CKD

Electric Actuator

EKS-L Series

INSTRUCTION MANUAL

SM-A02367-A/7

- Be sure to read this Instruction Manual before using the product.
- Read the safety notes carefully.
- Keep this Instruction Manual in a safe and convenient place for future reference.

CKD Corporation

PREFACE

Thank you for purchasing CKD's **"EKS-L Series" electric actuator**. This Instruction Manual contains basic matters such as installation and usage instructions in order to ensure optimal performance of the product. Please read this Instruction Manual thoroughly and use the product properly.
Keep this Instruction Manual in a safe place and be careful not to lose it.

Product specifications and appearances presented in this Instruction Manual are subject to change without notice.

CAUTION:
This product is not equipped with a motor.
You need to prepare, install, and adjust a motor and driver by yourself.
Make sure to install a motor properly in accordance with the instructions given in this Instruction Manual.
For how to adjust a motor, refer to the instruction manual of the motor.

SAFETY INFORMATION

When designing and manufacturing any device incorporating the product, the manufacturer has an obligation to ensure that the device is safe. To that end, make sure that the safety of the machine mechanism of the device and the electric system that controls such mechanism is ensured.

In order to use our products safely, it is important to select, use, handle, and maintain the products properly.
Observe the warnings and precautions described in this Instruction Manual to ensure device safety.

Although various safety measures have been adopted in the product, customer's improper handling may lead to an accident. To avoid this:

Be sure to read this Instruction Manual thoroughly and understand its descriptions before using the product.

To explicitly indicate the severity and likelihood of a potential harm or damage, precautions are classified into three categories: "DANGER", "WARNING", and "CAUTION".

DANGER	Indicates an imminent hazard. Improper handling may cause death or serious injury to people.
WARNING	Indicates a potential hazard. Improper handling may cause death or serious injury to people.
CAUTION	Indicates a potential hazard. Improper handling may cause injury to people or damage to property.

Some statements classified as "CAUTION" may still lead to serious results depending on the situation. All statements that follow these labels are important and must be observed.

Other general precautions and tips on using the product are indicated by the following icon.

	Indicates general precautions and tips on using the product.

Precautions on Product Use

DANGER

Do not use the product for the following applications:

- Medical equipment pertaining to sustainment and management of human life and body
- Mechanism and mechanical device for conveyance and transportation of people
- Important safety part of a mechanical device

WARNING

Use the product within its specifications.

Precautions on Product Disposal

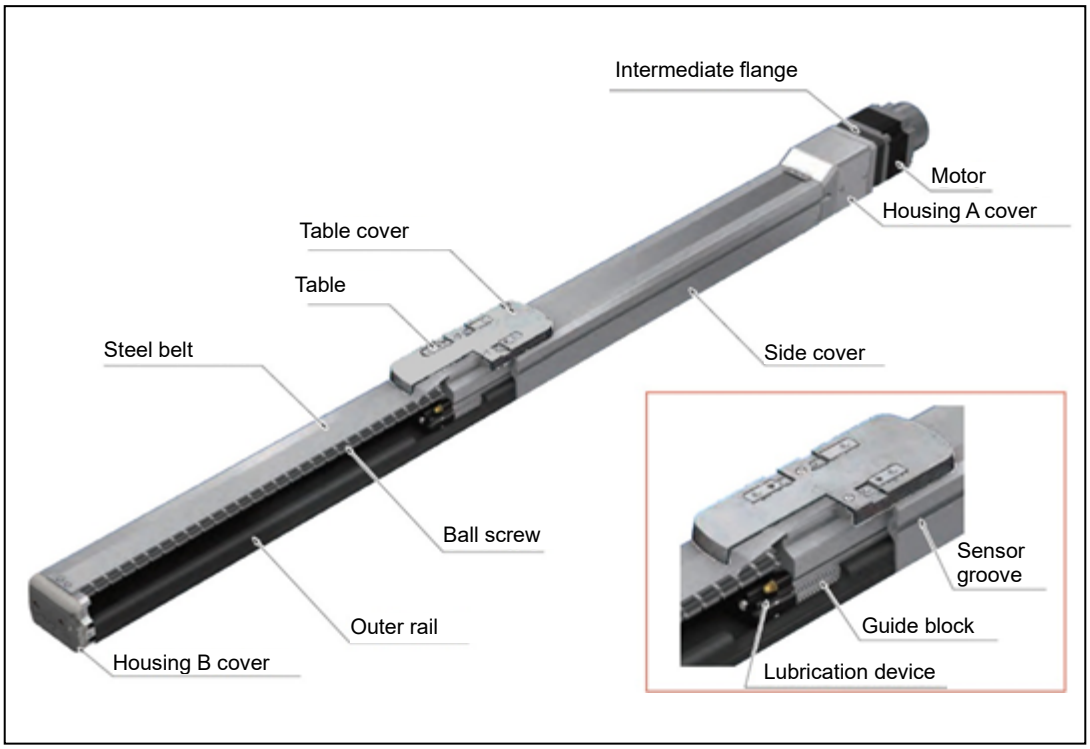
CAUTION

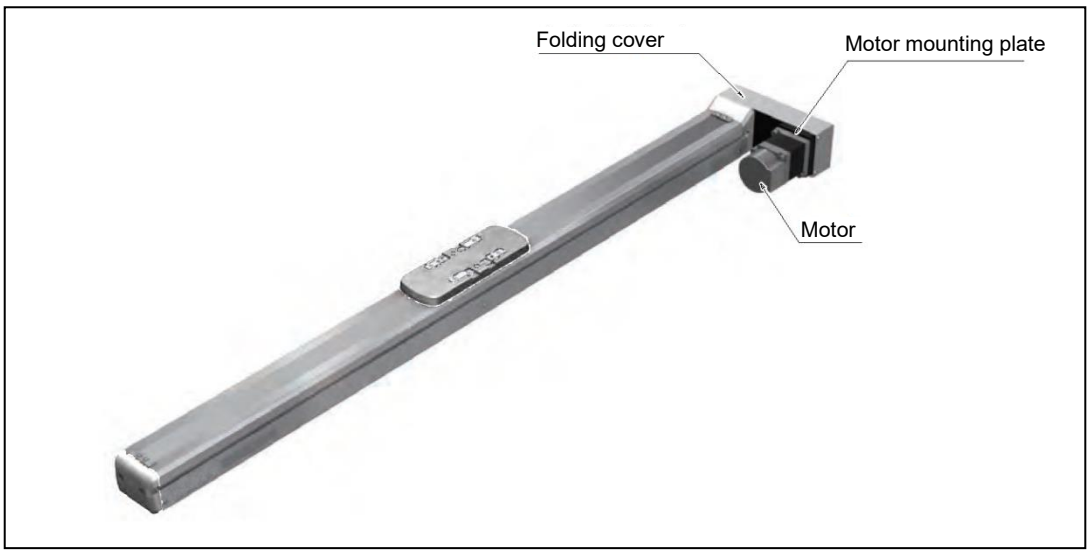
When disposing of the product, comply with laws pertaining to disposal and cleaning of wastes, and have an industrial waste disposal company dispose of the product.

CONTENTS

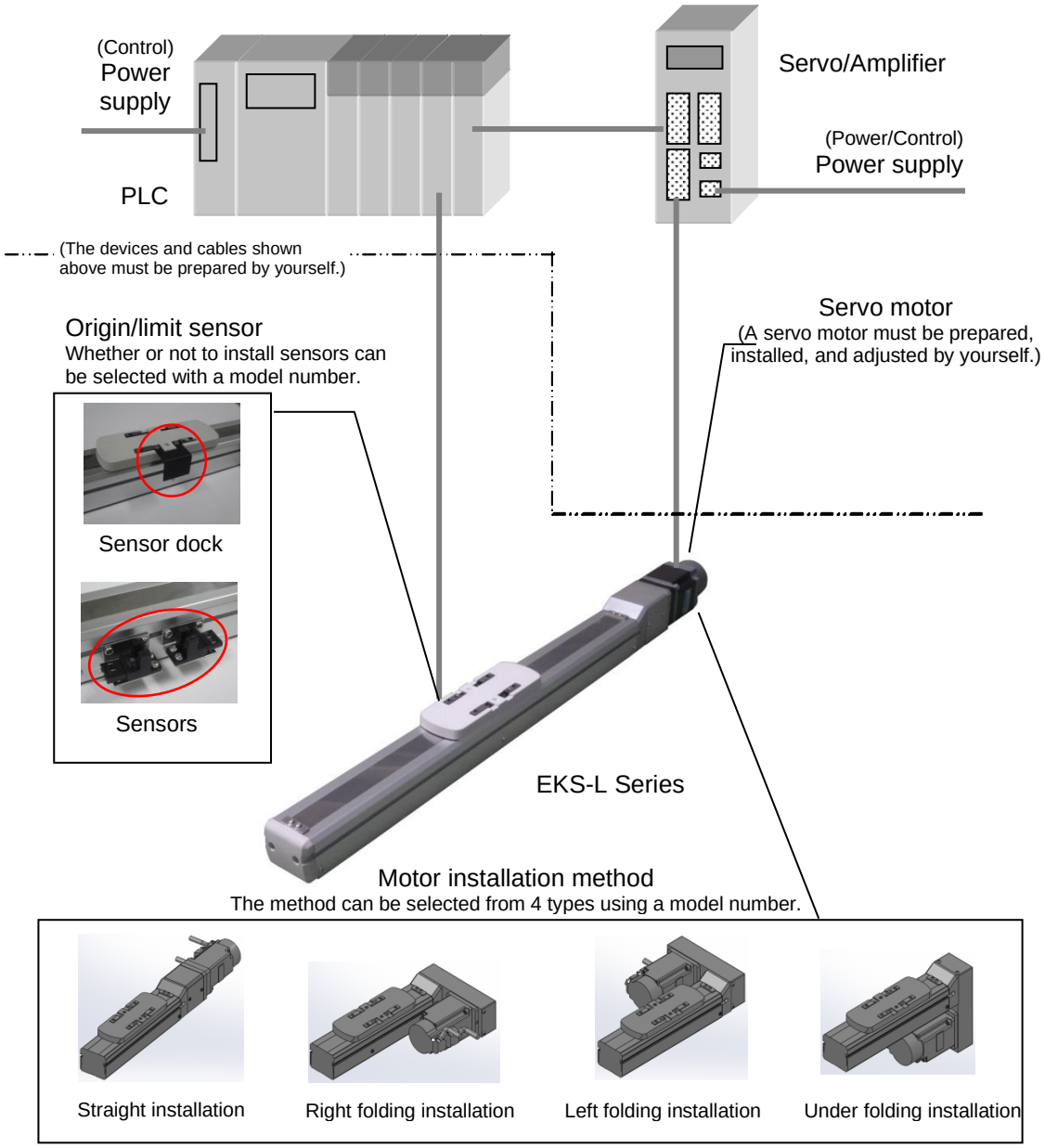
1. PRODUCT OVERVIEW

1.1 Part Name





1.2 System Configurations



Recommended servo motor network examples

	General	SSCNET	CC-Link	MECHATRO LINK-II	MECHATRO LINK-III	Device NET	Ether CAT
Mitsubishi Electric Corporation	○	○	○				
Delta Electronics, Inc.	○						○
SANYO Electric Co., Ltd.	○						○
YASKAWA Electric Corporation	○			○	○	○	
KEYENCE CORPORATION	○			○			
Panasonic Corporation	○						
OMRON Corporation	○			○			○

This product is not equipped w ith a motor. A motor and driver must be prepared, installed, and adjusted by yourself.

1.3 Model Number Indication

1.3.1 Model number configuration

EKS	–	04	L	E	–	10	0200	N	NN	–	M	1	N	C	B	–	U	N	–	P40

Model No.

<Example of model number indication>

EKS-04LE-100200NNN-M1NCB-UN-P40

Body size	:	Body width 43mm
Motor mounting direction	:	Straight installation
Screw lead	:	10mm
Stroke	:	200mm
Motor specifications	:	Mitsubishi
Motor size	:	100W
Motor axis fixing	:	In tha case of straight installation
Orijin sensor	:	With sensor
Limit sensor	:	With sensor
Anti-rust treatment	:	With anti-rust treatment
Fitting	:	Without fitting
Optional specifications	:	For rechargeable battery manufacturing process

Symbol	Description
(A)Body size	
04	Body width: 43mm
05	Body width: 53mm
06	Body width: 64mm
08	Body width: 84mm
10	Body width: 104mm

(B)Motor mounting direction	
E	Straight installation
R	Right folding installation
L	Left folding installation
D	Under folding installation

(C)Screw lead

Symbol	Lead	Body size				
		04	05	06	08	10
10	10mm	●	●	—	—	—
16	16mm	●	—	—	—	—
20	20mm	—	●	●	●	—
25	25mm	—	—	—	—	●
30	30mm	—	—	●	—	—
40	40mm	—	—	—	●	—
50	50mm	—	—	—	—	●

(D)Stroke

Symbol	Length	Body size				
		04	05	06	08	10
0100	100mm	●	●	●	●	●
0200	200mm	●	●	●	●	●
0300	300mm	●	●	●	●	●
0400	400mm	●	●	●	●	●
0500	500mm	●	●	●	●	●
0600	600mm	●	●	●	●	●
0700	700mm	●	●	●	●	●
0800	800mm	●	●	●	●	●
0900	900mm	●	●	●	●	●
1000	1000mm	—	—	●	●	●
1100	1100mm	—	—	●	●	●
1200	1200mm	—	—	●	●	●
1300	1300mm	—	—	●	●	●
1400	1400mm	—	—	—	●	●
1500	1500mm	—	—	—	●	●

(E)Motor specifications	
M Y P	For motor specifications, see the next page.

(F)Motor size

Symbol	Size	Body size				
		04	05	06	08	10
H	50W	●	—	—	—	—
1	100W	●	●	—	—	—
2	200W	—	—	●	—	—
4	400W	—	—	—	●	—
8	750W	—	—	—	—	●

(G)Motor axis fixing

Symbol	Fixing method	Body size				
		04	05	06	08	10
N	In the case of straight installation	●	●	●	●	●
D (※1)	Flat face	●	●	●	—	—
K (※1)	Key	●	●	●	—	—
M (※1)	Friction fastening	—	—	●	●	●

(H)Origin sensor	
N	Without sensor *2
C	With sensor

(I)Limit sensor	
N	Without sensor *2
B	With sensor

(J)Anti-rust treatment *5	
N	Without anti-rust treatment
U	With anti-rust treatment *4

(K)Fitting *5	
N	Without fitting
V	With fitting ※3

(L)Optional specifications *5	
P4	For rechargeable battery manufacturing process
P40	For rechargeable battery manufacturing process *3
FP1	For food manufacturing processes

*1: Cannnot be selected in the case of straight installation.
*2: Origin sensor and limit sensor are a set.
Select "Without sensor" for both of them if selecting it for either.
*3: Cannnot be selected in the case of folding installation.
*4: Can only be selected in the case of optional specifications "P40".
*5: No symbol if no option is specified.

