



THK Electrical Actuator Universal Series

US/USW

INSTRUCTION MANUAL

No.3050-2(0)E

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1. Introduction

1. Introduction

1-1

Acknowledgment

Thank you for purchasing our product.

This product is a high speed, high load capacity and long service life actuator.

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 custom products. However, the descriptions provided in the delivery specification drawings or delivery specification documents of those custom products take precedence over this manual.

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

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 the driver controller to be used is TLC or THC. Please note that driver controllers other than the above cannot be used.

1-4 About product support

For the following information, please contact THK.

- Technical support for this product

1-5 About related instruction manuals

- When you use the actuator US/USW, read the following instruction manuals as necessary.

When using driver controller TLC/THC

- | | |
|---------------------|-----------------------|
| ● Controller series | Driver controller TLC |
| ● 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: <https://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

It indicates that erroneous handling may cause death or serious injury to a person.



CAUTION

It indicates that erroneous handling may cause injury to a person or property damage only.



It indicates prohibitions (“don’t”).



It indicates 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.**

You might touch the moving part and get injured.

- **While the motor or sensor is energized, do not move or install this product.**

Doing so 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.



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

Doing so may cause your hand to be caught and injured.

2. Safety Precautions

WARNING



■ Maintenance

- **Turn off the machine (turning OFF the power) before performing maintenance.**
Failure to do so may cause electric shocks, or cause malfunction that could lead to injury.
- **If two or more people are involved in the maintenance work, confirm the procedure, signs and actions to cope with anomalies or the like in advance, and separately appoint a person for monitoring the work.**
Failure to do so may cause an unexpected accident.

CAUTION



■ General

- **Do not stand on this product or the packaging box.**
Doing so may cause fault or damage, or cause falling that could lead to injury.
- **Do not impact this product.**
Doing so may cause fault or damage, or injure you.
- **Do not apply a load that exceeds the permissible level.**
Doing so 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.**

Doing so may cause foreign material to enter the product, which could result in fault or adversely affect the performance or service life, or may cause abnormal operation that could lead to injury.



■ Unpacking

- **Be careful not to hit your hands or body against protruded parts.**
Failure to do so may injure you, 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.**
Doing so may cause injury or fracture, or a functional loss.
- **When transporting this product, do not hold any moving part or the cover.**
Also, do not hold US6T/6RT/8T/8RT by pressing the side covers from both sides.
Doing so may cause the product to fall, leading to injury, or cause fault or fracture.
- **When transporting this product, do not hold the motor, the sensor or the cable.**
Doing so 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 (top cover, side cover, end cap, motor, etc.).**

Note) This hoisting work should be carried out only by a qualified personnel wearing protective equipment (helmets, safety shoes, etc.).

Failure to do so may cause the product to fall, leading to injury, or cause fault or fracture.

2. Safety Precautions

CAUTION



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

Failure to do so may cause the product to fall, leading to injury, or cause fault or fracture.

* We provide the hanging jig for USW as an option.

We recommend to attach a hanging jig when the actuator main unit has the weight of 20 kg or more. For the details, see **9. Appendix Hanging Jig (→ P.9-1)**.

* For more information on the weight of the product, see the general catalog of THK electrical actuators.



■ 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.



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

Doing so may cause fault or damage, or may cause abnormal operation that could lead to injury. For your reference, see **the specification (→ P.4-1 to 4-2)**, which contains the maximum speed for each model number at each stroke.

- **Do not use the defected or fractured product.**

Doing so may cause injury or machine failure.

2. Safety Precautions

2-3

Checking the precautions/instruction labels

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

Figs.1 to 4 show the affixing positions.

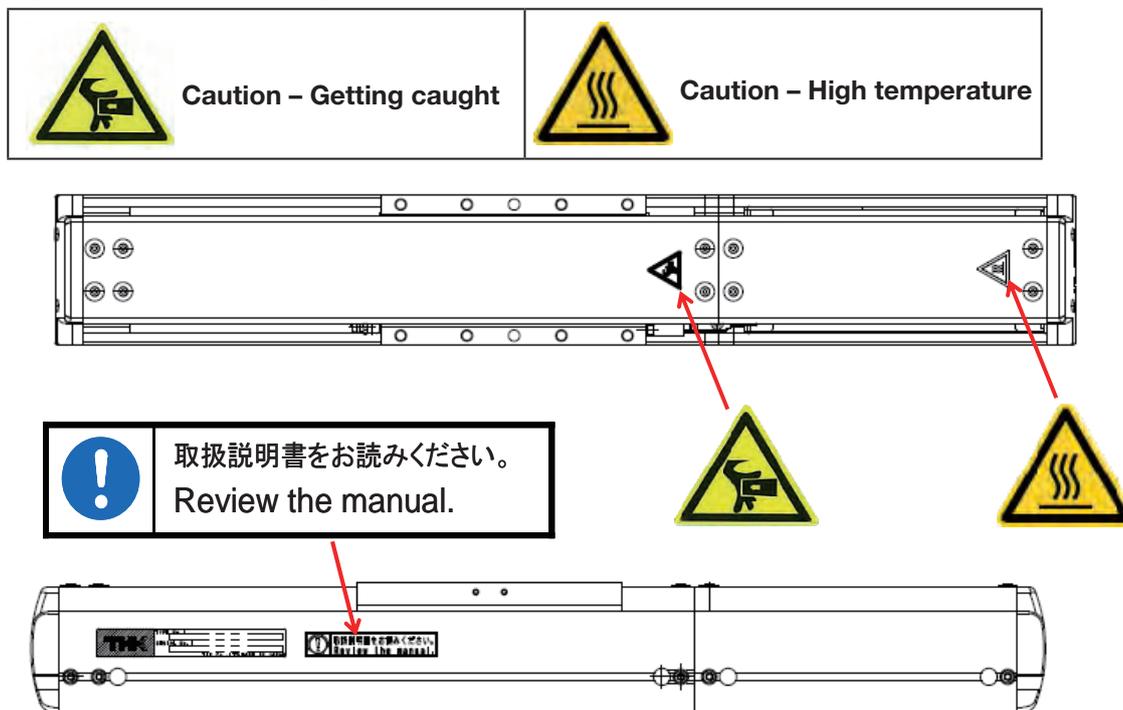


Fig.1 US6T/8T precautions/instruction labels affixing positions

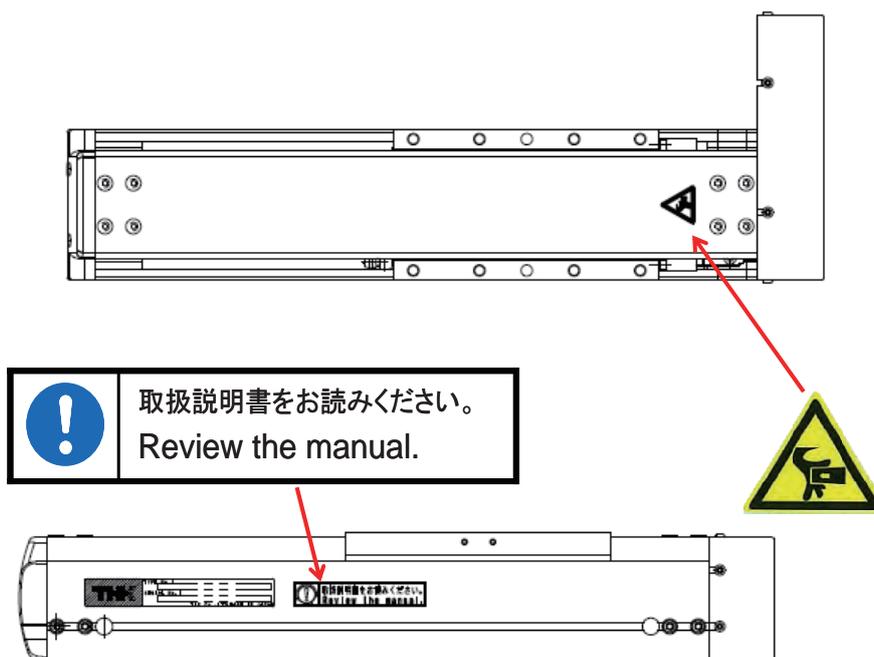


Fig.2 US6RT/8RT precautions/instruction labels affixing positions

2. Safety Precautions

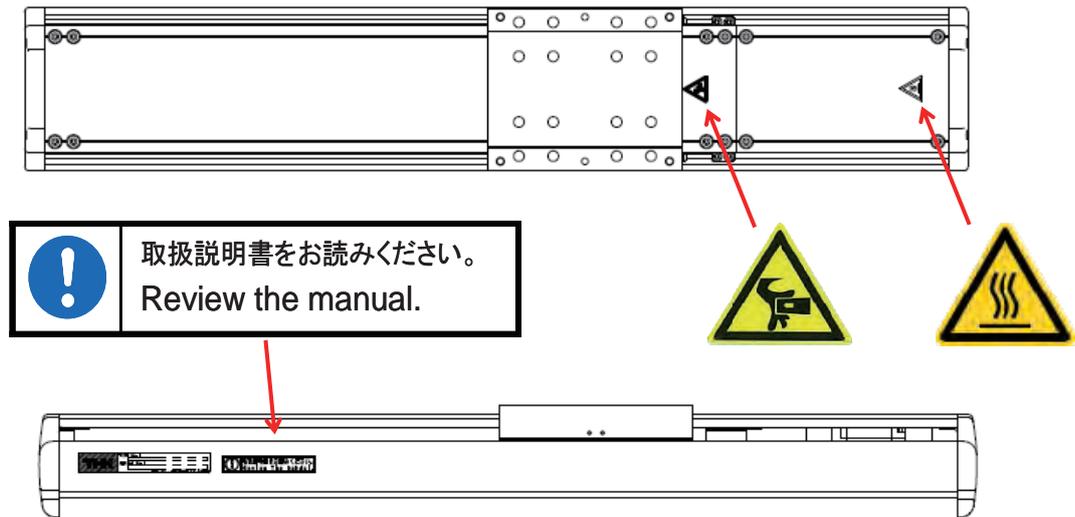


Fig.3 USW12T/16T/20T precautions/instruction labels affixing positions

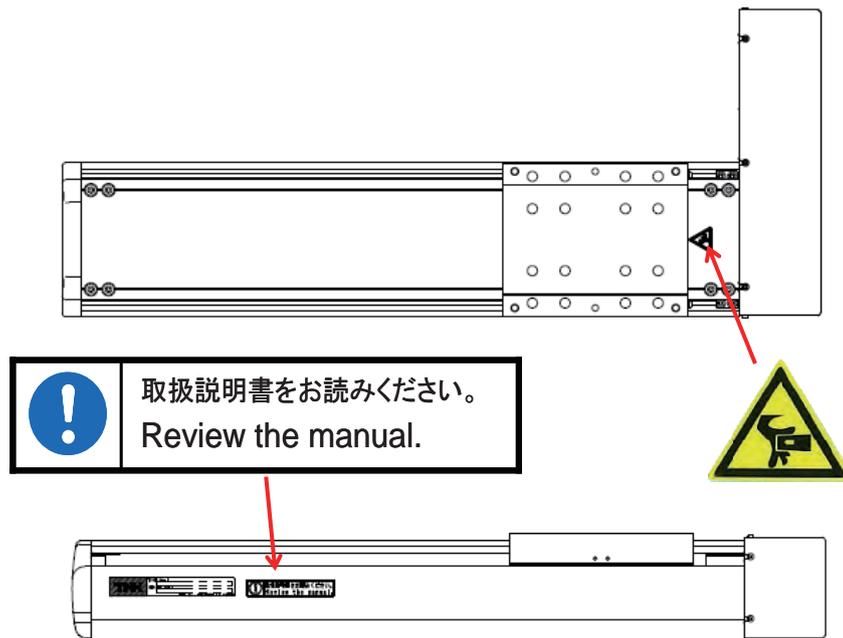


Fig.4 USW12RT/16RT/20RT cautions/instruction affixing positions

3. Nameplates display

3-1 Nameplates display and serial number

Fig. 5 and 6 show the nameplate format of Universal Series US/USW.

TYPE No.: Actuator model number

SERIAL No.: Manufacturing number

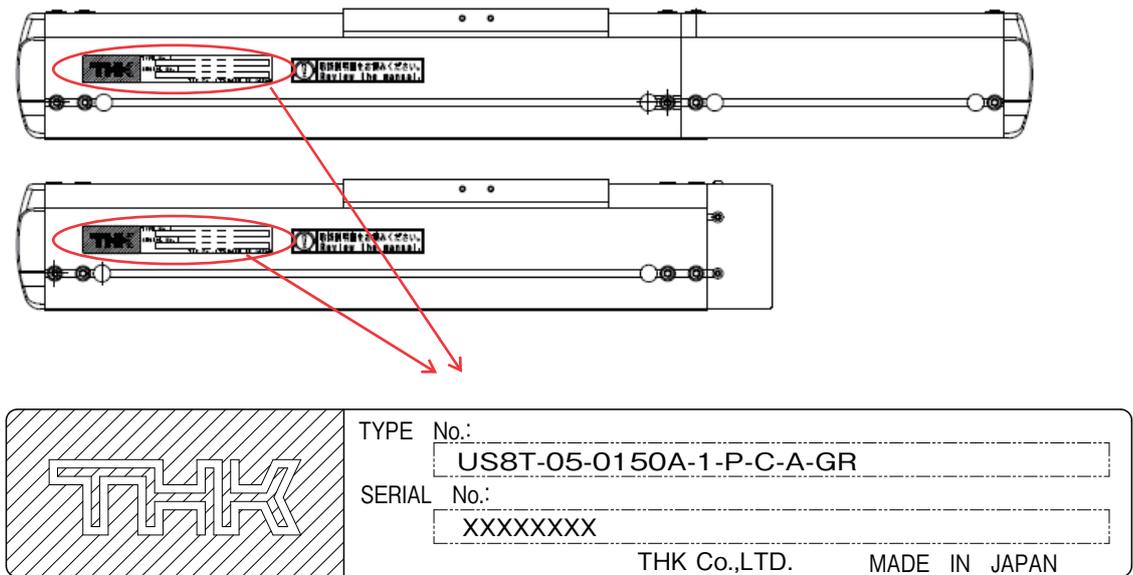


Fig.5 US Nameplate details

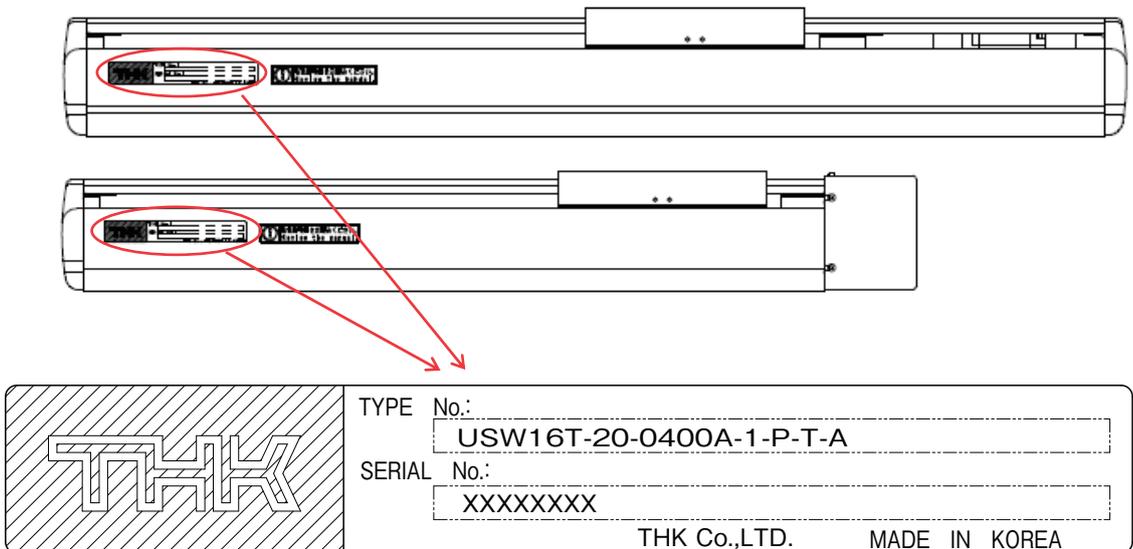


Fig.6 USW Nameplate details

4. Specification

4. Specification

4-1 The basic specification

The basic specification of US/USW is shown as follows. Do not exceed the following basic specification when using the product. Failure to do so may cause fault or damage, or may cause abnormal operation that could lead to injury.

When Controller TLC/THC is used/without motor specification

Model	Ball screw Lead [mm]	Stroke [mm]	Motor Rated output [W]	Maximum load capacity ^{*1} [kg]		
				Horizontal mount	Wall mount	Vertical mount
US6	6	100 to 900	50	30	30	7
	12			15	15	3
	6		100	70	33	14
	12			30	30	7
US8	5	100 to 1100	100	80	53.5	16*2
	10			40	40	8
	20			20	20	4
	30			8	8	2
	10		150	60	53	12
	20			30	30	6
	30			12	12	3
	5			200	100	100
10	80	80	20			
20	40	40	8			
30	25	25	5			
USW16	10	100 to 1500	400	120	120	35
	20			80	80	15
	40			40	40	9
USW20	20	200 to 1700	750	130	130	37
	40			70	70	20

*1 The value when the acceleration/deceleration rate is 0.3G.

*2 The value when the acceleration/deceleration rate is 0.2G.

4. Specification

4. Specification

When Controller TLC/THC is used/without motor specification

Model	Ball screw Lead [mm]	Stroke [mm]	Maximum speed at each stroke ^{*3} [mm/s]																		
			Stroke [mm]																		
			~600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700							
US6	6	100 to 900	360	310	270	240	210	180	160												
	12		720	630	550	480	420	370	330												
	6		360	310	270	240	210	180	160												
	12		720	630	550	480	420	370	330												
US8	5	100 to 1100	300	290	250	220	200	180	160	150	130	120									
	10		600	550	480	430	380	340	310	280	250	230									
	20		1200	1090	960	850	760	680	610	560	510	460									
	30		1800	1600	1410	1250	1120	1000	910	820	750	690									
	10		600	550	480	430	380	340	310	280	250	230									
	20		1200	1090	960	850	760	680	610	560	510	460									
USW12	5	100 to 1100	300	270	240	210	190	170	150	140	130	120									
	10		600	580	510	450	400	360	320	290	260	240	220								
	20		1200	1160	1020	900	800	720	640	580	530	480	440								
	30		1800	1700	1490	1320	1180	1050	950	860	780	720	660	600	550	510	480				
USW16	10	100 to 1500	550	520	470	420	380	340	310	290	250	240	230	210	190	180	170	160			
	20		1000	1040	930	840	760	700	640	590	540	500	460	430	400	380	350				
	40		2000	1970	1780	1610	1470	1340	1230	1130	1050	970	900	840	780	730	690				
USW20	20	200 to 1700	1100	1010	910	820	750	680	620	570	530	490	460	420	400	370	350	330	310	290	270
	40		2200	2140	1920	1730	1570	1430	1310	1210	1110	1030	950	890	830	770	720	680	640	600	570

*3 The maximum speed is restricted by the permissible rotational speed of the ball screw.

4. Specification

4. Specification

4-2

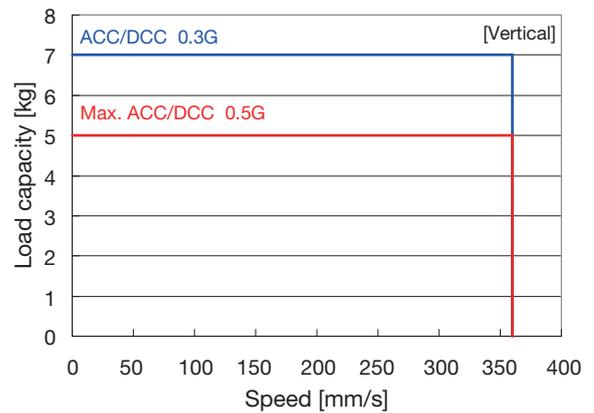
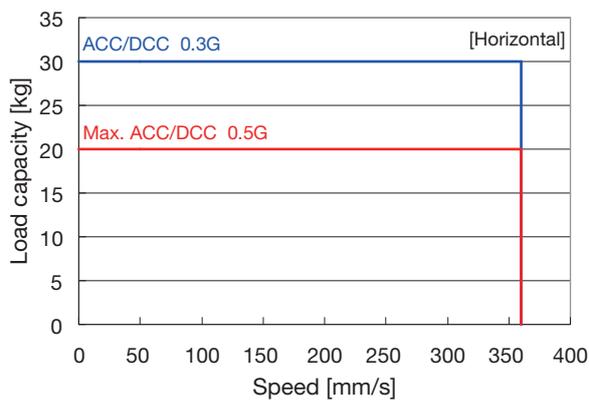
Speed and load capacity characteristic diagram

Load capacity and maximum speed vary with usage conditions.
Use the product within the range of following characteristic diagram.

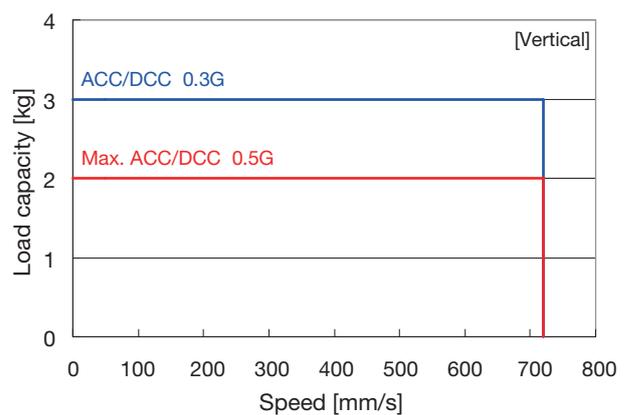
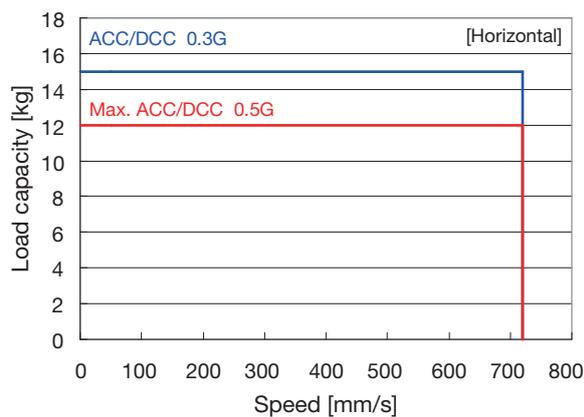


US6(50W).....When controllerTLC is used

○ Lead 6 mm



○ Lead 12 mm



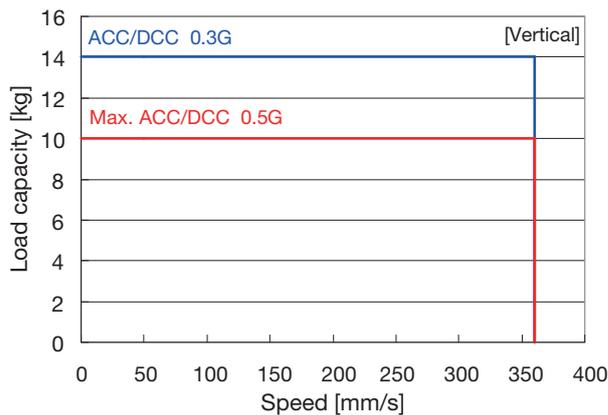
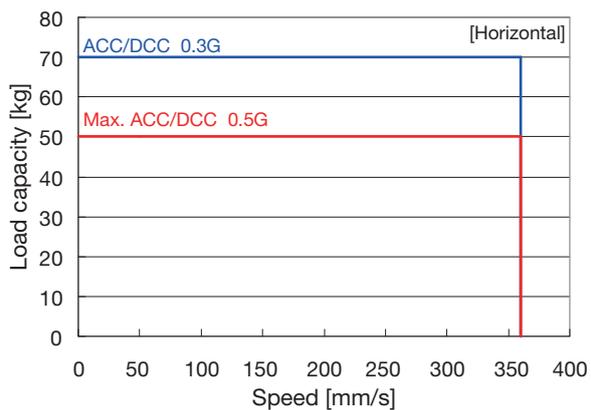
4. Specification

4. Specification

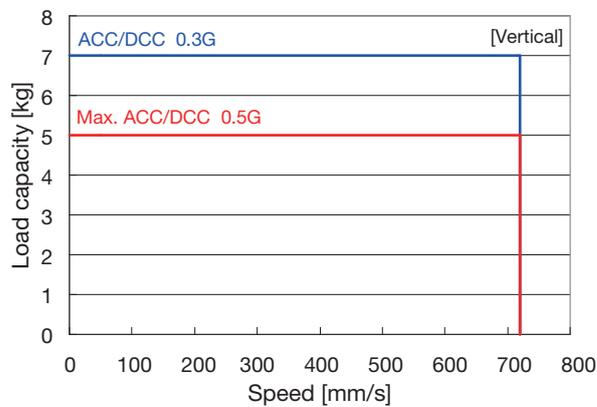
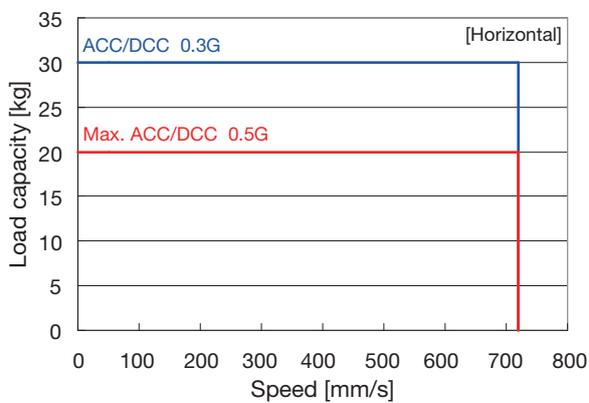


US6(100W).....When controller THC is used

○ Lead 6 mm



○ Lead 12 mm



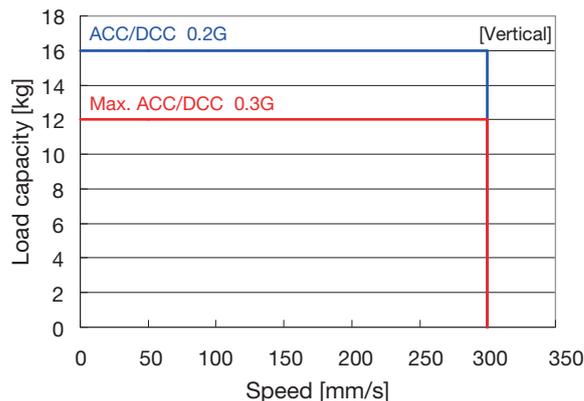
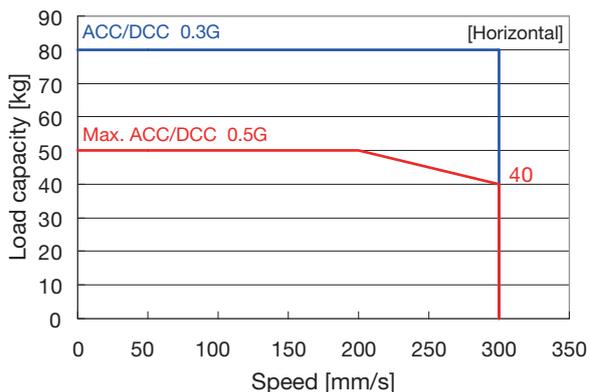
4. Specification

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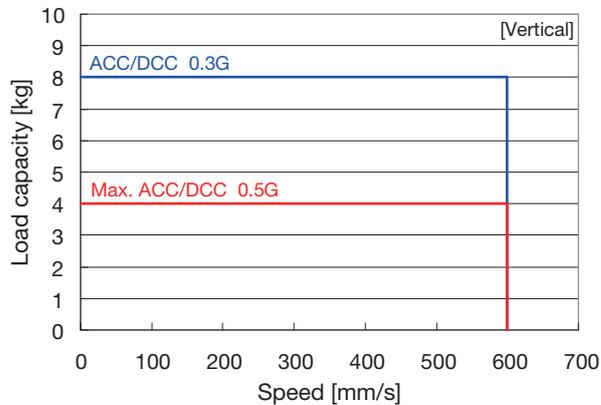
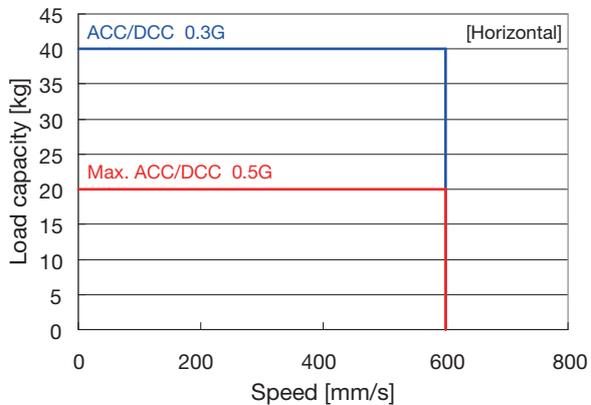


US8(100W).....When controller THC is used

○ Lead 5 mm



○ Lead 10 mm



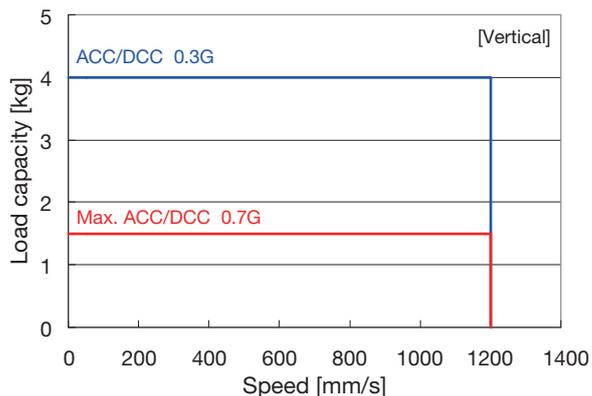
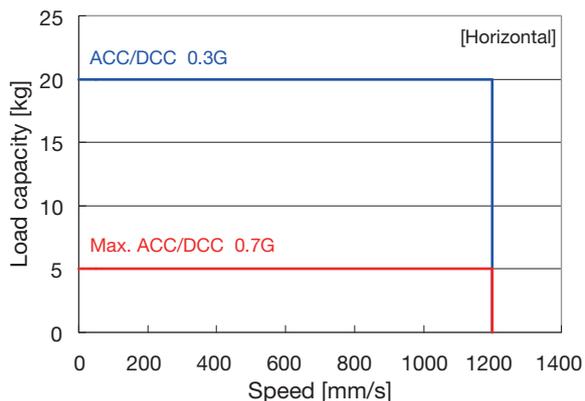
4. Specification

4. Specification

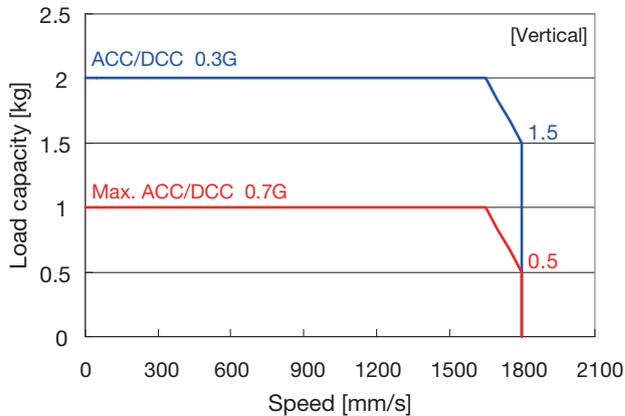
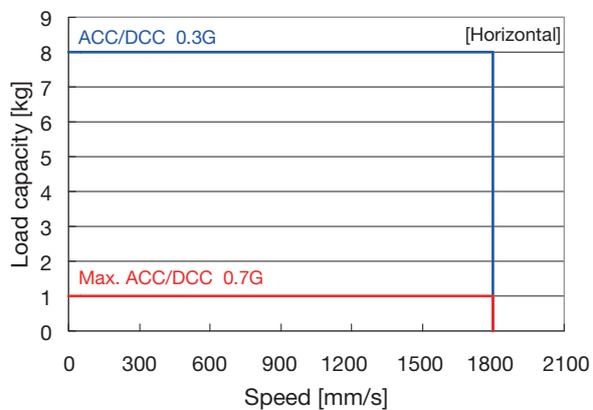


