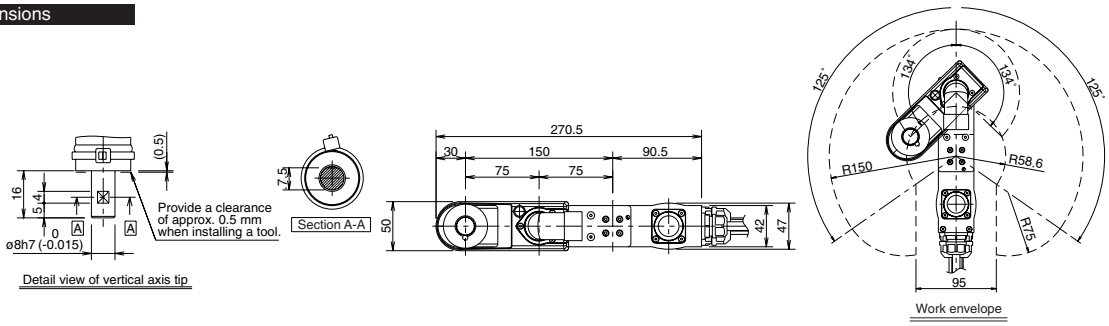
Model	Axis configuration		Arm length (mm)	Motor capacity (W)	Work envelope	Positioning repeatability (mm)	Maximum operating speed (Note 1)	Cycle time (sec) (Note 2)	Load capacity (kg) (Note 3)		Axis 3 push thrust (N)		Axis 4 allowable load	
									Rated	Maximum	Push motion (Note 4)	Maximum thrust (Note 4)	Allowable inertial moment (kg•m²) (Note 5)	Allowable torque (N•m)
IX-NNC1205-□-T2-□	Axis 1	Arm 1	75	12	±125°	±0.005 (XY)	2304mm/s (composite speed)	0.38	0.2	1.0	9.8	17.8	0.000386	0.13
	Axis 2	Arm 2	75	12	±134°									
	Axis 3	Vertical axis	–	12	50mm	±0.010	720mm/s							
	Axis 4	Rotating axis	–	60	±360°	±0.005	1800°/s							

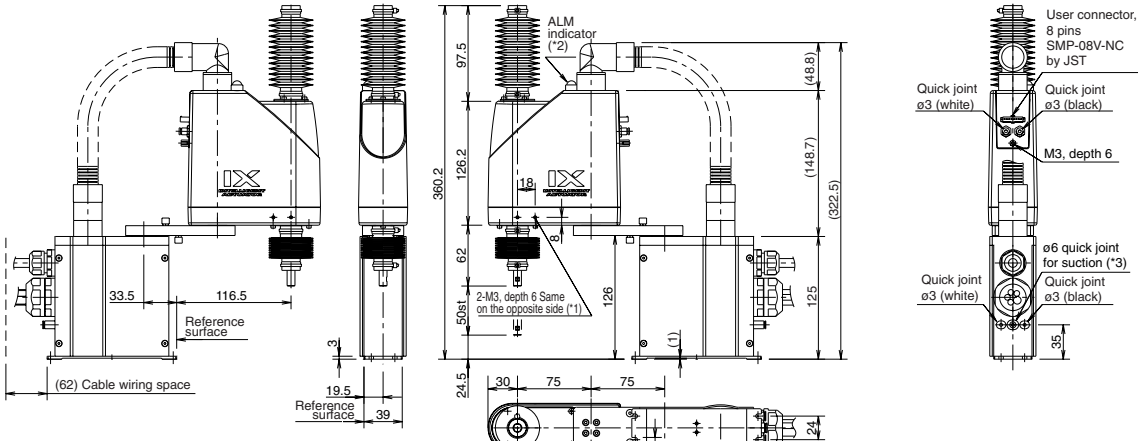
Common Specifications

Encoder type	Absolute
User wiring	8-core, AWG26 cable with shield / Connector: SMP-08V-NC (JST)
User piping	Air tube (outer diameter ø3/inner diameter ø2) x 2 (normal working pressure 0.7MPa)
Alarm indicator (Note 6)	Small red LED indicator x 1 (24-VDC power supply required)
Suction pipe joint	Quick pipe joint, accepting tube of outer diameter ø6

Suction rate	90NL/min
Cleanliness level	Conforming to class 10
Ambient temperature/humidity	Temperature 0~40°C, humidity 20~85%RH or less (non-condensing)
Weight	2.8kg
Cable length	3L : 3m 5L : 5m

Dimensions





*1: The hole is covered with a set screw. The 2-M3, depth 6 extends through the arm. If the mounting screw is too long, the tip of the screw will contact the internal mechanism parts. Exercise caution.
*2: For the ALM indicator to illuminate, the customer must provide a circuit that receives signals from the controller's I/O output and applies 24 VDC to the LED terminal in the user wiring connector.
*3: The intended cleanliness performance can be achieved by maintaining negative pressure inside the robot via suction from the suction joint. (Dust will generate if internal air is not suctioned.)

