

IAI

Quality and Innovation

www.actuator.ru тел.:(495) 662-87-56, e-mail: iai@actuator.ru

Ultra Compact SCARA Robot
Ultra Compact Cleanroom SCARA Robot

IX-NNN / NNC

Arm Length 120 mm / 150 mm / 180 mm



www.intelligentactuator.com

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

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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.

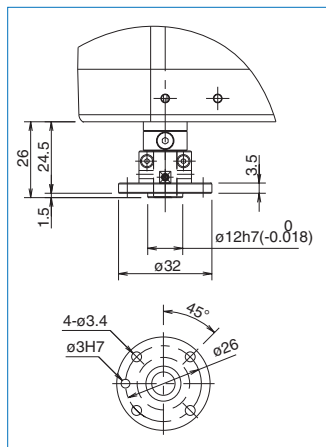
Maintenance Parts

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

www.actuator.ru тел. (495) 662-87-56, e-mail: iai@actuator.ru
 Ultra-Compact SCARA Robot, Standard Type,
 Arm Length 120mm, Vertical Axis 50mm



| | | | | | | | | | |
|---------------------------|-----------|---|---|---|-----------------------------|---|-----------------------|---|---|
| Model specification items | IX | — | NNN1205 | — | <input type="checkbox"/> | — | T2 | — | <input type="checkbox"/> |
| | 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 | |
|-------------------|--------------------|---------------|-----------------|--------------------|---------------|--------------------------------|----------------------------------|---------------------------|-----------------------------|---------|------------------------|-------------------------|---|------------------------|
| | Axis 1 | Axis 2 | | | | | | | Rated | Maximum | Push motion (Note 4) | Maximum thrust (Note 4) | Allowable inertial moment (kg·m ²) (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

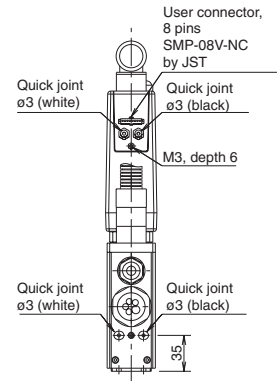
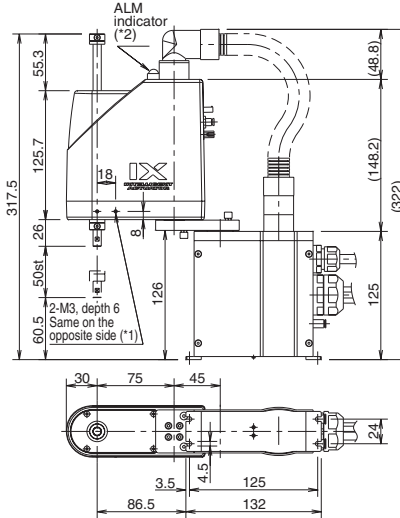
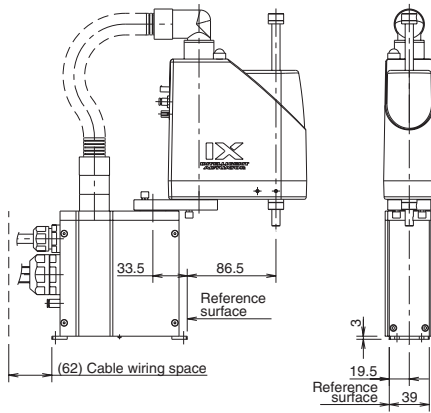
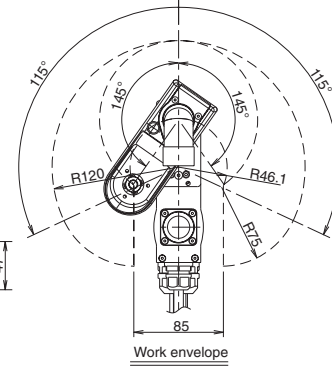
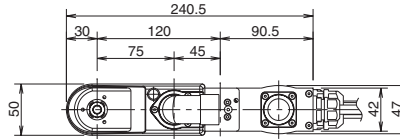
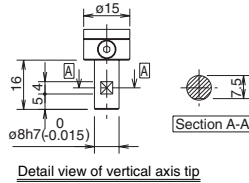
| | |
|--------------------------|---|
| Encoder type | Absolute |
| User wiring | 8-core, AWG26 cable with shield / Connector: SMP-08V-NC (JST) |
| User piping | Air tube (outer diameter ø3/inner diameter ø2) x 2 (normal working pressure 0.7MPa) |
| Alarm indicator (Note 6) | Small red LED indicator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

The CAD drawings can be downloaded from IAI's website.