US8(100W).....When controller THC is used

○ Lead 20 mm



○ Lead 30 mm



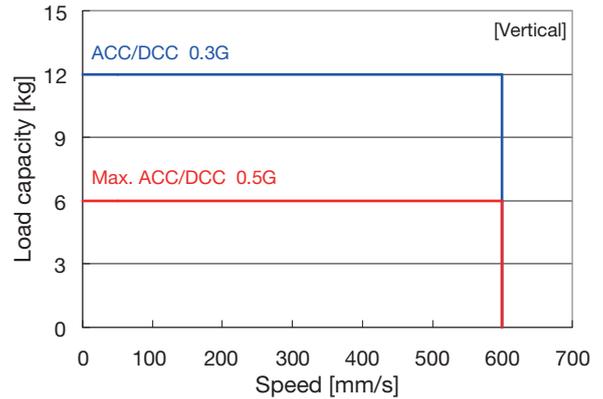
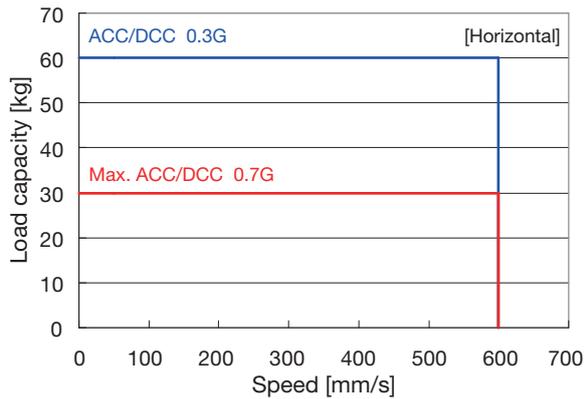
4. Specification

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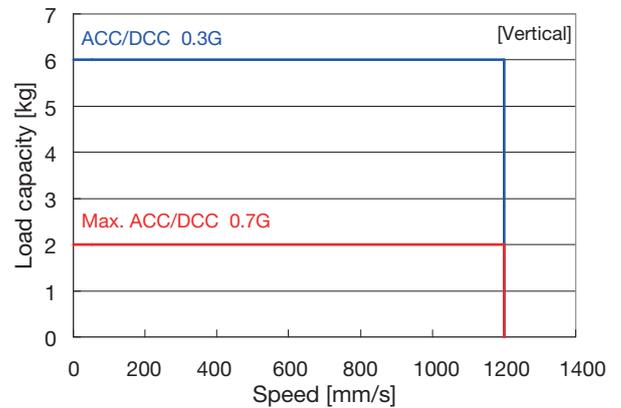
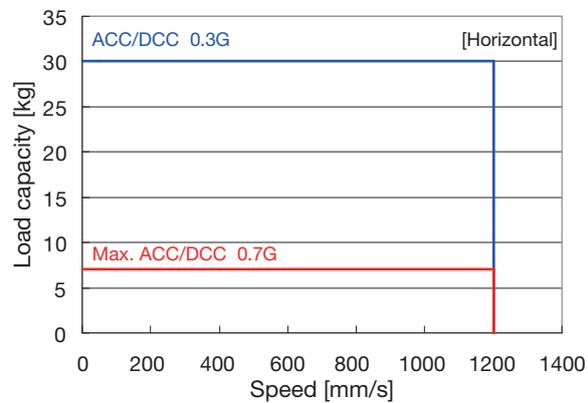


US8(150W).....When controllerTHC is used

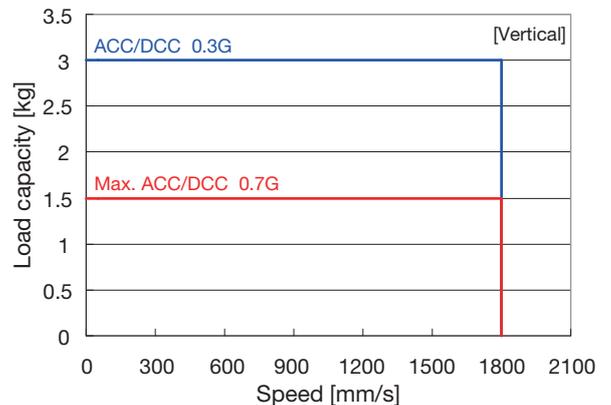
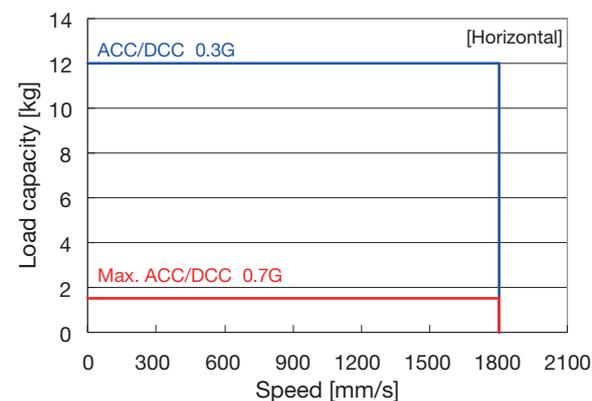
○ Lead 10 mm



○ Lead 20 mm



○ Lead 30 mm



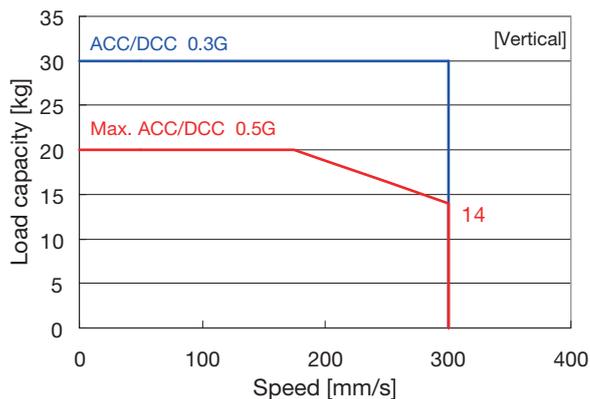
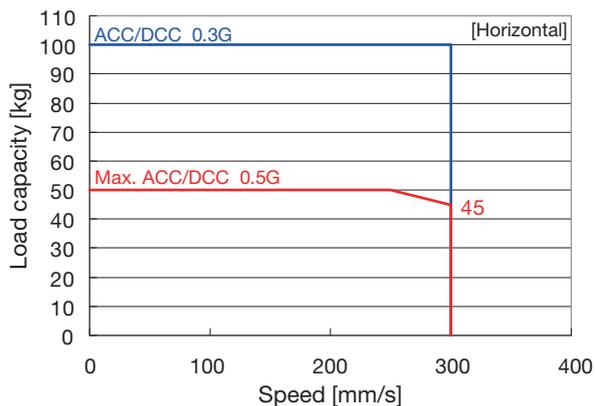
4. Specification

4. Specification

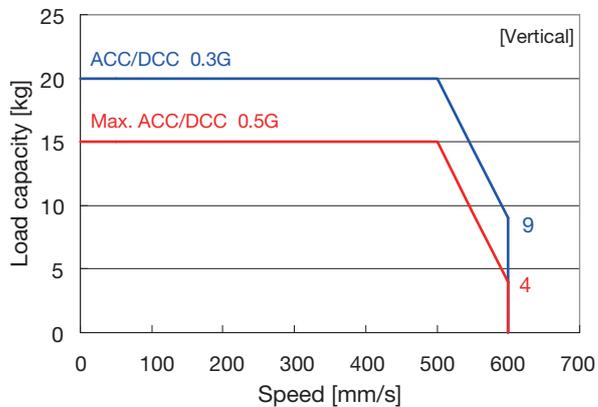
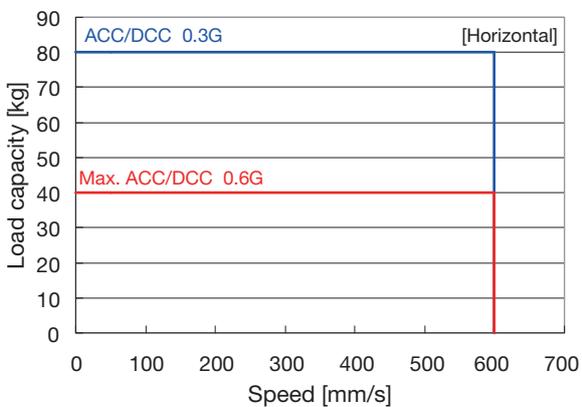
USW12.....When controller THC is used



○ Lead 5 mm



○ Lead 10 mm



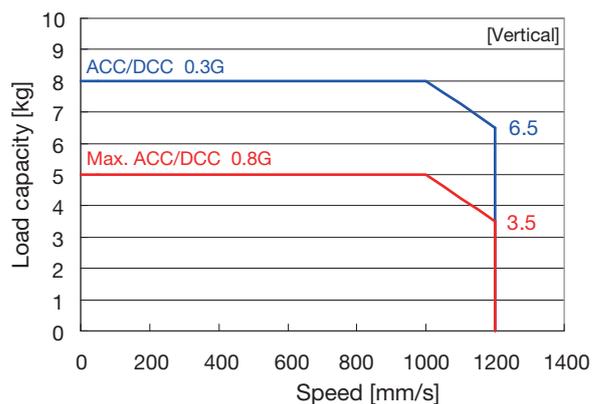
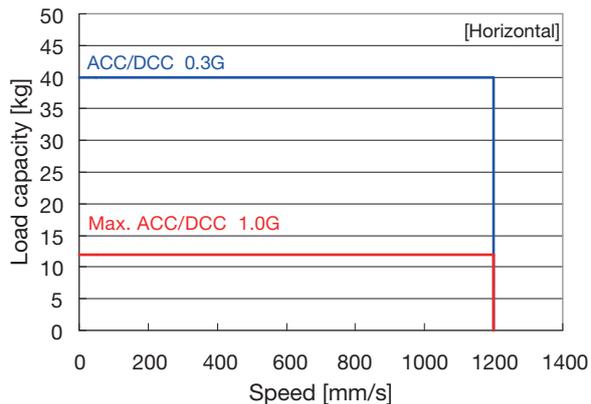
4. Specification

4. Specification

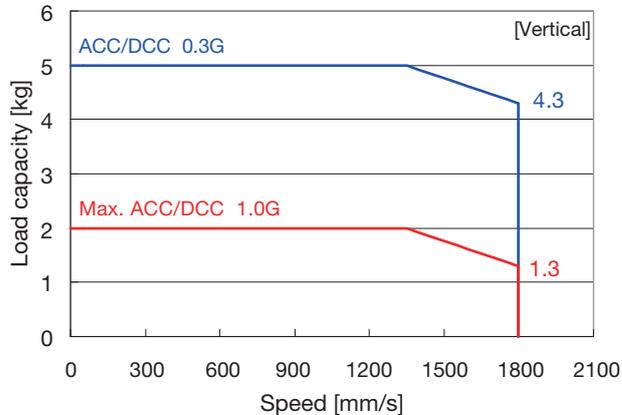
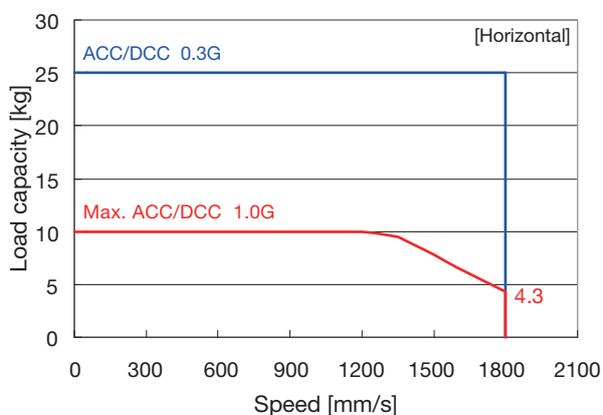
USW12.....When controller THC is used



○ Lead 20 mm



○ Lead 30 mm



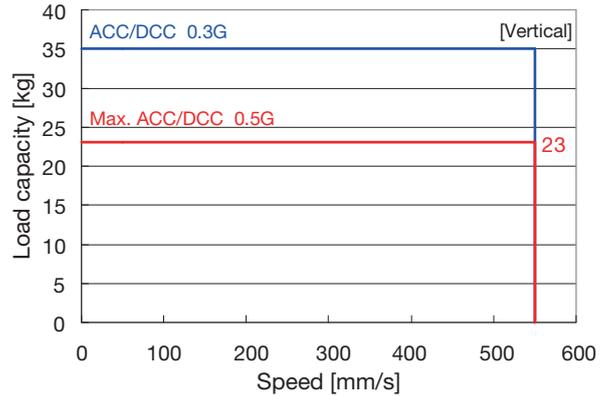
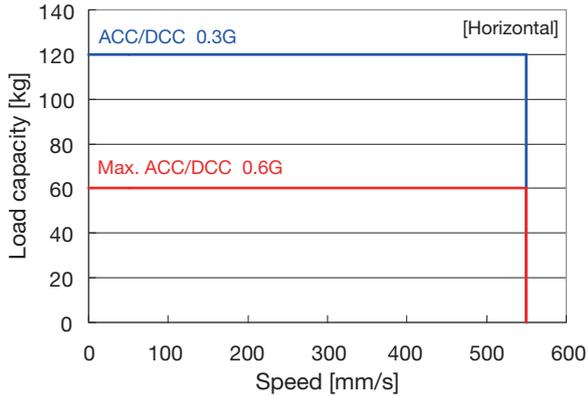
4. Specification

4. Specification

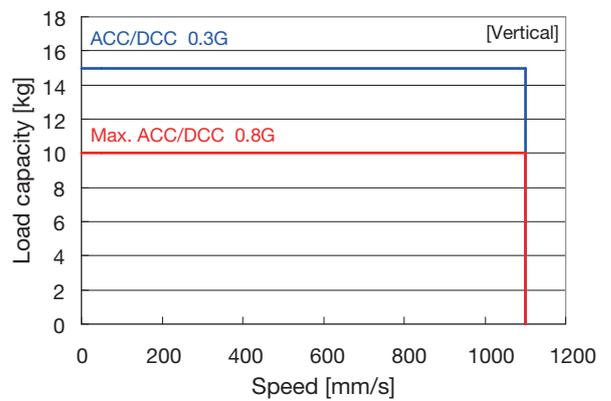
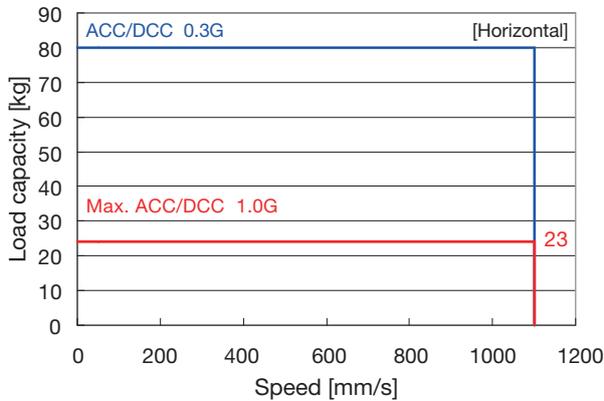
USW16.....When controller THC is used



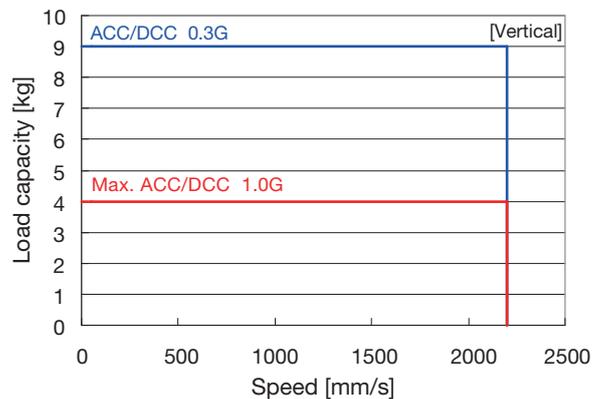
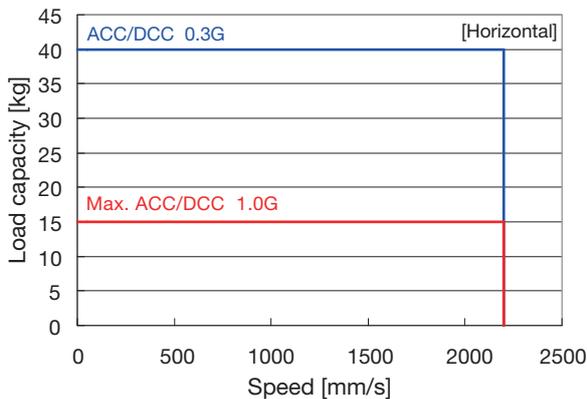
○ Lead 10 mm



○ Lead 20 mm



○ Lead 40 mm



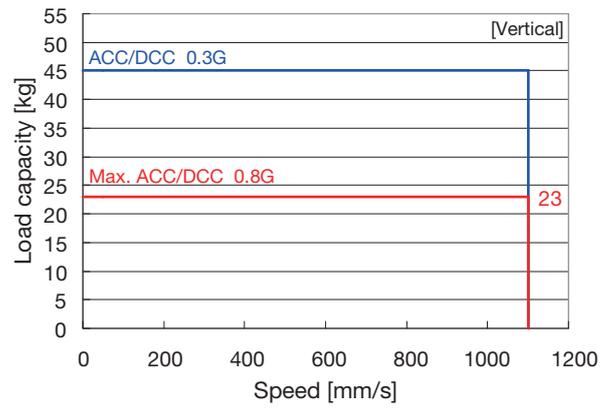
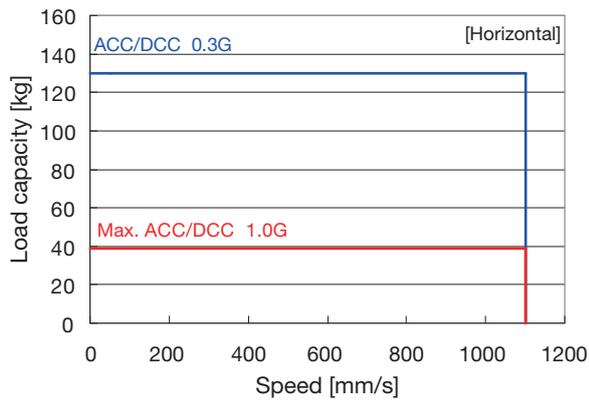
4. Specification

4. Specification

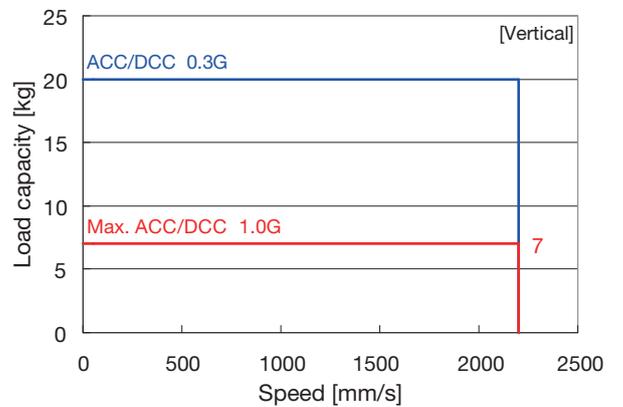
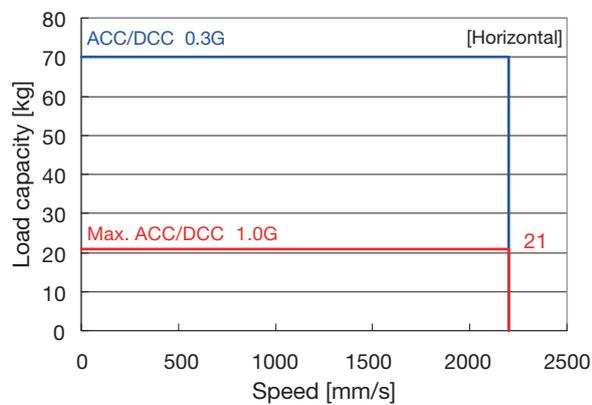
USW20.....When controller THC is used



○ Lead 20 mm



○ Lead 40 mm



5. Structure and Model Numbers

5-1 Structure and part names

The name of each part of this product is shown in Figs.7 - 10.

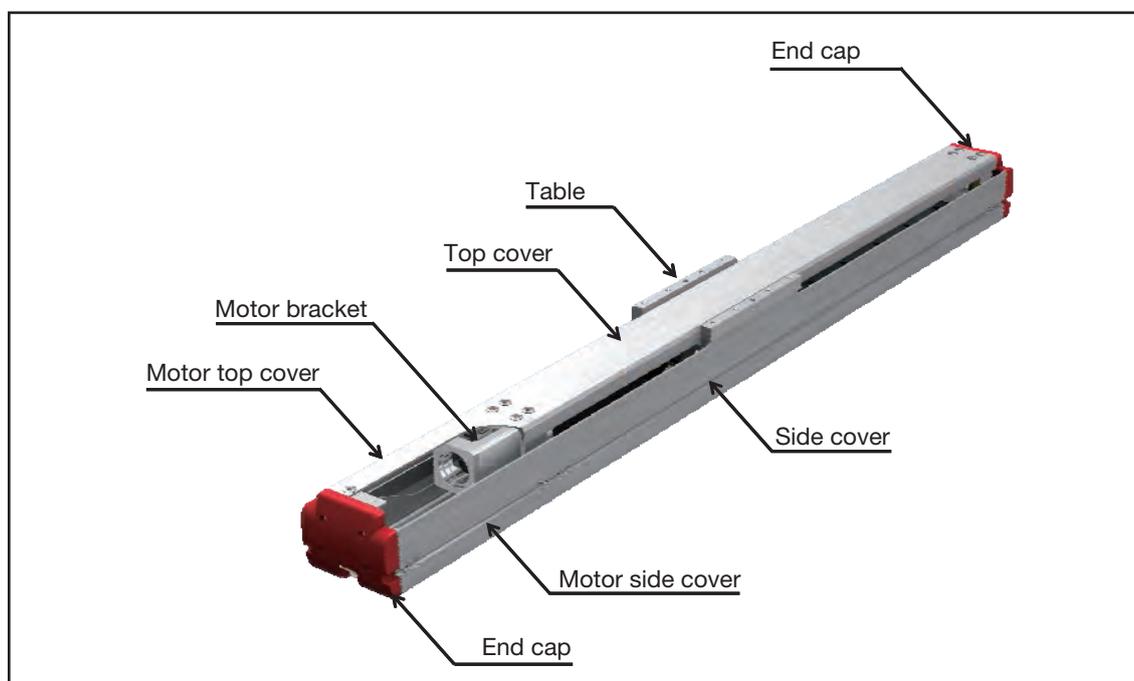


Fig.7 Structure and part names of US6T/8T

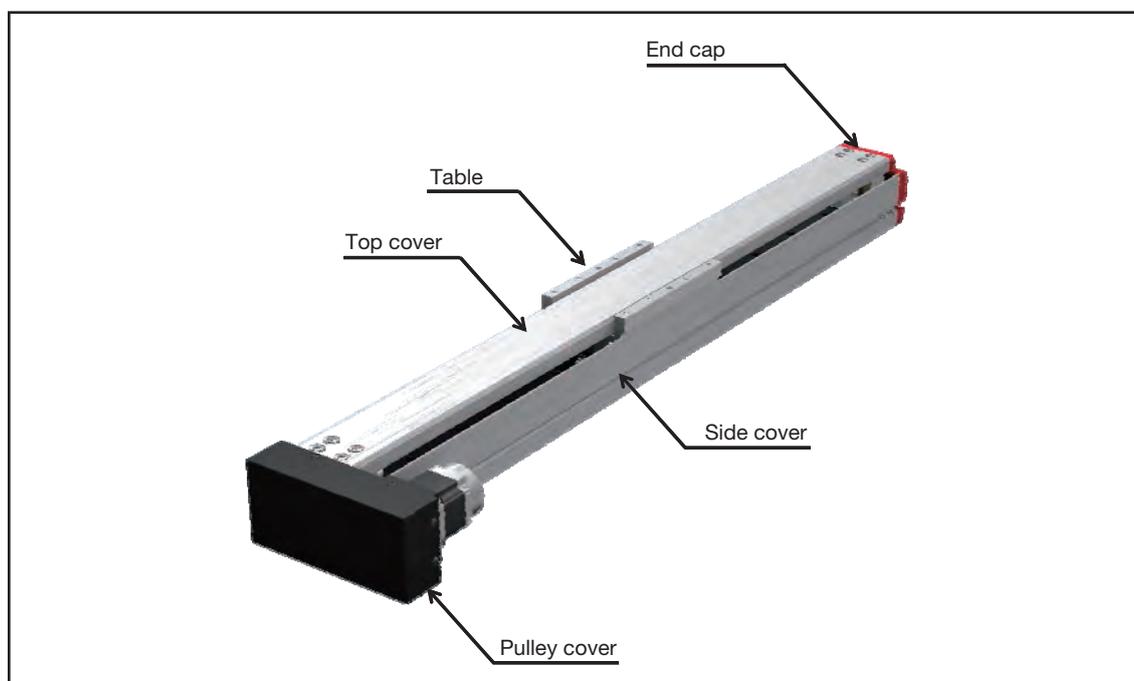


Fig.8 Structure and part names of US6RT/8RT

5. Structure and Model Numbers

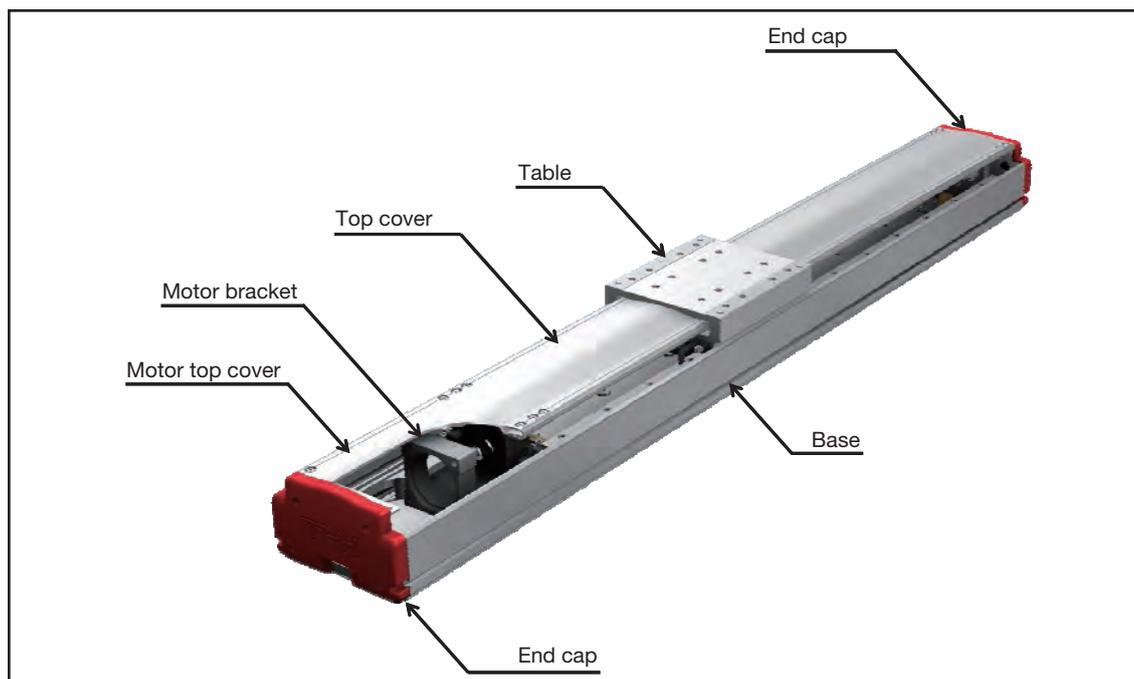


Fig.9 Structure and part names of USW12T/16T/20T

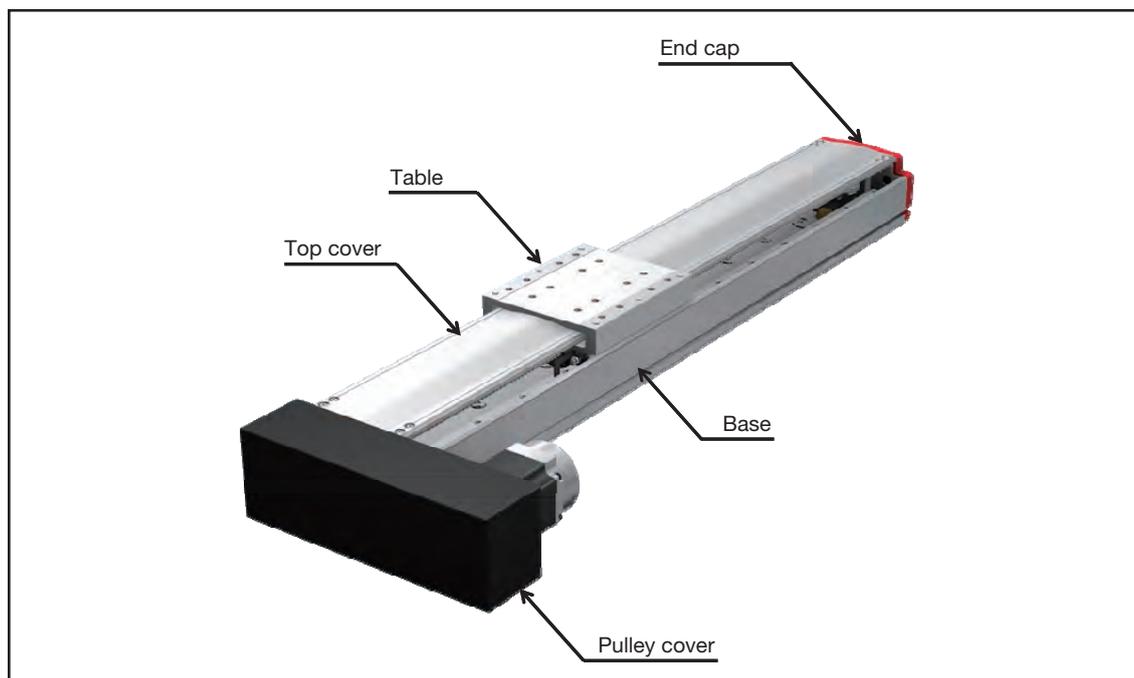


Fig.10 Structure and part names of USW12RT/16RT/20RT

* For details such as the dimensions and accuracy, see the delivery specification drawings or general catalog of THK electrical actuators.
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.

USW12RT – 05 – 0150 A – TH – 6 – SR – C – A – MR – GR /
 (1) (2) (3) (4) (5) (6) (7) (8) (9) (10)

(1) Model number	US6T, US8T, USW12T, USW16T, USW20T (direct motor coupling) US6RT, US8RT, USW12RT, USW16RT, USW20RT (motor return)
(2) Ball screw lead	05: 5 mm, 06: 6 mm, 10: 10 mm, 12: 12 mm, 20: 20 mm, 30: 30 mm, 40: 40 mm Ball screw leads you can select differ depending on the model number. US6: "06", "12" US8: "05", "10", "20", "30" USW12: "05", "10", "20", "30" USW16: "10", "20", "40" USW20: "20", "40" With 150W US8, ball screw lead "05" cannot be selected.
(3) Stroke	0150: 150 mm (100 to 1700 mm, 50 mm pitch) Maximum stroke = US6: 900, US8: 1100, USW12: 1100, USW16: 1500, USW20: 1700 Note) US6 maximum stroke is up to 900 mm for horizontal and vertical mount specifications, and up to 800 mm for wall mount specification.
(4) Design symbol	A
(5) With or without a motor/ control device type	0: Without motor 0B: Without motor (with brake) 1: With motor (Prepared by THK) 1B: With motor (Prepared by THK, with brake) When "0" or "0B" is selected Direct coupled specification: Coupling is not provided. Motor return specification: Timing pulley and timing belt are provided. When "1" or "1B" is selected Direct coupled specification: Mounting parts ... Motor, coupling, power cable, encoder cable, electromagnetic brake cable Motor return specification: Mounting parts... Motor, timing belt, timing pulley Included parts ... Power cable, encoder cable, electromagnetic brake cable Please select motor, coupling, and cables yourself. When "TL", or "TH" is selected Direct coupled specification: Mounting parts ... Motor, coupling Included parts ... Power cable, encoder cable, electromagnetic brake cable Motor return specification: Mounting parts... Motor, timing belt, timing pulley Included parts ... Power cable, encoder cable, electromagnetic brake cable Control device you can select differ depending on models. US6T/US6RT: TLC / THC US8T/US8RT: THC USW12T/USW12RT: THC USW16T/USW16RT: THC USW20T/USW20RT: THC

5. Structure and Model Numbers

(6) Sensor	P, Q, N, 6, E, J, M
(7) Sensor mounting position	No symbol: When P, Q, or N is selected SR: On right side as seen from side A SL: On left side as seen from side A
(8) Base mounting method	T: From underside of base (tapped holes) C: From top of base (counter-bore holes) For US6 and US8, you can select only "C".
(9) Motor bracket	A, B, C When "TL", or "TH" is selected for with or without a motor/control device type, please select "A".
(10) Options	No symbol: None MR: Motor right side return ML: Motor left side return GR: Change the cover color to gray HG: Hanging jig
(1) When motor return is selected in the model number, please select either "MR" or "ML".	