Applicable Controller Specifications

Applicable controller	Feature	Maximum I/O points (input/output)	Power-supply voltage	Page
XSEL-PX	Able to control SCARA + 2 axes	192 points /192 points	Three-phase 200VAC	→P8
XSEL-QX	Conforming to safety category 4			

Caution

(Note 1) Based on PTP operation. In CP operation, the maximum speed is limited.
(Note 2) The cycle time is based on reciprocating movements over a horizontal distance of 100 mm and vertical distance of 25 mm, carrying a 0.2-kg load.
(Note 3) The rated load capacity indicates the maximum weight that can be operated at the maximum speed and rated continuous acceleration. The maximum load capacity indicates the maximum weight that can be transferred at lower speed and acceleration.
(Note 4) The value under "Push motion" indicates the thrust generated when a push command is executed from a program. The value under "Maximum thrust" indicates the maximum thrust during normal positioning operation.
(Note 5) An equivalent allowable inertial moment at the center of rotation of axis 4. The offset from the center of rotation of axis 4 to the gravity center of the tool must not exceed 17.5 mm.
(Note 6) For the ALM indicator to operate, the customer must provide a circuit that receives signals from an I/O output, etc., and applies 24 VDC to the LED terminal in the user wiring connector.

IX-NNC1805

Ultra Compact SCARA Robot: Cleanroom Type, Arm Length 180mm, Vertical Axis 50mm

■Model specification items **IX** — **NNC1805** — [ ] — **T2** — [ ]

Series	Type	Cable length	Applicable controller	Option(s)
IX	Cleanroom type Arm length 180mm Vertical axis 50mm	3L: 3m (standard) 5L: 5m	XSEL-PX/QX	(Blank): No option B: Z-axis brake JY: Connector-type cable

* Refer to the cover for the details of model specification items.

Model/Specifications

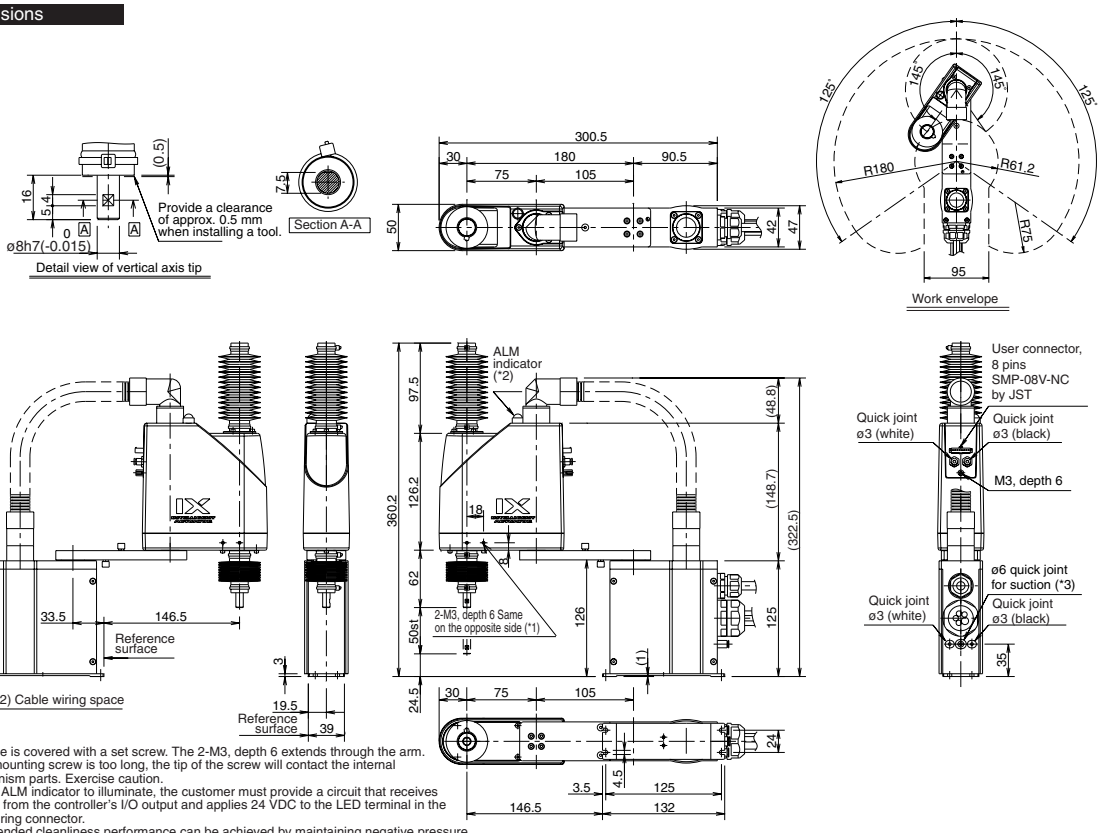
Model	Axis configuration		Arm length (mm)	Motor capacity (W)	Work envelope	Positioning repeatability (mm)	Maximum operating speed (Note 1)	Cycle time (sec) (Note 2)	Load capacity (kg) (Note 3)		Axis 3 push thrust (N)		Axis 4 allowable load	
									Rated	Maximum	Push motion (Note 4)	Maximum thrust (Note 4)	Allowable inertial moment (kg • m²) (Note 5)	Allowable torque (N • m)
IX-NNC1205-□-T2-□	Axis 1	Arm 1	105	12	±125°	±0.005 (XY)	2555mm/s (composite speed)	0.41	0.2	1.0	9.8	17.8	0.000386	0.13
	Axis 2	Arm 2	75	12	±145°									
	Axis 3	Vertical axis	–	12	50mm	±0.010	720mm/s							
	Axis 4	Rotating axis	–	60	±360°	±0.005	1800°/s							

