IF
Belt Drive Type Actuator

Features:
- Timing belt-type actuator using AC servo motor and incremental optical encoder.
- Maximum stroke length: 2500mm; maximum speed: 1750mm/s.
- Highly rigid base structure.
- Double slider option increases moment capability and allows greater overhang load length.
- Urethane timing belt is highly durable and generates minimal particles.
- Base structure is highly resistant to torsional deformation and warp.

Double Slider Option:
The double slider option provides the added feature and ability to vary the distance between the two sliders.
One slider is mounted to the timing belt and linear guide, while the other is mounted only to the linear guide.
The double slider option increases the overhang load capability of the IF Series actuator and adds a new dimension of flexibility
to accommodate a wide variety of configurations.

Load Moment / Overhang Load Length

The IF series W Slider is an option that can be chosen (An addition of an free-moving slider).
The dynamic movement and overhang load will be dependent on the span of the 2 sliders.
Please use the following examples as reference.

<table>
<thead>
<tr>
<th>Type</th>
<th>Image</th>
<th>Single Slider</th>
<th>Load Moment (Ma : Mb : Mc)</th>
<th>Overhang Load Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IF-SA-60</td>
<td>Image 1</td>
<td>Single Slider</td>
<td>Ma : 28.4 (2.9)</td>
<td>Mb : 40.2 (4.1)</td>
</tr>
<tr>
<td>IF-SA-100</td>
<td></td>
<td></td>
<td></td>
<td>Mb, Mc : Less than 450</td>
</tr>
<tr>
<td>IF-SA-60</td>
<td>Image 2</td>
<td>Double Slider (45mm span)</td>
<td>Ma : 130.3 (13.3)</td>
<td>Mb : 185.2 (18.9)</td>
</tr>
<tr>
<td>IF-SA-100</td>
<td></td>
<td></td>
<td></td>
<td>Mb, Mc : Less than 1125</td>
</tr>
<tr>
<td>IF-SA-60</td>
<td>Image 2</td>
<td>Double Slider (60mm span)</td>
<td>Ma : 142.0 (14.5)</td>
<td>Mb : 203.8 (20.8)</td>
</tr>
<tr>
<td>IF-SA-100</td>
<td></td>
<td></td>
<td></td>
<td>Mb, Mc : Less than 1200</td>
</tr>
<tr>
<td>IF-MA-200</td>
<td>Image 3</td>
<td>Single Slider</td>
<td>Ma : 69.8 (7.1)</td>
<td>Mb : 99.0 (10.1)</td>
</tr>
<tr>
<td>IF-MA-400</td>
<td></td>
<td></td>
<td></td>
<td>Mb, Mc : Less than 600</td>
</tr>
<tr>
<td>IF-MA-200</td>
<td>Image 4</td>
<td>Double Slider (55mm span)</td>
<td>Ma : 316.5 (32.3)</td>
<td>Mb : 450.8 (46.0)</td>
</tr>
<tr>
<td>IF-MA-400</td>
<td></td>
<td></td>
<td></td>
<td>Mb, Mc : Less than 1475</td>
</tr>
<tr>
<td>IF-MA-200</td>
<td>Image 4</td>
<td>Double Slider (80mm span)</td>
<td>Ma : 350.0 (35.8)</td>
<td>Mb : 500.0 (51.0)</td>
</tr>
<tr>
<td>IF-MA-400</td>
<td></td>
<td></td>
<td></td>
<td>Mb, Mc : Less than 1600</td>
</tr>
</tbody>
</table>

(*) Load moment calculated by assuming a traveled distance of 10000mm (n=1.2)
IF Series Motor Mounting Positions with CE Option

The positions of the motor and sensors can be changed to the 6 types as shown in the following figures, depending on the actuator installation requirements. With these changes, the motor position can be changed according to the installation environment. Note that in case of the motor on side and motor on bottom, the motor position becomes lower than the slider and there is thus no risk of contacting the load. Moreover, if optional creep sensor (C) and/or origin limit switch (L) are to be mounted, they shall be mounted as standard in the case the motor mount direction is L (to the right seen from the motor side, symbols C and L) and as reversed in the case the motor mount direction is R (to the left seen from the motor side, symbols CL and LL).

