



THK Electrical Actuator Compact Series

KSF : Full cover

KSF-U : Open cover

KSF-T : Top cover

INSTRUCTION MANUAL

No.2050-4 (0) E

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1. Introduction

1-1 Acknowledgment

Thank you for purchasing the Compact Series KSF.

This product is a long-stroke, high-speed, high acceleration/deceleration actuator.

This product is designed and manufactured to be incorporated in devices with wide range of application including conveyance system, implementing equipment, automated assemblers, and positioning equipment, etc.

We hope our creative inventions and unique technologies contribute to your further prosperity.

1-2 About this manual

1-2-1 Intended audience

The person in charge of designing embedded systems of the product and installing, wiring, and maintaining the product, and the person who actually uses the product.

1-2-2 Using this manual

This manual describes correct handling methods and precautions for the product.

For the maximum performance and long life of the product, carefully read and understand this manual to safely and correctly use the product.

If you use the printed version of this manual, be sure to keep it in the place that the audience can refer to it when needed.

1-2-3 Notice and attention

- Do not use or handle the product in the ways that are not described in this manual.
- Do not reproduce, reprint, or lend the whole contents or a part of this manual without permission.
- Please note that the description in this manual is subject to change without prior notice in the future, due to improvements of the product or other reasons.
- We have made all possible efforts to make the content of this manual accurate. However, if you find any mistake or uncertainty in this manual, please contact THK.
- Drawings throughout this manual are only intended as typical examples, and may differ from your product.
- Note that THK shall not be liable for any result incurred by applying this manual, regardless of the reason.
- This manual is also applied to special types of product. However, the descriptions provided in the delivery specification drawings or delivery specification documents of those special types take precedence over this manual.

* Special types represent the products that have different materials and specifications from those of the standard products on catalogs.

1-2-4 Notation of this manual

Important

- Notes that can lead to unsatisfactory functions, errors, or damages of the product if not observed while using the product.

Supplement

- Supplementary information for the description.

Reference

- Reference information for the description.

1-3 How to use this product

- This product must not be used for the devices or systems that are used under the situations that may be fatal to human life.
- If you consider using this product for special applications such as passenger movement vehicle, medical, aerospace, nuclear power, and electric power devices or systems, be sure to consult with THK in advance.
- This product is manufactured under the strict quality control, however, that does not mean that the product is free from failure. For applications to the equipment that may suffer serious accidents or loss from the failure of this product, install safety devices or backup devices that prevent such serious accidents or loss.

Important

- If you purchase this product with a motor, THC is the applicable driver controller. Please note that driver controllers other than the above cannot be used.

1-4 About product support

We have made all possible efforts to make the content of this manual accurate. However, if you find any mistake or uncertainty in this manual, please contact THK.

For the following information, please contact THK.

- Technical support for this product

1-5 About related instruction manuals

- When you use the actuator KSF, read the following instruction manuals as necessary.

· Controller series	Driver controller THC
· Controller series	Network unit TNU
· Controller series	Setup tool D-STEP
· Controller series	Digital operator TDO

1-6 Product and company information

To find the latest product and company information, we recommend you to periodically access our website.

- Website URL: <https://www.thk.com>
- Technical support website URL: <http://www.tech.thk.com/>

2. Safety Precautions

2-1

Warning indications on safety

This manual uses the following warning indications according to safety matters. The descriptions next to warning indications on safety are important messages. Be sure to observe those descriptions.



Warning "Erroneous handling may cause death or serious injury to a person"



Caution "Erroneous handling may cause injury to a person or property damage only"



"Prohibitions (don't)"



"Obligations (do)"

2-2

Safety precautions

This section describes important precautions that you must observe.

Warning



■ General

- **While this product is operating or operable, do not enter the working area of any moving part.**
Otherwise, it may cause you to touch the moving part and injure you.
- **While the motor or sensor is energized, do not move or install this product.**
Otherwise, it may cause electric shocks, or cause malfunction that could lead to injury.



■ Installation and operation

- **If any moving part may fall by its own weight in vertical application or the like, provide a safeguard for preventing the part from falling.**
If any moving part falls, it may cause injury or damage.
- **Motor wrap types do not have a safety device in case of timing belt breakage. Install a safety device to the equipment for greater safety. If any moving part falls, it may cause injury or damage.**



- **While this product is operating, do not touch any moving part or rotating part.**
Otherwise, it may cause your hand to be caught and injured.



■ Maintenance

- **Turn off the machine (turning power off) before conducting any maintenance.**
Otherwise, it may cause electric shocks, or cause malfunction that could lead to injury.



- **If two or more people are involved in the operation, confirm the procedures such as sequences, signs, and abnormalities in advance, and appoint another person for monitoring the operation.**

Failure to do so may cause an unexpected accident.

2. Safety Precautions

2. Safety Precautions

Caution



■ General

- **Do not stand on this product or the packaging box.**
Otherwise, it may cause fault or damage, or cause falling that could lead to injury.
- **Do not impact this product.**
Otherwise, it may cause fault or damage, or injure you.
- **Do not apply a load that exceeds the permissible level.**
Otherwise, it may cause fault or damage, or may cause abnormal operation that could lead to injury.
* For your reference, see the Appendix, which contains the static permissible moment and permissible input torque for each model number.



- **Do not disassemble or alter this product.**
Otherwise, it may cause foreign material to enter the product, which could result in fault or adversely affect the performance or service life. Or it may cause abnormal operation that could lead to injury.



■ Unpacking

- **Be careful not to hit your hands or body against protruded parts.**
Otherwise, it may cause injury, or cause fault or fracture.
- **Check whether the delivered product is the product you ordered.**
Using a wrong product may cause malfunction that could lead to injury or fault.
- **Check whether the product has any fractured parts.**
Using a fractured product may cause injury or fault.
* If you find any defect, contact our Sales Division.



■ Transportation



- **Do not drop or hit this product.**
Otherwise, it may cause injury or fracture, or a functional loss.
- **When transporting this product, do not hold any moving part or the cover.**
Do not hold the side cover from the both sides. (Full cover specification)
Do not hold by the top cover when carrying. (Top cover specification)
Otherwise, it may cause the product to fall, leading to injury, or cause fault or fracture.
- **Do not grasp the strip seal of this product.**
It may injure you.
Some parts of the strip seal may be sharp. Take care not to cut your hands or fingers.
Also, the strip seal must be replaced when it is scratched, pitted or dented.
Use of the strip seal in this state may cause early breakage or other damages.



- **When transporting this product, do not hold the motor, the sensor or the cable.**
Otherwise, it may cause the product to fall, leading to injury, or cause fault or fracture.



- **When carrying this product, hold the bottom face of the product. KSF8 and KSF10 are heavy articles (20 kg or heavier). Two or more people should hold the product as necessary.**

Otherwise, it may cause the product to fall, leading to injury, or cause fault or fracture.

* For more information on the weight of the product, see the catalog of the Compact Series KSF.

2. Safety Precautions

2. Safety Precautions

■ Installation and operation

- **Firmly secure this product before operating it.**

Failure to do so may cause abnormal operation that could cause injury, fault or fracture.

- **If anomaly occurs, immediately stop the machine.**

Failure to do so may cause abnormal operation that could cause injury, fault or fracture.



- **Anti-rust oil is applied on the table, outer rail and ball screw shaft end. Thoroughly wipe off the oil before operating the product.**

The grease applied to the screw shaft will spatter on the main unit exterior during initial operation. Wipe off the grease on surfaces other than the screw shaft groove. (Open cover specification, top cover specification)

- **Do not exceed the maximum speed when using the product.**

Otherwise, it may cause fault or damage, or may cause abnormal operation that could lead to injury. For your reference, see the specification (→ P.4-1), which contains the maximum speed for each model number at each stroke.

- **Do not use the failed and broken product.**

Otherwise, it may cause injury or machine failure.

2. Safety Precautions

2. Safety Precautions

2-3

Checking the precautions/instruction labels

This product is affixed with precautions/instruction labels. Identify them when unpacking the product.

Fig.1 shows the affixing position.

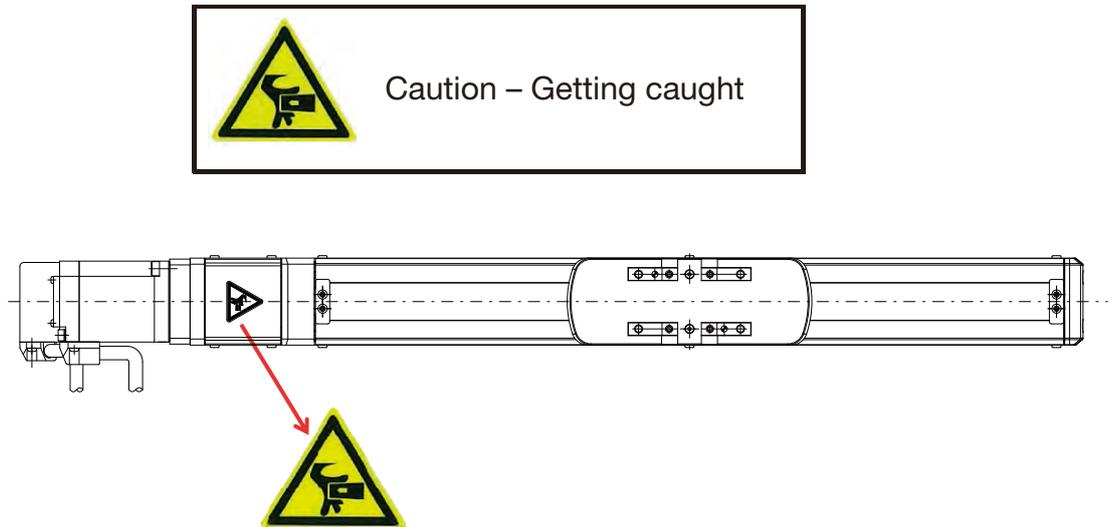


Fig. 1 KSF precaution label affixing position (common for all models)

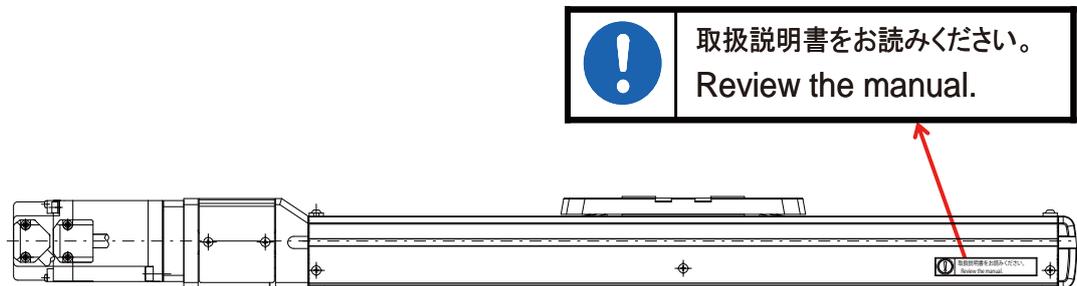


Fig. 2 Instruction label affixing position (full cover specification)

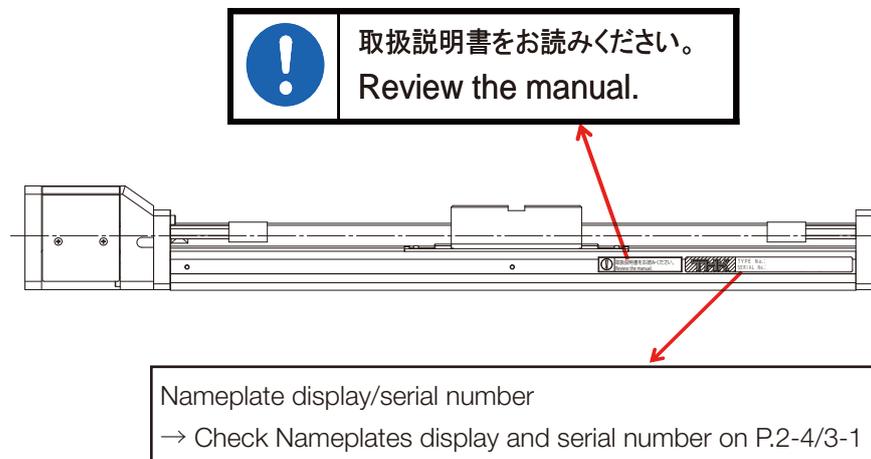


Fig. 3-1 Instruction label standard affixing position (open cover/top cover specification)

2. Safety Precautions

2. Safety Precautions

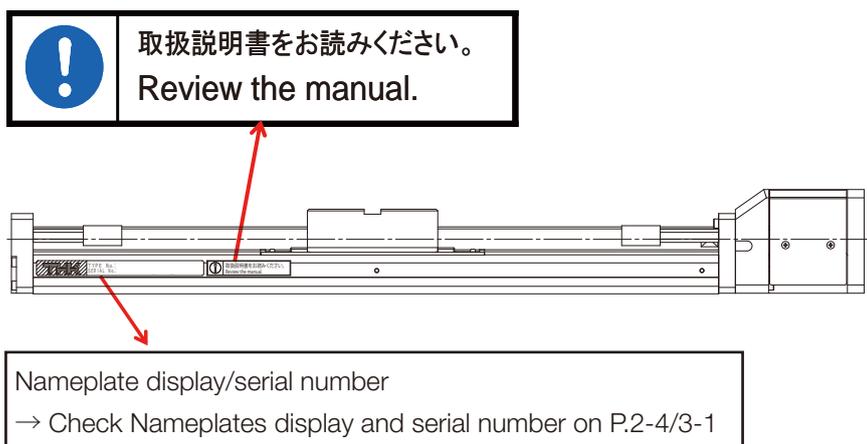


Fig. 3-2 Instruction label affixing position with sensor mounted for opposite reference side (open cover/top cover specification)

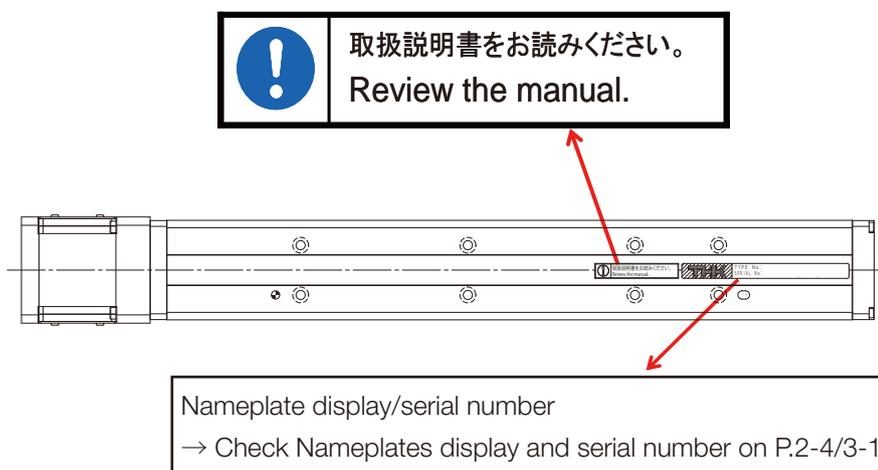


Fig. 3-3 Instruction label affixing position with sensor mounted for both sides (open cover/top cover specification)

3. Nameplates Display

3. Nameplates Display

3-1

Nameplates display and serial number

Fig. 4 shows the nameplate format of the Compact Series KSF.

TYPE No. : Actuator model

SERIAL No.: Serial number

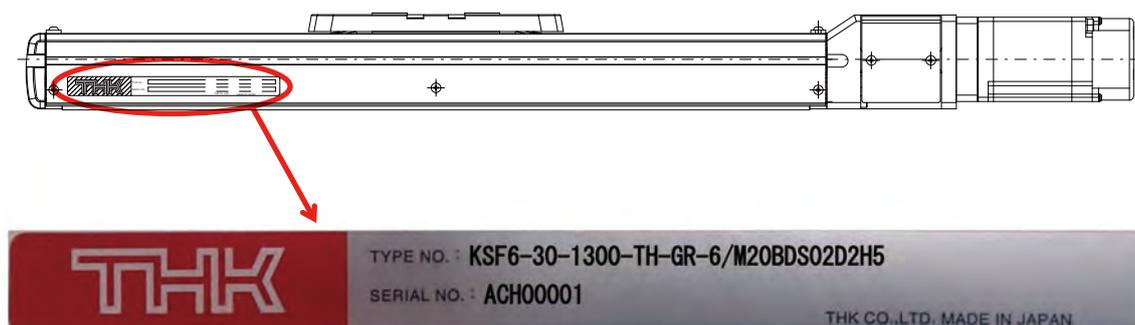


Fig. 4 Nameplate affixing position (full cover specification)

Precautions/instruction labels → Check Precautions/instruction labels on P.2-3/2-4

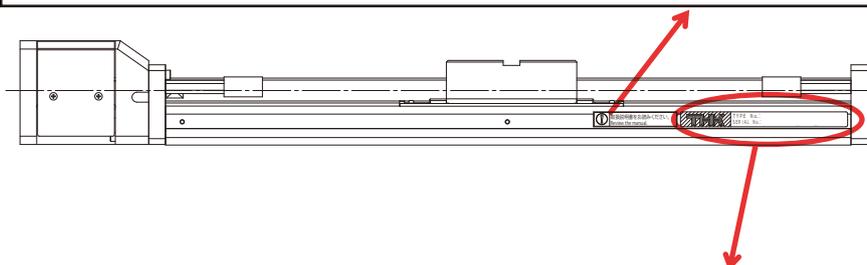


Fig. 5-1 Nameplate standard affixing position (open cover/top cover specification)

Precautions/instruction labels → Check Precautions/instruction labels on P.2-3/2-4

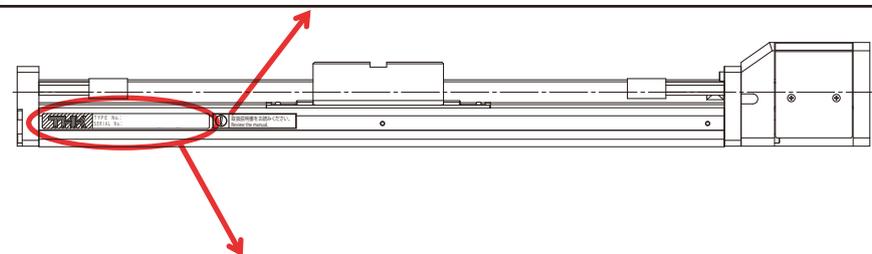
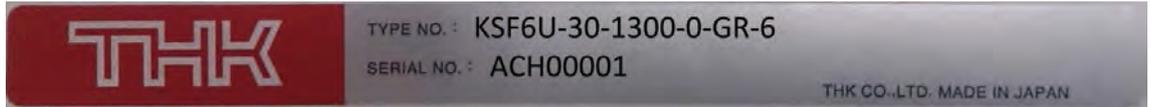
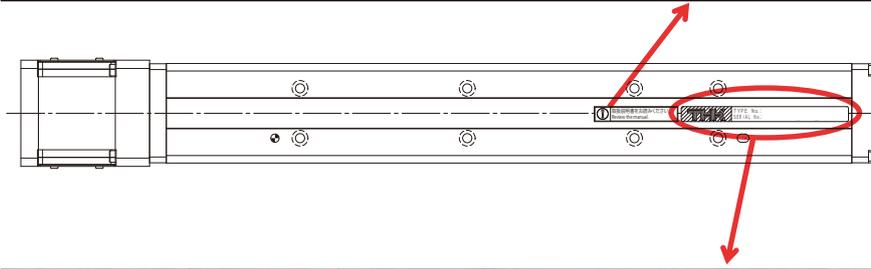


Fig. 5-2 Nameplate affixing position with sensor mounted for opposite reference side (open cover/top cover specification)

3. Nameplates Display

3. Nameplates Display

Precautions/instruction labels → Check Precautions/instruction labels on P.2-3/2-4



**Fig. 5-3 Nameplate affixing position with sensor mounted for both sides
(open cover/top cover specification)**

4. Specifications

4. Specifications

4-1

Basic specification

The basic specification of KSF is shown as follows. Do not exceed the following basic specification when using the product. Otherwise, it may cause fault or damage, or may cause abnormal operation that could lead to injury.

