

IS Series Actuator

ISB, ISPB, SSPA

Instruction Manual Eighteenth Edition ME3708-18C



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Please Read Before Use

Thank you for purchasing our product.

This instruction manual explains the handling methods, structure and maintenance of this product, providing the information you need in order to use the product safely.

Before using the product, be sure to read this manual and fully understand the contents explained herein to ensure safe use of the product.

Please download the user's manual from our website.

You can download it free of charge. User registration is required for the first time downloading.

URL : www.iai-robot.co.jp/data_dl/CAD_MANUAL/

When using the product, print out of the necessary portions of the relevant manual, or please display it on your computer, tablet terminal, etc. so that you can check it immediately.

After reading the instruction manual, keep it in a convenient place so that whoever is handling the product can refer to it quickly when necessary.

[Important]

- This instruction manual is an original document dedicated for this product.
- This product cannot be used in ways not shown in this instruction manual. IAI shall not be liable for any result whatsoever arising from the use of the product in any other way than what is noted in the manual.
- The information contained in this instruction manual is subject to change without notice for the purpose of product improvement.
- If any issues arise regarding the information contained in this instruction manual, contact our customer center or the nearest sales office.
- Use or reproduction of this instruction manual in full or in part without permission is prohibited.
- The company names, names of products and trademarks of each company shown in the text are registered trademarks.



INTELLIGENT ACTUATOR



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Safety Guide

“Safety Guide” has been written to use the machine safely and so prevent personal injury or property damage beforehand. Make sure to read it before the operation of this product.

Safety Precautions for Our Products

The common safety precautions for the use of any of our robots in each operation.

No.	Operation Description	Description
1	Model Selection	• This product has not been planned and designed for the application where high level of safety is required, so the guarantee of the protection of human life is impossible. Accordingly, do not use it in any of the following applications. 1) Medical equipment used to maintain, control or otherwise affect human life or physical health. 2) Mechanisms and machinery designed for the purpose of moving or transporting people (For vehicle, railway facility or air navigation facility) 3) Important safety parts of machinery (Safety device, etc.) • Do not use the product outside the specifications. Failure to do so may considerably shorten the life of the product. • Do not use it in any of the following environments. 1) Location where there is any inflammable gas, inflammable object or explosive 2) Place with potential exposure to radiation 3) Location with the ambient temperature or relative humidity exceeding the specification range 4) Location where radiant heat is added from direct sunlight or other large heat source 5) Location where condensation occurs due to abrupt temperature changes 6) Location where there is any corrosive gas (sulfuric acid or hydrochloric acid) 7) Location exposed to significant amount of dust, salt or iron powder 8) Location subject to direct vibration or impact • For an actuator used in vertical orientation, select a model which is equipped with a brake. If selecting a model with no brake, the moving part may drop when the power is turned OFF and may cause an accident such as an injury or damage on the work piece.



No.	Operation Description	Description
2	Transportation	• When carrying a heavy object, do the work with two or more persons or utilize equipment such as crane. • When the work is carried out with 2 or more persons, make it clear who is to be the “leader” and who to be the “follower(s)” and communicate well with each other to ensure the safety of the workers. • When in transportation, consider well about the positions to hold, weight and weight balance and pay special attention to the carried object so it would not get hit or dropped. • Transport it using an appropriate transportation measure. The actuators available for transportation with a crane have eyebolts attached or there are tapped holes to attach bolts. Follow the instructions in the instruction manual for each model. • Do not step or sit on the package. • Do not put any heavy thing that can deform the package, on it. • When using a crane capable of 1t or more of weight, have an operator who has qualifications for crane operation and sling work. • When using a crane or equivalent equipments, make sure not to hang a load that weighs more than the equipment’s capability limit. • Use a hook that is suitable for the load. Consider the safety factor of the hook in such factors as shear strength. • Do not get on the load that is hung on a crane. • Do not leave a load hung up with a crane. • Do not stand under the load that is hung up with a crane.
3	Storage and Preservation	• The storage and preservation environment conforms to the installation environment. However, especially give consideration to the prevention of condensation. • Store the products with a consideration not to fall them over or drop due to an act of God such as earthquake.
4	Installation and Start	(1) Installation of Robot Main Body and Controller, etc. • Make sure to securely hold and fix the product (including the work part). A fall, drop or abnormal motion of the product may cause a damage or injury. Also, be equipped for a fall-over or drop due to an act of God such as earthquake. • Do not get on or put anything on the product. Failure to do so may cause an accidental fall, injury or damage to the product due to a drop of anything, malfunction of the product, performance degradation, or shortening of its life. • When using the product in any of the places specified below, provide a sufficient shield. 1) Location where electric noise is generated 2) Location where high electrical or magnetic field is present 3) Location with the mains or power lines passing nearby 4) Location where the product may come in contact with water, oil or chemical droplets



No.	Operation Description	Description
4	Installation and Start	(2) Cable Wiring • Use our company's genuine cables for connecting between the actuator and controller, and for the teaching tool. • Do not scratch on the cable. Do not bend it forcibly. Do not pull it. Do not coil it around. Do not insert it. Do not put any heavy thing on it. Failure to do so may cause a fire, electric shock or malfunction due to leakage or continuity error. • Perform the wiring for the product, after turning OFF the power to the unit, so that there is no wiring error. • When the direct current power (+24V) is connected, take the great care of the directions of positive and negative poles. If the connection direction is not correct, it might cause a fire, product breakdown or malfunction. • Connect the cable connector securely so that there is no disconnection or looseness. Failure to do so may cause a fire, electric shock or malfunction of the product. • Never cut and/or reconnect the cables supplied with the product for the purpose of extending or shortening the cable length. Failure to do so may cause the product to malfunction or cause fire. (3) Grounding • The grounding operation should be performed to prevent an electric shock or electrostatic charge, enhance the noise-resistance ability and control the unnecessary electromagnetic radiation. • For the ground terminal on the AC power cable of the controller and the grounding plate in the control panel, make sure for grounding work. For security grounding, it is necessary to select an appropriate wire thickness suitable for the load. Perform wiring that satisfies the specifications (electrical equipment technical standards). For detail, follow the description in an instruction manual of each controller or controller built-in actuator. • Perform Class D Grounding (former Class 3 Grounding with ground resistance 100Ω or below).



No.	Operation Description	Description
4	Installation and Start	(4) Safety Measures • When the work is carried out with 2 or more persons, make it clear who is to be the “leader” and who to be the “follower(s)” and communicate well with each other to ensure the safety of the workers. • When the product is under operation or in the ready mode, take the safety measures (such as the installation of safety and protection fence) so that nobody can enter the area within the robot’s movable range. When the robot under operation is touched, it may result in death or serious injury. • Make sure to install the emergency stop circuit so that the unit can be stopped immediately in an emergency during the unit operation. • Take the safety measure not to start up the unit only with the power turning ON. Failure to do so may start up the machine suddenly and cause an injury or damage to the product. • Take the safety measure not to start up the machine only with the emergency stop cancellation or recovery after the power failure. Failure to do so may result in an electric shock or injury due to unexpected power input. • When the installation or adjustment operation is to be performed, give clear warnings such as “Under Operation; Do not turn ON the power!” etc. Sudden power input may cause an electric shock or injury. • Take the measure so that the work part is not dropped in power failure or emergency stop. • Wear protection gloves, goggle or safety shoes, as necessary, to secure safety. • Do not insert a finger or object in the openings in the product. Failure to do so may cause an injury, electric shock, damage to the product or fire. • When releasing the brake on a vertically oriented actuator, exercise precaution not to pinch your hand or damage the work parts with the actuator dropped by gravity.
5	Teaching	• When the work is carried out with 2 or more persons, make it clear who is to be the “leader” and who to be the “follower(s)” and communicate well with each other to ensure the safety of the workers. • Perform the teaching operation from outside the safety protection fence, if possible. In the case that the operation is to be performed unavoidably inside the safety protection fence, prepare the “Stipulations for the Operation” and make sure that all the workers acknowledge and understand them well. • When the operation is to be performed inside the safety protection fence, the worker should have an emergency stop switch at hand with him so that the unit can be stopped any time in an emergency. • When the operation is to be performed inside the safety protection fence, in addition to the workers, arrange a watchman so that the machine can be stopped any time in an emergency. Also, keep watch on the operation so that any third person can not operate the switches carelessly. • Place a sign “Under Operation” at the position easy to see. • When releasing the brake on a vertically oriented actuator, exercise precaution not to pinch your hand or damage the work parts with the actuator dropped by gravity. * Safety protection Fence : In the case that there is no safety protection fence, the movable range should be indicated.



No.	Operation Description	Description
6	Trial Operation	• When the work is carried out with 2 or more persons, make it clear who is to be the “leader” and who to be the “follower(s)” and communicate well with each other to ensure the safety of the workers. • After the teaching or programming operation, perform the check operation one step by one step and then shift to the automatic operation. • When the check operation is to be performed inside the safety protection fence, perform the check operation using the previously specified work procedure like the teaching operation. • Make sure to perform the programmed operation check at the safety speed. Failure to do so may result in an accident due to unexpected motion caused by a program error, etc. • Do not touch the terminal block or any of the various setting switches in the power ON mode. Failure to do so may result in an electric shock or malfunction.
7	Automatic Operation	• Check before starting the automatic operation or rebooting after operation stop that there is nobody in the safety protection fence. • Before starting automatic operation, make sure that all peripheral equipment is in an automatic-operation-ready state and there is no alarm indication. • Make sure to operate automatic operation start from outside of the safety protection fence. • In the case that there is any abnormal heating, smoke, offensive smell, or abnormal noise in the product, immediately stop the machine and turn OFF the power switch. Failure to do so may result in a fire or damage to the product. • When a power failure occurs, turn OFF the power switch. Failure to do so may cause an injury or damage to the product, due to a sudden motion of the product in the recovery operation from the power failure.



No.	Operation Description	Description
8	Maintenance and Inspection	• When the work is carried out with 2 or more persons, make it clear who is to be the “leader” and who to be the “follower(s)” and communicate well with each other to ensure the safety of the workers. • Perform the work out of the safety protection fence, if possible. In the case that the operation is to be performed unavoidably inside the safety protection fence, prepare the “Stipulations for the Operation” and make sure that all the workers acknowledge and understand them well. • When the work is to be performed inside the safety protection fence, basically turn OFF the power switch. • When the operation is to be performed inside the safety protection fence, the worker should have an emergency stop switch at hand with him so that the unit can be stopped any time in an emergency. • When the operation is to be performed inside the safety protection fence, in addition to the workers, arrange a watchman so that the machine can be stopped any time in an emergency. Also, keep watch on the operation so that any third person can not operate the switches carelessly. • Place a sign “Under Operation” at the position easy to see. • For the grease for the guide or ball screw, use appropriate grease according to the instruction manual for each model. • Do not perform the dielectric strength test. Failure to do so may result in a damage to the product. • When releasing the brake on a vertically oriented actuator, exercise precaution not to pinch your hand or damage the work parts with the actuator dropped by gravity. • The slider or rod may get misaligned OFF the stop position if the servo is turned OFF. Be careful not to get injured or damaged due to an unnecessary operation. • Pay attention not to lose the removed cover or screws, and make sure to put the product back to the original condition after maintenance and inspection works. Use in incomplete condition may cause damage to the product or an injury. * Safety protection Fence : In the case that there is no safety protection fence, the movable range should be indicated.
9	Modification and Dismantle	• Do not modify, disassemble, assemble or use of maintenance parts not specified based at your own discretion.
10	Disposal	• When the product becomes no longer usable or necessary, dispose of it properly as an industrial waste. • When removing the actuator for disposal, pay attention to drop of components when detaching screws. • Do not put the product in a fire when disposing of it. The product may burst or generate toxic gases.
11	Other	• Do not come close to the product or the harnesses if you are a person who requires a support of medical devices such as a pacemaker. Doing so may affect the performance of your medical device. • See Overseas Specifications Compliance Manual to check whether complies if necessary. • For the handling of actuators and controllers, follow the dedicated instruction manual of each unit to ensure the safety. • Using the devise in a way not indicated by IAI may lose the protection performance equipped to the device.



Alert Indication

The safety precautions are divided into “Danger”, “Warning”, “Caution” and “Notice” according to the warning level, as follows, and described in the instruction manual for each model.

Level	Degree of Danger and Damage	Symbol
Danger	This indicates an imminently hazardous situation which, if the product is not handled correctly, will result in death or serious injury.	 Danger
Warning	This indicates a potentially hazardous situation which, if the product is not handled correctly, could result in death or serious injury.	 Warning
Caution	This indicates a potentially hazardous situation which, if the product is not handled correctly, may result in minor injury or property damage.	 Caution
Notice	This indicates lower possibility for the injury, but should be kept to use this product properly.	 Notice

Caution in Handling

1. Do not set speeds and accelerations/decelerations equal to or greater than the respective ratings.
If the actuator is operated at a speed or acceleration/deceleration exceeding the allowable value, abnormal noise or vibration, failure, or shorter life may result.
In the case of interpolated operation of combined axes, the speed and acceleration/deceleration settings should correspond to the minimum values among all combined axes.
2. Keep the load moment within the allowable value.
If the actuator is operated under a load equal to or greater than the allowable load moment, abnormal noise or vibration, failure, or shorter life may result. In an extreme case, flaking may occur.
3. Keep the overhang length to within the allowable value.
If the overhang length is equal to or greater than the allowable value, vibration or abnormal noise may occur.
4. Back and forth operation in a short distance may cause wear of grease.
If the actuator is moved back and forth continuously over a short distance of 30 mm or less, grease film may run out. As a guide, move the actuator back and forth repeatedly for around 5 cycles over a distance of 50 mm or more after every 5,000 to 10,000 cycles.
5. The base oil separate from grease may leaked out from inside an actuator in some conditions of environment to use, installation posture and operational conditions.
In case peripheral devices could have a bad influence due to the base oil applied, it is recommended to have a protection.
6. Do not attempt to collide a slider to an obstacle in high speed.
Internal structural components may get damaged.
7. Make sure to attach the actuator properly by following this operation manual.
Using the product with the actuator not being certainly retained or affixed may cause abnormal noise, vibration, malfunction or shorten the product life.



International Standard Compliance

The IXA SCARA Robot complies with the following overseas standards.
Refer to the Overseas Standard Compliance Manual (ME0287) for more detailed information.

CE Marking	RoHS3 Directive
○	○

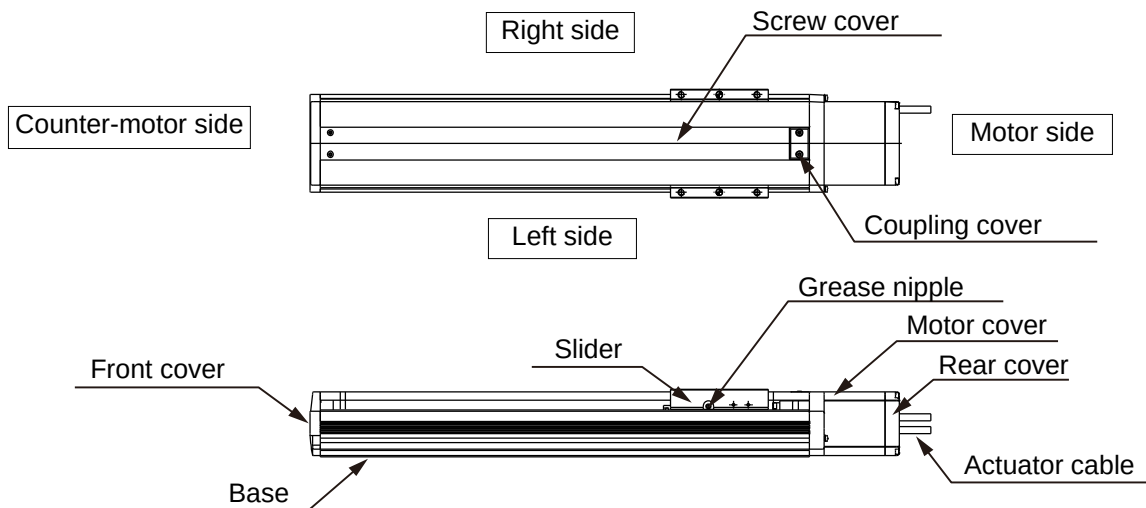


Names of the Parts

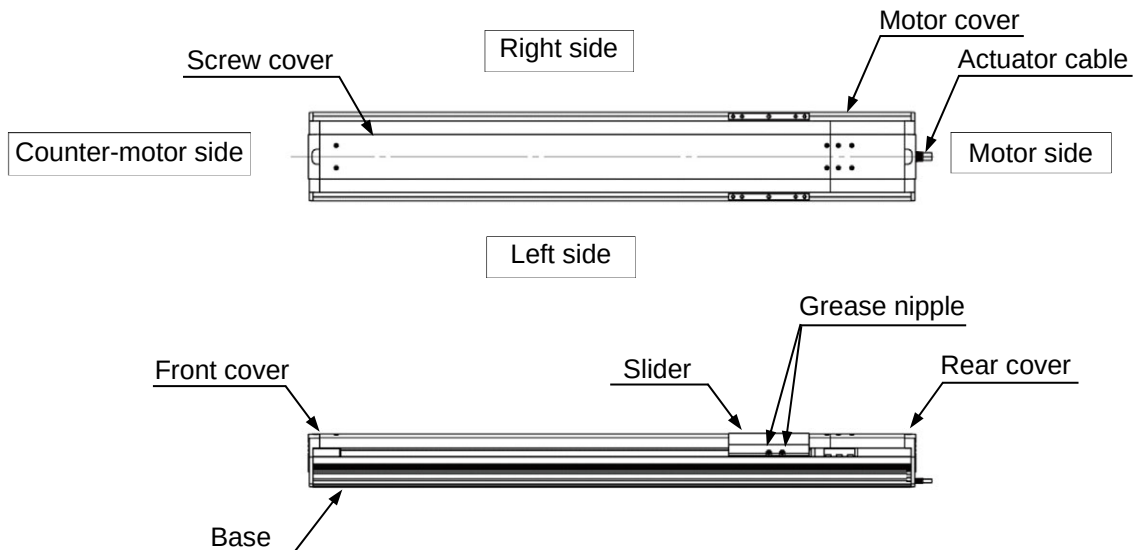
1. ISB/ISPB

In this operating manual, the left and right sides are indicated by looking at the actuator from the motor end, with the actuator placed horizontally, as shown in the figure below.

[Other than WXM, WXMx]



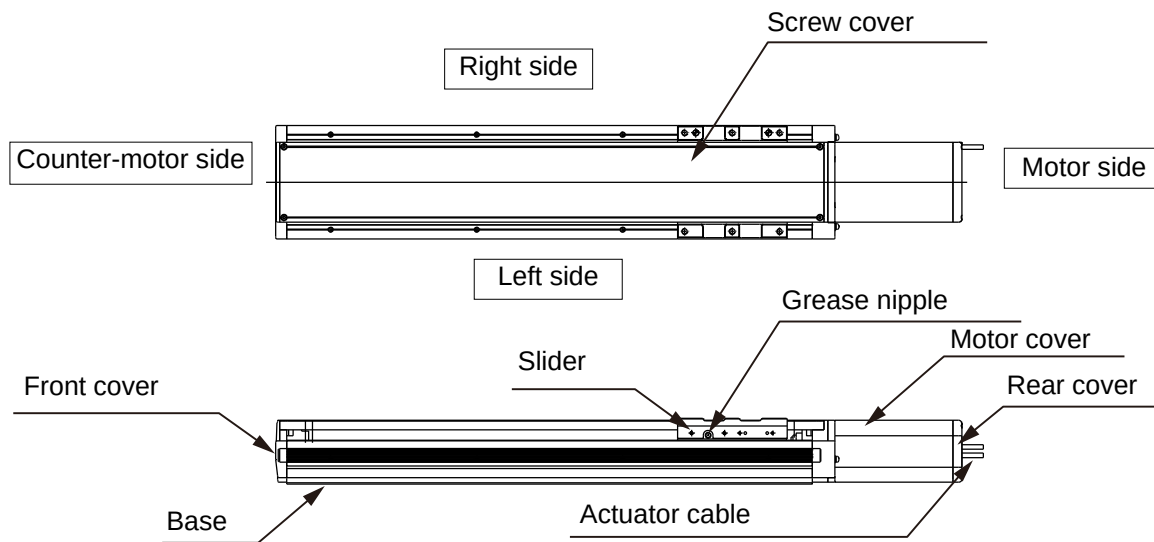
[WXM, WXMx]





2. SSPA

In this operating manual, the left and right sides are indicated by looking at the actuator from the motor end, with the actuator placed horizontally, as shown in the figure below.





INTELLIGENT ACTUATOR

1. Checking the Product

If based on a standard configuration, this product consists of the items listed below.

 **Caution:** Check the packed items against the packing specification. Should you find a wrong model or any missing item, please contact your IAI dealer or IAI.

1.1 Components

No.	Name	Model number	Remarks
1	Actuator	Refer to "How to Read the Model Nameplate" and "How to Read the Model Number."	
Accessories			
2	Motor/Encoder cables ^{*1}		
3	Dedicated washer		Enclosed to M, L and W sizes in ISB and ISPB
4	Safety Guide	M0194	

^{*1} The motor/encoder cables supplied vary depending on the controller used. Refer to [12, "Motor/Encoder Cables."]

1.2 Related Operation Manuals for Each Controller Supported by This Product

(1) XSEL-J/K controllers

No.	Name	Control No.
1	Operation Manual for XSEL-J/K Controller	ME0116
2	Operation Manual for PC Software IA-101-X-MW/IA-101-X-USBMW	ME0154
3	Operation Manual for Touch Panel Teaching Pendant TB-03 Applicable for Program Controller * It should not be applicable for XSEL-J.	ME0377
4	Operation Manual for Touch Panel Teaching Pendant TB-02, TB-02D Applicable for Program Controller	ME0356
5	Operation Manual for Touch Panel Teaching TB-01, TB-01D, TB-01DR Applicable for Program Controller	ME0325
6	Operation Manual for Teaching Pendant SEL-T/TD/TG	ME0183
7	Operation Manual for Teaching Pendant IA-T-X/XD	ME0160
8	Operation Manual for DeviceNet	ME0124
9	Operation Manual for CC-Link	ME0123
10	Operation Manual for PROFIBUS-DP	ME0153
11	Operation Manual for X-SEL Ethernet	ME0140
12	Operation Manual for Multi-point I/O Board	ME0138
13	Operation Manual for Dedicated Multi-point I/O Board Terminal Block	ME0139



(2) XSEL-P/Q, XSEL-R/S, XSEL-RA/SA controllers

No.	Name	Control No.
1	Operation Manual for XSEL-P/Q Controller	ME0148
2	Operation Manual for XSEL-R/S Controller	ME0313
3	Operation Manual for XSEL-RA/SA	ME0359
4	Operation Manual for XSEL-P/Q/PX/QX RC Gateway Function	ME0188
5	Operation Manual for PC Software IA-101-X-MW/IA-101-X-USBMW	ME0154
6	Operation Manual for Touch Panel Teaching Pendant TB-03 Applicable for Program Controller	ME0377
7	Operation Manual for Touch Panel Teaching Pendant TB-02, TB-02D Applicable for Program Controller	ME0356
8	Operation Manual for Touch Panel Teaching TB-01, TB-01D, TB-01DR Applicable for Program Controller	ME0325
9	Operation Manual for Teaching Pendant SEL-T/TD/TG	ME0183
10	Operation Manual for Teaching Pendant IA-T-X/XD	ME0160
11	Operation Manual for DeviceNet	ME0124
12	Operation Manual for CC-Link	ME0123
13	Operation Manual for PROFIBUS-DP	ME0153

(3) SSEL controllers

No.	Name	Control No.
1	Operation Manual for SSEL Controller	ME0157
2	Operation Manual for PC Software IA-101-X-MW/IA-101-X-USBMW	ME0154
3	Operation Manual for Touch Panel Teaching Pendant TB-03 Applicable for Program Controller	ME0377
4	Operation Manual for Touch Panel Teaching Pendant TB-02, TB-02D Applicable for Program Controller	ME0356
5	Operation Manual for Touch Panel Teaching TB-01, TB-01D, TB-01DR Applicable for Program Controller	ME0325
6	Operation Manual for Teaching Pendant SEL-T/TD/TG	ME0183
7	Operation Manual for Teaching Pendant IA-T-X/XD	ME0160
8	Operation Manual for DeviceNet	ME0124
9	Operation Manual for CC-Link	ME0123
10	Operation Manual for PROFIBUS-DP	ME0153

(4) RSEL system

No.	Name	Control No.
1	Operation Manual for RSEL System	ME0392
2	Operation Manual for PC Software IA-101-X-MW/IA-101-X-USBMW (RSEL Edition)	ME0398
3	Operation Manual for Touch Panel Teaching Pendant TB-03 Applicable for Program Controller	ME0377
4	Operation Manual for Touch Panel Teaching Pendant TB-02, TB-02D Applicable for Program Controller	ME0356



(5) SCON, MSCON controllers

No.	Name	Control No.
1	Operation Manual for SCON Controller	ME0161
2	Operation Manual for SCON-CA Controller	ME0243
3	Operation Manual for SCON-CB/CGB Controller	ME0340
4	Operation Manual for MSCON Controller	ME0306
5	Operation Manual for PC Software RCM-101-MW/RCM-101-USB	ME0155
6	Operation Manual for Touch Panel Teaching Pendant TB-03 Applicable for Position Controller	ME0376
7	Operation Manual for Touch Panel Teaching Pendant TB-02, TB-02D Applicable for Position Controller	ME0355
8	Operation Manual for Touch Panel Teaching TB-01, TB-01D, TB-01DR Applicable for Position Controller	ME0324
9	Operation Manual for Teaching Pendant CON-T/TG	ME0178
10	Operation Manual for Touch Panel Teaching Pendant CON-PT/PD/PG	ME0227
11	Operation Manual for Simple Teaching Pendant RCM-E	ME0174
12	Operation Manual for Data Setter RCM-P	ME0175
13	Operation Manual for Touch Panel Display RCM-PM-01	ME0182
14	Operation Manual for DeviceNet (SCON-C)	ME0124
15	Operation Manual for CC-Link (SCON-C)	ME0123
16	Operation Manual for PROFIBUS-DP (SCON-C)	ME0153
17	Operation Manual for DeviceNet (SCON-CA/CB)	ME0256
18	Operation Manual for CC-Link (SCON-CA/CB)	ME0254
19	Operation Manual for PROFIBUS-DP (SCON-CA/CB)	ME0258

(6) RCON system

No.	Name	Control No.
1	Operation Manual for RCON System	ME0384
2	Operation Manual for PC Software RCM-101-MW/RCM-101-USB	ME0155
3	Operation Manual for Touch Panel Teaching Pendant TB-03 Applicable for Position Controller	ME0376
4	Operation Manual for Touch Panel Teaching Pendant TB-02, TB-02D Applicable for Position Controller	ME0355

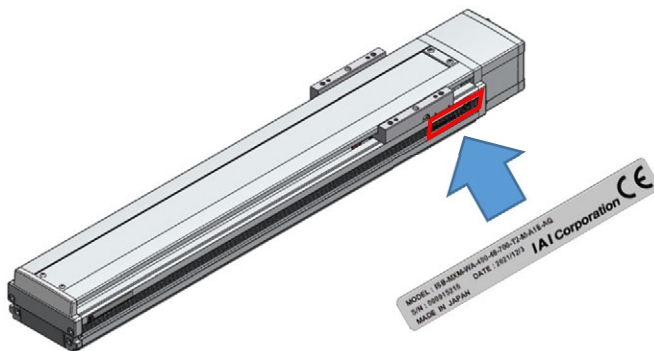


1.3 How to Read the Model Nameplate

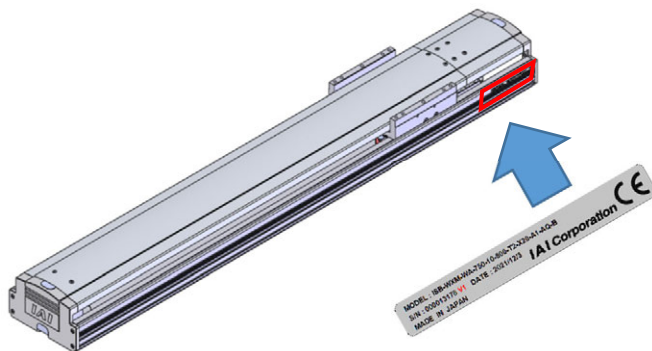
Model → **MODEL : ISB-WXM-WA-750-10-800-T2-X20-A1-AQ-B**
Serial number → **S/N : 000013178 V1 DATE : 2021/12/3**
MADE IN JAPAN **IAI Corporation** **CE**

* ISB-WXM actuators after December 2021 have a large payload capacity of vertical direction.
For actuator after changing the payload capacity, there is "V1" after serial number.

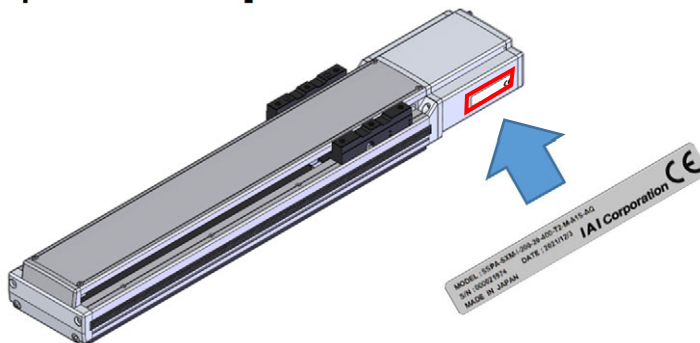
[Position of nameplate other than ISB-WXM/WXMX]



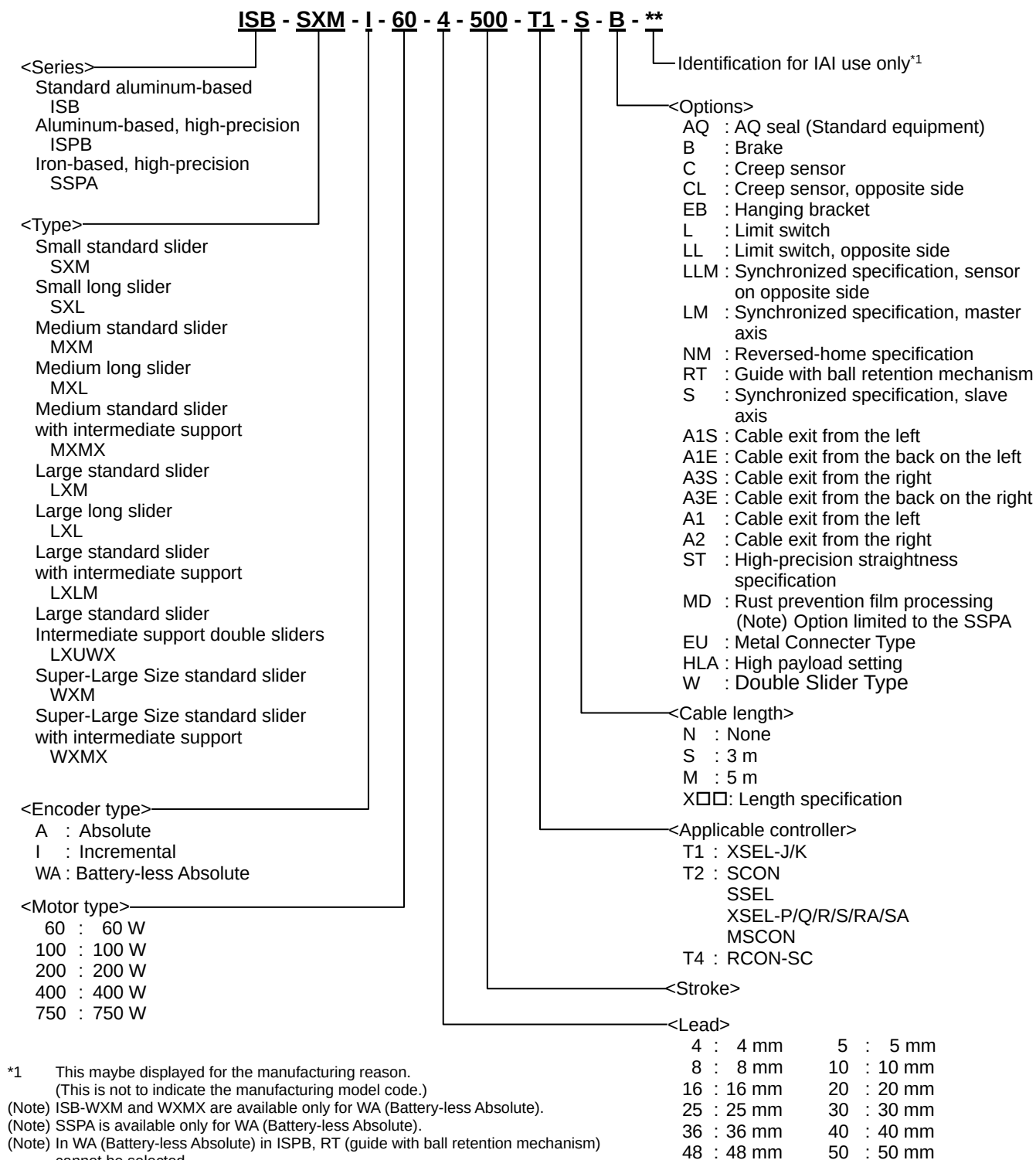
[Position of nameplate for ISB-WXM/WXMX]



[Position of nameplate for SSPA]



1.4 How to Read the Model Number





INTELLIGENT ACTUATOR



2. Specification

2.1 Maximum Speed

The maximum speed of the actuator is limited to prevent resonance of the ball screw shaft by the motor speed limit. Be sure to observe the applicable maximum speed shown in the table below.

(1) ISB, ISPB

Strokes and maximum speed limits (Unit: mm/s)

Type	Motor capacity [W]	Lead [mm]	Stroke [mm]									
			100	150 200	250 300	350 400	450 500	550 600	650 700	750 800	850	900
SXM	60	4	240						165	130	100	100
		8	480						330	260	210	210
		16	960						655	515	415	415

Type	Motor capacity [W]	Lead [mm]	Stroke [mm]									
			130	180 230	280 330	380 430	480 530	580	630 680	730 780	830	880
SXL	60	4	240						165	130	100	100
		8	480						330	260	210	210
		16	960						655	515	415	415

ISB

Type	Motor capacity [W]	Lead [mm]	Stroke [mm]															
			100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850
SXM	100	36	1100	1425	1700	1925	2075	2125	2160				2000	1740	1520	1340	1190	1065
													960	865	790	721	660	

ISB

Type	Motor capacity [W]	Lead [mm]	Stroke [mm]													
			130	180	230	280	330	380	430	480	530	580	630	680	730	780
SXL	100	36	1425	1700	1925	2075	2125	2160				2000	1740	1520	1340	1190
												960	865	790	721	660

Type	Motor capacity [W]	Lead [mm]	Stroke [mm]										
			100	150 200	250 300	350 400	450 500	550 600	650 700	750 800	850 900	950 1000	1050 1100
MXM	100	5	300						215	170	140	115	115
		10	600						430	345	280	230	230
		20	1200						860	695	570	460	460
		30	1800						1290	1045	860	690	690
	200	5	300						215	170	140	115	115
		10	600						430	345	280	230	230
		20	1200						860	695	570	460	460
		30	1800						1290	1045	860	690	690

Type	Motor capacity [W]	Lead [mm]	Stroke [mm]										
			120 170	220 270	320 370	420 470	520 570	620 670	720 770	820 870	920 970	1020	1070
MXL	100	5	300						215	170	140	115	115
		10	600						430	345	280	230	230
		20	1200						860	695	570	460	460
		30	1800						1290	1045	860	690	690
	200	5	300						215	170	140	115	115
		10	600						430	345	280	230	230
		20	1200						860	695	570	460	460
		30	1800						1290	1045	860	690	690



ISB

Type	Motor capacity [W]	Lead [mm]	Stroke [mm]													
			100	150	200	250	300	350	400	450	500	550	600	650	700	750
MXM	400	48	1025	1325	1575	1825	2025	2200	2350	2400	2500					2270
			Stroke [mm]													
			800	850	900	950	1000	1050	1100	1150	1200	1250	1300			
			2030	1825	1645	1495	1365	1250	1150	1060	980	910	845			

ISB

Type	Motor capacity [W]	Lead [mm]	Stroke [mm]													
			120	170	220	270	320	370	420	470	520	570	620	670	720	770
MXL	400	48	1325	1575	1825	2025	2200	2350	2400	2500					2270	2030
			Stroke [mm]													
			820	870	920	970	1020	1070	1120	1170	1220	1270				
			1825	1645	1495	1365	1250	1150	1060	980	910	845				

Type	Motor capacity [W]	Lead [mm]	Stroke [mm]													
			100	150	250	350	450	550	650	750	850	950	1050	1150	1250	1300
LXM	200	10	600								460	380	320	270	220	220
		20	1200								920	765	645	550	440	440
		40	2400								1840	1530	1290	1100	880	880
	400	10	600								460	380	320	270	220	220
		20	1200								920	765	645	550	440	440
		40	2400								1840	1530	1290	1100	880	880

Type	Motor capacity [W]	Lead [mm]	Stroke [mm]													
			120	220	320	420	520	620	720	820	920	1020	1120	1220	1270	
LXL	200	10	600								460	380	320	270	220	220
		20	1200								920	765	645	550	440	440
		40	2400								1840	1530	1290	1100	880	880
	400	10	600								460	380	320	270	220	220
		20	1200								920	765	645	550	440	440
		40	2400								1840	1530	1290	1100	880	880

Type	Motor capacity [W]	Lead [mm]	Stroke [mm]													
			100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	
MXMX	200	20	—	—	—	—	—	—	—	1200					1100	1000
		30	—	—	—	—	—	—	—	1800					1650	1500
LXMX	200	20	—	—	—	—	—	—	—	—	—	1200				1150
		40	—	—	—	—	—	—	—	—	—	2400				2300
	400	40	—	—	—	—	—	—	—	—	—	2400				2300
LXUWX	200	20	—	—	—	—	—	—	—	—	—	1200				1150
		40	—	—	—	—	—	—	—	—	—	2400				2300
	400	40	—	—	—	—	—	—	—	—	—	2400				2300

Type	Motor capacity [W]	Lead [mm]	Stroke [mm]											
			1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500
MXMX	200	20	950	800	700	600	550	500	450	—	—	—	—	—
		30	1425	1200	1050	900	825	750	675	—	—	—	—	—
LXMX	200	20	1000	950	830	740	650	590	540	490	460	410	370	340
		40	1000	950	830	740	650	590	540	490	460	410	370	340
	400	40	2000	1900	1660	1480	1300	1180	1080	980	900	820	740	680
LXUWX	200	20	1000	950	830	740	650	590	540	490	440	430	370	340
		40	1000	950	830	740	650	590	540	490	440	430	370	340
	400	40	2000	1900	1660	1480	1300	1180	1080	980	880	840	740	680



ISB

Type	Motor capacity [W]	Lead [mm]	Stroke [mm]													
			800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450
MXMX	400	48	1700	1750	1800	1850	1900	1950	2000	2050	2100	2150	2200	2065	1925	1805
			Stroke [mm]													
			1500	1550	1600	1650	1700	1750	1800	1850	1900	1950	2000			
			1690	1590	1495	1410	1335	1265	1195	1135	1080	1025	980			

Type	Motor capacity [W]	Lead [mm]	Stroke [mm]										
			100 to 800 (Every 50mm)	850	900	950	1000	1050	1100	1150	1200	1250	1300
WXM	750	10	600	460		380		320		270		235	
		25	1250			1130		920		785		680	
		50	2500			2260		1840		1570		1360	

Type	Motor capacity [W]	Lead [mm]	Stroke [mm]
			900 to 3000 (Every 50mm)
WXM	750	25	1250
		50	2500



- Caution: (1) Do not set speeds equal to or greater than the respective ratings. Doing so may result in vibration, failure or shorter life.
- (2) In the case of interpolated operation of two or more orthogonal axes, the speed and acceleration/deceleration of the actuator with the lowest specifications in the axis is the maximum speed and acceleration/deceleration of all axes.



(2) SSPA

Stroke and maximum speed (or speed to reach) limits (Unit: mm/s)

Type	Motor capacity [W]	Lead [mm]	Stroke [mm]																			
			100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950		
SXM	200	10	600												560	490	440	390	350	320	290	
		20	1200												1120	990	880	780	710	640	580	
		30	1800												1680	1480	1320	1180	1060	960	870	
MXM	400	10	600															530	480	430	390	360
		20	1200															1070	960	870	790	720
		40	2400															2150	1930	1740	1580	1440
LXM	750	25	1080		1250																	
			620		880		1080		1250													
	750	50	1080		1530		1870		2160		2420		2500									
			620		880		1080		1250		1400		1530		1650		1770		1870			

Type	Motor capacity [W]	Lead [mm]	Stroke [mm]											
			1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	
SXM	200	10	260	240	220	—	—	—	—	—	—	—	—	
		20	530	480	440	—	—	—	—	—	—	—	—	
		30	790	730	670	—	—	—	—	—	—	—	—	
MXM	400	10	330	300	280	250	240	220	200	—	—	—	—	
		20	660	600	560	510	480	440	410	—	—	—	—	
		40	1320	1210	1120	1030	960	890	830	—	—	—	—	
LXM	750	25	1160		970		830		720		620		550	
			1160		970		830		720		620		550	
	750	50	2320		1950		1660		1440		1250		1100	
			1970		1950		1660		1440		1250		1100	



- Caution: (1) Do not set speeds equal to or greater than the respective ratings. Doing so may result in vibration, failure or shorter life.
- (2) In the case of interpolated operation of two or more orthogonal axes, the speed and acceleration/deceleration of the actuator with the lowest specifications in the axis is the maximum speed and acceleration/deceleration of all axes.



2.2 Acceleration/Deceleration, Payload Capacity and Rated Thrust

If the payload capacity is smaller than as specified, the acceleration/deceleration can be raised beyond the applicable level.

(1) ISB, ISPB

Type	Type	Motor capacity [W]	Lead [mm]	Rated acceleration/ deceleration [G]	Maximum acceleration/ deceleration [G]	Horizontal/ Vertical	Payload capacity by acceleration/deceleration [kg]										Rated thrust [N]	
							0.2G	0.3G	0.4G	0.5G	0.6G	0.7G	0.8G	0.9G	1.0G	1.1G		1.2G
Guide with ball retention mechanism (RT) not used	SXM SXL	60	4	0.2	0.5	Horizontal	55	50	38	30	-	-	-	-	-	-	212.3	
				0.2	0.4	Vertical	14	13	12	-	-	-	-	-	-	-		
			8	0.4	0.7	Horizontal	27	27	27	20	15	12	-	-	-	-	-	106.1
				0.4	0.6	Vertical	7	7	7	6	5	-	-	-	-	-	-	
			16	0.4	1.2	Horizontal	13	13	13	10.5	8.5	7	6	5.5	4.5	4	3.5	53.1
				0.4	0.8	Vertical	3.5	3.5	3.5	3.0	2.6	2.3	2	-	-	-	-	
	MXM MXL	100	5	0.2	0.5	Horizontal	85	80	60	45	-	-	-	-	-	-	-	339.7
				0.2	0.4	Vertical	20	17	15	-	-	-	-	-	-	-	-	
			10	0.4	0.7	Horizontal	45	45	45	30	23	20	-	-	-	-	-	169.8
				0.4	0.6	Vertical	10	10	10	8	7	-	-	-	-	-	-	
			20	0.4	1.2	Horizontal	23	23	23	18	15	13	11	9	8	7	6	84.9
				0.4	1	Vertical	5	5	5	4.5	4	3.5	3	2.8	2.5	-	-	
			30	0.4	1.2	Horizontal	15	15	15	11	9	7	6	5	4	3.5	3	56.6
				0.4	1.2	Vertical	2.5	2.5	2.5	2.2	1.9	1.7	1.5	1.4	1.2	1.1	1	
	MXM MXL	200	5	0.2	0.5	Horizontal	110	100	90	80	-	-	-	-	-	-	-	683.6
				0.2	0.4	Vertical	40	34	30	-	-	-	-	-	-	-	-	
			10	0.4	0.7	Horizontal	90	90	90	66	51	40	-	-	-	-	-	341.8
				0.4	0.6	Vertical	20	20	20	17	15	-	-	-	-	-	-	
			20	0.4	1.2	Horizontal	45	45	45	35	28	23	20	17	15	13	12	170.9
				0.4	1	Vertical	10	10	10	8.5	7.5	7	6	5.5	5	-	-	
			30	0.4	1.2	Horizontal	30	30	30	24	20	17	15	13	12	10	9	113.9
				0.4	1.2	Vertical	6	6	6	5.5	5	4.5	4	3.5	3	2.5	2	
	MXMX	200	20	0.4	0.4	Horizontal	45	45	45	-	-	-	-	-	-	-	-	170.9
				-	-	Vertical	-	-	-	-	-	-	-	-	-	-	-	
			30	0.4	0.4	Horizontal	30	30	30	-	-	-	-	-	-	-	-	113.9
				-	-	Vertical	-	-	-	-	-	-	-	-	-	-	-	



- Caution: (1) Even when the acceleration/deceleration is less than the rated acceleration/deceleration, the payload capacity will not exceed the specified payload capacity at the rated acceleration/deceleration.
- (2) In the case of interpolated operation of two or more orthogonal axes, the speed and acceleration/deceleration of the actuator with the lowest specifications in the axis is the maximum speed and acceleration/deceleration of all axes.



(1) ISB, ISPB (continuous)

Type	Type	Motor capacity [W]	Lead [mm]	Rated acceleration/ deceleration [G]	Maximum acceleration/ deceleration [G]	Horizontal/ Vertical	Payload capacity by acceleration/deceleration [kg]										Rated thrust [N]	
							0.2G	0.3G	0.4G	0.5G	0.6G	0.7G	0.8G	0.9G	1.0G	1.1G		1.2G
Guide with ball retention mechanism (RT) not used	LXM LXL	200	10	0.4	0.7	Horizontal	90	90	90	66	51	40	-	-	-	-	-	341.8
				0.4	0.6	Vertical	20	20	20	16	14	-	-	-	-	-	-	
			20	0.4	1.2	Horizontal	45	45	45	35	28	23	20	17	15	13	12	170.9
				0.4	1	Vertical	10	10	10	8.5	7.5	7	6	5.5	5	-	-	
			40	0.4	1.2	Horizontal	15	15	15	12	10.5	9	8	7.5	7	6.5	6	85.5
				0.4	1.2	Vertical	4	4	4	3.5	3.1	2.8	2.5	2.2	2.0	1.8	1.6	
	LXM LXL	400	10	0.4	0.7	Horizontal	120	120	120	92	73	60	-	-	-	-	-	678.3
				0.4	0.6	Vertical	40	40	40	34	30	-	-	-	-	-	-	
			20	0.4	1.2	Horizontal	90	90	90	70	57	47	40	35	30	27	24	339.1
				0.4	1	Vertical	20	20	20	17	15	14	12	11	10	-	-	
			40	0.4	1.2	Horizontal	40	40	40	32	27	23	21	19	17	16	15	169.6
				0.4	1.2	Vertical	10	10	10	8.5	7.5	7	6	5.5	5	4.5	4	
	LXMX	200	20	0.4	0.4	Horizontal	45	45	45	-	-	-	-	-	-	-	-	170.9
				-	-	Vertical	-	-	-	-	-	-	-	-	-	-	-	
	LXMX	400	20	0.4	0.4	Horizontal	90	90	90	-	-	-	-	-	-	-	-	339.1
				-	-	Vertical	-	-	-	-	-	-	-	-	-	-	-	
			40	0.4	0.4	Horizontal	40	40	40	-	-	-	-	-	-	-	-	169.6
				-	-	Vertical	-	-	-	-	-	-	-	-	-	-	-	
	LXUWX	200	20	0.4	0.4	Horizontal	45	45	45	-	-	-	-	-	-	-	-	170.1
				-	-	Vertical	-	-	-	-	-	-	-	-	-	-	-	
	LXUWX	400	20	0.4	0.4	Horizontal	90	90	90	-	-	-	-	-	-	-	-	339.1
				-	-	Vertical	-	-	-	-	-	-	-	-	-	-	-	
			40	0.4	0.4	Horizontal	40	40	40	-	-	-	-	-	-	-	-	169.6
				-	-	Vertical	-	-	-	-	-	-	-	-	-	-	-	



- Caution: (1) Even when the acceleration/deceleration is less than the rated acceleration/deceleration, the payload capacity will not exceed the specified payload capacity at the rated acceleration/deceleration.
- (2) In the case of interpolated operation of two or more orthogonal axes, the speed and acceleration/deceleration of the actuator with the lowest specifications in the axis is the maximum speed and acceleration/deceleration of all axes.



ISB

Type	Type	Motor capacity [W]	Lead [mm]	Rated acceleration/ deceleration [G]	Maximum acceleration/ deceleration [G]	Horizontal/ Vertical	Payload capacity by acceleration/deceleration [kg]										Rated thrust [N]				
							0.4G	0.5G	0.6G	0.7G	0.8G	0.9G	1.0G	1.1G	1.2G	1.3G		1.4G			
Guide with ball retention mechanism (RT) not used	SXM SXL	100	36	0.4	2.0	Horizontal	10.0	9.0	8.2	7.5	6.7	6.0	5.5	5.0	4.5	4.3	4.1	47.2			
				0.4	1.6	Vertical	2	2	2	2	2	2	2	2	2	2	2				
										Payload capacity by acceleration/deceleration [kg]											
										1.5G	1.6G	1.7G	1.8G	1.9G	2.0G	-	-		-	-	-
				0.4	2.0	Horizontal	4.0	3.9	3.8	3.7	3.6	3.5	-	-	-	-	-		-	-	
				0.4	1.6	Vertical	2	2	-	-	-	-	-	-	-	-	-		-	-	
				* When the actuator is installed in horizontal orientation, acceleration / deceleration can be increased to 3.0G at maximum if gain adjustment is conducted in the offboard tuning.。																	
										Payload capacity by acceleration/deceleration [kg]											
										2.1G	2.2G	2.3G	2.4G	2.5G	2.6G	2.7G	2.8G		2.9G	3.0G	-
				-	3.0	Horizontal	3.2	2.9	2.6	2.3	2.0	1.9	1.8	1.7	1.6	1.5	-		-	-	
				MXM MXL	400	48							Payload capacity by acceleration/deceleration [kg]								
							0.4G	0.5G	0.6G	0.7G	0.8G	0.9G	1.0G	1.1G	1.2G	1.3G	1.4G				
	0.4	2.0	Horizontal				20.0	19.1	18.2	17.3	16.4	15.5	14.6	13.8	13.0	12.6	12.2				
	0.4	1.6	Vertical				6	6	6	6	6	6	6	6	6	6	6				
							Payload capacity by acceleration/deceleration [kg]														
							1.5G	1.6G	1.7G	1.8G	1.9G	2.0G	-	-	-	-	-				
	0.4	2.0	Horizontal				11.8	11.4	11.0	10.8	10.4	10.0	-	-	-	-	-	-	-		
	0.4	1.6	Vertical				6	6	-	-	-	-	-	-	-	-	-	-	-		
	* When the actuator is installed in horizontal orientation, acceleration / deceleration can be increased to 3.0G at maximum if gain adjustment is conducted in the offboard tuning.。																				
							Payload capacity by acceleration/deceleration [kg]														
							2.1G	2.2G	2.3G	2.4G	2.5G	2.6G	2.7G	2.8G	2.9G	3.0G	-				
	-	3.0	Horizontal				9.4	8.8	8.2	7.6	7.0	6.6	6.2	5.8	5.4	5.0	-	-	-		
	MXMX	400	48										Payload capacity by acceleration/deceleration [kg]								
										0.4G	-	-	-	-	-	-	-	-	-	-	
				0.4	0.4	Horizontal	20.0	-	-	-	-	-	-	-	-	-	-	-	-		



- Caution: (1) Even when the acceleration/deceleration is less than the rated acceleration/deceleration, the payload capacity will not exceed the specified payload capacity at the rated acceleration/deceleration.
- (2) In the case of interpolated operation of two or more orthogonal axes, the speed and acceleration/deceleration of the actuator with the lowest specifications in the axis is the maximum speed and acceleration/deceleration of all axes.