2D CAD



*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 | | | |



- (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

www.actuator.ru, tel: (495) 662-87-56, e-mail: iai@actuator.ru
 Ultra compact SCARA robot, Standard type,
 Arm Length 150mm, Vertical Axis 50mm



| | | | | | | | | | |
|---------------------------|-----------|---|--------------------|---|--------------------------|---|-----------------------|---|--------------------------|
| Model specification items | IX | — | NNN1505 | — | <input type="checkbox"/> | — | T2 | — | <input type="checkbox"/> |
| | Series | — | Type | — | Cable length | — | Applicable controller | — | Option(s) |
| | | | Standard type | | 3L: 3m (standard) | | XSEL-PX/QX | | (Blank): No option |
| | | | Arm length 150mm | | 5L: 5m | | | | B: Z-axis brake |
| | | | Vertical axis 50mm | | | | | | 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 | |
|-------------------|--------------------|---------------|-----------------|--------------------|---------------|--------------------------------|----------------------------------|---------------------------|-----------------------------|---------|------------------------|-------------------------|---|------------------------|
| | Axis 1 | Axis 2 | | | | | | | Rated | Maximum | Push motion (Note 4) | Maximum thrust (Note 4) | Allowable inertial moment (kg·m ²) (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

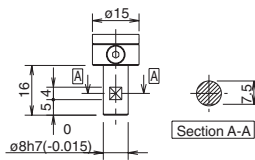
| | |
|--------------------------|---|
| Encoder type | Absolute |
| User wiring | 8-core, AWG26 cable with shield / Connector: SMP-08V-NC (JST) |
| User piping | Air tube (outer diameter ø3/inner diameter ø2) x 2 (normal working pressure 0.7MPa) |
| Alarm indicator (Note 6) | Small red LED indicator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

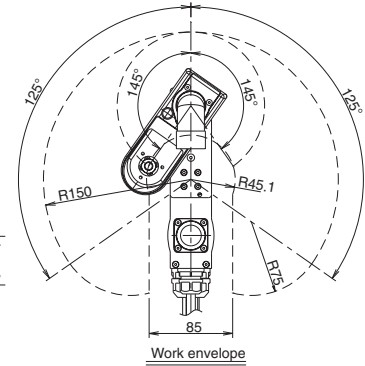
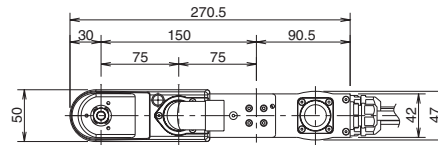
Dimensions

The CAD drawings can be downloaded from IAI's website.

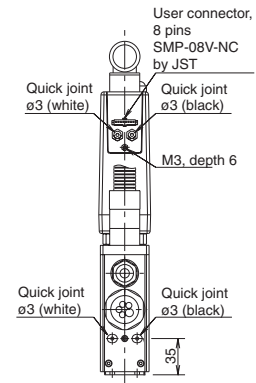
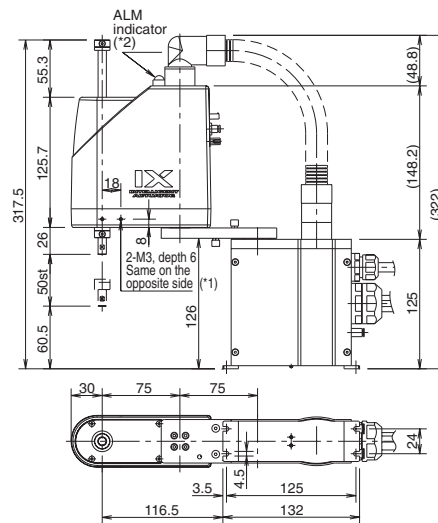
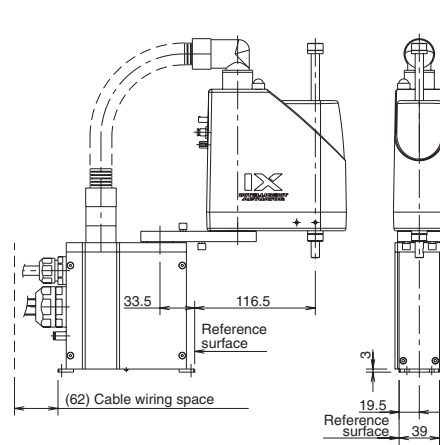
2D CAD