Maximum speed: When the servo driver controller THC is used (without motor specification)

Model	Motor Rated output [W]	Ball screw Lead [mm]	Stroke [mm]	Rated speed ^{*1} [mm/s]	Maximum speed at each stroke ^{*2} [mm/s]																		
					Stroke [mm]																		
					to 550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450
KSF4/KSF4R KSF4U/ KSF4RU	100	10	50 to 900	500	500	440	380	340	300	260	230	210	-	-	-	-	-	-	-	-			
		16		800	800	710	620	540	480	420	380	340	-	-	-	-	-	-	-	-	-		
KSF5/KSF5R KSF5T/KSF5RT KSF5U/KSF5RU	100	10	50 to 900	500	500	440	390	340	310	270	250	-	-	-	-	-	-	-	-	-			
		20		1000	1000	890	780	690	620	550	500	-	-	-	-	-	-	-	-	-	-		
KSF6/KSF6R KSF6T/KSF6RT KSF6U/KSF6RU	200	20	50 to 1300	1000	1000	980	870	770	690	630	570	520	470	430	400	370	340	320	-	-			
		30		1500	1500	1480	1310	1160	1040	940	850	780	710	650	600	550	510	480	-	-	-		
KSF8/KSF8R KSF8T/KSF8RT KSF8U/KSF8RU	400	20	100 to 1500	1000	1000	980	-	800	-	670	-	560	-	480	-	420	-	360	-	320			
		40		2000	2000	1970	-	1610	-	1340	-	1130	-	970	-	840	-	730	-	650	-		
KSF10/KSF10R KSF10T/KSF10RT KSF10U/KSF10RU	750	25	100 to 1500	1250	1250	1250	-	1050	-	890	-	760	-	660	-	580	-	510	-	-			
		50		2500	2500	2500	-	2110	-	1790	-	1530	-	1330	-	1160	-	1030	-	-	-		

*1 The rated speed assumes the rated motor rotational speed (3,000min⁻¹).

*2 The maximum speed is the value restricted by the motor rotational speed (3,000 min⁻¹) or by the permissible rotational speed of the ball screw.

Load capacity: When the servo driver controller THC is used (without motor specification)

Model	Motor Rated output [W]	Ball screw Lead [mm]	Maximum load capacity ^{*3,*4} [kg]					
			Horizontal mount		Wall mount		Vertical mount	
			ACC/DEC rate	[kg]	ACC/DEC rate	[kg]	ACC/DEC rate	[kg]
KSF4/ KSF4R	100	10	0.3G	19	0.3G	10.5	0.3G	8.5
			0.5G	19	0.5G	10.5	0.5G	8.5
		16	0.3G	14	0.3G	8.5	0.3G	7
			0.5G	14	0.5G	8	0.5G	7
KSF5/ KSF5R	100	10	0.3G	26	0.3G	19	0.3G	12.5(11.5)
			0.5G	26	0.5G	19	0.5G	12.5(11.5)
		20	0.5G	7.5	0.5G	7.5	0.5G	6(5)
			1G	7.5	1G	7.5	1G	5.5(4.5)
KSF6/ KSF6R	200	20	0.5G	42(41)	0.5G	20	0.5G	12(10.5)
			1G	27(20.5)	1G	18.5	1.5G	8.5(5.5)
		30	0.5G	20.5(19)	0.5G	18	0.5G	7.5(6.5)
			1G	14(11)	1G	14(11)	1.5G	5.5(4.5)
		20	2G	7.5(5)	2G	7.5(5)	-	-
			-	-	-	-	-	-
KSF8/ KSF8R	400	20	0.5G	83.5(79.5)	0.5G	45	0.5G	23.5(20.5)
			1G	49(38.5)	1G	42(38.5)	1.5G	14.5(9.5)
		40	0.5G	19(18)	0.5G	19(18)	0.5G	10.5(9)
			1G	16.5(13.5)	1G	16.5(13.5)	1.5G	7(5.5)
		20	2G	8.5(6)	2G	8.5(6)	-	-
			-	-	-	-	-	-
KSF10/ KSF10R	750	25	0.5G	118.5(92.5)	0.5G	76	0.5G	33.5(28)
			1.5G	33.5(16.5)	1.5G	33.5(16.5)	1.5G	19(8.5)
		50	0.5G	40(37.5)	0.5G	40(37.5)	0.5G	14.5(12.5)
			1.5G	11(6)	1.5G	11(6)	1.5G	7.5(4)

*3 The maximum load capacity is the value when operating at the rated speed.

*4 Values in parentheses are for motor wrap specification.

4. Specifications

Load capacity: When the servo driver controller THC is used (without motor specification) (continued)

Model	Motor Rated output [W]	Ball screw Lead [mm]	Sub-table material	Maximum load capacity ^{*3*} [kg]					
				Horizontal mount		Wall mount		Vertical mount	
				ACC/DEC rate	[kg]	ACC/DEC rate	[kg]	ACC/DEC rate	[kg]
KSF5T/ KSF5RT	100	10	Aluminum	0.3G	26	0.3G	19	0.3G	12.5(11.5)
				0.5G	26	0.5G	18.5	0.5G	12(11.5)
			Iron	0.3G	26	0.3G	19	0.3G	12.5(11.5)
				0.5G	26	0.5G	18.5	0.5G	12(11.5)
		20	Aluminum	0.5G	7.5	0.5G	7.5	0.5G	6(5)
				1G	7.5	1G	7.5	1G	5.5(4.5)
Iron	0.5G	7.5	0.5G	7.5	0.5G	6(5)			
	1G	7.5	1G	7.5	1G	5.5(4.5)			
KSF6T/ KSF6RT	200	20	Aluminum	0.5G	41.5(41)	0.5G	20	0.5G	12(10.5)
				1G	27(20.5)	1G	18	1.5G	8.5(5.5)
			Iron	0.5G	41.5(41)	0.5G	19.5	0.5G	11.5(10)
				1G	26.5(20)	1G	18	1.5G	8(5)
		30	Aluminum	0.5G	20.5(19)	0.5G	18	0.5G	7.5(6.5)
				1G	14(11)	1G	14(11)	1.5G	5.5(4.5)
			Iron	2G	7.5(5)	2G	7.5(5)	-	-
				0.5G	20(18.5)	0.5G	17.5	0.5G	7(6)
				1G	14(10.5)	1G	14(10.5)	1.5G	5(4)
				2G	7(4.5)	2G	7(4.5)	-	-
KSF8T/ KSF8RT	400	20	Aluminum	0.5G	83(79)	0.5G	42	0.5G	23(20)
				1G	48.5(38)	1G	39(38)	1.5G	14(9)
			Iron	0.5G	82(78)	0.5G	41.5	0.5G	22(19)
				1G	47.5(37)	1G	38.5(37)	1.5G	13(8)
		40	Aluminum	0.5G	18.5(18)	0.5G	18.5(18)	0.5G	10(8.5)
				1G	16.5(13)	1G	16.5(13)	1.5G	6.5(5)
			Iron	2G	8(5.5)	2G	8(5.5)	-	-
				0.5G	17.5(16.5)	0.5G	17.5(16.5)	0.5G	9(7.5)
				1G	15(12)	1G	15(12)	1.5G	5.5(4)
				2G	7(4.5)	2G	7(4.5)	-	-
KSF10T/ KSF10RT	750	25	Iron	0.5G	116(90)	0.5G	71.5	0.5G	31(25.5)
				1.5G	31.5(14)	1.5G	31.5(14)	1.5G	16.5(6)
		50		0.5G	37.5(35)	0.5G	37.5(35)	0.5G	12.5(10)
				1.5G	9(4)	1.5G	9(4)	1.5G	5(2)

Model	Motor Rated output [W]	Ball screw Lead [mm]	Maximum load capacity ^{*3*} [kg]					
			Horizontal mount		Wall mount		Vertical mount	
			ACC/DEC rate	[kg]	ACC/DEC rate	[kg]	ACC/DEC rate	[kg]
KSF4U/ KSF4RU	100	10	0.3G	19	0.3G	11.5	0.3G	9.5
			0.5G	19	0.5G	11.5	0.5G	9.5
		16	0.3G	14.5	0.3G	9	0.3G	7.5(7)
			0.5G	14.5	0.5G	9	0.5G	7.5(7)
KSF5U/ KSF5RU	100	10	0.3G	26	0.3G	21.5	0.3G	13(11.5)
			0.5G	26	0.5G	21	0.5G	13(11.5)
		20	0.5G	8	0.5G	8	0.5G	6(5.5)
			1G	8	1G	8	1G	5.5(5)
KSF6U/ KSF6RU	200	20	0.5G	45.5(41.5)	0.5G	22	0.5G	12(10.5)
			1G	27(20.5)	1G	20.5	1.5G	9(5.5)
		30	0.5G	20.5(19)	0.5G	20(19)	0.5G	7.5(6.5)
			1G	14.5(11)	1G	14.5(11)	1.5G	6(4.5)
KSF8U/ KSF8RU	400	20	0.5G	83.5(79.5)	0.5G	47.5	0.5G	23.5(20.5)
			1G	49(38.5)	1G	44.5(38.5)	1.5G	14.5(9.5)
		40	0.5G	19(18.5)	0.5G	19(18.5)	0.5G	10.5(9)
			1G	17(13.5)	1G	17(13.5)	1.5G	7(5.5)
KSF10U/ KSF10RU	750	25	0.5G	119(93)	0.5G	82.5	0.5G	34(28.5)
			1.5G	34(17)	1.5G	34(17)	1.5G	19.5(9)
		50	0.5G	40.5(38)	0.5G	40.5(38)	0.5G	15(13)
			1.5G	11.5(6.5)	1.5G	11.5(6.5)	1.5G	8(4.5)

*3 The maximum load capacity is the value when operating at the rated speed.

*4 Values in parentheses are for motor wrap specification.

5. Structure and Model Numbers

5. Structure and Model Numbers

5-1 Structure and part names

The name of each part of the KSF full cover specification is shown in Fig. 6.

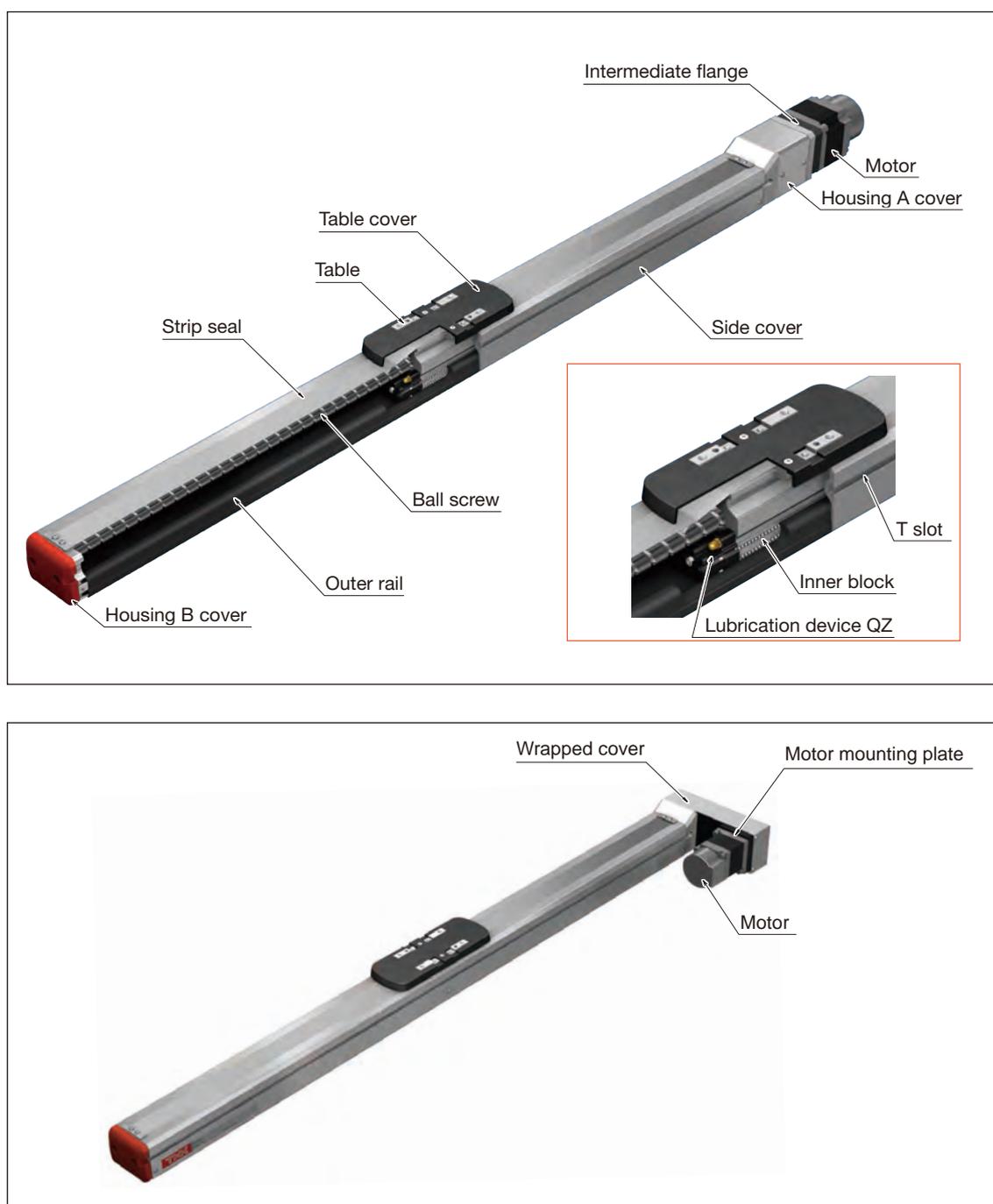


Fig. 6 The structure and part names of KSF full cover

* For details such as the dimensions and accuracy, see the delivery specification drawings or the catalog of Compact Series KSF.

If you have any question, contact THK.

5. Structure and Model Numbers

5. Structure and Model Numbers

The name of each part of the KSF open cover specification is shown in Fig. 7.

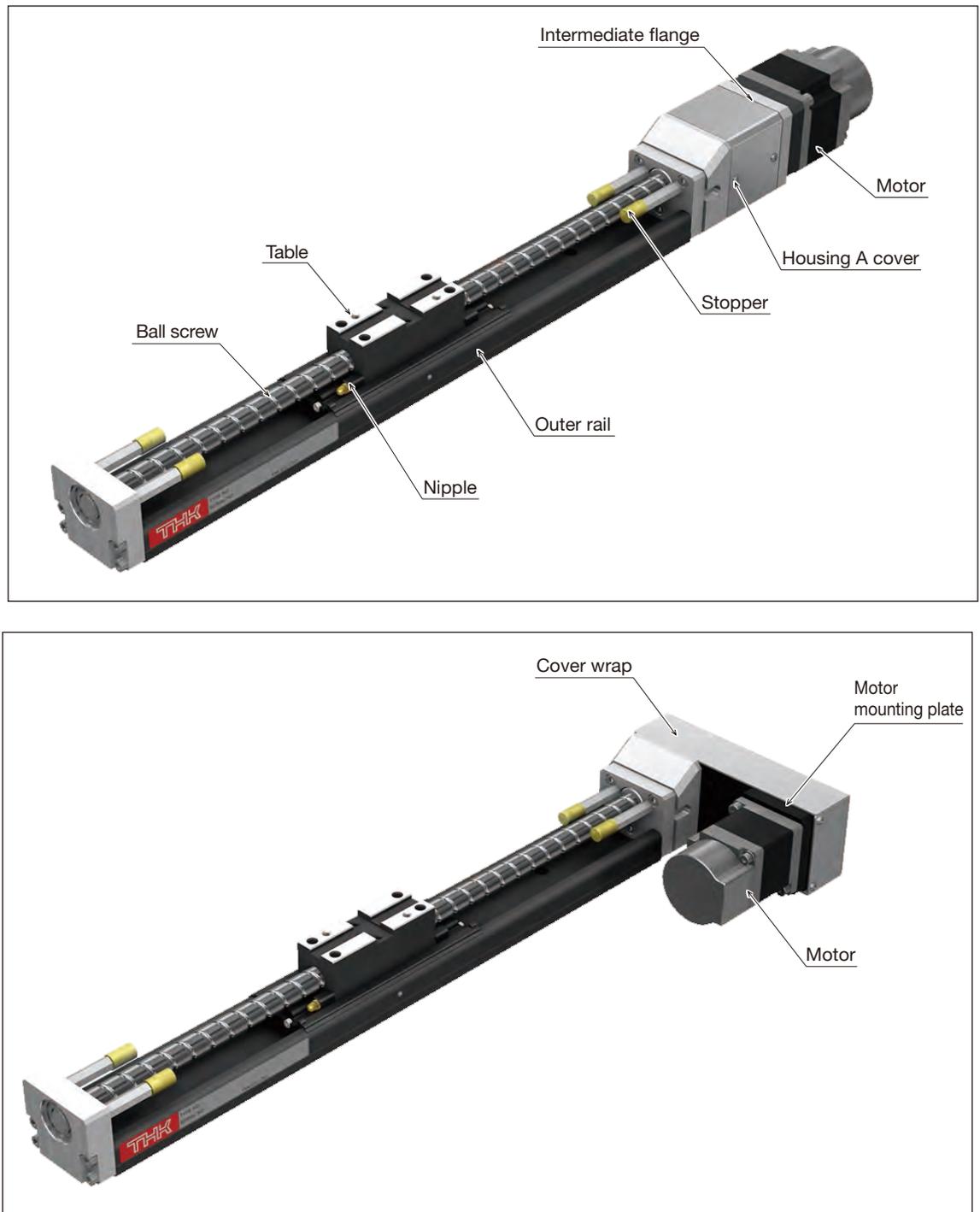


Fig. 7 The structure and part names of KSF open cover

* For details such as the dimensions and accuracy, see the delivery specification drawings or the catalog of Compact Series KSF.

If you have any question, contact THK.

5. Structure and Model Numbers

5. Structure and Model Numbers

The name of each part of the KSF top cover specification is shown in Fig. 8.

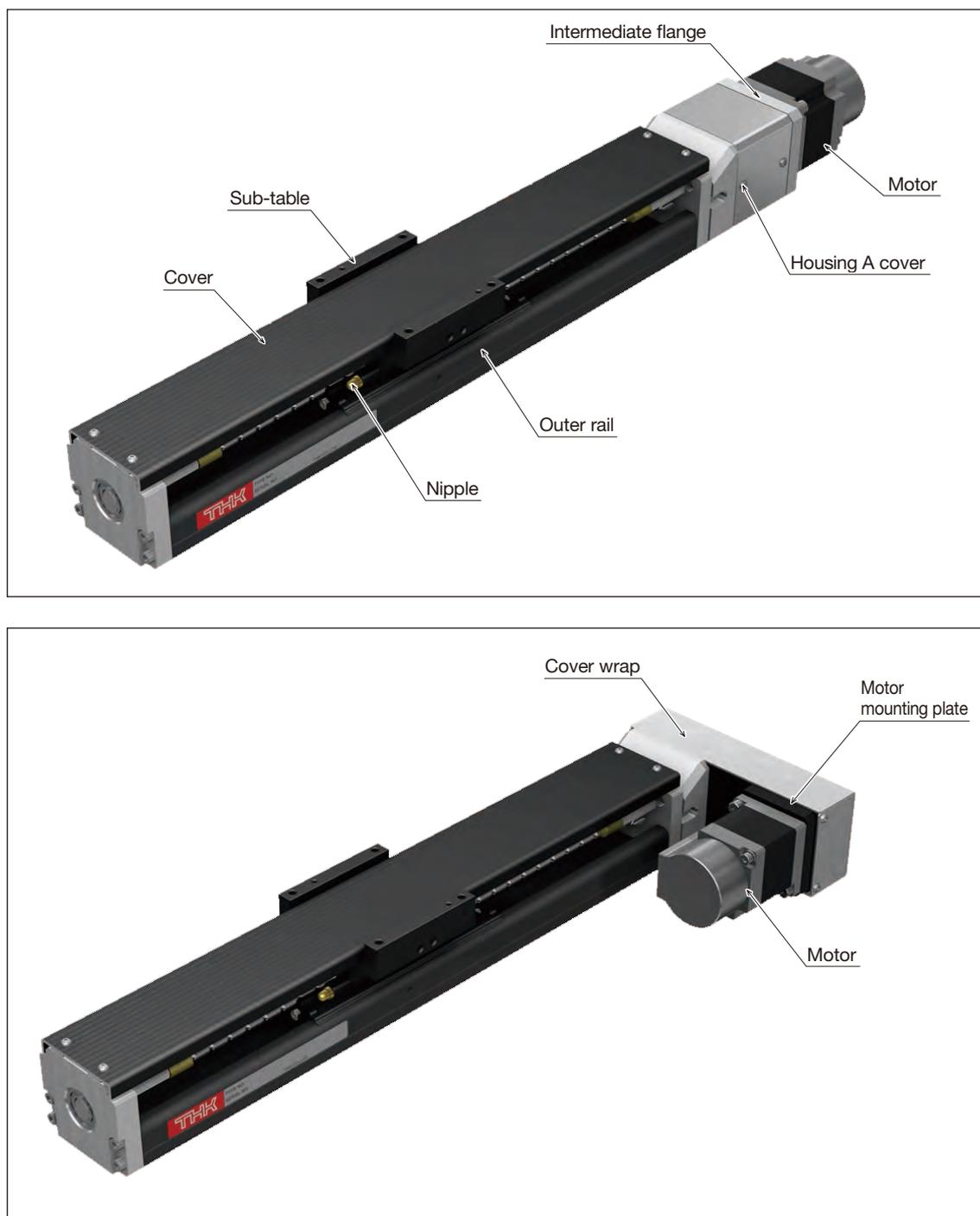


Fig. 8 The structure and part names of KSF top cover

* For details such as the dimensions and accuracy, see the delivery specification drawings or the catalog of Compact Series KSF.

