Super-Large SCARA Robot IX-1000/1200
The latest addition to our offerings is the super-large SCARA series boasting an arm length of 1200 mm and payload of 50 kg, both of which are the largest among all our SCARA robots.

1. Wide range of operation and small footprint
The long arm extending 1200 mm allows the IX to carry work parts over a wide range of up to 2400 mm. The IX is also space-saving because its footprint is only one-eighth that of a Cartesian robot having an equivalent range of operation.

2. High-speed transfer
The IX demonstrates excellent high-speed performance backed by its maximum operating speed of 8308 mm/s. The IX can certainly help you reduce cycle times.

3. High payload
The IX can carry up to 50 kg, which is one of the highest payloads in its class. The IX is the perfect choice if your equipment must transfer heavy objects.
**IX SCARA robot**

### Model

<table>
<thead>
<tr>
<th>IX</th>
<th>Series Type</th>
<th>Cable length</th>
<th>T2 Applicable controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>NNN10040</td>
<td>High payload type</td>
<td>5L 5m</td>
<td>T2 XSEL-SX4</td>
</tr>
<tr>
<td>NNN12040</td>
<td>High payload type</td>
<td>10L 10m</td>
<td></td>
</tr>
</tbody>
</table>

### System Configuration

- **Option**
  - PC software RS232 version  
    - Model: IA-101-XA-MW
    - Ver. 9.00.00.00 or later
  - ANSI-compatible Teaching pendant  
    - Model: SEL-TD
    - Ver. 1.12 or later

- **Supplied with controller**  
  - PIO cable  
    - Model: CB-X-PIO0020
    - Standard: 2 m  
    - (Supplied with the PIO specification controller)

- **Option**  
  - Expansion I/O unit  
    - Model: EI0U-4-□□□□□

- **Supplied with Expansion I/O unit**  
  - Comm. cable  
    - Model: CB-RS-IAN□□□□

- **Supplied with SCARA robot**  
  - Motor cable  
    - Model: CB-SX4-MA050
    - Standard: 5 m
  - Encoder cable  
    - Model: CB-SX4-PA050
    - Standard: 5 m
  - Absolute data backup battery  
    - Model: AB-3

- **Field network**  
  - DeviceNet
  - CC-Link
  - PROFINET-DP
  - EtherCAT
  - EtherNet/IP

- **Control power**  
  - Single-phase  
    - AC 200 V/230 V

- **Brake release power supply**  
  - DC 24 V

- **Power for I/O**  
  - DC 24 V

- **Motor power supply**  
  - 3-phase  
    - AC 200 V/230 V

- **Drive power shut-off circuit**  
  - (Supplied by user)

- **Control power**  
  - Single-phase  
    - AC 200 V/230 V

- **Main power supply:** Three-phase AC 200 V

  - Noise filter  
    - Recommended model Three-phase: MC1320 (Manufacturer: TDK Lambda)
    - Single-phase: MCX-1220-33 (Manufacturer: TDK Lambda)
  - Ring core  
    - Recommended model ESD-R-25 (Manufacturer: NEC Tokin)
  - Clamp filter  
    - Recommended model Control power supply: ZCAT3035-1330 (Manufacturer: TDK)
  - Surge protector  
    - Recommended model Motor power supply: RFC-H13 (Manufacturer: Kitagawa Kogyo)

- **Surge protector**  
  - Recommended model  
    - Three-phase: RA-V-781BK2-4
    - Single-phase: RA-V-781BK5-4 (Manufacturer: Okaya Electric Industries)

* Be sure to install the following filters or equivalent on the lines connected to the power supply:
  - Noise filter  
    - Recommended model Three-phase: MC1320 (Manufacturer: TDK Lambda)
    - Single-phase: MCX-1220-33 (Manufacturer: TDK Lambda)
  - Ring core  
    - Recommended model ESD-R-25 (Manufacturer: NEC Tokin)
  - Clamp filter  
    - Recommended model Control power supply: ZCAT3035-1330 (Manufacturer: TDK)
  - Surge protector  
    - Recommended model Motor power supply: RFC-H13 (Manufacturer: Kitagawa Kogyo)

* Refer to P. 6.