ISB, ISPB

Type	Type	Motor capacity [W]	Lead [mm]	Rated acceleration/ deceleration [G]	Maximum acceleration/ deceleration [G]	Horizontal/ Vertical	Payload capacity by acceleration/deceleration [kg]										Rated thrust [N]	
							0.2G	0.3G	0.4G	0.5G	0.6G	0.7G	0.8G	0.9G	1.0G	1.1G		1.2G
Guide with ball retention mechanism (RT) used	SXM	60	4	0.2	0.5	Horizontal	55	50	38	30	-	-	-	-	-	-	212.3	
				0.2	0.4	Vertical	13.5	12.5	11.5	-	-	-	-	-	-	-		
			8	0.4	0.7	Horizontal	27	27	27	20	15	12	-	-	-	-	106.1	
				0.4	0.6	Vertical	6.5	6.5	6.5	5.5	4.5	-	-	-	-	-		
			16	0.4	1.2	Horizontal	13	13	13	10.5	8.5	7	6	5.5	4.5	4	3.5	53.1
				0.4	0.8	Vertical	3.0	3.0	3.0	2.5	2.1	1.8	1.5	-	-	-	-	
	MXM	100	5	0.2	0.5	Horizontal	85	80	60	45	-	-	-	-	-	-	-	339.7
				0.2	0.4	Vertical	19.5	16.5	14.5	-	-	-	-	-	-	-	-	
			10	0.4	0.7	Horizontal	45	45	45	30	23	20	-	-	-	-	-	169.8
				0.4	0.6	Vertical	9.5	9.5	9.5	7.5	6.5	-	-	-	-	-	-	
			20	0.4	1.2	Horizontal	23	23	23	18	15	13	11	9	8	7	6	84.9
				0.4	1	Vertical	4.5	4.5	4.5	4.0	3.5	3.0	2.5	2.3	2.0	-	-	
			30	0.4	1.2	Horizontal	15	15	15	11	9	7	6	5	4	3.5	3	56.6
				0.4	1.2	Vertical	2.0	2.0	2.0	1.7	1.4	1.2	1.0	0.9	0.7	0.6	0.5	
	MXM	200	5	0.2	0.5	Horizontal	110	100	90	80	-	-	-	-	-	-	-	683.6
				0.2	0.4	Vertical	40	34	30	-	-	-	-	-	-	-	-	
			10	0.4	0.7	Horizontal	90	90	90	66	51	40	-	-	-	-	-	341.8
				0.4	0.6	Vertical	20	20	20	17	15	-	-	-	-	-	-	
			20	0.4	1.2	Horizontal	45	45	45	35	28	23	20	17	15	13	12	170.9
				0.4	1	Vertical	10	10	10	8.5	7.5	7	6	5.5	5	-	-	
			30	0.4	1.2	Horizontal	30	30	30	24	20	17	15	13	12	10	9	113.9
				0.4	1.2	Vertical	6	6	6	5.5	5	4.5	4	3.5	3	2.5	2	
	MXMX	200	20	0.4	0.4	Horizontal	45	45	45	-	-	-	-	-	-	-	-	170.9
				-	-	Vertical	-	-	-	-	-	-	-	-	-	-	-	
			30	0.4	0.4	Horizontal	30	30	30	-	-	-	-	-	-	-	-	113.9
				-	-	Vertical	-	-	-	-	-	-	-	-	-	-	-	
	LXM	200	10	0.4	0.7	Horizontal	90	90	90	66	51	40	-	-	-	-	-	341.8
				0.4	0.6	Vertical	19	19	19	15	13	-	-	-	-	-	-	
			20	0.4	1.2	Horizontal	45	45	45	35	28	23	20	17	15	13	12	170.9
				0.4	1	Vertical	9	9	9	7.5	6.5	6	5	4.5	4	-	-	
			40	0.4	1.2	Horizontal	15	15	15	12	10.5	9	8	7.5	7	6.5	6	85.5
				0.4	1.2	Vertical	3	3	3	2.5	2.1	1.8	1.5	1.2	1.0	0.8	0.6	
	LXM	400	10	0.4	0.7	Horizontal	120	120	120	92	73	60	-	-	-	-	-	678.3
				0.4	0.6	Vertical	40	40	40	34	30	-	-	-	-	-	-	
			20	0.4	1.2	Horizontal	90	90	90	70	57	47	40	35	30	27	24	339.1
				0.4	1	Vertical	20	20	20	17	15	14	12	11	10	-	-	
			40	0.4	1.2	Horizontal	40	40	40	32	27	23	21	19	17	16	15	169.6
				0.4	1.2	Vertical	10	10	10	8.5	7.5	7	6	5.5	5	4.5	4	
	LXMX	200	20	0.4	0.4	Horizontal	45	45	45	-	-	-	-	-	-	-	-	170.9
				-	-	Vertical	-	-	-	-	-	-	-	-	-	-	-	
LXMX	400	20	0.4	0.4	Horizontal	90	90	90	-	-	-	-	-	-	-	-	339.1	
			-	-	Vertical	-	-	-	-	-	-	-	-	-	-	-		
		40	0.4	0.4	Horizontal	40	40	40	-	-	-	-	-	-	-	-	169.6	
			-	-	Vertical	-	-	-	-	-	-	-	-	-	-	-		
LXUWX	200	20	0.4	0.4	Horizontal	45	45	45	-	-	-	-	-	-	-	-	170.1	
			-	-	Vertical	-	-	-	-	-	-	-	-	-	-	-		
LXUWX	400	20	0.4	0.4	Horizontal	90	90	90	-	-	-	-	-	-	-	-	339.1	
			-	-	Vertical	-	-	-	-	-	-	-	-	-	-	-		
		40	0.4	0.4	Horizontal	40	40	40	-	-	-	-	-	-	-	-	169.6	
			-	-	Vertical	-	-	-	-	-	-	-	-	-	-	-		



- Caution: (1) Even when the acceleration/deceleration is less than the rated acceleration/deceleration, the payload capacity will not exceed the specified payload capacity at the rated acceleration/deceleration.
- (2) In the case of interpolated operation of two or more orthogonal axes, the speed and acceleration/deceleration of the actuator with the lowest specifications in the axis is the maximum speed and acceleration/deceleration of all axes.



ISB

Type	Type	Motor capacity [W]	Lead [mm]	Rated acceleration/ deceleration [G]	Maximum acceleration/ deceleration [G]	Horizontal/ Vertical	Payload capacity by acceleration/deceleration [kg]										Rated thrust [N]				
							0.4G	0.5G	0.6G	0.7G	0.8G	0.9G	1.0G	1.1G	1.2G	1.3G		1.4G			
Guide with ball retention mechanism (RT) used	SXM	100	36	0.4	2.0	Horizontal	10.0	9.0	8.2	7.5	6.7	6.0	5.5	5.0	4.5	4.3	4.1	47.2			
				0.4	1.6	Vertical	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5				
										Payload capacity by acceleration/deceleration [kg]											
										1.5G	1.6G	1.7G	1.8G	1.9G	2.0G	-	-		-	-	-
				0.4	2.0	Horizontal	4.0	3.9	3.8	3.7	3.6	3.5	-	-	-	-	-		-	-	
				0.4	1.6	Vertical	1.5	1.5	-	-	-	-	-	-	-	-	-		-	-	
				* When the actuator is installed in horizontal orientation, acceleration / deceleration can be increased to 3.0G at maximum if gain adjustment is conducted in the offboard tuning.。																	
										Payload capacity by acceleration/deceleration [kg]											
										2.1G	2.2G	2.3G	2.4G	2.5G	2.6G	2.7G	2.8G		2.9G	3.0G	-
				-	3.0	Horizontal	3.2	2.9	2.6	2.3	2.0	1.9	1.8	1.7	1.6	1.5	-		-	-	-
	MXM	400	48							Payload capacity by acceleration/deceleration [kg]										141.3	
										0.4G	0.5G	0.6G	0.7G	0.8G	0.9G	1.0G	1.1G	1.2G	1.3G		1.4G
				0.4	2.0	Horizontal	20.0	19.1	18.2	17.3	16.4	15.5	14.6	13.8	13.0	12.6	12.2	-	-		
				0.4	1.6	Vertical	6	6	6	6	6	6	6	6	6	6	6	6	-		
										Payload capacity by acceleration/deceleration [kg]											
										1.5G	1.6G	1.7G	1.8G	1.9G	2.0G	-	-	-	-		-
				0.4	2.0	Horizontal	11.8	11.4	11.0	10.8	10.4	10.0	-	-	-	-	-	-	-		
				0.4	1.6	Vertical	6	6	-	-	-	-	-	-	-	-	-	-	-		
				* When the actuator is installed in horizontal orientation, acceleration / deceleration can be increased to 3.0G at maximum if gain adjustment is conducted in the offboard tuning.。																	
										Payload capacity by acceleration/deceleration [kg]											
										2.1G	2.2G	2.3G	2.4G	2.5G	2.6G	2.7G	2.8G	2.9G	3.0G		-
				-	3.0	Horizontal	9.4	8.8	8.2	7.6	7.0	6.6	6.2	5.8	5.4	5.0	-	-	-		-
	MXMX	400	48							Payload capacity by acceleration/deceleration [kg]										141.3	
										0.4G	-	-	-	-	-	-	-	-	-		-
				0.4	0.4	Horizontal	20.0	-	-	-	-	-	-	-	-	-	-	-	-		



- Caution: (1) Even when the acceleration/deceleration is less than the rated acceleration/deceleration, the payload capacity will not exceed the specified payload capacity at the rated acceleration/deceleration.
- (2) In the case of interpolated operation of two or more orthogonal axes, the speed and acceleration/deceleration of the actuator with the lowest specifications in the axis is the maximum speed and acceleration/deceleration of all axes.



ISB, ISPB

Type	Motor capacity [W]	Lead [mm]	Rated acceleration/ deceleration [G]	Maximum acceleration/ deceleration [G]	Horizontal/ Vertical	Payload capacity by acceleration/deceleration [kg]										Rated thrust [N]	
						0.2G	0.3G	0.4G	0.5G	0.6G	0.7G	0.8G	0.9G	1.0G	1.1G		1.2G
WXM	750	10	0.3	0.6	Horizontal	200	200	150	120	100	-	-	-	-	-	-	1021
			0.3	0.5	Vertical	65	65	60	50	-	-	-	-	-	-		
		25	0.3	1.2	Horizontal	160	160	120	96	80	68	60	54	46	36	30	510
			0.3	1.0	Vertical	(Note 1) 32	(Note 1) 32	(Note 1) 32	(Note 1) 31	29	26	24	22	20	-	-	
		50	0.3	1.2	Horizontal	80	80	60	48	40	34	30	27	23	18	15	255
			0.3	1.0	Vertical	14	14	14	14	14	13	12	11	10	-	-	
(Note 2) WXXM	750	25	0.3	1.2	Horizontal	160	160	120	96	80	68	60	54	46	36	30	510
			0.3	0.6	Vertical	32	32	32	26	21	-	-	-	-	-		
		50	0.3	1.2	Horizontal	80	80	60	48	40	34	30	27	23	18	15	255
			0.3	1.0	Vertical	14	14	14	14	12	10	9	8	7	-	-	

Note 1 Actuator that does not have "V1" after the serial number on the model nameplate will be 29 [kgf].

Note 2 It may make the operation unstable when the velocity is low and the payload is almost none at the same time in the vertical direction.

ISPB

Type	Motor capacity [W]	Lead [mm]	Rated acceleration/ deceleration [G]	Maximum acceleration/ deceleration [G]	Horizontal/ Vertical	Payload capacity by acceleration/deceleration [kg]										Rated thrust [N]
						0.2G	0.3G	0.4G	0.5G	0.6G	0.7G	0.8G	0.9G	1.0G	1.1G	
WXM High payload setting	750	10	0.2	0.6	Horizontal	100 to 400	100 to 265	100 to 200	100 to 160	100to 135	-	-	-	-	-	1021
			0.2	0.5	Vertical	40 to 80 (Note 1)	40 to 80 (Note 1)	40 to 68	40 to 64	-	-	-	-	-	-	

Note 1 Actuator that does not have "V1" after the serial number on the model nameplate will be 70 [kgf].

* High payload setting (option model code HLA) should be used with the payload at 100kg or more in the horizontal oriented installation and 40kg or more in the vertical oriented installation.



Caution: (1) Even when the acceleration/deceleration is less than the rated acceleration/deceleration, the payload capacity will not exceed the specified payload capacity at the rated acceleration/deceleration.
 (2) In the case of interpolated operation of two or more orthogonal axes, the speed and acceleration/deceleration of the actuator with the lowest specifications in the axis is the maximum speed and acceleration/deceleration of all axes.



(2) SSPA

Type	Type	Motor capacity [W]	Lead [mm]	Rated acceleration/ deceleration [G]	Maximum acceleration/ deceleration [G]	Horizontal/ Vertical	Payload capacity by acceleration/deceleration [kg]										Rated thrust [N]		
							0.2G	0.3G	0.4G	0.5G	0.6G	0.7G	0.8G	0.9G	1.0G	1.1G		1.2G	
SXM	-	200	10	0.4	0.7	Horizontal	90	90	90	72	60	50	-	-	-	-	-	341.8	
					0.6	Vertical	12	12	12	10	8	-	-	-	-	-	-		
			20	0.4	1.2	Horizontal	45	45	45	36	30	26	22.5	19.5	17	-	-	-	170.9
					1.2	Vertical	6	6	6	4.8	4	3.4	3	2.7	2.4	-	-	-	
			30	0.4	1.2	Horizontal	30	30	30	24	20	17	15	13	12	11	10	-	113.9
					1.2	Vertical	4	4	4	3.2	2.7	2.3	2	1.7	1.4	1.2	1	-	
MXM	-	400	10	0.4	0.7	Horizontal	120	120	120	96	80	70	-	-	-	-	-	678.3	
					0.6	Vertical	25	25	25	20	16.5	-	-	-	-	-	-		-
			20	0.4	1.2	Horizontal	90	90	90	72	60	51	45	39	34	-	-	-	339.1
					1.2	Vertical	12	12	12	9.6	8	6.9	6	5.3	4.8	-	-	-	
			40	0.4	1.2	Horizontal	45	45	45	36	30	25.5	22.5	19.5	17	15	13.5	-	169.6
					1.2	Vertical	6	6	6	4.8	4	3.4	3	2.7	2.4	2.2	2	-	
LXM	Guide with ball retention mechanism (RT) not used	750	25	0.4	1.2	Horizontal	120	120	120	96	80	69	60	53	48	44	40	510	
						Vertical	25	25	25	20	17	14	13	11	10	9	8		-
			50	0.4	1.2	Horizontal	60	60	60	48	40	34	30	27	24	22	20	255	
						Vertical	12	12	12	10	8	7	6	5	5	4	4		-
	Guide with ball retention mechanism (RT) used	750	25	0.4	1.2	Horizontal	120	120	120	96	80	69	60	53	48	44	40	510	
						Vertical	23	23	23	18	15	12	11	9	8	7	6		-
			50	0.4	1.2	Horizontal	60	60	60	48	40	34	30	27	24	22	20	255	
						Vertical	10	10	10	8	6	5	4	3	3	2	2		-



- Caution: (1) Even when the acceleration/deceleration is less than the rated acceleration/deceleration, the payload capacity will not exceed the specified payload capacity at the rated acceleration/deceleration.
- (2) In the case of interpolated operation of two or more orthogonal axes, the speed and acceleration/deceleration of the actuator with the lowest specifications in the axis is the maximum speed and acceleration/deceleration of all axes.



2.3 Driving System/Position Detector

The actuator is driven by the AC servo control method.

(1) ISB, ISPB

Type	Motor capacity [W]	Lead [mm]	Encoder pulses*1	Ball screw specification			
				Type	Diameter	ISB series	ISPB series
SXM SXL	60	4	Incremental Absolute 16384 Battery-less Absolute 131072	Rolled	φ 12mm	C10	C5 or equivalent
		8					
		16					
ISB-SXM/SXL	100	36		Rolled	φ 12mm	C10	-
MXM MXL	100	5		Rolled	φ 16mm	C10	C5 or equivalent
		10					
		20					
		30					
MXM MXL	200	5		Rolled	φ 16mm	C10	C5 or equivalent
		10					
		20					
		30					
ISB-MXM/MXL	400	48		Rolled	φ 16mm	C10	-
MXMX	200	20		Rolled	φ 16mm	C10	C5 or equivalent
		30					
ISB-MXMX	400	48		Rolled	φ 16mm	C10	-
LXM LXL	200	10		Rolled	φ 20mm	C10	C5 or equivalent
		20					
		40					
LXM LXL	400	10		Rolled	φ 20mm	C10	C5 or equivalent
		20					
		40					
LXMX	200	20		Rolled	φ 20mm	C10	C5 or equivalent
LXMX	400	20		Rolled	φ 20mm	C10	C5 or equivalent
		40					
LXUWX	200	20		Rolled	φ 20mm	C10	C5 or equivalent
LXUWX	400	20		Rolled	φ 20mm	C10	C5 or equivalent
		40					
WXM	750	10		Rolled	φ 20mm	C10	C5 or equivalent
		25					
		50					
WXM	750	25		Rolled	φ 25mm	C10	C5 or equivalent
		50					

*1 Number of pulses input to the controller.

(Note) In Pulse Train Control Mode for SCON-CB Controller, the setting of denominator and numerator for electronic gear ratio is restricted by the upper limit of internal calculation.

For battery-less absolute type, it will be restricted even more as the number of encoder pulse is high. In case it gets restricted, have a countermeasure such as to adjust the movement per unit.

Refer to the [instruction manuals of SCON-CB controller for details]



(2) SSPA

The actuator is driven by the AC servo control method.

Type	Motor capacity [W]	Lead [mm]	Encoder pulses ^{*1}	Ball screw		
				Type	Diameter	
SXM	200	10	16384	Rolled	ϕ 16 mm	C5 or equivalent
		20				
		30				
MXM	400	10		Rolled	ϕ 20 mm	C5 or equivalent
		20				
		40				
LXM	750	25		Rolled	ϕ 25 mm	C5 or equivalent
		50				

*1 This is a number of pulses entered in the controller.



2.4 Positioning Repeatability

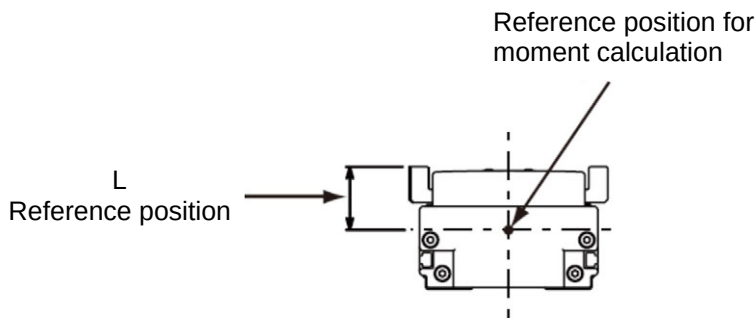
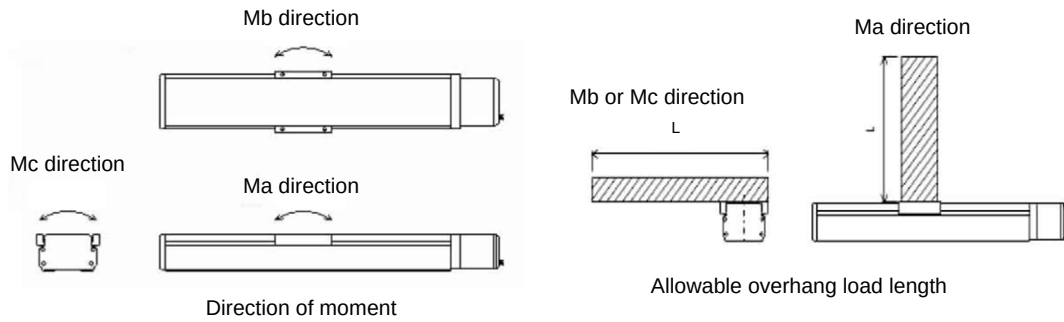
Item	Functions			
	ISB	ISPB (Incremental Absolute) ISPB WXM, WXM (Battery-less Absolute)	ISPB (Battery-less Absolute) Except for WXM, WXM	SSPA
Positioning repeatability ^{*1}	±0.01 mm	±0.005 mm	±0.003 mm	±0.005 mm
Lost motion ^{*1}	0.05 mm or less	0.02 mm or less	0.02 mm or less	0.02 mm or less

^{*1} Initial value

2.5 Allowable Moment of the Actuator

(1) ISB, ISPB

Type	Static allowable moment [N·m]			Dynamic allowable moment [N·m]			Allowable overhang load length L [mm]
	Ma	Ma	Mb	Mc	Mb	Mc	
SXM	143.8	205.4	336.0	32.9	47.0	76.8	Ma direction: 450 Mb or Mc direction: 450
SXL	216.0	308.5	415.1	46.3	66.2	89.0	Ma direction: 550 Mb or Mc direction: 550
MXM	341.5	487.0	796.5	81.0	116.0	189.0	Ma direction: 600 Mb or Mc direction: 600
MXL	560.3	800.2	1030.8	123.0	176.0	227.0	Ma direction: 750 Mb or Mc direction: 750
MXMX	341.5	487.0	796.5	81.0	116.0	189.0	Ma direction: 600 Mb or Mc direction: 600
LXM	560.2	800.1	1325.3	123.0	176.0	291.0	Ma direction: 750 Mb or Mc direction: 750
LXL	774.6	1106.4	1566.3	162.0	231.0	327.0	Ma direction: 900 Mb or Mc direction: 900
LXMX	560.2	800.1	1325.3	123.0	176.0	291.0	Ma direction: 750 Mb or Mc direction: 750
LXUWX	746.7	1066.4	1086.7	299.0	427.0	292.0	Ma direction: 1250 Mb or Mc direction: 1250
WXM	774	1106	2175	162	231	455	Ma direction: 900 Mb or Mc direction: 900
WXM	774	1106	2175	162	231	455	Ma direction: 900 Mb or Mc direction: 900



Type	Reference position L [mm]
SXM	30
SXL	30
MXM	37.5
MXL	37.5
MXMX	37.5
LXM	44.5
LXL	44.5
LXMX	44.5
LXUWX	44.5
WXM	63.5
WXMx	63.5

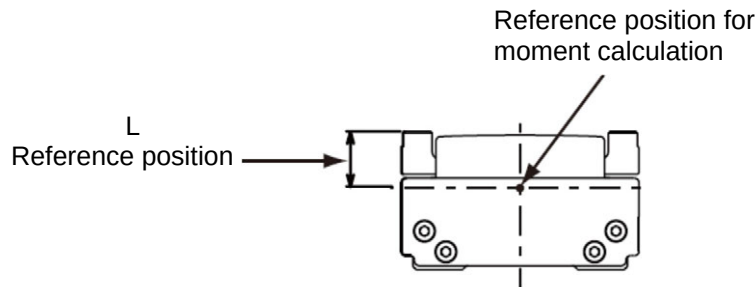
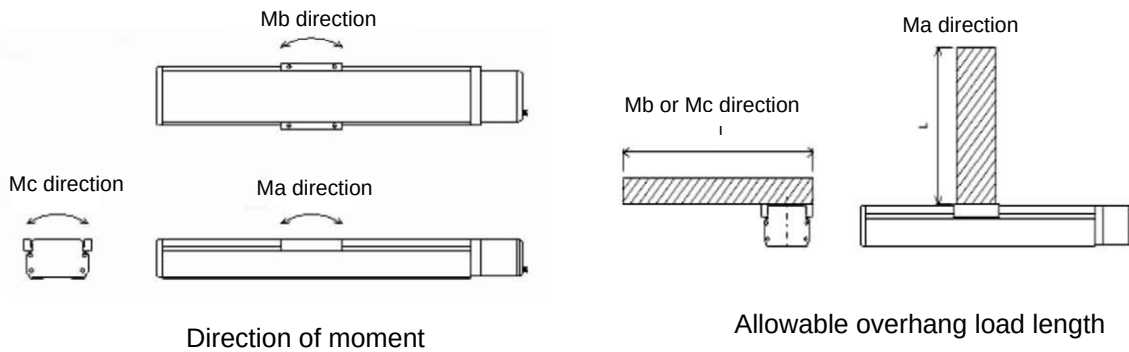


Caution: Make sure the load installed on the actuator is not longer than the allowable overhang load length (L). If the load is longer than L, vibration may occur or the settling time may increase depending on the position of center of gravity position or weight of the work part. If a moment exceeding the allowable moment is applied, not only the life of the guide will become shorter but vibration or longer settling time may also result.



(2) SSPA

Type	Static allowable moment [N·m]			Dynamic allowable moment [N·m]			Allowable overhang load length L [mm]
	Ma	Mb	Mc	Ma	Mb	Mc	
SXM	190	190	530	43.4	43.4	116	Ma direction: 450 Mb or Mc direction: 450
MXM	470	470	1210	107	107	276	Ma direction: 600 Mb or Mc direction: 600
LXM	750	750	1850	162	162	391	Ma direction: 750 Mb or Mc direction: 750



Type	Reference position L [mm]
SXM	45.0
MXM	48.5
LXM	50.5



Caution: Make sure the load installed on the actuator is not longer than the allowable overhang load length (L). If the load is longer than L, vibration may occur or the settling time may increase depending on the position of center of gravity position or weight of the work part. If a moment exceeding the allowable moment is applied, not only the life of the guide will become shorter but vibration or longer settling time may also result.



2.6 Brake Holding Force

The brake in the brake-equipped type (Option Model Code: B) is a non-excitation electromagnetic brake. The brake holding force is described only for the actuators in the brake-equipped type which are capable of vertical mount.

(1) ISB, ISPB

Type	Motor capacity [W]	Lead [mm]	Brake holding force [kgf]
SXM SXL	60	4	14
		8	7
		16	3.5
ISB-SXM/SXL	100	36	2
MXM MXL	100	5	20
		10	10
		20	5
		30	2.5
MXM MXL	200	5	40
		10	20
		20	10
		30	6
ISB-MXM/MXL	400	48	6
MXMX	200	20	—
		30	—
ISB-MXMX	400	48	—
LXM LXL	200	10	20
		20	10
		40	4
LXM LXL	400	10	40
		20	20
		40	10
LXMX	200	20	—
LXMX	400	20	—
		40	—
LXUWX	200	20	—
LXUWX	400	20	—
		40	—
WXM	750	10	80 ^{*1}
		25	32 ^{*1}
		50	14
WXM	750	25	32
		50	14

*1 Actuator that does not have "V1" after the serial number on the model nameplate will be 70 [kgf].

*2 Actuator that does not have "V1" after the serial number on the model nameplate will be 29 [kgf].



(2) SSPA

Type	Motor capacity [W]	Lead [mm]	Brake holding force [kgf]
SXM	200	10	12
		20	8
		30	4
MXM	400	10	25
		20	12
		40	6
LXM	750	25	25
		50	12



3. Double Slider (Option) Type

Application: IS(P)B-SXM, SXL, MXM, MXL, LXM, LXL, WXM, WXXMX

[Table for Double Slider Specifications]

Type	Standard Rated Life* ¹ [km]	Slider Actual Span [mm]	Dynamic allowable moment			Static Allowable Moment			Overhang Load Length* ² [mm]	Slider Weight [kg]	Slider Length [mm]	Min. Effective Stroke for Double Slider [mm]
			Ma Direction [N·m]	Mb Direction [N·m]	Mc Direction [N·m]	Ma Direction [N·m]	Mb Direction [N·m]	Mc Direction [N·m]				
SXM	10000	Min 30	140	200	125	752	1070	671	1050	1.5	90	100
		Max 90	228	325	125	752	1070	671	1350			
SXL	10000	Min 30	188	269	145	983	1400	756	1250		110	130
		Max 90	286	409	145	983	1400	756	1550			
MXM	10000	Min 35	332	475	307	1720	2460	1590	1375	2.5	120	100
		Max 120	561	801	307	1720	2460	1590	1800			
MXL	10000	Min 35	481	687	368	2450	3500	1880	1675		150	120
		Max 120	743	1060	368	2450	3500	1880	2100			
LXM	10000	Min 35	481	687	473	2690	3840	2650	1675	3.5	150	100
		Max 150	845	1210	473	2690	3840	2650	2250			
LXL	10000	Min 35	616	880	532	3300	4720	2850	1975		180	105
		Max 150	1010	1450	532	3300	4720	2850	2550			
WXM WXXMX	10000	Min 35	616	880	739	3620	5170	4340	1975	3	180	100
		Max 180	1130	1610	739	3620	5170	4340	2700			

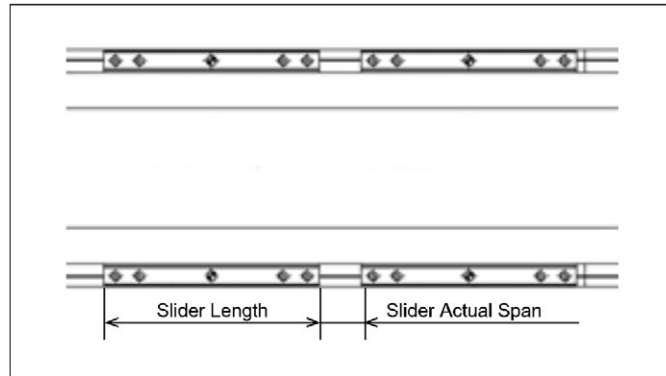
*1 It is the value with 90% reliability.

*2 It is when the center of gravity of an attached object is 1/2 of the overhang length.

Even if the overhanging load length and the load moment are in the allowable ranges, there may be a case that abnormal vibration or noise may occur during operation due to the way of attaching the main body or a transporting object or the stiffness of a beam for overhang installation. In such a case, attempt to ease the operational condition.



[Figure of Double slider]



- When the double slider (option) is selected, the length that the slider length + slider actual span is subtracted from the stroke of a model code should be the stroke actually available for operation. Therefore, the stroke to be arranged should be the stroke that the following strength is added to the necessary stroke; Also, the "necessary stroke" should be set at the minimum effective stroke of the double slider type or higher.

Stroke Length to be Arranged (Nominal Stroke)
Length of "Necessary Stroke" + "Slider Actual Span" + "Slider Length" or More

- Note that the maximum velocity cannot be set up for each stroke.
For S, M and L sizes of the double-slider type, make operation with the payload that the weight of the free slider is subtracted from the payload described in the table shown in [2.2 Acceleration/Deceleration, Payload Capacity and Rated Thrust].
Refer to the following pages for the maximum velocity, acceleration/deceleration and payload for ISB-WXM and WXM actuators.

**[Maximum Speed]**

The maximum speed of the ISB-WXM, WXMx actuator is limited to prevent resonance of the ball screw shaft by the motor speed limit.

Be sure to observe the applicable maximum speed shown in the table below.

Type	Motor capacity [W]	Lead [mm]	Max. Speed [mm/s] for Each Nominal Stroke [mm]										
			350 to 800mm (Every 50mm)	850 mm	900 mm	950 mm	1000 mm	1050 mm	1100 mm	1150 mm	1200 mm	1250 mm	1300 mm
WXM	750	10	600	460		380		320		270		235	
		25	1250			1130		920		785		680	
		50	2500			2260		1840		1570		1360	

Type	Motor capacity [W]	Lead [mm]	Max. Speed [mm/s] for Each Nominal Stroke [mm]
			900 to 3000mm (Every 50mm)
WXMx	750	25	1250
		50	2500



- Caution: (1) Do not set speeds equal to or greater than the respective ratings. Doing so may result in vibration, failure or shorter life.
- (2) In the case of interpolated operation of two or more orthogonal axes, the speed and acceleration/deceleration of the actuator with the lowest specifications in the axis is the maximum speed and acceleration/deceleration of all axes.



[Acceleration/Deceleration, Payload Capacity and Rated Thrust]

If the payload capacity is smaller than as specified, the acceleration/deceleration can be raised beyond the applicable level.

ISB, ISPB

Type	Motor capacity [W]	Lead [mm]	Rated acceleration/ deceleration [G]	Maximum acceleration/ deceleration [G]	Horizontal/ Vertical	Payload capacity [kg] by acceleration/deceleration										Rated thrust [N]	
						0.2G	0.3G	0.4G	0.5G	0.6G	0.7G	0.8G	0.9G	1.0G	1.1G		1.2G
WXM	750	10	0.3	0.6	Horizontal	190	190	140	110	90	—	—	—	—	—	—	1021
			0.3	0.5	Vertical	56	56	50	40	—	—	—	—	—	—		
		25	0.3	1.2	Horizontal	150	150	110	86	70	58	50	44	36	26	20	510
			0.3	1.0	Vertical	25	25	22	20	19	15	12	9	7	—	—	
		50	0.3	1.2	Horizontal	70	70	50	38	30	24	20	17	14	8	5	255
			0.3	1.0	Vertical	10	10	8	6	4	3	2.5	2	1	—	—	
(Note 1) WXX	750	25	0.3	1.2	Horizontal	150	150	110	86	70	58	50	44	36	26	20	510
			0.3	0.6	Vertical	25	25	22	20	19	-	-	-	-	-		
		50	0.3	1.2	Horizontal	70	70	50	38	30	24	20	17	14	8	5	255
			0.3	0.6	Vertical	10	10	8	6	4	-	-	-	-	-	-	

Note 1 It may make the operation unstable when the velocity is low and the payload is almost none at the same time in the vertical direction.

ISPB

Type	Motor capacity [W]	Lead [mm]	Rated acceleration/ deceleration [G]	Maximum acceleration/ deceleration [G]	Horizontal/ Vertical	Payload capacity [kg] by acceleration/deceleration										Rated thrust [N]
						0.2G	0.3G	0.4G	0.5G	0.6G	0.7G	0.8G	0.9G	1.0G	1.1G	
WXM High payload setting	750	10	0.2	0.6	Horizontal	100 to 390	100 to 255	100 to 190	100 to 150	100 to 125	—	—	—	—	—	1021
			0.2	0.5	Vertical	40 to 70 (Note 1)	40 to 70 (Note 1)	40 to 58	40 to 54	—	—	—	—	—	—	

Note 1 Actuator that does not have "V1" after the serial number on the model nameplate will be 60 [kg].

* High payload setting (option model code HLA) should be used with the payload at 100kg or more in the horizontal oriented installation and 40kg or more in the vertical oriented installation.



Caution: (1) Even when the acceleration/deceleration is less than the rated acceleration/deceleration, the payload capacity will not exceed the specified payload capacity at the rated acceleration/deceleration.

(2) In the case of interpolated operation of two or more orthogonal axes, the speed and acceleration/deceleration of the actuator with the lowest specifications in the axis is the maximum speed and acceleration/deceleration of all axes.



4. Life

The mechanical life of the actuator is represented by that of the guide receiving the greatest moment load. Operation life of the linear guide is to be determined by the total driving distance which can reach without having 90% flaking (peeling on rail surface).

Operation life can be figured out with the calculation method shown below.

4.1 How to Calculate Operation Life

For the operation life of the linear guide, use the dynamic allowable moment stated in 1.2 Specifications, and figure out with the formula below.

$$L = \left(\frac{C_M}{M} \right)^3 \cdot 10000\text{km}$$

L : Operation life (km) C_M : Dynamic allowable moment (N·m)

M : Moment to work (N·m) 10000km : Standard rated life of Single-Axis actuator

In addition, have a calculation for the drop of life with the formula below if there is a concern that the life could drop due to the condition of vibration or way to be attached.

$$L = \left(\frac{C_M}{M} \cdot \frac{f_{ws}}{f_w} \cdot \frac{1}{f_\alpha} \right)^3 \cdot 10000\text{km}$$

L : Operation life (km) C_M : Dynamic allowable moment (N·m)

M : Moment to work (N·m) f_{ws} : Standard operational coefficient

f_w : Load coefficient f_α : Attachment coefficient

10000km : Standard rated life of Single-Axis actuator

Explained below is regarding the standard operational coefficient f_{ws} , load coefficient f_w and attachment coefficient f_α .

Refer to the contents below to set them up.

[Standard operational coefficient f_{ws}]

For Single-Axis actuator described in this manual, $f_{ws} = 1.2$. It is a coefficient defined for each model, some models such as RCS3 high-speed type is 1.35.



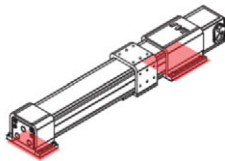
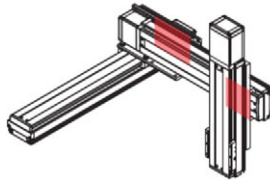
[Load coefficient f_w]

It is a coefficient to consider the life drop due to operational conditions.

Load coefficient f_w	Operation Condition	Reference for acceleration/deceleration
1.0 to 1.5	Small vibration or impact in slow operation	1.0G or less
1.5 to 2.0	Medium level vibration or impact, sudden acceleration and Immediate braking	1.0G to 1.2G

[Attachment coefficient f_α]

Attachment coefficient f_α is a coefficient to consider the life drop due to the condition of actuator attachment.

Attachment coefficient f_α	1.0	1.2	1.5
	Attachment in whole area	Attachment on both ends	Attachment on spots
Attached condition			

* As the figures are those in common for each manual, they are not for IS(P)B, SSPA

Replace to figures for IS(P)B, SSPA and select the attachment coefficient.

* Even when in attachment in whole area, and the actuator is seated in the whole length of the product, select 1.2 or 1.5 for the attachment coefficient depending on the position of screw fixing.

* For attachment in whole area, use all of the threaded holes (counterbored holes) on the seat surface to fix.

4.2 Operation Life

The operation life depends on the moment to work. With light load, it will be longer than 10,000km, the standard rated life. With no consideration of vibration and attachment condition, the operation life is 80,000km according to the calculation with formula in the previous page under assumption that 0.5 C_M (half of dynamic allowable moment) of moment is applied on. It shows that it can be 8 times longer than the standard rated life, which is 10,000km.



5. Installation and Storage/Preservation Environment

5.1 Installation Environment

The actuator should be installed in a location other than those specified below.

In general, the installation environment should be one in which an operator can work without protective gear. Also provide sufficient work space required for maintenance inspection.

- Where the actuator receives radiant heat from strong heat sources such as heat treatment furnaces
- Where the ambient temperature exceeds the range of 0 to 40°C
- Where the temperature changes rapidly and condensation occurs
- Where the relative humidity exceeds 85% RH
- Where the actuator receives direct sunlight
- Where the actuator is exposed to corrosive or combustible gases
- Where the ambient air contains a large amount of powder dust, salt or iron (at level exceeding what is normally expected in an assembly plant)
- Where the actuator is subject to splashed water, oil (including oil mist or cutting fluid) or chemical solutions
- Where the actuator receives impact or vibration

If the actuator is used in any of the following locations, provide sufficient shielding measures:

- Where noise generates due to static electricity, etc.
- Where the actuator is subject to a strong electric or magnetic field
- Where the actuator is subject to ultraviolet ray or radiation

5.2 Storage/Preservation Environment

The storage/preservation environment should be similar to the installation environment. In addition, make sure condensation will not occur when the actuator is to be stored or preserved for a long period of time. Unless specified, we do not include drying agents when shipping the actuator. If you are storing the actuator in an environment where condensation might occur, you must treat the entire shipping box, or treat the actuator itself after unpacking, to prevent condensation. The unit can withstand temperatures up to 60°C during a short storage/preservation period, but only up to 50°C if the storage/preservation period is longer than one month.

The actuator should be lying flat during storage/preservation.

If the actuator is to be stored in a packed state, follow the specified actuator position if indicated.



INTELLIGENT ACTUATOR

6. Precautions for transportation

6.1 Handling a Single Axis

6.1.1 Handling the Packed Unit

Unless otherwise instructed, each actuator axis is packed individually and shipped.

- Do not bump or drop the package. The package is not specially designed to withstand the impact of dropping or bumping.
- The operator should not carry heavy shipping boxes by himself. Transport the package using an appropriate transport means.
- If the shipping box is to be left standing or transported, it should be in a horizontal position. If the packing specification is instructed, follow the instruction.
- Do not climb on top of the shipping box.
- Do not place heavy objects, or objects having a section where loads concentrate, on top of the shipping box.

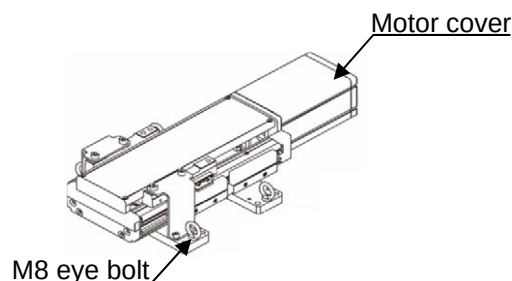
6.1.2 Handling an Actuator after Unpacking

(1) ISB, ISPB

- Do not transport the actuator by holding the cables or move it by pulling the cables.
- When transporting the actuator, do so by holding the base.
- Be careful not to bump the actuator during transport.
- Do not exert an excessive force on any part of the actuator.
- In the case of the high-precision straightness specification type, be careful not to make a damage and the traces of hitting at the base bottom.
There is a possibility that the running accuracy changes.

(2) SSPA

- Four eye bolts are installed, so use these eye bolts to transport the actuator. The SSPA, when unpacked, looks like the condition shown in the figure below.



- Do not hold the motor cover when transporting the SSPA. Doing so may damage the cover due to the weight of the actuator or the main unit may fall.
- Do not transport the actuator by holding the cable, or move it by pulling the cable.
- Be careful not to bump the actuator against anything when transporting it.
- Do not apply excessive force on any of the actuator parts.
- In the case of the high-precision straightness specification type, be careful not to make a damage and the traces of hitting at the base bottom.
There is a possibility that the running accuracy changes.

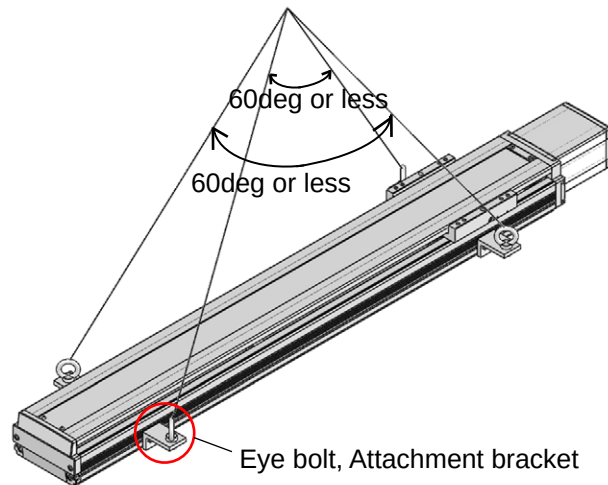


6.1.3 Transportation Using Hanging Bracket(Optional model : EB)

Subject Models : IS(P)B-LXM/LXL/LXMX/LXUWX/WXM/WXMX

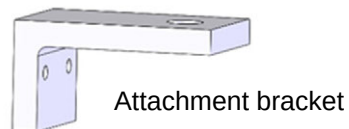
When handling an actuator after taking it out of the package, attach the hanging brackets on the body and lift it up on a crane using four points of brackets with four ropes. Follow the caution note below to carry the actuator. Take off the hanging brackets after transportation is complete.

- Pay attention to the actuator balance during transportation, and carry it calmly without apply vibration or impact.
- In case the carried actuator has dropped, becoming crushed under it could cause serious injury. Do not attempt to go under the hanged load.
- Use a hoist and ropes capable enough with margin to carry the actuator weight.
* Hoist : A small device used for lifting or lowering a load or transporting a load by means of a lift-wheel
- Keep the hanging angle at 60deg or less when lifting.
- Make sure that an operator who has appropriate certificates operate the transportation when equipment or method that requires specific qualifications is necessary.
- Affix cables so they would not get pinched.



[Enclosure]

Components	Quantity
Attachment bracket	4
Eye bolt M10	4
Hex Nut M10	4
Hex Socket Head Cap Screw M4×10	8



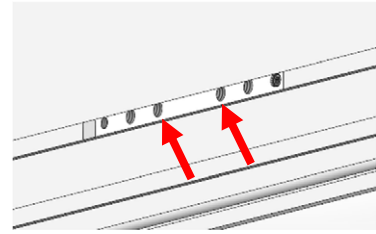
Attachment bracket



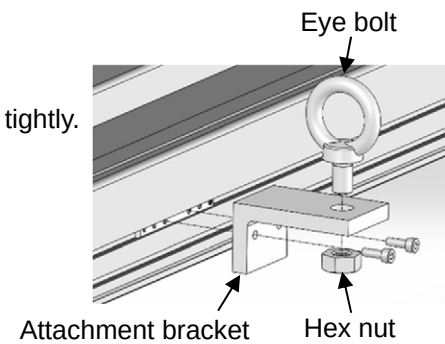
[How to Attach Hanging Bracket]

Attach the hanging brackets at four places following the procedures below.

- [1] Affix the attachment bracket with screws on the plate nut fixed at the T-slot.
Use the two tapped holes inside on the plate nut.
Screw to be Used : Hex Socket Head Cap Screw M4×10...2 pieces
Recommended Tightening Torque : 3.6N·m



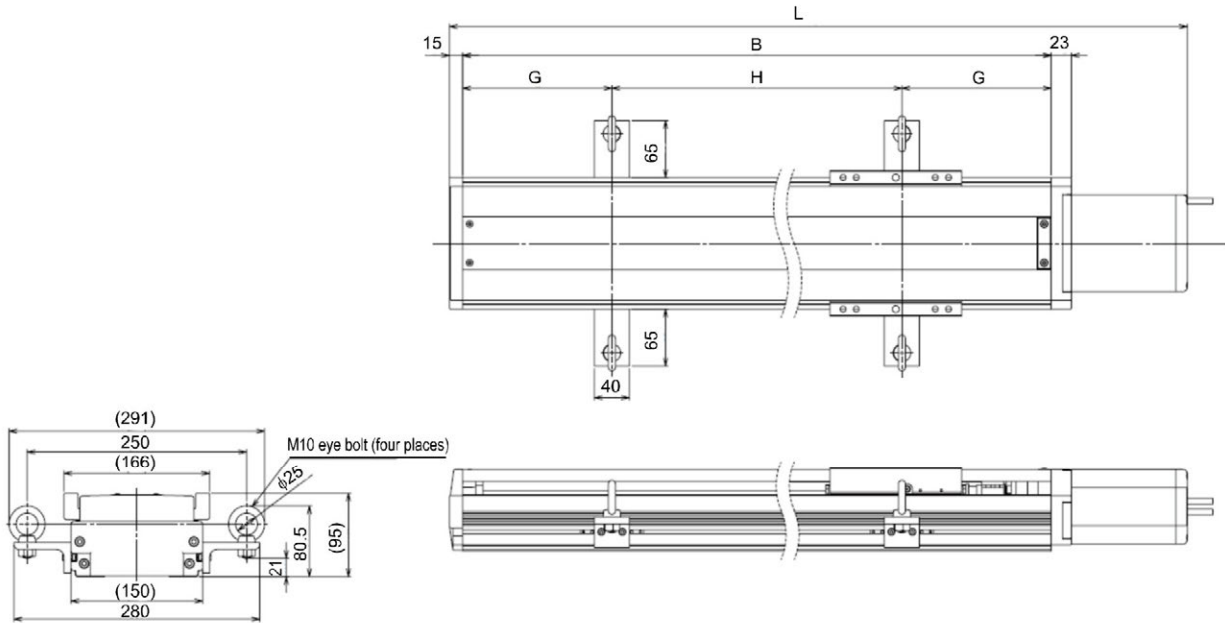
- [2] Affix the eye bolt using the hex nut on the attachment bracket.
Tighten up the eye bolt so the seat surface of it sits on the bracket tightly.
Adjust the orientation of the eye bolt as required.





[Dimensions with Hanging Brackets Attached]

■IS(P)B-LXM/LXL/LXMX/LXUWX



◆IS(P)B-LXM/LXL

ST : Stroke

ST	LXM	100	150	200	250	300	350	400	450	500	550	600	650	700
	LXL	-	120	170	220	270	320	370	420	470	520	570	620	670
G	With No Sensor (Note 1)	36	36	36	50	60	70	80	90	100	110	130	140	150
H	With No Sensor (Note 1)	266	316	366	388	418	448	478	508	538	568	578	608	638

ST	LXM	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300
	LXL	720	770	820	870	920	970	1020	1070	1120	1170	1220	1270
G	With No Sensor (Note 1)	160	170	180	190	200	210	220	240	250	260	270	280
H	With No Sensor (Note 1)	668	698	728	758	788	818	848	858	888	918	948	978

Note 1 The hanging bracket option is not available for the models equipped with the creep sensor or the home limit sensor.



◆IS(P)B-LXMX/LXUWX

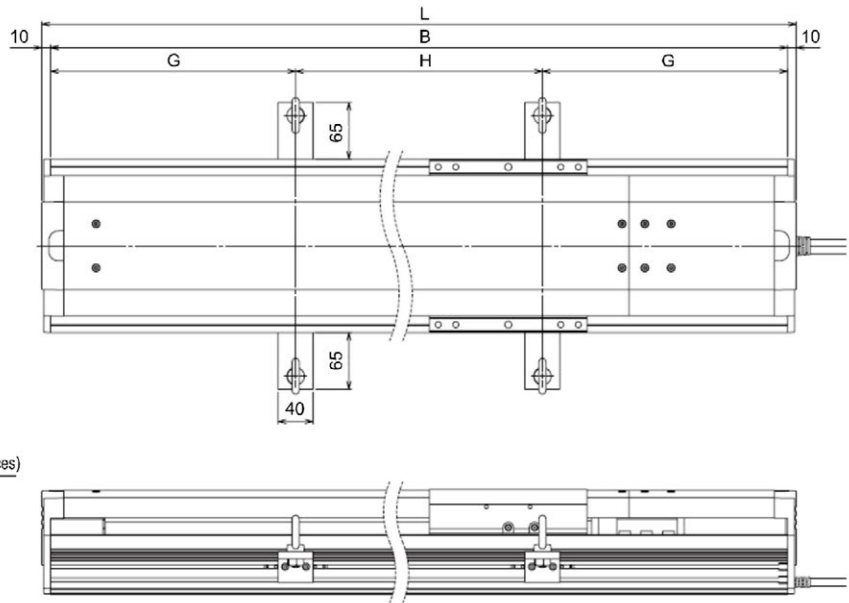
ST : Stroke

ST			1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750
G	With No Sensor		210	220	240	250	260	270	280	310	330	340	350	360	370	380	390	400
	With Sensor		36															
H	LXMX	With No Sensor	930	960	970	1000	1030	1060	1090	1080	1090	1120	1150	1180	1210	1240	1270	1300
		With Sensor	1278	1328	1378	1428	1478	1528	1578	1628	1678	1728	1778	1828	1878	1928	1978	2028
	LXUWX	With No Sensor	1030	1060	1070	1100	1130	1160	1190	1180	1190	1220	1250	1280	1310	1340	1370	1400
		With Sensor	1378	1428	1478	1528	1578	1628	1678	1728	1778	1828	1878	1928	1978	2028	2078	2128

ST			1800	1850	1900	1950	2000	2050	2100	2150	2200	2250	2300	2350	2400	2450	2500
G	With No Sensor		410	430	440	450	460	470	480	490	500	510	520	540	550	560	570
	With Sensor		36														
H	LXMX	With No Sensor	1330	1340	1370	1400	1430	1460	1490	1520	1550	1580	1610	1620	1650	1680	1710
		With Sensor	2078	2128	2178	2228	2278	2328	2378	2428	2478	2528	2578	2628	2678	2728	2778
	LXUWX	With No Sensor	1430	1440	1470	1500	1530	1560	1590	1620	1650	1680	1710	1720	1750	1780	1810
		With Sensor	2178	2228	2278	2328	2378	2428	2478	2528	2578	2628	2678	2728	2778	2828	2878



■IS(P)B-WXM/WXMX



◆IS(P)B-WXM

Stroke	100	150	200	250	300	350	400	450	500	550	600	650	700
G	90	120	130	140	150	160	170	190	200	210	220	230	240
H	360	350	380	410	440	470	500	510	540	570	600	630	660

Stroke	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300
G	250	260	270	280	300	310	320	330	340	350	360	370
H	690	720	750	780	790	820	850	880	910	940	970	1000

◆IS(P)B-WXMX

Stroke	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600
G	280	300	310	320	330	340	350	360	370	390	410	420	430	440	450
H	830	840	870	900	930	960	990	1020	1050	1060	1070	1100	1130	1160	1190

Stroke	1650	1700	1750	1800	1850	1900	1950	2000	2050	2100	2150	2200	2250	2300
G	460	470	480	490	500	520	530	540	550	560	570	580	590	600
H	1220	1250	1280	1310	1340	1350	1380	1410	1440	1470	1500	1530	1560	1590

Stroke	2350	2400	2450	2500	2550	2600	2650	2700	2750	2800	2850	2900	2950	3000
G	620	630	640	650	660	670	680	690	700	710	730	740	750	760
H	1600	1630	1660	1690	1720	1750	1780	1810	1840	1870	1880	1910	1940	1970



6.2 Handling an Cartesian Robot (ICS)

Take note of the following points when transporting a set of axes that have been combined.

6.2.1 Handling a Package

Before shipment, combined axes are packed in an outer frame nailed to the base made of square lumbers. Each slider is secured to prevent accidental movement during transport. Each actuator end is also secured to prevent oscillating due to external vibration.

- Do not bump or drop the package. The package is not designed to withstand the impact of dropping or bumping.
- An operator must not attempt to carry a heavy package alone. Transport the package using an appropriate transport means.
- When hoisting the package using ropes, etc., support the square lumber base at the reinforcements at the bottom. Similarly when lifting the package with a forklift, insert the forks at the bottom of the square lumber base.
- When setting down the package, be careful not to let the package receive shock or bounce.
- Do not step onto the package.
- Do not put any article on the package which may deform or damage the package.

6.2.2 Handling an Actuator after Unpacking

- Secure the sliders to prevent sudden movement during transport.
- If any end of the actuator is overhanging, secure it properly to avoid significant movement due to external vibration.
- If the actuator assembly is transported without the ends being secured, do not apply an impact of 0.3 G or more.
- When hoisting the actuator using ropes, etc., use appropriate cushioning materials to protect the actuator against strain or distortion. Also keep a stable, horizontal posture. If necessary, use the threaded mounting holes provided on the bottom face of the base to install hoisting jigs.
- Be careful not to apply a load on any of the actuator brackets or covers or on the connector box. Also, do not allow the cable to be pinched or deformed excessively.



6.3 Handling an Actuator Assembled to a Mechanical System

When transporting an actuator that has been assembled to a mechanical system, as the whole system, take note of the following points:

- Secure the sliders to prevent sudden movement during transport.
- If any end of the actuator is overhanging, secure it properly to avoid significant movement due to external vibration.
- If the actuator assembly is transported without the ends being secured, do not apply an impact of 0.3 G or more.
- When hoisting the mechanical system using ropes, etc., prevent the actuator, connector box, etc., from receiving a load. Also make sure the cables are not pinched or deformed unnaturally.

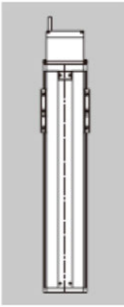
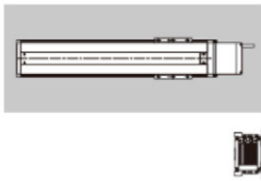
7. Installation

7.1 Installation Orientations

Actuators are subject to certain limitations regarding their installation orientations.

If an actuator is installed in an orientation not allowed for that actuator, it may lead to any problem to occur.