1.3.2 Motor specifications

Code	Manufacturer	Series	50W (EKS-04 Series)	100W (EKS-04/05 Series)
M	Mitsubishi Electric Corporation	MELSERVO J4	HG-KR053	HG-KR13
		MELSERVO J5	HK-KT053W	HK-KT13W
M	Delta Electronics Co., Ltd.	ECMA-C	ECMA-C1040F	ECMA-C10401
M	Sanyo Corporation, Ltd.	SANMOTION R ※1	R2☐A04005	R2☐A04010
Y	YASKAWA Electric Corporation	Σ -7	SGM7J-A5	SGM7J-01
		Σ -X	SGMXJ-A5	SGMXJ-01
Y	Keyence Corporation	SV	SV-☐005	SV-☐010
		SV2	SV2-☐005	SV2-☐010
P	Panasonic Corporation	MINAS A5	MSMD5A	MSMD01
		MINAS A6	MSMF5A	MSMF01
M	OMRON Corporation	G5	R88M-K05030	R88M-K10030
		1S	R88M-1M05030	R88M-1M10030
M	Fuji Electric Co., Ltd.	ALPHA7 GYS	GYS500D7-☐B2☐	GYS101D7-☐B2☐
		ALPHA7 GYB	-	-
M	FANUC CORPORATION	β is series	β is0.2/5000	β is0.3/5000
P	Bosch Rexroth AG	MSM	MSM019A	MSM019B
M	Rockwell Automation, Inc.	TLP	TLP-A046-005-DKA☐2	TLP-A046-010-DKA☐2
M	SIEMENS AG	1FK2 ※2	1FK2102-0AG0	1FK2102-1AG0

Code	Manufacturer	Series	200W (EKS-06 Series)	400W (EKS-08 Series)	750W (EKS-10 Series)
M	Mitsubishi Electric Corporation	MELSERVO J4	HG-KR23	HG-KR43	HG-KR73
		MELSERVO J5	HK-KT23W	HK-KT43W	HK-KT7M3W
M	Delta Electronics Co., Ltd.	ECMA-C	ECMA-C10602	ECMA-C10604	ECMA-C10807
M	Sanyo Corporation, Ltd.	SANMOTION R	R2☐A06020	R2☐A06040	-
Y	YASKAWA Electric Corporation	Σ -7	SGM7J-02	SGM7J-04	SGM7J-08
		Σ -X	SGMXJ-02	SGMXJ-04	SGMXJ-08
Y	Keyence Corporation	SV	SV-☐020	SV-☐040	SV-☐075
		SV2	SV2-☐020	SV2-☐040	SV2-☐075
P	Panasonic Corporation	MINAS A5	MSMD02	MSMD04	MSMD08
		MINAS A6	MSMF02	MSMF04	MSMF08
P	OMRON Corporation	G5	R88M-K20030	R88M-K40030	R88M-K75030
		1S	R88M-1M20030	R88M-1M40030	R88M-1M75030
M	Fuji Electric Co., Ltd.	ALPHA7 GYS	GYS201D7-☐B2☐	GYS401D7-☐B2☐	-
		ALPHA7 GYB	GYB201D7-☐B2☐	GYB401D7-☐B2☐	GYB751D7-☐B2☐
P	Bosch Rexroth AG	MSM	MSM031B	MSM031C	MSM041B
M	Rockwell Automation, Inc.	TLP	TLP-A070-020-DKA☐2	TLP-A070-040-DKA☐2	TLP-A090-075-DKA☐2
M	SIEMENS AG	1FK2 ※2	1FK2203-2AG0	1FK2203-4AG0	1FK2204-5AK0

※ Contact CKD for mounting other than the above motors and products of other motor manufacturers.
※1: Motor side/bottom mounting direction (R: right, D: bottom, L: left) is not supported.
※2: The servo motor is subject to the regulations of Export Trade Control Order Appendix Table 1 Item 7(8), and is applicable with regard to its specifications. (as of January 2021)

1.4 Specifications

1.4.1 Product specifications (straight)

Item \ Model			EKS-L Series motor mounting direction: Straight									
			EKS-04LE		EKS-05LE		EKS-06LE		EKS-08LE		EKS-10LE	
Applicable motor size		W	50, 100		100		200		400		750	
Ball screw diameter		mm	10		13		15		20		25	
Screw lead		mm	10	16	10	20	20	30	20	40	25	50
Stroke		mm	100~900 (in increments of 100 mm)				100~1300 (in increments of 100 mm)		100~1500 (in increments of 100 mm)			
Max. speed mm/s (The speed must not exceed the max. speed.)		~500st	500	800	500	1000	1000	1500	1000	2000	1250	2500
		~600st	440	710								
		~700st	340	540	390	780	980	1480				
		~800st	260	420	310	620	770	1160	980	1970		
		~900st	210	340	250	500	630	940	800	1610		
		~1000st	-	-	-	-	520	780	670	1340	1050	2110
		~1100st	-	-	-	-	430	650	560	1130	890	1790
		~1200st	-	-	-	-	370	550	480	970	760	1530
		~1300st	-	-	-	-	320	480	420	840	660	1330
		~1400st	-	-	-	-	-	-	360	730	580	1160
		~1500st	-	-	-	-	-	-	320	650	510	1030
Repetitive positioning accuracy		mm	± 0.01									
Lost motion		mm	0.1 or less									
Max. load capacity *Note 1	Horizontal	kg	19	14	26	7.5	42	20.5	83.5	19	118.5	40
	Wall-hung	kg	10.5	8	19	7.5	20	18	45	19	76	40
	Vertical	kg	8.5	7	12.5	6	12	7.5	23.5	10.5	33.5	14.5
Operating ambient temperature			0°C to 40°C (no freezing)									
Operating ambient humidity			20% to 80% (no condensation)									
Storage ambient temperature			0°C to 40°C (no freezing)									
Storage ambient humidity			20% to 80% (no condensation)									
Atmosphere			No corrosive gas, explosive gas, and dust									

*Note 1: Value when the acceleration/deceleration speed is 0.5 G. When the acceleration/deceleration speed is increased, the maximum load capacity is decreased.

■ Weight (straight)

(kg)

Model	Stroke (mm)														
	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
EKS-04LE	1.7	2.1	2.5	2.9	3.2	3.6	4	4.4	4.7	-	-	-	-	-	-
EKS-05LE	2.6	3.1	3.7	4.2	4.8	5.4	5.9	6.5	7	-	-	-	-	-	-
EKS-06LE	4.3	5.1	5.8	6.6	7.4	8.2	8.9	9.7	10.5	11.3	12	12.8	13.6	-	-
EKS-08LE	8.1	9.4	10.7	12	13.3	14.6	15.9	17.2	18.5	19.8	21.1	22.4	23.7	25	26.3
EKS-10LE	14.7	16.8	18.8	20.9	22.9	25	27	29.1	31.2	33.2	35.3	37.3	39.4	41.5	43.5

1.4.2 Product specifications (folding)

Item \ Model			EKS-L Series motor mounting direction: Folding									
			EKS-04L[D/L/R]		EKS-05L[D/L/R]		EKS-06L[D/L/R]		EKS-08L[D/L/R]		EKS-10L[D/L/R]	
Applicable motor size		W	50, 100		100		200		400		750	
Ball screw diameter		mm	10		13		15		20		25	
Screw lead		mm	10	16	10	20	20	30	20	40	25	50
Stroke		mm	100~900 (in increments of 100 mm)				100~1300 (in increments of 100 mm)		100~1500 (in increments of 100 mm)			
Max. speed mm/s (The speed must not exceed the max. speed.)		~500st	500	800	500	1000	1000	1500	1000	2000	1250	2500
		~600st	440	710								
		~700st	340	540	390	780	980	1480				
		~800st	260	420	310	620	770	1160	980	1970		
		~900st	210	340	250	500	630	940	800	1610		
		~1000st	-	-	-	-	520	780	670	1340	1050	2110
		~1100st	-	-	-	-	430	650	560	1130	890	1790
		~1200st	-	-	-	-	370	550	480	970	760	1530
		~1300st	-	-	-	-	320	480	420	840	660	1330
		~1400st	-	-	-	-	-	-	360	730	580	1160
		~1500st	-	-	-	-	-	-	320	650	510	1030
Repetitive positioning accuracy		mm	± 0.01									
Lost motion		mm	0.1 or less									
Max. load capacity *Note 1	Horizontal	kg	19	14	26	7.5	41	19	79.5	18	92.5	37.5
	Wall-hung	kg	10.5	8	19	7.5	20	18	45	18	76	37.5
	Vertical	kg	8.5	7	11.5	5	10.5	6.5	20.5	9	28	12.5
Operating ambient temperature			0°C to 40°C (no freezing)									
Operating ambient humidity			20% to 80% (no condensation)									
Storage ambient temperature			0°C to 40°C (no freezing)									
Storage ambient humidity			20% to 80% (no condensation)									
Atmosphere			No corrosive gas, explosive gas, and dust									

*Note 1: Value when the acceleration/deceleration speed is 0.5 G. When the acceleration/deceleration speed is increased, the maximum load capacity is decreased.

■ Weight (folding)

(kg)

Model	Stroke (mm)														
	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
EKS-04L[D/L/R]	1.9	2.3	2.7	3.0	3.4	3.8	4.2	4.5	4.9	-	-	-	-	-	-
EKS-05L[D/L/R]	2.7	3.3	3.8	4.4	4.9	5.5	6.0	6.6	7.2	-	-	-	-	-	-
EKS-06L[D/L/R]	4.9	5.6	6.4	7.2	8.0	8.7	9.5	10.3	11.1	11.8	12.6	13.4	14.2	-	-
EKS-08L[D/L/R]	8.7	10.0	11.3	12.6	13.9	15.2	16.5	17.8	19.1	20.4	21.7	23.0	24.3	25.6	26.9
EKS-10L[D/L/R]	15.6	17.7	19.8	21.8	23.9	25.9	28.0	30.1	32.1	34.2	36.2	38.3	40.4	42.4	44.5

2. INSTALLATION

DANGER

Do not use the product in a place where dangerous substances such as ignitable, inflammable or explosive materials are present.
Ignition, inflammation, or explosion may occur.

Do not splash water droplets or oil droplets onto the product.
A fire or failure may occur.

Be sure to hold and secure the product (including workpieces) while installing the product.
An injury may be caused due to a fall, drop and abnormal operation of the product.

Upon wiring, install overcurrent protective equipment (breaker for wiring, circuit protector, etc.) on the primary side of the power supply in accordance with "JIS B 9960-1:2008 Safety of machinery - Electrical equipment of machines - Part 1: General requirements".

For reference: Described in "7.2.1 General information" of JIS B 9960-1
If a current in the circuit of the machine (electric device) may exceed the rating of the component or the current capacity of the conductor, whichever is lower, take preventive measures against overcurrent. The rated values or setting values to be used are described in 7.2.10.

WARNING

Install the product to an incombustible material.
If it is installed directly to a combustible material or installed to the vicinity of a combustible material, a fire may occur.

Design the safety circuit or device to prevent device damage and bodily injury when the machine stops in the event of a system failure such as an emergency stop and power failure.

Install the product in indoor and dry place.
In a place splashed with rainwater or place where humidity is high (80% or more, with condensation), an electric leakage or fire accident may occur.

Perform class D grounding (ground resistance: 100 Ω or less) for the product.
If an electric leakage occurs, an electric shock or malfunction may be caused.

Make sure to refer to this Instruction Manual, so that there is no miswiring or loose connector when wiring the product. Also, check the insulation of the wiring.
Due to contact with other circuits, ground fault, insulation failure between terminals, overcurrent may flow into the product and the product may be damaged. Such may cause abnormal operation or fire.

Insulate unused wires.
A malfunction, failure, or electric shock may occur.

Do not damage, apply unnecessary stress, or place a heavy object or pinch cables.
Conduction failure or electric shock may occur.

Use an actuator with a brake when using an actuator with an installation method other than the horizontal installation.
If using an actuator without a brake, the movable section may fall during servo off (including emergency stop and alarm) or while the power is turned off, resulting in injury or damage to the workpiece.

CAUTION

Install the wiring properly so that no induction noise will be applied.

- Avoid using the product in a place where a large current or strong magnetic field occurs.
- Avoid arranging the cables along high-power motor power cables sharing the same conduit or the same cables (with multi-conductor cable).
- Avoid arranging the cables along inverter power cables and other wiring cables for robots, sharing the same conduit or the same cables. Provide the frame ground for the power and insert a filter into the output section.

Do not use the product in an environment where a strong magnetic field occurs.
A malfunction may occur.

Separate the power for the output section of the product from the power for inductive loads (such as a solenoid valve and relay) that generate a surge.
If the power is shared, a surge current will flow into the output section causing damage.
If the power cannot be separated, connect surge absorption elements in parallel directly to all the inductive loads.

Remove all the FG (frame ground) connections of the product before performing an electric welding work for a device with the product installed.
If an electric welding work is performed without removing the FG connections, the product may be damaged due to a welding current or excessive high voltage and surge voltage during welding.

Select a power that has enough capacity for the number of products installed.
If there is not enough capacity, a malfunction may occur.

Do not disassemble the product.

Do not bend the fixed cable repeatedly.
If repetitive bending is unavoidable, use a movable cable.

Secure the movable cable so that it will not move easily. When securing the movable cable, do not bend it to an acute angle.

Place an external stopper or holding mechanism (such as a brake) at a position where it does not affect the detection of the origin position when installing.
The origin position is detected when the power is turned on. If the detection is interfered by an external stopper or holding mechanism, an unintended position may be recognized as the origin position.

Do not carry or install the product by holding the movable section or cable.
An injury or cable disconnection may occur.

Do not use the product in a place exposed to ultraviolet rays or in an atmosphere with corrosive gas or salt.
A performance degradation, abnormal operation, or strength deterioration due to rust formation may occur.

Do not install the product in a place subjected to strong vibrations or impacts.
If it is subjected to strong vibrations or impacts, a malfunction may occur.

Do not use the product in a place where condensation occurs due to a sudden change in the ambient temperature.

The customer is responsible for checking compatibility of the product used in the customer's system, machinery or device.

2.1 Environment

WARNING

Do not install the product in a place where water or oil may come into contact.
An electric leakage or fire accident may occur. Also, do not use oil droplets or oil mist.

- Check the environment temperature and atmosphere before start using or storing the product.
- Use the product at an ambient temperature between 0°C and 40°C. Ventilate when the heat is trapped.
- Install the product in a place where it is not subjected to a direct sunlight and away from a heating element. Also, avoid dust, corrosive gas, explosive gas, inflammable gas, and combustible material.
- Install the actuator on a smooth and flat surface.
- In order to avoid operation fault or damage, do not install the actuator on a surface with dents.

2.2 Unpacking

- When carrying and handling the product, use extreme care not to subject it to an impact such as dropping.
- Carry the heavy package with two or more workers.
- Place the package in a horizontal state.
- Do not stand on the package.
- Do not place heavy objects or items of which load concentrates, which may deform the package.
- When holding the actuator, hold the bottom of the actuator (outer rail).
- When hanging the actuator, do not apply load to other parts (table, table cover, side cover, steel belt, housing A and B covers, and motor, etc.) by using the outer rail.
- Do not apply unnecessary force to the parts of the actuator.

- Check that the model number ordered and model number indicated on the product are the same.
- Check the exterior of the product for any damage.

2.2.1 Product list

Straight type

Product list	Quantity
Actuator	1
Intermediate flange	1
Bolt for intermediate flange	4
Bolt for motor mounting	4
Coupling	1
Origin sensor (option)	(1)
Limit sensor (option)	(2)
Fitting (option)	(2)
Plug (option)	(2)

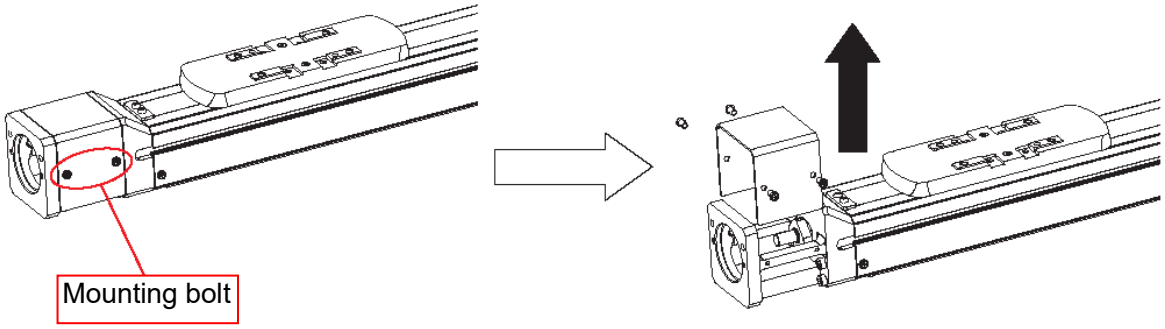
Folding type

Product list	Quantity
Actuator	1
Motor mounting plate	1
Bolt for motor mounting plate	4
Bolt for motor mounting	4
Spring washer for motor mounting (Body size 04, 05, and 06 only)	(4)
Pulley	1
Timing belt	1
Bracket adjuster	1
Bracket adjuster mounting bolt	2
Tension adjustment bolt	1
Flat washer	3
Origin sensor (option)	(1)
Limit sensor (option)	(2)

2.3 Installing motor

2.3.1 Straight type

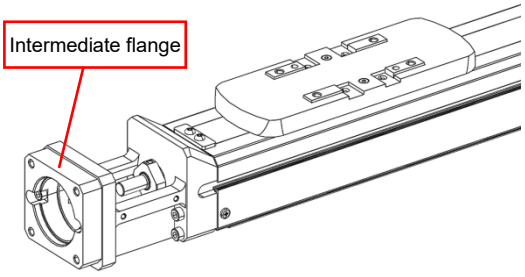
(1) Remove the bolts and detach the housing A cover in the arrow direction.