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 | | | |



- (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

www.actuator.ru TEL: (495) 662-87-56 e-mail: iai@actuator.ru
Ultra-compact SCARA robot, Cleanroom type, Arm Length 120mm, Vertical Axis 50mm



| | | | | | |
|---------------------------|-----------|--|-----------------------------|-----------------------|---|
| Model specification items | IX | NNC1205 | <input type="checkbox"/> | T2 | <input type="checkbox"/> |
| | 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 | |
|-------------------|--------------------|---------------|-----------------|--------------------|---------------|--------------------------------|----------------------------------|---------------------------|-----------------------------|---------|------------------------|-------------------------|---|------------------------|
| | Axis 1 | Axis 2 | | | | | | | Rated | Maximum | Push motion (Note 4) | Maximum thrust (Note 4) | Allowable inertial moment (kg·m ²) (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

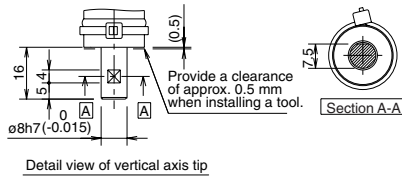
| | |
|--------------------------|---|
| Encoder type | Absolute |
| User wiring | 8-core, AWG26 cable with shield / Connector: SMP-08V-NC (JST) |
| User piping | Air tube (outer diameter ø3/inner diameter ø2) x 2 (normal working pressure 0.7MPa) |
| Alarm indicator (Note 6) | Small red LED indicator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

| | |
|------------------------------|--|
| Suction rate | 90N/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 |

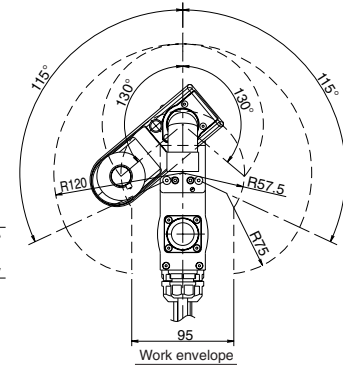
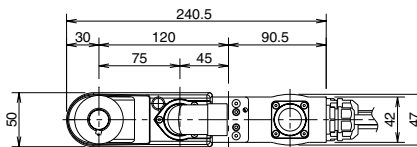
Dimensions

The CAD drawings can be downloaded from IAI's website.

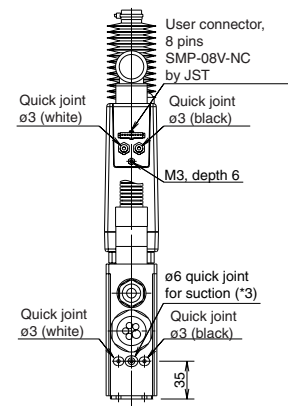
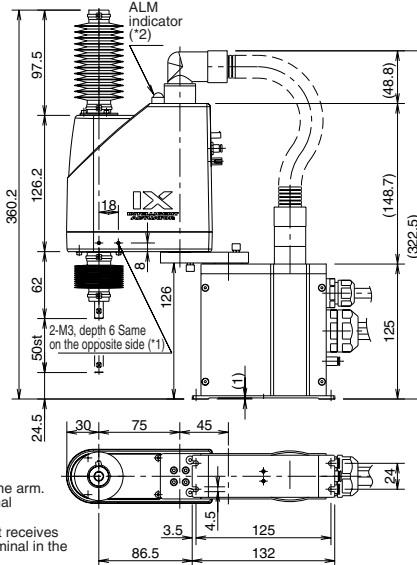
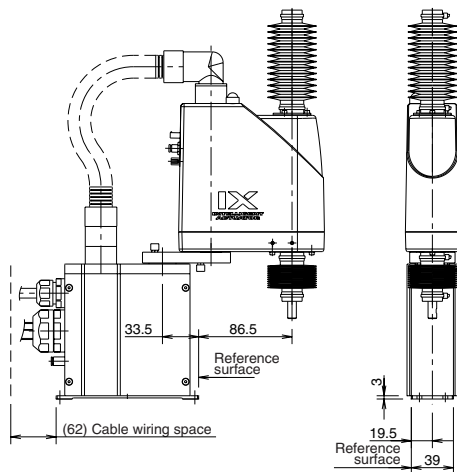
2D CAD