If you have any question, contact THK.

5. Structure and Model Numbers

5-2

Model configuration

The following is an example of model number coding.

■ KSF (without motor)

In the case of actuator main unit only or when the motor specified by the customer is installed

<Model configuration> Without motor type

KSF4R-10-0150-0-WQ-08 D-MR-GR

(1) (2) (3) (4) (5) (6) (7) (8)

(1) Model number	KSF4, KSF5, KSF6, KSF8, KSF10 (direct motor coupled) KSF4U, KSF5U, KSF6U, KSF8U, KSF10U (direct motor coupled) KSF5T, KSF6T, KSF8T, KSF10T (direct motor coupled) KSF4R, KSF5R, KSF6R, KSF8R, KSF10R (wrapped motor) KSF4RU, KSF5RU, KSF6RU, KSF8RU, KSF10RU (wrapped motor) KSF5RT, KSF6RT, KSF8RT, KSF10RT (wrapped motor)
(2) Ball screw lead	10: (KSF4, KSF4U, KSF4R, KSF4RU, KSF5, KSF5U, KSF5T, KSF5R, KSF5RU, KSF5T) 16: (KSF4, KSF4U, KSF4R, KSF4RU) 20: (KSF5, KSF5U, KSF5T, KSF5R, KSF5RU, KSF5RT, KSF6, KSF6U, KSF6T, KSF6R, KSF6RU, KSF6RT, KSF8, KSF8U, KSF8T, KSF8R, KSF8RU, KSF8RT) 25: (KSF10, KSF10U, KSF10T, KSF10R, KSF10RU, KSF10T) 30: (KSF6, KSF6U, KSF6T, KSF6R, KSF6RU, KSF6RT) 40: (KSF8, KSF8U, KSF8T, KSF8R, KSF8RU, KSF8RT) 50: (KSF10, KSF10U, KSF10T, KSF10R, KSF10RU, KSF10RT)
(3) Stroke	0150: 150mm (50 to 1500 mm) Maximum stroke = KSF4: 900 mm (50 mm pitch), KSF5: 900 mm (50 mm pitch), KSF6: 1300 mm (50 mm pitch), KSF8: 1500 mm (100 mm pitch), KSF10: 1500 mm (100 mm pitch)
(4) With/without motor	0: Without motor When selecting "0", a coupling is not provided. 1: With motor When selecting "1", the motor you specify will be installed.
(5) Intermediate flange / motor mounting place	A0: No intermediate flange AQ AV AP AY AR AU AZ A5 A6 WQ WV WY WZ W5
(6) Motor shaft diameter	No symbol : To be selected when directly coupled 08 : 8 mm 11 : 11 mm 14 : 14 mm 16 : 16 mm 19 : 19 mm
(7) Method of fixing motor shaft	No symbol : To be selected when directly coupled D : Flat side K : key M : Friction tightening
(8) Option	No symbol : None MR : Motor right wrap ML : Motor left wrap MD : Motor down-turn return T : Power tap GR : Gray 6 : Photo sensor J : Proximity sensor M : Proximity sensor (PNP)

5. Structure and Model Numbers

■ KSF (type with motor)

When combining with dedicated controller

<Model configuration> Specification of TLC/THC with motor

KSF4 - 10 - 0150 - TH - GR-6/M10 L S02 D1 H3

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10)

(1) Model number	KSF4, KSF5, KSF6, KSF8, KSF10 (direct motor coupled) KSF4U, KSF5U, KSF6U, KSF8U, KSF10U (direct motor coupled) KSF5T, KSF6T, KSF8T, KSF10T (direct motor coupled) KSF4R, KSF5R, KSF6R, KSF8R, KSF10R (wrapped motor) KSF4RU, KSF5RU, KSF6RU, KSF8RU, KSF10RU (wrapped motor) KSF5RT, KSF6RT, KSF8RT, KSF10RT (wrapped motor)
(2) Ball screw lead	10: (KSF4, KSF4U, KSF4R, KSF4RU, KSF5, KSF5U, KSF5T, KSF5R, KSF5RU, KSF5T) 16: (KSF4, KSF4U, KSF4R, KSF4RU) 20: (KSF5, KSF5U, KSF5T, KSF5R, KSF5RU, KSF5RT, KSF6, KSF6U, KSF6T, KSF6R, KSF6RU, KSF6RT, KSF8, KSF8U, KSF8T, KSF8R, KSF8RU, KSF8RT) 25: (KSF10, KSF10U, KSF10T, KSF10R, KSF10RU, KSF10T) 30: (KSF6, KSF6U, KSF6T, KSF6R, KSF6RU, KSF6RT) 40: (KSF8, KSF8U, KSF8T, KSF8R, KSF8RU, KSF8RT) 50: (KSF10, KSF10U, KSF10T, KSF10R, KSF10RU, KSF10RT)
(3) Stroke	0150: 150mm (50 to 1500 mm) Maximum stroke = KSF4: 900 mm (50 mm pitch), KSF5: 900 mm (50 mm pitch), KSF6: 1300 mm (50 mm pitch), KSF8: 1500 mm (100 mm pitch), KSF10: 1500 mm (100 mm pitch)
(4) Control device	TH : Driver controller THC Separate order for the control device is required.
(5) Option	No symbol : None MR : Motor right wrap ML : Motor left wrap MD : Motor down wrap T : Power tap GR : Gray 6 : Photo sensor J : Proximity sensor
(6) Motor rated output	M10 : 100 W M10B : 100W with brake M20 : 200 W M20B : 200W with brake M40 : 400 W M40B : 400W with brake M75 : 750 W M75B : 750W with brake
(7) Motor cable direction	R : Right U : Up L : Left D : Down
(8) Origin	D00 : Motor side R00 : Reverse motor side S02 : Motor side (sensor right side) S03 : Reverse motor side (sensor right side) S20 : Motor side (sensor left side) S30 : Reverse motor side (sensor left side)
(9) Power supply voltage	D1 : 100 V D2 : 200 V
(10) Cable length	No symbol : None F3 : 3 m standard F5 : 5 m standard FA : 10 m standard H3 : 3 m high flex H5 : 5 m high flex HA : 10 m high flex Indicates the type and length of attached cables.

6. Storage and Transportation

6-1

Precautions to be observed for safe use

Caution



- **Do not drop or hit this product.**

Otherwise, it may cause injury or fracture, or a functional loss.

- **When transporting this product, do not hold any moving part or the cover.**

Otherwise, it may cause the product to fall, leading to injury, or cause fault or fracture.



- **Do not grasp the strip seal of this product. (Full cover specification)**

It may injure you.

Some parts of the strip seal may be sharp. Take care not to cut your hands or fingers.

Also, the strip seal must be replaced when it is scratched, pitted or dented.

Use of the strip seal in this state may cause early breakage or other damages.

- **When transporting this product, do not hold the motor, the sensor or the cable.**

Otherwise, it may cause the product to fall, leading to injury, or cause fault or fracture.

- **When hoisting this product, use the base, and avoid applying load to any other parts (table, sub-table, top cover, side cover, strip seal, housing B cover, motor, etc.).**



- **When carrying this product, hold the bottom face of the product. KSF8 and KSF10 are heavy articles (20 kg or heavier). Two or more people should hold the product as necessary.**

* For more information on the weight of the product, see the catalog of the Compact Series KSF.

6. Storage and Transportation

6-2

Precautions to be observed for prevention of product fault or fracture



- **Since using an adverse storage environment may cause fault, store the product in the environment described below:**

- Place where the ambient temperature range is 0 to 40°C indoors (no freezing)
- Place where the ambient humidity range is 20% to 80% RH indoors (no condensation)
- Place where the product is not exposed to water
- Place where no flammable substance exists in the vicinity
- Place where a vibration or shock does not transmit to the product
- Place where liquid containing impurities such as conductive iron dust, powder such as solid abrasive, dust, oil mist, cutting oil, water content, salt content, organic solvent, or corrosive/flammable gas is not generated or does not float
- Place where no direct sunlight nor radiation heat reaches
- Place where no strong electric field nor strong magnetic field develops
- Place where inspections and cleanings can be easily performed

- **This product is provided with antirust treatment and sealed before being packed. When storing the product, enclose it in a package designated by THK and store it in a horizontal orientation while avoiding high temperature, low temperature and high humidity.**



- **Do not apply an excessive load on the package, otherwise, it may cause fault or fracture.**

7. Installation and Operation

7-1

Precautions to be observed for safe use

Warning



- **If any moving part may fall by its own weight in vertical application or the like, provide a safeguard for preventing the part from falling.**

If any moving part falls, it may cause injury or damage.



- **While this product is operating, do not touch any moving part or rotating part.**

Otherwise, it may cause your hand to be caught and injured.

Caution



- **Firmly secure this product before operating it.**

Failure to do so may cause abnormal operation that could cause injury, fault or fracture.

- **If anomaly occurs, immediately stop the machine.**

Failure to do so may cause abnormal operation that could cause injury, fault or fracture.

- **Do not grasp the strip seal of this product. (Full cover specification)**

It may injure you.

Some parts of the strip seal may be sharp. Take care not to cut your hands or fingers.



- **Do not exceed the permissible rotation speed when using the product.**

Otherwise, it may cause fault or damage, or cause abnormal operation that could lead to injury.

- **Do not use the failed and broken product.**

Otherwise, it may cause injury or machine failure.

7. Installation and Operation

7. Installation and Operation

7-2

Precautions to be observed for prevention of product fault or fracture



- **Since using an adverse service environment may cause fault, use the product in the environment described below.**
 - Place where the ambient temperature range is 0 to 40°C indoors (no freezing)
 - Place where the ambient humidity range is 20% to 80% RH indoors (no condensation)
 - Place where the product is not exposed to water
 - Place where no flammable substance exists in the vicinity
 - Place where a vibration or shock does not transmit to the product
 - Place where liquid containing impurities such as conductive iron dust, powder such as solid abrasive, dust, oil mist, cutting oil, water content, salt content, organic solvent, or corrosive/flammable gas is not generated or does not float
 - Place where no direct sunlight nor radiation heat reaches
 - Place where no strong electric field nor strong magnetic field develops
 - Place where inspections and cleanings can be easily performed
- **For the full cover specification, a magnet is used for adhering the strip seal. Do not use in environments where large quantities of iron powder or other magnetic substances are contained in the atmosphere. If using in such an environment, cover the actuator so that iron powder does not get inside.**
- **Certain types of coolants may cause trouble to the function of the product. If using the product in an environment where the coolant may enter into the product, contact THK.**
- **Prevent foreign materials such as dust or metallic powder from entering into the product since it may cause abnormal wear or shorten the service life.**

If foreign material enter the product, take a dustproof measure that matches the service atmosphere.
- **The mounting surface for this product must be a machined plane or have the accuracy equivalent to the machined plane. If the surface is insufficiently accurate, it may adversely affect the performance or the service life. In addition, be sure to mount the product on a sufficiently rigid base.**
- **When installing the product, provide a space sufficient to perform the maintenance.**
- **Use the product within the stroke range.**
- **Be careful not to let the parts to be mounted on the table of this product interfere with any other parts near the stroke end.**
- **Check that there is no tool or bolt in the product before operating it.**



- **The stoppers attached to both stroke ends are not for positioning. Do not use them for positioning.**
- **For the full cover specification, the T slot on the side cover is provided for the sensor installation only. Do not use this in any other purpose.**



- **Do not let the table collide with the stopper.**

Collision may cause fault or fracture.



- **The standard models contain the following grease.**

THK AFF grease

7. Installation and Operation



- **The photomicro sensors do not have the water-proof or dust-proof structure. Do not use it in a place where much dust or oil mist is present, or where water, oil or chemical directly or indirectly flies. For other detail information, see the catalog issued by the sensor manufacturer.**

* Sensor

· EE-SX674: OMRON Corp.

- **Do not apply external force on the strip seal. (Full cover specification)**

Otherwise, the strip seal might become scratched, pitted or dented. Use of the strip seal in this state may cause early breakage or other damages. The strip seal must be replaced when it is scratched or dented.

- **Do not drop objects on the strip seal, or scratch, pit or dent it. (Full cover specification)**

The strip seal must be replaced when it is scratched, pitted or dented as a result of a tool or other object falling on it.

Use of the strip seal in this state may cause early breakage or other damages.

Also, if there is the risk of tools or other items falling onto the main unit during work, cover the top surface of the main unit (strip seal section) with shock absorber (e.g. thickish (3mm or thicker) natural rubber or PVC resin). This will make it harder for the strip seal to be damaged by falling objects.

During work, take sufficient care not to damage the strip seal or other parts.

- **Check the strip seal for dirt or adhesion of foreign material. (Full cover specification)**

Adhesives, paints or other viscous items or solids sticking to the strip seal or other parts might cause the slider to malfunction or damage the strip seal. If it becomes dirty, wipe off the dirt using a clean waste cloth soaked with alcohol-based detergent.

7-3

Other precautions

- **If you use proximity sensors close to each other, they may interfere with each other. To avoid such mutual interference, consider taking an appropriate measure such as keeping a sufficient distance between the sensors and using sensors of different frequencies.**

For details, see the catalog issued by the sensor manufacturer.

- **If a stainless steel sensor dog is used when a proximity sensor is used, note that the detection distance is shorter than that of an iron dog.**

For details, see the catalog issued by the sensor manufacturer.

* Sensor

· GX-F12A, GX-F12B: Panasonic Industrial Devices SUNX Co., Ltd.

- **For selection and handling of a motor, see the respective catalog and instruction manual issued by the motor manufacturer.**

For data required to select a motor, see the appendix for your reference.

- **For selection, handling and mounting of a coupling, see the respective catalog issued by the coupling manufacturer.**

Check necessary data such as permissible torque, eccentricity, deflection angle and tightening torque of the assembly bolt.

7. Installation and Operation

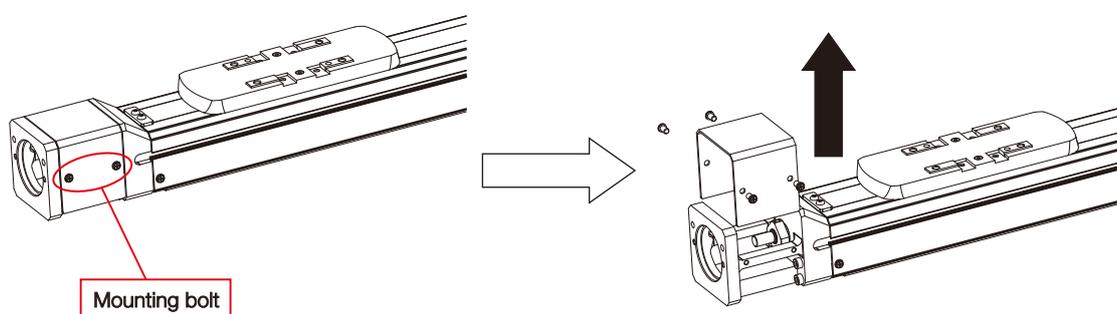
7-4 Motor mounting method

We have an intermediate flange to mount various motors in KSF.

[Direct motor coupled type] (Common for full cover, open cover and top cover specifications)

Below is the mounting method when using a servo motor made by Tamagawa Seiki Co., Ltd. and a coupling made by Miki Pulley Co., Ltd.

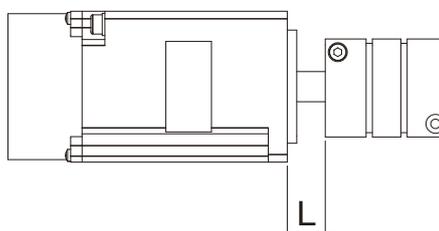
1. Remove the bolt and remove the housing A cover toward the direction of arrow.



Model	Bolt size, pcs
KSF4	M2.6 × 5L 4 pcs
KSF5	M2.6 × 5L 4 pcs
KSF6	M2.6 × 5L 4 pcs
KSF8	M2.6 × 5L 4 pcs
KSF10	M2.6 × 5L 4 pcs

Bolt type: cross recessed head screw for precision devices (No. 0 pan-head screw Type 3)

2. Tighten the coupling onto the motor shaft.



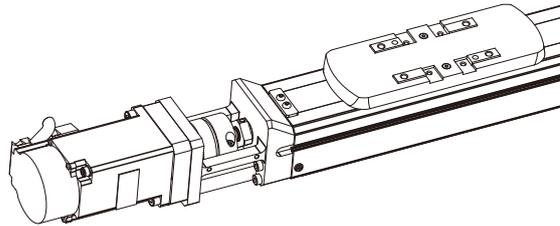
Model	Motor models (Tamagawa Seiki Co., Ltd.)	Coupling models (Miki Pulley Co., Ltd.)	L dimensions [mm]	Clamping bolt size	Tightening torque [N·cm]
KSF4	TS4603	SFC-020DA2-6B-8B	15	M2.5	100 to 110
KSF5	TS4603	SFC-020DA2-8B-8B	14.7	M2.5	100 to 110
KSF6	TS4607	SFC-030DA2-9B-14B	17.5	M3	150 to 190
KSF8	TS4609	SFC-030DA2-12B-14B	17.7	M3	150 to 190
KSF10	TS4614	SFC-040DA2-15B-19B	17	M4	340 to 410

Bolt type: Hexagonal-socket-head type bolt

7. Installation and Operation

7. Installation and Operation

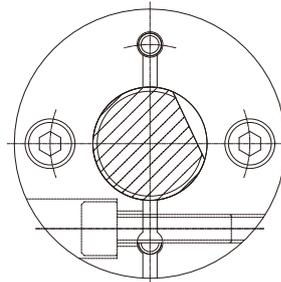
3. Mount the motor.



Model	Bolt size, pcs	Tightening torque [N·cm]
KSF4	M4 x 10L 2 pcs / flat washer / small washer 4	266
KSF5	M4 x 10L 2 pcs / flat washer / small washer 4	266
KSF6	M5 x 12L 4 pcs / flat washer / small washer 5	474
KSF8	M5 x 12L 4 pcs / flat washer / small washer 5	474
KSF10	M6 x 18L 4 pcs / flat washer / small washer 6	763

4. Tighten the coupling to the ball screw shaft. Take note of the position of the flat face of the ball screw end when securing the coupling.

The flat face should be positioned as per the figure below.



