IAI
Quality and Innovation

EC
ELECYLINDER

ELECYLINDER®

Products designed for use in secondary battery production processes
Radial Cylinder Type

EC-RR3□B/RR3□BR
EC-RR4□B/RR4□BR
EC-RR6□B/RR6□BR/RR6□AHB/
RR6□AHBR/RR6X□AHB
EC-RR7□B/RR7□BR/RR7□AHB/
RR7□AHBR/RR7X□AHB
EC-RR8□B/RR8□BR
EC-RR10□B/RR10□BR

Instruction Manual First Edition ME3841-1A



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For electric / control details such as electrical specification, wiring, connection, parameters and how to control, and also trouble shooting, refer to [ELECYLINDER Electric Section Instruction Manual (ME3816)] provided separately.

IAI Corporation

Please Read Before Use

Thank you for purchasing our product.

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

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

Please downloaded the user's manual from our website.
You can download it free of charge. User registration is required for the first time downloading.
URL : www.iai-robot.co.jp/data_dl/CAD_MANUAL/

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

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

[Important]

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

ME3841-1A

ELECYLINDER Instruction Manual Configuration

Product name	Instruction manual name	Control number
ELECYLINDER	Instruction Manual (this document)	ME3841
ELECYLINDER	Electricity Section Instruction Manual	ME3816
ELECYLINDER	3 Position Mode Specification Instruction Manual	ME3837
RCON System	Instruction Manual	ME0384
RSEL System	Instruction Manual	ME0392
REC System	Instruction Manual	ME0394
XSEL2	Instruction Manual	ME0478
PC software	IA-OS First Step Guide * Refer to the guidance feature stored in IA-OS for how to operate	ME0391
PC Software for X-SEL	A-101-X-MW/IA-101-X-USBMW Instruction Manual	ME0154
Touch Panel Teaching Pendant TB-02/02D	Applicable for Position Controller Instruction Manual	ME0355
	Applicable for Program Controller Instruction Manual	ME0356
Touch Panel Teaching Pendant TB-03 Wireless Link	Applicable for ELECYLINDER Instruction Manual	ME0375
Touch Panel Teaching Pendant TB-03 Wired Link	Applicable for Position Controller Instruction Manual	ME0376
	Applicable for Program Controller Instruction Manual	ME0377
Digital Speed Controller Teaching	Digital Speed Controller Instruction Manual	ME3818

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Safety Guide

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

Safety Precautions for Our Products

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

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

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

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

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

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

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

Alert Indication

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

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

Precautions for Handling

1. The Safety Guide attached with the product is intended to permit safe use of the product and thus to prevent risks and property damage. Be sure to read it before handling the product.

2. Do not attempt any handling or operation that is not indicated in this instruction manual.

3. Make sure to secure the ELECYLINDER properly in accordance with this instruction manual.
   If the ELECYLINDER is not securely fixed, this may lead to abnormal noise, vibration, breakdown or shortened product life.

4. Make sure to observe the usage conditions and environment of the product.
   Operation outside the warranty could cause decreased performance or product breakdown.
   Use within the allowable range for each item.

Item	Cautions for use	Problems or breakdowns which may occur if the allowable range is exceeded
Speed and acceleration/deceleration	Use within the allowable range	May lead to abnormal noise, vibration, breakdown, or shortened product life.
Radial load (Radial cylinder type)	Use within the allowable range (Static/dynamic)	Otherwise, this may lead to vibration, shortened product life, or damage.
Torque (Mc) (Radial cylinder type)		
Uniform load (Radial cylinder type)		

5. If return operations are continued over a short distance, they may rapidly degrade the film of grease.

   Continuous return operation within a distance less than 30mm may cause the grease film to degrade rapidly.
   As a guideline, in every 5,000 to 10,000 cycles, have approximately 5 cycles of return operation over a 50mm distance or more to regenerate the oil film. Continued use of the actuator in that state may lead to breakdown.
   In extreme cases, flaking may occur on the guide or ball screw.

6. Do not attempt to have rods collide with an obstacle at high speed.

   This may damage other mechanical parts.

7. Grease has been applied to the outer periphery of the rod.
   Protect the peripheral equipment if grease adhesion negatively affects them.

8. The diagram showing the relation between the pressing force and the current limit shows the reference of the lower limit of the pressing force at each current limit.

   Especially when the current limit is 30% or below, the pressing force may exceed the lower limit by 40% or more.

9. The "Allow 100 or more" indicated in the External Dimensions is intended to enable wiring without excessive force applied to the cable.
   Allow 100 mm or more cable linearity.

International Standard Compliance

The ELECYLINDER complies with overseas standards marked with a circle.
Refer to the Overseas Standard Compliance Manual (ME0287) for more detailed information.

CE Marking			UL Standard
RoHS3 Directive	EMC Directive	RE Directive (Note1)	
○	○	○	×

If it is necessary to announce EC Declaration of Conformity with this product built in your facility, as this product itself declares the conformity to EU Directives in some specific conditions as stated below, you would be able to utilize this declaration.

EU Directives Applicable for EC Declaration of Conformity
EMC Directive (2014/30/EU) ····· To be checked in CE marking described in model nameplate.
RoHS3 Directive (2011/65/EU + (EU)2015/863) ····· Same as above.
RE Directive (2014/53/EU)····· To be checked in EC Declaration of Conformity.

EC Declaration of Conformity proving conformity to RE Directive may be modified without notice according to addition of conformed models, specification change and so on. Consult with our sales person in charge if necessary.

(Note 1) RE Directive applies to ELECYLINDERs with WL (wireless communication specification) or WL2 (Wireless axis operation specification) in model name options.
Certificates and self-declarations regarding the wireless function are handled under the model name below for the wireless circuit board.
MODEL : IABL3826, IABL3827



Precautions for Handling Wireless Operation

1. EC-RR6□B(R)/RR6□AHB(R)/RR6X□AHB/RR7□B(R)/RR7□AHB(R)/RR7X□AHB

When the option for wireless communication support (model: WL, WL2) is selected, a wireless communication circuit board is built into the ELECYLINDER. Certificates and self-declarations regarding the wireless function are handled under the model name below for the wireless circuit board.

Model name: IABL3826

This product uses the 2.4GHz radio band known as an ISM band. This frequency range is used by various devices such as microwave ovens and wireless LAN, so that communication may be disrupted by radio disturbance.
Use of this device is permitted within the following countries (regions) only. Use in other countries (regions) requires certification to be obtained based on the laws and regulations of the relevant country (region).

Wireless frequency	2,400 to 2,483.5MHz
Wireless output	+5dBm

【US】

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference and
2. This device must accept any interference received, including interference that may cause undesired operation of the device.

FCC RF Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure limits. This transmitter must not be colocated or operating with any other antenna or transmitter.

【CANADA】

This device complies with Industry Canada licence-exempt RSS standards.

Operation is subject to the following two conditions:

1. This device may not cause interference, and
2. This device must accept any interference, including interference that may cause undesired operation of the device

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence

L'exploitation est autorisée aux deux conditions suivantes:

1. l'appareil ne doit pas produire de brouillage, et
2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

IC RF Radiation Exposure Statement:

To comply with IC RF exposure requirements, this device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.
Pour se conformer aux exigences de conformité RF canadienne l'exposition, cet appareil et son antenne ne doivent pas étre co-localisés ou fonctionnant en conjonction avec une autre antenne ou transmetteur.

【日本】

本製品で使用している無線モジュールは、工事設計認証を受けていますので、以下の事項を行うと法律で罰せられることがあります。

・ 無線モジュールを分解/改造すること

【EU Member States】

- For details of the applicable standards, please refer to above mentioned international standards compliances.
- Import Corporation Name : IAI Industrieroboter GmbH

* The product can be used in any country which is a member of EU.

【中国／CHINA】

- 许可编号　　: CMIT ID=2017DJ6836
- 申请公司名　: IAI 株式会社
- 机型名　　: IABL3826
- 制造国　　: 日本（Made in Japan）
- 进口企业名　: IAI（Shanghai）Co., Ltd.

【한국／KOREA】

- 식별 부호　　: MSIP-CRM-IAI-IABL3826
- 제조사명　　: 주식회사 IAI
- 모델명　　: IABL3826
- 제조국　　: 일본(Made in Japan)
- 수입업자명　: IA KOREA Corp.

해당 무선설비는 전파혼신 가능성이 있으므로 인명안전과 관련된 서비스는 할 수 없습니다

【ประเทศไทย / Thailand】

- ผู้ผลิต　　: IAI CORPORATION.
- ชื่อโมเดล　　: IABL3826
- ประเทศผู้ผลิต　: ญี่ปุ่น (Made in Japan)
- ผู้นำเข้า　　: IAI Robot (Thailand) Co., Ltd.

【México / Mexico】

- Número de Certificación　　:IFT:RCPIATB19-1956-A1
- Nombre de la Empresa Solicitante　:IAI Corporation
- Nombre del Modelo　　:IABL3826
- País de Fabricación　　:Japón (Hecho en Japón)
- Nombre de la Empresa Importadora　:IAI America, Inc.

2. EC-RR3□B(R)/RR4□B(R)/RR8□B(R)/RR10□B(R)

When the option for wireless communication support (model: WL, WL2) is selected, a wireless communication circuit board is built into the ELECYLINDER. Certificates and self-declarations regarding the wireless function are handled under the model name below for the wireless circuit board.

Model name: IABL3827

This product uses the 2.4GHz radio band known as an ISM band. This frequency range is used by various devices such as microwave ovens and wireless LAN, so that communication may be disrupted by radio disturbance.
Use of this device is permitted within the following countries (regions) only. Use in other countries (regions) requires certification to be obtained based on the laws and regulations of the relevant country (region).

Wireless frequency	2,400 to 2,483.5MHz
Wireless output	+5dBm

【US】

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference and
2. This device must accept any interference received, including interference that may cause undesired operation of the device.

FCC RF Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure limits. This transmitter must not be colocated or operating with any other antenna or transmitter.

【CANADA】

This device complies with Industry Canada licence-exempt RSS standards.

Operation is subject to the following two conditions:

1. This device may not cause interference, and
2. This device must accept any interference, including interference that may cause undesired operation of the device

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence

L'exploitation est autorisée aux deux conditions suivantes:

1. l'appareil ne doit pas produire de brouillage, et
2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

IC RF Radiation Exposure Statement:

To comply with IC RF exposure requirements, this device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.
Pour se conformer aux exigences de conformité RF canadienne l'exposition, cet appareil et son antenne ne doivent pas étre co-localisés ou fonctionnant en conjonction avec une autre antenne ou transmetteur.

【日本】

本製品で使用している無線モジュールは、工事設計認証を受けていますので、以下の事項を行うと法律で罰せられることがあります。

・ 無線モジュールを分解/改造すること

【EU Member States】

- For details of the applicable standards, please refer to above mentioned international standards compliances.
- Import Corporation Name : IAI Industrieroboter GmbH

* The product can be used in any country which is a member of EU.

【中国／CHINA】

- 许可编号　　: CMIT ID=2018DJ0331
- 申请公司名　: IAI 株式会社
- 机型名　　: IABL3827
- 制造国　　: 日本（Made in Japan）
- 进口企业名　: IAI（Shanghai）Co., Ltd.

【한국／KOREA】

- 식별 부호　　: R-CRM-IAI-IABL3827
- 제조사명　　: 주식회사 IAI
- 모델명　　: IABL3827
- 제조국　　: 일본(Made in Japan)
- 수입업자명　: IA KOREA Corp.

해당 무선설비는 전파혼신 가능성이 있으므로 인명안전과 관련된 서비스는 할 수 없습니다

【ประเทศไทย / Thailand】

- ผู้ผลิต　　: IAI CORPORATION.
- ชื่อโมเดล　　: IABL3827
- ประเทศผู้ผลิต　: ญี่ปุ่น (Made in Japan)
- ผู้นำเข้า　　: IAI Robot (Thailand) Co., Ltd.

【México / Mexico】

- Número de Certificación　　:IFT:RCPIATB19-1956
- Nombre de la Empresa Solicitante　:IAI Corporation
- Nombre del Modelo　　:IABL3827
- País de Fabricación　　:Japón (Hecho en Japón)
- Nombre de la Empresa Importadora　:IAI America, Inc.

Precautions for Axis Operation with Wireless Connection

Touch Panel Teaching Pendant TB-03 (V2.30 or later) can operate the option model code -WL2 ELECYLINDER with wireless connection. For operation with wireless connection, secure safety by following the precautions below before use.

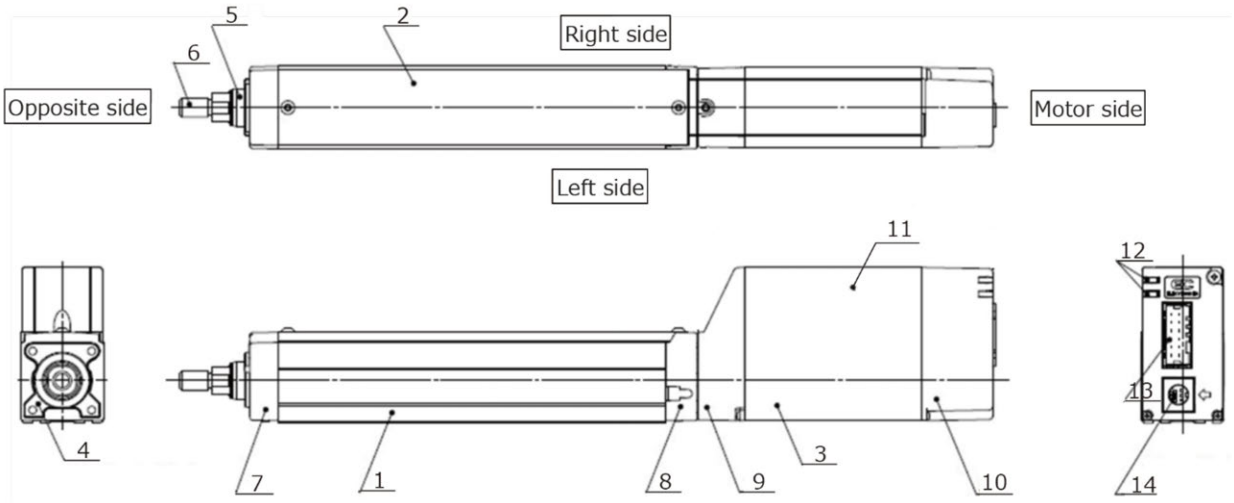
1. The stop switch on Touch Panel Teaching Pendant TB-03 will not function during wireless connection. Prepare a device / circuit to stop the operation when emergency stop is required.
2. For axis operation with wireless connection, operation testing (movement to forward and backward ends, jog operation, inching operation) is possible, but the control device is not designed for purposes of automatic operation. Construct a mechanical system based on the risks of the operating environment.
3. Carry out risk assessment based on the standard/spec requirements of the machinery for installation. Dangerous operation, such as that requiring an automatic stop when control signals cannot be received (including disabled communication) is not acceptable.
4. Stopping axis operation by wireless network cannot be used as a safety feature as defined in EN ISO 13849-1: 2015. It is also not compliant with Safety Category B or Categories 1 to 4 stated in EN ISO 13849-1: 2015.

Part Names

In this manual, the ELECYLINDER's left/right sides and motor/opposite sides are shown as in the figure below.

Radial cylinder type (EC-RR□□B)

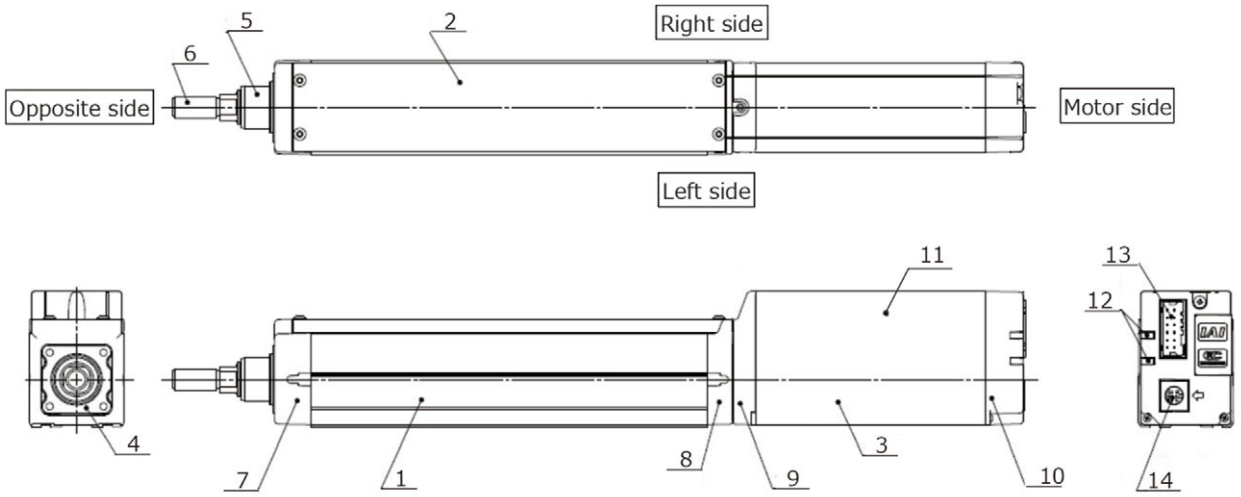
◎ EC-RR3□B



[Main Component Materials]

No.	Name	Materials	Surface Treatment
1	Base	Aluminum Alloy	Black Anodizing Treatment
2	Frame cover	Aluminum Alloy	Black Anodizing Treatment
3	Motor cover	Aluminum Alloy	Black Anodizing Treatment
4	Front bracket	Aluminum die-casting	—
5	Rod	Φ16mm Aluminum Alloy	Hard Anodizing Treatment
6	Rod tip adaptor	Stainless Steel	—
7	Front cover	Plastic	—
8	Track housing cover	Plastic	—
9	Bracket cover	Plastic	—
10	End cover	Plastic	—
11	Motor unit	—	—
12	Status LED	—	—
13	Power & I/O connector	—	—
14	Teaching port	—	—

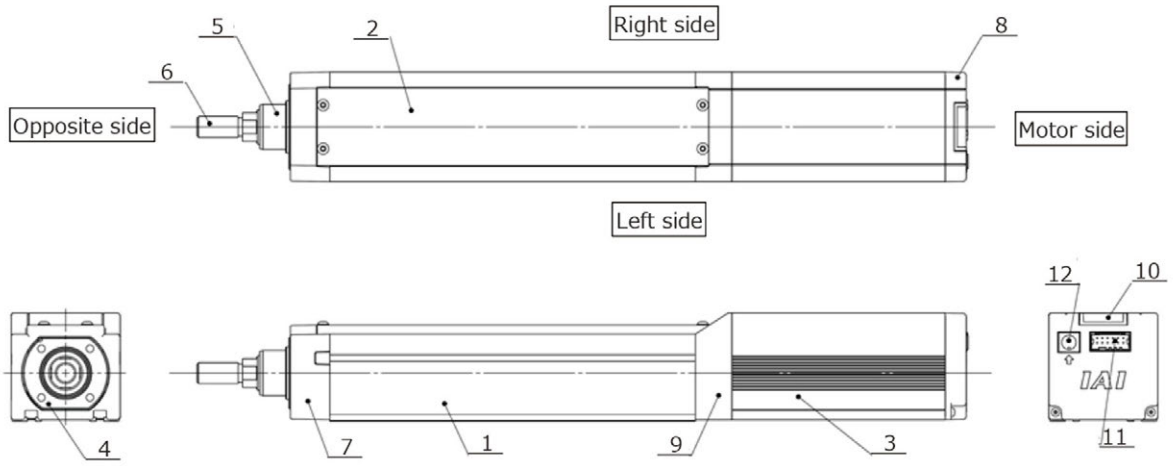
◎ **EC-RR4□B**



[Main Component Materials]

No.	Name	Materials	Surface Treatment
1	Base	Aluminum Alloy	Black Anodizing Treatment
2	Frame cover	Aluminum Alloy	Black Anodizing Treatment
3	Motor cover	Aluminum Alloy	Black Anodizing Treatment
4	Front bracket	Aluminum die-casting	—
5	Rod	Φ20mm Aluminum	Hard Anodizing Treatment
6	Rod tip adaptor	Stainless Steel	—
7	Front cover	Plastic	—
8	Track housing cover	Plastic	—
9	Bracket cover	Plastic	—
10	End cover	Plastic	—
11	Motor unit	—	—
12	Status LED	—	—
13	Power & I/O connector	—	—
14	Teaching port	—	—

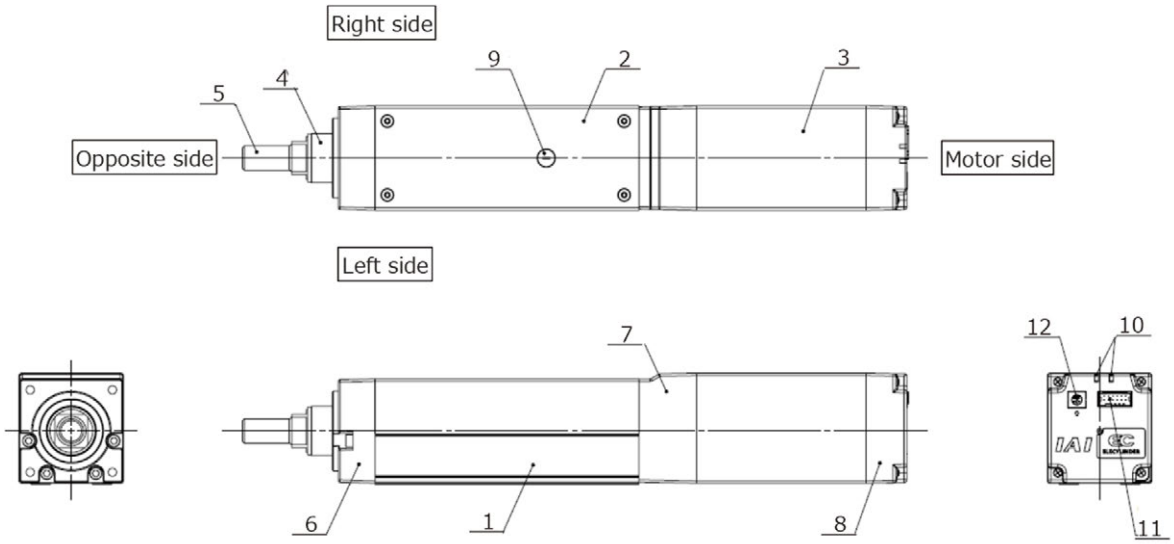
◎ EC-RR6□/RR7□B



[Main Component Materials]

No.	Name	Materials		Surface Treatment
1	Base	Aluminum Alloy		Black Anodizing Treatment
2	Frame cover	Aluminum Alloy		Black Anodizing Treatment
3	Motor cover	Aluminum Alloy		Black Anodizing Treatment
4	Front bracket	Aluminum die-casting		—
5	Rod	RR6 B Φ25mm RR7 B Φ30mm	Aluminum Alloy	Hard Anodizing Treatment
6	Rod tip adaptor	Stainless Steel		—
7	Front cover	Plastic		—
8	End cover	Plastic		—
9	Track housing cover	Plastic		—
10	Status LED	—		—
11	Power & I/O connector	—		—
12	Teaching port	—		—

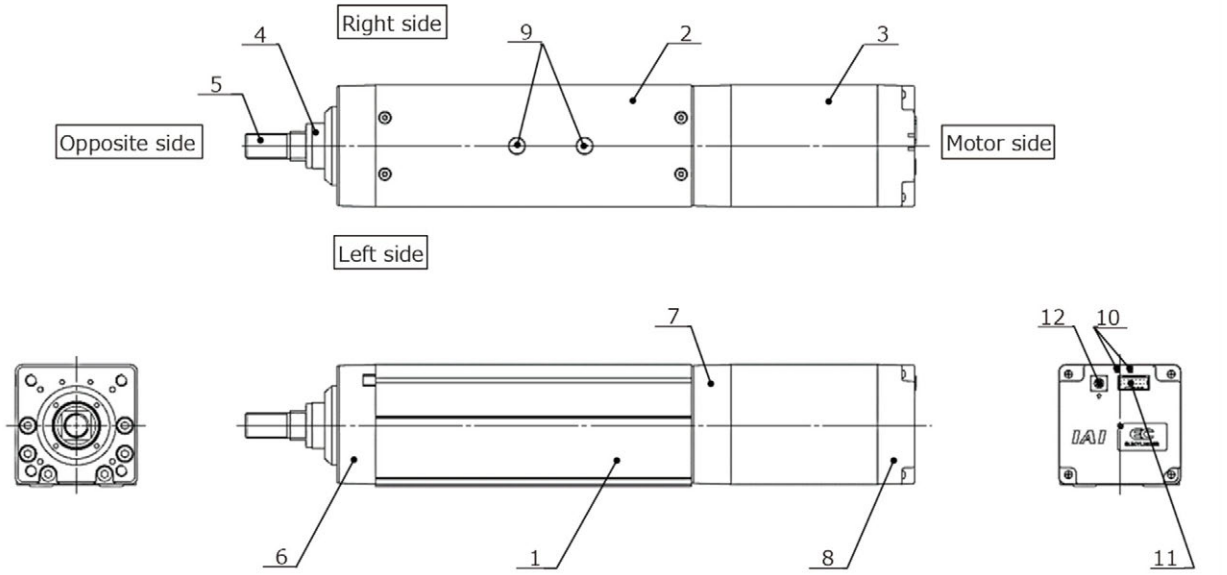
◎ **EC-RR8□B**



[Main Component Materials]

No.	Name	Materials	Surface Treatment
1	Base	Aluminum Alloy	Black Anodizing Treatment
2	Frame cover	Aluminum Alloy	Black Anodizing Treatment
3	Motor cover	Aluminum Alloy	Black Anodizing Treatment
4	Rod	Φ40mm Aluminum Alloy	Hard Anodizing Treatment
5	Rod tip adaptor	Stainless Steel	—
6	Front bracket	Aluminum die-casting	—
7	Rear bracket	Aluminum die-casting	Decorative Surface Coating
8	Controller cover	Plastic	—
9	Cap	Rubber	—
10	Status LED	—	—
11	Power & I/O connector	—	—
12	Teaching port	—	—

◎ EC-RR10□B

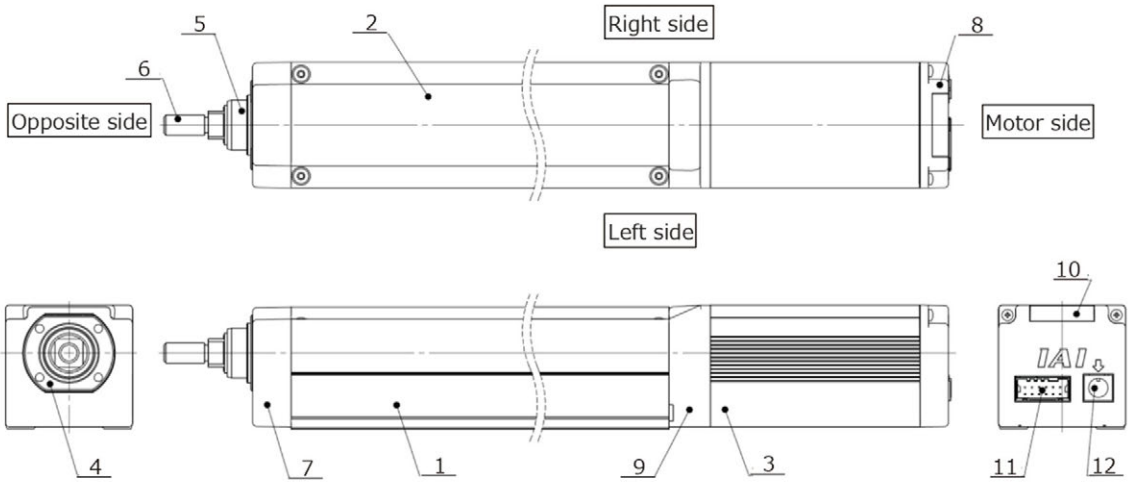


[Main Component Materials]

No.	Name	Materials	Surface Treatment
1	Base	Aluminum Alloy	Black Anodizing Treatment
2	Frame cover	Aluminum Alloy	Black Anodizing Treatment
3	Motor cover	Aluminum Alloy	Black Anodizing Treatment
4	Rod	Φ40mm Aluminum Alloy	Hard Anodizing Treatment
5	Rod tip adaptor	Stainless Steel	—
6	Front bracket	Aluminum die-casting	—
7	Rear bracket	Aluminum die-casting	Decorative Surface Coating
8	Controller cover	Plastic	—
9	Cap	Rubber	—
10	Status LED	—	—
11	Power & I/O connector	—	—
12	Teaching port	—	—

High rigidity radial cylinder type (EC-RR□□AHB)
High rigidity radial cylinder type equipped with support (EC-RR□X□AHB)

◎ EC-RR6(X)□AHB/RR7(X)□AHB

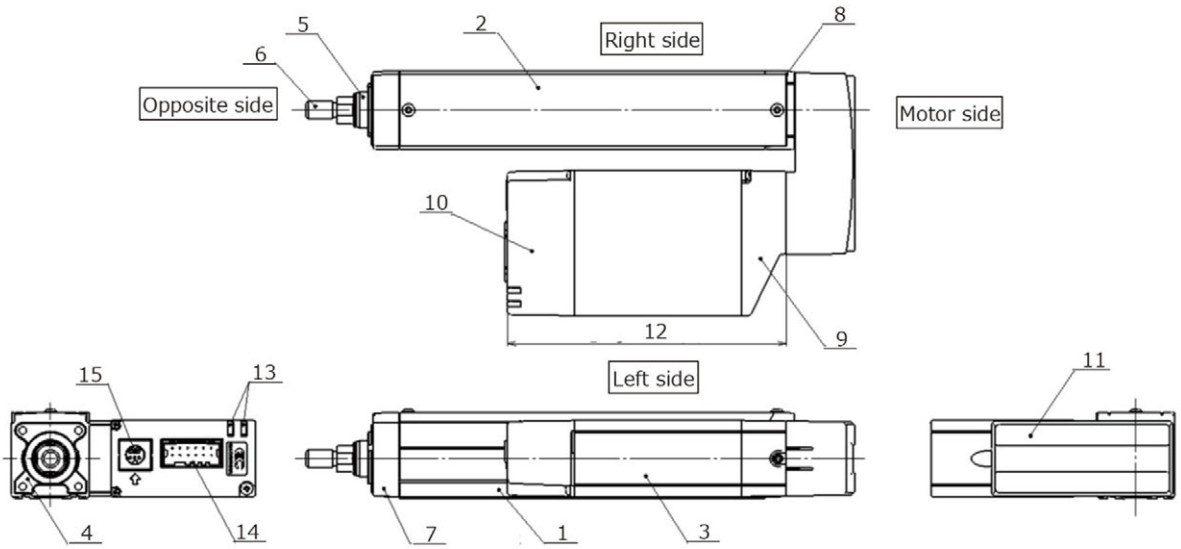


[Main Component Materials]

No.	Name	Materials		Surface Treatment
1	Base	Aluminum Alloy		Black Anodizing Treatment
2	Frame cover	Aluminum Alloy		Black Anodizing Treatment
3	Motor cover	Aluminum Alloy		Black Anodizing Treatment
4	Front bracket	Aluminum die-casting		—
5	Rod	RR6(X) AHB Φ25mm	Aluminum Alloy	Hard Anodizing Treatment
		RR7(X) AHB Φ30mm		
6	Rod tip adaptor	Stainless Steel		—
7	Front cover	Plastic		—
8	End cover	Plastic		—
9	Track housing cover	Plastic		—
10	Status LED	—		
11	Power & I/O connector	—		
12	Teaching port	—		—

Radial cylinder type reversed (EC-RR□□BR)

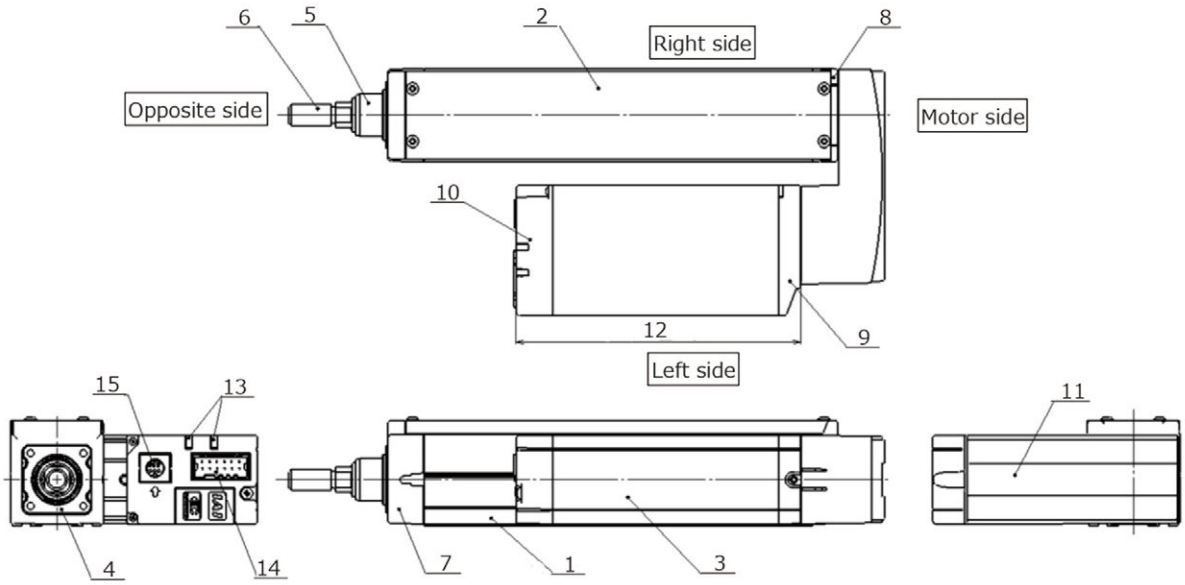
◎ EC-RR3□BR



[Main Component Materials]

No.	Name	Materials	Surface Treatment
1	Base	Aluminum Alloy	Black Anodizing Treatment
2	Frame cover	Aluminum Alloy	Black Anodizing Treatment
3	Motor cover	Aluminum Alloy	Black Anodizing Treatment
4	Front bracket	Aluminum die-casting	—
5	Rod	Φ16mm Aluminum Alloy	Hard Anodizing Treatment
6	Rod tip adaptor	Stainless Steel	—
7	Front cover	Plastic	—
8	Track housing cover	Plastic	—
9	Bracket cover	Plastic	—
10	End cover	Plastic	—
11	Pulley cover	Plastic	—
12	Motor unit	—	—
13	Status LED	—	—
14	Power & I/O connector	—	—
15	Teaching port	—	—

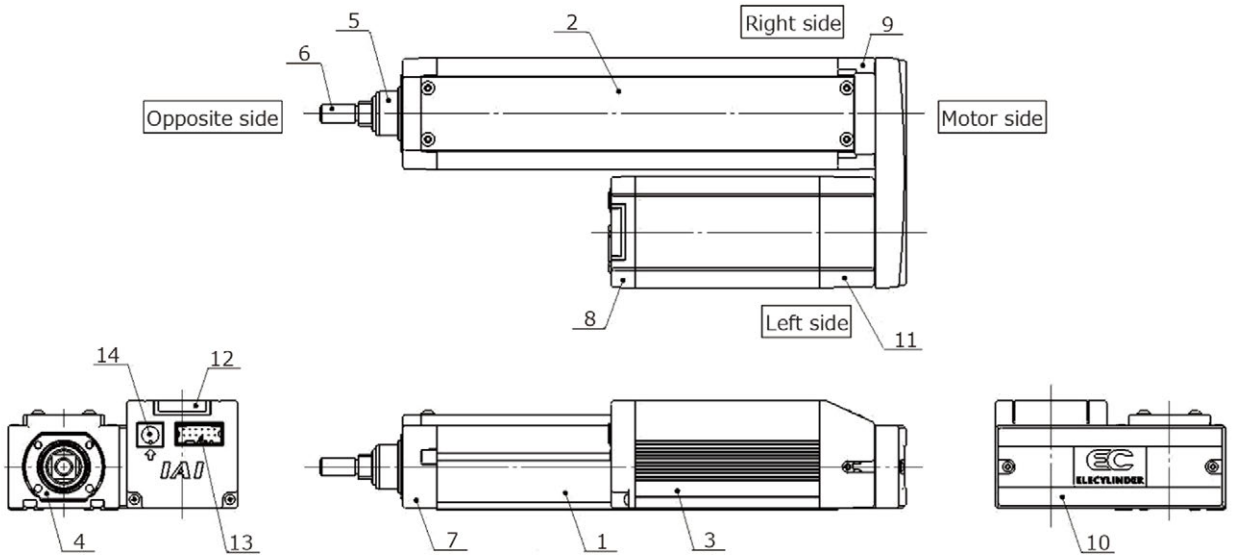
◎ **EC-RR4□BR**



[Main Component Materials]

No.	Name	Materials	Surface Treatment
1	Base	Aluminum Alloy	Black Anodizing Treatment
2	Frame cover	Aluminum Alloy	Black Anodizing Treatment
3	Motor cover	Aluminum Alloy	Black Anodizing Treatment
4	Front bracket	Aluminum die-casting	—
5	Rod	Φ20mm Aluminum Alloy	Hard Anodizing Treatment
6	Rod tip adaptor	Stainless Steel	—
7	Front cover	Plastic	—
8	Track housing cover	Plastic	—
9	Bracket cover	Plastic	—
10	End cover	Plastic	—
11	Pulley cover	Plastic	—
12	Motor unit	—	—
13	Status LED	—	—
14	Power & I/O connector	—	—
15	Teaching port	—	—

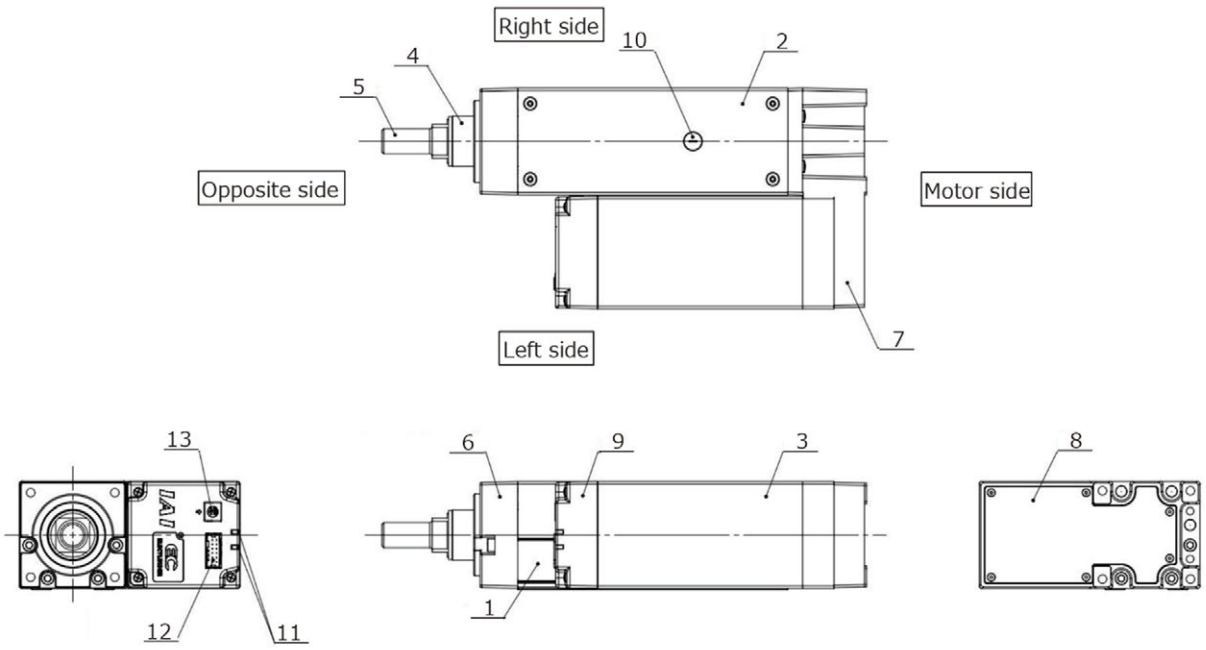
◎ EC-RR6□BR/RR7□BR



[Main Component Materials]

No.	Name	Materials		Surface Treatment
1	Base	Aluminum Alloy		Black Anodizing Treatment
2	Frame cover	Aluminum Alloy		Black Anodizing Treatment
3	Motor cover	Aluminum Alloy		Black Anodizing Treatment
4	Front bracket	Aluminum die-casting		—
5	Rod	RR6 BR Φ25mm RR7 BR Φ30mm	Aluminum Alloy	Hard Anodizing Treatment
6	Rod tip adaptor	Stainless Steel		—
7	Front cover	Plastic		—
8	End cover	Plastic		—
9	Track housing cover	Plastic		—
10	Pulley cover	Plastic		
11	Motor bracket cover	Plastic		
12	Status LED	—		—
13	Power & I/O connector	—		—
14	Teaching port	—		—

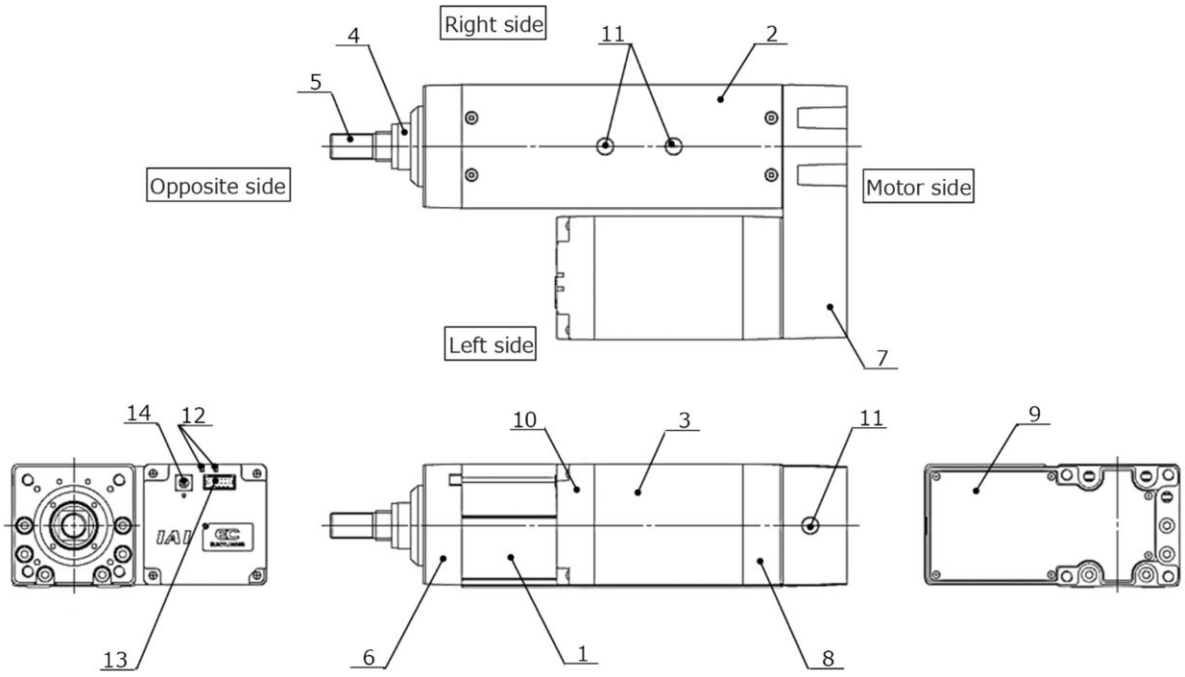
◎ **EC-RR8□BR**



[Main Component Materials]

No.	Name	Materials	Surface Treatment
1	Base	Aluminum Alloy	Black Anodizing Treatment
2	Frame cover	Aluminum Alloy	Black Anodizing Treatment
3	Motor cover	Aluminum Alloy	Black Anodizing Treatment
4	Rod	Φ40mm Aluminum Alloy	Hard Anodizing Treatment
5	Rod tip adaptor	Stainless Steel	—
6	Front bracket	Aluminum die-casting	—
7	Reversing bracket	Aluminum die-casting	Decorative Surface Coating
8	Rear cover	Aluminum Alloy	—
9	Controller cover	Plastic	—
10	Cap	Rubber	—
11	Status LED	—	—
12	Power & I/O connector	—	—
13	Teaching port	—	—

◎ EC-RR10□BR

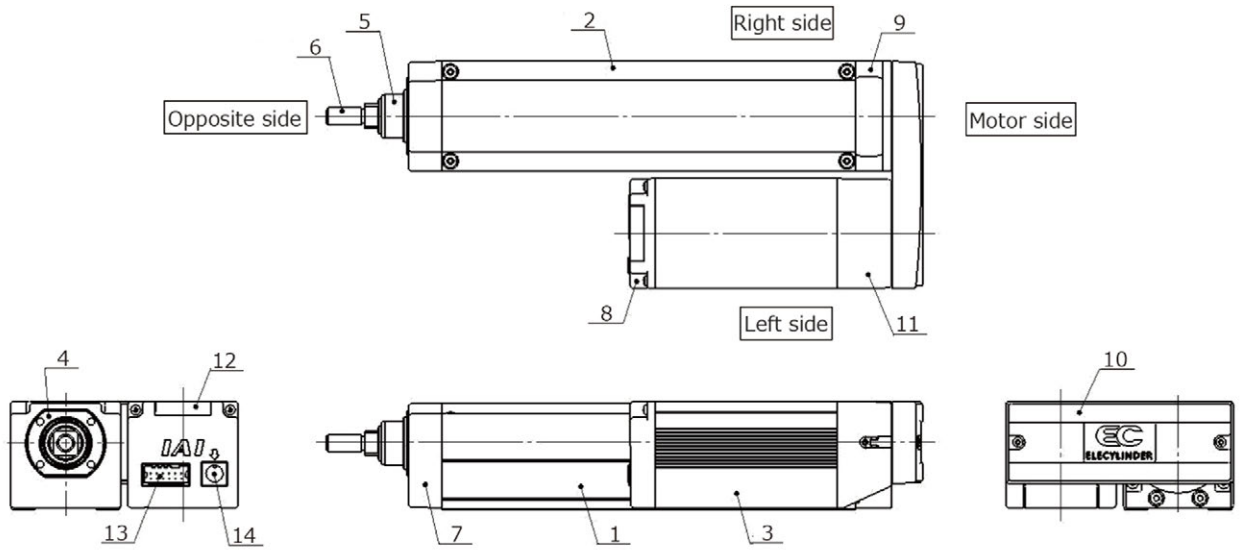


[Main Component Materials]

No.	Name	Materials	Surface Treatment
1	Base	Aluminum Alloy	Black Anodizing Treatment
2	Frame cover	Aluminum Alloy	Black Anodizing Treatment
3	Motor cover	Aluminum Alloy	Black Anodizing Treatment
4	Rod	Φ40mm Aluminum Alloy	Hard Anodizing Treatment
5	Rod tip adaptor	Stainless Steel	—
6	Front bracket	Aluminum die-casting	—
7	Reversing bracket	Aluminum die-casting	Decorative Surface Coating
8	Motor bracket	Aluminum die-casting	—
9	Pulley cover	Aluminum Alloy	—
10	Controller cover	Plastic	—
11	Cap	Rubber	—
12	Status LED	—	—
13	Power & I/O connector	—	—
14	Teaching port	—	—

High rigidity radial cylinder type reversed (EC-RR□□AHBR)

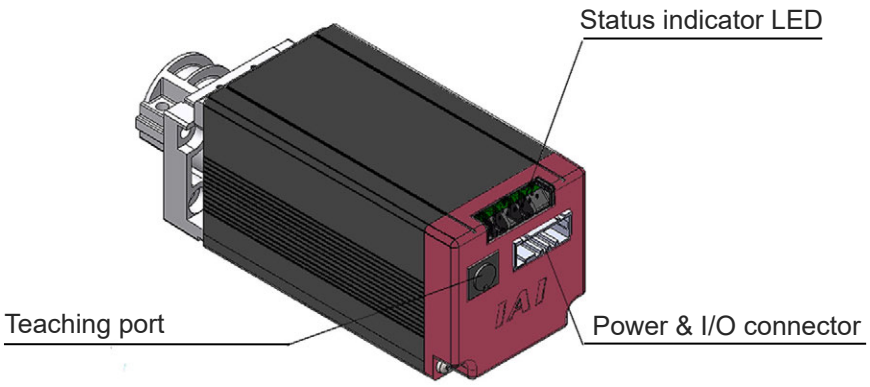
◎ EC-RR6□AHBR/RR7□AHBR



[Main Component Materials]

No.	Name	Materials		Surface Treatment
1	Base	Aluminum Alloy		Black Anodizing Treatment
2	Frame cover	Aluminum Alloy		Black Anodizing Treatment
3	Motor cover	Aluminum Alloy		Black Anodizing Treatment
4	Front bracket	Aluminum die-casting		—
5	Rod	RR6 AHBR Φ25mm	Aluminum Alloy	Hard Anodizing Treatment
		RR7 AHBR Φ30mm		
6	Rod tip adaptor	Stainless Steel		—
7	Front cover	Plastic		—
8	End cover	Plastic		—
9	Track housing cover	Plastic		—
10	Pulley cover	Plastic		—
11	Motor bracket cover	Plastic		—
12	Status LED	—		—
13	Power & I/O connector	—		—
14	Teaching port	—		—

Motor (built in controller)



[Teaching port]
This connector is for the connection of a teaching pendant or PC teaching software.
When connecting, remove the cap.

[Status indicator LED]
They are the LED lamps to display the status of servo-on/off, alarm and wireless connection.
For the details of layout and illumination conditions, refer to [3.6 Troubleshooting Confirmations].

[Power & I/O connector]
This connector connects power and I/O wiring.

ELECYLINDER

Chapter 1

Specifications

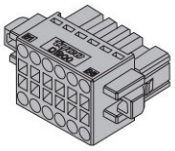
1.1 Checking the product ····· 1-1
1.1.1 Components ····· 1-1
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1.1 Checking the product

1.1.1 Components

The following table shows the product configuration for the standard specification.
See the packing list for the details of the enclosed components. In the unlikely case that any model number errors or missing parts come to light, contact your local IAI distributor.

<table>
<tr><th colspan="3">Body</th></tr>
<tr><td colspan="3">ELECYLINDER Quantity: 1
  </td></tr>
<tr><th colspan="3">Accessories</th></tr>
<tr><td>Power & I/O Cable
Quantity: 1
  </td><td>Power & I/O Connector
Quantity: 1
  </td><td>Protective Cap
Quantity: 1
  </td></tr>
<tr><td colspan="3">Components included
as selected in the model number</td></tr>
<tr><th>Accessories (Documents)</th><th colspan="2">Radial cylinder type accessories</th></tr>
<tr><td>Safety Guide
Quantity: 1
 
IAI
安全ガイド 第 9 版
Safety Guide Ninth Edition
1. Make sure to read this Guide thoroughly before use of the robot.
2. Please follow this Guide and take necessary measures to ensure safety in the design and production of the system by use of the robot.
3. Please ensure that this Guide is ultimately delivered to the customer who uses the product.
* Using or copying all or a part of this SAFETY GUIDE without permission is prohibited.</td><td colspan="2">Square Nut Holder Set - 1 set
(D)RR3□(R): M3
(D)RR4□(R)/(D)RR6□(R): M4
(D)RR7□(R): M5
Qty 6pcs each
  </td><td>Hex Nut
Quantity: 1
RR3□B(R) : M8×1.25
RR4□B(R) : M10×1.25
RR6□B(R) : M10×1.25
RR7□B(R) : M14×1.5
RR8□B(R) : M20 x 1.5
RR10□B(R): M22 x 1.5
  </td></tr>
</table>

1.1.2 How to read the model nameplate

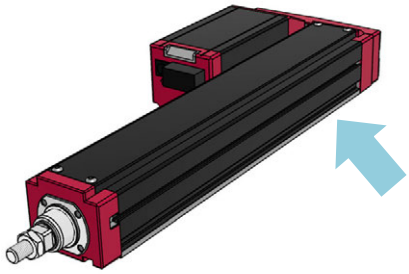


nameplate position

Radial cylinder type, High rigidity radial cylinder type



Radial cylinder type reversed, High rigidity radial cylinder type reversed



1.1.3 How to read the model number

It is a list of the model codes.

Available options should differ depending on types and conditions. Refer to the catalog for details.

EC – RR6X M AH B R – 200 – 5 – FT

<Series>
EC : ELECYLINDER

<Type>
RR3 : Radial cylinder 30mm width
RR4 : Radial cylinder 40mm width
RR6 : Radial cylinder 60mm width
RR6X : Radial cylinder 60mm width Equipped with support
RR7 : Radial cylinder 70mm width
RR7X : Radial cylinder 70mm width Equipped with support
RR8 : Radial cylinder 80mm width
RR10 : Radial cylinder 100mm width

<Lead>

RR3
H : 6mm
M : 4mm
L : 2mm

RR4
S :16mm
H :10mm
M : 5mm
L : 2.5mm

RR6
S :20mm
H :12mm
M : 6mm
L : 3mm

RR7
S :24mm
H :16mm
M : 8mm
L : 4mm

RR8
M :10mm
L : 5mm

RR10
M : 5mm
L : 2.5mm

<Specification>
Blank : Standard
AH : High rigidity

<Specification>
B : Products designed for use in secondary battery production processes

<Motor coupling method>
Blank : Straight
R : Reversed

<Options>
Blank : Incremental encoder specification NPN specification, no option
ACR : RCON-EC connection specification
B : Brake
FFA : Tip adapter (Frange)
FL : Frange (front)
FT : Foot bracket
MF : 3 position mode specification
ML : Motor left reversed specification
MR : Motor right reversed specification
MOB : Motor ejecting orientation changed (Bottom side)
MOL : Motor ejecting orientation changed (Left side)
MOR : Motor ejecting orientation changed (Right side)
MOT : Motor ejecting orientation changed (Top side)
NFA : Tip adapter (internal thread)
NJ : Knuckle joint
NJPB : Knuckle joint + oscillation receiving bracket
NM : Home reverse specification
PN : PNP specification
QR : Clevis bracket
QRPB : Clevis bracket + oscillation receiving bracket
SVL : Stainless Steel Suction Joint Left-Mounted Specification
SVR : Stainless Steel Suction Joint Right-Mounted Specification
TMD2 : 2-circuit power supply specification
WA : Battery-less Absolute Encoder specification
WL : Wireless communication specification
WL2 : Wireless axis operation specification

<Power & I/O cable length>
0 : No cable With power & I/O connector
(S)1 to (S)8 : 1m to 8m (every 1m)

(S) : 4-way connector cable

<Stroke>
50 to 1000 : 50mm to 1000mm

1.2 Mechanical specifications EC-RR3

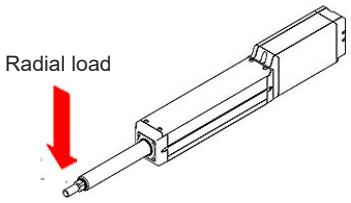
1.2.1 EC-RR3□B

[1] Actuator Specifications

Item		Content
Drive system		Ball screw Φ6mm, rolled C10
Positioning repeatability		±0.02 mm
Lost motion		0.1mm or less
Linear guide		Linear infinite circulation system
Brake (Option)	Specification	Non-excitation activating electromagnetic brake
	Holding force	Lead 6：1kgf Lead 4：1.5kgf Lead 2：2.5kgf
Ambient operating temperature/humidity		10 to 40°C, 85%RH or less (Non-condensing)
Degree of protection		IP20
Vibration and Impact resistance		4.9m/s2
Motor type		□28 pulse motor（Power capacity：Max.2.2A）
Encoder type		Incremental / Battery-less absolute
Encoder pulse count		800pulse/rev

Because the radial cylinder type has a linear guide built into the body,
radial and moment loads can be applied to the rod.
The applicable radial and moment loads must meet the following three conditions.

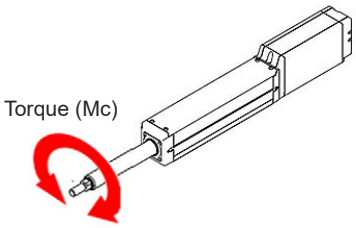
1. The radial load acting on the rod must not exceed the allowable value.



Rod tip static allowable radial load	Rod tip dynamic allowable radial load (Note 1)
40N	20N

Note 1 The value assumes a basic rated life of 5,000km.

2. The torque (Mc) acting on the rod must not exceed the allowable value.



Rod tip static allowable torque	Rod tip dynamic allowable torque (Note 1)
3.5N·m	3.5N·m

Note 1 The value assumes a basic rated life of 5,000km.

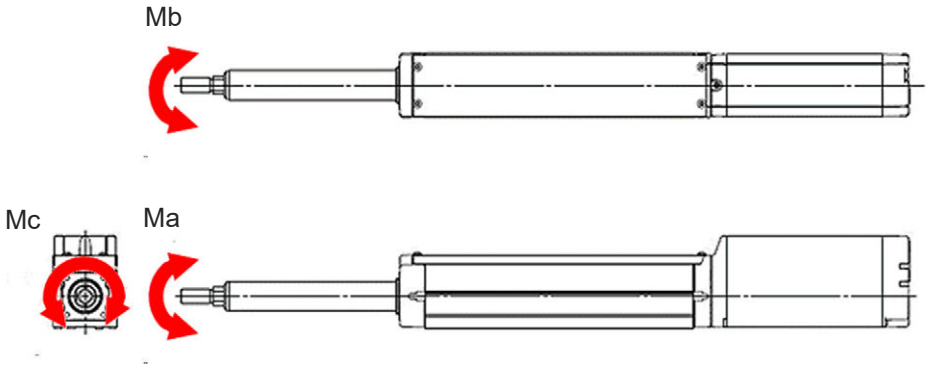
3. The uniform load (*) acting on the rod must not exceed the allowable value.

