

# Belt Drive Type Actuator **IF**



# IF

## Belt Drive Type Actuator



IF Series base structure deformation under a given amount of force.



Deformation of a competitor's base structure under the same amount of force.

### Features:

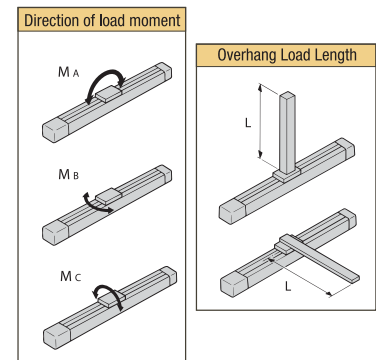
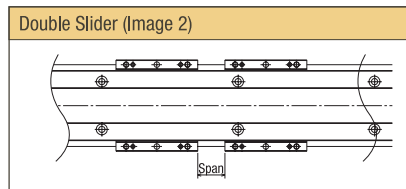
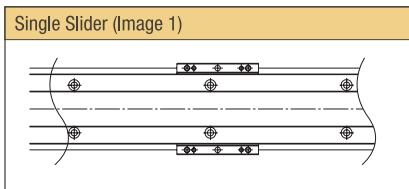
- Timing belt-type actuator using AC servo motor and incremental optical encoder.
- Maximum stroke length: 2500mm; maximum speed: 1750mm/s.
- Highly rigid base structure.
- Double slider option increases moment capability and allows greater overhang load length.
- Urethane timing belt is highly durable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



| Type                   |         |                              | Load Moment<br>N · m (Kgf · m)                              | Overhang Load Length<br>(mm)                   |
|------------------------|---------|------------------------------|---|--|
| IF-SA-60<br>IF-SA-100  | Image ① | Single Slider                | Ma : 28.4 (2.9)<br>Mb : 40.2 (4.1)<br>Mc : 65.7 (6.7)       | Ma : Less than 450<br>Mb, Mc : Less than 450   |
|                        | Image ② | Double Slider<br>(45mm span) | Ma : 130.3 (13.3)<br>Mb : 185.2 (18.9)<br>Mc : 106.8 (10.9) | Ma : Less than 1125<br>Mb, Mc : Less than 1125 |
|                        |         | Double Slider<br>(60mm span) | Ma : 142.0 (14.5)<br>Mb : 203.8 (20.8)<br>Mc : 106.8 (10.9) | Ma : Less than 1200<br>Mb, Mc : Less than 1200 |
| IF-MA-200<br>IF-MA-400 | Image ① | Single Slider                | Ma : 69.6 (7.1)<br>Mb : 99.0 (10.1)<br>Mc : 161.7 (16.5)    | Ma : Less than 600<br>Mb, Mc : Less than 600   |
|                        | Image ② | Double Slider<br>(55mm span) | Ma : 316.5 (32.3)<br>Mb : 450.8 (46.0)<br>Mc : 262.0 (26.8) | Ma : Less than 1475<br>Mb, Mc : Less than 1475 |
|                        |         | Double Slider<br>(80mm span) | Ma : 350.0 (35.8)<br>Mb : 500.0 (51.0)<br>Mc : 262.0 (26.8) | Ma : Less than 1600<br>Mb, Mc : Less than 1600 |

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(\*) Load moment calculated by assuming a traveled distance of 10,000km (fw=1.2)

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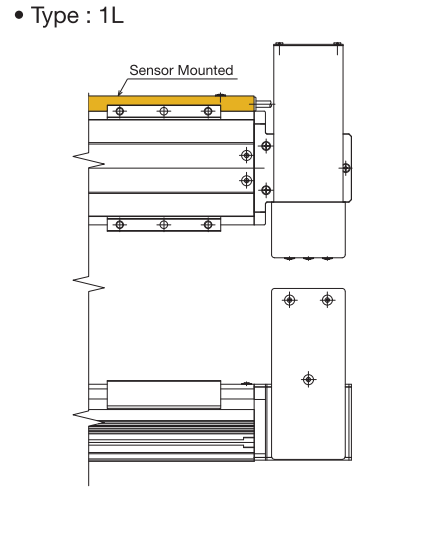
**[IF Series]**

|                  |   |               |  |                             |  |  |  |   |  |   |  |  |  |  |  |
|------------------|---|---------------|--|-----------------------------|--|--|--|---|--|---|--|--|--|--|--|
| <b>IF</b>        |   |               |  |                             |  |  |  |   |  |   |  |  |  |  |  |
| <b>① Series</b>  |   | <b>② Type</b> |  | <b>③ Encoder Model</b>      |  | <b>④ Motor Type</b>                        |  | <b>⑤ Stroke</b>                                   |  | <b>⑥ Applicable Controller</b>            |  | <b>⑦ Cable Length</b>                              |  | <b>⑧ Option</b>  |  |
| IF Standard Type |   |               |  | A Absolute<br>I Incremental |  | 60 60W<br>100 100W<br>200 200W<br>400 400W |  | 200 200mm<br>~ ~<br>2500 2500mm<br>In 100mm steps |  | T1 XSEL-J/K<br>SCON<br>T2 SSEL<br>XEL-P/Q |  | N No Cable<br>S 3m<br>M 5m<br>X□□ Specified Length |  | AQ AQ Seal LM Master Axis of Synchronized Specification<br>C Creep Sensor NM Reverse Home Specification<br>CL Creep Sensor Mounting Reversed RT Guide with Ball Retention Mechanism<br>L Limit Switch S Slave Axis of Synchronized Specification<br>LL Limit Switch Mounting Reversed W Double Slider<br>LLM Synchronized Specification Sensor Mounting Reversed |  |
| SA1L             | Compact Standard Type                           | MA1L          | Medium Standard Type                           |                             |  |  |  |   |  |   |  |  |  |  |  |
| SA2L             | Compact Motor On Side                           | MA2L          | Medium Motor On Side                           |                             |  |  |  |   |  |   |  |  |  |  |  |
| SA3L             | Compact Motor On Bottom                         | MA3L          | Medium Motor On Bottom                         |                             |  |  |  |   |  |   |  |  |  |  |  |
| SA1R             | Compact Standard Type Motor Mounting Reversed   | MA1R          | Medium Standard Type Motor Mounting Reversed   |                             |  |  |  |   |  |   |  |  |  |  |  |
| SA2R             | Compact Motor On Side Motor Mounting Reversed   | MA2R          | Medium Motor On Side Motor Mounting Reversed   |                             |  |  |  |   |  |   |  |  |  |  |  |
| SA3R             | Compact Motor On Bottom Motor Mounting Reversed | MA3R          | Medium Motor On Bottom Motor Mounting Reversed |                             |  |  |  |   |  |   |  |  |  |  |  |