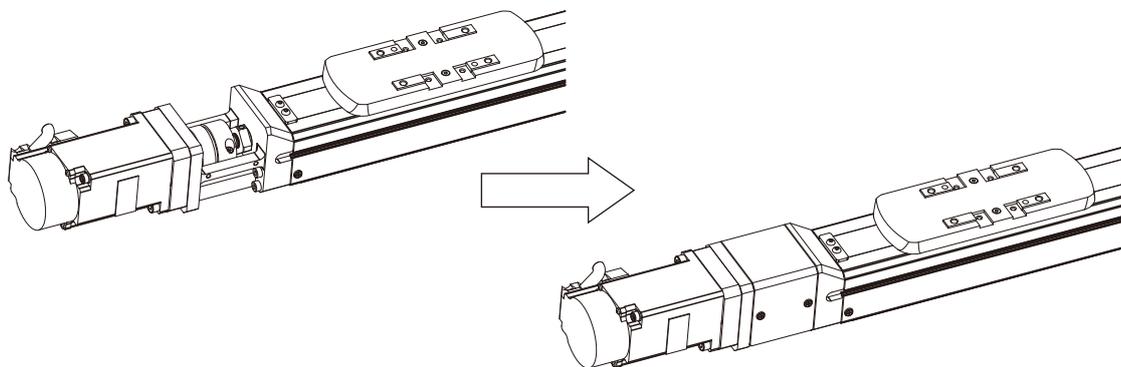
Model	Motor models (Tamagawa Seiki Co., Ltd.)	Coupling models (Miki Pulley Co., Ltd.)	Clamping bolt size	Tightening torque [N·cm]
KSF4	TS4603	SFC-020DA2-6B-8B	M2.5	100 to 110
KSF5	TS4603	SFC-020DA2-8B-8B	M2.5	100 to 110
KSF6	TS4607	SFC-030DA2-9B-14B	M3	150 to 190
KSF8	TS4609	SFC-030DA2-12B-14B	M3	150 to 190
KSF10	TS4614	SFC-040DA2-15B-19B	M4	340 to 410

Bolt type: Hexagonal-socket-head type bolt

7. Installation and Operation

7. Installation and Operation

5. Mount the housing A cover.

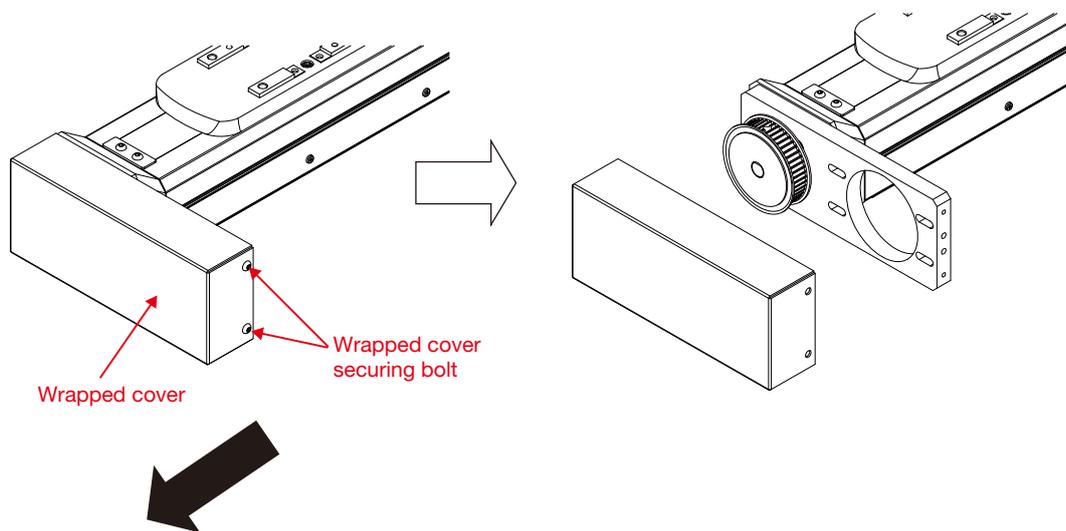


Model	Bolt size, pcs	Tightening torque [N·cm]
KSF4	M2.6 × 5L 4 pcs	30
KSF5	M2.6 × 5L 4 pcs	30
KSF6	M2.6 × 5L 4 pcs	30
KSF8	M2.6 × 5L 4 pcs	30
KSF10	M2.6 × 5L 4 pcs	30

Bolt type: cross recessed head screw for precision devices (No. 0 pan-head screw Type 3)

[Wrap type] (Common for full cover, open cover and top cover specifications)

1. Remove the bolts for securing the wrapped cover and pull off in the ← direction.



Model	Bolt size, pcs
KSF4R	M3 × 6L 4 pcs
KSF5R	M3 × 6L 4 pcs
KSF6R	M3 × 6L 4 pcs
KSF8R	M3 × 6L 4 pcs
KSF10R	M3 × 6L 4 pcs

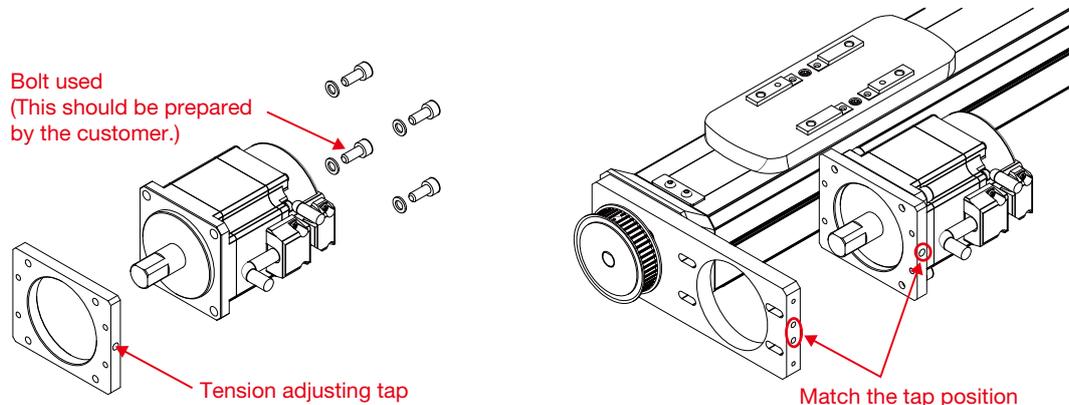
Bolt type: Hexagonal-socket-head type button bolt

7. Installation and Operation

2. Mount the servo motor to the motor mounting plate.

Check that the mounting bolt is not sticking out from the motor mounting plate.

Note the direction of the motor mounting plate when mounting the motor as there is a tension adjusting tap.



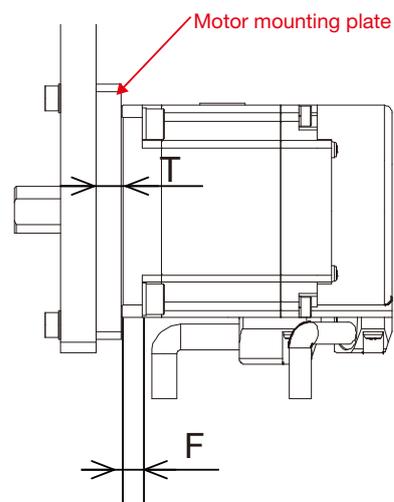
$$F + 1D \leq \text{Bolt Length} < T + F$$

T: Motor mounting plate length
(See table below)

F: Motor flange length
(Check for each motor mounted)

D: Screw nominal diameter

Model	Motor mounting plate thickness T [mm]
KSF4R	5
KSF5R	5
KSF6R	7
KSF8R	7
KSF10R	8

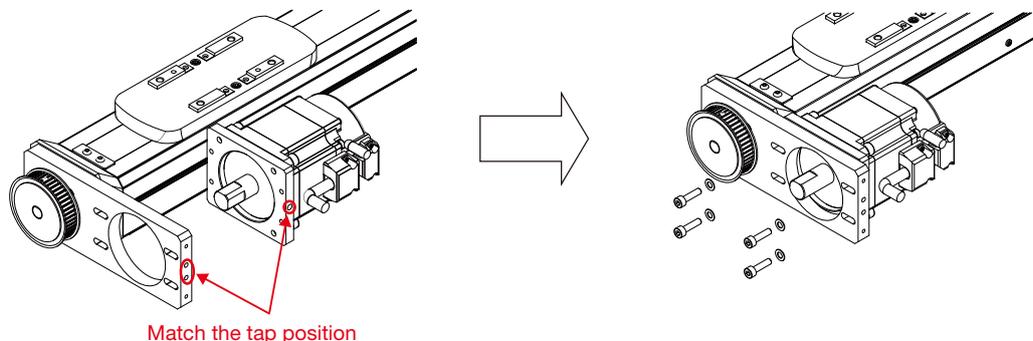


7. Installation and Operation

3. Temporarily fasten the motor mounting plate to a motor bracket.

Check that the mounting bolt is not sticking out from the motor mounting plate.

Note the direction of the motor mounting plate when mounting the motor as there is a tension adjusting tap.

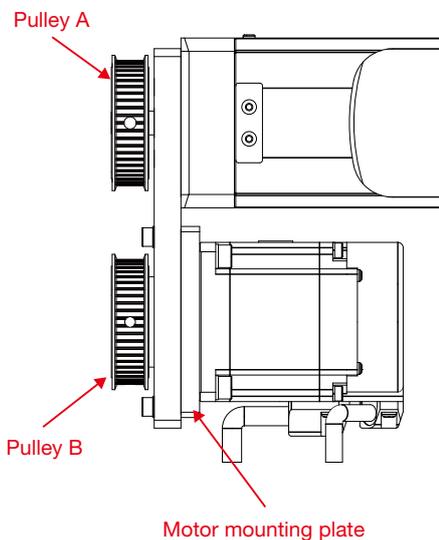


Model	Bolt size, pcs
KSF4R	M3 × 12L 4 pcs / flat washer / small washer 3
KSF5R	M3 × 12L 4 pcs / flat washer / small washer 3
KSF6R	M4 × 16L 4 pcs / flat washer / small washer 4
KSF8R	M4 × 16L 4 pcs / flat washer / small washer 4
KSF10R	M4 × 22L 4 pcs / flat washer / small washer 4

Bolt type: Hexagonal-socket-head type bolt

4. Mount the pulley to the motor.

Adjust the position of pulley B to the L dimension to mount pulley B.



Adjust the position of pulley B such that the ends of pulley A and pulley B are the same.

The following dimensions can be used as a guide for the ends of pulley B from the motor mounting surface.

Pulley B mounting position	
Model	L dimensions
KSF4R	(2)
KSF5R	(2)
KSF6R	(2)
KSF8R	(2)
KSF10R	(3)

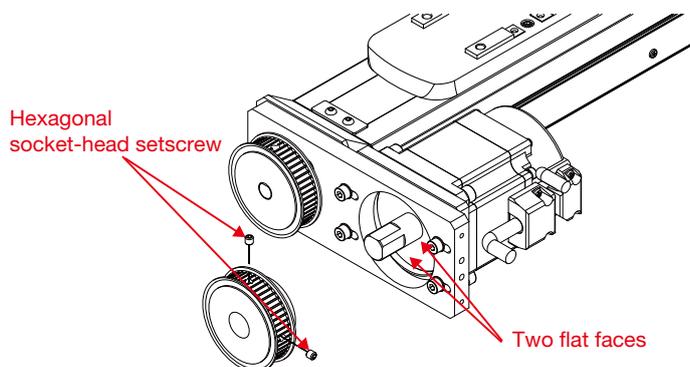
7. Installation and Operation

7. Installation and Operation

- For method symbol D of fixing motor shaft

Take care to align the position of the flat face of the motor shaft with the hex-socket set screw such that the point of contact of the two objects is as close to perpendicular as possible.

When fastening to a shaft with two flat surfaces, fasten the hexagonal socket-head set screws alternately a little at a time.

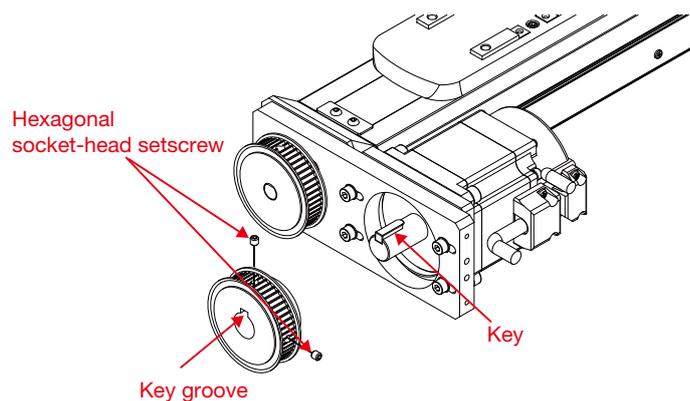


Model	Hexagonal socket-head setscrew	Tightening torque [N·cm]
KSF4R	M4 × 4L 2 pcs	133
KSF5R	M4 × 4L 2 pcs	133

- For method symbol K of fixing motor shaft

Be sure to align the key portion of the pulley with the key way of the motor shaft.

When fastening to a shaft with key, fasten the hexagonal socket-head setscrews alternately a little at a time.



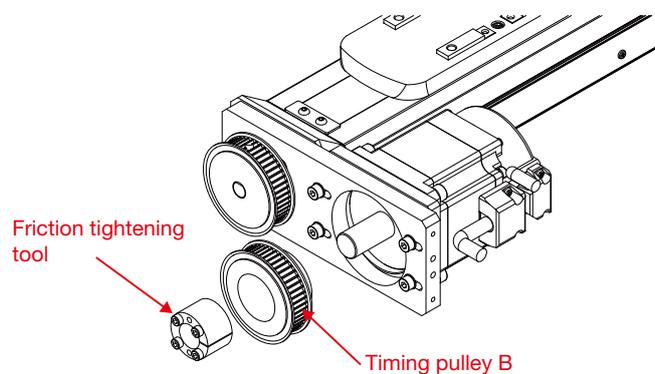
Model	Hexagonal socket-head setscrew	Tightening torque [N·cm]
KSF4R	M4 × 4L 2 pcs	133
KSF5R	M4 × 4L 2 pcs	133

7. Installation and Operation

7. Installation and Operation

- For method symbol M of fixing motor shaft

Mount the timing pulley and friction tightening tool that come with the product.

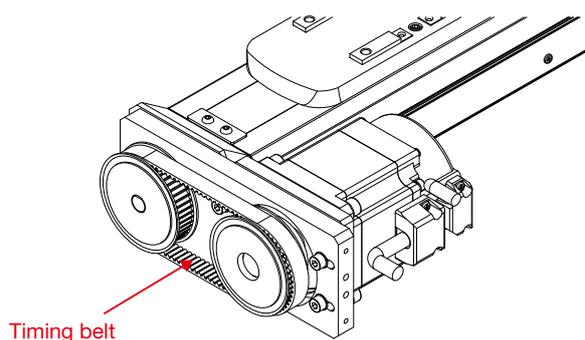


Friction tightening tool			
Model	Motor shaft diameter	Bolt size, pcs	Tightening torque [N·cm]
KSF6R	φ11	M2.5 × 12L 4 pcs	100
	φ14	M3 × 16L 4 pcs	200
KSF8R	φ14	M3 × 16L 4 pcs	200
KSF10R	φ16	M4 × 16L 4 pcs	400
	φ19	M4 × 20L 4 pcs	400

Bolt type: Hexagonal-socket-head type bolt

Retighten the mounting bolts evenly in diagonal order. And then, tighten all the bolts evenly using a torque wrench according to the recommended tightening torque until it comes to a stop. Do not use any bolts other than the ones attached to the friction tightening tool unit.

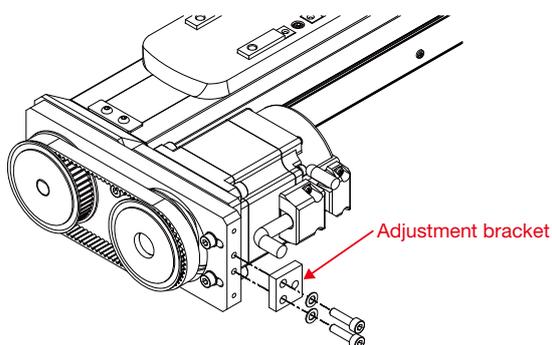
5. Set the belt to the pulley.



7. Installation and Operation

7. Installation and Operation

6. Use the 2 locations on the tap of the motor bracket side surface to mount the adjustment bracket.



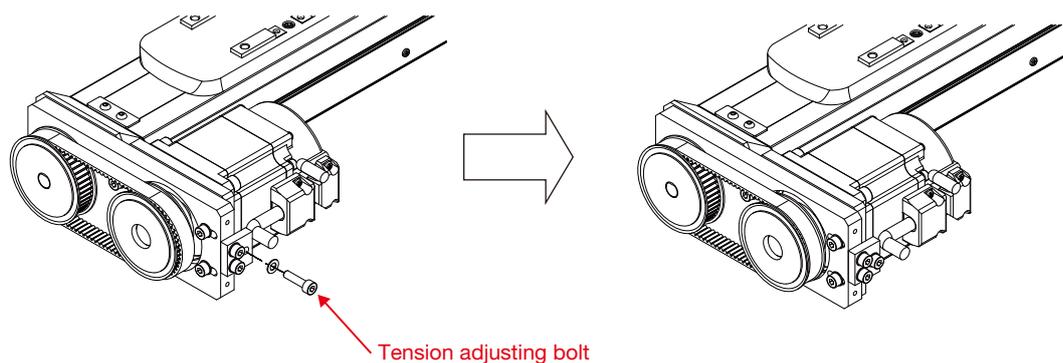
Model	Bolt size, pcs	Tightening torque [N·cm]
KSF4R	M3 × 10L 2 pcs / flat washer / small washer 3	244
KSF5R	M3 × 10L 2 pcs / flat washer / small washer 3	244
KSF6R	M4 × 12L 2 pcs / flat washer / small washer 4	559
KSF8R	M4 × 12L 2 pcs / flat washer / small washer 4	559
KSF10R	M4 × 12L 2 pcs / flat washer / small washer 4	559

Bolt type: Hexagonal-socket-head type bolt

* The adjustment bracket and bolts are attached articles.

7. Mount a tension adjusting bolt to the adjustment bracket.

Use a tension adjusting bolt to adjust the tension of the timing belt.



Model	Bolt size
KSF4R	M3 × 18L/ flat washer / small washer 3
KSF5R	M3 × 18L/ flat washer / small washer 3
KSF6R	M4 × 16L/ flat washer / small washer 4
KSF8R	M4 × 16L/ flat washer / small washer 4
KSF10R	M4 × 22L/ flat washer / small washer 4

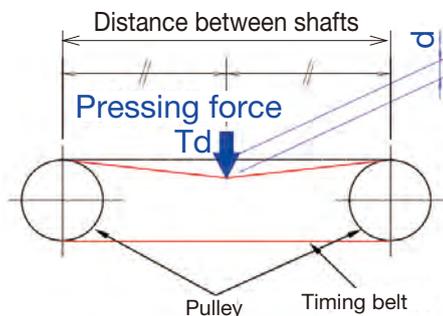
Bolt type: Hexagonal-socket-head type bolt

7. Installation and Operation

7. Installation and Operation

(1) Simple measurement method

Mount the motor so that the deflection of the belt is d by pressing the center of the belt by pressing force T_d .

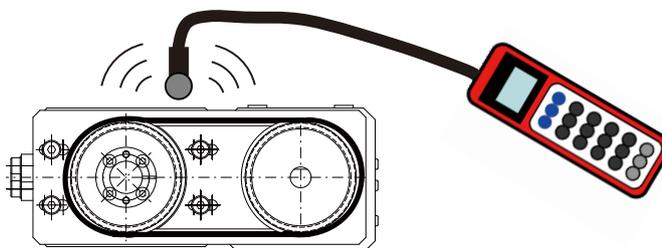


Model	Pressing force T_d [N]	Deflection d [mm]	Distance between shafts [mm]
KSF4R	1.6 to 2.2	0.9	(60)
KSF5R	1.6 to 2.2	0.9	(60)
KSF6R	2.5 to 3.3	1.2	(75)
KSF8R	3.3 to 4.5	1.6	(103.5)
KSF10R	6.0 to 8.1	1.9	(120)

(2) How to use a sonic belt tensimeter

Use a belt tensimeter for the measurement. Flip the belt at the measurement position by your finger and the like, measure the frequency (of vibration), and check that the tension is correct.

Note) For how to use the belt tensimeter, see the instruction manual of each manufacturer.



Model	Initial tension [N]	Unit weight [g/(mm width x m length)]	Span length (Distance between shafts) [mm]	Belt width (mm)
KSF4R	24.7 to 33.4	2.5	(60)	6
KSF5R	24.7 to 33.4	2.5	(60)	6
KSF6R	37.4 to 50.6	2.5	(75)	9
KSF8R	50.2 to 67.9	2.5	(103.5)	12
KSF10R	83.3 to 112.7	4.0	(120)	12

Reference: Belt types used by types with angled wrap standard specifications

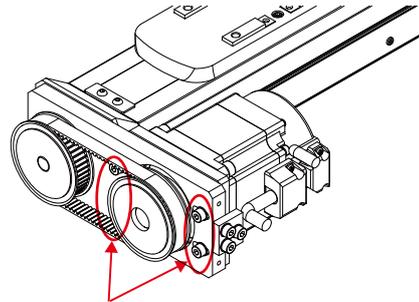
Model	Belt type (Gates Unitta Asia Company)
KSF4R	204-3GT-6
KSF5R	204-3GT-6
KSF6R	300-3GT-9
KSF8R	357-3GT-12
KSF10R	440-EV5GT-12

7. Installation and Operation

8. After adjusting the tension, conduct final tightening of the bolts for securing the motor mounting plate.

Check the tension after final tightening and verify that the initial tension of the belt is within the specified range.

