IF

Belt Drive Type Actuator

www.intelligentactuator.com
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 overhand 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>Load Moment (N·m (Kgf·m))</th>
<th>Overhang Load Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Slider</td>
<td>Ma: 28.4 (2.9) Mb: 40.2 (4.1) Mc: 65.7 (6.7)</td>
<td>Ma: Less than 450 Mb, Mc: Less than 450</td>
</tr>
<tr>
<td>Double Slider (45mm span)</td>
<td>Ma: 130.3 (13.3) Mb: 185.2 (18.9) Mc: 106.8 (10.9)</td>
<td>Ma: Less than 1125 Mb, Mc: Less than 1125</td>
</tr>
<tr>
<td>Double Slider (60mm span)</td>
<td>Ma: 142.0 (14.5) Mb: 203.8 (20.8) Mc: 106.8 (10.9)</td>
<td>Ma: Less than 1200 Mb, Mc: Less than 1200</td>
</tr>
<tr>
<td>Single Slider</td>
<td>Ma: 69.6 (7.1) Mb: 99.0 (10.1) Mc: 161.7 (16.5)</td>
<td>Ma: Less than 600 Mb, Mc: Less than 600</td>
</tr>
<tr>
<td>Double Slider (55mm span)</td>
<td>Ma: 316.5 (32.3) Mb: 450.8 (46.0) Mc: 262.0 (26.8)</td>
<td>Ma: Less than 1475 Mb, Mc: Less than 1475</td>
</tr>
<tr>
<td>Double Slider (80mm span)</td>
<td>Ma: 350.0 (35.8) Mb: 500.0 (51.0) Mc: 262.0 (26.8)</td>
<td>Ma: Less than 1600 Mb, Mc: Less than 1600</td>
</tr>
</tbody>
</table>

(*) Load moment calculated by assuming a traveled distance of 10,000km (f_w = 1.2)
IF Series Motor Mounting Positions

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).
IF-SA-60
Single-Axis Robot, Compact Belt Type, Actuator Width 90mm, 60W

Model Designation IF - 60

Series
SAT: Standard
SAL: Motor on Side
SEL: Motor on Bottom
SATV: Motor, Reversed
SALV: Motor, Reversed
SASS: Motor on Side, Reversed
SALB: Motor on Bottom, Reversed

Encoder Model
Absolute<br>Incremental

Motor Mounting Position
Standard<br>Motor on Side<br>Motor on Bottom


Motor Output (A)
60

Motor Mounting Position (Note 1)
Standard
Motor on Side
Motor on Bottom

Stroke 100mm Unit (mm)
<br>Standard: 290–2000

Speed (mm/s)
1–1750

Rated Thrust (N)
5 Horizontal Only

Load Capacity (Note 2)
Horizontal (kg) Vertical (kg)

Options
Motor Mounting Direction: L: Standard, R: Reversed
Encoder Type: Absolute, Incremental
Stroke: Motor on Side, Motor on Bottom
Applicable Controller: X-SEL-UK, X-SEL-PD, XSEL-SDW
Cable Length: Specified Length

Common Specifications
Positioning Repeatability ±0.01mm
Drive Method Timing Belt
Load Motion 0.1mm max.
Static Allowable Moment Please refer to page 1
Diaslic Allowable Torque Please refer to page 1
Overhang Length Please refer to page 1
Base Material: Aluminum with white anodizing treatment
Applicable Controller: X-SEL-UK, X-SEL-PD, XSEL-SDW
Cable Length (Note 5):
N: No Cable, S: 5m, M: 10m, XL: 15m, XXL: 20m

Dimensions

Single Slider

Double Slider

Applicable Controller Specifications

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 motor is operated at the acceleration of 0.3g.
Note 3: Note that if creep sensor and home limit switch are to be added, the sensor mounting angle is determined by the motor mounting direction due to its configuration,

Caution

In case the traveling life is 10,000km,
Note 4: The maximum cable length is 30m. Specify the length in the unit of m.
Example: XSEL-UK 8m
**IF-SA-100**

**Single-Axis Robot, Compact Belt Type, Actuator Width 90mm, 100W**

### 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 100mm Stroke Unit (mm)</th>
<th>Speed (mm/s)</th>
<th>Load Capacity (Note 2)</th>
<th>Rated Thrust (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IF-SA1 100</td>
<td>Absolute</td>
<td>100</td>
<td>Standard</td>
<td>290~2000</td>
<td>1~1750</td>
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<td>IF-SA2 100</td>
<td>Incremental</td>
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<td>Motor on Side</td>
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<tr>
<td>IF-SA3 100</td>
<td>Incremental</td>
<td></td>
<td>Motor on Bottom</td>
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</tr>
</tbody>
</table>

**Options**

- AQ Seal: AQ
- Creep Sensor (Note 3): C (CL: Reversed Mounting Side)
- Home Limit Switch (Note 3): L (LL: Reversed Mounting Side)
- Reversed Home Specification: NM
- Guide with Ball Retention Mechanism: RT
- Double Slider: W