Common Specifications

Encoder type	Absolute
User wiring	8-core, AWG26 cable with shield / Connector: SMP-08V-NC (JST)
User piping	Air tube (outer diameter ø3/inner diameter ø2) x 2 (normal working pressure 0.7MPa)
Alarm indicator (Note 6)	Small red LED indicator x 1 (24-VDC power supply required)
Suction pipe joint	Quick pipe joint, accepting tube of outer diameter ø6

Suction rate	90NL/min
Cleanliness level	Conforming to class 10
Ambient temperature/humidity	Temperature 0~40°C, humidity 20~85%RH or less (non-condensing)
Weight	3.1kg
Cable length	3L : 3m 5L : 5m

Dimensions



*1: The hole is covered with a set screw. The 2-M3, depth 6 extends through the arm. If the mounting screw is too long, the tip of the screw will contact the internal mechanism parts. Exercise caution.
*2: For the ALM indicator to illuminate, the customer must provide a circuit that receives signals from the controller's I/O output and applies 24 VDC to the LED terminal in the user wiring connector.
*3: The intended cleanliness performance can be achieved by maintaining negative pressure inside the robot via suction from the suction joint. (Dust will generate if internal air is not suctioned.)

Applicable Controller Specifications

Applicable controller	Feature	Maximum I/O points (input/output)	Power-supply voltage	Page
XSEL-PX	Able to control SCARA + 2 axes	192 points /192 points	Three-phase 200VAC	→P8
XSEL-QX	Conforming to safety category 4			

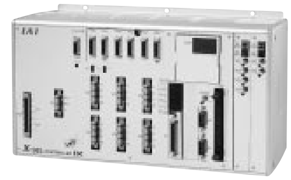
Caution

(Note 1) Based on PTP operation. In CP operation, the maximum speed is limited.
(Note 2) The cycle time is based on reciprocating movements over a horizontal distance of 100 mm and vertical distance of 25 mm, carrying a 0.2-kg load.
(Note 3) The rated load capacity indicates the maximum weight that can be operated at the maximum speed and rated continuous acceleration. The maximum load capacity indicates the maximum weight that can be transferred at lower speed and acceleration.
(Note 4) The value under "Push motion" indicates the thrust generated when a push command is executed from a program. The value under "Maximum thrust" indicates the maximum thrust during normal positioning operation.
(Note 5) An equivalent allowable inertial moment at the center of rotation of axis 4. The offset from the center of rotation of axis 4 to the gravity center of the tool must not exceed 17.5 mm.
(Note 6) For the ALM indicator to operate, the customer must provide a circuit that receives signals from an I/O output, etc., and applies 24 VDC to the LED terminal in the user wiring connector.