Model	Bolt size, Quantity
EKS-04LE	M2.6 × 5L, 4
EKS-05LE	M2.6 × 5L, 4
EKS-06LE	M2.6 × 5L, 4
EKS-08LE	M2.6 × 5L, 4
EKS-10LE	M2.6 × 5L, 4

Bolt type: Small screw with a cross recessed head for precision instruments (No. 0 pan head screw, 3 types)

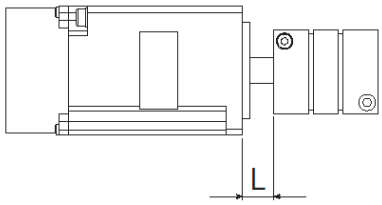
(2) Install the intermediate flange to the actuator.



Model	Bolt size, Quantity	Tightening torque (N•m)
EKS-04LE	M3 × 8L, 2	1.47 (0.81)
EKS-05LE	M3 × 8L, 2	1.47 (0.81)
EKS-06LE	M4 × 12L, 4	3.42 (1.90)
EKS-08LE	M4 × 12L, 4	3.42 (1.90)
EKS-10LE	M5 × 12L, 4	6.13 (3.83)

Bolt type: Hex head bolt
Note: Values in ( ) apply to P40 specification products.

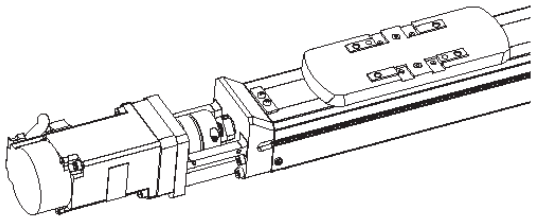
(3) Combine the coupling to the motor shaft.



Model	L length (mm)	Clamp bolt size	Tightening torque (N•m)
EKS-04LE	15	M2.5	1.0~1.1
EKS-05LE	14.7	M2.5	1.0~1.1
EKS-06LE	17.5	M3	1.5~1.9
EKS-08LE	7.5	M4	3.4~4.1
EKS-10LE	17	M4	3.4~4.1

Bolt type: Hex head bolt

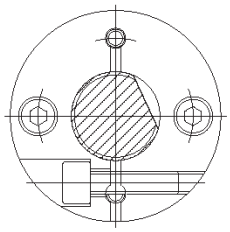
(4) Install the motor.



Model	Motor Specifications	Bolt size, Quantity	Tightening torque (N•m)
EKS-04LE EKS-05LE	M , Y	M4 × 10L, 2	2.66 (1.90)
	P	M3 × 10L, 2	1.16 (0.81)
EKS-06LE EKS-08LE	M , Y	M5 × 12L, 4	4.74 (3.83)
	P	M4 × 12L, 4	2.66 (1.90)
EKS-10LE	M , Y	M6 × 14L, 4	7.63 (6.51)
	P	M5 × 14L, 4	4.74 (3.83)

Bolt type: Hex head bolt
Note: Values in parentheses apply to P40 specification products.

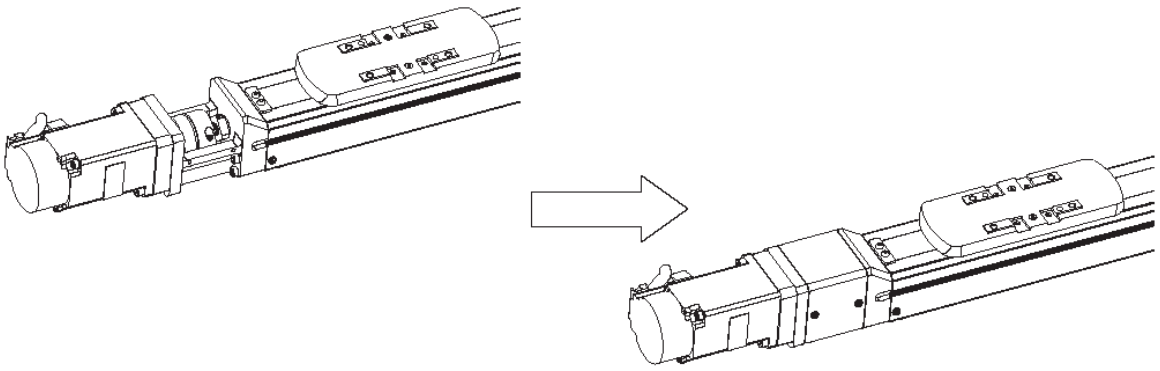
(5) Combine the coupling to the ball screw shaft. When fixing the coupling, note the position of the flat face of the ball screw terminal.
For the position of the flat face, see the figure below.



Model	L length (mm)	Clamp bolt size	Tightening torque (N•m)
EKS-04LE	15	M2.5	1.0~1.1
EKS-05LE	14.7	M2.5	1.0~1.1
EKS-06LE	17.5	M3	1.5~1.9
EKS-08LE	7.5	M4	3.4~4.1
EKS-10LE	17	M4	3.4~4.1

Bolt type: Hex head bolt

(6) Install the housing A cover.

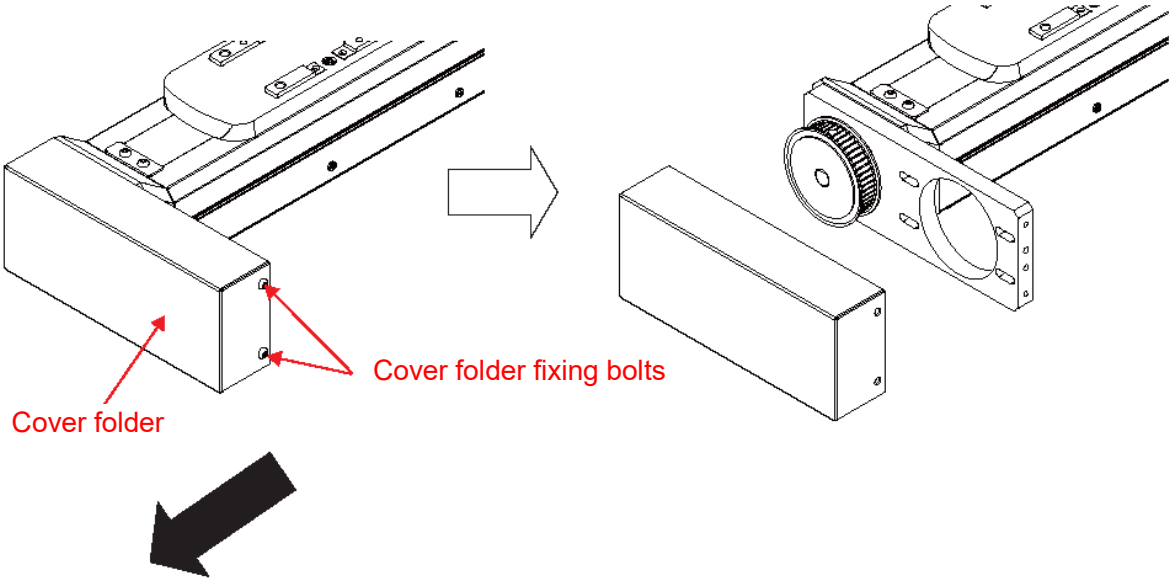


Model	Bolt size, Quantity	Tightening torque (N•m)
EKS-04LE	M2.6 × 5L, 4	0.3
EKS-05LE	M2.6 × 5L, 4	0.3
EKS-06LE	M2.6 × 5L, 4	0.3
EKS-08LE	M2.6 × 5L, 4	0.3
EKS-10LE	M2.6 × 5L, 4	0.3

Bolt type: Small screw with a cross recessed head for precision instruments
(No. 0 pan head screw, 3 types)

2.3.2 Folding type

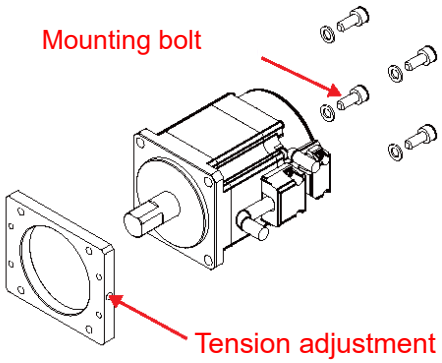
(1) Remove the cover folder fixing bolts and detach the cover folder in the ⬅ arrow direction.

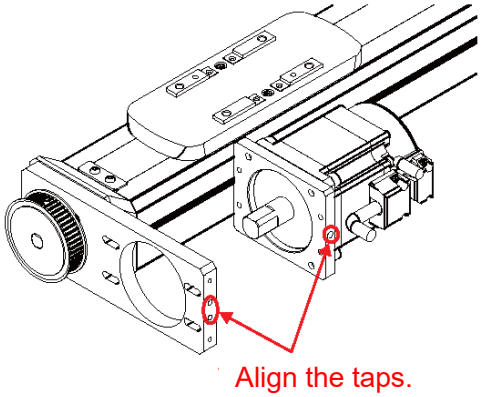


Model	Bolt size, Quantity
EKS-04L[D/L/R]	M3 × 6L, 4
EKS-05L[D/L/R]	M3 × 6L, 4
EKS-06L[D/L/R]	M3 × 6L, 4
EKS-08L[D/L/R]	M3 × 6L, 4
EKS-10L[D/L/R]	M3 × 6L, 4

Bolt type: Hex head button bolt

(2) Install the motor to the motor mounting plate.
Check that the mounting bolts do not protrude from the motor mounting plate.
Align the taps for tension adjustment and install the motor as paying attention to the orientation of the motor mounting plate.

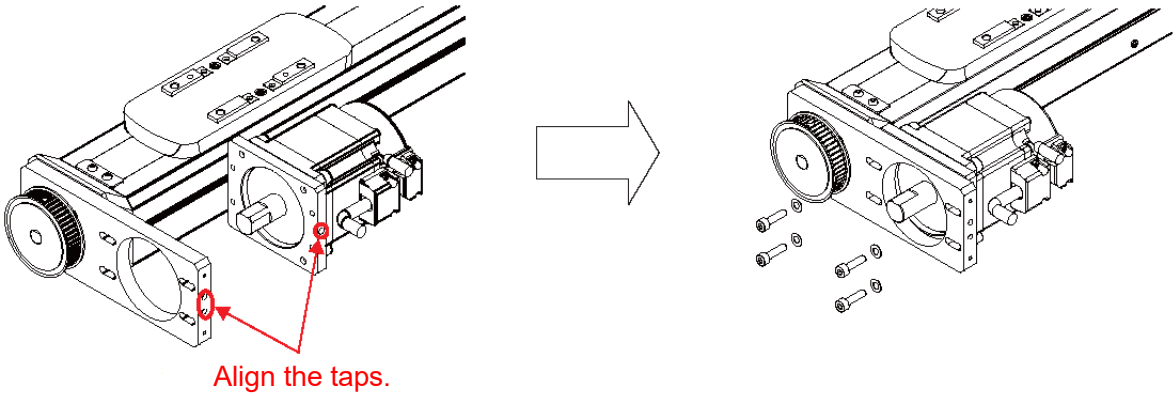




Model	Motor Specifications	Bolt size, Quantity	Tightening torque (N•m)
EKS-04L[D/L/R] EKS-05L[D/L/R]	M , Y	M4 × 10L, 2 Conical spring washer	2.66
	P	M3 × 10L, 2 Conical spring washer	1.16
EKS-06L[D/L/R] EKS-08L[D/L/R]	M , Y	M5 × 12L, 4	4.74
	P	M4 × 12L, 4	2.66
EKS-10L[D/L/R]	M , Y	M6 × 14L, 4	7.63
	P	M5 × 14L, 4	4.74

Bolt type: Hex head bolt

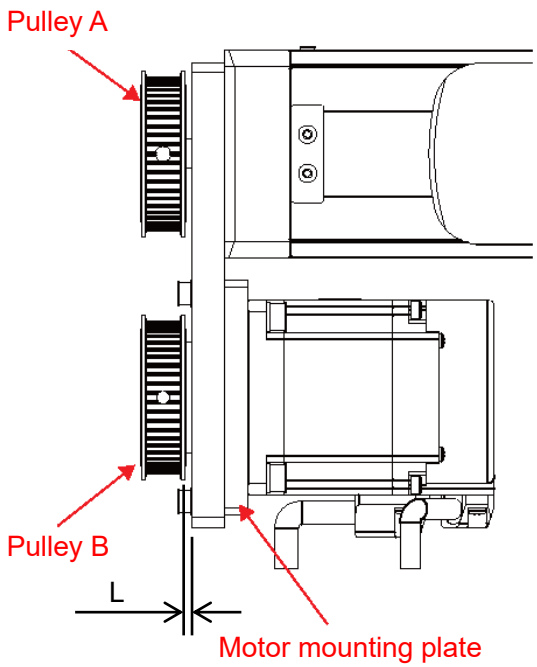
(3) Temporarily fix the motor mounting plate to the bracket motor.
Check that the mounting bolts do not protrude from the motor mounting plate.
Align the taps for tension adjustment and install the motor as paying attention to the orientation of the motor mounting plate.



Model	Bolt size, Quantity
EKS-04L[D/L/R]	M3 × 12 L, 4, Small round 3 mm flat washer
EKS-05L[D/L/R]	M3 × 12 L, 4, Small round 3 mm flat washer
EKS-06L[D/L/R]	M4 × 16 L, 4, Small round 4 mm flat washer
EKS-08L[D/L/R]	M4 × 16 L, 4, Small round 4 mm flat washer
EKS-10L[D/L/R]	M5 × 20 L, 4, Small round 5 mm flat washer

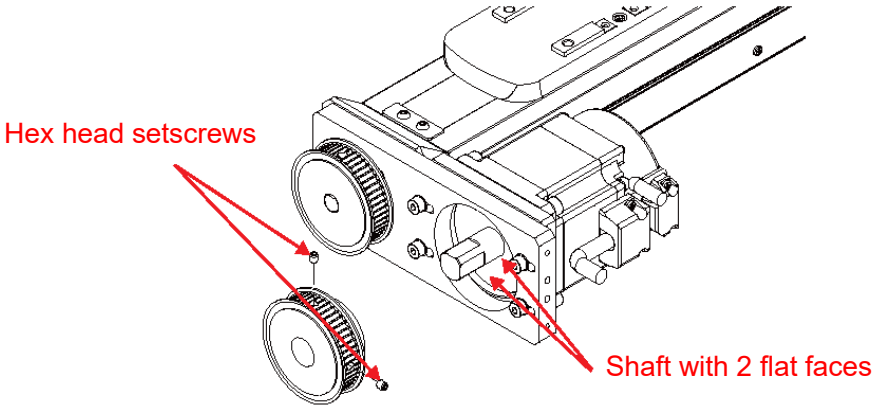
Bolt type: Hex head bolt

(4) Install the pulley to the motor.
Based on the L length, adjust the position of the pulley B to align the end face of the pulley A and B and install the pulley B.



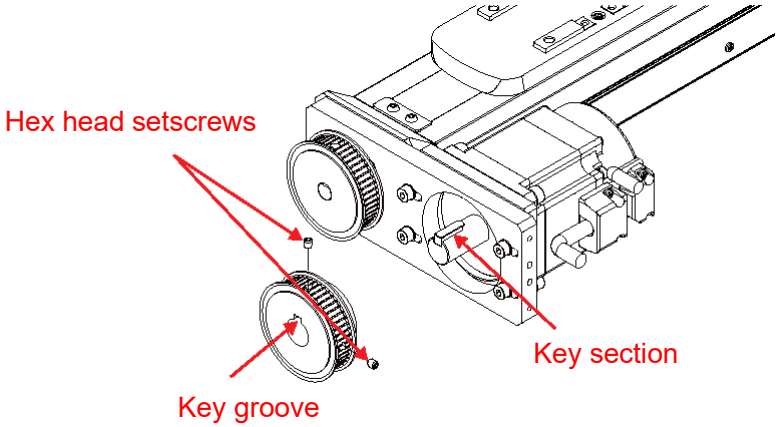
Model	L length
EKS-04L[D/L/R]	(2)
EKS-05L[D/L/R]	(2)
EKS-06L[D/L/R]	(2)
EKS-08L[D/L/R]	(2)
EKS-10L[D/L/R]	(3)

●When the motor shaft fixing method is “D”
Make sure to align the hex head setscrews with the flat faces of the motor shaft so that the flat faces and hex head set screws will be positioned at a right angle.
When fixing the pulley to the shaft with 2 flat faces, tighten the hex head setscrews little by little in turn.