Readjust the tension if outside of the correct range.

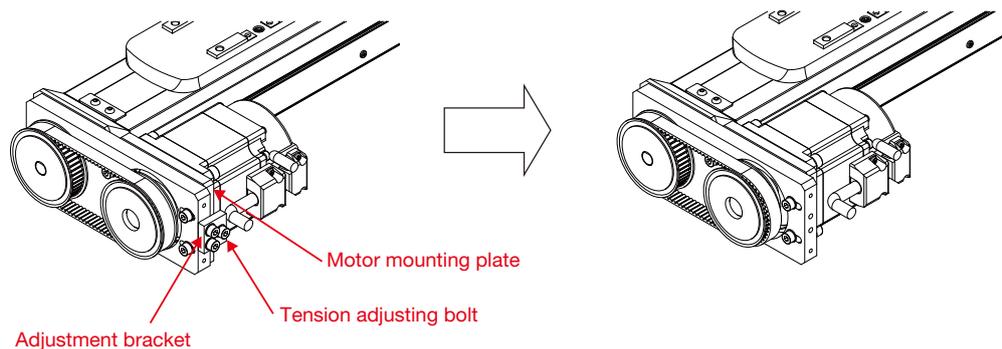


Bolts for securing motor mounting plate

Model	Bolt size, pcs	Tightening torque [N·cm]
KSF4R	M3 × 12L 4 pcs / flat washer / small washer 3	177
KSF5R	M3 × 12L 4 pcs / flat washer / small washer 3	177
KSF6R	M4 × 16L 4 pcs / flat washer / small washer 4	342
KSF8R	M4 × 16L 4 pcs / flat washer / small washer 4	342
KSF10R	M5 × 20L 4 pcs / flat washer / small washer 5	711

Bolt type: Hexagonal-socket-head type bolt

9. Remove the adjustment bracket after removing the tension adjusting bolt from the motor mounting plate.



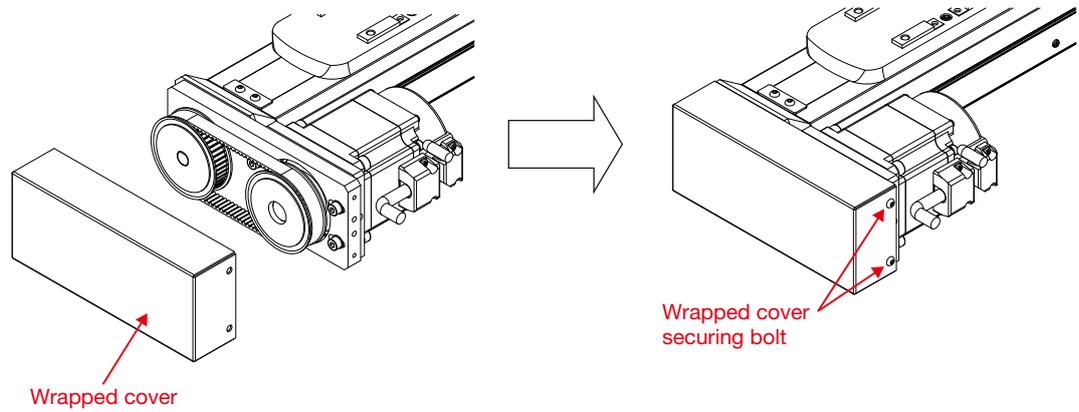
Model	Adjustment bracket securing bolts	Tension adjusting bolt
	Bolt size, pcs	Bolt size, pcs
KSF4R	M3 × 10L 2 pcs / flat washer / small washer 3	M3 × 18L/ flat washer / small washer 3
KSF5R	M3 × 10L 2 pcs / flat washer / small washer 3	M3 × 18L/ flat washer / small washer 3
KSF6R	M4 × 12L 2 pcs / flat washer / small washer 4	M4 × 16L/ flat washer / small washer 4
KSF8R	M4 × 12L 2 pcs / flat washer / small washer 4	M4 × 16L/ flat washer / small washer 4
KSF10R	M4 × 12L 2 pcs / flat washer / small washer 4	M4 × 22L/ flat washer / small washer 4

Bolt type: Hexagonal-socket-head type bolt

7. Installation and Operation

7. Installation and Operation

9. Use cover wrap fixing bolts to secure the cover wrap.



Model	Bolt size, pcs	Tightening torque [N·cm]
KSF4R	M3 × 6L 4 pcs	103
KSF5R	M3 × 6L 4 pcs	103
KSF6R	M3 × 6L 4 pcs	103
KSF8R	M3 × 6L 4 pcs	103
KSF10R	M3 × 6L 4 pcs	103

Bolt type: Hexagonal-socket-head type button bolt

7. Installation and Operation

7-5 Securing the outer rail

Full cover specification

Caution

- **Do not drop objects on the strip seal, or scratch, pit or dent it.**

The strip seal must be replaced when it is scratched, pitted or dented as a result of a tool or other object falling on it.

Use of the strip seal in this state may cause early breakage or other damages.

During work, take sufficient care not to damage the strip seal or other parts.

- **Make sure to wear gloves while working.**

Some parts of the strip seal of this product may be sharp. Take care not to cut your hands or fingers.

[Countersunk hole specification] (Common for all models)

The example below is the case of mounting KSF (full cover specification) onto the base.
(For cover removal in the top cover specification, refer to P.7-22.)

1. Move the table to the stroke center.

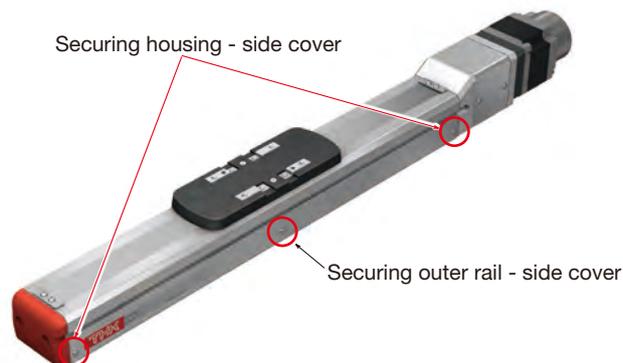


2. Remove the bolt securing the side cover.

Note) Do not remove the strip seal.

You will need the dedicated jig and adjustments when you mount the strip seal.

Always use a dedicated jig for adjustment when mounting the strip seal. See 8-7 for information regarding the strip seal mounting procedure.



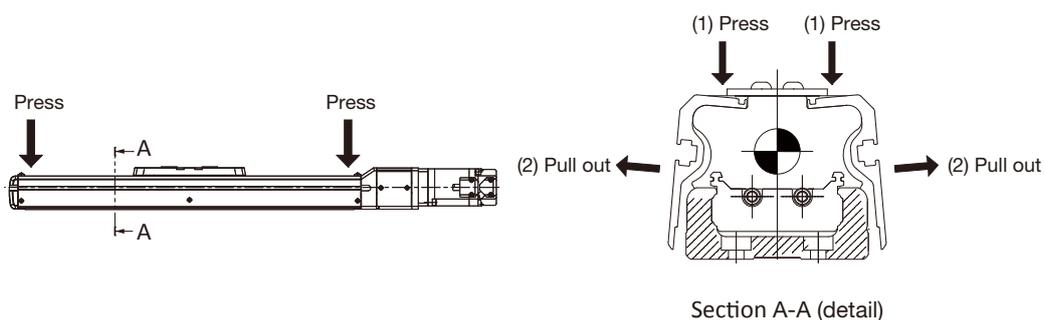
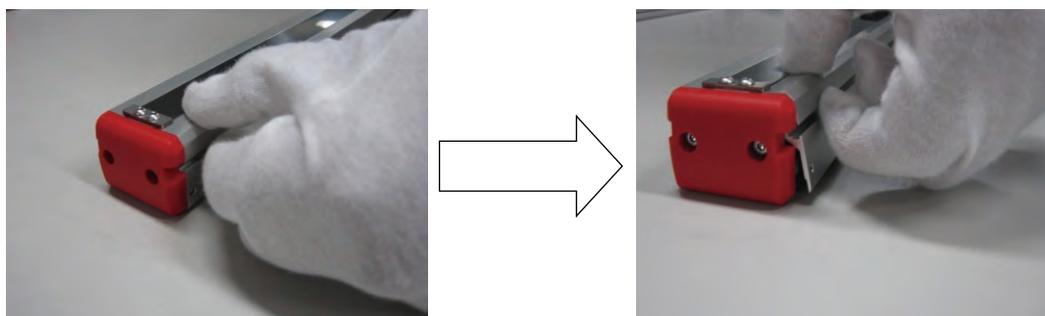
7. Installation and Operation

7. Installation and Operation

Model	Outer rail - Side cover	Housing - Side cover
KSF4	M2.6 × 5L	M2.6 × 5L
KSF5	M2.6 × 5L	M2.6 × 5L
KSF6	M2.6 × 5L	M2.6 × 10L
KSF8	M2.6 × 5L	M2.6 × 10L
KSF10	M2.6 × 5L	M2.6 × 10L

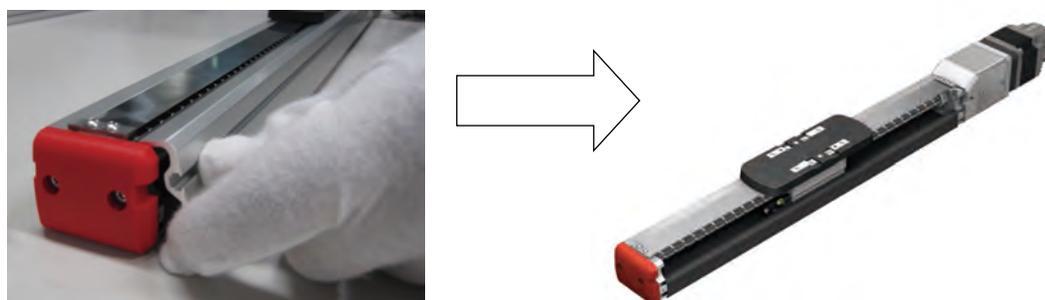
Bolt type: cross recessed head screw for precision devices (No. 0 pan-head screw Type 3)

3. Press onto the top face of both ends of the side cover and tilt the cover.



4. Remove the side cover while tilted.

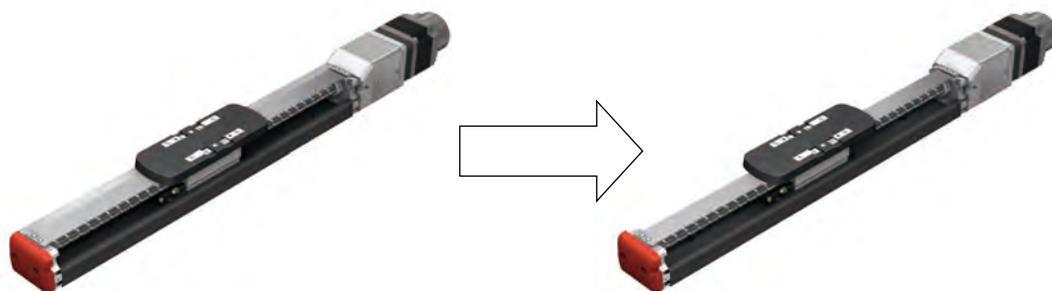
Note) Be careful not to damage the strip seal when you remove the side cover.



7. Installation and Operation

7. Installation and Operation

5. Remove the opposite side in the same manner.



6. Secure it with a bolt.

Note) For the tightening torque, refer to Table 1 Outer rail tightening torque on P.7-17.

Note) Secure the actuator using all the mounting holes.

Note) Use the bolt with the most appropriate length. See Table 1 on P.7-17 for details.

Note) You will need a bit with a ball point attached when you tighten the bolt to secure the outer rail.

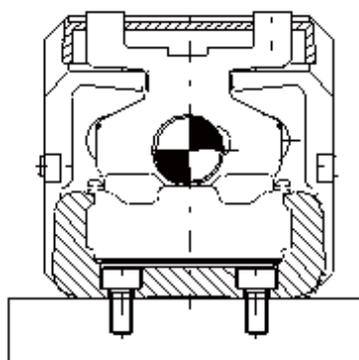


Table 1 Outer rail tightening torque

Model			KSF4U/RU		KSF5U/T/RU/RT		KSF6U/T/RU/RT	
Bolt size			M3		M4		M5	
Bolt material (tensile strength rank)			Steel (10.9)	SUS (A2-70)	Steel (10.9)	SUS (A2-70)	Steel (10.9)	SUS (A2-70)
Fit length of screw [mm]			4.5		6		7.5	
Tightening torque [N·cm]	Material of mounting surface	Iron	170	100	345	229	616	457
		Aluminum	137	100	320	229	614	457
Model			KSF8U/T/RU/RT		KSF10U/T/RU/RT			
Bolt size			M6		M8			
Bolt material (tensile strength rank)			Steel (10.9)	SUS (A2-70)	Steel (10.9)	SUS (A2-70)		
Screw-in depth [mm]			9		12			
Tightening torque [N·cm]	Material of mounting surface	Iron	991	772	2039	1870		
		Aluminum	991	772	2039	1870		

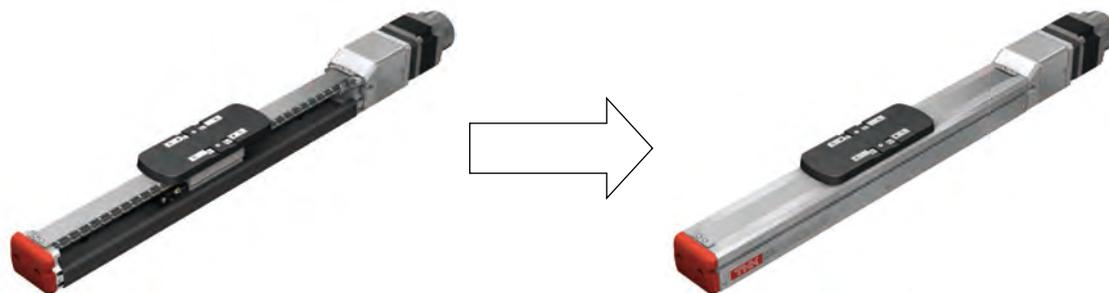
7. Installation and Operation

7. Installation and Operation

7. Move the table to the stroke center and mount the side cover.

Note) For a long stroke, the strip seal may sag depending on the installation direction. If that happens, lift up a strip seal slightly with fingers so that it will not contact the side cover.

- * Take care not to pull the strip seal up too far if lifting with fingers. Lifting the strip seal up too far while the strip seal holder is fastened may cause the strip seal to break or require adjustment to the mounting position.



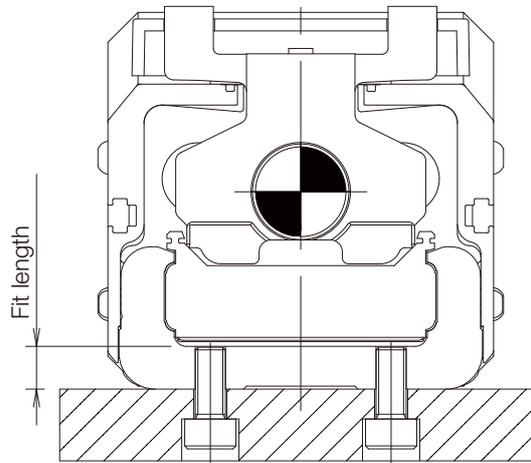
Model	Outer rail - Side cover	Housing - Side cover	Tightening torque [N·cm]
KSF4	M2.6 × 5L	M2.6 × 5L	30
KSF5	M2.6 × 5L	M2.6 × 5L	30
KSF6	M2.6 × 5L	M2.6 × 10L	30
KSF8	M2.6 × 5L	M2.6 × 10L	30
KSF10	M2.6 × 5L	M2.6 × 10L	30

Bolt type: cross recessed head screw for precision devices (No. 0 pan-head screw Type 3)

7. Installation and Operation

7. Installation and Operation

[Rear tap specifications]



Model			KSF4U/RU		KSF5U/T/RU/RT		KSF6U/T/RU/RT	
Bolt size			M4		M5		M5	
Bolt material (tensile strength rank)			Steel (10.9)	SUS (A2-70)	Steel (10.9)	SUS (A2-70)	Steel (10.9)	SUS (A2-70)
Fit length of screw [mm]			4		5		5	
Tightening torque [N·cm]	Material of mounting surface	Iron	345	229	616	457	616	457
		Aluminum	266	229	474	457	474	457
Model			KSF8U/T/RU/RT		KSF10U/T/RU/RT			
Bolt size			M6		M8			
Bolt material (tensile strength rank)			Steel (10.9)	SUS (A2-70)	Steel (10.9)	SUS (A2-70)		
Screw-in depth [mm]			6		8			
Tightening torque [N·cm]	Material of mounting surface	Iron	991	772	2039	1870		
		Aluminum	763	763	1569	1569		

7. Installation and Operation

7-6 Mounting method for objects to be mounted

Full cover specification

Caution

- **Do not drop objects on the strip seal.**

The strip seal must be replaced when it is scratched, pitted or dented as a result of a tool or other object falling on it.

Use of the strip seal in this state may cause early breakage or other damages.

Also, if there is the risk of tools or other items falling onto the main unit during work, cover the top surface of the main unit (strip seal section) with shock absorber (e.g. thickish (3mm or thicker) natural rubber or PVC resin). This will make it harder for the strip seal to be damaged by falling objects.

During work, take sufficient care not to damage the strip seal or other parts.

Secure objects to be conveyed using the taps provided on the table.

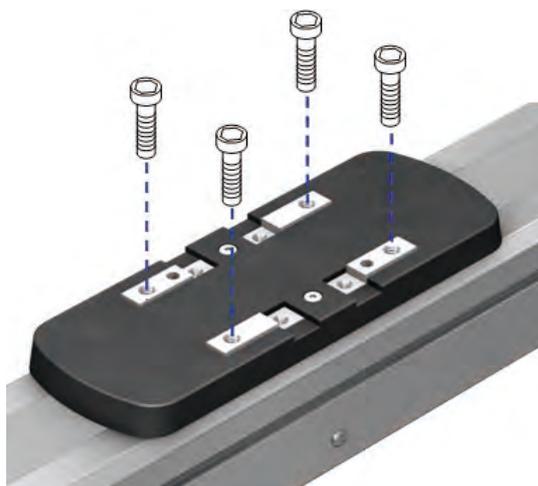


Table 2 Tightening torque for table mounting bolts

Model			KSF4		KSF5		KSF6	
Bolt size			M4		M4		M5	
Bolt material (tensile strength rank)			Steel (10.9)	SUS (A2-70)	Steel (10.9)	SUS (A2-70)	Steel (10.9)	SUS (A2-70)
Screw-in depth [mm]			6		6		7.5	
Tightening torque [N·cm]	Material of mounting surface	Iron	345	229	345	229	616	457
		Aluminum	266	229	266	229	474	457
Model			KSF8		KSF10			
Bolt size			M6		M8			
Bolt material (tensile strength rank)			Steel (10.9)	SUS (A2-70)	Steel (10.9)	SUS (A2-70)		
Screw-in depth [mm]			9		12			
Tightening torque [N·cm]	Material of mounting surface	Iron	991	772	2039	1870		
		Aluminum	763	763	1569	1569		

7. Installation and Operation

Open cover specification

Secure objects to be conveyed using the taps provided on the table.