5. Structure and Model Numbers

When "TL" is selected, you must designate (11) to (13) and (15).

When "TH" is selected, you must designate (11) to (15).

M20 **R** **S02** **D2** **H5** **(11)** **(12)** **(13)** **(14)** **(15)**

(11) Motor rated output

M05: 50W

M05B: 50W with brake

M10: 100 W

M10B: 100W with brake

M15: 150W

M15B: 150W with brake

M20: 200W

M20B: 200W with brake

M40: 400W

M40B: 400W with brake

M75: 750W

M75B: 750W with brake

When "TL" is selected, only "M05" and "M05B" can be selected.

When "TH" is selected, only "M15" and "M15B" can be selected.

(12) Motor cable direction

No symbol: In the case of direct
motor coupling

L: Left

D: Down

R: Right

U: Up

When "MR" is selected as an option, "R" cannot be selected.

When "ML" is selected as an option, "L" cannot be selected.

When "U" is selected, note that the motor connector may be placed above the level of the top face of the slider.

(13) Home position

No symbol: When sensor "P" or "Q" is selected

S02: Motor side home position (home position sensor)

S03: Reverse motor side (home position sensor)

D00: Motor side home position (stopper)

R00: Reverse motor side home position (stopper)

(14) Power supply voltage

No symbol

D1: 100 V

D2: 200 V

"D1" and "D2" are attributes when controllers THC are selected.

(15) Cable type and length

F3 : 3 m standard

FA : 10 m standard

F5 : 5 m standard

H3 : 3 m high flex

H5 : 5 m high flex

HA : 10 m high flex

Lengths for motor cable, motor electromagnetic brake cable (only when designating motor with electromagnetic cable), encoder cable, home position/limit sensor, and sensor cable.

Cables you can select differ depending on controllers.

TLC/THC: "F3", "F5", "FA", "H3", "H5", "HA"

6. Storage and Transportation

6-1

Precautions to be observed for safe use

CAUTION



- **Do not drop or hit this product.**
Doing so may cause injury or fracture, or a functional loss.
- **When transporting this product, do not hold any moving part or the cover.**
Doing so may cause the product to fall, leading to injury, or cause fault or fracture.

CAUTION



- **When transporting this product, do not hold the motor, the sensor or the cable.**
Doing so 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 (side cover, end cap, motor, etc.).**
Note) This hoisting work should be carried out only by a qualified personnel wearing protective equipment (helmets, safety shoes, etc.).
Failure to do so may cause the product to fall, leading to injury, or cause fault or fracture.



- **When carrying this product, hold the bottom face of the aluminum base. Most models of this product are heavy articles (20 kg or heavier). Two or more people should hold the product as necessary.**
Failure to do so may cause the product to fall, leading to injury, or cause fault or fracture.
* We provide the hanging jig for USW as an option.
We recommend to attach a hanging jig when the actuator main unit has the weight of 20kg or more. For the details, see **9. Appendix Hanging Jig (→ P.9-1)**.
* For more information on the weight of the product, see the general catalog of THK electric actuators.

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 at ambient temperature within the following storage temperature range:
Storage temperature : 0 °C to 50 °C
(Ambient humidity 80% RH or less, no freezing or condensation)
* With the product unpacked
 - Place with non-corrosive gas nor flammable gas
 - Place with little dust, salt or metallic powder
 - Place where water, oil or chemical can not contact the product
 - Place where a vibration or shock does not transmit to the main unit
- **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, since failure to do so 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.**

Doing so 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 exceed the permissible rotation speed when using the product.**

Doing so may cause fault or damage. Or may cause abnormal operation that could lead to injury. Also, see the appendix, which contains the permissible rotation speed for each model number.

- **Do not use the defected or fractured product.**

Doing so may cause injury or machine failure.

7. Installation and Operation

7-2

Precautions to be observed for prevention of product fault or fracture



- **Since using in an adverse service environment may cause fault, use the product in the environment described below.**
 - Place at the following operating temperature range
Operating temperature: 0°C to 40°C (ambient humidity 80% RH or less, no freezing or condensation)
* If you desire to use the product outside of the operating temperature range, contact THK.
 - Place with non-corrosive gas nor flammable gas
 - Place with little dust, salt or metallic powder
 - Place where water, oil or chemical can not contact the product
 - Place where a vibration or shock does not transmit to the main unit
- **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 material such as dust or metallic powder from entering the product since it may cause abnormal wear or shorten the service life.**
If foreign material may 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 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.**



- **Do not let the table collide the stopper.**
→ Collision to do so may cause fault or fracture.



- **Anti-rust oil is applied on the product. Thoroughly wipe off the oil before operating the product. In addition, supply grease after trial run, and then use the product.**
The standard models contain the following greases.

US: THK AFA Grease

US (from October 1, 2014, on): LM guide portion: THK AFA Grease
Ball screw portion: THK AFF Grease

USW: THK AFB-LF Grease



- **The photomicro sensors do not have a waterproof or dustproof 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.**

* Optional sensors

· EE-SX674: OMRON Corporation

7. Installation and Operation

7-3

Other precautions

- **If using 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 or aluminum 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

- APM-D3A1, APM-D3B1: Azbil Corporation
- 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 catalog 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 clamp bolt.

* The maximum outer diameter of usable couplings [mm]

- US6T/8T: ϕ 27
- USW12T: ϕ 43
- USW16T/20T: ϕ 47

7. Installation and Operation

7-4 Motor bracket (detail)

US/USW have the motor covered. If using a motor not indicated in the catalog, please confirm that the motor does not cause interference. For details of the motor bracket, please confirm with Figs. 11 to 15. Dimensions when brake is installed are shown in parentheses.

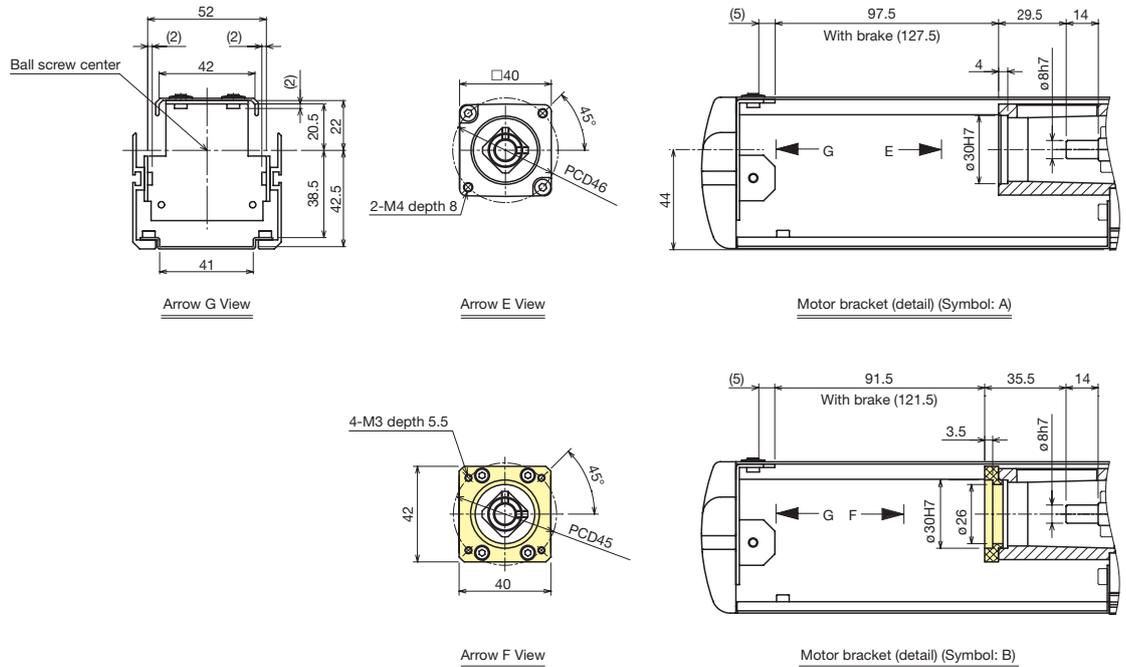


Fig. 11 US6T motor bracket

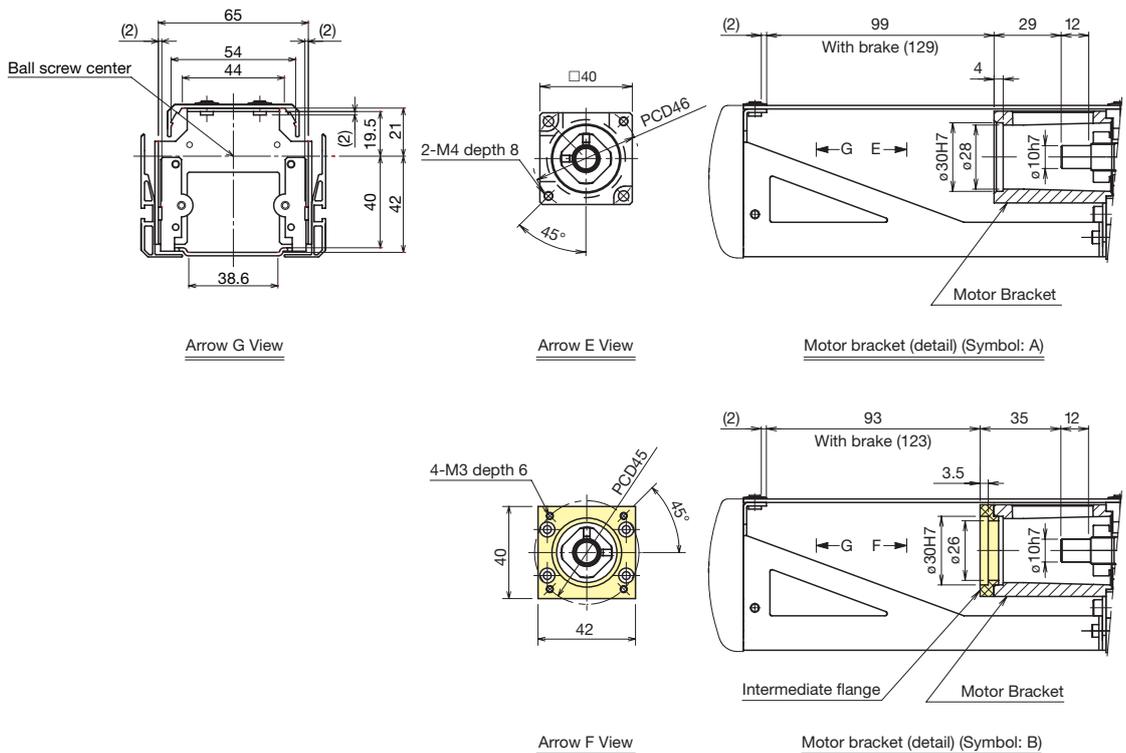


Fig. 12 US8T motor bracket

7. Installation and Operation

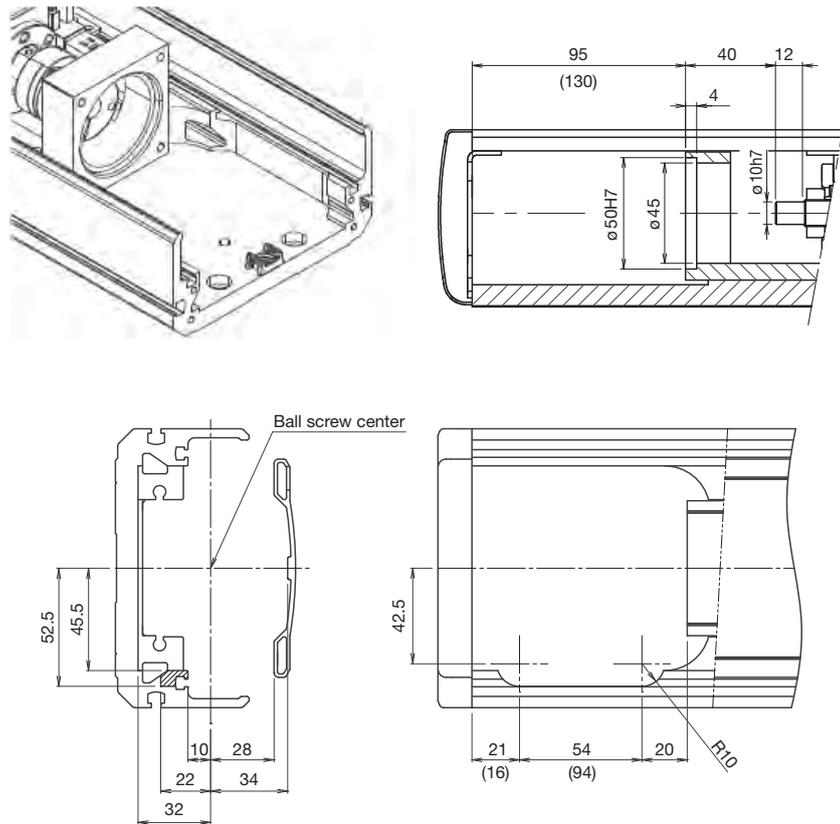


Fig. 13 USW12T motor bracket

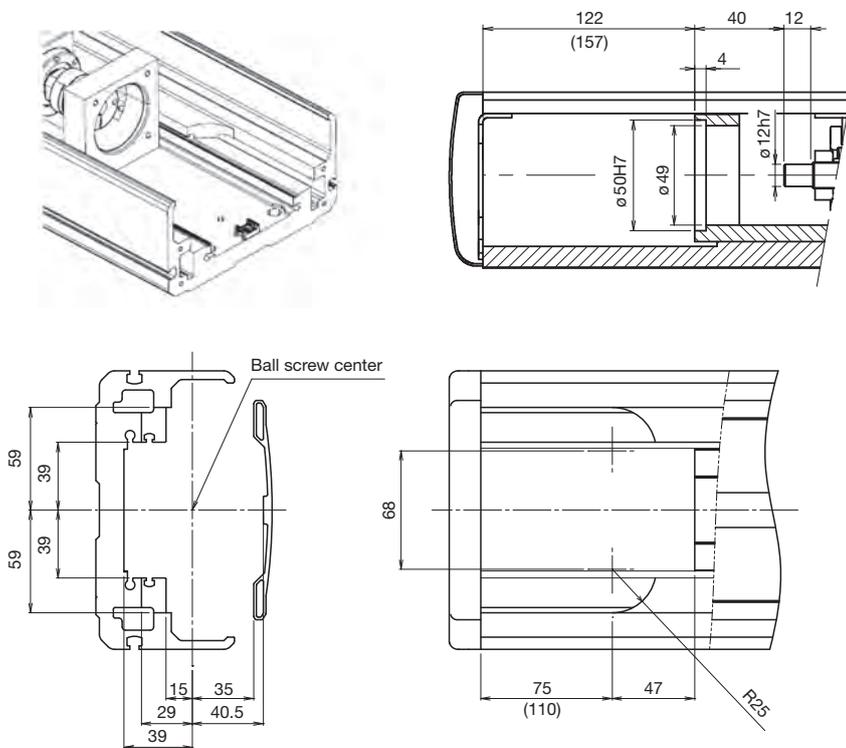


Fig. 14 USW16T motor bracket

7. Installation and Operation

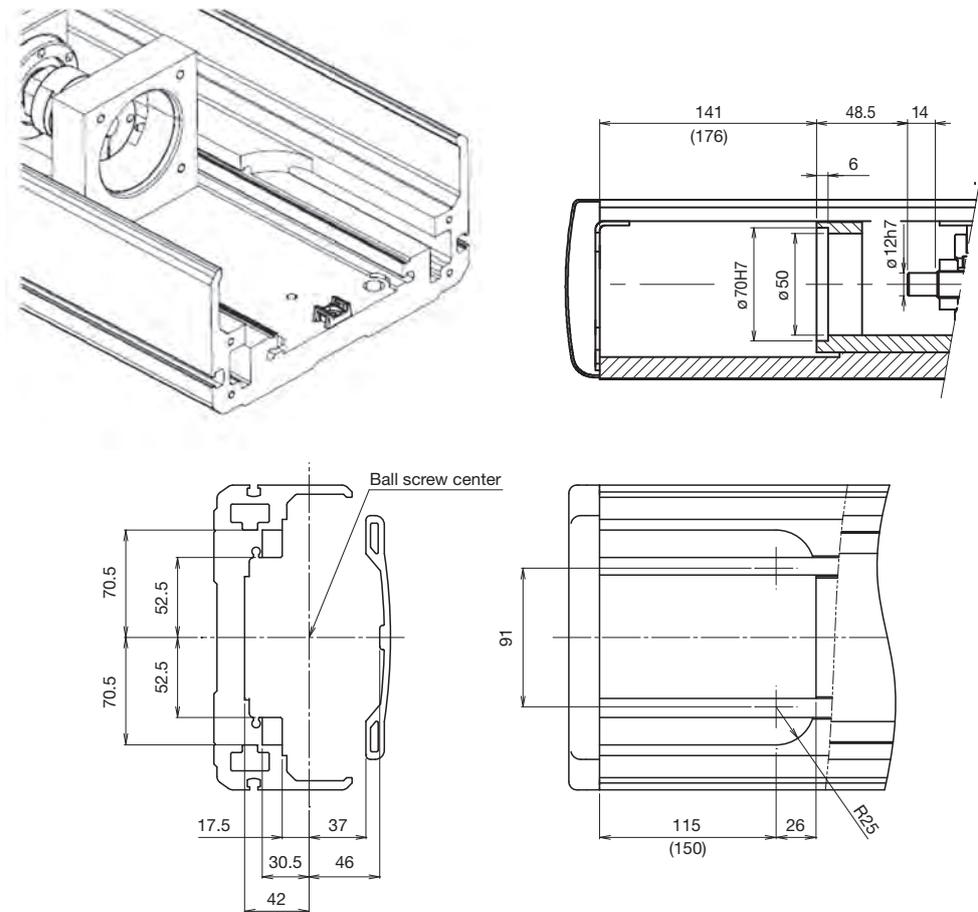


Fig. 15 USW20T motor bracket

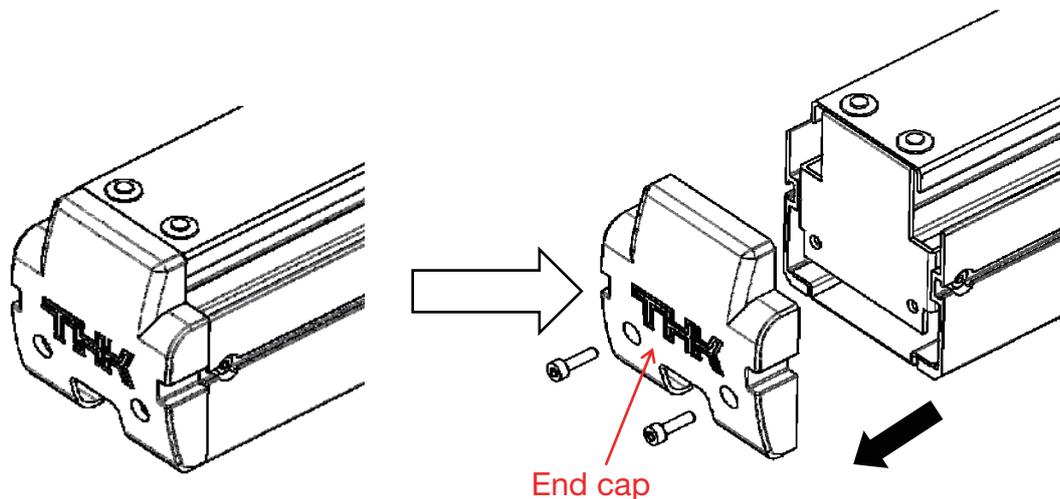
7. Installation and Operation

7-5 Motor mounting method

For US/USW, motor bracket is provided to allow mounting of various motors.

○ **In the case of direct coupled specification (US6T)**

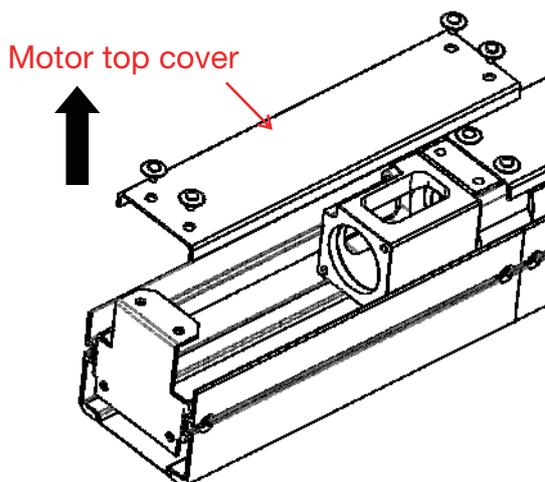
1. Remove the bolt, and remove the end cap toward the direction of arrow (painted in black).



Model number	Bolt size
US6T	M3 x 12L

Bolt type: Hexagonal-socket-head type bolt

2. Remove the bolt, and remove the motor top cover toward the direction of arrow.

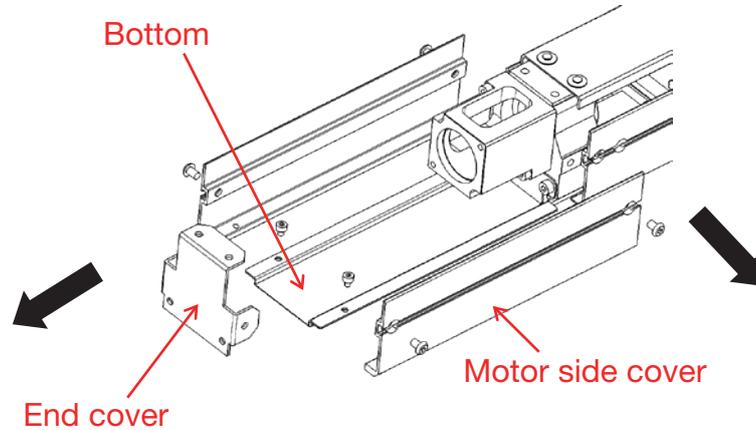


Model number	Bolt size
US6T	M4 x 6L

Bolt type: Thin head screw

7. Installation and Operation

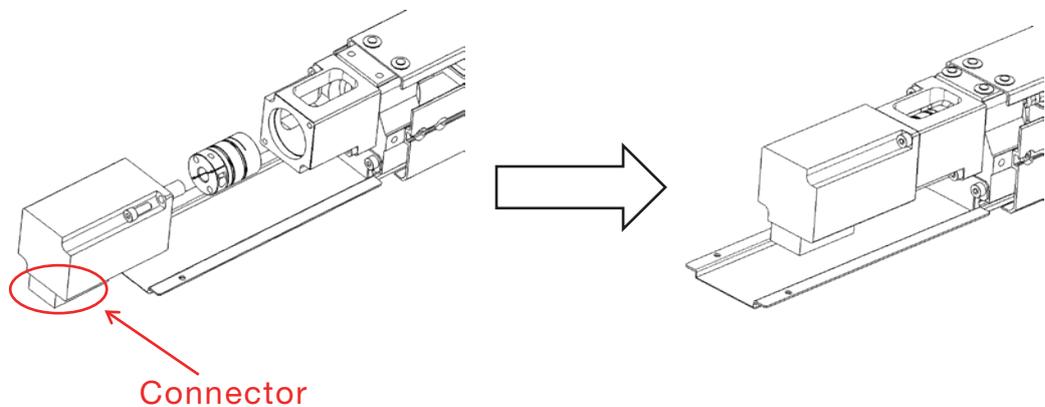
3. Remove the bolt, and remove the motor side cover and end cover toward the direction of arrow.



Model number	Bolt size	
	Motor side cover	Bottom surface cover
US6T	M4 x 6L	M3 x 4L

Bolt type (Motor side cover): Hexagonal-socket-head type button bolt
 Bolt type (Bottom surface cover): Hexagonal-socket-head type bolt

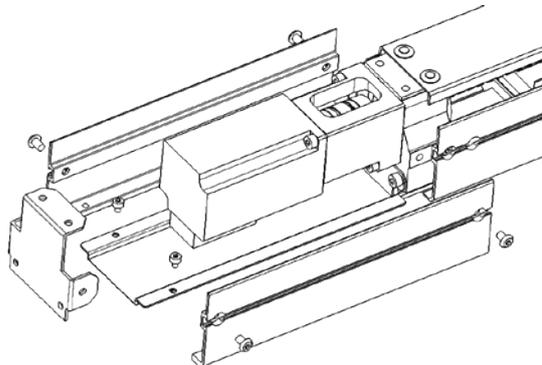
4. Mount the motor and coupling



- * Mount the connector to face downward. You cannot mount it with any other orientations.
- * Mount the motor while the cable connected to the connector.
- * 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 clamp bolt.

7. Installation and Operation

5. Mount the motor side cover and the end cover.



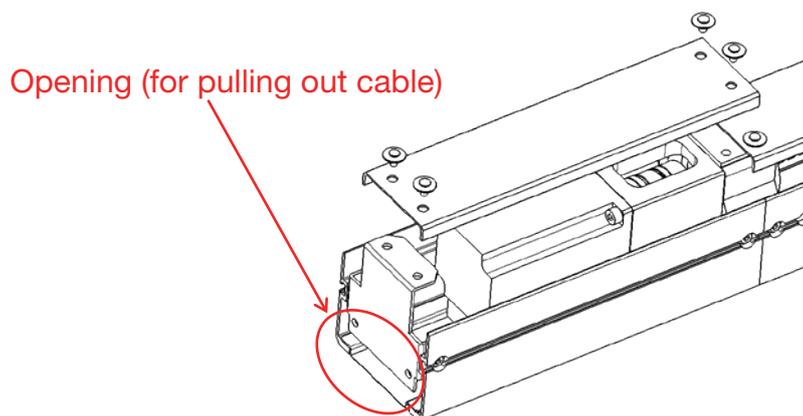
Motor side cover		
Model number	Bolt size	Tightening torque [N·cm]
US6T	M4 x 6L	107

Bolt type: Hexagonal-socket-head type button bolt

Bottom surface cover		
Model number	Bolt size	Tightening torque [N·cm]
US6T	M3 x 4L	84

Bolt type: Hexagonal-socket-head type bolt

6. Pull out the cable from the opening of end cover, and mount the motor top cover.

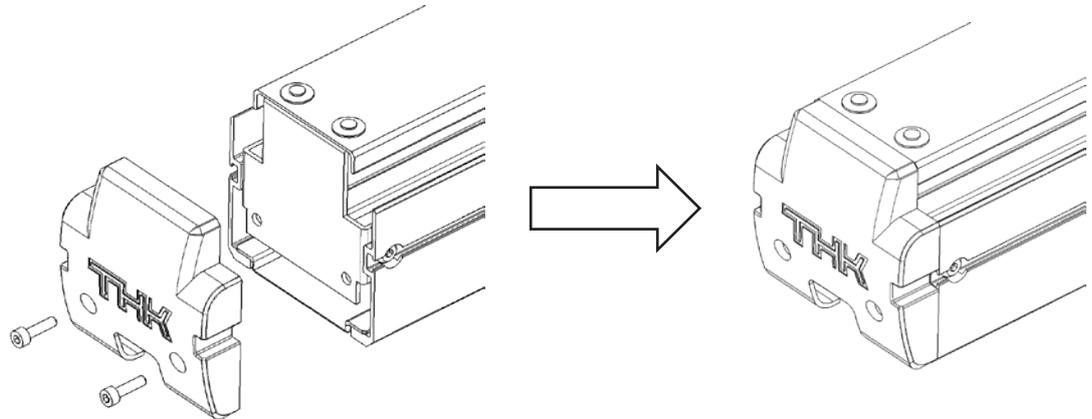


Motor top cover		
Model number	Bolt size	Tightening torque [N·cm]
US6T	M4 x 6L	107

Bolt type: Thin head screw

7. Installation and Operation

7. Mount end cap.



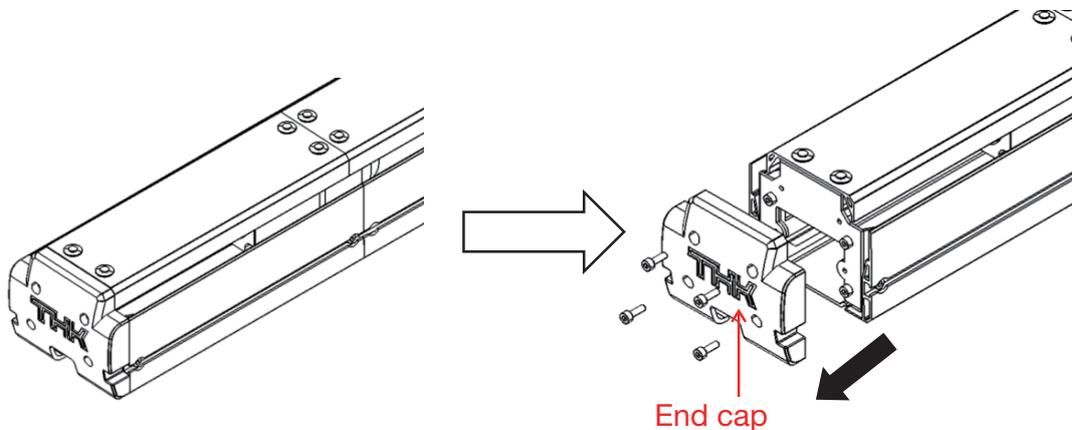
Model number	Bolt size	Tightening torque [N·cm]
US6T	M3 x 12L	17

Bolt type: Hexagonal-socket-head type bolt

7. Installation and Operation

○ **In the case of direct coupled specification (US8T)**

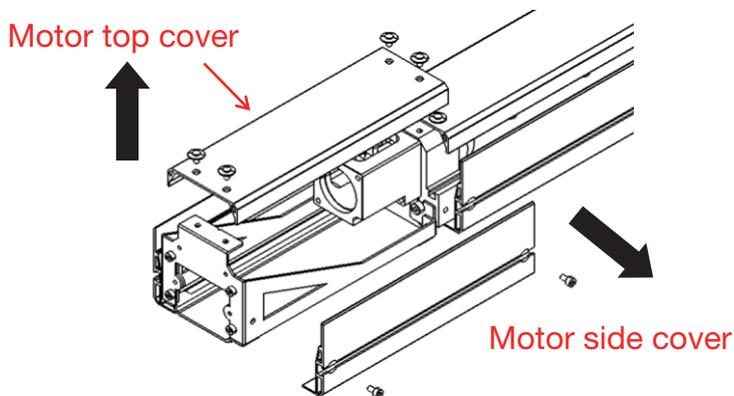
1. Remove the bolt, and remove the end cap toward the direction of arrow (painted in black).