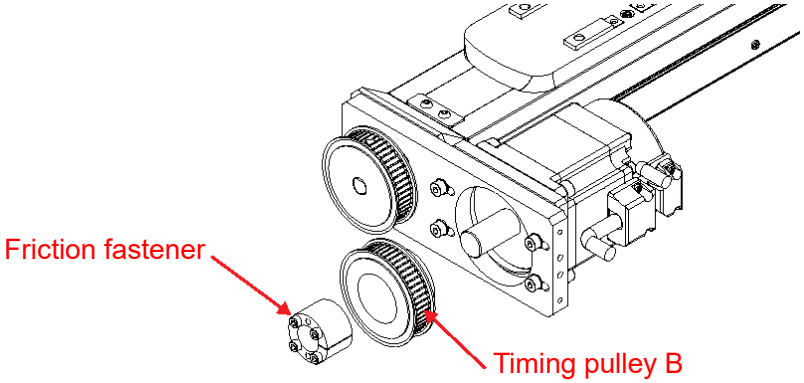
Model	Hex head setscrews	Tightening torque (N•m)
EKS-04L[D/L/R]	M4 × 4L, 2	1.33
EKS-05L[D/L/R]	M4 × 4L, 2	1.33
EKS-06L[D/L/R]	M4 × 4L, 2	1.33

●When the motor shaft fixing method is “K”
Make sure to align the key section of the motor shaft with the key groove of the pulley.
When fixing the pulley to the shaft with a key, tighten the hex head setscrews little by little in turn.



Model	Hex head setscrews	Tightening torque (N•m)
EKS-04L[D/L/R]	M4 × 4L, 2	1.33
EKS-05L[D/L/R]	M4 × 4L, 2	1.33
EKS-06L[D/L/R]	M4 × 4L, 2	1.33

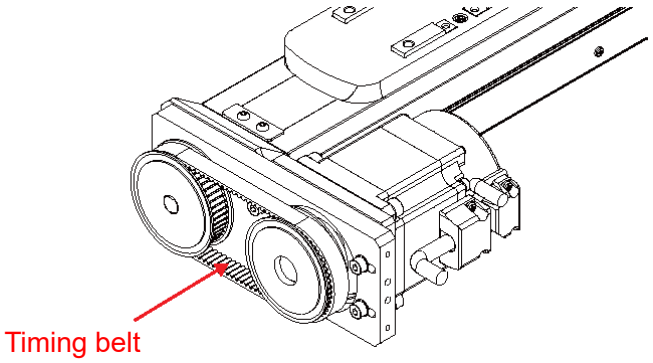
●When the motor shaft fixing method is “M”
Install the pulley and friction fastener supplied with the product.



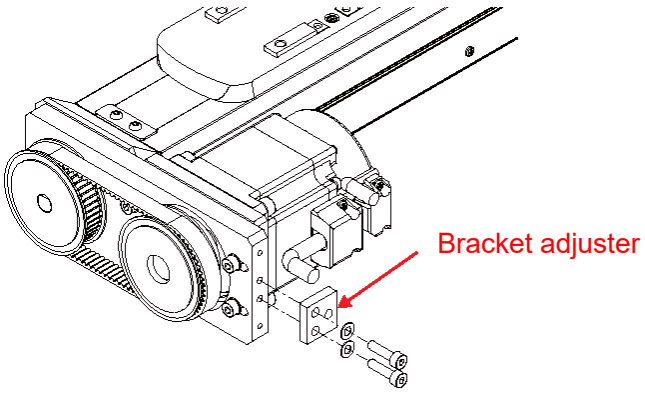
Model	Motor shaft diameter	Bolt size, Quantity	Tightening torque (N•m)
EKS-06L[D/L/R]	φ11	M2.5 × 12L, 4	1.0
	φ14	M3 × 16L, 4	2.0
EKS-08L[D/L/R]	φ14	M3 × 16L, 4	2.0
EKS-10L[D/L/R]	φ19	M4 × 20L, 4	4.0

Bolt type: Hex head bolt
Retighten the mounting bolts equally in the diagonal order. Then, tighten all the bolts at the specified tightening torque using a torque wrench until the bolts cannot be rotated any further. Do not use bolts other than those mounted on the friction fastener.

(5) Mount a timing belt on the pulleys.



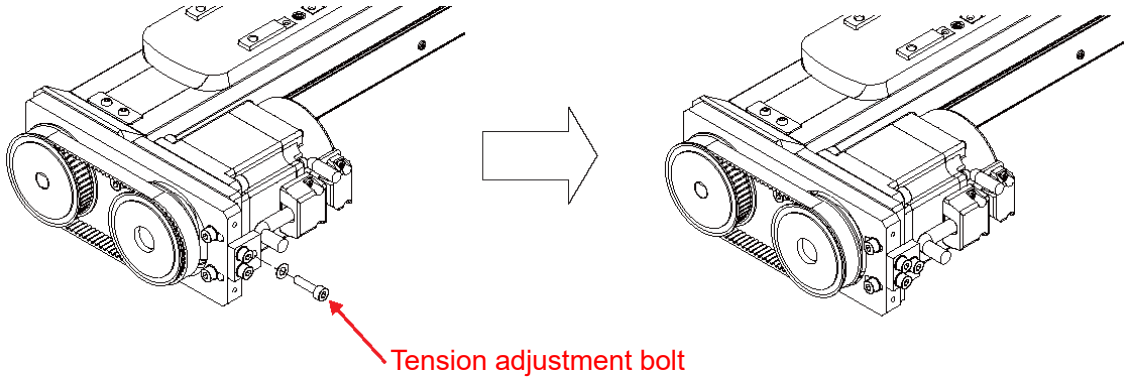
(6) Install the bracket adjuster using the two taps on the side of the bracket motor.



Model	Bolt size, Quantity	Tightening torque (N•m)
EKS-04L[D/L/R]	M3 × 10L, 2, Small round 3 mm flat washer	2.44
EKS-05L[D/L/R]	M3 × 10L, 2, Small round 3 mm flat washer	2.44
EKS-06L[D/L/R]	M4 × 12L, 2, Small round 4 mm flat washer	5.59
EKS-08L[D/L/R]	M4 × 12L, 2, Small round 4 mm flat washer	5.59
EKS-10L[D/L/R]	M4 × 12L, 2, Small round 4 mm flat washer	5.59

Bolt type: Hex head bolt
Note: The bracket adjuster and bolts are supplied parts.

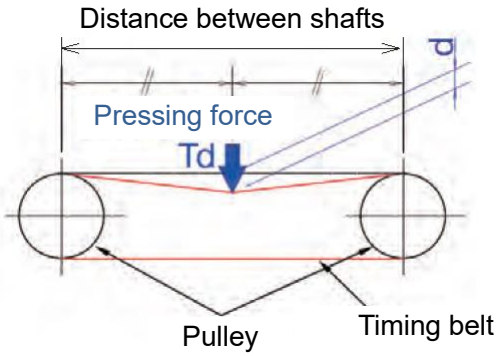
(7) Install the tension adjustment bolt to the bracket adjuster.
Adjust the tension of the timing belt using the tension adjustment bolt.



Model	Bolt size
EKS-04L[D/L/R]	M3 × 18L, Small round 3 mm flat washer
EKS-05L[D/L/R]	M3 × 18L, Small round 3 mm flat washer
EKS-06L[D/L/R]	M4 × 16L, Small round 4 mm flat washer
EKS-08L[D/L/R]	M4 × 16L, Small round 4 mm flat washer
EKS-10L[D/L/R]	M4 × 22L, Small round 4 mm flat washer

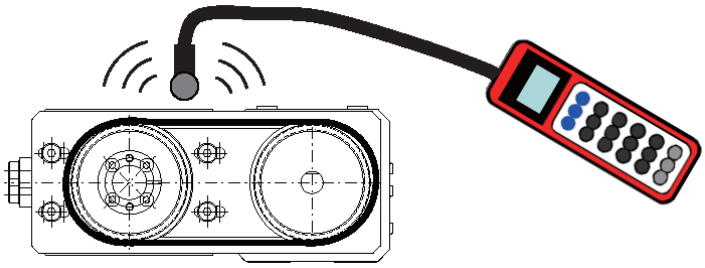
Bolt type: Hex head bolt

(1) Simplified measurement method
Press the center of the belt with the pressing force Td and install the motor in a way that the deflection of the belt becomes d.



Model	Pressing force Td [N]	Deflection d [mm]	Distance between shafts [mm]
EKS-04L[D/L/R]	1.6~2.2	0.9	(60)
EKS-05L[D/L/R]	1.6~2.2	0.9	(60)
EKS-06L[D/L/R]	2.5~3.3	1.2	(75)
EKS-08L[D/L/R]	3.3~4.5	1.6	(103.5)
EKS-10L[D/L/R]	6.0~8.1	1.9	(120)

(2) Method using a sonic belt tension meter
Measure the tension using a belt tension meter. Measure the frequency (vibration) by flipping the belt with a finger at the measuring position and check if the tension is appropriate.
Note) For how to use a belt tension meter, see its operation manual.

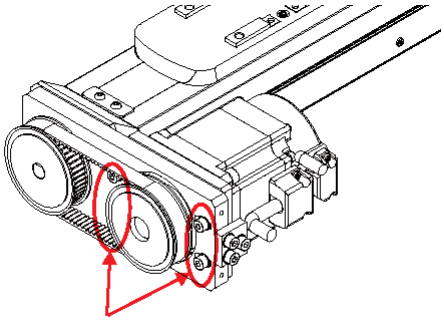


Model	Initial tension [N]	Unit weight [g/(width (mm) × length (m))]	Distance between shafts [mm]	Belt width [mm]
EKS-04L[D/L/R]	24.7~33.4	2.5	(60)	6
EKS-05L[D/L/R]	24.7~33.4	2.5	(60)	6
EKS-06L[D/L/R]	37.4~50.6	2.5	(75)	9
EKS-08L[D/L/R]	50.2~67.9	2.5	(103.5)	12
EKS-10L[D/L/R]	83.3~112.7	4.0	(120)	12

Reference: Belt types used by folding type

Model	Belt types (Gates Unitta Asia Company)
EKS-04L[D/L/R]	204-3GT-6
EKS-05L[D/L/R]	204-3GT-6
EKS-06L[D/L/R]	300-3GT-9
EKS-08L[D/L/R]	357-3GT-12
EKS-10L[D/L/R]	440-EV5GT-12

(8) After adjusting tension, fully tighten the motor mounting plate fixing bolts.
After fully tightening the bolts, measure the tension again and check that the initial tension of the belt is within the specified range.
If it is not within the range, adjust the tension again.

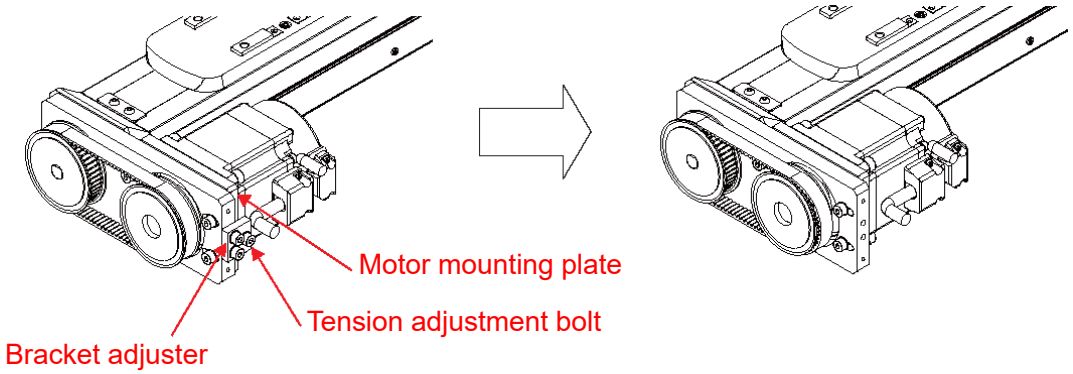


Motor mounting plate fixing bolts

Model	Bolt size, Quantity	Tightening torque (N•m)
EKS-04L[D/L/R]	M3 × 12L, 4, Small round 3 mm flat washer	1.77
EKS-05L[D/L/R]	M3 × 12L, 4, Small round 3 mm flat washer	1.77
EKS-06L[D/L/R]	M4 × 16L, 4, Small round 4 mm flat washer	3.42
EKS-08L[D/L/R]	M4 × 16L, 4, Small round 4 mm flat washer	3.42
EKS-10L[D/L/R]	M5 × 20L, 4, Small round 5 mm flat washer	7.11

Bolt type: Hex head bolt

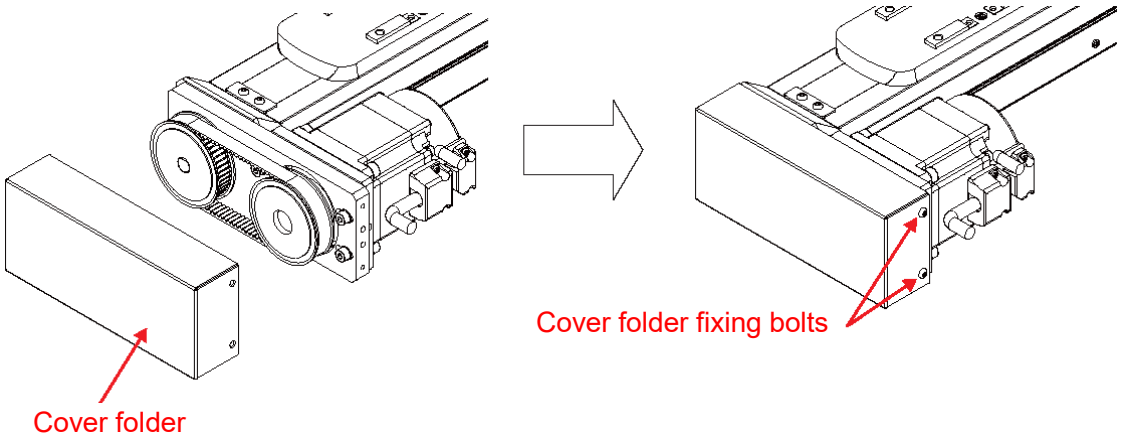
(9) Remove the tension adjustment bolts from the motor mounting plate and then remove the bracket adjuster.



Model	Bracket adjuster fixing bolt	Tension adjustment bolt
	Bolt size, Quantity	Bolt size
EKS-04L[D/L/R]	M3×10L, 2, Small round 3 mm flat washer	M3×18L, Small round 3 mm flat washer
EKS-05L[D/L/R]	M3×10L, 2, Small round 3 mm flat washer	M3×18L, Small round 3 mm flat washer
EKS-06L[D/L/R]	M4×12L, 2, Small round 4 mm flat washer	M4×16L, Small round 4 mm flat washer
EKS-08L[D/L/R]	M4×12L, 2, Small round 4 mm flat washer	M4×16L, Small round 4 mm flat washer
EKS-10L[D/L/R]	M4×12L, 2, Small round 4 mm flat washer	M4×22L, Small round 4 mm flat washer

Bolt type: Hex head bolt

(10) Fix the cover folder using the cover folder fixing bolts.



Model	Bolt size, Quantity	Tightening torque (N•m)
EKS-04L[D/L/R]	M3 × 6L, 4	1.03
EKS-05L[D/L/R]	M3 × 6L, 4	1.03
EKS-06L[D/L/R]	M3 × 6L, 4	1.03
EKS-08L[D/L/R]	M3 × 6L, 4	1.03
EKS-10L[D/L/R]	M3 × 6L, 4	1.03

Bolt type: Hex head button bolt

2.4 Installing option parts

2.4.1 Installing fittings

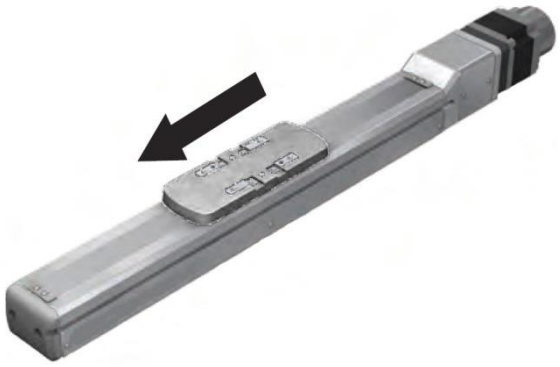
(1) Fittings and plugs are included if the product with fitting (option) is selected.
Attach them with the tightening torque shown in the table below.
Note) Fittings and plugs can be attached in the position opposite from as shown in the picture.
Select the position according to the usage.