Installation orientations

Horizontal	Vertical	Sideway	Ceiling mount
			

○: Installable △: Unavailable to mount less than 1300mm for stroke x: Not Installable

Type	Horizontal installation	Vertical installation ^(Note 1)	Sideway installation ^(Note 2)	Ceiling mount installation ^(Note 3)
ISB, ISPB SXM/SXL/MXM/ MXL/LXM/LXL/ WXM	○	○	○	○
ISB, ISPB MXMX/LXMX/ LXUWX	○	X	X	△
ISB, ISPB WXM	○ (Note 5)	○ (Note 4, 5)	X	X
SSPA	○	○	○	○

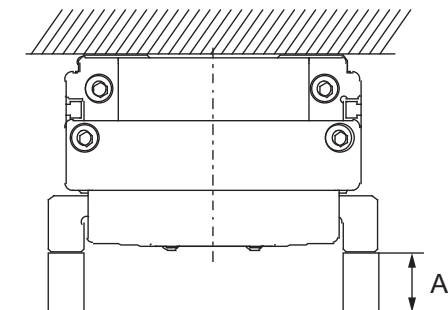
* Make sure to check the caution note in the following page.



! Caution:

1. When installing the actuator vertically, make sure the motor comes to the top.
When the actuator is installed with the motor at the bottom, there shouldn't be any problems during normal operations. If the actuator is not operated for an extended period of time, however, depending on the ambient environment (especially at high temperature) grease may separate and base oil may flow into the motor unit, causing problems on rare occasions.
In the case of Sideway installation, base oil may flow out from the aperture on the side of the actuator, causing problems on rare occasions.
2. If the actuator is installed in horizontally oriented wall mount, it is easy for a foreign object to get inside the actuator from the opening on the side of the actuator.
3. In the Ceiling mount installation, the screw cover may bend, and it will be likely to interfere with the work part. ISB, when it exceeds the stroke 600mm, SSPA, when it exceeds the stroke 800mm, separate the work etc from slider seating surface and install.
4. In WXXMX, it may make the operation unstable when the velocity is low and the payload is almost none at the same time in the vertical direction.
5. WXXMX should require different parameters between when mounted vertically and when mounted horizontally oriented on the wall.
When the brake-equipped option is selected, the delivery should be made with the parameters for vertical mount while it made with the parameters for horizontal orientation on the wall when this option is not selected. It will require the parameters to be changed when brake-equipped WXXMX is to be used in horizontal orientation on the ceiling. Consult with IAI in such a case.

Model	Stroke	Distance
ISB ISPB	600mm or more less than 1000mm	5mm or more
	1000mm or more less than 1300mm	10mm or more
SSPA	800mm or more less than 1500mm	5mm or more

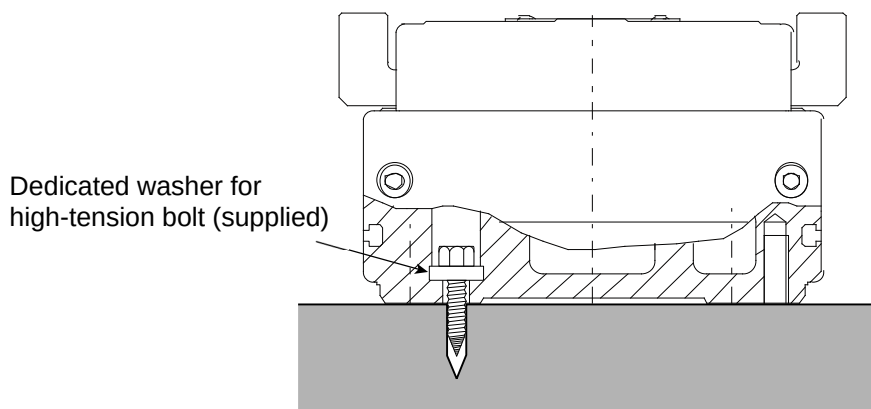


Work seating surface

7.2 Installing the Actuator

7.2.1 Installation Method

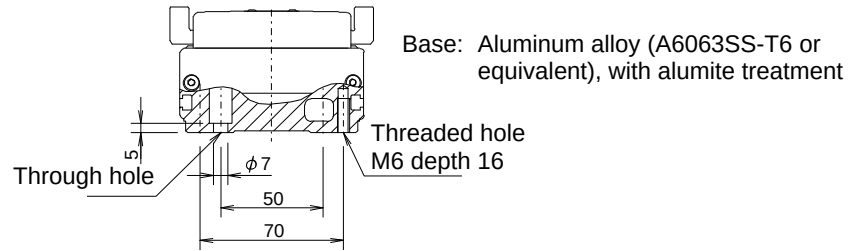
- Use the threaded holes on the back of the base to install the actuator. However, there are no threaded holes on the intermediate support unequipped type (WXM) and the intermediate type (MXMX/LXMX/LXUWX/WXMX). Actuators have through holes, in addition to the aforementioned threaded holes, so that the actuator can be installed using hexagonal socket-head bolts that are guided through from the actuator side. If the throw holes are used, remove the screw cover and install them from the top surface.
 - The way to install the intermediate support type (MXMX/LXMX/LXUWX/WXMX) should be the same as that to install the intermediate support unequipped type, however it is necessary to pay attention not to take out or pull the intermediate support wire rope for the intermediate support type (MXMX/LXMX/LXUWX).
 - When positioning pins are used, use pins with an engagement tolerance of h7 or equivalent.
 - Positioning can be performed by pushing the reference surface on the side of the base. [Refer to 7.2.2, "Precision of the Installation Surface."]
 - Use high-tension bolts conforming to ISO 10.9 or higher.
 - When the threaded holes are used, determine the required thread length as specified below:
 - ISB, ISPB
Depth of threaded hole > Thread engagement length > Nominal thread size x 1.8
 - SSPA
Depth of threaded hole > Thread engagement length > Nominal thread size
 - If the through holes are used for installation, provide the following effective engagement length, whichever is applicable, for the female thread:
 - If the female thread is made of steel, same as the nominal diameter
 - If the female thread is made of aluminum, 1.8 times of nominal diameter
 - If the bolt seating surface is aluminum, or the through holes are used, also use high-tension bolts with dedicated washers. Failure to do so may cause the seating surface to buckle.
- * Use the enclosed washers dedicated for a high strength bolt for M, L and W sizes in ISB and ISPB.





● ISB, ISPB: Small type SXM/SXL

The installation method is shown by a section view.



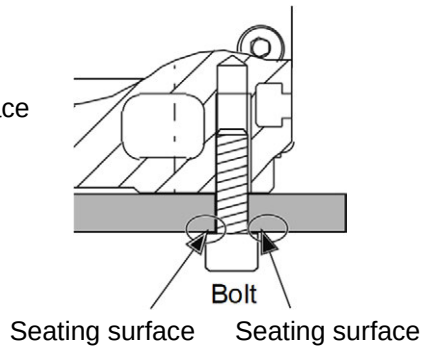
[Through hole]

Installation bolt	Tightening torque
M6	5.4 N·m

[Threaded hole]

Installation bolt	Tightening torque	
	Bolt seating surface is steel	Bolt seating surface is aluminum
M6	12.3 N·m	5.4 N·m

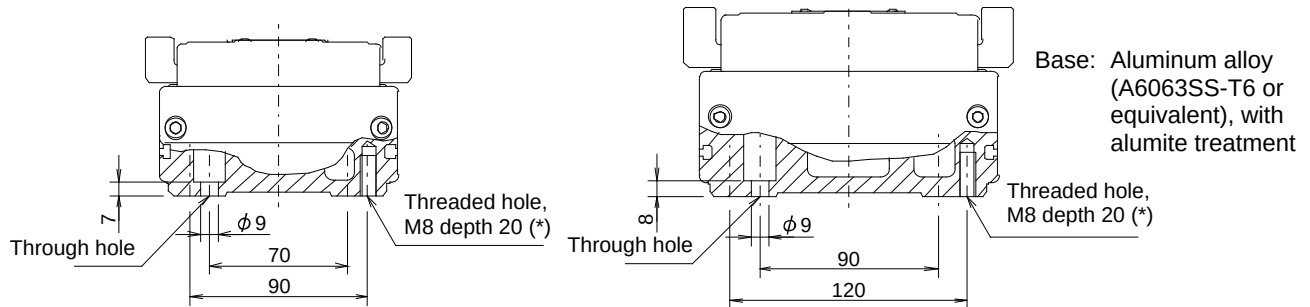
Bolt seating surface



Warning: The threaded holes are not through, so exercise caution when selecting the bolt length. Use of inappropriate bolts may damage the threaded holes or result in insufficient mounting strength of the actuator, leading to a lower precision or unexpected accident.

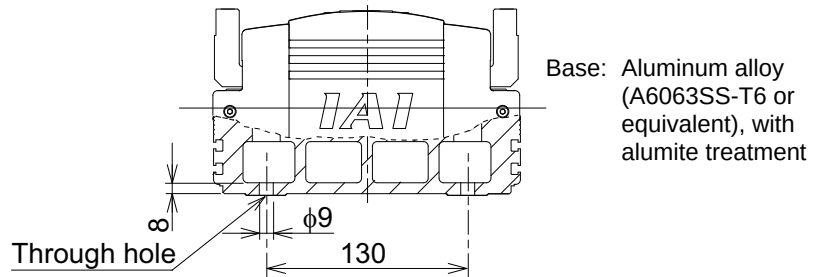


- ISB, ISPB: Medium type MXM/MXL/MXMX, Large type LXM/LXL/LXMX/LXUWX
The installation method is shown by a section view.



(Note) Threaded hole indicated with (*) in the figure above is not provided on the intermediate support type (MXMX/LXMX/LXUWX).

Super-Large Size WXM/WXMX

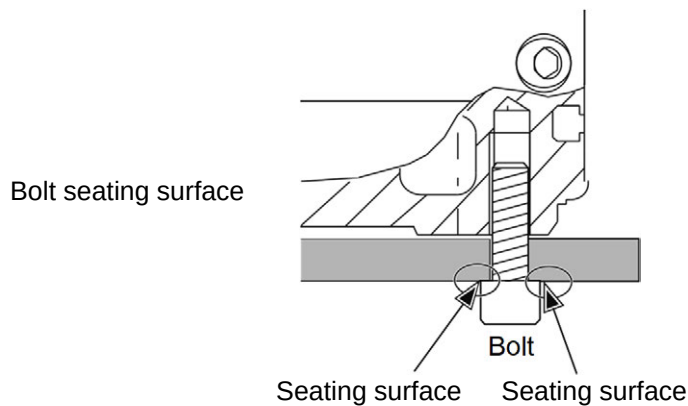


[Through hole]

Installation bolt	Tightening torque
M8	11.5 N·m

[Threaded hole]

Installation bolt	Tightening torque	
	Bolt seating surface is steel	Bolt seating surface is aluminum
M8	30.0 N·m	11.5 N·m



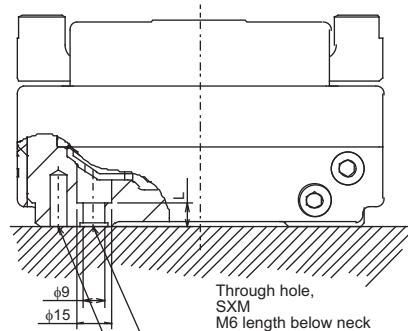
Warning: The threaded holes are not through, so exercise caution when selecting the bolt length. Use of inappropriate bolts may damage the threaded holes or result in insufficient mounting strength of the actuator, leading to a lower precision or unexpected accident.



● SSPA

The installation method is shown by a section view.

Type	L [mm]
SXM	6
MXM	8
LXM	10



Base: Cast iron, coated

Through hole,
SXM
M6 length below neck
* 13.5 mm min. for iron (Female screw depth of 9 mm min.)
16.5 mm min. for aluminum (Female screw depth of 12 mm min.)
MXM
M6 length below neck
* 17.5 mm min. for iron (Female screw depth of 12 mm min.)
21.5 mm min. for aluminum (Female screw depth of 16 mm min.)
LXM
M8 length below neck
* 22 mm min. for iron (Female screw depth of 12 mm min.)
26 mm min. for aluminum (Female screw depth of 16 mm min.)

Threaded hole,
SXM
M6 screw-in length
6 mm min. and less than 9 mm
MXM
M8 screw-in length
8 mm min. and less than 12 mm
LXM
M8 screw-in length
12 mm min. and less than 16 mm

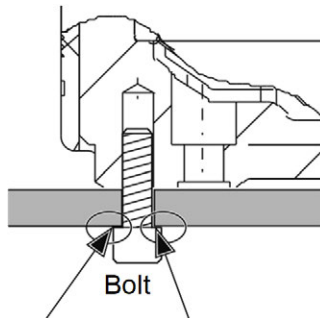
[Through hole]

Installation bolt	Tightening torque
M6	5.4 N·m
M8	11.5 N·m

[Threaded hole]

Installation bolt	Tightening torque	
	Bolt seating surface is steel	Bolt seating surface is aluminum
M6	12.3 N·m	5.4 N·m
M8	30.0 N·m	11.5 N·m

Bolt seating surface



Seating surface Seating surface

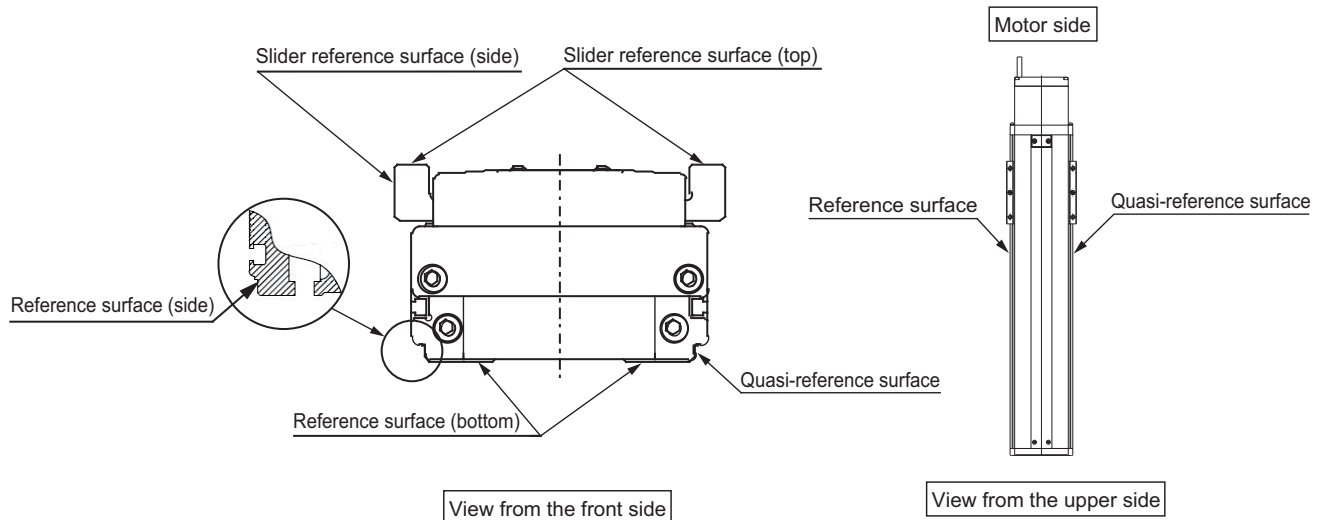


Warning: The threaded holes are not through, so exercise caution when selecting the bolt length. Use of inappropriate bolts may damage the threaded holes or result in insufficient mounting strength of the actuator, leading to a lower precision or unexpected accident.



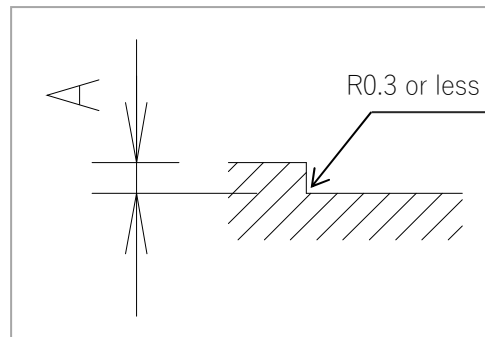
7.2.2 Precision of the Installation Surface

- The frame on which the actuator is installed shall have sufficient structural rigidity to remain free from vibration, etc.
 - The basis of measurement of the running accuracy of the slider is from the lower side and motor side to right side.
If accuracy for its run is required, use these surfaces as a datum of the installation.
In view of the motor side, the parallelism of the quasi-reference surface of left side to the reference surface is 0.1mm or less.
 - The surface where the actuator, excluding the high-precision straightness specification (model number: ST (optional)), will be mounted should be machined or be equally level, and the flatness between the actuator and the frame should be within 0.05 mm/m. If the installation surface is rough, abnormal noise or other problems may occur due to poor contact of the actuator.
 - Install the actuator, excluding the high-precision straightness specification (model number: ST (optional)), after removing any dirt on the base surface on a flat surface with a precision of the flatness of 0.02 mm/m. For the high-precision straightness specification (model number: ST (optional)), refer to [11.9, "High-Precision Straightness Specification."]
 - Provide enough space around the actuator so that maintenance work can be carried out.
- ISB, ISPB: Small type SXM/SXL, Medium type MXM/MXL/MXMX, Large type LXM/LXL/LXMX/LXUWX, Super-Large Size WXM/WXMX





- When mounting using the side datum surface, machine the installation surface according to the figure below.



Size	Reference Surface	Dimension A
S	Slider reference surface (side)	2 to 9
	Base reference surface (side)	3 to 5
M	Slider reference surface (side)	2 to 9
	Base reference surface (side)	3 to 7.5
L	Slider reference surface (side)	2 to 9
	Base reference surface (side)	3 to 8
W	Slider reference surface (side)	2 to 9
	Base reference surface (side)	2 to 5

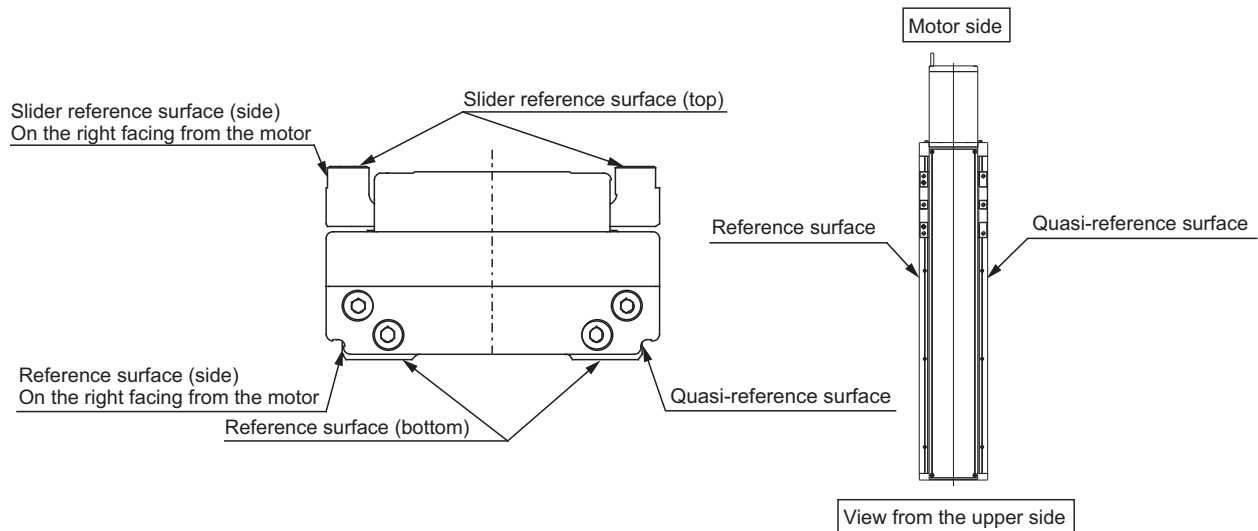


● SSPA

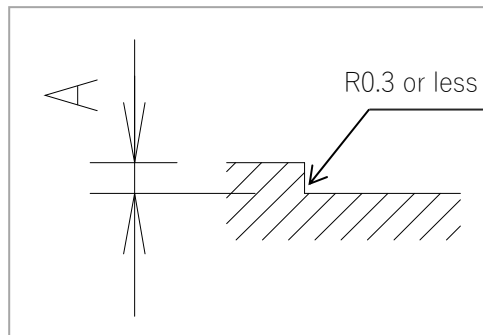
Unless it is the optional rust-proof model (model code: MD), there is no rust-proof treatment (plating or paint coating) conducted on the base datum surface (bottom surface and datum side surface) nor slider datum surface (top surface and datum side surface).

Before installing the actuator and the work part, remove any dirt or oil from the reference surface with a waste cloth soaked with alcohol and grease, wipe it off again with a dry waste cloth, and brush paint it with anti-corrosion oil.

(JIS K 2246 NP-3-1 or equivalent anti-corrosion oil is applied when shipped from IAI.)



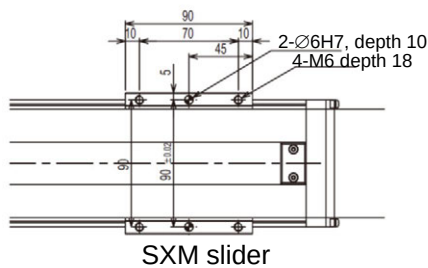
- When mounting using the side datum surface, machine the installation surface according to the figure below.



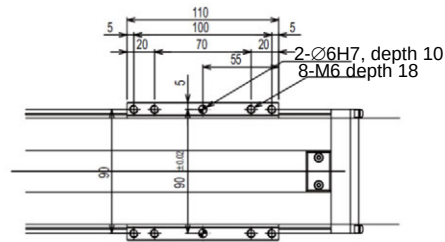
Reference surface	A [mm]
Slider reference surface (side)	2 to 9
Base reference surface (side)	3 to 8

7.3 Installing the Load on the Slider

- The slider has threaded holes, so affix the load using these holes. The affixing method shall conform to the method for installing the actuator.
- Similarly when the slider is affixed and actuator is moved, install the slider using these threaded holes on the slider.
- The slider has two reamed holes. If repeatability is required after removal/re-installation, use positioning pins. If squareness is required, use one positioning pin and make installation adjustment.
- After removal/re-installation, repeatability can also be ensured by pushing the reference surface on the side of the base.
- Use high-tension bolts conforming to ISO 10.9 or higher.
- When the threaded holes are used, determine the required thread length as specified below:
 - ISB, ISPB
Depth of threaded hole > Thread engagement length > Nominal thread size x 1.8
 - SSPA
Depth of threaded hole > Thread engagement length > Nominal thread size
- ISB, ISPB: Small type SXM/SXL



SXM slider



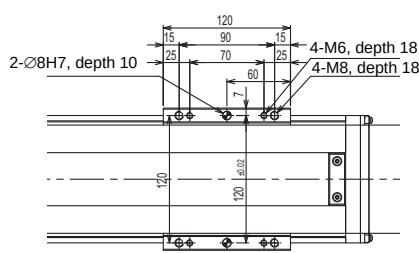
SXL slider

Installation bolt	Tightening torque	
	Bolt seating surface is steel	Bolt seating surface is aluminum
M6	12.3 N·m	5.4 N·m

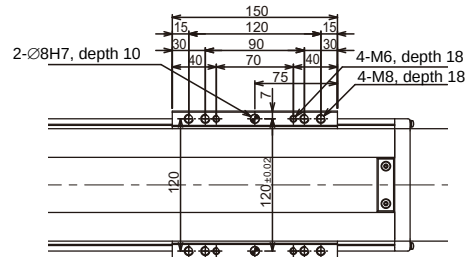
(Note) When using positioning holes, use pins with an engagement tolerance of h7 or equivalent.



● ISB, ISPB: Medium type MXM/MXL/MXMX



MXM/MXMX slider

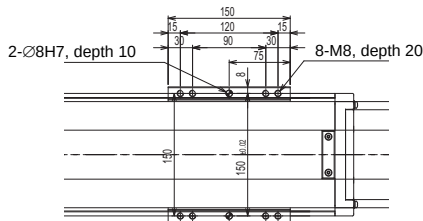


MXL slider

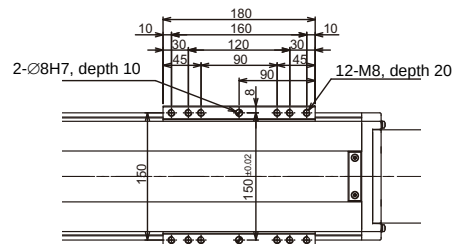
Installation bolt	Tightening torque	
	Bolt seating surface is steel	Bolt seating surface is aluminum
M6	12.3 N·m	5.4 N·m
M8	30.0 N·m	11.5 N·m

(Note) When using positioning holes, use pins with an engagement tolerance of h7 or equivalent.

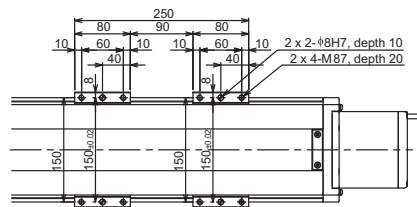
● ISB, ISPB: Large type LXM/LXL/LXMX/LXUWX



LXM/LXMX slider



LXL slider



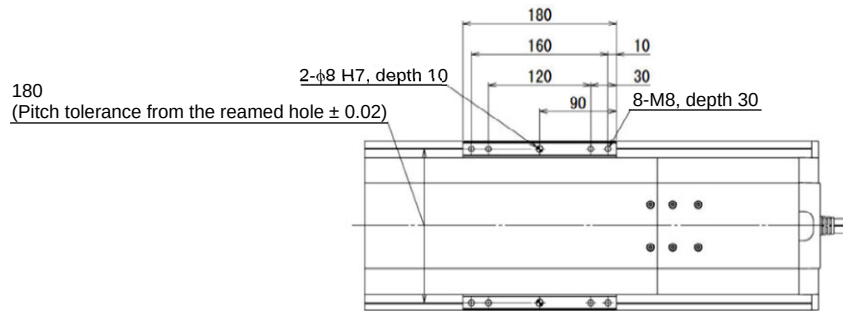
LXUWX slider

Installation bolt	Tightening torque	
	Bolt seating surface is steel	Bolt seating surface is aluminum
M8	30.0 N·m	11.5 N·m

(Note) When using positioning holes, use pins with an engagement tolerance of h7 or equivalent.



● ISB, ISPB: Super-Large Size WXM/WXMX

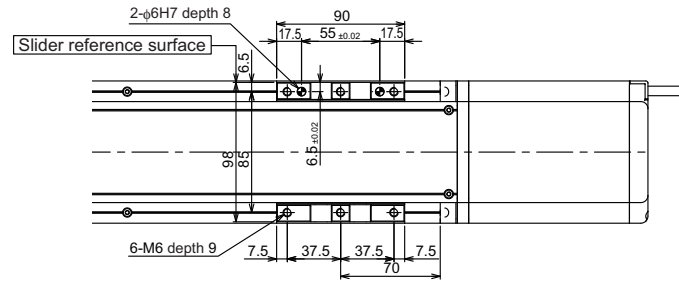


Installation bolt	Tightening torque	
	Bolt seating surface is steel	Bolt seating surface is aluminum
M8	30.0 N·m	11.5 N·m

(Note) When using positioning holes, use pins with an engagement tolerance of h7 or equivalent.

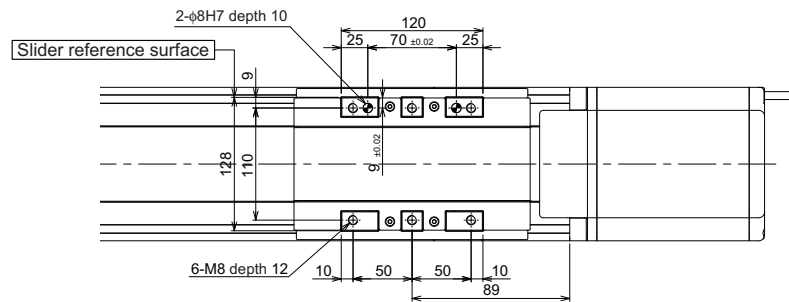


- SSPA: Small type SXM



Installation bolt	Tightening torque	
	Bolt seating surface is steel	Bolt seating surface is aluminum
M6	12.3 N·m	5.4 N·m

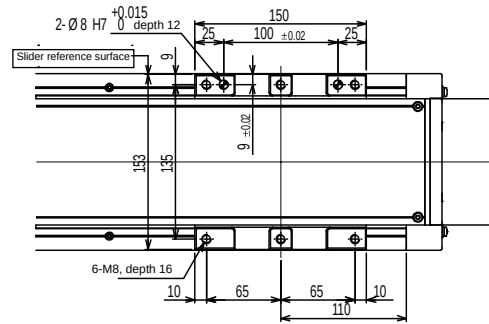
- SSPA: Medium type MXM



Installation bolt	Tightening torque	
	Bolt seating surface is steel	Bolt seating surface is aluminum
M8	30.0 N·m	11.5 N·m

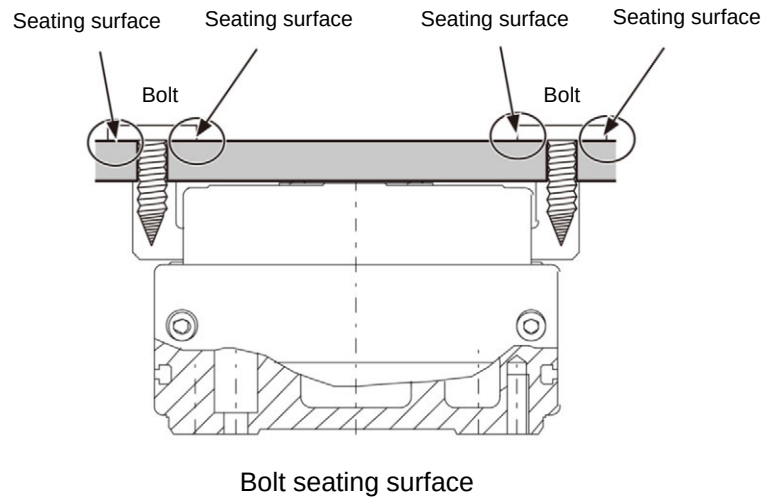


● SSPA: Large type LXM



Installation bolt	Tightening torque	
	Bolt seating surface is steel	Bolt seating surface is aluminum
M8	30.0 N·m	11.5 N·m

(Note) When using two positioning holes, use a pin with a hole of h7 or equivalent and another with a hole of g6.

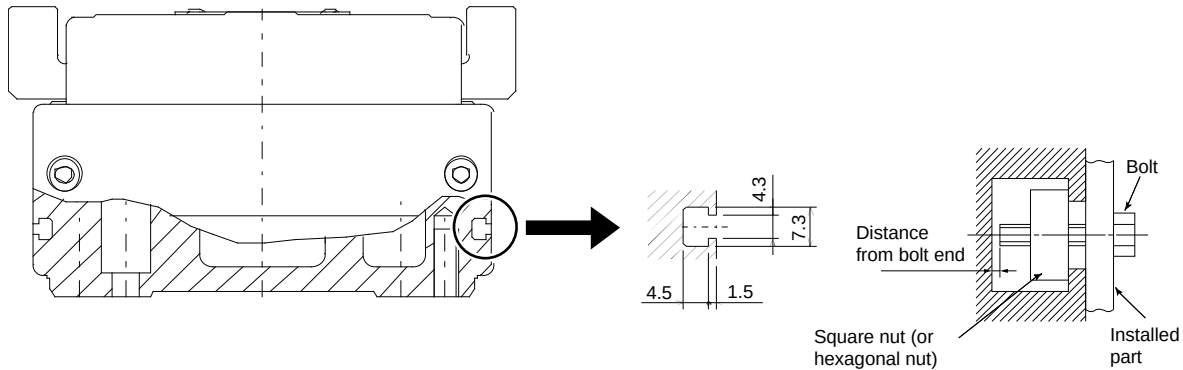




7.4 Using T-slots

M4 T-slots for installing the connector box, etc. are provided on the side face of the base of ISB or ISPB, when configuring the orthogonal axes. (See the figure below.)

You can also use these T-slots for installing sensors, securing wires or for other purposes as necessary.



Caution: Square nuts are recommended for use with T-slots, but general hexagonal nuts can also be used. When installing bolts in T-slots, pay attention to the length of each bolt to prevent the bolt end from contacting the bottom of the T-slot.



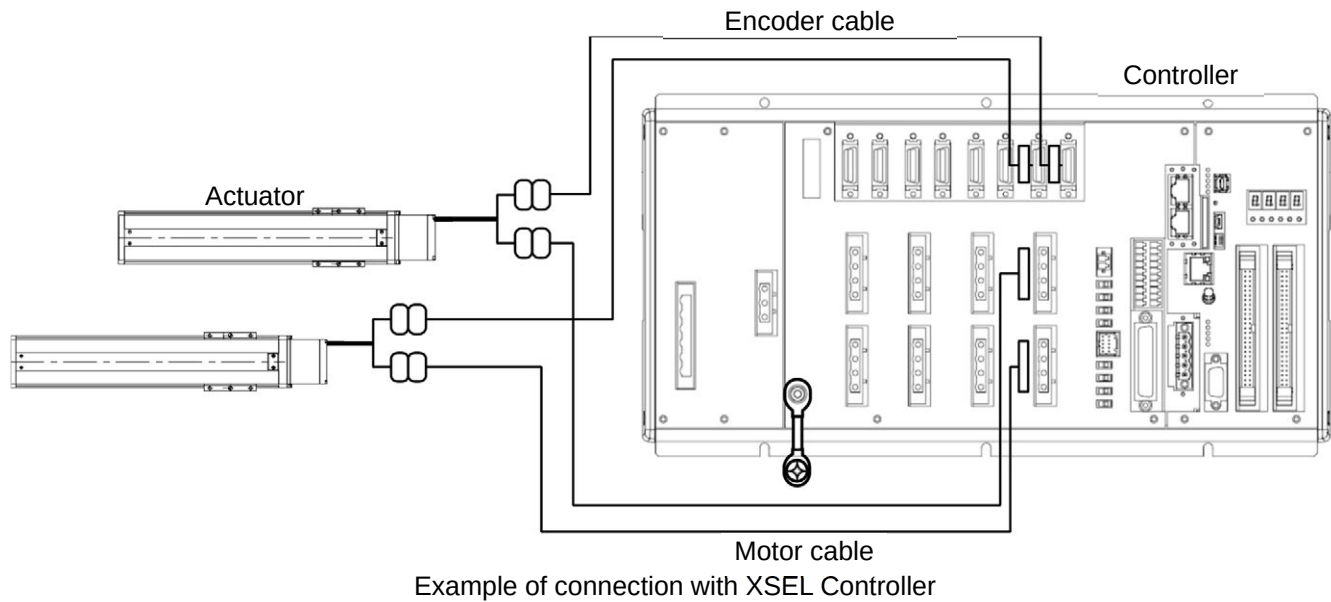
INTELLIGENT ACTUATOR



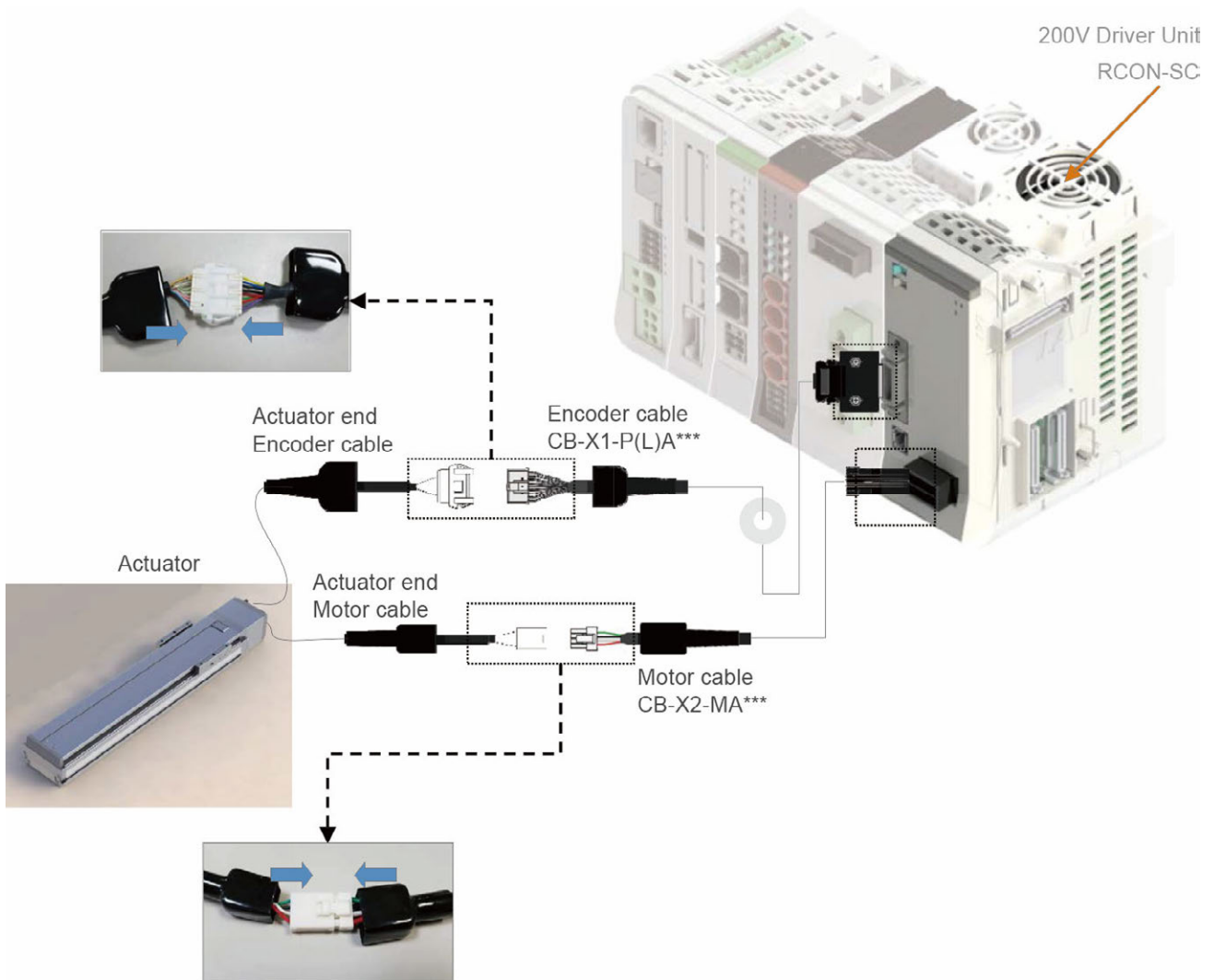
8. Connecting the Controller

8.1 Wiring

The actuator and controller are connected via the motor cable and encoder cable (genuine parts) using connectors.



For details on extension cables, refer to [12, "Motor/Encoder Cables."]

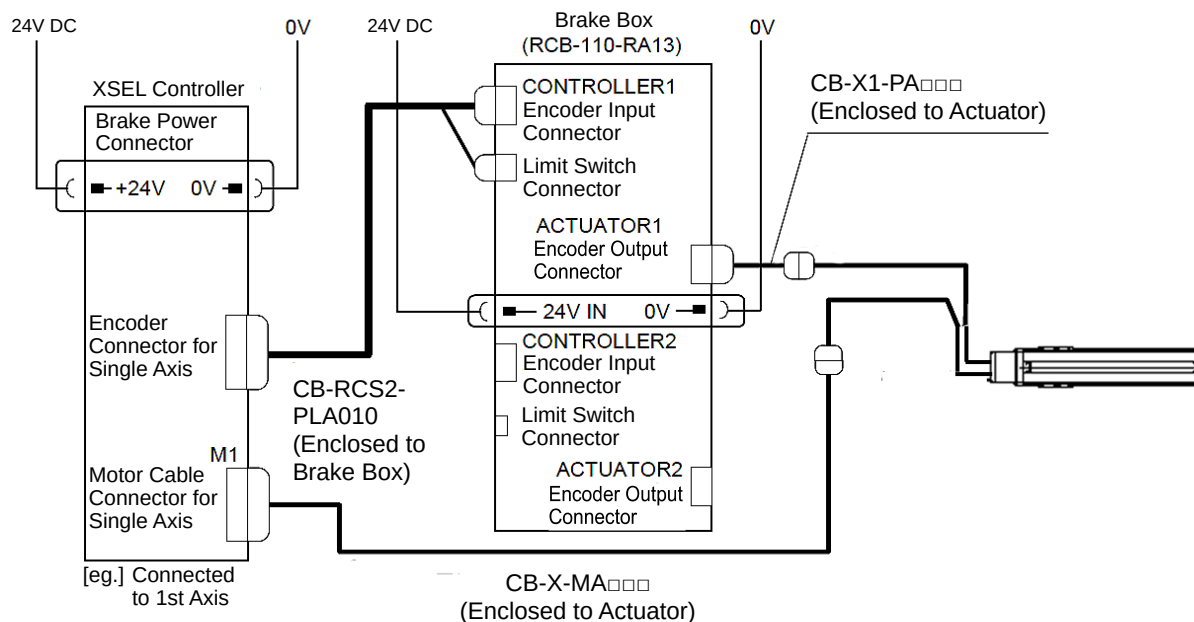


Example of connection with RCON and RSEL Systems

For details on extension cables, refer to [12, "Motor/Encoder Cables."]

(If it is a standard unit, it should have a motor equipped with a brake with 45V DC brake operation voltage mounted, thus there is no need of a brake box.)

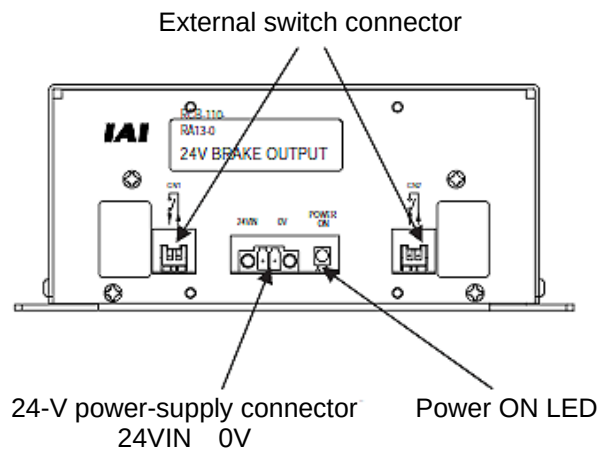
- Link a brake box between an actuator and the controller as the wiring diagram below shows. Refer to the next page for the linkable connectors.
- Supply +24V power to the 24V power connector on the brake box.



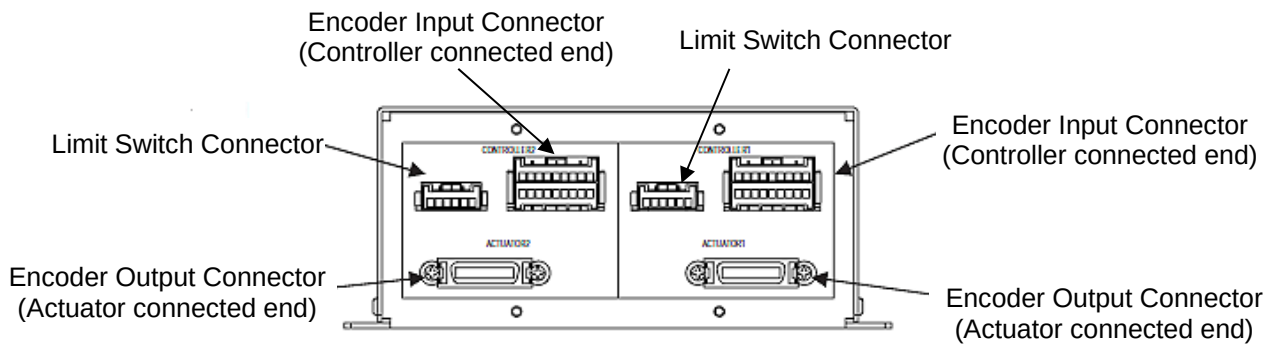


© Brake Box (RCB-110-RA13)

[Front view]



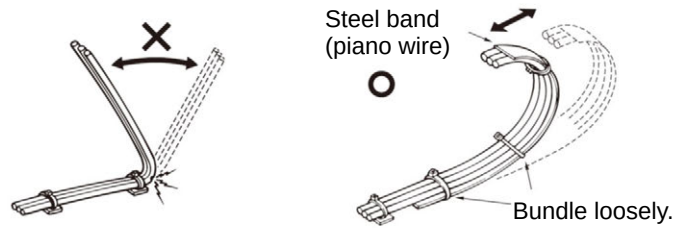
[Rear view]



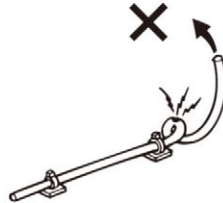


When designing an application system, incorrect wiring or connection of each cable may cause unexpected problems such as a disconnected cable or poor contact. The following explains examples of prohibited handling of cables.

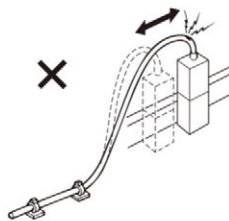
- Do not cut and reconnect the cable to extend or shorten the cable.
- Use a robot cable for any section where the cable will flex. For the bending radius, refer to [12, "Motor/Encoder Cable."]
- Provide a sufficient bending radius and prevent the cable from bending at the same point.



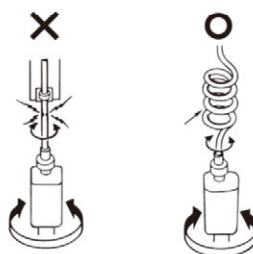
- Do not let the cable bend, kink or twist.



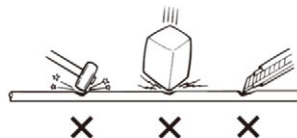
- Do not pull the cable with a strong force



- Do not let the cable receive a turning force at a single point.

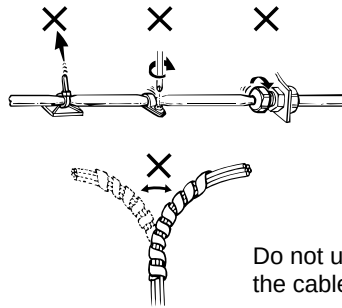


- Do not pinch, drop a heavy object onto or cut the cable



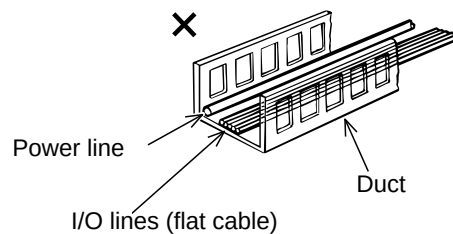


- When fixing the cable, provide a moderate slack and do not tension it too tight.



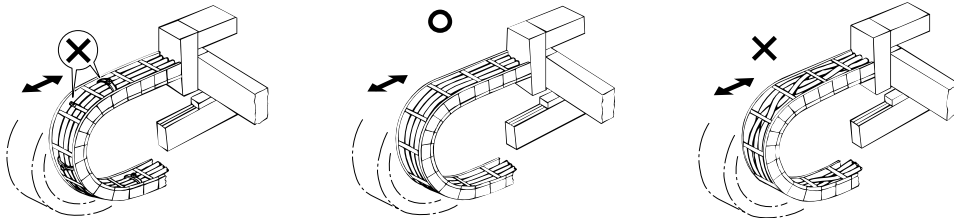
Do not use a spiral tube where the cable flexes frequently.

- Separate the I/O and communication lines from the power and drive lines. Do not wire them together in the same duct.



Follow the instructions below when using a cable carrier.

- If there is an indication to the cable for the space factor in a cable carrier, refer to the wiring instruction given by the supplier when storing the cable in the cable carrier.
- Avoid the cables to get twined or twisted in the cable carrier, and also to have the cables move freely and do not tie them up. (Avoid tension being applied when the cables are bent.)
Do not pile up cables. It may cause faster abrasion of the sheaths or cable breakage.



Warning:

- Always turn off the controller power before connecting/disconnecting cables. If cables are connected/disconnected while the power is still supplied, the actuator may malfunction and serious injury or equipment damage may occur.
- Loose connectors may cause the actuator to malfunction and create a dangerous situation. Be sure to confirm that all connectors are securely connected.



9. Operating Conditions

9.1 Duty Ratio during Continuous Operation

Have the duty ratio at 50% or less when using WXXM in the vertical orientation.
Follow the description below for other models.

Operate at duty ratios equal to or less than the allowable value.

“Duty ratio” refers to a utilization ratio indicating the percentage (%) of the time during which the actuator is operating in one cycle.



Caution: If an overload error occurs, increase the standstill time to lower the duty ratio or decrease the acceleration/deceleration.

[How to Calculate Duty Ratio]

Calculate the load factor and acceleration/deceleration time ratio and find an applicable duty ratio on a graph of calculated values.

If the load factor is less than 50%, the actuator can be operated at a duty ratio of 100% (continuous operation).

[1] Load factor LF

The maximum payload capacity at rated acceleration, and rated acceleration/deceleration, are specified in 2, “Specifications.”

[When commanded acceleration speed is lower than the rated acceleration speed]

Load factor	: $LF = M \times \alpha / M_r \times \alpha_r$ [%]
Maximum payload capacity at rated acceleration	: M_r [kg]
Rated acceleration/deceleration	: α_r [G]
Transfer weight during operation	: M [kg]
Acceleration/deceleration during operation	: α [G]

[When commanded acceleration speed is higher than the rated acceleration speed]

Load factor	: $LF = M \times \alpha / M_d \times \alpha = M / M_d$ [%]
Transportable weight in commanded acceleration	: M_d [kg]
Transfer weight during operation	: M [kg]
Acceleration/deceleration during operation	: α [G]

[2] Calculate the acceleration/deceleration time ratio t_{od} using the calculation formula below:

Acceleration/deceleration time ratio t_{od} =

Acceleration time during operation + Deceleration time during operation / Operating time (%)

Acceleration time = Operating speed [mm/s] / Acceleration during operation [mm/s²] (sec.)

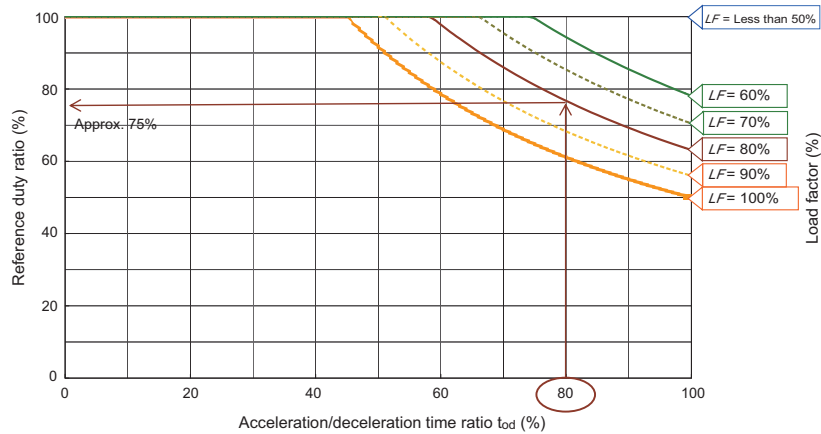
Acceleration (mm/s²) = Acceleration (G) x 9,800 mm/s²

Deceleration time = Operating speed [mm/s] / Deceleration during operation [mm/s²] (sec.)

Deceleration (mm/s²) = Deceleration (G) x 9,800 mm/s²



- [3] Find the applicable duty ratio on the graph based on each load factor LF for which the duty ratio has been calculated, and the acceleration/deceleration time ratio t_{od} .
- Example) If the load factor LF is 80% and acceleration/deceleration time ratio t_{od} is 80%, a reference duty ratio is approx. 75%.



10. Setting the Home Position

10.1 Home Return

Home return involves the operation explained below:

- [1] When a home return command is issued, the actuator moves (in the direction set by the applicable parameter).
- [2] The software detects the mechanical end in the return operation. If option L (home limit switch) is installed, the mechanical end is detected by a sensor.
- [3] The slider reverses its direction when the mechanical end or home limit switch is detected, after which the Z-phase signal is detected and the position where this signal has been detected becomes the reference point.
- [4] The slider travels further by the offset amount set by the parameter, and this position becomes home.

10.2 Factory-set Home Position

How much the motor would turn after the mechanical end or home limit switch is detected until the Z-phase signal is generated has been adjusted prior to shipment.

The standard distance travelled by each slider after it reverses its direction upon detection of the mechanical end or home limit switch, until stopping at the home position, is shown in the table below.

Model	Home position from mechanical stopper or home sensor (approx. in mm)
ISB, ISPB Small type SXM/SXL Medium type MXM/MXL/MXMX Large type LXM/LXL/LXMX/LXUMX	5 mm
SSPA Small type SXM Medium type MXM	5 mm
SSPA Large type LXM	10 mm
Super-Large Size WXM/WXMX	7 mm

10.3 Changing the Home Direction

If the home direction is changed after the actuator has been delivered, the moving direction parameter must be changed, and the encoder's Z-phase may also need to be adjusted on some models. Contact IAI.



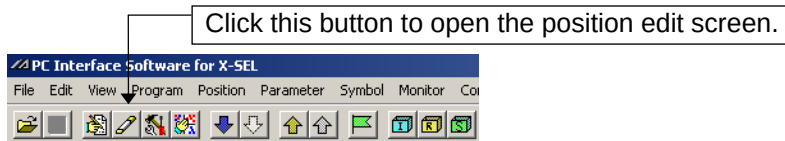
10.4 Fine-tuning the Home Position

Correct the position deviation by changing the parameter for home preset in the case of an X-SEL or SSEL controller, or by changing the parameter for home return offset in the case of a SCON, MSCON controller. How to set these parameters is explained below.

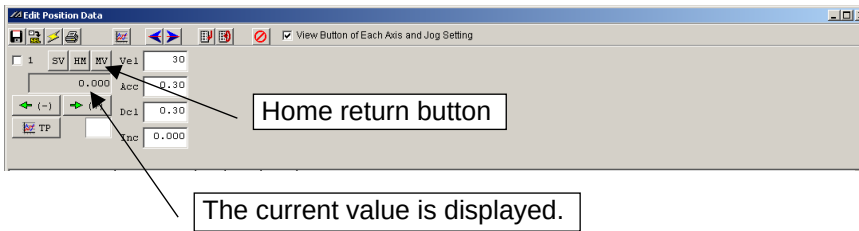
10.4.1 X-SEL and SSEL Controllers

- (1) Open the position edit screen.