### Common Specifications

- Positioning Repeatability: ±0.09mm
- Drive Method: Timing Belt
- Last Motion: 0.1mm max.
- Static Allowable Moment: Please refer to page 1
- Dynamic Allowable Wrench (Note 4): Please refer to page 1
- Overhang Length: Please refer to page 1
- Base: Material: Aluminum with white alumite treatment
- Applicable Controller: T: XSEL, Y: 3-Phase 200V, 50/60Hz, DC72
- Cable Length (Note 5): N: No Cable, S: ISO, M: SI, Multi-Spec: Specified Length
- Surrounding Air Temperature: 0 to 40°C, 85% RH (non-condensing)

### Dimensions

#### Single Slider

- F7 through ø11: depth, caustic, area depth 1
- Detailed view of A
- Detailed View of A
- T-slip Dimensions
- Cable Joint Connector *1
- Connect the motor cable and encoder cable.

#### Double Slider

- Minimum Spacing
- ø11: reversed depth 10
- T-slip

### Stroke

<table>
<thead>
<tr>
<th>Stroke</th>
<th>200</th>
<th>300</th>
<th>400</th>
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</tr>
</tbody>
</table>

#### Power Supply Voltage

- Single-Phase 1-phase 200V
- Single-Phase 3-phase 200V

**Applicable Controller Specifications**

- X-SEL: 6 axes
- Y-SEL: 4 axes
- SSEL: 2 axes
- SCON: 1 axis

**Operating Method**

- Absolute
- Incremental

**Operating Voltage**

- Single-Phase 100V/200V

**Note**

- Referring to page 2 for detailed explanation on the motor mounting positions.
- The load capacity is the value obtained when the robot is operated at the acceleration of 0.3g.
- Note that if the creep sensor and home limit switch are added, the sensor mounting position is determined by the motor mounting direction due to its configuration. (See page 2 for details)
- In case the travel length is 10,000mm, specify the length in the unit of m.
- Example: X29 = 8m
# IF-MA-200

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

## Models/Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Encoder Type</th>
<th>Motor Output (W)</th>
<th>Motor Mounting Position</th>
<th>Stroke (mm) Unit (mm)</th>
<th>Speed (mm/s)</th>
<th>Load Capacity (N)</th>
<th>Rated Thrust (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IF-MA1</td>
<td>Absolute</td>
<td>200</td>
<td>Standard</td>
<td>200-2500</td>
<td>1-1750</td>
<td>20</td>
<td>Horizontal Only</td>
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<tr>
<td>IF-MA2</td>
<td>Incremental</td>
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<td>Motor on Side</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>IF-MA3</td>
<td>Incremental</td>
<td></td>
<td>Motor on Bottom</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Options

- **Encoder Type**: AL - Absolute, IN - Incremental
- **Motor Mounting Position**: SM - Standard Mounting, SB - Side Mounting
- **Stroke**: MS - Motorized Stroke, RS - Reversed Stroke
- **Applicable Controller**: T - 3-Pulse, S - 2-Pulse
- **Cable Length**: N - No Cable, SC - Short Cable, L - Long Cable
- **Option**: A - B - C - D - E

## Common Specifications

- **Positioning Repeatability**: ±0.04mm
- **Drive Method**: Timing Belt
- **Last Motion**: 0.1mm max.
- **Static Allowable Moment**: Please refer to page 1
- **Dynamic Allowable Moment**: Please refer to page 1
- **Overhang Length**: Please refer to page 1
- **Base**: Material: Aluminum with white alumite treatment
- **Applicable Controller**: T - 3-Pulse, S - 2-Pulse
- **Cable Length (mm)**: N - No Cable, SC - Short Cable, L - Long Cable

### Dimensions

**Single Slider**

- **F-9 through 16 depth, 16mm thickness**

**Double Slider**

- **F-16 through 16 depth, 10mm thickness**

**Table of Stroke and Load Capacity**

<table>
<thead>
<tr>
<th>Stroke (mm)</th>
<th>200</th>
<th>300</th>
<th>400</th>
<th>500</th>
<th>600</th>
<th>800</th>
<th>1000</th>
<th>1200</th>
<th>1500</th>
<th>2000</th>
<th>2500</th>
<th>3000</th>
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</thead>
<tbody>
<tr>
<td>Load Capacity (N)</td>
<td>127</td>
<td>177</td>
<td>227</td>
<td>277</td>
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<td>377</td>
<td>427</td>
<td>477</td>
<td>527</td>
<td>577</td>
<td>627</td>
<td>677</td>
</tr>
</tbody>
</table>

**Note**: For detailed specifications, please refer to page 2.

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**Technical Specifications**

- **Motor Type**: 120W, 3-Pulse
- **Encoder Type**: Absolute Incremental
- **Controller**: 3-Pulse or 2-Pulse
- **Power Supply Voltage**: 100/200 VAC

**Caution**

1. Refer to page 2 for detailed explanation on the motor mounting positions.
2. The load capacity is the value obtained when the robot is operated at the acceleration of 0.1G.
3. Note that if creep sensor and home limit switch are added, the sensor mounting position is determined by the motor mounting direction due to its configuration (See page 2 for details).
4. In case the travelling distance is 10,000mm, specify the length in the unit of m. (Example: X08 = 8m)