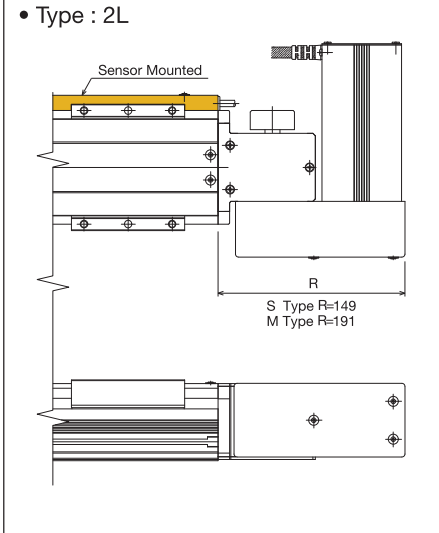
**IF Series Motor Mounting Positions**

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).

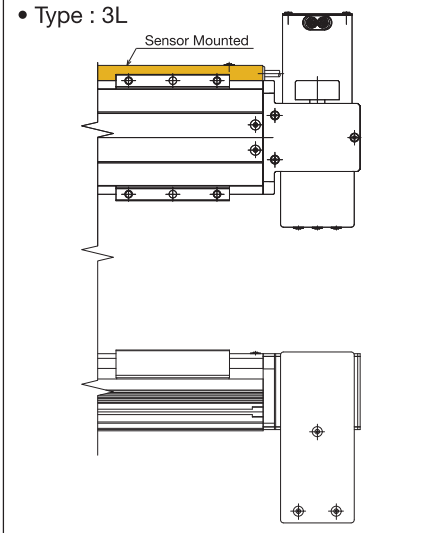
**Standard Type**



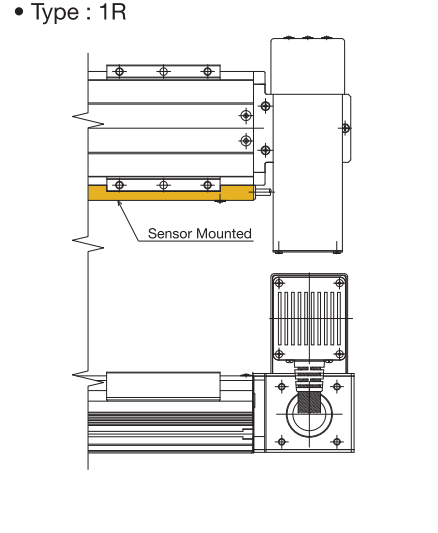
**Motor On Side**



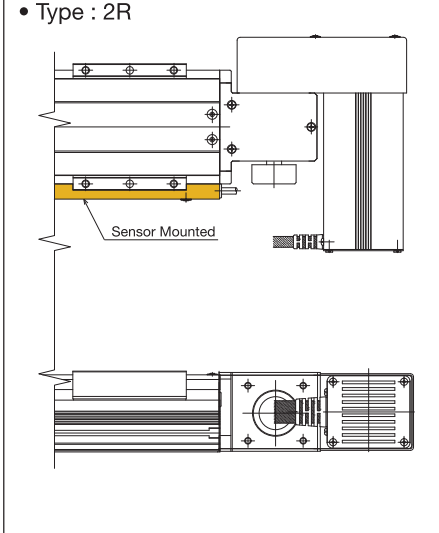
**Motor On Bottom**



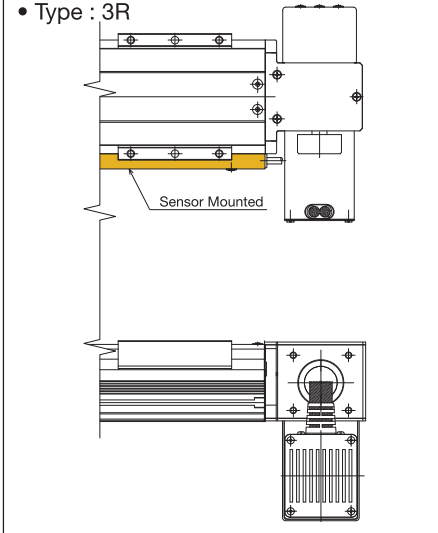
**Standard Type**



**Motor On Side**



**Motor On Bottom**



# IF-SA-60

Single-Axis Robot, Compact Belt Type, Actuator Width 90mm, 60W



|  |                               |               |  |  |  |                                  |        |   |   |   |   |
|--|-------------------------------|---------------|--|--|--|----------------------------------|--------|---|---|---|---|
| <b>Model Designation</b>   | <b>IF</b>                     | —             | —  | —  | <b>60</b>  | —                                | —      | — | — | — | — |
| <b>Series</b>  | Type                          | Encoder Model | Motor Type                                   | Stroke                                       | Applicable Controller                                  | Cable Length                     | Option |   |   |   |   |
| S A1 L: Standard<br>S A2 L: Motor on Side<br>S A3 L: Motor on Bottom<br>S A1 R: Motor, Reversed<br>S A2 R: Horizontal Motor, Reversed<br>S A3 R: Motor on Bottom, Reversed | A: Absolute<br>I: Incremental | 60-60W        | 200-200mm<br>2000-2000mm<br>(in 100mm steps) | T1: XSEL-J/K<br>T2: SCON<br>SSEL<br>XSEL-P/Q | N: No Cable<br>S: 3m<br>M: 5m<br>X□□: Specified Length | Refer to the options table below |        |   |   |   |   |