On the PC software screen, click , select a desired position number, and then click **OK** to display the following screen.



Click the home return button  to perform home return.



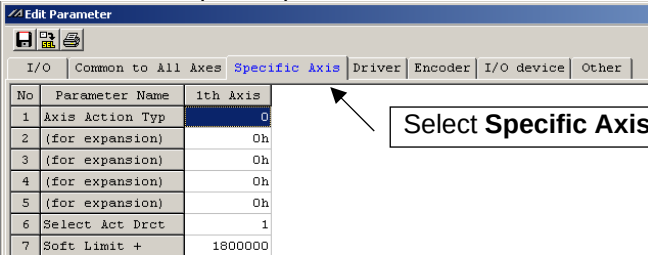
- (2) Turn OFF the servo and move the slider to the home position by hand.
If the slider cannot be moved by hand, move the slider in the jog or inching mode.
Check the current value being displayed, and record the position deviation.

- (3) Open the parameter screen.

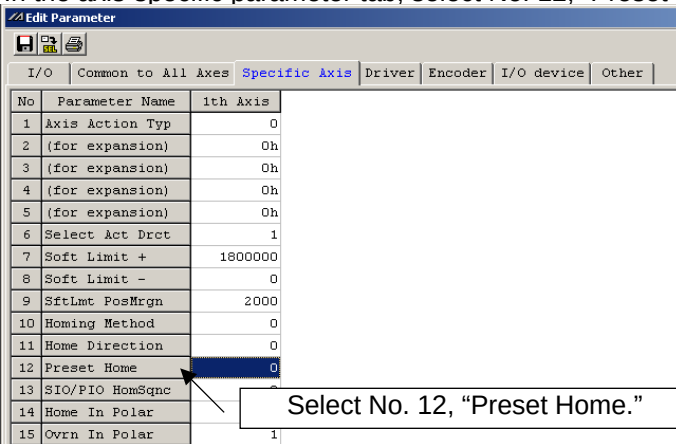


Click this button to open the parameter edit screen.

- (4) Select the axis-specific parameter tab.

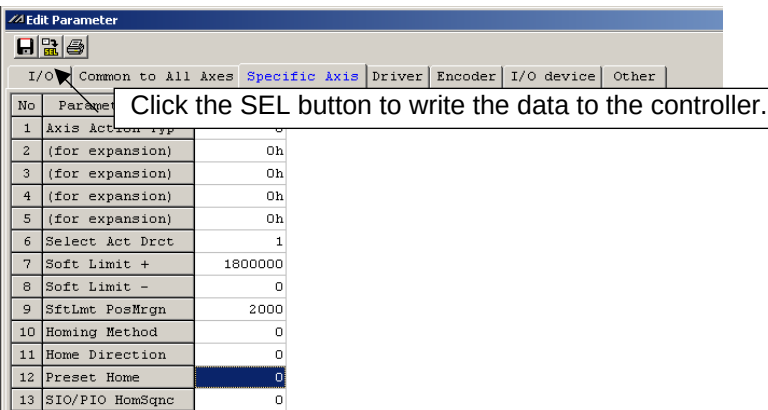


- (5) In the axis-specific parameter tab, select No. 12, "Preset Home."



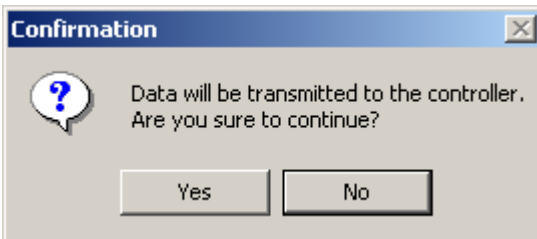
- (6) Change the setting of axis-specific parameter No. 12 (Preset Home).
Add or subtract the value measured in (2) to/from the value currently input.
The setting unit is 0.001 mm.
Example: When subtracting 1 mm
Current preset value = Current setting – 1000

- (7) Write the new data.





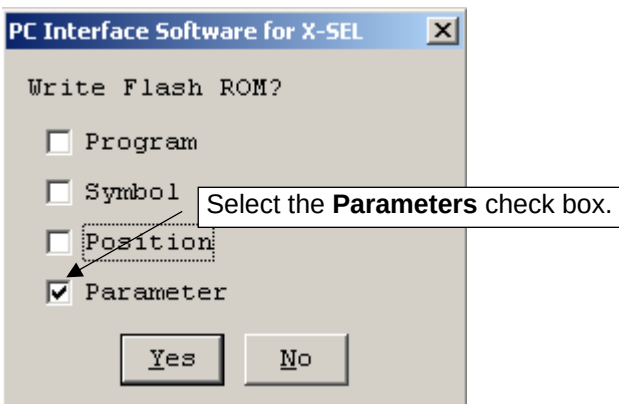
- (8) Transfer the data to the controller.



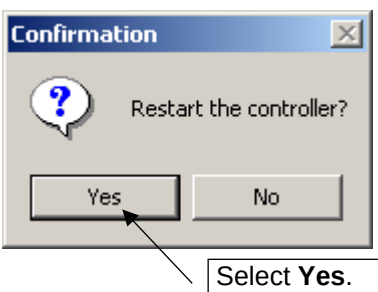
- (9) Click **OK**.



- (10) Write the data to the flash ROM.



- (11) Restart the controller.



10.4.2 ECON, SCON, MSCON and RCON Controllers

(Note) The parameters for the home-return offset should be changed also for RSEL.

RSEL operation should be different from shown below.

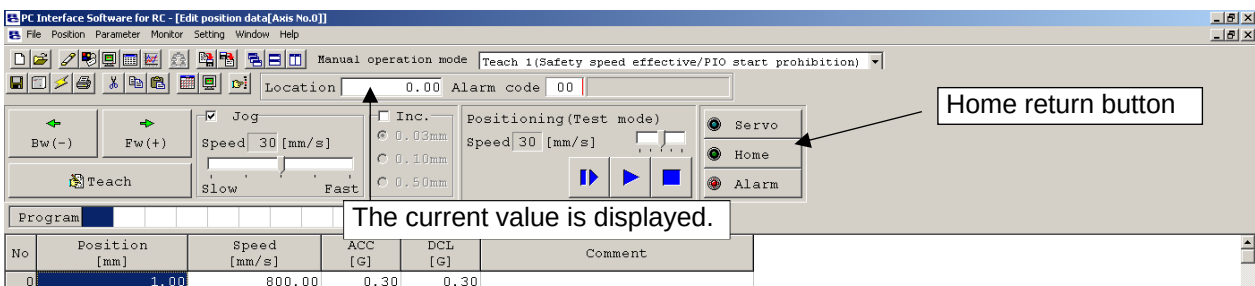
Refer to PC Software IA-101-X-MW/IA-101-X-USBMW (RSEL Edition) Instruction Manual for how to make operation.

- (1) Open the position edit screen.
On the PC software screen, click , select a desired position number, and then click **OK** to display the following screen.



Click this button to select the position edit screen.

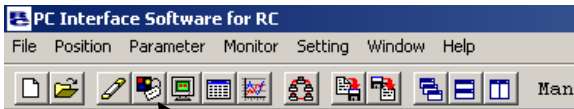
Click the home return button to perform home return.



- (2) Turn OFF the servo and move the slider to the home position by hand.
If the slider cannot be moved by hand, move the slider in the jog or inching mode.
Check the current value being displayed, and record the position deviation.

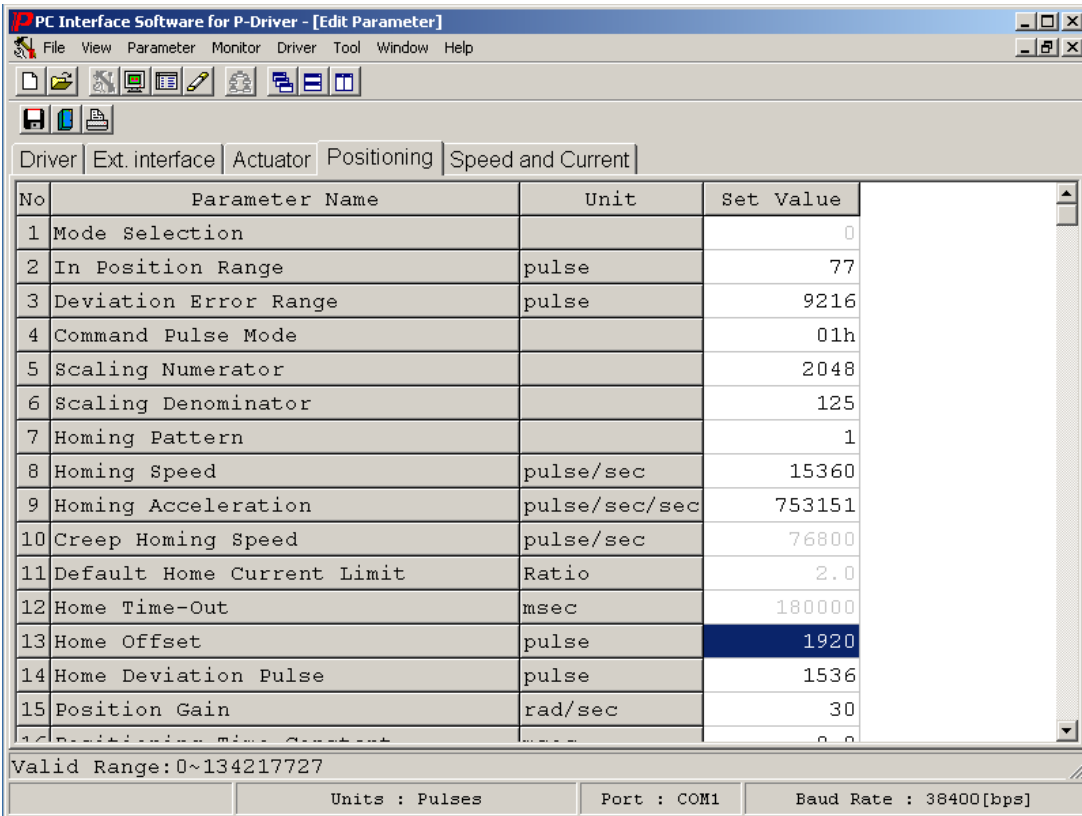


- (3) Open the parameter screen.



Click this button to select the parameter screen.

- (4) The user parameter screen appears.



- (5) Change user parameter No. 22 (home offset).

* The setting unit is mm.

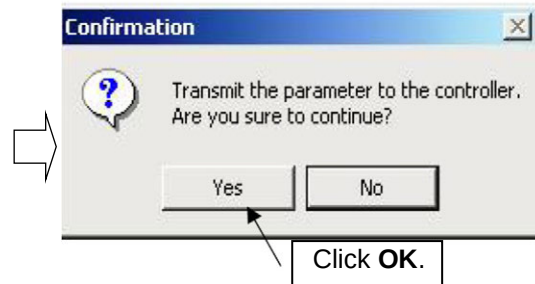
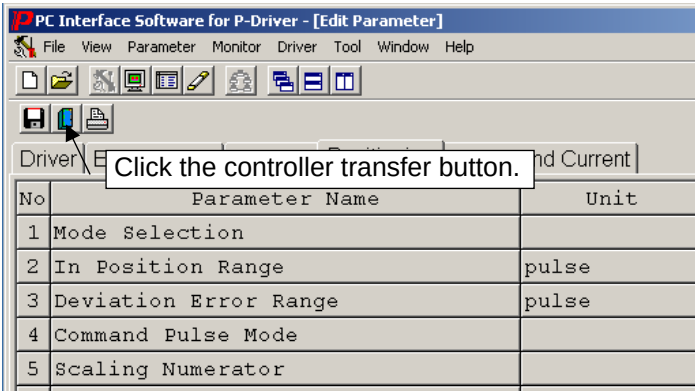
Add or subtract the value measured in (2) to/from the value currently input.

Example: When subtracting 0.5 mm

Home offset = Current setting – 0.5 mm



- (6) Write the new data.
Click the controller transfer button, and then click **OK**.
* After the data has been written, turn off the controller power.





10.5 Absolute Reset Method (Absolute Specification)

If the battery has been replaced or encoder cable unplugged following an absolute encoder battery voltage error, etc., absolute reset must be performed.

For the method to perform absolute reset, check 1.2, “Related Operation Manuals for Each Controller Supported by This Product” in the operation manual of your controller.



11. Options

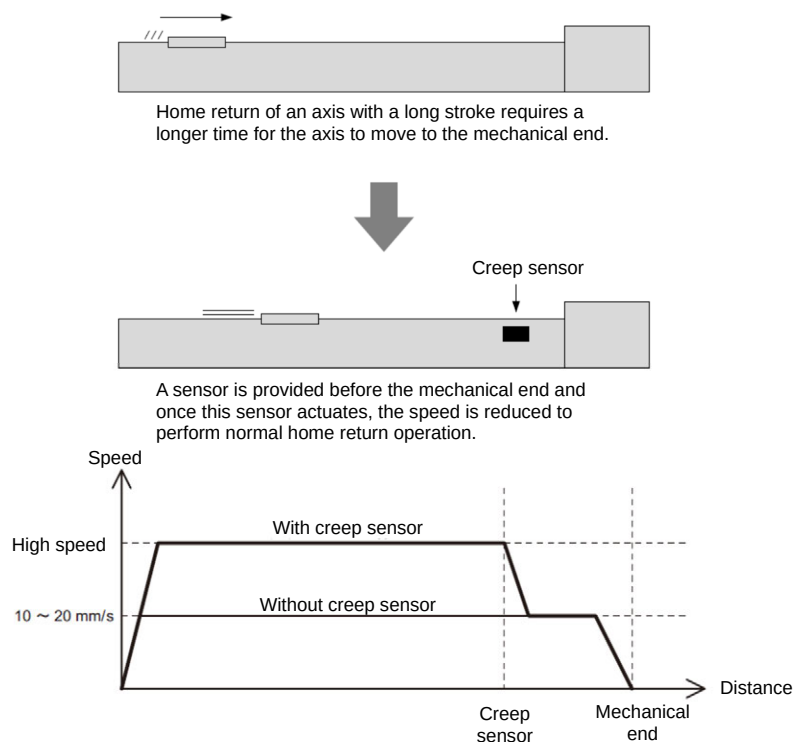
11.1 Brake (Model: B)

The brake is a mechanism to retain the slider of a vertically installed actuator so that the slider will not drop when the power is cut off or servo turns off. If any axis is used vertically, an optional brake is required. WXM should require different parameters between when mounted vertically and when mounted horizontally oriented on the wall.

When the brake-equipped option is selected, the delivery should be made with the parameters for vertical mount while it made with the parameters for horizontal orientation on the wall when this option is not selected. It will require the parameters to be changed when brake-equipped WXM is to be used in horizontal orientation on the ceiling. Consult with IAI in such a case.

11.2 Creep Sensor (Model: C, CL)

This sensor is used to perform home return at high speed. Normally home return is implemented with the slider contacting the stopper at the stroke end on the motor side and then reversing its direction. To support this "stopper method," the home return speed is kept to a range of 10 to 20 mm/s. This means that sliders of long strokes require a longer time to complete the home return. The creep sensor is a proximity sensor that allows the slider to move at high speed until halfway and then reduce its speed to the normal home return speed before the home, in order to shorten the time required for home return. The standard installation position of this sensor is on the right side of the actuator as viewed from the motor, represented by the option model number "C." A cover similar to the one used for limit switches is provided on the outside of the sensor. If both the creep sensor and limit switches are installed, the same cover is used for each. If you want to have the creep sensor on the left side, specify the option model number "CL." Check the figure of cover installation in [11.3, "Limit Switch."] (Note) WXM and WXM_X are not available to select.





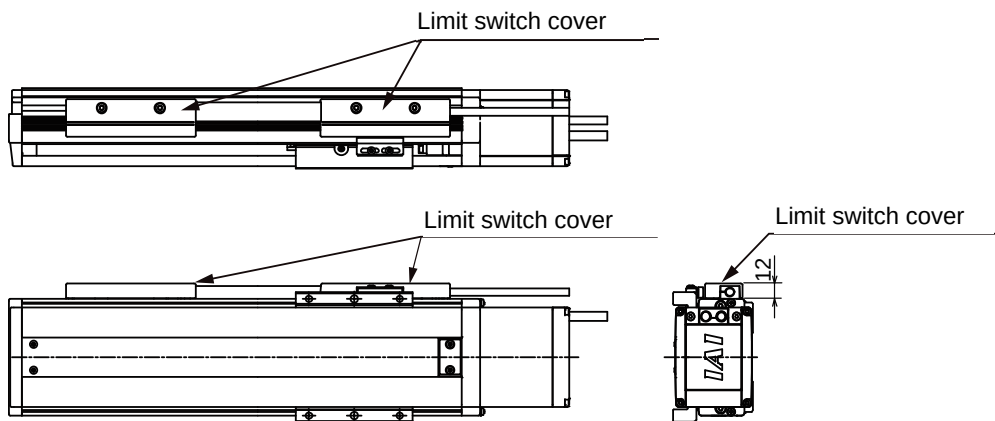
11.3 Limit Switch (Model: L, LL)

Normal home return operation uses the “stopper method” wherein the slider contacts the stopper and reverses, after which the Z-phase is detected and defined as the home. The home limit switch (L) is an option which is designed to perform this reversing operation using a proximity sensor, not a stopper. Use the home limit switch if you want to increase the reliability of home return by, for example, preventing a false detection of mechanical end due to contact with other device, etc.

If this option is selected, three proximity sensors are installed, including the home detection sensor (HOME), overtravel sensor on front side (+OT) and overtravel sensor on motor side (-OT). (HOME and -OT are integrated as twin sensors.) Take note that moving the home sensor significantly may shorten the stroke.

The standard installation position of the home limit switch and cover is on the right side of the actuator as viewed from the motor, represented by the option model number “L.” If you want to have the limit switch on the left side, specify the option model number “LL.”

(Note) WXM and WXMx are not available to select LL.





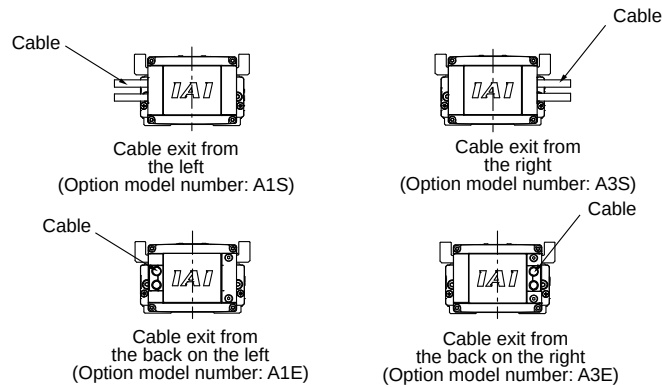
11.4 Reversed-home Specification (Model: NM)

In the reversed-home specification, the home is located on the front side. If you wish to change the home direction after the delivery, consult IAI because the moving direction parameter must be adjusted, as well as the encoder's Z-phase on certain models.

11.5 Cable Exit Direction (Model: A1S, A1E, A3S, A3E)

The cable should exit in one of the following four

(Note) WXM and WXMx are not available to select.

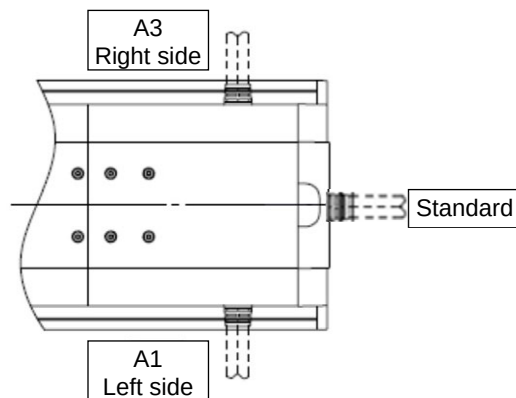


11.6 Cable Exit Direction (Model: A1, A3)

It should be indicated when the direction of ejection is to be changed for the actuator cable.

The option model code for the cable ejection to the left is A1, and the option model code for the cable ejection to the right is A3.

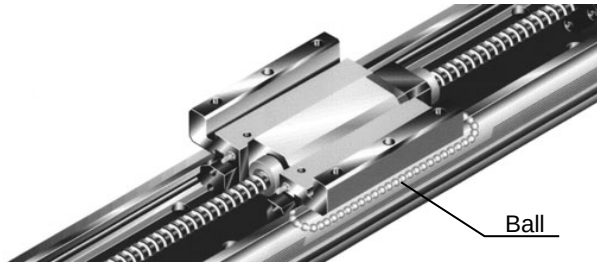
(Note) Only WXM and WXMx are available to select.



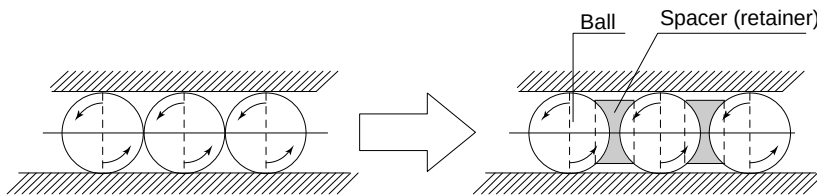


11.7 Guide with Ball Retention Mechanism (Model: RT)

A spacer (retainer) is inserted between adjacent balls (steel balls) in the guide to reduce noise and achieve smooth operation.



There is no longer metal noise generated by colliding balls and thus noise is reduced. Since balls are aligned by retainers, annoying noise decreases. Wear caused by friction between balls decreases, oil no longer runs out due to contact, and lubricating oil collects at the retainers. Accordingly, operation becomes smooth.



(Note) WXM and WXMx are not available to select.



11.8 Master Axis/Slave Axis Specification for Synchronized Operation (Model: LM, LLM, S)

If the “synchronized operation function” is used, where two actuator axes are operated with the XSEL controller or SSEL controller, one axis is designated as the master axis, while the other axis is designated as the slave axis.

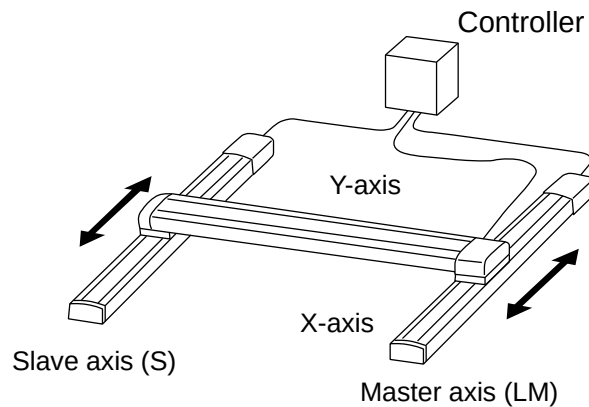
The actuators serving as the master axis and slave axis must be of the same specification.

The master axis comes with the home limit switch, represented by the option model number “LM.”

The standard installation position of the home limit switch and cover is on the right side of the actuator as viewed from the motor. If you want to have the limit switch on the right side, specify the option model number “LLM.”

The option model code for the slave axis should be expressed with S.

(Note) WXM and WXMx are not available to select LLM.





11.9 High-Precision Straightness Specification (Model: ST)

The high-precision straightness specification type is a precision actuator with high-level settings of parallelism and straightness, which is the base and slider travel accuracies.

(Note) WXM and WXMx are not available to select.

- Aluminum-based ISB/ISPB

	Parallelism	Straightness
With no High-precision straightness specification	0.05 mm/m Max. (However, the stroke less 500mm is 0.025mm uniformed.)	0.05 mm/m Max. (However, the stroke less 500mm is 0.025mm uniformed.)
With High-precision straightness specification	0.03 mm/m Max. (However, the stroke less 500mm is 0.015mm uniformed.)	0.02 mm/m Max. (However, the stroke less 500mm is 0.015mm uniformed.)

- Iron-based SSPA

	Parallelism	Straightness
With no High-precision straightness specification	0.05 mm/m Max. (However, the stroke less 500mm is 0.025mm uniformed.)	0.05 mm/m Max. (However, the stroke less 500mm is 0.025mm uniformed.)
With High-precision straightness specification	0.03 mm/m Max. (However, the stroke less 500mm is 0.015mm uniformed.)	0.015 mm/m Max. (However, the stroke less 500mm is 0.008mm uniformed.)

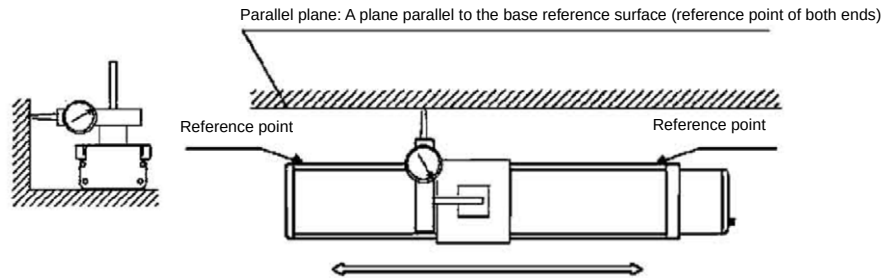
- The values for the high-precision straightness specification are based on measurement at a temperature of $20 \pm 3^{\circ}\text{C}$ using a precision stone surface plate of grade 00 and $6.5 \mu\text{m}$ in flatness.
- The values for the standard specification and high-precision specification are based on measurement at a temperature of $20 \pm 3^{\circ}\text{C}$ using a surface plate of 0.05 mm or less in flatness.
- The parallelism and the straightness of the chart are the standard value of 1m.
Standard value (mm/m) $\times$ stroke (m) will be straightness or flatness of the all stroke.



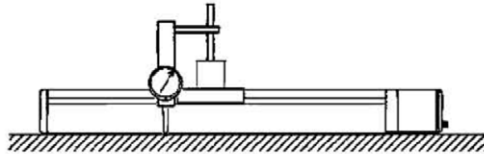
(Reference)

[Measurement Method]

- [1] Parallelism (horizontal) between the base reference surface and the slider (reference surface)
Affix the base on the surface plate and, with the indicator on the slider contacting a surface running parallel with the two points at both edges of the base reference surface, move the slider over its entire stroke to perform measurement.



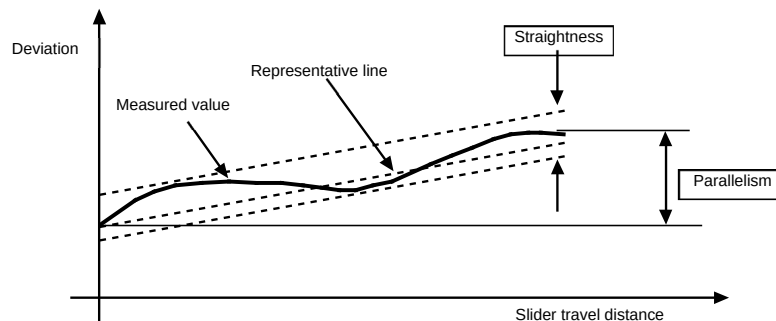
- [2] Parallelism (vertical) between the base mounting surface and the slider (work part mounting surface)
With the base affixed on the surface plate and indicator on the slider also contacting the surface plate, move the slider over its entire stroke to perform measurement.



[Parallelism and Straightness]

Parallelism is represented by the maximum value on a graph of indicator changes measured by moving the slider over its entire stroke.

Straightness, or degree of being straight, is represented by the maximum value among all measured results of parallelism expressed by intervals between two straight lines.





11.10 Rust prevention film processing (Model: MD)

The rust prevention film processing is the one that the rust prevention processing (electrolysis rust prevention black film processing) was given to the base reference surface (bottom and the side reference surface) and the slider reference surface (top and the side reference surface). Used to suppress rusts and dusts. Option of SSPA. It is used to suppress the environment.

11.11 Metal Connector Type (Model: EU)

The connectors on the motor cable and encoder cable to connect to the actuator change from plastic connectors to metal connectors.

11.12 AQ seal (Model: AQ)

The AQ seal is a lubrication unit that uses a lubricating member made of resin-solidified lubricating oil.

The AQ seal is a porous member containing a lot of lubricating oil, so lubricating oil oozes out to the surface by means of capillary phenomenon.

When the AQ seal is pressed against the guide and ball screw surface (steel-ball rolling surface), lubricating oil is supplied and this, combined with use of grease, keeps the actuator maintenance-free for a long time.

However, in order for you to use the product stably for a long period of time, it is recommended to have a grease-up regularly in regular maintenance works.

11.13 High Payload Setting (Model: HLA)

It is an option to increase the maximum payload of the standard type.

As the parameters set to the controller should differ from the standard type, it is necessary to have the controller in the high payload type when operation is to be made with high payload.

(Note) Only ISPB-WXM Lead 10 is available to select.

11.14 Hanging Bracket (Model: EB)

It is an option to enable to attach eye bolts at four places on an actuator and lift the actuator up for transportation.

There are eye bolts, attachment brackets, hex socket head cap screws and hex nuts enclosed.

Refer to [6.1.3 Transportation Using Hanging Bracket]

11.15 Double Slider Type

Application: IS(P)B-SXM, SXL, MXM, MXL, LXM, LXL, WXM, WXMx

It is an option to add a free slider that is not connected to the ball screw.

By making the slider double, the moment and the overhang load length can be made bigger.

12. Motor/Encoder Cables

12.1 Standard

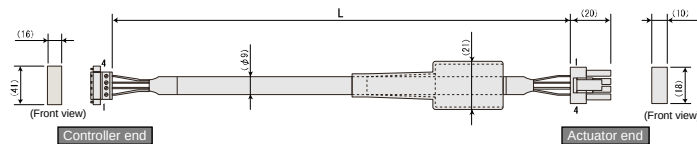
The same cables are used regardless of the actuator model number. The applicable cables vary depending on the combined controller.

Correspondence table of controllers and motor/encoder cables

Controller	XSEL-J/K		XSEL-P/Q/R/S/RA/SA		SSEL		SCON/MSCON	
LS	Without LS	With LS	Without LS	With LS	Without LS	With LS	Without LS	With LS
Applicable cables	[1], [2]	[1], [2], [3]	[1], [4]	[1], [5]	[1], [4]	[1], [5]	[1], [4]	[1], [5]

Controller	RCON-SC	
LS	Without LS	With LS
Applicable cables	[6], [4]	[6], [5]

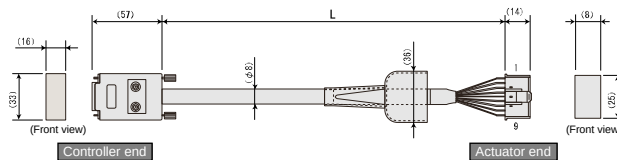
[1] Motor cable CB-X-MA□□□



* □□□ indicates the cable length (L). Up to 30 m can be specified.
Example) 080 = 8 m
[Minimum bending radius]
Movable: 51 mm
Fixed: 34 mm

Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
0.75sq	Green	PE	1	1	U	Red	0.75sq
	Red	U	2	2	V	White	
	White	V	3	3	W	Black	
	Black	W	4	4	PE	Green	

[2] Encoder cable CB-X-PA□□□

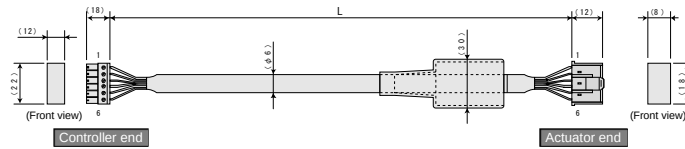


* □□□ indicates the cable length (L). Up to 30 m can be specified.
Example) 080 = 8 m
[Minimum bending radius]
Movable: 44 mm
Fixed: 29 mm

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

The shield is clamped to the hood.
Ground wire and braided shield wires

[3] Limit switch cable CB-X-LC□□□

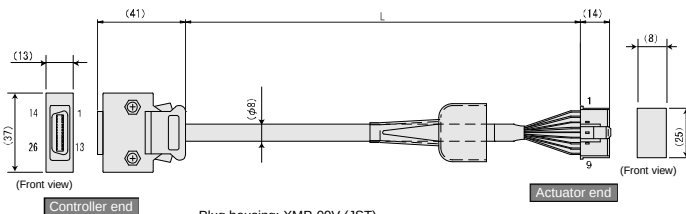


* □□□ indicates the cable length (L). Up to 30 m can be specified.
Example) 080 = 8 m
[Minimum bending radius]
Movable: 33 mm
Fixed: 22 mm

Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
AWG24	Skyblue	24VOUT	6	1	24VOUT	Skyblue	AWG24
	Pink	N	5	2	N	Pink	
	Light green	LS	4	3	LS	Light green	
	Orange	CLEEP	3	4	CLEEP	Orange	
	Gray	OT	2	5	OT	Gray	
	1B ¹⁾ skyblue	RSV	1	6	RSV	1B ¹⁾ skyblue	

Note) 1B indicates one black dot mark.

[4] Encoder cable CB-X1-PA□□□



Plug housing: XMP-09V (JST)
Socket contact: BXA-001T-P0.6 (JST) x 9
Retainer: XMS-09V (JST)
Note 6: Use the crimper recommended by the connector manufacturer.

* □□□ indicates the cable length (L). Up to 30 m can be specified.
Example) 080 = 8 m
[Minimum bending radius]
Movable: 44 mm
Fixed: 29 mm

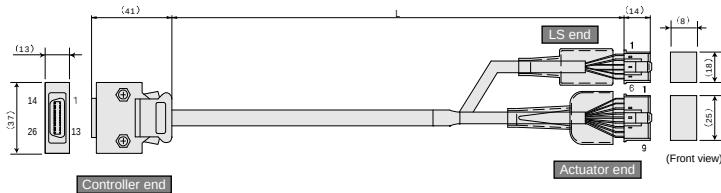
Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
AWG26 (soldered)	—	—	10	1	BAT+	Black	AWG26 (crimped)
	—	—	11	2	BAT-	Yellow	
	—	E24V	12	3	SD	Blue	
	—	OV	26	4	SD	Orange	
	—	LS	25	5	VCC	Green	
	—	CLEEP	24	6	GND	Brown	
	—	OT	23	7	FG	Ground	
	—	RSV	9	8	BK-	Gray	
	—	—	18	9	BK+	Red	
	—	—	19				
	—	A+	1				
	—	A-	2				
	—	B+	3				
	—	B-	4				
	—	Z+	5				
	—	Z-	6				
	Orange	SRD+	7				
	Green	SRD-	8				
	Purple	BAT+	14				
	Gray	BAT-	15				
	Red	VCC	16				
	Black	GND	17				
Blue	BKR+	20					
Yellow	BKR-	21					
—	—	22					

The shield is clamped to the hood.

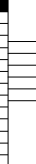
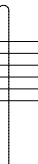
Ground wire and braided shield wires

The shield is clamped to the hood.
Ground wire and braided shield wires

[5] Encoder cable with LS CB-X1-PLA□□□



* □□□ indicates the cable length (L). Up to 30 m can be specified.
Example) 080 = 8 m
[Minimum bending radius]
Movable: 54 mm
Fixed: 36 mm

Wiring	Color	Signal	No.			No.	Signal	Color	Wiring
AWG26 (soldered)	—	—	10			1	E24V	White/blue	AWG26 (crimped)
	White/blue	E24V	12	2	E24V	White/yellow			
	White/yellow	OV	13	3	LS	White/red			
	White/red	LS	26	4	White/black				
	White/black	CLEEP	25	5	OT	White/purple			
	White/purple	OT	24	6	RSV	White/gray			
	White/gray	RSV	23	9					
	—	—	18						
	—	—	19						
	—	A+	1						
	—	A-	2						
	—	B+	3						
	—	B-	4						
	—	Z+	5						
	—	Z-	6						
	Orange	SRD+	7						
	Green	SRD-	8						
	Purple	BAT+	14						
	Gray	BAT-	15						
	Red	VCC	16						
	Black	GND	17						
	Blue	BKR+	20						
Yellow	BKR-	21							
—	—	22							
The shield is clamped to the hood.				Ground wire and braided shield wires		No. <th>Signal</th> <th>Color</th> <th>Wiring</th>	Signal	Color	Wiring
						1	BAT+	Purple	AWG26 (crimped)
						2	BAT-	Gray	
						3	SD	Orange	
						4	SD	Green	
						5	VCC	Red	
						6	GND	Blue	
						7	FG	Ground	
						8	BK-	Blue	
						9	BK+	Yellow	
						(As for wire color, "White/blue" indicates the band is white and indicator is blue.			

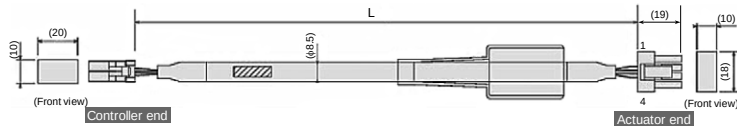
The shield is clamped to the hood.

Ground wire and braided shield wires

(As for wire color, "White/blue" indicates that the band is white and insulator is blue.)



[6] Motor cable CB-X2-MA□□□



* □□□ indicates the cable length (L). Up to 30 m can be specified.
Example) 080 = 8 m
[Minimum bending radius]
Movable: 51 mm
Fixed: 34 mm

Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
0.75sq	Red	U	B1	1	U	Red	0.75sq
	White	V	B2	2	V	White	
	Black	W	A1	3	W	Black	
	Green	PE	A2	4	PE	Green	



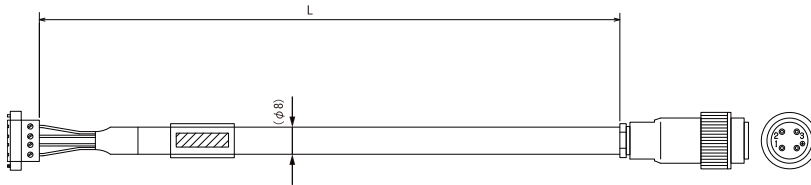
12.2 Metal Connector Type (Option: Model EU)

The same cables are used regardless of the actuator model. The applicable cables vary depending on the models without LS, with LS.

Correspondence table of controllers and motor/encoder cables

Controller	XSEL-P/Q/R/S/RA/SA, SSEL, SCON, MSCON	
LS	Without LS	With LS
Applicable cables	[1], [2]	[1], [3]

[1] Motor cable CB-XEU-MA□□□



* □□□ indicates the cable length (L). Up to 30m can be specified.
Example) 080 = 8m

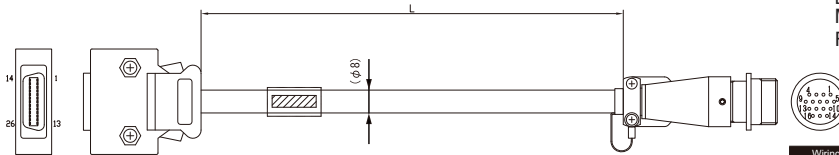
[Minimum bending radius]

Movable: 48 mm

Fixed: 48 mm

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

[2] Encoder cable CB-XEU1-PA□□□



* □□□ indicates the cable length (L). Up to 30m can be specified.
Example) 080 = 8m

[Minimum bending radius]

Movable: 44 mm

Fixed: 29 mm

Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
AWG26 (soldered)	—	—	10	1	SD	Orange	AWG26 (soldered)
	—	—	11	2	SD	Green	
	—	E24V	12	3	—	—	
	—	OV	26	4	—	—	
	—	LS	25	5	—	—	
	—	CLEEP	24	6	—	—	
	—	OT	23	7	—	—	
	—	RSV	9	8	—	—	
	—	—	18	9	—	—	
	—	—	19	10	VCC	Red	
	—	A+	1	11	GND	Black	
	—	A-	2	12	BAT+	Purple	
	—	B+	3	13	BAT-	Gray	
	—	B-	4	14	—	—	
	—	Z+	5	15	BKR-	Blue	
	—	Z-	6	16	BKR+	Yellow	
	Orange	SRD+	7				
	Green	SRD-	8				
	Purple	BAT+	14				
	Gray	BAT-	15				
	Red	VCC	16				
	Black	GND	17				
	Blue	BKR-	20				
	Yellow	BKR+	21				
	—	—	22				

The shield is clamped to the hood.

Drain wire and braided shield wires
(As for wire color, "White/blue" indicates that
the band is white and insulator is blue.)

The shield is connected to the earth sleeve.



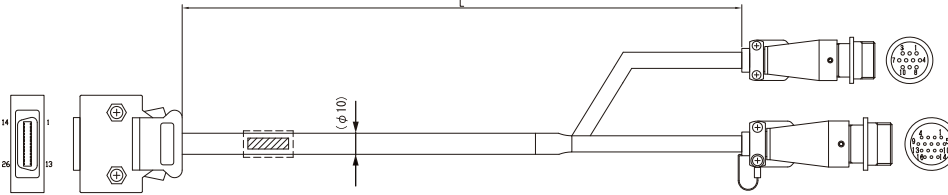
[3] Encoder cable with LS CB-XEU1-PLA□□□

* □□□ indicates the cable length (L). Up to 30m can be specified.
Example) 080 = 8m

[Minimum bending radius]

Movable: 58 mm

Fixed: 33 mm



No.	信号	色	配線
1	E24V	White/blue	AWG26 (crimped)
2	OV	White/yellow	
3	—	—	
4	LS	White/red	
5	CLEEP	White/black	
6	OT	White/purple	
7	RSV	White/gray	
8	—	—	
9	—	—	
10	—	—	
No.	信号	色	配線
1	SD	Orange	AWG26 (crimped)
2	SD	Green	
3	—	—	
4	—	—	
5	—	—	
6	—	—	
7	—	—	
8	—	—	
9	—	—	
10	VCC	Red	
11	GND	Black	
12	BAT+	Purple	
13	BAT-	Gray	
14	—	—	
15	BK-	Blue	
16	BK+	Yellow	

The shield is clamped to the hood.

Drain wire and braided shield wires
(As for wire color, "White/blue" indicates that the band is white and insulator is blue.)

The shield is connected to the earth sleeve.



13. Maintenance/Inspection

13.1 Inspection Items and Intervals

Perform maintenance/inspection according to the following timetable.

The operating time is assumed to be 8 hours a day. If the actuator is used continuously for 24 hours or the utilization rate is otherwise high, shorten the inspection intervals accordingly.

Period	Visual inspection of machine exterior	Interior check	Grease Supply ^(Note 1)
At start of operation	○		
After 1 month of operation	○		
After 3 month of operation			○
After 3 month of operation thereafter			Period of Grease Supply (reference)
After 6 month of operation	○	○ ^(Note 2)	
Every 6 months thereafter	○	○ ^(Note 2)	

(Note 1) When the actuator is moved back and forth continuously over a distance of 30 mm or less, grease film may disappear. As a guide, move the actuator back and forth over a distance of 50 mm or more for five cycles or so after every 5,000 to 10,000 back-and-forth operations over a short distance. This will restore the oil film.

(Note 2) Check the condition of grease and wipe it off in case it is extremely dirty before supplying new grease.

[Period of Grease Supply (reference)]

Supply grease in the earlier timing of either the operation distance or months described in the table below.

Max. Velocity of Use [mm/s]	Period of Grease Supply (reference)	
	Operation Distance	Months
0 to 750 or less	1,250 km	12 months
Above 750 to 1500 or less	2,500 km	
Above 1500 to 2500 or less	5,000 km	

For the actuators with the guide equipped with the ball retainer (option code RT), implement grease supply in the frequency of the period of grease supply (reference) described in the table below.

Max. Velocity of Use [mm/s]	Period of Grease Supply (reference)	
	Operation Distance	Months
0 to 750 or less	625 km	6 months
Above 750 to 1500 or less	1,250 km	
Above 1500 to 2500 or less	2,500 km	



Caution:

- The grease may be degraded if the actuator has got stored for 6 months or more. Supply grease before starting to use. Reference to [13.5 Grease Supply]
- The speed of grease degradation differs depending on the environment of use (temperature, humidity and ambient environment). It is recommended to shorten the period of grease supply in case of use in bad environment with high temperature, high humidity, high rate of dust and so on. Also, it is recommended to improve the environment in case the color of the grease changes remarkably due to bad environmental condition.



13.2 Visual Inspection of the Machine Exterior

Check the following items visually.

Main body and work part	Loose mounting bolts, etc.
Cables	Damage to cables, connection of connectors
General	Noise, vibration

13.3 External Cleaning

- Clean the exterior surfaces from time to time.
- Wipe off dirt with a soft cloth, etc.
- Depending on the situation, base oil or grease may ooze out to the actuator surface. If oil has oozed out, wipe it off using a soft cloth, etc.
- To prevent dust from entering the actuator through gaps and openings, do not clean the actuator by blowing highly compressed air onto it.
- Do not use petroleum-based solvents as they damage plastic parts and painted surfaces.
- If the unit gets badly soiled, moisten a soft cloth, etc. with a neutral detergent or alcohol and wipe the soiled area gently.



13.4 Interior Check

Turn off the power, remove the screw cover and visually inspect the interior.

For the interior inspection, check the following items.

Actuator	Loosening of actuator mounting bolts, intrusion of dust and other foreign matters, etc.
Guide	Lubrication condition, soiling, wear, flaking
Ball screw	Lubrication condition, soiling

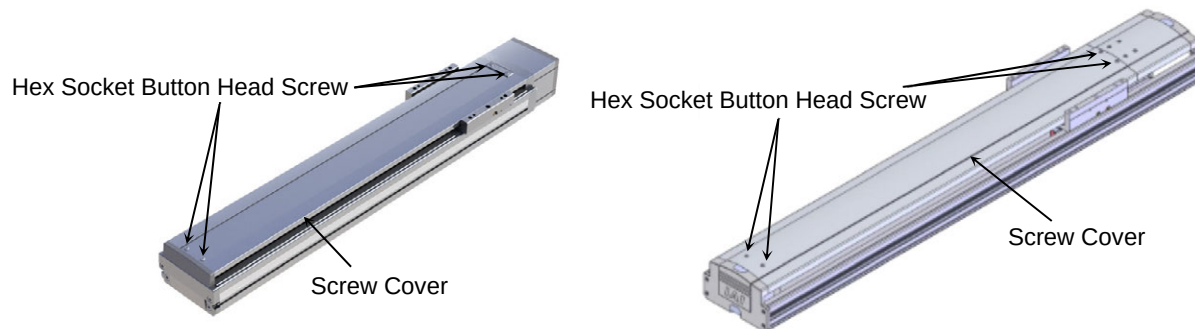
Visually check the condition of the interior. Specifically, see if there is any dust or foreign object, etc. inside the actuator and also check the condition of lubrication.

Even if the grease has turned brown, lubrication is fine as long as the traveling surface appears shiny.

If the grease becomes dirty and dull due to dust, or if the grease has worn away due to an extended operating time, lubricate the parts after cleaning them.

[The procedure for checking the interior is explained below.]

- [1] Remove the screw cover using an Allen wrench of 2 mm across flats for ISB and ISPB-SXM, or 2.5 mm across flats for all other models.



- [2] Check the interior.

- [3] When the inspection is complete, tighten the mounting screws for the screw cover.

[Cleaning the interior]

- Wipe off dirt with a soft cloth, etc.
- If constituents of grease have separated and base oil has accumulated on both ends of the guide rail, wipe off the oil using a soft cloth, etc. If the accumulated oil is not wiped off, it may seep out to the exterior of the actuator.
- To prevent dust from entering the actuator through gaps and openings, do not clean the actuator by blowing highly compressed air onto it.
- Do not use petroleum-based solvents, neutral detergents or alcohol.



Caution: If grease contains a large amount of foreign matter, be sure to wipe off the dirty grease before adding new grease.



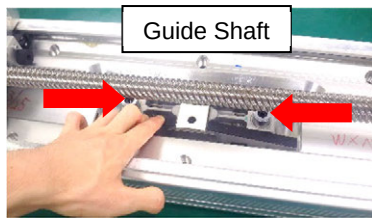
- Warning:**
- Do not disassemble the front cover because the ball screw is supported by the front cover. If a proper adjustment of the front cover is lost, the shaft center may become offset and the traveling resistance may increase or life of each part may become shorter, or abnormal noises may generate.
 - An encoder is built into the encoder cover. The encoder not only detects the rotation angle and home signal, but it also performs a critical function in the AC control and the encoder and motor phases have been adjusted precisely. Never touch the encoder.

[Inspection on Intermediate Support]

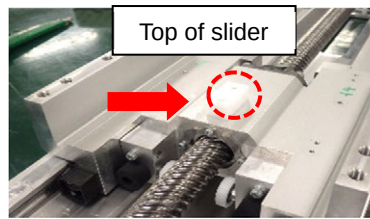
Applicable Models: ISB, ISPB-WXMX

- (1) Conduct a visual inspection on the intermediate support and the slider top. In case any of those below is confirmed, clean up each area and have grease supplied.
- Grease is dirty and has lost gloss on the guide shaft (pointed with arrow) for the intermediate support.
 - Grease is dirty and has lost gloss on the slider top (marked in red circle).

Refer to ["13.5 Grease Supply" for procedures for grease supply]



Intermediate Support





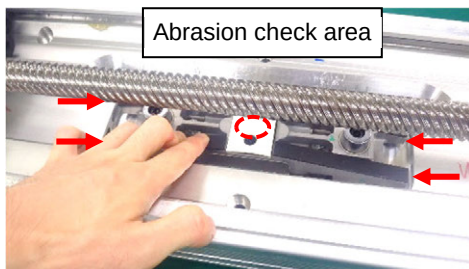
(2) Conduct a replacing work with below as reference.

- When the contact to the ball screw (1 place: marked in red circle) or rubber parts (4 places: pointed with arrow) is/are remarkably worn down
- When the operation resistance has exceeded the criteria below in upward and downward operation of the intermediate support when it is pressed straight with a tool such as a force gauge at any point in the marked area in the figure below

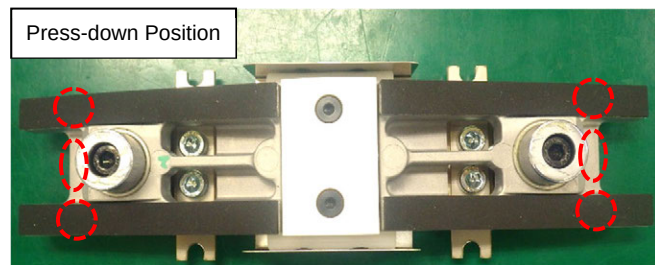
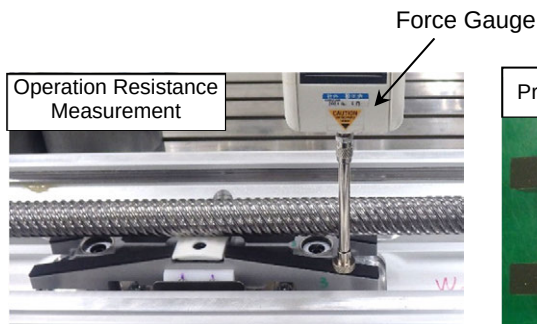
Installation orientations	Operation Resistance for Reference of Replacement
Horizontal	50N
Vertical	60N

Refer to ["14. Replacing Intermediate Support Parts Procedures" for procedures for replacement of intermediate support unit]

Operation resistance at delivery (reference)
15 to 25 N



Make sure to press down straight on one of the press-down points (marked in red circle) shown in the figure below for measurement when measuring the operation resistance of the intermediate support unit. Do not attempt to press down at the center otherwise the period of maintenance cannot be grasped properly.





13.5 Grease Supply

13.5.1 Applicable Grease

[1] For Those other than Lead 36mm of SXM/SXL and Lead 48mm of MXM/MXL/MXMX

The following blends of lithium-based grease are charged before shipment from IAI.

Model	Parts	Factor-set grease	Manufacturer
ISB, ISPB SXM/SXL MXM/MXL/MXMX LXM/LXL/LXMX/LXUWX WXM/WXMX	Guide, ball screw	Daphne Grease MP No. 2	Idemitsu Kosan
SSPA	Guide, ball screw	Daphne Grease MP No. 2	Idemitsu Kosan
ISB, ISPB LXM/LXMX/LXUWX WXMX	Intermediate support	Daphne Grease MP No. 2 ^(Note 1)	Idemitsu Kosan

Note 1 Multemp LRL No. 3 (Kyodo Yushi) can also be applied for models other than WXM.



Warning: Never use with anything other than lithium-based grease.
Mixing with anything other lithium-based grease not only reduces the performance of the grease, it may even cause damage to the actuator.

[2] For Lead 36mm of SXM/SXL and Lead 48mm of MXM/MXL/MXMX

Urea based grease is used at the delivery from our factory

Model	Parts	Factor-set grease	Manufacturer
ISB SXM/SXL: Lead 36mm MXM/MXL/MXMX: Lead 48mm	Guide, ball screw	Multemp ET-R	Kyodo Yushi



Warning: Never use with anything other than urea-based grease.
Mixing with anything other urea-based grease not only reduces the performance of the grease, it may even cause damage to the actuator.

13.5.2 Grease Application Method

(Note) In case supplying grease from the grease nipple is not possible, follow (2) to supply grease.

(1) Grease supply to the guide and ball screw from the grease nipple

◆ Models except for WXM/WXMX

There are grease nipples equipped on the sides of the slider (1 place on one side, 2 places in total). Grease supply to the guide and ball screw through here.

The grease nipple on the right facing from the motor is to grease supply to the guide and ball screw on the right side.

The grease nipple on the left facing from the motor is to grease supply to the guide and ball screw on the left. (Grease can be added to the ball screw from either side of the grease nipples.)

◆ Models for WXM/WXMX (Drive Sliders for Single Slider Type and Double Slider Type)

There are grease nipples for guides and ball screw on the sides of the slider (2 points on one side, 4 points in total). Grease supply to the guide and ball screw through here.

At the grease nipples on the right side when facing the motor, grease can be supplied to the guide on the right and the ball screw.

At the grease nipples on the left side when facing the motor, grease can be supplied to the guide on the left and the ball screw.

(Grease can be added to the ball screw from either side of the grease nipples.)

◆ Models for WXM/WXMX (Free Slider for Double Slider Type)

There are grease nipples equipped on the sides of the slider for grease supply on the guides (1 place on one side, 2 places in total).