Table 3 Tightening torque for table mounting bolts

Model			KSF4U/RU		KSF5U/RU		KSF6U/RU	
Bolt size			M4		M4		M5	
Bolt material (tensile strength rank)			Steel (10.9)	SUS (A2-70)	Steel (10.9)	SUS (A2-70)	Steel (10.9)	SUS (A2-70)
Screw-in depth [mm]			6		6		7.5	
Tightening torque [N • cm]	Material of mounting surface	Iron	345	229	345	229	616	457
		Aluminum	266	229	266	229	474	457
Model			KSF8U/RU		KSF10U/RU			
Bolt size			M6		M8			
Bolt material (tensile strength rank)			Steel (10.9)	SUS (A2-70)	Steel (10.9)	SUS (A2-70)		
Screw-in depth [mm]			9		12			
Tightening torque [N • cm]	Material of mounting surface	Iron	991	772	2039	1870		
		Aluminum	763	763	1569	1569		

7. Installation and Operation

Top cover specification

Secure objects to be conveyed using the taps provided on the table.



Table 4 Tightening torque for table mounting bolts

Model			KSF5T/RT		KSF6T/RT		KSF8T/RT	
Bolt size			M4		M5		M6	
Bolt material (tensile strength rank)			Steel (10.9)	SUS (A2-70)	Steel (10.9)	SUS (A2-70)	Steel (10.9)	SUS (A2-70)
Screw-in depth [mm]			6		7.5		9	
Tightening torque [N · cm]	Material of mounting surface	Iron	320 (345)	229 (229)	614 (616)	457 (457)	991 (991)	772 (772)
		Aluminum	266 (266)	229 (229)	474 (474)	457 (457)	763 (763)	763 (763)
Model			KSF10T/RT					
Bolt size			M8					
Bolt material (tensile strength rank)			Steel (10.9)	SUS (A2-70)				
Screw-in depth [mm]			12					
Tightening torque [N · cm]	Material of mounting surface	Iron	2039	1870				
		Aluminum	1569	1569				

Mounting to the sub-table (aluminum, parentheses show iron)

7. Installation and Operation

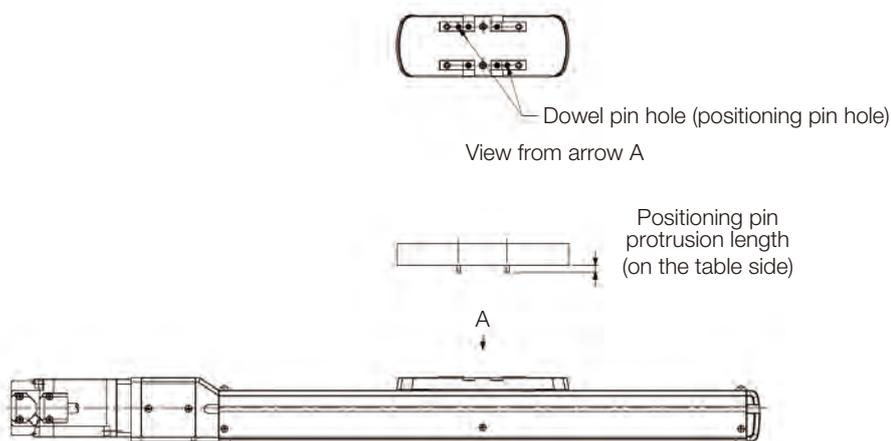
7. Installation and Operation

7-7

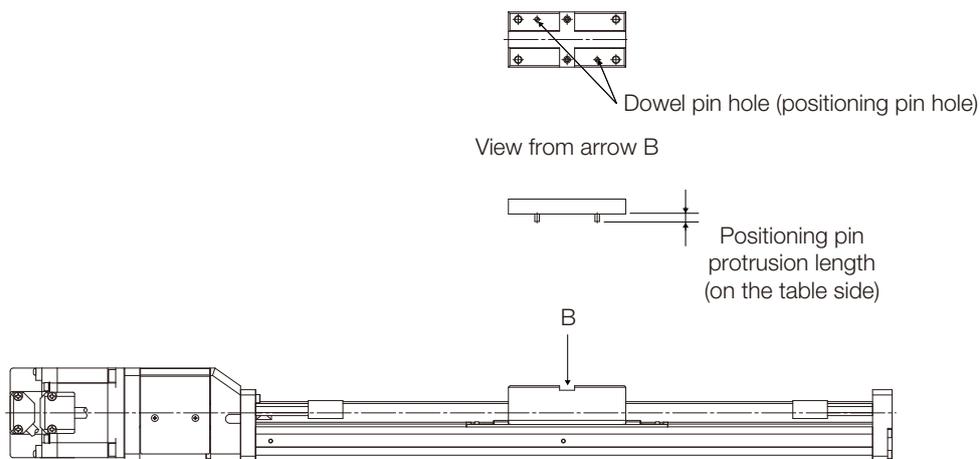
Positioning pin protrusion length

For the full cover specification

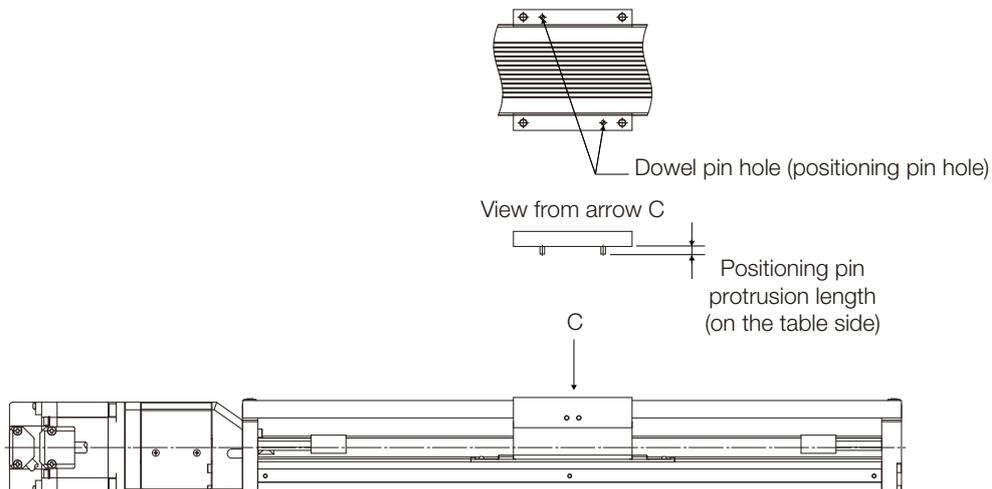
If you use the dowel pin holes for positioning pins when securing the objects to be mounted, assemble the table so that the protrusion length of the positioning pin is as shown in the table below or less.



For the open cover specification



For the top cover specification

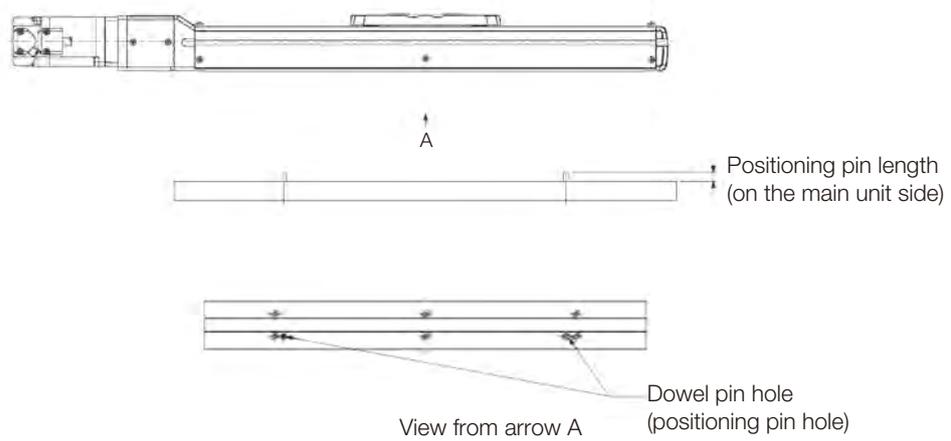


7. Installation and Operation

Table

Table 3 Table positioning pin hole details

Model	KSF4	KSF5	KSF6	KSF8	KSF10
Table hole diameter	$\phi 3H7$	$\phi 3H7$	$\phi 3H7$	$\phi 5H7$	$\phi 5H7$
Table hole depth [mm]	5	5	5	10	10
Positioning pin length [mm]	4	4	4	9	9



Outer rail (The figure shows full cover specification)

Table 4 Main unit positioning pin hole details (Common)

Model	KSF4	KSF5	KSF6	KSF8	KSF10
Table hole diameter	$\phi 4H7$	$\phi 4H7$	$\phi 5H7$	$\phi 5H7$	$\phi 5H7$
Table hole depth [mm]	4	4	5	5	5
Positioning pin length [mm]	3	3	4	4	4

8. Maintenance

8. Maintenance

8-1

Precautions to be observed for safe use

Warning



- **Turn off the machine (turning power off) before conducting any maintenance.**
Otherwise, it may cause electric shocks. Or cause malfunction that could lead to injury.
- **If two or more people are involved in the operation, confirm the procedures such as sequences, signs, and abnormalities in advance, and appoint another person for monitoring the operation.**
Failure to do so may cause an unexpected accident.

Caution



- **When handling grease, wear a protective glasses and protective gloves.**
If grease gets into eyes or touch the skin, it may affect your body such as causing inflammation.



- **Do not expose grease to a flame, spark or high-temperature object.**

Otherwise, it may ignite the grease, which could cause fire.

* For other information on handling grease, see the precautions indicated on the grease package or catalog. We have "Material Safety Data Sheets" for THK original greases. Contact THK for details.

- **Do not grasp the strip seal of this product. (Full cover specification)**

It may injure you.

Some parts of the strip seal may be sharp. Take care not to cut your hands or fingers.

8-2

Precautions to be observed for prevention of product fault or fracture



- **To have this product fully exert its functions, it is essential to lubricate the product. Be sure to supply grease on a regular basis.**

Using the product with insufficient lubrication may shorten the service life.

- **Do not let foreign materials enter into the LM guide or the ball screw.**

Otherwise, it may cause fault, or could adversely affect the performance or service life.



- **Do not mix different types of grease.**

Otherwise, it may affect the performance.

8. Maintenance

8. Maintenance

8-3

Daily inspection

- **Before operating the product, visually check any exterior damage or stain.**
- **Check the grease state (stain, etc.). If the grease is significantly stained, wipe off the grease, and then supply new grease. (Supply the new grease until it comes out from the inner block, and exhaust the stained grease.)**
- **Check whether abnormal noise or vibration occurs during operation. If abnormal noise or vibration occurs, immediately stop the machine and inspect the state of the product.**
Insufficient lubrication or loosening of a mounting bolt can be a cause of abnormal noise or vibration. Check for insufficient lubrication or loosening of a mounting bolt.
- **Check the strip seal for dirt or adhesion of foreign material. (Full cover specification)**
Adhesives, paints or other viscous items or solids sticking to the strip seal or other parts might cause the slider to malfunction or damage the strip seal. If it becomes dirty, wipe off the dirt using a clean waste cloth soaked with alcohol-based detergent.
- **Check the strip seal for scratches, pits or dents. (Full cover specification)**
Use of the strip seal in this state may cause early breakage or other damages. The strip seal must be replaced when it is scratched or dented.

8-4

Periodical inspection

- **Perform more detailed inspection approximately once every 3 to 6 months.**
 - Check the lubrication state, and then clean the product and replenish the grease.
 - Inspect whether each mounting bolt has loosened, and if any of them has loosened, retighten it.
- **Visually check abnormal wear, scratches, or cracks on the surface of the strip seal. (Full cover specification)**
 - If you find any abnormalities, replace the strip seal.
 - For the replacement procedure, see “Replacement of the strip seal procedure”.

8-5

Lubrication

- **The standard models are supplied with the following grease before shipment.**
THK AFF grease
See the appendix for details of the greases.
- **Basically, this is the long-term maintenance-free product not requiring greasing, but depending on your operating conditions and service environment, greasing may be needed. We recommend you set up a greasing interval at the initial inspection. In addition, if you use the product exceeding 10000 km travel distance, replenish grease approximately every six months or 100 km travel distance, whichever comes first.**
* Note that the greasing interval becomes shorter than usual in case of high-load use or under the environment where oil content decreases.

8. Maintenance

8. Maintenance

8-6

Method for supplying grease

⚠ Caution

- **Do not drop objects on the strip seal, or scratch, pit or dent it. (Full cover specification)**
The strip seal must be replaced when it is scratched, pitted or dented as a result of a tool or other object falling on it.
Use of the strip seal in this state may cause early breakage or other damages.
During work, take sufficient care not to damage the strip seal or other parts.
- **Make sure to wear gloves while working.**
Some parts of the strip seal of this product may be sharp. Take care not to cut your hands or fingers. (Full cover specification)

8-6-1

Full cover specification

The following figure shows a KSF representative greasing method for your reference.

Procedure

1. Move the table to the stroke center.

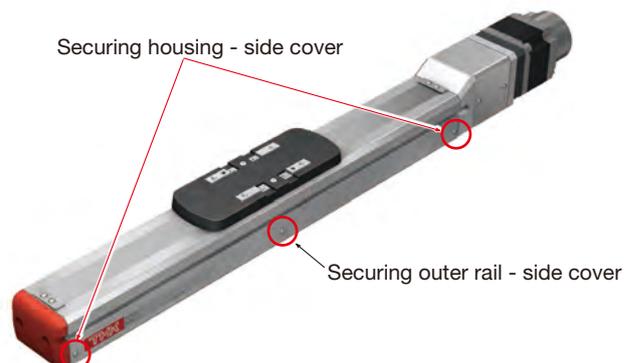


2. Remove the bolt securing the side cover.

Note) Do not remove the strip seal.

You will need the dedicated jig and adjustments when you mount the strip seal.

Always use a dedicated jig for adjustment when mounting the strip seal. See 8-7 for information regarding the strip seal mounting procedure.



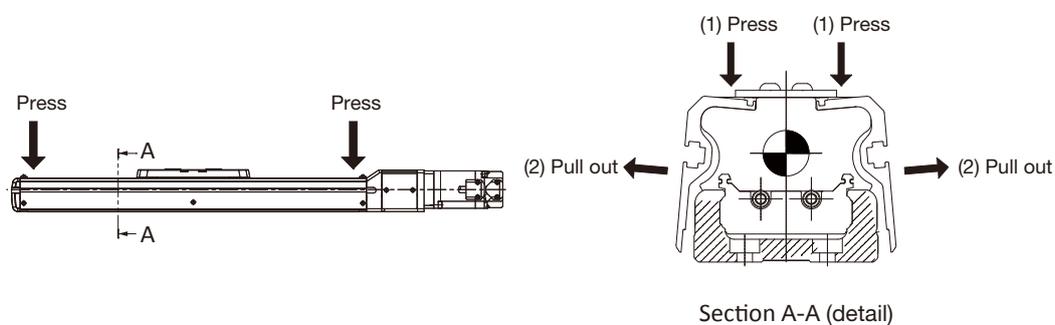
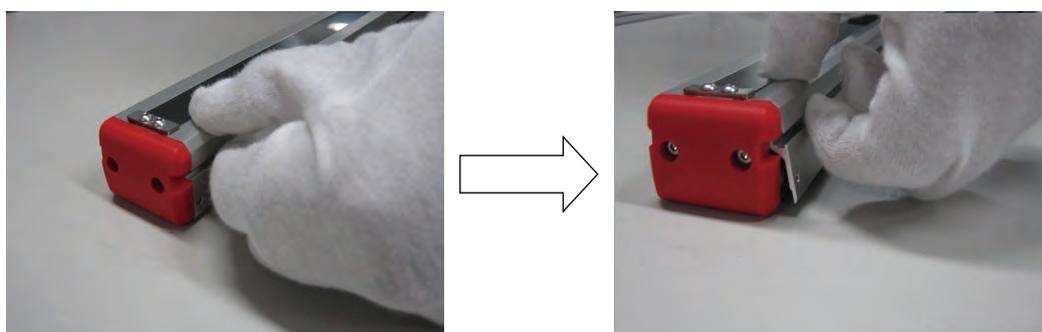
8. Maintenance

8. Maintenance

Model	Outer rail - Side cover	Housing - Side cover
KSF4	M2.6 × 5L	M2.6 × 5L
KSF5	M2.6 × 5L	M2.6 × 5L
KSF6	M2.6 × 5L	M2.6 × 10L
KSF8	M2.6 × 5L	M2.6 × 10L
KSF10	M2.6 × 5L	M2.6 × 10L

Bolt type: cross recessed head screw for precision devices (No. 0 pan-head screw Type 3)

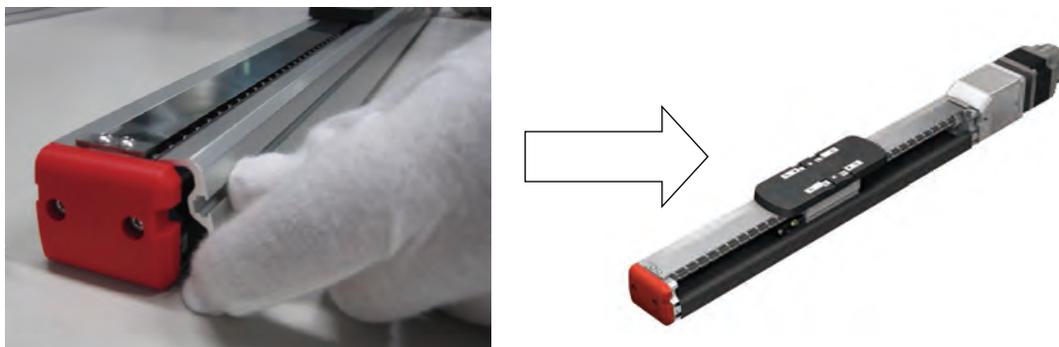
3. Press onto the top face of both ends of the side cover and tilt the cover.



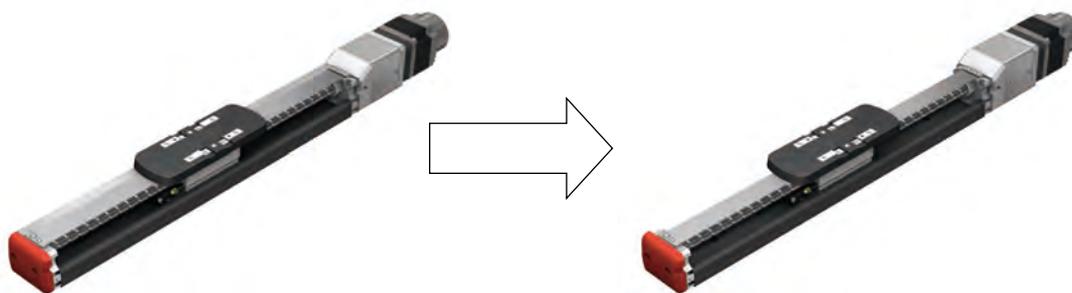
8. Maintenance

8. Maintenance

4. Remove the side cover while tilted.
Note) Be careful not to damage the strip seal when you remove the side cover.



5. Remove the opposite side in the same manner.



8. Maintenance

8. Maintenance

6. Supply grease using a grease gun as indicated in the figure below.

Lubrication of LM Guide

- (1) Mount the nozzle and attachment to the grease gun.
 - KSF4/5/6/8: Dedicated nozzle U type + N type attachment
 - KSF10:H type
- (2) Supply AFF grease from the grease nipple.
- (3) Stroke the table to apply the grease.



Grease gun

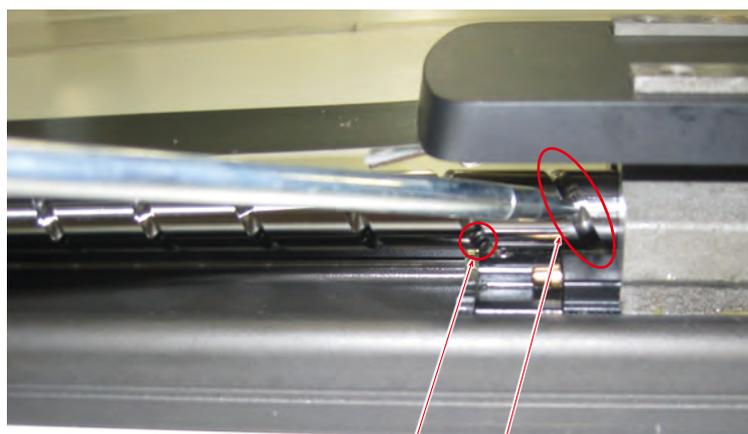


Grease nipple

Ball screw lubrication

- (1) Mount the dedicated U type nozzle and N type attachment to the grease gun.
- (2) Supply grease directly to the raceway of the ball screw.
- (3) Stroke the table to apply the grease.