## Models/Specifications

| Model                             | Encoder Type         | Motor Output (W) | Motor Mounting Position (Note 1) | Stroke 100mm Unit (mm) | Speed (mm/s) | Load Capacity (Note 2) |                 | Rated Thrust (N) |
|-----------------------------------|----------------------|------------------|----------------------------------|------------------------|--------------|------------------------|-----------------|------------------|
|                                   |                      |                  |                                  |                        |              | Horizontal (kg)        | Vertical (kg)   |                  |
| IF-SA1 [1]-[2]-60-[3]-[4]-[5]-[6] | Absolute Incremental | 60               | Standard                         | 200-2000               | 1-1750       | 5                      | Horizontal Only | 25.8             |
| IF-SA2 [1]-[2]-60-[3]-[4]-[5]-[6] |                      |                  | Motor on Side                    |                        |              |                        |                 |                  |
| IF-SA3 [1]-[2]-60-[3]-[4]-[5]-[6] |                      |                  | Motor on Bottom                  |                        |              |                        |                 |                  |

\* [1]: Motor mounting direction (L: Standard, R: Reversed), [2]: Encoder Type, [3]: Stroke, [4]: Applicable Controller, [5]: Cable Length, and [6]: Option.

## Options

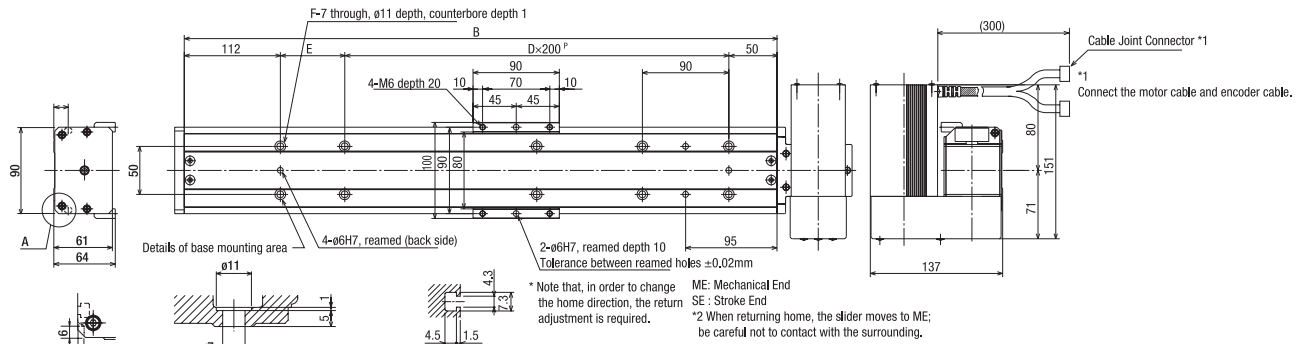
| Name                                | Model | Remarks                      |
|-------------------------------------|-------|------------------------------|
| AQ Seal                             | AQ    |                              |
| Creep Sensor (Note 3)               | C     | (CL: Reversed Mounting 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

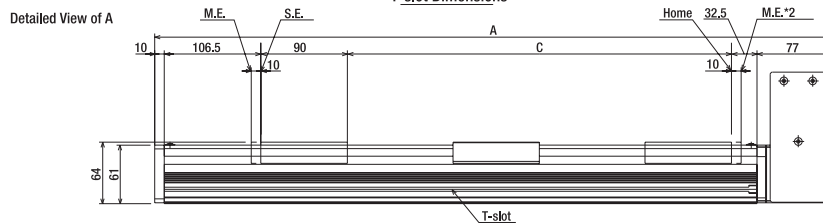
|                                   |  |
|-----------------------------------|--|
| Positioning Repeatability         | ±0.08mm  |
| Drive Method                      | Timing Belt                                      |
| Lost Motion                       | 0.1mm max.                                       |
| Static Allowable Moment           | Please refer to page 1                           |
| Dynamic Allowable Moment (Note 4) | Please refer to page 1                           |
| Overhang Length                   | Please refer to page 1                           |
| Base                              | Material: Aluminum with white alumite treatment  |
| Applicable Controller             | T1: XSEL-J/K T2: XSEL-P/Q, SSEL, SCON            |
| Cable Length (Note 5)             | N: No Cable, S: 3m, M: 5m, X□□: Specified Length |
| Surrounding Air Temp/Humidity     | 0 to 40°C, 85% RH (non-condensing)               |