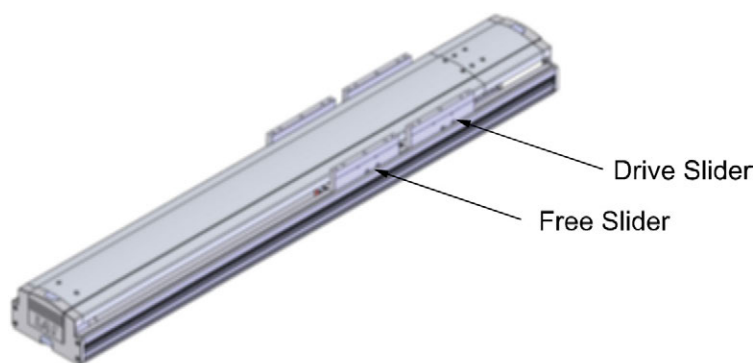
Refer to [Grease Supply Outlets for WXM/WXMX Double Slider in the Page 95]

Supply grease to the guides at the grease nipples for the guides.

On the grease nipple right side when facing the motor, should supply grease to the guide on the right side.

On the grease nipple left side when facing the motor, should supply to the guide on the left side.

(Note) Except the grease supply on the guides, there is no need of supplying grease.



WXM/WXMX Double Slider



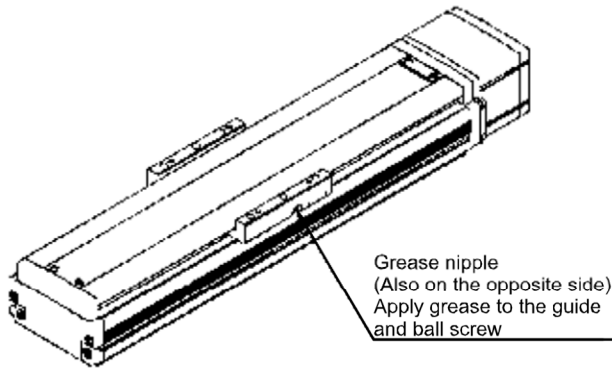
- [1] Apply grease from the left or right grease nipple using a grease gun.

Model		Grease Supply (Reference for 1 Slider)
ISB ISPB	SXM/SXL	1.5 cc to 2 cc
	MXM/MXMX/MXL	3.5 cc to 4 cc
	LXM/LXMX/LXL	4.5 cc to 5 cc
	LXUWX	2 cc to 2.5 cc
	WXM/WXMX	4.5 cc to 5 cc
SSPA	S	2 cc to 2.5 cc
	M	5 cc to 5.5 cc
	L	5 cc to 5.5 cc

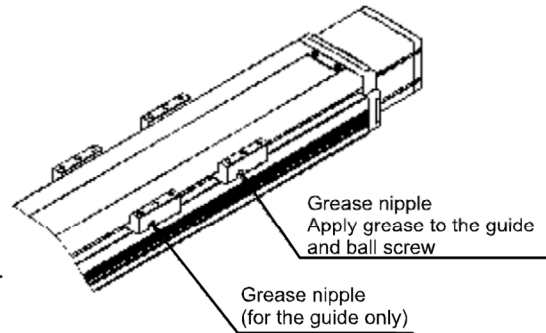
- [2] Rotate the slider several times manually to spread out the grease evenly. Confirm that the ball tracks on the ball screw and guide look glossy with oil of grease. Supply grease again if it is not spread enough.
- [3] Wipe off any excess grease.



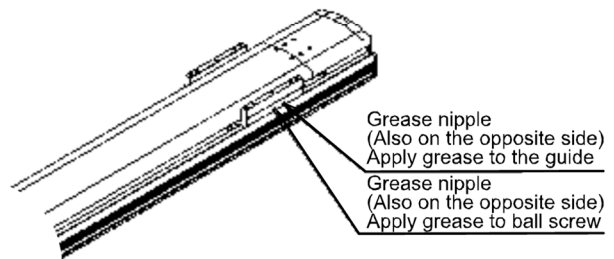
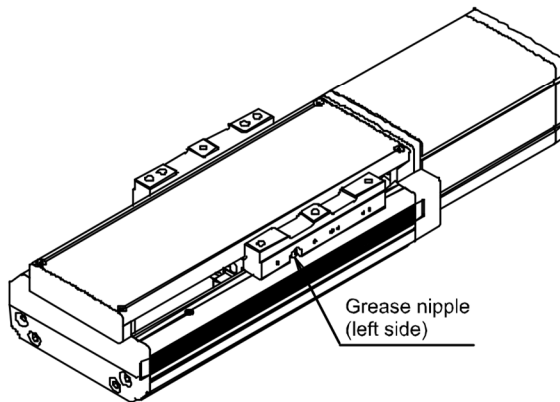
- Caution:
- Charging too much grease may increase the agitation resistance and cause the ball screw to generate heat easily or allow excess grease on the ball screw to scatter around and dirty the surroundings as the screw turns. Be sure to wipe off excess grease.
 - It is difficult to move actuators of short leads by hand. With these actuators, do not try to move the actuator by force, but connect a controller and move the actuator by jog operation.



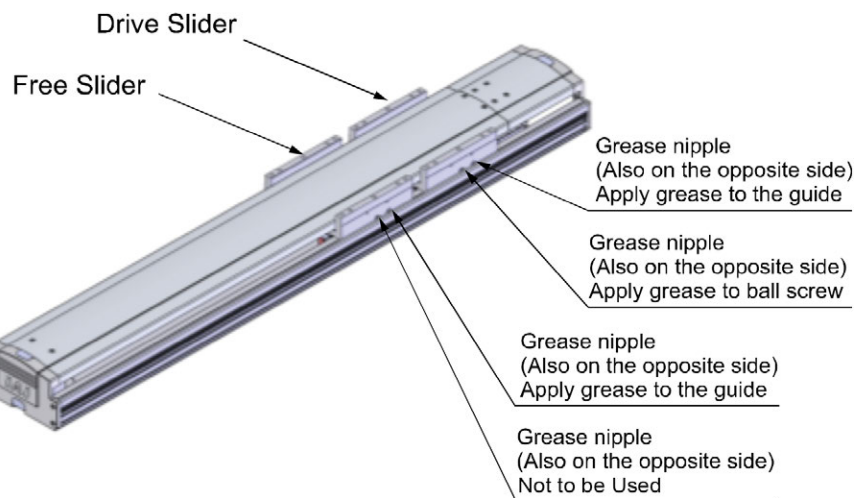
Standard grease application opening



LXUWX grease application opening



WXM/WXMX grease application opening



Grease Supply Outlets on WXM/WXMX Double Slider Type



(Note) Follow the grease nipple diameter shown in the list below when preparing a grease gun.

Model	Nipple diameter (mm)
ISB, ISPB-S	φ3.5
ISB, ISPB-M	φ6.0
ISB, ISPB-L	φ6.0
ISB, ISPB-W	φ6.0
SSPA-S	φ3.5
SSPA-M	φ6.0
SSPA-L	φ6.0

Grease Gun Attachment Screw R1/8	Maker
(Example) GC-57K	Yamada Corporation

Nozzle	Maker
N type + Dedicated Nozzle U Type N type  Dedicated Nozzle U Type  ◎ Connect N type to the tip of the dedicated nozzle U type and attach a grease gun to use.  N type Dedicated Nozzle U Type Attachment Screw R1/8 on Grease Gun Attachment Side	THK

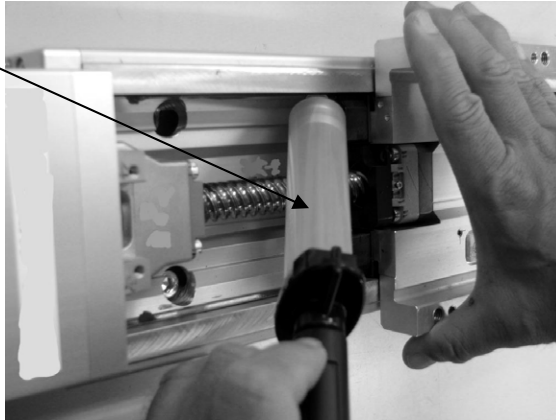


Caution: In case the grease got into your eye, immediately go to see the doctor to get an appropriate care.
After finishing the grease supply work, wash your hands carefully with water and soap to rinse the grease off.

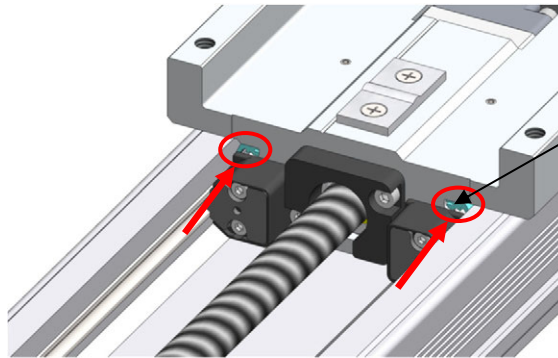


- (2) Grease supply to the guide and ball screw in case grease cannot be supplied from grease nipple
- [1] Remove the screw cover using an Allen wrench of 2.5 mm across flats for ISB and ISPB-SXM, or 3 mm across flats for all other models.
 - [2] For the guide part, apply grease to the ball sliding area from the gap on the side seal indicated with an arrow with using a grease injector while sliding the slider back and forth to spread the grease. Supply the grease to the guides on both sides. Wipe away the excess grease at last.

Grease Injector



Side Seal





- [3] Apply the grease on the ball screw with hand after cleaning it, and move the slider back and forth to spread the grease.
Wipe away the excess grease at last.



- [4] Once the grease supply is finished, attach the screw cover and tighten the screw.



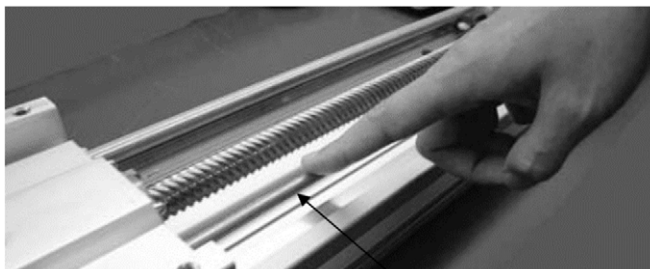
- Caution:**
- Charging too much grease may increase the agitation resistance and cause the ball screw to generate heat easily or allow excess grease on the ball screw to scatter around and dirty the surroundings as the screw turns. Be sure to wipe off excess grease.
 - It is difficult to move actuators of short leads by hand. With these actuators, do not try to move the actuator by force, but connect a controller and move the actuator by jog operation.
 - In case the grease got into your eye, immediately go to see the doctor to get an appropriate care. After finishing the grease supply work, wash your hands carefully with water and soap to rinse the grease off.



- (3) Grease supply to the intermediate support
Applicable models: ISB, ISPB-MXMX/LXMX/LXUWX

[Connecting rods]

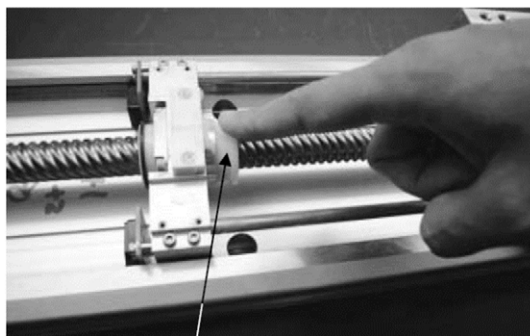
After cleaning the two connecting rods at the intermediate support, apply grease to the rods using a finger. Thereafter, move the slider back and forth to let the grease spread evenly.



Connecting rod

[Support bushes]

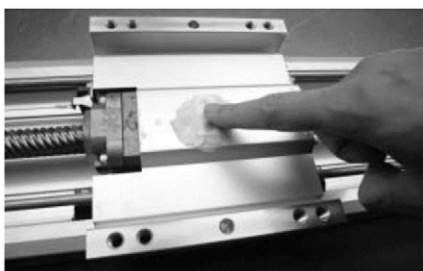
After cleaning the support bushes at both ends of the intermediate support, apply grease to the areas around the bushes using a finger while turning each support bush. Thereafter, move the slider back and forth to let the grease spread evenly.



Support bush

[Top of slider and intermediate support]

After cleaning the top of the slider and top of the intermediate support at both ends, apply grease to these areas using a finger. This is to protect the top of the slider and intermediate support against contact with the screw cover.



Top of slider



Top of intermediate support



Caution: In case the grease got into your eye, immediately go to see the doctor to get an appropriate care. After finishing the grease supply work, wash your hands carefully with water and soap to rinse the grease off.



Applicable Models: ISB, ISPB-WXMX

The intermediate support does not require regular grease supply.

Supply grease when the grease is dirty and has lost gloss at internal inspection or when grease is wiped off in a cleaning work.

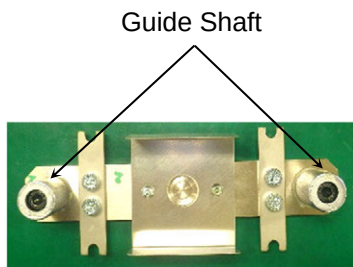
[Guide Shaft]

After cleaning the two guide shafts on the intermediate support, apply grease with hand.

Cleaning and grease supply should be performed with the intermediate support unit taken off or pressed down.

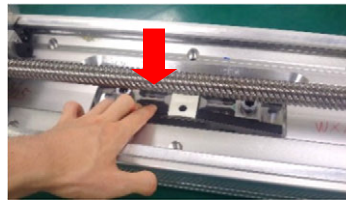
After applying grease on the intermediate support, move it up and down so the grease can be spread out evenly.

Refer to [14. Replacing Intermediate Support Parts Procedures for how to take the intermediate support out]



Intermediate support

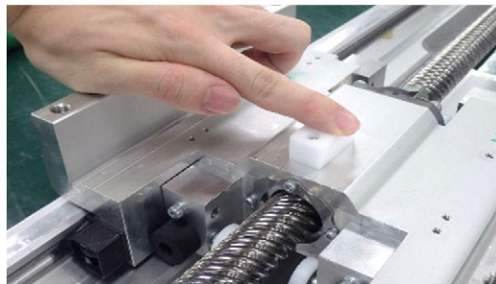
Press it down to supply grease



[Top of slider]

After cleaning the top of slider, apply grease with hand.

It is purposed to protect from a contact to the screw cover.





14. Replacing Intermediate Support Parts Procedures

In this section, explains how to replace the intermediate support procedure.

Those parts such as screws taken off for replacement work are necessary when assembling the product back. It is recommended to prepare a storage box in advance to starting the work, so the taken off parts can be kept in it.

14.1 MXMX/LXMX/LXUWX

[Need for replacement]

- Tension wire (For one model: Two tension wires)

Type	Model
MXMX	WR-MXMB- (Stroke)
LXMX	WR-LXMB- (Stroke)
LXUWX	WR-LXUB- (Stroke)



- Set of support hooks (For one model: Two sliders and two mounting bases) * Replace them if necessary

Type	Model
MXMX/LXMX/LXUWX	WF-1



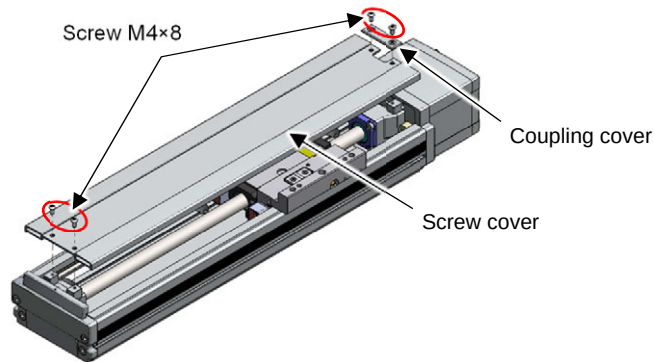
- Torque wrench or hex wrench 2.5mm-sized, 3mm-sized
- Tension gauge
- Adjustment wire *When pulling to measure tension

**[Step]**

- (1) Remove the hex socket button head screws holding the screw cover, and then remove the coupling cover and screw cover.

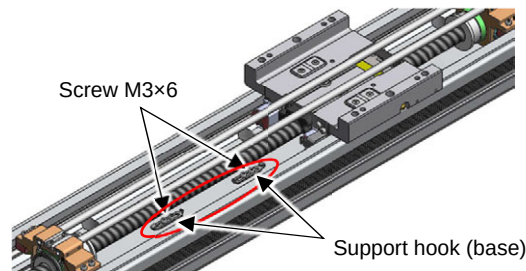
(Four screws: M4×8)

* If it cannot be removed, slide the screw cover to the position where you can process the work in step 2.



- (2) Loosen one of the hex socket head screws on the support hooks that secure to the base and remove the tension wire.

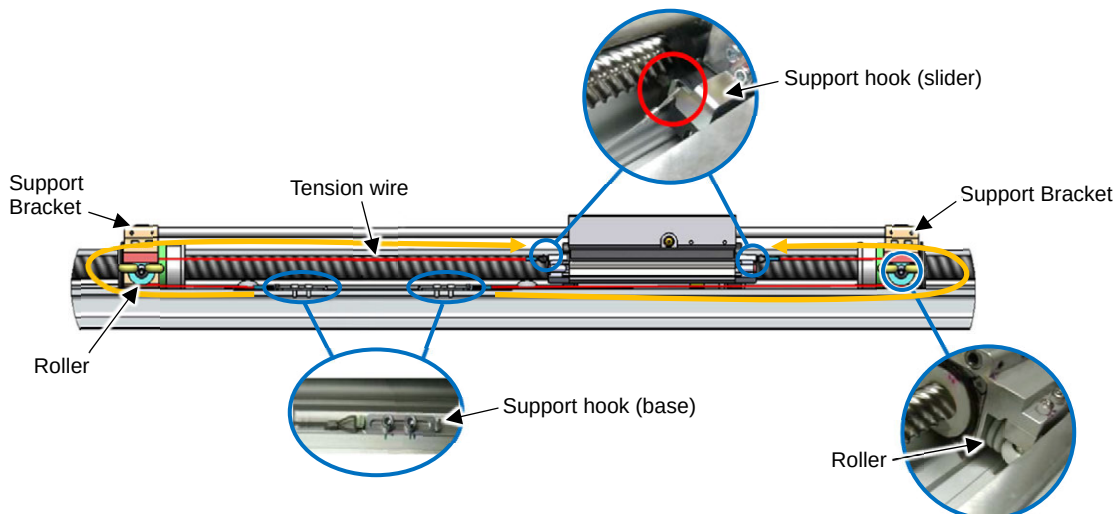
(Two screws: M3×6)



- (3) Attach the new tension wire.

Hook the tension wire on the support hook (base), thread through the roller of the support bracket, and hook the tension wire on the support hook (slider).

Tighten the bolts so that the support hook does not loosen up and down.



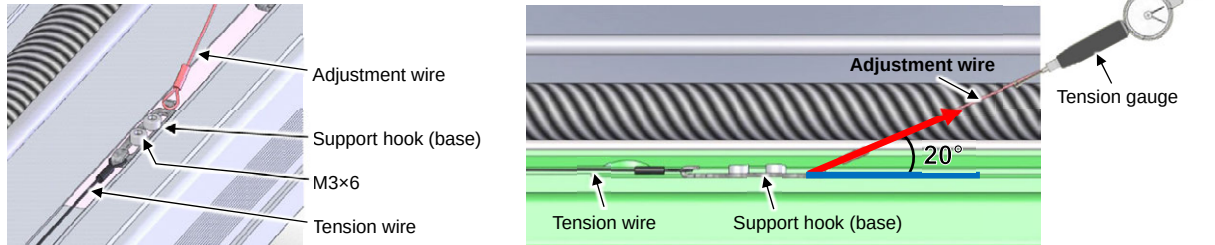


- (4) Apply the specified tension to the support hook (base) and tighten the hex socket head screws. The pulling (pushing) angle should be 20 degrees or less.

Tension	Tightening torque
1.6kgf	0.83N·m

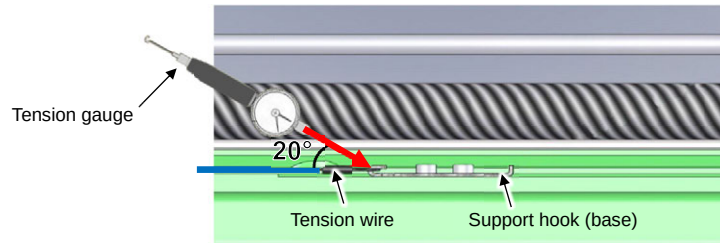
[Apply the tension (1)]

Hook the adjustment wire on the support hook (base) and pull it with the specified tension with a tension gauge.



[Apply the tension (2)]

Push the support hook (base) with the tension gauge to the specified pressure.

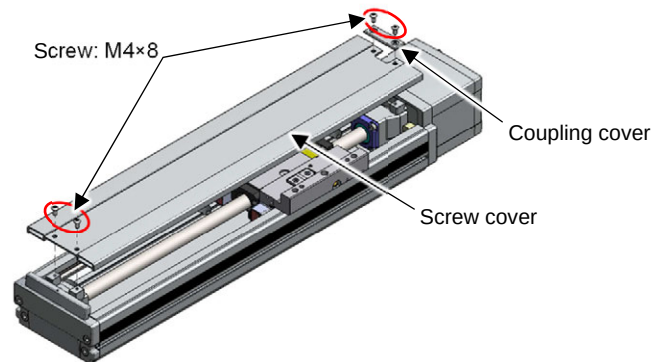


- (5) Move the slider by hand and make sure that slider works smoothly.



- (6) Install the screw cover and then
Secure with hex socket head screws for fixing.

Tightening torque
1.9N·m





14.2 WXXM

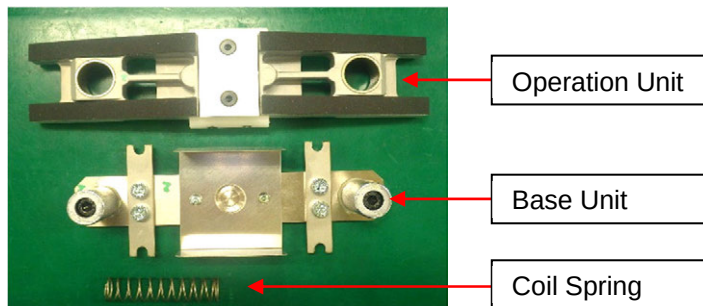
Quantity of Intermediate Supports

Stroke [mm]	Quantity
900 to 1550	1
1600 to 2550	2
2600 to 3000	3

(1) Check and Assembly of Intermediate Support Unit

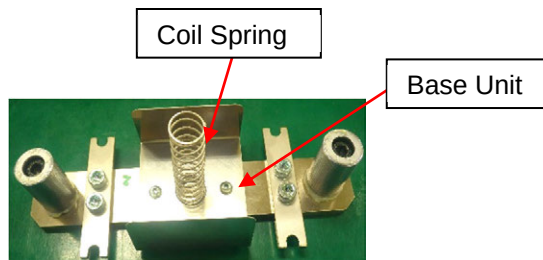
Make sure that all the components for the intermediate support unit are ready. (3 components in figure below)

* Intermediate Support Assembly Model Code: IMS-ISB-WXM

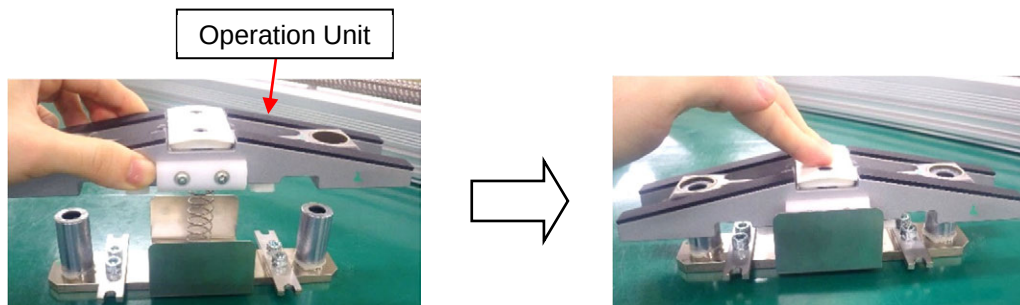


Assemble the intermediate support unit as shown in the figure below.

[1] Mount Coil Spring to Base Unit.



[2] Attach Operation Unit.



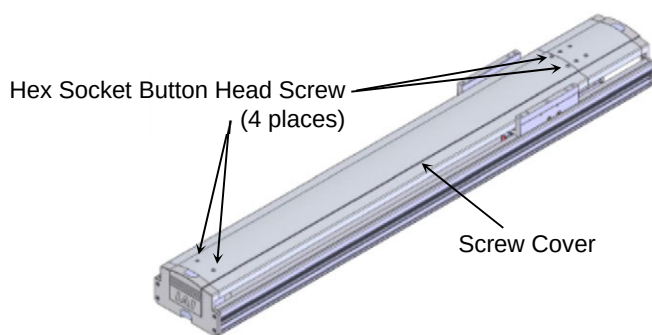


- Caution:**
- Do not attempt to wipe off the grease applied on the guide shafts. If wiped off, apply grease again to the entire area all around the shafts before use. Refer to [13.5 Grease Supply for the grease to be used]
 - Pay attention on the guide shafts so they would not have any foreign substance or dirt applied on them.
 - Insert the bearings straight to the guide shafts. Having the bearing tilted while insertion could make the bearings damaged and may cause operation error or abnormal noise.

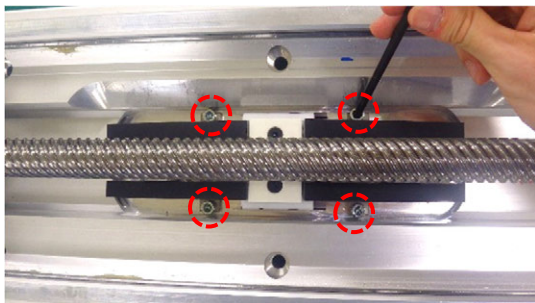
(2) Detaching Intermediate Support Unit

Take off the hex socket button head screws holding the screw cover with using a hex wrench, and then take off the screw cover.

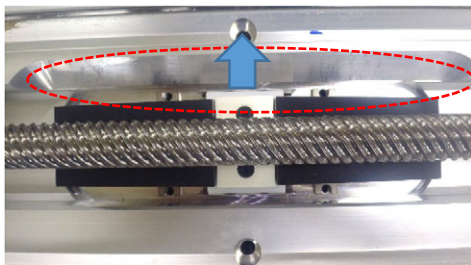
(Button head screw: 4 places, Hex wrench: 2.5mm-sized)



Take off the hex socket head cap screws holding the intermediate support unit with using a hex wrench. (4 places of button head screw: marked in red circle, Hex wrench: 5mm-sized)

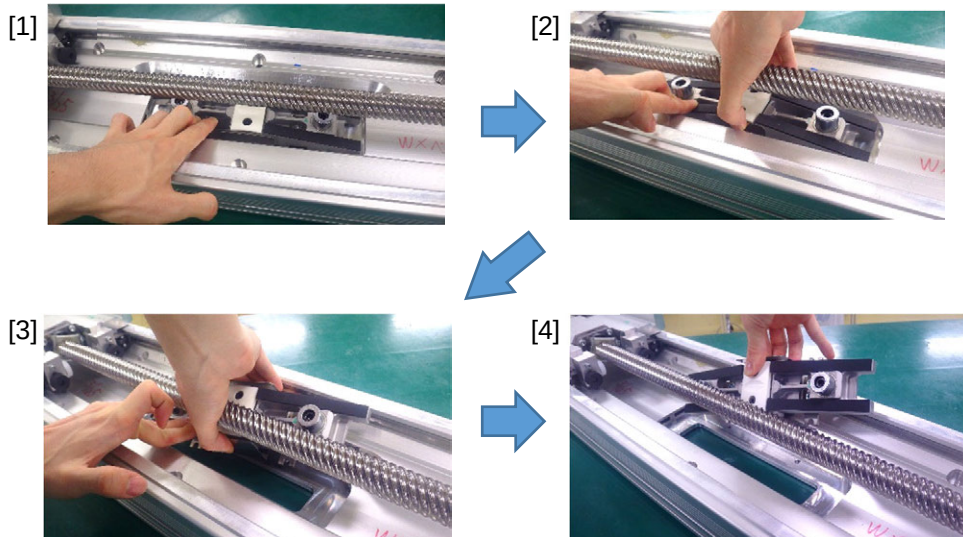


Confirm the direction to take off the intermediate support unit.
The direction with a big cutout on the base is the way to take off the unit.





With the operation unit being compressed, hold the metal plate part on the base unit and take it off.



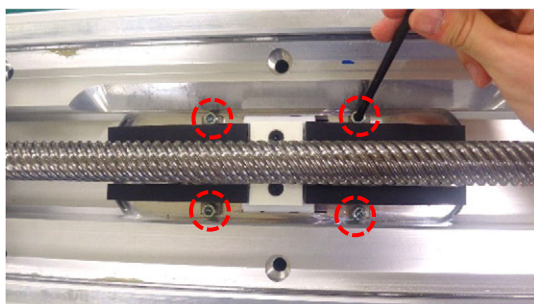
(3) Attaching Intermediate Support Unit

Attach the intermediate support unit in the back order of (2).

Tighten the hex socket head cap screws with using a hex wrench to hold the intermediate support unit.

(4 places of button head screw: marked in red circle, Hex wrench: 5mm-sized)

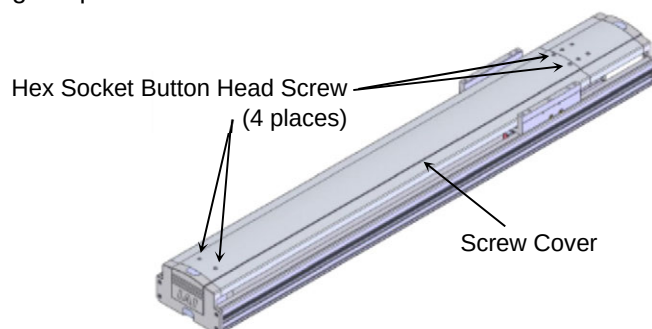
* Tightening Torque: 5.4N•m



Put on the screw cover, and tighten the hex socket button head screws (4 places) with using a 2.5mm-sized hex wrench to hold the screw cover.

(Button head screw: marked in red circle, Hex wrench: 2.5mm-sized)

* Tightening Torque: 1.9N•m







15. Motor Replacement Procedures

The following explains the procedure to replace the motor in the event of coil breakage, etc.

Prepare a storage box, etc., and keep in this box, etc., all screws and other parts you have removed to replace the motor, because they will be needed during the reassembly. Please be careful not to lose the removed parts.



Caution: When replacing the motor, you must turn on/off the power and servo to perform the following tasks.

Exercise due caution when carrying out each task with the power being supplied.

[1] Position the coupling on the motor alone

[2] Install the motor

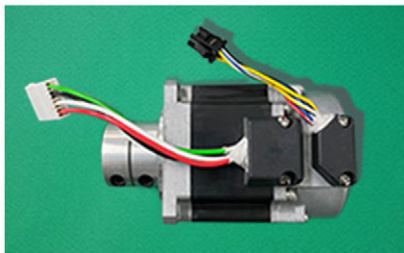
[3] Operate the brake

The purpose of [1] and [2] is to correlate the motor/encoder and actuator positions. If these tasks are not performed, home return may not be implemented normally.

[3] is performed because the brake, which is a non-excitation brake, cannot be released without excitation.

15.1 Other than WXM/WXMX

Replacement Motor



* with Actuator cable

Replacement Motor Unit Type

Type	Motor capacity [W]	Encoder types	Cable exit direction	Motor unit type * with Actuator cable	
				without Brake	with Brake
ISB/ISPB-SXM/SXL	60	Battery-less Absolute	A1E, A1S	M-ISB-TMA060-WA-CO-A1	M-ISB-TMA060-WA-B-CO-A1
			A3E, A3S	M-ISB-TMA060-WA-CO-A3	M-ISB-TMA060-WA-B-CO-A3
		Absolute	A1E, A1S	M-ISB-TMA060-TA-CO-A1	M-ISB-TMA060U-TA-B-CO-A1*
			A3E, A3S	M-ISB-TMA060-TA-CO-A3	M-ISB-TMA060U-TA-B-CO-A3*
		Incremental	A1E, A1S	M-ISB-TMA060-TC-CO-A1	M-ISB-TMA060U-TC-B-CO-A1*
			A3E, A3S	M-ISB-TMA060-TC-CO-A3	M-ISB-TMA060U-TC-B-CO-A3*
	100	Battery-less Absolute	A1E, A1S	M-ISB-TMA100S-WA-CO-A1	M-ISB-TMA100S-WA-B-CO-A1
			A3E, A3S	M-ISB-TMA100S-WA-CO-A3	M-ISB-TMA100S-WA-B-CO-A3
ISB/ISPB-XM/MXL/MXMX	100	Battery-less Absolute	A1E, A1S	M-ISB-TMA100-WA-CO-A1	M-ISB-TMA100-WA-B-CO-A1
			A3E, A3S	M-ISB-TMA100-WA-CO-A3	M-ISB-TMA100-WA-B-CO-A3
		Absolute	A1E, A1S	M-ISB-TMA100-TA-CO-A1	M-ISB-TMA100U-TA-B-CO-A1*
			A3E, A3S	M-ISB-TMA100-TA-CO-A3	M-ISB-TMA100U-TA-B-CO-A3*
		Incremental	A1E, A1S	M-ISB-TMA100-TC-CO-A1	M-ISB-TMA100U-TC-B-CO-A1*
			A3E, A3S	M-ISB-TMA100-TC-CO-A3	M-ISB-TMA100U-TC-B-CO-A3*
	200	Battery-less Absolute	A1E, A1S	M-ISB-TMA200-WA-CO1-A1	M-ISB-TMA200-WA-B-CO1-A1
			A3E, A3S	M-ISB-TMA200-WA-CO1-A3	M-ISB-TMA200-WA-B-CO1-A3
		Absolute	A1E, A1S	M-ISB-TMA200-TA-CO1-A1	M-ISB-TMA200U-TA-B-CO1-A1*
			A3E, A3S	M-ISB-TMA200-TA-CO1-A3	M-ISB-TMA200U-TA-B-CO1-A3*
		Incremental	A1E, A1S	M-ISB-TMA200-TC-CO1-A1	M-ISB-TMA200U-TC-B-CO1-A1*
			A3E, A3S	M-ISB-TMA200-TC-CO1-A3	M-ISB-TMA200U-TC-B-CO1-A3*
	400	Battery-less Absolute	A1E, A1S	M-ISB-TMA400M-WA-CO-A1	M-ISB-TMA400M-WA-B-CO-A1
			A3E, A3S	M-ISB-TMA400M-WA-CO-A3	M-ISB-TMA400M-WA-B-CO-A3
ISB/ISPB-LXM/LXL/LXMX/LXUWX	200	Battery-less Absolute	A1E, A1S	M-ISB-TMA200-WA-CO2-A1	M-ISB-TMA200-WA-B-CO2-A1
			A3E, A3S	M-ISB-TMA200-WA-CO2-A3	M-ISB-TMA200-WA-B-CO2-A3
		Absolute	A1E, A1S	M-ISB-TMA200-TA-CO2-A1	M-ISB-TMA200U-TA-B-CO2-A1*
			A3E, A3S	M-ISB-TMA200-TA-CO2-A3	M-ISB-TMA200U-TA-B-CO2-A3*
		Incremental	A1E, A1S	M-ISB-TMA200-TC-CO2-A1	M-ISB-TMA200U-TC-B-CO2-A1*
			A3E, A3S	M-ISB-TMA200-TC-CO2-A3	M-ISB-TMA200U-TC-B-CO2-A3*
	400	Battery-less Absolute	A1E, A1S	M-ISB-TMA400-WA-CO-A1	M-ISB-TMA400-WA-B-CO-A1
			A3E, A3S	M-ISB-TMA400-WA-CO-A3	M-ISB-TMA400-WA-B-CO-A3
		Absolute	A1E, A1S	M-ISB-TMA400-TA-CO-A1	M-ISB-TMA400U-TA-B-CO-A1*
			A3E, A3S	M-ISB-TMA400-TA-CO-A3	M-ISB-TMA400U-TA-B-CO-A3*
		Incremental	A1E, A1S	M-ISB-TMA400-TC-CO-A1	M-ISB-TMA400U-TC-B-CO-A1*
			A3E, A3S	M-ISB-TMA400-TC-CO-A3	M-ISB-TMA400U-TC-B-CO-A3*



Type	Motor capacity [W]	Encoder types	Cable exit direction	Motor unit type * with Actuator cable	
				without Brake	with Brake
SSPA-SXM	200	Absolute	A1E, A1S	M-SSPA-TMA200-TA-CO-A1	M-SSPA-TMA200U-TA-B-CO-A1
			A3E, A3S	M-SSPA-TMA200-TA-CO-A3	M-SSPA-TMA200U-TA-B-CO-A3
		Incremental	A1E, A1S	M-SSPA-TMA200-TC-CO-A1	M-SSPA-TMA200U-TC-B-CO-A1
			A3E, A3S	M-SSPA-TMA200-TC-CO-A3	M-SSPA-TMA200U-TC-B-CO-A3
SSPA-MXM	400	Absolute	A1E, A1S	M-SSPA-TMA400-TA-CO-A1	M-SSPA-TMA400U-TA-B-CO-A1
			A3E, A3S	M-SSPA-TMA400-TA-CO-A3	M-SSPA-TMA400U-TA-B-CO-A3
		Incremental	A1E, A1S	M-SSPA-TMA400-TC-CO-A1	M-SSPA-TMA400U-TC-B-CO-A1
			A3E, A3S	M-SSPA-TMA400-TC-CO-A3	M-SSPA-TMA400U-TC-B-CO-A3
SSPA-LXM	750	Absolute	A1E, A1S	M-SSPA-TMA750-TA-CO-A1	M-SSPA-TMA750-TA-B-CO-A1
			A3E, A3S	M-SSPA-TMA750-TA-CO-A3	M-SSPA-TMA750-TA-B-CO-A3
		Incremental	A1E, A1S	M-SSPA-TMA750-TC-CO-A1	M-SSPA-TMA750-TC-B-CO-A1
			A3E, A3S	M-SSPA-TMA750-TC-CO-A3	M-SSPA-TMA750-TC-B-CO-A3



- Caution:**
- The motor actuator cable exit direction varies depending on the actuator cable exit direction. The cable exit direction must be the same for the motor to be removed and replacement motor to be installed.
If the cable exit direction is different on the installed motor, deviation of the home position will occur.
 - Never loosen the coupling on the motor side.
The slit in the coupling is provided to help correlate the actuator and encoder positions. If the coupling is loosened, home return may not achieve a normal home position.

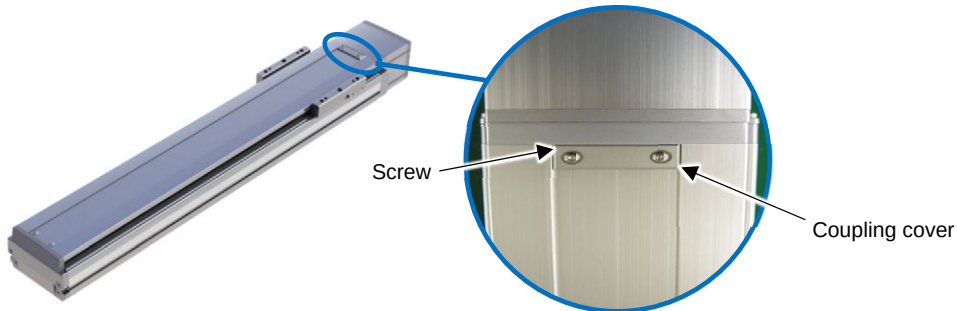


15.1.1 Removing the Motor Unit

[Need for replacement]

Torque wrench or hex wrench: 2.5mm-sized, 3mm-sized, 4mm-sized, 5mm-sized

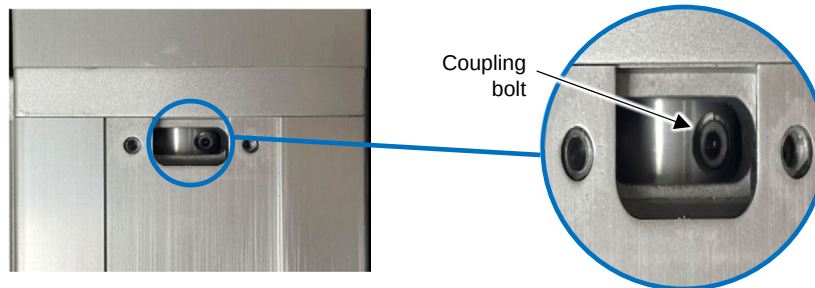
- (1) Removing the coupling cover (Only for ISB and ISPB. For SSPA, proceed to Step (2).)
Turn off the power supply to the controller, and then disconnect the motor cable and encoder cable.
Remove the screws that secures the coupling cover.
(Two screws: ISB, ISPB-SXM/SXL: M3, Other models: M4)
The coupling will be visible.



Move the slider to a position where the coupling bolt can be loosened.

* With brake

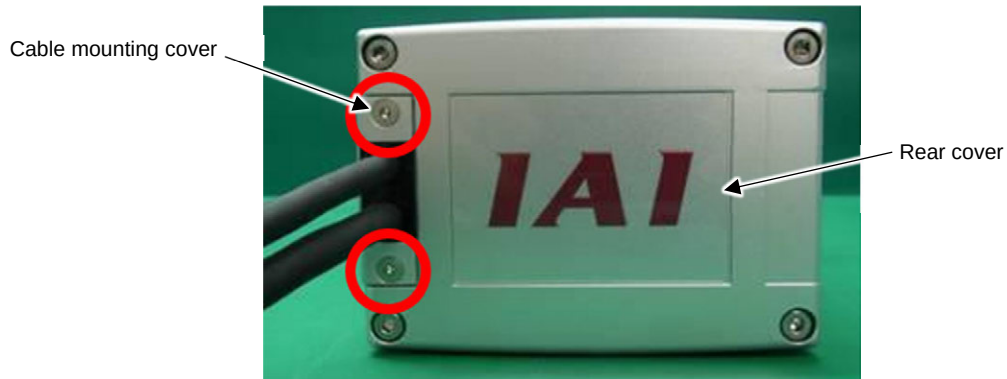
Connect the encoder cable and apply power to the controller to release the brake, and then move the slider. After moving the slider, deactivate the brake release, turn off the power to the controller and disconnect the encoder cable.



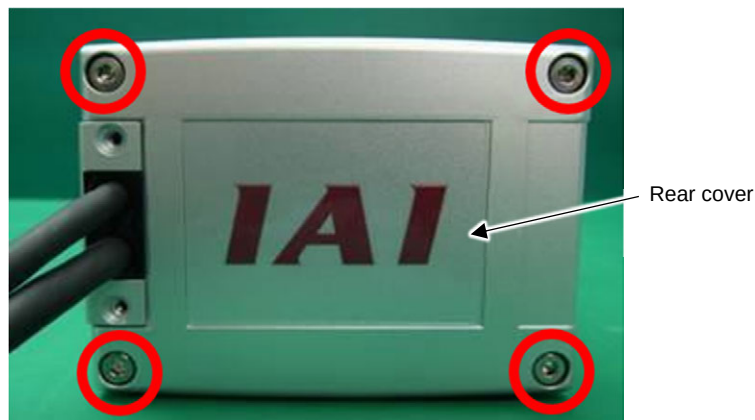
- Caution:
- When the actuator is vertically installed, exercise due caution so that the slider does not fall when the brake is released. Be sure to support the slider externally to prevent it (work part) from falling.
 - If you attempt to move the slider with the motor cable connected, the slider movement will become heavy due to regenerative braking.



- (2) Removing the rear cover
- [1] Remove the screws that secure the cable mounting cover.
(Two screws: M3)



- [2] Remove the screws used to secure the rear cover using a hex wrench, and then remove the rear cover.
(Four screws: M4)

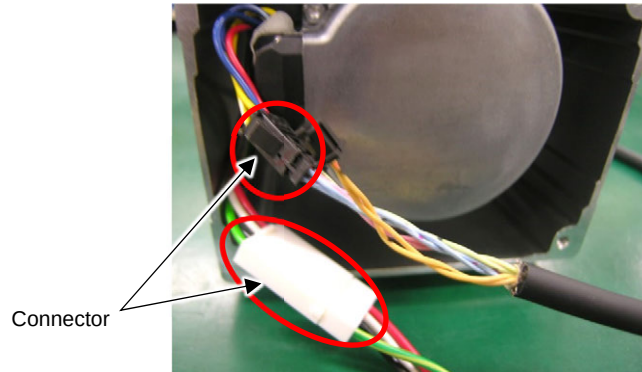




(3) Connector disconnection inside motor cover

There are motor cables and actuator cables joined with a connector inside the motor cover. Disconnect the connectors.

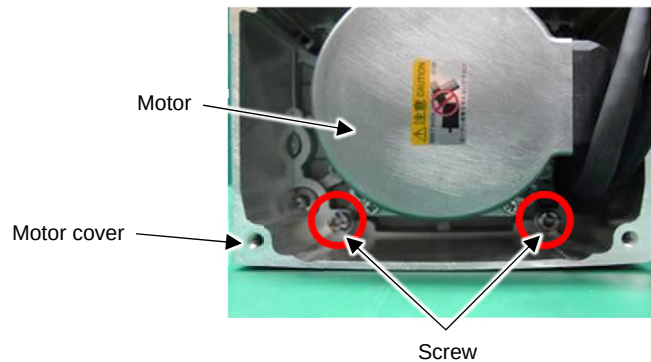
Proceed to Step (4) for those not connected with a connector.



(4) Removing the motor cover

Remove the screws that secure the motor cover. Two of these screws are found below the motor at locations further back in the motor cover.

(Two screws: M4)

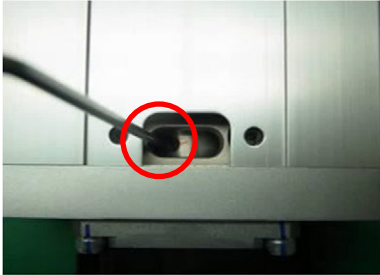




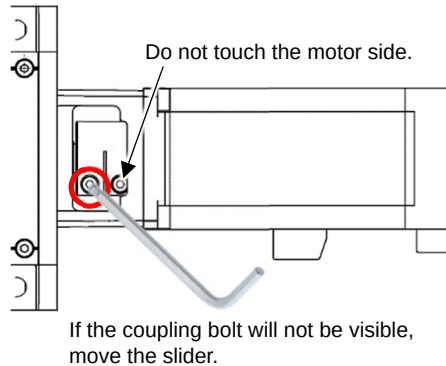
(5) Removing the motor unit

- [1] Loosen the coupling tightening screw (1 place).

ISA/ISPB (Screw: M3)

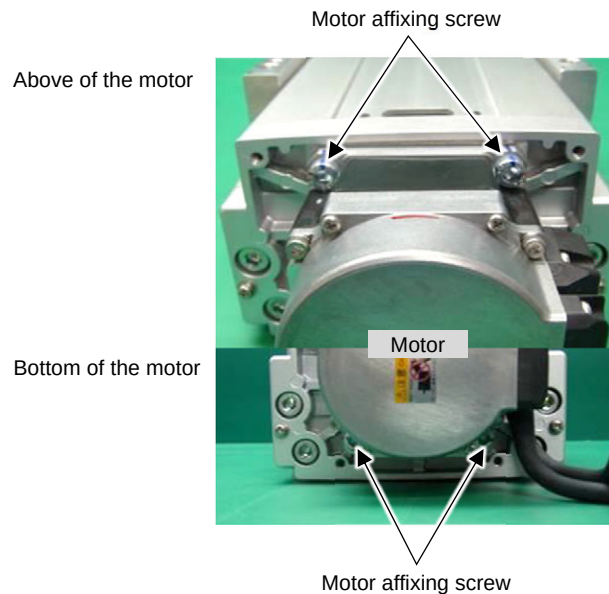


SSPA (Screw: M5)



Caution: If the actuator is installed vertically, exercise due caution not to let the slider drop. Hold the slider (work part) from the outside to prevent it from dropping, and then loosen the coupling bolt. Never loosen the coupling on the motor side.

- [2] Remove the screws used to secure the motor using a hex wrench, and pull out the motor unit and coupling from the motor housing.
(Four screws: ISB/ISPB M5, SSPA M6)

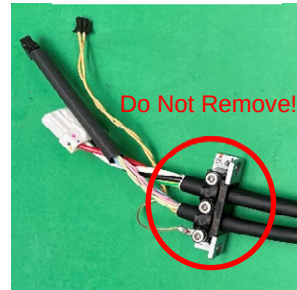




(6) Removing the cable mounting cover

(Note) It is not necessary to have this work process for the type with a connector inside the motor cover.
Do not detach the cable fixing cover.

Type with a connector



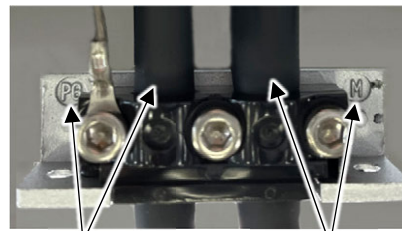
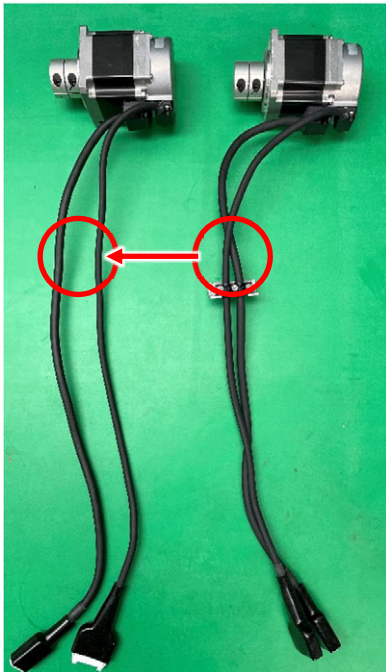
Remove the cable mounting cover from the motor that has been removed and replace it in the same position as the new motor cable.

(Three screws: M3)

The cable mounting cover is imprinted with M and PG. Clamp the motor cable to the M side, and the encoder cable to the PG side.

Tightening torque
0.54N·m

New Motor Removed motor



PG: Encoder cable

M: Motor cable



15.1.2 Installing a Replacement Motor

(1) Aligning the slider position

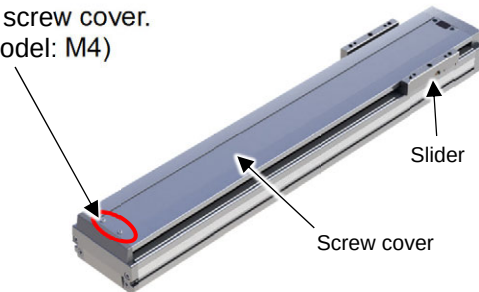
There are four ways to align the position.

- Standard home specification The screw cover can be removed
- Standard home specification The screw cover can not be removed and SSPA
- Reversed home specification The screw cover can be removed
- Reversed home specification The screw cover can not be removed and SSPA

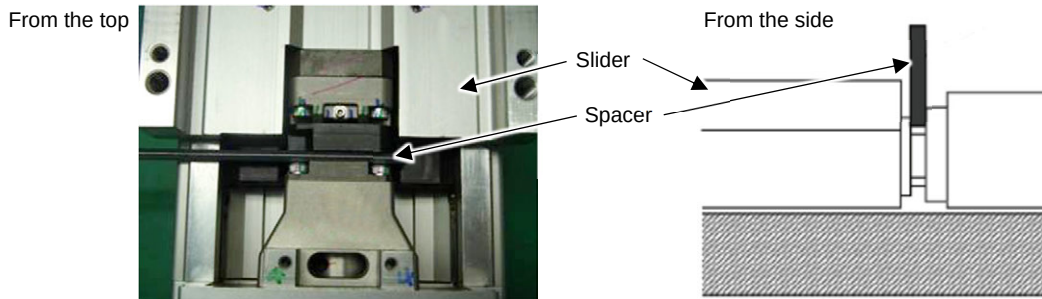
• Standard home specification

[When the screw cover can be removed]

- [1] After removing the jigs on the slider, remove the screw cover.
(Two screws: ISB, ISPB-SXM/SXL: M3, Other model: M4)



- [2] Put the spacer between slider and press it with no gaps.
Refer to the table below for thickness of spacer.



Spacer Thickness by Model

Unit: mm

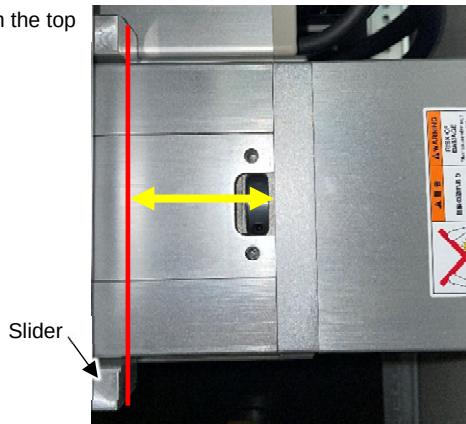
Type	Lead	Standard	Equipped with a limit switch
ISB, ISPB SXM/SXL	4	2	4
	8·16·36	4	4
ISB, ISPB MXM/MXL	5	2	4
	10·20·30·48	4	4
ISB, ISPB MXMX	20·30·48	4	4
ISB, ISPB LXM/LXL	10·20·40	4	4
ISB, ISPB LXMX	20·40	4	4
ISB, ISPB LXUWM	20·40	4	4



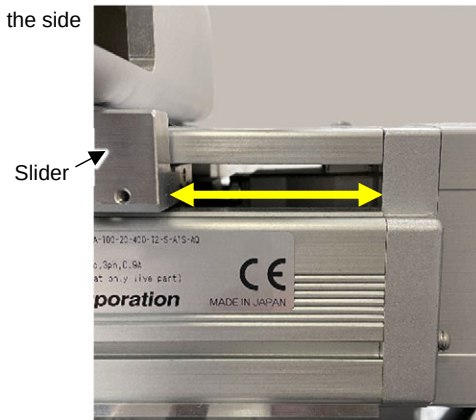
[If screw cover can not be remove and SSPA]

Move the slider according to the dimension in the “Dimension Table by Mode”.

