Ultra Compact SCARA Robot

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

- Ultra compact size for installation in a small space
  The IX-120/150 assures a maximum work envelope of 300 mm in a small installation space of 47 mm in width and 132 mm in depth, enabling significant size reduction of your production line.

- Rated load capacity of 0.2 kg and maximum load capacity of 1 kg (**1)
  Despite its compact body, the IX-120/150 can transport a 0.2kg load at high speed. It can drive up to 1 kg if the acceleration is reduced.
  (**1) The rated load capacity indicates the maximum weight that can be operated at the maximum speed and acceleration. The maximum load capacity indicates the maximum weight that can be transported at lower speed and acceleration.

- High-speed performance of 0.35 second in cycle time (**2)
  Designed for enhanced dynamic performance with a highly rigid body, the IX-120/150 boasts outstanding high-speed performance that is among the best in its class.
  (**2) The cycle time is based on reciprocating movements carrying a 0.2-kg load over a horizontal distance of 100 mm and vertical distance of 25 mm.

- Absolute encoder eliminates the need for home return
  The IX-120/150 is equipped with an absolute encoder that retains the current position even after the power is turned off.

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### Options

<table>
<thead>
<tr>
<th>IX</th>
<th>NNN1205</th>
<th>5L</th>
<th>T2</th>
<th>B</th>
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<td>Cable length</td>
<td>Applicable Controller</td>
<td>Option</td>
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<td>IX</td>
<td>NNN1205 : Standard type</td>
<td>5L : 5m</td>
<td>T2 : XSEL-PX/QX</td>
<td>B : Z-axis brake : Z</td>
</tr>
<tr>
<td></td>
<td>NNN1505 : Standard type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arm length 120mm</td>
<td>Z-axis 50mm</td>
<td>Arm length 150mm</td>
<td>Z-axis 50mm</td>
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</table>

**Note**
Even if the power is cut off, the Z-axis will not drop as long as the Z-axis load is within the rated load capacity (0.2 kg). If the Z-axis load exceeds the rating, however, the Z-axis may drop when the power is turned off or an emergency stop is actuated.

**Absolute Reset Adjustment Jig**
Model : JG-5 (For arm length of 120/150)
This adjustment jig is used when the absolute data in the encoder was lost and an absolute reset must be executed.

**Teaching Pendant**
Model : IA-T-X (Standard)
IA-T-XD (With deadman switch)
IA-T-XA (ANSI/CE Mark compliant type)
This teaching device supports program/position input, test operation, monitoring, etc.

**Absolute Data Backup Battery**
Model : AB-6 (For arm length of 120/150)
This absolute data backup battery allows the current position to be retained even after the power is turned off.

**PC Software**
Model : IA-101-X-MW
With a PC connection cable (D-sub, 9-pin on the PC end): For Windows 95, 98, NT, 2000 and ME.
A startup support tool offering the functions needed to input programs/positions and perform debugging.

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# IX-NNN1205

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

<table>
<thead>
<tr>
<th>Type</th>
<th>Arm length</th>
<th>Load capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>120mm</td>
<td>0.2kg rated / 1kg maximum</td>
</tr>
</tbody>
</table>

### Models/Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Axis configuration</th>
<th>Arm length (mm)</th>
<th>Motor capacity (W)</th>
<th>Work envelope</th>
<th>Maximum operating speed (Note 1)</th>
<th>Cycle time (sec)</th>
<th>Load capacity (kg) (Note 3)</th>
<th>Axis 3 Push thrust (N) (Note 4)</th>
<th>Axis 4 Allowable load (Nm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IX-NNN1205-5L-T2</td>
<td>Arm 1</td>
<td>45</td>
<td>12</td>
<td>±115°</td>
<td>≤0.005 (XY)</td>
<td>2053mm/s (Compu speed)</td>
<td>0.35</td>
<td>0.2</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Arm 2</td>
<td>75</td>
<td>12</td>
<td>±115°</td>
<td>≤0.005 (XY)</td>
<td>2053mm/s (Compu speed)</td>
<td>0.35</td>
<td>0.2</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Vertical axis</td>
<td>–</td>
<td>12</td>
<td>50mm</td>
<td>±0.010</td>
<td>720mm/s</td>
<td>0.35</td>
<td>0.2</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Rotating axis</td>
<td>–</td>
<td>60</td>
<td>±30°</td>
<td>≤0.005</td>
<td>1800°/s</td>
<td>0.35</td>
<td>0.2</td>
<td>1.0</td>
</tr>
</tbody>
</table>