Model number	Bolt size
US8T	M3 x 10L

Bolt type: Hexagonal-socket-head type bolt

2. Remove the bolt, and remove the motor top cover and motor side cover toward the direction of arrow.



Motor top cover	
Model number	Bolt size
US8T	M4 x 6L

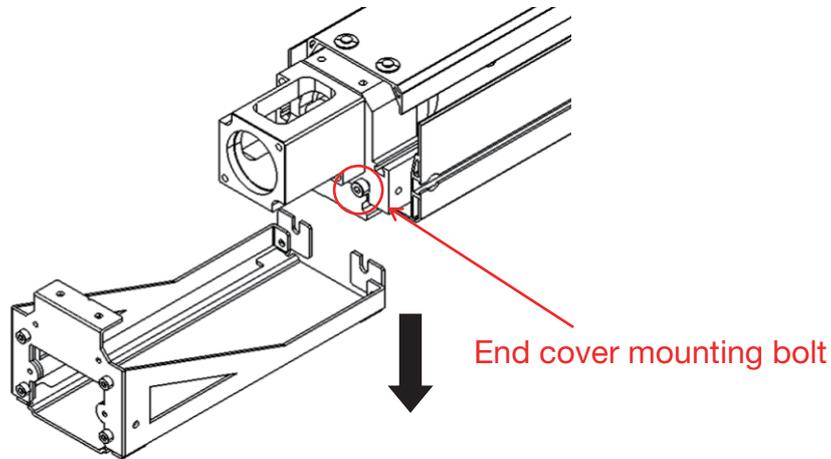
Bolt type: Thin head screw

Motor side cover		
Model number	Bolt size	Tightening torque [N·cm]
US8T	M4 x 6L	200

Bolt type: Thin head screw

7. Installation and Operation

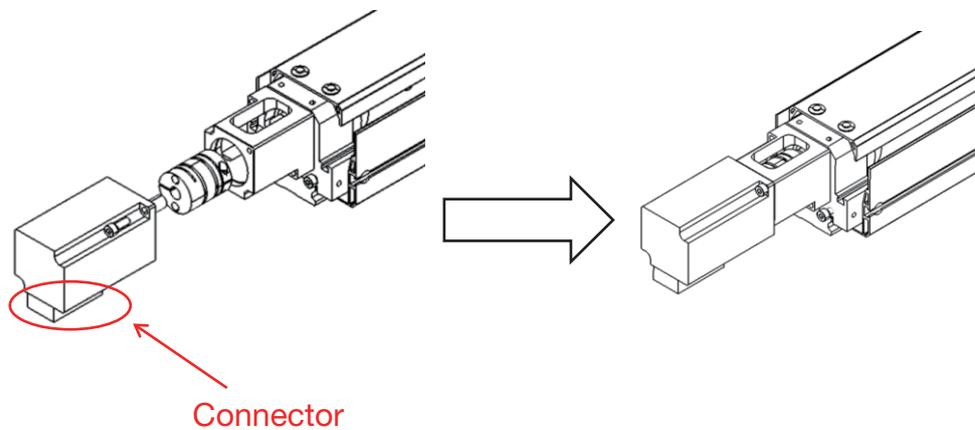
3. Loosen the end cover mounting bolt, and remove it toward the direction of arrow.



Model number	Bolt size
US8T	M4 x 6L

Bolt type: Hexagonal-socket-head type bolt

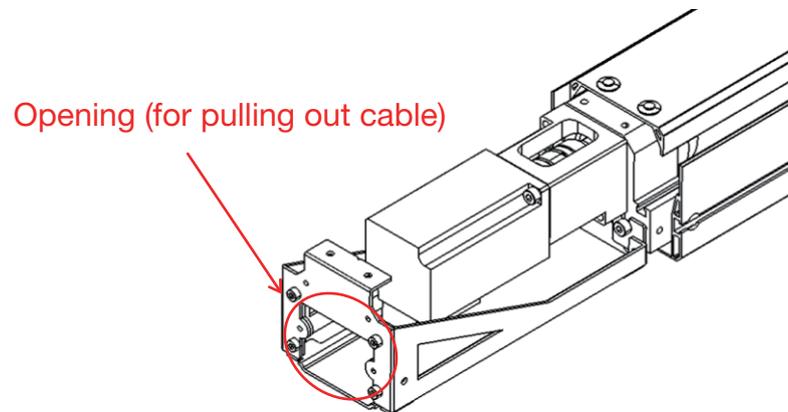
4. Mount the motor and coupling



- * Mount the connector to face downward. You cannot mount it with any other orientations.
- * Mount the motor while the cable connected to the connector.
- * 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 clamp bolt.

7. Installation and Operation

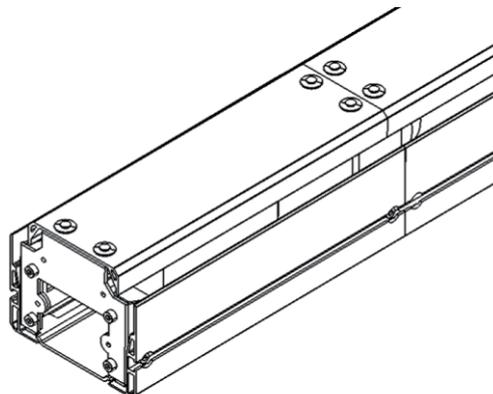
5. Mount the end cover, and pull out the cable from the opening of the end cover.



Model number	Bolt size	Tightening torque [N·cm]
US8T	M4 x 6L	179

Bolt type: Hexagonal-socket-head type bolt

6. Mount the motor top cover and motor side cover.



Motor top cover		
Model number	Bolt size	Tightening torque [N·cm]
US8T	M4 x 6L	107

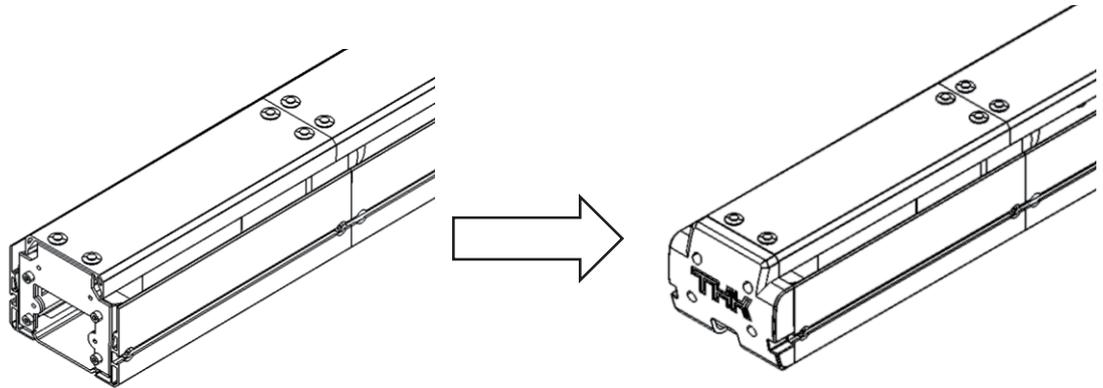
Bolt type: Thin head screw

Motor side cover		
Model number	Bolt size	Tightening torque [N·cm]
US8T	M4 x 6L	200

Bolt type: Thin head screw

7. Installation and Operation

7. Mount end cap.



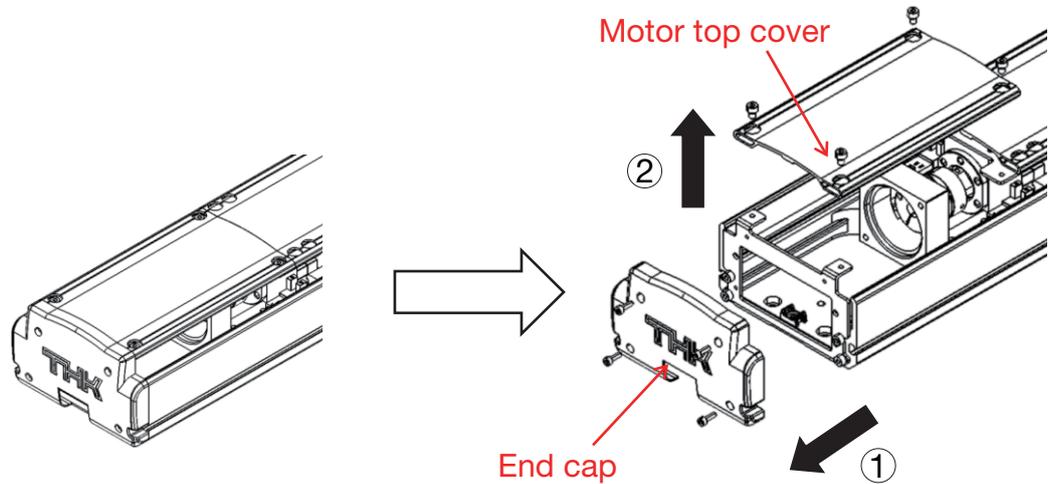
Model number	Bolt size	Tightening torque [N·cm]
US8T	M3 x 10L	17

Bolt type: Hexagonal-socket-head type bolt

7. Installation and Operation

○ In the case of direct coupled specification (USW)

1. Remove the bolt, and remove the end cap first and then motor top cover toward the direction of arrow (painted in black).

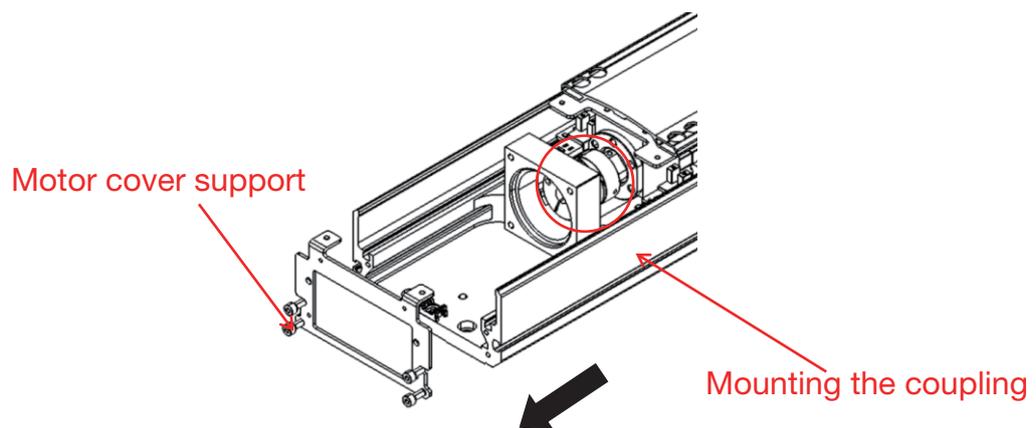


Model number	Bolt size	
	End cap	Motor top cover
USW12T	M3 x 8L	Special bolt
USW16T	M4 x 10L	Special bolt
USW20T	M4 x 10L	Special bolt

Bolt type (end cap): Hexagonal-socket-head type bolt

* When you remove the special bolt, use a hexagonal wrench (opposite side distance 3.0 mm).

2. Remove the motor cover support toward the direction of arrow, and mount the coupling at ball screw end.

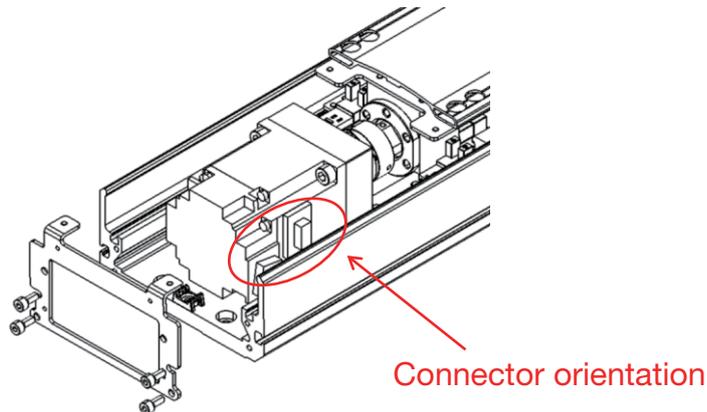


Model number	Bolt size
USW12T	M4 x 8L
USW16T	M4 x 8L
USW20T	M4 x 8L

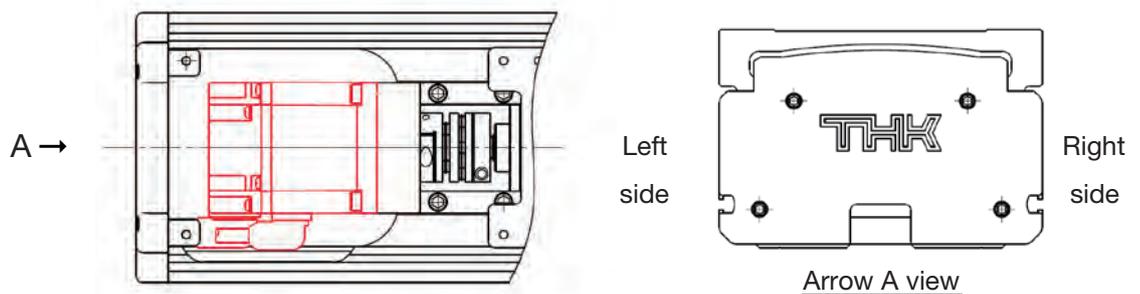
Bolt type: Hexagonal-socket-head type bolt

7. Installation and Operation

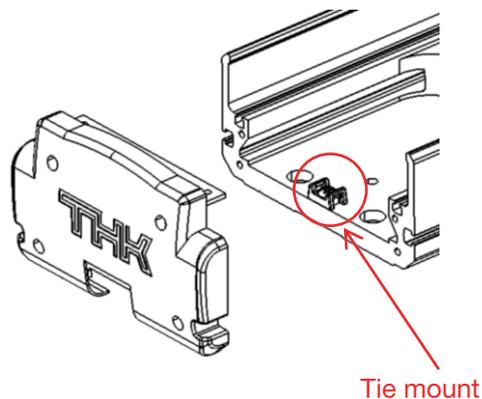
3. Set the connector to face to the side, and mount the servo motor.



- * Mount the connector to face either left or right direction. The connector cannot be mounted to face up or down.
- For the details, see the notch size of motor mounting part (→ P.7-4).
- Note: USW12T supports only right side.

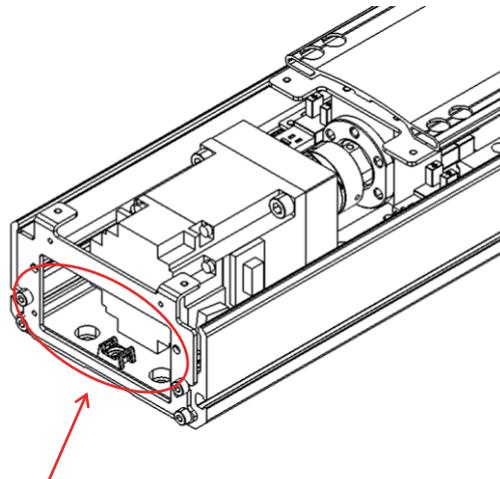


- * Mount the motor while the cable connected to the connector.
- * Some motor types allow mounting on only either left or right side.
- * For selection, handling and mounting of a coupling, see the respective catalog issued by the coupling manufacturer.
- * Check necessary data such as permissible torque, eccentricity, deflection angle and tightening torque of the clamp bolt.
- * Tie mount is provided at motor cable wiring part. Use it as necessary.
- Use the banding band with width of 4.8 mm or shorter.



7. Installation and Operation

4. Mount the motor cover support, and pull out each cable from the opening.



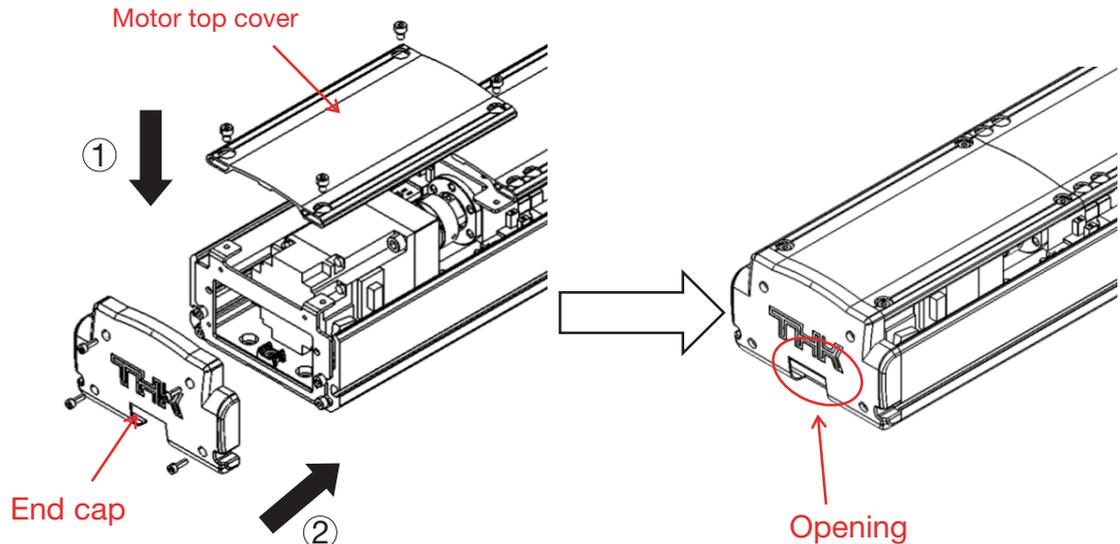
Opening (for pulling out cable)

Model number	Bolt size	Tightening torque [N-cm]
USW12T	M4 x 8L	431
USW16T	M4 x 8L	431
USW20T	M4 x 8L	431

Bolt type: Hexagonal-socket-head type bolt

7. Installation and Operation

5. Mount the motor top cover first and then mount the end cap toward the direction of arrow (painted in black).
Make sure to clamp the cable near the end cap opening.



End cap		
Model number	Bolt size	Tightening torque [N·cm]
USW12T	M3 x 8L	17
USW16T	M4 x 10L	34
USW20T	M4 x 10L	34

Bolt type: Hexagonal-socket-head type bolt

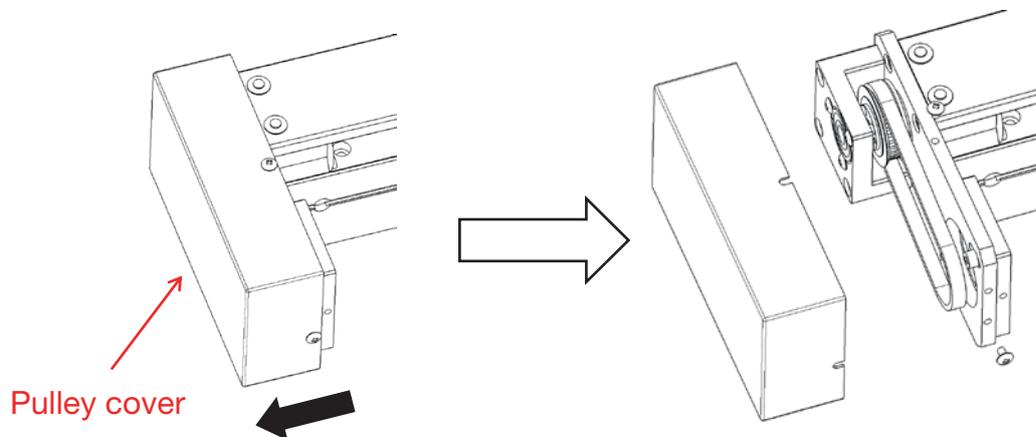
Motor top cover		
Model number	Bolt size	Tightening torque [N·cm]
USW12T	Special bolt	226
USW16T	Special bolt	226
USW20T	Special bolt	226

* When you mount the special bolt, use a hexagonal wrench (opposite side distance 3.0 mm).

7. Installation and Operation

○ **In the case of folded motor configuration (US6RT)**

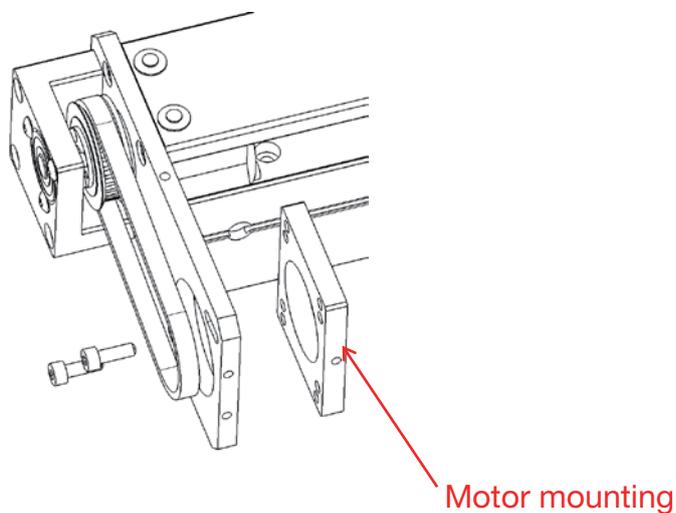
1. Remove the bolt, and take out the pulley cover toward the direction of the black arrow.



Model number	Bolt size
US6RT	M3 x 6L

Bolt type: Cross recessed button-head bolt

2. Loosen the mounting bolt of the motor mounting plate, and remove the motor mounting plate.



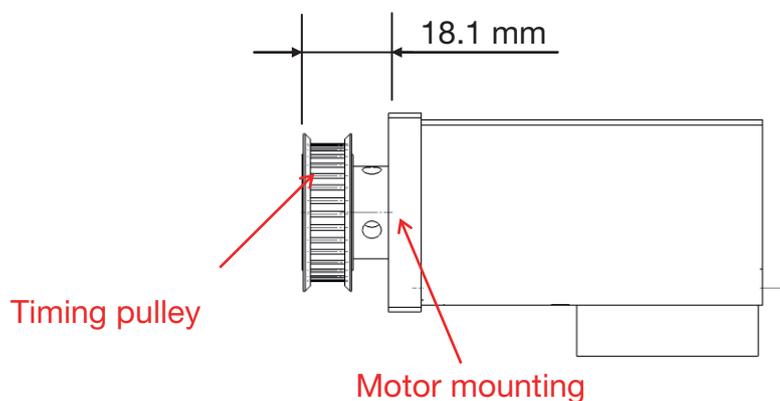
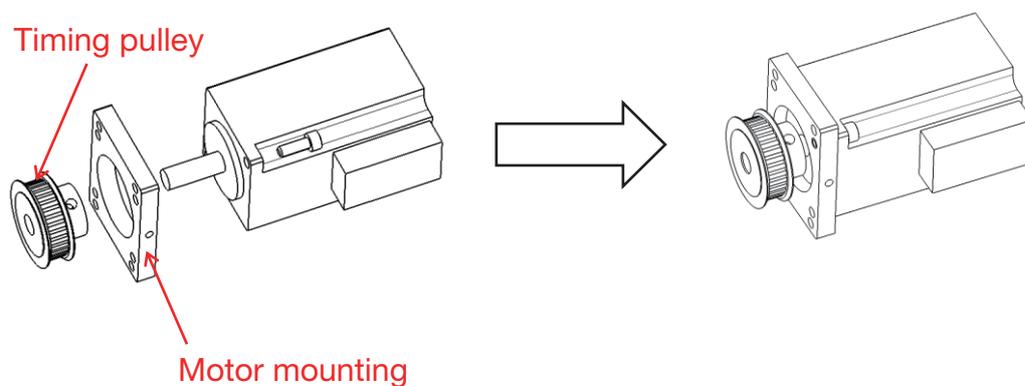
Model number	Bolt size
US6RT	M4 x 12L

Bolt type: Hexagonal-socket-head type bolt
(with small plain washer)

7. Installation and Operation

3. Secure the motor and motor mounting plate with bolts. Insert the timing pulley attached to the product into servo motor, and fasten it by setscrews at two locations.

* Thickness of motor mounting plate: 7 mm



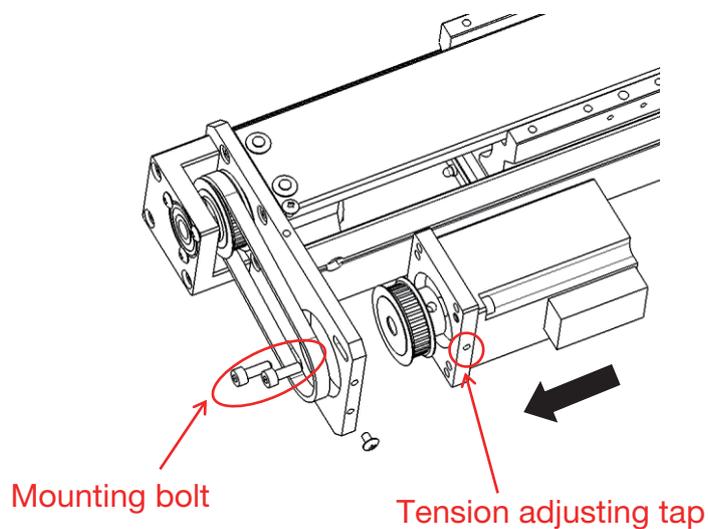
Model number	Bolt size	Tightening torque [N·cm]
US6RT	M4 x 4L	120

Bolt type: Hexagon socket set screw

- * The pulley at motor side is an attached article.
- * For the type of motor to be used, select orthogonal 2 face D cut type.

7. Installation and Operation

4. Temporarily fasten the mounting bolt of the motor mounting plate, and mount the servo motor.

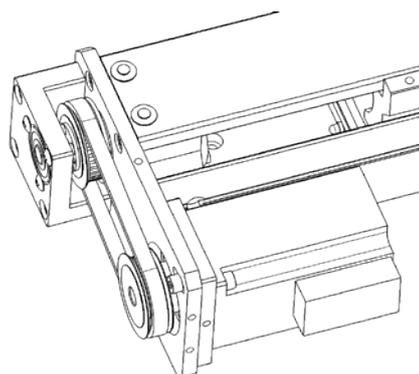


- * Set the connector to face upward, downward or outward.
- * Pay attention to the orientation of the tension adjusting tap.

Model number	Bolt size
US6RT	M4 x 12L

Bolt type: Hexagonal-socket-head type bolt
(with small plain washer)

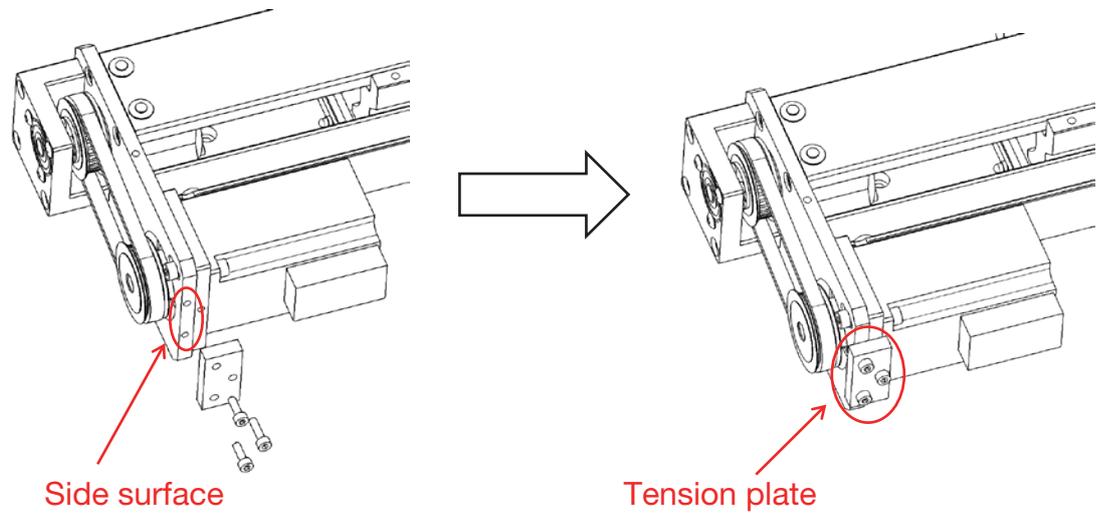
5. Set the belt to the pulley.



- * The timing belt is hung at the pulley of the main unit side.

7. Installation and Operation

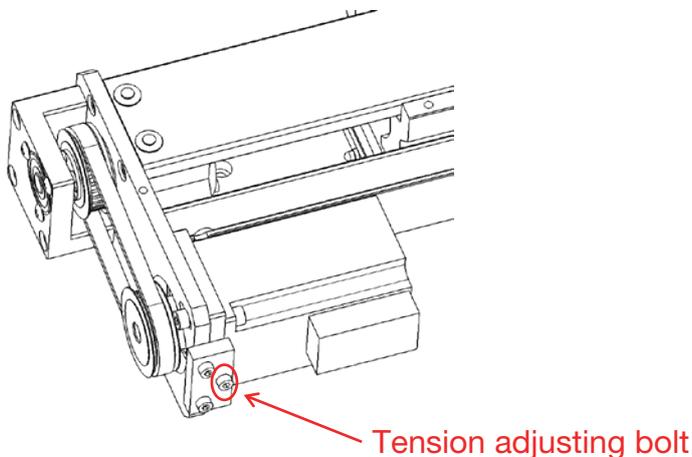
6. Use the 2 locations on the top of the pulley bracket side surface to mount the tension plate.



- * The tension plate and bolts are an attached article.

7. Installation and Operation

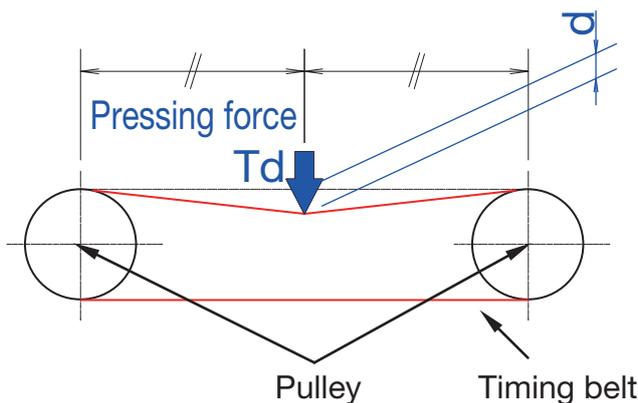
7. Tighten the tension plate (hexagonal-socket-head type bolt: M3) to adjust the belt tension.



How to adjust motor return type tension

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 Td .



Model number	Mounting tension F [N]	Pressing force Td [N]	Amount of deflection d [mm]
US6RT	22.5 to 29.5	1.50 to 1.96	1.10

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.

Recommended belt tensimeter...U507/U507D (Made by Gates Unitta Asia Company)

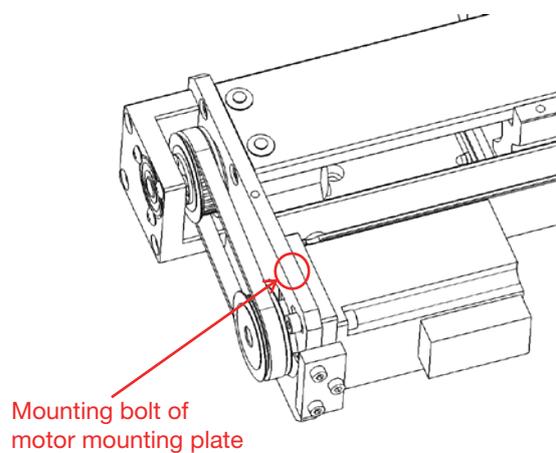
Belt to be used (Made by Gates Unitta Asia Company)

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

Model number	Timing belt	Belt unit mass [g/mm width x m length]	Belt width [mm]	Mounting span [mm]
US6RT	237-3GT	2.5	6	70.7

7. Installation and Operation

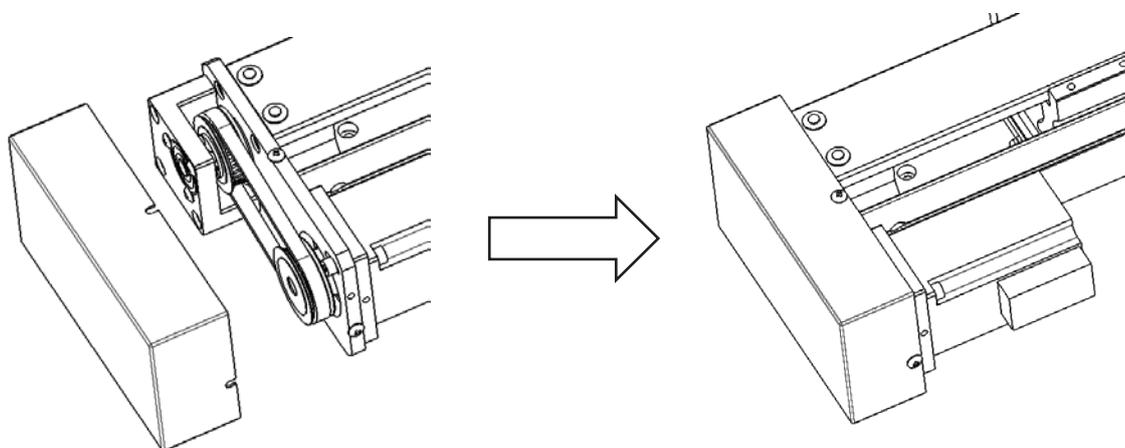
8. After adjusting the tension, tighten the mounting bolt of the motor mounting plate.