From the top



From the side



Dimension Table by Model

Unit: mm

Type	Lead	Adjust dimension	
		Standard	Equipped with a limit switch
ISB、ISPB SXM/SXL	4	35	37
	8・16・36	37	37
ISB、ISPB MXM/MXL	5	49	51
	10・20・30・48	51	51
ISB、ISPB MXMX	20・30・48	99	99
ISB、ISPB LXM/LXL	10・20・40	54	54
ISB、ISPB LXMX	20・40	106	106
ISB、ISPB LXUWM	20・40	106	106
SSPA SXM	10・20・30	24	24
SSPA MXM	10・20・40	28	28
SSPA LXM	25・50	32	32

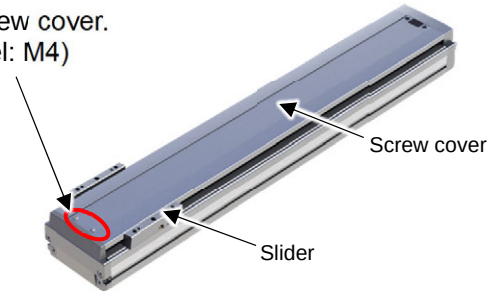


- Reversed home specification

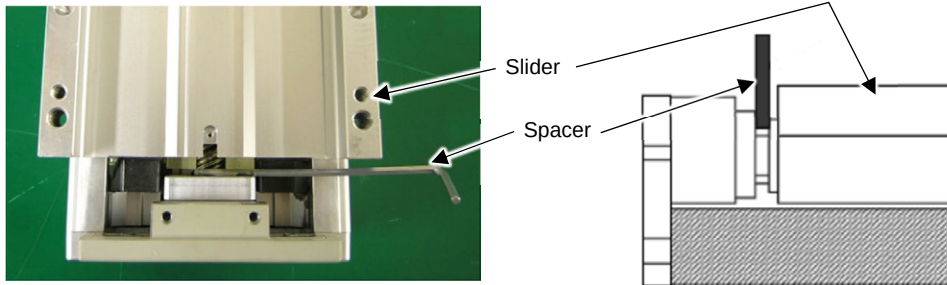
[When the screw cover can be removed]

After removing the jigs on the slider, remove the screw cover.

(Two screws: ISB, ISPB-SXM/SXL: M3, Other model: M4)



Put the spacer between slider and press it with no gaps.
Refer to the table below for thickness of spacer.



Spacer Thickness by Model

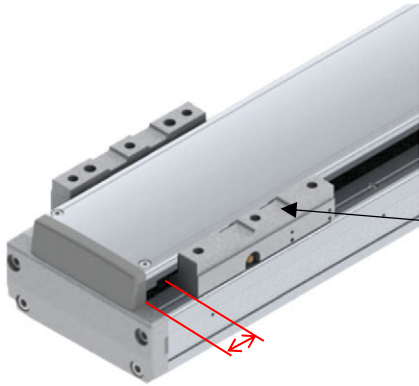
Unit: mm

Type	Lead	Standard	Equipped with a limit switch
ISB, ISPB SXM/SXL	4	2	4
	8·16·36	4	4
ISB, ISPB MXM/MXL	5	2	4
	10·20·30·48	4	4
ISB, ISPB MXMX	20·30·48	4	4
ISB, ISPB LXM/LXL	10·20·40	4	4
ISB, ISPB LXMX	20·40	4	4
ISB, ISPB LXUWM	20·40	4	4

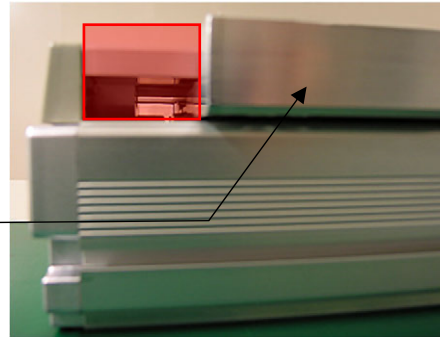


[If screw cover can not be remove and SSPA]

Move the slider according to the dimension in the “Dimension Table by Mode”.



Slider



Dimension Table by Model

Unit: mm

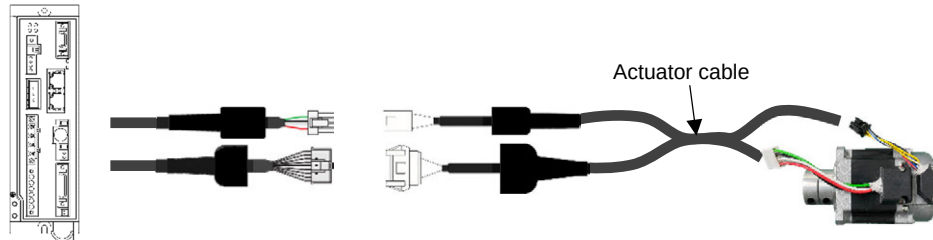
Type	Lead	Adjust dimension	
		Standard	Equipped with a limit switch
ISB、ISPB SXM/SXL	4	20	22
	8・16・36	22	22
ISB、ISPB MXM/MXL	5	29	31
	10・20・30・48	31	31
ISB、ISPB MXMX	20・30・48	79	79
ISB、ISPB LXM/LXL	10・20・40	32	32
ISB、ISPB LXMX	20・40	78	78
ISB、ISPB LXUWM	20・40	78	78
SSPA SXM	10・20・30	24	24
SSPA MXM	10・20・40	28	28
SSPA LXM	25・50	32	32



(2) Aligning the replacement motor position

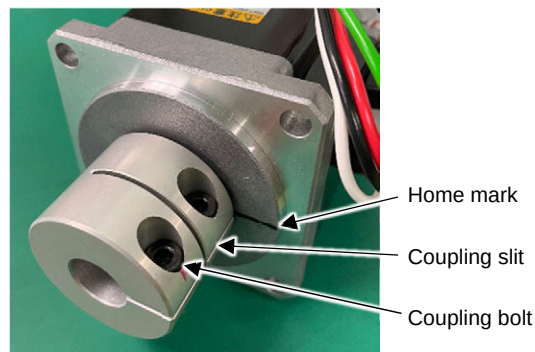
[1] Connect the replacement motor and controller.

* For types in which the motor cable and the actuator cable are connected by a connector, connect the actuator cable before connecting to the controller.



[2] Connect the controller, the teaching software for PC or teaching pendant.

[3] Apply power to the controller, and then run the motor with the jog control to align the home mark on the motor with the slit position on the coupling.
(Jog at 1 mm per second (minimum speed).)



* In certain situations such as when the controller is away from the motor, you can turn on the servo after aligning the coupling and slit positions by hand.



Caution: Never loosen the coupling on the motor side.

The slit in the coupling is provided to help correlate the actuator and encoder positions. If the coupling is loosened, home return may not achieve a normal home position.



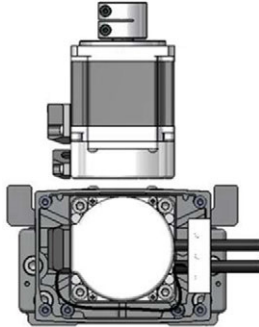
(3) Installing the replacement motor temporarily

- [1] While the servo in the replacement motor kept on, attach the coupling on the motor unit to the end of the ball screw.

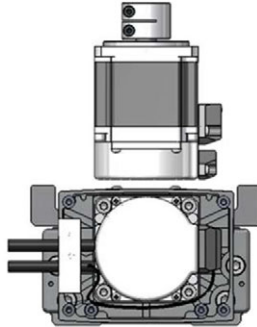
If the cable exits from the left, install the motor as shown in the photograph below so that the motor cable is positioned on the right side. If the cable exits from the right, install the replacement motor in the position opposite of the photograph.

* It may be different for some motors. Be sure to install with the coupling bolt on the upper side.

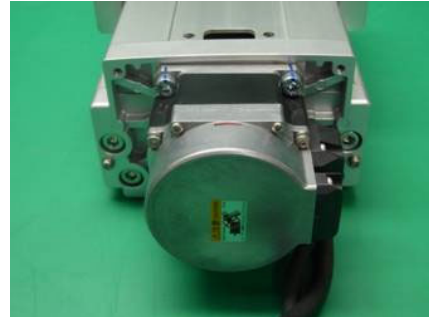
Cable exits from the right



Cable exits from the left



Cable exits from the left



Caution: The cable exit direction must be the same for the motor to be removed and replacement motor to be installed.

If the cable exit direction is different on the installed motor, deviation of the home position will occur.

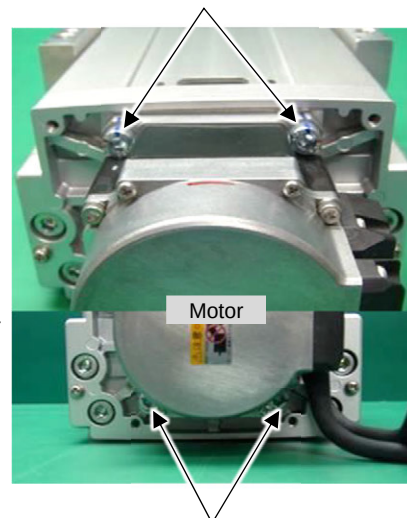
- [2] Tighten the replacement motor loosely with the motor fixing screws (4 places).

Be sure to place them next to each other with no gaps or play.

Type	Screw used
ISB、ISPB SXM/SXL	M4×12
ISB、ISPB MXM/MXL/ MXMX LXM/LXL/LXMX/ LXUWM	M5×15
SSPA SXM	M5×15
SSPA MXM	M5×15
SSPA LXM	M6×20

Above of the motor

Bottom of the motor



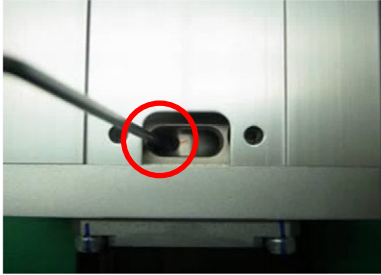
Motor affixing screws

Motor affixing screws

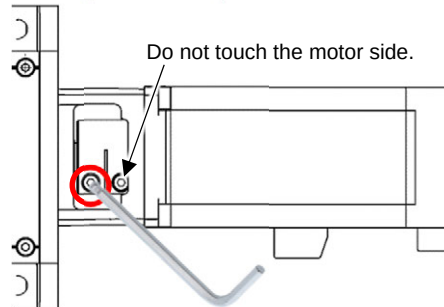


- [3] With the motor fastened temporarily, tighten the coupling screw (1 place) loosely.
* Do not tighten to the full tightening torque yet.

ISA/ISPB (Screw: M3)



SSPA (Screw: M5)



- [4] Turn off the power to the controller, disconnect all connectors (including the motor cable and encoder cable connectors), but this time tighten the bolts in place to the specified torque.

Tightening torques by coupling bolt type

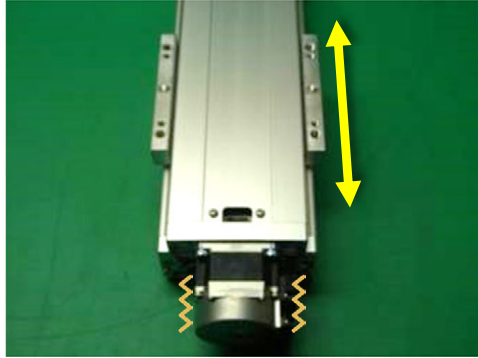
Type	Tightening torque
ISB, ISPB SXM/SXL	2.0N•m
ISB, ISPB MXM/MXL/ MXMX	2.0N•m
ISB, ISPB LXM/LXL/LXMX/ LXUWM	4.0N•m
SSPA SXM	2.0N•m
SSPA MXM	4.0N•m
SSPA LXM	7.0N•m



(4) Centering and securing the motor unit

Loosen the motor affixing screws you have tightened only loosely in an earlier step, move the slider back and forth by hand for three to four cycles.

Move the slider to near the mechanical end on the motor side and find a position at which the motor vibration becomes the smallest. Affix the motor unit in the motor housing at this position.

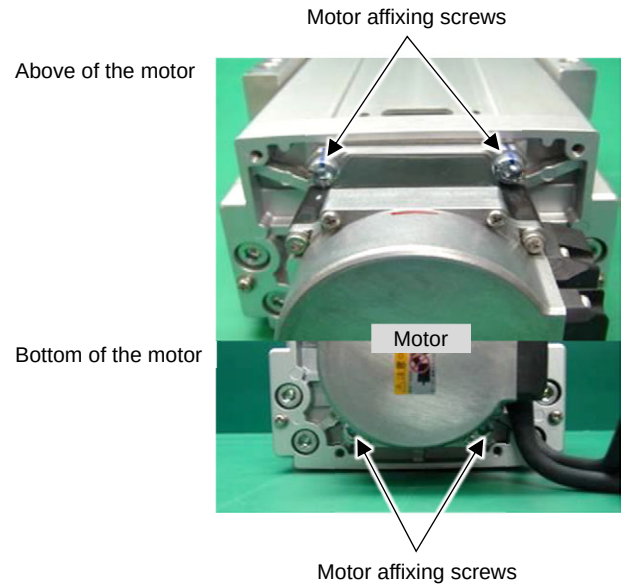


(Note) For with a brake, connect the encoder cable to the controller and release the brake to move the slider.

For safety reasons, after securing the motor unit, deactivate the brake release, turn off the power to the controller and disconnect the cable connectors.

Tightening torque of the screw when motor is affixed

Type	Screw used	Tightening torque
ISB, ISPB SXM/SXL	M4×12	1.8 N•m
ISB, ISPB MXM/MXL/ MXMX LXM/LXL/LXMX/ LXUWM	M5×15	3.4 N•m
SSPA SXM	M5×15	3.4 N•m
SSPA MXM	M5×15	3.4 N•m
SSPA LXM	M6×20	5.4 N•m



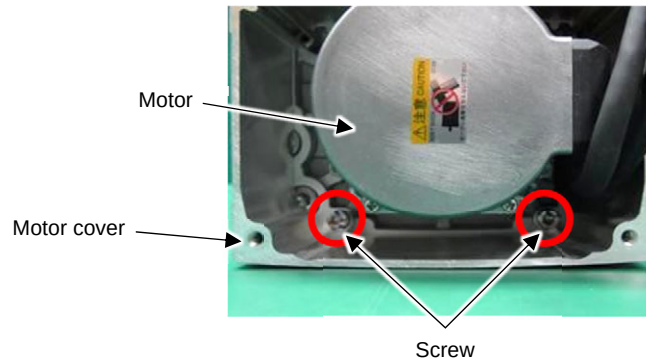


(5) Installing the motor cover

Install the motor cover and secure it with screws. Two of these screws are found below the motor at locations further back in the motor cover.

(Two screws, Hex wrench: ISB, ISPB-SXM/SXL: 2.5mm-sized, Other model: 3mm-sized)

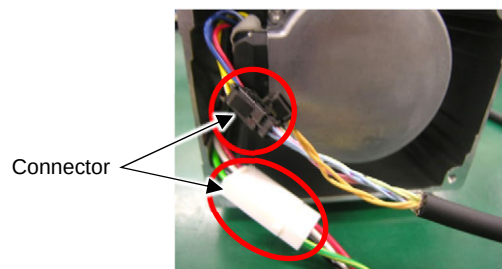
Tightening torque
1.8N·m



(6) Connection of connectors inside motor cover

Connect with the actuator cable and connector.

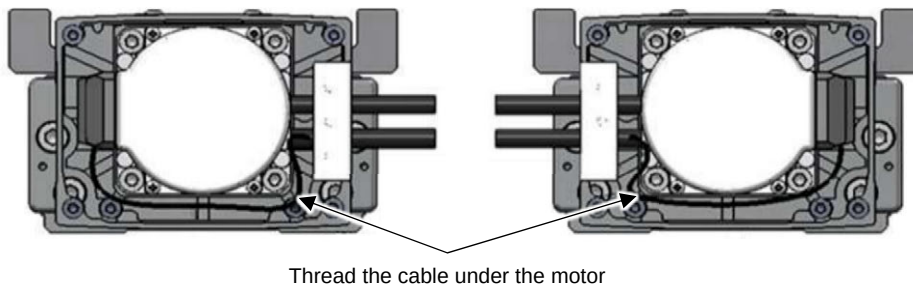
For other process, proceed to Step (8).



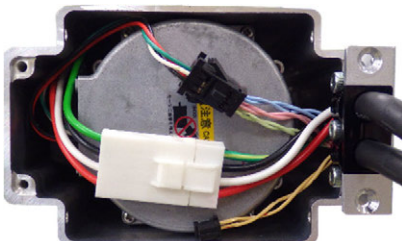
Store the connector in the motor cover.

Pay attention not to pinch the cables on the motor cover or end cover when storing the cables.

ISB



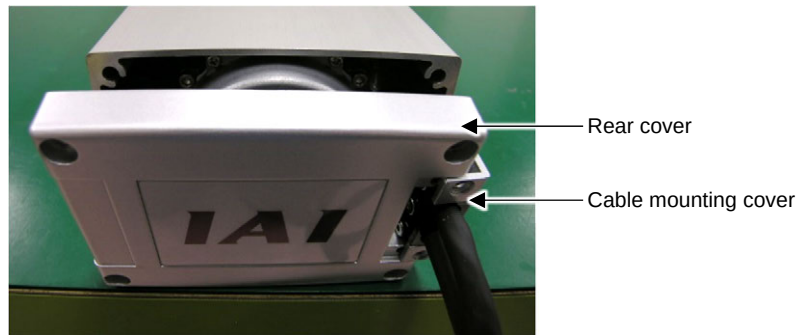
SSPA





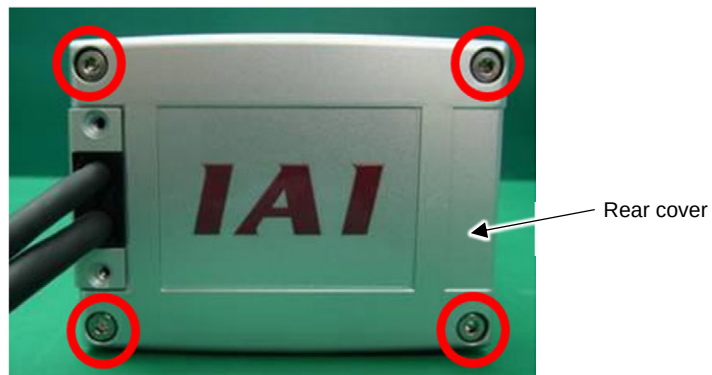
(7) Installing the rear cover

- [1] Slide the rear cover and insert it into the cable mounting cover.



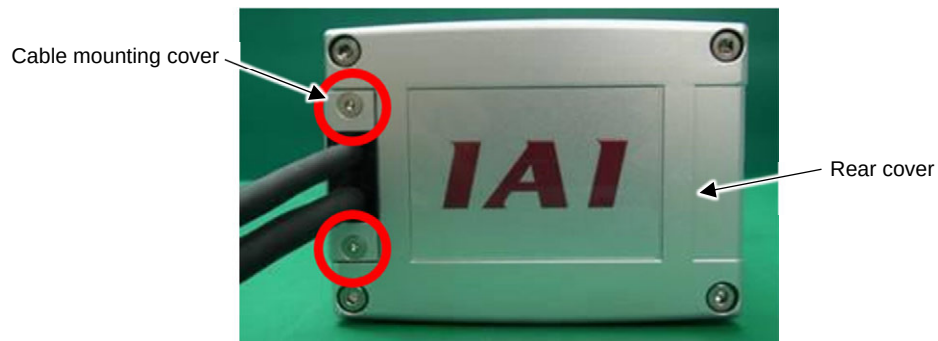
- [2] Tighten the screws with a hex wrench and install the rear cover.
(Four screws: M4)

Tightening torque
1.8N·m



- [3] Tighten the screws with a hex wrench and install the cable mounting cover.
(Two screws: M3)

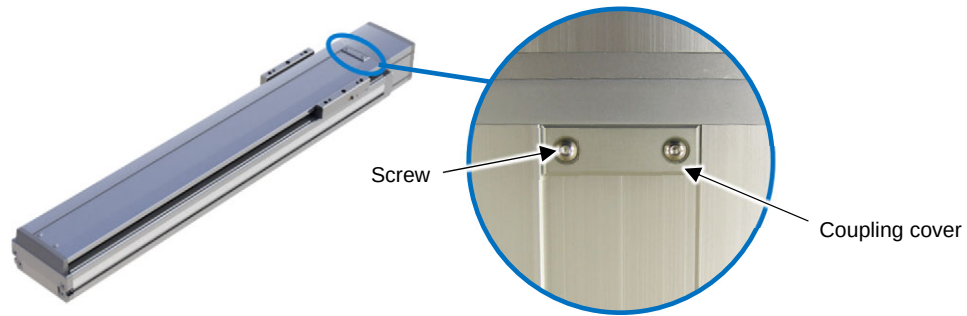
Tightening torque
0.73N·m





- (8) Installing the coupling cover
Install the coupling cover.
(Two screws: ISB, ISPB-SXM/SXL: M3, Other model: M4)
The coupling will be visible.

Tightening torque
0.73N·m





15.1.3 Correcting for Position Deviation

- (1) Connect the motor cable and encoder cable and turn on the controller power.
 - (2) Use the PC software or teaching pendant to perform homing and check the home position.
Repeat homing several times to confirm that the actuator returns to the same position.
(If the actuator is of absolute specification, perform an absolute reset.)
 - (3) Check the amount of position deviation.
The position may have changed slightly from where it was before the motor was replaced.
Accordingly, select a desired position number that allows you to check the amount of deviation before and after the replacement, and then perform positioning to that position and measure the amount of deviation.
 - (4) Reflect the deviation in the home preset parameter in the case of an XSEL/SSEL controller, or in the home return offset parameter in the case of an SCON, MSCON, RCON and RSEL controllers.
For the setting method, refer to [10.4, "Fine-tuning the Home Position."]
- * If the two positions differ significantly (one ball screw revolution or more = lead or more) or if the actuator does not return to the same position when homing is repeated, install the motor unit again by following the procedure described in this manual.
~~When the motor unit was installed, a wrong spacer size may have been used or the slider may have moved instead of remaining stationary at the mechanical end.~~

15.1.4 Operation Check after Replacing the Motor

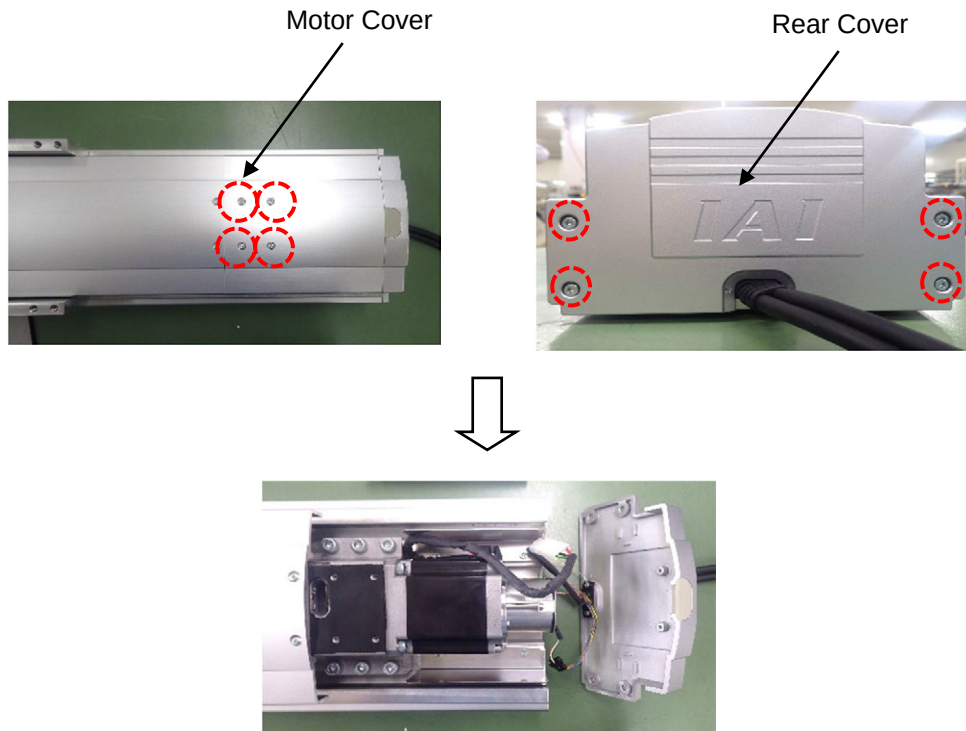
After replacing the motor, perform continuous operation to confirm absence of vibration or abnormal noise.



15.2 WXM/WXMX

15.2.1 Detaching Motor Unit

- (1) Take the motor cover and the rear cover off.
Turn off the power supplied to the controller.
Take off the hex socket button head screws (4 places) holding the motor cover with using a 2.5mm-sized hex wrench.
Take off the hex socket head cap screws (4 places) holding the rear cover with using a 3mm-sized hex wrench.

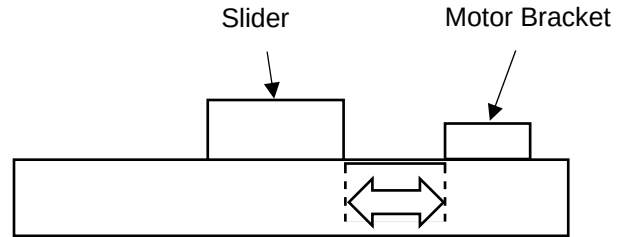
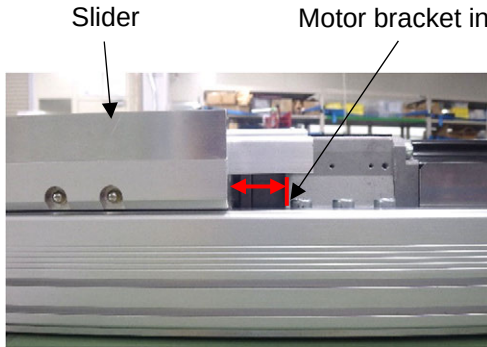


Caution: When the motor cover does not come out easily, do not forcefully take the motor cover off. The motor cover is stuck on the anti-vibration rubber on the seat. Hit lightly with a tool such as a rubber mallet that would not damage or give excess impact to the cover to remove the adhesive on the rubber and take off the motor cover. Taking the cover off forcefully could hurt you on a sharp part, a projection portion or a corner of the motor cover.

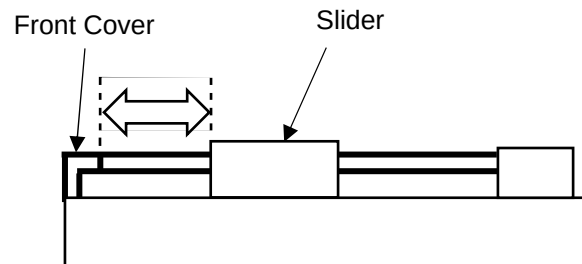
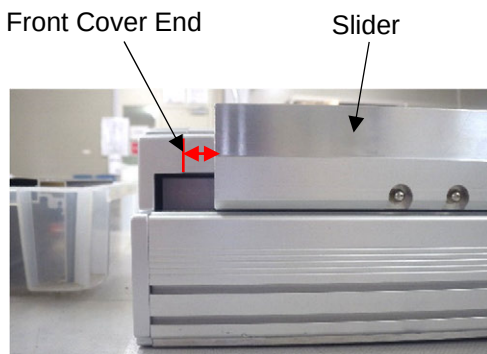


(2) Move the slider to the position below.

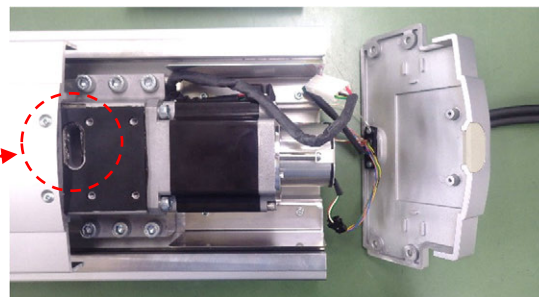
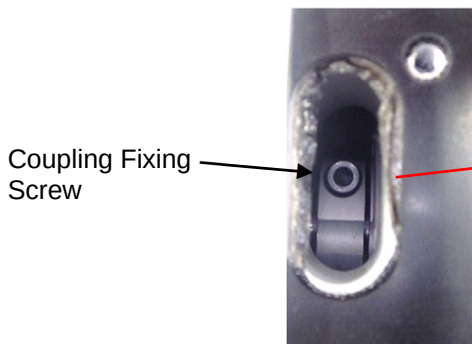
- ◆ For Standard Home Position (home position on motor end)
 - Distance between motor bracket inside end and slider end
 - WXM (with no intermediate support) 31mm
 - WXMx (with intermediate support) 56mm



- ◆ For Reversed Home Position (home position on opposite end of motor)
 - Distance between slider end and front cover inside end
 - WXM (with no intermediate support) 13mm
 - WXMx (with intermediate support) 38mm



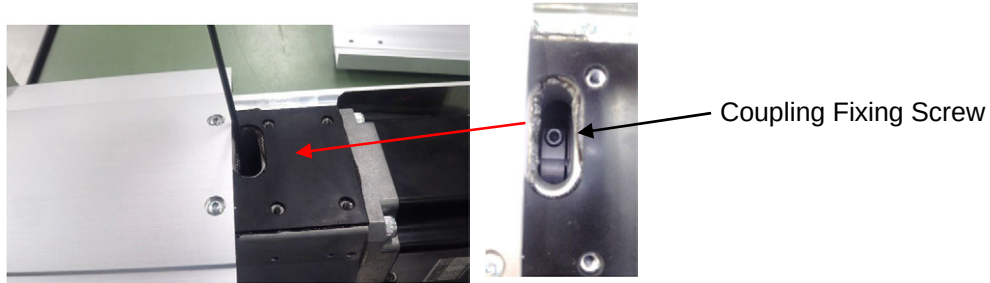
Set the slider to the indicated position and the coupling fixing screw should face up.



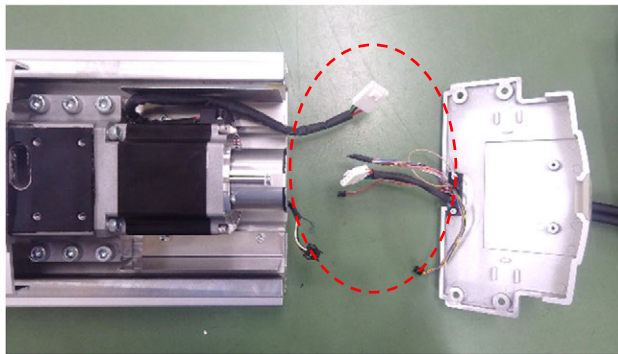


Caution: For the vertical axis, supply power to the controller and release the brake compulsorily to move it. Note that it is very risky because a workpiece (slider) may drop suddenly. Make sure to prepare a platform to hold the slider so it will not be dropped suddenly and pinch finger or damage a workpiece.

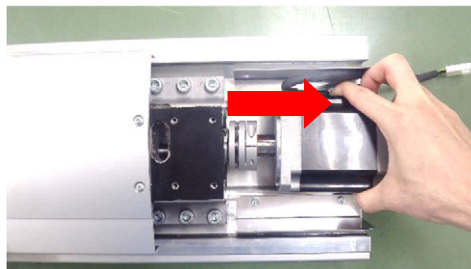
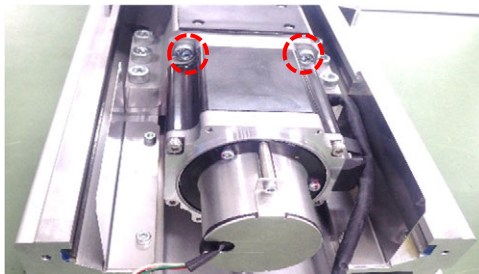
- (3) Loosen the coupling (on ball screw end).
Loosen the hex socket head cap screw (1 place) holding the coupling with using 3mm-sized a hex wrench.



- (4) Unplug all of the motor connector and encoder connector on the relay cable.
In case the power is turned on to release the brake, turn it off before unplugging the connectors. It is no need of releasing the brake in the following procedures.



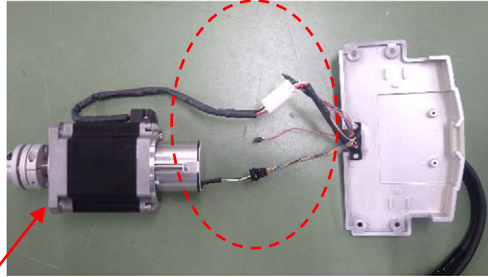
- (5) Take the motor off.
Take off the hex socket head cap screws (4 places) holding the motor with using a 5mm-sized hex wrench. And then pull the motor out slowly.





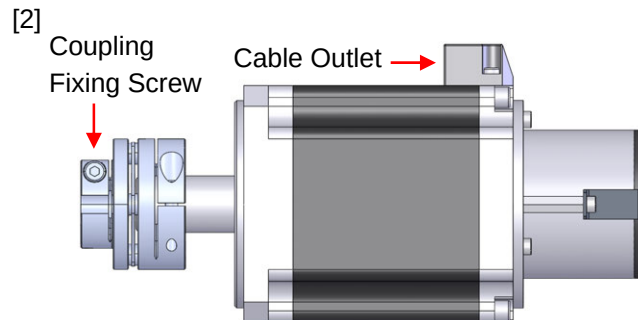
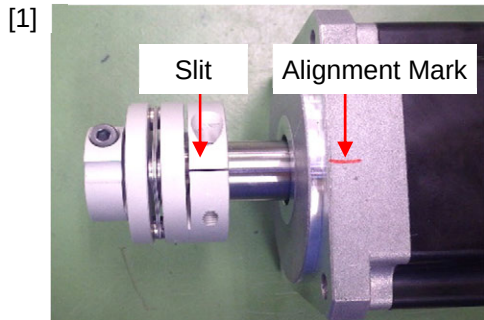
15.2.2 Attaching Motor for Replacement

- (1) Plug in the motor connector and encoder connector on the relay cable to a new motor.



New Motor

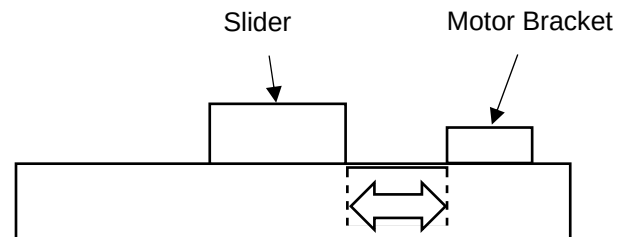
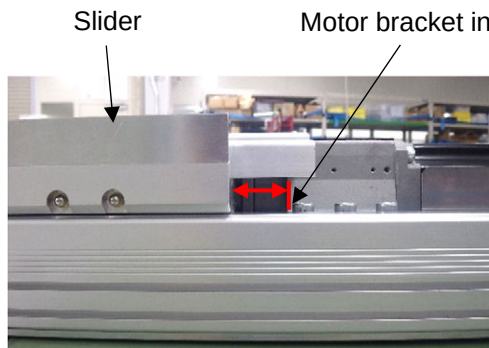
- (2) Have position alignment conducted for the motor shaft.
Rotate the motor shaft with hand and adjust the position of the coupling with either of the references below.
 - [1] The alignment mark on the motor aligns with the slit on the coupling.
 - [2] With the cable outlet facing up, have the coupling fixing screw (on ball screw end) oriented in front.



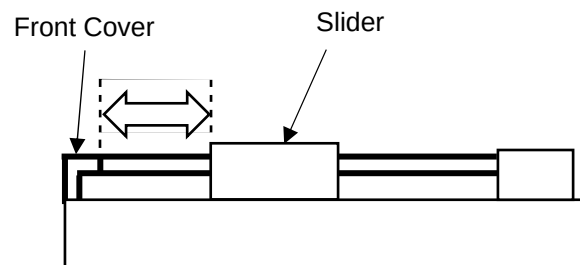
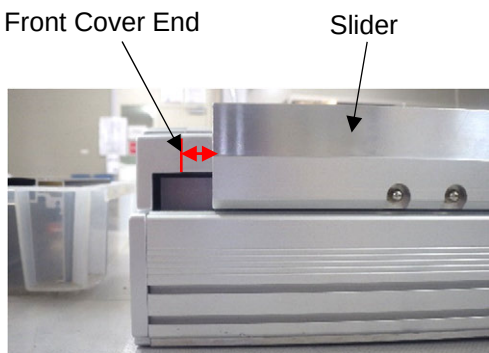


- (3) Put on a new motor.
Confirm that the slider is positioned at the point shown below.
Adjust the position if it is not.

- ◆ For Standard Home Position (home position on motor end)
Distance between motor bracket inside end and slider end
WXM (with no intermediate support) 31mm
WXMx (with intermediate support) 56mm



- ◆ For Reversed Home Position (home position on opposite end of motor)
Distance between slider end and front cover inside end
WXM (with no intermediate support) 13mm
WXMx (with intermediate support) 38mm



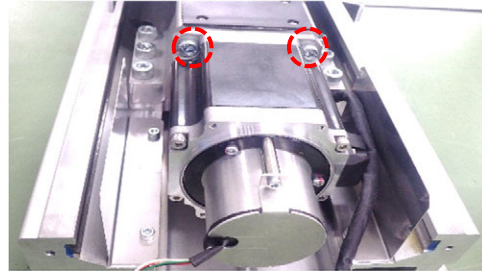
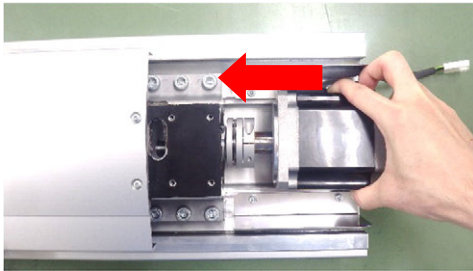


Connect the connector and turn the servo on. With the servo turned on, put the coupling of the motor to the axis end of the ball screw, and affix the motor to the motor bracket.

Set the fixing screws on the bottom in advance.

Tighten the hex socket head cap screws M6 × 20 (4 places) with using a 5mm-sized hex wrench.

* Tightening Torque: 5.4N•m



* If the slider has moved while attaching the motor, set the slider back to the position again.

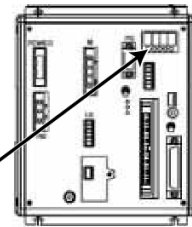
◆ Action to be taken upon error

- With XSEL or SSEL controller, if the 7-segment display on the front face of the controller does not show “rdy” or “Ardy” but indicates an alarm after turning on the power, reset the alarm by checking the operation manual. If the problem cannot be resolved, contact IAI.

The 7-segment display shows “Erg”: Cancel the emergency stop.

The 7-segment display shows “ECA1”: Perform absolute reset.

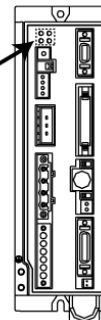
7-segment display



- With the SCON controller, if the PWR LED indicator on the front panel of the controller does not come on, but the ALM indicator comes on instead, after turning on the power, connect the PC or teaching pendant to check the nature of the alarm. Reset the alarm by checking the operation manual. If the problem cannot be resolved, contact IAI.

Alarm code “OEE”: Perform absolute reset.

LED display





- If SIS in the LED display on the front panel of RCON-SC controller turns on after the power gets supplied to RCON or RSEL system even with STOP Signal not being input, connect a PC or teaching pendant to check the detail of the alarm. Check in the instruction manual and reset the alarm. If the problem cannot be resolved, contact IAI.

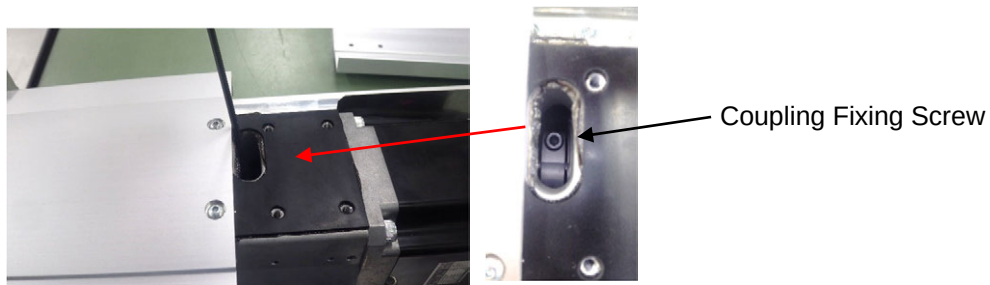
RCON Alarm Code "0EE" : Conduct the absolute reset.
RSEL Alarm Code "402" : Conduct the absolute reset.



(4) Affix the coupling.

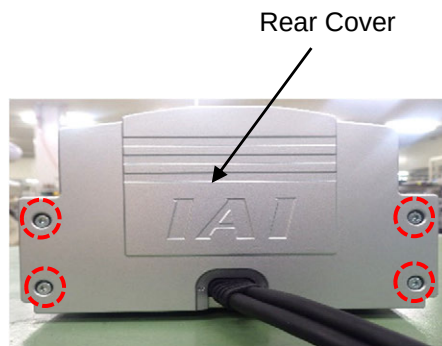
Loosely tighten the hex socket head cap screw M4 × 12 (1 place) with using a 3mm-sized hex wrench to hold the coupling. Turn the servo off after that and then tighten the screw up to the specified torque.

* Tightening Torque: 4.0N•m



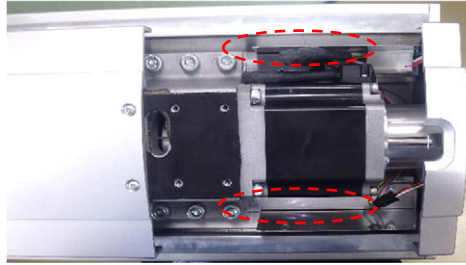
(5) Connect the LS connector for those equipped with a sensor and the brake connector for those equipped with a brake.

(6) Loosely tighten the hex socket head cap screws (4 places) with using a 3mm-sized hex wrench to hold the rear cover with attention not to pinch the cables.



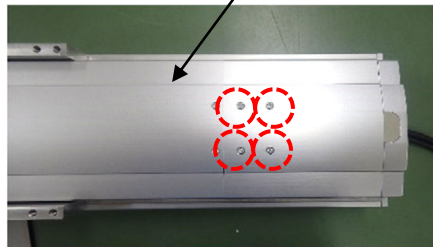


- (7) Store connectors and cables in the space between the motor and the metal plate.



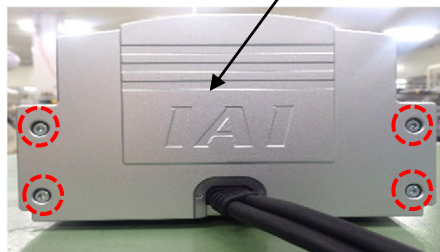
- (8) Attach the motor cover.
Tighten the hex socket button head screws (4 places) with using a 2.5mm-sized hex wrench to hold the motor cover.
* Tightening Torque: 1.9N•m

Motor Cover



- (9) Fully tighten up the rear cover.
* Tightening Torque: 1.8N•m

Rear Cover





15.2.3 Correcting for Position Deviation

- (1) Connect the motor cable and encoder cable and turn on the controller power.
- (2) Use the PC software or teaching pendant to perform homing and check the home position.
Repeat homing several times to confirm that the actuator returns to the same position.
- (3) Check the amount of position deviation.
The position may have changed slightly from where it was before the motor was replaced.
Accordingly, select a desired position number that allows you to check the amount of deviation before and after the replacement, and then perform positioning to that position and measure the amount of deviation.
- (4) Reflect the deviation in the home preset parameter in the case of an XSEL/SSEL controller, or in the home return offset parameter in the case of an SCON, MCON, RCON and RSEL controllers.
For the setting method, refer to [10.4, "Fine-tuning the Home Position."]

* If the two positions differ significantly (one ball screw revolution or more = lead or more) or if the actuator does not return to the same position when homing is repeated, install the motor unit again by following the procedure described in this manual.

It is considered that the slider has moved while the motor unit was being attached.

15.2.4 Operation Check after Replacing the Motor

After replacing the motor, perform continuous operation to confirm absence of vibration or abnormal noise.

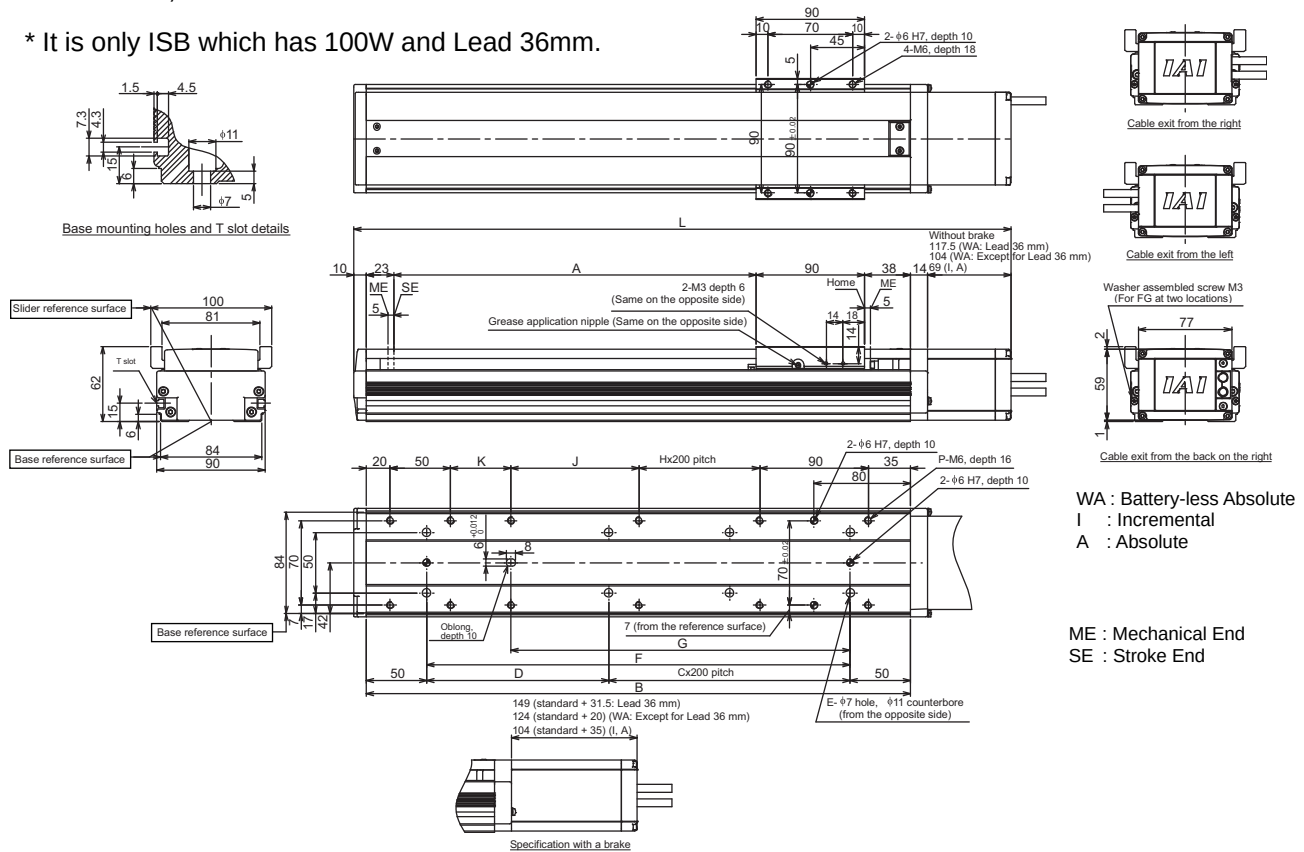


16. Appendix

16.1 External Dimensions

16.1.1 ISB, ISPB-SXM

* It is only ISB which has 100W and Lead 36mm.



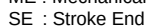


Stroke	L						A	B	C	D	E	F	G	H	J	K	P	Mass [kg]			
	Incremental Absolute		Battery-less Absolute															Except for Lead 36mm		Lead 36mm	
			Except for Lead 36mm		Lead 36mm																
	Stand-ard	with Brake	Stand-ard	with Brake	Stand-ard	with Brake												Stand-ard	with Brake	Stand-ard	with Brake
100	344	379	379	399	392.5	424	100	251	0	151	4	151	131	0	56	0	8	3.0	3.3	3.2	3.5
150	394	429	429	449	442.5	474	150	301	0	201	4	201	131	0	56	50	10	3.4	3.7	3.6	3.9
200	444	479	479	499	492.5	524	200	351	0	251	4	251	181	0	106	50	10	3.8	4.1	4.0	4.3
250	494	529	529	549	542.5	574	250	401	1	101	6	301	231	0	156	50	10	4.2	4.5	4.3	4.6
300	544	579	579	599	592.5	624	300	451	1	151	6	351	281	0	206	50	10	4.5	4.8	4.7	5.0
350	594	629	629	649	642.5	674	350	501	1	201	6	401	331	0	256	50	10	4.9	5.2	5.0	5.3
400	644	679	679	699	692.5	724	400	551	1	251	6	451	381	1	106	50	12	5.2	5.5	5.4	5.7
450	694	729	729	749	742.5	774	450	601	2	101	8	501	431	1	156	50	12	5.6	5.9	5.7	6.0
500	744	779	779	799	792.5	824	500	651	2	151	8	551	481	1	206	50	12	5.9	6.2	6.1	6.4
550	794	829	829	849	842.5	874	550	701	2	201	8	601	531	1	256	50	12	6.3	6.6	6.5	6.8
600	844	879	879	899	892.5	924	600	751	2	251	8	651	581	2	106	50	14	6.6	6.9	6.8	7.1
650	894	929	929	949	942.5	974	650	801	3	101	10	701	631	2	156	50	14	7.0	7.3	7.2	7.5
700	944	979	979	999	992.5	1024	700	851	3	151	10	751	681	2	206	50	14	7.3	7.6	7.5	7.8
750	994	1029	1029	1049	1042.5	1074	750	901	3	201	10	801	731	2	256	50	14	7.7	8.0	7.9	8.2
800	1044	1079	1079	1099	1092.5	1124	800	951	3	251	10	851	781	3	106	50	16	8.0	8.3	8.2	8.5
850	1094	1129	1129	1149	1142.5	1174	850	1001	4	101	12	901	831	3	156	50	16	8.4	8.7	8.6	8.9
900	1144	1179	1179	1199	1192.5	1224	900	1051	4	151	12	951	881	3	206	50	16	8.7	9.0	8.9	9.2

Stroke can be indicated from 950 to 1100 for Lead 36mm.

Stroke	L		A	B	C	D	E	F	G	H	J	K	P	Mass [kg]	
	Battery-less Absolute													Lead 36mm	
	Lead 36mm													Stand-ard	with Brake
	Stand-ard	with Brake													
950	1242.5	1274	950	1101	4	201	12	1001	931	3	256	50	16	9.3	9.6
1000	1292.5	1324	1000	1151	4	251	12	1051	981	4	106	50	18	9.7	10.0
1050	1342.5	1374	1050	1201	5	101	14	1101	1031	4	156	50	18	10.0	10.3
1100	1392.5	1424	1100	1251	5	151	14	1151	1081	4	206	50	18	10.4	10.7

* It is only ISB which has 100W and Lead 36mm.





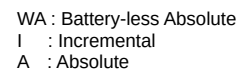
Nominal Stroke	Effective Stroke ^(Note 1)	L				A	B	C	D	E	F	G	H	J	K	Mass [kg]			
		Battery-less Absolute														Except for Lead 36mm		Lead 36mm	
		Except for Lead 36mm		Lead 36mm															
		Stand ard	with Brake	Stand ard	with Brake											Stand ard	with Brake		
250	130	529	549	542.5	574	425	401	156	0	10	101	1	6	231	301	5.7	6.0	5.8	6.1
300	180	579	599	592.5	624	475	451	206	0	10	151	1	6	281	351	6.0	6.3	6.2	6.5
350	230	629	649	642.5	674	525	501	256	0	10	201	1	6	331	401	6.4	6.7	6.5	6.8
400	280	679	699	692.5	724	575	551	306	1	12	251	1	6	381	451	6.7	7.0	6.9	7.2
450	330	729	749	742.5	774	625	601	356	1	12	301	2	8	431	501	7.1	7.4	7.2	7.5
500	380	779	799	792.5	824	675	651	406	1	12	351	2	8	481	551	7.4	7.7	7.6	7.9
550	430	829	849	842.5	874	725	701	456	1	12	401	2	8	531	601	7.8	8.1	8.0	8.3
600	480	879	899	892.5	924	775	751	506	2	14	451	2	8	581	651	8.1	8.4	8.3	8.6
650	530	929	949	942.5	974	825	801	556	2	14	501	3	10	631	701	8.5	8.8	8.7	9.0
700	580	979	999	992.5	1024	875	851	606	2	14	551	3	10	681	751	8.8	9.1	9.0	9.3
750	630	1029	1049	1042.5	1074	925	901	656	2	14	601	3	10	731	801	9.2	9.5	9.4	9.7
800	680	1079	1099	1092.5	1124	975	951	706	3	16	651	3	10	781	851	9.5	9.8	9.7	10.0
850	730	1129	1149	1142.5	1174	1025	1001	756	3	16	701	4	12	831	901	9.9	10.2	10.1	10.4
900	780	1179	1199	1192.5	1224	1075	1051	806	3	16	751	4	12	881	951	10.2	10.5	10.4	10.7

Stroke can be indicated from 950 to 1100 for Lead 36mm.

Nominal Stroke	Effective Stroke ^(Note 1)	L		A	B	C	D	E	F	G	H	J	K	Mass [kg]	
		Battery-less Absolute												Lead 36mm	
		Lead 36mm												Lead 36mm	
		Stand ard	with Brake											Stand ard	with Brake
950	830	1242.5	1274	1125	1101	256	3	16	201	4	12	931	1001	10.8	11.1
1000	880	1292.5	1324	1175	1151	306	4	18	251	4	12	981	1051	11.2	11.5
1050	930	1342.5	1374	1225	1201	356	4	18	301	5	14	1031	1101	11.5	11.8
1100	980	1392.5	1424	1275	1251	406	4	18	351	5	14	1081	1151	11.9	12.2

Note 1 The effective strokes are the dimensions when the slider actual span is in minimum.
Refer to [3. Double Slider (Option) Type].

