

Flexible Belt Drive Linear Axes System **FS**



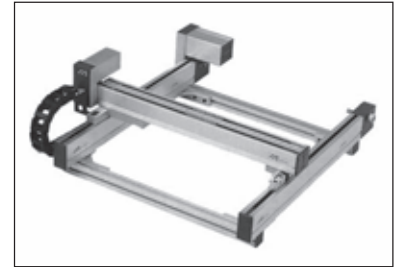
Freely Configurable
Actuator & Guide Modules
for Single- or Multi-axis
Systems

FS

Flexible Belt Drive Linear Axes System



FS Actuator Module & FS Guide Module



Example of FS Gantry System

* Figures above show non-CE compliant product versions with extra motor cover.

Features:

- A wide variety of configurations are possible by simply combining Actuator, Guide Rail and Profile Modules.
- The slim design enables the FS Linear Axes to provide from 300 up to 3000 mm stroke.
- The FS Large Type focuses on 2 main types: A High-Speed Type (max. speed: 2000 mm/s) and a High-Payload Type (max. payload: 60 kg).
- Timing Belt Drive Method provides a quieter motion.
- Gantry-Type Systems with larger work areas are achievable using guide modules also available in this series.

Long Slider Option:

D1 and D2 versions (available as options) have longer slider than the standard FS actuator and come with a dust prevention stainless steel sheet.

FS Series Overview

The FS Series is broadly classified into two product categories:

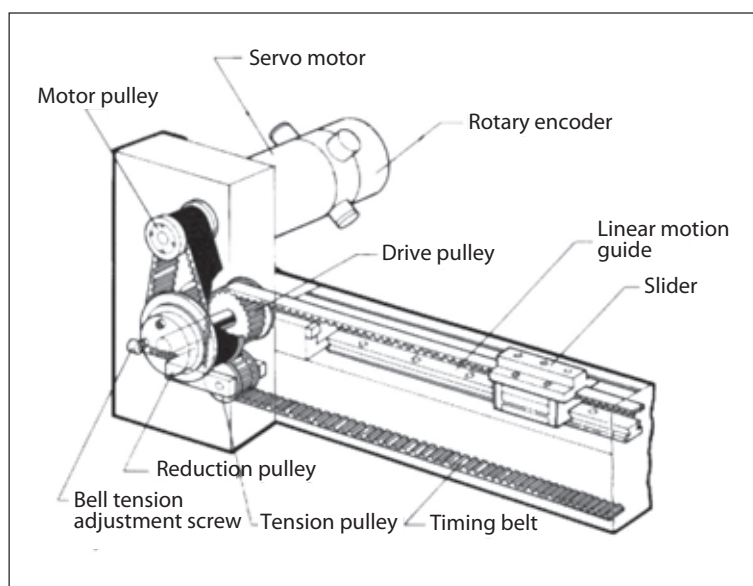
FS Modules (single unit) and FS Units (assembled FS modules)

FS Modules are either a narrow, wide or large frame type and consist of a single guide type actuator module connected to a 60W, 100W, 200W, or 400W AC servo motor and a single extruded guide module.

With the FS Series actuators, generally you would purchase the individual FS Modules to construct one of the three configuration types for the FS Units:

Single-axis Table, Gantry or Cantilever

However, depending on your particular application, you may find it easier to purchase the pre-assembled FS Units. Your FS Unit can be customized according to your specifications and drawings (stroke length, available space, payload, speed, etc.).



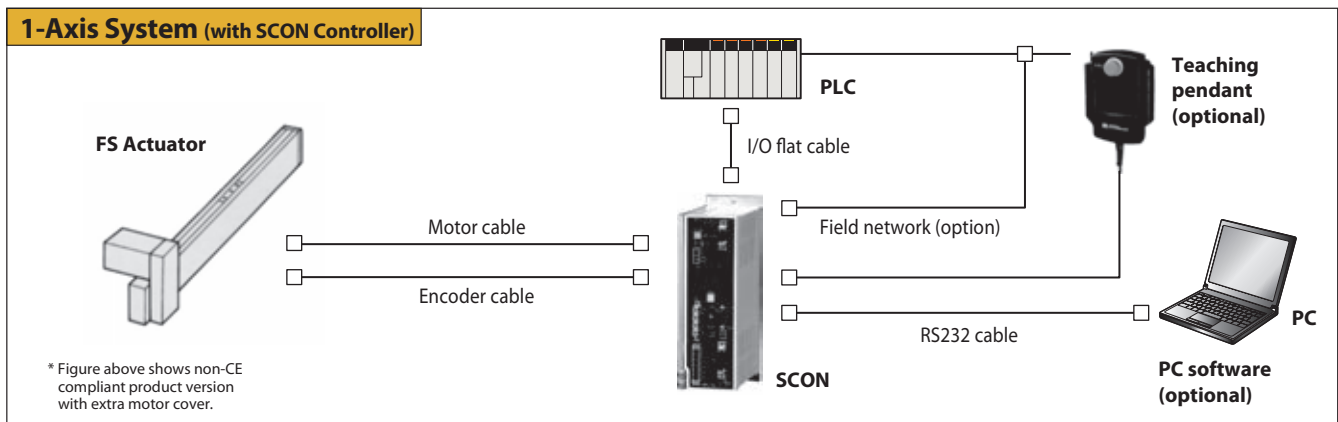
Components of FS Single Guide Type Actuator Module

Explanation of Model Description

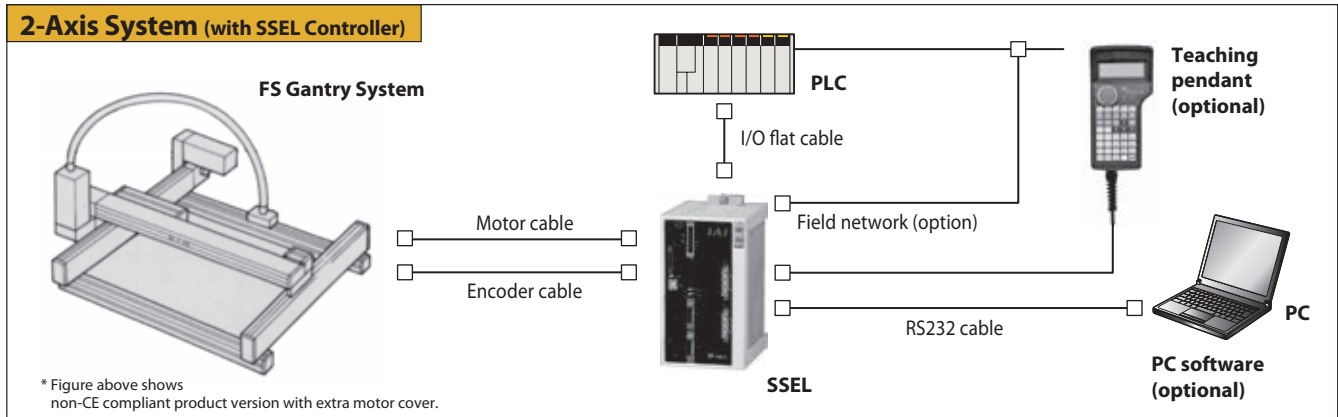
FS Series	Type	Encoder Type	Motor Type	Stroke	Applicable Controller	Cable Length	Options
FS	Standard Type	A Absolute I Incremental	60 60W 100 100W 200 200W 400 400W	300 300mm ~ ~ 3000 3000mm In 100mm steps	T1 XSEL-KE/KET SCON-CA/CAL T2 MSCON SSEL XSEL-P/Q	N No Cable S 3 m M 5 m X□□ Specified Length	D1 Slider Length equal to 2 standard Sliders (200mm) D2 Slider Length equal to 3 standard Sliders (300mm) NM Reverse Home Specification R Motor Mounting on Opposite Side U Motor Mounting on Bottom RU Motor Mounting on Opposite Side on Bottom EU Metal Cable Joint Connector CE Compliance with CE-Conformity (Standard Option)
11NM	Narrow Single Slider Type	11WO	Wide Single Slider Guide Module				
12NM	Narrow Double Slider Type	12WO	Wide Double Slider Guide Module				
11NO	Narrow Single Slider Guide Module	11LM	Large Single Slider Type				
12NO	Narrow Double Slider Guide Module	12LM	Large Double Slider Type				
11WM	Wide Single Slider Type	11LO	Large Single Slider Guide Module	11HM	Large High-speed Single Slider Type		
12WM	Wide Double Slider Type	12LO	Large Double Slider Guide Module	12HM	Large High-speed Double Slider Type		

System Configuration Examples

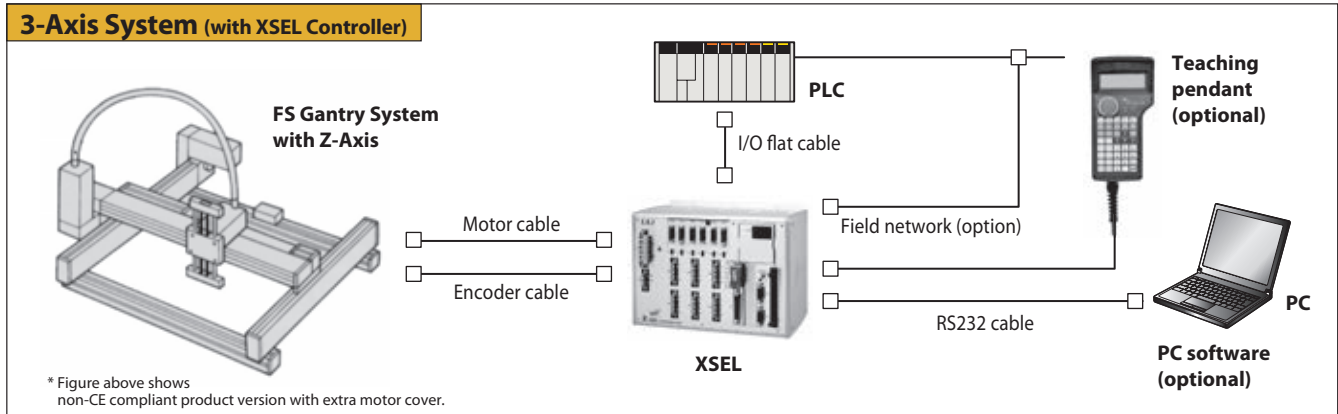
1-Axis System (with SCON Controller)



2-Axis System (with SSEL Controller)



3-Axis System (with XSEL Controller)



FS-NM-60

Single-axis robot / Narrow belt type / Actuator width: 40mm / 60W



Model Specification Items

FS	Type	Encoder type	60	Stroke	Applicable controller	Cable length	Options
11NM: Single slider specification 12NM: Double slider specification	A: Absolute specification I: Incremental specification	60: 60W 300: 300mm 1000: 1000mm (in 100mm increments)	T1: XSEL-KE/KET T2: SCON-CA/CAL MSCON XSEL-P/Q	N: None S: 3m M: 5m X□□: Specified length	Refer to the options table below.		

Models/Specifications

Model	Encoder type	Motor output (W)	Slider	Stroke in 100mm increments (mm)	Speed (mm/s)	Payload (Note 1)		Rated thrust (N)
						Horizontal (kg)	Vertical (kg)	
FS-11NM -①-60-②-③-④-⑤	Absolute Incremental	60	Single	300~1000	1~1250	2	Designed exclusively for horizontal use	29
FS-12NM -①-60-②-③-④-⑤			Double			9 (Note 2)		

* In the above model numbers, ① indicates the encoder type, ② indicates the stroke, ③ indicates the applicable controller, ④ indicates the cable length, and ⑤ indicates the option(s).