## Dimensions

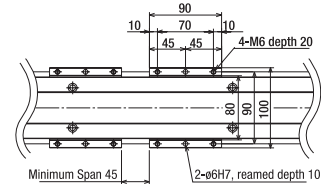
### Single Slider



### T-slot Dimensions



### Double Slider



| Stroke           | 200  | 300 | 400 | 500 | 600 | 700  | 800  | 900  | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 | 1600 | 1700 | 1800 | 1900 | 2000 |
|------------------|------|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| A                | 516  | 616 | 716 | 816 | 916 | 1016 | 1116 | 1216 | 1316 | 1416 | 1516 | 1616 | 1716 | 1816 | 1916 | 2016 | 2116 | 2216 | 2316 |
| B                | 429  | 529 | 629 | 729 | 829 | 929  | 1029 | 1129 | 1229 | 1329 | 1429 | 1529 | 1629 | 1729 | 1829 | 1929 | 2029 | 2129 | 2229 |
| C                | 200  | 300 | 400 | 500 | 600 | 700  | 800  | 900  | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 | 1600 | 1700 | 1800 | 1900 | 2000 |
| D                | 1    | 1   | 2   | 2   | 3   | 3    | 4    | 4    | 5    | 5    | 6    | 6    | 7    | 7    | 8    | 8    | 9    | 9    | 10   |
| E                | 67   | 167 | 67  | 167 | 67  | 167  | 67   | 167  | 67   | 167  | 67   | 167  | 67   | 167  | 67   | 167  | 67   | 167  | 67   |
| F                | 8    | 8   | 10  | 10  | 12  | 12   | 14   | 14   | 16   | 16   | 18   | 18   | 20   | 20   | 22   | 22   | 24   | 24   | 26   |
| Mass (kg)        | 4.4  | 4.9 | 5.4 | 5.9 | 6.4 | 6.8  | 7.3  | 7.8  | 8.3  | 8.8  | 9.2  | 9.7  | 10.2 | 10.7 | 11.2 | 11.6 | 12.1 | 12.6 | 13.1 |
| Max Speed (mm/s) | 1750 |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

## Applicable Controller Specifications

| Applicable Controller | Max number of controlled axes | Connectable Encoder Type | Operating Method       | Power Supply Voltage         |
|-----------------------|-------------------------------|--------------------------|------------------------|------------------------------|
| X-SEL-P/Q             | 6 axes                        | Absolute Incremental     | Program                | Single-Phase 3-phase 200 VAC |
| X-SEL-J/K             | 4 axes                        |                          |                        | Single-Phase 100/200 VAC     |
| SSEL                  | 2 axes                        |                          | Positioner Pulse Train | Single-Phase 100/200 VAC     |
| SCON                  | 1 axis                        |                          |                        |                              |



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 0.3G.  
 (Note 3) Note that if 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 (See page 2 for details)  
 (Note 4) In case the traveling life is 10,000km.  
 (Note 5) The maximum cable length is 30m. Specify the length in the unit of m. (Example: X08 = 8m)

# IF-SA-100

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



|  |           |                               |            |  |  |  |                                  |   |   |   |   |   |   |   |   |
|--|-----------|-------------------------------|------------|--|--|--|----------------------------------|---|---|---|---|---|---|---|---|
| <b>Model Designation</b>   | <b>IF</b> | —                             | □          | —  | □  | —  | <b>100</b>                       | — | □ | — | □ | — | □ | — | □ |
| Series   | Type      | Encoder Model                 | Motor Type | Stroke   | Applicable Controller                      | Cable Length   | Option                           |   |   |   |   |   |   |   |   |
| SA1L: Standard<br>SA2L: Motor on Side<br>SA3L: Motor on Bottom<br>SA1R: Motor, Reversed<br>SA2R: Horizontal Motor, Reversed<br>SA3R: Motor on Bottom, Reversed |           | A: Absolute<br>I: Incremental | 100:100W   | 200:200mm<br>5<br>2000:2000mm<br>( $\phi$ 100mm steps) | T1:XSEL-J/K<br>T2:SCON<br>SSEL<br>XSEL-P/Q | N: No Cable<br>S: 3m<br>M: 5m<br>X□□: Specified Length | Refer to the options table below |   |   |   |   |   |   |   |   |

## Models/Specifications

| Model                  | Encoder Type         | Motor Output (W) | Motor Mounting Position (Note 1) | Stroke 100mm Unit (mm) | Speed (mm/s) | Load Capacity (Note 2) |                 | Rated Thrust (N) |
|------------------------|----------------------|------------------|----------------------------------|------------------------|--------------|------------------------|-----------------|------------------|
|                        |                      |                  |                                  |                        |              | Horizontal (kg)        | Vertical (kg)   |                  |
| IF-SA1 ①-②-100-③-④-⑤-⑥ | Absolute Incremental | 100              | Standard                         | 200~2000               | 1~1750       | 10                     | Horizontal Only | 43.0             |
| IF-SA2 ①-②-100-③-④-⑤-⑥ |                      |                  | Motor on Side                    |                        |              |                        |                 |                  |
| IF-SA3 ①-②-100-③-④-⑤-⑥ |                      |                  | Motor on Bottom                  |                        |              |                        |                 |                  |

\* ①: Motor mounting direction (L: Standard, R: Reversed), ②: Encoder Type, ③: Stroke, ④: Applicable Controller, ⑤: Cable Length, and ⑥: Option.