Model number	Bolt size	Tightening torque [N·cm]
US6RT	M4 x 12L	210

Bolt type: Hexagonal-socket-head type bolt (with small plain washer)

9. Remove the tension plate, and mount the pulley cover.



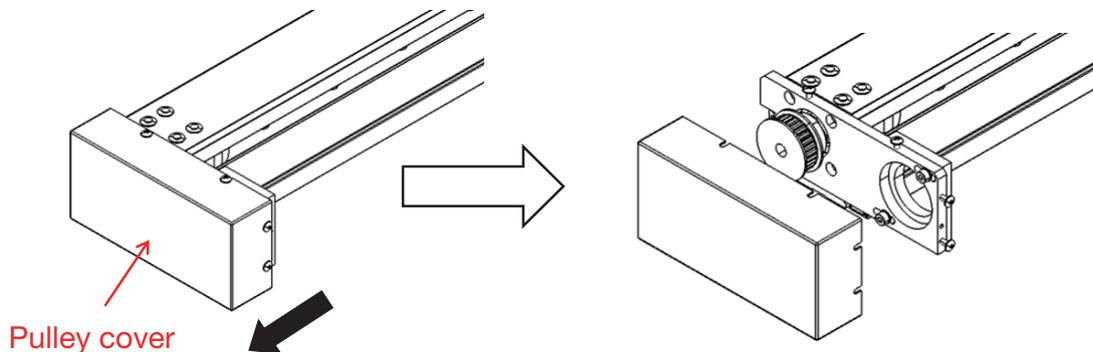
Model number	Bolt size	Tightening torque [N·cm]
US6RT	M3 x 6L	75

Bolt type: Cross recessed button-head bolt

7. Installation and Operation

○ In the case of folded motor configuration (US8RT)

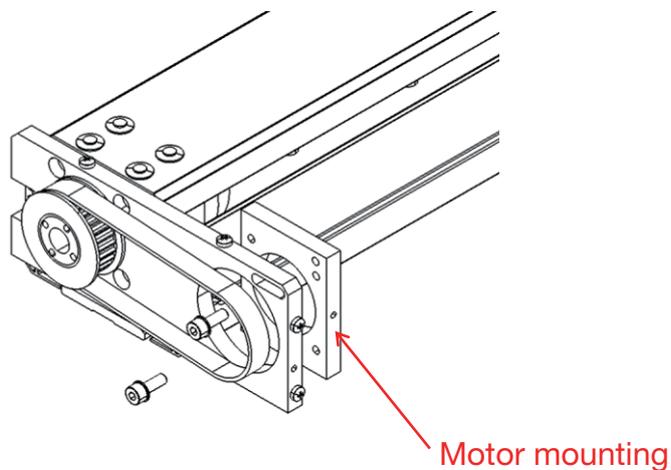
1. Remove the bolt, and take out the pulley cover toward the direction of the black arrow.



Model number	Bolt size
US8RT	M3 x 6L

Bolt type: Cross recessed button-head bolt

2. Loosen the mounting bolt of the motor mounting plate, and remove the motor mounting plate.



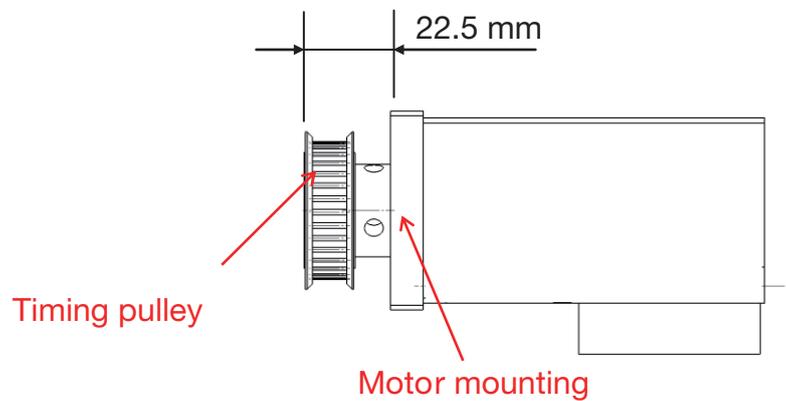
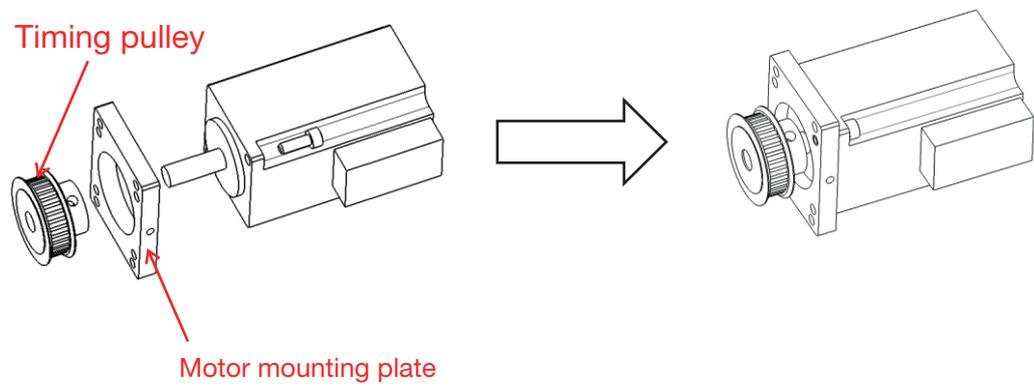
Model number	Bolt size
US8RT	M4 x 12L

Bolt type: Hexagonal-socket-head type bolt
(with small plain washer)

7. Installation and Operation

3. Secure the motor and motor mounting plate with bolts. Insert the timing pulley attached to the product into servo motor, and fasten it by setscrews at two locations.

* Thickness of motor mounting plate: 7 mm



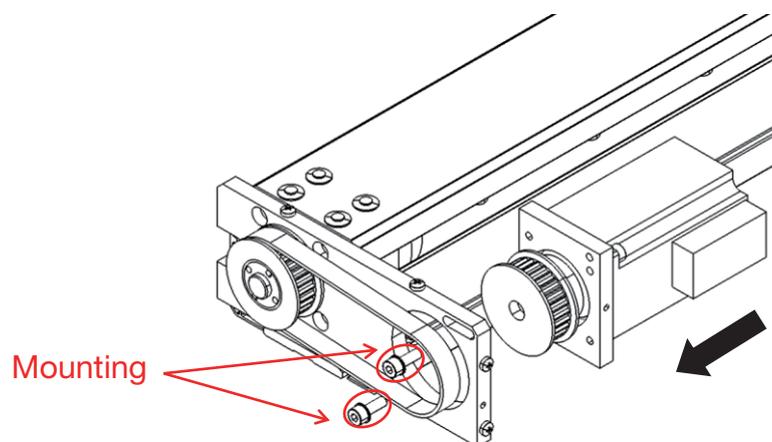
Model number	Bolt size	Tightening torque [N·cm]
US8RT	M4 x 6L	120

Bolt type: Hexagon socket set screw

- * The pulley at motor side is an attached article.
- * For the type of motor to be used, select orthogonal 2 face D cut type.

7. Installation and Operation

4. Temporarily fasten the mounting bolt of the motor mounting plate, and mount the servo motor.

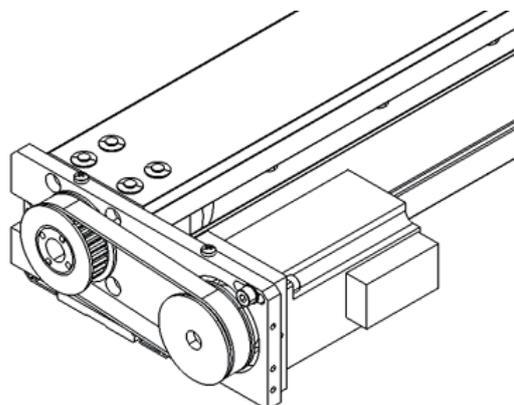


- * Set the connector to face upward, downward or outward.
- * Pay attention to the orientation of the tension adjusting tap.

Model number	Bolt size
US8RT	M4 x 12L

Bolt type: Hexagonal-socket-head type bolt
(with small plain washer)

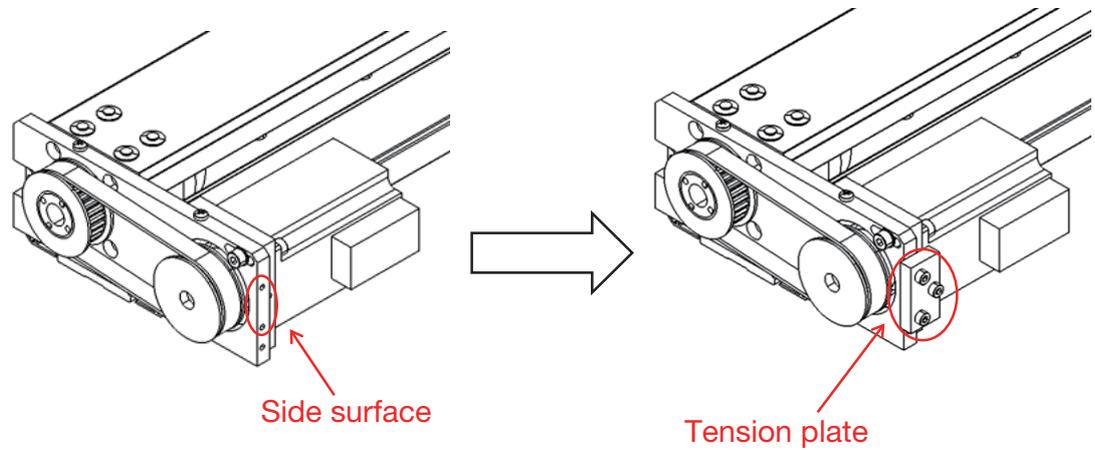
5. Set the belt to the pulley.



- * The timing belt is an attached article.

7. Installation and Operation

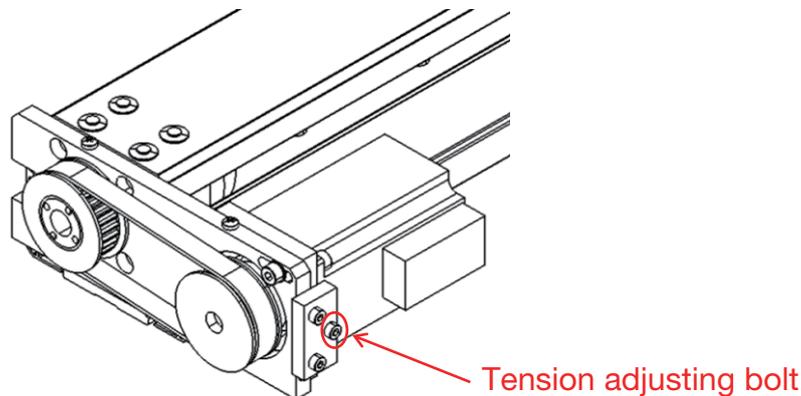
6. Use the 2 locations on the tap (two from the top) of pulley bracket side surface to mount the tension plate.



* The tension plate and bolts are an attached article.

7. Installation and Operation

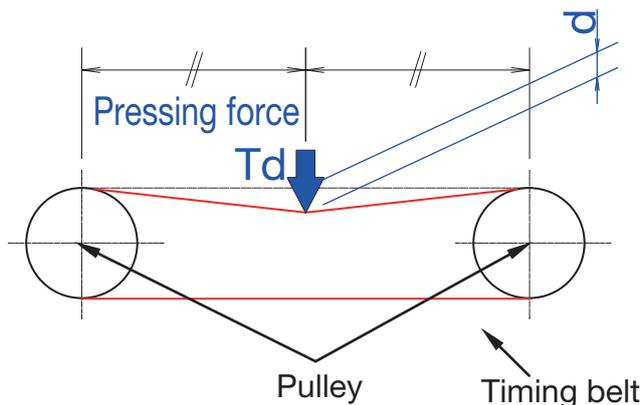
7. Tighten the tension plate (hexagonal-socket-head type bolt: M3) to adjust the belt tension.



How to adjust motor return type tension

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 Td .



Model number	Mounting tension F [N]	Pressing force Td [N]	Amount of deflection d [mm]
US8RT	23 to 30	1.54 to 2.00	1.17

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.

Recommended belt tensimeter...U507/U507D (Made by Gates Unitta Asia Company)

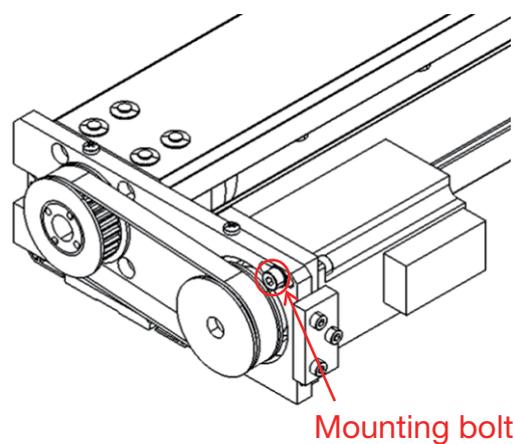
Belt to be used (Made by Gates Unitta Asia Company)

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

Model number	Timing belt	Belt unit mass [g/mm width x m length]	Belt width [mm]	Mounting span [mm]
US8RT	258-3GT	2.5	9	75

7. Installation and Operation

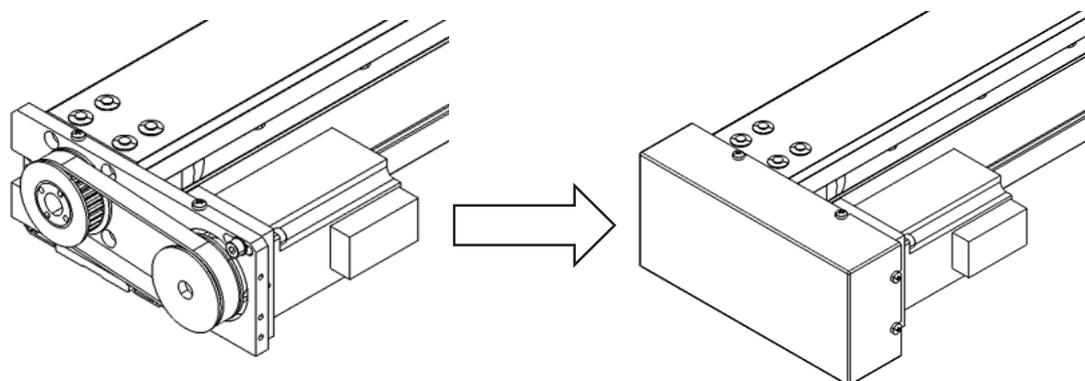
8. After adjusting the tension, tighten the mounting bolt of the motor mounting plate.



Model number	Bolt size	Tightening torque [N·cm]
US8RT	M4 x 12L	210

+ Bolt type: Hexagonal-socket-head type bolt (with small plain washer)

9. Remove the tension plate, and mount the pulley cover.



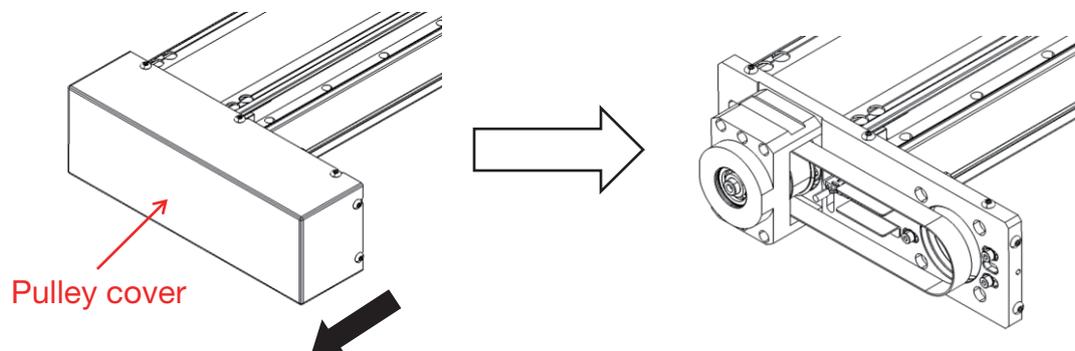
Model number	Bolt size	Tightening torque [N·cm]
US8RT	M3 x 6L	75

Bolt type: Cross recessed button-head bolt

7. Installation and Operation

○ In case of motor return type (USW12RT/16RT/20RT)

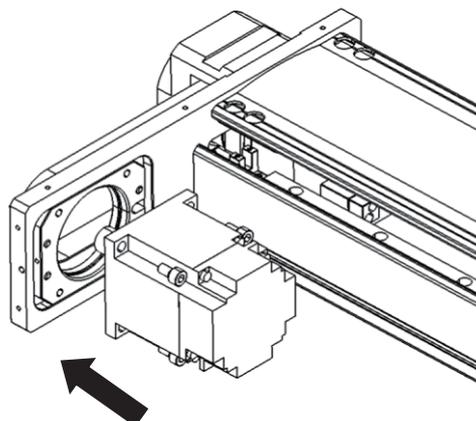
1. Loosen the bolt, and take out the pulley cover to the direction of the black arrow.



Model number	Bolt size
USW12RT	M3 x 6L
USW16RT	M3 x 6L
USW20RT	M4 x 8L

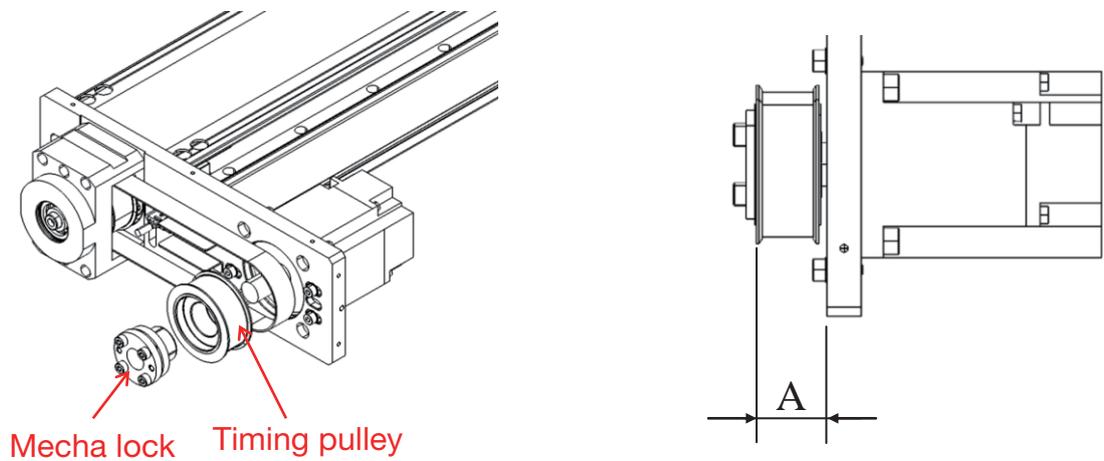
Bolt type: Hexagonal-socket-head type bolt

2. Mount the servo motor.
Note that when the connector is placed upside down, it can stick out from the base bottom surface.



7. Installation and Operation

3. Mount the timing pulley and mecha lock that come with the product to servo motor.



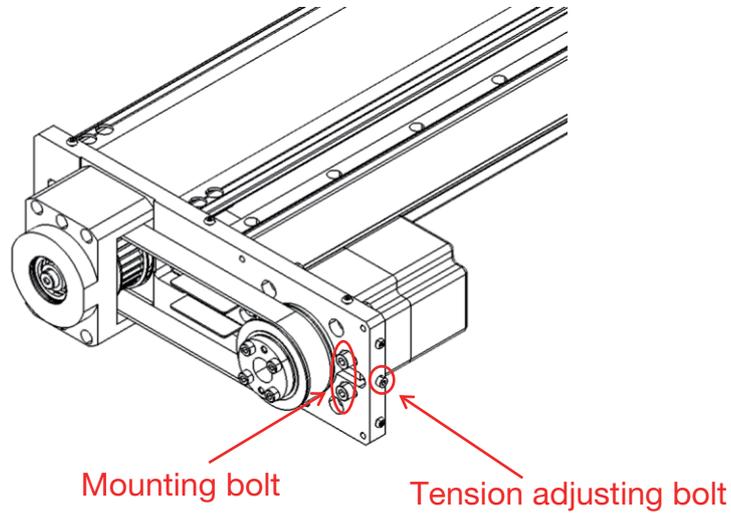
Mecha lock		
Model number	Bolt size	Tightening torque [N-cm]
USW12RT	M4 x 10L	400
USW16RT	M4 x 10L	400
USW20RT	M4 x 10L	400

Bolt type: Hexagonal-socket-head type bolt

Distance between pulley motors	
Model number	A dimension
USW12RT	22.5 mm
USW16RT	23.5 mm
USW20RT	26.5 mm

7. Installation and Operation

4. Mount the tension adjusting bolt (hexagonal-socket-head type bolt: M3x15L). Loosen the mounting bolt of the motor mounting plate, and adjust the belt tension with the tension adjusting bolt.



Model number	Mounting bolt size
USW12RT	M5 x 10L
USW16RT	M5 x 10L
USW20RT	M6 x 15L

Bolt type: Hexagonal-socket-head type bolt

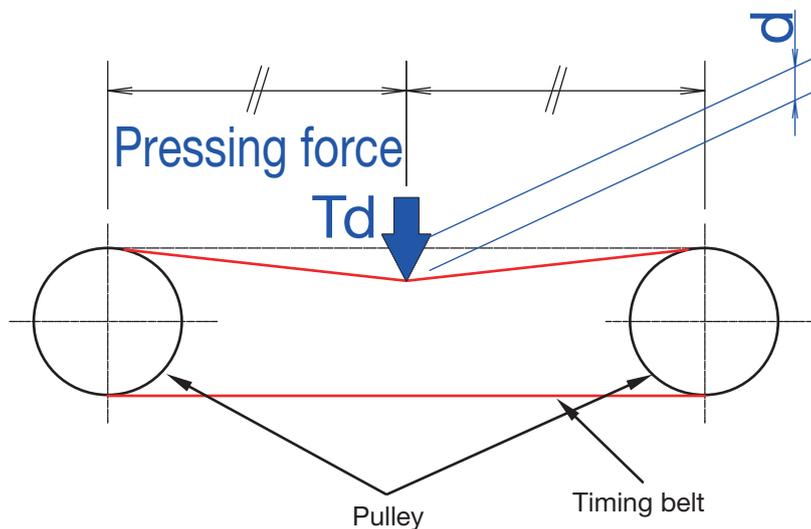
- * The timing belt is hung at the pulley of the mecha unit side.
- * The bolt for adjusting tension is an attached article.

7. Installation and Operation

How to adjust motor return type tension

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 number	Mounting tension F [N]	Pressing force T_d [N]	Amount of deflection d [mm]
USW12RT	86.4 to 105.6	6.17 to 7.54	2.11
USW16RT	86.4 to 105.6	6.17 to 7.54	2.53
USW20RT	123.3 to 150.7	8.81 to 10.76	3.00

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.

Recommended belt tensimeter....U507/U507D (Made by Gates Unitta Asia Company)

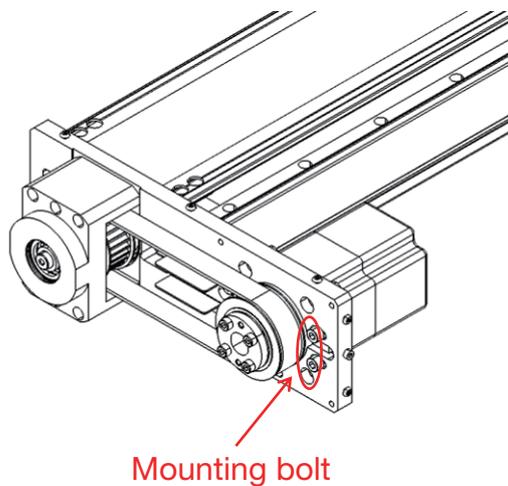
Belt to be used (Made by Gates Unitta Asia Company)

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

Model number	Timing belt	Belt unit mass [g/mm width x m length]	Belt width [mm]	Mounting span [mm]
USW12RT	450-5GT-15	4	15	135
USW16RT	457-5GT-15	4	15	162
USW20RT	575-5GT-20	4	20	192

7. Installation and Operation

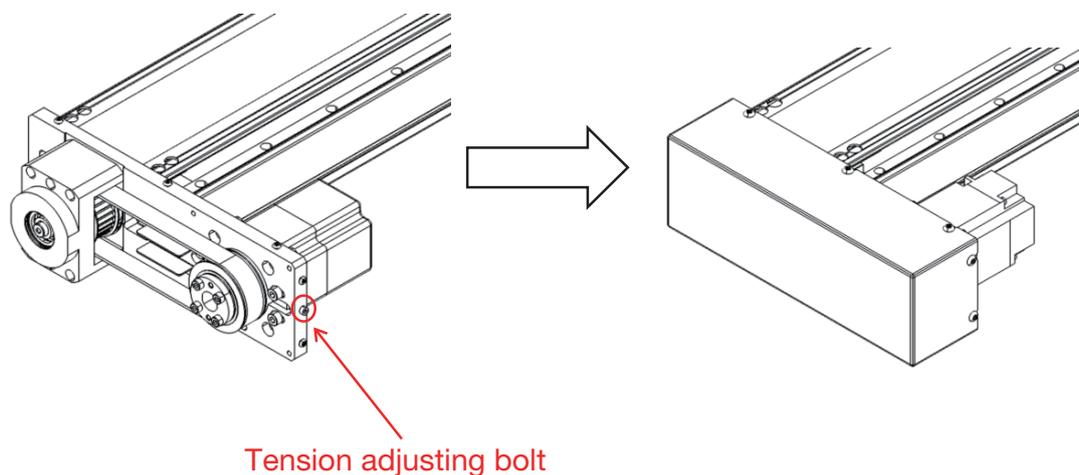
5. After adjusting the tension, tighten the mounting bolt of the motor mounting plate.



Model number	Bolt size	Tightening torque [N·cm]
USW12RT	M5 x 10L	725
USW16RT	M5 x 10L	725
USW20RT	M6 x 15L	1313

Bolt type: Hexagonal-socket-head type bolt

6. Remove the tension adjusting bolt (hexagonal-socket-head type bolt: M3), and mount the pulley cover.



Model number	Bolt size	Tightening torque [N·cm]
USW12RT	M3 x 6L	166
USW16RT	M3 x 6L	166
USW20RT	M4 x 8L	362

Bolt type: Hexagonal-socket-head type button bolt

7. Installation and Operation

7-6

Position where the sensor cable is pulled out

When the sensor code "P" or "Q" is selected, the sensor cable will be pulled out of the opening on the motor side. For the details, see Figs.16 to 23.