(*) Uniform load = Ma • Ka + Mb • Kb + Mc • Kc

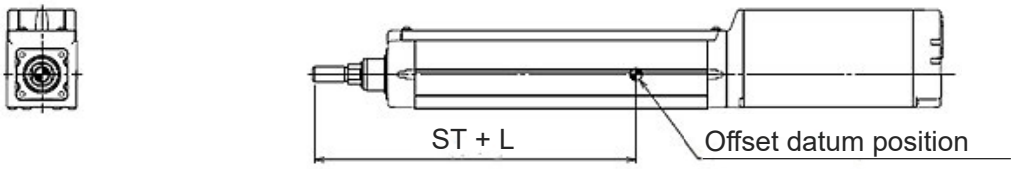
Static allowable uniform load	Dynamic allowable uniform load (Note 1)	Load uniform coefficient Ka	Load uniform coefficient Kb	Load uniform coefficient Kc
1440N	580N	209/m	147/m	131/m

Note 1 The value assumes a basic rated life of 5,000km.

Ma, Mb, Mc: Moment load

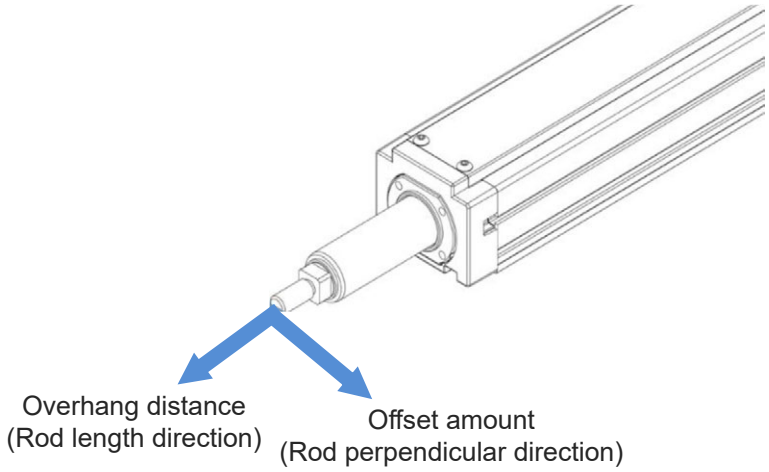


Moment offset datum position



L
73mm

Allowable offset amount, allowable overhang distance



Allowable offset amount	Allowable overhang distance
100mm	100mm

Caution

- Keep the radial load acting on the rod within the allowable offset amount and overhang distance for use. If the allowable values are exceeded, this may lead to vibration, shortened product life, or damage.

[2] Lead and Payload

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR3HB	6	6.5	1	45
EC-RR3MB	4	10	1.5	68
EC-RR3LB	2	12.5	2.5	136

[3] Stroke and Max. Speed

Caution

- The maximum speed may not be achieved when the stroke or movement distance is short or when acceleration/deceleration is set low.
- Setting the lower less than speed the minimum speed may cause such concerns of generating abnormal noise or making the speed unstable.
- The minimum speed is the lead 6 is 8mm/s, lead 4 is 5mm/s, and the lead 2 is 3mm/s.

Max. Speed [mm/s]

Lead [mm]	50 to 200mm (Every 50mm)	250mm	300mm
6	255	210	150
4	170	140	100
2	85	70	50

[4] Payload by Speed/Acceleration

Caution

- Do not attempt to configure settings for acceleration/deceleration above the allowable values. It may cause to generate vibration, malfunction or shorten the product life.

At low load capacity, the acceleration/deceleration can be increased.
The maximum acceleration/deceleration for Lead 6 is 0.5G in the horizontal direction and 0.3G in the vertical direction.
The maximum acceleration/deceleration for Lead 4 and 2 is 0.3G in the both horizontal direction/vertical direction.
Input in percentage is to be set with 0.5G for Lead 6 and 0.3G for Lead 4 and 2 as 100%.
(Note) "-" represent operation not available.

Lead 6 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.5	0.3
0	6.5	5	1
120	6.5	5	1
210	6.5	5	1
255	3.5	3	1

Lead 4 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.5	0.3
0	10	—	1.5
80	10	—	1.5
140	10	—	1.5
170	6	—	1.5

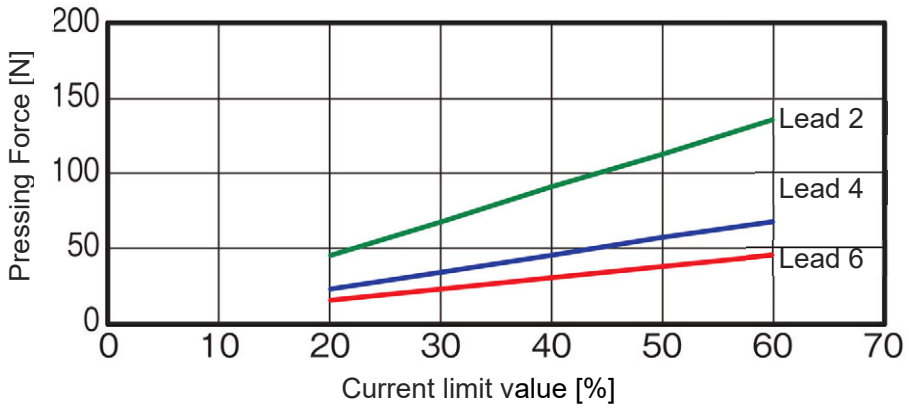
Lead 2 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G)		
	0.3	0.5	0.3
0	12.5	—	2.5
40	12.5	—	2.5
70	12.5	—	2.5
85	7.5	—	2.5

[5] Pressing Operation

Caution

- The relation of the current limit and the pressing force is a guideline at speed of 20mm/s. There is some variance in the actual pressing force. The variance increases when the current value is low.
- The current limit value cannot be set outside the 20 to 60% range.
- When the approach speed up to the pressing start position is 20mm/s or less, pressing operation will take place at approach speed.
  When the pressing speed is less than 20mm/s, the pressing force (reference) described in the graph below may not be satisfied. Confirm in advance that there is no problem in the pressing force.



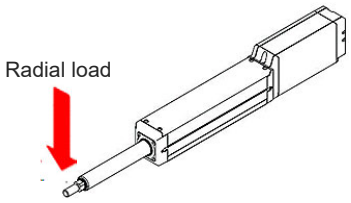
1.2.2 EC-RR3□BR

[1] Actuator Specifications

Item		Content
Drive system		Ball screw Φ6mm, rolled C10
Positioning repeatability		±0.02 mm
Lost motion		0.1mm or less
Linear guide		Linear infinite circulation system
Brake (Option)	Specification	Non-excitation activating electromagnetic brake
	Holding force	Lead 6：1kgf Lead 4：1.5kgf Lead 2：2.5kgf
Ambient operating temperature/humidity		10 to 40°C, 85%RH or less (Non-condensing)
Degree of protection		IP20
Vibration and Impact resistance		4.9m/s2
Motor type		□28 pulse motor（Power capacity：Max.2.2A）
Encoder type		Incremental / Battery-less absolute
Encoder pulse count		800pulse/rev

Because the radial cylinder type has a linear guide built into the body,
radial and moment loads can be applied to the rod.
The applicable radial and moment loads must meet the following three conditions.

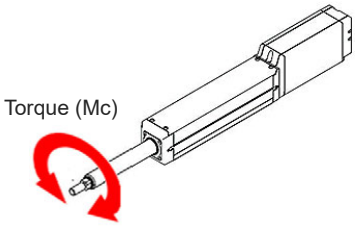
1. The radial load acting on the rod must not exceed the allowable value.



Rod tip static allowable radial load	Rod tip dynamic allowable radial load (Note 1)
40N	20N

Note 1 The value assumes a basic rated life of 5,000km.

2. The torque (Mc) acting on the rod must not exceed the allowable value.



Rod tip static allowable torque	Rod tip dynamic allowable torque (Note 1)
3.5N·m	3.5N·m

Note 1 The value assumes a basic rated life of 5,000km.

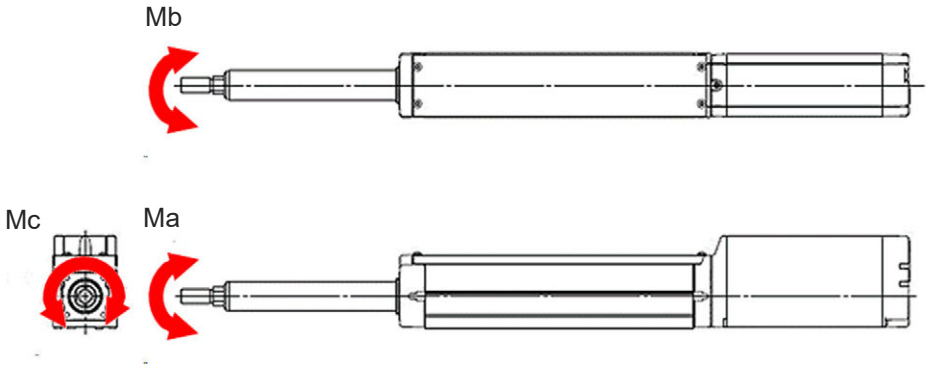
3. The uniform load (*) acting on the rod must not exceed the allowable value.

(*) Uniform load = Ma • Ka + Mb • Kb + Mc • Kc

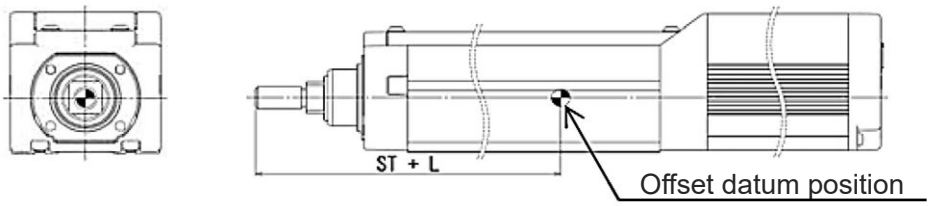
Static allowable uniform load	Dynamic allowable uniform load (Note 1)	Load uniform coefficient Ka	Load uniform coefficient Kb	Load uniform coefficient Kc
1440N	580N	209/m	147/m	131/m

Note 1 The value assumes a basic rated life of 5,000km.

Ma, Mb, Mc: Moment load

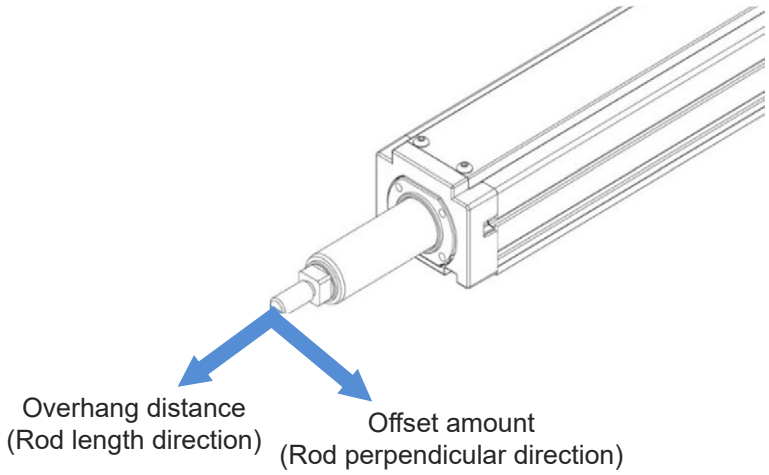


Moment offset datum position



L
73mm

Allowable offset amount, allowable overhang distance



Allowable offset amount	Allowable overhang distance
100mm	100mm

Caution

- Keep the radial load acting on the rod within the allowable offset amount and overhang distance for use. If the allowable values are exceeded, this may lead to vibration, shortened product life, or damage.

[2] Lead and Payload

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR3HBR	6	6.5	1	45
EC-RR3MBR	4	10	1.5	68
EC-RR3LBR	2	12.5	2.5	136

[3] Stroke and Max. Speed

Caution

- The maximum speed may not be achieved when the stroke or movement distance is short or when acceleration/deceleration is set low.
- Setting the lower less than speed the minimum speed may cause such concerns of generating abnormal noise or making the speed unstable.
- The minimum speed is the lead 6 is 8mm/s, lead 4 is 5mm/s, and the lead 2 is 3mm/s.

Max. Speed [mm/s]

Lead [mm]	50 to 200mm (Every 50mm)	250mm	300mm
6	255	210	150
4	170	140	100
2	85	70	50

[4] Payload by Speed/Acceleration

Caution

- Do not attempt to configure settings for acceleration/deceleration above the allowable values. It may cause to generate vibration, malfunction or shorten the product life.

At low load capacity, the acceleration/deceleration can be increased.
The maximum acceleration/deceleration for Lead 6 is 0.5G in the horizontal direction and 0.3G in the vertical direction.
The maximum acceleration/deceleration for Lead 4 and 2 is 0.3G in the both horizontal direction/vertical direction.
Input in percentage is to be set with 0.5G for Lead 6 and 0.3G for Lead 4 and 2 as 100%.
(Note) "-" represent operation not available.

Lead 6 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.5	0.3
0	6.5	5	1
120	6.5	5	1
210	6.5	5	1
255	3.5	3	1

Lead 4 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.5	0.3
0	10	—	1.5
80	10	—	1.5
140	10	—	1.5
170	6	—	1.5

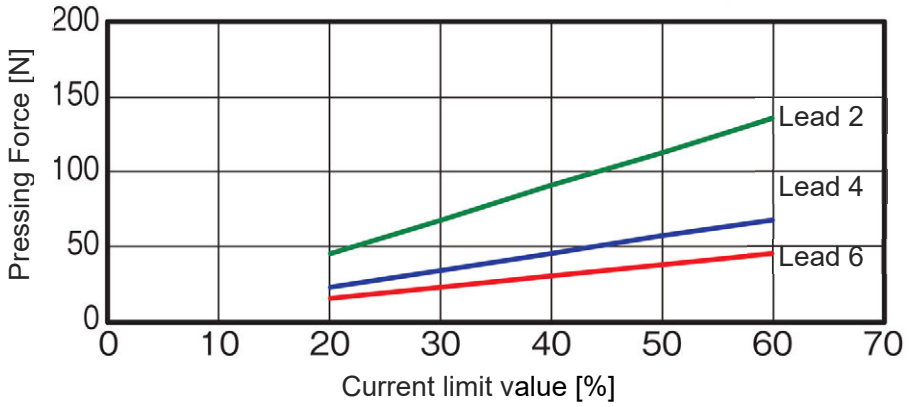
Lead 2 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.5	0.3
0	12.5	—	2.5
40	12.5	—	2.5
70	12.5	—	2.5
85	7.5	—	2.5

[5] Pressing Operation

Caution

- The relation of the current limit and the pressing force is a guideline at speed of 20mm/s. There is some variance in the actual pressing force. The variance increases when the current value is low.
- The current limit value cannot be set outside the 20 to 60% range.
- When the approach speed up to the pressing start position is 20mm/s or less, pressing operation will take place at approach speed.
  When the pressing speed is less than 20mm/s, the pressing force (reference) described in the graph below may not be satisfied. Confirm in advance that there is no problem in the pressing force.



1.3 Mechanical specifications EC-RR4

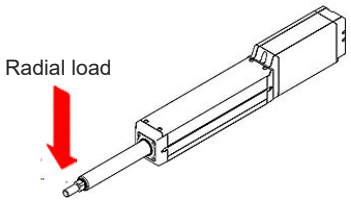
1.3.1 EC-RR4□B

[1] Actuator Specifications

Item		Content
Drive system		Ball screw Φ8mm, rolled C10
Positioning repeatability		±0.02 mm
Lost motion		0.1mm or less
Linear guide		Linear infinite circulation system
Brake (Option)	Specification	Non-excitation activating electromagnetic brake
	Holding force	Lead 16：1kgf Lead 10：1.5kgf Lead 5：3.5kgf Lead 2.5：4.5kgf
Ambient operating temperature/humidity		10 to 40°C, 85%RH or less (Non-condensing)
Degree of protection		IP20
Vibration and Impact resistance		4.9m/s2
Motor type		□35 pulse motor（Power capacity：Max. 4.2A）
Encoder type		Incremental / Battery-less absolute
Encoder pulse count		800pulse/rev

Because the radial cylinder type has a linear guide built into the body,
radial and moment loads can be applied to the rod.
The applicable radial and moment loads must meet the following three conditions.

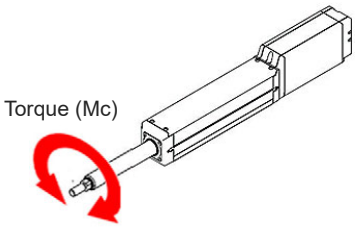
1. The radial load acting on the rod must not exceed the allowable value.



Rod tip static allowable radial load	Rod tip dynamic allowable radial load (Note 1)
40N	20N

Note 1 The value assumes a basic rated life of 5,000km.

2. The torque (Mc) acting on the rod must not exceed the allowable value.



Rod tip static allowable torque	Rod tip dynamic allowable torque (Note 1)
3.5N·m	3.5N·m

Note 1 The value assumes a basic rated life of 5,000km.

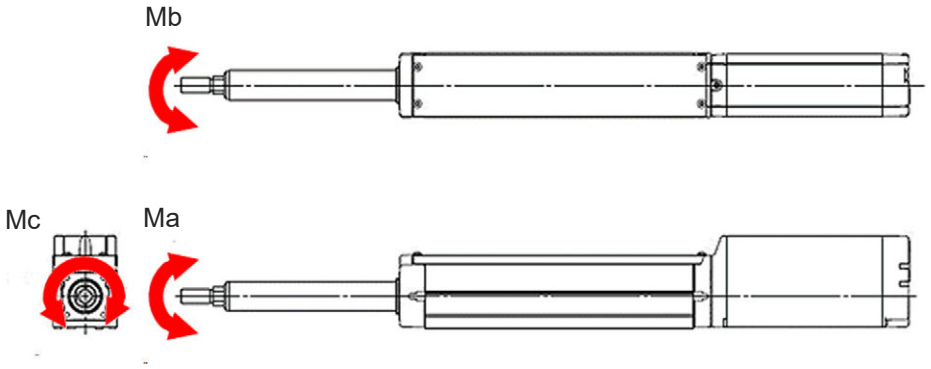
3. The uniform load (*) acting on the rod must not exceed the allowable value.

(*) Uniform load = Ma • Ka + Mb • Kb + Mc • Kc

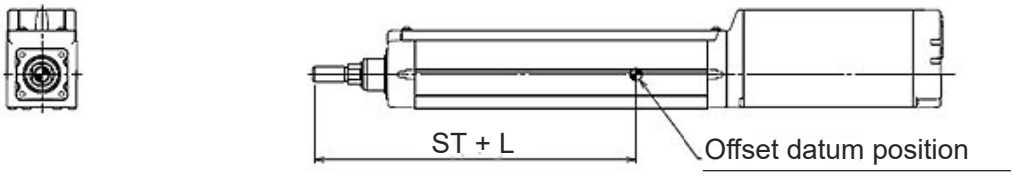
Static allowable uniform load	Dynamic allowable uniform load (Note 1)	Load uniform coefficient Ka	Load uniform coefficient Kb	Load uniform coefficient Kc
1720N	660N	181/m	127/m	93/m

Note 1 The value assumes a basic rated life of 5,000km.

Ma, Mb, Mc: Moment load

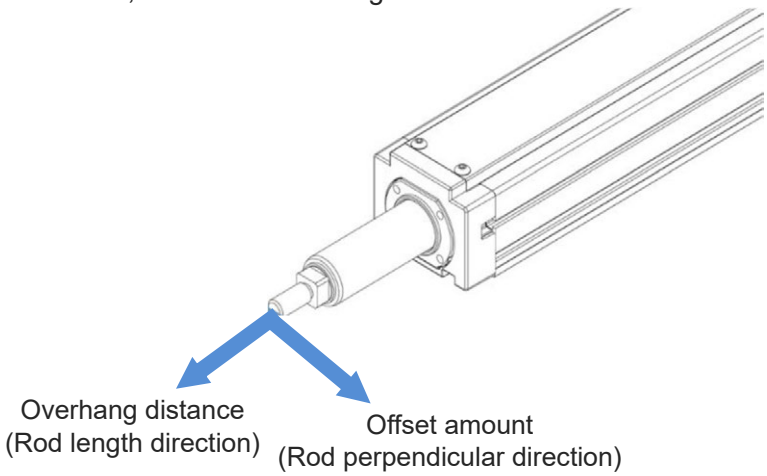


Moment offset datum position



L
102mm

Allowable offset amount, allowable overhang distance



Allowable offset amount	Allowable overhang distance
100mm	100mm

Caution

- Keep the radial load acting on the rod within the allowable offset amount and overhang distance for use. If the allowable values are exceeded, this may lead to vibration, shortened product life, or damage.

[2] Lead and Payload

Power Saving Setting : Disabled

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR4SB	16	5	1	41
EC-RR4HB	10	11	1.5	66
EC-RR4MB	5	17.5	3.5	132

Power Saving Setting : Enabled

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR4SB	16	3.5	0.5	41
EC-RR4HB	10	7	1.5	66
EC-RR4MB	5	15.5	3	132
EC-RR4LB	2.5	24.5	4.5	263

[3] Stroke and Max. Speed

Caution

- The maximum speed may not be achieved when the stroke or movement distance is short or when acceleration/deceleration is set low.
- Setting the lower less than speed the minimum speed may cause such concerns of generating abnormal noise or making the speed unstable.
- The minimum speed is the lead 16 is 40mm/s, the lead 10 is 30mm/s, the lead 5 is 7mm/s, and the lead 2.5 is 4mm/s.

Power Saving Setting : Disabled Max. Speed [mm/s]

Lead [mm]	50 to 200mm (Every 50mm)	250mm	300mm
16	800<700>	600	440
10	525<435>	390	290
5	260<215>	190	140
2.5	135<105>	90	70

< > represents vertical operation.

Power Saving Setting : Enable Max. Speed [mm/s]

Lead [mm]	50 to 200mm (Every 50mm)	250mm	300mm
16	560		440
10	435	390	290
5	215	190	140
2.5	105	90	70

[4] Payload by Speed/Acceleration

Caution

- Do not attempt to configure settings for acceleration/deceleration above the allowable values. It may cause to generate vibration, malfunction or shorten the product life.

Power Saving Setting : Disabled

At low load capacity, the acceleration/deceleration can be increased.
The maximum acceleration/deceleration for Lead 16 and 10 is 1.0G in the horizontal direction and 0.5G in the vertical direction.
The maximum acceleration/deceleration for Lead 5 is 0.5G in the both horizontal direction/vertical direction. The maximum acceleration/deceleration for Lead 2.5 is 0.3G in the both horizontal direction/vertical direction.
Input in percentage is to be set with 1.0G for Lead 16 and 10, 0.5G for Lead 5 and 0.3G for Lead 2 as 100%.
(Note) "-" represent operation not available.

Lead 16 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	5	4	3.5	2.5	1	1
140	5	4	3.5	2.5	1	1
280	5	4	3	2.5	1	1
420	5	4	2.5	1.5	1	1
560	4.5	4	2.5	1.5	1	1
700	4	1.5	1	0.5	0.5	0.5
800	—	0.5	—	—	—	—

Lead 10 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	11	10.5	9	7.5	1.5	1.5
175	11	10.5	9	7.5	1.5	1.5
350	11	7.5	7.5	5	1.5	1.5
435	10.5	3.5	3.5	2	1.5	1.5
525	4	2.5	—	—	—	—

Lead 5 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	17.5	15.5	—	—	3.5	3
85	17.5	15.5	—	—	3.5	3
130	17.5	15.5	—	—	3.5	3
215	17.5	9	—	—	3.5	3
260	8.5	7.5	—	—	—	—

Lead 2.5 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	24.5	—	—	—	4.5	—
40	24.5	—	—	—	4.5	—
85	24.5	—	—	—	4.5	—
105	24.5	—	—	—	4.5	—
135	11	—	—	—	—	—

Power Saving Setting : Enable

At low load capacity, the acceleration/deceleration can be increased.
The maximum acceleration/deceleration for Lead 16 and 10 is 0.7G in the horizontal direction and 0.3G in the vertical direction.
The maximum acceleration/deceleration for Lead 5 and 2.5 is 0.3G in the both horizontal direction/vertical direction.
Input in percentage is to be set with 1.0G for Lead 16 and 10, 0.5G for Lead 5 and 0.3G for Lead 2 as 100%.
(Note) "-" represent operation not available.

Lead 16 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	3.5	2	0.5
140	3.5	2	0.5
280	3.5	2	0.5
420	3	2	0.5
560	2	1	0.5

Lead 10 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	7	4.5	1.5
175	7	4.5	1.5
350	6.5	4.5	1
435	3.5	1.5	1

Lead 5 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	15.5	—	3
85	15.5	—	3
130	15.5	—	2.5
215	12.5	—	2

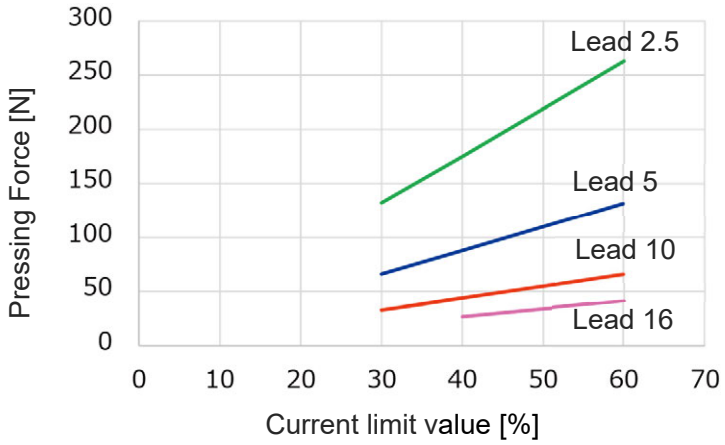
Lead 2.5 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	24.5	—	4.5
40	24.5	—	4.5
85	24.5	—	3.5
105	21	—	3

[5] Pressing Operation

Caution

- The relation of the current limit and the pressing force is a guideline at speed of 20mm/s for lead 2.5 and 5, 30mm/s for lead 10, and 40mm/s for lead 16. There is some variance in the actual pressing force. The variance increases when the current value is low.
- The current limit value cannot be set outside the 30 to 60% (40 to 60% for lead 16) range.
- When the approach speed up to the pressing start position is 20mm/s or less for lead 2.5 and 5, 30mm/s or less for lead 10, and 40mm/s or less for lead 16, pressing operation will take place at approach speed.
  When the pressing speed is less than 20mm/s for lead 2.5 and 5, less than 30mm/s for lead 10, and less than 40mm/s for lead 16, the pressing force (reference) described in the graph below may not be satisfied. Confirm in advance that there is no problem in the pressing force.



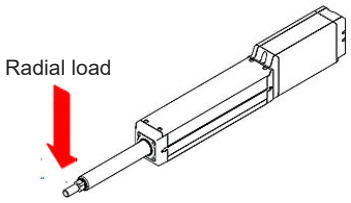
1.3.2 EC-RR4□BR

[1] Actuator Specifications

Item		Content
Drive system		Ball screw Φ8mm, rolled C10
Positioning repeatability		±0.02 mm
Lost motion		0.1mm or less
Linear guide		Linear infinite circulation system
Brake (Option)	Specification	Non-excitation activating electromagnetic brake
	Holding force	Lead 16：1kgf Lead 10：1.5kgf Lead 5：3.5kgf Lead 2.5：4.5kgf
Ambient operating temperature/humidity		10 to 40°C, 85%RH or less (Non-condensing)
Degree of protection		IP20
Vibration and Impact resistance		4.9m/s2
Motor type		□35 pulse motor（Power capacity：Max. 4.2A）
Encoder type		Incremental / Battery-less absolute
Encoder pulse count		800pulse/rev

Because the radial cylinder type has a linear guide built into the body,
radial and moment loads can be applied to the rod.
The applicable radial and moment loads must meet the following three conditions.

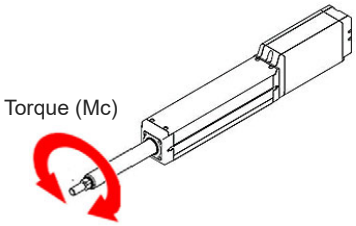
1. The radial load acting on the rod must not exceed the allowable value.



Rod tip static allowable radial load	Rod tip dynamic allowable radial load (Note 1)
40N	20N

Note 1 The value assumes a basic rated life of 5,000km.

2. The torque (Mc) acting on the rod must not exceed the allowable value.



Rod tip static allowable torque	Rod tip dynamic allowable torque (Note 1)
3.5N·m	3.5N·m

Note 1 The value assumes a basic rated life of 5,000km.

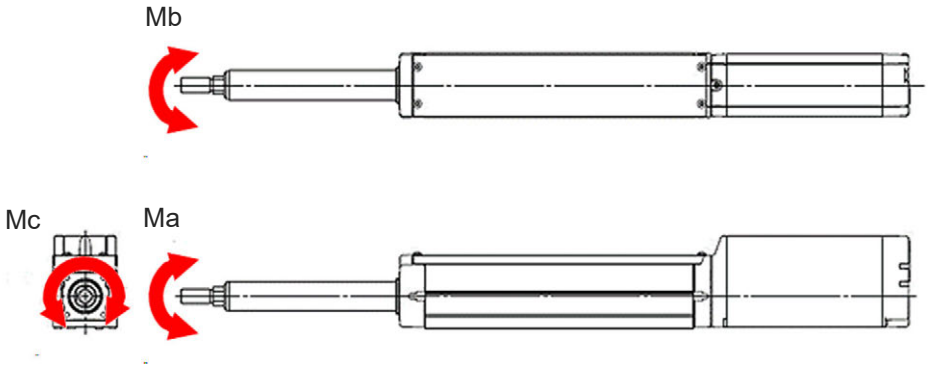
3. The uniform load (*) acting on the rod must not exceed the allowable value.

(*) Uniform load = Ma • Ka + Mb • Kb + Mc • Kc

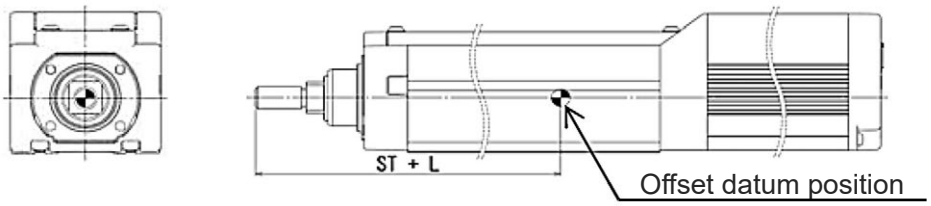
Static allowable uniform load	Dynamic allowable uniform load (Note 1)	Load uniform coefficient Ka	Load uniform coefficient Kb	Load uniform coefficient Kc
1720N	660N	181/m	127/m	93/m

Note 1 The value assumes a basic rated life of 5,000km.

Ma, Mb, Mc: Moment load

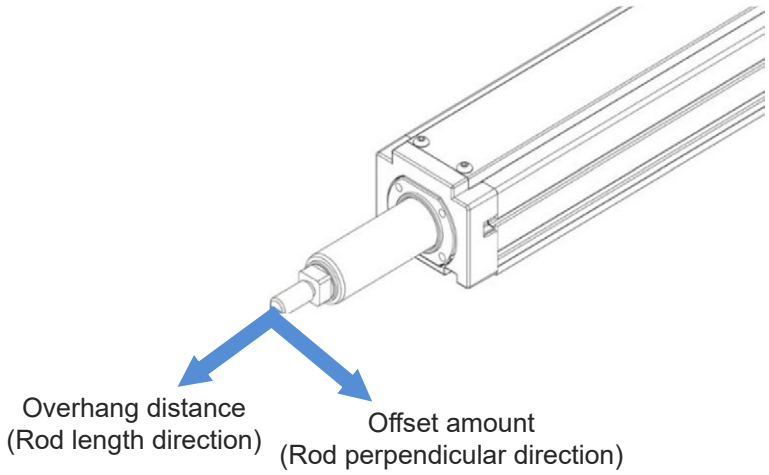


Moment offset datum position



L
102mm

Allowable offset amount, allowable overhang distance



Allowable offset amount	Allowable overhang distance
100mm	100mm

Caution

- Keep the radial load acting on the rod within the allowable offset amount and overhang distance for use. If the allowable values are exceeded, this may lead to vibration, shortened product life, or damage.

[2] Lead and Payload

Power Saving Setting : Disabled

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR4SBR	16	5	1	39
EC-RR4HBR	10	11	1.5	62
EC-RR4MBR	5	17.5	3.5	124
EC-RR4LBR	2.5	24.5	4.5	263

Power Saving Setting : Enable

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR4SBR	16	3.5	0.5	39
EC-RR4HBR	10	7	1.5	62
EC-RR4MBR	5	15.5	3	124
EC-RR4LBR	2.5	24.5	4.5	263

[3] Stroke and Max. Speed

Caution

- The maximum speed may not be achieved when the stroke or movement distance is short or when acceleration/deceleration is set low.
- Setting the lower less than speed the minimum speed may cause such concerns of generating abnormal noise or making the speed unstable.
- The minimum speed is the lead 16 is 40mm/s, the lead 10 is 30mm/s, the lead 5 is 7mm/s, and the lead 2.5 is 4mm/s.

Power Saving Setting : Disabled Max. Speed [mm/s]

Lead [mm]	50 to 200mm (Every 50mm)	250mm	300mm
16	800<700>	600	440
10	525<435>	390	290
5	260<215>	190	140
2.5	135<105>	90	70

< > represents vertical operation.

Power Saving Setting : Enable Max. Speed [mm/s]

Lead [mm]	50 to 200mm (Every 50mm)	250mm	300mm
16	560		440
10	435	390	290
5	215	190	140
2.5	105	90	70

[4] Payload by Speed/Acceleration

Caution

- Do not attempt to configure settings for acceleration/deceleration above the allowable values. It may cause to generate vibration, malfunction or shorten the product life.

Power Saving Setting : Disable

At low load capacity, the acceleration/deceleration can be increased.

The maximum acceleration/deceleration for Lead 16 and 10 is 1.0G in the horizontal direction and 0.5G in the vertical direction.

The maximum acceleration/deceleration for Lead 5 is 0.5G in the both horizontal direction/vertical direction. The maximum acceleration/deceleration for Lead 2.5 is 0.3G in the both horizontal direction/vertical direction.

Input in percentage is to be set with 1.0G for Lead 16 and 10, 0.5G for Lead 5 and 0.3G for Lead 2 as 100%.

(Note) "-" represent operation not available.

Lead 16 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	5	4	3.5	2.5	1	1
140	5	4	3.5	2.5	1	1
280	5	4	3	2.5	1	1
420	5	4	2.5	1.5	1	1
560	4.5	4	2.5	1.5	1	1
700	4	1.5	1	0.5	0.5	0.5
800	—	0.5	—	—	—	—

Lead 10 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	11	10.5	9	7.5	1.5	1.5
175	11	10.5	9	7.5	1.5	1.5
350	11	6.5	6.5	3.5	1.5	1.5
435	8.5	3	3	1.5	1.5	1.5
525	3	1.5	—	—	—	—

Lead 5 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	17.5	15.5	—	—	3.5	3
85	17.5	15.5	—	—	3.5	3
130	17.5	15.5	—	—	3.5	3
215	17.5	9	—	—	3.5	3
260	8.5	7.5	—	—	—	—

Lead 2.5 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	24.5	—	—	—	4.5	—
40	24.5	—	—	—	4.5	—
85	24.5	—	—	—	4.5	—
105	24.5	—	—	—	4.5	—
135	11	—	—	—	—	—

Power Saving Setting : Enabled

At low load capacity, the acceleration/deceleration can be increased.

The maximum acceleration/deceleration for Lead 16 and 10 is 0.7G in the horizontal direction and 0.3G in the vertical direction.

The maximum acceleration/deceleration for Lead 5 and 2.5 is 0.3G in the both horizontal direction/vertical direction.

Input in percentage is to be set with 1.0G for Lead 16 and 10, 0.5G for Lead 5, and 0.3G for Lead 2.5 as 100%.

(Note) "-" represent operation not available.

Lead 16 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	3.5	2	0.5
140	3.5	2	0.5
280	3.5	2	0.5
420	3	2	0.5
560	2	1	0.5

Lead 10 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	7	4.5	1.5
175	7	4.5	1.5
350	6.5	4.5	1
435	3.5	0.5	0.5

Lead 5 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	15.5	—	3
85	15.5	—	3
130	15.5	—	2.5
215	12.5	—	2

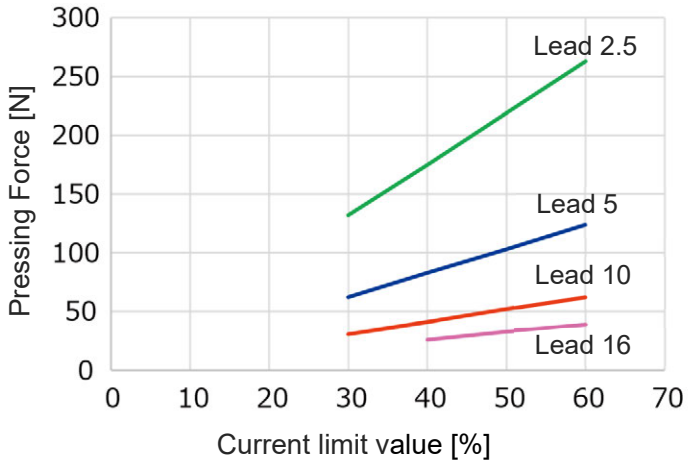
Lead 2.5 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	24.5	—	4.5
40	24.5	—	4.5
85	24.5	—	3.5
105	21	—	3

[5] Pressing Operation

Caution

- The relation of the current limit and the pressing force is a guideline at speed of 20mm/s for lead 2.5 and 5, 30mm/s for lead 10, and 40mm/s for lead 16. There is some variance in the actual pressing force. The variance increases when the current value is low.
- The current limit value cannot be set outside the 30 to 60% (40 to 60% for lead 16) range.
- When the approach speed up to the pressing start position is 20mm/s or less for lead 2.5 and 5, 30mm/s or less for lead 10, and 40mm/s or less for lead 16, pressing operation will take place at approach speed.
  When the pressing speed is less than 20mm/s for lead 2.5 and 5, less than 30mm/s for lead 10, and less than 40mm/s for lead 16, the pressing force (reference) described in the graph above may not be satisfied. Confirm in advance that there is no problem in the pressing force.



1.4 Mechanical specifications EC-RR6

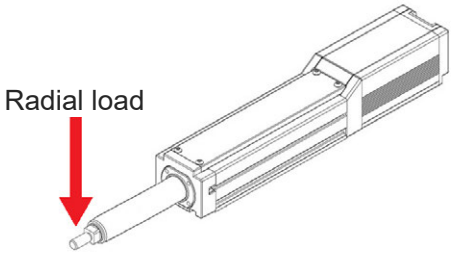
1.4.1 EC-RR6□B

[1] Actuator Specifications

Item		Content
Drive system		Ball screw Φ10mm, rolled C10
Positioning repeatability		Lead 3/6/12 : ±0.02 mm, Lead 20 : ±0.03 mm
Lost motion		0.1mm or less
Linear guide		Linear infinite circulation system
Brake (Option)	Specification	Non-excitation activating electromagnetic brake
	Holding force	Lead 20：1kgf Lead 12：3kgf Lead 6：7kgf Lead 3：8.5kgf
Ambient operating temperature/humidity		10 to 40°C, 85%RH or less (Non-condensing)
Degree of protection		IP20
Vibration and Impact resistance		4.9m/s^2
Motor type		□42 pulse motor（Power capacity：Max.4.2A）
Encoder type		Incremental / Battery-less absolute
Encoder pulse count		800pulse/rev

Because the radial cylinder type has a linear guide built into the body,
radial and moment loads can be applied to the rod.
The applicable radial and moment loads must meet the following three conditions.

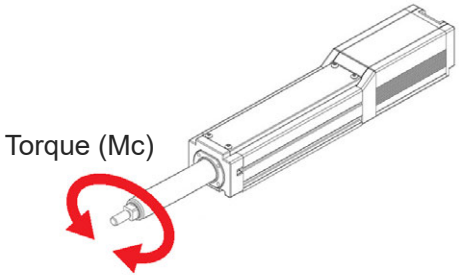
1. The radial load acting on the rod must not exceed the allowable value.



Rod tip static allowable radial load	Rod tip dynamic allowable radial load (Note 1)
90N	45N

Note 1 The value assumes a basic rated life of 5,000km.

2. The torque (Mc) acting on the rod must not exceed the allowable value.



Rod tip static allowable torque	Rod tip dynamic allowable torque (Note 1)
5.5N·m	5.5N·m

Note 1 The value assumes a basic rated life of 5,000km.

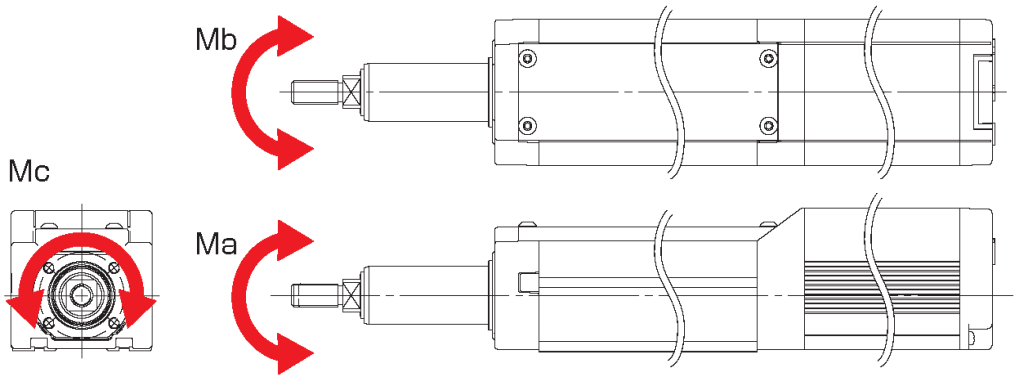
3. The uniform load (*) acting on the rod must not exceed the allowable value.

(*) Uniform load = Ma • Ka + Mb • Kb + Mc • Kc

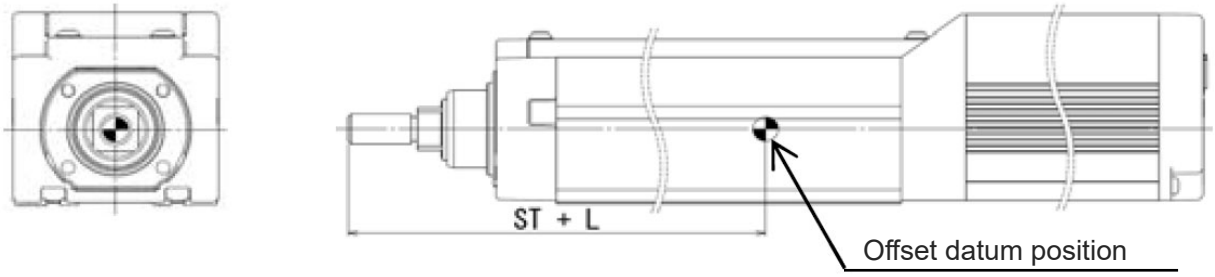
Static allowable uniform load	Dynamic allowable uniform load (Note 1)	Load uniform coefficient Ka	Load uniform coefficient Kb	Load uniform coefficient Kc
4400N	1050N	124/m	87/m	62/m

Note 1 The value assumes a basic rated life of 5,000km.

Ma, Mb, Mc: Moment load

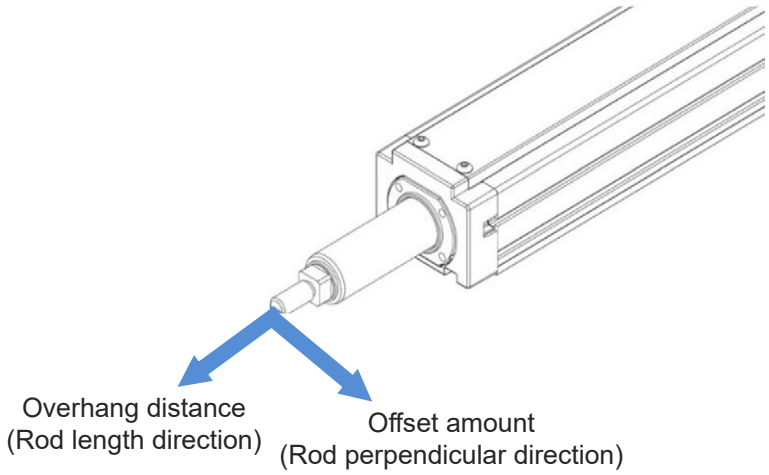


Moment offset datum position



L
111mm

Allowable offset amount, allowable overhang distance



Allowable offset amount	Allowable overhang distance
100mm	100mm

Caution

- Keep the radial load acting on the rod within the allowable offset amount and overhang distance for use. If the allowable values are exceeded, this may lead to vibration, shortened product life, or damage.

[2] Lead and Payload

Power Saving Setting : Disabled

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR6SB	20	4	1	67
EC-RR6HB	12	17.5	3	112
EC-RR6MB	6	28	7	224
EC-RR6LB	3	42	8.5	449

Power Saving Setting : Enable

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR6SB	20	4	0.5	67
EC-RR6HB	12	17.5	3	112
EC-RR6MB	6	28	7	224
EC-RR6LB	3	28	8.5	449

[3] Stroke and Max. Speed

Caution

- The maximum speed may not be achieved when the stroke or movement distance is short or when acceleration/deceleration is set low.
- Setting the lower less than speed the minimum speed may cause such concerns of generating abnormal noise or making the speed unstable.
- The minimum speed is the lead 20 is 25mm/s, lead 12 is 15mm/s, lead 6 is 8mm/s, and the lead 3 is 4mm/s.

Power Saving Setting : Disabled Max. Speed [mm/s]

Lead [mm]	65 to 315mm (Every 50mm)
20	800
12	400
6	200
3	100

Power Saving Setting : Enable Max. Speed [mm/s]

Lead [mm]	65 to 315mm (Every 50mm)
20	640
12	400
6	200
3	100

[4] Payload by Speed/Acceleration

Caution

- Do not attempt to configure settings for acceleration/deceleration above the allowable values. It may cause to generate vibration, malfunction or shorten the product life.

Power Saving Setting : Disabled

At low load capacity, the acceleration/deceleration can be increased.

The maximum acceleration/deceleration is 1G in the horizontal direction and 0.5G in the vertical direction.

Input in percentage is to be set with 1G as 100%.

(Note) "-" represent operation not available.

Lead 20 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	4	4	3.5	3.5	1	1
160	4	4	3.5	3.5	1	1
320	4	4	3.5	2	1	1
480	4	4	3.5	2	1	1
640	4	3	2	1.5	1	1
800	3	2	—	—	0.5	0.5

Lead 12 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	17.5	12.5	11	8.5	3	3
100	17.5	12.5	11	8.5	3	3
200	17.5	12.5	11	7	3	3
400	14	10	7	4	3	3

Lead 6 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	28	24.5	21	17.5	7	7
50	28	24.5	21	17.5	7	7
100	28	24.5	21	17.5	7	7
200	28	21	17.5	14	7	7

Lead 3 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	42	35	31.5	28	8.5	8.5
50	42	35	31.5	28	8.5	8.5
100	42	35	31.5	28	8.5	8.5

Power Saving Setting : Enable

At low load capacity, the acceleration/deceleration can be increased.

The maximum acceleration/deceleration is 0.7G in the horizontal direction and 0.3G in the vertical direction.

Input in percentage is to be set with 1G as 100%.

(Note) "-" represent operation not available.

Lead 20 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	4	3.5	0.5
160	4	3.5	0.5
320	4	3.5	0.5
480	3	1.5	0.5
640	2	0.5	—

Lead 12 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	17.5	7	3
100	17.5	7	3
200	17.5	7	3
300	14	5.5	2
400	7	3.5	1.5

Lead 6 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	28	14	7
50	28	14	7
100	28	14	7
150	28	14	5.5
200	24.5	12.5	3.5

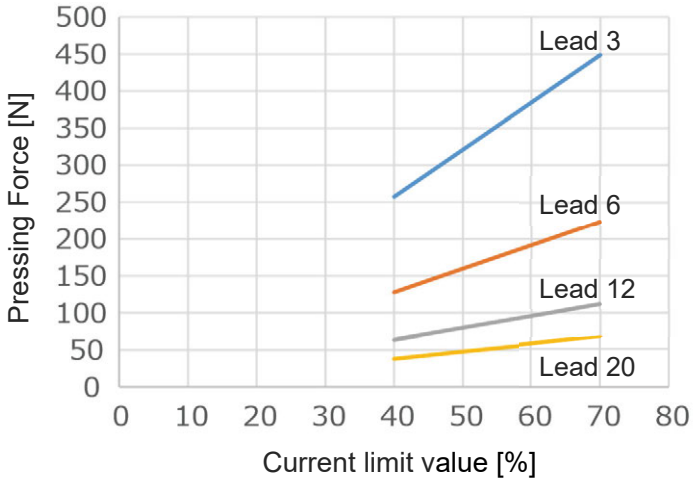
Lead 3 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	28	17.5	8.5
25	28	17.5	8.5
50	28	17.5	8.5
75	28	17.5	8.5
100	28	17.5	6.5

[5] Pressing Operation

Caution

- The relation of the current limit and the pressing force is a guideline at speed of 20mm/s. There is some variance in the actual pressing force. The variance increases when the current value is low.
- The current limit value cannot be set outside the 40 to 70% range.
- When the approach speed up to the pressing start position is 20mm/s or less, pressing operation will take place at approach speed.
  When the pressing speed is less than 20mm/s, the pressing force (reference) described in the graph below may not be satisfied. Confirm in advance that there is no problem in the pressing force.



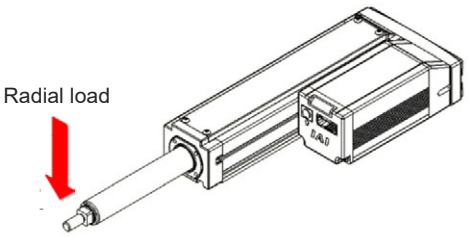
1.4.2 EC-RR6□BR

[1] Actuator Specifications

Item		Content
Drive system		Ball screw Φ10mm, rolled C10
Positioning repeatability		Lead 3/6/12 : ±0.02 mm, Lead 20 : ±0.03 mm
Lost motion		0.1mm or less
Linear guide		Linear infinite circulation system
Brake (Option)	Specification	Non-excitation activating electromagnetic brake
	Holding force	Lead 20：1kgf Lead 12：3kgf Lead 6：7kgf Lead 3：8.5kgf
Ambient operating temperature/humidity		10 to 40°C, 85%RH or less (Non-condensing)
Degree of protection		IP20
Vibration and Impact resistance		4.9m/s2
Motor type		□42 pulse motor（Power capacity：Max.4.2A）
Encoder type		Incremental / Battery-less absolute
Encoder pulse count		800pulse/rev

Because the radial cylinder type has a linear guide built into the body,
radial and moment loads can be applied to the rod.
The applicable radial and moment loads must meet the following three conditions.

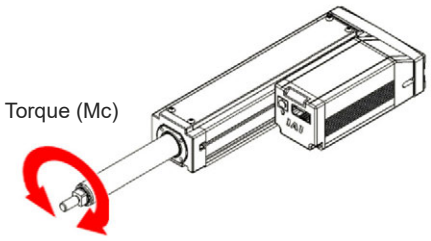
1. The radial load acting on the rod must not exceed the allowable value.



Rod tip static allowable radial load	Rod tip dynamic allowable radial load (Note 1)
90N	45N

Note 1 The value assumes a basic rated life of 5,000km.

2. The torque (Mc) acting on the rod must not exceed the allowable value.



Rod tip static allowable torque	Rod tip dynamic allowable torque (Note 1)
5.5N·m	5.5N·m

Note 1 The value assumes a basic rated life of 5,000km.

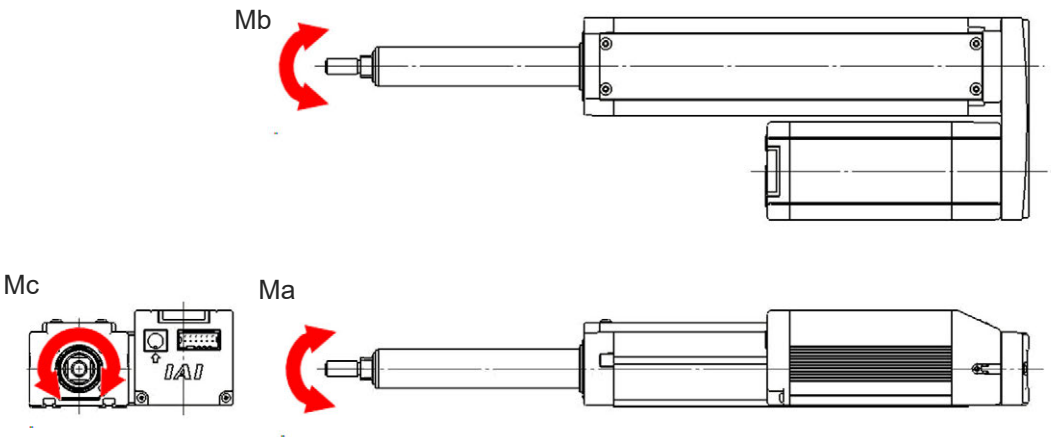
3. The uniform load (*) acting on the rod must not exceed the allowable value.

(*) Uniform load = Ma • Ka + Mb • Kb + Mc • Kc

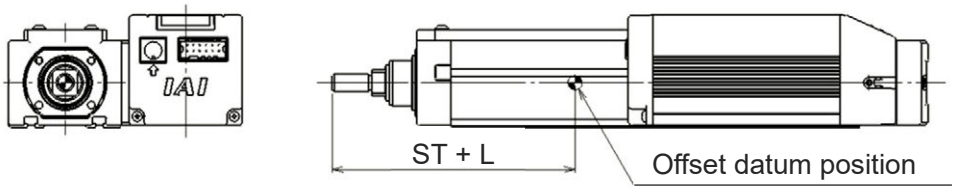
Static allowable uniform load	Dynamic allowable uniform load (Note 1)	Load uniform coefficient Ka	Load uniform coefficient Kb	Load uniform coefficient Kc
4400N	1050N	124/m	87/m	62/m

Note 1 The value assumes a basic rated life of 5,000km.

Ma, Mb, Mc: Moment load

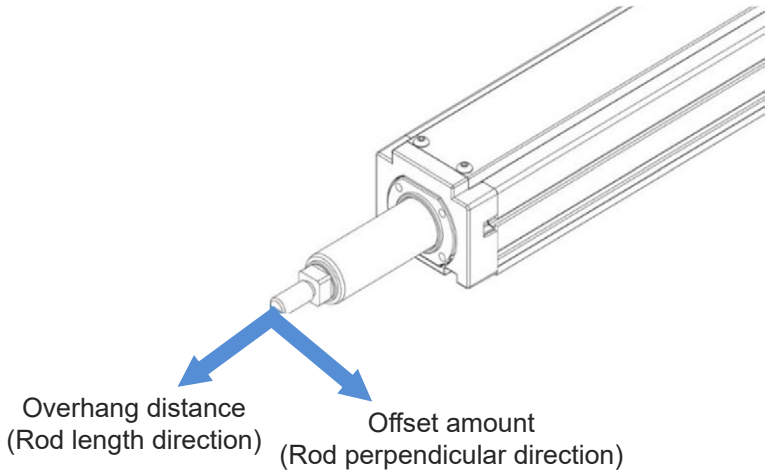


Moment offset datum position



L
111mm

Allowable offset amount, allowable overhang distance



Allowable offset amount	Allowable overhang distance
100mm	100mm

Caution

- Keep the radial load acting on the rod within the allowable offset amount and overhang distance for use. If the allowable values are exceeded, this may lead to vibration, shortened product life, or damage.

[2] Lead and Payload

Power Saving Setting : Disabled

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR6SBR	20	4	1	67
EC-RR6HBR	12	17.5	3	112
EC-RR6MBR	6	28	7	224
EC-RR6LBR	3	42	8.5	449

Power Saving Setting : Enable

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR6SBR	20	4	0.5	67
EC-RR6HBR	12	17.5	3	112
EC-RR6MBR	6	28	7	224
EC-RR6LBR	3	28	8.5	449

[3] Stroke and Max. Speed

Caution

- The maximum speed may not be achieved when the stroke or movement distance is short or when acceleration/deceleration is set low.
- Setting the lower less than speed the minimum speed may cause such concerns of generating abnormal noise or making the speed unstable.
- The minimum speed is the lead 20 is 25mm/s, lead 12 is 15mm/s, lead 6 is 8mm/s, and the lead 3 is 4mm/s.

Power Saving Setting : Disabled Max. Speed [mm/s]

Lead [mm]	65 to 315mm (Every 50mm)
20	800
12	400
6	200
3	100

Power Saving Setting : Enable Max. Speed [mm/s]

Lead [mm]	65 to 315mm (Every 50mm)
20	640
12	400
6	200
3	100

[4] Payload by Speed/Acceleration

Caution

- Do not attempt to configure settings for acceleration/deceleration above the allowable values. It may cause to generate vibration, malfunction or shorten the product life.

Power Saving Setting : Disabled

At low load capacity, the acceleration/deceleration can be increased.

The maximum acceleration/deceleration is 1G in the horizontal direction and 0.5G in the vertical direction.

Input in percentage is to be set with 1G as 100%.

(Note) "-" represent operation not available.

Lead 20 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	4	4	3.5	3.5	1	1
160	4	4	3.5	3.5	1	1
320	4	4	3.5	2	1	1
480	4	4	3.5	2	1	1
640	4	3	2	1.5	1	1
800	3	2	—	—	0.5	0.5

Lead 12 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	17.5	12.5	11	8.5	3	3
100	17.5	12.5	11	8.5	3	3
200	17.5	12.5	11	7	3	3
400	14	10	7	4	3	3

Lead 6 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	28	24.5	21	17.5	7	7
50	28	24.5	21	17.5	7	7
100	28	24.5	21	17.5	7	7
200	28	21	17.5	14	7	7

Lead 3 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	42	35	31.5	28	8.5	8.5
50	42	35	31.5	28	8.5	8.5
100	42	35	31.5	28	8.5	8.5

Power Saving Setting : Enable

At low load capacity, the acceleration/deceleration can be increased.

The maximum acceleration/deceleration is 0.7G in the horizontal direction and 0.3G in the vertical direction.

Input in percentage is to be set with 1G as 100%.