Model	Fitting / plug mounting screw hole size	Tightening torque (N•m)
EKS-04	M5	1.0～1.5
EKS-05	M5	1.0～1.5
EKS-06	R1/8	3～5
EKS-08	R1/8	3～5
EKS-10	R1/8	3～5

2.5 Installing main unit

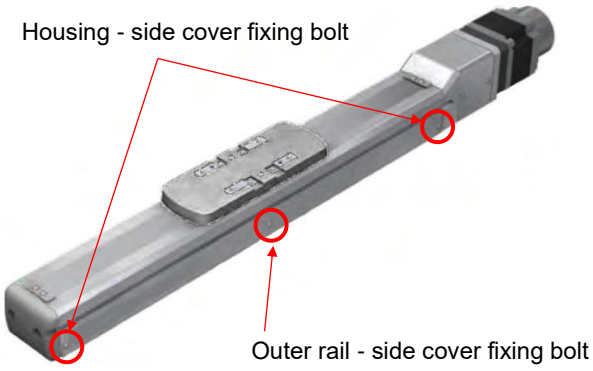
2.5.1 Installation from top

(1) Move the table to the center of the stroke.



(2) Remove the bolts that fix the side cover.

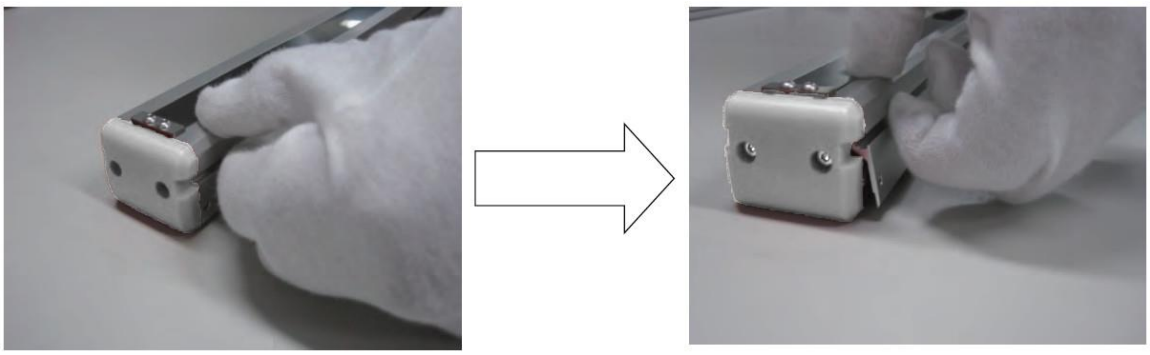
Note) Do not remove the steel belt.
When mounting the steel belt, adjustment using a dedicated jig is required.
When mounting the steel belt, make sure to adjust the belt using a dedicated jig is required.
For the steel belt mounting procedure, see 4.1.5.

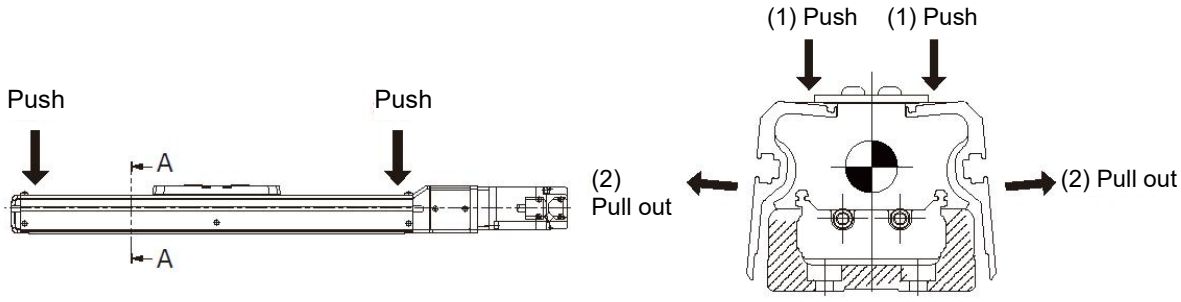


Model	Outer rail - side cover	Housing - side cover
EKS-04	M2.6 × 5L	M2.6 × 5L
EKS-05	M2.6 × 5L	M2.6 × 5L
EKS-06	M2.6 × 5L	M2.6 × 10L
EKS-08	M2.6 × 5L	M2.6 × 10L
EKS-10	M2.6 × 5L	M2.6 × 10L

Bolt type: Small screw with a cross recessed head for precision instruments
(No. 0 pan head screw, 3 types)

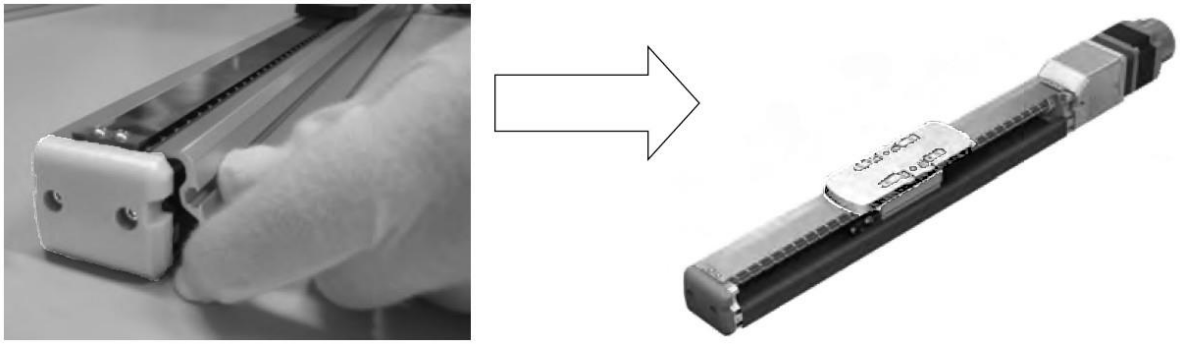
(3) Push the both ends of the side cover from the top and lift the bottom of the cover as holding the sensor groove.



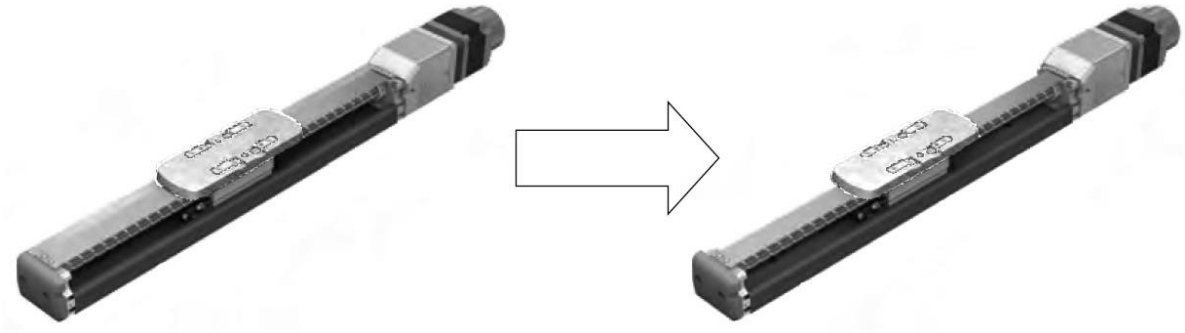


A-A cross section (detailed figure)

(4) Pull the side cover out at an oblique angle.
Note) Be careful not to damage the steel belt when pulling out the side cover.



(5) Remove the side cover on the other side.



(6) Fix the actuator with bolts.
Note) Regarding the tightening torque, see Table 1 Outer rail tightening torque.
Note) Use all the mounting holes to fix the actuator.
Note) Use bolts with the optimum length. See Table 1.
Note) A ball point bit is required to tighten the outer rail fixing bolts.

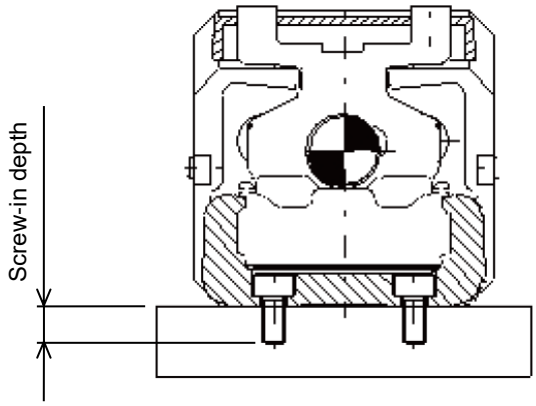


Table 1 Outer rail tightening torque

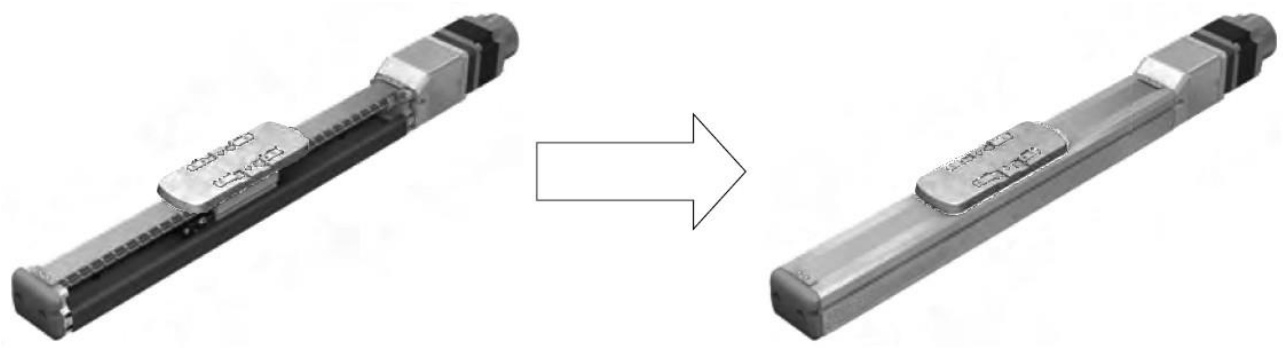
Model			EKS-04		EKS-05		EKS-06	
Bolt size			M3		M4		M5	
Bolt material (strength category)			Steel (10.9)	SUS (A2-70)	Steel (10.9)	SUS (A2-70)	Steel (10.9)	SUS (A2-70)
Screw-in depth [mm]			4.5 or more		6 or more		7.5 or more	
Tightening torque [N•m]	Material of mounting surface	Iron	1.7	1.0	3.45	2.29	6.16	4.57
		Aluminum	1.37	1.0	3.2	2.29	6.14	4.57

Model			EKS-08		EKS-10	
Bolt size			M6		M8	
Bolt material (strength category)			Steel (10.9)	SUS (A2-70)	Steel (10.9)	SUS (A2-70)
Screw-in depth [mm]			9 or more		12 or more	
Tightening torque [N•m]	Material of mounting surface	Iron	9.91	7.72	20.39	18.7
		Aluminum	9.91	7.72	20.39	18.7

(7) Move the table to the center of the stroke and mount the side covers.

Note) When the stroke is long, the steel belt may be bent depending on the mounting posture. If the belt is bent, slightly lift the steel belt with fingers so that it will not contact the side covers. If it is difficult to mount the side covers as lifting the steel belt, it is recommended to perform this work by 2 workers.

* When lifting the steel belt with fingers, do not lift it too much. If the steel belt is lifted too much as the steel belt holder is tightened, the steel belt may be cut or displaced, and adjustments may be required.



Model	Outer rail - Side cover -	Housing - Side cover -	Tightening torque [N•m]
EKS-04	M2.6 × 5L	M2.6 × 5L	0.3
EKS-05	M2.6 × 5L	M2.6 × 5L	0.3
EKS-06	M2.6 × 5L	M2.6 × 10L	0.3
EKS-08	M2.6 × 5L	M2.6 × 10L	0.3
EKS-10	M2.6 × 5L	M2.6 × 10L	0.3

Bolt type: Small screw with a cross recessed head for precision instruments
(No. 0 pan head screw, 3 types)

2.5.2 Installation from bottom

Fix the actuator with bolts.
Note) Regarding the tightening torque, see Table 2 Outer rail tightening torque.
Note) Use all the mounting holes to fix the actuator.
Note) Use bolts with the optimum length. See Table 2.

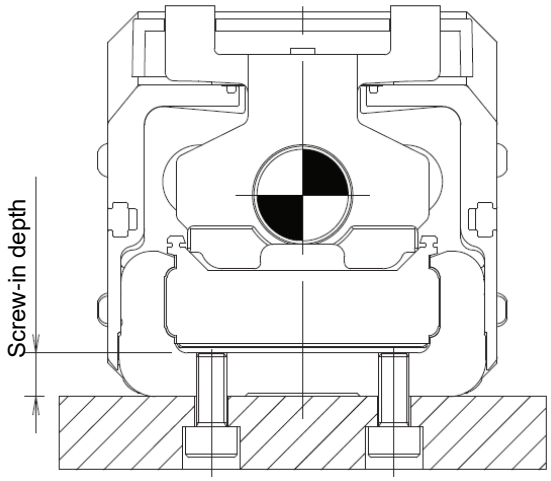


Table 2 Outer rail tightening torque

Model			EKS-04		EKS-05		EKS-06	
Bolt size			M4		M5		M5	
Bolt material (strength category)			Steel (10.9)	SUS (A2-70)	Steel (10.9)	SUS (A2-70)	Steel (10.9)	SUS (A2-70)
Screw-in depth [mm]			4~5		5~6		5~7	
Tightening torque [N•m]	Material of mounting surface	Iron	3.45	2.29	6.16	4.57	6.16	4.57
		Aluminum	2.66	2.29	4.74	4.57	4.74	4.57

Model			EKS-08		EKS-10	
Bolt size			M6		M8	
Bolt material (strength category)			Steel (10.9)	SUS (A2-70)	Steel (10.9)	SUS (A2-70)
Screw-in depth [mm]			6~10		8~13	
Tightening torque [N•m]	Material of mounting surface	Iron	9.91	7.72	20.39	18.7
		Aluminum	7.63	7.63	15.69	15.69

2.5.3 Installing loaded object

Fix a transferred object using the taps on the table.
Note) Regarding the tightening torque, see Table 3 Table mounting bolt tightening torque.
Note) Fix a transferred object using all the taps.
Note) Use bolts with the optimum length. See Table 3.

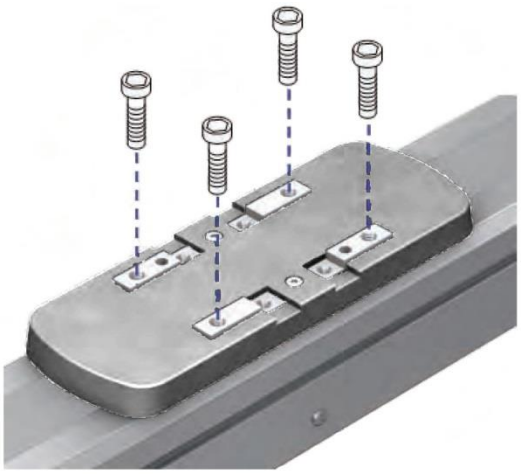


Table 3 Table mounting bolt tightening torque

Model			EKS-04		EKS-05		EKS-06	
Bolt size			M4		M4		M5	
Bolt material (strength category)			Steel (10.9)	SUS (A2-70)	Steel (10.9)	SUS (A2-70)	Steel (10.9)	SUS (A2-70)
Screw-in depth [mm]			6~6.5		6~8		7.5~8.5	
Tightening torque [N•m]	Material of mounting surface	Iron	3.45	2.29	3.45	2.29	6.16	4.57
		Aluminum	2.66	2.29	2.66	2.29	4.74	4.57

Model			EKS-08		EKS-10	
Bolt size			M6		M8	
Bolt material (strength category)			Steel (10.9)	SUS (A2-70)	Steel (10.9)	SUS (A2-70)
Screw-in depth [mm]			9~12		12~15	
Tightening torque [N•m]	Material of mounting surface	Iron	9.91	7.72	20.39	18.7
		Aluminum	7.63	7.63	15.69	15.69

2.5.4 Positioning pin protrusion length

If you use the knock holes (holes for the positioning pins) when fixing a loaded object, the positioning pin protrusion length must not exceed the value specified in Table 4 and Table 5.