Standard Type (Motor on Top, Left-mounted) • Type : 1L

Motor on Side (Left-mounted) • Type : 2L

Motor on Bottom (Left-mounted) • Type : 3L

Standard Type (Motor on Top, Right/Reversed-mounted) • Type : 1R

Motor on Side (Right/Reversed-mounted) • Type : 2R

Motor on Bottom (Right/Reversed-mounted) • Type : 3R
**Models/Specifications**

<table>
<thead>
<tr>
<th>Model</th>
<th>Encoder Type</th>
<th>Motor Output (A)</th>
<th>Motor Mounting Position (Note 1)</th>
<th>Stroke 1000mm Unit (mm)</th>
<th>Speed (rpm)</th>
<th>Load Capacity (Note 2)</th>
<th>Rod End Thrust (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IFS-A1</td>
<td>Absolute Incremental</td>
<td>60</td>
<td>Standard Motor on Side</td>
<td>200 – 2000</td>
<td>1 – 1750</td>
<td>5</td>
<td>Horizontal Only</td>
</tr>
<tr>
<td>IFS-A2</td>
<td>Absolute Incremental</td>
<td>60</td>
<td>Motor on Bottom</td>
<td>80</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Options**

- **Encoder Type**<br>  - Absolute Incremental<br>  - Incremental<br>
- **Motor Output (A)**<br>  - 60 A<br>  - 80 A<br>
- **Motor Mounting Position**<br>  - Standard Motor on Side<br>  - Motor on Bottom<br>
- **Stroke 1000mm Unit (mm)**<br>  - 200 – 2000<br>  - 80<br>
- **Speed (rpm)**<br>  - 1 – 1750<br>  - 5<br>
- **Load Capacity (Note 2)**<br>  - 5<br>  - Horizontal Only<br>

**Common Specifications**

- **Positioning Repeatability** ±0.04mm<br>
- **Drive Method** Timing Belt<br>
- **Load Motion** 0.1mm max<br>
- **Static Allowable Moment** Please refer to chapter 2 of Technical Reference of IA/RC General Catalogue<br>
- **Dynamic Allowable Moment** Please refer to page 1<br>
- **Reversal** Please refer to page 1<br>
- **Package** Material: Aluminum with white anodizing treatment<br>
- **Applicable Controller** T1, T2-XSEL-KE/KET, T3-XSEL-P/Q, SSEL, SCW<br>
- **Cable Length (Note 6)** N: No Cable, S: 5m, M: 10m, L: 15m, XL: Specified Length<br>
- **Corrosion Resistant (Non-Corrosion)** Yes<br>

**Dimensions (Motor Mounting with CE Option)**

- **Motor Mounting with CE Option**<br>
- **Dimensions**<br>
- **Motor on Side**<br>
- **Motor on Bottom**

**Table:**

<table>
<thead>
<tr>
<th>Stroke</th>
<th>Stride</th>
<th>Width</th>
<th>Height</th>
<th>Depth</th>
<th>Weight (kg)</th>
<th>Max Speed (rpm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>502</td>
<td>300</td>
<td>200</td>
<td>120</td>
<td>4.4</td>
<td>1750</td>
</tr>
<tr>
<td>B</td>
<td>402</td>
<td>300</td>
<td>200</td>
<td>120</td>
<td>4.9</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>302</td>
<td>300</td>
<td>200</td>
<td>120</td>
<td>5.4</td>
<td></td>
</tr>
</tbody>
</table>

**Note:**<br>

**Applicable Controller Specifications**

- **Controller**<br>  - X-SEL-KE/KET<br>  - T1-XSEL-KE/KET<br>  - T2-XSEL-P/Q<br>  - SSEL, SCW<br>
- **Encoder Type**<br>  - Absolute Incremental<br>  - Incremental<br>
- **Operating Method**<br>  - Program<br>  - Single-Phase/3-phase 200V AC<br>
- **Power Supply Voltage**<br>  - Single-Phase 200V AC<br>  - 200V AC

**Caution:**<br>
1. Refer to page 2 for the detailed explanation on the motor mounting positions.<br>2. The load capacity is the value obtained when the robot is operated at the acceleration of 0.3G.<br>3. Note that if a creep sensor and home limit switch are to be added, the sensor mounting side is determined by the motor mounting direction due to the configuration (see page 2 for details).<br>4. In case the traveling life is 10000 km.<br>5. The max. cable length is 30m. Specify the length in the unit of m. (Example: X08 = 8 m)
**Model Designation**