(Note) "-" represent operation not available.

Lead 20 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	4	3.5	0.5
160	4	3.5	0.5
320	4	3.5	0.5
480	3	1.5	0.5
640	2	0.5	—

Lead 12 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	17.5	7	3
100	17.5	7	3
200	17.5	7	3
300	14	5.5	2
400	7	3.5	1.5

Lead 6 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	28	14	7
50	28	14	7
100	28	14	7
150	28	14	5.5
200	24.5	12.5	3.5

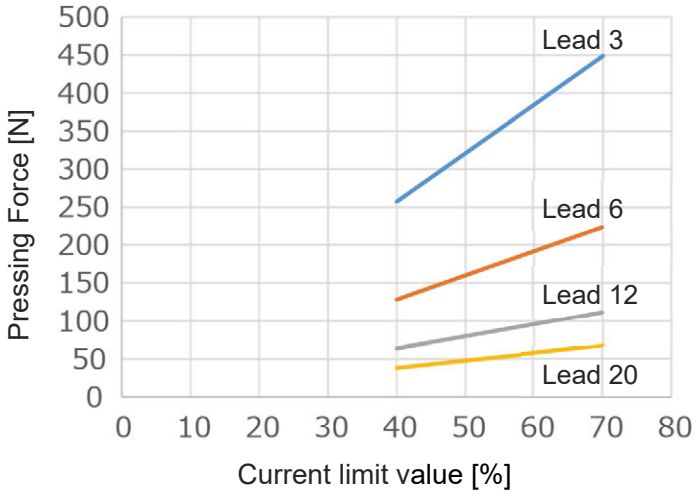
Lead 3 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	28	17.5	8.5
25	28	17.5	8.5
50	28	17.5	8.5
75	28	17.5	8.5
100	28	17.5	8.5

[5] Pressing Operation

Caution

- The relation of the current limit and the pressing force is a guideline at speed of 20mm/s. There is some variance in the actual pressing force. The variance increases when the current value is low.
- The current limit value cannot be set outside the 40 to 70% range.
- When the approach speed up to the pressing start position is 20mm/s or less, pressing operation will take place at approach speed.
  When the pressing speed is less than 20mm/s, the pressing force (reference) described in the graph below may not be satisfied. Confirm in advance that there is no problem in the pressing force.

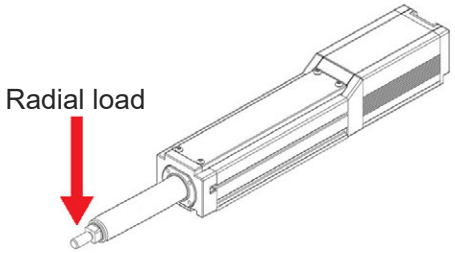


1.4.3 EC-RR6□AHB

[1] Actuator Specifications

Item		Content
Drive system		Ball screw Φ10mm, rolled C10
Positioning repeatability		Lead 3/6/12 : ±0.02 mm, Lead 20 : ±0.03 mm
Lost motion		0.1mm or less
Linear guide		Linear infinite circulation system
Brake (Option)	Specification	Non-excitation activating electromagnetic brake
	Holding force	Lead 20：1kgf Lead 12：3kgf Lead 6：7kgf Lead 3：14kgf
Ambient operating temperature/humidity		10 to 40°C, 85%RH or less (Non-condensing)
Degree of protection		IP20
Vibration and Impact resistance		4.9m/s2
Motor type		□42 pulse motor（Power capacity：Max.4.2A）
Encoder type		Incremental / Battery-less absolute
Encoder pulse count		800pulse/rev

1. The radial load acting on the rod must not exceed the allowable value.



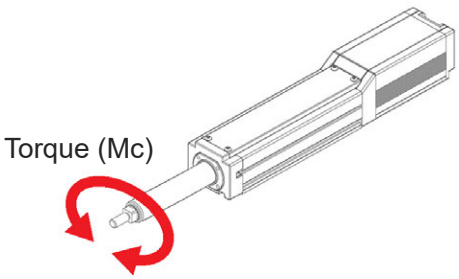
Rod tip static allowable radial load	Rod tip dynamic allowable radial load (Note 1)
190N	130N (Note 2)

Note 1 The value assumes a basic rated life of 5,000km.

Note 2 For stroke 300mm or more, set the value specified in the table below.

Stroke [mm]	300	350	400	450	500	550
Rod tip dynamic allowable radial load [N]	40	35	25	20	20	15

2. The torque (Mc) acting on the rod must not exceed the allowable value.



Rod tip static allowable torque	Rod tip dynamic allowable torque (Note 1)
9N·m	5.5N·m

Note 1 The value assumes a basic rated life of 5,000km.

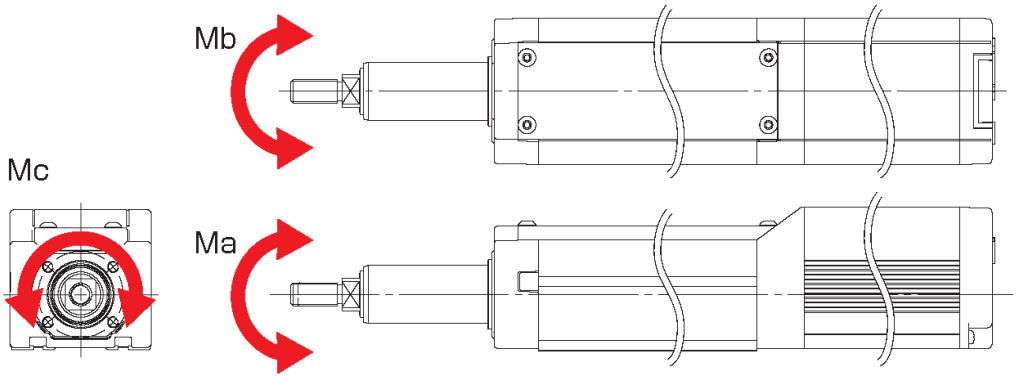
3. The uniform load (*) acting on the rod must not exceed the allowable value.

(*) Uniform load = Ma • Ka + Mb • Kb + Mc • Kc

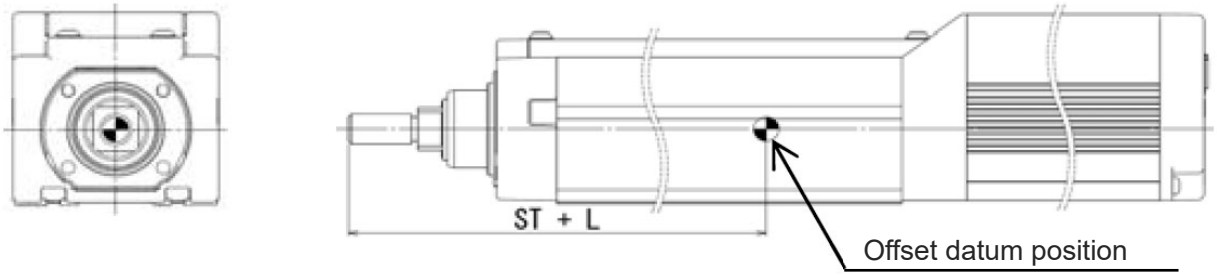
Static allowable uniform load	Dynamic allowable uniform load (Note 1)	Load uniform coefficient Ka	Load uniform coefficient Kb	Load uniform coefficient Kc
6700N	2400N	104/m	87/m	62/m

Note 1 The value assumes a basic rated life of 5,000km.

Ma, Mb, Mc: Moment load

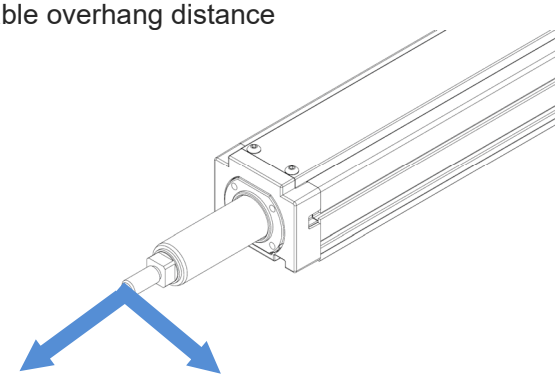


Moment offset datum position



L
126mm

Allowable offset amount, allowable overhang distance



Overhang distance
(Rod length direction)

Offset amount
(Rod perpendicular direction)

Allowable offset amount	Allowable overhang distance
100mm	100mm

Caution

- Keep the radial load acting on the rod within the allowable offset amount and overhang distance for use. If the allowable values are exceeded, this may lead to vibration, shortened product life, or damage.
- If abnormal vibration or noise occurs during operation, even when within allowable values for radial and torque loads, use less stringent operating conditions.
- Keep the mounted object center mass location at below 1/2 the overhang distance or offset amount.

[2] Lead and Payload

Power Saving Setting : Disabled

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR6SAHB	20	4	1	67
EC-RR6HAHB	12	17.5	3	112
EC-RR6MAHB	6	28	7	224
EC-RR6LAHB	3	42	14	449

Power Saving Setting : Enable

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR6SAHB	20	4	0.5	67
EC-RR6HAHB	12	17.5	3	112
EC-RR6MAHB	6	28	7	224
EC-RR6LAHB	3	28	14	449

[3] Stroke and Max. Speed

Caution

- The maximum speed may not be achieved when the stroke or movement distance is short or when acceleration/deceleration is set low.
- Setting the lower less than speed the minimum speed may cause such concerns of generating abnormal noise or making the speed unstable.
- The minimum speed is the lead 20 is 25mm/s, lead 12 is 15mm/s, the lead 6 is 8mm/s and the lead 3 is 4mm/s.

Power Saving Setting : Disabled Max. Speed [mm/s]

Lead [mm]	50 to 550mm (Every 50mm)
20	800
12	400
6	200
3	100

Power Saving Setting : Enable Max. Speed [mm/s]

Lead [mm]	50 to 550mm (Every 50mm)
20	640
12	400
6	200
3	100

[4] Payload by Speed/Acceleration

Caution

- Do not attempt to configure settings for acceleration/deceleration above the allowable values. It may cause to generate vibration, malfunction or shorten the product life.

Power Saving Setting : Disabled

At low load capacity, the acceleration/deceleration can be increased.
The maximum acceleration/deceleration is 1G in the horizontal direction and 0.5G in the vertical direction.
Input in percentage is to be set with 1G as 100%.
(Note) "-" represent operation not available.

Lead 20 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	4	4	3.5	3.5	1	1
160	4	4	3.5	3.5	1	1
320	4	4	3.5	2	1	1
480	4	4	3.5	2	1	1
640	4	3	2	1.5	1	1
800	3	2	—	—	0.5	0.5

Lead 12 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	17.5	12.5	11	8.5	3	3
100	17.5	12.5	11	8.5	3	3
200	17.5	12.5	11	7	3	3
400	14	10	7	4	3	3

Lead 6 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	28	24.5	21	17.5	7	7
50	28	24.5	21	17.5	7	7
100	28	24.5	21	17.5	7	7
200	28	21	17.5	14	7	7

Lead 3 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	42	35	31.5	28	14	14
50	42	35	31.5	28	14	14
100	42	35	31.5	28	14	14

Power Saving Setting : Enable

At low load capacity, the acceleration/deceleration can be increased.

The maximum acceleration/deceleration is 0.7G in the horizontal direction and 0.3G in the vertical direction.

Input in percentage is to be set with 1G as 100%.

(Note) "-" represent operation not available.

Lead 20 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	4	3.5	0.5
160	4	3.5	0.5
320	4	3.5	0.5
480	3	1.5	0.5
640	2	0.5	—

Lead 12 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	17.5	7	3
100	17.5	7	3
200	17.5	7	3
300	14	5.5	2
400	7	3.5	1.5

Lead 6 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	28	14	7
50	28	14	7
100	28	14	7
150	28	14	5.5
200	24.5	12.5	3.5

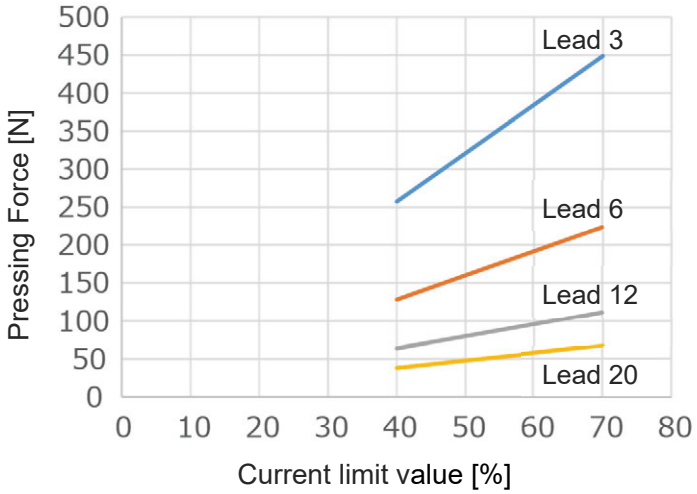
Lead 3 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	28	17.5	14
25	28	17.5	14
50	28	17.5	14
75	28	17.5	8.5
100	28	17.5	6.5

[5] Pressing Operation

Caution

- The relation of the current limit and the pressing force is a guideline at speed of 20mm/s. There is some variance in the actual pressing force. The variance increases when the current value is low.
- The current limit value cannot be set outside the 40 to 70% range.
- When the approach speed up to the pressing start position is 20mm/s or less, pressing operation will take place at approach speed.
  When the pressing speed is less than 20mm/s, the pressing force (reference) described in the graph below may not be satisfied. Confirm in advance that there is no problem in the pressing force.

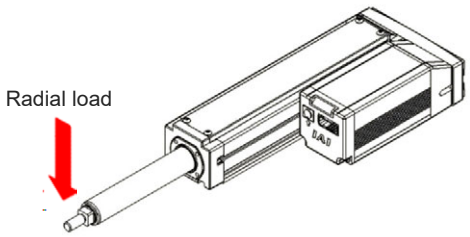


1.4.4 EC-RR6□AHBR

[1] Actuator Specifications

Item		Content
Drive system		Ball screw Φ10mm, rolled C10
Positioning repeatability		Lead 3/6/12 : ±0.02 mm, Lead 20 : ±0.03 mm
Lost motion		0.1mm or less
Linear guide		Linear infinite circulation system
Brake (Option)	Specification	Non-excitation activating electromagnetic brake
	Holding force	Lead 20：1kgf Lead 12：3kgf Lead 6：7kgf Lead 3：14kgf
Ambient operating temperature/humidity		10 to 40°C, 85%RH or less (Non-condensing)
Degree of protection		IP20
Vibration and Impact resistance		4.9m/s2
Motor type		□42 pulse motor（Power capacity：Max.4.2A）
Encoder type		Incremental / Battery-less absolute
Encoder pulse count		800pulse/rev

1. The radial load acting on the rod must not exceed the allowable value.



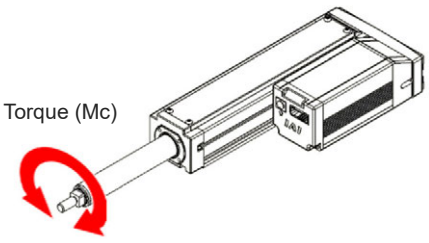
Rod tip static allowable radial load	Rod tip dynamic allowable radial load (Note 1)
190N	130N (Note 2)

Note 1 The value assumes a basic rated life of 5,000km.

Note 2 For stroke 300mm or more, set the value specified in the table below.

Stroke [mm]	300	350	400
Rod tip dynamic allowable radial load [N]	40	35	25

2. The torque (Mc) acting on the rod must not exceed the allowable value.



Rod tip static allowable torque	Rod tip dynamic allowable torque (Note 1)
9N·m	5.5N·m

Note 1 The value assumes a basic rated life of 5,000km.

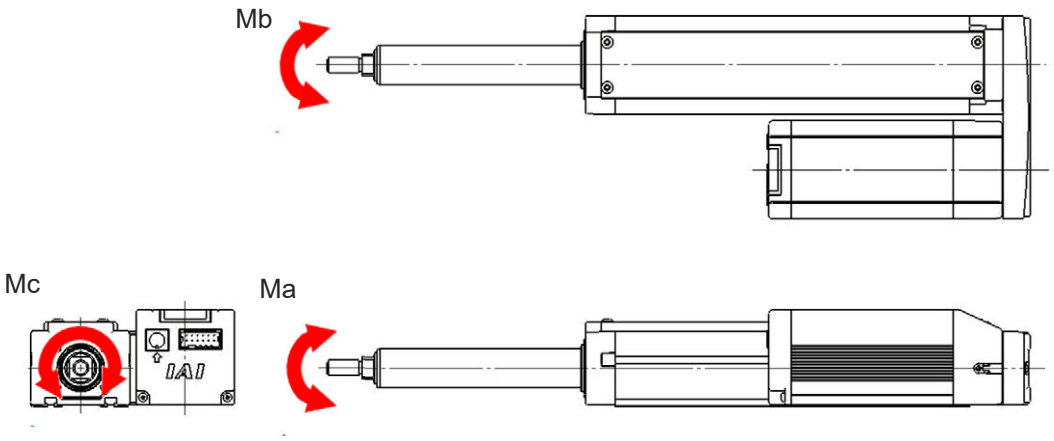
3. The uniform load (*) acting on the rod must not exceed the allowable value.

(*) Uniform load = Ma • Ka + Mb • Kb + Mc • Kc

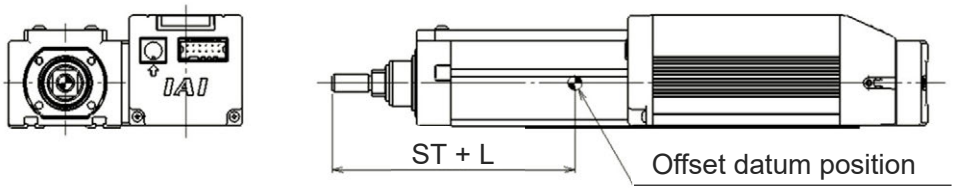
Static allowable uniform load	Dynamic allowable uniform load (Note 1)	Load uniform coefficient Ka	Load uniform coefficient Kb	Load uniform coefficient Kc
6700N	2400N	104/m	87/m	62/m

Note 1 The value assumes a basic rated life of 5,000km.

Ma, Mb, Mc: Moment load

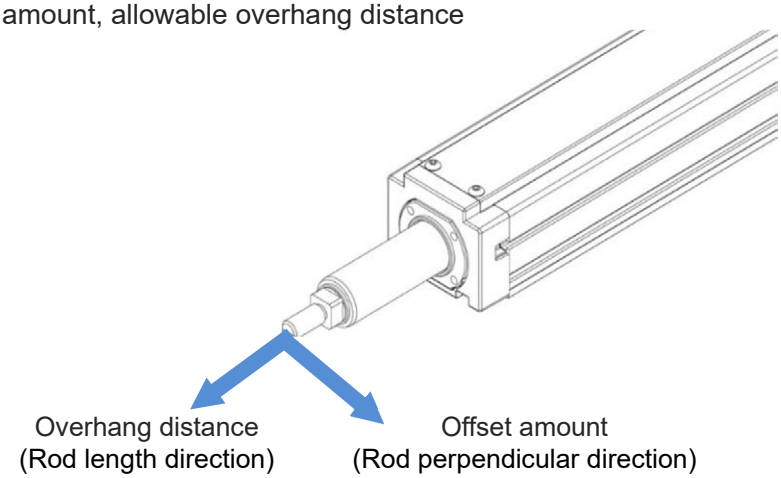


Moment offset datum position



L
126mm

Allowable offset amount, allowable overhang distance



Allowable offset amount	Allowable overhang distance
100mm	100mm

Caution

- Keep the radial load acting on the rod within the allowable offset amount and overhang distance for use. If the allowable values are exceeded, this may lead to vibration, shortened product life, or damage.
- If abnormal vibration or noise occurs during operation, even when within allowable values for radial and torque loads, use less stringent operating conditions.
- Keep the mounted object center mass location at below 1/2 the overhang distance or offset amount.

[2] Lead and Payload

Power Saving Setting : Disabled

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR6SAHBR	20	4	1	67
EC-RR6HAHBR	12	17.5	3	112
EC-RR6MAHBR	6	28	7	224
EC-RR6LAHBR	3	42	14	449

Power Saving Setting : Enable

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR6SAHBR	20	4	1	67
EC-RR6HAHBR	12	17.5	3	112
EC-RR6MAHBR	6	28	7	224
EC-RR6LAHBR	3	28	14	449

[3] Stroke and Max. Speed

Caution

- The maximum speed may not be achieved when the stroke or movement distance is short or when acceleration/deceleration is set low.
- Setting the lower less than speed the minimum speed may cause such concerns of generating abnormal noise or making the speed unstable.
- The minimum speed is the lead 20 is 25mm/s, lead 12 is 15mm/s, the lead 6 is 8mm/s and the lead 3 is 4mm/s.

Power Saving Setting : Disabled Max. Speed [mm/s]

Lead [mm]	50 to 400mm (Every 50mm)
20	800
12	400
6	200
3	100

Power Saving Setting : Enable Max. Speed [mm/s]

Lead [mm]	50 to 400mm (Every 50mm)
20	640
12	400
6	200
3	100

[4] Payload by Speed/Acceleration

Caution

- Do not attempt to configure settings for acceleration/deceleration above the allowable values. It may cause to generate vibration, malfunction or shorten the product life.

Power Saving Setting : Disabled

At low load capacity, the acceleration/deceleration can be increased.
The maximum acceleration/deceleration is 1G in the horizontal direction and 0.5G in the vertical direction.
Input in percentage is to be set with 1G as 100%.
(Note) "-" represent operation not available.

Lead 20 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	4	4	3.5	3.5	1	1
160	4	4	3.5	3.5	1	1
320	4	4	3.5	2	1	1
480	4	4	3.5	2	1	1
640	4	3	2	1.5	1	1
800	3	2	—	—	0.5	0.5

Lead 12 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	17.5	12.5	11	8.5	3	3
100	17.5	12.5	11	8.5	3	3
200	17.5	12.5	11	7	3	3
400	14	10	7	4	3	3

Lead 6 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	28	24.5	21	17.5	7	7
50	28	24.5	21	17.5	7	7
100	28	24.5	21	17.5	7	7
200	28	21	17.5	14	7	7

Lead 3 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	42	35	31.5	28	14	14
50	42	35	31.5	28	14	14
100	42	35	31.5	28	14	14

Power Saving Setting : Enable

At low load capacity, the acceleration/deceleration can be increased.

The maximum acceleration/deceleration is 0.7G in the horizontal direction and 0.3G in the vertical direction.

Input in percentage is to be set with 1G as 100%.

(Note) "-" represent operation not available.

Lead 20 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	4	3.5	0.5
160	4	3.5	0.5
320	4	3.5	0.5
480	3	1.5	0.5
640	2	0.5	0.5

Lead 12 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	17.5	7	3
100	17.5	7	3
200	17.5	7	3
300	14	5.5	2
400	7	3.5	1.5

Lead 6 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	28	14	7
50	28	14	7
100	28	14	7
150	28	14	5.5
200	24.5	12.5	3.5

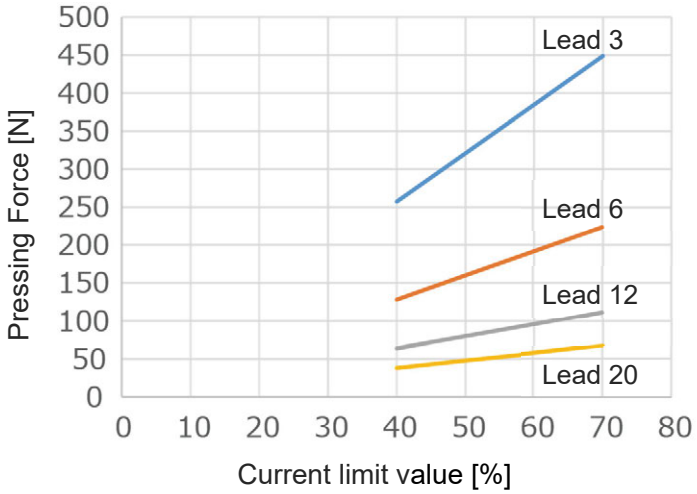
Lead 3 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	28	17.5	14
25	28	17.5	14
50	28	17.5	14
75	28	17.5	8.5
100	28	17.5	6.5

[5] Pressing Operation

Caution

- The relation of the current limit and the pressing force is a guideline at speed of 20mm/s. There is some variance in the actual pressing force. The variance increases when the current value is low.
- The current limit value cannot be set outside the 40 to 70% range.
- When the approach speed up to the pressing start position is 20mm/s or less, pressing operation will take place at approach speed.
  When the pressing speed is less than 20mm/s, the pressing force (reference) described in the graph below may not be satisfied. Confirm in advance that there is no problem in the pressing force.

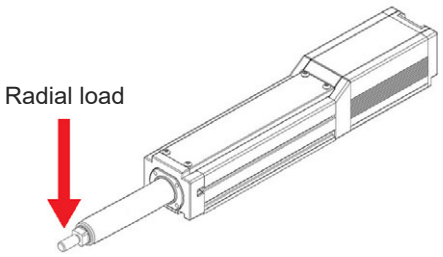


1.4.5 EC-RR6X□AHB

[1] Actuator Specifications

Item		Content
Drive system		Ball screw Φ10mm, rolled C10
Positioning repeatability		Lead 3/6/12 : ±0.02 mm, Lead 20 : ±0.03 mm
Lost motion		0.1mm or less
Linear guide		Linear infinite circulation system
Brake (Option)	Specification	Non-excitation activating electromagnetic brake
	Holding force	Lead 20 : 1kgf Lead 12 : 3kgf Lead 6 : 7kgf Lead 3 : 14kgf
Ambient operating temperature/humidity		10 to 40°C, 85%RH or less (Non-condensing)
Degree of protection		IP20
Vibration and Impact resistance		4.9m/s2
Motor type		□42 pulse motor (Power capacity : Max.4.2A)
Encoder type		Incremental / Battery-less absolute
Encoder pulse count		800pulse/rev

1. The radial load acting on the rod must not exceed the allowable value.



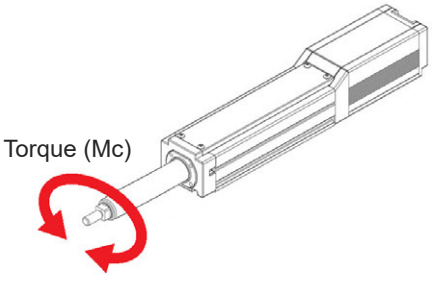
Rod tip static allowable radial load	Rod tip dynamic allowable radial load (Note 1)
190N	130N (Note 2)

Note 1 The value assumes a basic rated life of 5,000km.

Note 2 For stroke 600mm or more, set the value specified in the table below.

Stroke [mm]	600	650	700	750	800	850	900	950	1000
Rod tip dynamic allowable radial load [N]	15	15	15	15	10	10	10	5	5

2. The torque (Mc) acting on the rod must not exceed the allowable value.



Rod tip static allowable torque	Rod tip dynamic allowable torque (Note 1)
9N·m	5.5N·m

Note 1 The value assumes a basic rated life of 5,000km.

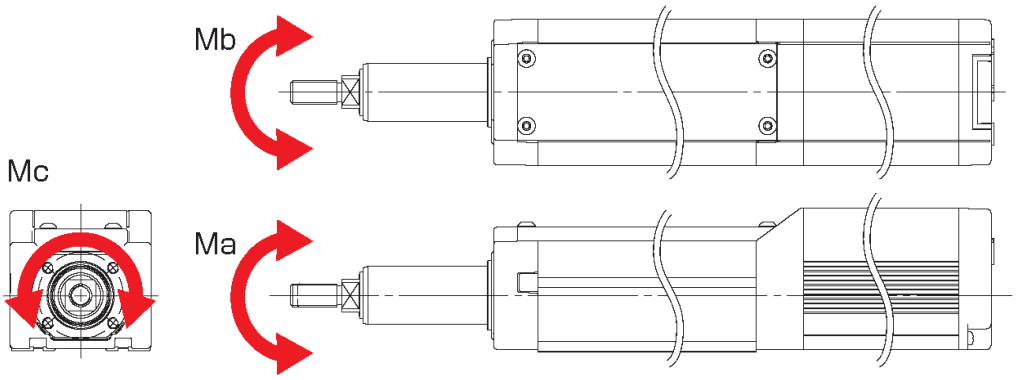
3. The uniform load (*) acting on the rod must not exceed the allowable value.

(*) Uniform load = Ma • Ka + Mb • Kb + Mc • Kc

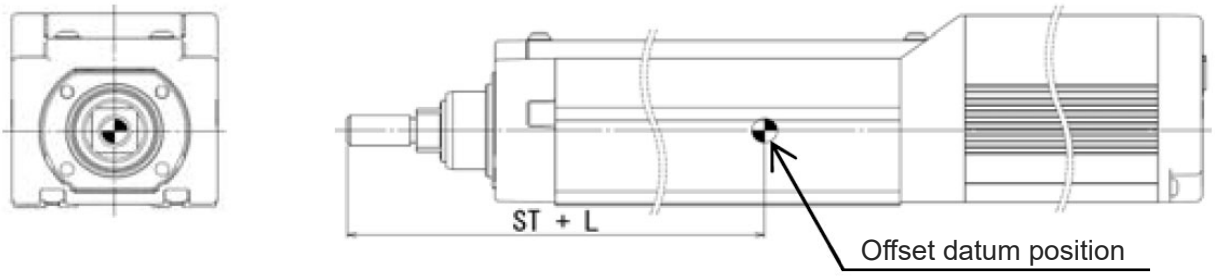
Static allowable uniform load	Dynamic allowable uniform load (Note 1)	Load uniform coefficient Ka	Load uniform coefficient Kb	Load uniform coefficient Kc
6700N	2400N	104/m	87/m	62/m

Note 1 The value assumes a basic rated life of 5,000km.

Ma, Mb, Mc: Moment load

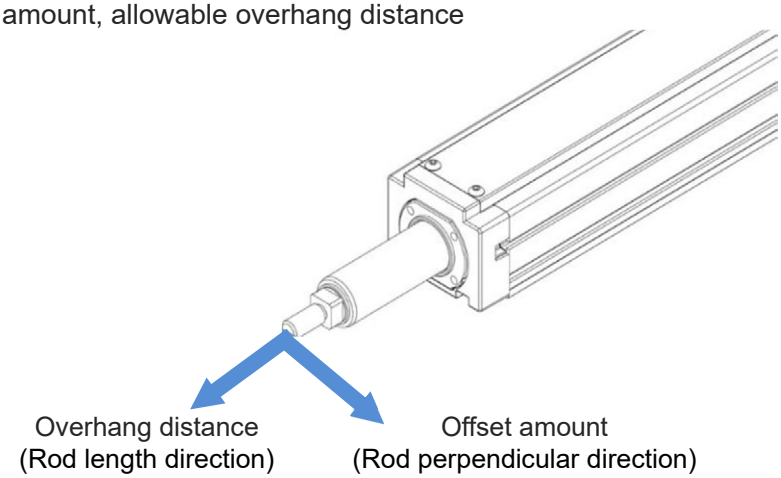


Moment offset datum position



L
153.5mm

Allowable offset amount, allowable overhang distance



Allowable offset amount	Allowable overhang distance
100mm	100mm

Caution

- Keep the radial load acting on the rod within the allowable offset amount and overhang distance for use. If the allowable values are exceeded, this may lead to vibration, shortened product life, or damage.
- If abnormal vibration or noise occurs during operation, even when within allowable values for radial and torque loads, use less stringent operating conditions.
- Keep the mounted object center mass location at below 1/2 the overhang distance or offset amount.

[2] Lead and Payload

Power Saving Setting : Disabled

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR6XSAHB	20	4	1	67
EC-RR6XHAHB	12	17.5	3	112
EC-RR6XMAHB	6	28	7	224
EC-RR6XLAHB	3	42	14	449

Power Saving Setting : Enable

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR6XSAHB	20	4	0.5	67
EC-RR6XHAHB	12	17.5	3	112
EC-RR6XMAHB	6	28	7	224
EC-RR6XLAHB	3	28	14	449

[3] Stroke and Max. Speed

Caution

- The maximum speed may not be achieved when the stroke or movement distance is short or when acceleration/deceleration is set low.
- Setting the lower less than speed the minimum speed may cause such concerns of generating abnormal noise or making the speed unstable.
- The minimum speed is the lead 20 is 25mm/s, lead 12 is 15mm/s, the lead 6 is 8mm/s and the lead 3 is 4mm/s.

Power Saving Setting : Disabled Max. Speed [mm/s]

Lead [mm]	600 to 1000mm (Every 50mm)
20	800
12	400
6	200
3	100

Power Saving Setting : Enable Max. Speed [mm/s]

Lead [mm]	600 to 1000mm (Every 50mm)
20	640
12	400
6	200
3	100

[4] Payload by Speed/Acceleration

Caution

- Do not attempt to configure settings for acceleration/deceleration above the allowable values. It may cause to generate vibration, malfunction or shorten the product life.

Power Saving Setting : Disabled

At low load capacity, the acceleration/deceleration can be increased.

The maximum acceleration/deceleration is 1G in the horizontal direction and 0.5G in the vertical direction.

Input in percentage is to be set with 1G as 100%.

(Note) "-" represent operation not available.

Lead 20 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	4	4	3.5	3.5	1	1
160	4	4	3.5	3.5	1	1
320	4	4	3.5	2	1	1
480	4	4	2	1.5	1	1
640	4	3	1.5	—	0.5	0.5
800	3	2	—	—	0.5	—

Lead 12 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	17.5	12.5	11	8.5	3	3
100	17.5	12.5	11	8.5	3	3
200	16	12.5	11	7	3	3
400	14	10	7	4	3	3

Lead 6 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	28	24.5	21	17.5	7	7
50	28	24.5	21	17.5	7	7
100	28	24.5	21	17.5	7	7
200	28	21	17.5	14	7	7

Lead 3 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	42	35	31.5	28	14	14
50	42	35	31.5	28	14	14
100	42	35	31.5	28	14	14

Power Saving Setting : Enable

At low load capacity, the acceleration/deceleration can be increased.

The maximum acceleration/deceleration is 0.7G in the horizontal direction and 0.3G in the vertical direction.

Input in percentage is to be set with 1G as 100%.

(Note) "-" represent operation not available.

Lead 20 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	4	3.5	0.5
160	4	3.5	0.5
320	4	3.5	0.5
480	3	1.5	0.5
640	2	0.5	—

Lead 12 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	17.5	7	3
100	17.5	7	3
200	17.5	7	3
280	14	5.5	2
400	7	3.5	1.5

Lead 6 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	28	14	7
50	28	14	7
100	28	14	7
150	28	14	5.5
200	24.5	12.5	3.5

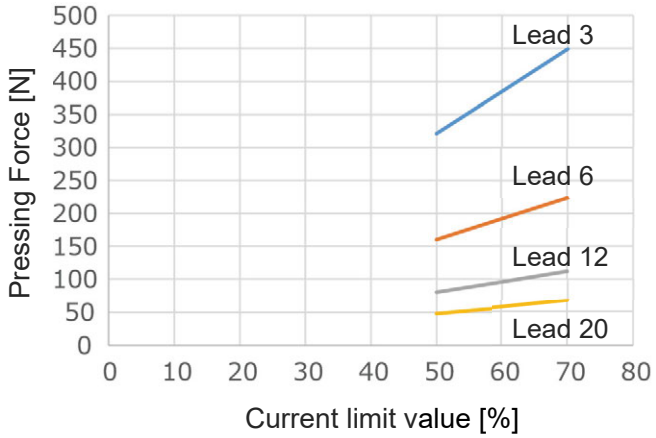
Lead 3 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	28	17.5	14
25	28	17.5	14
50	28	17.5	14
100	28	17.5	8.5

[5] Pressing Operation

Caution

- The relation of the current limit and the pressing force is a guideline at speed of 20mm/s. There is some variance in the actual pressing force. The variance increases when the current value is low.
- The current limit value cannot be set outside the 50 to 70% range.
- When the approach speed up to the pressing start position is 20mm/s or less, pressing operation will take place at approach speed.
  When the pressing speed is less than 20mm/s, the pressing force (reference) described in the graph below may not be satisfied. Confirm in advance that there is no problem in the pressing force.



1.5 Mechanical specifications EC-RR7

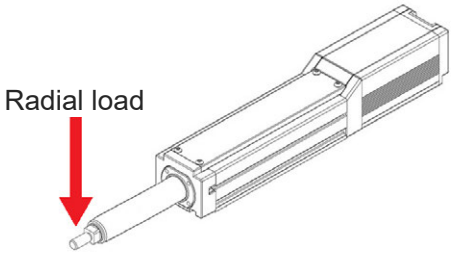
1.5.1 EC-RR7□B

[1] Actuator Specifications

Item		Content
Drive system		Ball screw Φ12mm, rolled C10
Positioning repeatability		Lead 4/8/16 : ±0.02 mm, Lead 24 : ±0.03 mm
Lost motion		0.1mm or less
Linear guide		Linear infinite circulation system
Brake (Option)	Specification	Non-excitation activating electromagnetic brake
	Holding force	Lead 24：2kgf Lead 16：5.5kgf Lead 8：12.5kgf Lead 4：13.5kgf
Ambient operating temperature/humidity		10 to 40°C, 85%RH or less (Non-condensing)
Degree of protection		IP20
Vibration and Impact resistance		4.9m/s2
Motor type		□56 pulse motor（Power capacity：Max.4.2A）
Encoder type		Incremental / Battery-less absolute
Encoder pulse count		800pulse/rev

Because the radial cylinder type has a linear guide built into the body,
radial and moment loads can be applied to the rod.
The applicable radial and moment loads must meet the following three conditions.

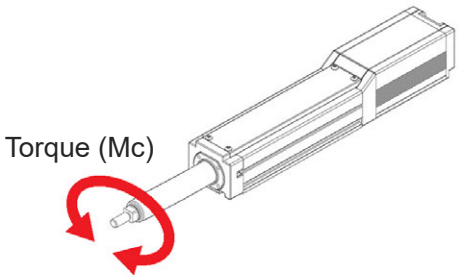
1. The radial load acting on the rod must not exceed the allowable value.



Rod tip static allowable radial load	Rod tip dynamic allowable radial load (Note 1)
120N	60N

Note 1 The value assumes a basic rated life of 5,000km.

2. The torque (Mc) acting on the rod must not exceed the allowable value.



Rod tip static allowable torque	Rod tip dynamic allowable torque (Note 1)
10.5N·m	10.5N·m

Note 1 The value assumes a basic rated life of 5,000km.

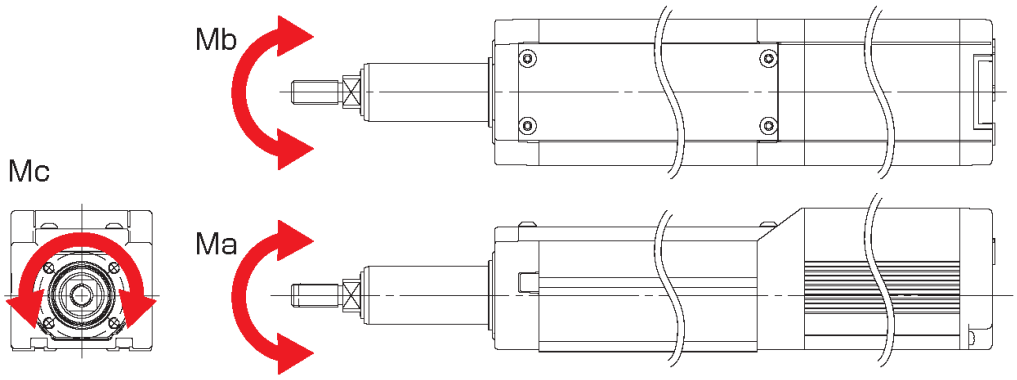
3. The uniform load (*) acting on the rod must not exceed the allowable value.

(*) Uniform load = Ma • Ka + Mb • Kb + Mc • Kc

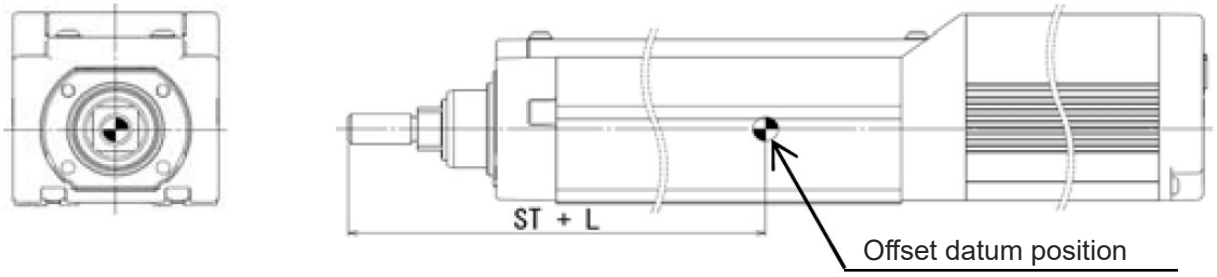
Static allowable uniform load	Dynamic allowable uniform load (Note 1)	Load uniform coefficient Ka	Load uniform coefficient Kb	Load uniform coefficient Kc
5680N	1260N	98/m	69/m	50/m

Note 1 The value assumes a basic rated life of 5,000km.

Ma, Mb, Mc: Moment load

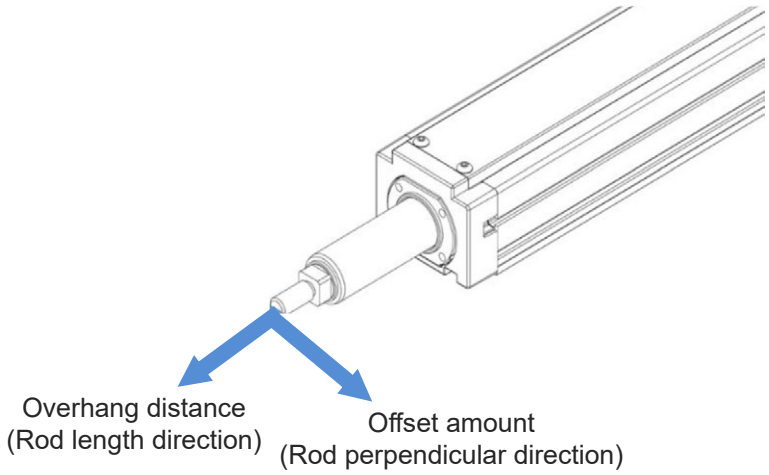


Moment offset datum position



L
144.5mm

Allowable offset amount, allowable overhang distance



Allowable offset amount	Allowable overhang distance
100mm	100mm

Caution

- Keep the radial load acting on the rod within the allowable offset amount and overhang distance for use. If the allowable values are exceeded, this may lead to vibration, shortened product life, or damage.

[2] Lead and Payload

Power Saving Setting : Disabled

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR7SB	24	14	2	182
EC-RR7HB	16	35	5.5	273
EC-RR7MB	8	42	12.5	547
EC-RR7LB	4	56	13.5	1094

Power Saving Setting : Enable

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR7SB	24	12.5	2	182
EC-RR7HB	16	28	3.5	273
EC-RR7MB	8	35	12	547
EC-RR7LB	4	38.5	13.5	1094

[3] Stroke and Max. Speed

Caution

- The maximum speed may not be achieved when the stroke or movement distance is short or when acceleration/deceleration is set low.
- Setting the lower less than speed the minimum speed may cause such concerns of generating abnormal noise or making the speed unstable.
- The minimum speed is the lead 24 is 30mm/s, lead 16 is 20mm/s, lead 8 is 10mm/s, and the lead 4 is 5mm/s.

Power Saving Setting : Disabled Max. Speed [mm/s]

Lead [mm]	65 to 315mm (Every 50mm)
24	860<640>
16	700<560>
8	350<280>
4	175<140>

< > represents vertical operation.

Power Saving Setting : Enable Max. Speed [mm/s]

Lead [mm]	65 to 315mm (Every 50mm)
24	600<420>
16	420<280>
8	210
4	105

< > represents vertical operation.

[4] Payload by Speed/Acceleration

Caution

- Do not attempt to configure settings for acceleration/deceleration above the allowable values. It may cause to generate vibration, malfunction or shorten the product life.

Power Saving Setting : Disabled

At low load capacity, the acceleration/deceleration can be increased.
The maximum acceleration/deceleration is 1G in the horizontal direction and 0.5G in the vertical direction.
Input in percentage is to be set with 1G as 100%.
(Note) "-" represent operation not available.

Lead 24 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	14	12.5	10.5	8.5	2	2
200	14	12.5	10.5	8.5	2	2
400	14	10	8.5	5.5	2	2
420	12	8.5	7	4	2	2
600	10	4	3.5	3	2	1.5
640	3.5	2	1.5	1	1.5	0.5
800	3.5	0.5	0.5	—	—	—
860	1.5	—	—	—	—	—

Lead 16 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	35	28	24.5	21	5.5	5.5
140	35	28	24.5	21	5.5	5.5
280	35	24.5	17.5	14	5	5
420	17.5	12.5	10	7	3	3
560	7	3	2	1.5	1.5	0.5
700	1.5	—	—	—	—	—

Lead 8 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	42	35	31.5	28	12.5	12.5
70	42	35	31.5	28	12.5	12.5
140	42	35	31.5	28	11	8.5
210	42	28	21.5	18	7	6.5
280	24	12.5	10.5	7.5	3.5	3
350	8.5	—	—	—	—	—

Lead 4 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	56	49	45.5	42	13.5	13.5
35	56	49	45.5	42	13.5	13.5
70	56	49	45.5	42	13.5	13.5
105	56	42	35	28	12.5	12.5
140	35	19	14	10.5	8.5	7
175	10.5	—	—	—	—	—

Power Saving Setting : Enable

At low load capacity, the acceleration/deceleration can be increased.

The maximum acceleration/deceleration is 0.7G in the horizontal direction and 0.3G in the vertical direction.

Input in percentage is to be set with 1G as 100%.

(Note) "-" represent operation not available.

Lead 24 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	12.5	6.5	2
200	12.5	6.5	2
420	7	3.5	1
600	0.5	—	—

Lead 16 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	28	17.5	3.5
140	28	17.5	3.5
280	12.5	8.5	1.5
420	1	0.5	—

Lead 8 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	35	21	12
70	35	21	12
140	35	21	5
210	10	5	1.5

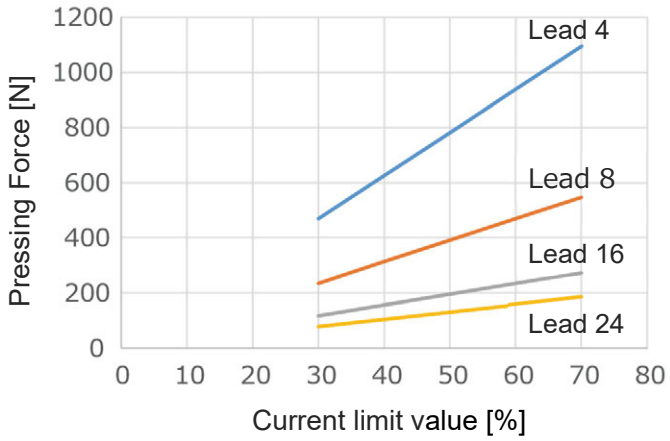
Lead 4 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	38.5	35	13.5
35	38.5	35	13.5
70	38.5	35	9
105	21	10.5	1.5

[5] Pressing Operation

Caution

- The relation of the current limit and the pressing force is a guideline at speed of 20mm/s. There is some variance in the actual pressing force. The variance increases when the current value is low.
- The current limit value cannot be set outside the 30 to 70% range.
- When the approach speed up to the pressing start position is 20mm/s or less, pressing operation will take place at approach speed.
  When the pressing speed is less than 20mm/s, the pressing force (reference) described in the graph below may not be satisfied. Confirm in advance that there is no problem in the pressing force.



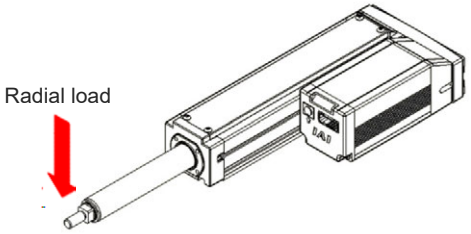
1.5.2 EC-RR7□BR

[1] Actuator Specifications

Item		Content
Drive system		Ball screw Φ12mm, rolled C10
Positioning repeatability		Lead 4/8/16 : ±0.02 mm, Lead 24 : ±0.03 mm
Lost motion		0.1mm or less
Linear guide		Linear infinite circulation system
Brake (Option)	Specification	Non-excitation activating electromagnetic brake
	Holding force	Lead 24：2kgf Lead 16：5.5kgf Lead 8：12.5kgf Lead 4：13.5kgf
Ambient operating temperature/humidity		10 to 40°C, 85%RH or less (Non-condensing)
Degree of protection		IP20
Vibration and Impact resistance		4.9m/s2
Motor type		□56 pulse motor（Power capacity：Max.4.2A）
Encoder type		Incremental / Battery-less absolute
Encoder pulse count		800pulse/rev

Because the radial cylinder type has a linear guide built into the body,
radial and moment loads can be applied to the rod.
The applicable radial and moment loads must meet the following three conditions.

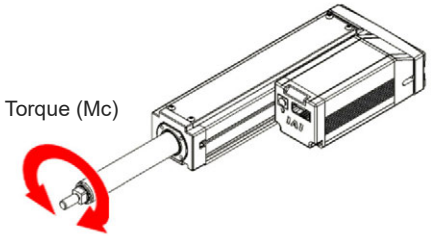
1. The radial load acting on the rod must not exceed the allowable value.



Rod tip static allowable radial load	Rod tip dynamic allowable radial load (Note 1)
120N	60N

Note 1 The value assumes a basic rated life of 5,000km.

2. The torque (Mc) acting on the rod must not exceed the allowable value.



Rod tip static allowable torque	Rod tip dynamic allowable torque (Note 1)
10.5N·m	10.5N·m

Note 1 The value assumes a basic rated life of 5,000km.

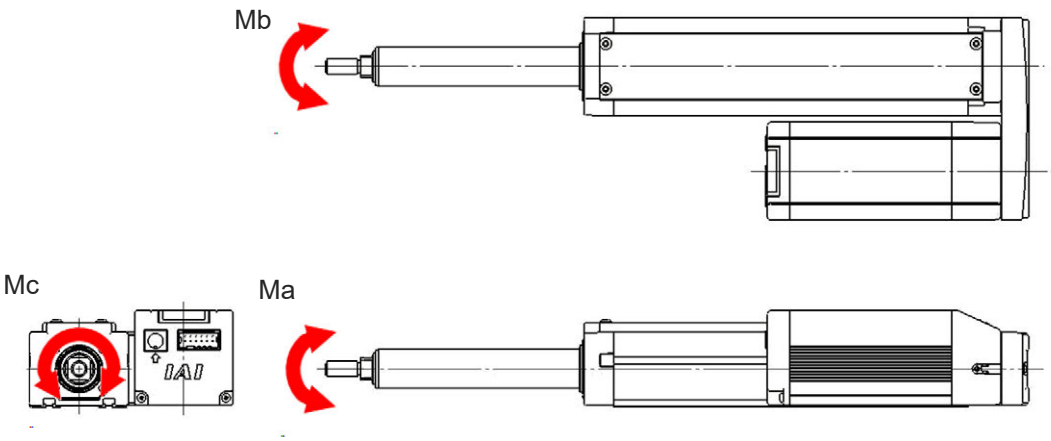
3. The uniform load (*) acting on the rod must not exceed the allowable value.

(*) Uniform load = Ma • Ka + Mb • Kb + Mc • Kc

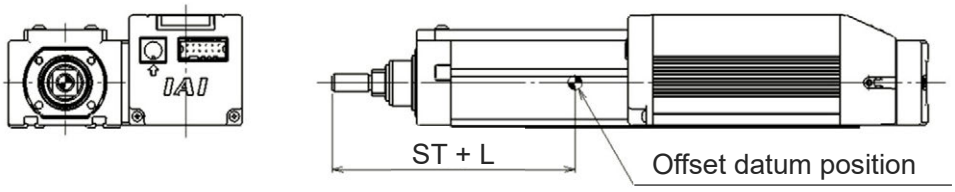
Static allowable uniform load	Dynamic allowable uniform load (Note 1)	Load uniform coefficient Ka	Load uniform coefficient Kb	Load uniform coefficient Kc
5680N	1260N	98/m	69/m	50/m

Note 1 The value assumes a basic rated life of 5,000km.

Ma, Mb, Mc: Moment load

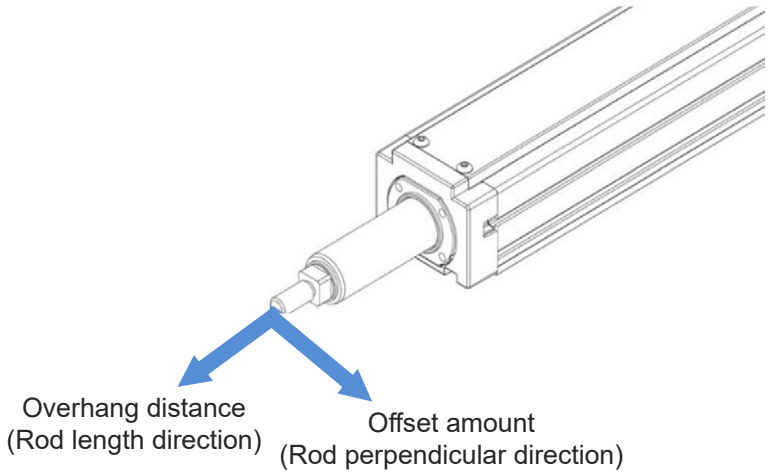


Moment offset datum position



L
144.5mm

Allowable offset amount, allowable overhang distance



Allowable offset amount	Allowable overhang distance
100mm	100mm

Caution

- Keep the radial load acting on the rod within the allowable offset amount and overhang distance for use. If the allowable values are exceeded, this may lead to vibration, shortened product life, or damage.

[2] Lead and Payload

Power Saving Setting : Disabled

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR7SBR	24	14	2	182
EC-RR7HBR	16	35	5.5	273
EC-RR7MBR	8	42	12.5	547
EC-RR7LBR	4	56	13.5	1094

Power Saving Setting : Enable

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR7SBR	24	12.5	2	182
EC-RR7HBR	16	28	3.5	273
EC-RR7MBR	8	35	12	547
EC-RR7LBR	4	38.5	13.5	1094

[3] Stroke and Max. Speed

Caution

- The maximum speed may not be achieved when the stroke or movement distance is short or when acceleration/deceleration is set low.
- Setting the lower less than speed the minimum speed may cause such concerns of generating abnormal noise or making the speed unstable.
- The minimum speed is the lead 24 is 30mm/s, lead 16 is 20mm/s, lead 8 is 10mm/s, and the lead 4 is 5mm/s.

Power Saving Setting : Disabled Max. Speed [mm/s]

Lead [mm]	65 to 315mm (Every 50mm)
24	860<640>
16	700<560>
8	320<280>
4	160<140>

< > represents vertical operation.

Power Saving Setting : Enable Max. Speed [mm/s]

Lead [mm]	65 to 315mm (Every 50mm)
24	630<420>
16	420<280>
8	210
4	105

< > represents vertical operation.

[4] Payload by Speed/Acceleration

Caution

- Do not attempt to configure settings for acceleration/deceleration above the allowable values. It may cause to generate vibration, malfunction or shorten the product life.

Power Saving Setting : Disabled

At low load capacity, the acceleration/deceleration can be increased.
The maximum acceleration/deceleration is 1G in the horizontal direction and 0.5G in the vertical direction.
Input in percentage is to be set with 1G as 100%.
(Note) "-" represent operation not available.

Lead 24 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	14	12.5	10.5	8.5	2	2
200	14	12.5	10.5	8.5	2	2
400	14	10	8.5	5.5	2	2
420	12	8.5	7	4	2	2
600	10	4	3.5	3	1.5	1.5
640	3.5	2	1.5	1	1.5	0.5
800	3.5	0.5	0.5	—	—	—
860	1.5	—	—	—	—	—

Lead 16 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	35	28	24.5	21	5.5	5.5
140	35	28	24.5	21	5.5	5.5
280	35	24.5	17.5	14	5	5
420	17.5	12.5	10	7	3	3
560	7	3	2	1	0.5	0.5
700	0.5	—	—	—	—	—

Lead 8 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	42	35	31.5	28	12.5	12.5
70	42	35	31.5	28	12.5	12.5
140	42	35	31.5	28	11	8.5
210	42	28	21.5	18	7	6.5
280	17.5	6.5	5.5	4	2	1.5
320	3.5	—	—	—	—	—

Lead 4 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	56	49	45.5	42	13.5	13.5
35	56	49	45.5	42	13.5	13.5
70	56	49	45.5	42	13.5	13.5
105	56	42	35	28	12.5	12.5
140	35	15.5	10.5	7	5	3.5
160	7	—	—	—	—	—

Power Saving Setting : Enable

At low load capacity, the acceleration/deceleration can be increased.

The maximum acceleration/deceleration is 0.7G in the horizontal direction and 0.3G in the vertical direction.

Input in percentage is to be set with 1G as 100%.

(Note) "-" represent operation not available.

Lead 24 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	12.5	6.5	2
200	12.5	6.5	2
420	7	3.5	1
630	0.5	—	—

Lead 16 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	28	17.5	3.5
140	28	17.5	3.5
280	12.5	8.5	1.5
420	1	0.5	—

Lead 8 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	35	21	12
70	35	21	12
140	35	21	5
210	10	5	1.5

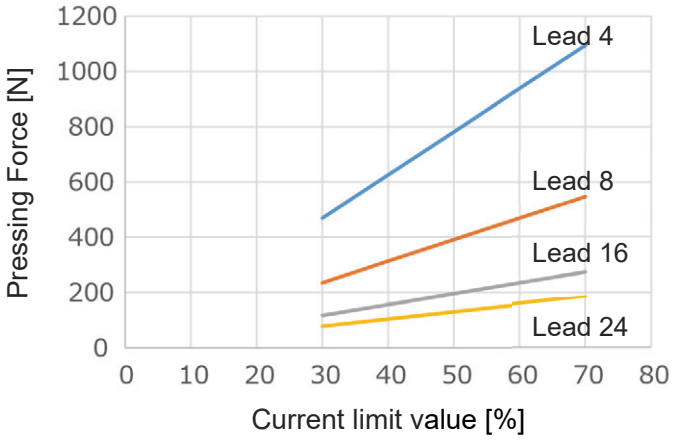
Lead 4 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	38.5	35	13.5
35	38.5	35	13.5
70	38.5	35	9
105	21	10.5	1.5

[5] Pressing Operation

Caution

- The relation of the current limit and the pressing force is a guideline at speed of 20mm/s. There is some variance in the actual pressing force. The variance increases when the current value is low.
- The current limit value cannot be set outside the 30 to 70% range.
- When the approach speed up to the pressing start position is 20mm/s or less, pressing operation will take place at approach speed.
  When the pressing speed is less than 20mm/s, the pressing force (reference) described in the graph below may not be satisfied. Confirm in advance that there is no problem in the pressing force.