Note) Supply it on the raceway on the slider side close to the felt.



Felt Raceway

8. Maintenance

8. Maintenance

Model	Ball screw lead [mm]	Amount of filled grease [cc]	
		LM guide part	Ball screw part
KSF4	10	0.4	0.3
	16		0.3
KSF5	10	0.8	0.7
	20		0.4
KSF6	20	1.2	0.6
	30		0.6
KSF8	20	2.4	5.6
	40		1.8
KSF10	25	4.7	4.2
	50		2.5

7. Move the table to the stroke center and mount the side cover.

Note) For a long stroke, the strip seal may sag depending on the installation direction. If that happens, lift up a strip seal slightly with fingers so that it will not contact the side cover. Working with 2 people is recommended if it is difficult to mount the side cover while pulling up the strip seal.

* Take care not to pull the strip seal up too far if lifting with fingers. Lifting the strip seal up too far while the strip seal holder is fastened may cause the strip seal to break or require adjustment to the mounting position.



Model	Outer rail - Side cover	Housing - Side cover	Tightening torque [N·cm]
KSF4	M2.6 × 5L	M2.6 × 5L	30
KSF5	M2.6 × 5L	M2.6 × 5L	30
KSF6	M2.6 × 5L	M2.6 × 10L	30
KSF8	M2.6 × 5L	M2.6 × 10L	30
KSF10	M2.6 × 5L	M2.6 × 10L	30

Bolt type: cross recessed head screw for precision devices (No. 0 pan-head screw Type 3)

8. Maintenance

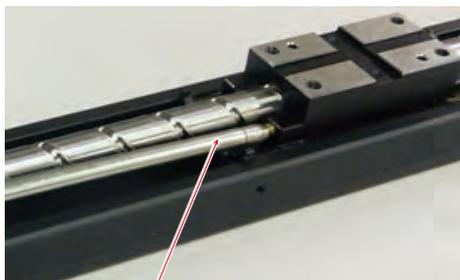
8. Maintenance

8-6-2 Open cover specification

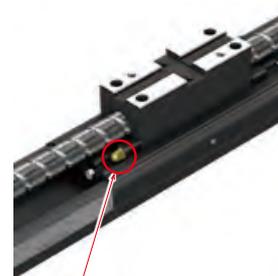
Supply grease using a grease gun as indicated in the figure below.

Lubrication of LM Guide

- (1) Mount the nozzle and attachment to the grease gun.
 - KSF4U/5U/6U/8U: Dedicated U type nozzle + N type attachment
 - KSF10: H type
- (2) Supply AFF grease from the grease nipple.
- (3) Stroke the table to apply the grease.



Grease gun

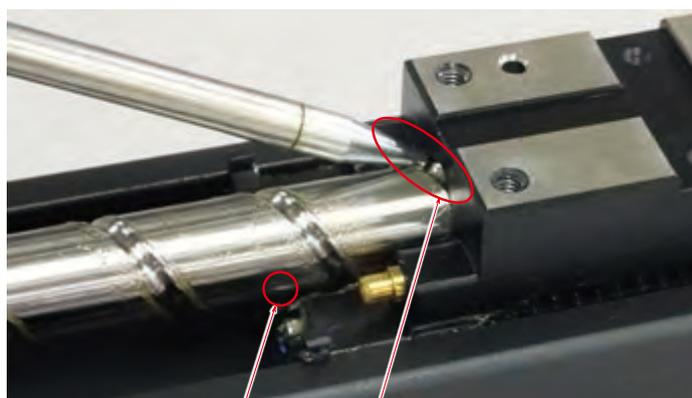


Grease nipple

Ball screw lubrication

- (1) Mount the dedicated U type nozzle and N type attachment to the grease gun.
- (2) Supply grease directly to the raceway of the ball screw.
- (3) Stroke the table to apply the grease.

Note) Supply it on the raceway on the slider side close to the felt.



Felt

Raceway

8. Maintenance

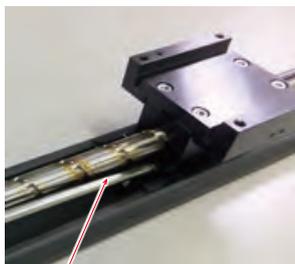
8. Maintenance

8-6-3 Top cover specification

Supply grease using a grease gun as indicated in the figure below.

Lubrication of LM Guide

- (1) Mount the nozzle and attachment to the grease gun.
 - KSF4U/5U/6U/8U: Dedicated U type nozzle + N type attachment
 - KSF10: H type
- (2) Supply AFF grease from the grease nipple.
- (3) Stroke the table to apply the grease.



Grease gun

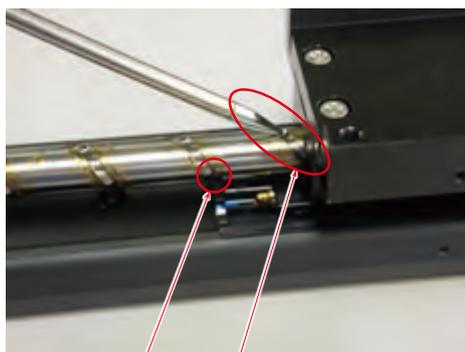


Grease nipple

Ball screw lubrication

- (1) Mount the dedicated U type nozzle and N type attachment to the grease gun.
- (2) Supply grease directly to the raceway of the ball screw.
- (3) Stroke the table to apply the grease.

Note) Supply it on the raceway on the slider side close to the felt.



Felt Raceway

8. Maintenance

8. Maintenance

8-7 How to replace the strip seal

Full cover specification

⚠ Caution

- **Do not drop objects on the strip seal, or scratch, pit or dent it.**

The strip seal must be replaced when it is scratched, pitted or dented as a result of a tool or other object falling on it.

Use of the strip seal in this state may cause early breakage or other damages.

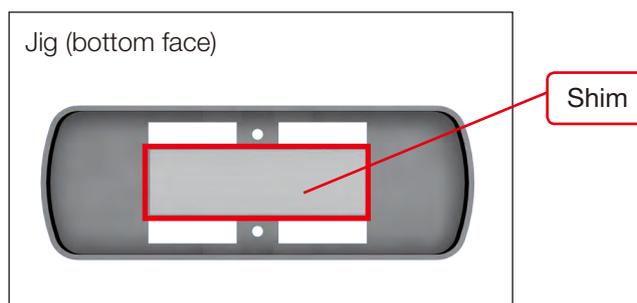
During work, take sufficient care not to damage the strip seal or other parts.

- **Do not grasp the strip seal of this product.**

It may injure you.

Some parts of the strip seal may be sharp. Take care not to cut your hands or fingers.

When you adjust the strip seal, you will need the strip seal adjustment jig with the shim pasted on the back of the table cover. Please contact THK for details.



1. Remove the table cover.



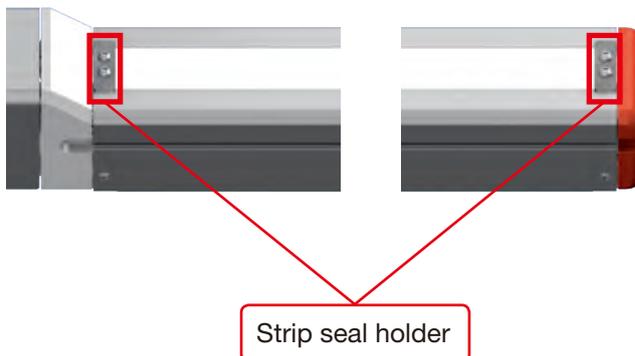
Model	Bolt size, pcs
KSF4	M2.6 × 4L 2 pcs
KSF5	M2.6 × 4L 2 pcs
KSF6	M3 × 5L 2 pcs
KSF8	M3 × 5L 2 pcs
KSF10	M3 × 5L 2 pcs

Thin head FH type screws

8. Maintenance

8. Maintenance

2. Remove the strip seal holder.



Model	Bolt size, pcs
KSF4	M2.5 × 4L 4 pcs
KSF5	M2.5 × 4L 4 pcs
KSF6	M3 × 5L 4 pcs
KSF8	M3 × 5L 4 pcs
KSF10	M3 × 5L 4 pcs

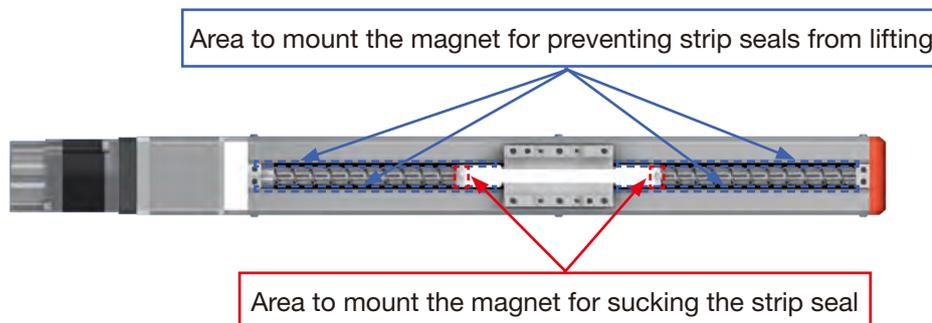
Hexagonal-socket-head type button bolt

3. Remove the strip seal from the main unit.



Precautions

The KSF table has magnets with strong magnetic fields attached at the two areas for sucking up the strip seal. Be careful handling it because magnetic bodies may stick to the magnets. It also has a belt-like magnet mounted to the top of the side cover to prevent the strip seal from lifting.



8. Maintenance

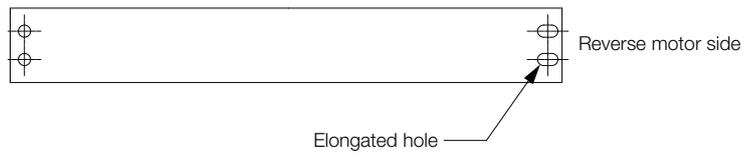
8. Maintenance

- Temporary mount a new strip seal and adjust the strip seal position.

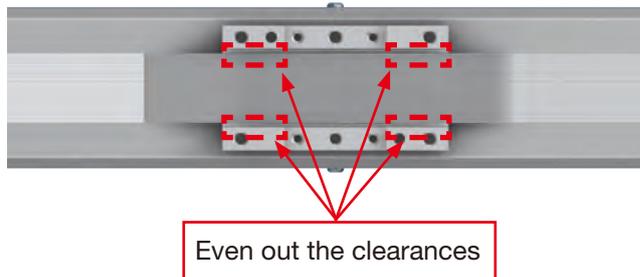


Caution

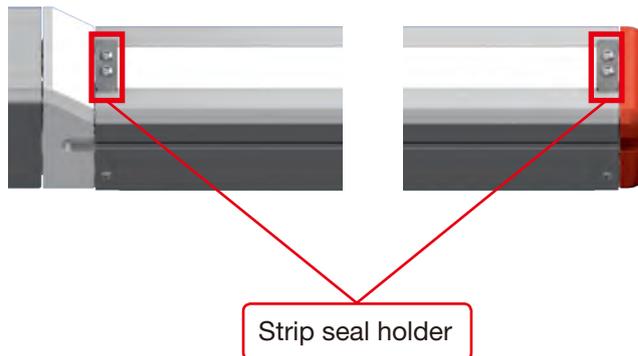
Some strip seal models must be mounted in a specific direction. For items with a combination of round and elongated mounting holes, always mount so that the elongated holes are on the reverse motor side.



- Adjust the strip seal position to be at the center of the table and even out the clearances.



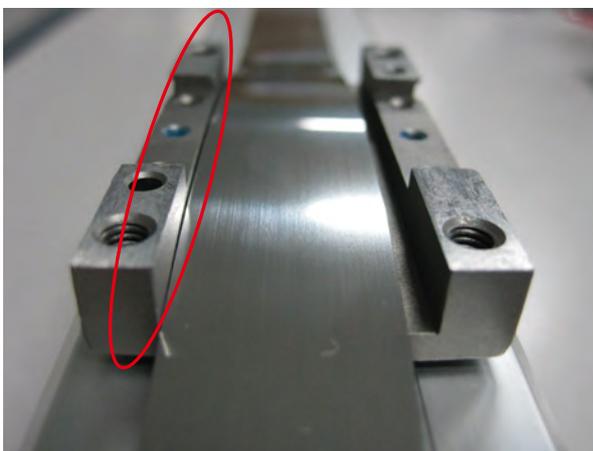
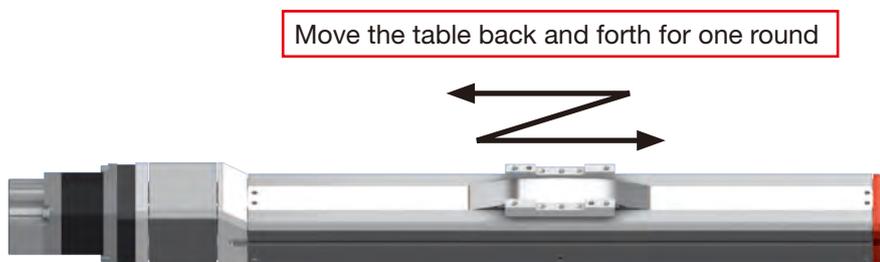
- Tighten it until the strip seal holder stays in place. Loosen the thin head screw by one turn.



8. Maintenance

8. Maintenance

- 7. Move the table back and forth for one round to make sure that the strip seal will not contact the table in the entire stroke.
If they contact as shown in the photo, loosen the strip seal holders and adjust the strip seal position from step 5 once again.



- 8. Tighten it until the strip seal holder on the housing A side will not slide.



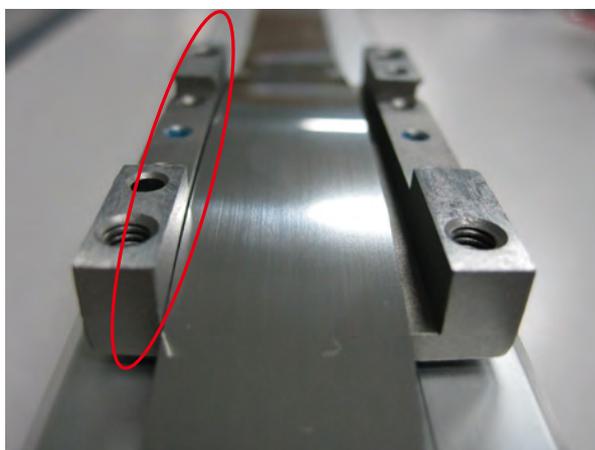
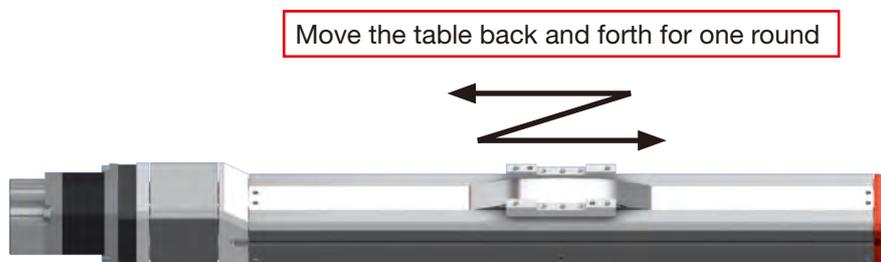
Strip seal holder

8. Maintenance

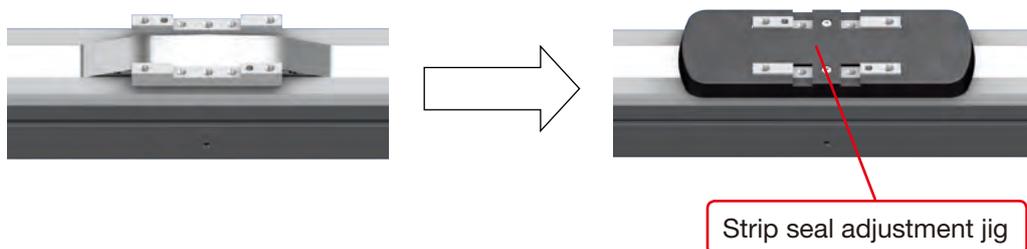
8. Maintenance

9. Move the table back and forth for one round to make sure that the strip seal will not contact the table in the entire stroke.

If they contact as shown in the photo, loosen the strip seal holders and adjust the strip seal position from step 5 once again.



10. Mount the strip seal adjustment jig.



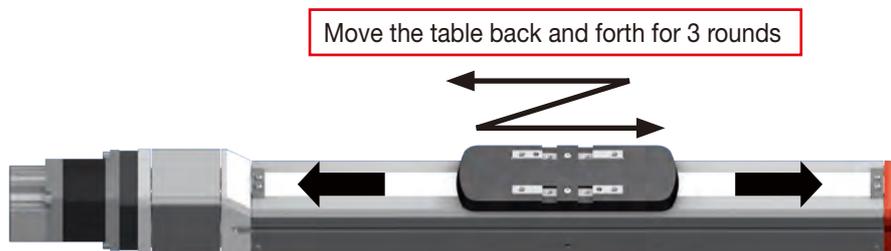
Model	Bolt size, pcs	Tightening torque [N·cm]
KSF4	M2.6 × 4L 2 pcs	17
KSF5	M2.6 × 4L 2 pcs	17
KSF6	M3 × 5L 2 pcs	17
KSF8	M3 × 5L 2 pcs	17
KSF10	M3 × 5L 2 pcs	17

Bolt type: Thin head (FH type) head screws

8. Maintenance

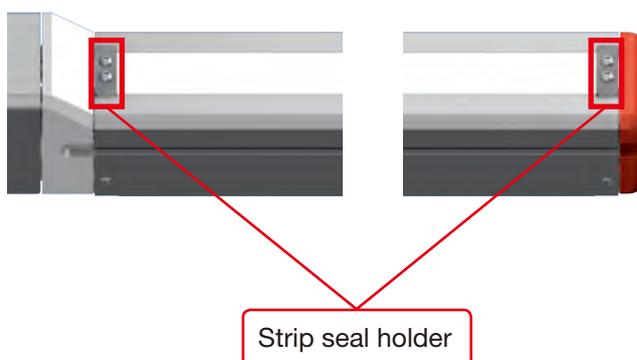
8. Maintenance

11. Move the table back and forth for three rounds covering the entire stroke. Stop the table around the stroke center.

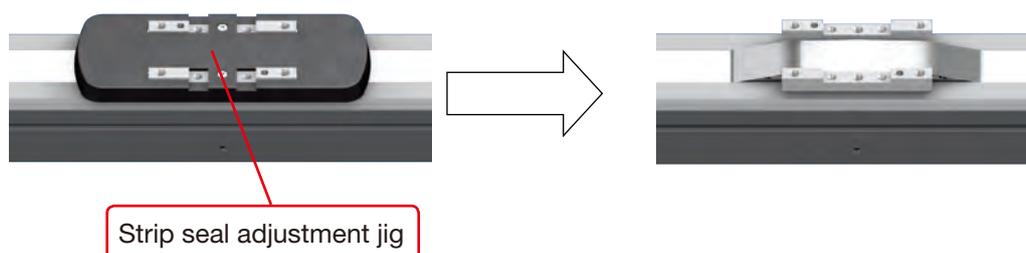


12. Fully fasten the strip seal.

Note) Never pull the strip seal toward the stroke direction when you fully fasten the strip seal.



13. Remove the strip seal adjustment jig.



Model	Bolt size, pcs
KSF4	M2.6 × 4L 2 pcs
KSF5	M2.6 × 4L 2 pcs
KSF6	M3 × 5L 2 pcs
KSF8	M3 × 5L 2 pcs
KSF10	M3 × 5L 2 pcs

Thin head FH type screws

8. Maintenance

8. Maintenance

14. Check the clearance of the strip seal. Verify the height of the strip seal and table cover mounting surface to make sure that the strip seal is located lower than the table cover mounting surface. If the strip seal is higher than the table cover mounting surface, re-adjust the strip seal from the temporary assembly process.