### Common Specifications

- **Encoder type**: Absolute
- **User wiring**: 8-core, AWG26 cable with shield / Connector: SMP-08V-NC by JST
- **User tubing**: Air tube (O.D. ø3, I.D. ø2) x 2 (Normal working pressure 0.7MPa)
- **Alarm indicator (Note 6)**: Small red LED indicator x 1 (24VDC must be supplied)

### Dimensions

#### Work envelope

![Work envelope diagram](image)

#### Alarm indicator

![Alarm indicator diagram](image)

#### Applicable Controller Specifications

<table>
<thead>
<tr>
<th>Applicable controller</th>
<th>Feature</th>
<th>Maximum I/O points (Input/Output)</th>
<th>Power supply voltage</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>XSEL-PX SCARA + 2 robot axes can be controlled</td>
<td>192 points / 192 points</td>
<td>Three phase 200VAC</td>
<td>Back cover</td>
<td></td>
</tr>
<tr>
<td>XSEL-GX Conform to safety category 4.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Notes

- **(Note 1)**: The vertical axis does not come with a brake. If the power or servo is turned off, the vertical axis may drop. Exercise caution.
- **(Note 2)**: To illuminate the alarm indicator, the user must provide a wiring that uses an I/O output signal from the controller to apply 24 VDC to the LED terminal in the user wiring connector.
- **(Note 3)**: The allowable inertial moment indicates an equivalent value measured at the rotational center of axis 4 and the gravity center of the tool must not exceed 17.5 mm.
- **(Note 4)**: The allowable load capacity indicates the maximum weight that can be transported at lower speed and acceleration. The thrust in the push mode indicates the force generated when a push command is executed from the program. The maximum thrust corresponds to the maximum force generated during normal positioning operation.
- **(Note 5)**: Based on PTP operation. In CP operation, the maximum speed is limited. The cycle time is based on reciprocating movements carrying a 0.2-kg load over a horizontal distance of 100 mm and vertical distance of 25 mm.
- **(Note 6)**: The rated load capacity indicates the maximum weight that can be operated at lower speed and acceleration.
IX-NNN1505
Ultra Compact SCARA Robot: Standard Type, Arm Length 150mm, Vertical Axis 50mm

<table>
<thead>
<tr>
<th>Type</th>
<th>Arm length</th>
<th>Load capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard type</td>
<td>150mm</td>
<td>0.2kg rated / 1kg maximum</td>
</tr>
</tbody>
</table>

### Models/Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Axis configuration</th>
<th>Arm length (mm)</th>
<th>Motor capacity (W)</th>
<th>Work envelope</th>
<th>Positioning repeatability (mm)</th>
<th>Maximum operating speed</th>
<th>Cycle time (sec)</th>
<th>Load capacity (kg)</th>
<th>Axis 3 Push thrust (N)</th>
<th>Axis 4 Allowable load (N×m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IX-NNN1505-5L-T2</td>
<td>Axis 1: Arm 1, 12</td>
<td>75</td>
<td>-125</td>
<td>-0.005</td>
<td>2304mm/s (number speed)</td>
<td>0.35</td>
<td>0.2</td>
<td>1.0</td>
<td>9.8</td>
<td>17.8</td>
</tr>
<tr>
<td></td>
<td>Axis 2: Arm 2, 12</td>
<td>75</td>
<td>-145</td>
<td>-0.010</td>
<td>725mm/s</td>
<td>3.0</td>
<td>2.0</td>
<td>1.0</td>
<td>9.8</td>
<td>17.8</td>
</tr>
<tr>
<td></td>
<td>Arm 3: Vertical axis, 60</td>
<td>50</td>
<td>-360</td>
<td>-0.005</td>
<td>1800*r/s</td>
<td>3.0</td>
<td>2.0</td>
<td>1.0</td>
<td>9.8</td>
<td>17.8</td>
</tr>
</tbody>
</table>

### Common Specifications

- **Encoder type**: Absolute
- **User wiring**: 8-core, AWG26 cable with shielding / Connector: SMP-08V-NC (JST)
- **Alarm indicator (Note 6)**: Small red LED indicator x 1 (24VDC must be supplied)
- **Operating temperature/humidity**: Temperature 0~40°C, humidity 20~85% RH or less (non-condensing)
- **Robot weight**: 2.7 kg
- **Cable length**: 5L: 5m

### Dimensions

- **Arm length**: 150mm, Vertical Axis 50mm
- **Work envelope**: 62 (horizontal) x 85 (vertical) x 125 (depth)
- **Troubleshooting**: 33.5 (horizontal) x 75 (vertical) x 75 (depth)
- **Reference surface**: 33.5
- **Reference surface**: 116.5
- **Reference surface**: 19.5
- **Reference surface**: 30
- **Reference surface**: 0

*Note: The 2-M3 hole (depth 6) passes through the arm. If the mounting screw is too long, the screw will contact the internal mechanical parts. Exercise caution.*

*Note: To illuminate the alarm indicator, the user must provide a wiring that uses an I/O output signal from the controller to apply 24 VDC to the LED terminal in the user wiring connector.