## Options

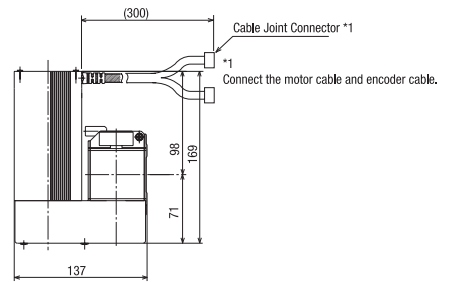
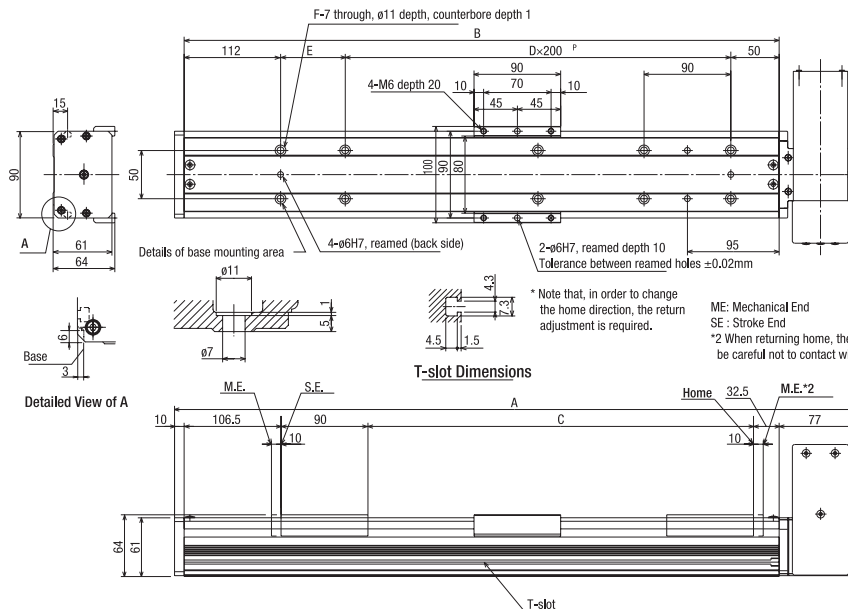
| Name                                | Model | Remarks                      |
|-------------------------------------|-------|------------------------------|
| AQ Seal                             | AQ    |                              |
| Creep Sensor (Note 3)               | C     | (CL: Reversed Mounting 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

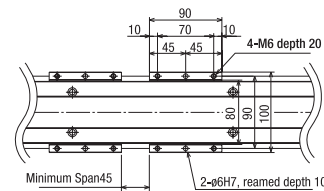
|                                   |  |
|-----------------------------------|--|
| Positioning Repeatability         | ±0.08mm  |
| Drive Method                      | Timing Belt                                      |
| Lost Motion                       | 0.1mm max.                                       |
| Static Allowable Moment           | Please refer to page 1                           |
| Dynamic Allowable Moment (Note 4) | Please refer to page 1                           |
| Overhang Length                   | Please refer to page 1                           |
| Base                              | Material: Aluminum with white alumite treatment  |
| Applicable Controller             | T1: XSEL-J/K T2: XSEL-P/Q, SSEL, SCON            |
| Cable Length (Note 5)             | N: No Cable, S: 3m, M: 5m, X□□: Specified Length |
| Surrounding Air Temp/Humidity     | 0 to 40°C, 85% RH (non-condensing)               |

## Dimensions

### Single Slider



### Double Slider



\* In the case of the double sliders, the stroke becomes shorter by the length of slider plus the span between sliders.

| Stroke           | 200  | 300 | 400 | 500 | 600 | 700  | 800  | 900  | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 | 1600 | 1700 | 1800 | 1900 | 2000 |
|------------------|------|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| A                | 516  | 616 | 716 | 816 | 916 | 1016 | 1116 | 1216 | 1316 | 1416 | 1516 | 1616 | 1716 | 1816 | 1916 | 2016 | 2116 | 2216 | 2316 |
| B                | 429  | 529 | 629 | 729 | 829 | 929  | 1029 | 1129 | 1229 | 1329 | 1429 | 1529 | 1629 | 1729 | 1829 | 1929 | 2029 | 2129 | 2229 |
| C                | 200  | 300 | 400 | 500 | 600 | 700  | 800  | 900  | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 | 1600 | 1700 | 1800 | 1900 | 2000 |
| D                | 1    | 1   | 2   | 2   | 3   | 3    | 4    | 4    | 5    | 5    | 6    | 6    | 7    | 7    | 8    | 8    | 9    | 9    | 10   |
| E                | 67   | 167 | 67  | 167 | 67  | 167  | 67   | 167  | 67   | 167  | 67   | 167  | 67   | 167  | 67   | 167  | 67   | 167  | 67   |
| F                | 8    | 8   | 10  | 10  | 12  | 12   | 14   | 14   | 16   | 16   | 18   | 18   | 20   | 20   | 22   | 22   | 24   | 24   | 26   |
| Mass (kg)        | 4.6  | 5.1 | 5.6 | 6.1 | 6.6 | 7.0  | 7.5  | 8.0  | 8.5  | 9.0  | 9.4  | 9.9  | 10.4 | 10.9 | 11.4 | 11.8 | 12.3 | 12.8 | 13.3 |
| Max Speed (mm/s) | 1750 |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

## Applicable Controller Specifications

| Applicable Controller | Max number of controlled axes | Connectable Encoder Type | Operating Method       | Power Supply Voltage         |
|-----------------------|-------------------------------|--------------------------|------------------------|------------------------------|
| X-SEL-P/Q             | 6 axes                        | Absolute Incremental     | Program                | Single-Phase 3-phase 200 VAC |
| X-SEL-J/K             | 4 axes                        |                          |                        | Single-Phase 100/200 VAC     |
| SSEL                  | 2 axes                        |                          | Positioner Pulse Train | Single-Phase 100/200 VAC     |
| SCON                  | 1 axis                        |                          |                        |                              |



(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 0.3G.  
 (Note 3) Note that if 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 (See page 2 for details)  
 (Note 4) In case the traveling life is 10,000km.  
 (Note 5) The maximum cable length is 30m. Specify the length in the unit of m. (Example: X08 = 8m)

# IF-MA-200

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



|  |                               |               |  |  |  |                                  |        |  |  |  |
|--|-------------------------------|---------------|--|--|--|----------------------------------|--------|--|--|--|
| <b>Model Designation</b>   | <b>IF</b>                     |               |  |  | <b>200</b>   |                                  |        |  |  |  |
| <b>Series</b>  | Type                          | Encoder Model | Motor Type                                   | Stroke                                       | Applicable Controller                                  | Cable Length                     | Option |  |  |  |
| MA1L: Standard<br>MA2L: Motor on Side<br>MA3L: Motor on Bottom<br>MA1R: Motor, Reversed<br>MA2R: Horizontal Motor, Reversed<br>MA3R: Motor on Bottom, Reversed | A: Absolute<br>I: Incremental | 200:200W      | 200:200mm<br>2500:2500mm<br>(ø: 100mm steps) | T1: XSEL-J/K<br>T2: SCON<br>SSEL<br>XSEL-P/Q | N: No Cable<br>S: 3m<br>M: 5m<br>X□□: Specified Length | Refer to the options table below |        |  |  |  |