Detail view of vertical axis tip



Work envelope



- *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 | | | |



- (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

www.actuator.ru тел.: (495) 662-87-56 e-mail: iai@actuator.ru
Ultra-Compact SCARA Robot Cleanroom Type, Arm Length 180mm, Vertical Axis 50mm



| | | | | | | | | | |
|---------------------------|-----------|---|--|---|-----------------------------|---|-----------------------|---|---|
| Model specification items | IX | — | NNC1805 | — | <input type="checkbox"/> | — | T2 | — | <input type="checkbox"/> |
| | Series | — | Type | — | Cable length | — | Applicable controller | — | Option(s) |
| | | | 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 | |
|-------------------|--------------------|---------------|-----------------|--------------------|---------------|--------------------------------|----------------------------------|---------------------------|-----------------------------|---------|------------------------|-------------------------|---|------------------------|
| | Axis 1 | Axis 2 | | | | | | | Rated | Maximum | Push motion (Note 4) | Maximum thrust (Note 4) | Allowable inertial moment (kg·m ²) (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

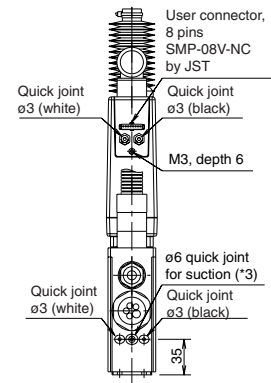
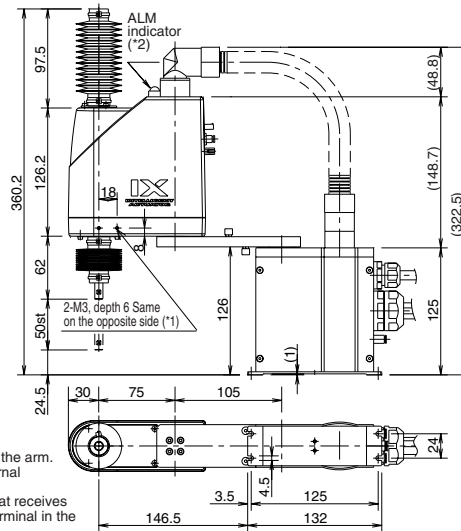
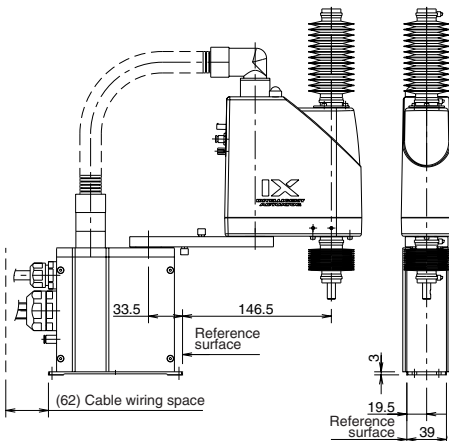
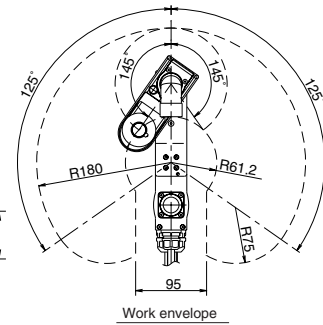
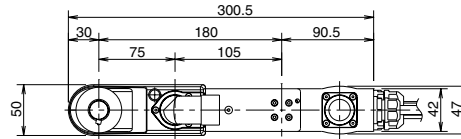
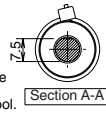
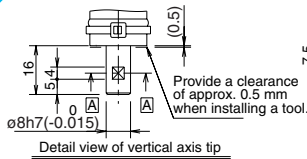
| | |
|--------------------------|---|
| Encoder type | Absolute |
| User wiring | 8-core, AWG26 cable with shield / Connector: SMP-08V-NC (JST) |
| User piping | Air tube (outer diameter ø3/inner diameter ø2) x 2 (normal working pressure 0.7MPa) |
| Alarm indicator (Note 6) | Small red LED indicator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

| | |
|------------------------------|--|
| Suction rate | 90N/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