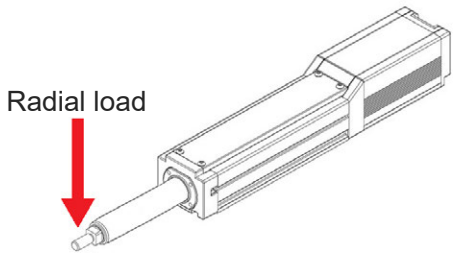


1.5.3 EC-RR7□AHB

[1] Actuator Specifications

Item		Content
Drive system		Ball screw Φ12mm, rolled C10
Positioning repeatability		Lead 4/8/16 : ±0.02 mm, Lead 24 : ±0.03 mm
Lost motion		0.1mm or less
Linear guide		Linear infinite circulation system
Brake (Option)	Specification	Non-excitation activating electromagnetic brake
	Holding force	Lead 24：2kgf Lead 16：5.5kgf Lead 8：12.5kgf Lead 4：19.5kgf
Ambient operating temperature/humidity		10 to 40°C, 85%RH or less (Non-condensing)
Degree of protection		IP20
Vibration and Impact resistance		4.9m/s2
Motor type		□56 pulse motor（Power capacity：Max.4.2A）
Encoder type		Incremental / Battery-less absolute
Encoder pulse count		800pulse/rev

1. The radial load acting on the rod must not exceed the allowable value.



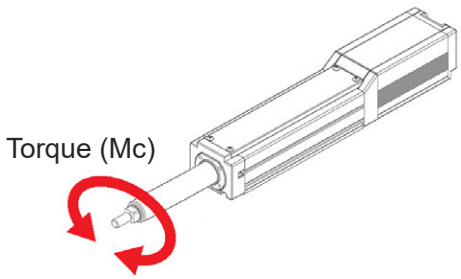
Rod tip static allowable radial load	Rod tip dynamic allowable radial load (Note 1)
250N	170N (Note 2)

Note 1 The value assumes a basic rated life of 5,000km.

Note 2 For stroke 300mm or more, set the value specified in the table below.

Stroke [mm]	300	350	400	450	500	550	600	650	700
Rod tip dynamic allowable radial load [N]	50	45	40	35	30	30	25	25	20

2. The torque (Mc) acting on the rod must not exceed the allowable value.



Rod tip static allowable torque	Rod tip dynamic allowable torque (Note 1)
17.6N·m	10.5N·m

Note 1 The value assumes a basic rated life of 5,000km.

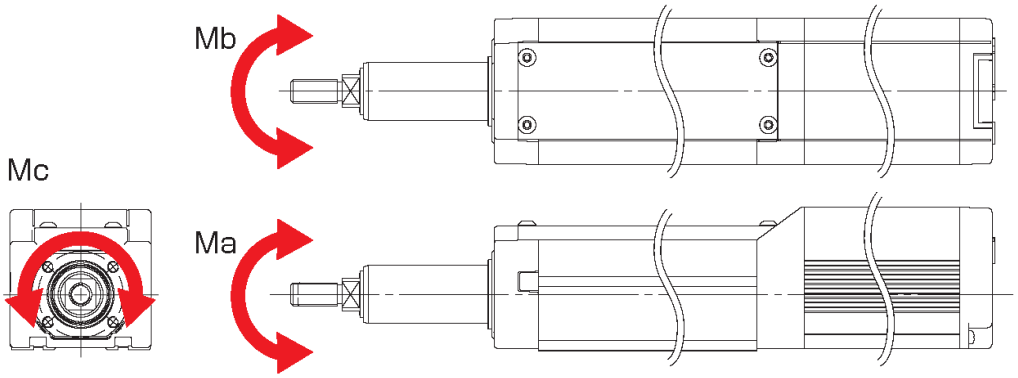
3. The uniform load (*) acting on the rod must not exceed the allowable value.

(*) Uniform load = Ma • Ka + Mb • Kb + Mc • Kc

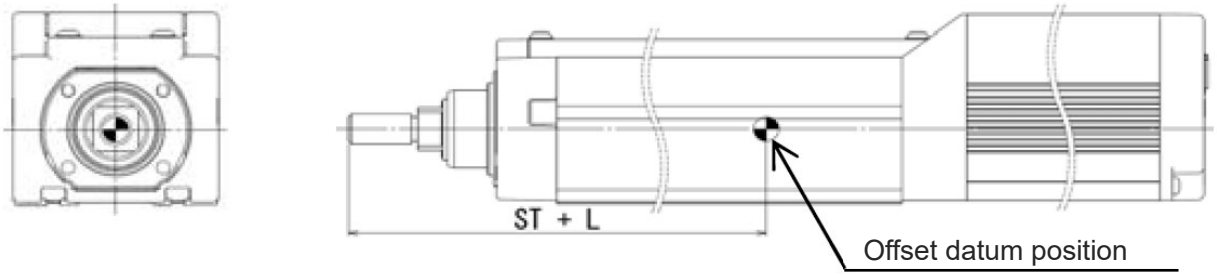
Static allowable uniform load	Dynamic allowable uniform load (Note 1)	Load uniform coefficient Ka	Load uniform coefficient Kb	Load uniform coefficient Kc
11400N	3000N	90/m	76/m	50/m

Note 1 The value assumes a basic rated life of 5,000km.

Ma, Mb, Mc: Moment load

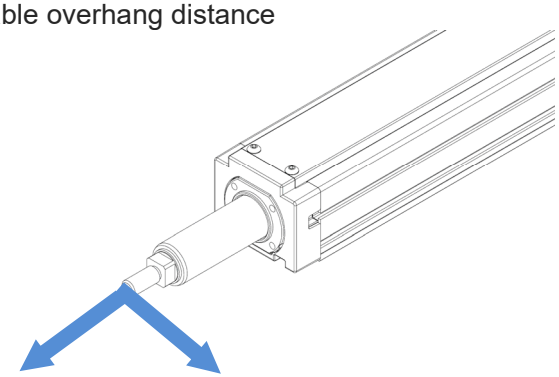


Moment offset datum position



L
153.5mm

Allowable offset amount, allowable overhang distance



Overhang distance
(Rod length direction)

Offset amount
(Rod perpendicular direction)

Allowable offset amount	Allowable overhang distance
150mm	150mm

Caution

- Keep the radial load acting on the rod within the allowable offset amount and overhang distance for use. If the allowable values are exceeded, this may lead to vibration, shortened product life, or damage.
- If abnormal vibration or noise occurs during operation, even when within allowable values for radial and torque loads, use less stringent operating conditions.
- Keep the mounted object center mass location at below 1/2 the overhang distance or offset amount.

[2] Lead and Payload

Power Saving Setting : Disabled

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR7SAHB	24	14	2	182
EC-RR7HAHB	16	35	5.5	273
EC-RR7MAHB	8	42	12.5	547
EC-RR7LAHB	4	56	19.5	1094

Power Saving Setting : Enable

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR7SAHB	24	12.5	2	182
EC-RR7HAHB	16	28	3.5	273
EC-RR7MAHB	8	35	12	547
EC-RR7LAHB	4	38.5	18	1094

[3] Stroke and Max. Speed

Caution

- The maximum speed may not be achieved when the stroke or movement distance is short or when acceleration/deceleration is set low.
- Setting the lower less than speed the minimum speed may cause such concerns of generating abnormal noise or making the speed unstable.
- The minimum speed is the lead 24 is 30mm/s, lead 16 is 20mm/s, the lead 8 is 10mm/s and the lead 4 is 5mm/s.

Power Saving Setting : Disabled Max. Speed [mm/s]

Lead [mm]	50 to 700mm (Every 50mm)
24	860<640>
16	700<560>
8	350<280>
4	175<140>

< > represents vertical operation.

Power Saving Setting : Enable Max. Speed [mm/s]

Lead [mm]	50 to 700mm (Every 50mm)
24	630<420>
16	420<280>
8	210
4	105

< > represents vertical operation.

[4] Payload by Speed/Acceleration

Caution

- Do not attempt to configure settings for acceleration/deceleration above the allowable values. It may cause to generate vibration, malfunction or shorten the product life.

Power Saving Setting : Disabled

At low load capacity, the acceleration/deceleration can be increased.
The maximum acceleration/deceleration is 1G in the horizontal direction and 0.5G in the vertical direction.
Input in percentage is to be set with 1G as 100%.
(Note) "-" represent operation not available.

Lead 24 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	14	12.5	10.5	8.5	2	2
200	14	12.5	10.5	8.5	2	2
400	14	10	8.5	5.5	2	2
420	12	8.5	7	4	2	2
600	10	4	3.5	3	2	1.5
640	3.5	2	1.5	1	1.5	0.5
800	3.5	0.5	0.5	—	—	—
860	1.5	—	—	—	—	—

Lead 16 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	35	28	24.5	21	5.5	5.5
140	35	28	24.5	21	5.5	5.5
280	35	24.5	17.5	14	5	5
420	17.5	12.5	10	7	3	3
560	7	3	2	1.5	1.5	0.5
700	1.5	—	—	—	—	—

Lead 8 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	42	35	31.5	28	12.5	12.5
70	42	35	31.5	28	12.5	12.5
140	42	35	31.5	28	11	8.5
210	42	28	21.5	18	7	6.5
280	24	12.5	10.5	7.5	3.5	3
360	8.5	—	—	—	—	—

Lead 4 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	56	49	45.5	42	19.5	19.5
35	56	49	45.5	42	19.5	19.5
70	56	49	45.5	42	19.5	19.5
105	56	42	35	28	12.5	12.5
140	35	19	14	10.5	8.5	7
175	10.5	—	—	—	—	—

Power Saving Setting : Enable

At low load capacity, the acceleration/deceleration can be increased.

The maximum acceleration/deceleration is 0.7G in the horizontal direction and 0.3G in the vertical direction.

Input in percentage is to be set with 1G as 100%.

(Note) "-" represent operation not available.

Lead 24 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	12.5	6.5	2
200	12.5	6.5	2
420	7	3.5	1
630	0.5	—	—

Lead 16 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	28	17.5	3.5
140	28	17.5	3.5
280	12.5	8.5	1.5
420	1	0.5	—

Lead 8 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	35	21	12
70	35	21	12
140	35	21	5
210	10	5	1.5

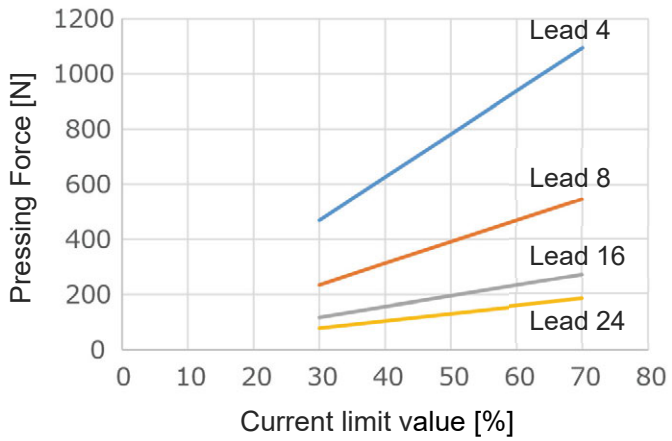
Lead 4 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	38.5	35	18
35	38.5	35	18
70	38.5	35	9
105	21	10.5	1.5

[5] Pressing Operation

Caution

- The relation of the current limit and the pressing force is a guideline at speed of 20mm/s. There is some variance in the actual pressing force. The variance increases when the current value is low.
- The current limit value cannot be set outside the 30 to 70% range.
- When the approach speed up to the pressing start position is 20mm/s or less, pressing operation will take place at approach speed.
  When the pressing speed is less than 20mm/s, the pressing force (reference) described in the graph below may not be satisfied. Confirm in advance that there is no problem in the pressing force.

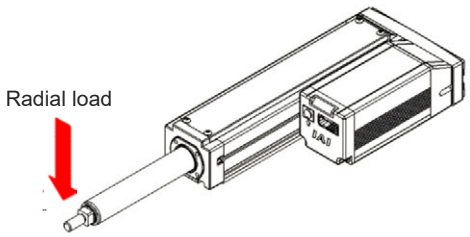


1.5.4 EC-RR7□AHBR

[1] Actuator Specifications

Item		Content
Drive system		Ball screw Φ12mm, rolled C10
Positioning repeatability		Lead 4/8/16 : ±0.02 mm, Lead 24 : ±0.03 mm
Lost motion		0.1mm or less
Linear guide		Linear infinite circulation system
Brake (Option)	Specification	Non-excitation activating electromagnetic brake
	Holding force	Lead 24：2kgf Lead 16：5.5kgf Lead 8：12.5kgf Lead 4：19.5kgf
Ambient operating temperature/humidity		10 to 40°C, 85%RH or less (Non-condensing)
Degree of protection		IP20
Vibration and Impact resistance		4.9m/s2
Motor type		□56 pulse motor（Power capacity：Max.4.2A）
Encoder type		Incremental / Battery-less absolute
Encoder pulse count		800pulse/rev

1. The radial load acting on the rod must not exceed the allowable value.



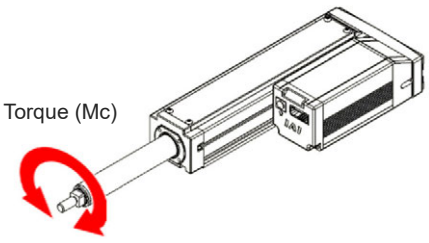
Rod tip static allowable radial load	Rod tip dynamic allowable radial load (Note 1)
250N	170N (Note 2)

Note 1 The value assumes a basic rated life of 5,000km.

Note 2 For stroke 300mm or more, set the value specified in the table below.

Stroke [mm]	300	350	400	450	500
Rod tip dynamic allowable radial load [N]	50	45	40	35	30

2. The torque (Mc) acting on the rod must not exceed the allowable value.



Rod tip static allowable torque	Rod tip dynamic allowable torque (Note 1)
17.6N·m	10.5N·m

Note 1 The value assumes a basic rated life of 5,000km.

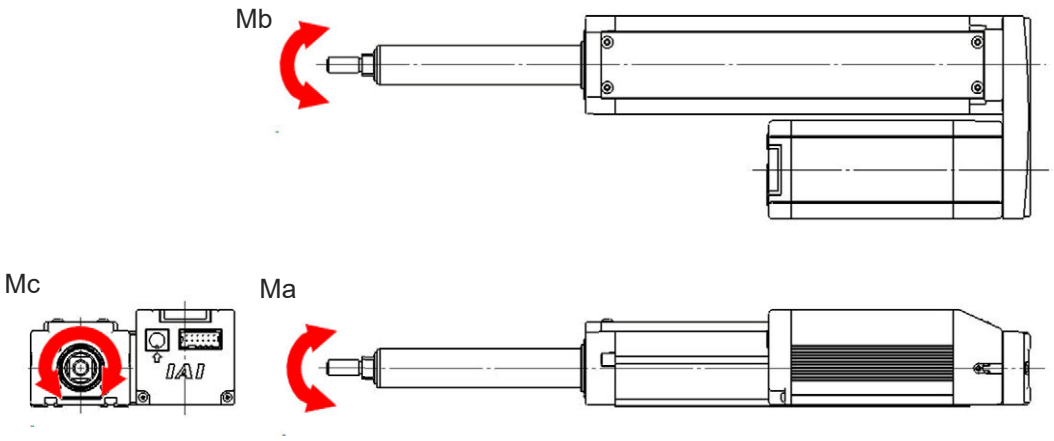
3. The uniform load (*) acting on the rod must not exceed the allowable value.

(*) Uniform load = Ma • Ka + Mb • Kb + Mc • Kc

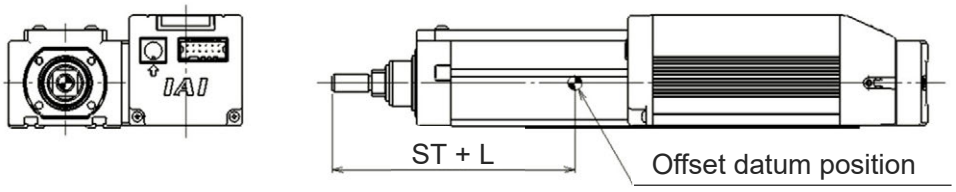
Static allowable uniform load	Dynamic allowable uniform load (Note 1)	Load uniform coefficient Ka	Load uniform coefficient Kb	Load uniform coefficient Kc
11400N	3000N	90/m	76/m	50/m

Note 1 The value assumes a basic rated life of 5,000km.

Ma, Mb, Mc: Moment load

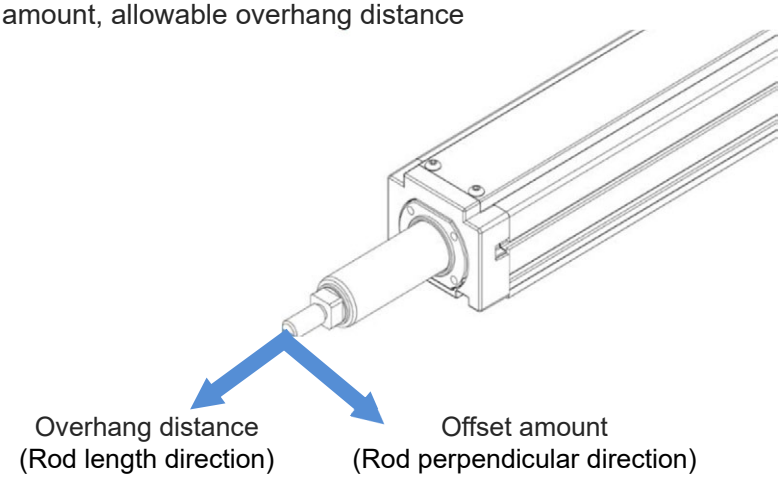


Moment offset datum position



L
153.5mm

Allowable offset amount, allowable overhang distance



Allowable offset amount	Allowable overhang distance
150mm	150mm

Caution

- Keep the radial load acting on the rod within the allowable offset amount and overhang distance for use. If the allowable values are exceeded, this may lead to vibration, shortened product life, or damage.
- If abnormal vibration or noise occurs during operation, even when within allowable values for radial and torque loads, use less stringent operating conditions.
- Keep the mounted object center mass location at below 1/2 the overhang distance or offset amount.

[2] Lead and Payload

Power Saving Setting : Disabled

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR7SAHBR	24	14	2	182
EC-RR7HAHBR	16	35	5.5	273
EC-RR7MAHBR	8	42	12.5	547
EC-RR7LAHBR	4	56	19.5	1094

Power Saving Setting : Enable

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR7SAHBR	24	12.5	2	182
EC-RR7HAHBR	16	28	3.5	273
EC-RR7MAHBR	8	35	12	547
EC-RR7LAHBR	4	38.5	18	1094

[3] Stroke and Max. Speed

Caution

- The maximum speed may not be achieved when the stroke or movement distance is short or when acceleration/deceleration is set low.
- Setting the lower less than speed the minimum speed may cause such concerns of generating abnormal noise or making the speed unstable.
- The minimum speed is the lead 24 is 30mm/s, lead 16 is 20mm/s, the lead 8 is 10mm/s and the lead 4 is 5mm/s.

Power Saving Setting : Disabled Max. Speed [mm/s]

Lead [mm]	50 to 500mm (Every 50mm)
24	860<640>
16	640<560>
8	320<280>
4	150<140>

< > represents vertical operation.

Power Saving Setting : Enable Max. Speed [mm/s]

Lead [mm]	50 to 500mm (Every 50mm)
24	630<420>
16	420<280>
8	210
4	105

< > represents vertical operation.

[4] Payload by Speed/Acceleration

Caution

- Do not attempt to configure settings for acceleration/deceleration above the allowable values. It may cause to generate vibration, malfunction or shorten the product life.

Power Saving Setting : Disabled

At low load capacity, the acceleration/deceleration can be increased.
The maximum acceleration/deceleration is 1G in the horizontal direction and 0.5G in the vertical direction.
Input in percentage is to be set with 1G as 100%.
(Note) "-" represent operation not available.

Lead 24 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	14	12.5	10.5	8.5	2	2
200	14	12.5	10.5	8.5	2	2
400	14	10	8.5	5.5	2	2
420	12	8.5	7	4	2	2
600	10	4	3.5	3	1.5	1.5
640	3.5	2	1.5	1	1.5	0.5
800	3.5	0.5	0.5	—	—	—
860	1.5	—	—	—	—	—

Lead 16 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	35	28	24.5	21	5.5	5.5
140	35	28	24.5	21	5.5	5.5
280	35	24.5	17.5	14	5	5
420	17.5	12.5	10	7	3	3
560	7	3	2	1	0.5	0.5
640	1.5	—	—	—	—	—

Lead 8 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	42	35	31.5	28	12.5	12.5
70	42	35	31.5	28	12.5	12.5
140	42	35	31.5	28	11	8.5
210	42	28	21.5	18	7	6.5
280	17.5	6.5	5.5	4	2	1.5
320	3.5	—	—	—	—	—

Lead 4 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	56	49	45.5	42	19.5	19.5
35	56	49	45.5	42	19.5	19.5
70	56	49	45.5	42	19.5	19.5
105	56	42	35	28	12.5	12.5
140	28	9.5	7	3.5	3.5	2
150	14	—	—	—	—	—

Power Saving Setting : Enable

At low load capacity, the acceleration/deceleration can be increased.

The maximum acceleration/deceleration is 0.7G in the horizontal direction and 0.3G in the vertical direction.

Input in percentage is to be set with 1G as 100%.

(Note) "-" represent operation not available.

Lead 24 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	12.5	6.5	2
200	12.5	6.5	2
420	7	3.5	1
630	0.5	—	—

Lead 16 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	28	17.5	3.5
140	28	17.5	3.5
280	12.5	8.5	1.5
420	1	0.5	—

Lead 8 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	35	21	12
70	35	21	12
140	35	21	5
210	10	5	0.5

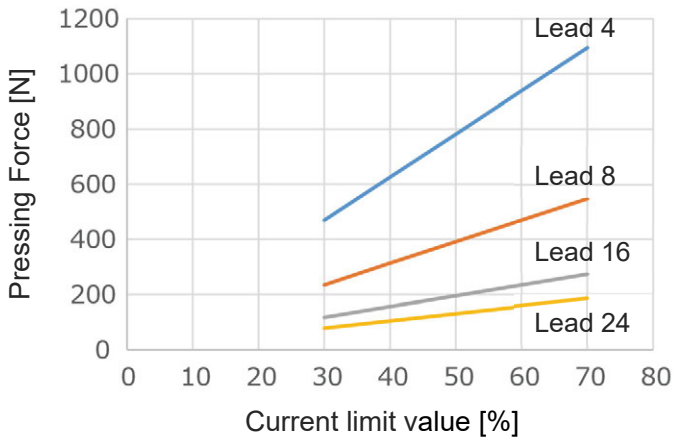
Lead 4 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	38.5	35	18
35	38.5	35	18
70	38.5	35	9
105	21	10.5	1.5

[5] Pressing Operation

Caution

- The relation of the current limit and the pressing force is a guideline at speed of 20mm/s. There is some variance in the actual pressing force. The variance increases when the current value is low.
- The current limit value cannot be set outside the 30 to 70% range.
- When the approach speed up to the pressing start position is 20mm/s or less, pressing operation will take place at approach speed.
  When the pressing speed is less than 20mm/s, the pressing force (reference) described in the graph below may not be satisfied. Confirm in advance that there is no problem in the pressing force.

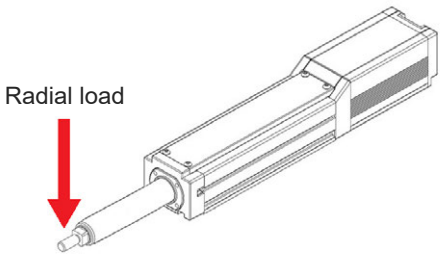


1.5.5 EC-RR7X□AHB

[1] Actuator Specifications

Item		Content
Drive system		Ball screw Φ12mm, rolled C10
Positioning repeatability		Lead 4/8/16 : ±0.02 mm, Lead 24 : ±0.03 mm
Lost motion		0.1mm or less
Linear guide		Linear infinite circulation system
Brake (Option)	Specification	Non-excitation activating electromagnetic brake
	Holding force	Lead 24：2kgf Lead 16：5.5kgf Lead 8：12.5kgf Lead 4：19.5kgf
Ambient operating temperature/humidity		10 to 40°C, 85%RH or less (Non-condensing)
Degree of protection		IP20
Vibration and Impact resistance		4.9m/s2
Motor type		□56 pulse motor（Power capacity：Max.4.2A）
Encoder type		Incremental / Battery-less absolute
Encoder pulse count		800pulse/rev

1. The radial load acting on the rod must not exceed the allowable value.



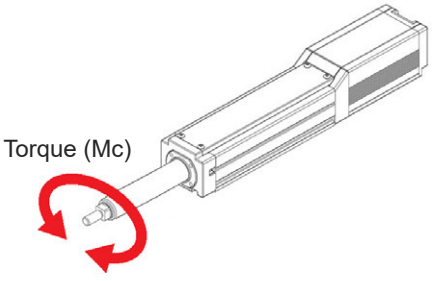
Rod tip static allowable radial load	Rod tip dynamic allowable radial load (Note 1)
250N	170N (Note 2)

Note 1 The value assumes a basic rated life of 5,000km.

Note 2 For stroke 750mm or more, set the value specified in the table below.

Stroke [mm]	750	800	850	900	950	1000
Rod tip dynamic allowable radial load [N]	20	15	15	10	10	10

2. The torque (Mc) acting on the rod must not exceed the allowable value.



Rod tip static allowable torque	Rod tip dynamic allowable torque (Note 1)
17.6N·m	10.5N·m

Note 1 The value assumes a basic rated life of 5,000km.

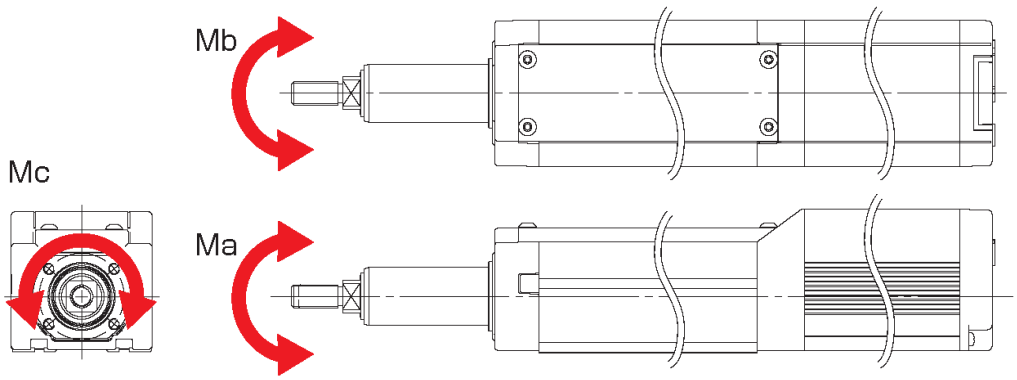
3. The uniform load (*) acting on the rod must not exceed the allowable value.

(*) Uniform load = Ma • Ka + Mb • Kb + Mc • Kc

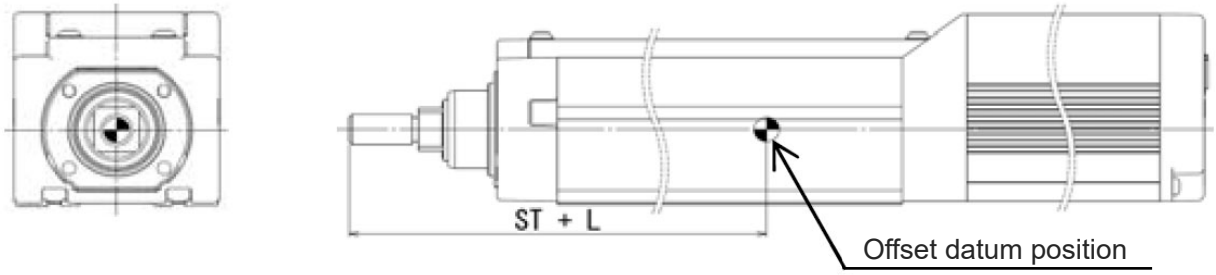
Static allowable uniform load	Dynamic allowable uniform load (Note 1)	Load uniform coefficient Ka	Load uniform coefficient Kb	Load uniform coefficient Kc
11400N	3000N	90/m	76/m	50/m

Note 1 The value assumes a basic rated life of 5,000km.

Ma, Mb, Mc: Moment load

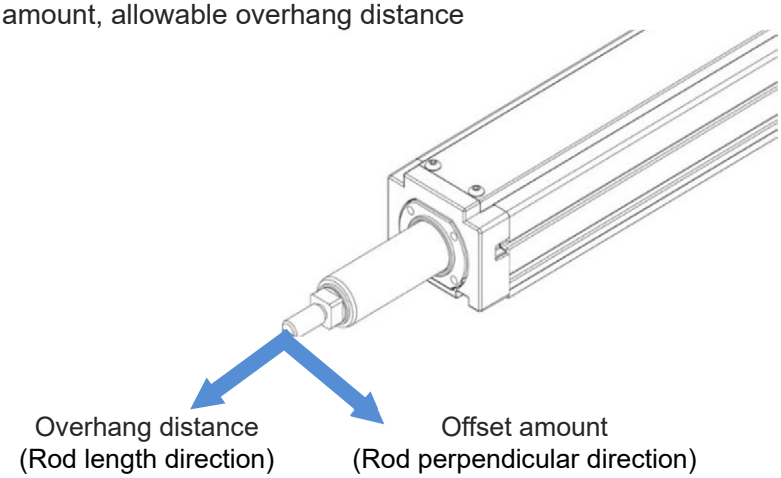


Moment offset datum position



L
183mm

Allowable offset amount, allowable overhang distance



Allowable offset amount	Allowable overhang distance
150mm	150mm

Caution

- Keep the radial load acting on the rod within the allowable offset amount and overhang distance for use. If the allowable values are exceeded, this may lead to vibration, shortened product life, or damage.
- If abnormal vibration or noise occurs during operation, even when within allowable values for radial and torque loads, use less stringent operating conditions.
- Keep the mounted object center mass location at below 1/2 the overhang distance or offset amount.

[2] Lead and Payload

Power Saving Setting : Disabled

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR7XSAHB	24	14	2	182
EC-RR7XHAHB	16	35	5.5	273
EC-RR7XMAHB	8	42	12.5	547
EC-RR7XLAHB	4	56	19.5	1094

Power Saving Setting : Enable

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR7XSAHB	24	12.5	2	182
EC-RR7XHAHB	16	28	3.5	273
EC-RR7XMAHB	8	35	12	547
EC-RR7XLAHB	4	38.5	18	1094

[3] Stroke and Max. Speed

Caution

- The maximum speed may not be achieved when the stroke or movement distance is short or when acceleration/deceleration is set low.
- Setting the lower less than speed the minimum speed may cause such concerns of generating abnormal noise or making the speed unstable.
- The minimum speed is the lead 24 is 30mm/s, lead 16 is 20mm/s, the lead 8 is 10mm/s and the lead 4 is 5mm/s.

Power Saving Setting : Disabled Max. Speed [mm/s]

Lead [mm]	750 to 1000mm (Every 50mm)
24	860<640>
16	700<560>
8	350<280>
4	175<140>

< > represents vertical operation.

Power Saving Setting : Enable Max. Speed [mm/s]

Lead [mm]	750 to 1000mm (Every 50mm)
24	630<420>
16	420<280>
8	210
4	105

< > represents vertical operation.

[4] Payload by Speed/Acceleration

Caution

- Do not attempt to configure settings for acceleration/deceleration above the allowable values. It may cause to generate vibration, malfunction or shorten the product life.

Power Saving Setting : Disabled

At low load capacity, the acceleration/deceleration can be increased.
The maximum acceleration/deceleration is 1G in the horizontal direction and 0.5G in the vertical direction.
Input in percentage is to be set with 1G as 100%.
(Note) "-" represent operation not available.

Lead 24 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	14	12.5	10.5	8.5	2	2
200	14	12.5	10.5	8.5	2	2
400	14	10	8.5	5.5	2	2
420	12	8.5	7	4	2	2
560	10	4	3	2	1.5	1
640	3.5	2	1.5	0.5	0.5	0.5
800	3	0.5	—	—	—	—
860	1.5	—	—	—	—	—

Lead 16 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	35	28	24.5	21	5.5	5.5
140	35	28	24.5	21	5.5	5.5
280	35	21	16	12.5	5	5
420	17.5	12	8.5	5.5	3	2.5
560	7	3	1.5	0.5	0.5	0.5
700	1.5	—	—	—	—	—

Lead 8 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	42	35	31.5	28	12.5	12.5
70	42	35	31.5	28	12.5	12.5
140	42	35	31.5	28	11	8.5
210	42	28	21.5	18	7	6.5
280	24	12.5	10.5	7.5	3.5	3
350	8.5	—	—	—	—	—

Lead 4 Payload [kg]

Orientation	Horizontal				Vertical	
Speed [mm/s]	Acceleration [G]					
	0.3	0.5	0.7	1	0.3	0.5
0	56	49	45.5	42	19.5	19.5
35	56	49	45.5	42	19.5	19.5
70	56	49	45.5	42	19.5	19.5
105	56	42	35	28	12.5	12.5
140	35	19	14	10.5	8.5	7
175	10.5	—	—	—	—	—

Power Saving Setting : Enable

At low load capacity, the acceleration/deceleration can be increased.

The maximum acceleration/deceleration is 0.7G in the horizontal direction and 0.3G in the vertical direction.

Input in percentage is to be set with 1G as 100%.

(Note) "-" represent operation not available.

Lead 24 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	12.5	6.5	2
200	12.5	6.5	2
420	7	3.5	1
630	0.5	—	—

Lead 16 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	28	17.5	3.5
140	28	17.5	3.5
280	12.5	8.5	1.5
420	1	0.5	—

Lead 8 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	35	21	12
70	35	21	12
140	35	21	5
210	10	5	1.5

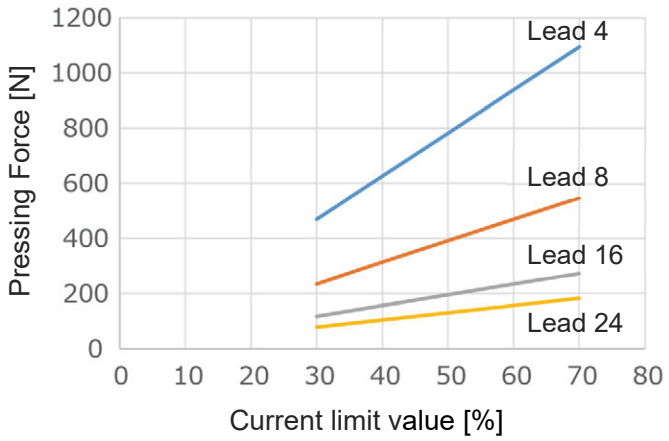
Lead 4 Payload [kg]

Orientation	Horizontal		Vertical
Speed [mm/s]	Acceleration [G]		
	0.3	0.7	0.3
0	38.5	35	18
35	38.5	35	18
70	38.5	35	9
105	21	10.5	1.5

[5] Pressing Operation

Caution

- The relation of the current limit and the pressing force is a guideline at speed of 20mm/s. There is some variance in the actual pressing force. The variance increases when the current value is low.
- The current limit value cannot be set outside the 30 to 70% range.
- When the approach speed up to the pressing start position is 20mm/s or less, pressing operation will take place at approach speed.
  When the pressing speed is less than 20mm/s, the pressing force (reference) described in the graph below may not be satisfied. Confirm in advance that there is no problem in the pressing force.



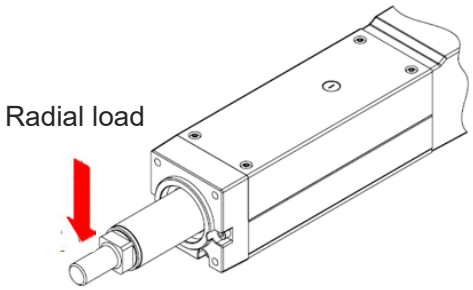
1.6 Mechanical specifications EC-RR8

1.6.1 EC-RR8□B

[1] Actuator Specifications

Item		Content
Drive system		Ball screw Φ16mm, rolled C10
Positioning repeatability		±0.02 mm
Lost motion		0.1mm or less
Linear guide		Linear infinite circulation system
Brake (Option)	Specification	Non-excitation activating electromagnetic brake
	Holding force	Lead 10：24.5kgf Lead 5：38.5kgf
Ambient operating temperature/humidity		10 to 40°C, 85%RH or less (Non-condensing)
Degree of protection		IP20
Vibration and Impact resistance		4.9m/s2
Motor type		□60 pulse motor（Power capacity：Max.6A）
Encoder type		Incremental / Battery-less absolute
Encoder pulse count		800pulse/rev

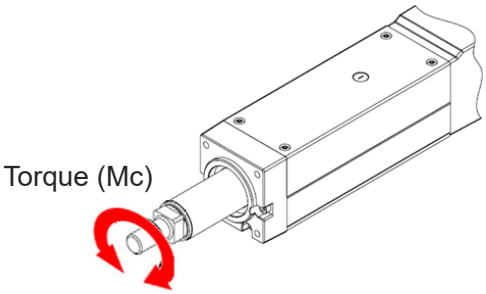
1. The radial load acting on the rod must not exceed the allowable value.



Rod tip static allowable radial load	Rod tip dynamic allowable radial load (Note 1)
280N	145N

Note 1 The value assumes a basic rated life of 5,000km.

2. The torque (Mc) acting on the rod must not exceed the allowable value.



Rod tip static allowable torque	Rod tip dynamic allowable torque (Note 1)
24.5N·m	24.5N·m

Note 1 The value assumes a basic rated life of 5,000km.

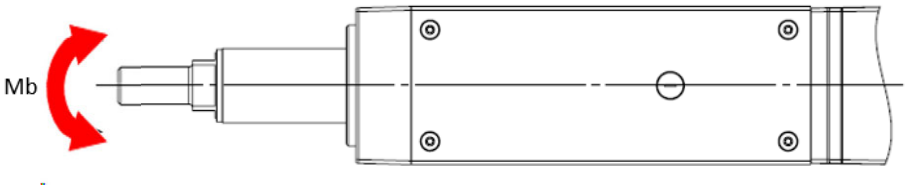
3. The uniform load (*) acting on the rod must not exceed the allowable value.

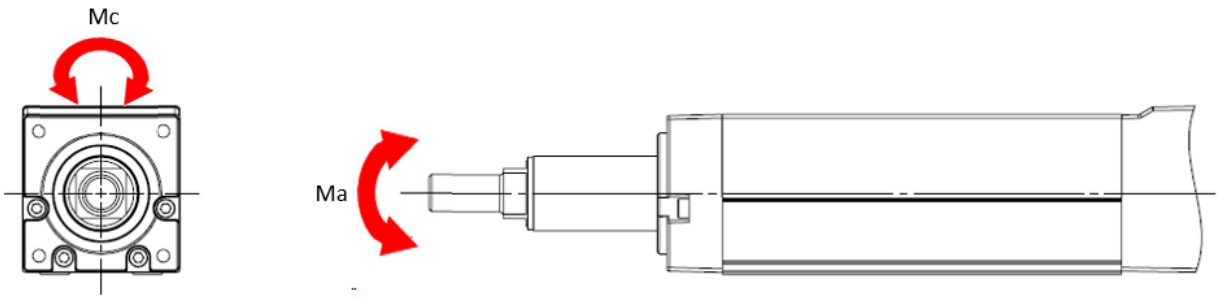
(*) Uniform load = Ma • Ka + Mb • Kb + Mc • Kc

Static allowable uniform load	Dynamic allowable uniform load (Note 1)	Load uniform coefficient Ka	Load uniform coefficient Kb	Load uniform coefficient Kc
7800N	3000N	93/m	93/m	39/m

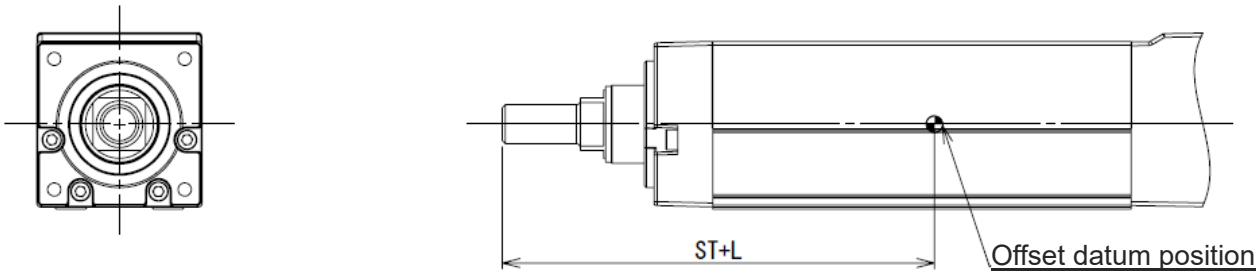
Note 1 The value assumes a basic rated life of 5,000km.

Ma, Mb, Mc: Moment load



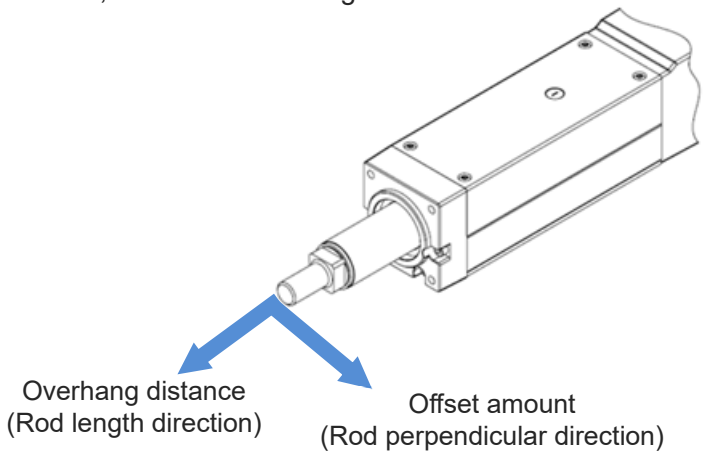


Moment offset datum position



L
172mm

Allowable offset amount, allowable overhang distance



Allowable offset amount	Allowable overhang distance
100mm	100mm

Caution

- Keep the radial load acting on the rod within the allowable offset amount and overhang distance for use. If the allowable values are exceeded, this may lead to vibration, shortened product life, or damage.

[2] Lead and Payload

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR8MB	10	49	24.5	1000
EC-RR8LB	5	70	38.5	2000

[3] Stroke and Max. Speed

Caution

- The maximum speed may not be achieved when the stroke or movement distance is short or when acceleration/deceleration is set low.
- Setting the lower less than speed the minimum speed may cause such concerns of generating abnormal noise or making the speed unstable.
- The minimum speed is the lead 10 is 13mm/s and the lead 5 is 7mm/s.

Max. Speed [mm/s]

Lead [mm]	50 to 400mm (Every 50mm)	450mm	500mm	550mm	600mm	650mm	700mm
10	240	220	180	160	120	120	110
5	120	110	90	80	70	40	40

[4] Payload by Speed/Acceleration

Caution

- Do not attempt to configure settings for acceleration/deceleration above the allowable values. It may cause to generate vibration, malfunction or shorten the product life.

The maximum acceleration/deceleration for Lead 10 is 0.2G in the both horizontal direction/vertical direction. The maximum acceleration/deceleration for Lead 5 is 0.1G in the both horizontal direction/vertical direction.
Input in percentage is to be set with 0.2G for Lead 10 and 0.1G for Lead 5 as 100%.

Lead 10 Payload [kg]

Orientation	Horizontal
Speed [mm/s]	Acceleration [G]
	0.2
0	49
150	49
180	42
240	42

Lead 10 Payload [kg]

Orientation	Vertical
Speed [mm/s]	Acceleration [G]
	0.2
0	24.5
88	24.5
100	21
110	19.5
120	16
130	12.5
140	10.5
150	7.5
160	7
170	5.5
180	5
190	3.5
200	3
220	2
240	1.5

Lead 5 Payload [kg]

Orientation	Horizontal
Speed [mm/s]	Acceleration [G]
	0.1
0	70
45	70
120	70

Lead 5 Payload [kg]

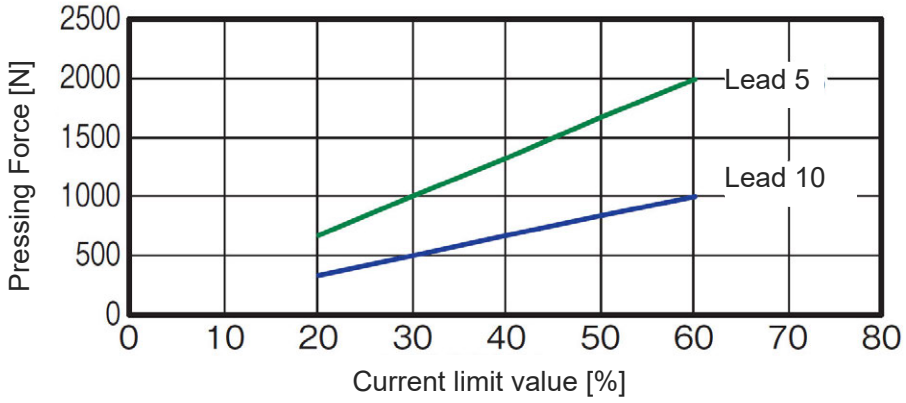
Orientation	Vertical
Speed [mm/s]	Acceleration [G]
	0.1
0	38.5
35	38.5
60	35
70	24.5
90	14
100	10.5
120	7

[5] Pressing Operation

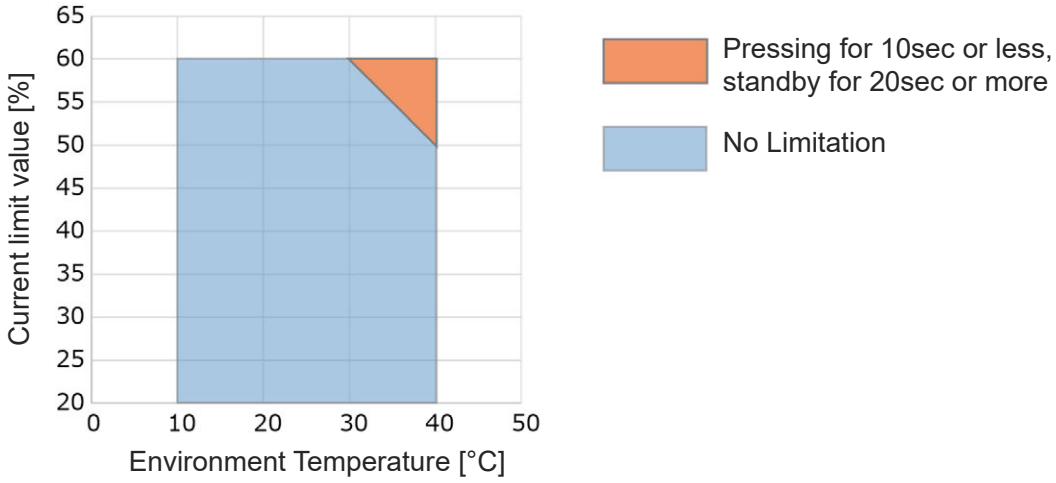
Caution

- The relation of the current limit and the pressing force is a guideline at speed of 10mm/s. There is some variance in the actual pressing force. The variance increases when the current value is low.
- The current limit value cannot be set outside the 20 to 60% range.
- When the approach speed up to the pressing start position is 10mm/s or less, pressing operation will take place at approach speed.
  When the pressing speed is less than 10mm/s, the pressing force (reference) described in the graph below may not be satisfied. Confirm in advance that there is no problem in the pressing force.

■Correlation of current limit value

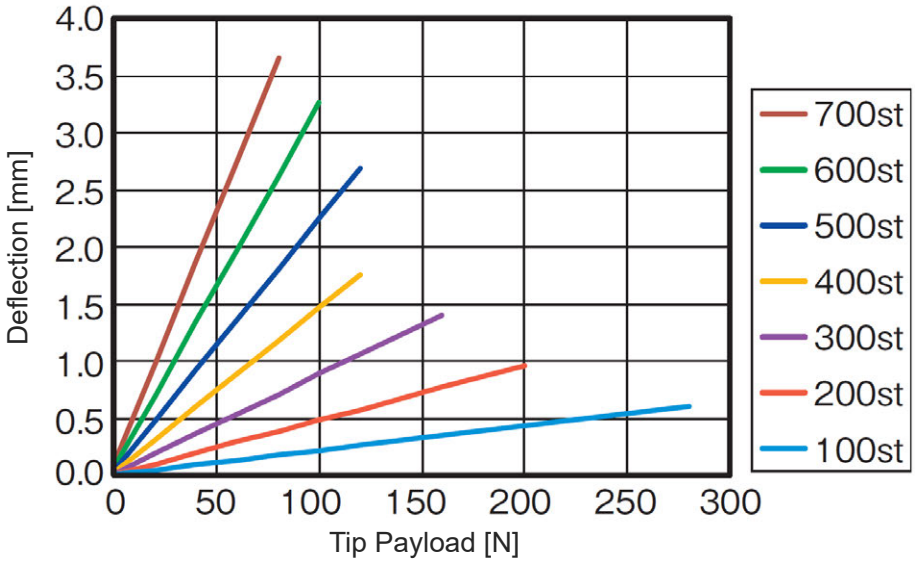


■Limit in High Temperature Environment



[Rod Deflection (Reference)]

Shown below is the deflection of rods. The values are for reference.
The upper limit for the tip payload should be the calculated value of the allowable static radial load on the rod tip for each stroke.

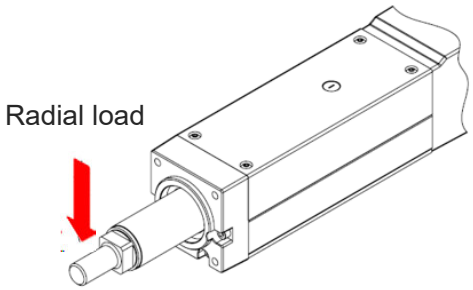


1.6.2 EC-RR8□BR

[1] Actuator Specifications

Item		Content
Drive system		Ball screw Φ16mm, rolled C10
Positioning repeatability		±0.02 mm
Lost motion		0.1mm or less
Linear guide		Linear infinite circulation system
Brake (Option)	Specification	Non-excitation activating electromagnetic brake
	Holding force	Lead 10：21kgf Lead 5：38.5kgf
Ambient operating temperature/humidity		10 to 40°C, 85%RH or less (Non-condensing)
Degree of protection		IP20
Vibration and Impact resistance		4.9m/s^2
Motor type		□60 pulse motor（Power capacity：Max.6A）
Encoder type		Incremental / Battery-less absolute
Encoder pulse count		800pulse/rev

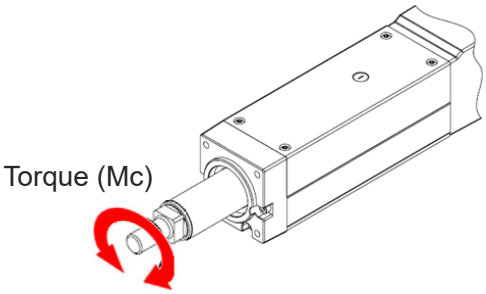
1. The radial load acting on the rod must not exceed the allowable value.



Rod tip static allowable radial load	Rod tip dynamic allowable radial load (Note 1)
280N	145N

Note 1 The value assumes a basic rated life of 5,000km.

2. The torque (Mc) acting on the rod must not exceed the allowable value.



Rod tip static allowable torque	Rod tip dynamic allowable torque (Note 1)
24.5N·m	24.5N·m

Note 1 The value assumes a basic rated life of 5,000km.

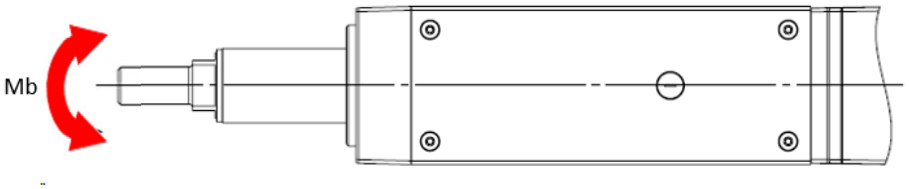
3. The uniform load (*) acting on the rod must not exceed the allowable value.

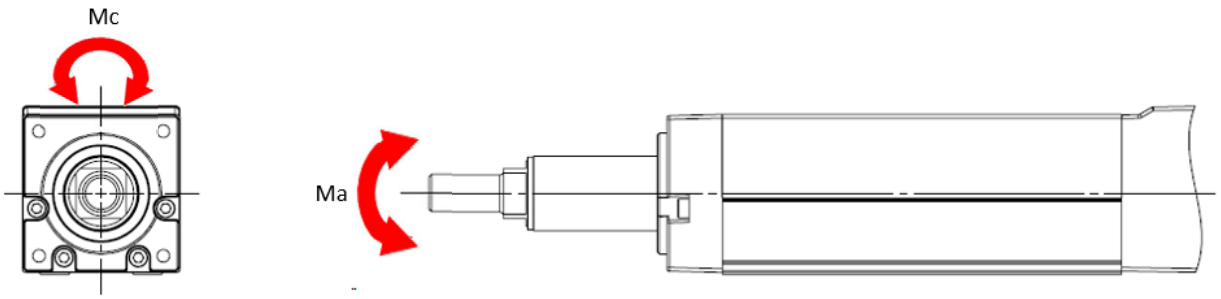
(*) Uniform load = Ma • Ka + Mb • Kb + Mc • Kc

Static allowable uniform load	Dynamic allowable uniform load (Note 1)	Load uniform coefficient Ka	Load uniform coefficient Kb	Load uniform coefficient Kc
7800N	3000N	93/m	93/m	39/m

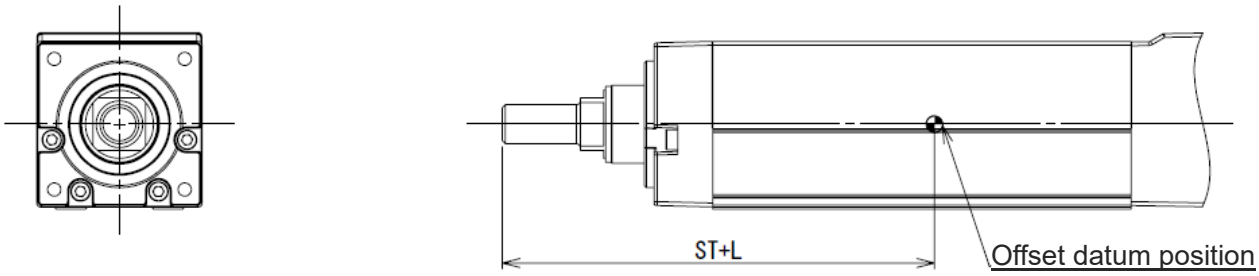
Note 1 The value assumes a basic rated life of 5,000km.

Ma, Mb, Mc: Moment load



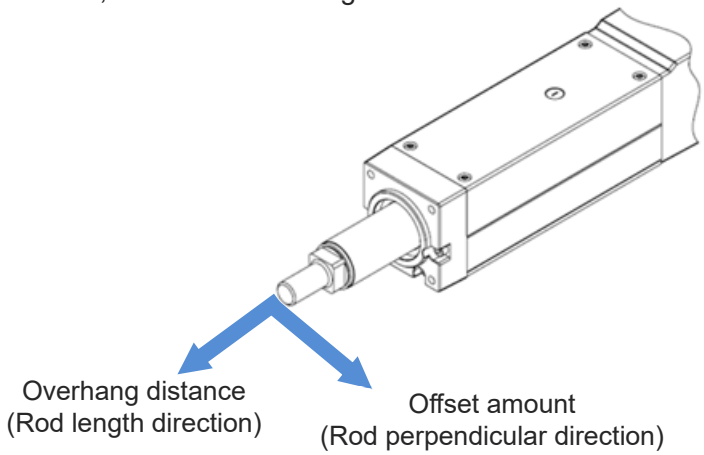


Moment offset datum position



L
172mm

Allowable offset amount, allowable overhang distance



Allowable offset amount	Allowable overhang distance
100mm	100mm

Caution

- Keep the radial load acting on the rod within the allowable offset amount and overhang distance for use. If the allowable values are exceeded, this may lead to vibration, shortened product life, or damage.

[2] Lead and Payload

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR8MB	10	42	21	1000
EC-RR8LB	5	70	38.5	2000

[3] Stroke and Max. Speed

Caution

- The maximum speed may not be achieved when the stroke or movement distance is short or when acceleration/deceleration is set low.
- Setting the lower less than speed the minimum speed may cause such concerns of generating abnormal noise or making the speed unstable.
- The minimum speed is the lead 10 is 13mm/s and the lead 5 is 7mm/s.

Max. Speed [mm/s]

Lead [mm]	50 to 450mm (Every 50mm)	500mm	550mm	600mm	650mm	700mm
10	190<180>	180	160	120	120	110
5	100<90>	90	80	70	35	35

< > represents vertical operation.

[4] Payload by Speed/Acceleration

Caution

- Do not attempt to configure settings for acceleration/deceleration above the allowable values. It may cause to generate vibration, malfunction or shorten the product life.