Options

Name	Code	Remarks
Slider length equal to 200mm	D1	Available for 12NM only
Slider length equal to 300mm	D2	Available for 12NM only
Reversed-home specification	NM	
Motor positioned on the opposite side	R	Refer to P. 12 (Installation/Mounting)
Motor positioned at the bottom	U	Refer to P. 12 (Installation/Mounting)
Motor positioned at bottom on opposite side	RU	Refer to P. 12 (Installation/Mounting)
Metal Cable Joint Connector	EU	
Compliance with CE Conformity	CE	Standard option

Common Specifications

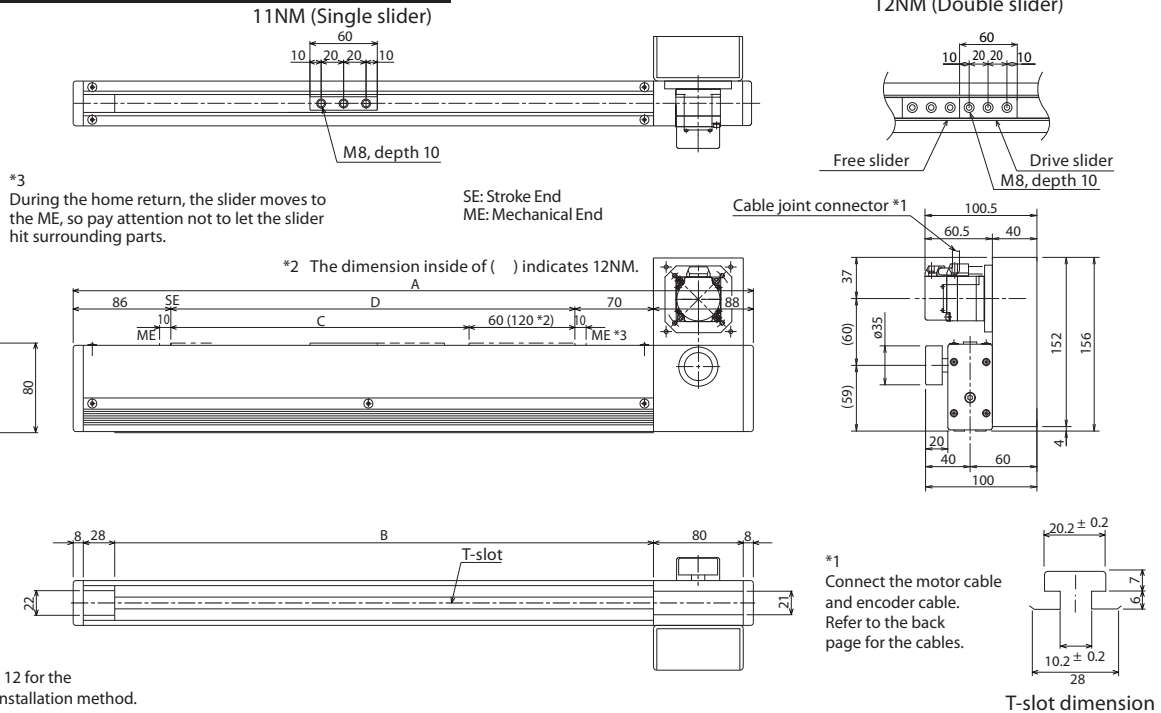
Positioning repeatability	±0.08mm
Drive method	Timing belt
Lost Motion	0.1mm max.
Allowable static load moment	Refer to P. 14 (Technical Reference)
Allowable dynamic load moment	Refer to P. 13 (Technical Reference)
Overhang load length	Refer to P. 13 (Technical Reference)
Base	Material: Aluminum, with white alumite treatment
Applicable controller	T1: XSEL-KE/KET T2: XSEL-P/Q, SSEL, SCON-CA/CAL, MSCON
Cable length (Note 3)	N: None, S: 3m, M: 5m, X□□: Specified length
Ambient operating temperature/humidity	0 to 40°C, 85%RH max. (non-condensing)

Dimensions

CAD drawings are available for download from our website.

2D CAD

RoHS



FS-11NM-60

Stroke	300	400	500	600	700	800	900	1000
A	604	704	804	904	1004	1104	1204	1304
B	480	580	680	780	880	980	1080	1180
C	300	400	500	600	700	800	900	1000
D	360	460	560	660	760	860	960	1060
Mass (kg)	5.0	5.4	5.8	6.2	6.6	7.0	7.4	7.8
Payload (kg)	2							

FS-12NM-60

Stroke	300	400	500	600	700	800	900	1000
A	704	804	904	1004	1104	1204	1304	1404
B	580	680	780	880	980	1080	1180	1280
C	340	440	540	640	740	840	940	1040
D	460	560	660	760	860	960	1060	1160
Mass (kg)	5.7	6.0	6.5	6.9	7.3	7.7	8.1	8.5
Payload (kg)	9		7			5		

* 300~1000mm strokes are available in 100mm increments. Dimensions A~D increase by 100mm for every 100mm stroke increment.

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/three-phase 230 VAC
X-SEL-KE/KET	4 axes			Positioner control
SSEL	2 axes			
MSCON	6 axes			
SCON-CA/CAL	1 axis			



- (Note 1) The payload is the value when operated at 0.3 G acceleration.
- (Note 2) Note that when the stroke increases, the payload will drop. (Refer to the tables above for payload by stroke.)
- (Note 3) The maximum cable length is 30 m. Specify a desired length in meters. (Example. X08 = 8 m)

FS-NM-100

Single-axis robot / Narrow belt type / Actuator width: 40mm / 100W



Model Specification Items	FS Series	Type	Encoder type	Motor type	Stroke	Applicable controller	Cable length	Options
		11NM: Single slider specification 12NM: Double slider specification	A: Absolute specification I: Incremental specification	100: 100W	300: 300mm 1000: 1000mm (in 100mm increments)	T1: XSEL-KE/KET T2: SCON-CA/CAL MSCON XSEL-P/Q	N: None S: 3m M: 5m X□□: Specified length	Refer to the options table below.

Models/Specifications

Model	Encoder type	Motor output (W)	Slider	Stroke in 100mm increments (mm)	Speed (mm/s)	Payload (Note 1)		Rated thrust (N)
						Horizontal (kg)	Vertical (kg)	
FS-11NM - ①-100-②-③-④-⑤	Absolute Incremental	100	Single	300~1000	1~1250	3	Designed exclusively for horizontal use	49
FS-12NM - ①-100-②-③-④-⑤			Double			15 (Note 2)		

* In the above model numbers, ① indicates the encoder type, ② indicates the stroke, ③ indicates the applicable controller, ④ indicates the cable length, and ⑤ indicates the option(s).

Options

Name	Code	Remarks
Slider length equal to 200mm	D1	Available for 12NM only
Slider length equal to 300mm	D2	Available for 12NM only
Reversed-home specification	NM	
Motor positioned on the opposite side	R	Refer to P. 12 (Installation/Mounting)
Motor positioned at the bottom	U	Refer to P. 12 (Installation/Mounting)
Motor positioned at bottom on opposite side	RU	Refer to P. 12 (Installation/Mounting)
Metal Cable Joint Connector	EU	
Compliance with CE Conformity	CE	Standard option

Common Specifications

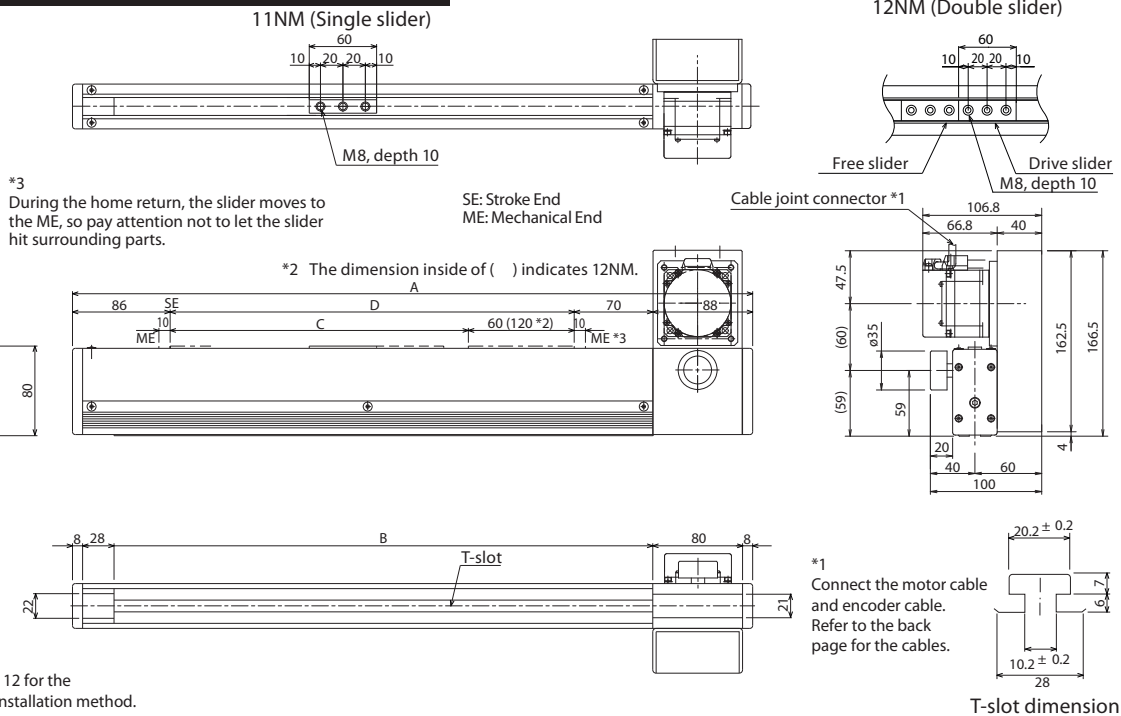
Positioning repeatability	±0.08mm
Drive method	Timing belt
Lost Motion	0.1mm max.
Allowable static load moment	Refer to P. 14 (Technical Reference)
Allowable dynamic load moment	Refer to P. 13 (Technical Reference)
Overhang load length	Refer to P. 13 (Technical Reference)
Base	Material: Aluminum, with white alumite treatment
Applicable controller	T1: XSEL-KE/KET T2: XSEL-P/Q SSEL, SCON-CA/CAL, MSCON
Cable length (Note 3)	N: None, S: 3m, M: 5m, X□□: Specified length
Ambient operating temperature/humidity	0 to 40°C, 85%RH max. (non-condensing)

Dimensions

CAD drawings are available for download from our website.

2D CAD

RoHS



* Refer to P. 12 for the actuator installation method.

FS-11NM-100

Stroke	300	400	500	600	700	800	900	1000
A	604	704	804	904	1004	1104	1204	1304
B	480	580	680	780	880	980	1080	1180
C	300	400	500	600	700	800	900	1000
D	360	460	560	660	760	860	960	1060
Mass (kg)	5.0	5.4	5.8	6.2	6.6	7.0	7.4	7.8
Payload (kg)	3							

FS-12NM-100

Stroke	300	400	500	600	700	800	900	1000
A	704	804	904	1004	1104	1204	1304	1404
B	580	680	780	880	980	1080	1180	1280
C	340	440	540	640	740	840	940	1040
D	460	560	660	760	860	960	1060	1160
Mass (kg)	5.7	6.0	6.5	6.9	7.3	7.7	8.1	8.5
Payload (kg)	15		11			9		

* 300~1000mm strokes are available in 100mm increments. Dimensions A~D increase by 100mm for every 100mm stroke increment.

