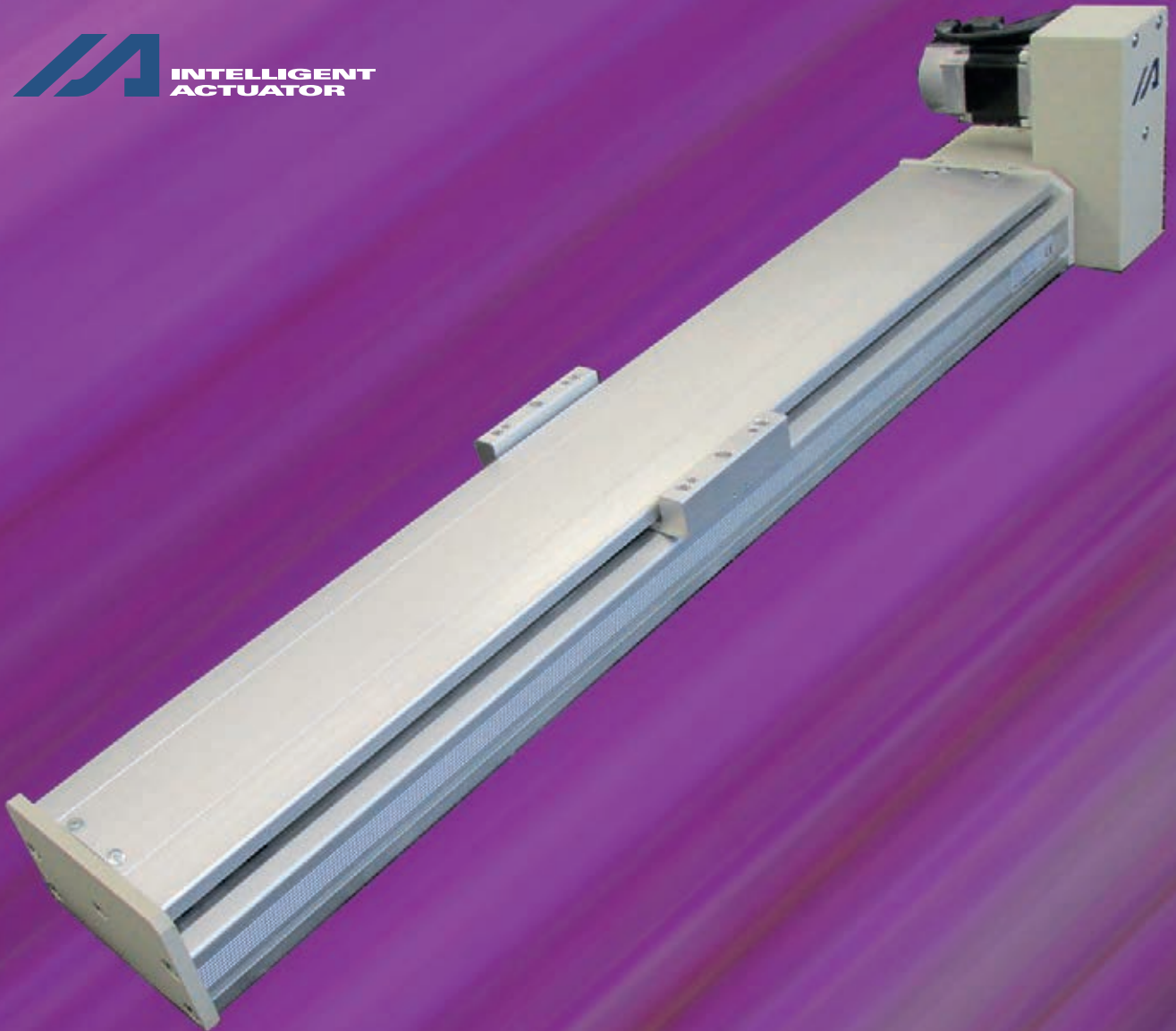


Belt Drive Type Actuator **IF**

**IAI** INTELLIGENT  
ACTUATOR

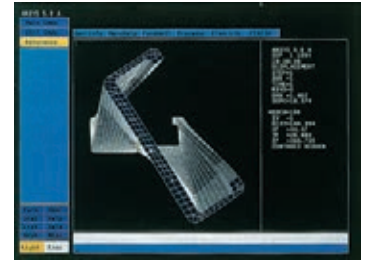


# IF

## 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:

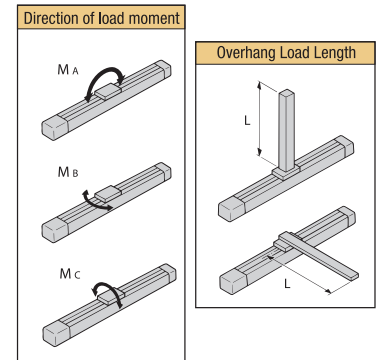
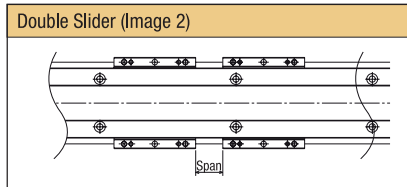
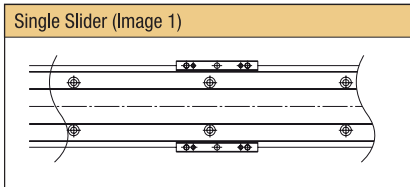
- Timing belt-type actuator using AC servo motor and incremental optical encoder.
- Maximum stroke length: 2500mm; maximum speed: 1750mm/s.
- Highly rigid base structure.
- Double slider option increases moment capability and allows greater overhang load length.
- Urethane timing belt is highly durable 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 N · m (Kgf · m)	Overhang Load Length (mm)
IF-SA-60 IF-SA-100	Image ①	Single Slider	Ma : 28.4 (2.9) Mb : 40.2 (4.1) Mc : 65.7 (6.7)	Ma : Less than 450 Mb, Mc : Less than 450
	Image ②	Double Slider (45mm span)	Ma : 130.3 (13.3) Mb : 185.2 (18.9) Mc : 106.8 (10.9)	Ma : Less than 1125 Mb, Mc : Less than 1125
		Double Slider (60mm span)	Ma : 142.0 (14.5) Mb : 203.8 (20.8) Mc : 106.8 (10.9)	Ma : Less than 1200 Mb, Mc : Less than 1200
IF-MA-200 IF-MA-400	Image ①	Single Slider	Ma : 69.6 (7.1) Mb : 99.0 (10.1) Mc : 161.7 (16.5)	Ma : Less than 600 Mb, Mc : Less than 600
	Image ②	Double Slider (55mm span)	Ma : 316.5 (32.3) Mb : 450.8 (46.0) Mc : 262.0 (26.8)	Ma : Less than 1475 Mb, Mc : Less than 1475