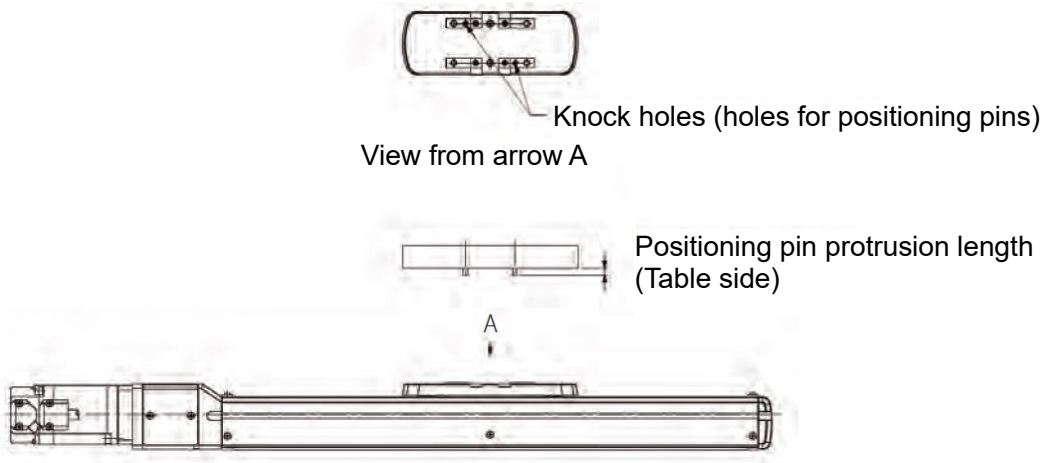


Table 4 Details of table positioning pin holes

Model	EKS-04	EKS-05	EKS-06	EKS-08	EKS-10
Knock hole diameter [mm]	φ3H7	φ3H7	φ3H7	φ5H7	φ5H7
Knock hole depth [mm]	5	5	5	10	10
Positioning pin protrusion length [mm]	4	4	4	9	9

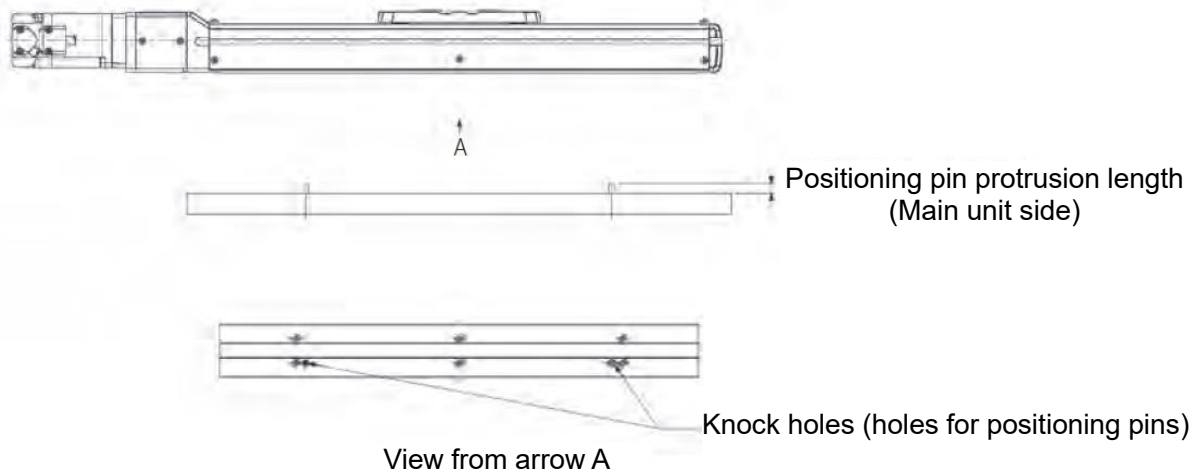


Table 5 Details of main unit positioning pin holes

No.	EKS-04	EKS-05	EKS-06	EKS-08	EKS-10
Knock hole diameter [mm]	φ4H7	φ4H7	φ5H7	φ5H7	φ5H7
Knock hole depth [mm]	4	4	5	5	5
Positioning pin protrusion length [mm]	3	3	4	4	4

3. USAGE

3.1 Safety Instructions

WARNING

Check the safety of the operation area of the product before supplying electricity to the device.
If electricity is supplied carelessly, an electric shock or injury may occur.

Turn off the power immediately if the lamp on the product does not blink even when the power is turned on.

Do not enter its operation area when the project is ready to operate.
An injury may be caused due to an unexpected operation of the product.

Do not touch the product body during or immediately after the operation.
A burn injury may be caused.

Do not stand or put an object on the device.
Such action may cause fall accident, injury due to a fall/drop of the device or malfunction/runaway due to the product damage.

Take measures not to damage human body and device even if the power fails.

Check that the actuator is safe to operate before the operation when the actuator is controlled from a position where it cannot be seen.

Confirm that the servo is turned off when moving and setting the movable section of the product manually (direct teaching).

Do not give commands smaller than encoder's minimum resolution and repetitive positioning accuracy.
Proper positioning control may not be performed.

Stop the operation immediately and replace the timing belt when there is an abnormality in the timing belt. Especially, the break of the timing belt during a vertical use is very dangerous. Replace the belt before it worn out.
Check the timing belt for abrasion on the tooth surface and side surface, tear, vertical rip in the tooth section, crack and softening of the back surface of the timing belt and partial cutting.

CAUTION

Do not operate the movable section of the product with external force. Do not perform an operation with sudden deceleration.
A malfunction or damage may occur due to a regenerative current.

Do not hit the table to parts such as the mechanical stopper, except for an origin return and clamp operation.
Feed screws may be damaged due to impacts and an operation fault may occur.

Do not create dents and scratches on movable sections.
An operation fault may occur.

Set the transfer load with a sufficient margin since the durability varies depending on the transfer load and environment.

Do not apply impacts to movable sections.

Do not apply external force to the product during an origin return operation.
The origin may be recognized incorrectly.

Do not turn off the servo while gravity or inertia force is applied.
The slider part or rod may continue to operate or drop if the servo is turned off. Turn off the servo in an equilibrium state where no gravity and inertia force are applied or after the safety is ensured.

CAUTION

Do not give a stop command while accelerating or decelerating.
It may lead to a speed change (acceleration) and cause a risk.

Be careful of the installation location and usage when using the motor mounting (left, right, bottom) types since abrasion powder is generated from the timing belt.
Abrasion powder is generated by driving the timing belt. Although it is covered with a belt cover, be careful when using the product above the workpiece.

Change the set speed so that the product is used with a speed that does not generate vibrations if vibrations are generated during a belt-driven operation.
Depending on the use conditions, an operation may generate vibrations even within the operation speed range.

Do not use the product in an extremely low dew point environment.
In an extremely low dew point environment, deterioration of resin and grease may accelerate, and lubrication performance and durability may decrease.

3.2 Operation

Please read through PREFACE of this manual and use the product within its specifications.
This product is not equipped with a motor.
You need to prepare, install, and adjust a motor and driver by yourself.
Make sure to install a motor properly in accordance with the instructions given in this Instruction Manual.
Regarding adjustment of a motor, refer to the instruction manual of the motor.

The recommended servo motor has a gain adjustment function which suppresses oscillation.
Operate the machine with control to suppress oscillation while the machine is running/stopped by making gain adjustment.
If the machine is operated under oscillation/resonance, its life may be shortened.
Set the acceleration/deceleration speeds upon actuation to 2G or less.

4. MAINTENANCE AND INSPECTION

CAUTION

Wiring work and inspections should be performed by specialized engineers.

Perform wiring after installing the product.
An electric shock may occur.

Do not work with wet hands.
An electric shock may occur.

Wait five minutes or longer after turning off the power and check the voltage with a tester. Then, perform wiring and inspection works.
An electric shock may occur.

Do not attach or remove wires and connectors with the power turned on.
A malfunction, failure or electric shock may occur.

Use a wire with sufficient diameter to accept the instantaneous maximum current as the lead wire to be used for the power cable.
Heat generation or damage may occur during an operation.

Do not disassemble or modify the product.
An injury, accident, malfunction or failure may occur.

Conduct periodic inspection (two to three times a year) to confirm that the product operates normally.

Greasing interval

EKS (standard), EKS-P4, and EKS-P40 series: These units are generally maintenance-free in the long term and do not require greasing. However, based on usage conditions and the environment, greasing may still be necessary. It is recommended to establish the greasing interval during the initial inspection. For travel distances exceeding 10,000 km, grease the unit every six months or after every 100 km traveled, whichever interval is shorter.

EKS-FP1 series: Grease the unit every three months or after every 100 km of travel, whichever interval is shorter. In certain cases, the greasing interval may be shorter than usual due to the usage conditions and environment. It is recommended to establish the greasing interval during the initial inspection.

Turn off the power immediately if abnormal heat, smoke, odor, sound or vibration occurs in the product.
The product may be damaged or a fire may occur due to continuous current flow.

Be sure to stop the power supply to the product before performing maintenance, inspection, and repair.
To prevent an unexpected energization during the maintenance, inspection or repair, inform people that the maintenance is undergoing.

4.1 Periodic Inspection

Conduct the following inspection periodically (two to three times a year) to use the product as long as possible.
Inspect a timing belt every 500 km.
Be sure to turn off the power when performing the item 1, 2, 3, and 4.

4.1.1 Inspection item

Inspection item	Method	Action
Check that the mounting bolts of the product, the screws of the terminal block, and the connectors are not loosened.	Check for looseness	Retighten the loosened parts.
Check that there are no scratches and cracks on the cables.	Visual inspection	A repair is required.
Check that no foreign matter accumulates or is caught on movable sections.	Visual inspection	Perform cleaning. Note 1 After cleaning, apply grease.
Check that there are no scratches, cracks, and tears in the timing belt.	Visual inspection	Replace the timing belt.
Check that there are no vibrations and abnormal sound during stop or operation.	Sound inspection	A repair is required.
Check that the power supply voltage is normal.	Inspection with a tester	Investigate the power system and be sure to use the product within the specified power supply range described in the Specifications.

* Note 1: Use a soft cloth for cleaning and be sure not to leave foreign matters on movable sections.

4.1.2 Recommended grease

■ EKS-L (standard) series: AFF grease manufactured by THK

High-grade synthetic oil, lithium thickener and additives are used for this grease, and it has a stable rolling resistance which is not found in conventional vacuum grease or low dust generating grease.

<Features>

- Since the viscosity resistance and the fluctuation of the rolling resistance are low, conformity at a low speed is excellent.
- It is suitable to use in a cleanroom, due to an excellent low dust generation performance.
- Since the wear resistance against minute vibrations is excellent, the intervals between greasings can be extended.

<Appearances of the grease tube and package>

Typical characteristics

Item		Typical characteristic state	Test method
Consistency enhancer		Lithium-based	
Base oil		High-grade synthetic oil	
Base oil kinematic viscosity: mm^2/s (40°C)		100	ISO 2137 ISO 2176 ISO 6743 ISO 11009 ISO 12924
Worked penetration(25°C, 60 W)		315	
Mixing stability (100,000 W)		345	
Dropping point: °C		220	
Amount of evaporation: mass% (99°C, 22 h)		0.7	
Oil separation: mass% (100°C, 24 h)		2.6	
Copper plate corrosion (Method B, 100°C, 24 h)		Accepted	
Low temperature torque: mN-m(−20°C)	Activation	220	
	Rotation	60	
4-ball test (fusion load): N		1236	ASTM D2596
Working temperature range °C		−40 to 120	
Appearance color		Reddish-brown	

■ EKS-L-FP1 series: L700 grease manufactured by THK

L700 Grease is an H1 grease product certified and registered by NSF International*. Using a high-grade synthetic oil as the base oil in conjunction with a calcium sulfonate complex-based consistency enhancer, L700 Grease maintains excellent water and corrosion resistance and withstands extreme pressure. It is intended for use in medical, pharmaceutical, and food equipment.

*A third party certification body for matters related to public safety and health

<Features>

- L700 Grease is an H1 grease product certified and registered by NSF International (NSF H1).
- Calcium sulfonate (the consistency enhancer) makes L700 Grease more resistant to water and corrosion than ordinary H1 grease.
- L700 Grease displays better extreme pressure resistance than general-purpose grease.

<Appearances of the grease tube and package>

Typical characteristics

Item		Typical characteristic state	Test method
Consistency enhancer		Calcium sulfonate complex-based	
Base oil		High-grade synthetic oil	
Base oil kinematic viscosity: mm^2/s (40°C)		89	ISO 2137 ISO 2176 ISO 6743 ISO 11009 ISO 12924
Worked penetration(25°C, 60 W)		314	
Mixing stability (100,000 W)		324	
Dropping point °C		250	
Amount of evaporation: mass% (99°C, 22 h)		0.15	
Oil separation: mass% (100°C, 24 h)		2.9	
Copper plate corrosion (Method B, 100°C, 24 h)		Accepted	
Low temperature torque: mN-m(−20°C)	Starting	43	
	Rotation	24	
4-ball test (welding load): N		3922	ASTM D2596
Working temperature range °C		−40 to 200	
Appearance color		Tan	

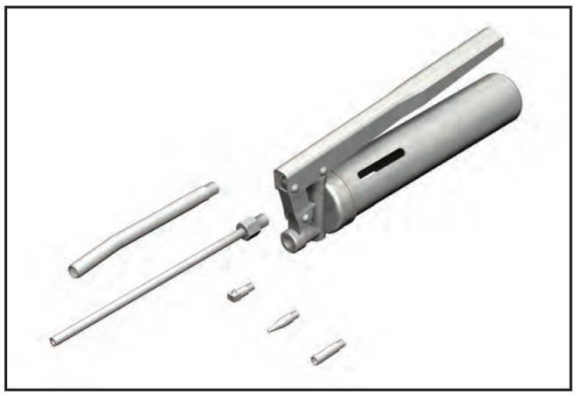
■ EKS-L-P4, EKS-L-P40 series : Special grease for low dew point environment

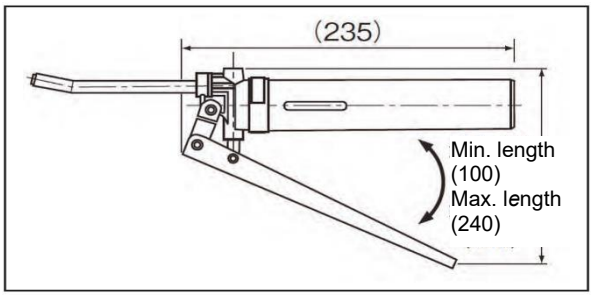
Contact your nearest CKD sales office.

4.1.3 Recommended grease gun

■ Recommended grease gun: MG70 grease gun unit manufactured by THK

- The MG70 grease gun unit can be used to apply grease to the product by replacing the nozzle with a special nozzle.
- The grease gun has a slit window so you can check the remaining amount of grease.
- The bellows cartridge system is adopted, and the cartridge can be exchanged without getting your hands dirty.





Discharge pressure	Maximum 19.6 MPa
Discharge volume	0.6 cm^3/stroke
Grease	70 g in bellows cartridge
Total length	235 mm (excluding nozzle)
Weight	480 g (including nozzle, excluding grease)

Grease gun specifications

Fig. 6 External view of grease gun

The shapes of the grease gun nozzle and attachment are shown in Fig. 7.

* Use of the P type attachment enables to lubricate locations where lubrication is difficult (by dropping grease on the rolling surface, etc.).

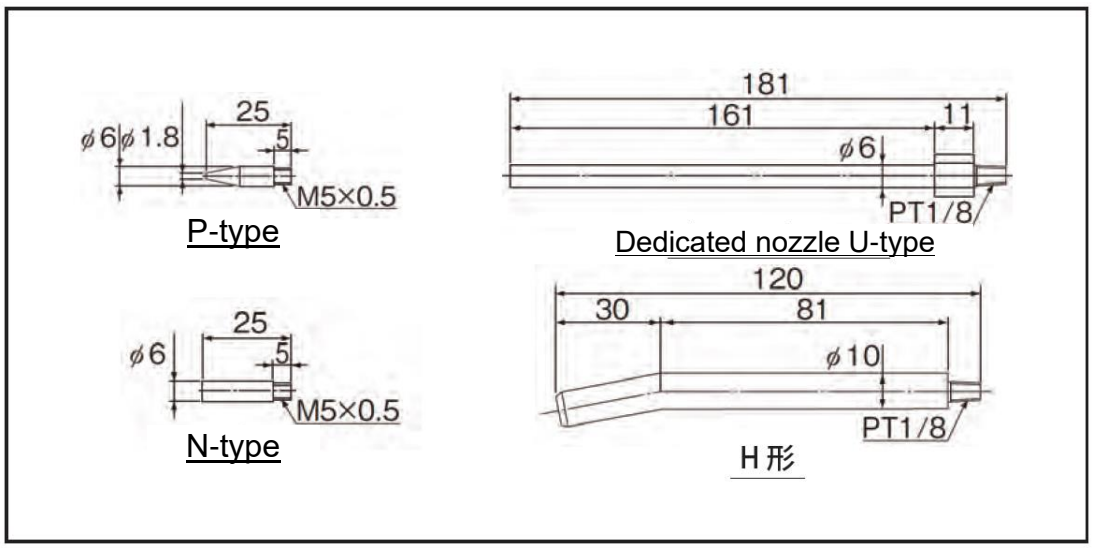


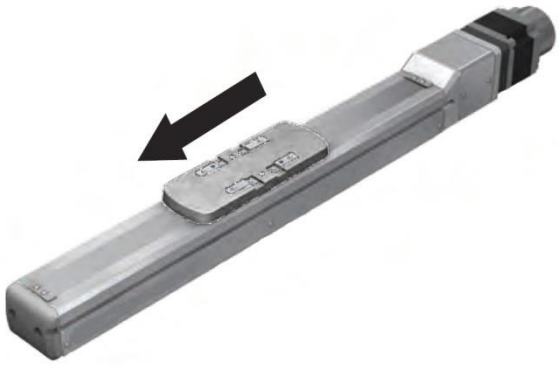
Fig. 7 Grease gun nozzle and attachr

4.1.4 EKS-L Series lubrication procedure

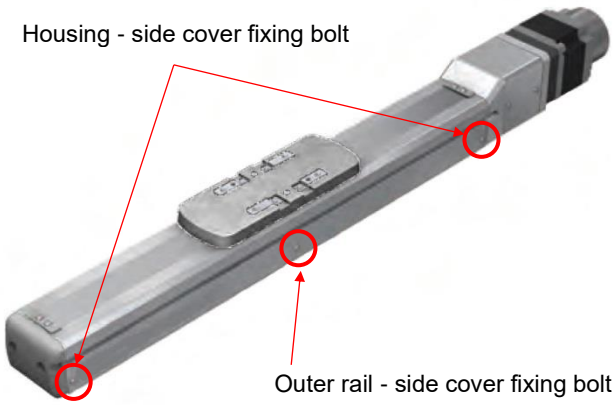
■ Removing the side cover

- Do not bend the removed side cover.
- Be careful not to strip the screw head.