Controller

XSEL-PX/QX

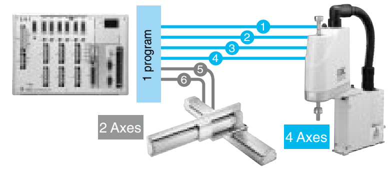
SCARA and single-axis robots can be controlled simultaneously with one controller.



Features

1 Controlling a maximum of 6 axes (SCARA robots + 2 single-axis robots)

In addition to SCARA robots, up to two axes of single-axis robots or cartesian robots can be controlled (total output: 2400 W).



2 "Global type" for applications that require conformance to safety category 4

The "global type" does not have a built-in drive-source cutoff circuit. Instead, it cuts off the drive source using an external safety circuit. This design conforms to safety category 4 under ISO 13849-1.
Both the large-capacity type (PX) and large-capacity global type (QX) conform to the CE Mark standard.

3 Compact, high performance and CE-compliant

- Approx. 40% slimmer than IAI's conventional controllers (X-SEL general-purpose controllers)
- Significantly faster than IAI's conventional controllers (command processing time is roughly one-half)
- Connectable to DeviceNet, CC-Link, Ethernet and other field networks
- Conforming to the CE Mark standard

Model

XSEL - □ - □ - □ - □ - □ - □ - □□□ - □ - □

① Series ② Controller type ③ IX robot type ④ Motor output of axis 5 ⑤ Motor output of axis 6 ⑥ Dedicated network slot ⑦ Standard I/O ⑧ Expansion I/O ⑨ I/O flat cable length ⑩ Power-supply voltage

① Series	② Controller type	③ IX robot type	④ Motor output of axis 5	⑤ Motor output of axis 6	⑥ Dedicated network slot	⑦ Standard I/O	⑧ Expansion I/O			⑨ I/O flat cable length	⑩ Power-supply voltage
						Slot 1	Slot 2	Slot 3	Slot 4		
XSEL	PX4 (Large-capacity, 4-axis type) PX5 (Large-capacity, 5-axis type) PX6 (Large-capacity, 6-axis type) QX4 (Large-capacity, global 4-axis type) QX5 (Large-capacity, global 5-axis type) QX6 (Large-capacity, global 6-axis type)	NNN1250~8040 (Standard type) NSN5016~6016 (High-speed type) NNW2515~8040 (Dustproof/splash-proof type) TNN3015~3515 (Wall mount type) UNN3015~3515 (Wall mount, inverse type) HNN5020~8040 (Ceiling mount type) INN5020~8040 (Inverse type) NNC1205~8040 (Cleanroom type)	Blank (No single axis) 20□ (20W) 30□ (30W) 60□ (60W) 100□ (100W) 200□ (200W) 400□ (400W) 600□ L (600W) 750□ L (750W)	Blank (No single axis) 20□ (20W) 30□ (30W) 60□ (60W) 100□ (100W) 200□ (200W) 400□ (400W) 600□ L (600W) 750□ L (750W)	Blank (No network) DV (DeviceNet) CC (CC-Link) PR (ProfiBus) ET (Ethernet)	E (Not used) N1 (I/O board NPN32/16) N2 (I/O board NPN16/32) N3 (I/O board NPN48/48) P1 (I/O board PNP32/16) P2 (I/O board PNP16/32) P3 (I/O board PNP48/48)	E (Not used) N1 (I/O board NPN32/16) N2 (I/O board NPN16/32) N3 (I/O board NPN48/48) P1 (I/O board PNP32/16) P2 (I/O board PNP16/32) P3 (I/O board PNP48/48)	E (Not used) N1 (I/O board NPN32/16) N2 (I/O board NPN16/32) N3 (I/O board NPN48/48) P1 (I/O board PNP32/16) P2 (I/O board PNP16/32) P3 (I/O board PNP48/48)	E (Not used) N1 (I/O board NPN32/16) N2 (I/O board NPN16/32) N3 (I/O board NPN48/48) P1 (I/O board PNP32/16) P2 (I/O board PNP16/32) P3 (I/O board PNP48/48)	2 (Standard specification: 2m) 3 (3m) 5 (5m) 0 (None)	3 (Three-phase 200V)

① Series
Indicate the series name.