*Note: The vertical axis does not come with a brake. If the power or servo is turned off, the vertical axis may drop. Exercise caution.*
### Controller XSEL-PX/QX

**Features**

- **Capable of controlling a SCARA robot and up to two single-axis robots**
  The XSEL-PX/QX performs complex controls with ease, such as controlling a SCARA robot simultaneously with a single-axis robot assembled underneath, or operating a SCARA robot and two-axis cartesian robot at the same time.

- **Ultra compact size**
  Despite being a 6-axis controller, the XSEL-PX/QX comes in a slim body (W 340 mm H 195 mm D 125.3 mm), and these dimensions correspond to the size of IAI’s 4-axis or smaller controller.

- **Direct connection to DeviceNet, CC-Link, ProfiBus or Ethernet**
  The XSEL-PX/QX can be directly connected to various field networks to perform centralized data control or exchange of signals with the various devices connected to the network.

### Controller type

| XSEL - PX6 - NNN1205 - 200A - 100A - DV - N1 - EEE - 2 - 3 |
|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Series            | Controller type   | Motor output of axis 5 | Network support | Expansion I/O | Power supply voltage | I/O flat cable length |
| XSEL PX4: High-output 4-axis type | SCARA only | 20A~750AL | DV: DeviceNet | N1: 32 input points/16 output points | 3: Three-phase 200VAC |
| PX5: High-output 5-axis type | SCARA only | 20A~750AL | PR: ProfiBus | P1: 32 input points/16 output points |
| PX6: High-output 6-axis type | SCARA only | 20A~750AL | ET: Ethernet (Blank) |
| QX4: 4-axis type conforming to safety category | SCARA only | 20A~750AL | No network support |
| QX5: 5-axis type conforming to safety category | 20W~750W, absolute | 20A~750AL | |
| QX6: 6-axis type conforming to safety category | 20W~750W, absolute | 20A~750AL | |

### Specifications

- **Standard specification**
  - Connectable axes: SCARA only
  - Total output when maximum number of axes are connected: 2400W
  - Control power input: 200/230VAC, single-phase, -10%, +10%
  - Motor power input: 200/230VAC, three-phase, -10%, +10%
  - Power capacity (*1): 310Vx 2, 3350Vx 2, 310Vx 2, 3350Vx 2
  - Safety circuit configuration: Redundant configuration (Redundant configuration)
  - Drive-source cutoff method: Contact-B input (External safety circuit)
  - Enable input: Cutoff B input (Contact-B input)
  - Position detection method: Incremental encoder / absolute encoder
  - Speed setting (*2): 1mm/sec - 2000mm/sec
  - Acceleration/deceleration ratio: 0.01G ~ 1G
  - Programming language: Super SEL Language
  - Number of program steps: 6000 steps (total)
  - Number of positions: 4000 positions (total)
  - Number of program (moving): 64 programs (16 programs)
  - Operating temperature/ humidity: 0~40°C, 10~95% (non-condensing)
  - Controller weight (*3): 5.3kg, 5.7kg, 4.5kg, 5kg

- **Global specification**
  - Connectable axes: SCARA only
  - Total output when maximum number of axes are connected: 2400W
  - Control power input: 200/230VAC, single-phase, -10%, +10%
  - Motor power input: 200/230VAC, three-phase, -10%, +10%
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  - Number of program (moving): 64 programs (16 programs)
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  - Controller weight (*3): 5.3kg, 5.7kg, 4.5kg, 5kg

*For the PX4 and QX4, the value indicates the power capacity when one IX-NNN1205/1505 is operated. For the PX5, PX6, QX5 and QX6, the value indicates the power capacity when one IX-NNN1205/1505 and two 750-watt axes are operated.

*Speed setting can be set up to 6000 steps/sec.

*The controller weight includes the absolute battery, brake mechanism and expansion I/O box.