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/three-phase 230 VAC
X-SEL-KE/KET	4 axes			Single-phase 115/230 VAC
SSEL	2 axes		Positioner control	Single-phase 115/230 VAC
MSCON	6 axes			
SCON-CA/CAL	1 axis			



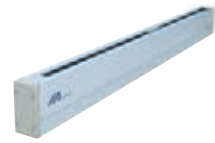
(Note 1) The payload is the value when operated at 0.3 G acceleration.

(Note 2) Note that when the stroke increases, the payload will drop. (Refer to the tables above for payload by stroke.)

(Note 3) The maximum cable length is 30 m. Specify a desired length in meters. (Example. X08 = 8 m)

FS-NO

Single-axis robot / Actuator width: 40mm / Narrow guide module



Model Specification Items	FS	—	□	—	0	—	□	—	□
	Series	Type	Motor type	Stroke	Options				
	11NO: Single slider specification 12NO: Double slider specification	0: No motor	300: 300mm 1000: 1000mm (in 100mm increments)	Refer to the options table below.					

Models/Specifications

Model	Encoder type	Motor output (W)	Slider	Stroke in 100mm increments (mm)	Speed (mm/s)	Payload		Rated thrust (N)
						Horizontal (kg)	Vertical (kg)	
FS-11NO-0-①-②	—	—	Single	300~1000	—	—	—	—
FS-12NO-0-①-②			Double					

* In the above model numbers, ① indicates the stroke, and ② indicates the option(s).

Options

Name	Code	Remarks
Slider length equal to 200mm	D1	Available for 12NO only
Slider length equal to 300mm	D2	Available for 12NO only

Common Specifications

Positioning repeatability	—
Drive method	—
Lost Motion	—
Allowable static load moment	Refer to P. 14 (Technical Reference)
Allowable dynamic load moment	Refer to P. 13 (Technical Reference)
Overhang load length	Refer to P. 13 (Technical Reference)
Base	Material: Aluminum, with white alumite treatment
Cable length	—
Ambient operating temperature/humidity	0 to 40°C, 85%RH max. (non-condensing)

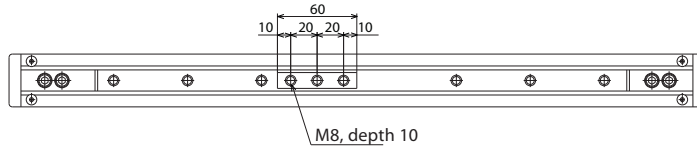
Dimensions

* CAD drawings are available for download from our website.

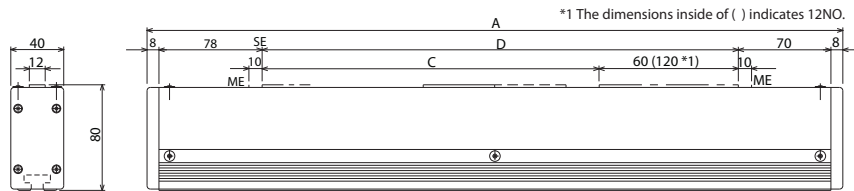
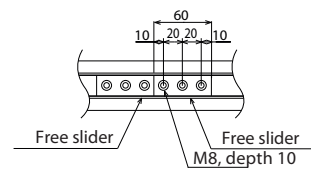
2D CAD

RoHS

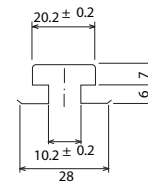
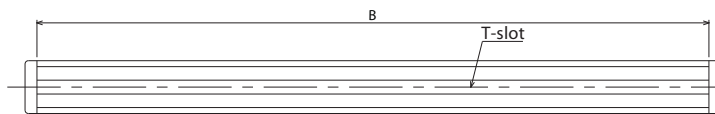
11NO (Single slider)



12NO (Double Slider)



SE: Stroke End
ME: Mechanical End



T-slot dimension

* Refer to P. 12 for the actuator installation method.

FS-11NO-0

Stroke	300	400	500	600	700	800	900	1000
A	524	624	724	824	924	1024	1124	1224
B	508	608	708	808	908	1008	1108	1208
C	300	400	500	600	700	800	900	1000
D	360	460	560	660	760	860	960	1060
Mass (kg)	2.4	2.8	3.2	3.6	4.1	4.4	4.8	5.2
Payload (kg)	—							

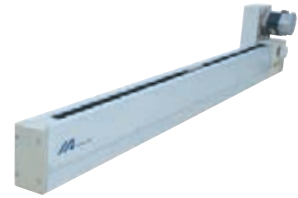
FS-12NO-0

Stroke	300	400	500	600	700	800	900	1000
A	624	724	824	924	1024	1124	1224	1324
B	608	708	808	908	1008	1108	1208	1308
C	340	440	540	640	740	840	940	1040
D	460	560	660	760	860	960	1060	1160
Mass (kg)	3.1	3.5	3.9	4.3	4.8	5.1	5.5	5.9
Payload (kg)	—							

* 300~1000mm strokes are available in 100mm increments.
Dimensions A~D increase by 100mm for every 100mm stroke increment.

FS-WM-100

Single-axis robot / Wide belt type / Actuator width: 52mm / 100W



Model Specification Items	FS Series	Type	Encoder type	100 Motor type	Stroke	Applicable controller	Cable length	Options
		11WM: Single slider specification 12WM: Double slider specification	A: Absolute specification I: Incremental specification	100: 100W	300: 300mm 2500: 2500mm (in 100mm increments)	T1: XSEL-KE/KET T2: SCON-CA/CAL MSCON XSEL-P/Q	N: None S: 3m M: 5m X□□: Specified length	Refer to the options table below.

Models/Specifications

Model	Encoder type	Motor output (W)	Slider	Stroke in 100mm increments (mm)	Speed (mm/s)	Payload (Note 1)		Rated thrust (N)
						Horizontal (kg)	Vertical (kg)	
FS-11WM-①-100-②-③-④-⑤	Absolute/Incremental	100	Single	300~2500	1~1250	3	Designed exclusively for horizontal use	49
FS-12WM-①-100-②-③-④-⑤			Double			15 (Note 2)		

* In the above model numbers, ① indicates the encoder type, ② indicates the stroke, ③ indicates the applicable controller, ④ indicates the cable length, and ⑤ indicates the option(s).

Options

Name	Code	Remarks
Slider length equal to 200mm	D1	Available for 12WM only
Slider length equal to 300mm	D2	Available for 12WM only
Reversed-home specification	NM	
Motor positioned on the opposite side	R	Refer to P. 12 (Installation/Mounting)
Motor positioned at the bottom	U	Refer to P. 12 (Installation/Mounting)
Motor positioned at bottom on opposite side	RU	Refer to P. 12 (Installation/Mounting)
Metal Cable Joint Connector	EU	
Compliance with CE Conformity	CE	Standard option

Common Specifications

Positioning repeatability	±0.08mm
Drive method	Timing belt
Lost Motion	0.1mm max.
Allowable static load moment	Refer to P. 14 (Technical Reference)
Allowable dynamic load moment	Refer to P. 13 (Technical Reference)
Overhang load length	Refer to P. 13 (Technical Reference)
Base	Material: Aluminum, with white alumite treatment
Applicable controller	T1: XSEL-KE/KET T2: XSEL-P/Q SSEL, SCON-CA/CAL, MSCON
Cable length (Note 3)	N: None, S: 3m, M: 5m, X□□: Specified length
Ambient operating temperature/humidity	0 to 40°C, 85%RH max. (non-condensing)

Dimensions

CAD drawings are available for download from our website.

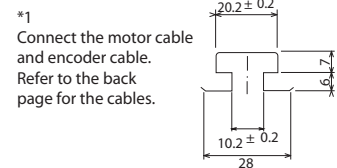
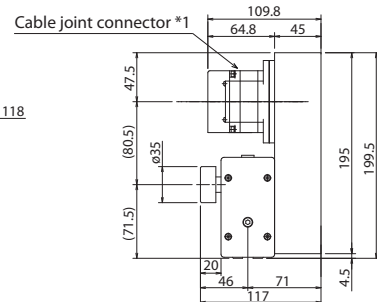
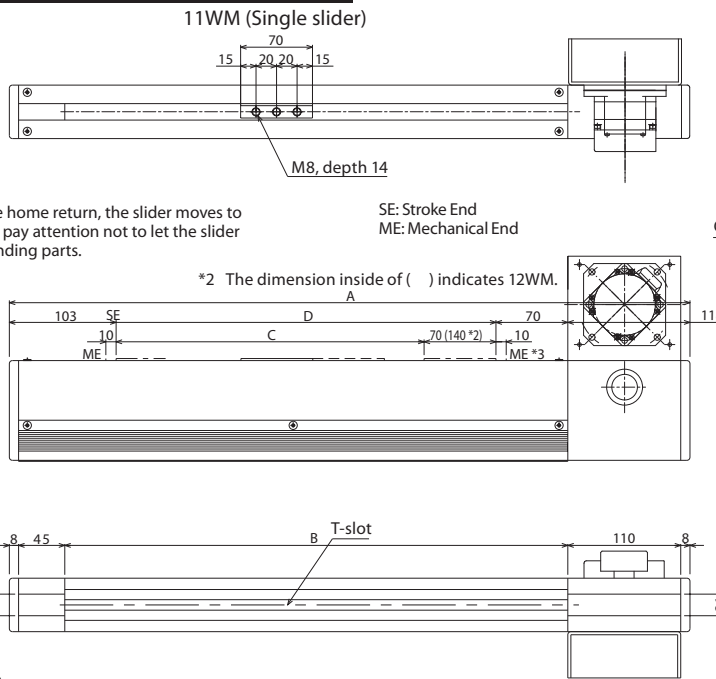
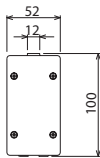
2D CAD

RoHS

*3 During the home return, the slider moves to the ME, so pay attention not to let the slider hit surrounding parts.

SE: Stroke End
ME: Mechanical End

*2 The dimension inside of () indicates 12WM.



*1 Connect the motor cable and encoder cable. Refer to the back page for the cables.

* Refer to P. 12 for the actuator installation method.

FS-11WM-100

Stroke	300	400	600	800	1000	1500	2000	2500
A	661	761	961	1161	1361	1861	2361	2861
B	490	590	790	990	1190	1690	2190	2690
C	300	400	600	800	1000	1500	2000	2500
D	370	470	670	870	1070	1570	2070	2570
Mass (kg)	8.7	9.3	10.5	11.7	12.9	15.9	18.9	21.9
Payload (kg)	3							

FS-12WM-100

Stroke	300	400	600	800	1000	1500	2000	2500
A	761	861	1061	1261	1461	1961	2461	2961
B	590	690	890	1090	1290	1790	2290	2790
C	330	430	630	830	1030	1530	2030	2530
D	470	570	770	970	1170	1670	2170	2670
Mass (kg)	9.9	10.5	11.7	12.9	14.1	17.1	20.1	23.1
Payload (kg)	15							

* 300~2500mm strokes are available in 100mm increments. Dimensions A~D increase by 100mm for every 100mm stroke increment.