The CAD drawings can be downloaded from IAI's website.

2D CAD



- *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 | | | |



- (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.

XSEL-PX/QX

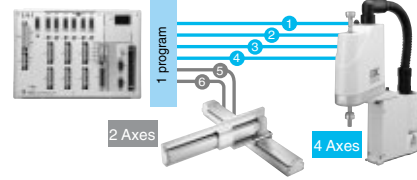
SCARA and single-axis robots can be controlled simultaneously with one controller.



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



| 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 | | | | 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) | NNN1250-8040 (Standard type) | Blank (No single axis) | Blank (No single axis) | Blank (No network) | E (Not used) | E (Not used) | E (Not used) | E (Not used) | 2 Standard (specification: 2m 3 (3m) 5 (5m) 0 (None) | 3 (Three-phase) 200V |
| | | NSN5016-6016 (High-speed type) | 20□ (20W) | 20□ (20W) | | N1 (I/O board NPN32/16) | N1 (I/O board NPN32/16) | N1 (I/O board NPN32/16) | N1 (I/O board NPN32/16) | | |
| | PX5 (Large-capacity, 5-axis type) | NNW2515-8040 (Dustproof/splash-proof type) | 30□ (30W) | 30□ (30W) | DV (DeviceNet) | N2 (I/O board NPN16/32) | N2 (I/O board NPN16/32) | N2 (I/O board NPN16/32) | N2 (I/O board NPN16/32) | | |
| | | TNN3015-3515 (Wall mount type) | 60□ (60W) | 60□ (60W) | | N3 (I/O board NPN48/48) | N3 (I/O board NPN48/48) | N3 (I/O board NPN48/48) | N3 (I/O board NPN48/48) | | |
| | PX6 (Large-capacity, 6-axis type) | UNN3015-3515 (Wall mount, inverse type) | 100□ (100W) | 100□ (100W) | CC (CC-Link) | P1 (I/O board PNP32/16) | P1 (I/O board PNP32/16) | P1 (I/O board PNP32/16) | P1 (I/O board PNP32/16) | | |
| | | HNN5020-8040 (Ceiling mount type) | 200□ (200W) | 200□ (200W) | | P2 (I/O board PNP16/32) | P2 (I/O board PNP16/32) | P2 (I/O board PNP16/32) | P2 (I/O board PNP16/32) | | |
| | QX4 (Large-capacity, global 4-axis type) | INN5020-8040 (Inverse type) | 400□ (400W) | 400□ (400W) | ET (Ethernet) | P3 (I/O board PNP48/48) | P3 (I/O board PNP48/48) | P3 (I/O board PNP48/48) | P3 (I/O board PNP48/48) | | |
| | | NNC1205-8040 (Cleanroom type) | 600□ L (600W) | 600□ L (600W) | | | | | | | |
| | QX5 (Large-capacity, global 5-axis type) | | 750□ L (750W) | 750□ L (750W) | | | | | | | |
| | | | | | | | | | | | |
| QX6 (Large-capacity, global 6-axis type) | | | | | | | | | | | |
| | | | | | | | | | | | |

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.

| | 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.