The maximum acceleration/deceleration for Lead 10 is 0.2G in the both horizontal direction/vertical direction. The maximum acceleration/deceleration for Lead 5 is 0.1G in the both horizontal direction/vertical direction.
Input in percentage is to be set with 0.2G for Lead 10 and 0.1G for Lead 5 as 100%.

Lead 10 Payload [kg]

Orientation	Horizontal
Speed [mm/s]	Acceleration [G]
	0.2
0	42
160	42
170	28
180	17.5
190	10.5

Lead 10 Payload [kg]

Orientation	Vertical
Speed [mm/s]	Acceleration [G]
	0.2
0	21
50	21
80	17
90	14
140	8.5
150	7
160	5.5
170	4
180	3

Lead 5 Payload [kg]

Orientation	Horizontal
Speed [mm/s]	Acceleration [G]
	0.1
0	70
90	70
100	52.5

Lead 5 Payload [kg]

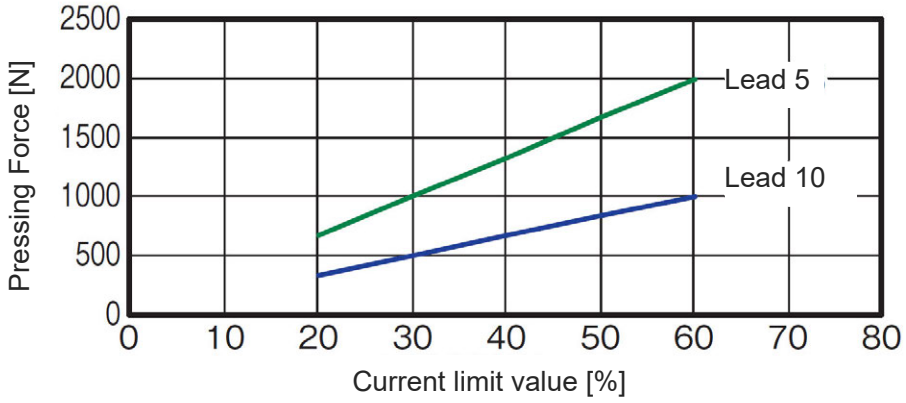
Orientation	Vertical
Speed [mm/s]	Acceleration [G]
	0.1
0	38.5
35	38.5
50	28
55	24.5
70	21
80	14
90	9

[5] Pressing Operation

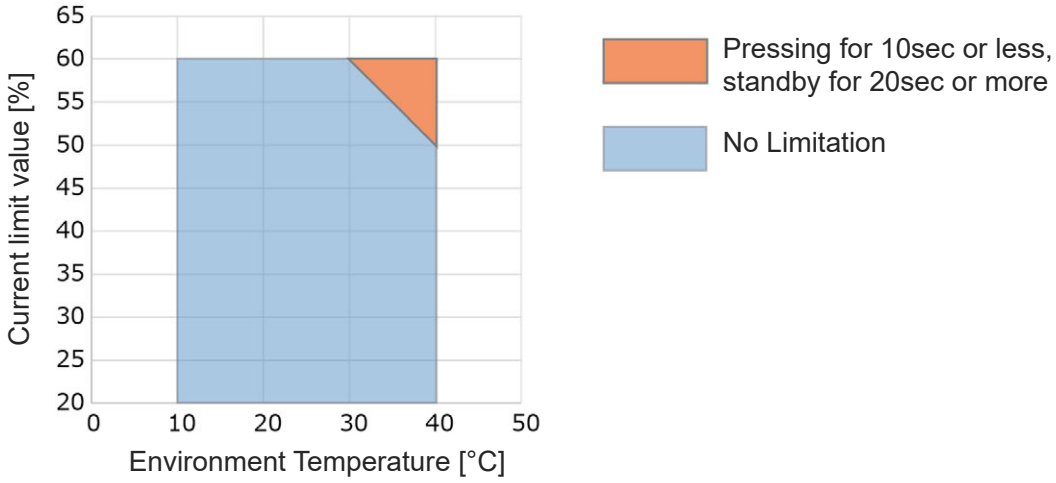
Caution

- The relation of the current limit and the pressing force is a guideline at speed of 10mm/s. There is some variance in the actual pressing force. The variance increases when the current value is low.
- The current limit value cannot be set outside the 20 to 60% range.
- When the approach speed up to the pressing start position is 10mm/s or less, pressing operation will take place at approach speed.
  When the pressing speed is less than 10mm/s, the pressing force (reference) described in the graph below may not be satisfied. Confirm in advance that there is no problem in the pressing force.

■Correlation of current limit value

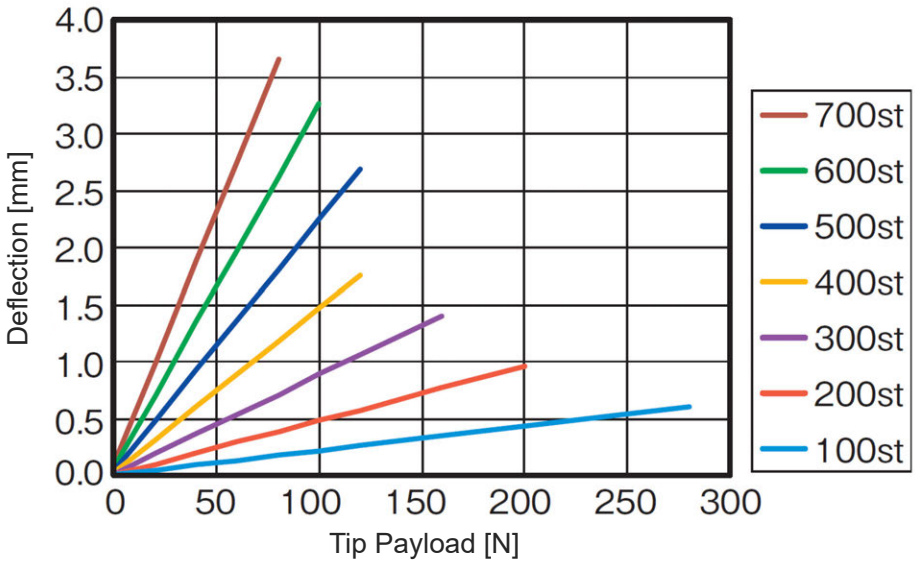


■Limit in High Temperature Environment



[Rod Deflection (Reference)]

Shown below is the deflection of rods. The values are for reference.
The upper limit for the tip payload should be the calculated value of the allowable static radial load on the rod tip for each stroke.



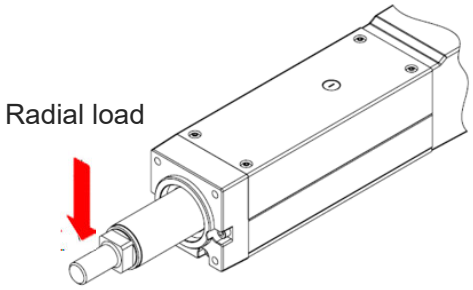
1.7 Mechanical specifications EC-RR10

1.7.1 EC-RR10□B

[1] Actuator Specifications

Item		Content
Drive system	Lead 5	Ball screw Φ16mm, rolled C10
	Lead 2.5	Ball screw Φ20mm, rolled C10
Positioning repeatability		±0.02 mm
Lost motion		0.1mm or less
Linear guide		Linear infinite circulation system
Brake (Option)	Specification	Non-excitation activating electromagnetic brake
	Holding force	Lead 5：70kgf Lead 2.5：105kgf
Ambient operating temperature/humidity		10 to 40°C, 85%RH or less (Non-condensing)
Degree of protection		IP20
Vibration and Impact resistance		4.9m/s2
Motor type		□86 pulse motor（Power capacity：Max.6A）
Encoder type		Incremental / Battery-less absolute
Encoder pulse count		800pulse/rev

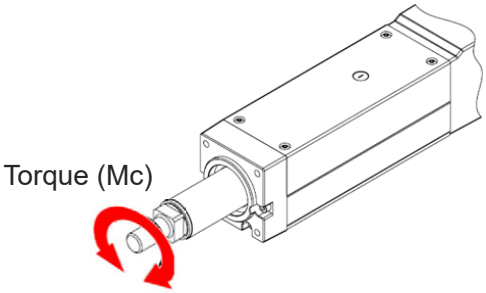
1. The radial load acting on the rod must not exceed the allowable value.



Rod tip static allowable radial load	Rod tip dynamic allowable radial load (Note 1)
290N	145N

Note 1 The value assumes a basic rated life of 5,000km.

2. The torque (Mc) acting on the rod must not exceed the allowable value.



Rod tip static allowable torque	Rod tip dynamic allowable torque (Note 1)
24.5N·m	24.5N·m

Note 1 The value assumes a basic rated life of 5,000km.

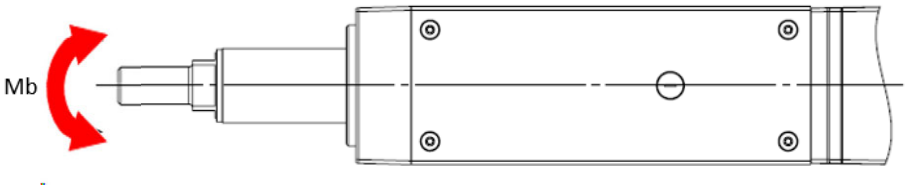
3. The uniform load (*) acting on the rod must not exceed the allowable value.

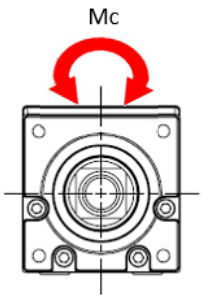
(*) Uniform load = Ma • Ka + Mb • Kb + Mc • Kc

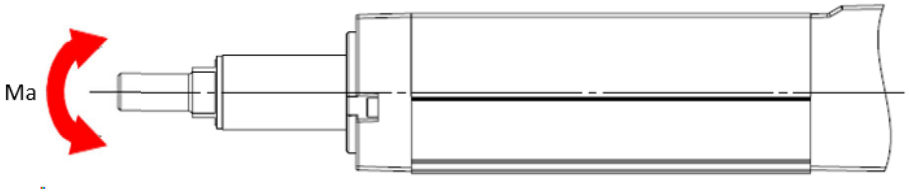
Static allowable uniform load	Dynamic allowable uniform load (Note 1)	Load uniform coefficient Ka	Load uniform coefficient Kb	Load uniform coefficient Kc
11960N	3100N	93/m	93/m	31/m

Note 1 The value assumes a basic rated life of 5,000km.

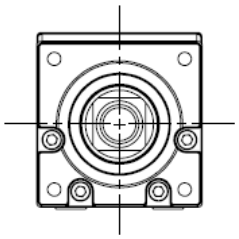
Ma, Mb, Mc: Moment load

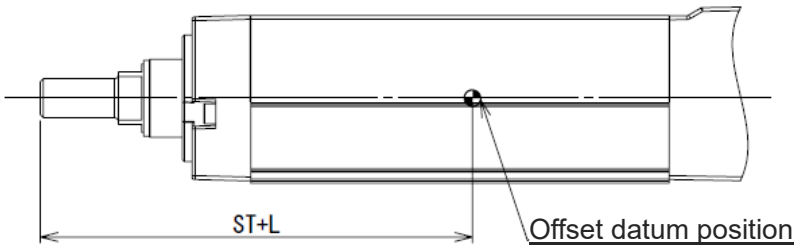






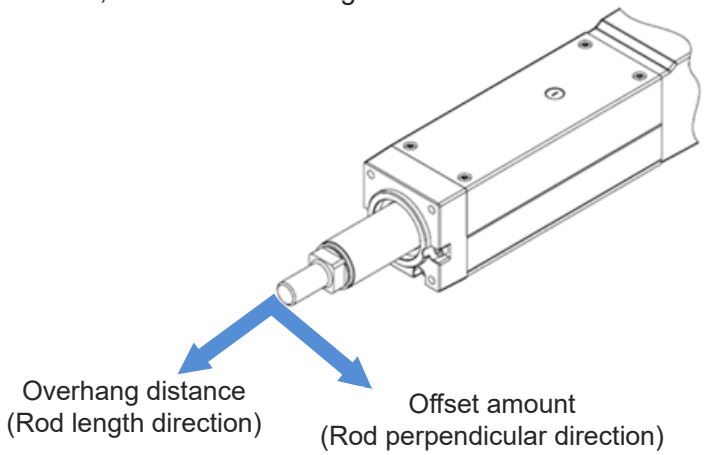
Moment offset datum position





L
174mm

Allowable offset amount, allowable overhang distance



Allowable offset amount	Allowable overhang distance
100mm	100mm

Caution

- Keep the radial load acting on the rod within the allowable offset amount and overhang distance for use. If the allowable values are exceeded, this may lead to vibration, shortened product life, or damage.

[2] Lead and Payload

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR10MB	5	105	70	3000
EC-RR10LB	2.5	210	105	6000

[3] Stroke and Max. Speed

Caution

- The maximum speed may not be achieved when the stroke or movement distance is short or when acceleration/deceleration is set low.
- Setting the lower less than speed the minimum speed may cause such concerns of generating abnormal noise or making the speed unstable.
- The minimum speed is the lead 5 is 7mm/s and the lead 2.5 is 4mm/s.

Max. Speed [mm/s]

Lead [mm]	50 to 500mm (Every 50mm)	550mm	600mm	650mm	700mm	750mm	800mm
5	100	90	80	70	60	50	45
2.5	45			40	37	30	25

[4] Payload by Speed/Acceleration

Caution

- Do not attempt to configure settings for acceleration/deceleration above the allowable values. It may cause to generate vibration, malfunction or shorten the product life.

The maximum acceleration/deceleration for Lead 5 is 0.02G in the both horizontal direction/vertical direction. The maximum acceleration/deceleration for Lead 2.5 is 0.01G in the both horizontal direction/vertical direction.

Input in percentage is to be set with 0.02G for Lead 5 and 0.01G for Lead 2.5 as 100%.

Lead 5 Payload [kg]

Orientation	Horizontal	Vertical
Speed [mm/s]	Acceleration [G]	
	0.02	0.02
0	105	70
20	105	70
25	105	63
30	105	56
40	105	43.5
45	105	38.5
50	105	33
60	105	24.5
70	105	17.5
80	105	11
90	105	7
100	105	3.5

Lead 2.5 Payload [kg]

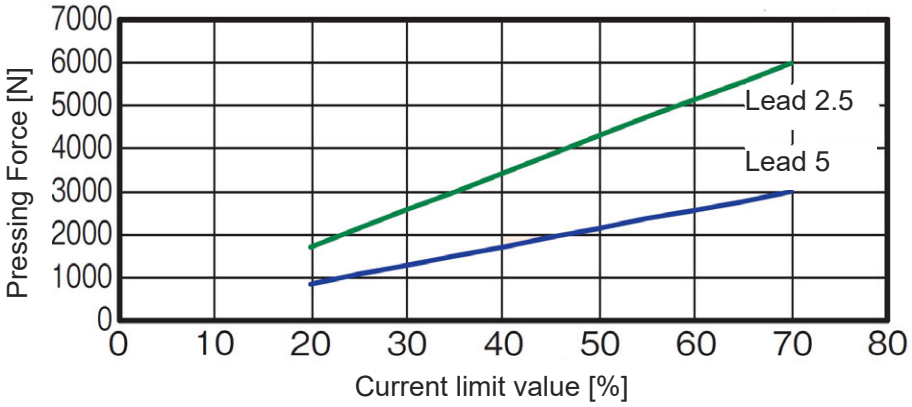
Orientation	Horizontal	Vertical
Speed [mm/s]	Acceleration [G]	
	0.01	0.01
0	210	105
20	210	105
25	210	84
30	210	66.5
37	210	42
40	210	31.5
45	210	14

[5] Pressing Operation

Caution

- The relation of the current limit and the pressing force is a guideline at speed of 10mm/s. There is some variance in the actual pressing force. The variance increases when the current value is low.
- The current limit value cannot be set outside the 20 to 70% range.(There are limits for long strokes.)
- When the approach speed up to the pressing start position is 10mm/s or less, pressing operation will take place at approach speed.
  When the pressing speed is less than 10mm/s, the pressing force (reference) described in the graph below may not be satisfied. Confirm in advance that there is no problem in the pressing force.

■Correlation of current limit value

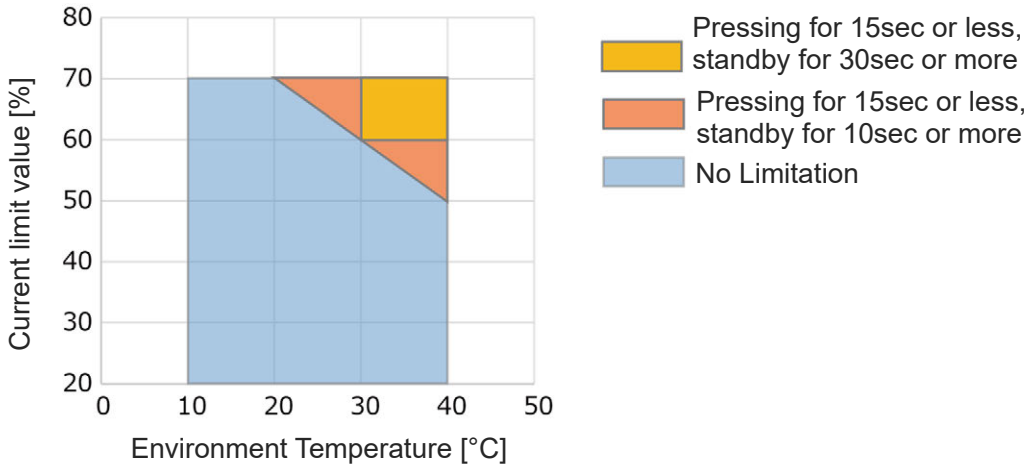


■ Limitation by Stroke

For the concern of buckling load of the ball screw or deflection of the base, do not attempt to exceed the limit of the pressing current below for long stroke types.

Lead	Stroke [mm]				
	600 or less	650	700	750	800
	Current limit value [%]				
5	70				
2.5	70	65	60	55	50

■ Limit in High Temperature Environment



■ Upper Limit of Pressing Count (Reference)

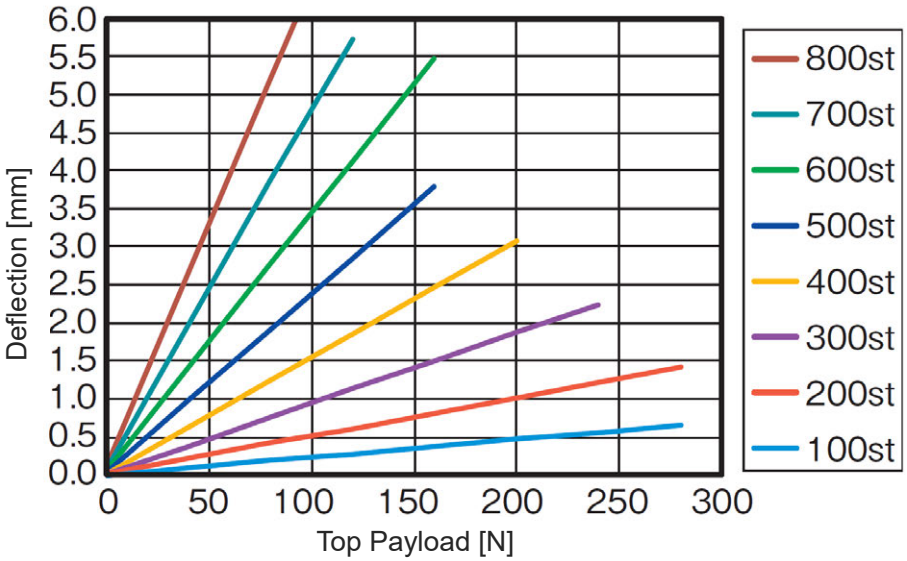
Refer below for the upper limit of the pressing count when pressing is performed with 1mm of movement amount.

Current limit value [%]	Pressing Count (10 thousand times)	
	Lead 5	Lead 2.5
20	179280	4880
30	53180	1440
40	22410	610
50	11480	310
60	6640	180
70	4170	110

(Note) They are values in a operational condition with no vibration or impact.

[Rod Deflection (Reference)]

Shown below is the deflection of rods. The values are for reference.
The upper limit for the tip payload should be the calculated value of the allowable static radial load on the rod tip for each stroke.

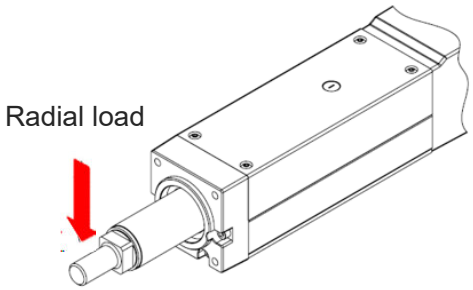


1.7.2 EC-RR10□BR

[1] Actuator Specifications

Item		Content
Drive system	Lead 5	Ball screw Φ16mm, rolled C10
	Lead 2.5	Ball screw Φ20mm, rolled C10
Positioning repeatability		±0.02 mm
Lost motion		0.1mm or less
Linear guide		Linear infinite circulation system
Brake (Option)	Specification	Non-excitation activating electromagnetic brake
	Holding force	Lead 5：70kgf Lead 2.5：105kgf
Ambient operating temperature/humidity		10 to 40°C, 85%RH or less (Non-condensing)
Degree of protection		IP20
Vibration and Impact resistance		4.9m/s2
Motor type		□86 pulse motor（Power capacity：Max.6A）
Encoder type		Incremental / Battery-less absolute
Encoder pulse count		800pulse/rev

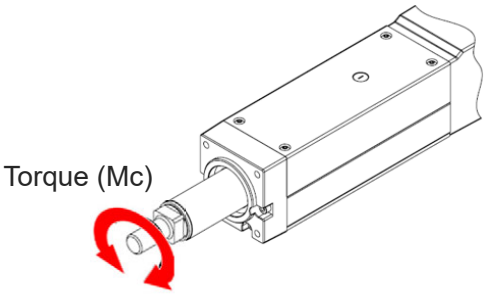
1. The radial load acting on the rod must not exceed the allowable value.



Rod tip static allowable radial load	Rod tip dynamic allowable radial load (Note 1)
290N	145N

Note 1 The value assumes a basic rated life of 5,000km.

2. The torque (Mc) acting on the rod must not exceed the allowable value.



Rod tip static allowable torque	Rod tip dynamic allowable torque (Note 1)
24.5N·m	24.5N·m

Note 1 The value assumes a basic rated life of 5,000km.

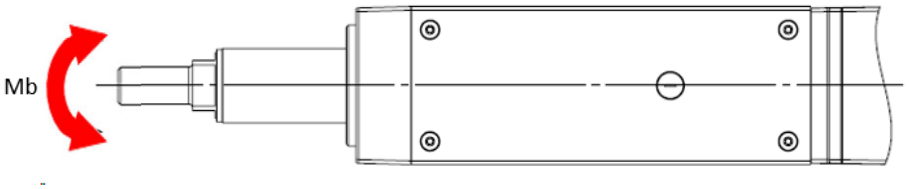
3. The uniform load (*) acting on the rod must not exceed the allowable value.

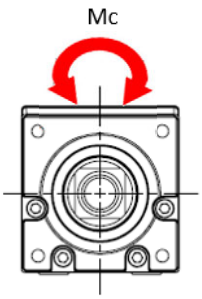
(*) Uniform load = Ma • Ka + Mb • Kb + Mc • Kc

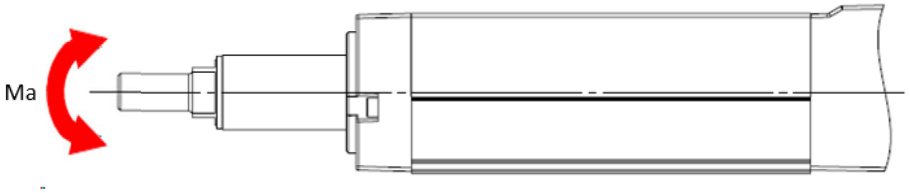
Static allowable uniform load	Dynamic allowable uniform load (Note 1)	Load uniform coefficient Ka	Load uniform coefficient Kb	Load uniform coefficient Kc
11960N	3100N	93/m	93/m	31/m

Note 1 The value assumes a basic rated life of 5,000km.

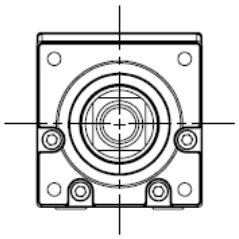
Ma, Mb, Mc: Moment load

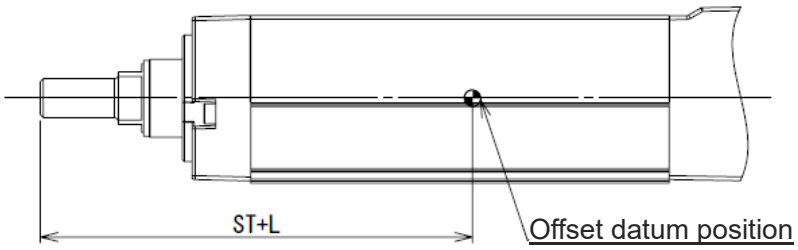






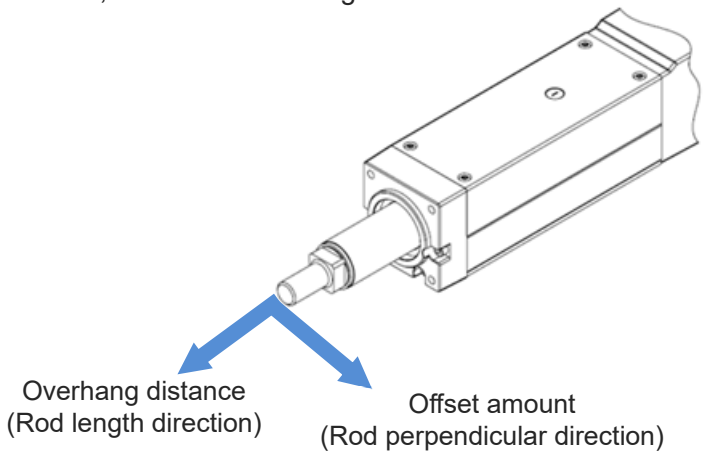
Moment offset datum position





L
174mm

Allowable offset amount, allowable overhang distance



Allowable offset amount	Allowable overhang distance
100mm	100mm

Caution

- Keep the radial load acting on the rod within the allowable offset amount and overhang distance for use. If the allowable values are exceeded, this may lead to vibration, shortened product life, or damage.

[2] Lead and Payload

Model number	Lead [mm]	Maximum payload		Maximum pressing force [N]
		Horizontal [kg]	Vertical [kg]	
EC-RR10MBR	5	105	70	3000
EC-RR10LBR	2.5	210	105	6000

[3] Stroke and Max. Speed

Caution

- The maximum speed may not be achieved when the stroke or movement distance is short or when acceleration/deceleration is set low.
- Setting the lower less than speed the minimum speed may cause such concerns of generating abnormal noise or making the speed unstable.
- The minimum speed is the lead 5 is 7mm/s and the lead 2.5 is 4mm/s.

Max. Speed [mm/s]

Lead [mm]	50 to 500mm (Every 50mm)	550mm	600mm	650mm	700mm	750mm	800mm
5	100	90	80	70	60	50	45
2.5	45			40	37	30	25

[4] Payload by Speed/Acceleration

Caution

- Do not attempt to configure settings for acceleration/deceleration above the allowable values. It may cause to generate vibration, malfunction or shorten the product life.

The maximum acceleration/deceleration for Lead 5 is 0.02G in the both horizontal direction/vertical direction. The maximum acceleration/deceleration for Lead 2.5 is 0.01G in the both horizontal direction/vertical direction.

Input in percentage is to be set with 0.02G for Lead 5 and 0.01G for Lead 2.5 as 100%.

Lead 5 Payload [kg]

Orientation	Horizontal	Vertical
Speed [mm/s]	Acceleration [G]	
	0.02	0.02
0	105	70
20	105	70
25	105	63
30	105	56
40	105	43.5
45	105	38.5
50	105	33
60	105	24.5
70	105	17.5
80	105	11
90	105	7
100	105	3.5

Lead 2.5 Payload [kg]

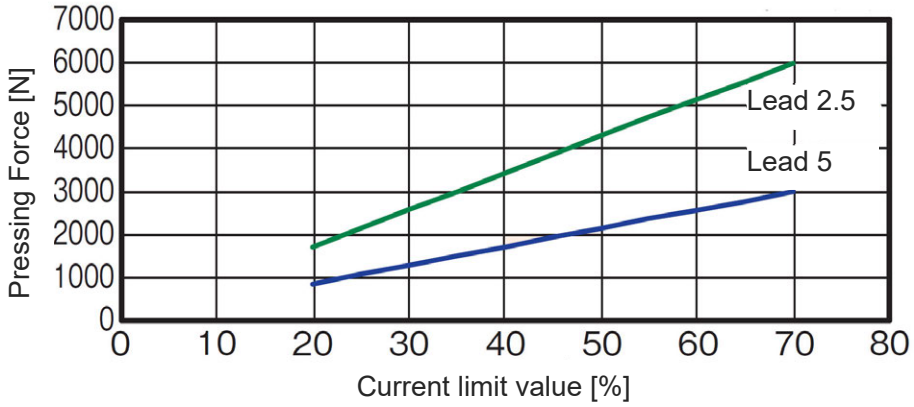
Orientation	Horizontal	Vertical
Speed [mm/s]	Acceleration [G]	
	0.01	0.01
0	210	105
20	210	105
25	210	84
30	210	66.5
37	210	42
40	210	31.5
45	210	14

[5] Pressing Operation

Caution

- The relation of the current limit and the pressing force is a guideline at speed of 10mm/s. There is some variance in the actual pressing force. The variance increases when the current value is low.
- The current limit value cannot be set outside the 20 to 70% range. (There are limits for long strokes.)
- When the approach speed up to the pressing start position is 10mm/s or less, pressing operation will take place at approach speed.
  When the pressing speed is less than 10mm/s, the pressing force (reference) described in the graph below may not be satisfied. Confirm in advance that there is no problem in the pressing force.

■Correlation of current limit value

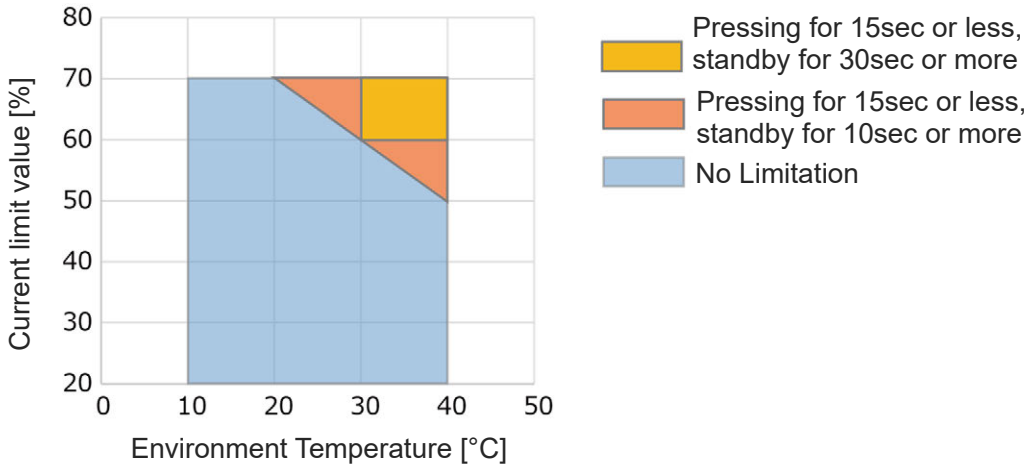


■ Limitation by Stroke

For the concern of buckling load of the ball screw or deflection of the base, do not attempt to exceed the limit of the pressing current below for long stroke types.

Lead	Stroke [mm]				
	600 or less	650	700	750	800
	Current limit value [%]				
5	70				
2.5	70	65	60	55	50

■ Limit in High Temperature Environment



■ Upper Limit of Pressing Count (Reference)

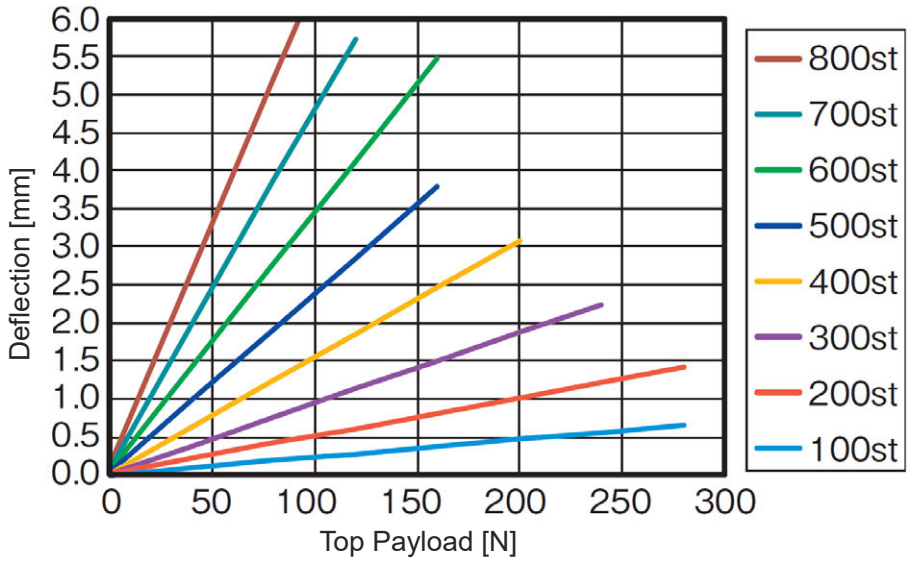
Refer below for the upper limit of the pressing count when pressing is performed with 1mm of movement amount.

Current limit value [%]	Pressing Count (10 thousand times)	
	Lead 5	Lead 2.5
20	179280	4880
30	53180	1440
40	22410	610
50	11480	310
60	6640	180
70	4170	110

(Note) They are values in a operational condition with no vibration or impact.

[Rod Deflection (Reference)]

Shown below is the deflection of rods. The values are for reference.
The upper limit for the tip payload should be the calculated value of the allowable static radial load on the rod tip for each stroke.

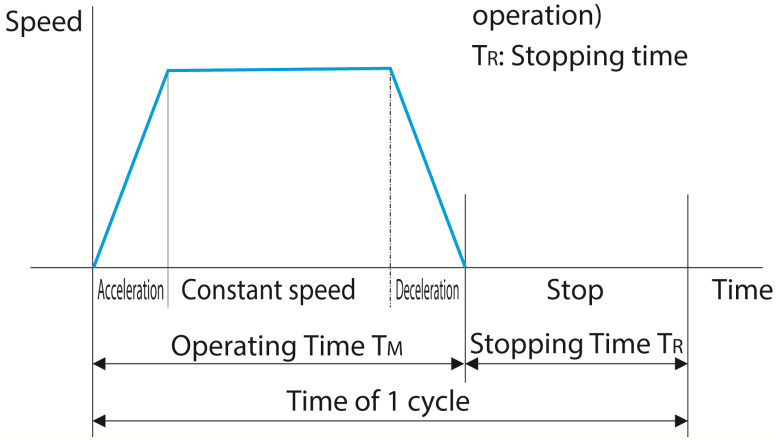


1.8 Duty ratio

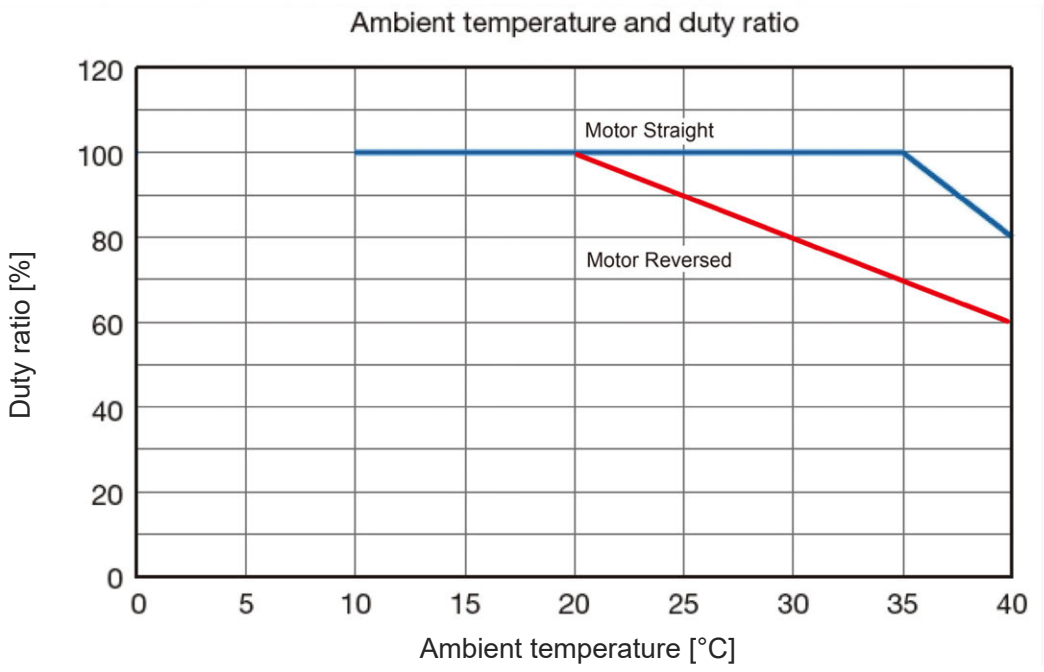
The duty ratio is the operating rate, shown in [%], of the actuator operating time within one cycle.

$$D = \frac{T_M}{T_M + T_R} \times 100\ [\%]$$

D: Duty ratio
T_M: Operating time (including push-motion operation)
T_R: Stopping time



EC-RR3□B/RR3□BR/RR4□B/RR4□BR/RR8□B/RR8□BR/RR10□B/RR10□BR are capable for continuous operation in 100% of the duty ratio.
The duty ratio for EC-RR6□B/RR7□B/RR6(X) □AHB/RR7(X) □AHB (Motor Straight) and EC-RR6□BR/RR7□BR/RR6□AHBR/RR7□AHBR (Motor Reversed) are limited to the values below.
Use so that the duty ratio falls within the specified conditions based on ambient temperature.



1.9 Options

1.9.1 RCON-EC connection specification (Model: ACR)

It is the code to be indicated when connected to RCON-EC.

* When this option is selected, it is not available to select PN Option (PNP specification) or TMD2 Option (2-circuit power supply specification).

1.9.2 With brake (Model: B)

This is used to prevent the rod from moving during power outages or when the servo is OFF. It can also be used to prevent the rod from falling when mounted vertically.

1.9.3 Tip adapter (flange) (Model: FFA)

This adapter is used to mount jigs, etc., on the rod tip with four bolts.

* Refer to [2.3.4, 2.4.4, 2.5.4 Body mounting] for details.

1.9.4 Flange (Front) (Model: FL)

This bracket is used for fixing the actuator body side with bolts.

* Refer to [2.3.4, 2.4.4, 2.5.4 Body mounting [When using flanges]] for details.

1.9.5 Foot bracket (Model: FT)

This bracket is used for fixing the actuator body from the top with bolts.

* Refer to [2.3.4, 2.4.4, 2.5.4 Body mounting [When using foot brackets]] for details.

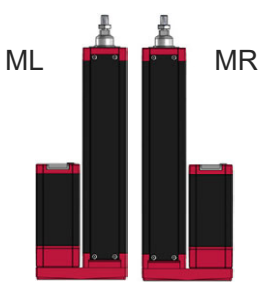
1.9.6 3 position mode specification (Model: MF)

This is an option that enables 3-point positioning (intermediate stop).

* For details, refer to the separate volume [an instruction manual of ELECYLINDER 3 position mode specification (ME3837)].

1.9.7 Motor reversed direction (Model: ML, MR)

It is the code to indicate the direction of motor reversed when selecting the motor reversed type.
Viewing from the rear side, reversing on the left is ML and reversing on the right is MR.



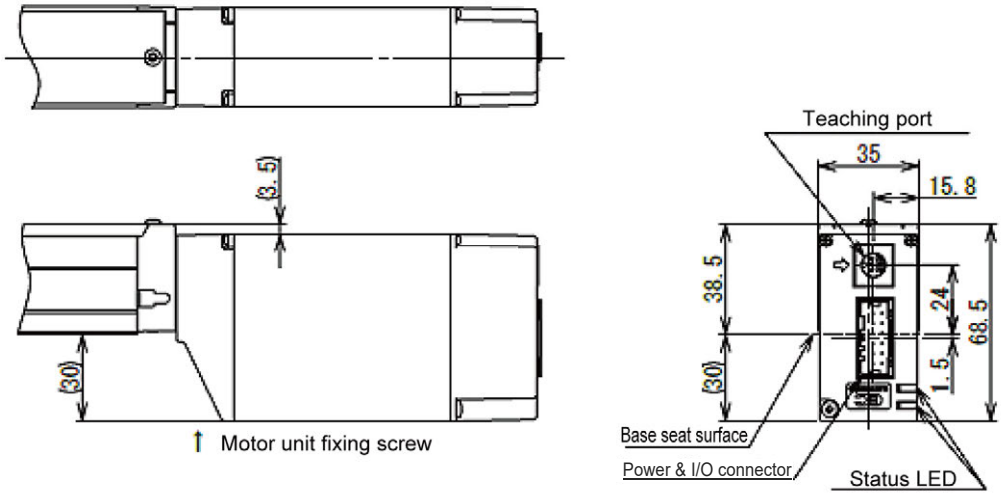
1.9.8 Motor ejecting orientation changed (Model: MOB, MOL, MOR, MOT)

They are the codes to indicate the motor ejecting orientations.

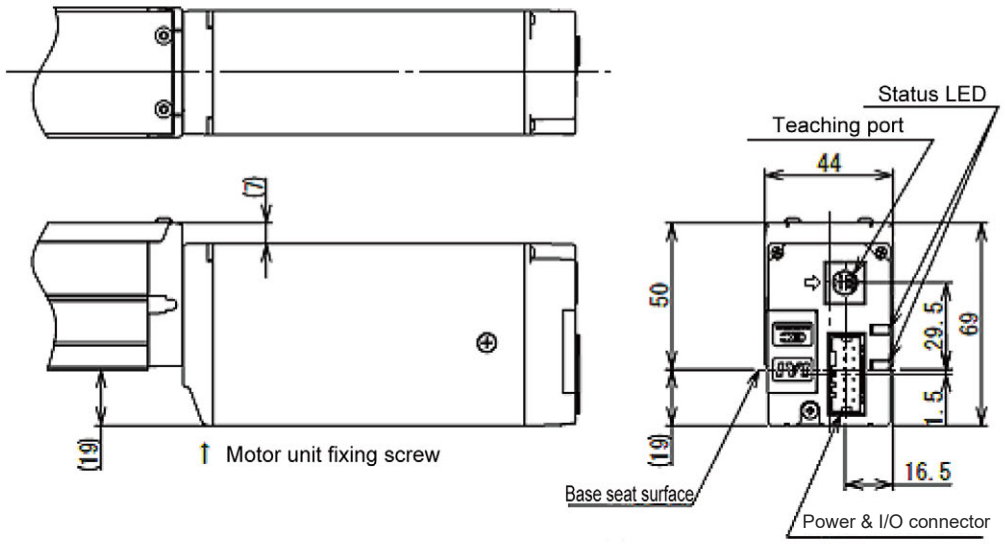
Applications: EC-RR3□B, RR4□B

Motor ejecting orientation changed (Bottom side) ■ Model code: MOB

EC-RR3□B

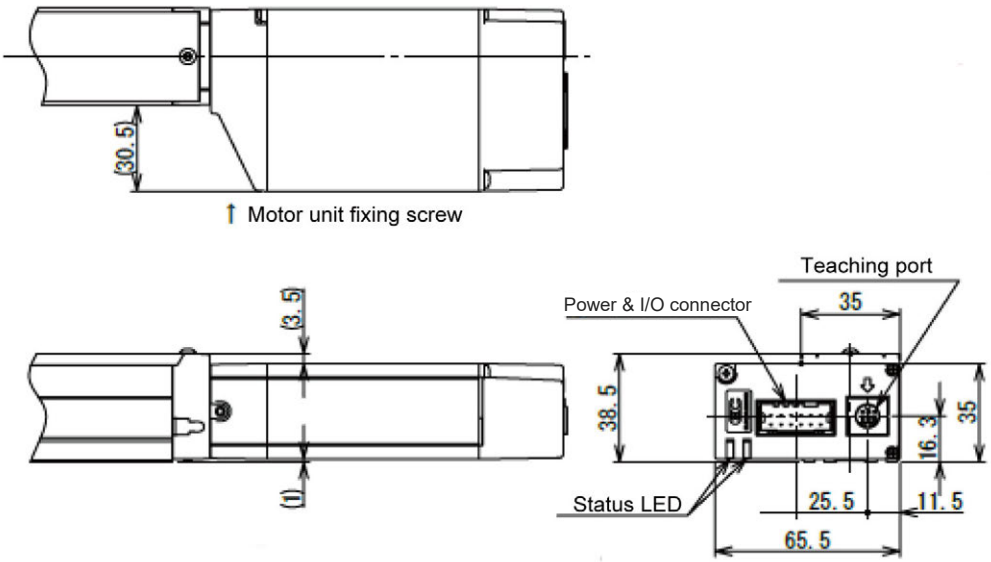


EC-RR4□B

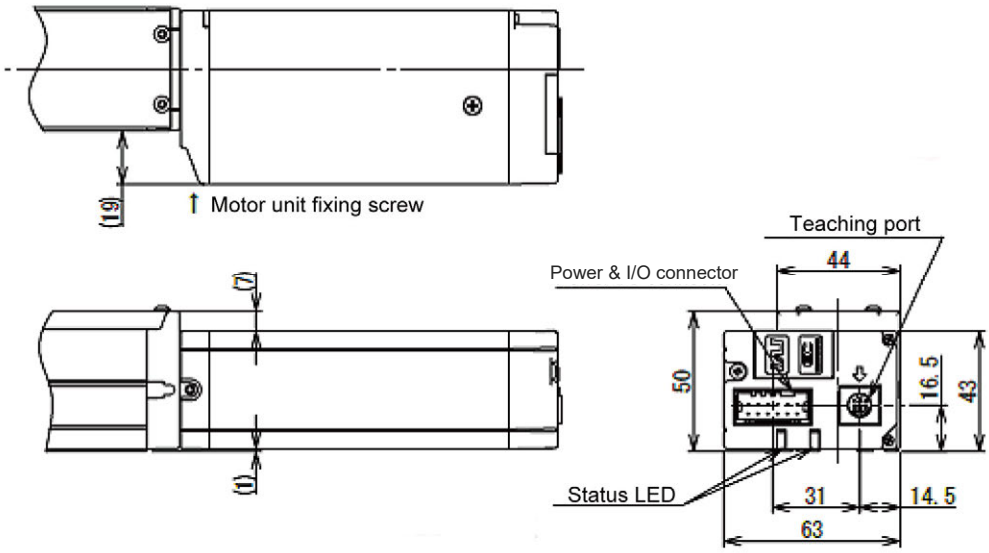


Motor ejecting orientation changed (Left side) ■ Model code: MOL

EC-RR3□B

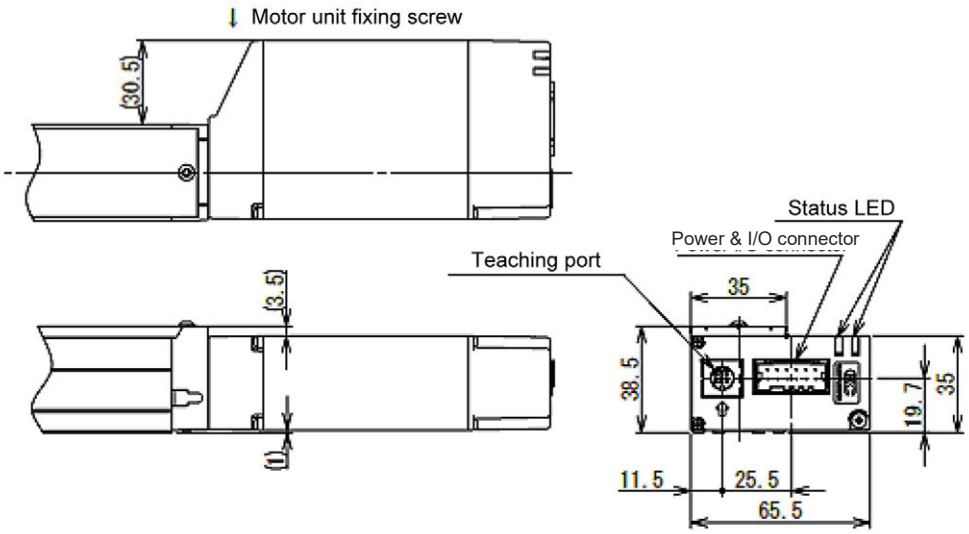


EC-RR4□B

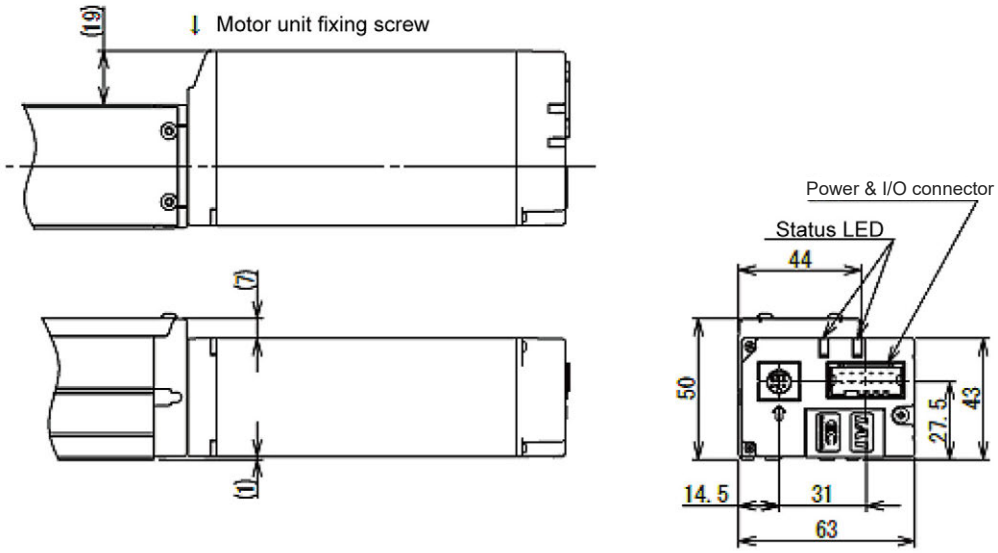


Motor ejecting orientation changed (Right side) ■ Model code: MOR

EC-RR3□B

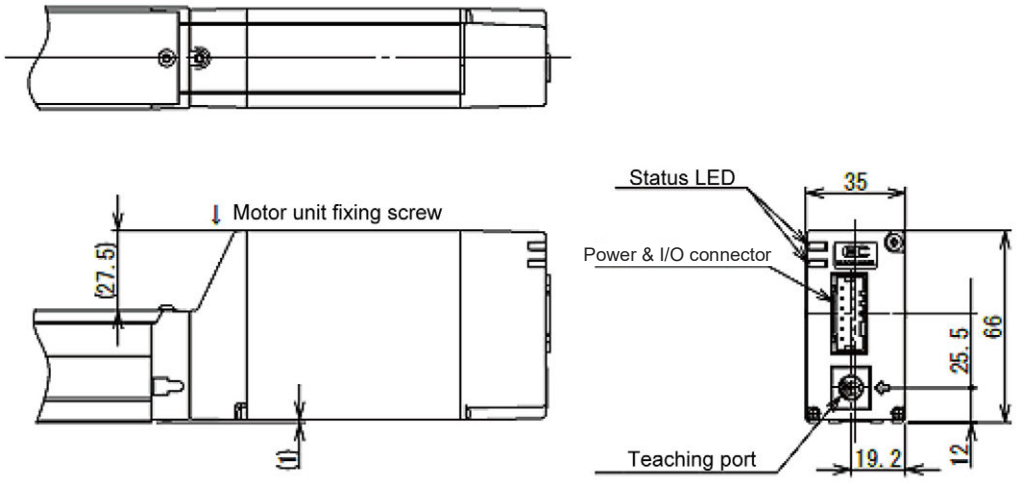


EC-RR4□B

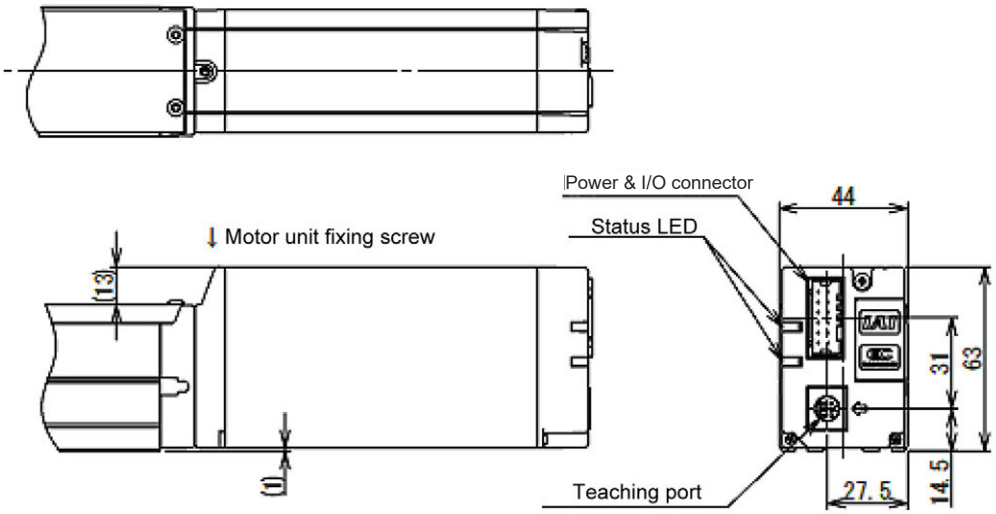


Motor ejecting orientation changed (Top side) ■ Model code: MOT

EC-RR3□B



EC-RR4□B



1.9.9 Tip adapter (Internal thread) (Model: NFA)

This adapter is used to secure jigs, etc., on the rod tip with one bolt for rod types.

* Refer to [2.3.5, 2.5.5 Mounting transported objects [When using tip adapter]] for details.

1.9.10 Knuckle joint (Model: NJ)

When using a clevis bracket, this bracket is used to allow the actuator rod tip to move freely (rotate).

(Note) Only RR6 Type with stroke from 50 to 400mm and RR7 Type with stroke from 50 to 500mm are available to select from.

* Refer to [2.3.7, 2.5.7 Mounting with oscillation [Installation orientation for oscillation]] for details.

1.9.11 Oscillation receiving bracket (knuckle joint) (Model: NJPB)

This is the oscillation receiving bracket for the knuckle joint.

(Note) Only RR6 Type with stroke from 50 to 400mm and RR7 Type with stroke from 50 to 500mm are available to select from.

* Refer to [2.3.7, 2.5.7 Mounting with oscillation [Installation orientation for oscillation]] for details.

1.9.12 Home reverse specification (Model: NM)

The standard home position is on the motor side.
However, the opposite side specification is selected if the home position direction is reversed in accordance with equipment layout or assembly direction.

1.9.13 PNP specification (Model: PN)

I/O input/output specifications are NPN specification as standard.
Specifying this option changes the unit to PNP specification.

* It cannot be selected together with the RCON-EC connection type (option model code: ACR).

1.9.14 Clevis bracket (Model: QR)

When the motion of the object mounted on the rod tip differs from the rod operation direction, this bracket is used to make it track the cylinder body.

(Note) Only RR6 Type with stroke from 50 to 400mm and RR7 Type with stroke from 50 to 500mm are available to select from.

* Refer to [2.3.7, 2.5.7 Mounting with oscillation [Installation orientation for oscillation]] for details.

1.9.15 Oscillation receiving bracket (clevis) (Model: QRPB)

This is the oscillation receiving bracket for the clevis.

(Note) Only RR6 Type with stroke from 50 to 400mm and RR7 Type with stroke from 50 to 500mm are available to select from.

* Refer to [2.3.7, 2.5.7 Mounting with oscillation [Installation orientation for oscillation]] for details.

1.9.16 Stainless Steel Suction Joint Mounted Specification (Model: SVL, SVR)

Mount the stainless steel suction joint for air intake on the side of the base (Note 1).

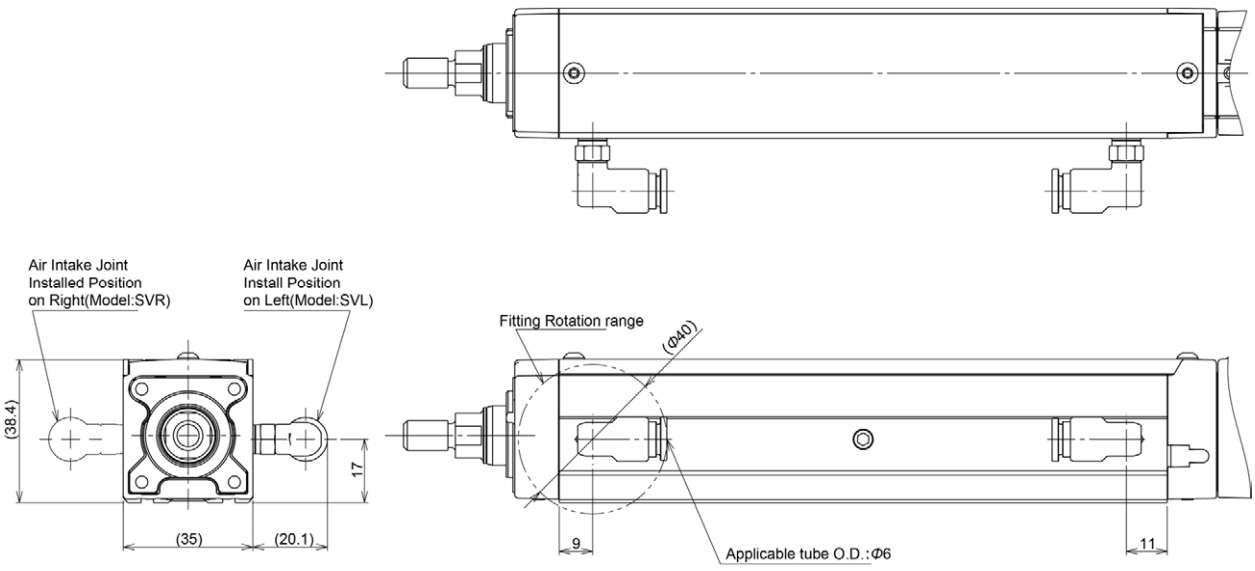
When viewed from the motor side, install the SVL on the left side of the main unit and the SVR on the right side.