- IF-5A1 100
- IF-5A2 100
- IF-5A3 100

**Options**

- Encoder Type: Incremental
- Motor Output (W): 100
- Motor Mounting Position (Note 1):
  - Motor on Side
  - Motor on Right

**Common Specifications**

- Positioning Repeatability: ±0.28mm
- Drive Method: Timing Belt
- Load Current: 0.15A max.
- Static Allowable Moment: Please refer to chapter Technical Reference of IA/RC General Catalogue
- Overhang Length: Please refer to page
- Base: Material Aluminum with white anodized treatment
- Applicable Controller: X-SEL-KET, X-SEL-SD, XSEL, SCOND
- Cable Length (Note 6): N: No Cable, S: 1m, M: 5m, X: Specify Length

**Dimensions (Motor Mounting with CE Option)**

- Maximum Speed (mm/min):
  - 1795

**Applicable Controller Specifications**

- Motor Code: X-SEL-P/Q
- Encoder Type: Incremental
- Operating Method: Single-Phase 230VAC
- Power Supply Voltage: 230VAC

**Caution**

- (Note 1) Refer to page 2 for the detailed explanation on the motor mounting positions.
- (Note 2) The load capacity is the value obtained when the robot is operated at the acceleration of 0.5G.
- (Note 3) Please refer to chapter Technical Reference of IA/RC General Catalogue
- (Note 4) Please refer to page 1
- (Note 5) Overhang Length: Please refer to page
- (Note 6) The max. cable length is 30 m. Specify the length in the unit of m. (Example: X08 = 8 m)
### IF-MA-200

**Single-Axis Robot, Medium Belt Type, Actuator Width 120mm, 200W**

#### Model Designation

<table>
<thead>
<tr>
<th>Model</th>
<th>Encoder Type</th>
<th>Motor Output (W)</th>
<th>Motor Mounting Position (Note 1)</th>
<th>Stroke</th>
<th>Speed (mm/min)</th>
<th>Load Capacity (Note 2)</th>
<th>Rodd Thrust (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IF-MA 500-1</td>
<td>Absolute Incremental</td>
<td>200</td>
<td>Motor on Side</td>
<td>200–2500</td>
<td>1–1750</td>
<td>20</td>
<td>85.7</td>
</tr>
<tr>
<td>IF-MA 500-2</td>
<td>Absolute Incremental</td>
<td>200</td>
<td>Motor on Bottom</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Options**

- **Motor Mounting Direction:** L: Standard, R: Reversed
- **Encoder Type:**
  - Absolute
  - Incremental
- **Stroke:**
  - Single-Phase: 230 VAC
  - 3-phase: 230 VAC
- **Applicable Control:**
  - XSEL-KE, KET
  - XSEL-P/Q, SSEL, SCON

#### Common Specifications

- **Positioning Repeatability:** ±0.04mm
- **Drive Method:** Timing Belt
- **Lost Motion:** 0.1mm max.
- **Statice Allowable Moment:** Please refer to chapter Technical Reference of IA/RC General Catalogue
- **Dynamic Allowable Moment:** Please refer to page 1
- **Overhang Length:** Please refer to page 1
- **Base Material:** Aluminum with white alumini treatment
- **Applicable Controller:**
  - X1SEL-KE/KET
  - X2SEL-PIQ, SSEL, SCON
- **Cable Length (Note 5):** N: No Cable; L: 5m; M: 10m; X: X1SEL-KE/KET
- **Specified Length:**
  - Standard Option
  - 5 to 40°C, 95% RH (non-condensing)

#### Dimensions (Motor Mounting with CE Option)

- **Dimensions:**
  - Motor: 152.7 x 76.1 x 85.7
  - Motor Mounting: 177 x 90 x 76.1
- **Compliance with CE Conformity (Standard Option):** CE