		Double Slider (80mm span)	Ma : 350.0 (35.8) Mb : 500.0 (51.0) Mc : 262.0 (26.8)	Ma : Less than 1600 Mb, Mc : Less than 1600

(\*) Load moment calculated by assuming a traveled distance of 10000km (fw=1.2)

## Explanation of Model Description

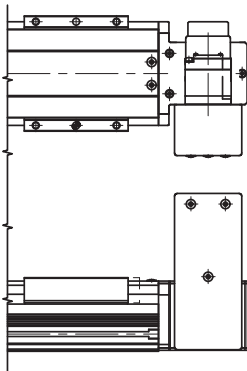
Series	Type	Encoder Type	Motor Type	Stroke	Applicable Controller	Cable Length	Options
IF	Standard Type	A Absolute I Incremental	60 60W 100 100W 200 200W 400 400W	200 200mm ~ ~ 2500 2500mm In 100mm steps	T1 XSEL-KE/KET SCON T2 SSEL XEL-P/Q	N No Cable S 3 m M 5 m X□ Specified Length	AQ AQ Seal C Creep Sensor CL Creep Sensor Mounting Reversed L Limit Switch LL Limit Switch Mounting Reversed LM Master Axis of Synchronized Spec. LLM Synchronized Spec. Sensor Mount. Rev. NM Reverse Home Specification
SA1L	Compact Standard Type	MA1L	Medium Standard Type			RT Guide with Ball Retention Mechanism	
SA2L	Compact Motor On Side	MA2L	Medium Motor On Side			S Slave Axis of Synchronized Specification	
SA3L	Compact Motor On Bottom	MA3L	Medium Motor On Bottom			W Double Slider	
SA1R	Compact Standard Type, Motor Mounting Reversed	MA1R	Medium Standard Type, Motor Mounting Reversed			EU Metal Cable Joint Connector	
SA2R	Compact Motor On Side, Motor Mounting Reversed	MA2R	Medium Motor On Side, Motor Mounting Reversed			CE Compliance with CE Conformity (Standard Option)	
SA3R	Compact Motor On Bottom, Motor Mounting Reversed	MA3R	Medium Motor On Side, Motor Mounting Reversed				