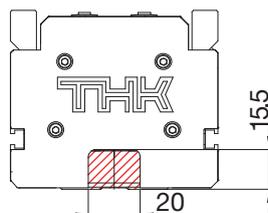


Fig.16 US8T opening

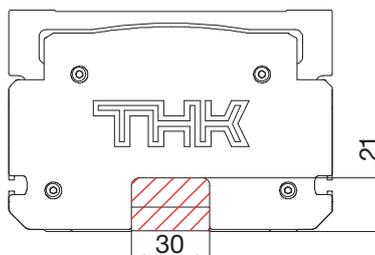


Fig.17 USW12T opening

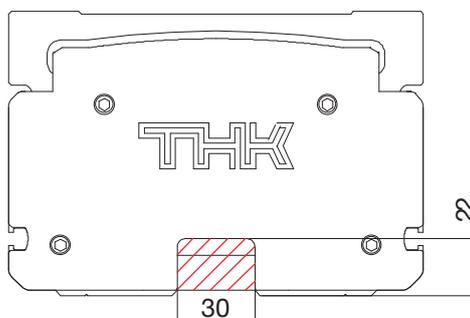


Fig.18 USW16T opening

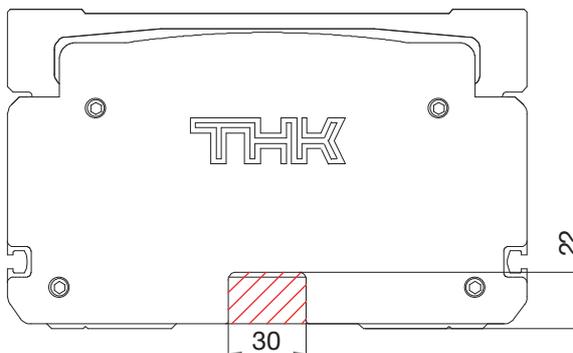


Fig.19 USW20T opening

7. Installation and Operation

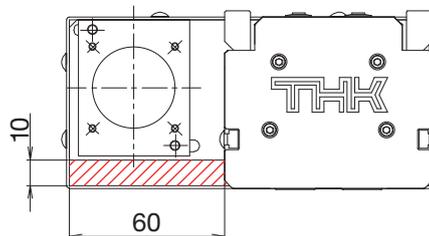


Fig.20 US8RT opening

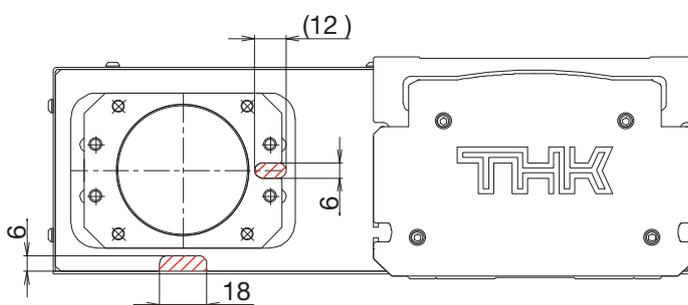


Fig.21 USW12RT opening

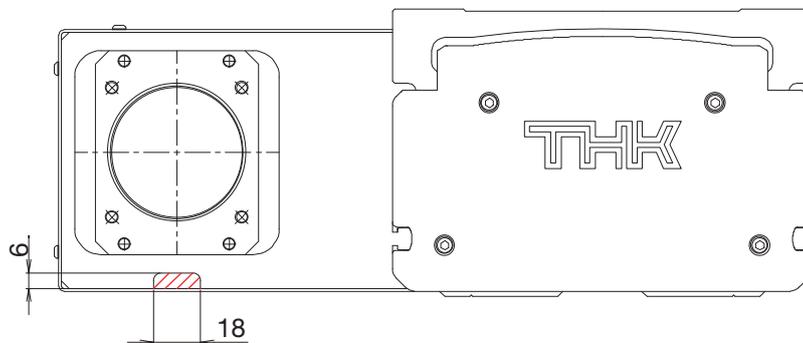


Fig.22 USW16RT opening

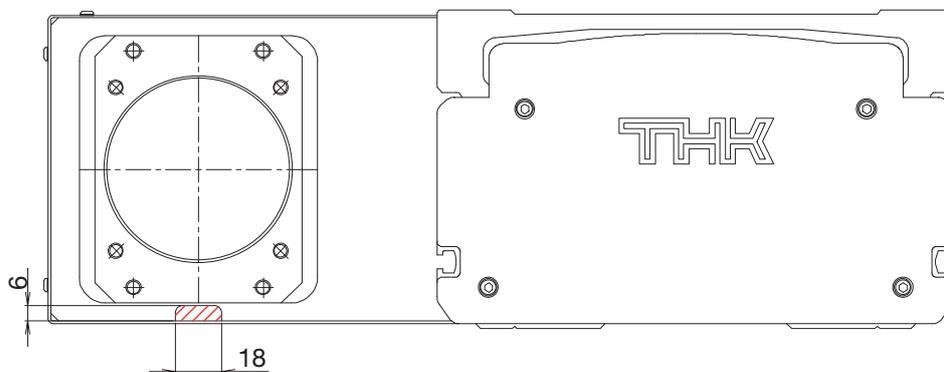


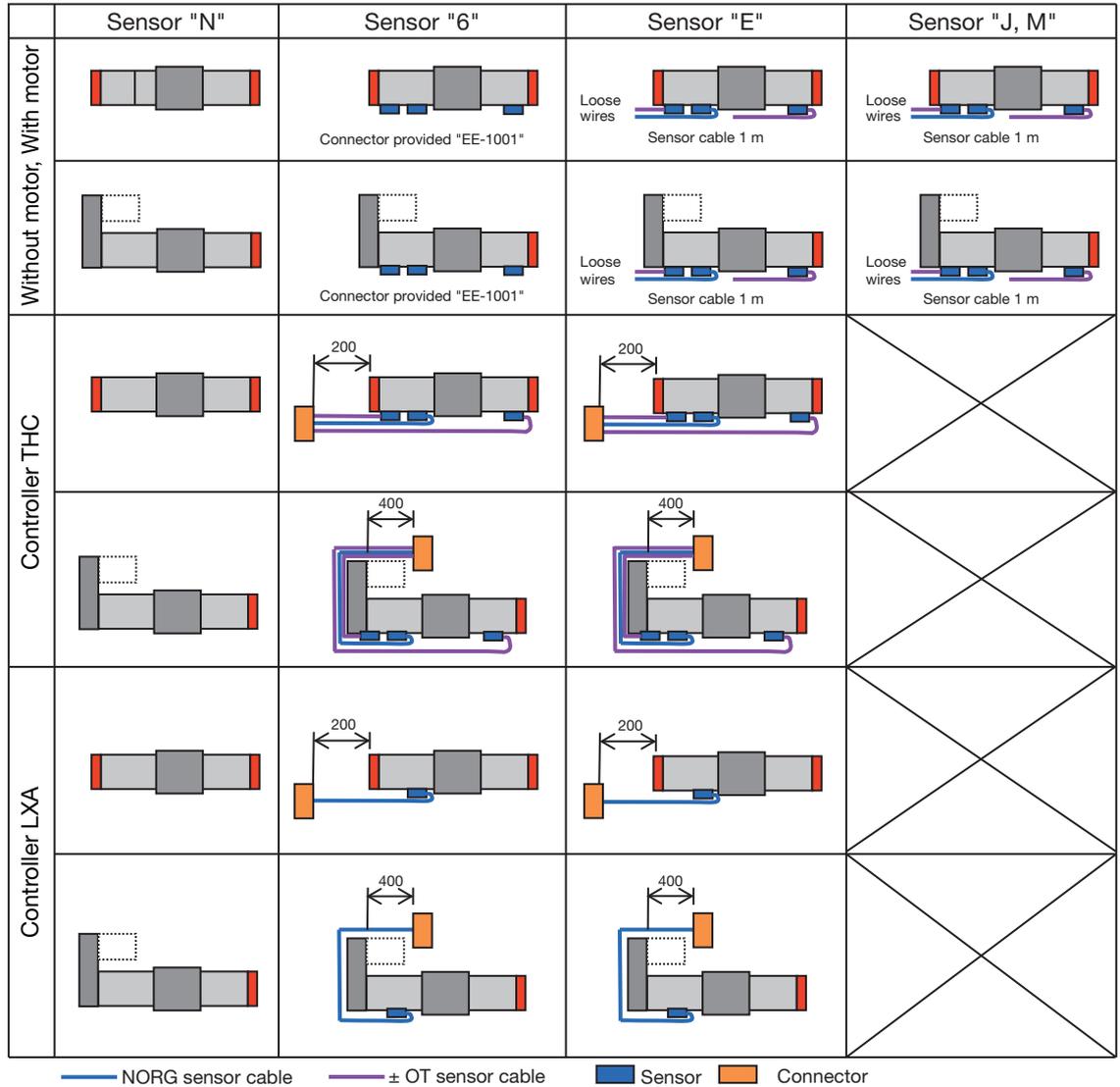
Fig.23 USW20RT opening

7. Installation and Operation

7-7 Sensor cable length

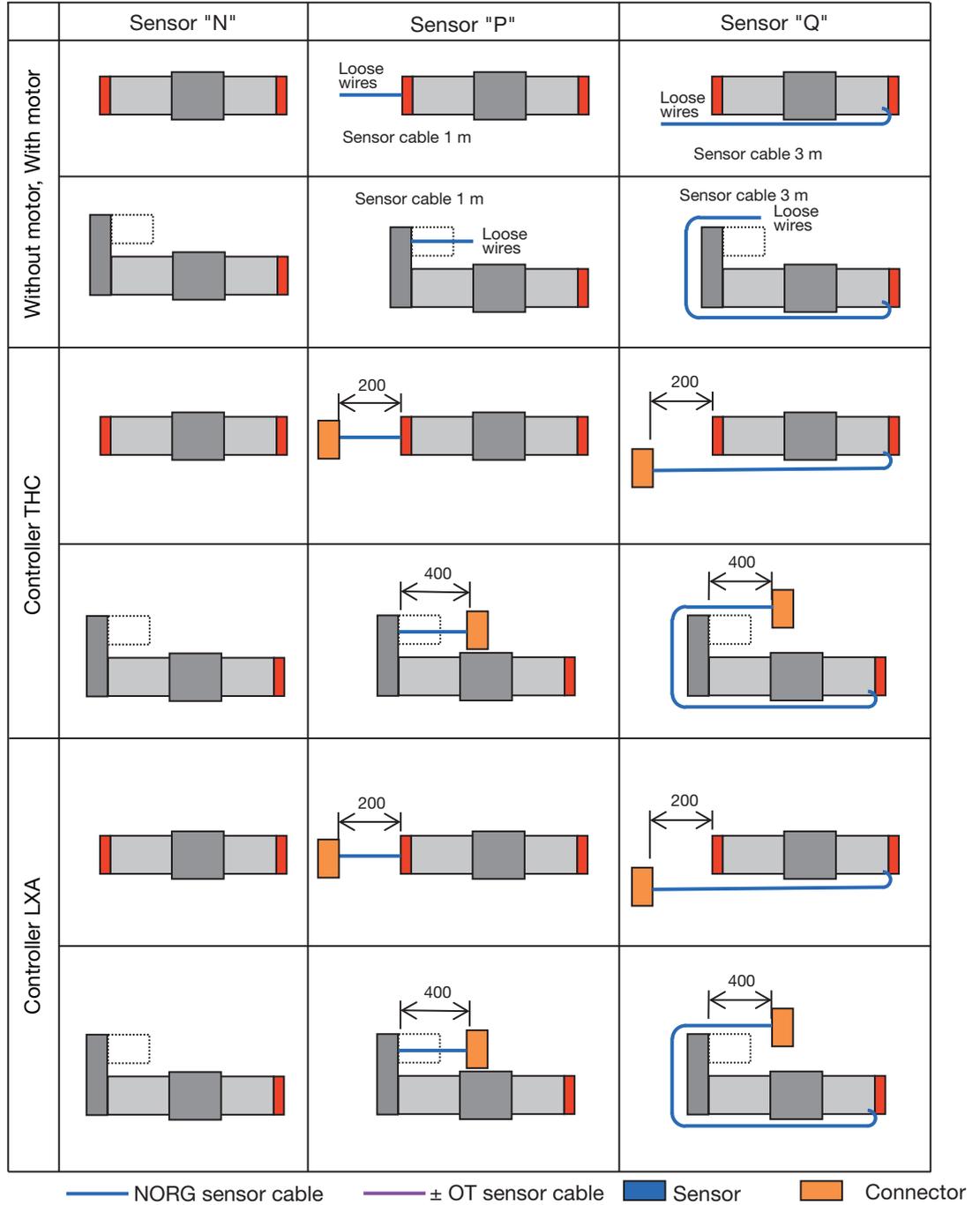
The cable length of US/USW depends on the sensor type. The cable length is the distance from the opening.

○ US6T/6RT sensor wiring diagram



7. Installation and Operation

○ US8T/8RT sensor wiring diagram



Note) When the sensor code "Q" is selected, the cable is pulled out of the top of the side cover on the reverse motor side. For the details, see Fig. 24. The product with the controller only is shipped with the cable fixed in the side cover.

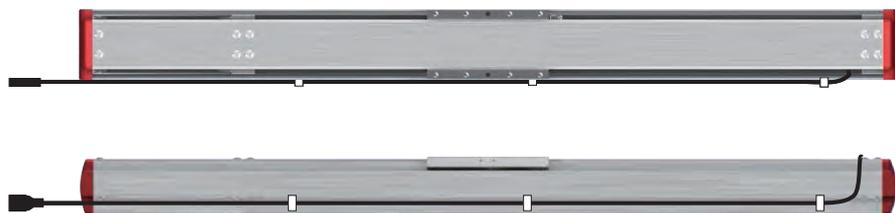
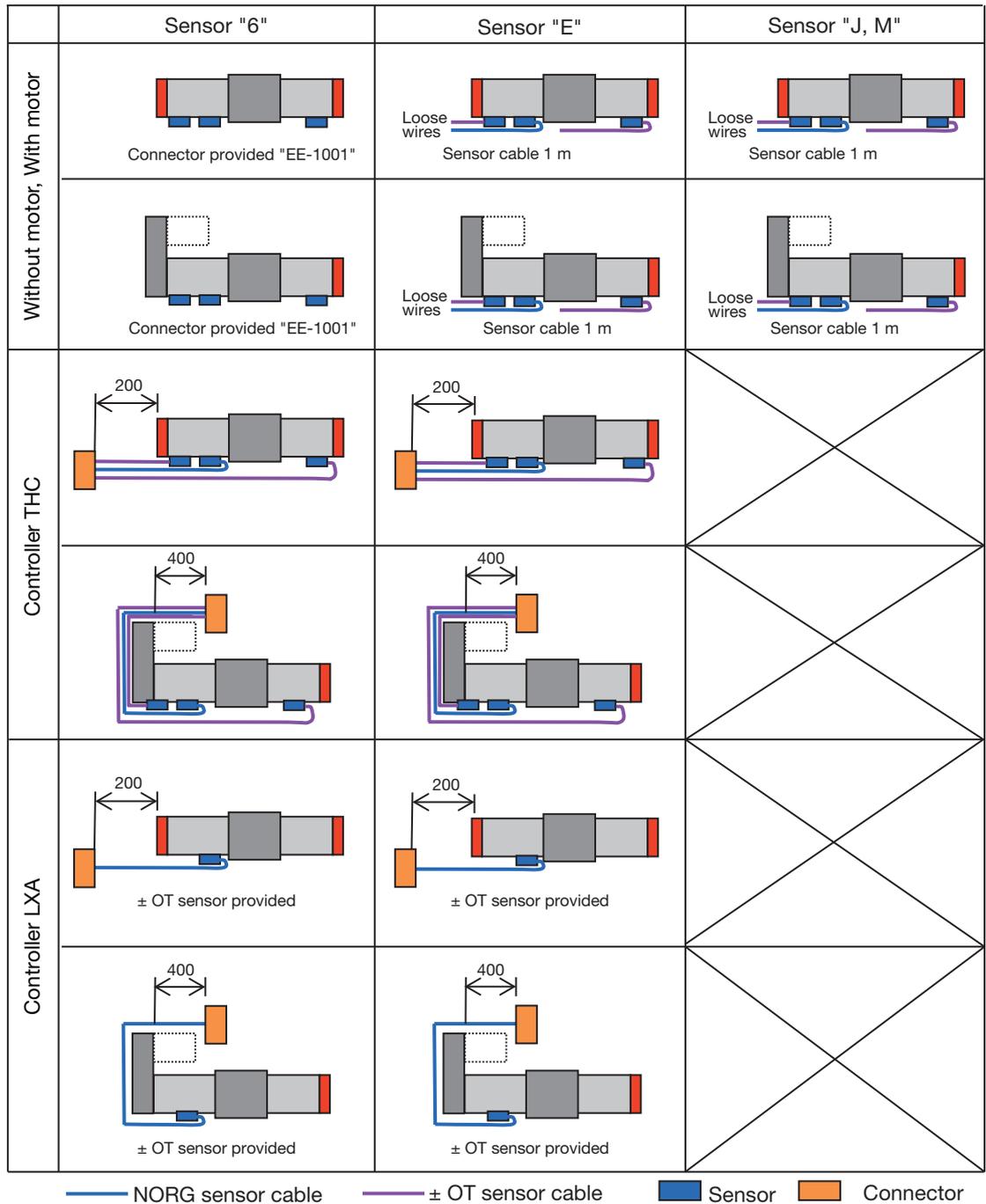


Fig.24 Wiring example of US8 sensor cable

7. Installation and Operation



— NORG sensor cable
 — ± OT sensor cable
 ■ Sensor
 ■ Connector

7. Installation and Operation

○ USW sensor wiring diagram

	Sensor "N"	Sensor "P"	Sensor "Q"
Without motor, With motor			
Controller THC			
Controller LXA			

NORG sensor cable
 ± OT sensor cable
 Sensor
 Connector

7. Installation and Operation

	Sensor "6"	Sensor "E"	Sensor "J, M"
Without motor, With motor	<p>Connector provided "EE-1001"</p>	<p>Loose wires Sensor cable 1 m</p>	<p>Loose wires Sensor cable 1 m</p>
	<p>Connector provided "EE-1001"</p>	<p>Loose wires Sensor cable 1 m</p>	<p>Loose wires Sensor cable 1 m</p>
Controller THC	<p>200</p>	<p>200</p>	
	<p>400</p>	<p>400</p>	
Controller LXA	<p>200 ± OT sensor provided</p>	<p>200 ± OT sensor provided</p>	
	<p>400 ± OT sensor provided</p>	<p>400 ± OT sensor provided</p>	

— NORG sensor cable
 — ± OT sensor cable
 ■ Sensor
 ■ Connector

7. Installation and Operation

7-8

Details of internal sensor

When the sensor code "P" or "Q" is selected, the sensors are built in the actuator. (Except for US6)

US8: Sensor 1 unit (for near home position)

USW: Sensor 3 units (for near home position and for limit)

7. Installation and Operation

○ Without the controller

Sensor configuration

Role	Logic	Sensor connector	Mark tube name
Sensor near home position	N.O. contact	EE-1001	ORG
+OT sensor	N.C. contact	EE-1001-1	+OT
-OT sensor	N.C. contact	EE-1001-1	-OT

* For US8T/US8RT, only the sensor near home position is used.

Pin assignment of sensor cable

Covering color	Signal name
Brown	Vcc
Black	OUT
Blue	GND

* The mark tube is attached to the end of the cable.

7. Installation and Operation

7-9

Base mounting method

For US series, secure the base on the mounting surface using the countersunk holes on the base or taps.

Note) For US6T/6RT/8T/8RT, only the countersunk hole can be used.

Note) Mount the base so that the bolts for securing base do not interfere with the moving parts.

○ US

1. Remove the bolt of  part, and remove the top cover.

The bolt used: Thin head screw M4 × 6L

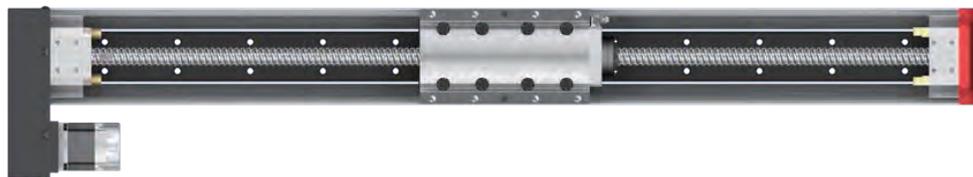


US6T/8T Top cover bolt position



US6RT/8RT Top cover bolt position

2. Secure the US main unit to the mounting surface using the countersunk holes of the base.



Note) Secure the actuator using all the mounting holes.

Note) The stroke 100 mm of US8 cannot be used for the countersunk holes in the center of the base.

7. Installation and Operation

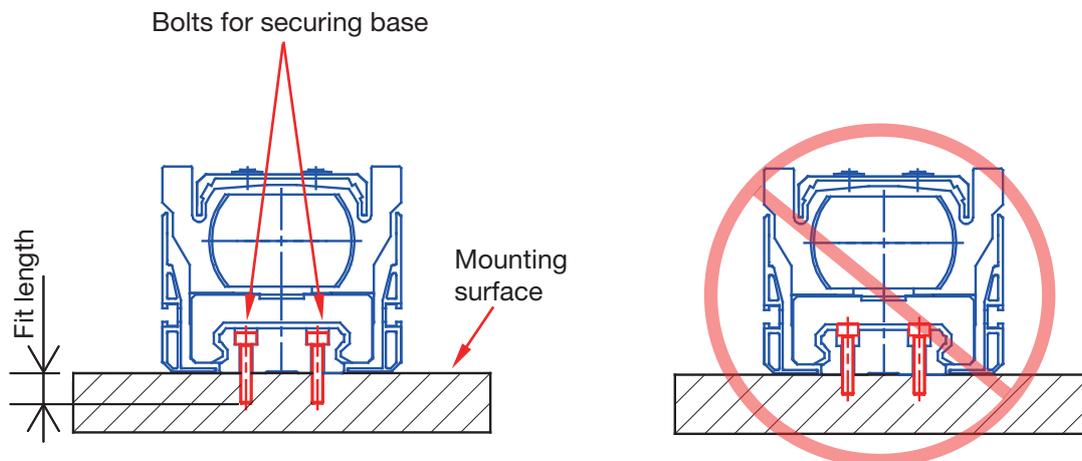


Fig.25 Drawing for mounting US6T/6RT/8T/8RT

Model number		US6		US8		
Bolt size		M4		M4		
Bolt material		Steel 10.9	SUS A2-70	Steel 10.9	SUS A2-70	
Fit length of bolt [mm]		8		8		
Recommended tightening torque [N·cm]	Material of mounting surface	Iron	457	228	457	228
		Aluminum	457	228	457	228

Table 1 US6T/6RT/8T/8RT countersunk specification tightening torque

- Mount the top cover using the bolts.
The bolt used: Thin head screw M4 x 6L
Tightening torque: 107 [N·cm]

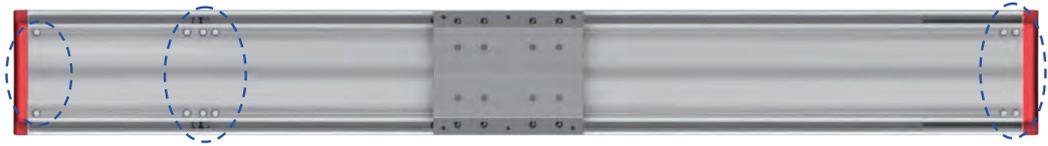
7. Installation and Operation

○ USW

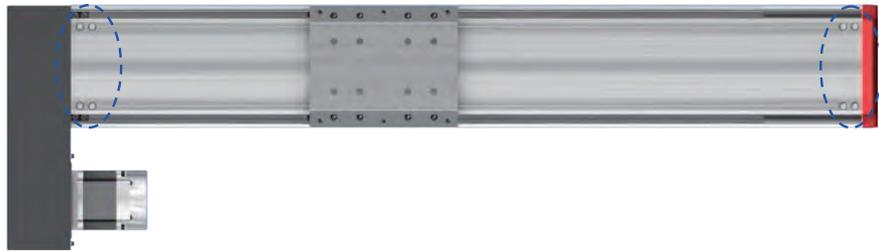
Countersunk hole specification

1. Remove the bolt of  part, and remove the top cover and motor top cover. Remove the top cover by sliding it along the longer side. You may need to remove the end cap as well depending on the stroke.

Bolt type used: Special bolt

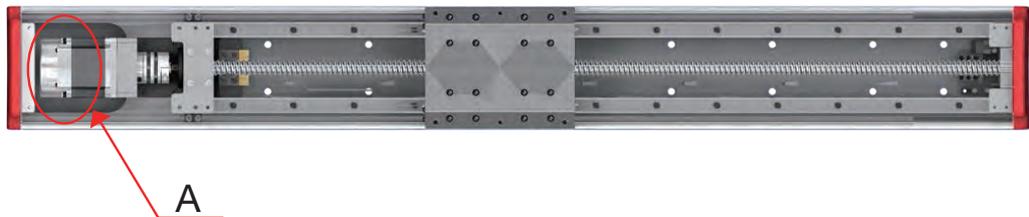


USW12T/16T/20T Top cover bolt position

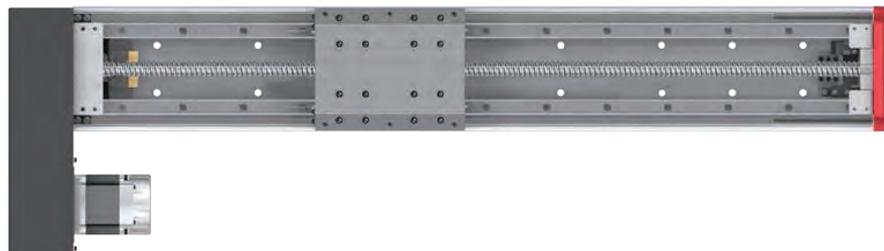


USW12RT/16RT/20RT Top cover bolt position

2. Secure the USW main unit to the mounting surface using the countersunk holes of the base. Depending on the type of the motor, you cannot access the countersunk holes shown in A part below.



A



Note) Secure the actuator using all the mounting holes.

7. Installation and Operation

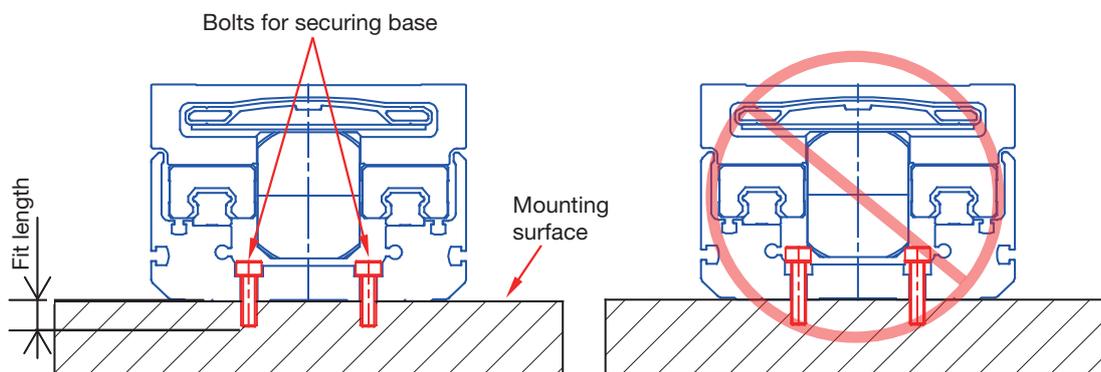


Fig.26 Drawing for mounting USW countersunk specification

Model number		USW12		USW16		USW20		
Bolt size		M6		M8		M8		
Bolt material		Steel 10.9	SUS A2-70	Steel 10.9	SUS A2-70	Steel 10.9	SUS A2-70	
Fit length of bolt [mm]		9		12		12		
Recommended tightening torque [N·cm]	Material of mounting surface	Iron	696	696	1568	1568	1568	1568
		Aluminum	696	696	1568	1568	1568	1568

Table 2 USW countersunk specification tightening torque

3. Mount the top cover using the bolts.
Bolt type used: Special bolt
Tightening torque: 431 [N·cm]

7. Installation and Operation

Tap hole specification

Note) Secure the actuator using all the mounting holes.

Note) Use the bolt with the most appropriate length. See Fig.27.

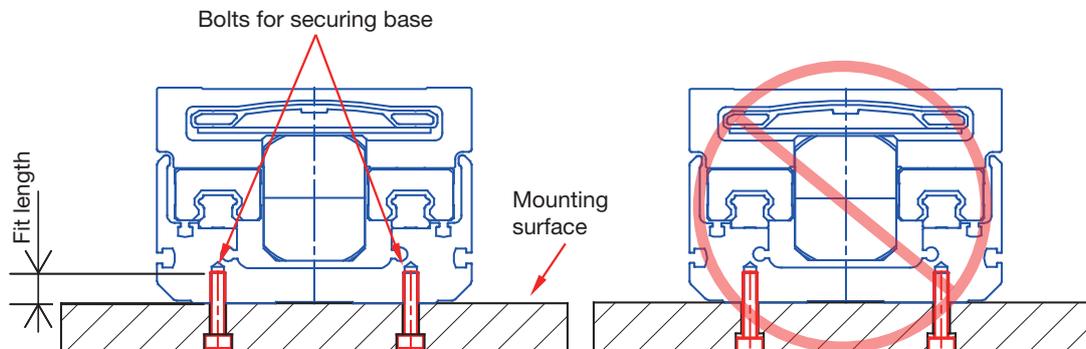


Fig.27 Drawing for mounting USW Tap specification

Model number		USW12T		USW16		USW20		
Bolt size		M6		M8		M8		
Bolt material		Steel 10.9	SUS A2-70	Steel 10.9	SUS A2-70	Steel 10.9	SUS A2-70	
Fit length of bolt [mm]		9		12		12		
Recommended tightening torque [N·cm]	Material of mounting surface	Iron	905	780	2039	1870	2039	1870
		Aluminum	696	696	1568	1568	1568	1568

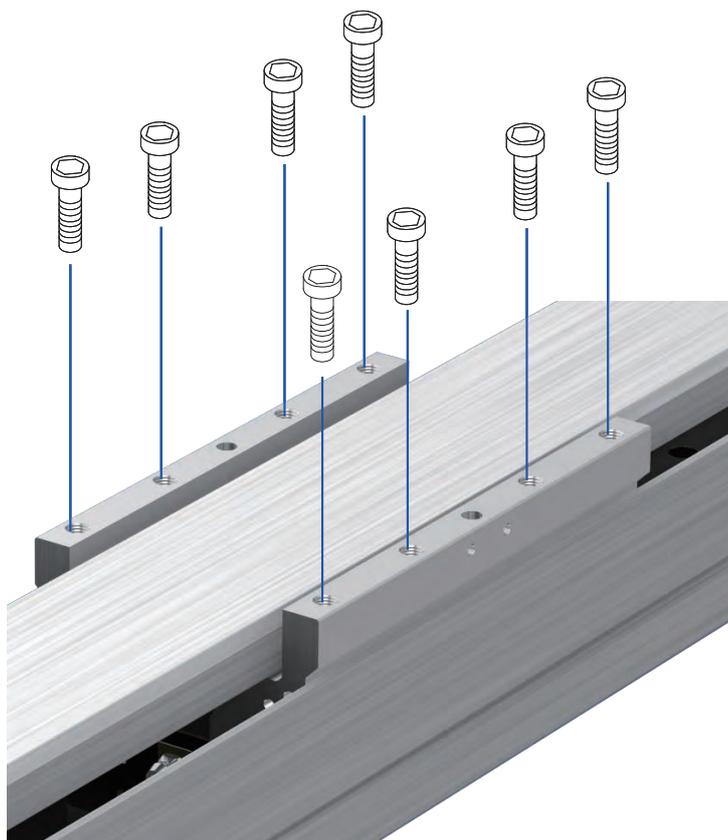
Table 3 Tightening torque for mounting base (when using the bottom surface tap)

7. Installation and Operation

7-10 Installation procedure of objects to be mounted

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

○ US

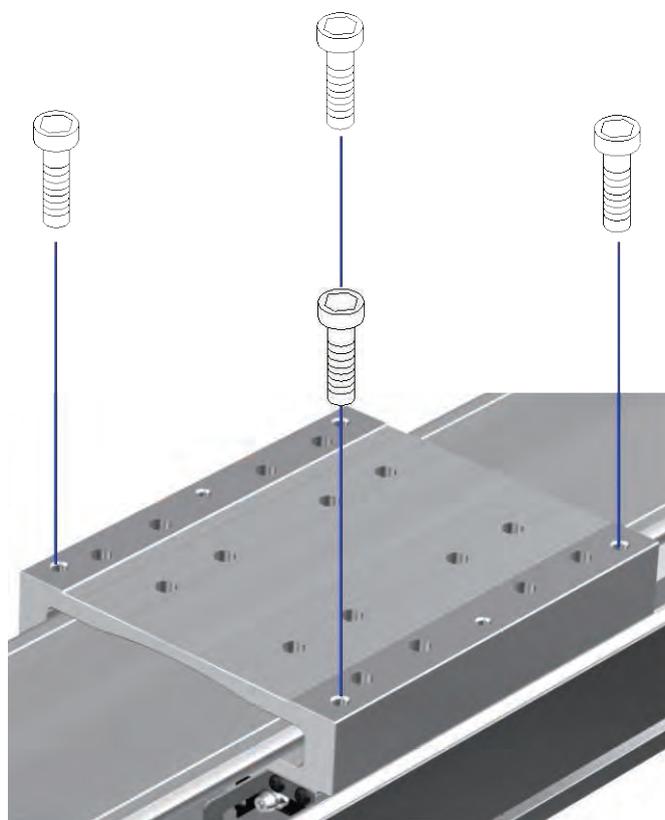


Model number		US6		US8		
Bolt size		M4		M6		
Bolt material		Steel 10.9	SUS A2-70	Steel 10.9	SUS A2-70	
Fit length of bolt [mm]		8		9		
Recommended tightening torque [N·cm]	Material of objects to be conveyed	Iron	345	228	904	780
		Aluminum	265	228	696	696

Table 4 Tightening torque for mounting US table

7. Installation and Operation

○ USW



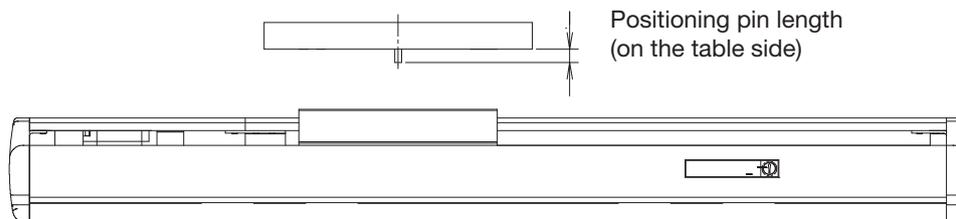
Model number		USW12		USW16		USW20		
Bolt size		M6		M8		M8		
Bolt material		Steel 10.9	SUS A2-70	Steel 10.9	SUS A2-70	Steel 10.9	SUS A2-70	
Fit length of bolt [mm]		9		12		12		
Recommended tightening torque [N·cm]	Material of mounting surface	Iron	904	780	2039	1870	2039	1870
		Aluminum	696	696	1568	1568	1568	1568

Table 5 Tightening torque for mounting USW table

7. Installation and Operation

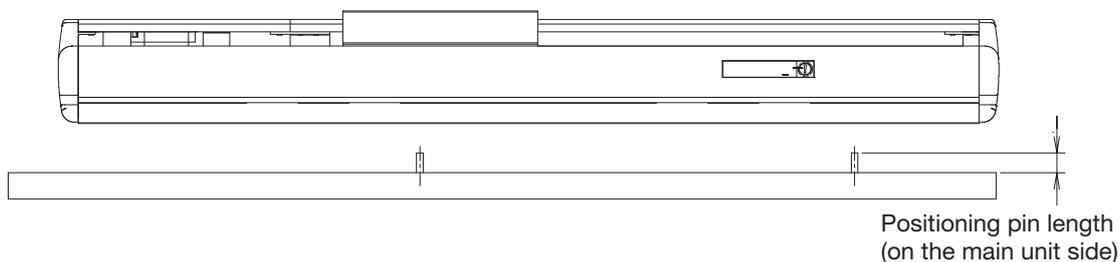
7-11 Positioning pin length

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



Model number	US6	US8	USW12	USW16	USW20
Table hole diameter	ϕ 4H7	ϕ 5H7	ϕ 5H7	ϕ 5H7	ϕ 5H7
Table hole depth [mm]	8	10	10	10	10
Positioning pin length [mm]	7	9	9	9	9

Table 6 Table positioning pin hole details



Model number	US6	US8	USW12	USW16	USW20
Main unit hole diameter	ϕ 5H7				
Main unit hole depth [mm]	7	11	10	8.5	8.5
Positioning pin length [mm]	6	10	9	7.5	7.5

Table 7 Main unit positioning pin hole details

7. Installation and Operation

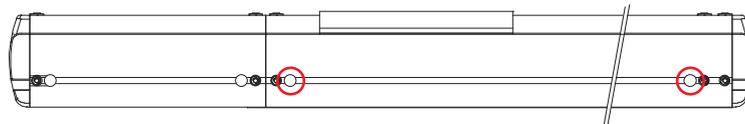
7-12 T slot

The US series have the T-slot as standard. It can be used for mounting sensors or cable chain supporter. For the details of T-slots, see Figs.28 to 32.

* US6/8 has the T-slot for mounting the sensor. You cannot use it for mounting mobile objects such as cable chains or heavy objects.

Method for inserting hexagonal nuts

US: Insert the hexagonal nut from the through hole (○ part) in the middle of the T-slot.



USW: Insert the hexagonal nut from the end cap.