## Models/Specifications

| Model                              | Encoder Type         | Motor Output (W) | Motor Mounting Position (Note 1) | Stroke 100mm Unit (mm) | Speed (mm/s) | Load Capacity (Note 2) |                 | Rated Thrust (N) |
|------------------------------------|----------------------|------------------|----------------------------------|------------------------|--------------|------------------------|-----------------|------------------|
|                                    |                      |                  |                                  |                        |              | Horizontal (kg)        | Vertical (kg)   |                  |
| IF-MA1 [1]-[2]-200-[3]-[4]-[5]-[6] | Absolute Incremental | 200              | Standard                         | 200-2500               | 1-1750       | 20                     | Horizontal Only | 85.7             |
| IF-MA2 [1]-[2]-200-[3]-[4]-[5]-[6] |                      |                  | Motor on Side                    |                        |              |                        |                 |                  |
| IF-MA3 [1]-[2]-200-[3]-[4]-[5]-[6] |                      |                  | Motor on Bottom                  |                        |              |                        |                 |                  |

\* [1]: Motor mounting direction (L: Standard, R: Reversed), [2]: Encoder Type, [3]: Stroke, [4]: Applicable Controller, [5]: Cable Length, and [6]: Option.

## Options

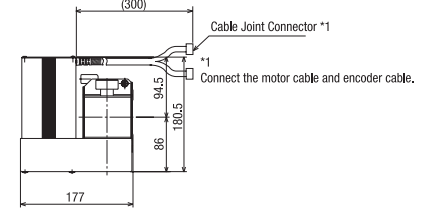
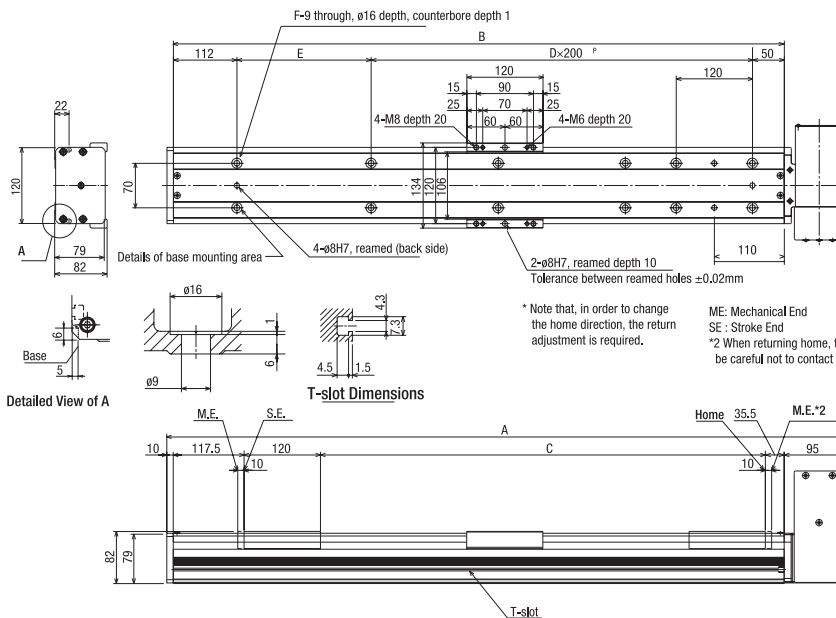
| Name                                | Model | Remarks                      |
|-------------------------------------|-------|------------------------------|
| AQ Seal                             | AQ    |                              |
| Creep Sensor (Note 3)               | C     | (CL: Reversed Mounting 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

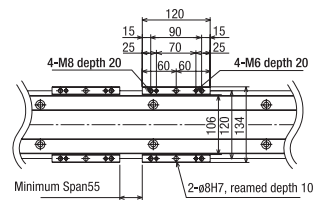
|                                   |  |
|-----------------------------------|--|
| Positioning Repeatability         | ±0.08mm  |
| Drive Method                      | Timing Belt                                      |
| Lost Motion                       | 0.1mm max.                                       |
| Static Allowable Moment           | Please refer to page 1                           |
| Dynamic Allowable Moment (Note 4) | Please refer to page 1                           |
| Overhang Length                   | Please refer to page 1                           |
| Base                              | Material: Aluminum with white alumite treatment  |
| Applicable Controller             | T1: XSEL-J/K T2: XSEL-P/Q, SSEL, SCON            |
| Cable Length (Note 5)             | N: No Cable, S: 3m, M: 5m, X□□: Specified Length |
| Surrounding Air Temp/Humidity     | 0 to 40°C, 85% RH (non-condensing)               |

## Dimensions

### Single Slider



### Double Slider



\* In the case of the double sliders, the stroke becomes shorter by the length of slider plus the span between sliders.