## 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).

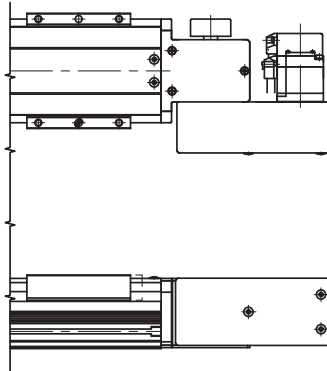
### Standard Type (Motor on Top, Left-mounted)

- Type : 1L



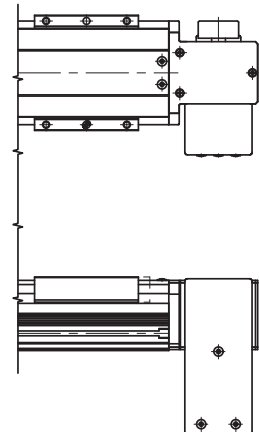
### Motor on Side (Left-mounted)

- Type : 2L



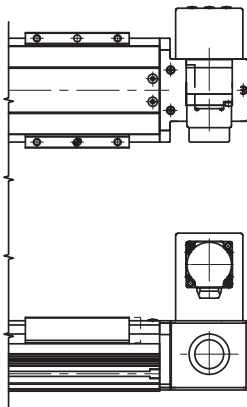
### Motor on Bottom (Left-mounted)

- Type : 3L



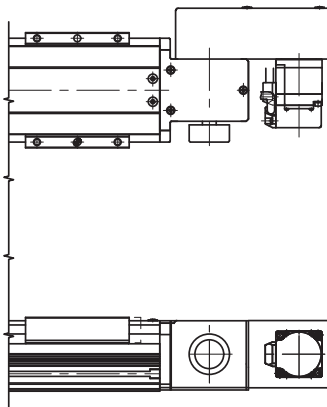
### Standard Type (Motor on Top, Right/Reversed-mounted)

- Type : 1R



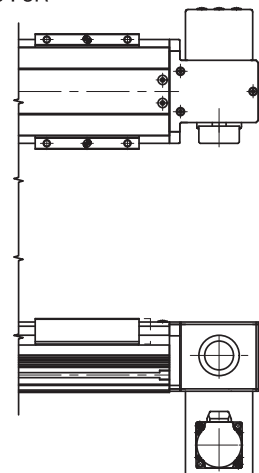
### Motor on Side (Right/Reversed-mounted)

- Type : 2R



### Motor on Bottom (Right/Reversed-mounted)

- Type : 3R









# IF-MA-200

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



Picture:  
Left-mounted motor standard model MA1L  
(EU special order version comes with motor cover)

<b>Model Designation</b>	<b>IF</b>	<b>200</b>						
<b>Series</b>	Type	Encoder Type	Motor Type	Stroke	Applicable Controller	Cable Length	Options	
MA1L: Standard MA2L: Motor on Side MA3L: Motor on Bottom MA1R: Motor, Reversed MA2R: Motor on Side, Reversed MA3R: Motor on Bottom, Reversed	A: Absolute I: Incremental	200:200W	200:200mm S 2500:2500mm (in 100mm steps)	T1: XSEL-KE/KET T2: SCON SSEL XSEL-P/Q	N: No Cable S: 3m M: 5m 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	Code	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	
Metal Cable Joint Connector	EU	
Compliance with CE Conformity (Standard Option)	CE	

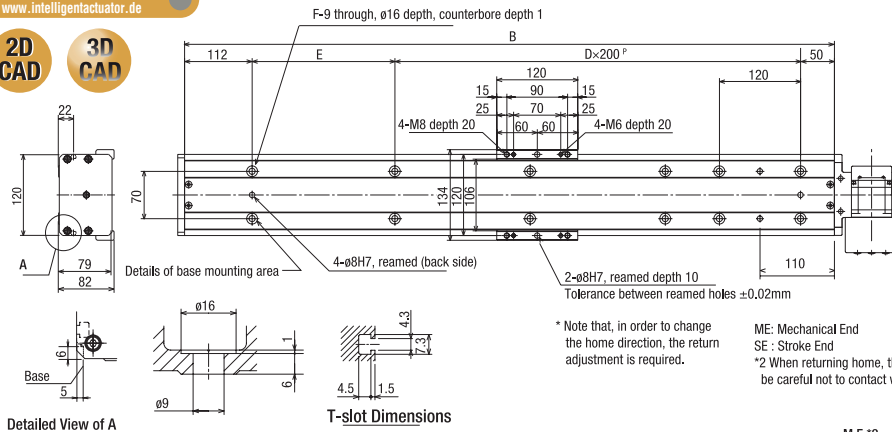
## Common Specifications

Positioning Repeatability	±0.08mm
Drive Method	Timing Belt
Lost Motion	0.1mm max.
Static Allowable Moment	Please refer to chapter Technical Reference of IA/RC General Catalogue
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-KE/KET 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)