② Controller type
Indicate the controller type.
PX4: Large-capacity, dedicated SCARA specification
PX5: Large-capacity, 5-axis (SCARA + 1 axis) specification
PX6: Large-capacity, 6-axis (SCARA + 2 axes) specification
QX4: Large-capacity, dedicated SCARA specification conforming to safety category 4
QX5: Large-capacity, 5-axis (SCARA + 1 axis) specification conforming to safety category 4
QX6: Large-capacity, 6-axis (SCARA + 2 axes) specification conforming to safety category 4

③ IX robot type
Indicate the type of the SCARA robot to be operated.

Notes
* If the arm length is 700 or 800, the maximum number of connectable axes is 5 (SCARA + 1 axis).
* With the high-speed types, the maximum number of connectable axes is 4 (SCARA only).

④ Motor output of axis 5 (single-axis robot)
Indicate the motor output of the single-axis robot to be connected to axis 5 of PX5, PX6, QX5 or QX6.
In □ , enter codes corresponding the encoder type and desired option(s).
* If multiple options are to be specified, indicate the applicable codes in alphabetical order after the encoder type. If no option is installed, indicate only the encoder type.
(Encoder type A: Absolute / I: Incremental)
(Options B: Brake / C: Creep sensor / L: Limit switch / M: Master-axis designation in synchronized operation / S: Slave-axis designation in synchronized operation)
Leave the space blank for PX4 or QX4.

⑤ Motor output of axis 6 (single-axis robot)
Indicate the motor output of the single-axis robot to be connected to axis 6 of PX6 or QX6.
The same explanation for axis 5 applies to the codes to be entered in □ . Leave the space blank for PX4 or QX4.

⑥ Dedicated network slot
Indicate an applicable code if you require connection to DeviceNet, CC-Link, ProfiBus or Ethernet.

⑦ Standard I/O
(slot 1) Indicate the specification of the standard slot (slot 1).

⑧ Expansion I/O
(slots 2 to 4)
Indicate the specification of the expansion slots (slots 2 to 4).
Take note that the external dimensions will change if the expansion slots are used.

⑨ I/O flat cable length
Indicate the length of the signal wire connecting the I/O board and PLC.
* If you have selected "E" (Not used) for the standard and expansion I/Os, this field is automatically filled with "0" (None).

⑩ Power-supply voltage
Indicate the voltage of the main controller power supply.