Applicable Controller Specifications

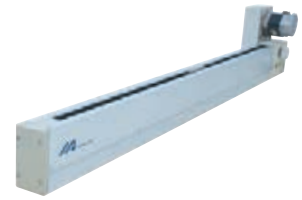
Applicable Controller	Max. number of controlled axes	Connectable encoder type	Operating method	Power-supply voltage
X-SEL-P/Q	6 axes	Absolute/Incremental	Program	Single/three-phase 230 VAC
X-SEL-KE/KET	4 axes			
SSEL	2 axes		Positioner control	Single-phase 115/230 VAC
MSCON	6 axes			
SCON-CA/CAL	1 axis			



- (Note 1) The payload is the value when operated at 0.3 G acceleration.
- (Note 2) Note that when the stroke increases, the payload will drop. (Refer to the tables above for payload by stroke.)
- (Note 3) The maximum cable length is 30 m. Specify a desired length in meters. (Example. X08 = 8 m)

FS-WM-200

Single-axis robot / Wide belt type / Actuator width: 52mm / 200W



Model Specification Items	FS	Series	□	Type	□	Encoder type	200	Motor type	□	Stroke	□	Applicable controller	□	Cable length	□	Options
	11WM: Single slider specification 12WM: Double slider specification	A: Absolute specification I: Incremental specification	200: 200W	300: 300mm 2500: 2500mm (in 100mm increments)	T1: XSEL-KE/KET T2: SCON-CA/CAL MSCON XSEL-P/Q	N: None S: 3m M: 5m X□□: Specified length	Refer to the options table below.									

Models/Specifications

Model	Encoder type	Motor output (W)	Slider	Stroke in 100mm increments (mm)	Speed (mm/s)	Payload (Note 1)		Rated thrust (N)
						Horizontal (kg)	Vertical (kg)	
FS-11WM-①-200-②-③-④-⑤	Absolute Incremental	200	Single	300~2500	1~1250	6	Designed exclusively for horizontal use	98
FS-12WM-①-200-②-③-④-⑤			Double			30 (Note 2)		

* In the above model numbers, ① indicates the encoder type, ② indicates the stroke, ③ indicates the applicable controller, ④ indicates the cable length, and ⑤ indicates the option(s).

Options

Name	Code	Remarks
Slider length equal to 200mm	D1	Available for 12WM only
Slider length equal to 300mm	D2	Available for 12WM only
Reversed-home specification	NM	
Motor positioned on the opposite side	R	Refer to P. 12 (Installation/Mounting)
Motor positioned at the bottom	U	Refer to P. 12 (Installation/Mounting)
Motor positioned at bottom on opposite side	RU	Refer to P. 12 (Installation/Mounting)
Metal Cable Joint Connector	EU	
Compliance with CE Conformity	CE	Standard option

Common Specifications

Positioning repeatability	±0.08mm
Drive method	Timing belt
Lost Motion	0.1mm max.
Allowable static load moment	Refer to P. 14 (Technical Reference)
Allowable dynamic load moment	Refer to P. 13 (Technical Reference)
Overhang load length	Refer to P. 13 (Technical Reference)
Base	Material: Aluminum, with white alumite treatment
Applicable controller	T1: XSEL-KE/KET T2: XSEL-P/Q, SSEL, SCON-CA/CAL, MSCON
Cable length (Note 3)	N: None, S: 3m, M: 5m, X□□: Specified length
Ambient operating temperature/humidity	0 to 40°C, 85%RH max. (non-condensing)

Dimensions

* CAD drawings are available for download from our website.

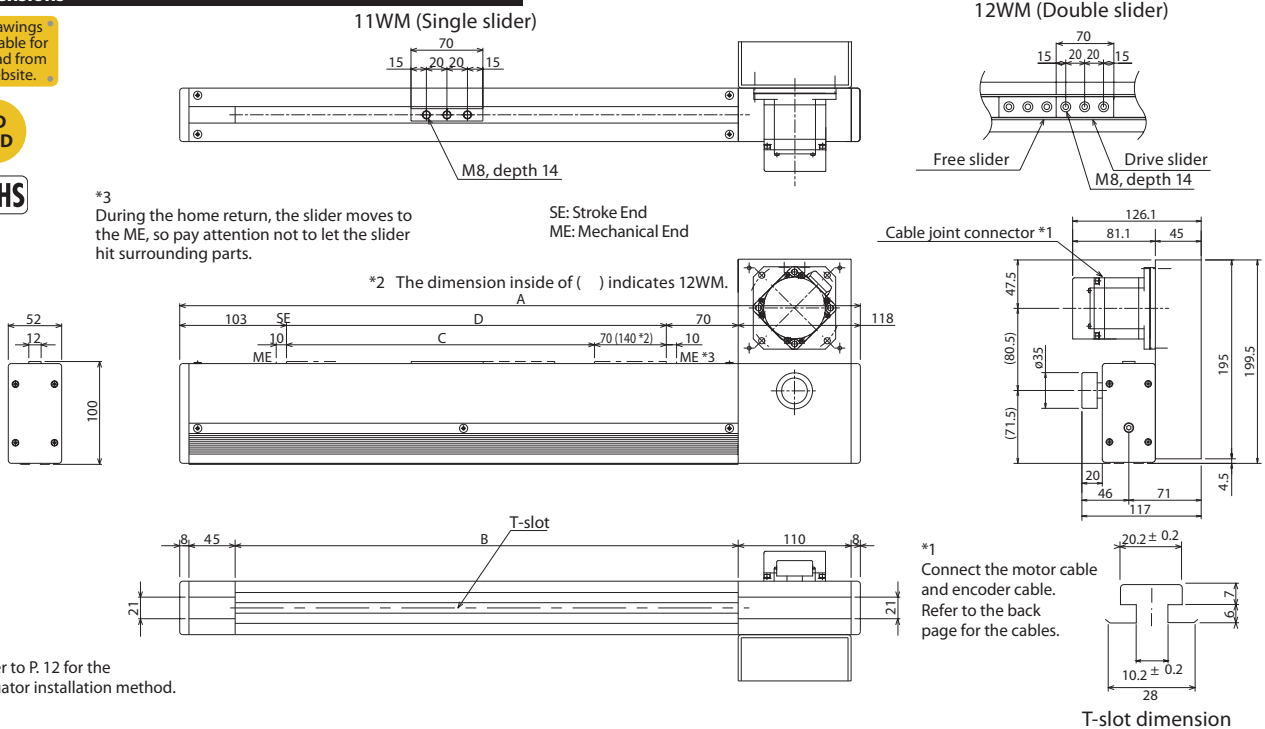
2D CAD

RoHS

*3 During the home return, the slider moves to the ME, so pay attention not to let the slider hit surrounding parts.

SE: Stroke End
ME: Mechanical End

*2 The dimension inside of () indicates 12WM.



* Refer to P. 12 for the actuator installation method.

FS-11WM-200

Stroke	300	400	600	800	1000	1500	2000	2500
A	661	761	961	1161	1361	1861	2361	2861
B	490	590	790	990	1190	1690	2190	2690
C	300	400	600	800	1000	1500	2000	2500
D	370	470	670	870	1070	1570	2070	2570
Mass (kg)	9.8	10.4	11.6	12.8	14.0	17.0	20.0	23.0
Payload (kg)	6							

FS-12WM-200

Stroke	300	400	600	800	1000	1500	2000	2500
A	761	861	1061	1261	1461	1961	2461	2961
B	590	690	890	1090	1290	1790	2290	2790
C	330	430	630	830	1030	1530	2030	2530
D	470	570	770	970	1170	1670	2170	2670
Mass (kg)	11.0	11.6	12.8	14.0	15.2	18.2	21.2	24.2
Payload (kg)	30							

* 300~2500mm strokes are available in 100mm increments. Dimensions A~D increase by 100mm for every 100mm stroke increment.

Applicable Controller Specifications

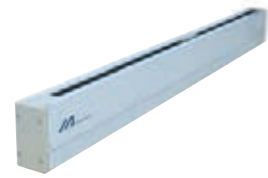
Applicable Controller	Max. number of controlled axes	Connectable encoder type	Operating method	Power-supply voltage
X-SEL-P/Q	6 axes	Absolute/ incremental	Program	Single/three-phase 230 VAC
X-SEL-KE/KET	4 axes			
SSEL	2 axes		Positioner control	Single-phase 115/230 VAC
MSCON	6 axes			
SCON-CA/CAL	1 axis			



- (Note 1) The payload is the value when operated at 0.3 G acceleration.
- (Note 2) Note that when the stroke increases, the payload will drop. (Refer to the tables above for payload by stroke.)
- (Note 3) The maximum cable length is 30 m. Specify a desired length in meters. (Example. X08 = 8 m)

FS-WO

Single-axis robot / Actuator width: 52mm / Wide guide module



Model Specification Items	FS Series	Type	Motor type	Stroke	Options
	11WO: Single slider specification 12WO: Double slider specification	0: No motor	300: 300mm 2500: 2500mm (in 100mm increments)	Refer to the options table below.	

Models/Specifications

Model	Encoder type	Motor output (W)	Slider	Stroke in 100mm increments (mm)	Speed (mm/s)	Payload		Rated thrust (N)
						Horizontal (kg)	Vertical (kg)	
FS-11WO-0-①-②	—	—	Single	300~2500	—	—	—	—
FS-12WO-0-①-②			Double					

* In the above model numbers, ① indicates the stroke, and ② indicates the option(s).

Options

Name	Code	Remarks
Slider length equal to 200mm	D1	Available for 12WO only
Slider length equal to 300mm	D2	Available for 12WO only

Common Specifications

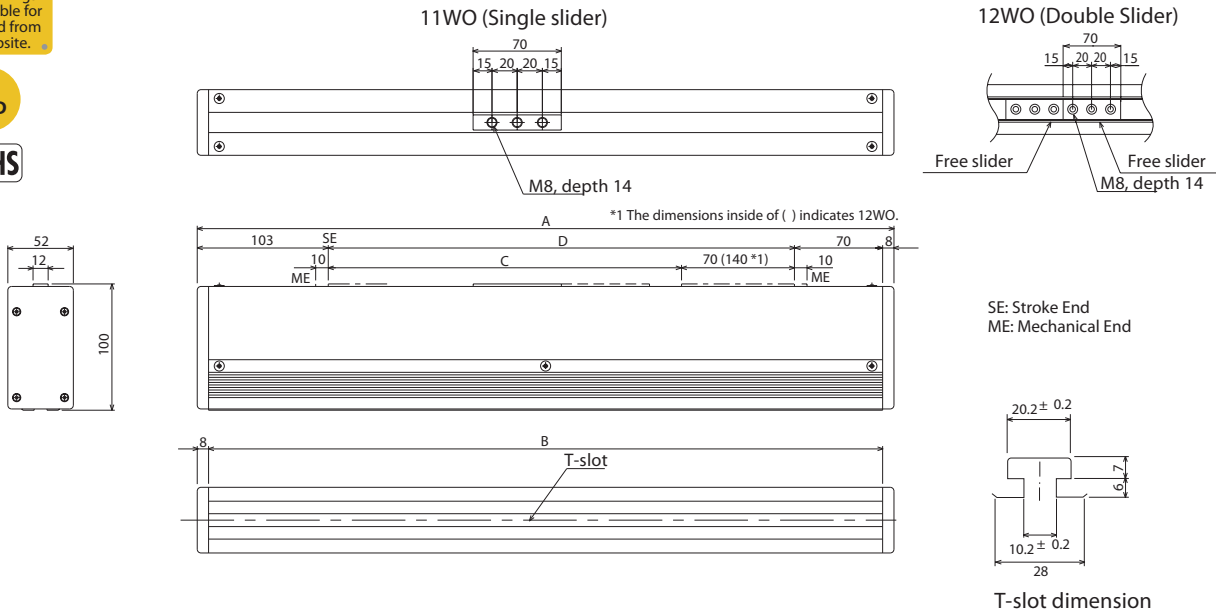
Positioning repeatability	—
Drive method	—
Lost Motion	—
Allowable static load moment	Refer to P. 14 (Technical Reference)
Allowable dynamic load moment	Refer to P. 13 (Technical Reference)
Overhang load length	Refer to P. 13 (Technical Reference)
Base	Material: Aluminum, with white alumite treatment
Cable length	—
Ambient operating temperature/humidity	0 to 40°C, 85%RH max. (non-condensing)

Dimensions

CAD drawings are available for download from our website.