For the motor reversed specification, the joint installation position can be selected only on the side opposite to the motor reversed direction.

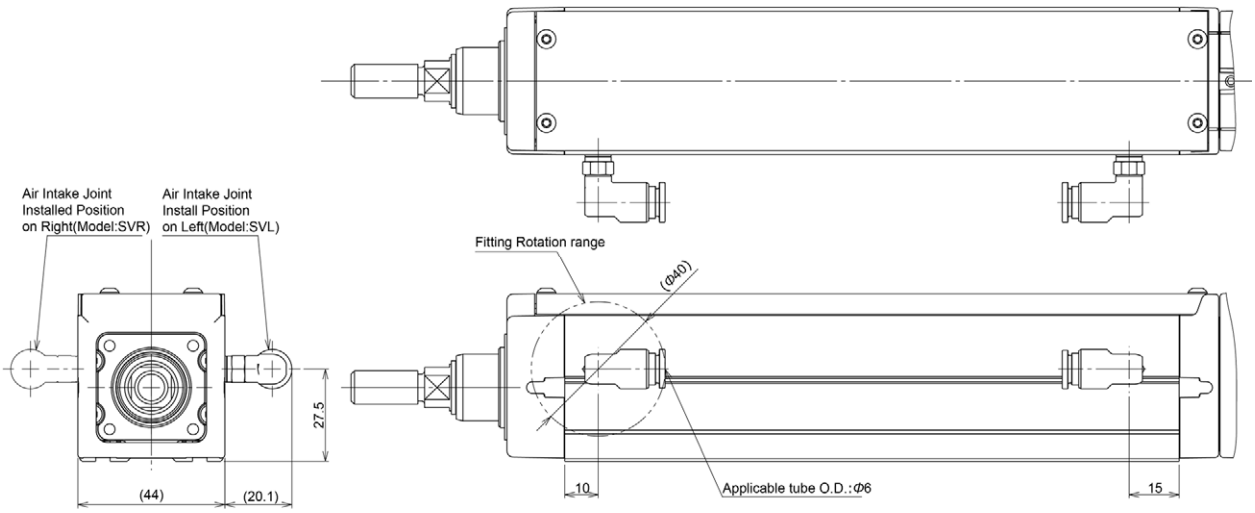
-ML-SVR, -MR-SVL

Note 1 For RR6□AHB, RR7□AHB, RR8□B, RR10□B, install the fitting on the side of the frame cover.

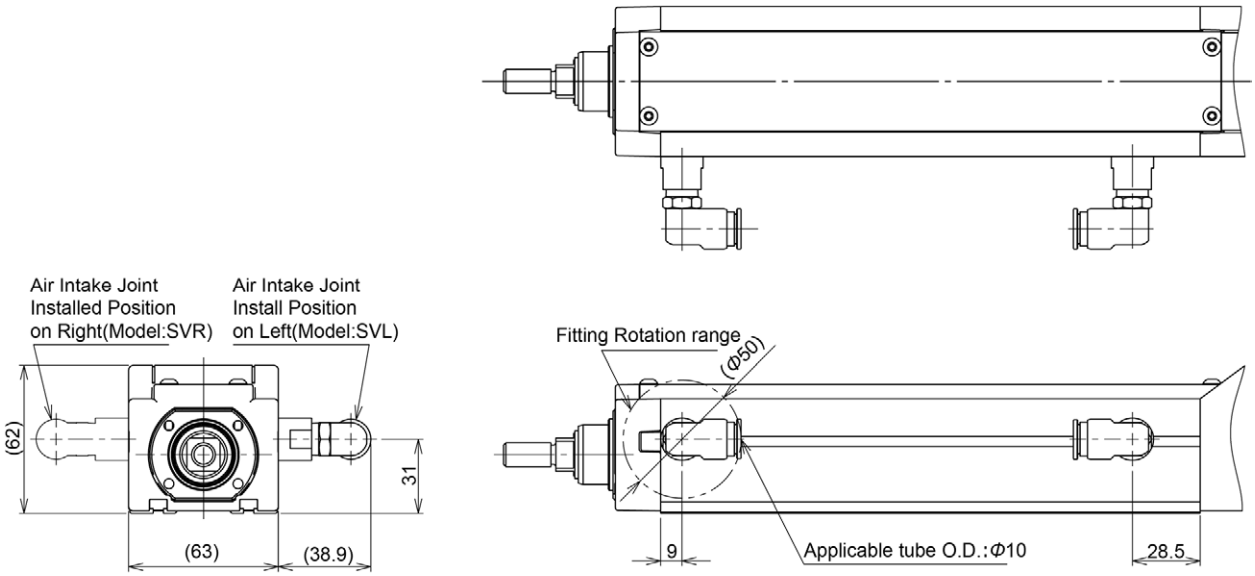
■EC-RR3□B(R)



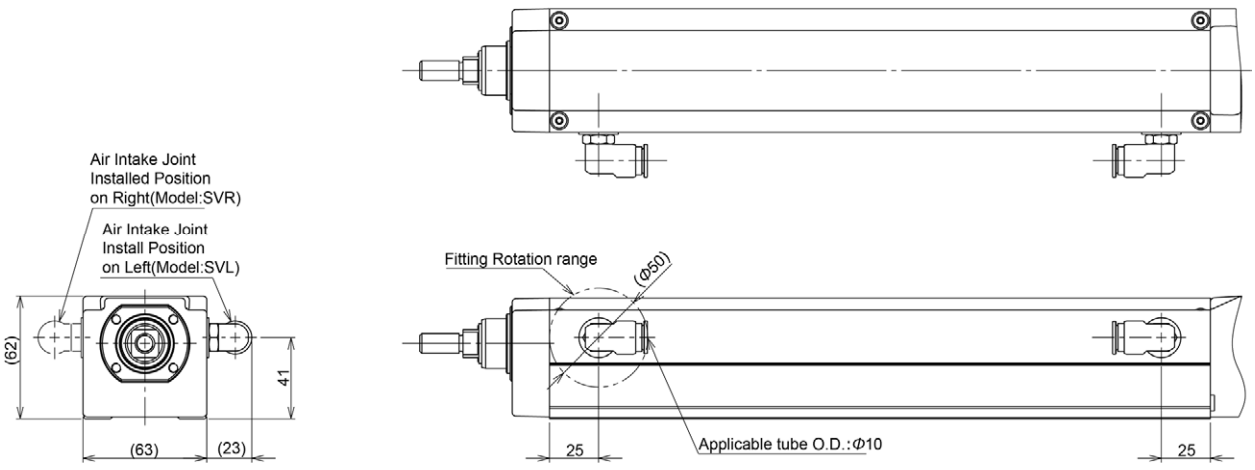
■EC-RR4□B(R)



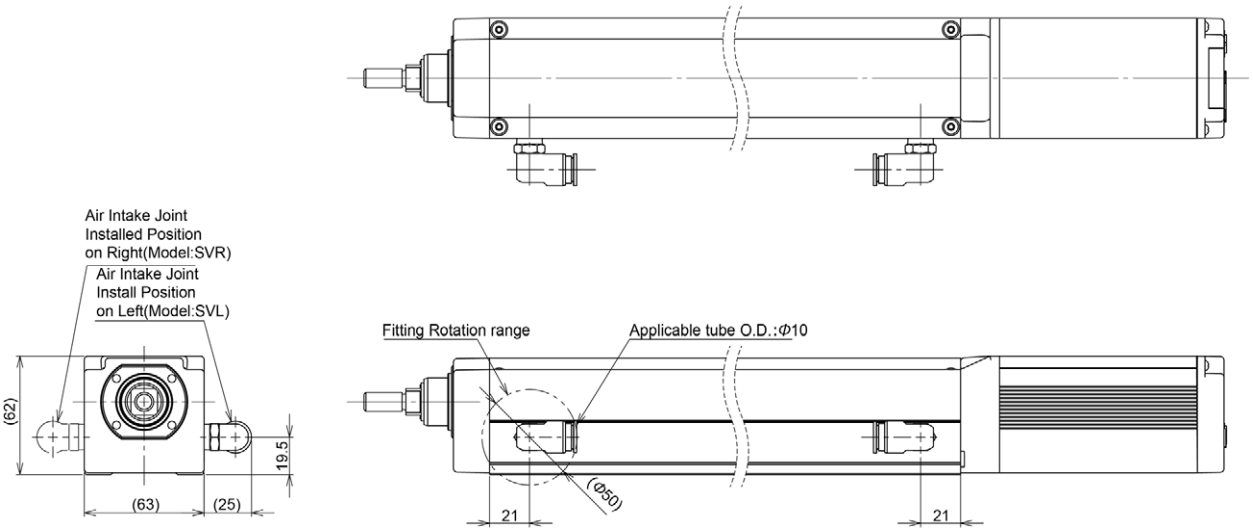
■EC-RR6□B(R)



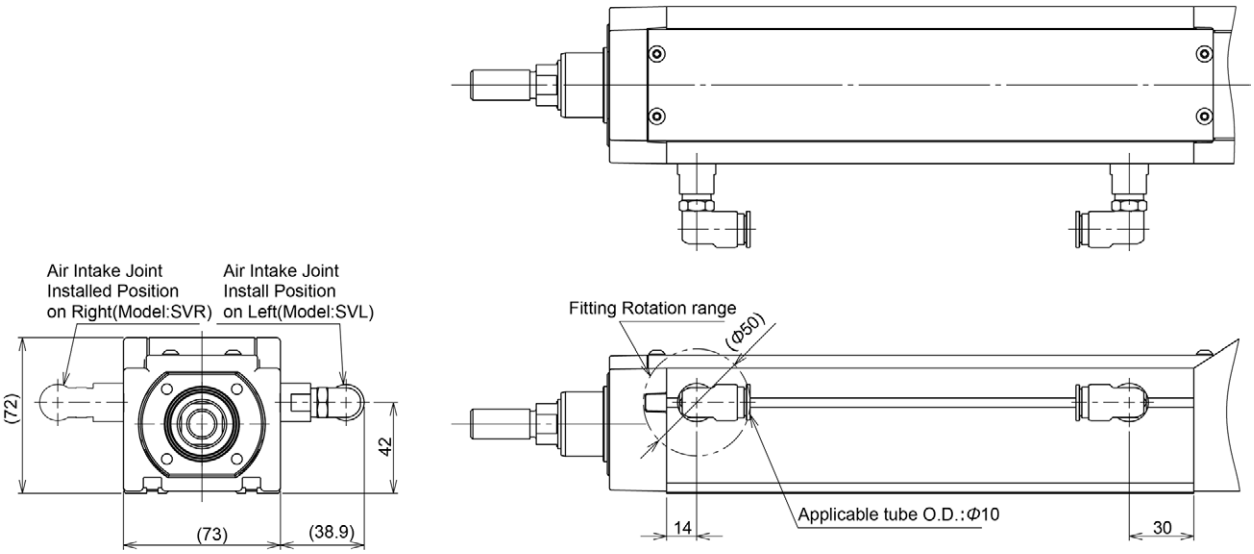
■EC-RR6□AHB(R)



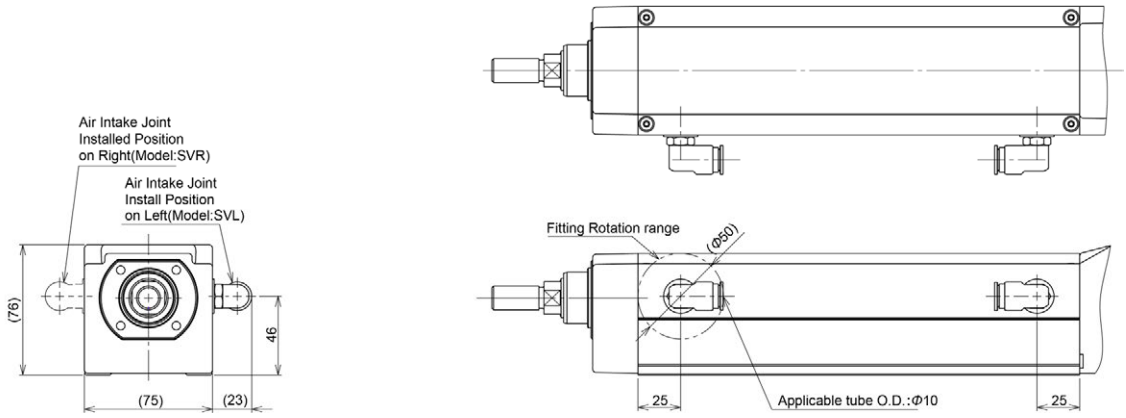
■EC-RR6X□AHB



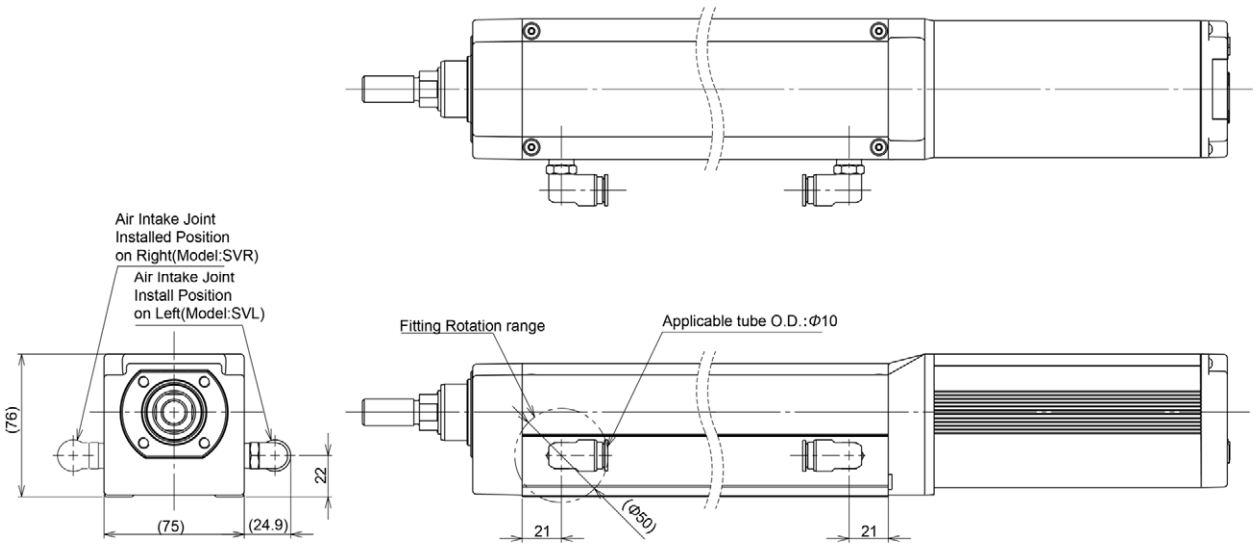
■EC-RR7□B(R)



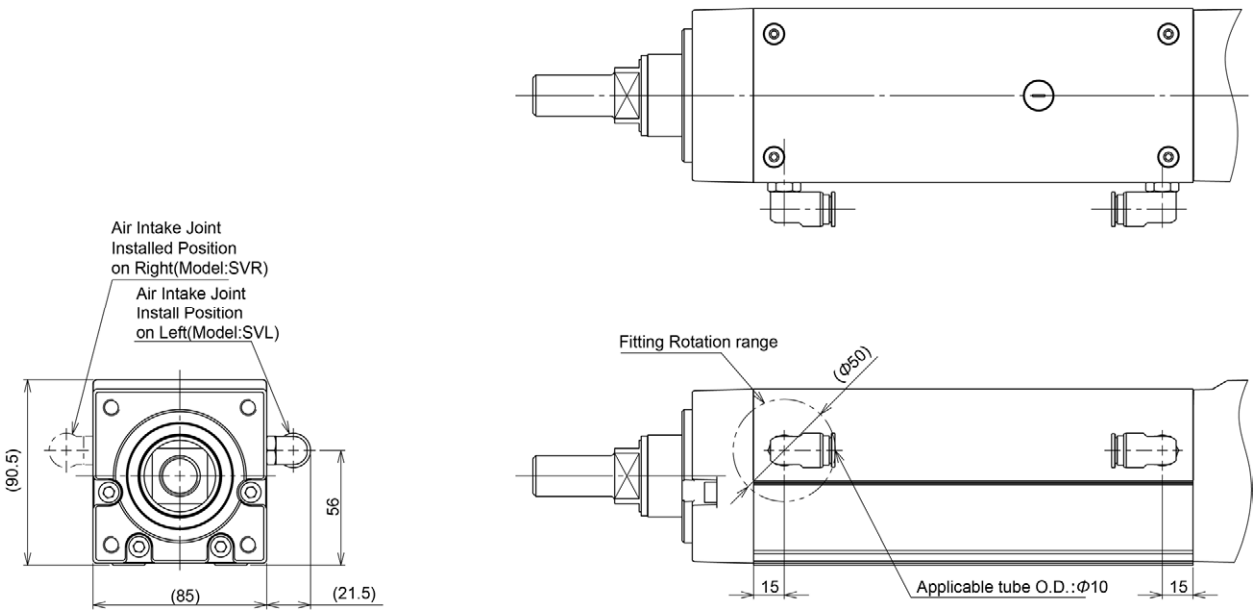
■EC-RR7□AHB(R)



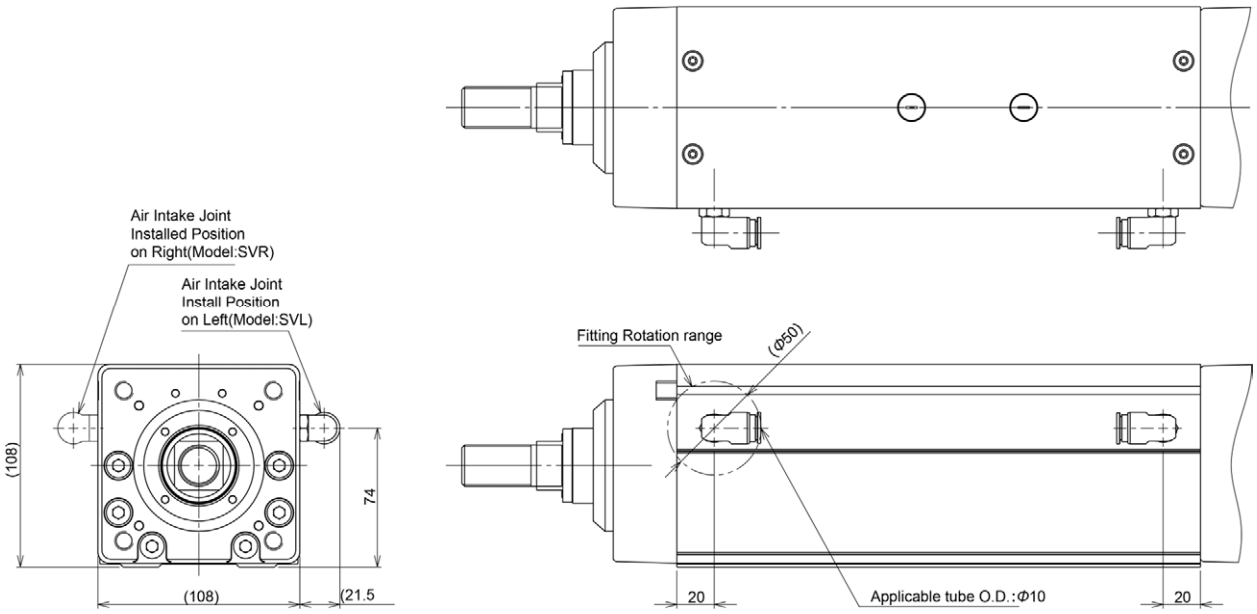
■EC-RR7X□AHB



■EC-RR8□B(R)



■EC-RR10□B(R)



1.9.17 2-circuit power supply specification (Model: TMD2)

It is an option to supply motor power and control power individually.

*It cannot be selected together with the RCON-EC connection type (option model code: ACR).

1.9.18 Battery-less absolute encoder specification (Model: WA)

The standard specification is for incremental encoder.

Specifying this option changes the unit to battery-less absolute encoder specification.

1.9.19 Wireless communication specification (Model: WL)

The models with wireless communication specification have built-in wireless circuit boards and enable wireless communication between ELECYLINDERs and Touch Panel Teaching Pendant.

Certificates and self-declarations regarding the wireless function are handled under the model name below for the wireless circuit board.

Model Name : IABL3826 or IABL3827, Refer to [Precautions for Handling Wireless Operation] for details

1.9.20 Wireless axis operation specification (Model: WL2)

The wireless axis operation specification includes a built-in wireless circuit board enabling wireless communication between the ELECYLINDER and the Touch Panel Teaching Pendant. Specifying WL2 enables operation testing of axis operation (movement to forward and backward ends, jog operation, inching operation) as well as the operation via wireless communication enabled with WL. However, the control device is not designed for purposes of automatic operation.

Be sure to refer to the Precautions for Axis Operation with Wireless Communication.

Certification and self-declaration regarding the wireless function are handled with the wireless circuit board model name below.

Model Name : IABL3826 or IABL3827, Refer to [Precautions for Handling Wireless Operation] for details

(Note) Changes from WL to WL2 and from WL2 to WL cannot be performed by the customer. Please contact us.

ELECYLINDER

Chapter 2

Installation

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2.1 Precautions for transportation

[Handling the package]

- Do not damage or drop the package.
  The package is not specially designed to withstand dropping or shock due to collision.
- Keep the unit in horizontal position for storage or transportation.
- Do not climb onto the package.
- Do not put anything that could deform the package on it.



[Handling after unpacking]

- Hold the base part for transportation for radial cylinder type.
- Do not carry the unit by its motor cover.
- Do not damage or drop the package during transportation.
- Do not apply excessive force to any part of the ELECYLINDER.
- The teaching port and power & I/O connector are connected to the built-in controller, so be especially careful not to apply external force.
  For the names of each part, refer to [Part Names] on page Intro-16 to 27.

Take out the optional part tray, and remove the actuator wrapped in film

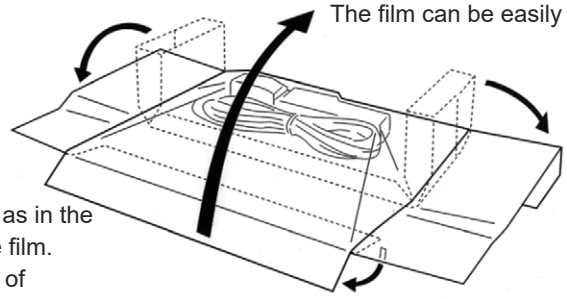


Unfold the cardboard and take out the actuator



Reference

These packaging materials can be recycled as cardboard.
The cardboard and urethane film are attached only with thermal bonding and use no adhesive.
This means they can be recycled as cardboard when disposed of, reducing industrial waste cost burdens.



Unfold the cardboard as in the figure, and pull off the film.
The film is also made of recyclable thermoplastic resin.

[Handling when assembled into machinery (system)]

- Secure rods to prevent sudden movement during transport.
- If the ELECYLINDER body or any moving part is overhanging, fix it appropriately to avoid large wobbles due to external vibration.
  When transporting without fixing the tip, do not apply impact of 0.3G or more.
- When suspending machinery (system) with ropes, be careful not to catch the rope on the ELECYLINDER or cable.

2.2 Installation and storage/preservation environment

Usage is possible in environments of pollution degree 2 or equivalent.

Pollution degree 2: Environment in which generally only nonconductive pollution occurs, but temporary conductive pollution may occur due to condensation (IEC 60664-1)

2.2.1 Installation environment

In general, it is an environmental that an operator can work without protection gear.
Avoid the following locations for installation.

- Where the unit receives radiant heat from strong heat sources such as heat treatment furnaces
- Where the ambient temperature exceeds the range of 10 to 40°C
- Where the temperature changes rapidly and condensation occurs
- Where the relative humidity exceeds 85% RH
- Where the unit receives direct sunlight
- Where the unit is exposed to corrosive or combustible gases
- Where the ambient air contains a large amount of dust, salt or iron (at levels exceeding those typical of an assembly plant)
- Where the unit is subject to splashed water or oil (including oil mist or cutting fluid) or chemical solutions
- Where the body receives impact or vibration
- Where the altitude is more than 1,000m

Provide sufficient work space for the following maintenance and inspection:

- Space to insert the teaching tool connector
- Space to replenish grease
- Space for replacement work of components such as a motor
  For details, refer to [Chapter 4 Maintenance and Inspection].

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

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

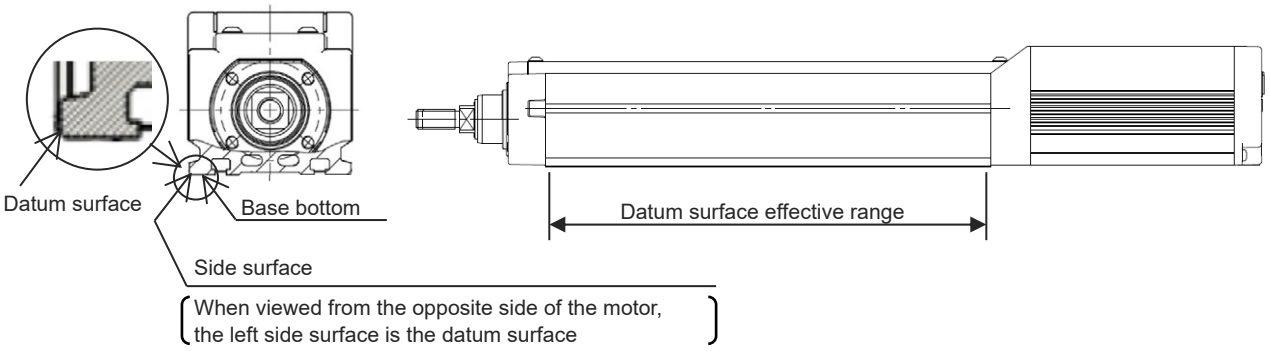
2.2.2 Storage/preservation environment

- For the storage and preservation environment, see the installation environment.
  Give especial consideration to the prevention of condensation in case of long-term storage/preservation.
- Unless especially specified, desiccant is not included in the package at shipping.
  If the product is to be stored/preserved in an environment where condensation is anticipated, take condensation preventive measures.
- For short-term storage, it can be stored at 60°C or below.
  For storage of one month or more, make sure that the temperature does not exceed 50°C.
- The product should be placed horizontally for storage and preservation.
  If storing in the packaged condition, observe the conditions, if any, regarding storage orientation.
  Refer to Horizontal installation in [2.3.2, 2.4.2, 2.5.2 Mounting Orientation] for the horizontal condition.

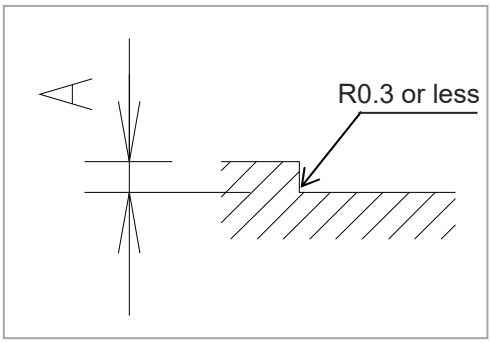
2.3 Installation of radial cylinder type (RR3 to RR7)

2.3.1 Installation surface

- The body mounting surface should be a machined surface or a plane with similar accuracy, with flatness within 0.05mm/m.
- The mounting frame should have a structure rigid enough to prevent the generation of vibration.
- Also consider the necessary space for maintenance work such as ELECYLINDER replacement and inspection.
- The bottom surface and left side surface (viewed from motor opposite side) of the body base serve as the datum surfaces for rod running. Use these surfaces as the datum surfaces for mounting when running accuracy is required.
- When applying radial load/moment load, fix the entire surface of the base bottom. Flange fixing may cause deflection or reflection throughout the product due to radial load/moment load, leading to vibration, shortened product life, or breakdown.



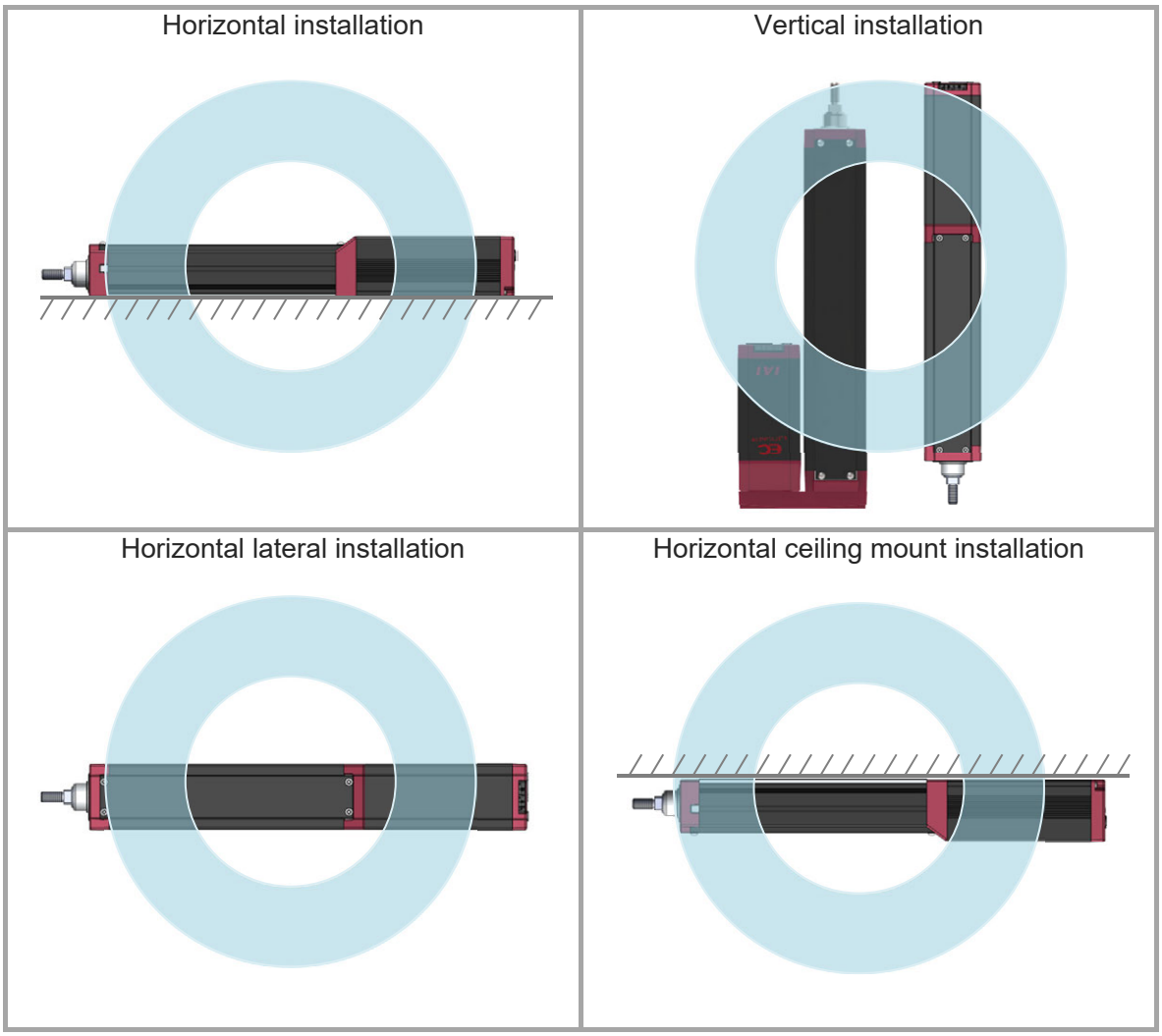
When mounting using the side datum surface, machine the installation surface according to the figure below.



A dimension
2 to 4mm

2.3.2 Mounting orientation

Type: EC-RR3□B/RR4□B/RR6□B/RR7□B/
RR3□BR/RR4□BR/RR6□BR/RR7□BR



○ : Available for Installation

Caution

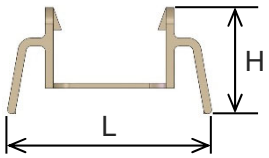
- Orientation with the motor located on top is recommended for the vertical installation.
- If the motor is installed on the top, cap the teaching port.
  Clogging with foreign matter may lead to a breakdown.
- Sometimes base oil separates from the grease due to the operating environment, mounting orientation, or operating conditions, and leaks from the inside of ELECYLINDER to the exterior. Protect the peripheral equipment if base oil adhesion negatively affects them.

2.3.3 Square nuts

The square nuts regulated in JIS B1163 can be used for the T-slots.
The square nut quantities enclosed at shipping and related information are as follows.

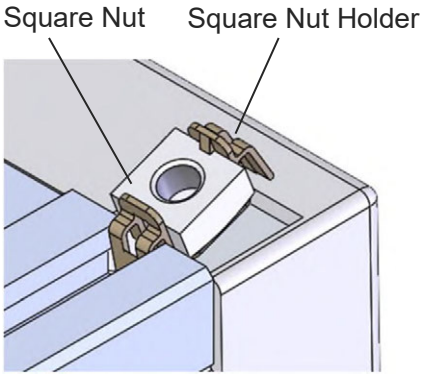
Type	Square nut quantity enclosed	Screw size	Required bolt length from base bottom	Minimum number of fixing bolts	Tightening torque
RR3□B RR3□BR	6 pcs	M3	4 to 4.5mm	4 pcs	0.8N·m
RR4□B RR4□BR RR6□B RR6□BR	6 pcs	M4	5 to 6mm	4 pcs	1.8N·m
RR7□B RR7□BR	6 pcs	M5	6.5 to 8mm	4 pcs	3.4N·m

Square Nut Holder

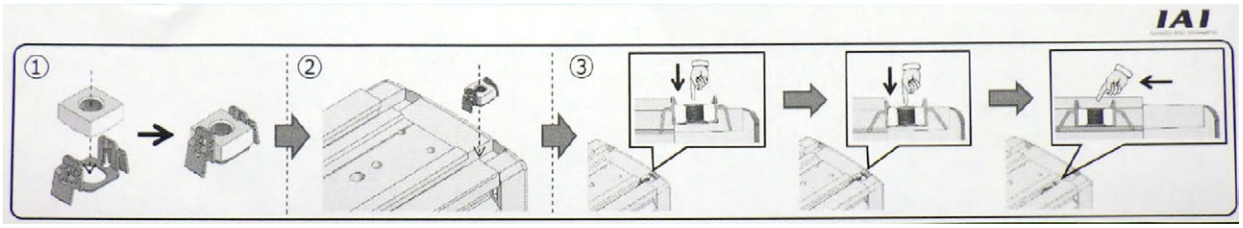


Dimension [mm]	For M3	For M4	For M5
L	12.9	12.7	13.7
W	5.5	6.8	8.0
H	4.8	6.6	8.6

Example of Insertion

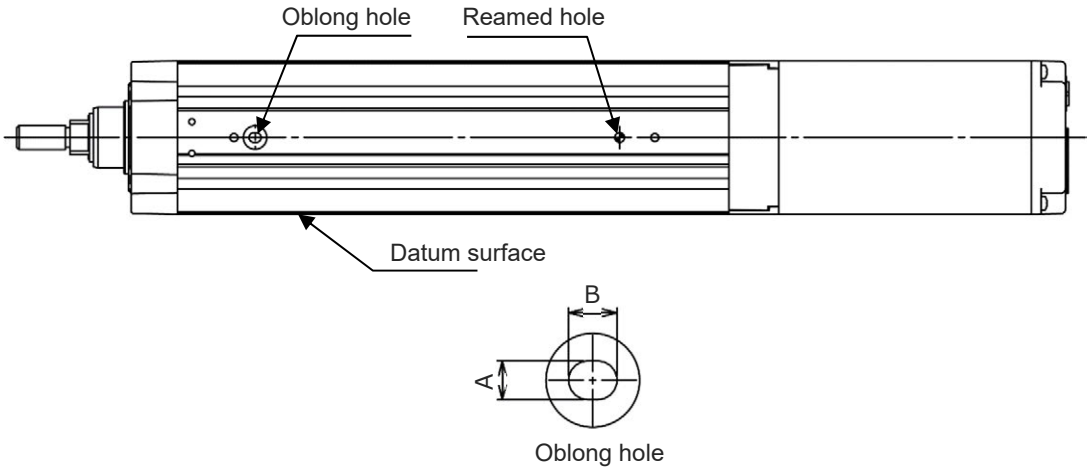


* Refer to the instruction manual enclosed with the product for how to mount it.



2.3.4 Body mounting

There are a reamed hole and an oblong hole for the positioning pins on the bottom of the actuator. Use the reamed hole and oblong hole if mounting reproducibility after detachment is required. When fine adjustment of angles, etc. is required, consider using only the reamed hole. Refer to [Chapter 5 External Dimensions].



Type	Reamed hole	Oblong hole
RR3□B RR3□BR	ϕ3H7 depth 4	A:3 $^{+0.010}_{0}$ B: 4 depth 4 mm
RR4□B RR4□BR	ϕ3H7 depth 4	A:3 $^{+0.010}_{0}$ B: 4 depth 4 mm
RR6□B RR6□BR	ϕ4H7 depth 5	A:4 $^{+0.012}_{0}$ B: 5 depth 5 mm
RR7□B RR7□BR	ϕ4H7 depth 5	A:4 $^{+0.012}_{0}$ B: 5 depth 5 mm

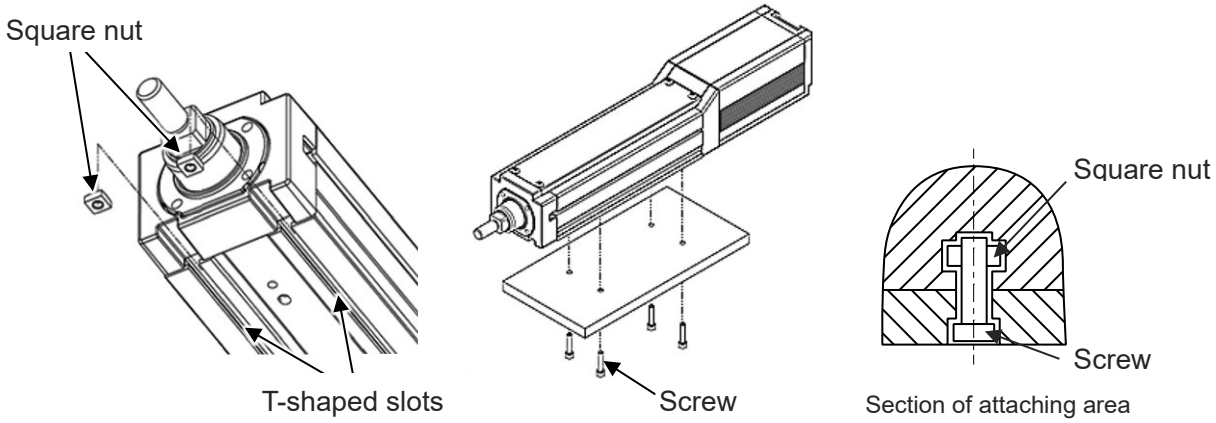
* Depth of reamed hole and oblong hole indicates depth from the base seating surface

[1] When using the T-shaped slot on the base bottom

The unit has T-shaped slots at the bottom of the base for mounting.

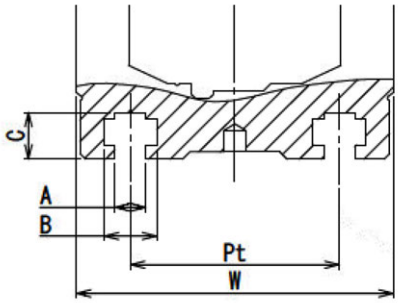
Insert square nuts into the T-shaped slots and fix it from the back.

For details regarding the position and dimensions, refer to [Chapter 5 External Dimensions].



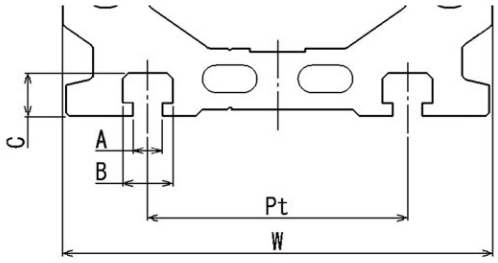
T-shaped slot dimensions

● EC-RR3□B/RR4□B/RR3□BR/RR4□BR



Type	W	Pt	A	B	C
RR3□B RR3□BR	35mm	22mm	3.3mm	5.8mm	4.8mm
RR4□B RR4□BR	44mm	29mm	4.3mm	7.3mm	6.5mm

● EC-RR6□B/RR7□B/RR6□BR/RR7□BR



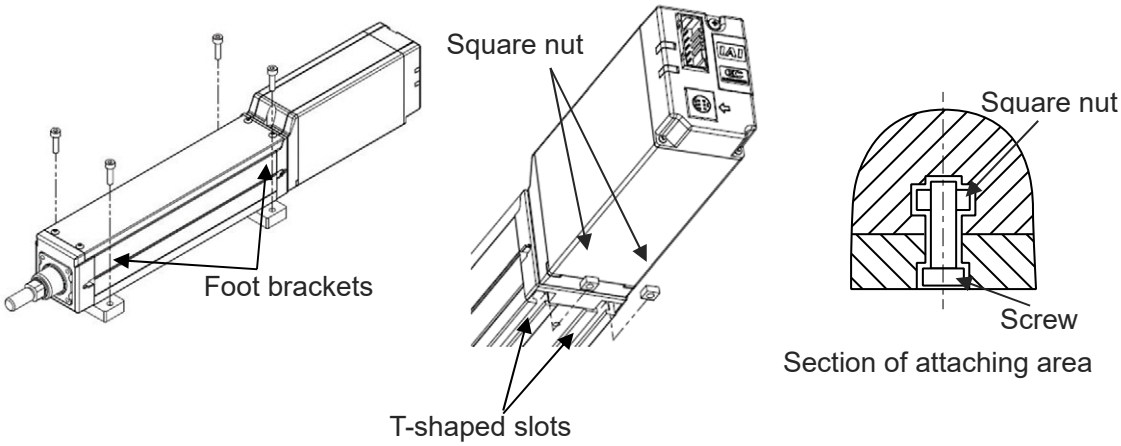
Type	W	Pt	A	B	C
RR6□B RR6□BR	63mm	38mm	4.3mm	7.3mm	6.3mm
RR7□B RR7□BR	73mm	46mm	5.3mm	8.5mm	8.5mm

[2] When using foot brackets

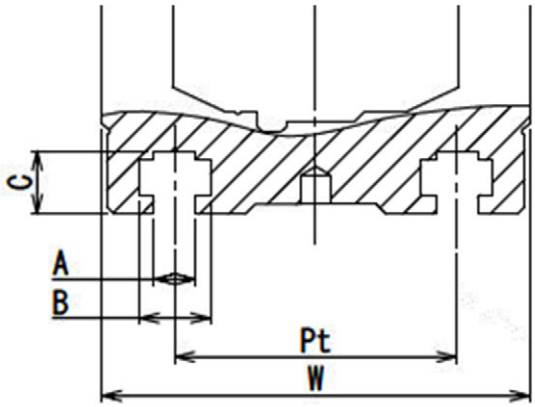
Mounting from the top is possible using foot brackets.

♦ **Motor Straight EC-RR3□B/RR4□B**

Insert square nuts to the T-slots and the foot brackets can be affixed at the back with screws.
For details regarding the position and dimensions, refer to [Chapter 5 External Dimensions].



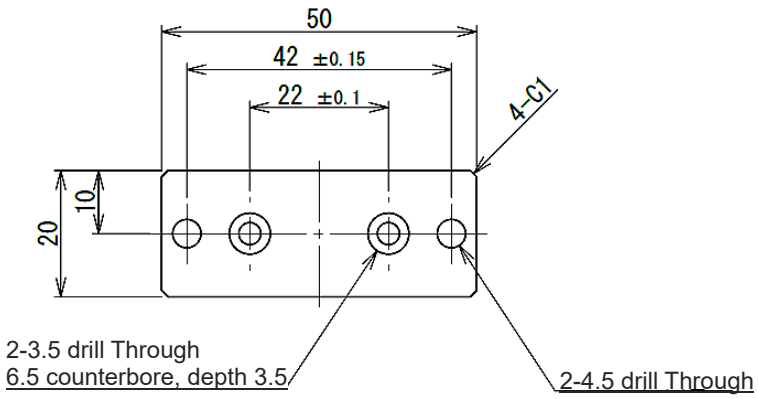
T-shaped slot dimensions



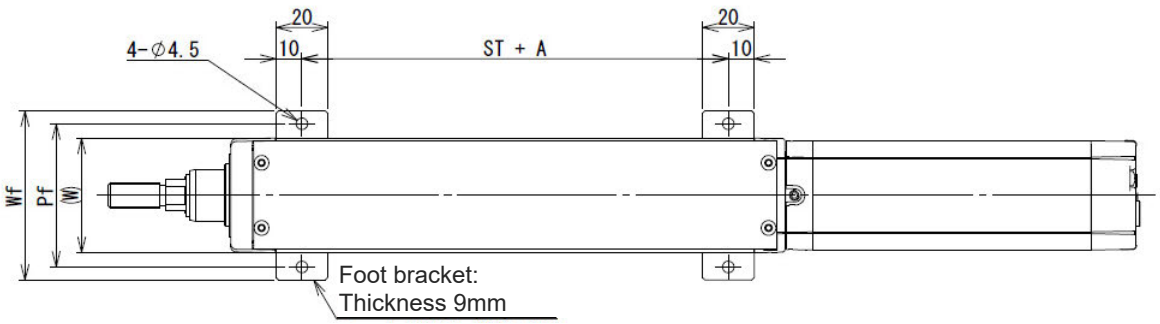
Type	W	Pt	A	B	C
RR3□B	35mm	22mm	3.3mm	5.8mm	4.8mm
RR4□B	44mm	29mm	4.3mm	7.3mm	6.5mm

[Foot bracket for EC-RR3□B]

(Part model number: EC-FT-SRR3, 2 pcs/set)



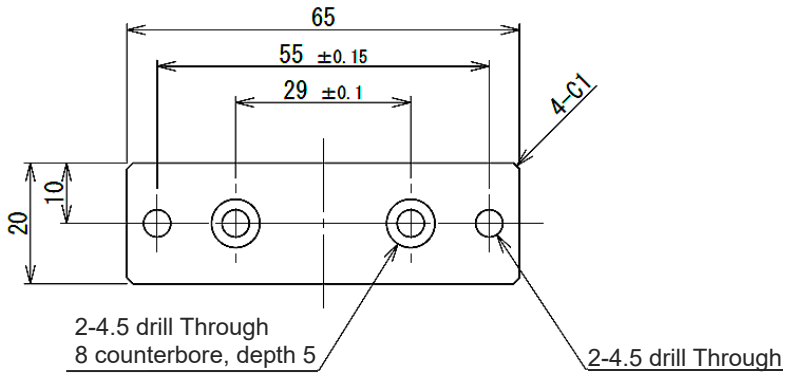
Foot bracket mounting dimensions



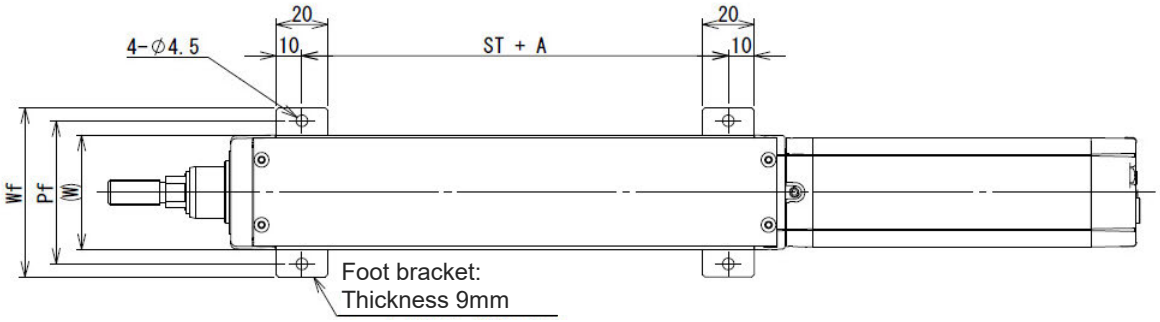
Type	Wf	Pf	W	A	Screw size	Number of brackets	Tightening torque
RR3□B	50mm	42mm	35mm	44mm	M4	4 locations	1.8N·m

[Foot bracket for EC-RR4□B]

(Part model number: EC-FT-SRR4, 2 pcs/set)



Foot bracket mounting dimensions



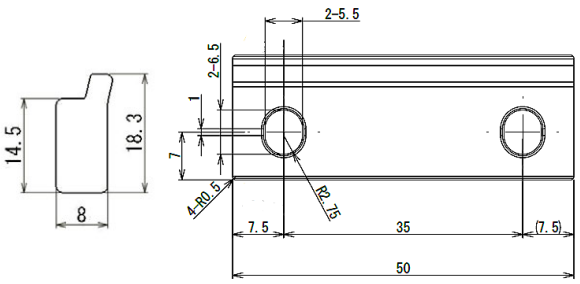
Type	Wf	Pf	W	A	Screw size	Number of brackets	Tightening torque
RR4□B	65mm	55mm	44mm	64mm	M4	4 locations	1.8N·m

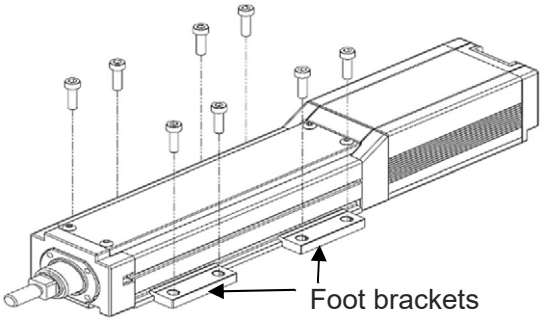
♦ Motor Straight EC-RR6□B/RR7□B

The groove on the side of the main body can be fixed from the top. (Refer to next page for how to mount the foot bracket)

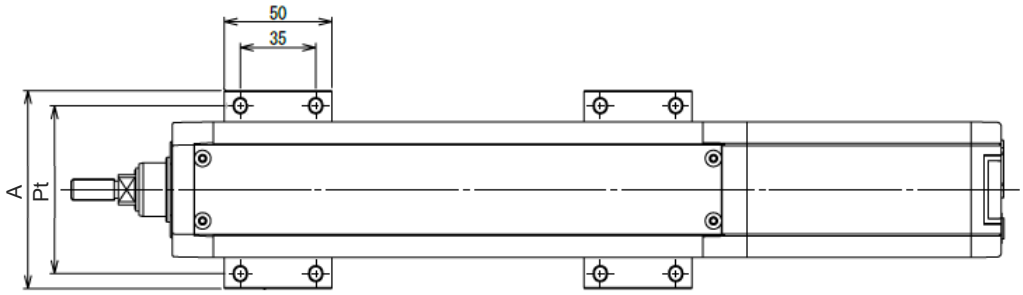
[Foot bracket for EC-RR6□B/RR7□B]

Part model number : For EC-RR7□B (EC-FTSB-02, 6 pcs/set)
For EC-RR6□B (EC-FTSB, 4 pcs/set)





Foot bracket mounting dimensions



Type	Pt	A	Screw size	Minimum number of brackets	Tightening torque
RR6□B	78mm	92mm	M5	4 locations	7.3N·m
RR7□B	88mm	102mm	M5	6 locations	7.3N·m

Caution

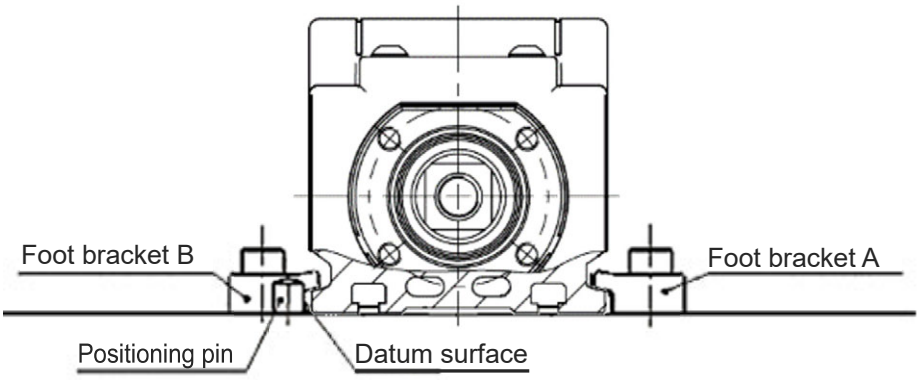
- Have the foot brackets attached on one end and the other as shown in the figure above. When the distance between the brackets is too close to each other, the stiffness at installation may not be enough.

Foot bracket mounting procedure

Before fixing, use a positioning pin or the like to position the bracket in the width direction.

Mounting procedure

(1) Press against the base datum surface with a positioning pin, etc.
(2) Maintaining the pressure, fix foot bracket A on the opposite side.
(3) Finally, fix foot bracket B.



Caution

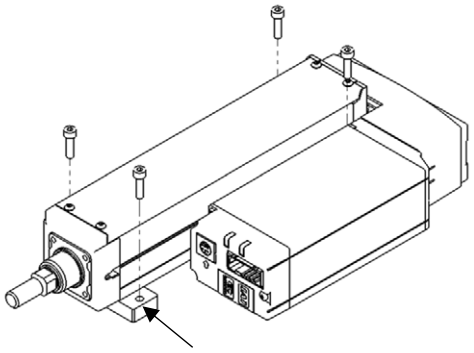
- Sufficient fastening force may not be obtainable when mounting with methods other than the procedure above.

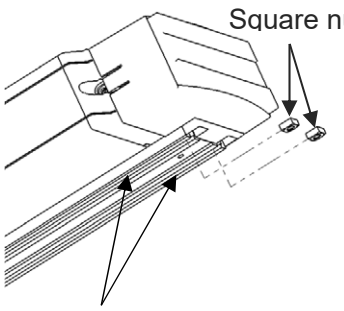
Notice

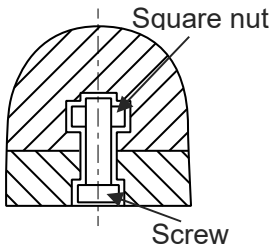
- The bolts for fixing foot brackets on the installation surface are to be prepared by the customer.
- The use of high-strength bolts of ISO-10.9 or higher is recommended.
- Make sure the internal thread and bolt effective engagement length is approximately 1.8 times the nominal diameter or more.

♦ **Motor reversed EC-RR3□BR/RR4□BR**

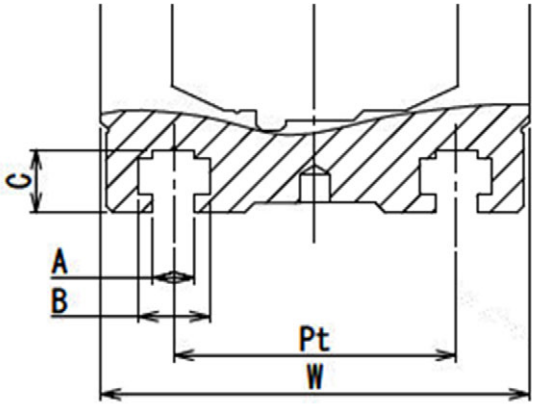
Insert square nuts to the T-slots and the foot brackets can be affixed at the back with screws.
For details regarding the position and dimensions, refer to [Chapter 5 External Dimensions].