| Stroke           | 200  | 300 | 400 | 500  | 600  | 700  | 800  | 900  | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 | 1600 | 1700 | 1800 | 1900 | 2000 | 2100 | 2200 | 2300 | 2400 | 2500 |
|------------------|------|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| A                | 578  | 678 | 778 | 878  | 978  | 1078 | 1178 | 1278 | 1378 | 1478 | 1578 | 1678 | 1778 | 1878 | 1978 | 2078 | 2178 | 2278 | 2378 | 2478 | 2578 | 2678 | 2778 | 2878 |
| B                | 473  | 573 | 673 | 773  | 873  | 973  | 1073 | 1173 | 1273 | 1373 | 1473 | 1573 | 1673 | 1773 | 1873 | 1973 | 2073 | 2173 | 2273 | 2373 | 2473 | 2573 | 2673 | 2773 |
| C                | 200  | 300 | 400 | 500  | 600  | 700  | 800  | 900  | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 | 1600 | 1700 | 1800 | 1900 | 2000 | 2100 | 2200 | 2300 | 2400 | 2500 |
| D                | 1    | 1   | 2   | 2    | 3    | 3    | 4    | 4    | 5    | 5    | 6    | 6    | 7    | 7    | 8    | 8    | 9    | 9    | 10   | 10   | 11   | 11   | 12   | 12   |
| E                | 111  | 211 | 111 | 211  | 111  | 211  | 111  | 211  | 111  | 211  | 111  | 211  | 111  | 211  | 111  | 211  | 111  | 211  | 111  | 211  | 111  | 211  | 111  | 211  |
| F                | 8    | 8   | 10  | 10   | 12   | 12   | 14   | 14   | 16   | 16   | 18   | 18   | 20   | 20   | 22   | 22   | 24   | 24   | 26   | 26   | 28   | 28   | 30   | 30   |
| Mass (kg)        | 7.7  | 8.5 | 9.3 | 10.0 | 10.8 | 11.6 | 12.4 | 13.2 | 14.0 | 14.8 | 15.6 | 16.4 | 17.2 | 17.9 | 18.7 | 19.5 | 20.3 | 21.1 | 21.9 | 22.7 | 23.5 | 24.3 | 25.1 | 25.8 |
| Max Speed (mm/s) | 1750 |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

## Applicable Controller Specifications

| Applicable Controller | Max number of controlled axes | Connectable Encoder Type | Operating Method       | Power Supply Voltage         |
|-----------------------|-------------------------------|--------------------------|------------------------|------------------------------|
| X-SEL-P/Q             | 6 axes                        | Absolute Incremental     | Program                | Single-Phase 3-phase 200 VAC |
| X-SEL-J/K             | 4 axes                        |                          |                        | Single-Phase 100/200 VAC     |
| SSEL                  | 2 axes                        |                          | Positioner Pulse Train | Single-Phase 100/200 VAC     |
| SCON                  | 1 axis                        |                          |                        |                              |



(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 0.3G.  
 (Note 3) Note that if 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 (See page 2 for details)  
 (Note 4) In case the traveling life is 10,000km.  
 (Note 5) The maximum cable length is 30m. Specify the length in the unit of m. (Example: X08 = 8m)

# IF-MA-400

Single-Axis Robot, Medium Belt Type, Actuator Width 120mm, 400W



|  |           |                               |            |   |  |  |                                  |  |  |
|--|-----------|-------------------------------|------------|---|--|--|----------------------------------|--|--|
| <b>Model Designation</b>   | <b>IF</b> |                               |            | <b>400</b>  |  |  |                                  |  |  |
| Series   | Type      | Encoder Model                 | Motor Type | Stroke  | Applicable Controller                        | Cable Length   | Option                           |  |  |
| MA1L: Standard<br>MA2L: Motor on Side<br>MA3L: Motor on Bottom<br>MA1R: Motor, Reversed<br>MA2R: Horizontal Motor, Reversed<br>MA3R: Motor on Bottom, Reversed |           | A: Absolute<br>I: Incremental | 400-400W   | 200-200mm<br>5<br>2500-2500mm<br>(in 100mm steps) | T1: XSEL-J/K<br>T2: SCON<br>SSEL<br>XSEL-P/Q | N: No Cable<br>S: 3m<br>M: 5m<br>X□□: Specified Length | Refer to the options table below |  |  |

## Models/Specifications

| Model                              | Encoder Type         | Motor Output (W) | Motor Mounting Position (Note 1) | Stroke 100mm Unit (mm) | Speed (mm/s) | Load Capacity (Note 2) |                 | Rated Thrust (N) |
|------------------------------------|----------------------|------------------|----------------------------------|------------------------|--------------|------------------------|-----------------|------------------|
|                                    |                      |                  |                                  |                        |              | Horizontal (kg)        | Vertical (kg)   |                  |
| IF-MA1 [1]-[2]-400-[3]-[4]-[5]-[6] | Absolute Incremental | 400              | Standard                         | 200-2500               | 1-1750       | 40                     | Horizontal Only | 171.5            |
| IF-MA2 [1]-[2]-400-[3]-[4]-[5]-[6] |                      |                  | Motor on Side                    |                        |              |                        |                 |                  |
| IF-MA3 [1]-[2]-400-[3]-[4]-[5]-[6] |                      |                  | Motor on Bottom                  |                        |              |                        |                 |                  |

\* [1]: Motor mounting direction (L: Standard, R: Reversed), [2]: Encoder Type, [3]: Stroke, [4]: Applicable Controller, [5]: Cable Length, and [6]: Option.