2D CAD

RoHS



* Refer to P. 12 for the actuator installation method.

FS-11WO-0

Stroke	300	400	600	800	1000	1500	2000	2500
A	551	651	851	1051	1251	1751	2251	2751
B	535	635	835	1035	1235	1735	2235	2735
C	300	400	600	800	1000	1500	2000	2500
D	370	470	670	870	1070	1570	2070	2570
Mass (kg)	4.9	5.6	6.7	8.3	9.6	12.9	16.3	19.6
Payload (kg)	—							

FS-12WO-0

Stroke	300	400	600	800	1000	1500	2000	2500
A	651	751	951	1151	1351	1851	2351	2851
B	635	735	935	1135	1335	1835	2335	2835
C	330	430	630	830	1030	1530	2030	2530
D	470	570	770	970	1170	1670	2170	2670
Mass (kg)	5.6	6.2	7.6	8.9	10.2	13.6	16.9	20.3
Payload (kg)	—							

* 300~2500mm strokes are available in 100mm increments.
Dimensions A~D increase by 100mm for every 100mm stroke increment.

FS-LM-400

Single-axis robot / Large belt type / Actuator width: 75mm / 400W



Model Specification Items	FS	□	□	400	□	□	□	□
	Series	Type	Encoder type	Motor type	Stroke	Applicable controller	Cable length	Options
	11LM: Single slider specification 12LM: Double slider specification	A: Absolute specification I: Incremental specification	400: 400W	1000: 1000mm 3000: 3000mm (in 100mm increments)	T1: XSEL-KE/KET T2: SCON-CA SSEL XSEL-P/Q	N: None S: 3m M: 5m X□□: Specified length	Refer to the options table below.	

Models/Specifications

Model	Encoder type	Motor output (W)	Slider	Stroke in 100mm increments (mm)	Speed (mm/s)	Payload (Note 1)		Rated thrust (N)
						Horizontal (kg)	Vertical (kg)	
FS-11LM-①-400-②-③-④-⑤	Absolute Incremental	400	Single	1000~3000	1~1250	15	Designed exclusively for horizontal use	196
FS-12LM-①-400-②-③-④-⑤			Double			60 (Note 2)		

* In the above model numbers, ① indicates the encoder type, ② indicates the stroke, ③ indicates the applicable controller, ④ indicates the cable length, and ⑤ indicates the option(s).

Options

Name	Code	Remarks
Reversed-home specification	NM	Available for 11LM only
Motor positioned on the opposite side	R	Refer to P. 12 (Installation/Mounting)
Motor positioned at the bottom	U	Special order; refer to P. 12 (Install./Mount.)
Motor positioned at bottom on opposite side	RU	Special order; refer to P. 12 (Install./Mount.)
Metal Cable Joint Connector	EU	
Compliance with CE Conformity	CE	Standard option

Common Specifications

Positioning repeatability	±0.08mm
Drive method	Timing belt
Lost Motion	0.1mm max.
Allowable static load moment	Refer to P. 14 (Technical Reference)
Allowable dynamic load moment	Refer to P. 13 (Technical Reference)
Overhang load length	Refer to P. 13 (Technical Reference)
Base	Material: Aluminum, with white alumite treatment
Applicable controller	T1: XSEL-KE/KET T2: XSEL-P/Q, SSEL, SCON-CA
Cable length (Note 3)	N: None, S: 3m, M: 5m, X□□: Specified length
Ambient operating temperature/humidity	0 to 40°C, 85%RH max. (non-condensing)

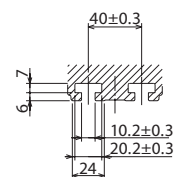
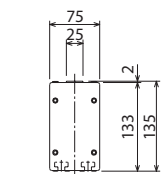
Dimensions

* CAD drawings are available for download from our website.

2D CAD

RoHS

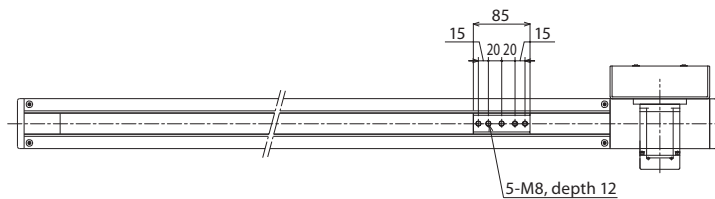
SE: Stroke End
ME: Mechanical End



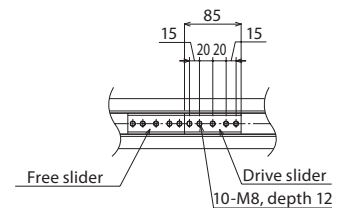
T-slot dimension

* Refer to P. 12 for the actuator installation method.

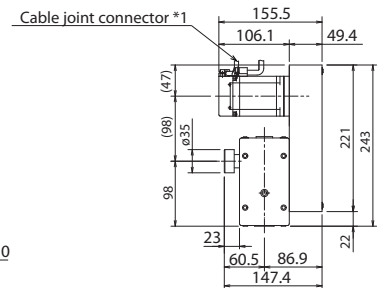
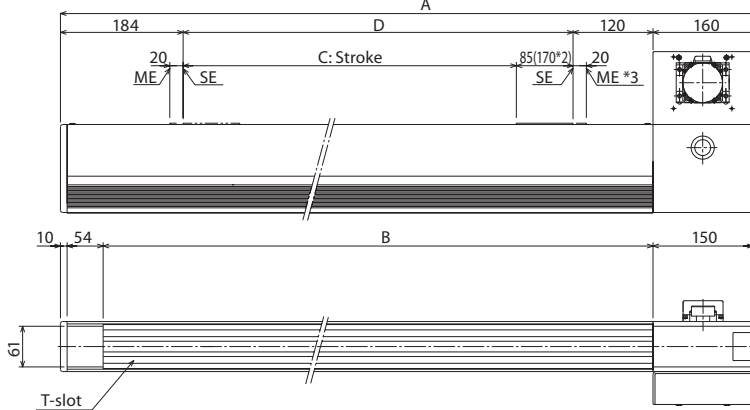
11LM (Single slider)



12LM (Double slider)



*2 The dimension inside of () indicates 12LM.



*1 Connect the motor cable and encoder cable. Refer to the back page for the cables.

*3 During the home return, the slider moves to the ME, so pay attention not to let the slider hit surrounding parts.

FS-11LM-400

Stroke	1000	1500	2000	2500	3000
A	1549	2049	2549	3049	3549
B	1325	1825	2325	2825	3325
C	1000	1500	2000	2500	3000
D	1085	1585	2085	2585	3085
Mass (kg)	28	34	40	47	53
Payload (kg)	15				

FS-12LM-400

Stroke	1000	1500	2000	2500	3000
A	1649	2149	2649	3149	3649
B	1425	1925	2425	2925	3425
C	1015	1515	2015	2515	3015
D	1185	1685	2185	2685	3185
Mass (kg)	31	37	43	49	56
Payload (kg)	60	44	36	28	

* 1000~3000mm strokes are available in 100mm increments.
Dimensions A~D increase by 100mm for every 100mm stroke increment.

Applicable Controller Specifications

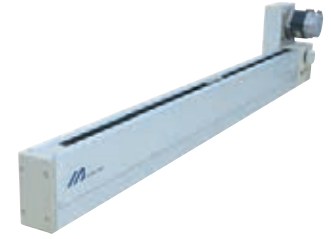
Applicable Controller	Maximum number of controlled axes	Connectable encoder type	Operating method	Power-supply voltage
X-SEL-P/Q	6 axes	Absolute/ incremental	Program	Single/three-phase 230 VAC
X-SEL-KE/KET	4 axes			Single-phase 115/230 VAC
SSEL	2 axes		Positioner control	
SCON-CA	1 axis			



- (Note 1) The payload is the value when operated at 0.3 G acceleration.
- (Note 2) Note that when the stroke increases, the payload will drop. (Refer to the tables above for payload by stroke.)
- (Note 3) The maximum cable length is 30 m. Specify a desired length in meters. (Example. X08 = 8 m)

FS-HM-400

Single-axis robot / Large belt type / Actuator width: 75mm / 400W
High-speed specification



Model Specification Items	FS Series	Type	Encoder type	Motor type	Stroke	Applicable controller	Cable length	Options
		11HM: Single slider specification 12HM: Double slider specification	A: Absolute specification I: Incremental specification	400: 400W	1000: 1000mm 3000: 3000mm (in 100mm increments)	T1: XSEL-KE/KET T2: SCON-CA SSEL XSEL-P/Q	N: None S: 3m M: 5m X□□: Specified length	Refer to the options table below.

Models/Specifications

Model	Encoder type	Motor output (W)	Slider	Stroke in 100mm increments (mm)	Speed (mm/s)	Payload (Note 1)		Rated thrust (N)
						Horizontal (kg)	Vertical (kg)	
FS-11HM-①-400-②-③-④-⑤	Absolute Incremental	400	Single	1000~3000	1~2000	10	Designed exclusively for horizontal use	127
FS-12HM-①-400-②-③-④-⑤			Double			40 (Note 2)		

* In the above model numbers, ① indicates the encoder type, ② indicates the stroke, ③ indicates the applicable controller, ④ indicates the cable length, and ⑤ indicates the option(s).

Options

Name	Code	Remarks
Reversed-home specification	NM	Available for 11HM only
Motor positioned on the opposite side	R	Refer to P. 12 (Installation/Mounting)
Motor positioned at the bottom	U	Special order; refer to P. 12 (Install./Mount.)
Motor positioned at bottom on opposite side	RU	Special order; refer to P. 12 (Install./Mount.)
Metal Cable Joint Connector	EU	
Compliance with CE Conformity	CE	Standard option

Common Specifications

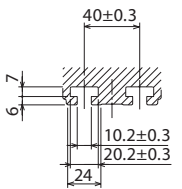
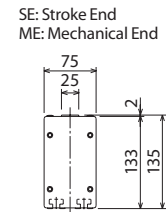
Positioning repeatability	±0.08mm
Drive method	Timing belt
Lost Motion	0.1mm max.
Allowable static load moment	Refer to P. 14 (Technical Reference)
Allowable dynamic load moment	Refer to P. 13 (Technical Reference)
Overhang load length	Refer to P. 13 (Technical Reference)
Base	Material: Aluminum, with white alumite treatment
Applicable controller	T1: XSEL-KE/KET T2: XSEL-P/Q, SSEL, SCON-CA
Cable length (Note 3)	N: None, S: 3m, M: 5m, X□□: Specified length
Ambient operating temperature/humidity	0 to 40°C, 85%RH max. (non-condensing)

Dimensions

CAD drawings are available for download from our website.