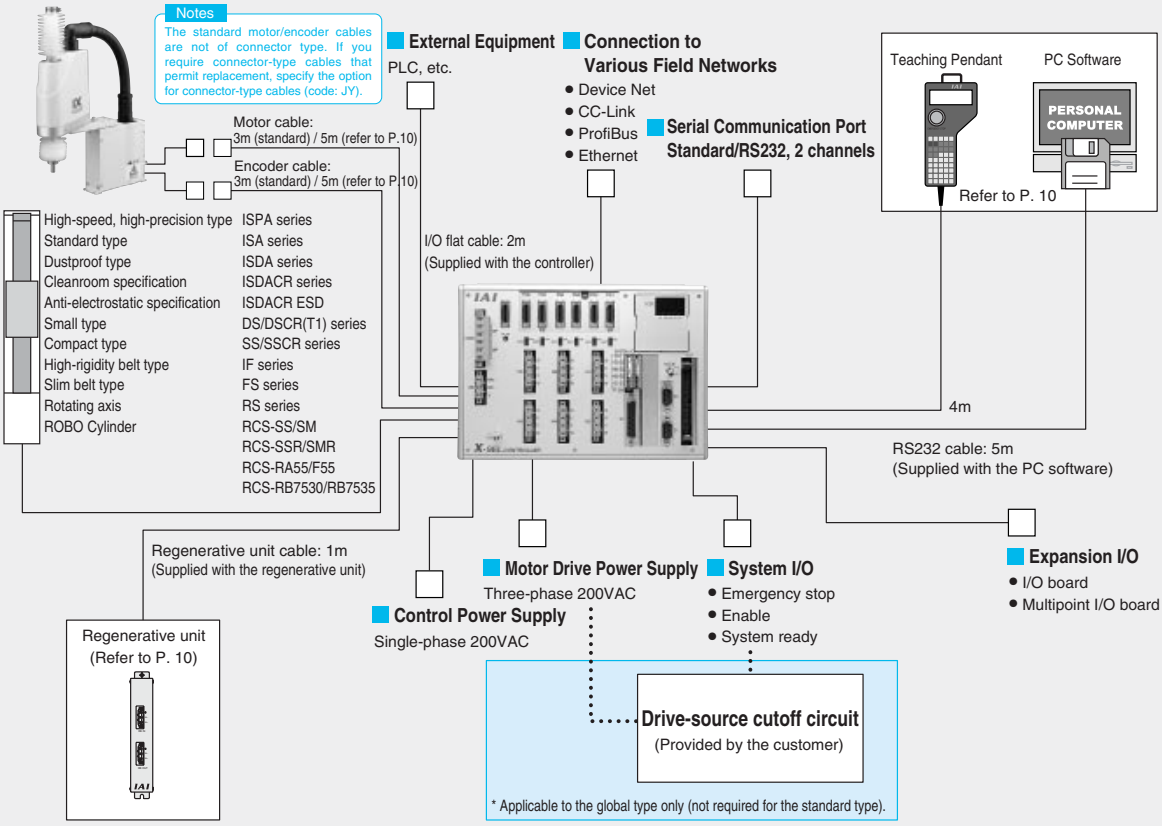
Specifications

	Large-capacity type		Large-capacity global type	
	PX4	PX5/PX6	QX4	QX5/QX6
Total output when maximum number of axes are connected	2400W			
Control power input	Single-phase 200/230VAC, -15%, +10%			
Motor power input	Three-phase 200/230VAC, -10%, +10%			
Power-supply capacity	310VA (*1)	3350VA (*2)	310VA (*1)	3350VA (*2)
Safety circuit configuration	Redundant configuration not supported		Redundant configuration supported	
Drive-source cutoff method	Internal cutoff relay		External safety circuit	
Enable input	Contact-B input (internal power supply type)		Contact-B input (external power supply type, redundant)	
Position detection method	Incremental encoder / absolute encoder			
Speed setting (*3)	1mm / sec ~ 2000mm / sec			
Acceleration/deceleration setting (*3)	0.01 G ~ 1 G			
Programming language	Super SEL language			
Number of program steps	6000 steps (total)			
Number of positions	4000 positions (total)			
Number of programs (number of multitasking programs)	64 programs (16 programs)			
Ambient operating temperature/humidity	0~40˚C, 10~95% (non-condensing)			
Weight (*4)	5.2kg	5.7kg	4.5kg	5kg

*1 Based on operation of IX-NNN1205/1505/1805 robots for the PX4/QX4 types, or operation of IX-NNN1205/1505/1805 robots and two 750-watt axes for the PX5/PX6/QX5/QX6 types.
*2 Based on operation of two 750-watt axes of arm length 500/600.
*3 The maximum limit varies depending on the actuator type.
*4 The weight includes the absolute battery, brake mechanism and expansion I/O box.

System Configuration

Connectable Actuator



Teaching Pendant

Model: IA-T-X (Standard)
IA-T-XD (With deadman switch)
IA-T-XA (ANSI/CE Mark compliant type)

Teaching devices offering functions for program/position input, test operation, monitoring and more.

* IA-T-X/XD of version 1.20 or older and IA-T-XA of version 1.10 or older cannot be used with the PX/QX controllers.

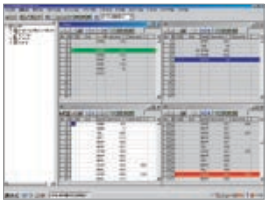
IA-T-X/XD IA-T-XA

PC Software

Model: IA-101-X-MX
With a PC cable (D-sub, 9-pin connector on PC end)
For Windows 95/98/NT/2000/ME

Support software combining all functions needed for program/position input and debugging.

* Version 5.0.1.0 or older cannot be used with the PX/QX controllers.



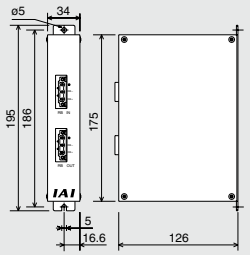
Regenerative Unit

Model: REU-1

This unit converts regenerative current produced when the motor decelerates, into heat. You need one or more regenerative units according to the total output of single-axis motors connected to the controller. (No regenerative unit is required for SCARA robots.) Refer to the table at right for the rough guideline on how to determine if your system needs a regenerative unit(s).