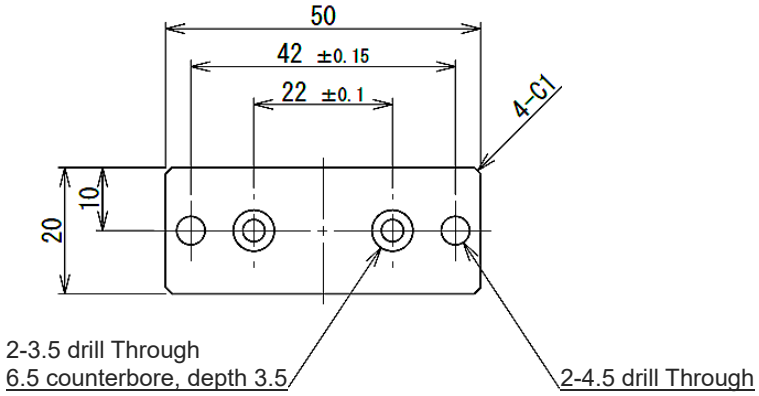
T-shaped slot dimensions



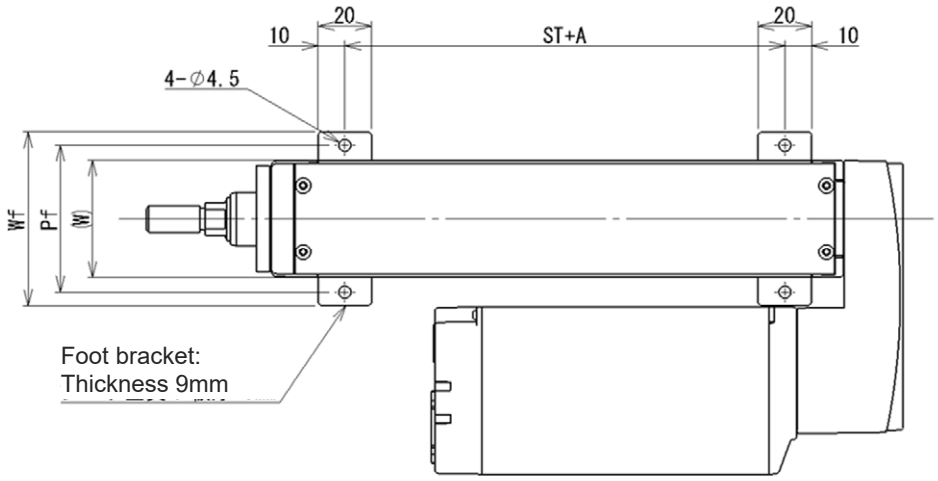
Type	W	Pt	A	B	C
RR3□BR	35mm	22mm	3.3mm	5.8mm	4.8mm
RR4□BR	44mm	29mm	4.3mm	7.3mm	6.5mm

[Foot bracket for EC-RR3□BR]

(Part model number: EC-FT-SRR3, 2 pcs/set)



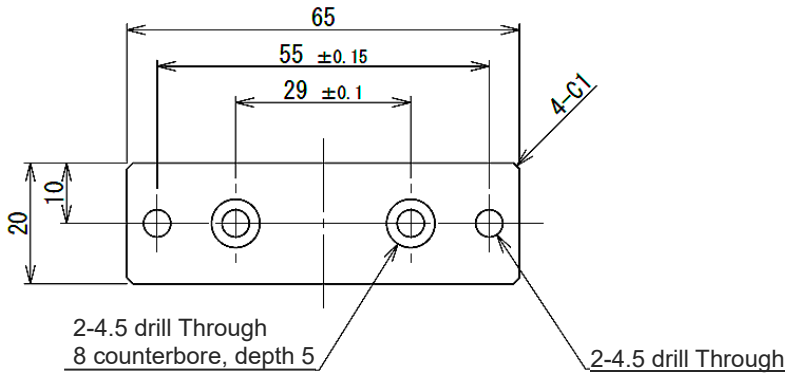
Foot bracket mounting dimensions



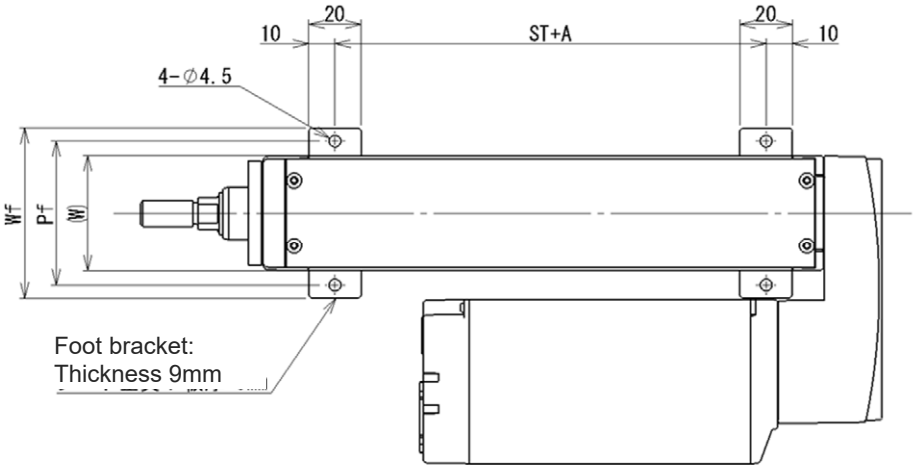
Type	Wf	Pf	W	A	Screw size	Minimum number of brackets	Tightening torque
RR3□BR	50mm	42mm	35mm	44mm	M4	4 locations	1.8N·m

[Foot bracket for EC-RR4□BR]

(Part model number: EC-FT-SRR4, 2 pcs/set)



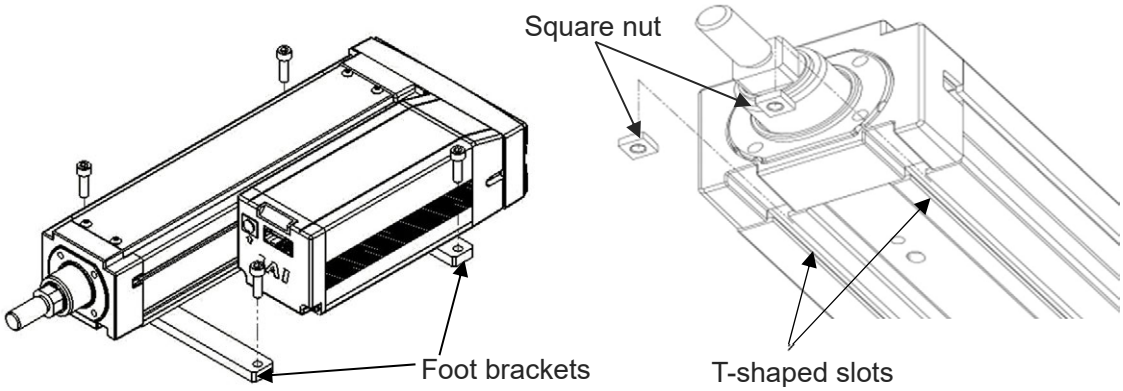
Foot bracket mounting dimensions

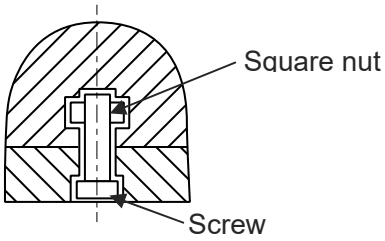


Type	Wf	Pf	W	A	Screw size	Minimum number of brackets	Tightening torque
RR4□BR	65mm	55mm	44mm	64mm	M4	4 locations	1.8N·m

♦ **Motor reversed EC-RR6□BR/RR7□BR**

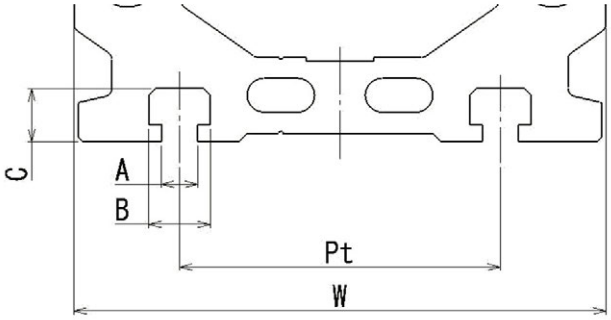
Insert square nuts to the T-slots and the foot brackets can be affixed at the back with screws.
For details regarding the position and dimensions, refer to [Chapter 5 External Dimensions].





Section of attaching area

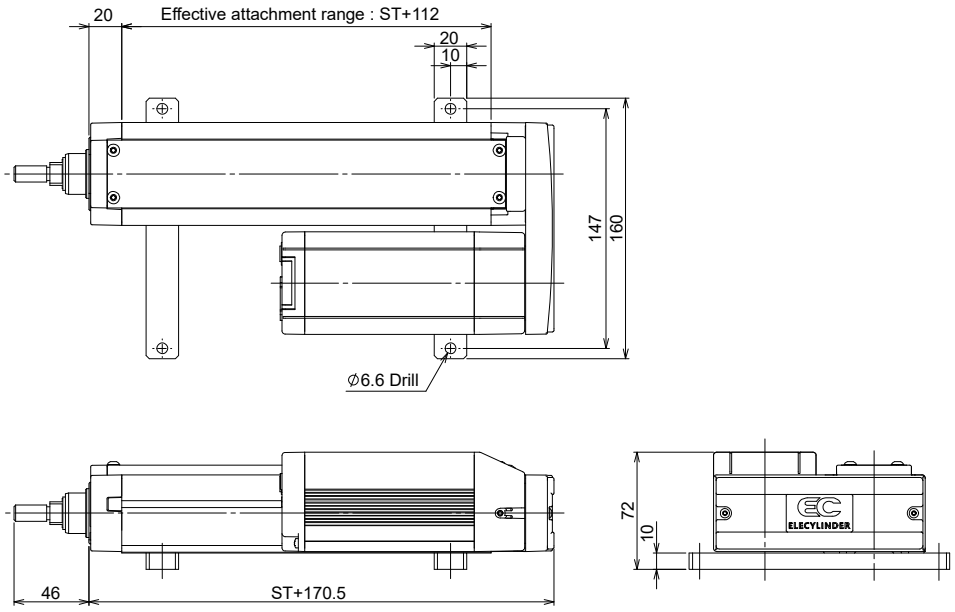
T-shaped slot dimensions



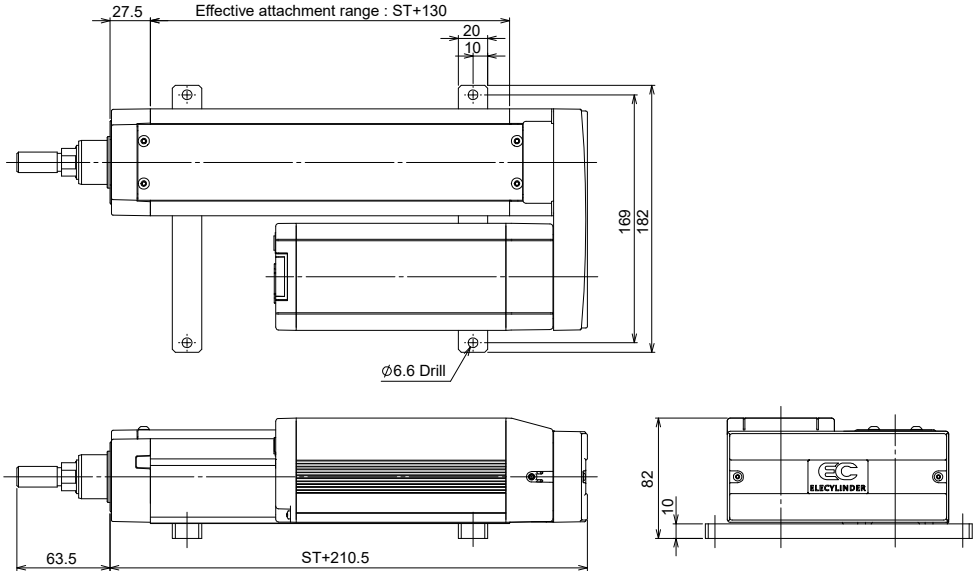
Type	W	Pt	A	B	C
RR6□BR	63mm	38mm	4.3mm	7.3mm	6.3mm
RR7□BR	73mm	46mm	5.3mm	8.5mm	8.5mm

Foot bracket mounting dimensions

● EC-RR6□BR



● EC-RR7□BR

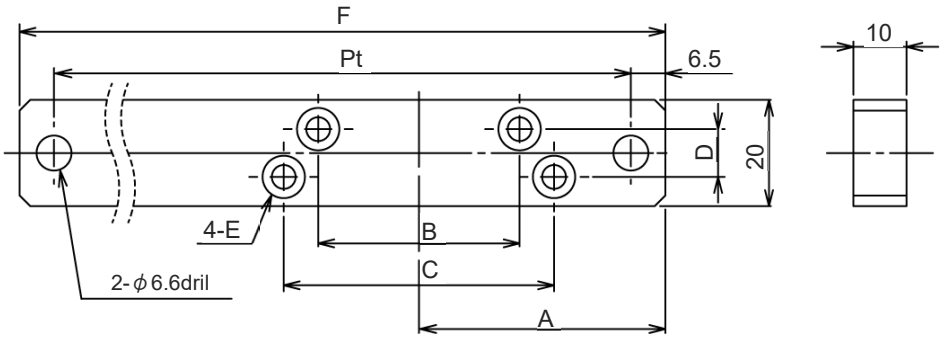


Quantity of foot brackets

Type	65	115	165	215	265	315
RR6□BR	2	2	2	2	2	2
RR7□BR	2	2	2	2	2	2

Foot bracket

(Note) When the foot bracket is ordered as a single product, it comes with a foot bracket (1 pc) and hex socket head bolts (2 pcs) as a set.



Type	Individual model code	A	B	C	D
RR6□BR	EC-FT-SRR6R	46.5mm	38mm	51mm	9mm
RR7□BR	EC-FT-SRR7R	52.5mm	46mm	61mm	8mm

Type	E	F	Pt
RR6□BR	ϕ4.5 drill ϕ8 counterbore, depth 5.5	160mm	147mm
RR7□BR	ϕ5.5 drill ϕ10 counterbore, depth 7	182mm	169mm

● Foot bracket attachment to ELECYLINDER

* Attach it with a square nut and a screw

Type	Screw size
RR6□BR	M4×10
RR7□BR	M5×10

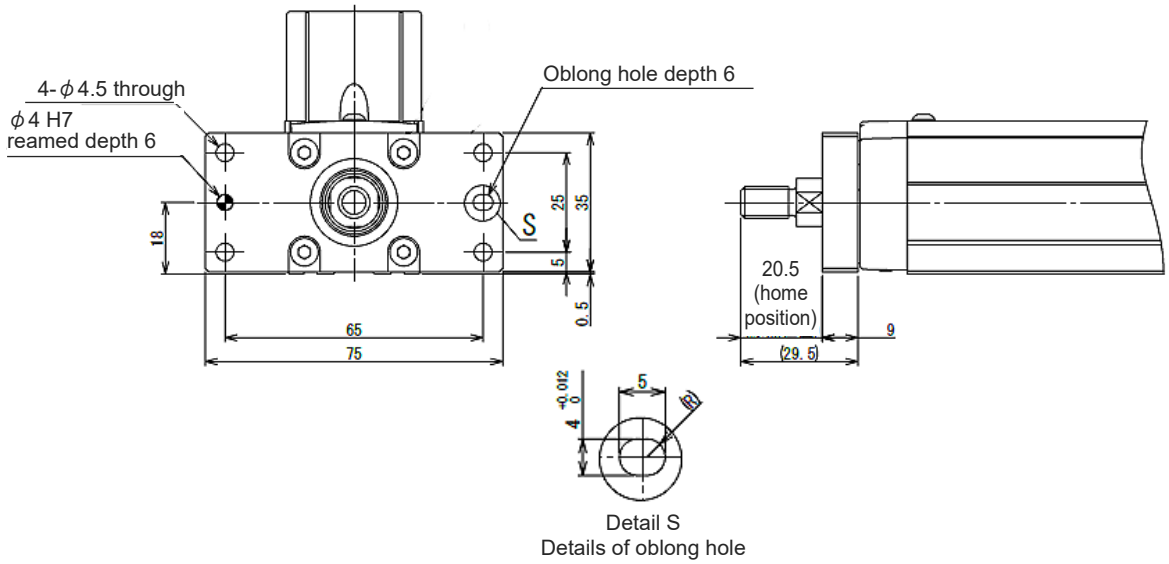
● Attaching foot bracket to frame

Type	Screw size	Tightening torque
RR6□BR	M6	5.4N·m
RR7□BR	M6	5.4N·m

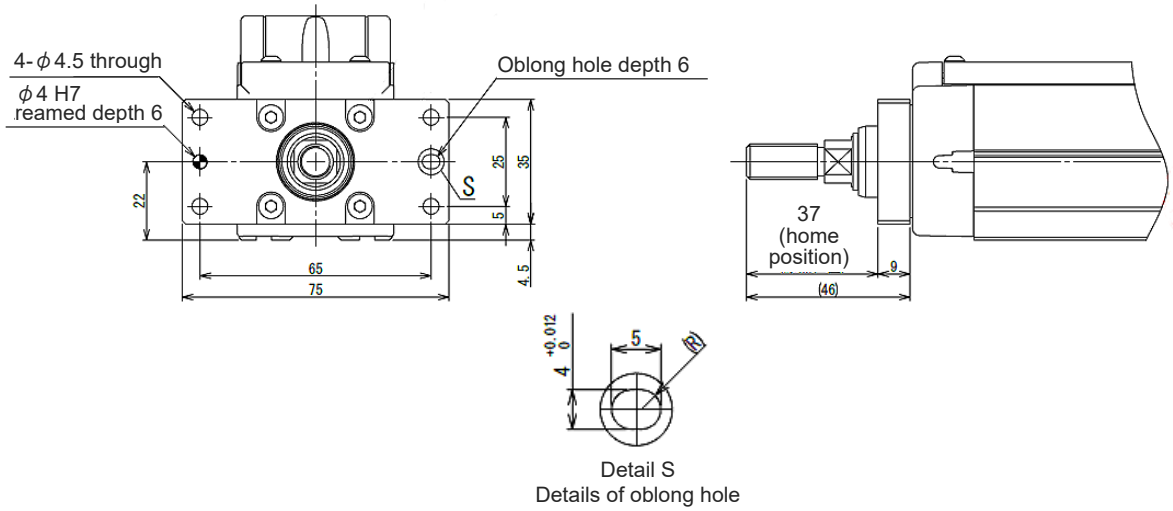
[2] When using flanges (front)

ELECYLINDERs can be mounted with flanges (front) (option: model FL).
For precautions for mounting, see [page 2-24].

● For EC-RR3□B/ RR3□BR (Part model number: EC-FL-RR3)

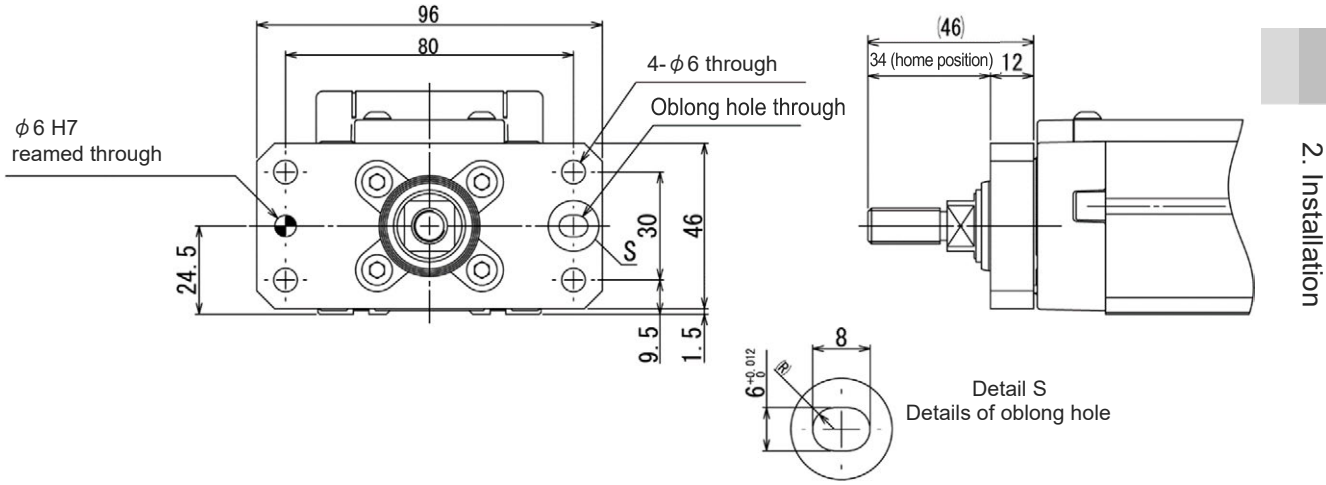


● For EC-RR4□B/ RR4□BR (Part model number: EC-FL-RR3)

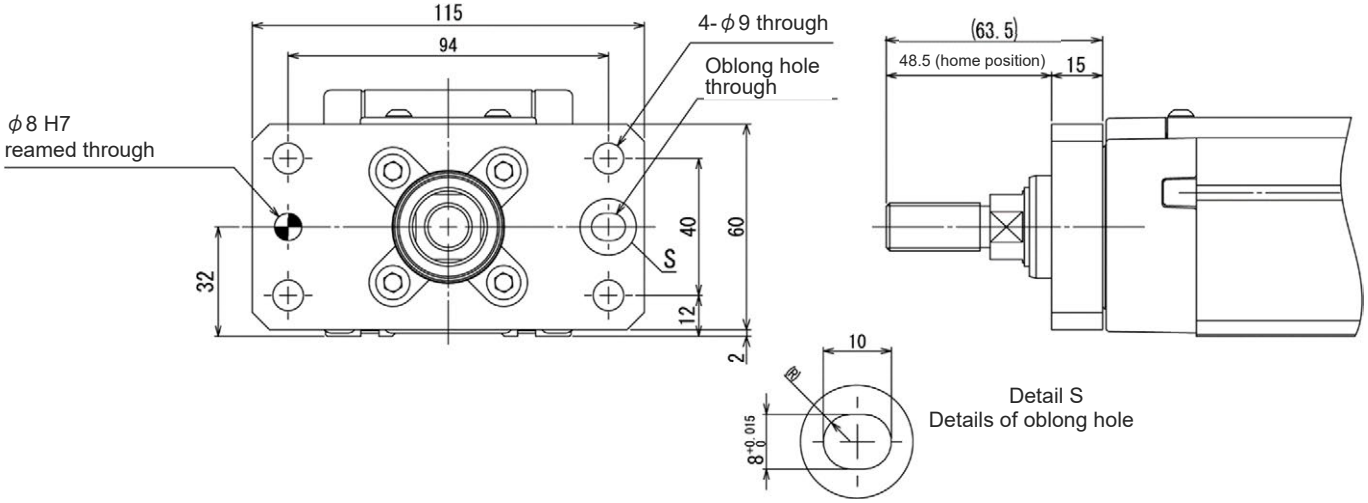


Type	Material	Tightening torque when mounting ELECYLINDER
RR3□B RR3□BR	Aluminum alloy	1.8N·m
RR4□B RR4□BR	Aluminum alloy	1.8N·m

● For EC-RR6□B/RR6□BR (Part model number ECB-FL-RR6)



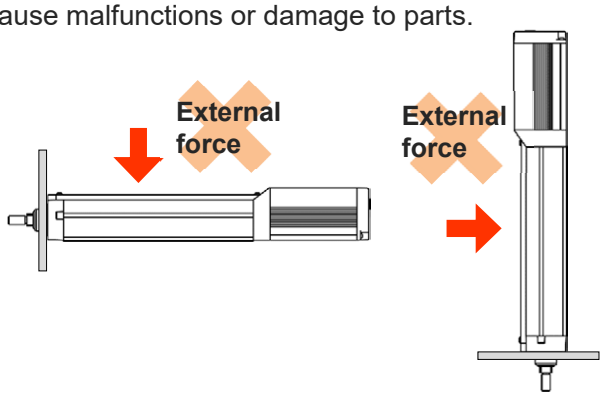
● For EC-RR7□B/RR7□BR (Part model number ECB-FL-RR7)



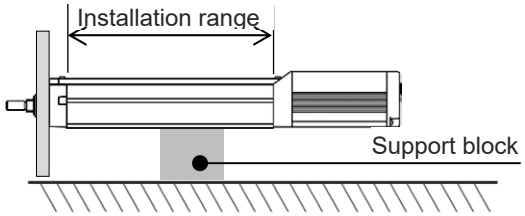
Type	Material	Tightening torque when mounting ELECYLINDER
RR6□B RR6□BR	Iron (Nickel plating treatment)	3.4N·m
RR7□B RR7□BR	Iron (Nickel plating treatment	5.4N·m

♦ Precautions

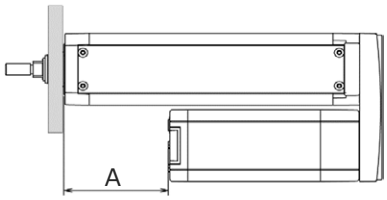
1) Do not apply external force to the ELECYLINDER body
External force may cause malfunctions or damage to parts.



2) ELECYLINDER is to be installed horizontally, have a support block prepared as shown in the figure to support the main unit.
- The support block should be installed on the frame motor side.
- We recommend either using the optional foot bracket or keeping the support block (aluminum alloy, etc.) close against the frame.



3) For models with short stroke, there may be a case that a screw to fix the flange cannot get in as there is no gap between the flange attachment surface and the motor (A).
Therefore, it is recommended to have the flange oriented vertically. Also, do not have the cables out from the connector forcefully bent.



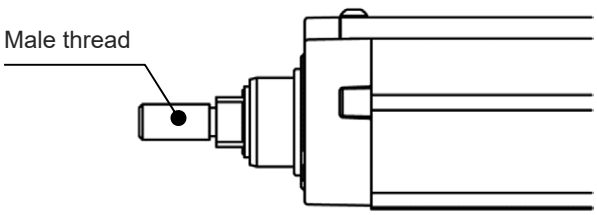
[Recommended Stroke in Vertical Orientation]

Type	Encoder	Brake	Stroke
RR3□BR RR4□BR	Incremental	Yes	50, 100
		No	50
	Battery-less absolute	Yes	50, 100
		No	50, 100
RR6□BR RR7□BR	Incremental	Yes	65
		No	
	Battery-less absolute	Yes	65
		No	

2.3.5 Mounting transported objects

[When using the rod tip adapter male thread]

- Remove the male thread cap.
- Transported objects can be secured using the male thread of the rod tip adapter.
  * Fix the rod tip bracket width across flats with a wrench, etc., to prevent loads from being applied to the rod.

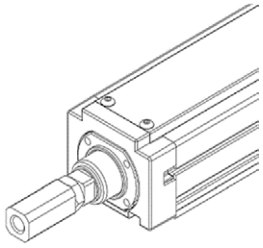


Type	Male thread dimensions	Tightening torque	Width across frats [mm]
RR3□B RR3□BR	M8 × 1.25, effective thread length 12.0mm	15.0N·m	12
RR4□B RR4□BR	M10 × 1.25, effective thread length 20.0mm	30.0N·m	12
RR6□B RR6□BR			14
RR7□B RR7□BR	M14 × 1.5, effective thread length 27.5mm	35.0N·m	19

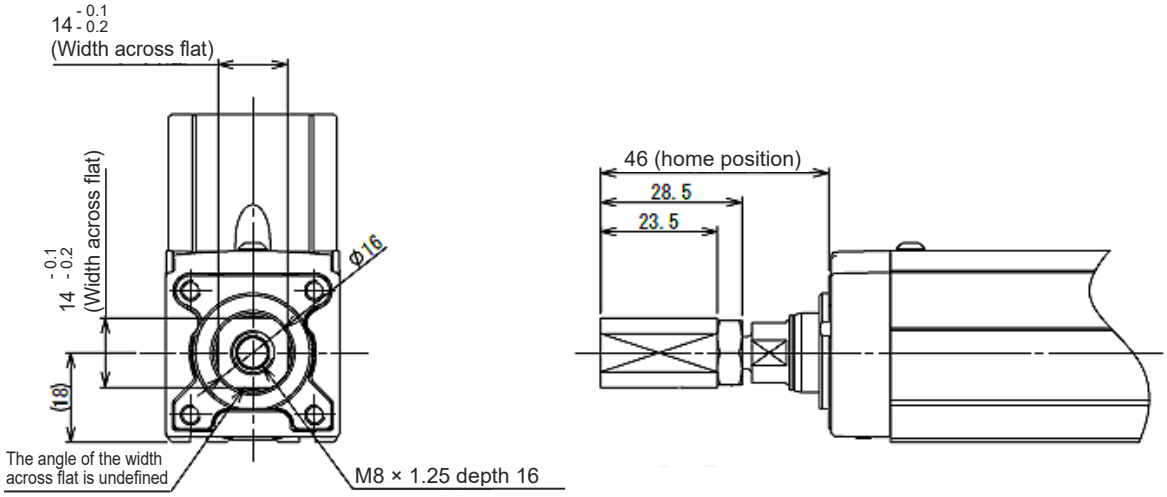
[When using tip adapter]

Transported objects can be secured using the internal thread of the tip adapter.

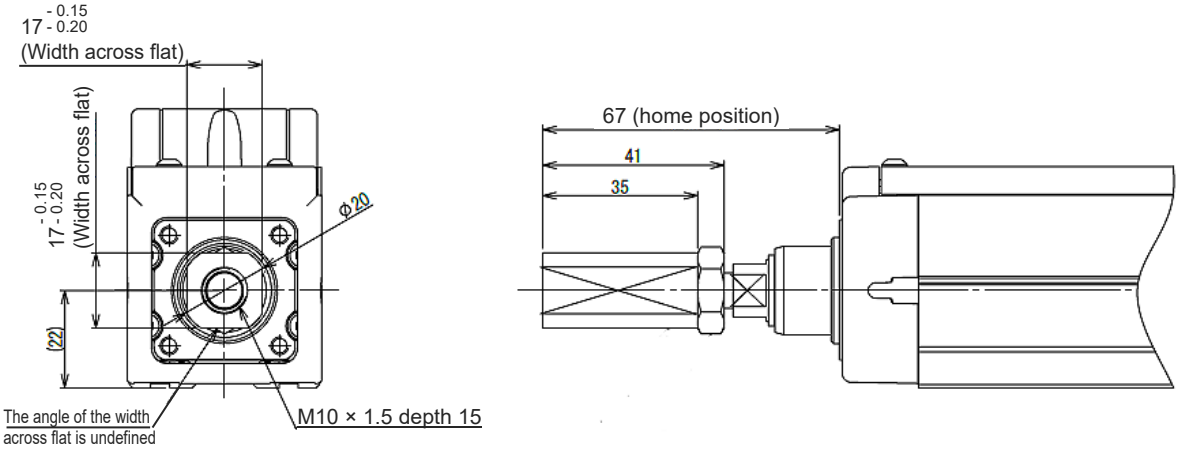
* Fix the rod tip bracket width across flats with a wrench, etc., to prevent loads from being applied to the rod.



● For EC-RR3□B/RR3□BR (Part model number: EC-NFA-RR3)

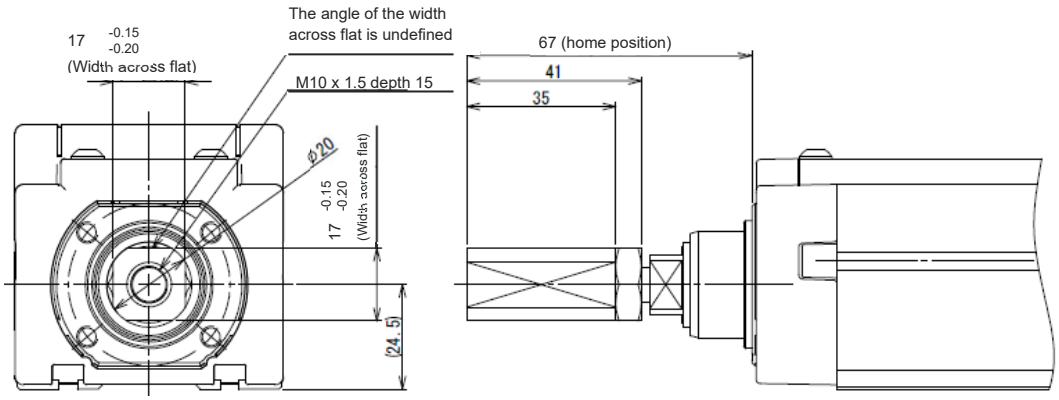


● For EC-RR4□B/RR4□BR (Part model number: EC-NFA-R6)

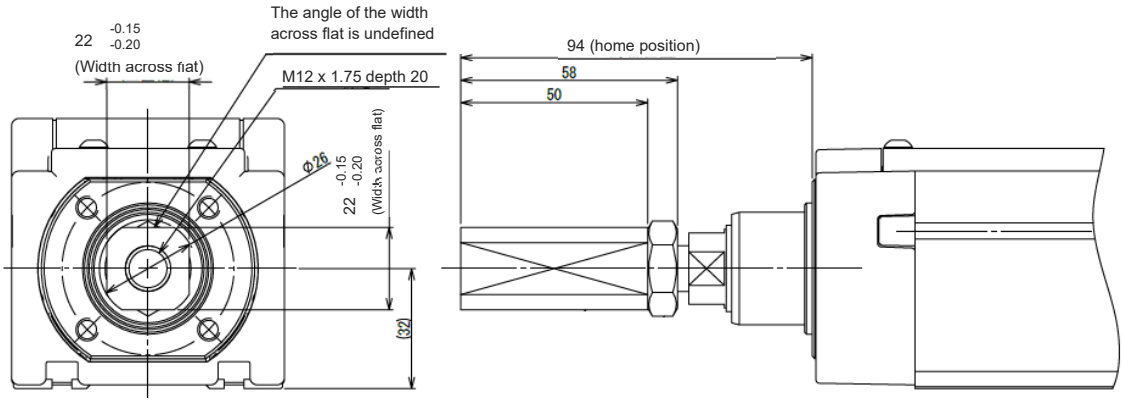


Type	Tightening torque when mounting ELECYLINDER
RR3□B RR3□BR	15.0N·m
RR4□B RR4□BR	30.0N·m

● For EC-RR6□B/RR6□BR (Part model number EC-NFA-R6)



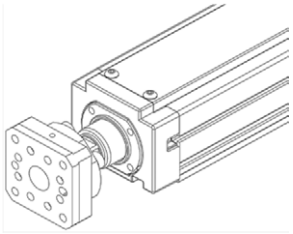
● For EC-RR7□B/RR7□BR (Part model number EC-NFA-R7)



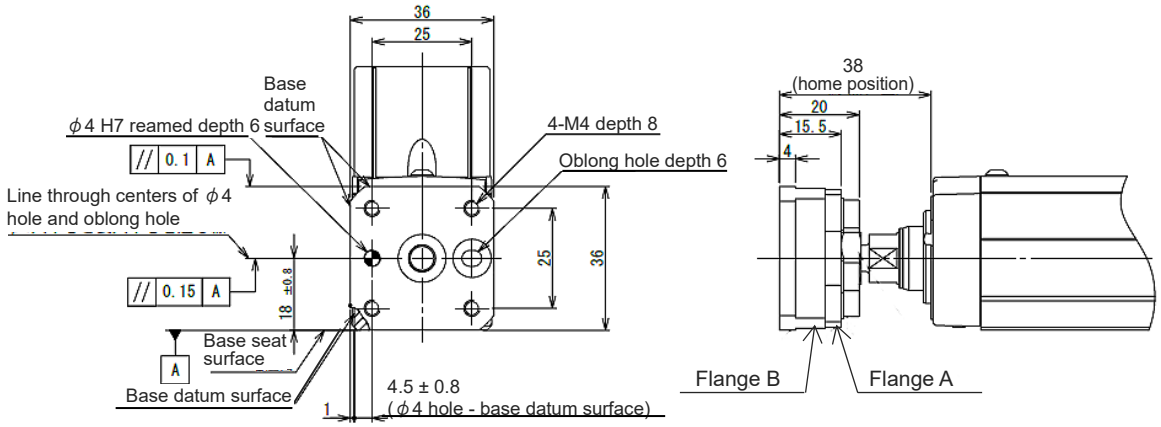
Type	Tightening torque when mounting ELECYLINDER
RR6□B RR6□BR	30.0N·m
RR7□B RR7□BR	35.0N·m

[When using tip flange]

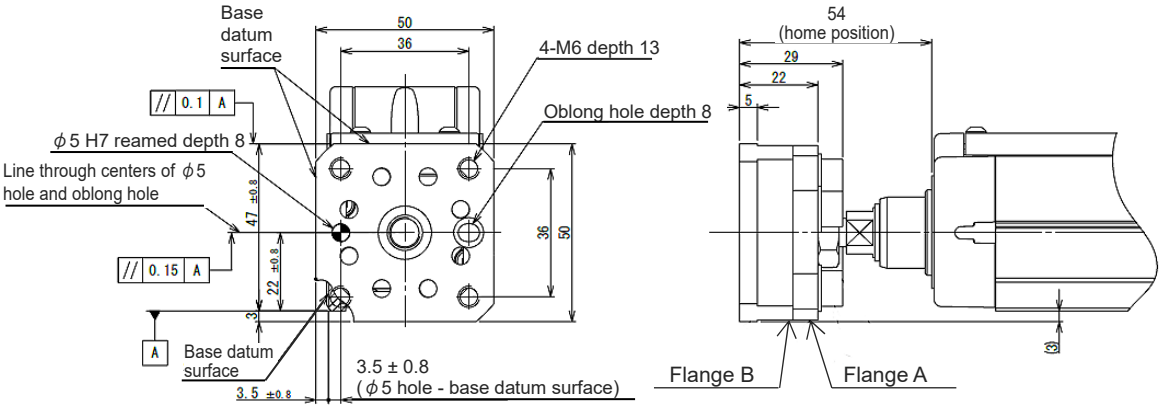
Transported objects can be secured using the flange of the tip adapter.



- For EC-RR3□B/RR3□BR (Part model number: EC-FFA-RR3)

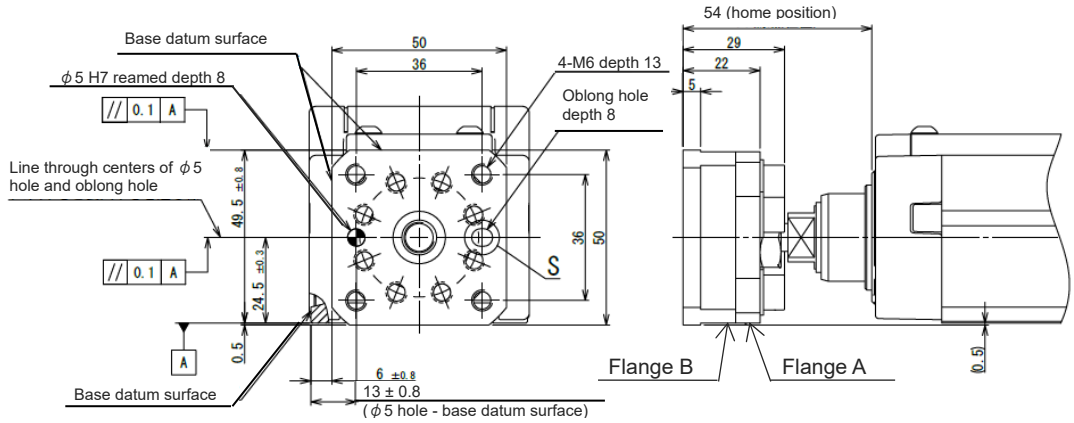


- For EC-RR4□B/RR4□BR (Part model number: EC-FFA-RR6)

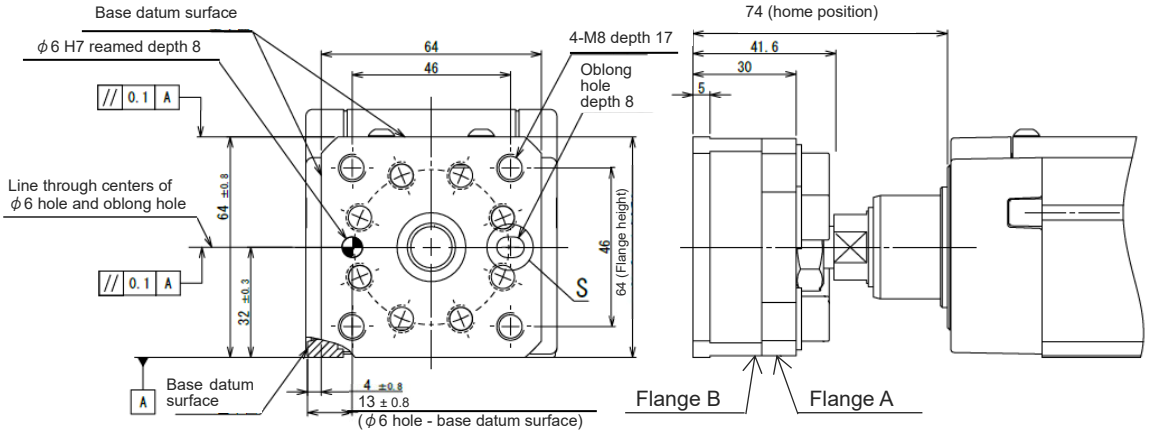


Type	Tightening torque when mounting flanges A and B	Tightening torque when mounting ELECYLINDER
RR3□B RR3□BR	2.1N·m (M4)	15.0N·m
RR4□B RR4□BR	7.1N·m (M6)	30.0N·m

● For EC-RR6□B/RR6□BR (Part model number EC-FFA-RR6)



● For EC-RR7□B/RR7□BR (Part model number EC-FFA-RR7)



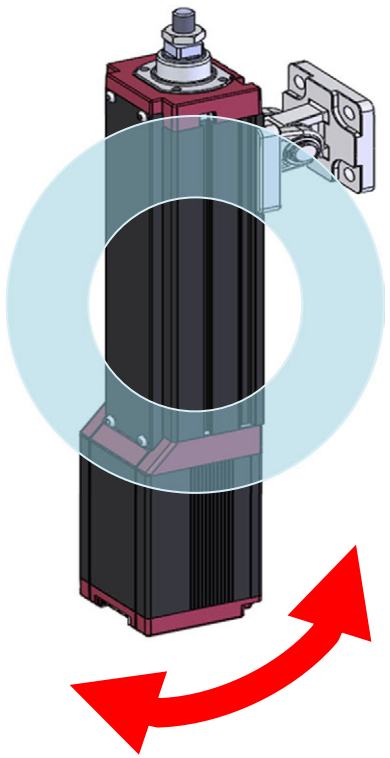
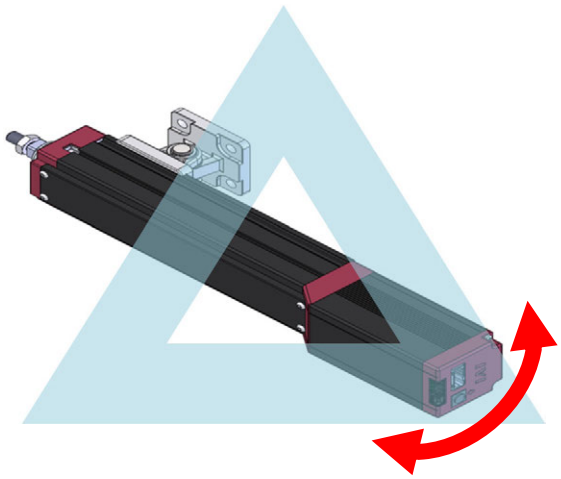
Type	Tightening torque when mounting flanges A and B	Tightening torque when mounting ELECYLINDER
RR6□B RR6□BR	7.1N·m (M6)	30.0N·m
RR7□B RR7□BR	17.2N·m (M8)	35.0N·m

2.3.6 Caution in Yawing operation

- When in use as the driving device for the link feature, the operational conditions should be determined from the thrust, not from the payload.
- When in use for yawing operation, high acceleration could generate vibration or impact load on a device or actuator, which may cause to drop life or malfunction the actuator.
  Have the acceleration at 0.3G or less (recommended) as a reference to avoid generating vibration or impact load.
- When in use for yawing operation, the maximum value for the acceleration should be 0.5G.

2.3.7 Mounting with oscillation

[Installation orientation for oscillation]

Vertical installation	Horizontal installation
	

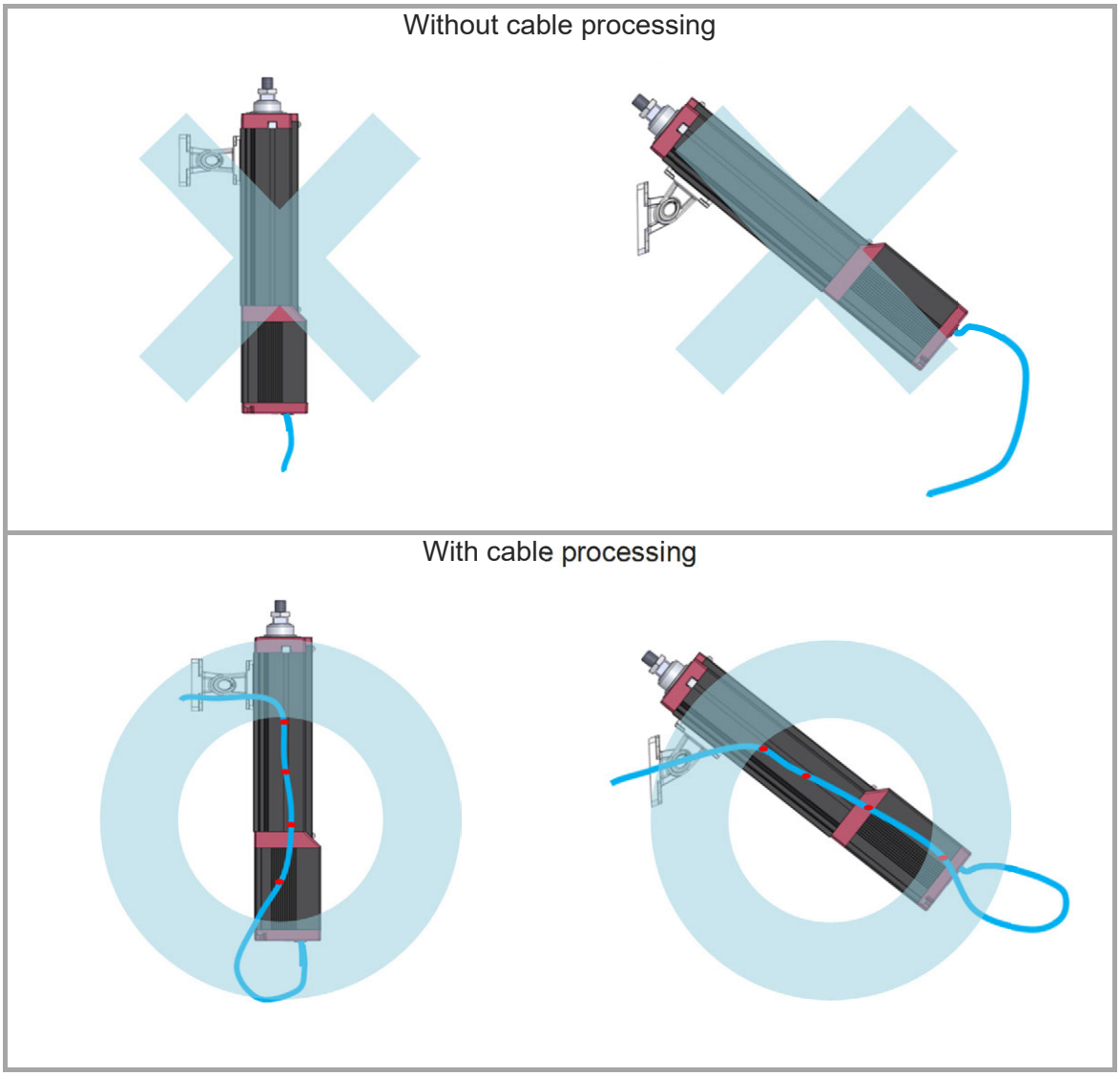
○ : Available for Installation

△ : Caution Needed

- We recommend vertical mounting for oscillation.
  When oscillation is performed with horizontal mounting, the product's self-weight causes moment loads to be applied to the joint, increasing the sliding friction on the joint and leading to thrust loss.
  As well, note that sliding in the joint may cause wear on the bracket.

[Cable processing for oscillation]

For oscillation, use a robot cable with bending resistance.
Fix the cable using the product body T-slots, etc., so that oscillation of the body does not cause load to be applied to the connector.
Be careful to arrange the cable so as not to exceed its flex radius allowable value.



○ : Available for Installation

× : Unavailable for Installation

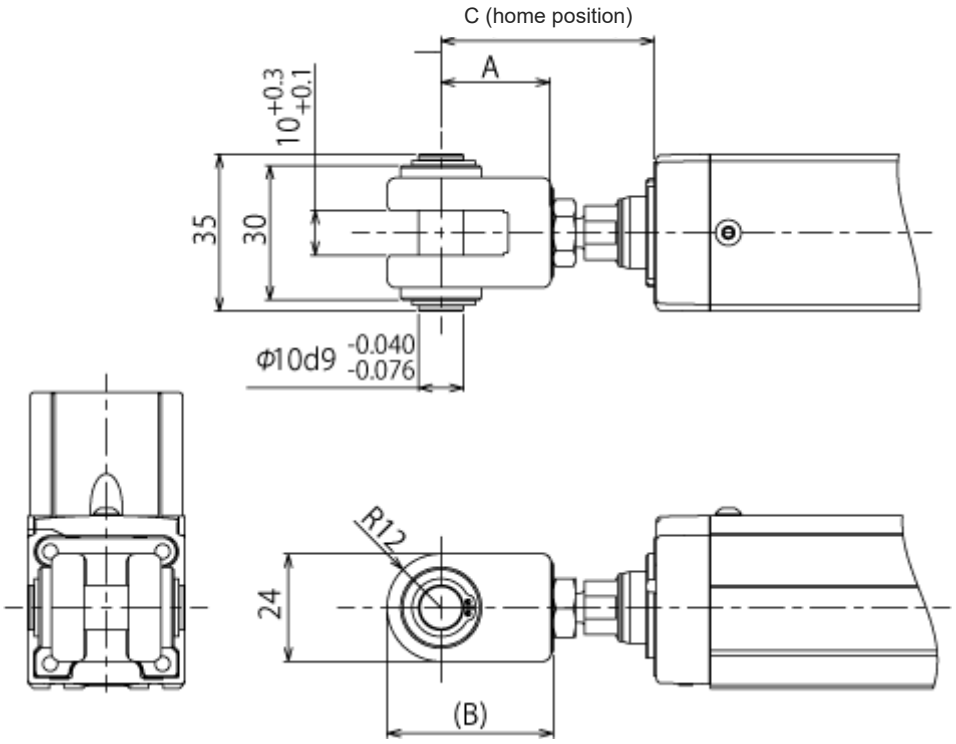
[Bracket mounting for oscillation]

Oscillation requires fixing the body with a joint able to move freely in the rotation direction.
Configured options include the tip knuckle joint (-NJ), the body clevis (-QR), the tip knuckle joint + oscillation receiving bracket (-NJPB), and the body clevis + oscillation receiving bracket (-QRPB).

[Knuckle joint (-NJ) mounting method and component dimensions]

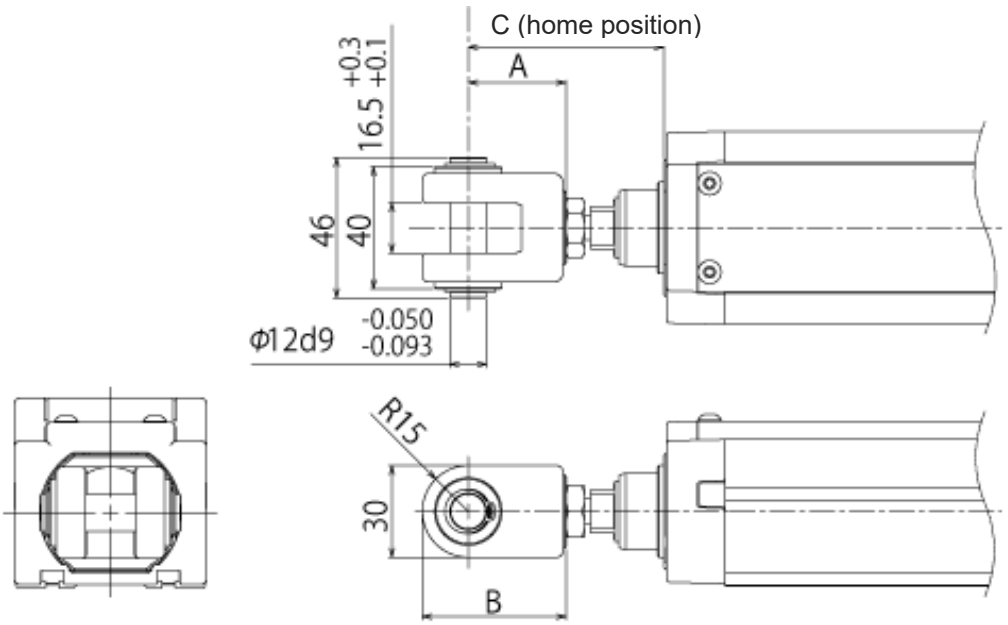
1) Pass the nut and knuckle joint through the rod tip male thread.
2) Adjust the knuckle joint position to the specified dimensions.
   * Adjust the knuckle joint angle so as to operate smoothly, with no load applied to the bracket or rod, when operating embedded in the equipment.
   * Mount with the geometric tolerance in the figure below as a guideline.
3) Fix by tightening the nut so that load is not applied to the rod.

● EC-RR3□B(R)/RR4□B(R)



Type	A	B	C	Nut tightening torque
RR3□B RR3□BR	25mm	37mm	47.5mm	15.0N·m
RR4□B RR4□BR	30mm	42mm	62mm	30.0N·m

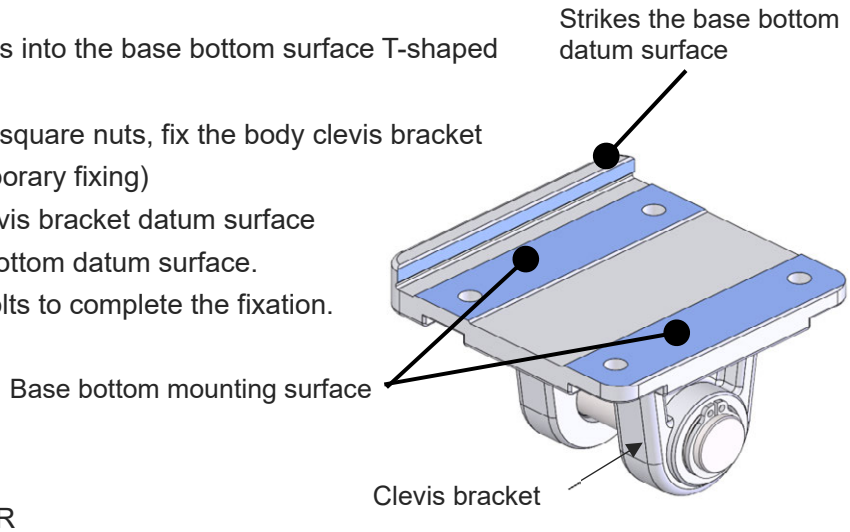
● EC-RR6□B(R)/RR7□B(R)



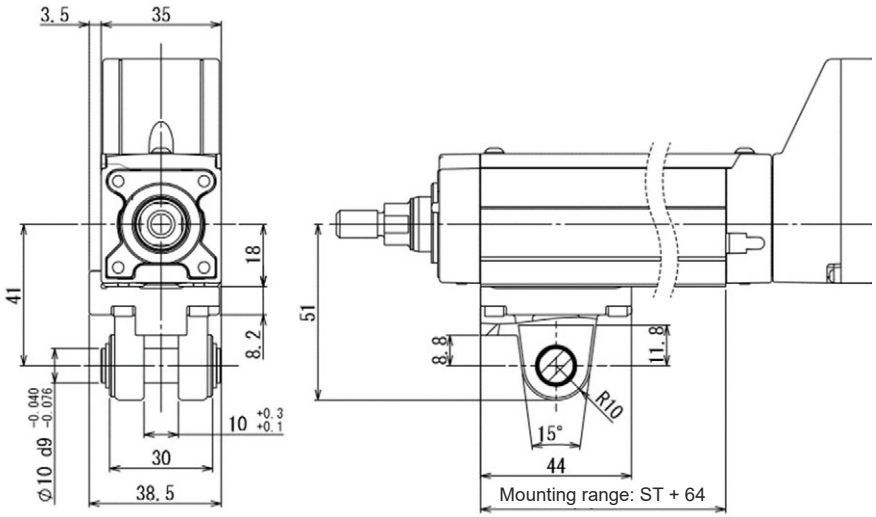
Type	A	B	C	Nut tightening torque
RR6□B RR6□BR	32mm	47mm	64mm	15.0N·m
RR7□B RR7□BR	37.5mm	52.5mm	81.5mm	30.0N·m

[Body clevis (-QR) mounting method and component dimensions]

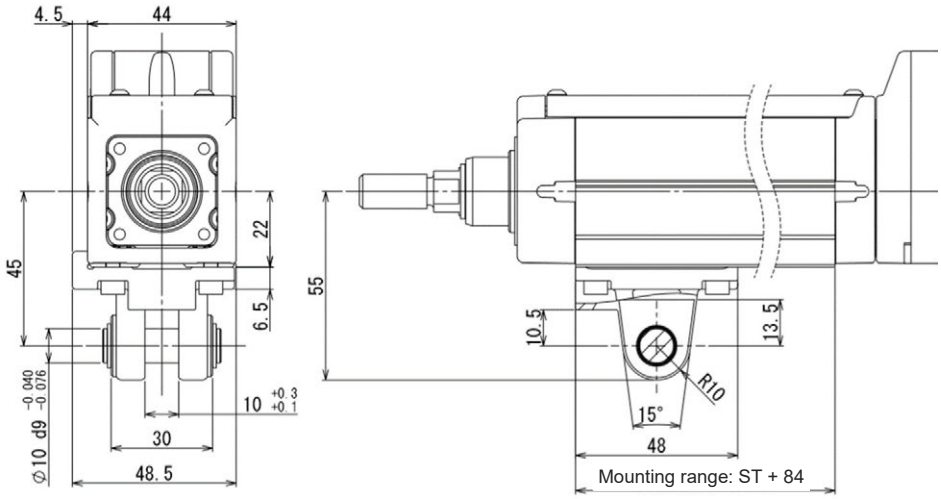
1) Insert 4 square nuts into the base bottom surface T-shaped slots.
2) Using the inserted square nuts, fix the body clevis bracket with the bolt. (temporary fixing)
3) Press the body clevis bracket datum surface against the base bottom datum surface.
4) Fully tighten the bolts to complete the fixation.