2D CAD

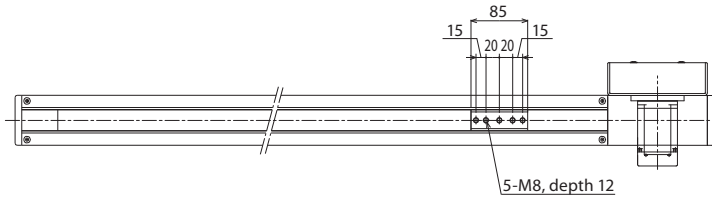
RoHS



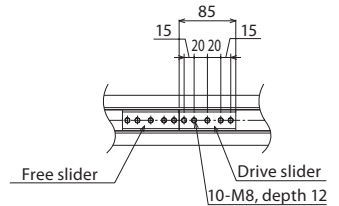
T-slot dimension

* Refer to P. 12 for the actuator installation method.

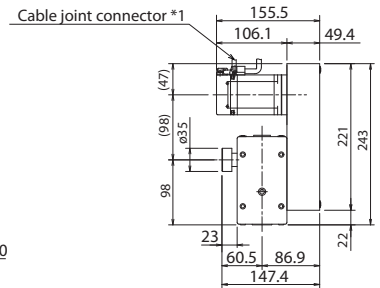
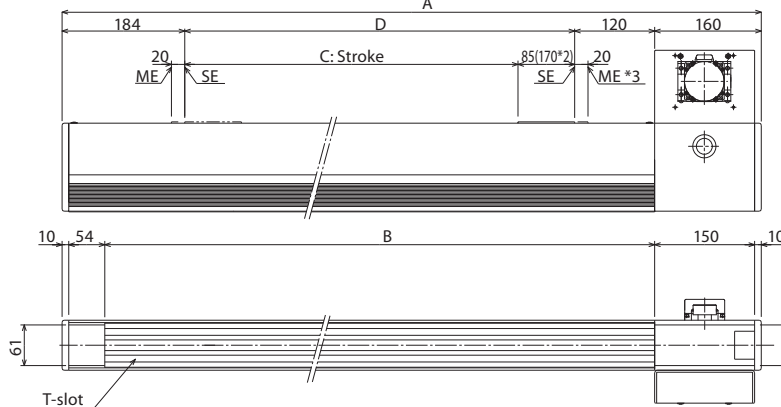
11HM (Single slider)



12HM (Double slider)



*2 The dimension inside of () indicates 12HM.



*1 Connect the motor cable and encoder cable. Refer to the back page for the cables.

*3 During the home return, the slider moves to the ME, so pay attention not to let the slider hit surrounding parts.

FS-11HM-400

Stroke	1000	1500	2000	2500	3000
A	1549	2049	2549	3049	3549
B	1325	1825	2325	2825	3325
C	1000	1500	2000	2500	3000
D	1085	1585	2085	2585	3085
Mass (kg)	28	34	40	47	53
Payload (kg)	10				

FS-12HM-400

Stroke	1000	1500	2000	2500	3000
A	1649	2149	2649	3149	3649
B	1425	1925	2425	2925	3425
C	1015	1515	2015	2515	3015
D	1185	1685	2185	2685	3185
Mass (kg)	31	37	43	49	56
Payload (kg)	40				

* 1000~3000mm strokes are available in 100mm increments.
Dimensions A~D increase by 100mm for every 100mm stroke increment.

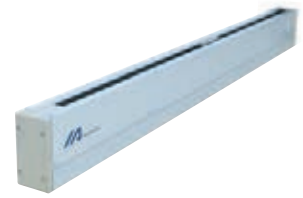
Applicable Controller Specifications

Applicable Controller	Maximum number of controlled axes	Connectable encoder type	Operating method	Power-supply voltage
X-SEL-P/Q	6 axes	Absolute/ incremental	Program Positioner control	Single/three-phase 230 VAC
X-SEL-KE/KET	4 axes			Single-phase 115/230 VAC
SSEL	2 axes			
SCON-CA	1 axis			

	(Note 1)	The payload is the value when operated at 0.3 G acceleration.
	(Note 2)	Note that when the stroke increases, the payload will drop. (Refer to the tables above for payload by stroke.)
	(Note 3)	The maximum cable length is 30 m. Specify a desired length in meters. (Example, X08 = 8 m)

FS-LO

Single-axis robot / Actuator width: 75mm / Large guide module



Model Specification Items	FS	—	□	—	0	—	□
	Series	Type	Motor type	Stroke			
	11LO: Single slider specification 12LO: Double slider specification		0: No motor	1000: 1000mm 3000: 3000mm (in 100mm increments)			

Models/Specifications

Model	Encoder type	Motor output (W)	Slider	Stroke in 100mm increments (mm)	Speed (mm/s)	Payload		Rated thrust (N)
						Horizontal (kg)	Vertical (kg)	
FS-11LO-0-□	—	—	Single	1000~3000	—	—	—	—
FS-12LO-0-□			Double					

* In the above model numbers, □ indicates the stroke.

Common Specifications

Positioning repeatability	—
Drive method	—
Lost Motion	—
Allowable static load moment	Refer to P. 14 (Technical Reference)
Allowable dynamic load moment	Refer to P. 13 (Technical Reference)
Overhang load length	Refer to P. 13 (Technical Reference)
Base	Material: Aluminum, with white alumite treatment
Cable length	—
Ambient operating temperature/humidity	0 to 40°C, 85%RH max. (non-condensing)

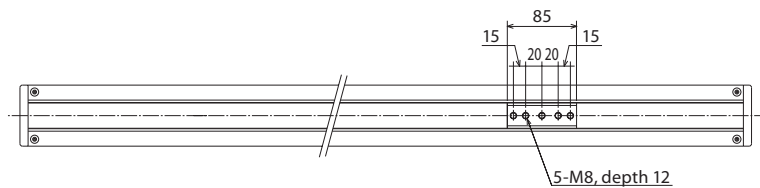
Dimensions

CAD drawings are available for download from our website.

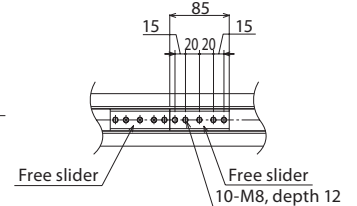
2D CAD

RoHS

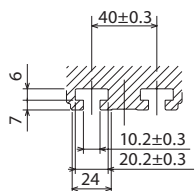
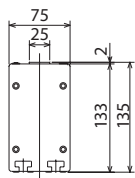
11LO (Single slider)



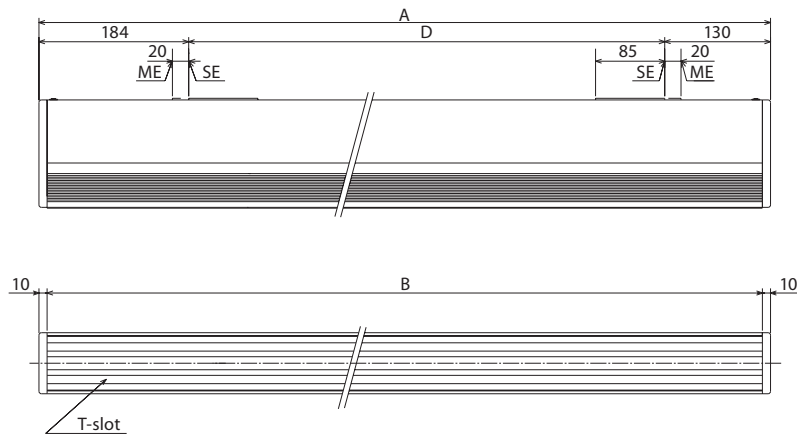
12LO (Double slider)



SE: Stroke End
ME: Mechanical End



T-slot dimension



FS-11LO-0

Stroke	1000	1500	2000	2500	3000
A	1403	1903	2403	2903	3403
B	1379	1879	2379	2879	3379
C	1000	1500	2000	2500	3000
D	1085	1585	2085	2585	3085
Mass (kg)	19	25	31	38	44
Payload (kg)	—				

FS-12LO-0

Stroke	1000	1500	2000	2500	3000
A	1503	2003	2503	3003	3503
B	1479	1979	2479	2979	3479
C	1015	1515	2015	2525	3025
D	1185	1685	2185	2685	3185
Mass (kg)	22	28	34	40	46
Payload (kg)	—				

* 1000~3000mm strokes are available in 100mm increments.
Dimensions A~D increase by 100mm for every 100mm stroke increment.

* Refer to P. 12 for the actuator installation method.

Installation & Mounting of FS Actuator

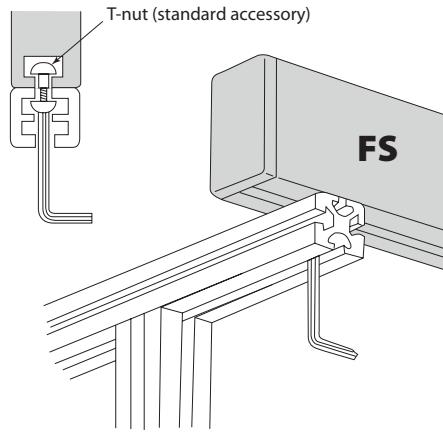
Installation method

FS Series

NM, NO, WM, WO, LM, LO, HM

■ Using the T-groove on the back of the base, secure the body with the T-nut supplied with the actuator.

- FS-NM (T-slot 1 line) : T-nut M8
- FS-NO (T-slot 1 line) : T-nut M8
- FS-WM (T-slot 1 line) : T-nut M8
- FS-WO (T-slot 1 line) : T-nut M8
- FS-LM (T-slot 2 lines) : T-nut M8
- FS-LO (T-slot 2 lines) : T-nut M8
- FS-HM (T-slot 2 lines) : T-nut M8



■ Quantity of T-nut included

Stroke	Quantity
300~1000	5
1100~1500	6
1600~2000	7
2100~2500	8
2600~3000	9

* Double the numbers for LM/LO/HM models.

Actuator installation posture

○ : Installable — : Not installable (*) Except for types with D1/D2 option

Installation posture

Horizontal	Vertical	Side-mounted	Ceiling mounted
○	—	—	○ (*)

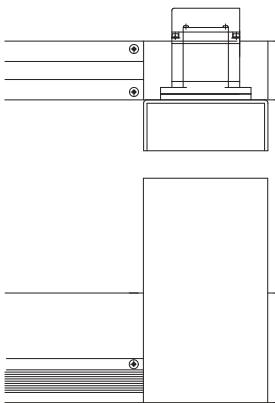
Motor mounting position options

The position of the motor can be optional changed to the 3 types as shown in the following figures, depending on the actuator requirements.

With these changes, the motor position can be changed according to the installation environment. Note, that in case of the motor on bottom, the motor position becomes lower than the slider and there is thus no risk of contacting the load.