(1) Move the table to the center of the stroke.



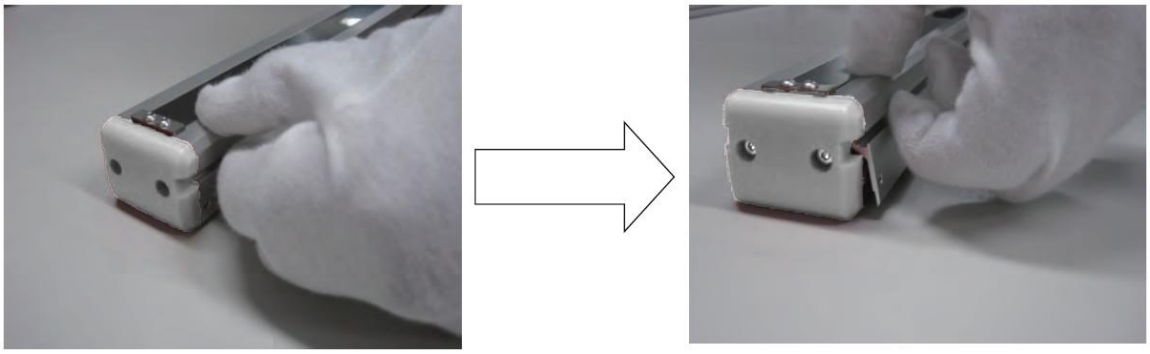
(2) Remove the bolts that fix the side cover.
Note) Do not remove the steel belt.
When mounting the steel belt, adjustment using a dedicated jig is required.
When mounting the steel belt, make sure to adjust the belt using a dedicated jig is required.
For the steel belt mounting procedure, see 4.1.5.

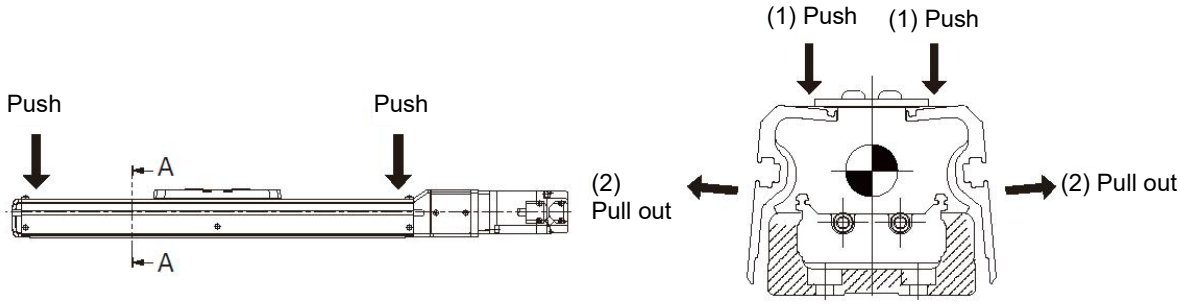


Model	Outer rail - side cover	Housing - side cover
EKS-04	M2.6 × 5L	M2.6 × 5L
EKS-05	M2.6 × 5L	M2.6 × 5L
EKS-06	M2.6 × 5L	M2.6 × 10L
EKS-08	M2.6 × 5L	M2.6 × 10L
EKS-10	M2.6 × 5L	M2.6 × 10L

Bolt type: Small screw with a cross recessed head for precision instruments
(No. 0 pan head screw, 3 types)

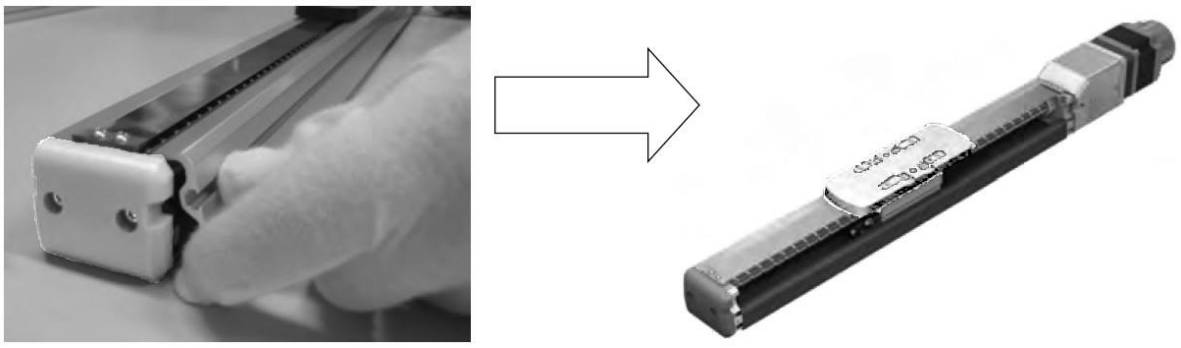
(3) Push the both ends of the side cover from the top and lift the bottom of the cover as holding the sensor groove.



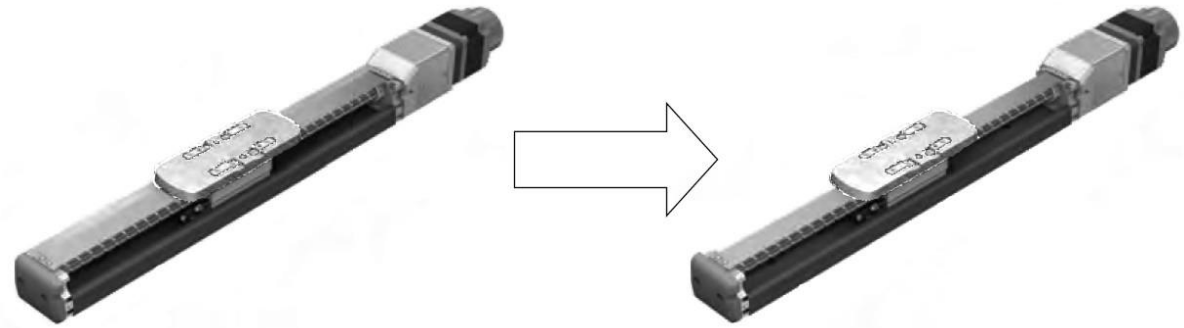


A-A cross section (detailed figure)

(4) Pull the side cover out at an oblique angle.
Note) Be careful not to damage the steel belt when pulling out the side cover.

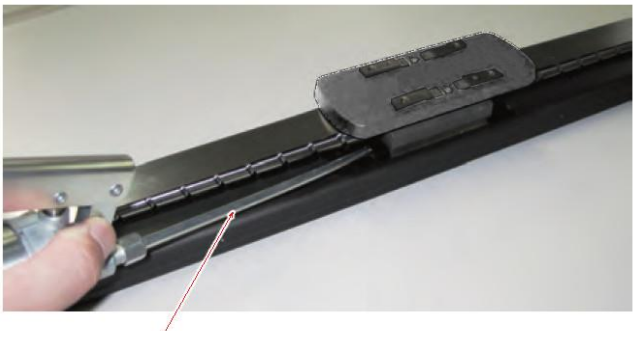


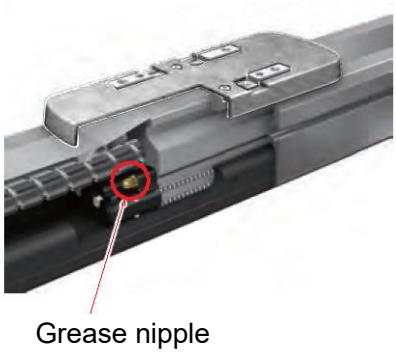
(5) Remove the side cover on the other side.



■ Applying grease to linear guide

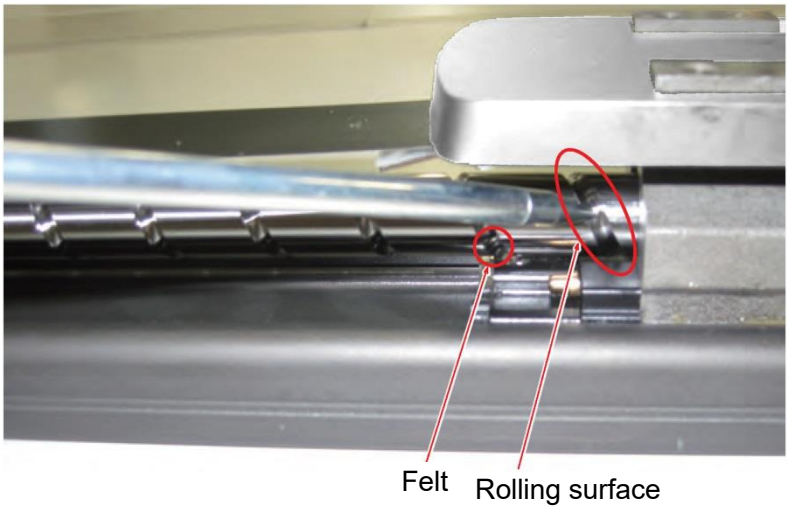
(1) Mount the corresponding nozzle and attachment to the grease gun.
•EKS-04/05/06/08: Dedicated nozzle U-type + N-type attachment
•EKS-10: H-type
(2) Apply AFF grease from the grease nipple.
(3) Stroke the table to spread grease.





■ Applying grease to ball screws

(1) Mount the U-type dedicated nozzle and N-type attachment to the grease gun.
(2) Apply grease directly to the rolling surface of the ball screw.
(3) Stroke the table to spread grease.
Note) Apply grease on the rolling surface from the felt to the slider side.

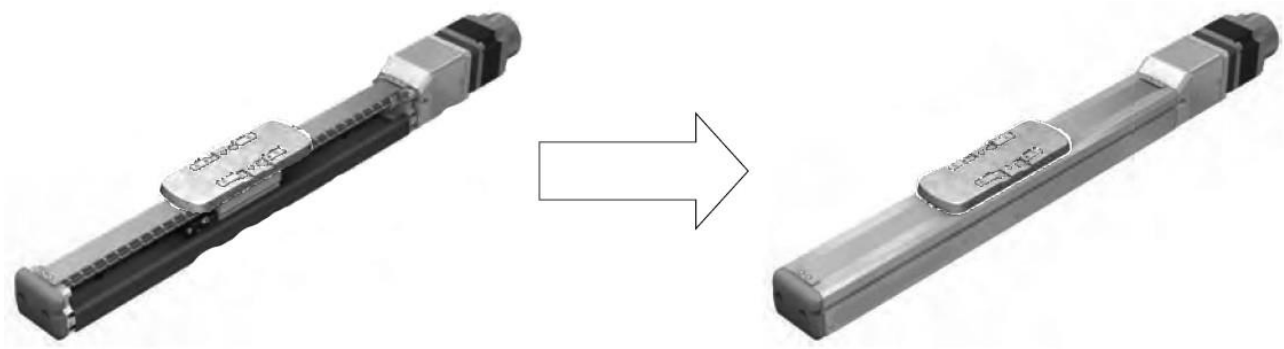


Model	Ball screw lead [mm]	Grease application amount [cc]	
		Linear guide	Ball screw
EKS-04	10	0.4	0.3
	16		0.3
EKS-05	10	0.8	0.7
	20		0.4
EKS-06	20	1.2	0.6
	30		0.6
EKS-08	20	2.4	5.6
	40		1.8
EKS-10	25	4.7	4.2
	50		2.5

■ Attaching the side cover

- Be careful not to damage the steel belt when reattaching the side covers.
- Be careful not to strip the screw head.

Move the table to the center of the stroke and mount the side covers.
Note) When the stroke is long, the steel belt may be bent depending on the mounting posture.
If the belt is bent, slightly lift the steel belt with fingers so that it will not contact the side covers.
If it is difficult to mount the side covers as lifting the steel belt, it is recommended to perform this work by 2 workers.
* When lifting the steel belt with fingers, do not lift it too much. If the steel belt is lifted too much as the steel belt holder is tightened, the steel belt may be cut or displaced, and adjustments may be required.



Model	Outer rail - Side cover	Housing - Side cover	Tightening torque [N•m]
EKS-04	M2.6 × 5L	M2.6 × 5L	0.3
EKS-05	M2.6 × 5L	M2.6 × 5L	0.3
EKS-06	M2.6 × 5L	M2.6 × 10L	0.3
EKS-08	M2.6 × 5L	M2.6 × 10L	0.3
EKS-10	M2.6 × 5L	M2.6 × 10L	0.3

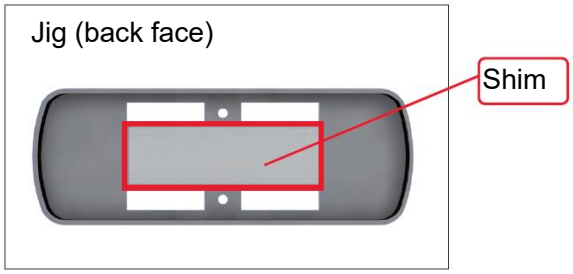
Bolt type: Small screw with a cross recessed head for precision instruments
(No. 0 pan head screw, 3 types)

4.1.5 How to replace steel belt

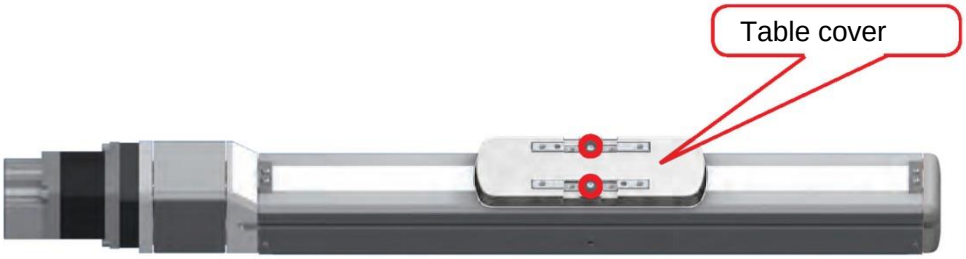
●Do not drop an object and create dents on the steel belt.
If any scratches and/or dents are made on the steel belt due to drop of a tool, etc. on it, the steel belt needs to be replaced.
If you keep using the steel belt with scratches and/or dents, it causes early damage of the steel belt such as breakage.
Pay due attention during work so as not to create scratches on the steel belt, etc.

● Do not grab the steel belt of this product.
It may cause injury.
The steel belt has sharp parts. Be careful not to cut your hands and fingers.

To adjust the steel belt, a steel belt adjustment jig in which a shim is affixed on the back of the table cover is required. For more information, please contact CKD.



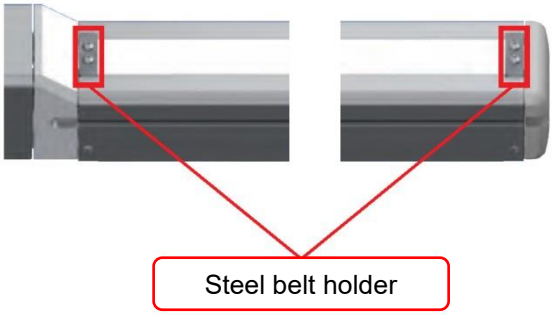
(1) Remove the table cover.