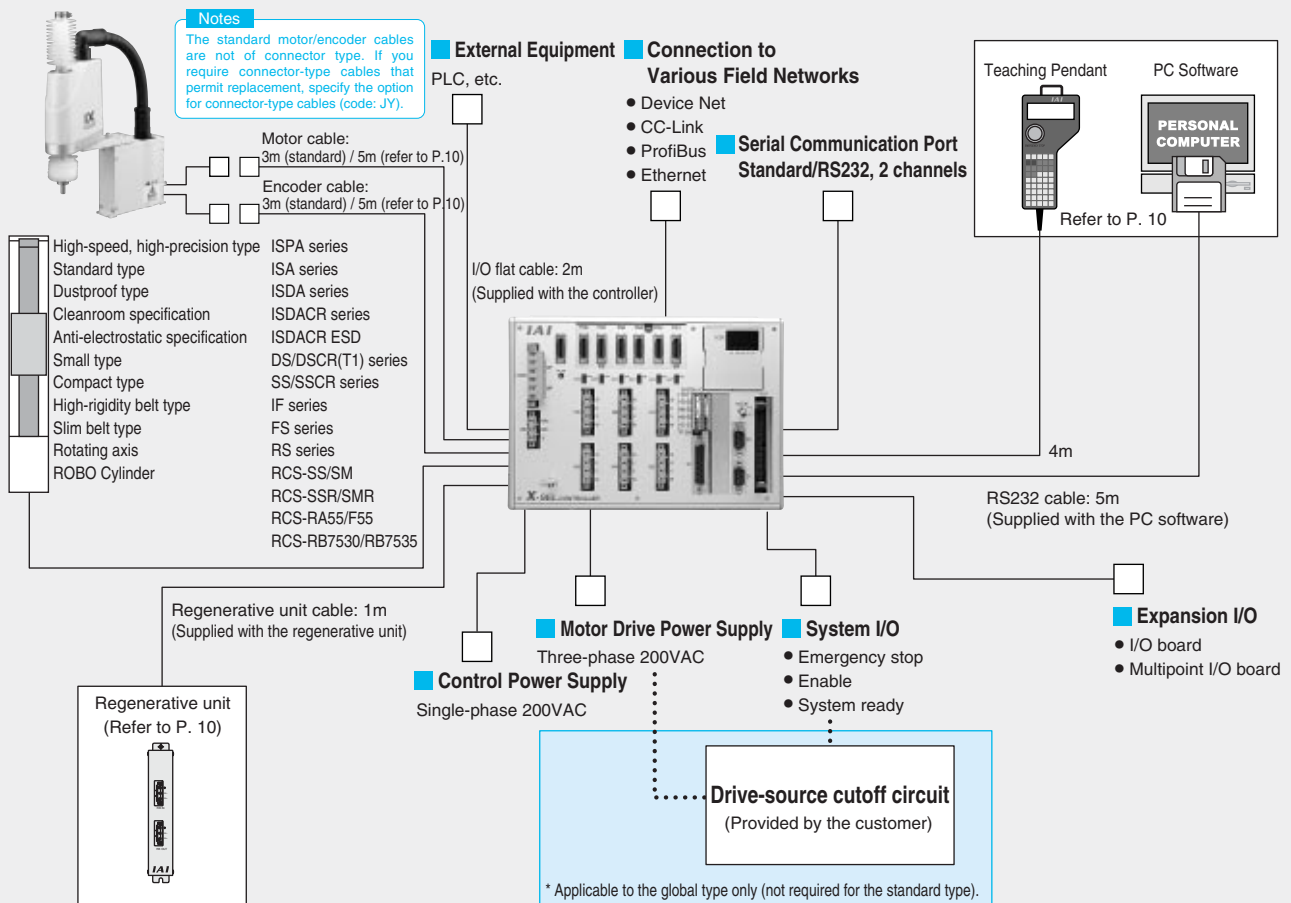
*2 Based on operation of two 750-watt axes of arm length 500/600.

*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/D 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/D IA-T-XA

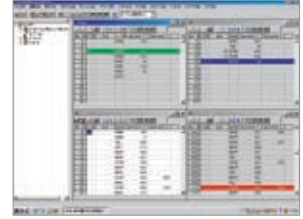
PC Software

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.