* It is only ISB which has 100W and Lead 36mm.



ME : Mechanical End
SE : Stroke End



Stroke	L						A	B	C	D	E	F	G	H	J	P	Mass [kg]			
	Incremental Absolute		Battery-less Absolute														Except for Lead 36mm		Lead 36mm	
			Except for Lead 36mm		Lead 36mm															
	Stand-ard	with Brake	Stand-ard	with Brake	Stand-ard	with Brake											Stand-ard	with Brake	Stand-ard	with Brake
130	394	429	429	449	442.5	474	130	301	0	201	4	201	131	0	56	10	3.1	3.4	3.7	4.0
180	444	479	479	499	492.5	524	180	351	0	251	4	251	181	0	106	10	3.5	3.8	4.1	4.4
230	494	529	529	549	542.5	574	230	401	1	101	6	301	231	0	156	10	3.9	4.2	4.4	4.7
280	544	579	579	599	592.5	624	280	451	1	151	6	351	281	0	206	10	4.3	4.5	4.8	5.1
330	594	629	629	649	642.5	674	330	501	1	201	6	401	331	0	256	10	4.6	4.9	5.1	5.4
380	644	679	679	699	692.5	724	380	551	1	251	6	451	381	1	106	12	5.0	5.3	5.5	5.8
430	694	729	729	749	742.5	774	430	601	2	101	8	501	431	1	156	12	5.3	5.6	5.8	6.1
480	744	779	779	799	792.5	824	480	651	2	151	8	551	481	1	206	12	5.7	6.0	6.2	6.5
530	794	829	829	849	842.5	874	530	701	2	201	8	601	531	1	256	12	6.0	6.3	6.6	6.9
580	844	879	879	899	892.5	924	580	751	2	251	8	651	581	2	106	14	6.4	6.7	6.9	7.2
630	894	929	929	949	942.5	974	630	801	3	101	10	701	631	2	156	14	6.7	7.0	7.3	7.6
680	944	979	979	999	992.5	1024	680	851	3	151	10	751	681	2	206	14	7.1	7.4	7.6	7.9
730	994	1029	1029	1049	1042.5	1074	730	901	3	201	10	801	731	2	256	14	7.4	7.7	8.0	8.3
780	1044	1079	1079	1099	1092.5	1124	780	951	3	251	10	851	781	3	106	16	7.8	8.1	8.3	8.6
830	1094	1129	1129	1149	1142.5	1174	830	1001	4	101	12	901	831	3	156	16	8.1	8.4	8.7	9.0
880	1144	1179	1179	1199	1192.5	1224	880	1051	4	151	12	951	881	3	206	16	8.5	8.8	9.0	9.3

Stroke can be indicated from 930 to 1080 for Lead 36mm.

Stroke	L		A	B	C	D	E	F	G	H	J	P	Mass [kg]	
	Battery-less Absolute													
	Lead 36mm												Lead 36mm	
	Stand-ard	with Brake											Stand-ard	with Brake
930	1242.5	1274	930	1101	4	201	12	1001	931	3	256	16	9.4	9.7
980	1292.5	1324	980	1151	4	251	12	1051	981	4	106	18	9.8	10.1
1030	1342.5	1374	1030	1201	5	101	14	1101	1031	4	156	18	10.1	10.4
1080	1392.5	1424	1080	1251	5	151	14	1151	1081	4	206	18	10.5	10.8

* It is only ISB which has 100W and Lead 36mm.





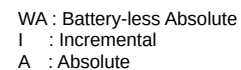
Nominal Stroke	Effective Stroke (Note 1)	L				A	B	C	D	E	F	G	H	J	K	Mass [kg]			
		Battery-less Absolute														Except for Lead 36mm		Lead 36mm	
		Except for Lead 36mm		Lead 36mm															
		Stand ard	with Brake	Stand ard	with Brake											Stand ard	with Brake		
280	140	579	599	592.5	624	475	451	206	0	10	151	1	6	281	351	5.8	6.0	6.3	6.6
330	190	629	649	642.5	674	525	501	256	0	10	201	1	6	331	401	6.1	6.4	6.6	6.9
380	240	679	699	692.5	724	575	551	106	1	12	251	1	6	381	451	6.5	6.8	7.0	7.3
430	290	729	749	742.5	774	625	601	156	1	12	101	2	8	431	501	6.8	7.1	7.3	7.6
480	340	779	799	792.5	824	675	651	206	1	12	151	2	8	481	551	7.2	7.5	7.7	8.0
530	390	829	849	842.5	874	725	701	256	1	12	201	2	8	531	601	7.5	7.8	8.1	8.4
580	440	879	899	892.5	924	775	751	106	2	14	251	2	8	581	651	7.9	8.2	8.4	8.7
630	490	929	949	942.5	974	825	801	156	2	14	101	3	10	631	701	8.2	8.5	8.8	9.1
680	540	979	999	992.5	1024	875	851	206	2	14	151	3	10	681	751	8.6	8.9	9.1	9.4
730	590	1029	1049	1042.5	1074	925	901	256	2	14	201	3	10	731	801	8.9	9.2	9.5	9.8
780	640	1079	1099	1092.5	1124	975	951	106	3	16	251	3	10	781	851	9.3	9.6	9.8	10.1
830	690	1129	1149	1142.5	1174	1025	1001	156	3	16	101	4	12	831	901	9.6	9.9	10.2	10.5
880	740	1179	1199	1192.5	1224	1075	1051	206	3	16	151	4	12	881	951	10.0	10.3	10.5	10.8

Stroke can be indicated from 930 to 1080 for Lead 36mm.

Nominal Stroke	Effective Stroke (Note 1)	L		A	B	C	D	E	F	G	J	P	Mass [kg]	
		Battery-less Absolute											Lead 36mm	
		Lead 36mm											Lead 36mm	
		Stand ard	with Brake										Stand ard	with Brake
930	790	1242.5	1274	1125	1101	256	3	16	201	4	12	931	10.9	11.2
980	840	1292.5	1324	1175	1151	106	4	18	251	4	12	981	11.3	11.6
1030	890	1342.5	1374	1225	1201	156	4	18	101	5	14	1031	11.6	11.9
1080	940	1392.5	1424	1275	1251	206	4	18	151	5	14	1081	12.0	12.3

Note 1 The effective strokes are the dimensions when the slider actual span is in minimum.
Refer to [3. Double Slider (Option) Type].

* It is only ISB which has 400W and Lead 48mm.



ME : Mechanical End
SE : Stroke End



Stroke	L					A	B	C	D	E	F	G	H	J	K	Mass [kg]									
	Incremental Absolute		Battery-less Absolute													100W						200W		400W	
	Standard															Stand-ard	with Brake	Stand-ard	with Brake	Stand-ard	with Brake				
	100W	200W	100W	200W	400W																				
100	393	408	417	443	468	100	304	0	204	4	204	134	0	24	10	6.0	6.5	6.4	7.0	7.0	7.6				
150	443	458	467	493	518	150	354	0	254	4	254	184	0	74	10	6.6	7.1	7.1	7.7	7.6	8.2				
200	493	508	517	543	568	200	404	1	104	6	304	234	0	124	10	7.2	7.7	7.7	8.3	8.3	8.9				
250	543	558	567	593	618	250	454	1	154	6	354	284	0	174	10	7.9	8.4	8.4	9.0	8.9	9.5				
300	593	608	617	643	668	300	504	1	204	6	404	334	0	224	10	8.5	9.0	9.0	9.6	9.5	10.1				
350	643	658	667	693	718	350	554	1	254	6	454	384	0	274	10	9.2	9.7	9.6	10.2	10.2	10.8				
400	693	708	717	743	768	400	604	2	104	8	504	434	1	124	12	9.8	10.3	10.2	10.8	10.8	11.4				
450	743	758	767	793	818	450	654	2	154	8	554	484	1	174	12	10.4	10.9	10.9	11.5	11.4	12.0				
500	793	808	817	843	868	500	704	2	204	8	604	534	1	224	12	11.0	11.5	11.5	12.1	12.1	12.7				
550	843	858	867	893	918	550	754	2	254	8	654	584	1	274	12	11.7	12.2	12.2	12.8	12.7	13.3				
600	893	908	917	943	968	600	804	3	104	10	704	634	2	124	14	12.3	12.8	12.8	13.4	13.3	13.9				
650	943	958	967	993	1018	650	854	3	154	10	754	684	2	174	14	13.0	13.5	13.4	14.0	14.0	14.6				
700	993	1008	1017	1043	1068	700	904	3	204	10	804	734	2	224	14	13.6	14.1	14.0	14.6	14.6	15.2				
750	1043	1058	1067	1093	1118	750	954	3	254	10	854	784	2	274	14	14.2	14.7	14.7	15.3	15.2	15.8				
800	1093	1108	1117	1143	1168	800	1004	4	104	12	904	834	3	124	16	14.8	15.3	15.3	15.9	15.9	16.5				
850	1143	1158	1167	1193	1218	850	1054	4	154	12	954	884	3	174	16	15.5	16.0	16.0	16.6	16.5	17.1				
900	1193	1208	1217	1243	1268	900	1104	4	204	12	1004	934	3	224	16	16.1	16.6	16.6	17.2	17.2	17.7				
950	1243	1258	1267	1293	1318	950	1154	4	254	12	1054	984	3	274	16	16.8	17.3	17.3	17.9	17.8	18.4				
1000	1293	1308	1317	1343	1368	1000	1204	5	104	14	1104	1034	4	124	18	17.4	17.9	17.9	18.5	18.4	19.0				
1050	1343	1358	1367	1393	1418	1050	1254	5	154	14	1154	1084	4	174	18	18.1	18.6	18.5	19.1	19.1	19.6				
1100	1393	1408	1417	1443	1468	1100	1304	5	204	14	1204	1134	4	224	18	18.7	19.2	19.1	19.7	19.7	20.3				

Stroke can be indicated from 1150 to 1300 for 400W, Lead 48mm.

Stroke can be indicated from 1150 to 1500 for 400W, Lead 48mm:													
Stroke	L	A	B	C	D	E	F	G	H	J	K	Mass [kg]	
	Battery-less Absolute											400W	
	Standard											Stand-ard	with Brake
	400W												
1150	1518	1150	1354	5	254	14	1254	1184	4	274	18	20.3	20.9
1200	1568	1200	1404	6	104	16	1304	1234	5	124	20	21.0	21.6
1250	1618	1250	1454	6	154	16	1354	1284	5	174	20	21.6	22.2
1300	1668	1300	1504	6	204	16	1404	1334	5	224	20	22.2	22.8

* It is only ISB which has 400W and Lead 48mm.



ME : Mechanical End

SE : Stroke End



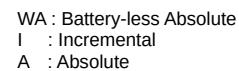
Nominal Stroke	Effective Stroke (Note 1)	L			A	B	C	D	E	F	G	H	J	K	Mass [kg]					
		Battery-less Absolute																		
		Standard W/o Brake																		
		100W	200W	400W											100W	with Brake	200W	with Brake	400W	with Brake
300	145	617	643	668	530	504	224	0	10	204	1	6	334	404	11.0	11.5	11.5	12.1	12.0	12.6
350	195	667	693	718	580	554	274	0	10	254	1	6	384	454	11.7	12.2	12.1	12.7	12.7	13.3
400	245	717	743	768	630	604	124	1	12	104	2	8	434	504	12.3	12.8	12.7	13.3	13.3	13.9
450	295	767	793	818	680	654	174	1	12	154	2	8	484	554	12.9	13.4	13.4	14.0	13.9	14.5
500	345	817	843	868	730	704	224	1	12	204	2	8	534	604	13.5	14.0	14.0	14.6	14.6	15.2
550	395	867	893	918	780	754	274	1	12	254	2	8	584	654	14.2	14.7	14.7	15.3	15.2	15.8
600	445	917	943	968	830	804	124	2	14	104	3	10	634	704	14.8	15.3	15.3	15.9	15.8	16.4
650	495	967	993	1018	880	854	174	2	14	154	3	10	684	754	15.5	16.0	15.9	16.5	16.5	17.1
700	545	1017	1043	1068	930	904	224	2	14	204	3	10	734	804	16.1	16.6	16.5	17.1	17.1	17.7
750	595	1067	1093	1118	980	954	274	2	14	254	3	10	784	854	16.7	17.2	17.2	17.8	17.7	18.3
800	645	1117	1143	1168	1030	1004	124	3	16	104	4	12	834	904	17.3	17.8	17.8	18.4	18.4	19.0
850	695	1167	1193	1218	1080	1054	174	3	16	154	4	12	884	954	18.0	18.5	18.5	19.1	19.0	19.6
900	745	1217	1243	1268	1130	1104	224	3	16	204	4	12	934	1004	18.6	19.1	19.1	19.7	19.7	20.2
950	795	1267	1293	1318	1180	1154	274	3	16	254	4	12	984	1054	19.3	19.8	19.8	20.4	20.3	20.9
1000	845	1317	1343	1368	1230	1204	124	4	18	104	5	14	1034	1104	19.9	20.4	20.4	21.0	20.9	21.5
1050	895	1367	1393	1418	1280	1254	174	4	18	154	5	14	1084	1154	20.6	21.1	21.0	21.6	21.6	22.1
1100	945	1417	1443	1468	1330	1304	224	4	18	204	5	14	1134	1204	21.2	21.7	21.6	22.2	22.2	22.8

Stroke can be indicated from 1150 to 1300 for 400W, Lead 48mm.

Nominal Stroke	Effective Stroke (Note 1)	L	A	B	C	D	E	F	G	H	J	K	Mass [kg]	
		Battery-less Absolute											400W	
		Standard W/o Brake											Stand ard	with Brake
		400W												
1150	995	1518	1380	1354	274	4	18	254	5	14	1184	1254	22.8	23.4
1200	1045	1568	1430	1404	324	5	20	304	6	16	1234	1304	23.5	24.1
1250	1095	1618	1480	1454	374	5	20	354	6	16	1284	1354	24.1	24.7
1300	1145	1668	1530	1504	424	5	20	404	6	16	1334	1404	24.7	25.3

Note 1 The effective strokes are the dimensions when the slider actual span is in minimum.
Refer to [3. Double Slider (Option) Type].

* It is only ISB which has 400W and Lead 48mm.



ME : Mechanical End
SE : Stroke End

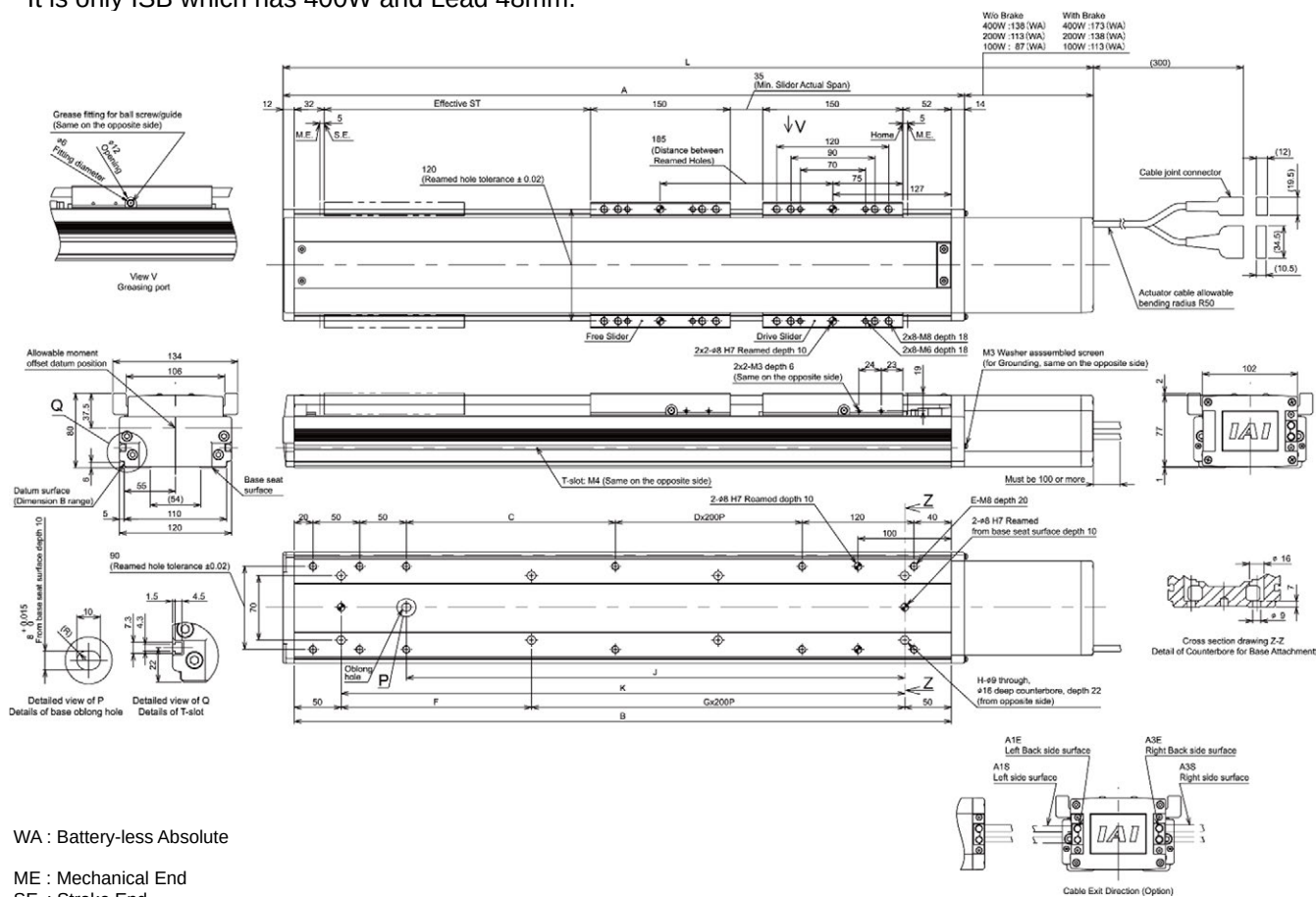


Stroke	L					A	B	C	D	E	F	G	H	J	K	Mass [kg]									
	Incremental Absolute		Battery-less Absolute													100W						200W		400W	
	Standard															Stand-ard	with Brake	Stand-ard	with Brake	Stand-ard	with Brake				
	100W	200W	100W	200W	400W																				
120	443	458	467	493	518	120	354	0	254	4	254	184	0	74	10	6.3	6.8	6.7	7.3	7.9	8.5				
170	493	508	517	543	568	170	404	1	104	6	304	234	0	124	10	6.9	7.4	7.4	8.0	8.6	9.2				
220	543	558	567	593	618	220	454	1	154	6	354	284	0	174	10	7.5	8.0	8.0	8.6	9.2	9.8				
270	593	608	617	643	668	270	504	1	204	6	404	334	0	224	10	8.2	8.7	8.7	9.3	9.8	10.4				
320	643	658	667	693	718	320	554	1	254	6	454	384	0	274	10	8.8	9.3	9.3	9.9	10.5	11.1				
370	693	708	717	743	768	370	604	2	104	8	504	434	1	124	12	9.5	10.0	9.9	10.5	11.1	11.7				
420	743	758	767	793	818	420	654	2	154	8	554	484	1	174	12	10.1	10.6	10.5	11.1	11.7	12.3				
470	793	808	817	843	868	470	704	2	204	8	604	534	1	224	12	10.7	11.2	11.2	11.8	12.4	13.0				
520	843	858	867	893	918	520	754	2	254	8	654	584	1	274	12	11.3	11.8	11.8	12.4	13.0	13.6				
570	893	908	917	943	968	570	804	3	104	10	704	634	2	124	14	12.0	12.5	12.5	13.1	13.6	14.2				
620	943	958	967	993	1018	620	854	3	154	10	754	684	2	174	14	12.6	13.1	13.1	13.7	14.3	14.9				
670	993	1008	1017	1043	1068	670	904	3	204	10	804	734	2	224	14	13.3	13.8	13.7	14.3	14.9	15.5				
720	1043	1058	1067	1093	1118	720	954	3	254	10	854	784	2	274	14	13.9	14.4	14.3	14.9	15.5	16.1				
770	1093	1108	1117	1143	1168	770	1004	4	104	12	904	834	3	124	16	14.5	15.0	15.0	15.6	16.2	16.8				
820	1143	1158	1167	1193	1218	820	1054	4	154	12	954	884	3	174	16	15.1	15.6	15.6	16.2	16.8	17.4				
870	1193	1208	1217	1243	1268	870	1104	4	204	12	1004	934	3	224	16	15.8	16.3	16.3	16.9	17.5	18.0				
920	1243	1258	1267	1293	1318	920	1154	4	254	12	1054	984	3	274	16	16.4	16.9	16.9	17.5	18.1	18.7				
970	1293	1308	1317	1343	1368	970	1204	5	104	14	1104	1034	4	124	18	17.1	17.6	17.6	18.2	18.7	19.3				
1020	1343	1358	1367	1393	1418	1020	1254	5	154	14	1154	1084	4	174	18	17.7	18.2	18.2	18.8	19.4	19.9				
1070	1393	1408	1417	1443	1468	1070	1304	5	204	14	1204	1134	4	224	18	18.4	18.9	18.9	19.5	20.0	20.6				

Stroke can be indicated from 1120 to 1270 for 400W, Lead 48mm.

Stroke	L	A	B	C	D	E	F	G	H	J	K	Mass [kg]	
	Battery-less Absolute											400W	
	Standard											Stand-ard	with Brake
	400W												
1120	1518	1120	1354	5	254	14	1254	1184	4	274	18	20.6	21.2
1170	1568	1170	1404	6	104	16	1304	1234	5	124	20	21.3	21.9
1220	1618	1220	1454	6	154	16	1354	1284	5	174	20	21.9	22.5
1270	1668	1270	1504	6	204	16	1404	1334	5	224	20	22.5	23.1

* It is only ISB which has 400W and Lead 48mm.



WA : Battery-less Absolute

ME : Mechanical End

SE : Stroke End



Nominal Stroke	Effective Stroke (Note 1)	L			A	B	C	D	E	F	G	H	J	K	Mass [kg]					
		Battery-less Absolute																		
		Standard W/o Brake																		
		100W	200W	400W											100W		200W		400W	
															Stand ard	with Brake	Stand ard	with Brake	Stand ard	with Brake
320	135	667	693	718	580	554	274	0	10	254	1	6	384	454	11.3	11.8	11.8	12.4	13.0	13.6
370	185	717	743	768	630	604	124	1	12	104	2	8	434	504	12.0	12.5	12.4	13.0	13.6	14.2
420	235	767	793	818	680	654	174	1	12	154	2	8	484	554	12.6	13.1	13.0	13.6	14.2	14.8
470	285	817	843	868	730	704	224	1	12	204	2	8	534	604	13.2	13.7	13.7	14.3	14.9	15.5
520	335	867	893	918	780	754	274	1	12	254	2	8	584	654	13.8	14.3	14.3	14.9	15.5	16.1
570	385	917	943	968	830	804	124	2	14	104	3	10	634	704	14.5	15.0	15.0	15.6	16.1	16.7
620	435	967	993	1018	880	854	174	2	14	154	3	10	684	754	15.1	15.6	15.6	16.2	16.8	17.4
670	485	1017	1043	1068	930	904	224	2	14	204	3	10	734	804	15.8	16.3	16.2	16.8	17.4	18.0
720	535	1067	1093	1118	980	954	274	2	14	254	3	10	784	854	16.4	16.9	16.8	17.4	18.0	18.6
770	585	1117	1143	1168	1030	1004	124	3	16	104	4	12	834	904	17.0	17.5	17.5	18.1	18.7	19.3
820	635	1167	1193	1218	1080	1054	174	3	16	154	4	12	884	954	17.6	18.1	18.1	18.7	19.3	19.9
870	685	1217	1243	1268	1130	1104	224	3	16	204	4	12	934	1004	18.3	18.8	18.8	19.4	20.0	20.5
920	735	1267	1293	1318	1180	1154	274	3	16	254	4	12	984	1054	18.9	19.4	19.4	20.0	20.6	21.2
970	785	1317	1343	1368	1230	1204	124	4	18	104	5	14	1034	1104	19.6	20.1	20.1	20.7	21.2	21.8
1020	835	1367	1393	1418	1280	1254	174	4	18	154	5	14	1084	1154	20.2	20.7	20.7	21.3	21.9	22.4
1070	885	1417	1443	1468	1330	1304	224	4	18	204	5	14	1134	1204	20.9	21.4	21.4	22.0	22.5	23.1

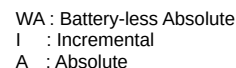
Stroke can be indicated from 1120 to 1270 for 400W, Lead 48mm.

Nominal Stroke	Effective Stroke (Note 1)												Mass [kg]	
		L											400W	
		Battery-less Absolute											Stand ard	with Brake
		Standard W/o Brake												
		A	B	C	D	E	F	G	H	J	K			
1120	935	1518	1380	1354	274	4	18	254	5	14	1184	1254	23.1	23.7
1170	985	1568	1430	1404	124	5	20	104	6	16	1234	1304	23.8	24.4
1220	1035	1618	1480	1454	174	5	20	154	6	16	1284	1354	24.4	25.0
1270	1085	1668	1530	1504	224	5	20	204	6	16	1334	1404	25.0	25.6

Note 1 The effective strokes are the dimensions when the slider actual span is in minimum.
Refer to [3. Double Slider (Option) Type].

* It is only ISB which has 400W and Lead 48mm.

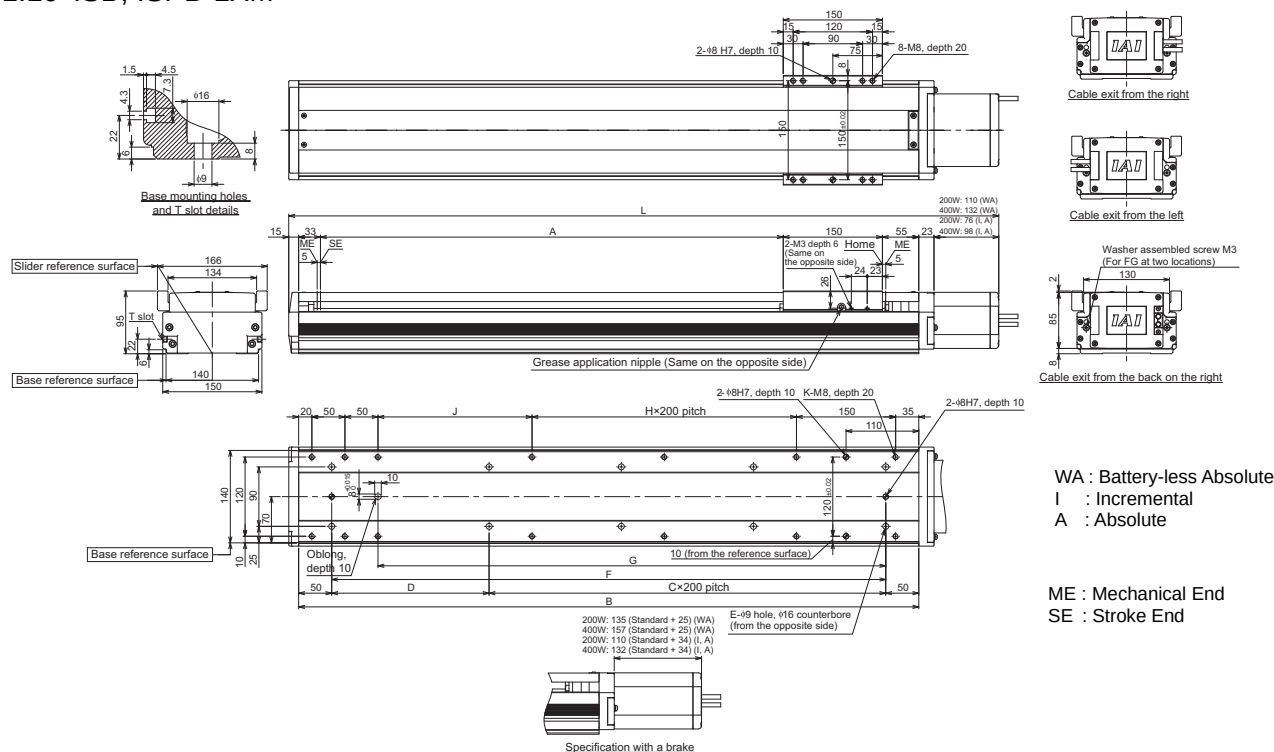
* It is only ISB which has 400W and Lead 48mm.



ME : Mechanical End
SE : Stroke End

Stroke	L						A	B	C	D	E	F	G	H	Mass [kg]			
	Incremental Absolute		Battery-less Absolute												Except for Lead 48mm		Lead 48mm	
	Stand-ard	with Brake	Stand-ard	with Brake	Stand-ard	with Brake									Stand-ard	with Brake		
800	1204	1239	1239	1264	1264	1299	800	1100	200	0	200	12	1000	800	16.5	17.1	17.1	17.7
900	1304	1339	1339	1364	1364	1399	900	1200	200	0	300	12	1100	900	17.8	18.4	18.4	19.0
1000	1404	1439	1439	1464	1464	1499	1000	1300	200	0	400	12	1200	1000	19.1	19.7	19.6	20.2
1100	1504	1539	1539	1564	1564	1599	1100	1400	250	0	400	12	1300	1100	20.3	20.9	20.9	21.5
1200	1604	1639	1639	1664	1664	1699	1200	1500	300	0	400	12	1400	1200	21.6	22.2	22.2	22.8
1300	1704	1739	1739	1764	1764	1799	1300	1600	350	0	400	12	1500	1300	22.9	23.5	23.4	24.0
1400	1804	1839	1839	1864	1864	1899	1400	1700	400	0	400	12	1600	1400	24.1	24.7	24.7	25.3
1500	1904	1939	1939	1964	1964	1999	1500	1800	450	0	400	12	1700	1500	25.4	26.0	26.0	26.6
1600	2004	2039	2039	2064	2064	2099	1600	1900	500	0	400	12	1800	1600	26.7	27.3	27.3	27.8
1700	2104	2139	2139	2164	2164	2199	1700	2000	550	0	400	12	1900	1700	28.0	28.6	28.5	29.1
1800	2204	2239	2239	2264	2264	2299	1800	2100	200	400	400	16	2000	1800	29.2	29.8	29.8	30.4
1900	2304	2339	2339	2364	2364	2399	1900	2200	200	450	400	16	2100	1900	30.5	31.1	31.1	31.7
2000	2404	2439	2439	2464	2464	2499	2000	2300	200	500	400	16	2200	2000	31.8	32.4	32.3	32.9

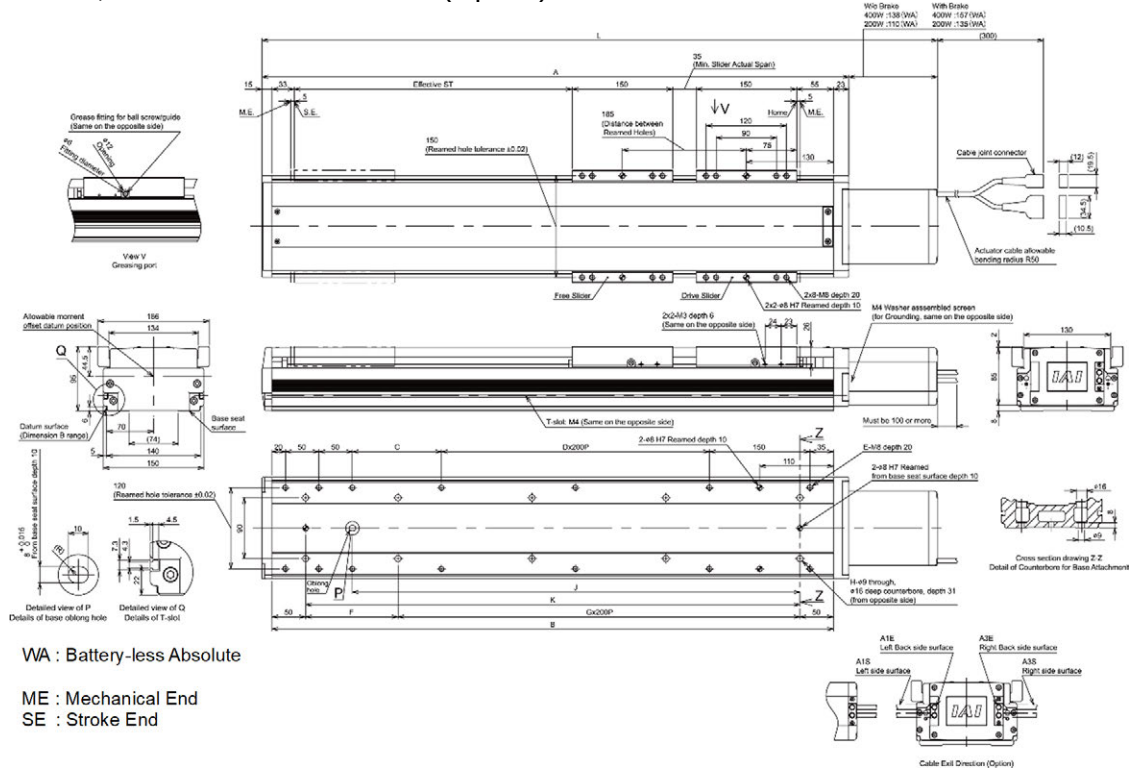
16.1.10 ISB, ISPB-LXM



Stroke	L				A	B	C	D	E	F	G	H	J	K	Mass [kg]			
	Incremental Absolute		Battery-less Absolute												200W Standard		400W Standard	
	Standard														Standard	With brake	Standard	With brake
	200W	400W	200W	400W														
100	452	474	486	508	100	338	1	238	4	238	168	0	33	10	9.4	10.0	9.8	10.4
150	502	524	536	558	150	388	0	288	4	288	218	0	83	10	10.3	10.9	10.7	11.3
200	552	574	586	608	200	438	1	138	6	338	268	0	133	10	11.1	11.7	11.6	12.2
250	602	624	636	658	250	488	1	188	6	388	318	0	183	10	12.0	12.6	12.5	13.1
300	652	674	686	708	300	538	1	238	6	438	368	0	233	10	12.8	13.4	13.3	13.9
350	702	724	736	758	350	588	1	288	6	488	418	0	283	10	13.7	14.3	14.2	14.8
400	752	774	786	808	400	638	2	138	8	538	468	1	133	12	14.6	15.2	15.0	15.6
450	802	824	836	858	450	688	2	188	8	588	518	1	183	12	15.5	16.1	15.9	16.5
500	852	874	886	908	500	738	2	238	8	638	568	1	233	12	16.3	16.9	16.8	17.4
550	902	924	936	958	550	788	2	288	8	688	618	1	283	12	17.2	17.8	17.7	18.3
600	952	974	986	1008	600	838	3	138	10	738	668	2	133	14	18.0	18.6	18.5	19.1
650	1002	1024	1036	1058	650	888	3	188	10	788	718	2	183	14	18.9	19.5	19.4	20.0
700	1052	1074	1086	1108	700	938	3	238	10	838	768	2	233	14	19.8	20.4	20.2	20.8
750	1102	1124	1136	1158	750	988	3	288	10	888	818	2	283	14	20.7	21.3	21.1	21.7
800	1152	1174	1186	1208	800	1038	4	138	12	938	868	3	133	16	21.5	22.1	22.0	22.6
850	1202	1224	1236	1258	850	1088	4	188	12	988	918	3	183	16	22.4	23.0	22.9	23.5
900	1252	1274	1286	1308	900	1138	4	238	12	1038	968	3	233	16	23.2	23.8	23.7	24.3
950	1302	1324	1336	1358	950	1188	4	288	12	1088	1018	3	183	16	24.1	24.7	24.6	25.2
1000	1352	1374	1386	1408	1000	1238	5	138	14	1138	1068	4	133	18	25.0	25.6	25.4	26.0
1050	1402	1424	1436	1458	1050	1288	5	188	14	1188	1118	4	183	18	25.9	26.5	26.3	26.9
1100	1452	1474	1486	1508	1100	1338	5	238	14	1238	1168	4	233	18	26.7	27.3	27.2	27.8
1150	1502	1524	1536	1558	1150	1388	5	288	14	1288	1218	4	283	18	27.6	28.2	28.1	28.7
1200	1552	1574	1586	1608	1200	1438	6	138	16	1338	1268	5	133	20	28.4	29.0	28.9	29.5
1250	1602	1624	1636	1658	1250	1488	6	188	16	1388	1318	5	183	20	29.3	29.9	29.8	30.2
1300	1652	1674	1686	1708	1300	1538	6	238	16	1438	1368	5	233	20	30.2	30.8	30.6	31.2



16.1.11 ISB, ISPB-LXM Double Slider (Option)



WA : Battery-less Absolute

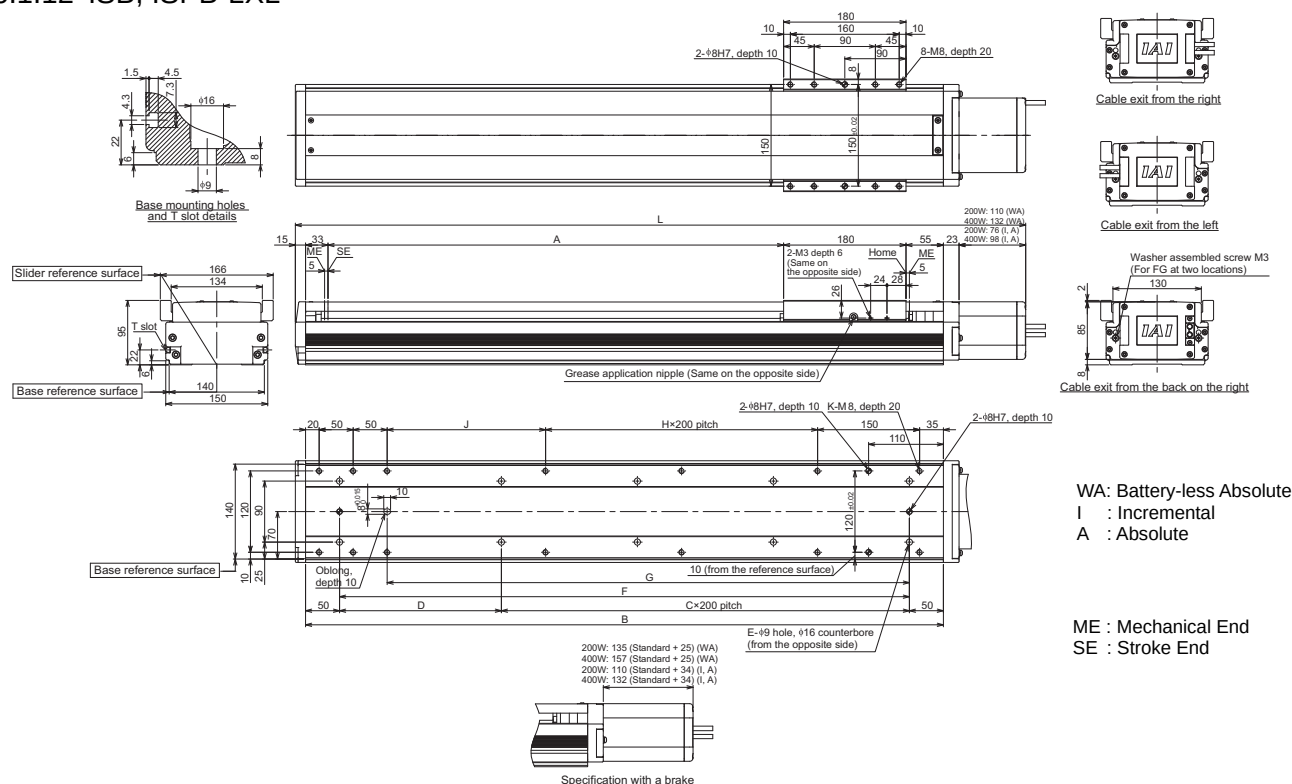
ME : Mechanical End

SE : Stroke End

Nominal Stroke	Effective Stroke (Note 1)	L		A	B	C	D	E	F	G	H	J	K	Mass [kg]			
		Battery-less Absolute												200W Standard		400W Standard	
		Standard W/o Brake															
		200W	400W											Stand ar d	with Brake	Stand ar d	with Brake
300	115	686	708	576	538	233	0	10	238	1	6	368	438	16.3	16.9	16.8	17.4
350	165	736	758	626	588	283	0	10	288	1	6	418	488	17.2	17.8	17.7	18.3
400	215	786	808	676	638	333	1	12	338	2	8	468	538	18.1	18.7	18.5	19.1
450	265	836	858	726	688	383	1	12	388	2	8	518	588	19.0	19.6	19.4	20.0
500	315	886	908	776	738	433	1	12	438	2	8	568	638	19.8	20.4	20.3	20.9
550	365	936	958	826	788	483	1	12	488	2	8	618	688	20.7	21.3	21.2	21.8
600	415	986	1008	876	838	533	2	14	538	3	10	668	738	21.5	22.1	22.0	22.6
650	465	1036	1058	926	888	583	2	14	588	3	10	718	788	22.4	23.0	22.9	23.5
700	515	1086	1108	976	938	633	2	14	638	3	10	768	838	23.3	23.9	23.7	24.3
750	565	1136	1158	1026	988	683	2	14	688	3	10	818	888	24.2	24.8	24.6	25.2
800	615	1186	1208	1076	1038	733	3	16	738	4	12	868	938	25.0	25.6	25.5	26.1
850	665	1236	1258	1126	1088	783	3	16	788	4	12	918	988	25.9	26.5	26.4	27.0
900	715	1286	1308	1176	1138	833	3	16	838	4	12	968	1038	26.7	27.3	27.2	27.8
950	765	1336	1358	1226	1188	883	3	16	888	4	12	1018	1088	27.6	28.2	28.1	28.7
1000	815	1386	1408	1276	1238	933	4	18	938	5	14	1068	1138	28.5	29.1	28.9	29.5
1050	865	1436	1458	1326	1288	983	4	18	988	5	14	1118	1188	29.4	30.0	29.8	30.4
1100	915	1486	1508	1376	1338	1033	4	18	1038	5	14	1168	1238	30.2	30.8	30.7	31.3
1150	965	1536	1558	1426	1388	1083	4	18	1088	5	14	1218	1288	31.1	31.7	31.6	32.2
1200	1015	1586	1608	1476	1438	1133	5	20	1138	6	16	1268	1338	31.9	32.5	32.4	33.0
1250	1065	1636	1658	1526	1488	1183	5	20	1188	6	16	1318	1388	32.8	33.4	33.3	33.9
1300	1115	1686	1708	1576	1538	1233	5	20	1238	6	16	1368	1438	33.7	34.3	34.1	34.7

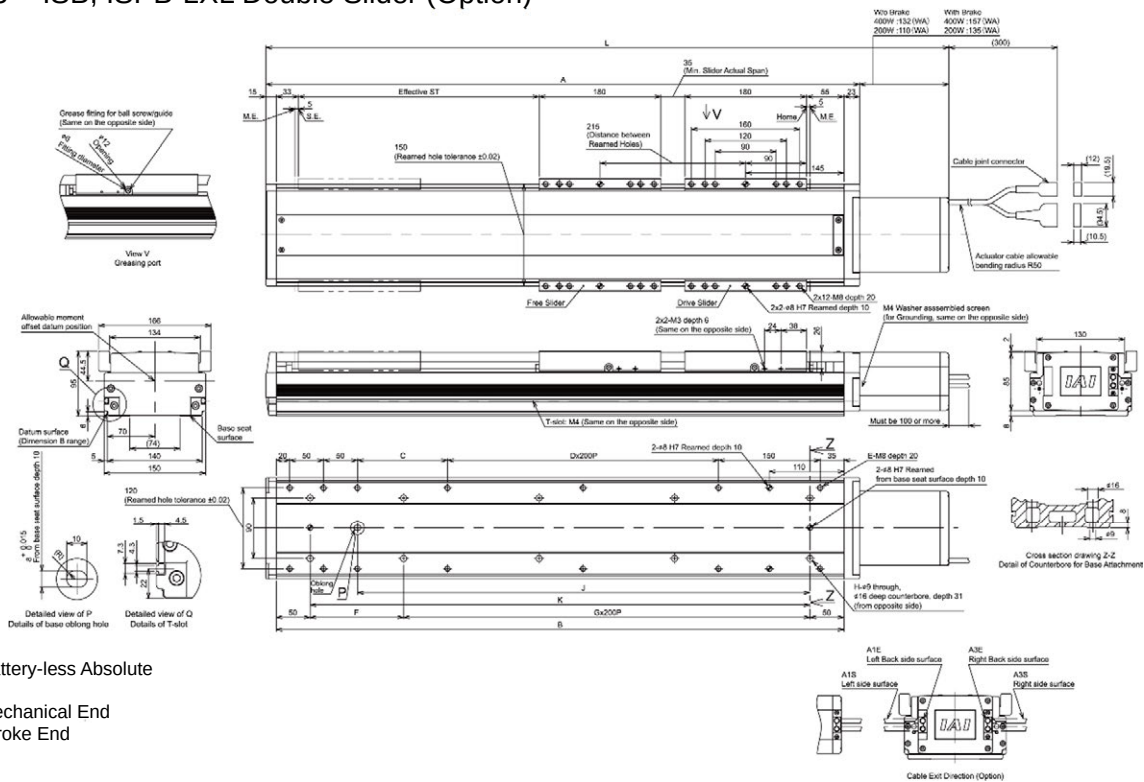
Note 1 The effective strokes are the dimensions when the slider actual span is in minimum.
Refer to [3. Double Slider (Option) Type].

16.1.12 ISB, ISPB-LXL



Stroke	L				A	B	C	D	E	F	G	H	J	K	Mass [kg]			
	Incremental Absolute		Battery-less Absolute												200W Standard		400W Standard	
	Standard														Standard	With brake	Standard	With brake
	200W	400W	200W	400W														
	120	502	524	536											558	120	388	0
170	552	574	586	608	170	438	1	138	6	338	268	0	133	10	10.7	11.3	11.1	11.7
220	602	624	636	658	220	488	1	188	6	388	318	0	183	10	11.5	12.1	12.0	12.6
270	652	674	686	708	270	538	1	238	6	438	368	0	233	10	12.4	13.0	12.9	13.5
320	702	724	736	758	320	588	1	288	6	488	418	0	283	10	13.2	13.8	13.7	14.3
370	752	774	786	808	370	638	2	138	8	538	468	1	133	12	14.1	14.7	14.6	15.2
420	802	824	836	858	420	688	2	188	8	588	518	1	183	12	15.0	15.6	15.4	16.0
470	852	874	886	908	470	738	2	238	8	638	568	1	233	12	15.9	16.5	16.3	16.9
520	902	924	936	958	520	788	2	288	8	688	618	1	283	12	16.7	17.3	17.2	17.8
570	952	974	986	1008	570	838	3	138	10	738	668	2	133	14	17.6	18.2	18.1	18.7
620	1002	1024	1036	1058	620	888	3	188	10	788	718	2	183	14	18.4	19.0	18.9	19.5
670	1052	1074	1086	1108	670	938	3	238	10	838	768	2	233	14	19.3	19.9	19.8	20.4
720	1102	1124	1136	1158	720	988	3	288	10	888	818	2	283	14	20.2	20.8	20.6	21.2
770	1152	1174	1186	1208	770	1038	4	138	12	938	868	3	133	16	21.1	21.7	21.5	22.1
820	1202	1224	1236	1258	820	1088	4	188	12	988	918	3	183	16	21.9	22.5	22.4	23.0
870	1252	1274	1286	1308	870	1138	4	238	12	1038	968	3	233	16	22.8	23.4	23.3	23.9
920	1302	1324	1336	1358	920	1188	4	288	12	1088	1018	3	183	16	23.6	24.2	24.1	24.7
970	1352	1374	1386	1408	970	1238	5	138	14	1138	1068	4	133	18	24.5	25.1	25.0	25.6
1020	1402	1424	1436	1458	1020	1288	5	188	14	1188	1118	4	183	18	25.4	26.0	25.8	26.4
1070	1452	1474	1486	1508	1070	1338	5	238	14	1238	1168	4	233	18	26.3	26.9	26.7	27.3
1120	1502	1524	1536	1558	1120	1388	5	288	14	1288	1218	4	283	18	27.1	27.7	27.6	28.2
1170	1552	1574	1586	1608	1170	1438	6	138	16	1338	1268	5	133	20	28.0	28.6	28.5	29.1
1220	1602	1624	1636	1658	1220	1488	6	188	16	1388	1318	5	183	20	28.8	29.4	29.3	29.9
1270	1652	1674	1686	1708	1270	1538	6	238	16	1438	1368	5	233	20	29.7	30.3	30.2	30.8

16.1.13 ISB, ISPB-LXL Double Slider (Option)



WA : Battery-less Absolute

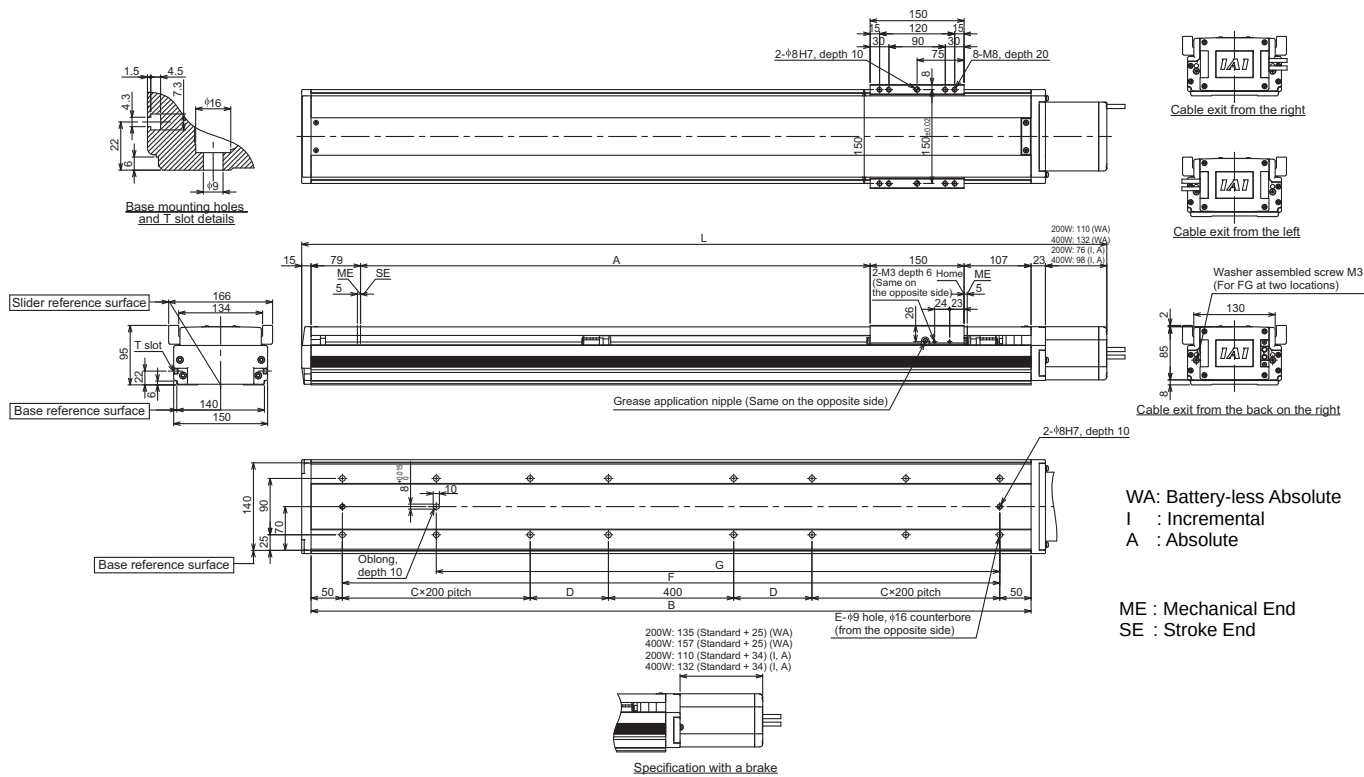
ME : Mechanical End

SE : Stroke End

Nominal Stroke	Effective Stroke (Note 1)	L		A	B	C	D	E	F	G	H	J	K	Mass [kg]			
		Battery-less Absolute												200W Standard		400W Standard	
		Standard W/o Brake															
		200W	400W											Stand ard	with Brake	Stand ard	with Brake
320	105	736	758	626	588	283	0	10	288	1	6	418	488	16.7	17.3	17.2	17.8
370	155	786	808	676	638	133	1	12	138	2	8	468	538	17.6	18.2	18.1	18.7
420	205	836	858	726	688	183	1	12	188	2	8	518	588	18.5	19.1	18.9	19.5
470	255	886	908	776	738	233	1	12	238	2	8	568	638	19.4	20.0	19.8	20.4
520	305	936	958	826	788	283	1	12	288	2	8	618	688	20.2	20.8	20.7	21.3
570	355	986	1008	876	838	133	2	14	138	3	10	668	738	21.1	21.7	21.6	22.2
620	405	1036	1058	926	888	183	2	14	188	3	10	718	788	21.9	22.5	22.4	23.0
670	455	1086	1108	976	938	233	2	14	238	3	10	768	838	22.8	23.4	23.3	23.9
720	505	1136	1158	1026	988	283	2	14	288	3	10	818	888	23.7	24.3	24.1	24.7
770	555	1186	1208	1076	1038	133	3	16	138	4	12	868	938	24.6	25.2	25.0	25.6
820	605	1236	1258	1126	1088	183	3	16	188	4	12	918	988	25.4	26.0	25.9	26.5
870	655	1286	1308	1176	1138	233	3	16	238	4	12	968	1038	26.3	26.9	26.8	27.4
920	705	1336	1358	1226	1188	283	3	16	288	4	12	1018	1088	27.1	27.7	27.6	28.2
970	755	1386	1408	1276	1238	133	4	18	138	5	14	1068	1138	28.0	28.6	28.5	29.1
1020	805	1436	1458	1326	1288	183	4	18	188	5	14	1118	1188	28.9	29.5	29.3	29.9
1070	855	1486	1508	1376	1338	233	4	18	238	5	14	1168	1238	29.8	30.4	30.2	30.8
1120	905	1536	1558	1426	1388	283	4	18	288	5	14	1218	1288	30.6	31.2	31.1	31.7
1170	955	1586	1608	1476	1438	133	5	20	138	6	16	1268	1338	31.5	32.1	32.0	32.6
1220	1005	1636	1658	1526	1488	183	5	20	188	6	16	1318	1388	32.3	32.9	32.8	33.4
1270	1055	1686	1708	1576	1538	233	5	20	238	6	16	1368	1438	33.2	33.8	33.7	34.3

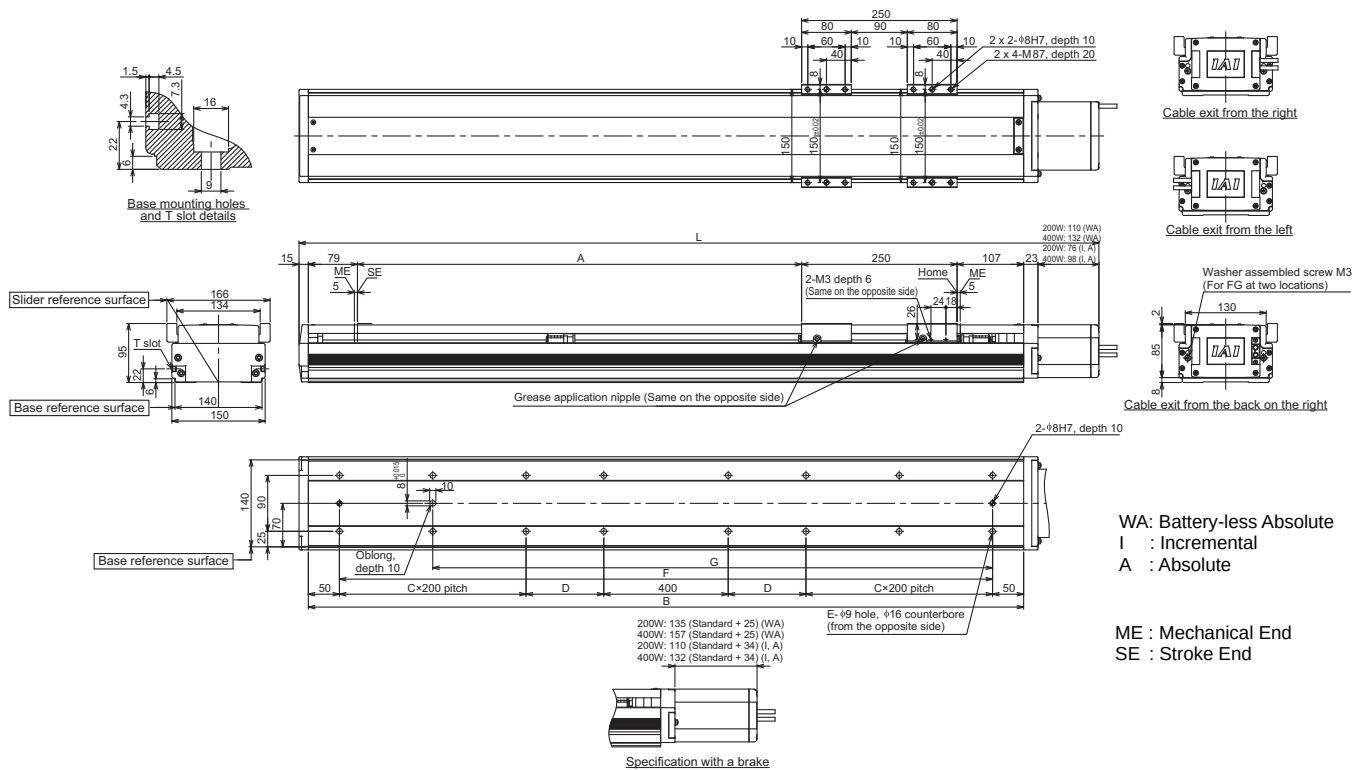
Note 1 The effective strokes are the dimensions when the slider actual span is in minimum. Refer to [3. Double Slider (Option) Type].