Model	Bolt size, Quantity
EKS-04	M2.6 × 4L, 2
EKS-05	M2.6 × 4L, 2
EKS-06	M3 × 5L, 2
EKS-08	M3 × 5L, 2
EKS-10	M3 × 5L, 2

Bolt type: Thin head FH-type small screw

(2) Remove the steel belt holder.



Model No.	Bolt size, Quantity
EKS-04	M2.5 × 4L, 4
EKS-05	M2.5 × 4L, 4
EKS-06	M3 × 5L, 4
EKS-08	M3 × 5L, 4
EKS-10	M3 × 5L, 4

Bolt type: Hex head button bolt

(3) Remove the steel belt from the main unit.

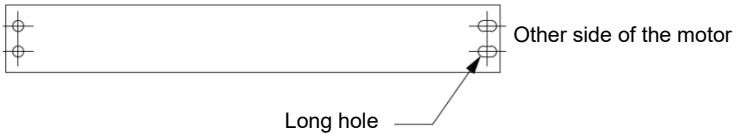
⚠ CAUTION

Two strong magnets to attract the steel belt are mounted on the EKS table. Care should be taken when handling magnetic substances because they may be attracted to these magnets.
In addition, a band-shaped magnet to prevent the steel belt from lifting is attached on the top of the side cover.

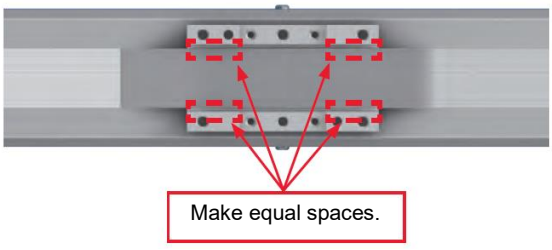
(4) Temporarily mount a new steel belt and adjust the position of the steel belt.

⚠ CAUTION

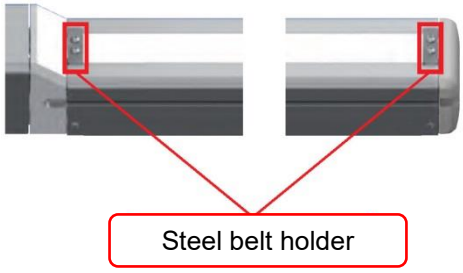
The mounting orientation is specified in some models of the steel belt. If the mounting holes consist of round holes and long holes, make sure to mount the street belt in a way that the long holes come to the other side of the motor.



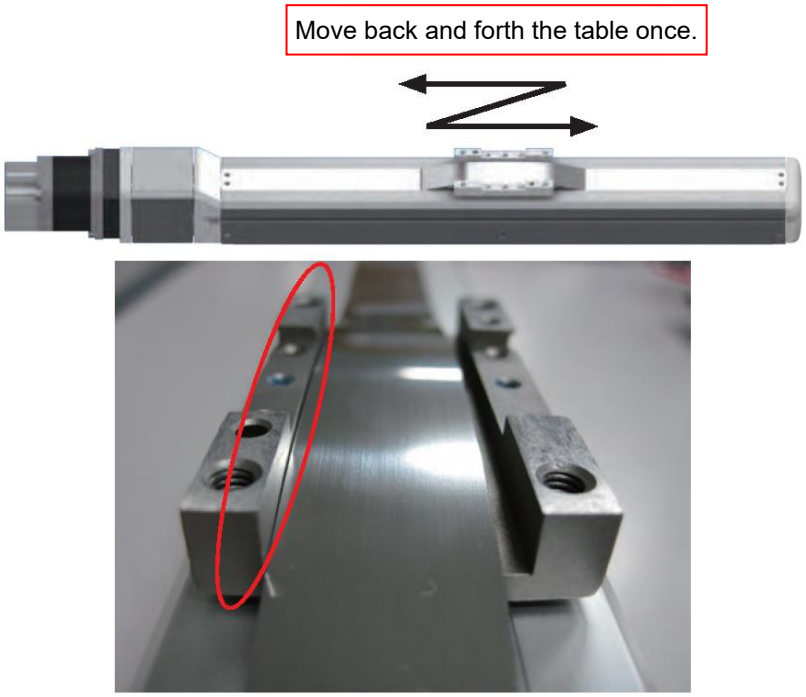
(5) Adjust the steel belt position to the center of the table and make equal spaces.



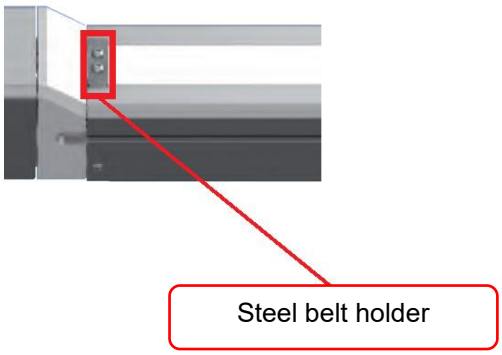
(6) Tighten the belt to the degree that the steel belt holder does not move and loosen the thin head small screw about one turn.



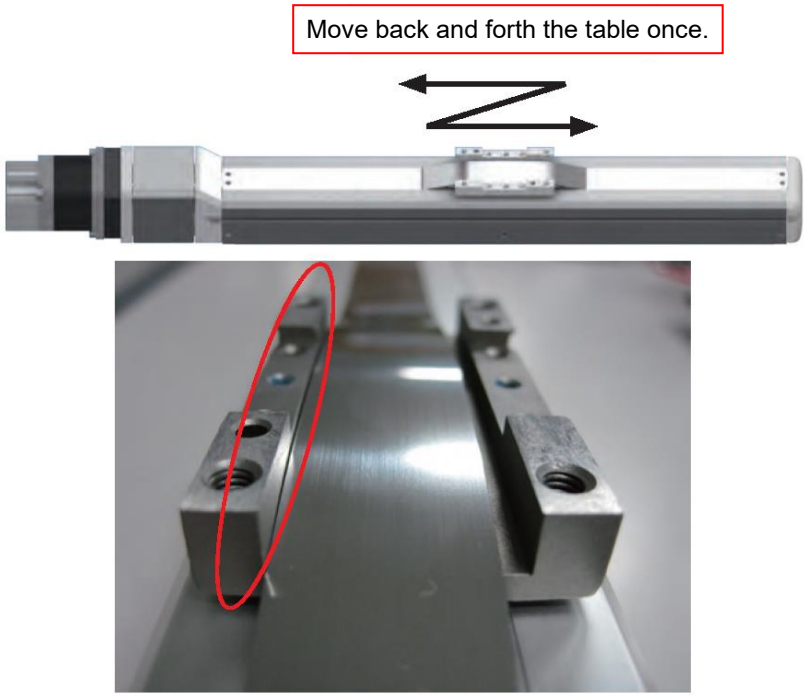
(7) Move the table back and forth once and confirm that the steel belt does not contact the table throughout the stroke.
If the steel belt contacts the table as shown in the photo, loosen the steel belt holder and go back to step (5) to adjust the position of the steel belt again.



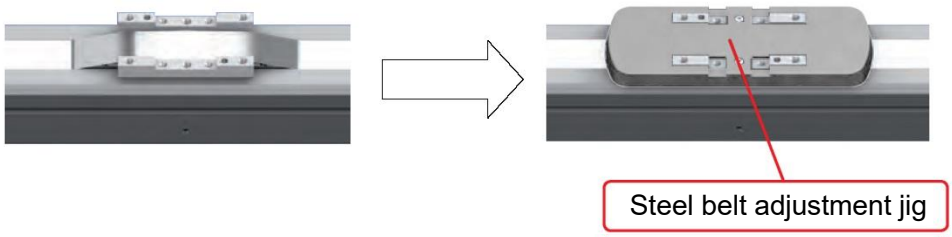
(8) Tighten the belt to the degree that the steel belt holder at the housing A side does not move.



(9) Move the table back and forth once and confirm that the steel belt does not contact the table throughout the stroke.
If the steel belt contacts the table as shown in the photo, loosen the steel belt holder and go back to step (5) to adjust the position of the steel belt again.



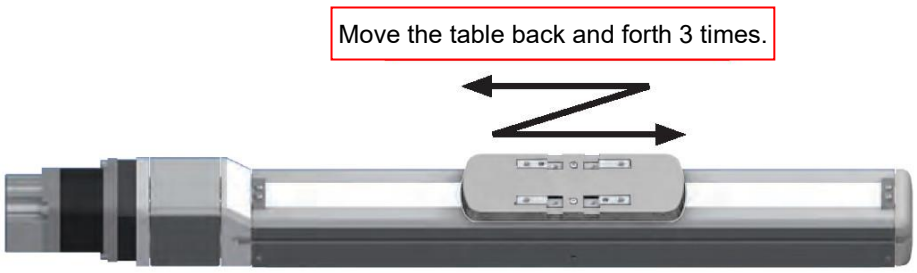
(10) Mount the steel belt adjustment jig.



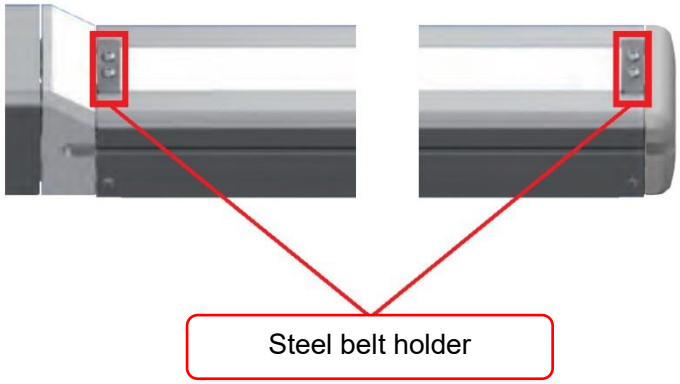
Model	Bolt size, Quantity	Tightening torque [N•m]
EKS-04	M2.6 × 4L, 2	0.17
EKS-05	M2.6 × 4L, 2	0.17
EKS-06	M3 × 5L, 2	0.17
EKS-08	M3 × 5L, 2	0.17
EKS-10	M3 × 5L, 2	0.17

Bolt type: Thin head FH-type small screw

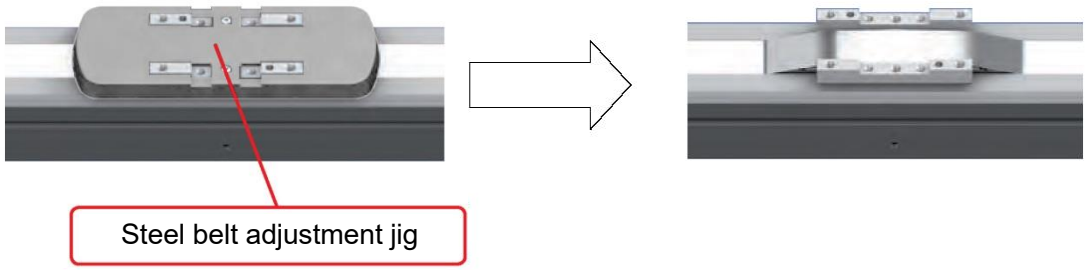
(11) Move the table back and forth throughout the stroke 3 times and stop it around the center of the stroke.



(12) Fully tighten the steel belt.
Note) When fully tightening the steel belt, never pull the steel belt in the stroke direction.



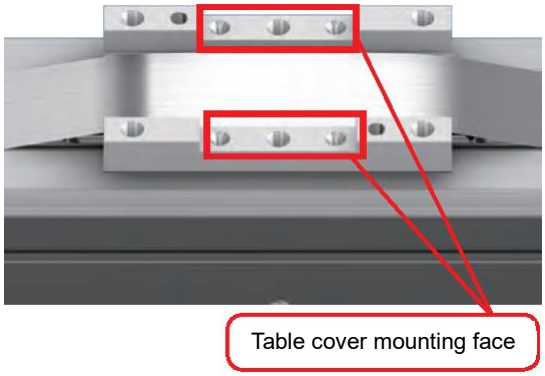
(13) Remove the steel belt adjustment jig.

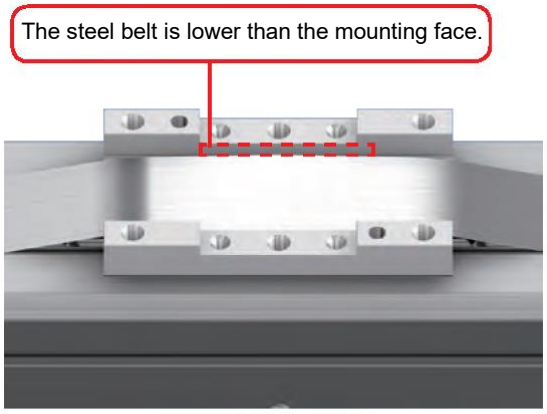


Model	Bolt size, Quantity
EKS-04	M2.6 × 4L, 2
EKS-05	M2.6 × 4L, 2
EKS-06	M3 × 5L, 2
EKS-08	M3 × 5L, 2
EKS-10	M3 × 5L, 2

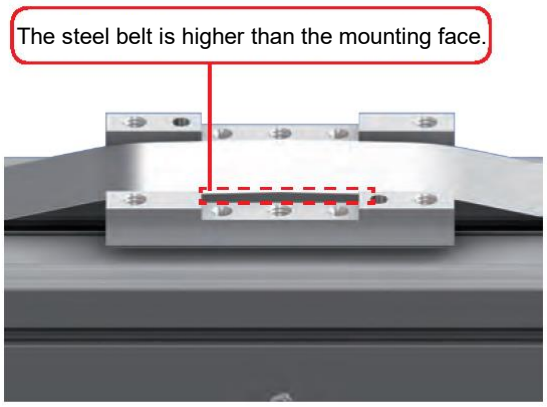
Bolt type: Thin head FH-type small screw

(14) Check the space of the steel belt. Check the height of the steel belt and that of the table cover mounting face to confirm that the steel belt is lower than the table cover mounting face.
If the steel belt is higher than the table cover mounting face, go back to temporary installation of the steel belt and make adjustments again.



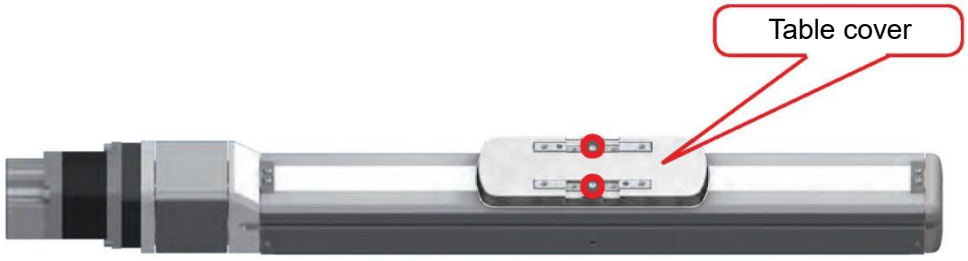


Example of acceptable mounting state



Example of unacceptable mounting state

(15) Mount the table cover.



Model	Bolt size, Quantity	Tightening torque [N•m]
EKS-04	M2.6 × 4L, 2	0.17
EKS-05	M2.6 × 4L, 2	0.17
EKS-06	M3 × 5L, 2	0.17
EKS-08	M3 × 5L, 2	0.17
EKS-10	M3 × 5L, 2	0.17

Bolt type: Thin head FH-type small screw

5. WARRANTY

5.1 Warranty Provisions

■ Warranty coverage

If the product specified herein fails for reasons attributable to CKD within the warranty period specified below, CKD will promptly repair the faulty product free of charge.
However, following failures are excluded from this warranty:

- Failure caused by handling or use of the product under conditions and in environments not conforming to those stated in the catalog, the Specifications, or this Instruction Manual.
- Failure caused by incorrect use or management such as careless handling.
- Failure not caused by the product.
- Failure caused by use not intended for the product.
- Failure caused by modifications/alterations and repairs not carried out by CKD.
- Damage that is avoidable if your machine or device is equipped with functions or structures that should be furnished in accordance with a generally accepted notion in the industry when the product is installed and used in your machine or device.
- Failure caused by reasons unforeseen at the level of technology available at the time of delivery.
- Failure caused by acts of nature and disasters beyond control of CKD.

Warranty stated here covers only the delivered product itself. Any loss or damage induced by failure of the delivered product is excluded from this warranty.

■ Confirmation of product compatibility

It is the responsibility of the customer to confirm compatibility of the product with any system, machinery, or device used by the customer.

■ Others

Terms and conditions of this warranty stipulate basic matters.
When terms and conditions of a warranty described in individual specification drawings or the Specifications are different from those of this warranty, the specification drawings or the Specifications shall have a higher priority.

5.2 Warranty Period

Our product is warranted for one (1) year from the date of delivery to the location specified by the customer.