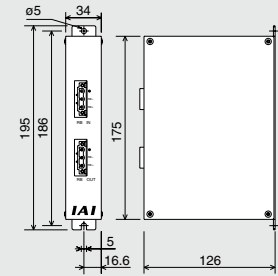
Regenerative Unit

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 |

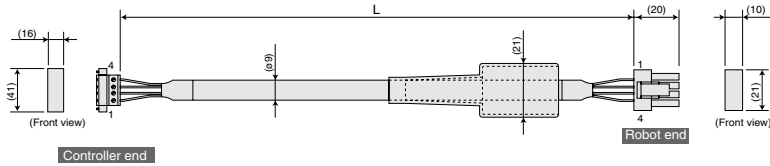
External Dimensions



Cables

Connector-type Motor Cable

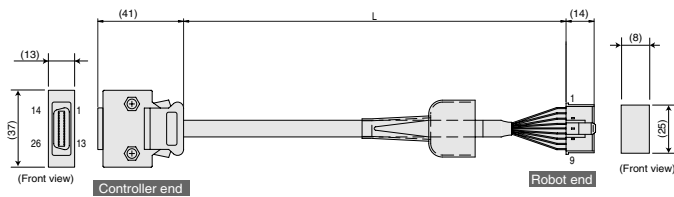
Model **CB-X-MA030(3m)** **CB-X-MA050(5m)**



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

Connector-type Encoder Cable

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

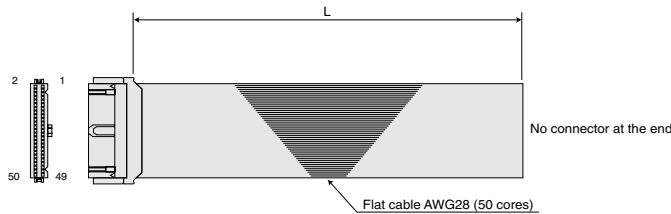


| Wire | Color | Signal | No. | No. | Signal | Color | Wire |
|--------|-------|--------|-----|-----|--------|-------|--------|
| - | - | - | 10 | 10 | - | - | - |
| - | - | - | 11 | 11 | - | - | - |
| - | - | E24V | 12 | 12 | - | - | - |
| - | - | UV | 13 | 13 | - | - | - |
| - | - | UV | 14 | 14 | - | - | - |
| - | - | GLEEP | 25 | 25 | - | - | - |
| - | - | Q | 26 | 26 | - | - | - |
| - | - | RSV | 23 | 23 | - | - | - |
| - | - | - | 18 | 18 | - | - | - |
| - | - | - | 19 | 19 | - | - | - |
| - | - | A | 1 | 1 | - | - | - |
| - | - | A | 2 | 2 | - | - | - |
| - | - | B | 3 | 3 | - | - | - |
| - | - | B | 4 | 4 | - | - | - |
| - | - | Z | 5 | 5 | - | - | - |
| - | - | - | 6 | 6 | - | - | - |
| - | - | - | 7 | 7 | - | - | - |
| Orange | SRP+ | - | 8 | 8 | 1 | BAT+ | Purple |
| Green | SRD- | - | 9 | 9 | 2 | BA- | Gray |
| Purple | BAT+ | - | 14 | 14 | 3 | SD | Orange |
| Gray | BAT- | - | 15 | 15 | 4 | SD | Green |
| Red | VCC | - | 16 | 16 | 5 | VCC | Blue |
| Black | GND | - | 17 | 17 | 6 | GND | Black |
| Blue | BKR+ | - | 20 | 20 | 7 | F3 | Gray |
| Yellow | BKR+ | - | 21 | 21 | 8 | BK- | Blue |
| - | - | - | 22 | 22 | 9 | BK+ | Yellow |