## Options

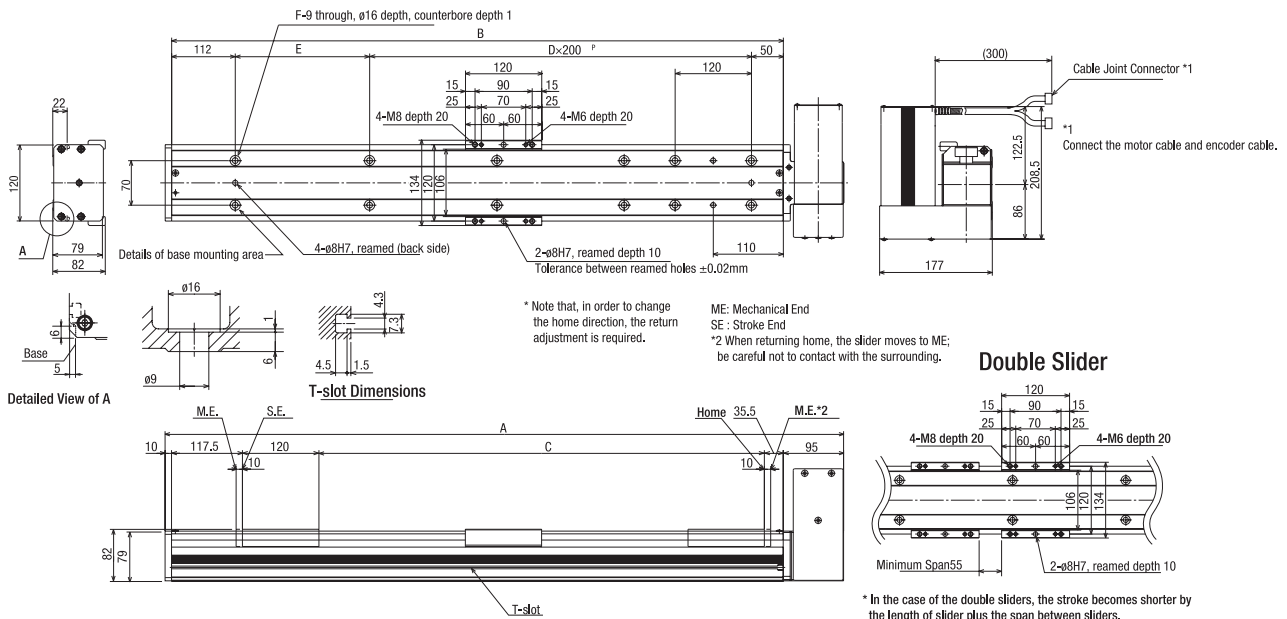
| Name                                | Model | Remarks                      |
|-------------------------------------|-------|------------------------------|
| AQ Seal                             | AQ    |                              |
| Creep Sensor (Note 3)               | C     | (CL: Reversed Mounting 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         | ±0.08mm  |
| Drive Method                      | Timing Belt                                      |
| Lost Motion                       | 0.1mm max.                                       |
| Static Allowable Moment           | Please refer to page 1                           |
| Dynamic Allowable Moment (Note 4) | Please refer to page 1                           |
| Overhang Length                   | Please refer to page 1                           |
| Base                              | Material: Aluminum with white alumite treatment  |
| Applicable Controller             | T1: XSEL-J/K T2: XSEL-P/Q, SSEL, SCON            |
| Cable Length (Note 5)             | N: No Cable, S: 3m, M: 5m, X□□: Specified Length |
| Surrounding Air Temp/Humidity     | 0 to 40°C, 85% RH (non-condensing)               |

## Dimensions

### Single Slider



| Stroke           | 200  | 300 | 400 | 500  | 600  | 700  | 800  | 900  | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 | 1600 | 1700 | 1800 | 1900 | 2000 | 2100 | 2200 | 2300 | 2400 | 2500 |
|------------------|------|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| A                | 578  | 678 | 778 | 878  | 978  | 1078 | 1178 | 1278 | 1378 | 1478 | 1578 | 1678 | 1778 | 1878 | 1978 | 2078 | 2178 | 2278 | 2378 | 2478 | 2578 | 2678 | 2778 | 2878 |
| B                | 473  | 573 | 673 | 773  | 873  | 973  | 1073 | 1173 | 1273 | 1373 | 1473 | 1573 | 1673 | 1773 | 1873 | 1973 | 2073 | 2173 | 2273 | 2373 | 2473 | 2573 | 2673 | 2773 |
| C                | 200  | 300 | 400 | 500  | 600  | 700  | 800  | 900  | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 | 1600 | 1700 | 1800 | 1900 | 2000 | 2100 | 2200 | 2300 | 2400 | 2500 |
| D                | 1    | 1   | 2   | 2    | 3    | 3    | 4    | 4    | 5    | 5    | 6    | 6    | 7    | 7    | 8    | 8    | 9    | 9    | 10   | 10   | 11   | 11   | 12   | 12   |
| E                | 111  | 211 | 111 | 211  | 111  | 211  | 111  | 211  | 111  | 211  | 111  | 211  | 111  | 211  | 111  | 211  | 111  | 211  | 111  | 211  | 111  | 211  | 111  | 211  |
| F                | 8    | 8   | 10  | 10   | 12   | 12   | 14   | 14   | 16   | 16   | 18   | 18   | 20   | 20   | 22   | 22   | 24   | 24   | 26   | 26   | 28   | 28   | 30   | 30   |
| Mass (kg)        | 8.2  | 9.0 | 9.8 | 10.5 | 11.3 | 12.1 | 12.9 | 13.7 | 14.5 | 15.3 | 16.1 | 16.9 | 17.7 | 18.4 | 19.2 | 20.0 | 20.8 | 21.6 | 22.4 | 23.2 | 24.0 | 24.8 | 25.6 | 26.3 |
| Max Speed (mm/s) | 1750 |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

## Applicable Controller Specifications

| Applicable Controller | Max number of controlled axes | Connectable Encoder Type | Operating Method       | Power Supply Voltage         |
|-----------------------|-------------------------------|--------------------------|------------------------|------------------------------|
| X-SEL-P/Q             | 6 axes                        | Absolute Incremental     | Program                | Single-Phase 3-phase 200 VAC |
| X-SEL-J/K             | 4 axes                        |                          |                        | Single-Phase 100/200 VAC     |
| SSEL                  | 2 axes                        |                          | Positioner Pulse Train |                              |
| SCON                  | 1 axis                        |                          |                        |                              |



(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 0.3G.  
 (Note 3) Note that if 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 (See page 2 for details)  
 (Note 4) In case the traveling life is 10,000km.  
 (Note 5) The maximum cable length is 30m. Specify the length in the unit of m. (Example: X08 = 8m)