* Contact us for details on driver power shut-off circuit.
**IX-NNN10040** Super-large SCARA Robot  
High-payload Type  
Arm Length 1000 mm  
Vertical Axis 400 mm

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### Model Specification Items

<table>
<thead>
<tr>
<th>Model</th>
<th>IX Series</th>
<th>NNN10040</th>
<th>T2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable length</td>
<td>5L: 5m (standard)  10L: 10m</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**Common Specifications**

- **Encoder type**: Absolute (Absolute data retention battery: Model AB-3)
- **User piping**: Outer diameter ø6, inner diameter ø4, air tube x 4 (Normal service pressure: 0.8 MPa)
- **User wiring**: 25-core AWG26 with shield + D-sub, 25-pin connector (socket)
- **Encoder type**: Absolute (Absolute data retention battery: Model AB-3)
- **Ambient temperature/humidity**: Temperature: 0 to 40°C, Humidity: 20 to 85%RH or less (non-condensing)

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**Applicable Controller Specification**

<table>
<thead>
<tr>
<th>Applicable controller</th>
<th>Feature</th>
<th>Maximum I/O points (input/output)</th>
<th>Power-supply voltage</th>
<th>Reference page</th>
</tr>
</thead>
<tbody>
<tr>
<td>XSEL-SX4</td>
<td>Safety category 4 can be supported</td>
<td>192 points/192 points</td>
<td>3-phase, AC 200V</td>
<td>P5</td>
</tr>
</tbody>
</table>

---

* Refer to P.2 for the details of model specification items.

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**Model/Specification**

<table>
<thead>
<tr>
<th>Model/Specification</th>
<th>IX-NNN10040-T2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor capacity (W)</td>
<td>Arm 1: 1000</td>
</tr>
<tr>
<td>Range of operation</td>
<td>±140 deg</td>
</tr>
<tr>
<td>Positioning repeatability (mm) (deg)</td>
<td>±0.040</td>
</tr>
<tr>
<td>Maximum operating speed in PTP mode</td>
<td>7356 mm/s (synthesis rate)</td>
</tr>
<tr>
<td>Standard cycle times (sec) (Note 1)</td>
<td>0.59</td>
</tr>
<tr>
<td>Payload (kg) (Note 2)</td>
<td>Max. 20</td>
</tr>
<tr>
<td>Axis 3 (Note 3) push force thrust (N)</td>
<td>50</td>
</tr>
<tr>
<td>Allowable load (kg)</td>
<td>0.5 20.0</td>
</tr>
</tbody>
</table>

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**Dimensional Drawings**

- CAD drawings can be downloaded from the website.
- 2D CAD RoHS
- Range of operation of right-arm system J1 mechanical end position: 150°  
  J2 mechanical end position: 160°
- Range of operation of left-arm system J1 mechanical end position: 150°  
  J2 mechanical end position: 160°

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* (*) Take note that the R-axis (rotational axis) cannot move unless this clearance is provided.
* (**) The ALM indicator lamp will operate only when the customer wires the controller’s I/O signal to supply DC 24 V to the LED power supply line on the user wiring connector.

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*SCARA robots cannot operate continuously at the 100% speed and acceleration. For the conditions in which they can operate, refer to "Reference for Operation Limits and Operation Settings" on the back cover.*
**IX-NNN12040** Super-large SCARA Robot, High-payload Type Arm Length 1200 mm, Vertical Axis 400 mm

### Model Specification Items

<table>
<thead>
<tr>
<th>Model</th>
<th>Axis configuration</th>
<th>Arm length (mm)</th>
<th>Motor capacity (W)</th>
<th>Range of operation</th>
<th>Positioning repeatability (mm) (deg)</th>
<th>Maximum operating speed in PTP mode</th>
<th>Standard cycle times (sec) (Note 2)</th>
<th>Payload (kg)</th>
<th>Axis 3 (Note 3)</th>
<th>Push force thrust (N)</th>
<th>Ax 4 allowable load (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IX-NNN12040-T2</td>
<td>Axis 1 Arm 1</td>
<td>700</td>
<td>1000</td>
<td>±140 deg</td>
<td>±0.050</td>
<td>8308 mm/s (synthesis rate)</td>
<td>0.66</td>
<td>20</td>
<td>50</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Axis 2 Arm 2</td>
<td>500</td>
<td>600</td>
<td>±150 deg</td>
<td>±0.020</td>
<td>1000 mm/s</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Vertical axis</td>
<td>—</td>
<td>400</td>
<td>±400 mm</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Rotational axis</td>
<td>—</td>
<td>400</td>
<td>±360 deg</td>
<td>±0.010</td>
<td>1197.3 deg/s</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

* Refer to P.2 for the details of model specification items.