#### Applicable Controller Specifications

<table>
<thead>
<tr>
<th>Controller</th>
<th>Max Number of Controlled Axes</th>
<th>Encoder Type</th>
<th>Operating Method</th>
<th>Power Supply Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>X-SEL-P/Q</td>
<td>6 axes</td>
<td>Absolute</td>
<td>Program</td>
<td>Single-Phase 230 VAC</td>
</tr>
<tr>
<td>X-SEL-KE/KET</td>
<td>4 axes</td>
<td>Incremental</td>
<td></td>
<td>Single-Phase 230 VAC</td>
</tr>
<tr>
<td>5SEL</td>
<td>2 axes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCON</td>
<td>1 axis</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Caution**

- **Note (1):** Refer to page 2 for the detailed explanation on the motor mounting positions.
- **Note (2):** The load capacity is the value obtained when the robot is operated in the acceleration of 0.3G.
- **Note (3):** Note that the freedom to mount is limited due to the construction. See page 2 for details.
- **Note (4):** In case the traveling time is 10 km.
- **Note (5):** The maximum cable length is 30 m, specify the length in the unit of m.

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**Single Slider**

- **Guide with Ball Retention Mechanism:** RT
- **Wrench:**
  - Guide with Ball Retention Mechanism: RT
  - Wrench: W

**Double Slider**

- **Guide with Ball Retention Mechanism:** RT
- **Wrench:**
  - Guide with Ball Retention Mechanism: RT
  - Wrench: W

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**Motor Mounting with CE Option**

- **Dimensions:**
  - Motor (L): 152.7 x 76.1 x 85.7
  - Motor Mounting (L): 177 x 90 x 76.1

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**Applicable Controller Specifications**

- **X-SEL-P/Q:** 6 axes
- **X-SEL-KE/KET:** 4 axes
- **5SEL:** 2 axes
- **SCON:** 1 axis

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**Technical Reference:**

- **IA/RC General Catalogue**
- **IA/RC Technical Reference**

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**Notes:**

- **Motor Mounting:** L: Standard, R: Reversed
- **Encoder Type:**
  - Absolute: Incremental
- **Stroke:**
  - Single-Phase: 230 VAC
  - 3-phase: 230 VAC

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**Dimensions:**

- **Motor:** 152.7 x 76.1 x 85.7
- **Motor Mounting:** 177 x 90 x 76.1

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**Applicable Controller Specifications:**

- **X-SEL-P/Q:** 6 axes
- **X-SEL-KE/KET:** 4 axes
- **5SEL:** 2 axes
- **SCON:** 1 axis

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**Technical Reference:**

- **IA/RC General Catalogue**
- **IA/RC Technical Reference**
IF-MA-400
Single-Axis Robot, Medium Belt Type, Actuator Width 120mm, 400W

- Model Designation: IF - 400 -
- Encoder Type: Absolute Incremental
- Motor Type: 400-W, 230VAC
- Stroke: 200-2500
- Speed: 1-1750 rpm
- Lead Capacity (Note 2): 40
- Rated Thrust (N): 171.5

**Options**
- AG Seal
- Creep Sensor (Note 3)
- Home Limit Switch (Note 3)
- Reversed Home Specification
- Guide with Ball Retention Mechanism
- Double Slider
- Metal Cable Joint Connector
- Compliance with CE Conformity (Standard Option)

**Common Specifications**
- Positioning Repeatability: ±0.2mm
- Drive Method: Timing Belt
- Lmt Motions: 0.1mm max.
- Static Allowable Moment: Please refer to chapter Technical Reference of IA/RC General Catalogue
- Overhang Length: Please refer to page 1
- Base: Material Aluminum with white anodizes treatment
- Applicable Controller: T1: XSEL-K/NET; T2: XSEL-P/D; SSEL, SCCN
- Cable Length: Not S: No Cable; S: 5m; M: 5m; XX: Specific Length
- (Assuming air temperature 0 to 40°C, 85% RH (non-condensing))

**Dimensions** (Motor Mounting with CE Option)

**Applicable Controller Specifications**
- Max number of controlled axes
- Connectable Encoder Type
- Operation Method
- Power Supply Voltage

**Notes:**
1. Ref. page 2 for the detailed explanation on the motor mounting positions.
2. The load capacity is the value obtained when the robot is operated at the acceleration of 0.5G.
3. Note thatif creep sensor and home limit switch are to be added, the sensor mounting side is determined by the motor mounting direction due to its configuration.
4. In case the traveling rate is 10000 km.
5. The maximum cable length is 30 m; Specify the length in the unit of m, (Example: 100 = 1m)