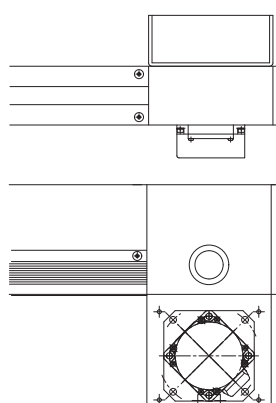
Motor on Top (Left/Reversed-mounted)

- Option code : R



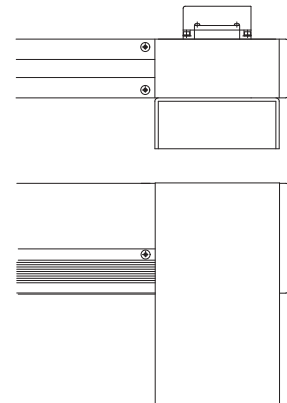
Motor on Bottom (Right-mounted)

- Option code : U



Motor on Bottom (Left/Reversed-mounted)

- Option code : R-U



FS Series Technical Reference

Allowable dynamic moment, Overhang load length

With each type of FS Series, a single or double slider can be selected.

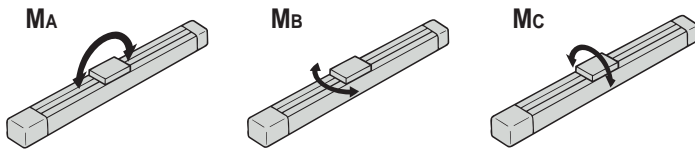
The allowable dynamic moment and overhang load length vary depending on the length of the slider.

Refer to the typical examples shown below.

Directions of allowable dynamic moments

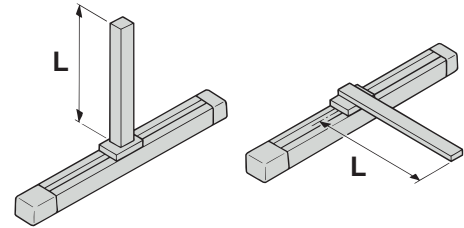
- Allowable dynamic moment values are based on a 20000 km service life. Please note that applying a moment exceeding the allowable value will reduce the service life of the guide.

Directions of load moments

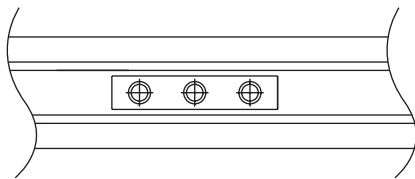


Overhang load length

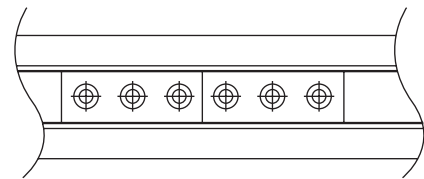
- When each model is used with an overhang load exceeding the allowable length, vibration may occur. Be sure to keep the overhang load length within the allowable value.



Single slider (Fig. 1)



Double slider (Fig. 2)



Type			Allowable dynamic moment (*) N·m (Kg·m)	Overhang L mm
FS-11NM FS-11NO	Fig. 1	Single slider	Ma: 2.9(0.3) Mb: 2.9(0.3) Mc: 4.5(0.46)	Ma, Mb, Mc directions: 200mm or less
FS-12NM FS-12NO	Fig. 2	Double slider (when sliders are joined together)	Ma: 20.5(2.1) Mb: 18.6(1.9) Mc: 9.1(0.93)	Ma, Mb, Mc directions: 500mm or less
FS-11WM FS-11WO	Fig. 1	Single slider	Ma: 4.4(0.45) Mb: 3.9(0.4) Mc: 5.8(0.6)	Ma, Mb, Mc directions: 240mm or less
FS-12WM FS-12WO	Fig. 2	Double slider (when sliders are joined together)	Ma: 27.4(2.8) Mb: 25.4(2.6) Mc: 11.7(1.2)	Ma, Mb, Mc directions: 600mm or less
FS-11LM FS-11LO FS-11HM	Fig. 1	Single slider	Ma: 8.8(0.9) Mb: 7.8(0.8) Mc: 12.7(1.3)	Ma, Mb, Mc directions: 300mm or less
FS-12LM FS-12LO FS-12HM	Fig. 2	Double slider (when sliders are joined together)	Ma: 51.9(5.3) Mb: 47.0(4.8) Mc: 25.4(2.6)	Ma, Mb, Mc directions: 750mm or less

(*) For case of 20000km service life (fw=1.2)

Calculation of allowable moments

There are two types of moment that can be applied to the the guide: the allowable dynamic moment and the allowable static moment. The allowable dynamic moment is calculated from the travel life (when flaking occurs) when moved with the moment load applied. In contrast, the static moment is calculated from the load that causes permanent deformation to the steel ball or its rolling surface (i.e. rated static moment), taking into account the rigidity and deformity of the base.

[Allowable Dynamic Moment]

IAI's catalog contains the allowable dynamic moments based on a load coefficient of 1.2 and 10000km or 5000km. This value is different from the so-called basic rated dynamic moment, which is based on a 50km travel life. To calculate the basic rated dynamic moment for a 50km travel life, use the following equation.

$$M_{50} = f_w \times M_s \div \left(\frac{50}{S}\right)^{\frac{1}{3}} \dots \text{Equation 1}$$

M_s : Allowable dynamic moment at an assumed travel distance (catalog value)
 S : IAI catalog assumed travel life (5000km or 10000km)
 f_w : Load coefficient (=1.2)
 M_{50} : Basic rated dynamic moment (50km travel life)

The allowable dynamic moments mentioned in the catalog (10,000km or 5,000km life) are based on a load coefficient $f_w=1.2$. To calculate the service life of a guide with a different load coefficient, use Table 1 below to determine the load coefficient that matches your requirements.

Table 1: Load Coefficients

Operation and Load Requirements	Load Coefficient f_w
Slow operation with light vibration/shock (1500mm/s or less, 0.3G or less)	1.0~1.5
Moderate vibration/shock, abrupt braking and accelerating (2500mm/s or less, 1.0G or less)	1.5~2.0
Operation with abrupt acceleration/deceleration with heavy vibration/shock (2500mm/s or faster, 1.0G or faster)	2.0~3.5

$$L_{10} = \left(\frac{C_{IA}}{P} \cdot \frac{1.2}{f_w}\right)^3 \times S \dots \text{Equation (2)}$$

L_{10} : Service life (90% Survival Probability)
 C_{IA} : Allowable dynamic moment in IAI Catalog (5000km or 10000km)
 P : Moment used ($\leq C_{IA}$)
 S : IAI catalog assumed travel life (5000km or 10000km)
 f_w : Load coefficient (from Table 1)

[Allowable Static Moment]

The maximum moment that can be applied to a slider at rest. These values are calculated by taking the basic rated static moment of the slider and multiplying with the safety rate that takes into consideration any effects from the rigidity and deformity of the base. Therefore, if a moment load is applied to the slider at rest, keep the moment within this allowable static moment. However, use caution to avoid adding any unexpected shock load from any inertia that reacts on the load.

[Basic Rated Static Moment]

The basic rated static moment is the moment value at which the sum of the permanent deformation at the center of contact between the rolling body (steel ball) and the rolling surface (rail) is 0.0001 times the diameter of the rolling body. These values are simply calculated strictly from the permanent deformation done to the steel ball and its rolling surface. However, the actual moment value is restricted by the rigidity and deformation of the base. Hence, the allowable static moment the actual moment that can be applied statically, taking into account those factors.

Motor / Encoder / PIO Cables

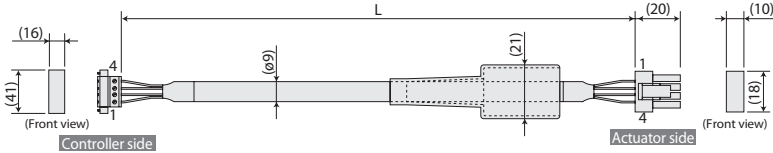
To connect the actuator cable joint connector and the controller there are a motor cable for the motor power, and an encoder cable for the encoder signals. All the motor/encoder cables are high-flexible robot cables, selectable with plastic connector or metal connector (EU version).

Motor Cable / EU Motor Cable for XSEL-KE/KET/P/Q, SSEL, MSCON, SCON-CA/CAL

Model: **CB-X-MA**□□□ / **CB-XEU-MA**□□□

* □□□ is the cable length (L); supports up to 30m.
Example: 080 = 8m

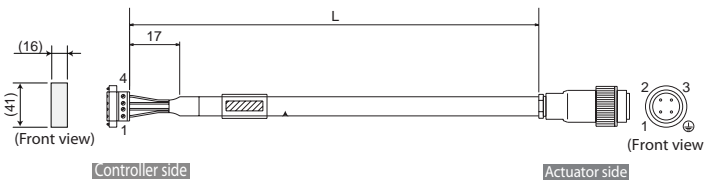
(Fig.: Motor cable CB-X-MA□□□ with plastic connector)



Minimum bending R: r = 51 mm or more (for movable use)

Wire	Color	Signal	No.	No.	Signal	Color	Wire
0.75sq	Green	PE	1	1	U	Red	0.75sq (crimped)
	Red	U	2	2	V	White	
	White	V	3	3	W	Black	
	Black	W	4	4	PE	Green	

(Fig.: EU motor cable CB-XEU-MA□□□, EU version with M18 plastic round connector)



Minimum bending R: r = 51 mm or more (for movable use)

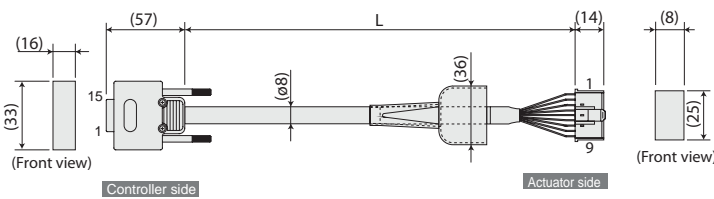
Wire	Color	Signal	No.	No.	Signal	Color	Wire
0.75sq	Green/yellow	PE	1	1	PE	Green/yellow	0.75sq (crimped)
	Black/white*1"	U	2	1	U	Black/white*1"	
	Black/white*2"	V	3	2	V	Black/white*2"	
	Black/white*3"	W	4	3	W	Black/white*3"	

Encoder Cable / EU Encoder Cable for XSEL-KE/KET

Model: **CB-X-PA**□□□ / **CB-XEU-PA**□□□

* □□□ is the cable length (L); supports up to 30m.
Example: 080 = 8m

(Fig.: Encoder cable CB-X-PA□□□ with plastic connector)

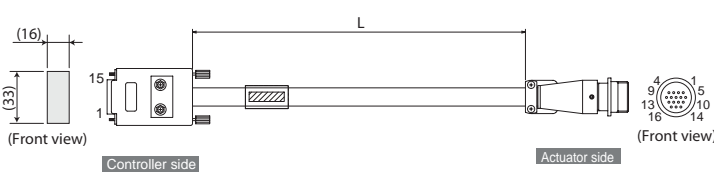


Minimum bend radius R: r = 44mm or larger (for movable use)