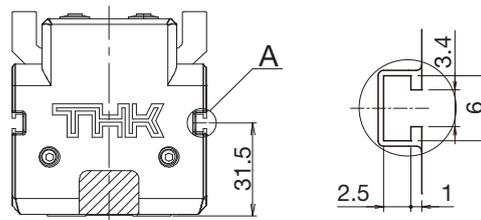


Fig.28 US6 T-slot details (A part)

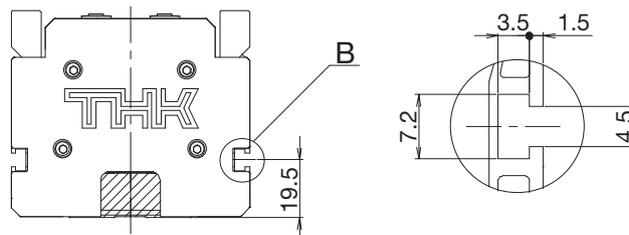


Fig.29 US8 T-slot details (B part)

7. Installation and Operation

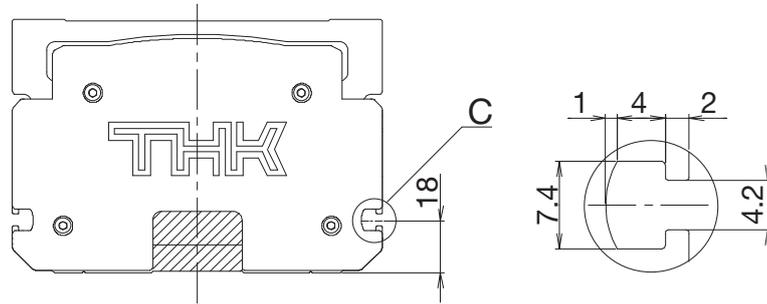


Fig.30 USW12 T-slot details (C part)

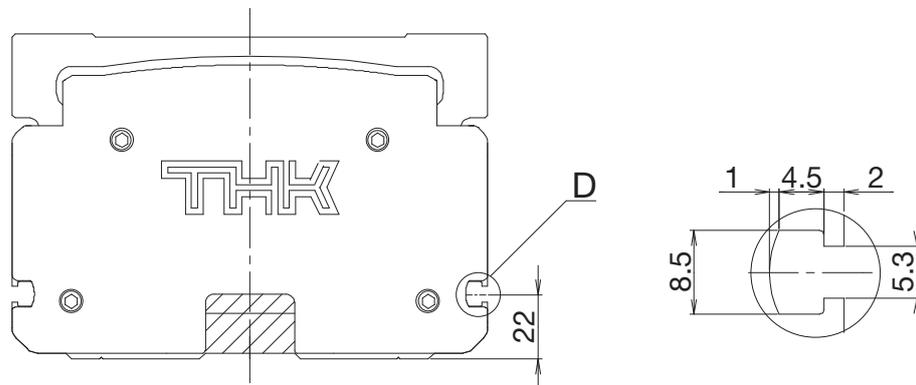


Fig.31 USW16 T-slot details (D part)

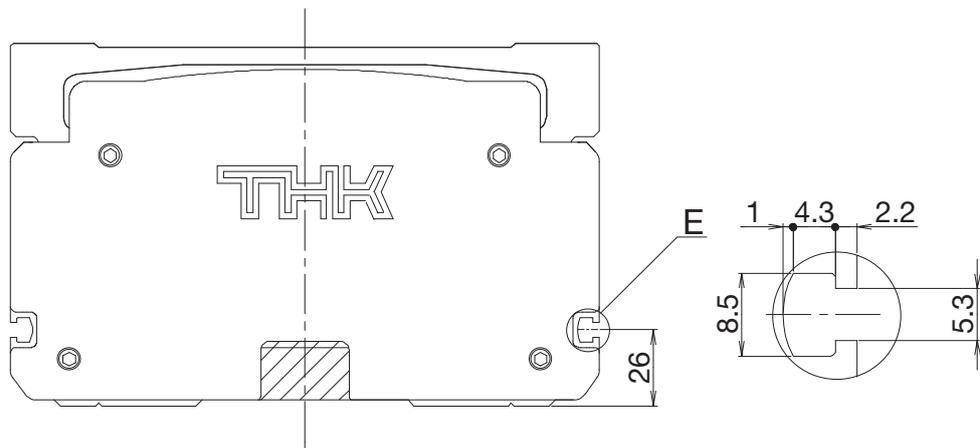


Fig.32 USW20 T-slot details (E part)

8. Maintenance

8. Maintenance

8-1 Precautions to be observed for safe use

WARNING



- **Turn off the machine (turning OFF the power) before performing maintenance.**
Failure to do so may cause electric shocks, or cause malfunction that could lead to injury.
- **If two or more people are involved in the maintenance work, confirm the procedure, signs and actions to cope with anomalies or the like in advance, and separately appoint a person for monitoring the work.**
Failure to do so may cause an unexpected accident.

CAUTION



- **When handling grease, wear 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 apply grease to a flame, a firework or a high-temperature object.**
Doing so 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.

8-2 Precautions to be observed for prevention of product fault or fracture



- **To have this product fully exerts 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 material enter the LM guide or ball screw.**
Doing so may cause fault, or could adversely affect the performance or service life.



- **Do not mix greases of different types.**
Doing so 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.

8-4 Periodical inspection

- **For the motor return type, we recommend you to adjust the belt tension after between about two weeks and one month of operation.**
 - Initial elongation of the belt may lower the belt tension.
- **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.
Inspection of timing belt (for the products using timing belts)
 - Adjust the belt tension.(See installation of motor)
 - * If you use the product with the belt tension low, it may adversely affect the performance.
 - Check whether the timing belt contacts the flange part of the pulley. If it contacts, adjust the alignment of the pulley.
(See Appendix)
 - * If you continue to use the product with the timing belt contacting the flange part, it may cause a fracture of the flange or abnormal wear of the belt.
 - Visually check an abnormal wear, scratch, or crack on the teeth or side of the timing belt.

8. Maintenance

8. Maintenance

8-5

Lubrication

- **The standard models are supplied with the following greases before shipment:**

- US: THK AFA Grease
- US (from October 1, 2014, on): LM guide portion: THK AFA Grease
Ball screw portion: THK AFF Grease
- USW: THK AFB-LF Grease
- For details of these three greases, see the appendix.

- **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 (5000 km for 5 mm / 6 mm leads), 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.

- **For lubrication, the LM guide and ball screw part have the grease nipples as standard. (US6 has the nipple only in the LM guide part)**

Table.8 shows the model numbers of the grease nipples and applicable nozzle types of the grease gun.

Model number	Greased part	Grease nipple model number	Applicable nozzle type
US6	LM guide	A-M6F	N type nozzle
	Ball screw	—	P type nozzle
US8	LM guide	A-M6F	H type nozzle
	Ball screw	C-MT6 x 1	
USW12	LM guide	PB1021B	Dedicated nozzle U type, N type attachment
	Ball screw	A-M6F	H type nozzle
USW16	LM guide	A-M6F	H type nozzle
	Ball screw		
USW20	LM guide	A-M6F	H type nozzle
	Ball screw		

Table 8 Grease nipple model number and applicable nozzle type

8. Maintenance

8. Maintenance

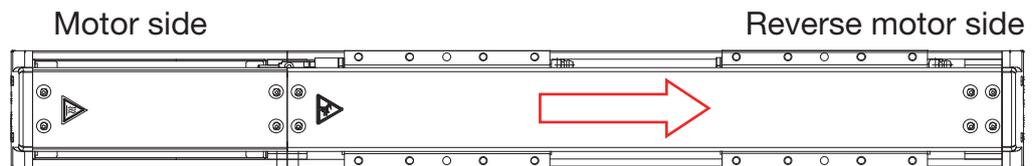
8-6

Method for supplying grease

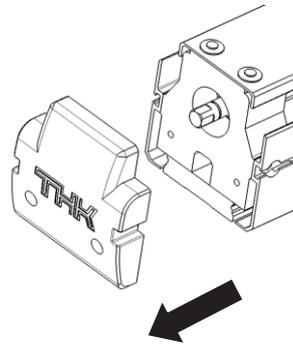
The following figure shows a US representative greasing method for your reference.

Procedures (US6T/6RT)

1. Move the table to the reverse motor side.

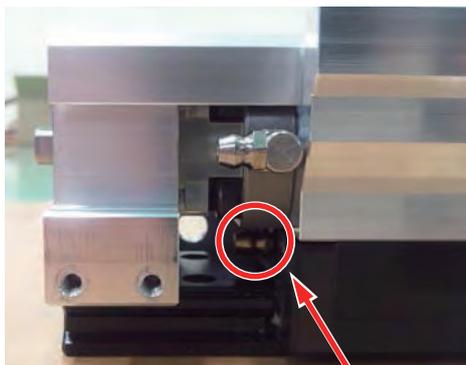


2. Remove the bolt (hexagonal-socket-head type bolt: M3 x 12L), and remove the end cap on reverse motor side.

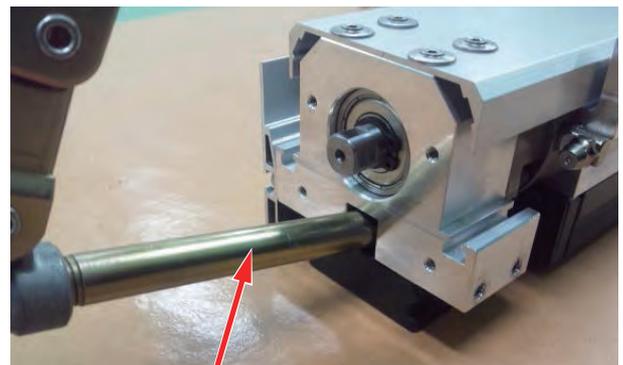


3. Supply grease using a grease gun as indicated in the figure below:

Lubrication of LM Guide



Grease nipple



Grease gun

- ① Mount the N type nozzle to the grease gun.
- ② Supply grease from the grease nipple attached on the end face of the LM block. (1 location)
- ③ Stroke the table to apply the grease.
- ④ Repeat this process several times until the amount of grease reaches the specified level. For the amount of grease, see Table 9.

Note) Make sure that you supply the grease several times. If you supply the specified amount of grease at once, the grease may not go around all the corners.

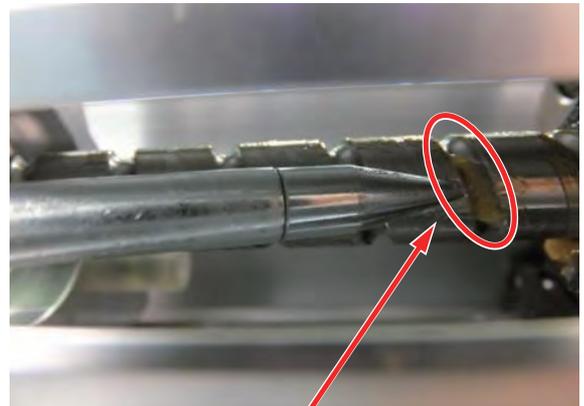
8. Maintenance

8. Maintenance

Ball screw lubrication



Grease gun



Raceway

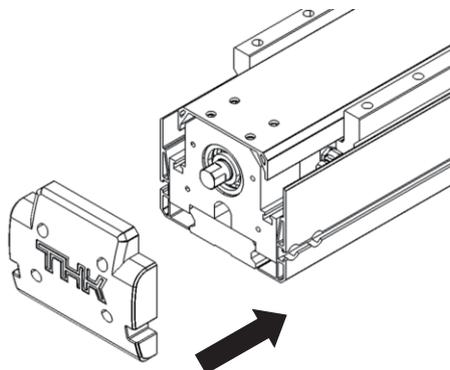
- ① Mount the P type nozzle to the grease gun.
- ② Apply grease directly for the raceway of the ball screw.
- ③ Stroke the table to apply the grease.
- ④ Repeat this process several times until the amount of grease reaches the specified level. For the amount of grease, see Table 17.

Note) Make sure that you supply the grease several times. If you supply the specified amount of grease at once, the grease may not go around all the corners.

US6T/6RT		Amount of greasing (cc/1 location)
LM guide part		1.5
Ball screw part	Lead 6 mm	$1.5 + 0.005 \times \text{stroke}$
	Lead 12 mm	$1.5 + 0.005 \times \text{stroke}$

Table 9 Amount of greasing

4. Mount the end cap on reverse motor side.



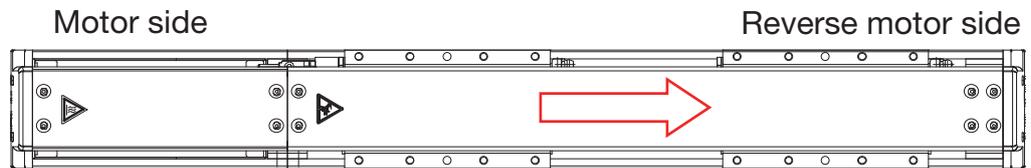
Bolt size	Tightening torque [N·cm]
M3 x 10L	17

Bolt type: Hexagonal-socket-head type bolt

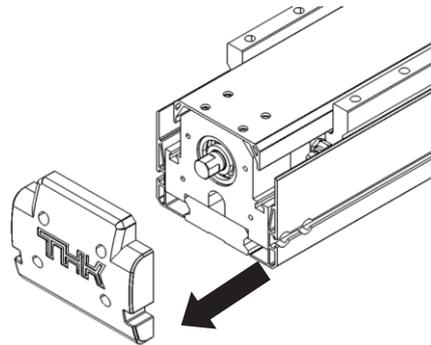
8. Maintenance

Procedures (US8T/8RT)

1. Move the table to the reverse motor side.

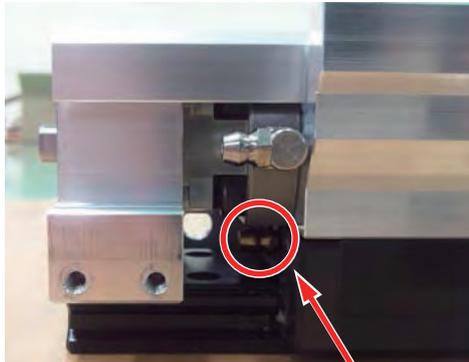


2. Remove the bolt (hexagonal-socket-head type bolt: M3 x 10L), and remove the end cap on the reverse motor side.

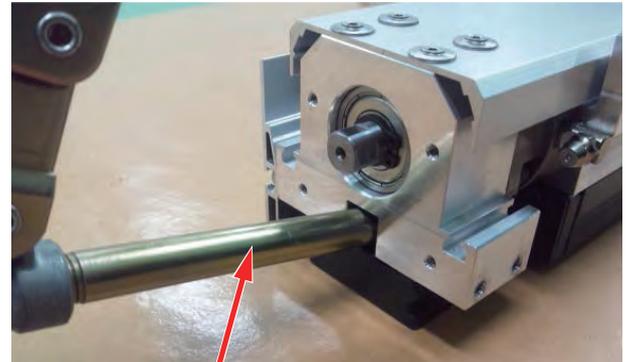


3. Supply grease using a grease gun as indicated in the figure below:

Lubrication of LM Guide



Grease nipple



Grease gun

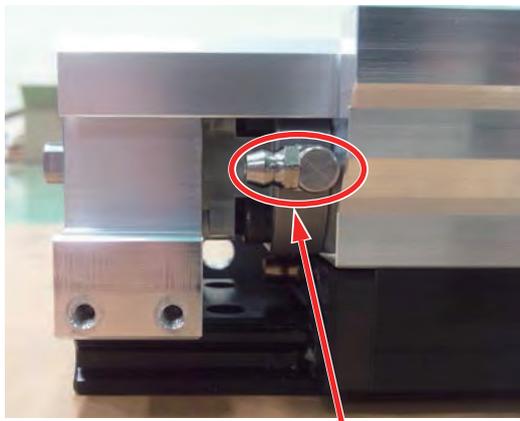
- ① Mount the H type nozzle to the grease gun.
- ② Supply grease from the grease nipple attached on the end face of the LM block. (1 location)
- ③ Stroke the table to apply the grease.
- ④ Repeat this process several times until the amount of grease reaches the specified level. For the amount of grease, see Table 10.

Note) Make sure that you supply the grease several times. If you supply the specified amount of grease at once, the grease may not go around all the corners.

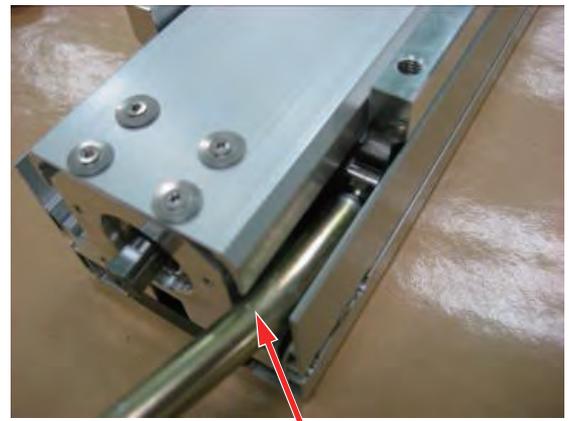
8. Maintenance

8. Maintenance

Ball screw lubrication



Grease nipple



Grease gun

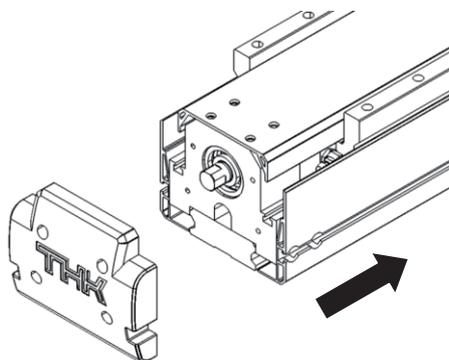
- ① Mount the H type nozzle to the grease gun.
- ② Supply grease from the grease nipple attached on the ball screw nut.(1 location)
- ③ Stroke the table to apply the grease.
- ④ Repeat this process several times until the amount of grease reaches the specified level. For the amount of grease, see Table 10.

Note) Make sure that you supply the grease several times. If you supply the specified amount of grease at once, the grease may not go around all the corners.

US8T/8RT		Amount of greasing (cc/1 location)
LM guide part		2.4
Ball screw part	Lead 5 mm	$2.3 + 0.007 \times \text{stroke}$
	Lead 10 mm	$2.3 + 0.007 \times \text{stroke}$
	Lead 20 mm	$2.3 + 0.007 \times \text{stroke}$
	Lead 30 mm	$2.3 + 0.007 \times \text{stroke}$

Table 10 Amount of greasing

4. Mount the end cap on reverse motor side.



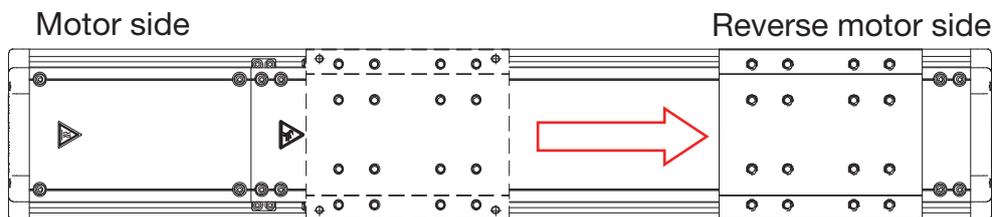
Bolt size	Tightening torque [N·cm]
M3 x 10L	17

Bolt type: Hexagonal-socket-head type bolt

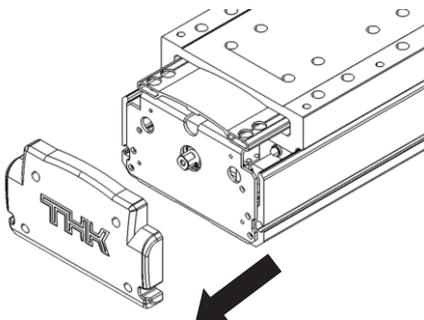
8. Maintenance

Procedures (USW)

1. Move the table to the reverse motor side.

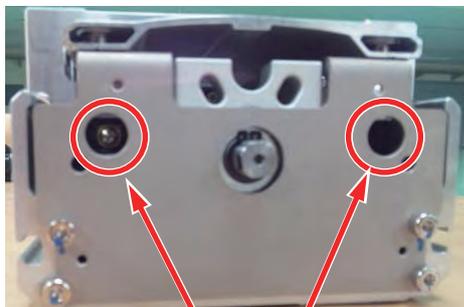


2. Remove the bolt (hexagonal-socket-head type bolt: M3 x 10L), and remove the end cap on the reverse motor side.

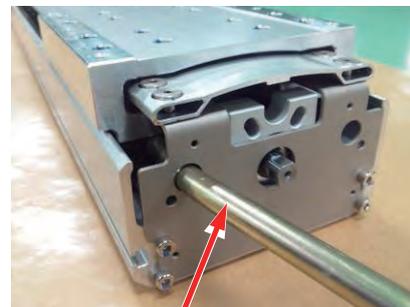


3. Supply grease using a grease gun as indicated in the figure below:

Lubrication of LM Guide



Grease nipple



Grease gun

- ① Mount the H type nozzle to the grease gun.
 - USW12T/12RT: Dedicated nozzle U type N type attachment
 - USW16T/16RT/USW20T/20RT: H type nozzle
- ② Supply grease from the grease nipple attached on the end face of the LM block. (2 locations)
- ③ Stroke the table to apply the grease.
- ④ Repeat this process several times until the amount of grease reaches the specified level. For the amount of grease, see Table 11.

Note) Make sure that you supply the grease several times. If you supply the specified amount of grease at once, the grease may not go around all the corners.

8. Maintenance

8. Maintenance

Ball screw lubrication



Grease nipple



Grease gun

- ① Mount the H type nozzle to the grease gun.
 - ② Supply grease from the grease nipple attached on the ball screw nut. (1 location)
 - ③ Stroke the table to apply the grease.
 - ④ Repeat this process several times until the amount of grease reaches the specified level. For the amount of grease, see Table 12.
- Note) Make sure that you supply the grease several times. If you supply the specified amount of grease at once, the grease may not go around all the corners.

Model number	Amount of greasing (cc/1 location)
USW12	1.8
USW16	3.6
USW20	5

Table 19 Amount of greasing for USW LM guide part

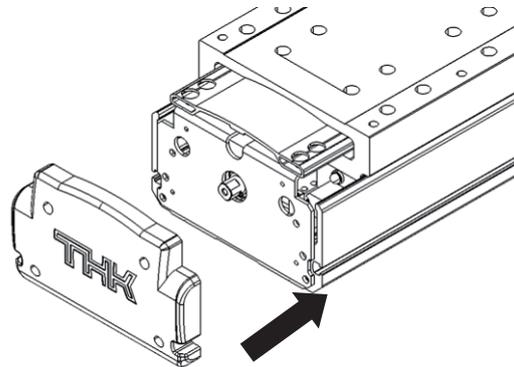
Model number	Ball screw lead	Amount of greasing (cc/1 location)
USW12	5 mm	2.4 + 0.007 x stroke
	10 mm	2.4 + 0.007 x stroke
	20 mm	2.4 + 0.007 x stroke
	30 mm	2.4 + 0.007 x stroke
USW16	10 mm	2.4 + 0.01 x stroke
	20 mm	3.5 + 0.01 x stroke
	40 mm	6.4 + 0.01 x stroke
USW20	20 mm	4 + 0.01 x stroke
	40 mm	6.9 + 0.01 x stroke

Table 12 Amount of greasing for USW ball screw part

8. Maintenance

8. Maintenance

4. Mount the end cap on reverse motor side.



Model number	Bolt size	Tightening torque [N·cm]
USW12	M3 x 8L	17
USW16	M4 x 10L	34
USW20	M4 x 10L	34

Bolt type: Hexagonal-socket-head type bolt

8. Maintenance

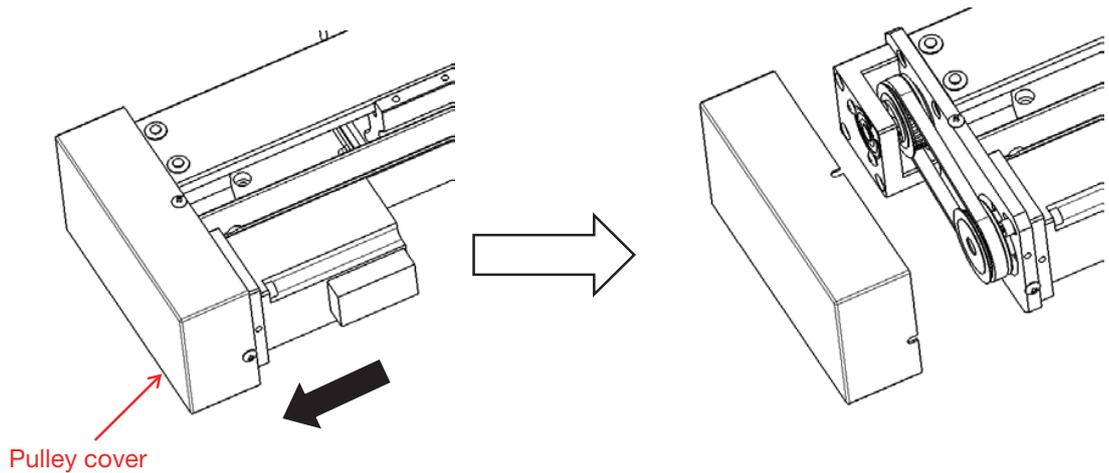
8-7

Belt replacement method for motor return type

The following figure shows the belt replacement method for US/USW your reference.

Procedures (US6RT)

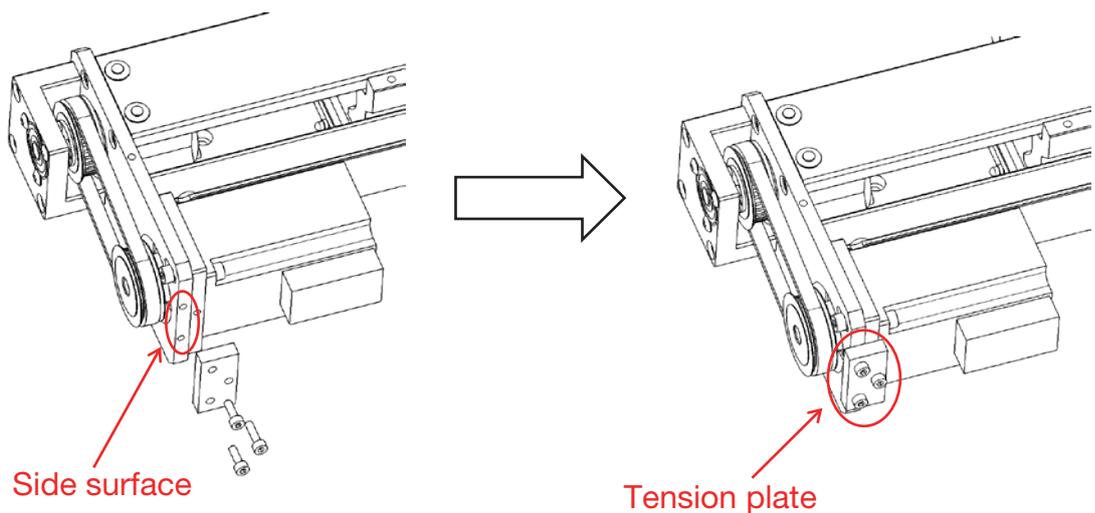
1. Remove the bolt, and take out the pulley cover toward the direction of the black arrow.



Model number	Bolt size
US6RT	M3 x 6L

Bolt type: Cross recessed button-head bolt

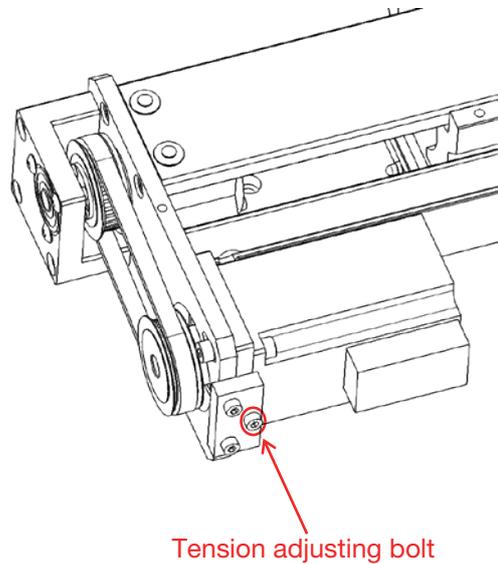
2. Use the 2 locations on the top of the pulley bracket side surface to mount the tension plate.



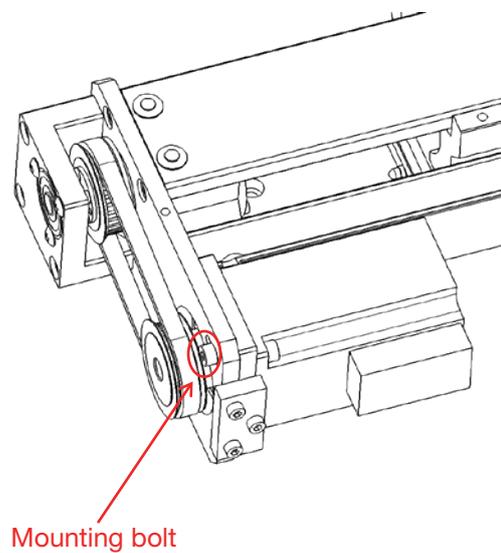
8. Maintenance

8. Maintenance

3. Use the tension adjusting bolt of the tension plate (hexagonal-socket-head type bolt: M3) to fix the motor mounting plate.



4. Loosen the mounting bolt of the motor mounting plate.

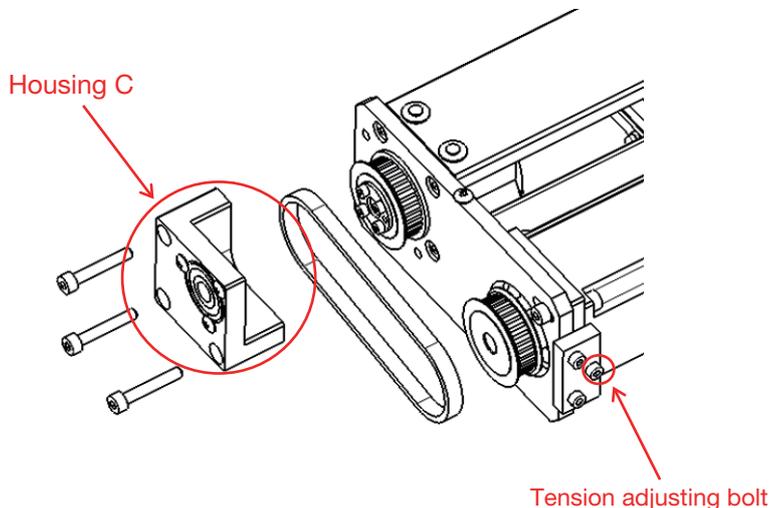


Model number	Bolt used
US6RT	M4 x 12L

Bolt type: Hexagonal-socket-head type bolt

8. Maintenance

- Remove the bolt for fixing the housing C, and remove the housing C. Loosen the tension adjusting bolt, and remove the old timing belt.
Belt to be used (Made by Gates Unitta Asia Company)

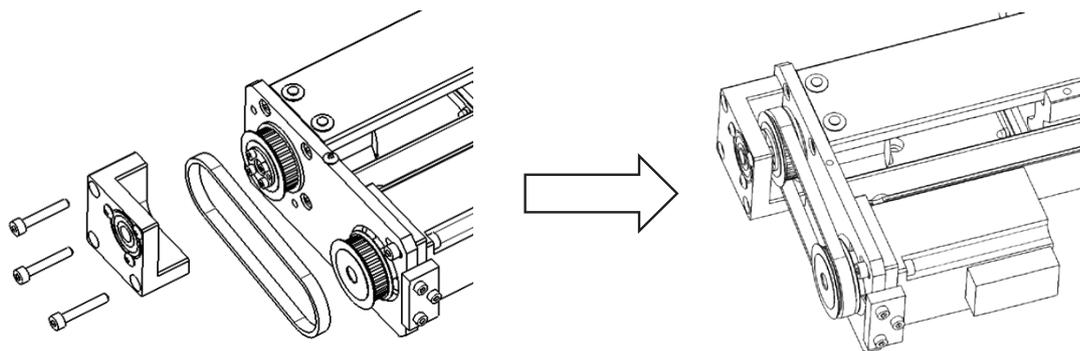


Model number	Bolt used
US6RT	M4 x 25

Bolt type: Hexagonal-socket-head type bolt

Model number	Timing belt
US6RT	237-3GT-6

- Replace with the new timing belt, and mount the housing C.