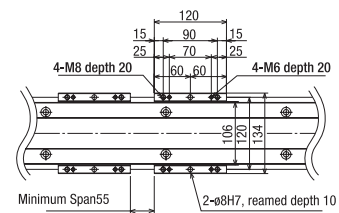
## Dimensions (Motor Mounting with CE Option)

### Single Slider

Download CAD drawings  
www.intelligentactuator.de



### 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 230 VAC
X-SEL-KE/KET	4 axes			Single-Phase 230 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 10000 km.  
 (Note 5) The maximum cable length is 30 m. Specify the length in the unit of m. (Example: X08 = 8 m)

# IF-MA-400

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



Pictured: Left-mounted motor standard model MA1L (EU special order version comes with motor cover)

<b>Model Designation</b>	<b>IF</b>	<b>400</b>					
Series	Type	Encoder Type	Motor Type	Stroke	Applicable Controller	Cable Length	Options
MA1L: Standard MA2L: Motor on Side MA3L: Motor on Bottom MA1R: Motor, Reversed MA2R: Motor on Side, Reversed MA3R: Motor on Bottom, Reversed		A: Absolute I: Incremental	400-400W	200-2500mm S 2500-2500mm (in 100mm steps)	T1: XSEL-KE/KET T2: SCON SSEL XSEL-P/Q	N: No Cable S: 3m M: 5m 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	Code	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	
Metal Cable Joint Connector	EU	
Compliance with CE Conformity (Standard Option)	CE	

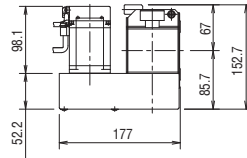
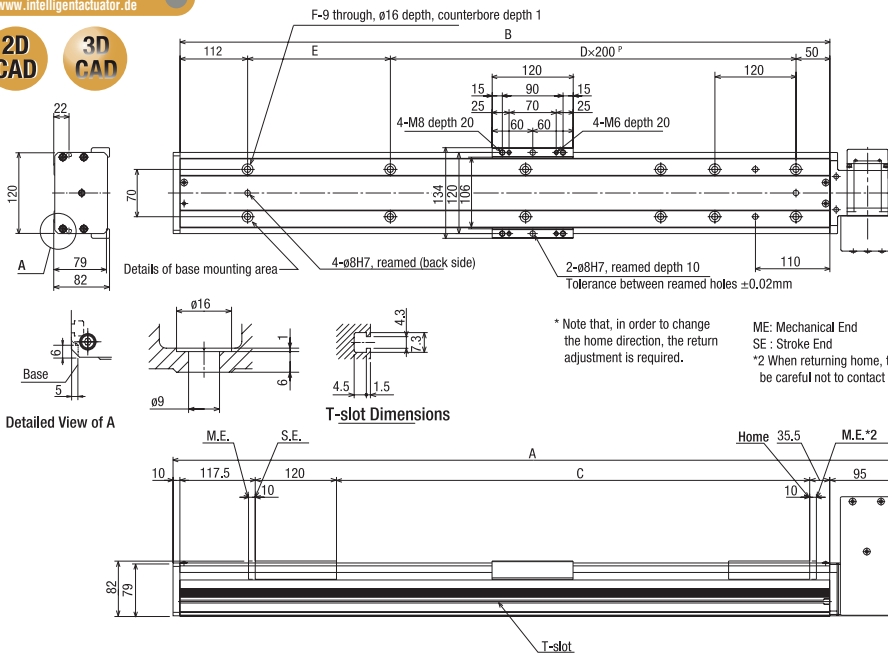
## Common Specifications

Positioning Repeatability	±0.08mm
Drive Method	Timing Belt
Lost Motion	0.1mm max.
Static Allowable Moment	Please refer to chapter Technical Reference of IA/RC General Catalogue
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-KE/KET 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)

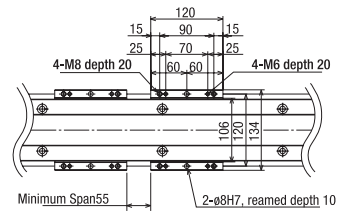
## Dimensions (Motor Mounting with CE Option)

### Single Slider

Download CAD drawings  
www.intelligentactuator.de



### 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)	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 230 VAC
X-SEL-KE/KET	4 axes			Single-Phase 230 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 10000 km.  
 (Note 5) The maximum cable length is 30 m. Specify the length in the unit of m. (Example: X08 = 8 m)

**IF Series V2**  
**Catalogue No. 0714-E**

The information contained in this catalog is subject to change without notice for the purpose of product improvement



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