Wire	Color	Signal	No.	No.	Signal	Color	Wire
—	—	—	1	1	BAT+	Black	0.15sq (crimped)
—	—	—	2	2	BAT-	Yellow	
—	—	—	3	3	SD	Blue	
—	—	—	4	4	SD	Orange	
—	—	—	5	5	VCC	Green	
—	—	—	6	6	GND	Brown	
Blue	SD	7	7	7	FG	Ground	
Orange	SD	8	8	8	BK-	Gray	
Black	BAT+	9	9	9	BK+	Red	
Yellow	BAT-	10	10	10	—	—	
Green	VCC	11	11	11	—	—	
Brown	GND	12	12	12	—	—	
Gray	BK-	13	13	13	—	—	
Red	BK+	14	14	14	—	—	
—	—	—	15	15	—	—	

The shield is clamped to the hood
Braided ground & shield wire

(Fig.: Encoder cable CB-XEU-PA□□□, EU version with metal connector)



Minimum bend radius R: r = 44mm or larger (for movable use)

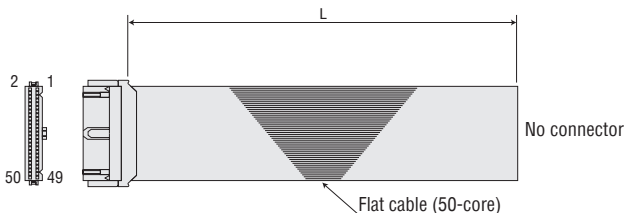
Wire	Color	Signal	No.	No.	Signal	Color	Wire
—	—	—	1	1	SD	Blue	0.15sq soldered
—	—	—	2	2	SD	Orange	
—	—	—	3	3	—	—	
—	—	—	4	4	—	—	
—	—	—	5	5	—	—	
—	—	—	6	6	—	—	
—	—	—	7	7	—	—	
Blue	SD	7	7	8	—	—	
Orange	SD	8	8	9	—	—	
Black	BAT+	9	9	10	VCC	Green	
Yellow	BAT-	10	10	11	GND	Brown	
Green	VCC	11	11	12	BAT+	Black	
Brown	GND	12	12	13	BAT-	Yellow	
Gray	BK-	13	13	14	—	—	
Red	BK+	14	14	15	BK-	Gray	
—	—	—	15	16	BK+	Red	

Connect the shielded wire to the hood using a clamp.
Drain line or shield braided wire
A shield is connected to shield soldered part.

PIO Flat Cable for XSEL-KE/KET/P/Q

Model: **CB-X-PIO**□□□

* □□□ is the cable length (L); supports up to 10m.
Example: 080 = 8m

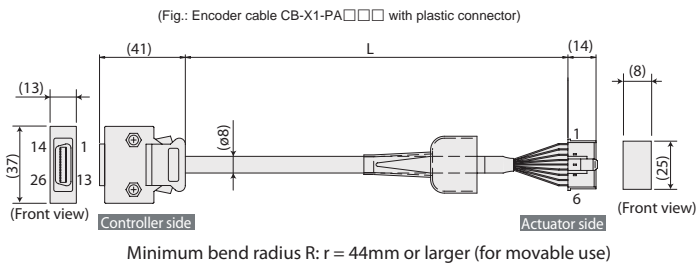


Number	Color	Wire	Number	Color	Wire	Number	Color	Wire	Number	Color	Wire
1	Brown 1	Flat cable crimped	11	Brown-2	Flat cable crimped	21	Brown-3	Flat cable crimped	31	Brown-4	Flat cable crimped
2	Red 1		12	Red 2		22	Red 3		32	Red 4	
3	Orange 1		13	Orange 2		23	Orange 3		33	Orange 4	
4	Yellow 1		14	Yellow 2		24	Yellow 3		34	Yellow 4	
5	Green 1		15	Green 2		25	Green 3		35	Green 4	
6	Blue 1		16	Blue 2		26	Blue 3		36	Blue 4	
7	Purple 1		17	Purple 2		27	Purple 3		37	Purple 4	
8	Gray 1		18	Gray 2		28	Gray 3		38	Gray 4	
9	White 1		19	White 2		29	White 3		39	White 4	
10	Black 1		20	Black 2		30	Black 3		40	Black 4	
									41	Brown-5	Flat cable crimped
									42	Red 5	
									43	Orange 5	
									44	Yellow 5	
									45	Green 5	
									46	Blue 5	
									47	Purple 5	
									48	Gray 5	
									49	White 5	
									50	Black 5	

Encoder Cable / EU Encoder Cable for XSEL-P/Q, SSEL, MSCON, SCON-CA/CAL

Model: **CB-X1-PA**□□□ / **CB-XEU1-PA**□□□

* □□□ is the cable length (L); supports up to 30m.
Example: 080 = 8m

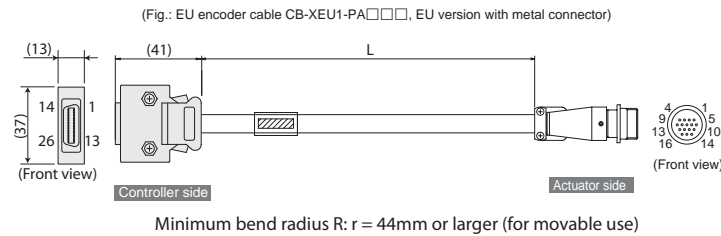


Wire	Color	Signal	No.
-	-	-	10
-	-	-	11
-	-	E24V	12
-	-	0V	13
-	-	LS	26
-	-	CREEP	25
-	-	OT	24
-	-	RSV	23
-	-	-	9
-	-	-	18
-	-	-	19
-	-	A+	1
-	-	A-	2
-	-	B+	3
-	-	B-	4
-	-	Z+	5
-	-	Z-	6
Orange	SRD+	7	7
Green	SRD-	8	8
Purple	BAT+	14	14
Grey	BAT-	15	15
Red	VCC	16	16
Black	GND	17	17
Blue	BKR-	20	20
Yellow	BKR+	21	21
-	-	-	22

No.	Signal	Color	Wire
1	BAT+	Purple	
2	BAT-	Grey	
3	SD	Orange	
4	SD	Green	
5	VCC	Red	
6	GND	Black	
7	FG	Ground	
8	BK-	Blue	
9	BK+	Yellow	

The shield is clamped to the hood.

Braided ground & shield wire



Wire	Color	Signal	No.
-	-	-	10
-	-	-	11
-	-	E24V	12
-	-	0V	13
-	-	LS	26
-	-	CREEP	25
-	-	OT	24
-	-	RSV	23
-	-	-	9
-	-	-	18
-	-	-	19
-	-	A+	1
-	-	A-	2
-	-	B+	3
-	-	B-	4
-	-	Z+	5
-	-	Z-	6
Orange	SRD+	7	7
Green	SRD-	8	8
Purple	BAT+	14	14
Grey	BAT-	15	15
Red	VCC	16	16
Black	GND	17	17
Blue	BKR-	20	20
Yellow	BKR+	21	21
-	-	-	22

No.	Signal	Color	Wire
1	SD	Orange	
2	SD	Green	
3	-	-	
4	-	-	
5	-	-	
6	-	-	
7	-	-	
8	-	-	
9	-	-	
10	VCC	Red	
11	GND	Black	
12	BAT+	Purple	
13	BAT-	Grey	
14	-	-	
15	BK-	Blue	
16	BK+	Yellow	

Connect the shield to the hood via a clamp.

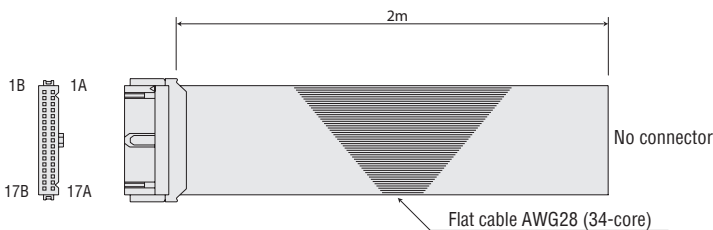
Drain line or shield braided wire

A shield is connected to shield soldered part.

PIO Flat Cable for SSEL

Model: **CB-DS-PIO**□□□

* □□□ is the cable length (L); supports up to 10m.
Example: 080 = 8m



Pin No.	Color	Wire	Pin No.	Color	Wire
1A	Brown 1		9B	Gray 2	
1B	Red 1		10A	White 2	
2A	Orange 1		10B	Black 2	
2B	Yellow 1		11A	Brown-3	
3A	Green 1		11B	Red 3	
3B	Blue1		12A	Orange 3	
4A	Purple 1		12B	Yellow 3	
4B	Gray 1		13A	Green 3	
5A	White 1		13B	Blue 3	
5B	Black 1		14A	Purple 3	
6A	Brown-2		14B	Gray 3	
6B	Red 2		15A	White 3	
7A	Orange 2		15B	Black 3	
7B	Yellow 2		16A	Brown-4	
8A	Green 2		16B	Red 4	
8B	Blue 2		17A	Orange 4	
9A	Purple 2		17B	Yellow 4	

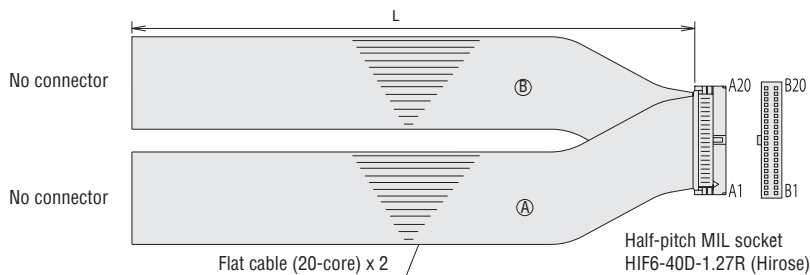
Flat cable crimped

Flat cable crimped

PIO Flat Cable for MSCON, SCON-CA/CAL

Model: **CB-PAC-PIO**□□□

* □□□ is the cable length (L); supports up to 10m.
Example: 080 = 8m



HIF6-40D-1.27R

No.	Signal name	Cable color	Wiring	No.	Signal name	Cable color	Wiring
A1	24V	Brown-1		B1	OUT0	Brown-3	
A2	24V	Red-1		B2	OUT1	Red-3	
A3	-	Orange-1		B3	OUT2	Orange-3	
A4	-	Yellow-1		B4	OUT3	Yellow-3	
A5	IN0	Green-1		B5	OUT4	Green-3	
A6	IN1	Blue-1		B6	OUT5	Blue-3	
A7	IN2	Purple-1		B7	OUT6	Purple-3	
A8	IN3	Gray-1		B8	OUT7	Gray-3	
A9	IN4	White-1		B9	OUT8	White-3	
A10	IN5	Black-1		B10	OUT9	Black-3	
A11	IN6	Brown-2		B11	OUT10	Brown-4	
A12	IN7	Red-2		B12	OUT11	Red-4	
A13	IN8	Orange-2		B13	OUT12	Orange-4	
A14	IN9	Yellow-2		B14	OUT13	Yellow-4	
A15	IN10	Green-2		B15	OUT14	Green-4	
A16	IN11	Blue-2		B16	OUT15	Blue-4	
A17	IN12	Purple-2		B17	-	Purple-4	
A18	IN13	Gray-2		B18	OV	White-4	
A19	IN14	White-2		B19	OV	White-4	
A20	IN15	Black-2		B20	OV	Black-4	

Flat cable (pressure-welded)

Flat cable (pressure-welded)

**FS Series V3
Catalogue No. 0609-E**

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



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