### Common Specifications

- **Encoder type**: Absolute (Absolute data retention battery: Model AB-3)
- **User wiring**: 25-core AWG26 with shield + D-sub, 25-pin connector (socket)
- **User piping**: Outer diameter ø6, inner diameter ø4, air tube x 4 (Normal service pressure: 0.8 MPa)
- **Alarm indicator lamp**: Red LED small indicator lamp x 1 (DC 24 V must be supplied)
- **Brake release switch**: Brake release switch to prevent vertical axis from dropping (DC 24 V must be supplied)
- **Motor**: 55 (Mechanical end)
- **Power-supply voltage**: 50 (input/output)
- **Rated voltage**: 3-phase, AC 200 V
- **Rated current**: —
- **Allowable moment of inertia (kgm²)**: —
- **Allowable torque (Nm)**: 0.5

### Applicable Controller Specification

<table>
<thead>
<tr>
<th>Applicable controller</th>
<th>Feature</th>
<th>Maximum I/O points (input/output)</th>
<th>Power-supply voltage</th>
<th>Reference page</th>
</tr>
</thead>
<tbody>
<tr>
<td>XSEL-SX4</td>
<td>Safety category 4 can be supported</td>
<td>192 points/192 points</td>
<td>3-phase, AC 200 V</td>
<td>→P5</td>
</tr>
</tbody>
</table>

### Dimensional Drawings

- **Range of operation of left-arm system**: J1 mechanical end position: 150° J2 mechanical end position: 160°
- **Range of operation of right-arm system**: J1 mechanical end position: 150° J2 mechanical end position: 160°

---

(*) Take note that the R-axis (rotational axis) cannot move unless this clearance is provided.

(*2) The ALM indicator lamp will operate only when the customer wires the controller’s I/O signal to supply DC 24 V to the LED power supply line on the user wiring connector.

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**Note 1**: When 2 kg is transferred back and forth over a horizontal distance of 300 mm and vertical distance of 25 mm

**Note 2**: The rated payload represents the maximum mass carrying which the actuator can operate at its maximum speed and maximum acceleration. The maximum payload represents the maximum mass achievable at the greatest sacrifice of the speed and acceleration.

**Note 3**: This robot does not support push-motion operation.
## Model List

<table>
<thead>
<tr>
<th>Type</th>
<th>SX4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Super-large SCARA controller</td>
</tr>
</tbody>
</table>

**External view**

<table>
<thead>
<tr>
<th>Type</th>
<th>Global specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety category (*1)</td>
<td>Category 4 can be supported</td>
</tr>
<tr>
<td>Number of programs</td>
<td>128 programs</td>
</tr>
<tr>
<td>Number of program steps</td>
<td>9999 steps</td>
</tr>
<tr>
<td>Number of positions</td>
<td>26666 positions</td>
</tr>
<tr>
<td>Power supply</td>
<td>3-phase AC 200 V</td>
</tr>
</tbody>
</table>

(*1) Meeting this safety category requires the customer to install a safety circuit externally to the controller.

### Model

#### Dedicated Super-large SCARA Controller XSEL-SX4 Type

<table>
<thead>
<tr>
<th>XSEL - SX4</th>
<th>Type</th>
<th>SCARA robot type</th>
<th>Dedicated network slot (Slot 1) (Slot 2) (Slot 3)</th>
<th>I/O slot (Slot 1) (Slot 2)</th>
<th>I/O cable length</th>
<th>Power/ voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>NNN10040</td>
<td>Arm length 1000 mm/Z-axis 400 mm type</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NNN12040</td>
<td>Arm length 1200 mm/Z-axis 400 mm type</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* For the details of options, refer to the XSEL-R/S controller catalog.

(*) Selectable boards are different and specified separately for dedicated network slots 1 to 3. For each slot, select one of the specified boards and enter the corresponding code.

(*) One of the above I/O boards can be installed in both I/O slot 1 and slot 2, but the DG (DeviceNet Gateway board) option can only be installed in slot 1.

(*) Both the dedicated network slots and I/O slots can be used at the same time.
# Specification Table