16.1.14 ISB, ISPB-LXMX



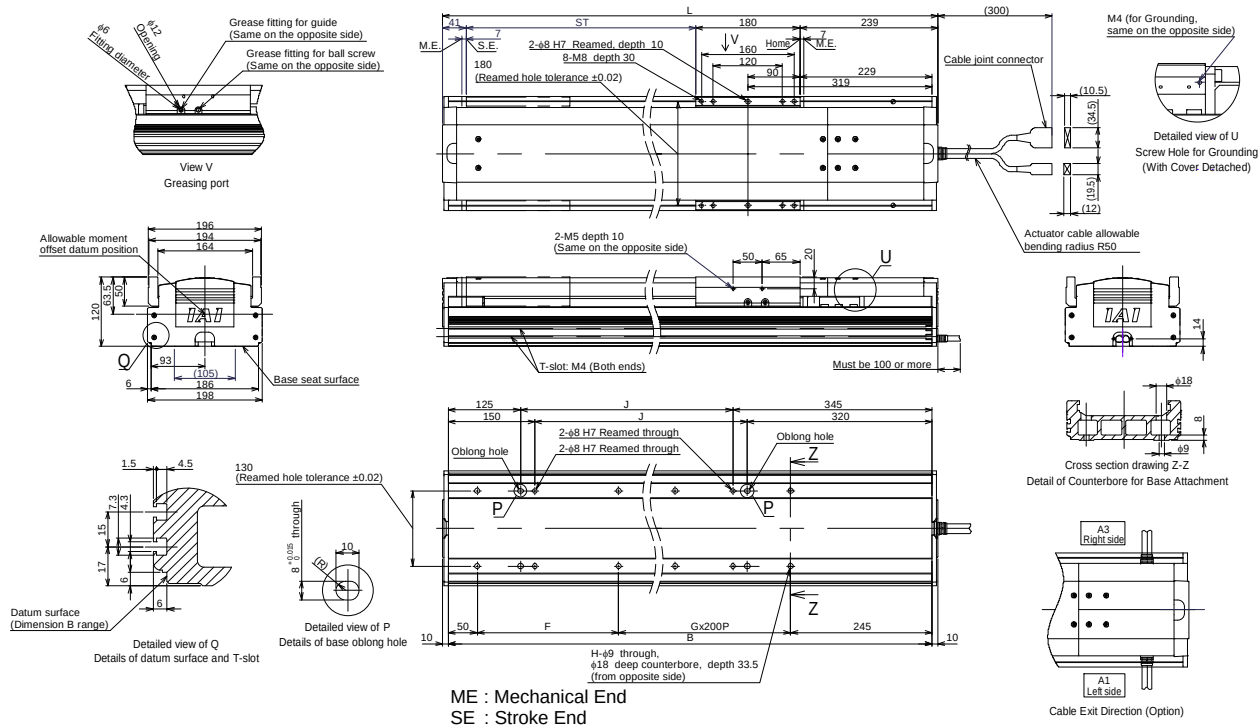
Stroke	L				A	B	C	D	E	F	G	Mass [kg]			
	Incremental Absolute		Battery-less Absolute									200W Standard		400W Standard	
	Standard											Standard	With brake	Standard	With brake
	200W	400W	200W	400W											
1000	1464	1486	1498	1520	1014	1350	1	225	12	1250	1050	27.3	27.9	27.7	28.3
1100	1564	1586	1598	1620	1114	1450	1	275	12	1350	1150	29.0	29.6	29.5	30.1
1200	1664	1686	1698	1720	1214	1550	1	325	12	1450	1250	30.8	31.4	31.3	31.9
1300	1764	1786	1798	1820	1314	1650	1	375	12	1550	1350	32.5	33.1	33.0	33.6
1400	1864	1886	1898	1920	1414	1750	1	425	12	1650	1450	34.3	34.9	34.8	35.4
1500	1964	1986	1998	2020	1514	1850	1	475	12	1750	1550	36.1	36.7	36.5	37.1
1600	2064	2086	2098	2120	1614	1950	1	525	12	1850	1650	37.8	38.4	38.3	38.9
1700	2164	2186	2198	2220	1714	2050	1	575	12	1950	1750	39.6	40.2	40.0	40.6
1800	2264	2286	2298	2320	1814	2150	2	425	16	2050	1850	41.3	41.9	41.8	42.4
1900	2364	2386	2398	2420	1914	2250	2	475	16	2150	1950	43.1	43.7	43.5	44.1
2000	2464	2486	2498	2520	2014	2350	2	525	16	2250	2050	44.8	45.4	45.3	45.9
2100	2564	2586	2598	2620	2114	2450	2	575	16	2350	2150	46.6	47.2	47.0	47.6
2200	2664	2686	2698	2720	2214	2550	3	425	20	2450	2250	48.3	48.9	48.8	49.4
2300	2764	2786	2798	2820	2314	2650	3	475	20	2550	2350	50.1	50.7	50.6	51.2
2400	2864	2886	2898	2920	2414	2750	3	525	20	2650	2450	51.8	52.4	52.3	52.9
2500	2964	2986	2998	3020	2514	2850	3	575	20	2750	2550	53.6	54.2	54.1	54.7

16.1.15 ISB, ISPB-LXUWX



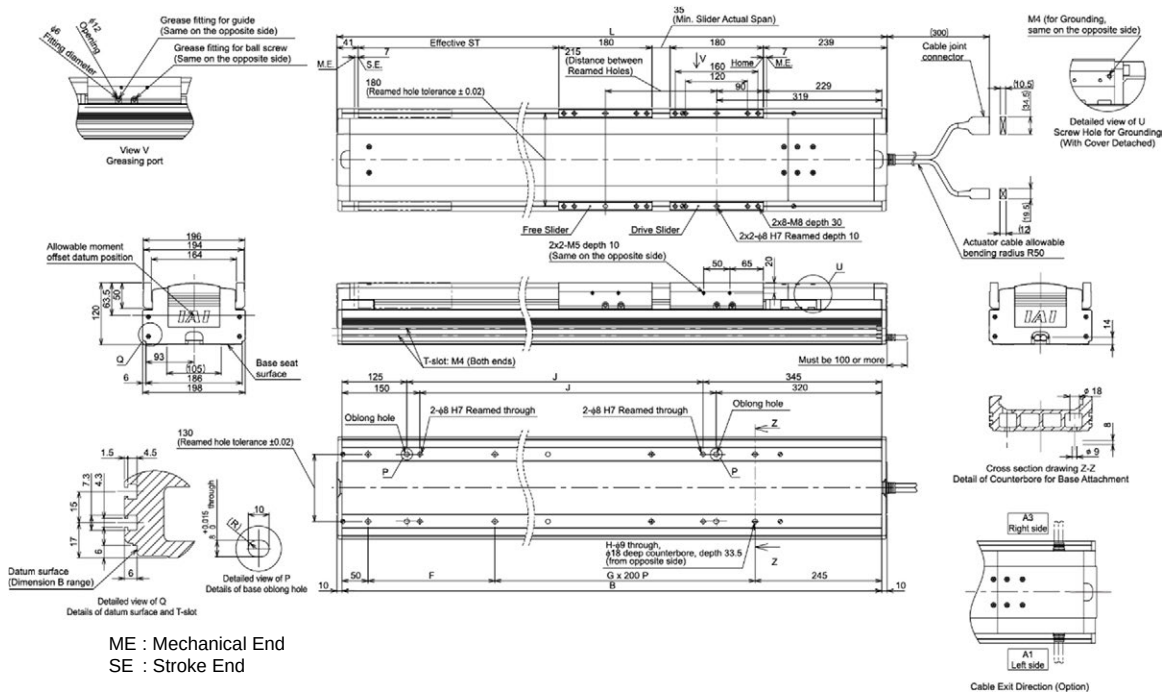
Stroke	L				A	B	C	D	E	F	G	Mass [kg]			
	Incremental Absolute		Battery-less Absolute									200W Standard		400W Standard	
	Standard											Standard	With brake	Standard	With brake
	200W	400W	200W	400W											
1000	1564	1586	1598	1620	1014	1450	1	275	12	1350	1150	30.4	31.0	30.8	31.4
1100	1664	1686	1698	1720	1114	1550	1	325	12	1450	1250	32.1	32.7	32.6	33.2
1200	1764	1786	1798	1820	1214	1650	1	375	12	1550	1350	33.9	34.5	34.3	34.9
1300	1864	1886	1898	1920	1314	1750	1	425	12	1650	1450	35.6	36.2	36.1	36.7
1400	1964	1986	1998	2020	1414	1850	1	475	12	1750	1550	37.4	38.0	37.8	38.4
1500	2064	2086	2098	2120	1514	1950	1	525	12	1850	1650	39.1	39.7	39.6	40.2
1600	2164	2186	2198	2220	1614	2050	1	575	12	1950	1750	40.9	41.5	41.4	42.0
1700	2264	2286	2298	2320	1714	2150	2	425	16	2050	1850	42.6	43.2	43.1	43.7
1800	2364	2386	2398	2420	1814	2250	2	475	16	2150	1950	44.4	45.0	44.9	45.5
1900	2464	2486	2498	2520	1914	2350	2	525	16	2250	2050	46.1	46.7	46.6	47.2
2000	2564	2586	2598	2620	2014	2450	2	575	16	2350	2150	47.9	48.5	48.4	49.0
2100	2664	2686	2698	2720	2114	2550	3	425	20	2450	2250	49.7	50.3	50.1	50.7
2200	2764	2786	2798	2820	2214	2650	3	475	20	2550	2350	51.4	52.0	51.9	60.5
2300	2864	2886	2898	2920	2314	2750	3	525	20	2650	2450	53.2	53.8	53.6	54.2
2400	2964	2986	2998	3020	2414	2850	3	575	20	2750	2550	54.9	55.5	55.4	56.0
2500	3064	3086	3098	3120	2514	2950	3	625	20	2850	2650	56.7	57.3	57.1	57.7

16.1.16 ISB, ISPB-WXM



Stroke	L	B	F	G	H	J	Mass [kg]	
	Battery-less Absolute						750W Standard	
	Standard						Standard	With brake
100	560	540	245	0	4	70	18.3	18.8
150	610	590	295	0	4	120	19.3	19.8
200	660	640	145	1	6	170	20.4	20.9
250	710	690	195	1	6	220	21.5	22.0
300	760	740	245	1	6	270	22.5	23.0
350	810	790	295	1	6	320	23.6	24.1
400	860	840	145	2	8	370	24.6	25.1
450	910	890	195	2	8	420	25.7	26.2
500	960	940	245	2	8	470	26.8	27.3
550	1010	990	295	2	8	520	27.8	28.3
600	1060	1040	145	3	10	570	28.9	29.4
650	1110	1090	195	3	10	620	29.9	30.4
700	1160	1140	245	3	10	670	31.0	31.5
750	1210	1190	295	3	10	720	32.0	32.5
800	1260	1240	145	4	12	770	33.1	33.6
850	1310	1290	195	4	12	820	34.2	34.7
900	1360	1340	245	4	12	870	35.2	35.7
950	1410	1390	295	4	12	920	36.3	36.8
1000	1460	1440	145	5	14	970	37.3	37.8
1050	1510	1490	195	5	14	1020	38.4	38.9
1100	1560	1540	245	5	14	1070	39.5	40.0
1150	1610	1590	295	5	14	1120	40.5	41.0
1200	1660	1640	145	6	16	1170	41.6	42.1
1250	1710	1690	195	6	16	1220	42.6	43.1
1300	1760	1740	245	6	16	1270	43.7	44.2

16.1.17 ISB, ISPB-WXM Double Slider (Option)

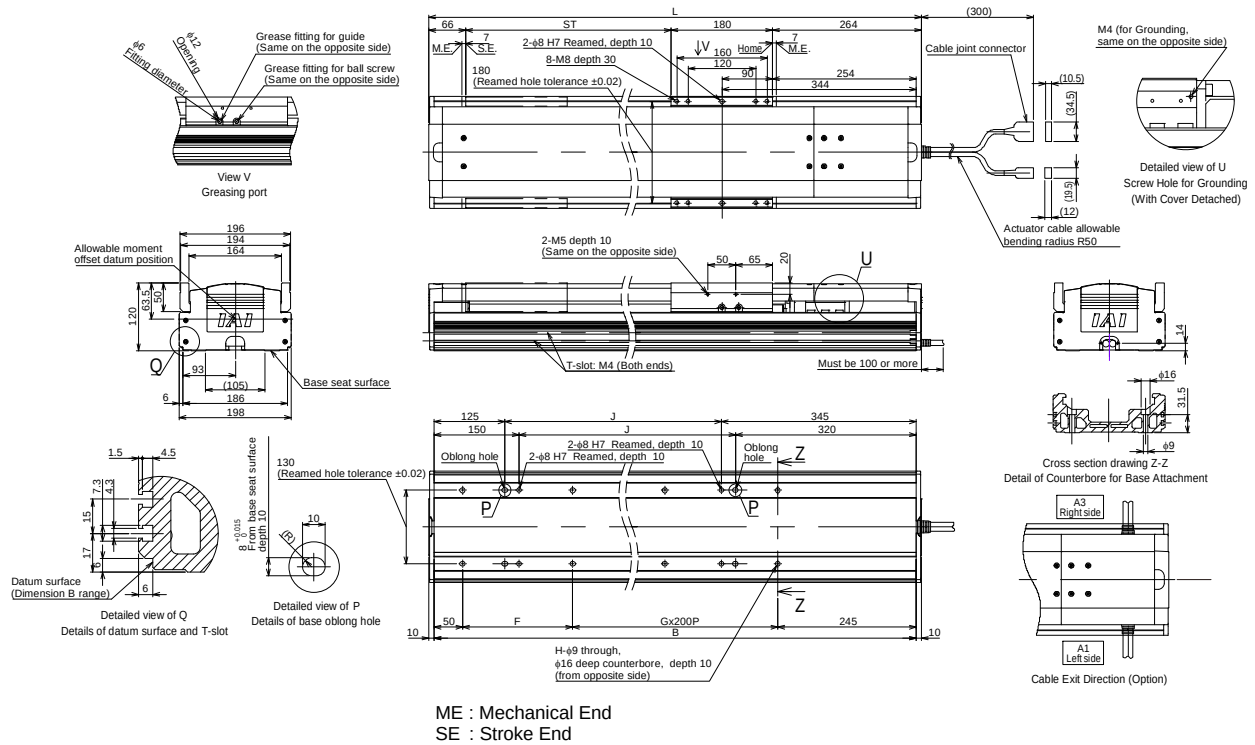


Nominal Stroke	Effective Stroke (Note 1)	L	B	F	G	H	J	Mass [kg]	
		Battery-less Absolute						750W Standard	
		Standard						Standard	With brake
350	135	810	790	295	1	6	320	26.6	27.1
400	185	860	840	145	2	8	370	27.6	28.1
450	235	910	890	195	2	8	420	28.7	29.2
500	285	960	940	245	2	8	470	29.8	30.3
550	335	1010	990	295	2	8	520	30.8	31.3
600	385	1060	1040	145	3	10	570	31.9	32.4
650	435	1110	1090	195	3	10	620	32.9	33.4
700	485	1160	1140	245	3	10	670	34.0	34.5
750	535	1210	1190	295	3	10	720	35.0	35.5
800	585	1260	1240	145	4	12	770	36.1	36.6
850	635	1310	1290	195	4	12	820	37.2	37.7
900	685	1360	1340	245	4	12	870	38.2	38.7
950	735	1410	1390	295	4	12	920	39.3	39.8
1000	785	1460	1440	145	5	14	970	40.3	40.8
1050	835	1510	1490	195	5	14	1020	41.4	41.9
1100	885	1560	1540	245	5	14	1070	42.5	43.0
1150	935	1610	1590	295	5	14	1120	43.5	44.0
1200	985	1660	1640	145	6	16	1170	44.6	45.1
1250	1035	1710	1690	195	6	16	1220	45.6	46.1
1300	1085	1760	1740	245	6	16	1270	46.7	47.2

Note 1 The effective strokes are the dimensions when the slider actual span is in minimum. Refer to [3. Double Slider (Option) Type].



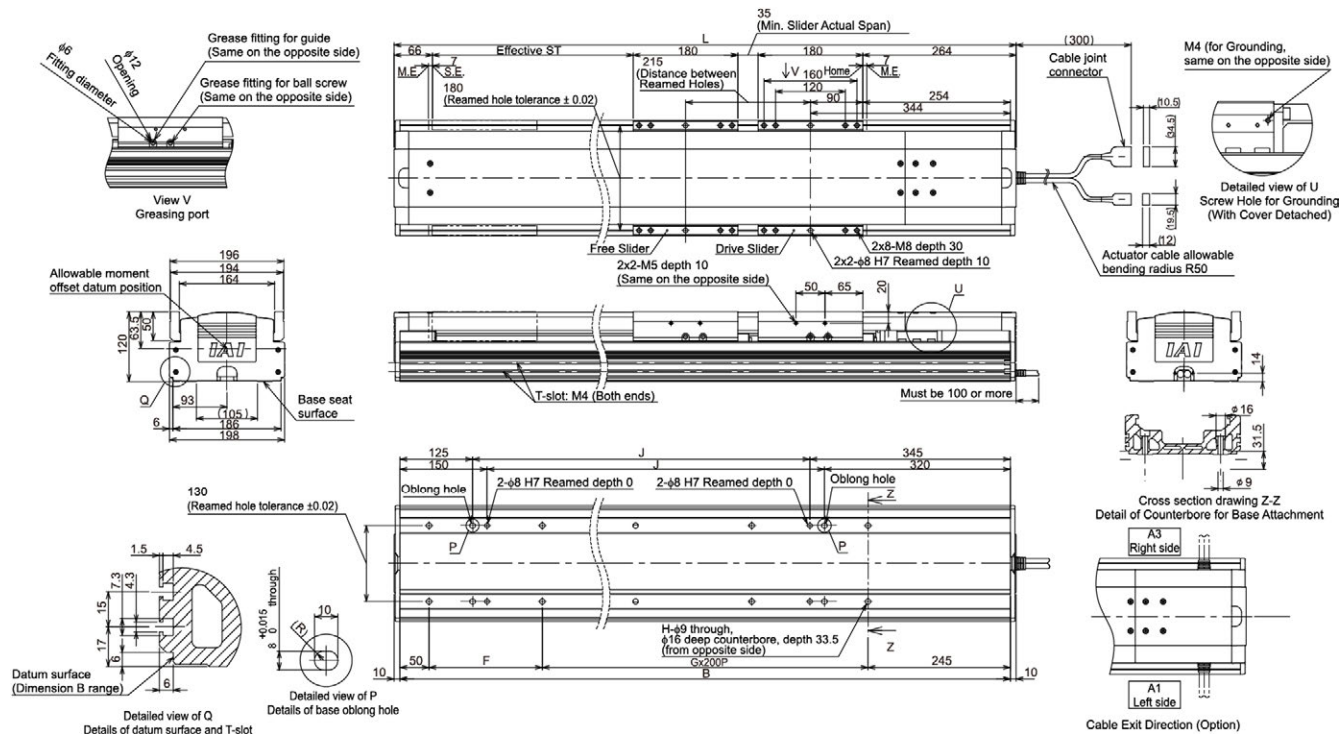
16.1.18 ISB, ISPB-WXXMX





Stroke	L	B	F	G	H	J	Mass [kg]	
	Battery-less Absolute						750W Standard	
	Standard						Standard	With brake
900	1410	1390	295	4	12	920	38.4	38.9
950	1460	1440	145	5	14	970	39.5	40.0
1000	1510	1490	195	5	14	1020	40.5	41.0
1050	1560	1540	245	5	14	1070	41.6	42.1
1100	1610	1590	295	5	14	1120	42.7	43.2
1150	1660	1640	145	6	16	1170	43.7	44.2
1200	1710	1690	195	6	16	1220	44.8	45.3
1250	1760	1740	245	6	16	1270	45.8	46.3
1300	1810	1790	295	6	16	1320	46.9	47.4
1350	1860	1840	145	7	18	1370	48.0	48.5
1400	1910	1890	195	7	18	1420	49.0	49.5
1450	1960	1940	245	7	18	1470	50.1	50.6
1500	2010	1990	295	7	18	1520	51.2	51.7
1550	2060	2040	145	8	20	1570	52.2	52.7
1600	2110	2090	195	8	20	1620	54.2	54.7
1650	2160	2140	245	8	20	1670	55.3	55.8
1700	2210	2190	295	8	20	1720	56.4	56.9
1750	2260	2240	145	9	22	1770	57.4	57.9
1800	2310	2290	195	9	22	1820	58.5	59.0
1850	2360	2340	245	9	22	1870	59.6	60.1
1900	2410	2390	295	9	22	1920	60.6	61.1
1950	2460	2440	145	10	24	1970	61.7	62.2
2000	2510	2490	195	10	24	2020	62.7	63.2
2050	2560	2540	245	10	24	2070	63.8	64.3
2100	2610	2590	295	10	24	2120	64.9	65.4
2150	2660	2640	145	11	26	2170	65.9	66.4
2200	2710	2690	195	11	26	2220	67.0	67.5
2250	2760	2740	245	11	26	2270	68.1	68.6
2300	2810	2790	295	11	26	2320	69.1	69.6
2350	2860	2840	145	12	28	2370	70.2	70.7
2400	2910	2890	195	12	28	2420	71.3	71.8
2450	2960	2940	245	12	28	2470	72.3	72.8
2500	3010	2990	295	12	28	2520	73.4	73.9
2550	3060	3040	145	13	30	2570	74.5	75.0
2600	3110	3090	195	13	30	2620	76.5	77.0
2650	3160	3140	245	13	30	2670	77.5	78.0
2700	3210	3190	295	13	30	2720	78.6	79.1
2750	3260	3240	145	14	32	2770	79.7	80.2
2800	3310	3290	195	14	32	2820	80.7	81.2
2850	3360	3340	245	14	32	2870	81.8	82.3
2900	3410	3390	295	14	32	2920	82.8	83.3
2950	3460	3440	145	15	34	2970	83.9	84.4
3000	3510	3490	195	15	34	3020	85.0	85.5

16.1.19 ISB, ISPB-WXMX Double Slider (Option)



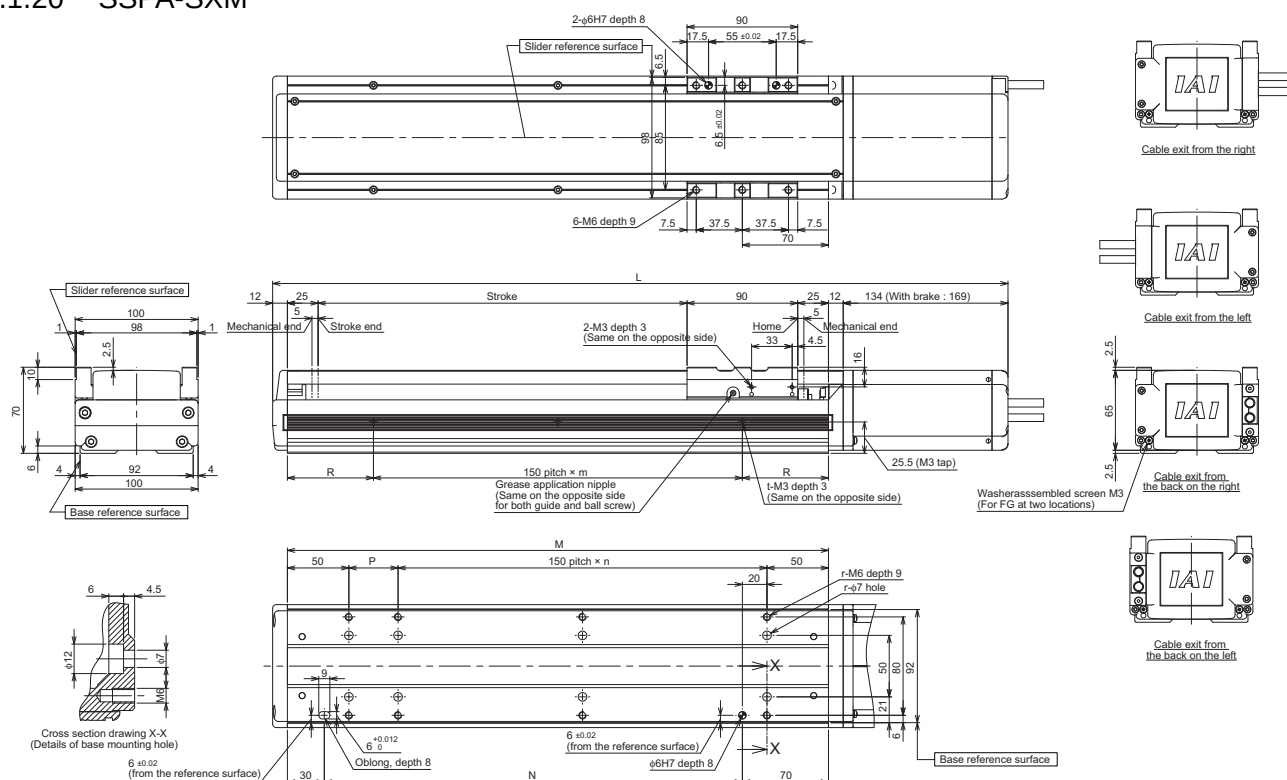
ME : Mechanical End
SE : Stroke End



Nominal Stroke	Effective Stroke ^(Note 1)	L	B	F	G	H	J	Mass [kg]	
		Battery-less Absolute						750W Standard	
		Standard						Standard	With brake
900	685	1410	1390	295	4	12	920	41.4	41.9
950	735	1460	1440	145	5	14	970	42.5	43.0
1000	785	1510	1490	195	5	14	1020	43.5	44.0
1050	835	1560	1540	245	5	14	1070	44.6	45.1
1100	885	1610	1590	295	5	14	1120	45.7	46.2
1150	935	1660	1640	145	6	16	1170	46.7	47.2
1200	985	1710	1690	195	6	16	1220	47.8	48.3
1250	1035	1760	1740	245	6	16	1270	48.8	49.3
1300	1085	1810	1790	295	6	16	1320	49.9	50.4
1350	1135	1860	1840	145	7	18	1370	51.0	51.5
1400	1185	1910	1890	195	7	18	1420	52.0	52.5
1450	1235	1960	1940	245	7	18	1470	53.1	53.6
1500	1285	2010	1990	295	7	18	1520	54.2	54.7
1550	1335	2060	2040	145	8	20	1570	55.2	55.7
1600	1385	2110	2090	195	8	20	1620	57.2	57.7
1650	1435	2160	2140	245	8	20	1670	58.3	58.8
1700	1485	2210	2190	295	8	20	1720	59.4	59.9
1750	1535	2260	2240	145	9	22	1770	60.4	60.9
1800	1585	2310	2290	195	9	22	1820	61.5	62.0
1850	1635	2360	2340	245	9	22	1870	62.6	63.1
1900	1685	2410	2390	295	9	22	1920	63.6	64.1
1950	1735	2460	2440	145	10	24	1970	64.7	65.2
2000	1785	2510	2490	195	10	24	2020	65.7	66.2
2050	1835	2560	2540	245	10	24	2070	66.8	67.3
2100	1885	2610	2590	295	10	24	2120	67.9	68.4
2150	1935	2660	2640	145	11	26	2170	68.9	69.4
2200	1985	2710	2690	195	11	26	2220	70.0	70.5
2250	2035	2760	2740	245	11	26	2270	71.1	71.6
2300	2085	2810	2790	295	11	26	2320	72.1	72.6
2350	2135	2860	2840	145	12	28	2370	73.2	73.7
2400	2185	2910	2890	195	12	28	2420	74.3	74.8
2450	2235	2960	2940	245	12	28	2470	75.3	75.8
2500	2285	3010	2990	295	12	28	2520	76.4	76.9
2550	2335	3060	3040	145	13	30	2570	77.5	78.0
2600	2385	3110	3090	195	13	30	2620	79.5	80.0
2650	2435	3160	3140	245	13	30	2670	80.5	81.0
2700	2485	3210	3190	295	13	30	2720	81.6	82.1
2750	2535	3260	3240	145	14	32	2770	82.7	83.2
2800	2585	3310	3290	195	14	32	2820	83.7	84.2
2850	2635	3360	3340	245	14	32	2870	84.8	85.3
2900	2685	3410	3390	295	14	32	2920	85.8	86.3
2950	2735	3460	3440	145	15	34	2970	86.9	87.4
3000	2785	3510	3490	195	15	34	3020	88.0	88.5

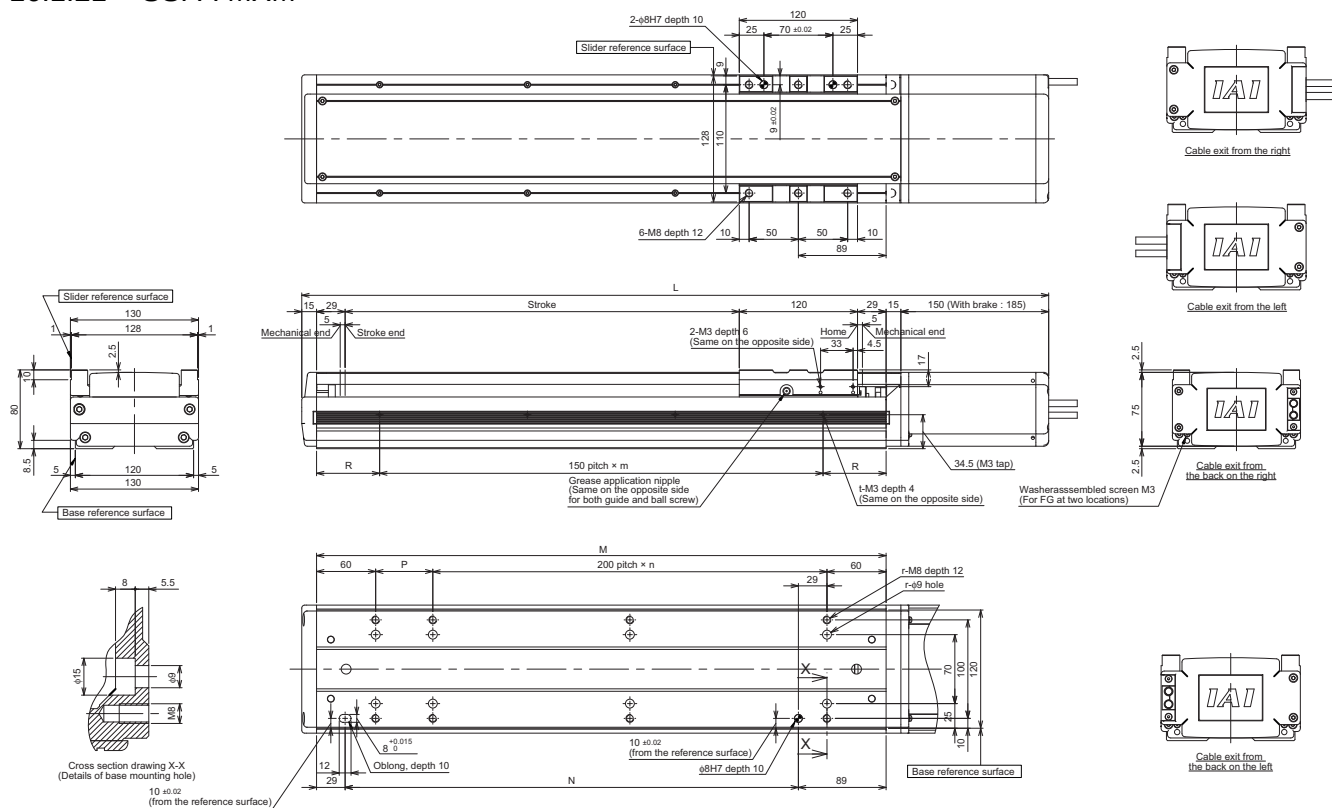
Note 1 The effective strokes are the dimensions when the slider actual span is in minimum.
Refer to [3. Double Slider (Option) Type]

16.1.20 SSPA-SXM



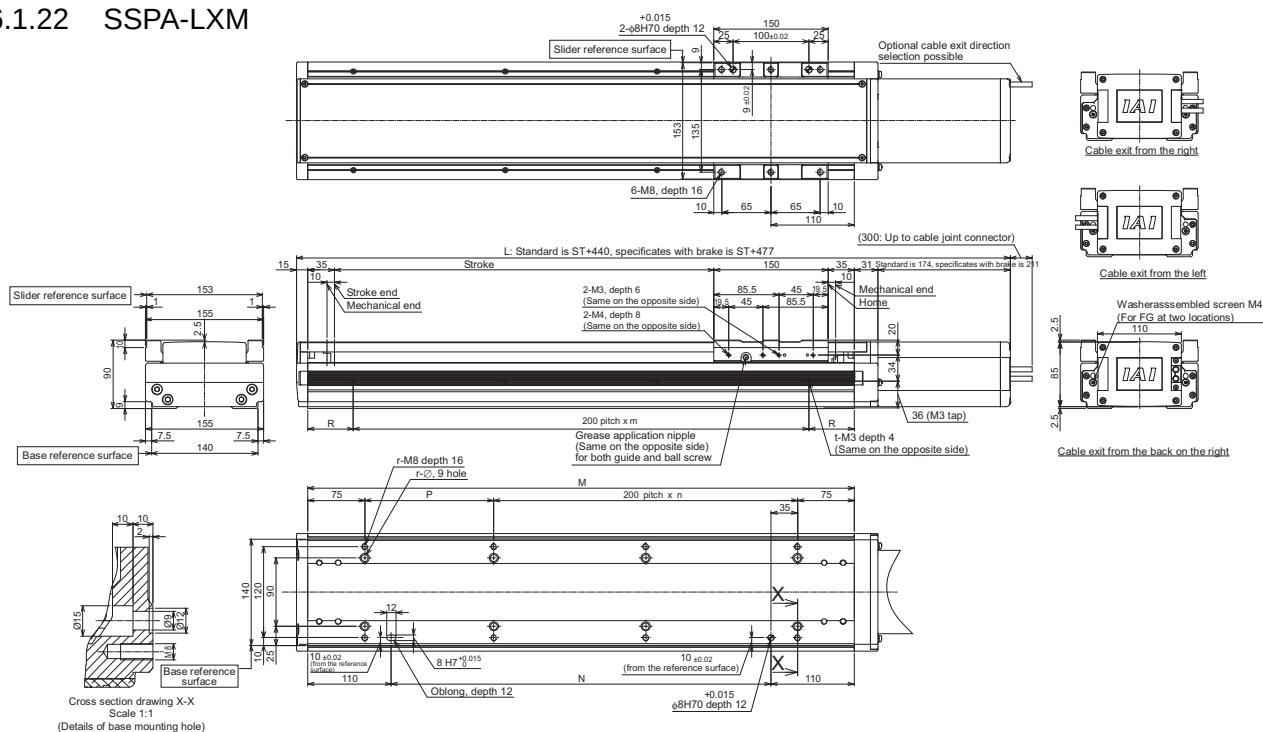
Stroke	L		M	N	P	R	m	n	r	t	Mass [kg]	
	Standard	With brake									Standard	With brake
100	398	433	240	140	140	45	1	0	4	2	6.8	7.4
150	448	483	290	190	40	70	1	1	6	2	7.4	8.0
200	498	533	340	240	90	20	2	1	6	3	8.1	8.7
250	548	583	390	290	140	45	2	1	6	3	8.7	9.3
300	598	633	440	340	40	70	2	2	8	3	9.3	9.9
350	648	683	490	390	90	20	3	2	8	4	10.0	10.6
400	698	733	540	440	140	45	3	2	8	4	10.6	11.2
450	748	783	590	490	40	70	3	3	10	4	11.2	11.8
500	798	833	640	540	90	20	4	3	10	5	11.9	12.5
550	848	883	690	590	140	45	4	3	10	5	12.5	13.1
600	898	933	740	640	40	70	4	4	12	5	13.1	13.7
650	948	983	790	690	90	20	5	4	12	6	13.8	14.4
700	998	1033	840	740	140	45	5	4	12	6	14.4	15.0
750	1048	1083	890	790	40	70	5	5	14	6	15.0	15.6
800	1098	1133	940	840	90	20	6	5	14	7	15.6	16.2
850	1148	1183	990	890	140	45	6	5	14	7	16.3	16.9
900	1198	1233	1040	940	40	70	6	6	16	7	16.9	17.5
950	1248	1283	1090	990	90	20	7	6	16	8	17.5	18.1
1000	1298	1333	1140	1040	140	45	7	6	16	8	18.2	18.8
1050	1348	1383	1190	1090	40	70	7	7	18	8	18.8	19.4
1100	1398	1433	1240	1140	90	20	8	7	18	9	19.4	20.0

16.1.21 SSPA-MXM



Stroke	L		M	N	P	R	m	n	r	t	Mass [kg]	
	Standard	With brake									Standard	With brake
100	458	493	278	160	158	64	1	0	4	2	12.4	13.0
150	508	543	328	210	208	14	2	0	4	3	13.5	14.1
200	558	593	378	260	58	39	2	1	6	3	14.6	15.2
250	608	643	428	310	108	64	2	1	6	3	15.7	16.3
300	658	693	478	360	158	14	3	1	6	4	16.7	17.3
350	708	743	528	410	208	39	3	1	6	4	17.8	18.4
400	758	793	578	460	58	64	3	2	8	4	18.9	19.5
450	808	843	628	510	108	14	4	2	8	5	20.0	20.6
500	858	893	678	560	158	39	4	2	8	5	21.1	21.7
550	908	943	728	610	208	64	4	2	8	5	22.2	22.8
600	958	993	778	660	58	14	5	3	10	6	23.2	23.8
650	1008	1043	828	710	108	39	5	3	10	6	24.3	24.9
700	1058	1093	878	760	158	64	5	3	10	6	25.4	26.0
750	1108	1143	928	810	208	14	6	3	10	7	26.5	27.1
800	1158	1193	978	860	58	39	6	4	12	7	27.6	28.2
850	1208	1243	1028	910	108	64	6	4	12	7	28.7	29.3
900	1258	1293	1078	960	158	14	7	4	12	8	29.7	30.3
950	1308	1343	1128	1010	208	39	7	4	12	8	30.8	31.4
1000	1358	1393	1178	1060	58	64	7	5	14	8	31.9	32.5
1050	1408	1443	1228	1110	108	14	8	5	14	9	33.0	33.6
1100	1458	1493	1278	1160	158	39	8	5	14	9	34.1	34.7
1150	1508	1543	1328	1210	208	64	8	5	14	9	35.2	35.8
1200	1558	1593	1378	1260	58	14	9	6	16	10	36.2	36.8
1250	1608	1643	1428	1310	108	39	9	6	16	10	37.3	37.9
1300	1658	1693	1478	1360	158	64	9	6	16	10	38.4	39.0

16.1.22 SSPA-LXM



Stroke	L		M	N	P	R	m	n	r	t	Mass [kg]	
	Standard	With brake									Standard	With brake
100	540	577	320	100	170	60	1	0	4	2	21.0	22.0
150	590	627	370	150	220	85	1	0	4	2	23.0	24.0
200	640	677	420	200	70	10	2	1	6	3	25.0	26.0
250	690	727	470	250	120	35	2	1	6	3	26.5	27.5
300	740	777	520	300	170	60	2	1	6	3	28.0	29.0
350	790	827	570	350	220	85	2	1	6	3	29.5	30.5
400	840	877	620	400	70	10	3	2	8	4	31.0	32.0
450	890	927	670	450	120	35	3	2	8	4	33.0	34.0
500	940	927	720	500	170	60	3	2	8	4	35.0	36.0
550	990	1027	770	550	220	85	3	2	8	4	36.5	37.5
600	1040	1077	820	600	70	10	4	3	10	5	38.0	39.0
650	1090	1127	870	650	120	35	4	3	10	5	39.5	40.5
700	1140	1177	920	700	170	60	4	3	10	5	41.0	42.0
750	1190	1227	970	750	220	85	4	3	10	5	43.0	44.0
800	1240	1277	1020	800	70	10	5	4	12	6	45.0	46.0
850	1290	1327	1070	850	120	35	5	4	12	6	46.5	47.5
900	1340	1377	1120	900	170	60	5	4	12	6	48.0	49.0
950	1390	1427	1170	950	220	85	5	4	12	6	49.5	50.5
1000	1440	1477	1220	1000	70	10	6	5	14	7	51.0	52.0
1050	1490	1527	1270	1050	120	35	6	5	14	7	52.5	53.5
1100	1540	1577	1320	1100	170	60	6	5	14	7	54.0	55.0
1150	1590	1627	1370	1150	220	85	6	5	14	7	56.0	57.0
1200	1640	1677	1420	1200	70	10	7	6	16	8	58.0	59.0
1250	1690	1727	1470	1250	120	35	7	6	16	8	59.5	60.5
1300	1740	1777	1520	1300	170	60	7	6	16	8	61.0	62.0
1350	1790	1827	1570	1350	220	85	7	6	16	8	62.5	63.5
1400	1840	1877	1620	1400	70	10	8	7	18	9	64.0	65.0
1450	1890	1927	1670	1452	120	35	8	7	18	9	66.0	67.0
1500	1940	1977	1720	1500	170	60	8	7	18	9	68.0	69.0



17. Warranty

17.1 Warranty Period

One of the following periods, whichever is shorter:

- 18 months after shipment from our company
- 12 months after delivery to the specified location
- 2,500 hours of operation

17.2 Scope of Warranty

Our products are covered by warranty when all of the following conditions are met. Faulty products covered by warranty will be replaced or repaired free of charge:

- (1) The breakdown or problem in question pertains to our product as delivered by us or our authorized dealer.
- (2) The breakdown or problem in question occurred during the warranty period.
- (3) The breakdown or problem in question occurred while the product was in use for an appropriate purpose under the conditions and environment of use specified in the operation manual and catalog.
- (4) The breakdown or problem in question was caused by a specification defect or problem, or by the poor quality of our product.

Note that breakdowns due to any of the following reasons are excluded from the scope of warranty:

- [1] Anything other than our product
- [2] Modification or repair performed by a party other than us (unless we have approved such modification or repair)
- [3] Anything that could not be easily predicted with the level of science and technology available at the time of shipment from our company
- [4] A natural disaster, man-made disaster, incident or accident for which we are not liable
- [5] Natural fading of paint or other symptoms of aging
- [6] Wear, depletion or other expected result of use
- [7] Operation noise, vibration or other subjective sensation not affecting function or maintenance

Note that the warranty only covers our product as delivered and that any secondary loss arising from a breakdown of our product is excluded from the scope of warranty.

17.3 Honoring the Warranty

As a rule, the product must be brought to us for repair under warranty.



17.4 Limited Liability

- (1) We shall assume no liability for any special damage, consequential loss or passive loss such as a loss of expected profit arising from or in connection with our product.
- (2) We shall not be liable for any program or control method created by the customer to operate our product or for the result of such program or control method.

17.5 Conditions of Conformance with Applicable Standards/Regulations, Etc., and Applications

- (1) If our product is combined with another product or any system, device, etc., used by the customer, the customer must first check the applicable standards, regulations and/or rules. The customer is also responsible for confirming that such combination with our product conforms to the applicable standards, etc. In such a case we will not be liable for the conformance of our product with the applicable standards, etc.
- (2) Our product is for general industrial use. It is not intended or designed for the applications specified below, which require a high level of safety. Accordingly, as a rule our product cannot be used in these applications. Contact us if you must use our product for any of these applications:
 - [1] Medical equipment pertaining to maintenance or management of human life or health
 - [2] A mechanism or mechanical equipment intended to move or transport people (such as a vehicle, railway facility or aviation facility)
 - [3] Important safety parts of mechanical equipment (such as safety devices)
 - [4] Equipment used to handle cultural assets, art or other irreplaceable items
- (3) Contact us at the earliest opportunity if our product is to be used in any condition or environment that differs from what is specified in the catalog or operation manual.

17.6 Other Items Excluded from Warranty

The price of the product delivered to you does not include expenses associated with programming, the dispatch of engineers, etc. Accordingly, a separate fee will be charged in the following cases even during the warranty period:

- [1] Guidance for installation/adjustment and witnessing of test operation
- [2] Maintenance and inspection
- [3] Technical guidance and education on operating/wiring methods, etc.
- [4] Technical guidance and education on programming and other items related to programs

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Change History

Revision Date	Description of Revision
July 2011	First edition
November 2011	Second edition Contents changed in Safety Guide Caution notes added for when working with two or more persons SSPA-SXM, MXM added
March 2012	Third edition Pg. 31, 37 ISP and ISPB Note changed to 1.8 times more of the nominal diameter for the length of thread engagement Pg. 59 "This is an option limited to the high-precision specifications (ISPB/SSPA)." deleted Note added to tell the straightness is 0.025mm for all with stroke 500mm or less unless the model is the high-precision specifications one.
March 2012	Fourth edition Pg. 1 to 7 Contents added and changed in Safety Guide Pg. 8 Note "Make sure to attach the actuator properly by following this operation manual." added in Caution in Handling Pg. 69 Warning notes added such as in case the grease got into your eye, immediately go to see the doctor for an appropriate care. Pg. 90 to 101 Weight added to appearance drawing
November 2012	Fifth edition Pg. 45 Line of LF = 100% added in graph.
January 2013	Sixth edition Pg. 29 Note changed to available to mount less than 1300mm for stroke for ceiling mount of ISB, SIPB-MXMX/LXMX/LXUWX Pg. 44 Correction made to some area in items to be prohibited in handling of cables Pg. 45 Calculation formula added for when commanded acceleration speed is higher than rated acceleration speed
March 2013	Seventh edition Pg. 35 The unit of flatness changed 0.05 mm → 0.05 mm/m 0.02 mm → 0.02 mm/m



Revision Date	Description of Revision
June 2013	Eighth edition Pg. 67 Grease before factory at intermediate support changed to Daphne Eponex Grease No. 2
December 2013	Ninth edition Pg. 69 Information added for when grease supply from grease nipple is not possible Pg. 87 Note corrected In table $N \cdot m \rightarrow N \cdot cm$
May 2014	Tenth edition Change partly made to "14. Motor Replacement Procedures" in accord with change of replacement motor
November 2014	10C edition Pg. 65 Joint deleted from the table
December 2014	Eleventh edition Pg. 64 Change made to grease supply period Pg. 68 to 69 Recommended grease gun at grease supply added
April 2015	Twelfth edition Pg. 11, 12 Touch panel teaching TB-01 added Pg. 12, 13, 49, 52, 63, 98 Dedicated controller added Pg. 13, 62, 65, 66 Option EU (Metal connector type) added Pg. 21, 23 Dynamic allowable moment value changed Pg. 24 Change made about life
July 2015	12B edition Pg. 63 Wiring table of CB-X-MA□□□ Correction made of mechanical side
October 2015	12C edition Pg. 67 Period of grease supply (reference) added for actuators with guide equipped with ball retainer Pg. 39, 102, 105 Four tapped holes added on top surface of slider for MXL and LXL
April 2016	Thirteenth edition Contents added for Battery-less Absolute



Revision Date	Description of Revision
April 2016	13B edition Pg. 73 Grease gun and nozzle changed
September 2016	13C edition Pg. 39 LXUWX slider drawings added
September 2016	Fourteenth edition Contents added for Lead 36mm of ISB-SXM and SXL and Lead 48mm of ISB-MXM, MXL and MXMX
November 2016	14B edition Pg. 16, 17 “Acceleration/deceleration” and “creep phenomenon or slipped coupling” deleted Pg. 18 to 23 Caution note added for interpolated operation of two or more orthogonal axes
February 2018	14C edition Pg. 76 Correction made to model of grease Multemp ET-R No.2 → Multemp ET-R
June 2018	14D edition Pg. 16 Change made to maximum velocity for LXXMX Stroke 2200 and LXUWX Stroke 2300 In order for prevention of abnormal noise due to ball screw resonance Pg. 54 Explanation added for how to connect brake box for special-ordered unit equipped with brake
September 2019	14E edition Pg. 87 Grease changed from Daphne Eponex Grease No. 2 to Daphne Grease MP No. 2 Pg. 88 Note added stating SSPA-L grease supply volume (reference) from 5cc to 5.5cc
September 2020	Fifteenth edition Contents added for ISB, ISPB-WXM and WXXMX Applicable controllers RCON and RSEL added
October 2020	15B edition Hanging bracket option added
May 2021	Sixteenth edition Pg. 4, 23 to 26, 80, 93, 95 Contents added for double slider Pg. 102 Description added for quantity of intermediate supports Pg. 139,143,147,151, 155, 157, 161, 164 Appearance drawing added for Double Slider Type



Revision Date	Description of Revision
November 2021	Seventeenth edition Intro-9 Corresponding to revised RoHS Directive Pg. 4 Added the note on the How to Read the Model Nameplate Pg. 16, 28 Added the payload capacity by acceleration/deceleration of vertical high portability actuator Pg. 23 Added the brake holding force of vertical high portability actuator Pg. 103 to 106 Added the replacing intermediate support parts procedure Pg. 112 to 129 Changed/Revised the contents of motor replacement procedures General Corrected mistakes, unified terms
January 2022	17B edition Pg. 149 ISB, ISPB-MXM Correction made of external dimensions
April 2022	Eighteenth edition Pg. 1, 66 Change made in accordance with deletion of homing mark stickers to be enclosed Pg. 5, 16, 23, 28, 41, 42, 63, 73, 91, 165, 167 ISB-WXMX applied for vertical mount Pg. 20 Correction made to allowable overhang load length for ISB and ISPB-MXL Pg. 25 Note added for static allowable moment in double-slider specification General Corrected mistakes, unified terms
October 2025	18B edition Changes due to discontinuation of including the First Step Guide
June 2026	18C edition Terms integrated (cable carrier)



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