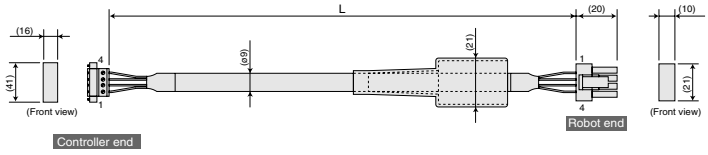
Motor output	Horizontal application	Vertical application
0~100W	Not required	Not required
~200W	Not required	1 unit
~400W	1 unit	1 unit
~600W	1 unit	1 unit
~800W	1 unit	1 unit
~1000W	1 unit	2 units
~1200W	2 units	2 units
~1500W	2 units	3 units

External Dimensions



Connector-type Motor Cable

Model **CB-X-MA030(3m) CB-X-MA050(5m)**

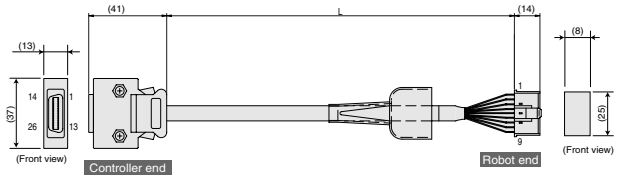


Wire	Color	Signal	No.
0.75sq	GREEN	PE	1
	RED	U	2
	WHITE	V	3
	BLACK	W	4

No.	Signal	Color	Wire
1	U	RED	0.75sq (crimped)
2	V	WHITE	
3	W	BLACK	
4	PE	GREEN	

Connector-type Encoder Cable

Model **CB-X1-PA030(3m) CB-X1-PA050(5m)**



Wire	Color	Signal	No.
AWG26 (soldered)	–	–	10
	–	–	11
	–	E24V	12
	–	0V	13
	–	LS	26
	–	CLEEP	25
	–	DT	24
	–	RSV	23
	–	–	9
	–	–	18
	–	–	19
	–	A+	1
	–	A–	2
	–	B+	3
	–	B–	4
	–	Z+	5
	–	Z–	6
Orange	Green	SRD+	7
Green		SRD –	8
Purple		BAT +	14
Gray		BAT –	15
Red		VCC	16
Black		GND	17
Blue		BKR–	20
Yellow		BKR+	21
–		–	22

The shield is clamped to the hood.

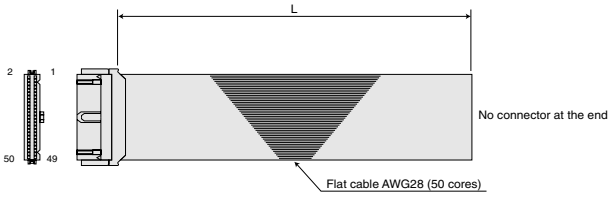
No.	Signal	Color	Wire
1	BAT +	Purple	AWG26 (soldered)
2	BAT –	Gray	
3	SD	Orange	
4	SD	Green	
5	VCC	Red	
6	GND	Black	
7	FG	Drain	
8	BK–	Blue	
9	BK+	Yellow	

Drain & shield (braided) cable

I/O Flat Cable (X-SEL)