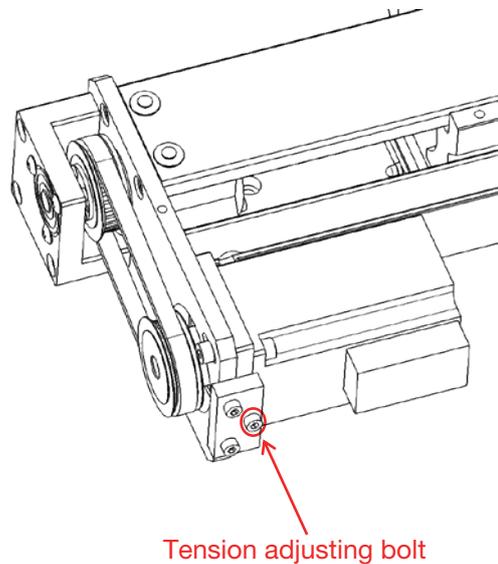
Model number	Bolt used	Tightening torque [N·cm]
US6RT	M4 x 25	250

Bolt type: Hexagonal-socket-head type bolt

8. Maintenance

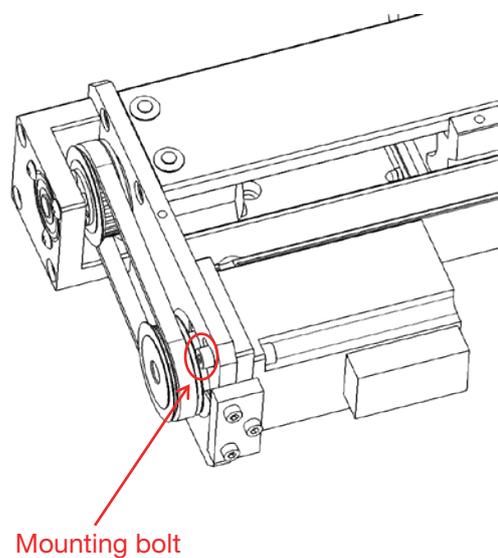
8. Maintenance

7. Tighten the tension adjusting bolt (hexagonal-socket-head type bolt: M3) to adjust the belt tension.



* For the method to adjust the belt, see “Motor mounting method”.

8. Tighten the mounting bolt of the motor mounting plate.



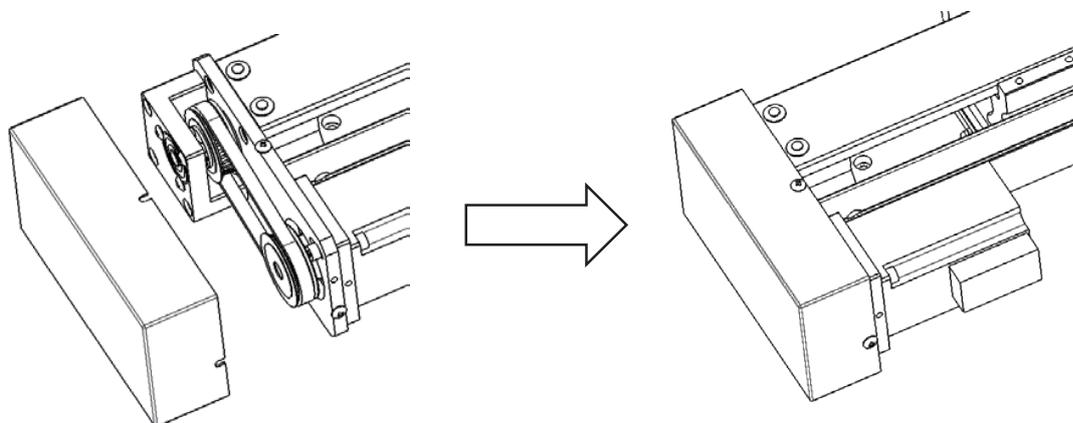
Model number	Bolt used	Tightening torque [N·cm]
US6RT	M4 x 12L	210

Bolt type: Hexagonal-socket-head type bolt

8. Maintenance

8. Maintenance

9. Remove the tension plate, and mount the pulley cover.



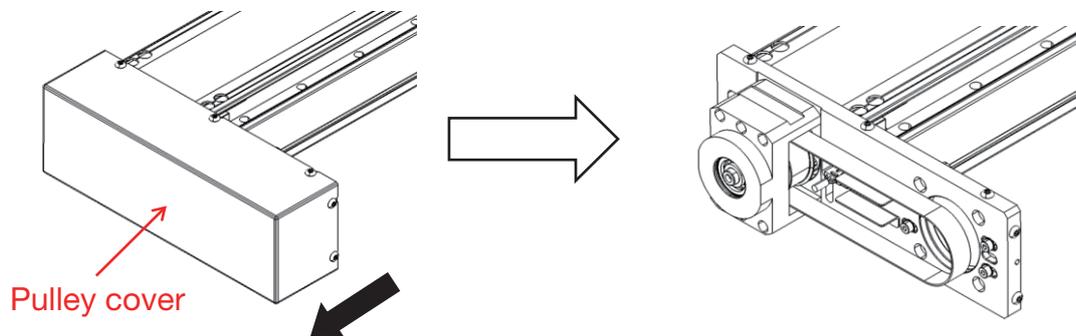
Model number	Bolt size	Tightening torque [N·cm]
US6RT	M3 x 6L	75

Bolt type: Cross recessed button-head bolt

8. Maintenance

Procedures (USW)

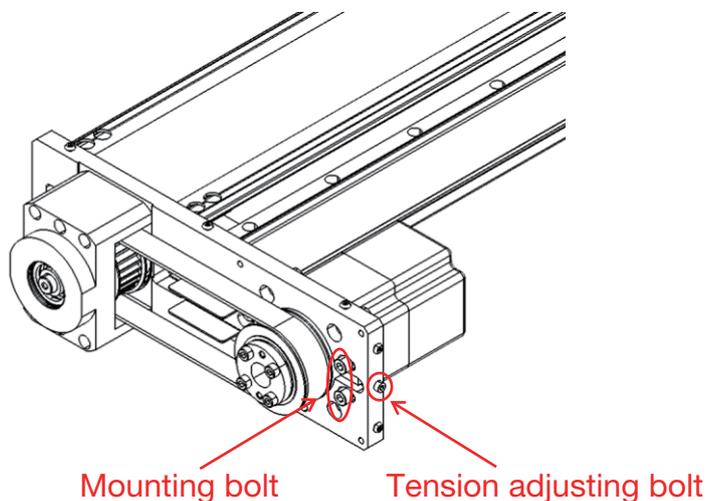
1. Loosen the bolt, and take out the pulley cover to the direction of the arrow.



Model number	Bolt size
USW12RT	M3 x 6L
USW16RT	M3 x 6L
USW20RT	M4 x 8L

Bolt type: Hexagonal-socket-head type bolt

2. Mount the tension adjusting bolt (hexagonal-socket-head type bolt: M3). Loosen the mounting bolt of the motor mounting plate.



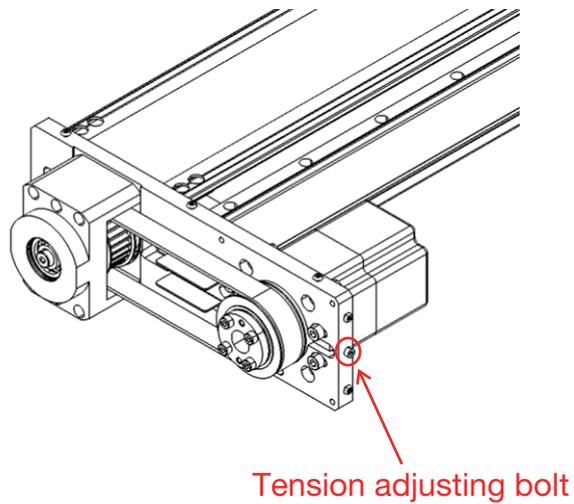
Model number	Bolt size
USW12RT	M5 x 10L
USW16RT	M5 x 10L
USW20RT	M6 x 15L

Bolt type: Hexagonal-socket-head type bolt

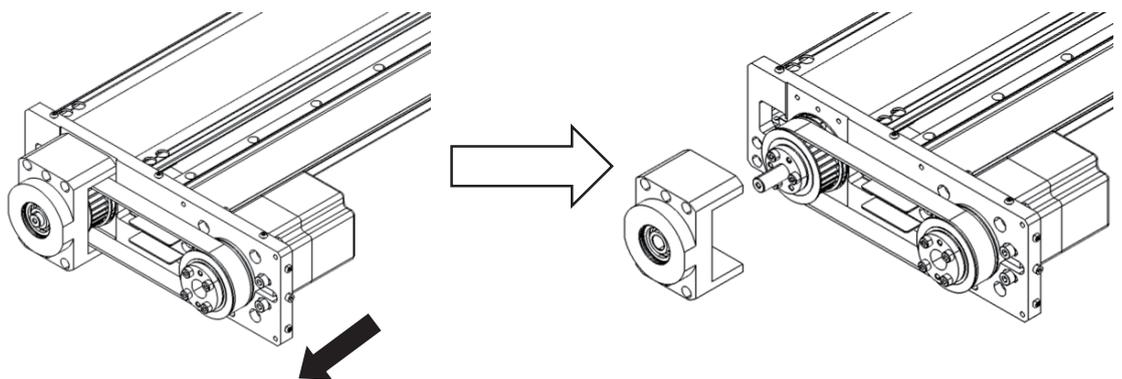
8. Maintenance

8. Maintenance

3. Loosen the tension adjusting bolt (hexagonal-socket-head type bolt: M3).



4. Remove the hexagonal-socket-head type bolt, and take out the pulley support to the direction of the arrow.

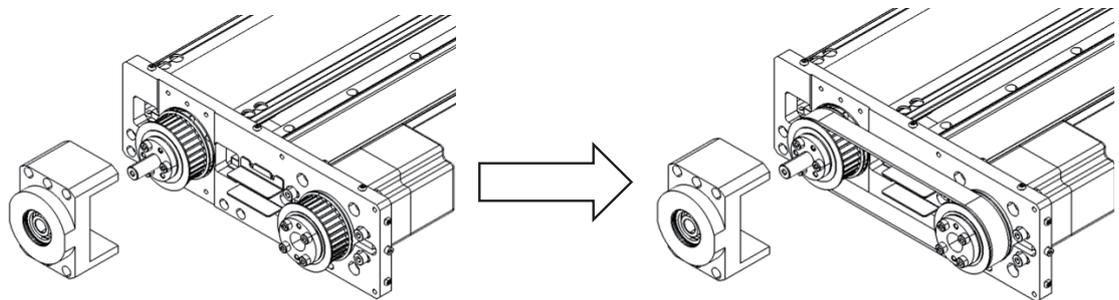


Model number	Bolt used
USW12RT	M4 x 40L
USW16RT	M5 x 45L
USW20RT	M5 x 45L

Bolt type: Hexagonal-socket-head type bolt

8. Maintenance

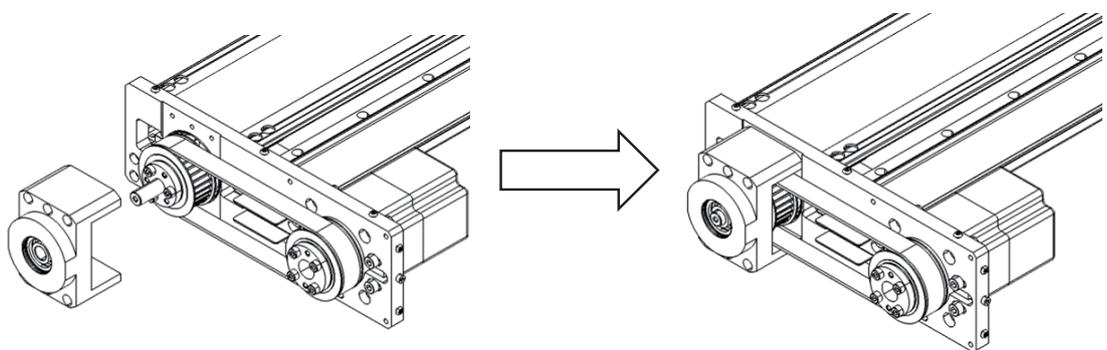
5. Remove the old timing belt, and replace it with the new one.
Belt to be used (Made by Gates Unitta Asia Company)



Model number	Timing belt
USW12RT	450-5GT-15
USW16RT	457-5GT-15
USW20RT	575-5GT-20

Bolt type: Hexagonal-socket-head type bolt

6. Mount the pulley support.

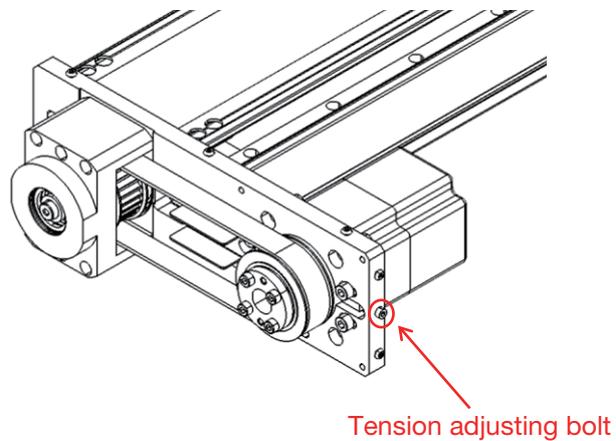


Model number	Bolt used	Tightening torque [N·cm]
USW12RT	M4 x 40L	499
USW16RT	M5 x 45L	813
USW20RT	M5 x 45L	999

Bolt type: Hexagonal-socket-head type bolt

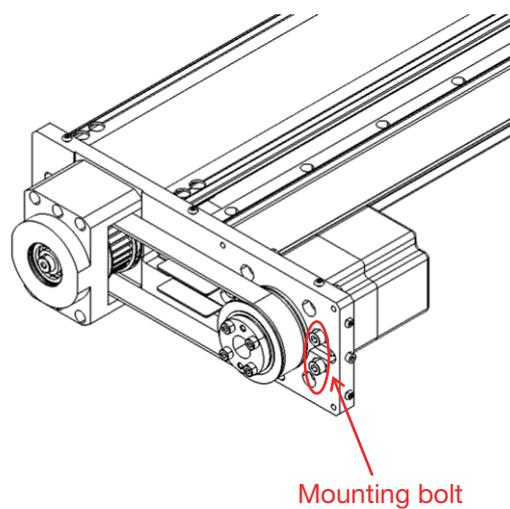
8. Maintenance

7. Tighten the tension adjusting bolt (hexagonal-socket-head type bolt: M3) to adjust the belt tension.



- * For the method to adjust the belt, see “Motor mounting method”.

8. Tighten the mounting bolt of the motor mounting plate.



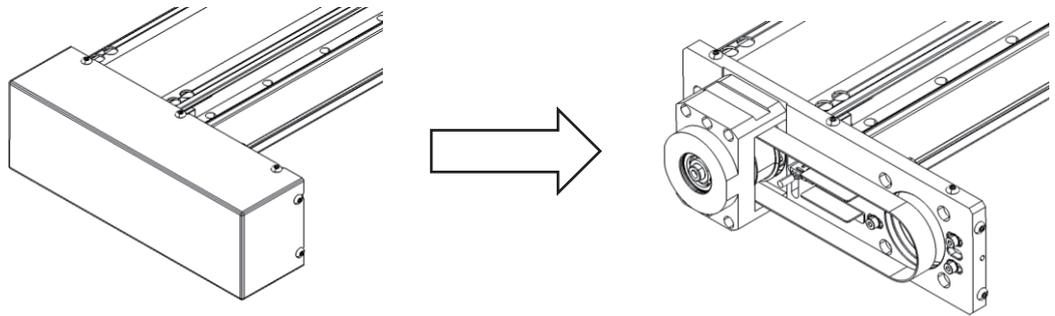
Model number	Bolt used	Tightening torque [N-cm]
USW12RT	M5 x 10L	725
USW16RT	M5 x 10L	725
USW20RT	M6 x 15L	1313

Bolt type: Hexagonal-socket-head type bolt

8. Maintenance

8. Maintenance

9. Mount the pulley cover.



Model number	Bolt used	Tightening torque [N-cm]
USW12RT	M3 x 6L	166
USW16RT	M3 x 6L	166
USW20RT	M4 x 8L	362

Bolt type: Hexagonal-socket-head type button bolt

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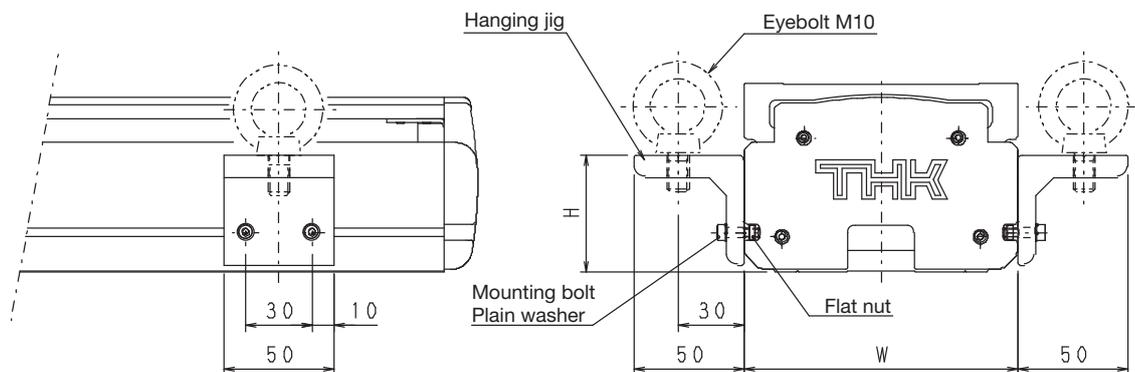
9-1

Hanging jig

- * We recommend to attach a hanging jig when the actuator main unit has the weight of 20 kg or more.
- * The hanging jig is applicable to USW.
- * When THK mounts the hanging jig to the actuator for shipment, please prepare the eyebolts M10 (4 pcs, equivalent to JIS B 1169) by yourself.
- * When we mount the hanging jig to the actuator for shipment, and when you select "6", "E", "J" or "M" for the sensor, install the sensor near the base end on the motor side.
- * When you purchase the hanging jig singly, place an order according to the following model number:

Model number: USW□□-HANG Hanging jig (4 pcs), flat nut (4 pcs)

Prepare the mounting bolts (8 pcs) and eyebolts (4 pcs) by yourself.



	W	H
USW12T/12RT	124	53
USW16T/16RT	160	52
USW20T/20RT	200	56

Table 13 Hanging jig dimensions

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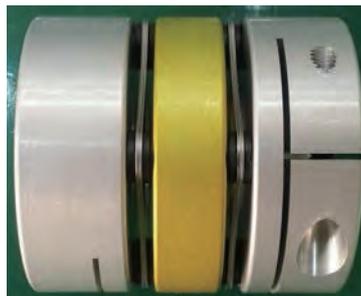
Standard coupling

When combined with controller, we use the following couplings:

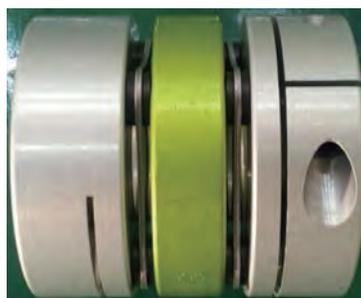
Model number	Standard coupling		
	Models	Manufacturers	Inertia moment [kg·cm ²]
US6T	NES20W-N8C×N8C	Tsubaki E&M Co., Ltd.	0.034
US8T	NES20W-N8C×N10C	Tsubaki E&M Co., Ltd.	0.034
USW12T	SDWA31C-10×14	SUNGIL	0.075
USW16T	SDWA31C-12×14	SUNGIL	0.075
USW20T	SDWA47C-12×19	SUNGIL	0.55

Table 14 Standard couplings

- * When you (the customer) purchase the standard coupling of USW on your own, the color of surface treatment of the coupling will be different from that of the others, but the performance/quality of the product will be the same.



Color of surface treatment (THK standard coupling)



Color of surface treatment (Manufacturer standard coupling)

9. Appendix

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Recommended coupling

The recommended couplings of US/USW are shown in the following table:

Model number	Recommended couplings		
	Models	Manufacturers	Inertia moment [kg·cm ²]
US6T	SFC-020DA2_C	Miki Pulley Co., LTD.	0.034
US8T	SFC-020DA2_C		0.034
USW12T	SFC-030DA2_B		0.095
USW16T	SFC-035DA2_C		0.271
USW20T	SFC-040DA2_B		0.363

Table 15 Recommended couplings (Miki Pulley Co., LTD.)

Model number	Recommended couplings		
	Models	Manufacturers	Inertia moment [kg·cm ²]
US6T	XBW-25C2	Nabeya Bi-tech Kaisha	0.023
US8T	XBW-25C2		0.023
USW12T	XBW-34C2		0.09
USW16T	XBW-34C2		0.09
USW20T	XBW-39C2		0.210

Table 16 Recommended couplings (Nabeya Bi-tech Kaisha)

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9-4 Static permissible moment

- Static permissible moment is shown in Table 17. For the direction of the moment, see Fig.33. (The static moment is the value when a load is applied only to one direction.)

Model number		US6	US8	USW12	USW16	USW20
Static permissible moment [N·m]	Ma direction	123	287	915	2161	1921
	Mb direction	290	235	317	740	793
	Mc direction	138	226	786	1681	2221

Table 17 Static permissible moment

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.

9-5 Static permissible load

- Static permissible load is shown in Table 18. For the direction of the load, see Fig.18. (The static permissible load is the value when a load is applied only to one direction.)

Model number		US6	US8	USW12	USW16	USW20
Static permissible load [N]	Reverse radial direction	16753	28599	14300	24007	24007
	Lateral direction	3651	7520	3760	6488	6488
	Axial direction	1740 Direct motor coupling	2095 Direct motor coupling (100W)	3330	3760	2571
			2689 Motor return (100W)			
		1288 Motor return	1047 Direct motor coupling (150W)			
			1345 Motor return (150W)			

Table 18 Static permissible load

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

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9. Appendix

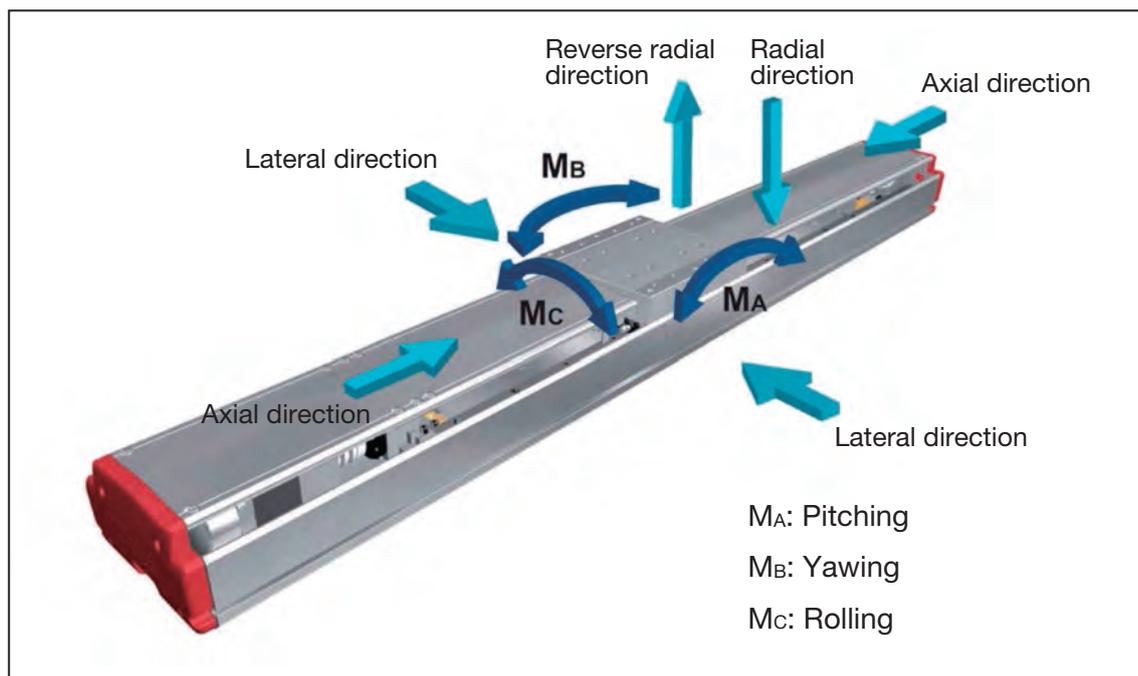


Fig.33 Imposed load ratio and moment direction

9-6

Permissible input torque

- Table 19 shows the permissible input torque when the product is directly coupled with a motor. If you use a motor that exceeds the permissible input torque, consider taking a necessary measure such as limiting the motor torque.

Model number	Direct motor coupling [N·m]	Motor return [N·m]
US6	1.67	1.23
US8	1.67	2.14
USW12	2.65	2.65
USW16	5.98	5.98
USW20	8.18	8.18

Table 19 Permissible input torque

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9. Appendix

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Introduction of the grease

THK original grease

AFA Grease

It is high-class grease with a long service life using a urea-based consistency enhancer with high-class synthetic oil as the base oil.

● Property

- Unlike ordinary metal soap based grease, it excels in antioxidation stability and can be used for a long period.
- Grease unsusceptible to entrance of water.
- Grease that does not easily soften even if used for a long period.

● Representative properties

Test items	Representative property values	
Consistency enhancer	Urea-based	
Base oil	High-class synthetic oil	
Base oil kinetic viscosity: mm ² /s (40°C)	25	
Worked penetration (25°C, 60 W)	285	
Mixing stability (100,000 W)	329	
Dropping point: °C	261	
Evaporation: mass% (99°C, 22 h)	0.2	
Oil separation rate: mass% (100°C, 24 h)	0.5	
Copper plate corrosion (B method, 100°C, 24 h)	Accepted	
Low temperature torque: mN·m (-20°C)	Startup	170
	Rotation	70
4-ball test (fusion load): N	3089	
Service temperature range (°C)	-45 to 160	
Appearance color	Brown	



Fig.34 Appearances of the grease tube and product box

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AFB-LF Grease

It is universal grease using a lithium-based consistency enhancer with refined mineral oil as the base oil.

● **Property**

- Excels in abrasion resistance and extreme pressure resistance in comparison to off-the-shelf universal lithium-based grease due to the action of a special additive.
- Not easily softens and excels in mechanical stability even if used for a long period.
- Unsusceptible to influences of water such as softening in case of water entrance and decrease in extreme pressure resistance.

● **Representative properties**

Test items	Representative property values	
Consistency enhancer	Lithium-based grease	
Base oil	Refined mineral oil	
Base oil kinetic viscosity: mm ² /s (40°C)	170	
Worked penetration (25°C, 60 W)	275	
Mixing stability (100,000 W)	345	
Dropping point: °C	193	
Evaporation: mass% (99°C, 22 h)	0.4	
Oil separation rate: mass% (100°C, 24 h)	0.6	
Copper plate corrosion (B method, 100°C, 24 h)	Accepted	
Low temperature torque: mN·m (-20°C)	Startup	130
	Rotation	51
4-ball test (fusion load): N	3089	
Service temperature range (°C)	-15 to 100	
Appearance color	Brownish yellow	



Fig.35 Appearances of the grease tube and product box

9. Appendix

AFF Grease

The grease made of high-class synthetic oil, lithium-based consistency enhancer and special additives has a stable rolling resistance value, low dust generation, and excellent fretting resistance unlike the existing vacuum grease or low-dust grease.

● **Characteristics**

- The lower viscous resistance realizes the superior follow-up performance at low speed.
- Excellent low dust generation.
- Excellent abrasion resistance against slight vibration.

● **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	30
4-ball test (fusion load): N	1236	
Operating temperature range (° C)	-40 to 120	
Appearance color	Reddish brown	



Fig. 36 Appearance of the grease tube and the product box

9. Appendix

9. Appendix

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Introduction of the grease gun unit

Grease Gun Unit MG70



The grease gun unit MG70 is capable of supplying grease for US/USW 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 20 shows the specifications of the grease gun while Fig.37 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 20 Specifications of the grease gun

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9. Appendix

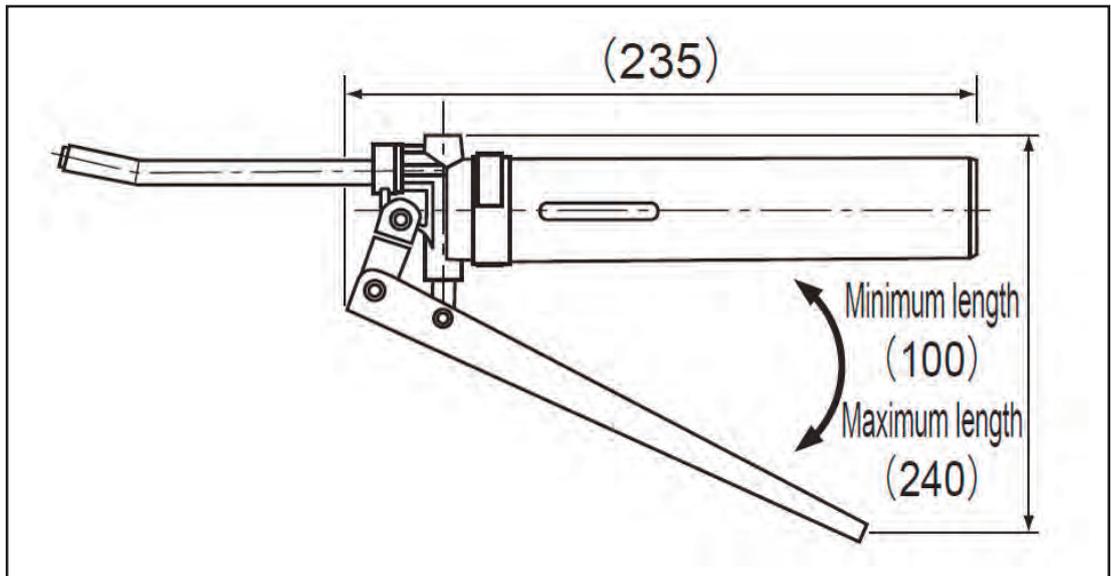


Fig.37 Appearance of the grease gun

Fig. 38 shows the shapes of the nozzles and attachment for the grease gun used to lubricate US/USW.

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

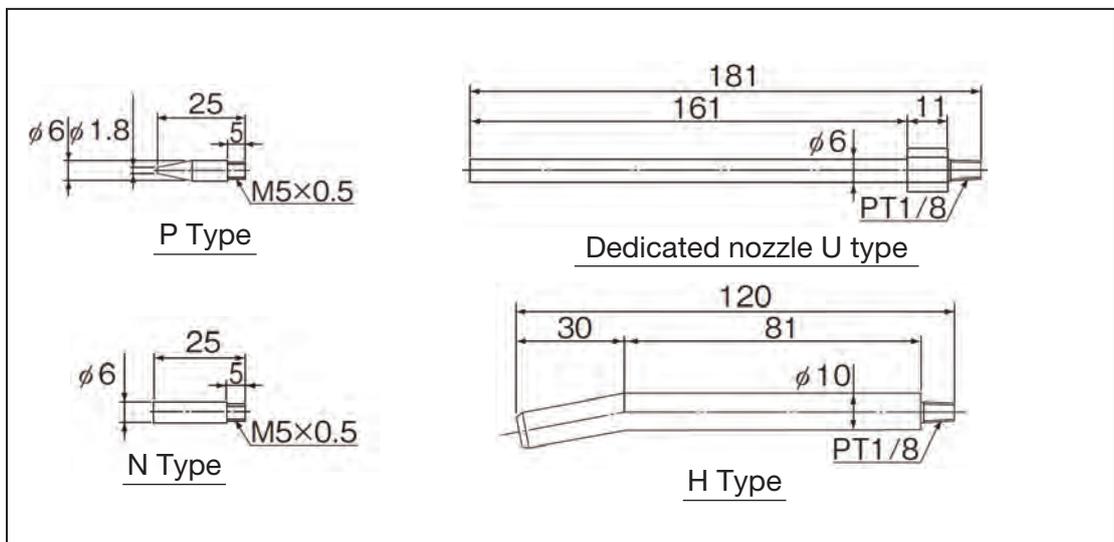


Fig.38 Shapes of the nozzle and attachment for the grease gun

Appendix

Revision history

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

Date of issue	Instruction manual No.	Details
1/2016	No.3050-1(0)E	First edition
1/2017	No.3050-1(1)E	Errors corrected
2/2018	No.3050-2(0)E	Errors corrected



THK Electric Actuator Universal Series

US / USW

INSTRUCTION MANUAL