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



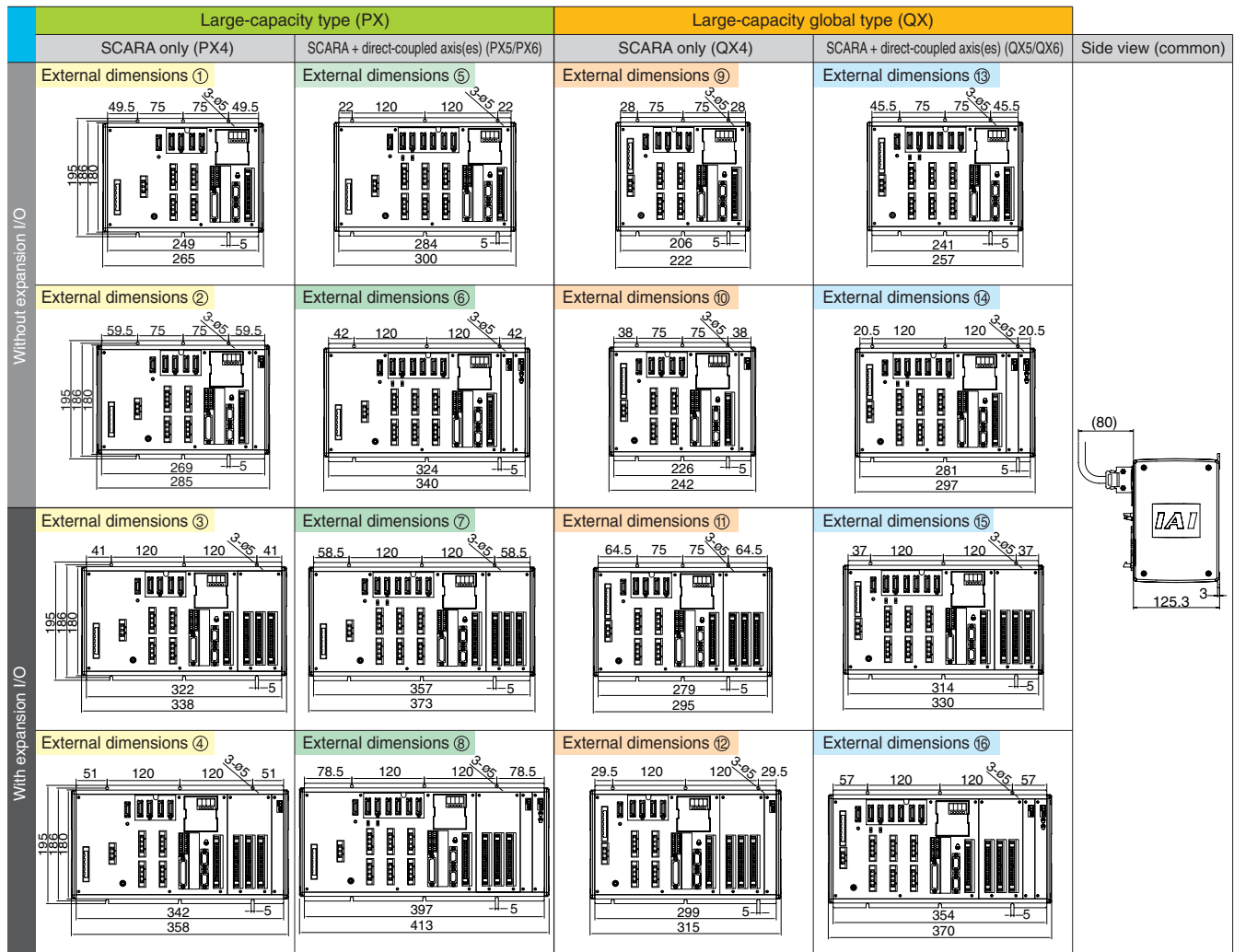
| No. | Color | Wire | No. | Color | Wire | No. | Color | Wire |
|-----|---------|-----------------------------|-----|---------|-----------------------------|-----|---------|-----------------------------|
| 1 | Brown1 | Flat cable, pressure-welded | 18 | Gray2 | Flat cable, pressure-welded | 35 | Green4 | 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 | | | | | | | |
|-------------|--------------|--------------------------|-----------------------|---|-----------------------|---------------------------------|-----------------------|---|-----------------------|
| Type | Brake | 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) | |
| | | 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 | Not equipped | External dimensions ① | External dimensions ③ | External dimensions ⑤ | External dimensions ⑦ | External dimensions ⑨ | External dimensions ⑪ | External dimensions ⑬ | External dimensions ⑮ |
| NNN1505 | | | | | | | | | |
| NNN1805 | | | | | | | | | |
| NNC1205 | Equipped | External dimensions ② | External dimensions ④ | External dimensions ⑥ | External dimensions ⑧ | External dimensions ⑩ | External dimensions ⑫ | External dimensions ⑭ | External dimensions ⑯ |
| NNC1505 | | | | | | | | | |
| NNC1805 | | | | | | | | | |

(*)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.



* All controller types have the same height.