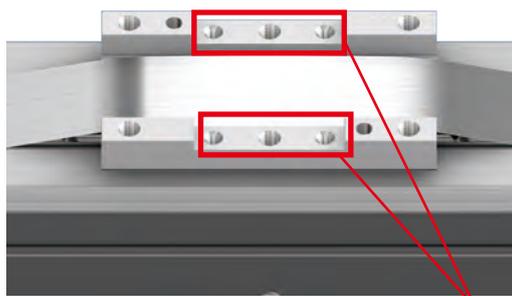
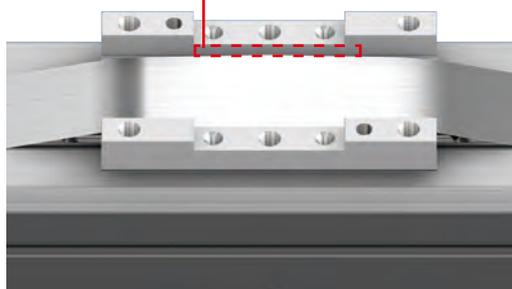


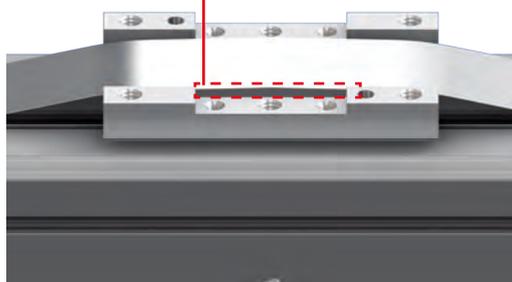
Table cover mounting surface

Strip seal is lower than the mounting surface



Example of appropriate mounting state

Strip seal is higher than the mounting surface

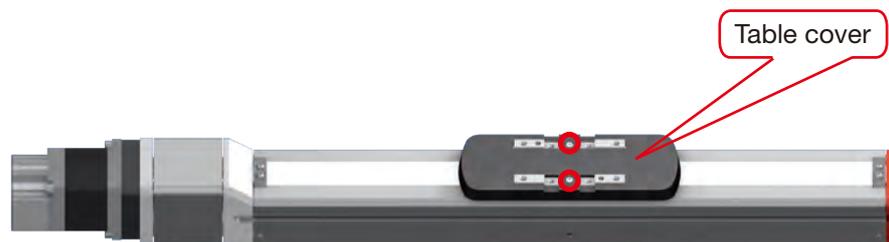


Example of inappropriate mounting state

8. Maintenance

8. Maintenance

15. Mount the table cover.



Model	Bolt size, pcs	Tightening torque [N·cm]
KSF4	M2.6 × 4L 2 pcs	17
KSF5	M2.6 × 4L 2 pcs	17
KSF6	M3 × 5L 2 pcs	17
KSF8	M3 × 5L 2 pcs	17
KSF10	M3 × 5L 2 pcs	17

Thin head FH type screws

8-8

Removing and mounting the cover

Top cover specification

Procedure (removal)

1. Remove the 4 bolts securing the top cover.
For the bolt type, refer to Table 5 Bolt type.

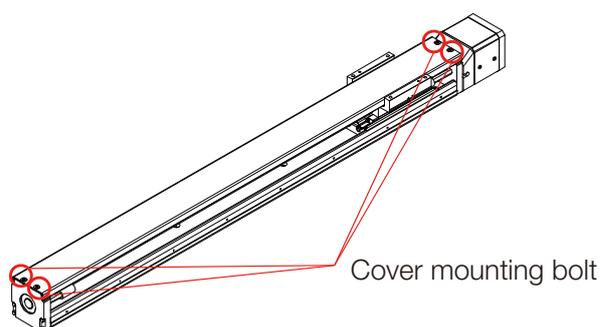


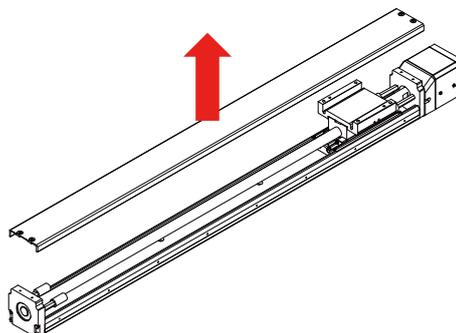
Table 5 Bolt type

Model	Bolt type, size, number of bolts
KSF5T	Small hexagonal socket-head thin head screw TP type M3 x 6L, 4 pcs
KSF6T	Small hexagonal socket-head thin head screw TP type M3 x 6L, 4 pcs
KSF8T	Hexagonal socket-head button bolt M4 x 12L, 4 pcs
KSF10T	Hexagonal socket-head button bolt M4 x 12L, 4 pcs

8. Maintenance

8. Maintenance

2. Hold the top cover by its edges and lift it up.



Procedure (mounting)

1. Hold both ends of the top cover and attach to the KSF unit, then fix it with mounting bolts. For the proper tightening torque, refer to Table 6 Cover tightening torque.

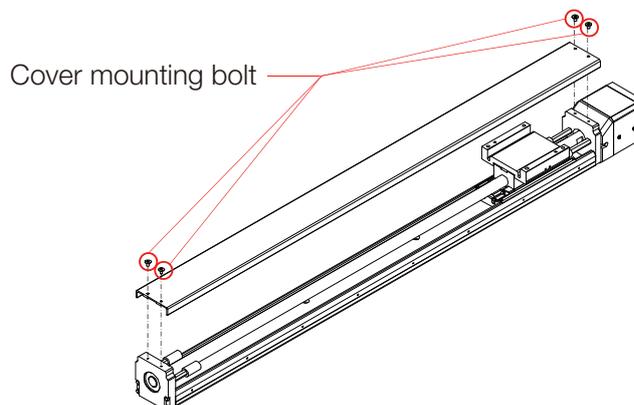


Table 6 Cover tightening torque

Model	Bolt type, size, number of bolts	Tightening torque [N · cm]
KSF5T	Small hexagonal socket-head thin head screw TP type M3 x 6L, 4 pcs	131
KSF6T	Small hexagonal socket-head thin head screw TP type M3 x 6L, 4 pcs	131
KSF8T	Hexagonal socket-head button bolt M4 x 12L, 4 pcs	228
KSF10T	Hexagonal socket-head button bolt M4 x 12L, 4 pcs	228

8. Maintenance

8. Maintenance

8-9 Free warranty period

The warranty period shall be 12 months from the product delivery date or 18 months from the date of shipping (based on the manufacture date), whichever is earlier.

If the free warranty period has been expired at the time of receiving notice of any defect, repair works will be charged.

8-10 Usage conditions (range)

The normal usage conditions (range) specified in our catalogs and/or instruction manuals shall apply.

8-11 Warranty scope

8-11-1 Failure diagnosis

Please inform THK of the trouble description, content, and model and serial number indicated on the product label. Then we will perform the initial diagnosis of the product failure.

When we recognize that the failure occurred within the free warranty period set forth above and the responsibility of the cause rests on us, the warranty is applied without charge. Otherwise any repair or replacement will be charged.

The final judgment of the warranty qualification is determined when we check the product in our site.

Location of the product label: **3-1 Nameplates display and serial number** (→ **P.3-1**)

8-11-2 Consumables and spare parts

- Timing belt, strip seals, strip seal guide, and cables are consumables.

8. Maintenance

8. Maintenance

8-11-3 Repair

We will perform free repair works or replacement for any failure occurred within the free warranty period set forth above.

However, it is our discretion whether we provide repair or replacement.

Free warranty is not applicable even within the warranty period for any of the following cases:

- Failure arising out of improper storage or handling by the customer, or software and/or hardware installed by the customer.
- Failure arising out of any alteration of our products by the customer.
- Failure arising out of any use of our products out of the usage conditions set forth in section 8-9 of this manual.
- Failure arising out of any use of the product without taking appropriate water-, oil-, and dust-proof measures.
- Lack of maintenance works specified in our instruction manual.
- Wearing caused by usage conditions.
- Wearing of consumables including cables, strip seals, a strip seal guide, and timing belt, etc.
- Failure arising out of any convulsion of nature, such as earthquake, lightning, flood and wind damage.
- Failure arising out of any factor that is not recognized as our responsibility.

*In case of any free repair work within the free warranty period, the warranty period of the pertinent product shall still be the period set forth in section 8-8, not the period originating from the time of free repair work.

*In case of any paid repair work, the warranty period of the repaired section shall be six months from the repair work regardless of the warranty period of the product itself.

*Repair work is performed at our Japanese site. Whether free or paid repair work, cost of returning the product to our site shall be customer's responsibility.

*The cost of delivering the repaired or replacing product to customer's site is our responsibility in case of free warranty, or included in the repair charge in case of a paid repair service. However, the destination must be in Japan.

8-11-4 Repair period

The warranty period of actuator KSF shall be seven years from the date of purchase or five years from the product discontinuation date, whichever comes first.

8-12 Exclusion of warranty liability

- Regardless of whether it is within the free warranty period or not, any damage to the equipment other than our products and opportunity loss incurred by the customer due to the failure of the products are not covered by the warranty.
- We hold no responsibility for removal of the product for repair work, reinstallation after repair work, and other costs caused thereby.
- We hold no responsibility for any damage arising out of any use of the product without taking appropriate water-, oil-, and dust-proof measures.

8-13 Delivery conditions

Delivery products will be shipped by mixed cargo and passed on the car.

Unpacking, transportation, installation, on-site adjustment and trial run after delivery are not our responsibility.

9. Appendix

9. Appendix

9-1

Permissible input torque

- If you use a motor that exceeds the permissible input torque, consider taking a necessary measure such as limiting the motor torque.

Table 7 Permissible input torque (common for all specifications)

Model	Permissible input torque [N·m]
KSF4	1.2
KSF5	1.8
KSF6	3.1
KSF8	7.1
KSF10	15.5
KSF4R	1.1
KSF5R	1.1
KSF6R	2.2
KSF8R	4.5
KSF10R	8.4

9. Appendix

9. Appendix

9-2

Static permissible moment

- Static permissible moment is shown in Table 8. For the direction of the moment, see Fig. 4. (The static moment is the value when a load is applied only to one direction.)

Table 8 Static permissible moment

Unit: N · m

Model	Static permissible moment*			Model	Static permissible moment*		
	M _A	M _B	M _C		M _A	M _B	M _C
KSF4	103	103	58	KSF6U	355	203	152
KSF4U	103	95	58	KSF8	730	437	387
KSF5	147	147	149	KSF8T	324 (730)	253 (425)	265 (503)
KSF5T	103 (147)	61 (137)	80 (149)	KSF8U	730	414	277
KSF5U	147	107	89	KSF10	1,049	712	671
KSF6	330	216	188	KSF10T	1,259	949	787
KSF6T	150 (266)	124 (252)	139 (253)	KSF10U	1,259	775	504

* The values in parentheses are for the sub-table iron specification.

Note) The static permissible moment is the value when all of the mounting holes of the table are used.

Note) The static permissible moment is the maximum moment permissible under the static condition.

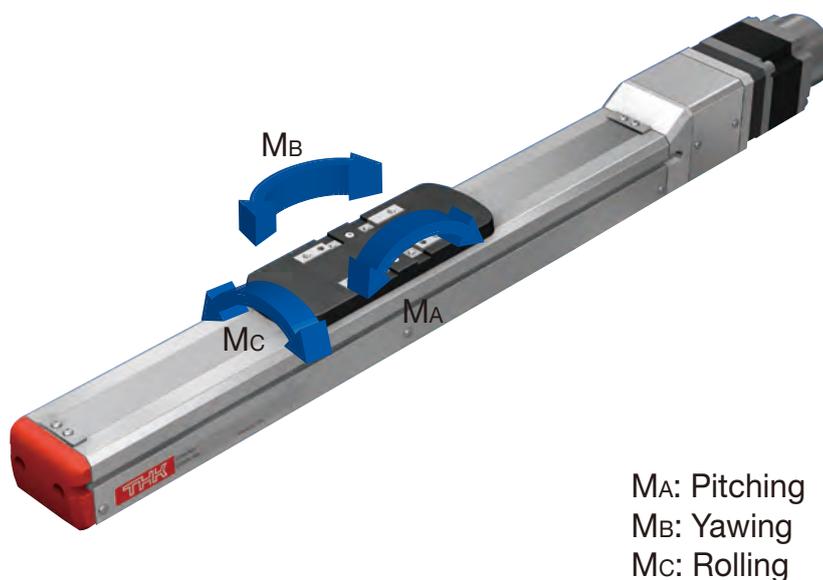


Fig. 4 Load moment direction

9. Appendix

9. Appendix

9-3

Introduction of the grease

THK original grease

AFF Grease

Using high-class synthetic oil and lithium-based consistency enhancer and additive, this grease has a stable rolling resistance that has not been achieved with conventional vacuum grease or low particle-generative grease.

● Characteristics

- Excels in conformability at low speed operation with a small fluctuation in rolling resistance due to a low viscose resistance.
- Optimal for use in a clean room due to excellently low particle-generative characteristics.
- Allows the greasing interval to be extended due to excellent wear resistance in micro vibrations.

● Representative properties

Test items	Representative property values	
Consistency enhancer	Lithium-based grease	
Base oil	High-class synthetic oil	
Base oil kinetic viscosity: mm ² /s (40°C)	100	
Worked penetration (25°C, 60 W)	315	
Mixing stability (100,000 W)	345	
Dropping point: °C	220	
Evaporation: mass% (99°C, 22 h)	0.7	
Oil separation rate: mass% (100°C, 24 h)	2.6	
Copper plate corrosion (B method, 100°C, 24 h)	Accepted	
Low temperature torque: mN·m (-20°C)	Startup	220
	Rotation	60
4-ball test (fusion load): N	1236	
Service temperature range (°C)	-40 to 120	
Appearance color	Reddish brown	



Fig. 5 Appearance of the grease tube and the product box

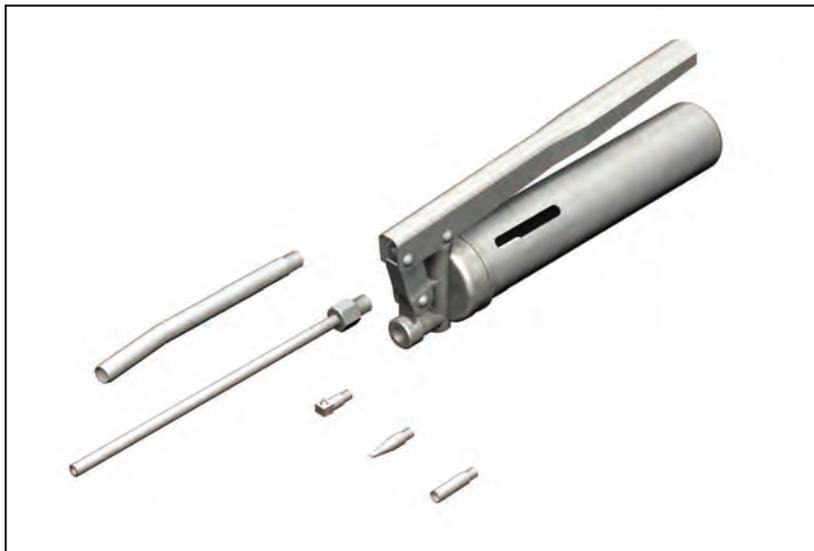
9. Appendix

9. Appendix

9-4

Introduction of the grease gun unit

Grease gun unit MG70



The grease gun unit MG70 is capable of supplying grease for KSF by replacing the dedicated nozzle. The grease gun has a slit window that allows you to visually check the remaining amount of grease. Since grease is contained in a 70 g bellows cartridge, you can replace the nozzle without soiling your hand.

Table 9 shows the specifications of the grease gun, and Fig. 6 shows its appearance.

Discharge pressure	19.6 MPa max
Discharge rate	0.6 cc/stroke
Grease	70 g bellows cartridge
Overall length	235 mm (excluding nozzle)
Weight	480 g (with nozzle, excluding grease)

Table 9 Specifications of the grease gun

9. Appendix

9. Appendix

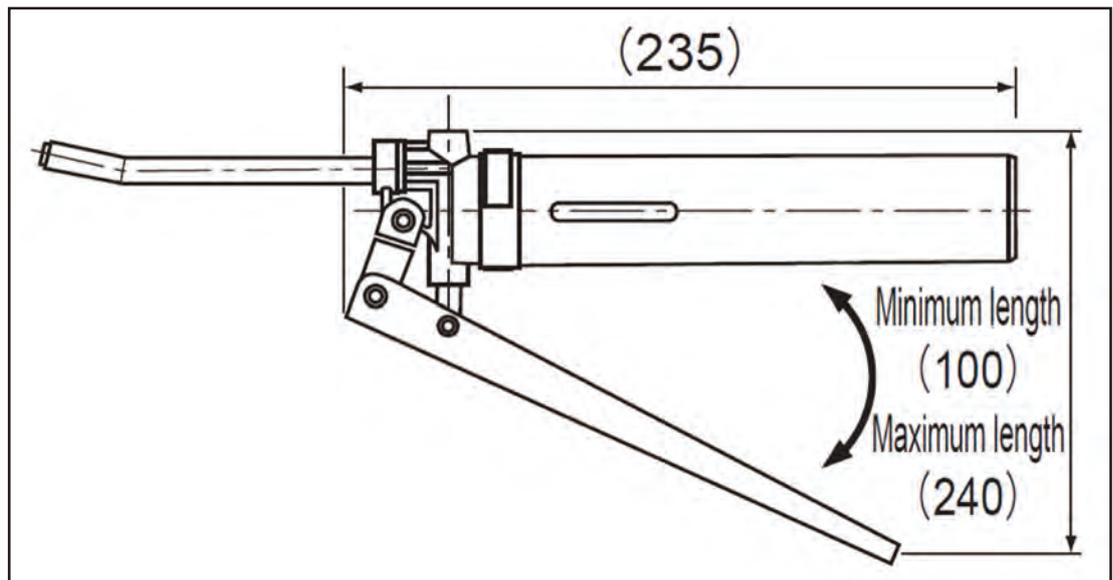


Fig. 6 Appearance of the grease gun

Fig. 7 shows the shapes of the nozzles and attachment for the grease gun used for lubrication.

* It allows you to supply grease to a part difficult to lubricate (by dropping grease onto the raceway) by using the P type attachment.

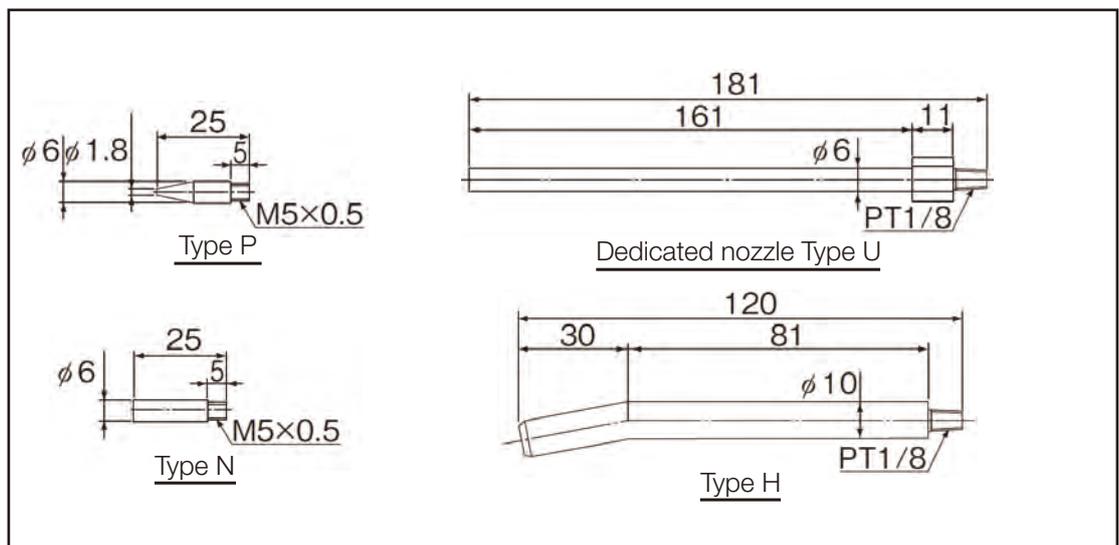


Fig. 7 Shapes of the nozzle and attachment for the grease gun

Appendix

Revision history

The instruction manual No. is described on the back cover.

Date of issue	Instruction manual No.	Details
9/2014	No.2050-1(0)E	First edition
5/2015	No.2050-1(1)E	Errors corrected
1/2016	No.2050-2(0)E	Additional model numbers Additional options Errors corrected
8/2016	No.2050-3(0)E	Additional model numbers
2/2017	No.2050-3(1)E	Errors corrected
1/2018	No.2050-4(0)E	Errors corrected



THK Electric Actuator Compact Series

KSF

INSTRUCTION MANUAL