<table>
<thead>
<tr>
<th>Controller type</th>
<th>SX4 type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control power-supply input</td>
<td>Single-phase AC 200/230 V ± 10%</td>
</tr>
<tr>
<td>Motor power-supply input</td>
<td>Three-phase AC 200 to 230 V ± 10%</td>
</tr>
<tr>
<td>Power supply capacity</td>
<td>10838 VA (The specific value varies depending on the I/O and network boards.)</td>
</tr>
<tr>
<td>Safety circuit configuration</td>
<td>Redundancy supported</td>
</tr>
<tr>
<td>Drive source breaker system</td>
<td>External safety circuit</td>
</tr>
<tr>
<td>Emergency stop input</td>
<td>B contact input (External power supply model, redundancy supported)</td>
</tr>
<tr>
<td>Enable input</td>
<td>B contact input (External power supply model, redundancy supported)</td>
</tr>
<tr>
<td>Number of programs</td>
<td>128 programs</td>
</tr>
<tr>
<td>Number of program steps</td>
<td>9999 steps (total)</td>
</tr>
<tr>
<td>Number of multi-tasking programs</td>
<td>16 programs</td>
</tr>
<tr>
<td>Number of positions</td>
<td>26,666 positions</td>
</tr>
<tr>
<td>Data memory device</td>
<td>Flash ROM + non-volatile RAM (FRAM): System battery (button battery) not required</td>
</tr>
<tr>
<td>Data input method</td>
<td>Teaching pendant (Model: SEL-TD) or PC software (Model: IA-101-XA-MW)</td>
</tr>
<tr>
<td>Standard input/output</td>
<td>2 boards can be installed, including a PIO board of 48 I/O points (NPN/PNP) and a PIO board of 96 I/O points (NPN/PNP)</td>
</tr>
<tr>
<td>Expansion input/output</td>
<td>None (A separate expansion I/O unit can be used to add up to 4 PIO boards.)</td>
</tr>
<tr>
<td>Serial communications function</td>
<td>Teaching port (D-sub 25 pins), 2-channel RS232C ports (D-sub 9 pins) Baud rate: 115.2 kbps max.</td>
</tr>
<tr>
<td>IA net</td>
<td>Number of connected units: 64 points / Baud rate: 12 Mbps, fixed</td>
</tr>
<tr>
<td>RC Gateway function</td>
<td>RS232C communication port (Channel 2 only) or DeviceNet Gateway master board port.</td>
</tr>
<tr>
<td>Fieldbus communication function</td>
<td>DeviceNet, CC-LINK, Profinet, EtherNet/IP, EtherCAT (One of EtherNet/IP and EtherCAT, and one of DeviceNet, CC-LINK and Profinet, can be supported at the same time.)</td>
</tr>
<tr>
<td>Clock function</td>
<td>Retention time: Approx. 10 days Charge time: Approx. 100 hours</td>
</tr>
<tr>
<td>Display unit</td>
<td>Optional panel unit (PU-1) can be connected.</td>
</tr>
<tr>
<td>Regenerative resistance</td>
<td>Built-in regenerative resistor of 1 kΩ/20 W 4 external regenerative resistor units must be connected.</td>
</tr>
<tr>
<td>Absolute battery</td>
<td>Built into the SCARA robot (Model: AB-3)</td>
</tr>
<tr>
<td>Protective function</td>
<td>Motor overcurrent, overload, motor driver temperature check, overload check, encoder open-circuit check, soft limit over, system error, absolute battery error, etc.</td>
</tr>
</tbody>
</table>

*Refer to the operation manual or contact us for the power-supply capacity, etc.

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## External Dimensions

### Front view

![SX4 Front View](image)

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main unit dimensions</td>
<td>W 34 mm x H 195 mm x D 126 mm</td>
</tr>
<tr>
<td>Main unit weight</td>
<td>0.9 kg</td>
</tr>
<tr>
<td>Built-in regenerative resistor</td>
<td>220 Ω, 80 W</td>
</tr>
<tr>
<td>Accessories</td>
<td>Controller connection cable (Model: CB-ST-REU010): 1 m</td>
</tr>
</tbody>
</table>

### Side view

![SX4 Side View](image)

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## Option [Regenerative Resistor Unit]

**Model** REU-1

**Description**

This unit converts to heat the regenerative current generated when the motor decelerates. The controller has an internal regenerative resistor, but it does not offer enough capacity when the robot operates in tough conditions, in which case this regenerative unit is required. (Refer to the table on the right.)

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*Ambient operating temp/humidity* 0 to 40°C, 85%RH or less (non-condensing). Free from corrosive gases. In particular, there shall be no significant dust.

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Option [Flange]

Use this flange when installing tooling, etc., at the end of the Z-axis of your Super-large SCARA NNN10040/NNN12040.

Model: IX-FL-5

Reference for Operation Limits and Operation Settings

SCARA robots cannot operate continuously at the maximum acceleration/deceleration and maximum speed. If your robot must operate at the maximum acceleration/deceleration, provide stationary periods by referring to the "Reference for Continuous Operation Duties" graph. If your robot must operate continuously, set its acceleration/deceleration by referring to the "Reference for Acceleration/Deceleration Settings" graph.

Note: The "100% acceleration/deceleration" means that the maximum acceleration/deceleration at which the robot can operate optimally under the specified load condition represents 100%.

The acceleration/deceleration represented by the 100% acceleration/deceleration when 20 to 50 kg is carried is not the same as the acceleration/deceleration represented by the 100% acceleration/deceleration when 0 to 20 kg is carried.

Also note that the operation settings give priority to speed when the load is 0 to 20 kg, and to actuator behavior during operation as well as continuous operation when the load is over 20 kg.

Reference for Continuous Operation Duties

Reference for Acceleration/Deceleration Settings

Limitations on Load Overhang/Speed Settings

The information contained in this product brochure may change without prior notice due to product improvements.