Model **CB-X-PIO□□□**

* Enter a desired cable length (L) up to 10 m in □□□.
Example) 080 = 8 m



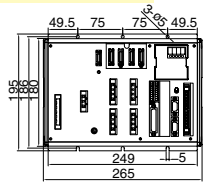
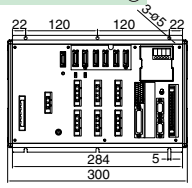
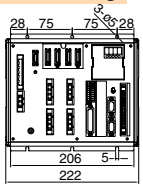
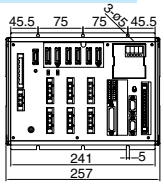
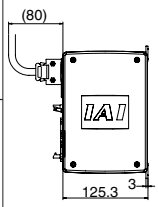
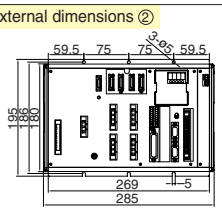
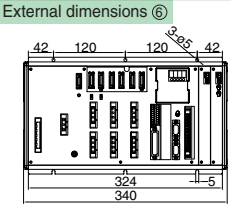
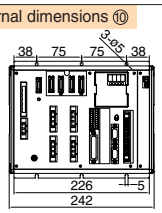
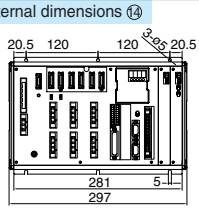
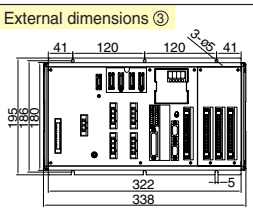
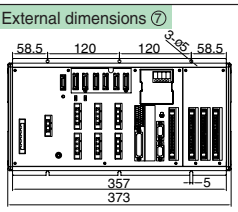
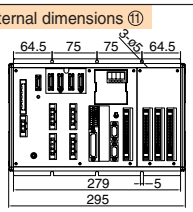
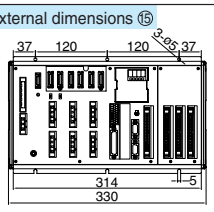
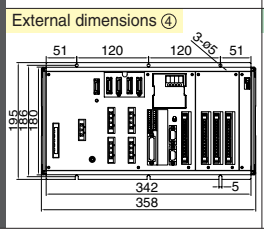
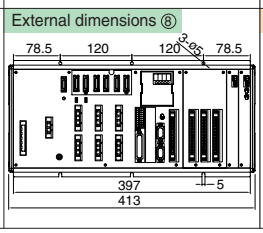
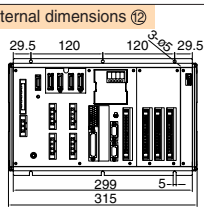
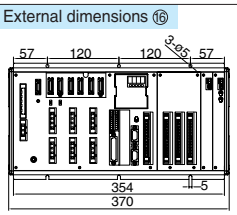
No.	Color	Wire	No.	Color	Wire	No.	Color	Wire
1	Brown1	Flat cable, pressure -welded	18	Gray2	Flat cable, pressure -welded	35	Green4	Flat cable, pressure -welded
2	Red1		19	White2		36	Blue4	
3	Orange1		20	Black2		37	Purple4	
4	Yellow1		21	Brown-3		38	Gray4	
5	Green1		22	Red3		39	White4	
6	Blue1		23	Orange3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

External Dimensions

The external dimensions of X-SEL PX/QX controllers vary depending on the number of connected axes and specified option(s) (brake and/or expansion I/O).
Refer to the table below and identify the number corresponding to the external dimensions of your controller, and reference the drawing bearing the same number.

SCARA robot		Controller							
		Large-capacity type (PX)				Large-capacity global type (QX)			
		SCARA only (PX4)		SCARA + direct-coupled axis(es) (PX5/PX6)		SCARA only (QX4)		SCARA + direct-coupled axis(es) (QX5/QX6)	
Type	Brake	Without expansion I/O	With expansion I/O	Without expansion I/O	With expansion I/O	Without expansion I/O	With expansion I/O	Without expansion I/O	With expansion I/O
NNN1205 NNN1505 NNN1805	Not equipped	External dimensions ①	External dimensions ③	External dimensions ⑤ (*1)	External dimensions ⑦ (*2)	External dimensions ⑨	External dimensions ⑪	External dimensions ⑬ (*3)	External dimensions ⑮ (*4)
NNC1205 NNC1505 NNC1805	Equipped	External dimensions ②	External dimensions ④	External dimensions ⑥ (*1)	External dimensions ⑧ (*2)	External dimensions ⑩	External dimensions ⑫	External dimensions ⑭ (*3)	External dimensions ⑯ (*4)

(*1) If the direct-coupled axis has a brake or is of absolute encoder specification, refer to external dimensions ⑥ .
(*2) If the direct-coupled axis has a brake or is of absolute encoder specification, refer to external dimensions ⑧ .
(*3) If the direct-coupled axis has a brake or is of absolute encoder specification, refer to external dimensions ⑭ .
(*4) If the direct-coupled axis has a brake or is of absolute encoder specification, refer to external dimensions ⑯ .

	Large-capacity type (PX)		Large-capacity global type (QX)		
	SCARA only (PX4)	SCARA + direct-coupled axis(es) (PX5/PX6)	SCARA only (QX4)	SCARA + direct-coupled axis(es) (QX5/QX6)	Side view (common)
Without expansion I/O	External dimensions ① 	External dimensions ⑤ 	External dimensions ⑨ 	External dimensions ⑬ 	
	External dimensions ② 	External dimensions ⑥ 	External dimensions ⑩ 	External dimensions ⑭ 	
With expansion I/O	External dimensions ③ 	External dimensions ⑦ 	External dimensions ⑪ 	External dimensions ⑮ 	
	External dimensions ④ 	External dimensions ⑧ 	External dimensions ⑫ 	External dimensions ⑯ 	

* All controller types have the same height.