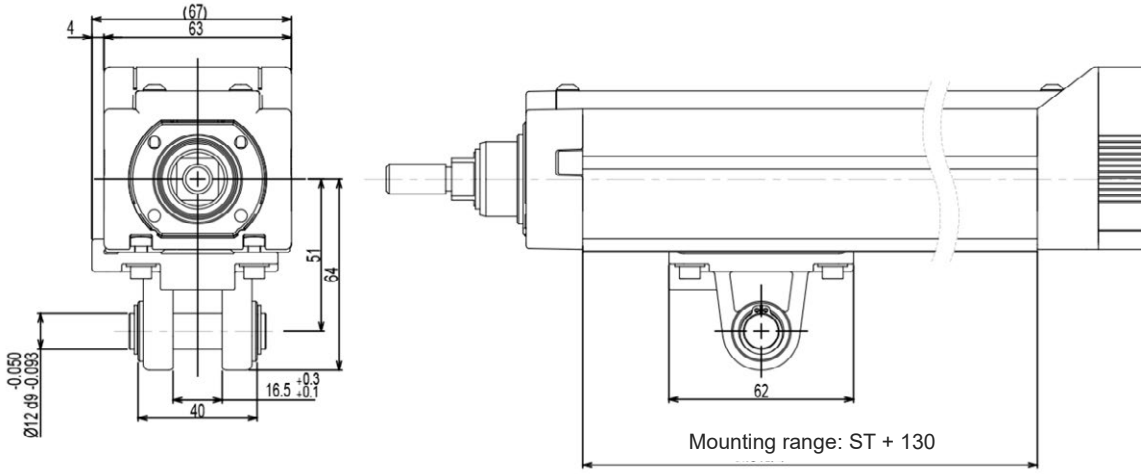
● For EC-RR3□B/RR3□BR



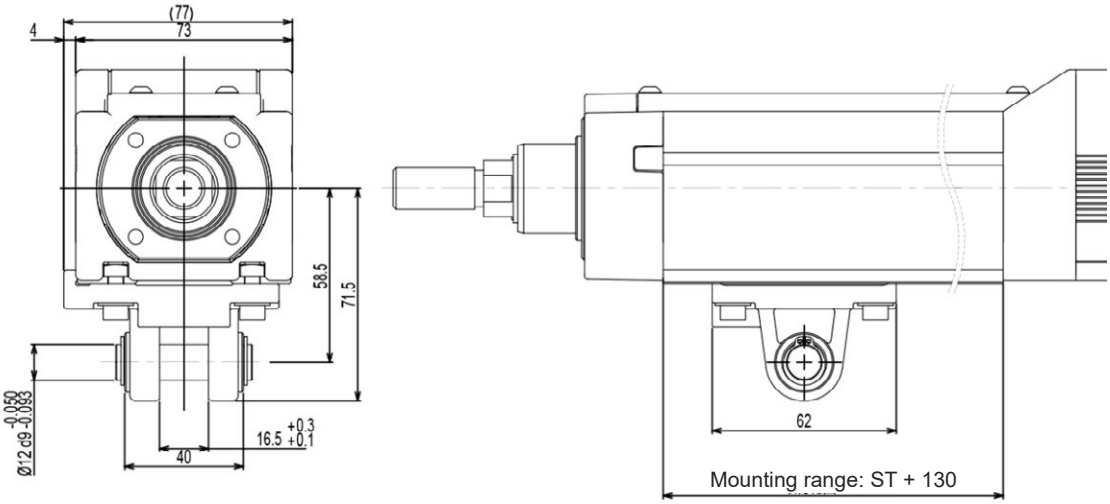
● For EC-RR4□B/RR4□BR



● For EC-RR6□B/RR6□BR

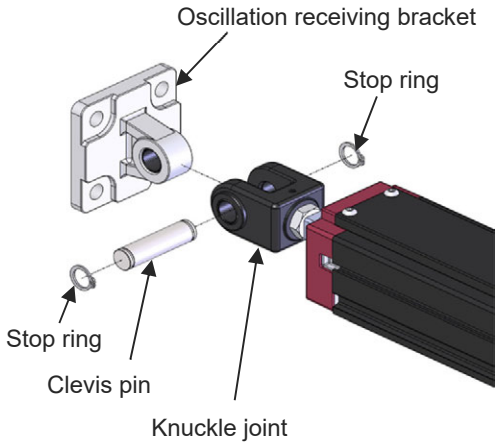


● For EC-RR7□B/RR7□BR

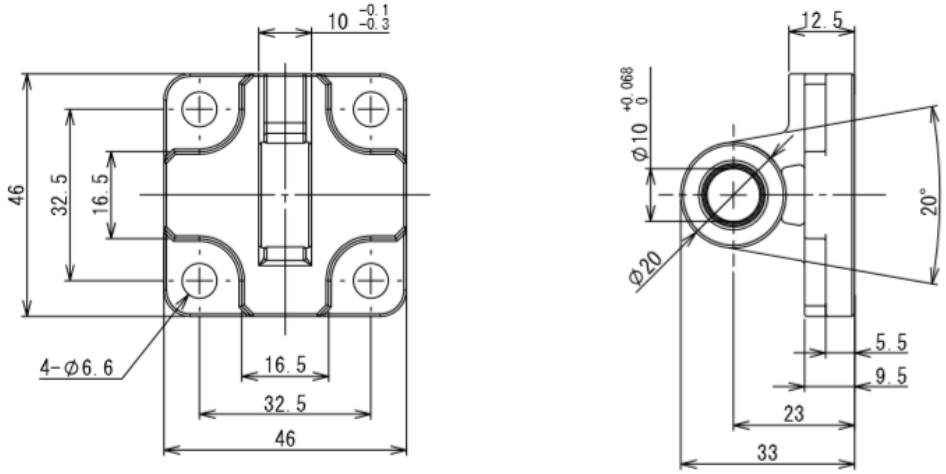


[Oscillation receiving bracket mounting method and component dimensions]

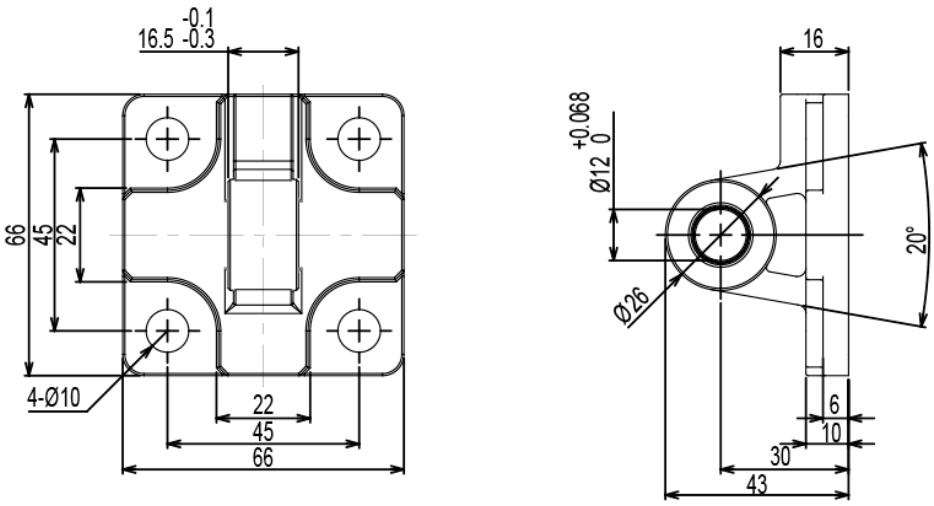
1) Insert the oscillation receiving bracket ridge between the knuckle joint and body clevis ridges.
2) Match the positions of the ridges and pass the clevis pin through.
3) Mount a stop ring on each end of the clevis pin.
   *Stop ring: C-shaped stop ring for shaft, nominal diameter 12
4) Mount the oscillation receiving bracket on the equipment.
   * Adjust so as to operate smoothly, with no load applied to the bracket or rod, when operating embedded in the equipment.



● EC-RR3□B(R)/RR4□B(R)

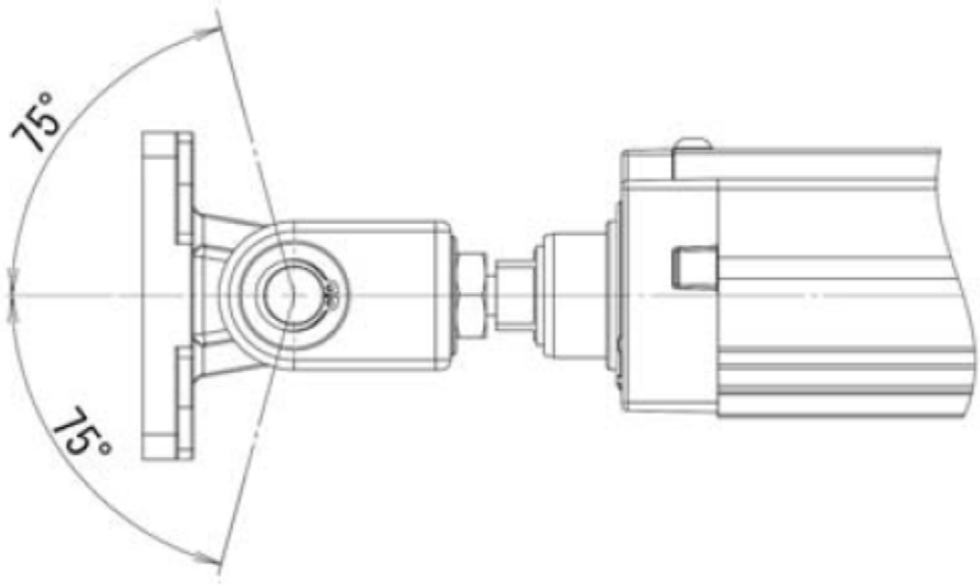


● EC-RR6□B(R)/RR7□B(R)

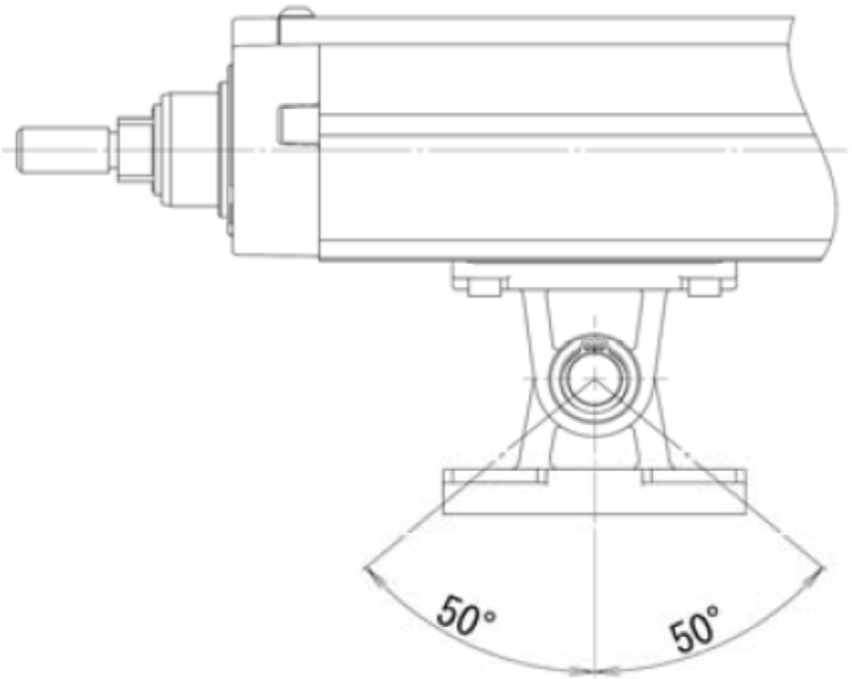


[Oscillation receiving bracket movable range]

-NJPB



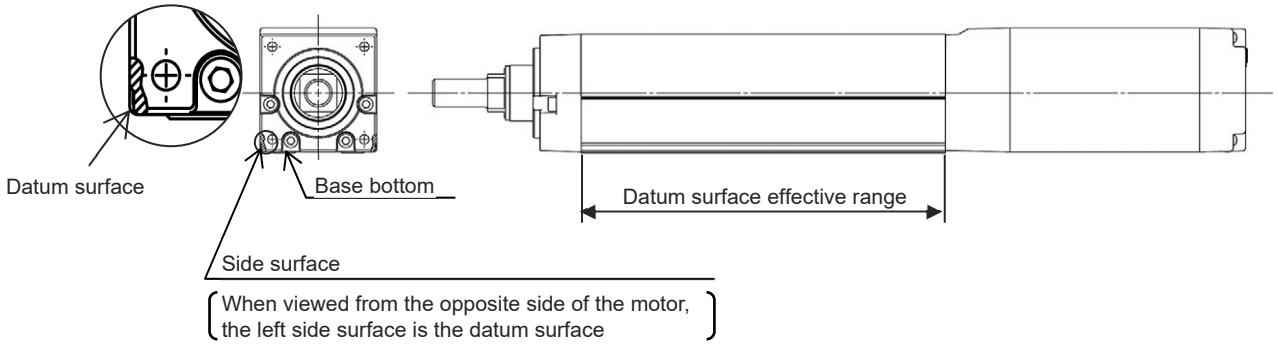
-QRPB



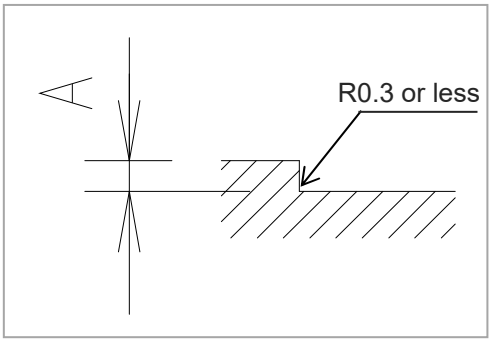
2.4 Installation of radial cylinder type (RR8, RR10)

2.4.1 Installation surface

- The body mounting surface should be a machined surface or a plane with similar accuracy, with flatness within 0.05mm/m.
- The mounting frame should have a structure rigid enough to prevent the generation of vibration.
- Also consider the necessary space for maintenance work such as ELECYLINDER replacement and inspection.
- The bottom surface and left side surface (viewed from motor opposite side) of the body base serve as the datum surfaces for rod running. Use these surfaces as the datum surfaces for mounting when running accuracy is required.
- When applying radial load/moment load, fix the entire surface of the base bottom. Flange fixing may cause deflection or reflection throughout the product due to radial load/moment load, leading to vibration, shortened product life, or breakdown.



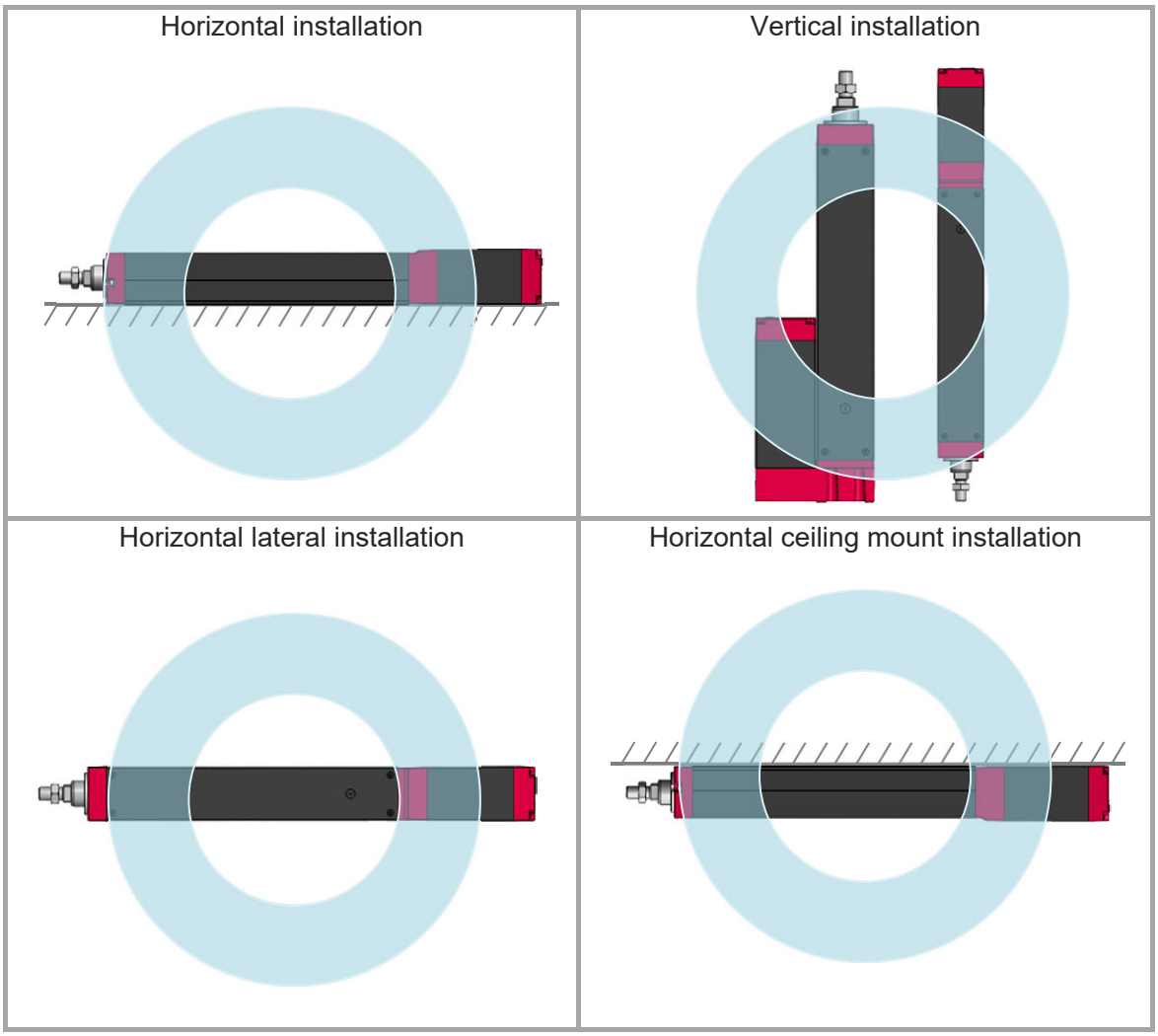
When mounting using the side datum surface, machine the installation surface according to the figure below.



A dimension
2 to 4mm

2.4.2 Mounting orientation

(1) Fixed on Base (Type : EC-RR8□B/RR10□B/RR8□BR/RR10□BR)

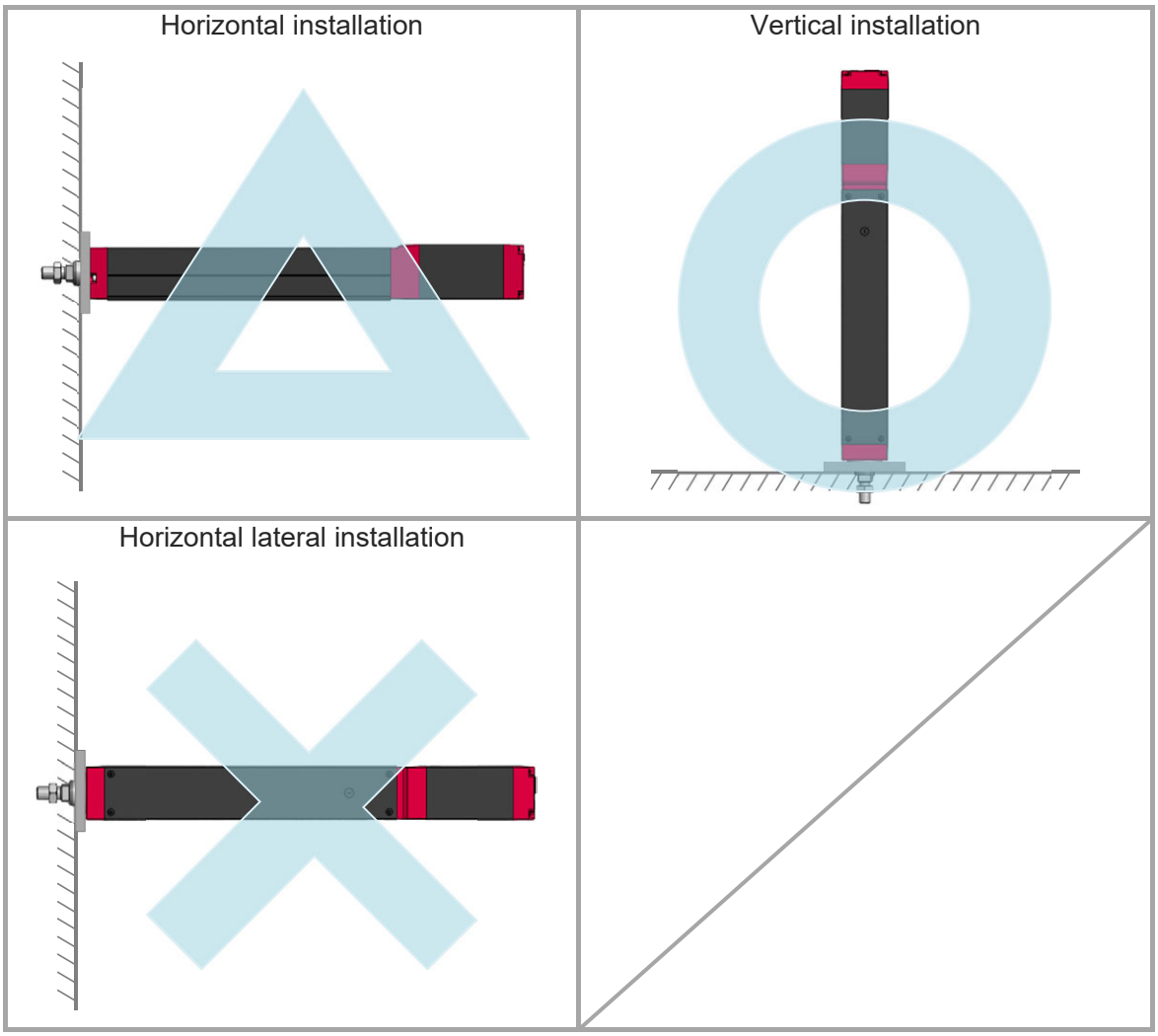


○ : Available for Installation

Caution

- Orientation with the motor located on top is recommended for the vertical installation.
- If the motor is installed on the top, cap the teaching port.
  Clogging with foreign matter may lead to a breakdown.
- Sometimes base oil separates from the grease due to the operating environment, mounting orientation, or operating conditions, and leaks from the inside of ELECYLINDER to the exterior. Protect the peripheral equipment if base oil adhesion negatively affects them.

(2) Fixed on Front Bracket (Type : EC-RR8□B/RR10□B/RR8□BR/RR10□BR)

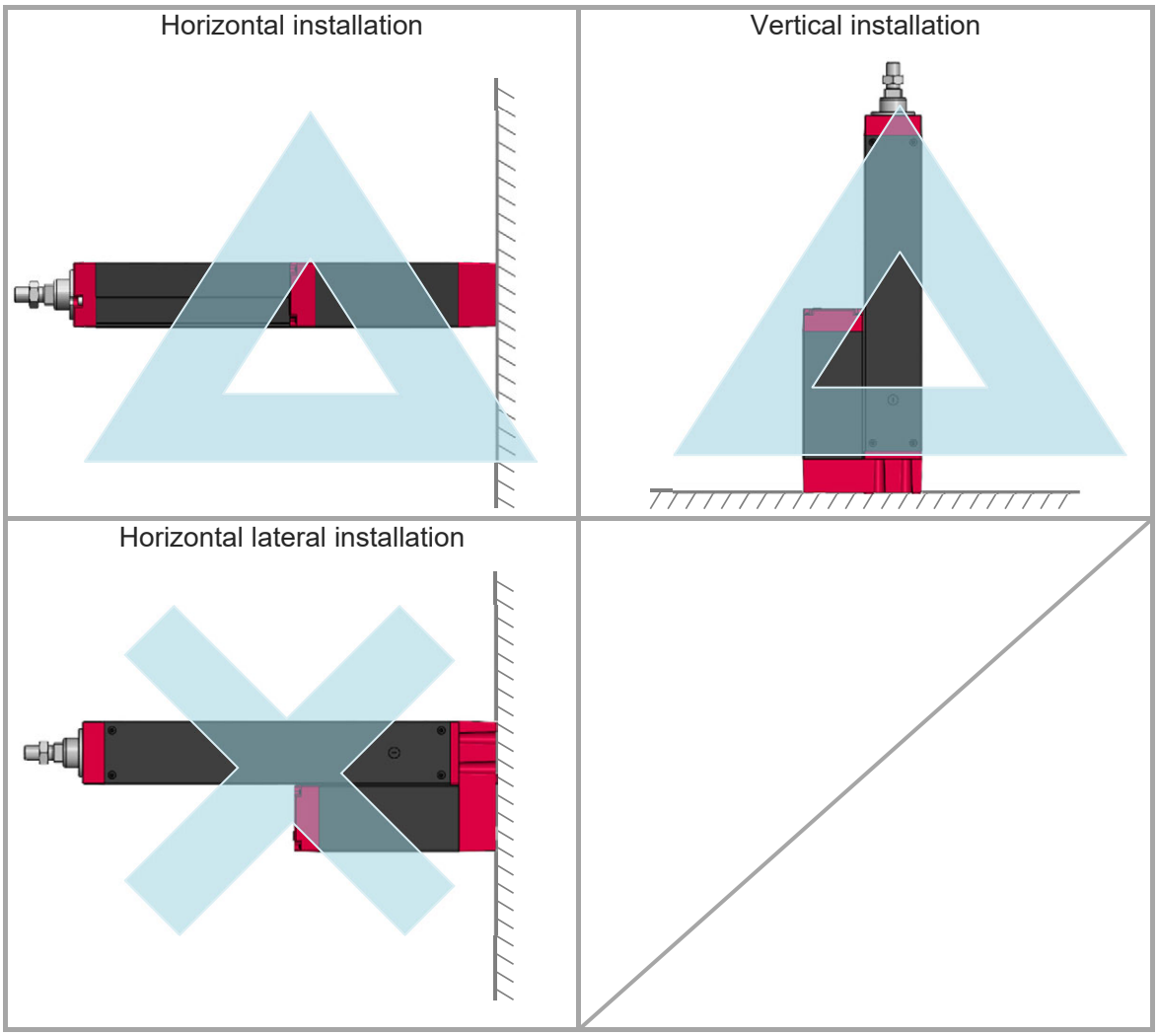


○ : Available for Installation △ : With Conditions × : Unavailable for Installation

Caution

- Orientation with the motor located on top is recommended for the vertical installation.
- If the motor is installed on the top, cap the teaching port.
  Clogging with foreign matter may lead to a breakdown.
- Sometimes base oil separates from the grease due to the operating environment, mounting orientation, or operating conditions, and leaks from the inside of ELECYLINDER to the exterior. Protect the peripheral equipment if base oil adhesion negatively affects them.

(3) Fixed on Reversing Bracket (Type : EC-RR8□BR/RR10□BR)



○ : Available for Installation △ : With Conditions × : Unavailable for Installation

Caution

- If the rod is installed on the top, cap the teaching port.
  Clogging with foreign matter may lead to a breakdown.
- Sometimes base oil separates from the grease due to the operating environment, mounting orientation, or operating conditions, and leaks from the inside of ELECYLINDER to the exterior. Protect the peripheral equipment if base oil adhesion negatively affects them.

2.4.3 Fixing bolt

- Screws to fix the base bottom and front flange to the installation surface should be prepared by a user.
- Use hex socket head bolt for installation.
- The use of high-strength bolts of ISO-10.9 or higher is recommended.
- Make sure the internal thread and bolt effective engagement length is approximately 1.8 times the nominal diameter or more.
- When the tightening torque is not specified, tighten with the recommended values in the table below.

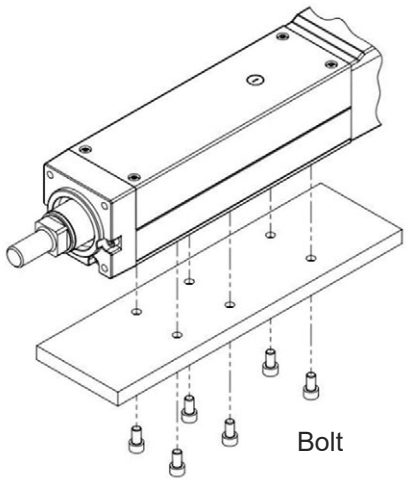
Fixing bolt	When bolt seating surface is made of copper	When bolt seating surface is made of aluminum
M4	3.6N·m	1.8N·m
M5	7.3N·m	3.4N·m
M6	12.3N·m	5.4N·m
M8	30.0N·m	11.5N·m
M10	59.4N·m	23.3N·m

2.4.4 Body mounting

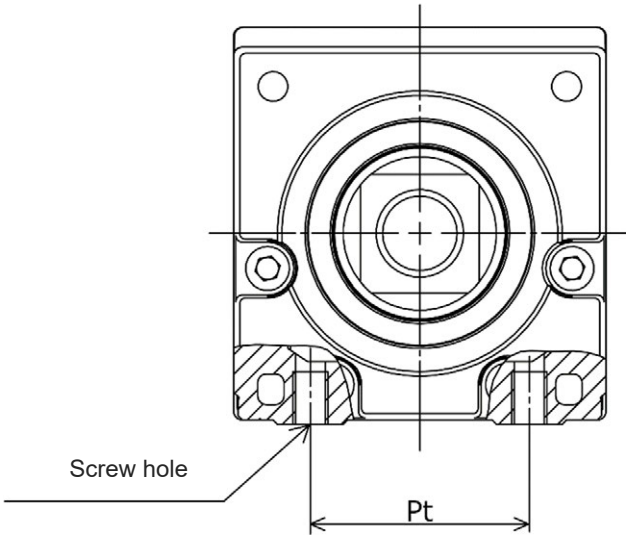
(1) Fixed on Base (Type :EC-RR8□/RR10□/RR8□R/RR10□R)

[When Using Attachment Holes on Bottom of Main Unit Frame]

The unit is to be mounted on the installation surface using the screw holes on the bottom surface of the main unit frame.



●Body mounting dimensions

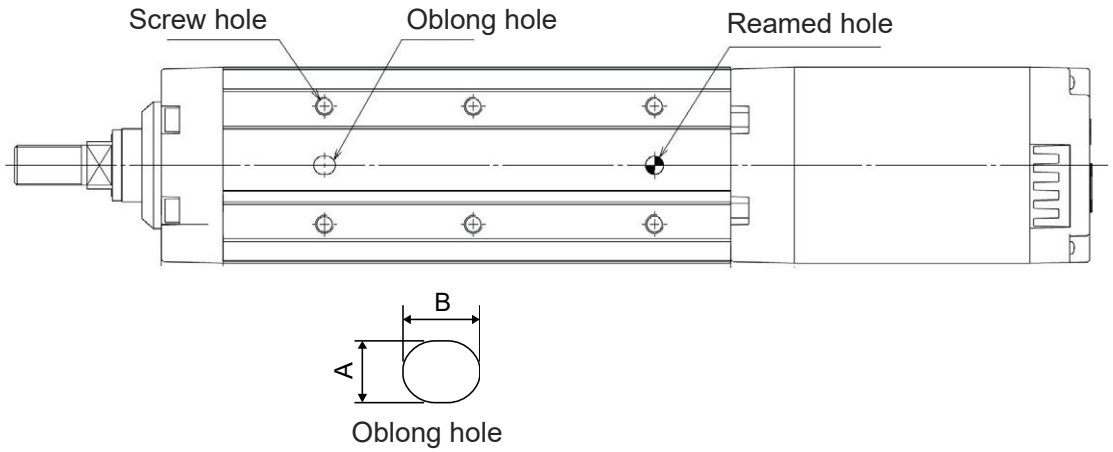


Type	Screw size	Pt	Effective thread depth
RR8□B RR8□BR	M8	50mm	12mm
RR10□B RR10□BR	M10	65mm	20mm

* Refer to [Chapter 5 External Dimensions] for the positions and number of the screw holes.

There are a reamed hole and an oblong hole for the positioning pins.
Use the reamed hole and oblong hole if mounting reproducibility after detachment is required.
When fine adjustment of angles, etc. is required, consider using only the reamed hole.

Reamed hole/oblong hole position dimensions



Type	Reamed hole	Oblong hole
RR8□B RR8□BR	ϕ 8H7 depth6.5	A:$8^{+0.015}_{0}$ B:11 depth 6.5mm or less
RR10□B RR10□BR	ϕ 10H7 depth6.5	A:$10^{+0.015}_{0}$ B:12 depth 6.5mm or less

* Depth of reamed hole and oblong hole indicates depth from the base seating surface

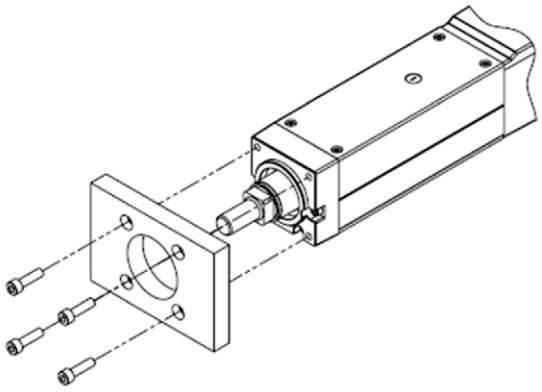
Caution

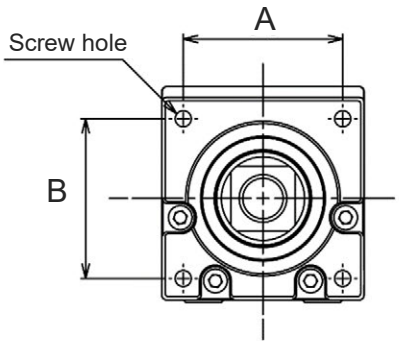
- Use all the screw holes to hold the main unit.
- Pay attention when selecting the screw length. Use of an inappropriate length of a screw may cause damage on the screw holes, insufficient stiffness in the actuator attachment, or interference of driving part, which could lead to a drop of the accuracy or an unexpected accident.

(2) Fixed on Front Bracket (Type : EC-RR8□B/RR10□B/RR8□BR/RR10□BR)

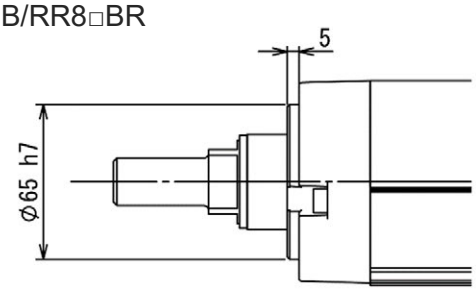
[When Using Attachment Holes on Front Bracket]

The unit can be mounted on the installation surface using the screw holes on the front bracket.
For precautions for mounting, refer to [page 2-49].

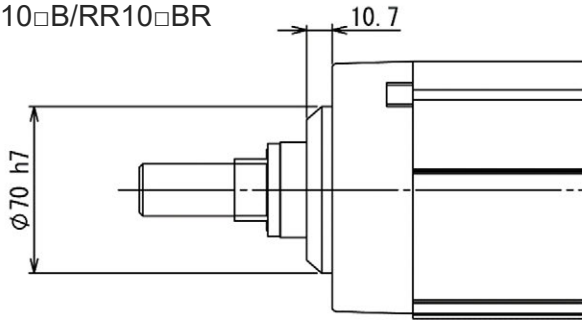




RR8□B/RR8□BR



RR10□B/RR10□BR



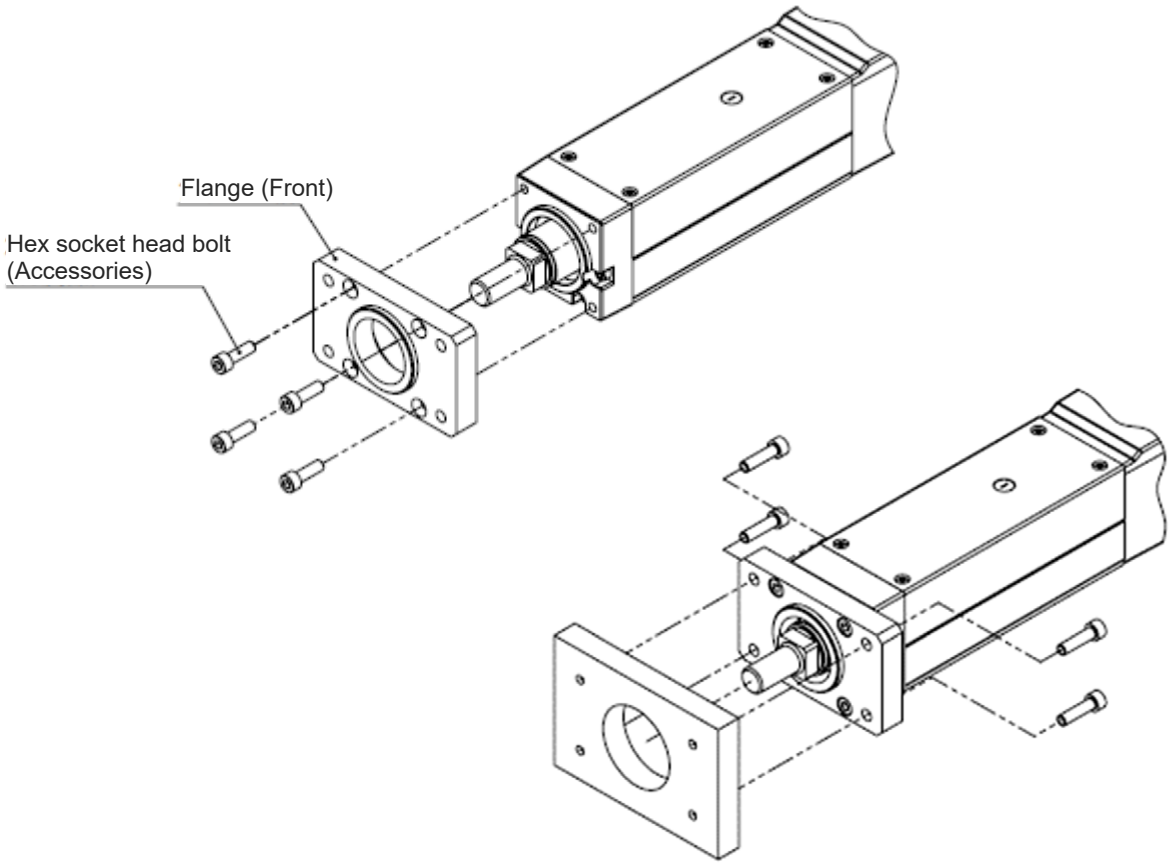
Type	A	B	Screw hole
RR8□B RR8□BR	67	67	4-M8 depth 16
RR10□B RR10□BR	80	80	4-M10 depth 20

* Use all the screw holes to hold the main unit.

[When using flanges (front)]

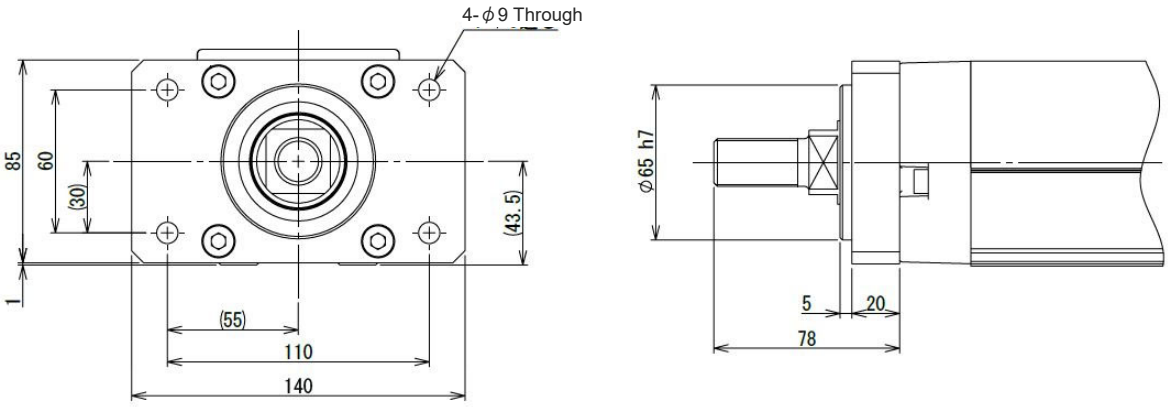
The unit can be mounted with the flange (front) (option: Model FL).

For precautions for mounting, refer to [page 2-49].

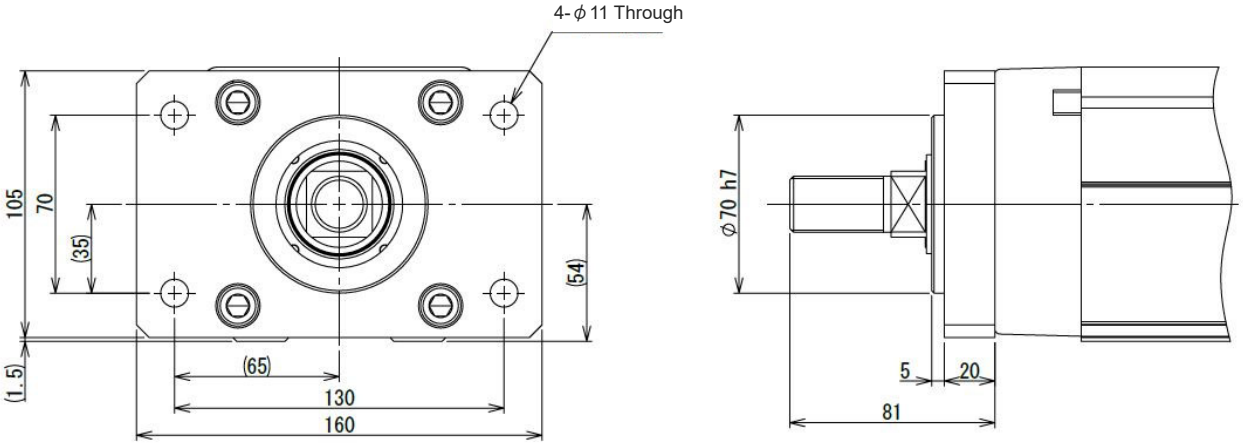


* There are 4 pieces of flange fixing screws enclosed with the flange (front). Use the enclosed screws and the screw holes on the front bracket to mount the flange (front) on ELECYLINDER.

●For EC-RR8□/RR8□R (Part model number : RCP6B-FL-RRA8)
Enclosed Screw M8 x 25 (4pcs)



●For EC-RR10□B/RR10□BR (Part model number : RCP5B-FL-RA10)
Enclosed Screw M10 x 25 (4pcs)



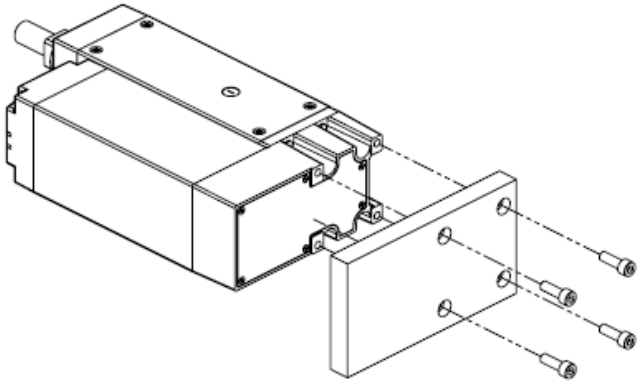
Type	Material	Mass	Tightening torque when mounting ELECYLINDER
RR8□B RR8□BR	Iron (Nickel plating treatment)	1.4kg	30.0N·m
RR10□B RR10□BR	Iron (Nickel plating treatment	2.1kg	59.4N·m

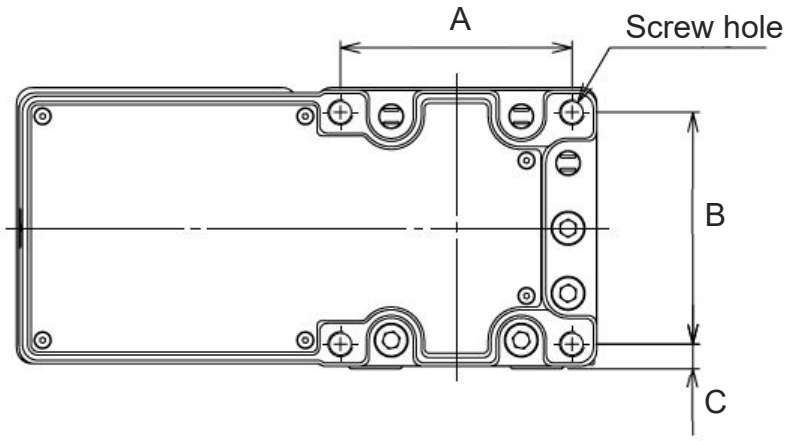
(3) Fixed on Reversing Bracket (Type : EC-RR8□BR/RR10□BR)

[When Using Attachment Holes on Reversing Bracket]

The unit can be mounted on the installation surface using the screw holes on the reversing Bracket.

For precautions for mounting, refer to [page 2-49].



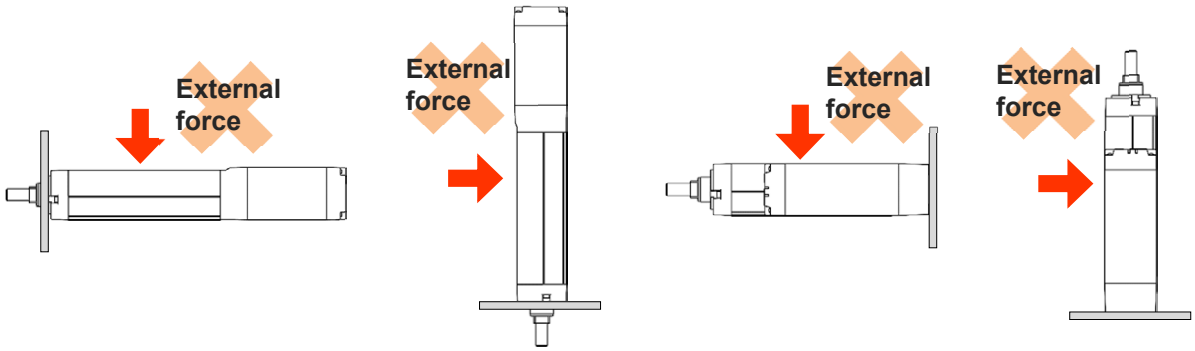


Type	A	B	C	Screw hole
RR8□B RR8□BR	70	70	8.5	4-M8 depth 16
RR10□B RR10□BR	89	89	9.5	4-M10 depth 20

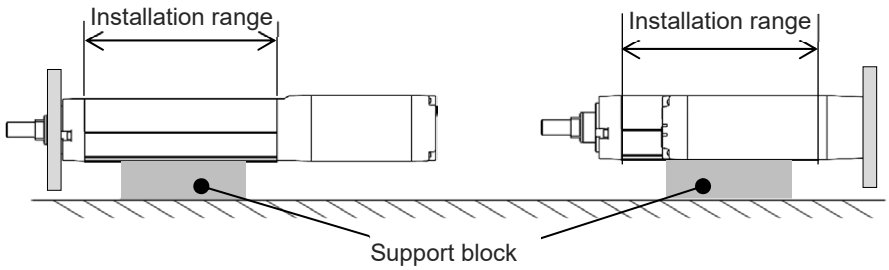
* Use all the screw holes to hold the main unit.

♦ Precautions

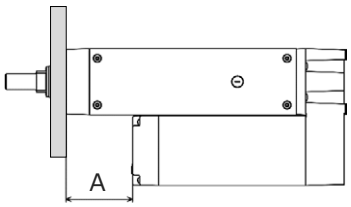
1) Do not apply external force to the ELECYLINDER body
External force may cause malfunctions or damage to parts.



2) ELECYLINDER is to be installed horizontally, have a support block prepared as shown in the figure to support the main unit.
- The support block should be installed on the frame motor side.
- We recommend a use of the unit with keeping the support block (aluminum alloy, etc.) close against the frame.



3) For models with short stroke, there may be a case that a screw to fix the flange cannot get in as there is no gap between the flange attachment surface and the motor (A).
Therefore, it is recommended to have the flange oriented vertically. Also, do not have the cables out from the connector forcefully bent.



[Recommended Stroke in Vertical Orientation]

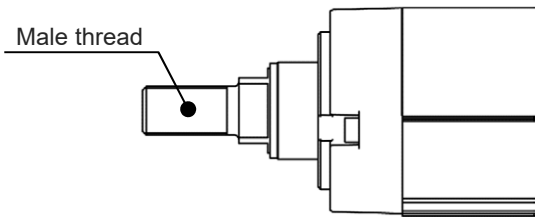
Type	Encoder	Brake	Stroke
RR8□BR	Incremental/ Battery-less absolute	Yes	50
		No	50
RR10□BR		Yes	50
		No	50, 100

2.4.5 Mounting transported objects

[When using the rod tip adapter male thread]

- Remove the male thread cap.
- Transported objects can be secured using the male thread of the rod tip adapter.

  * Fix the rod tip bracket width across flats with a wrench, etc., to prevent loads from being applied to the rod.

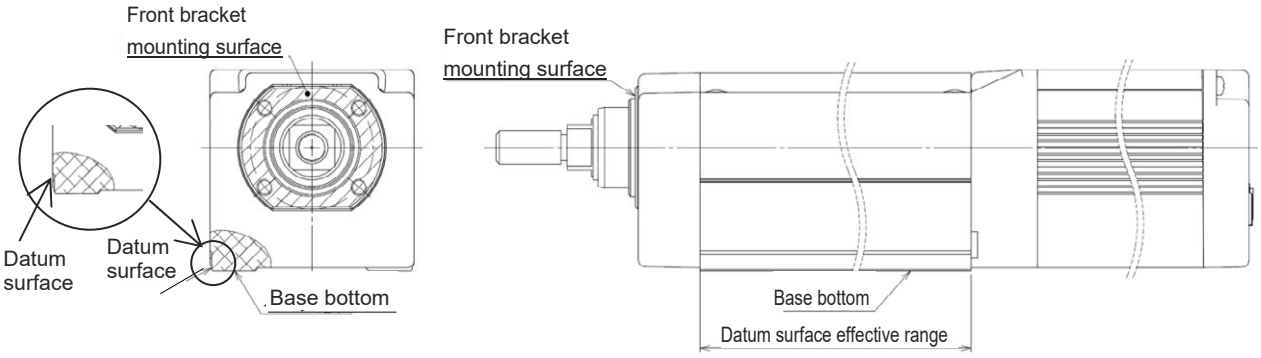


Type	Male thread dimensions	Tightening torque	Width across frats [mm]
RR8□B RR8□BR	M20 × 1.5, effective thread length 35.0mm	55N·m	27
RR10□B RR10□BR	M22 × 1.5, effective thread length 37.0mm	55N·m	26

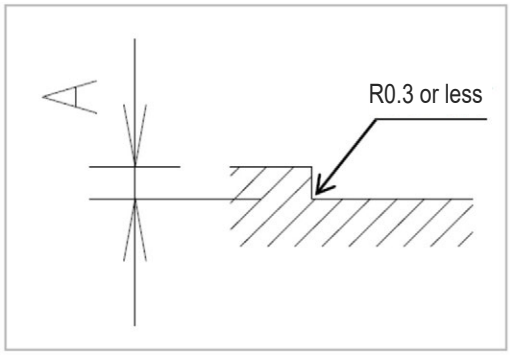
2.5 Installation of high rigidity radial cylinder type

2.5.1 Installation surface

- The body installation surface should be a machined surface or a plane with similar accuracy, with flatness within 0.05mm/m.
- The mounting frame should have a structure rigid enough to prevent the generation of vibration.
- Also consider the necessary space for maintenance work such as ELECYLINDER replacement and inspection.
- The bottom surface and left side surface (viewed from motor opposite side) of the body base serve as the datum surfaces for rod running. Use these surfaces as the datum surfaces for mounting when running accuracy is required.
- When applying radial load/moment load, fix the entire surface of the base bottom. Flange fixing may cause deflection or reflection throughout the product due to radial load/moment load, leading to vibration, shortened product life, or breakdown.

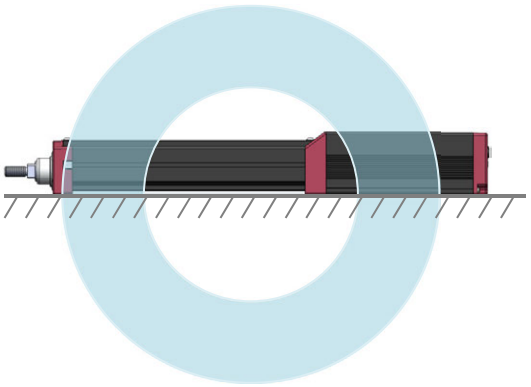
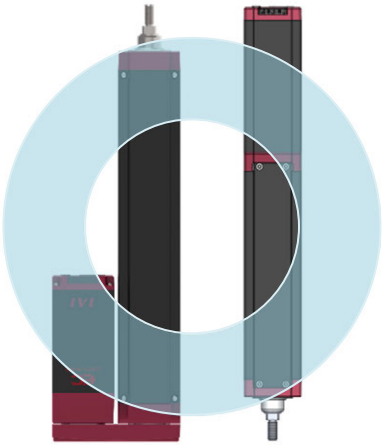
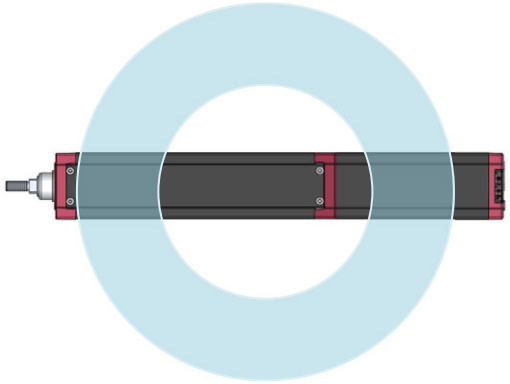
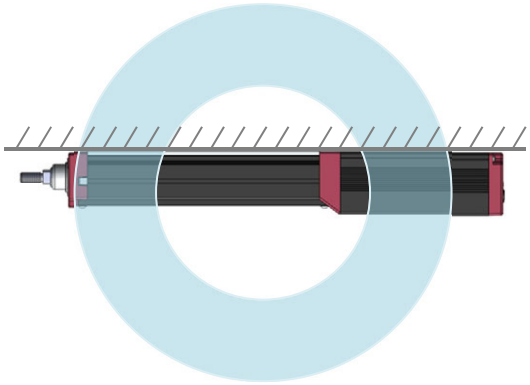


When mounting using the side datum surface, machine the installation surface according to the figure below.



A dimension
2 to 4mm

2.5.2 Mounting orientation

Horizontal installation	Vertical installation
	
Horizontal lateral installation	**Horizontal ceiling mount installation**
	

○ : Available for Installation

Caution

- Orientation with the motor located on top is recommended for the vertical installation.
- If the motor is installed on the top, cap the teaching port.
- Clogging with foreign matter may lead to a breakdown.
- Sometimes base oil separates from the grease due to the operating environment, mounting orientation, or operating conditions, and leaks from the inside of ELECYLINDER to the exterior. Protect the peripheral equipment if base oil adhesion negatively affects them.

2.5.3 Fixing bolt

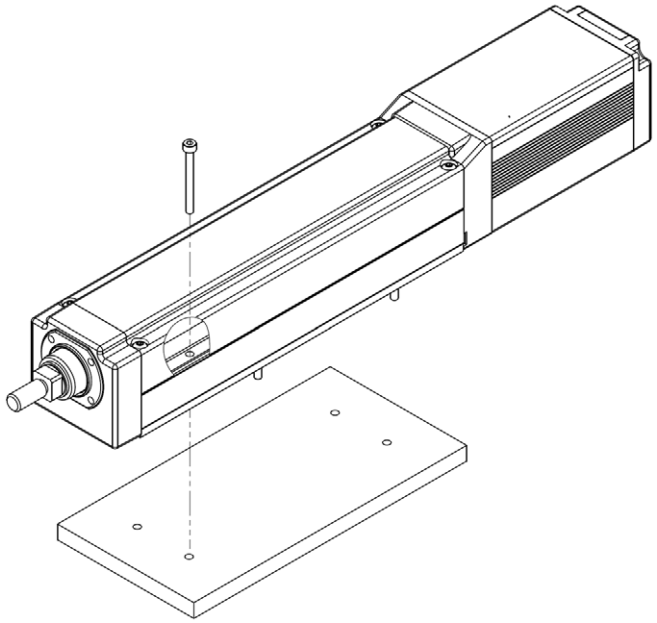
- It is necessary that you prepare the screws to hold the base bottom, foot bracket or flange to the installation surface by your own.
- The use of high-strength bolts of ISO-10.9 or higher is recommended.
- Make sure the internal thread and bolt effective engagement length is approximately 1.8 times the nominal diameter or more.
- When the tightening torque is not specified, tighten with the recommended values in the table below.

Fixing bolt	When bolt seating surface is made of copper	When bolt seating surface is made of aluminum
M4	3.6N·m	1.8N·m
M5	7.3N·m	3.4N·m

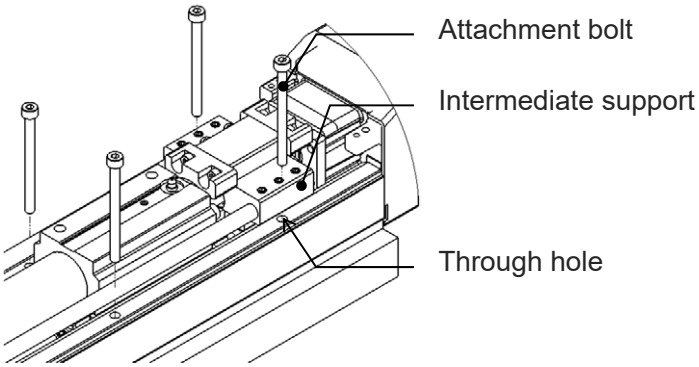
2.5.4 Body mounting

[When using base through holes]

When fixing the actuator with the base through holes, remove the frame cover before work. For details regarding the position and dimensions, refer to [Chapter 5 External Dimensions].

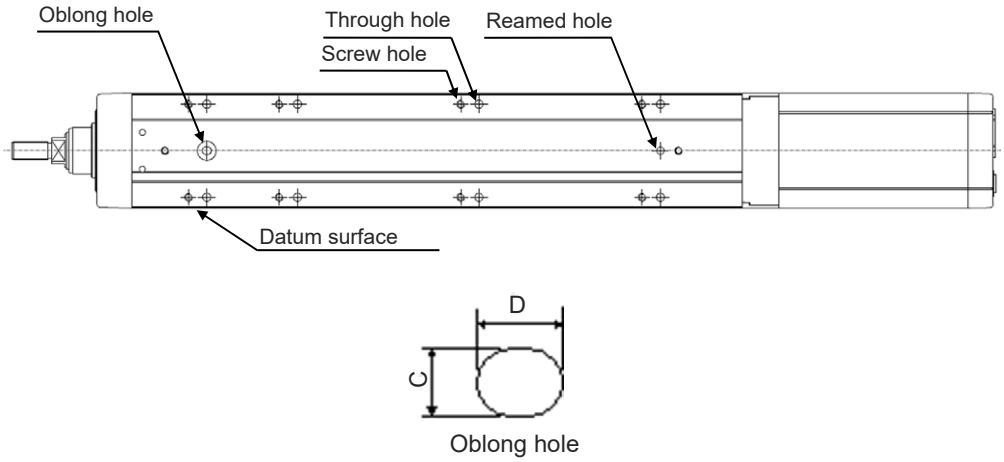


(Note) For EC-RR□X□AH equipped with support, as the through holes are allocated on the bottom of the support, move the rod back and forth to conduct the installation.

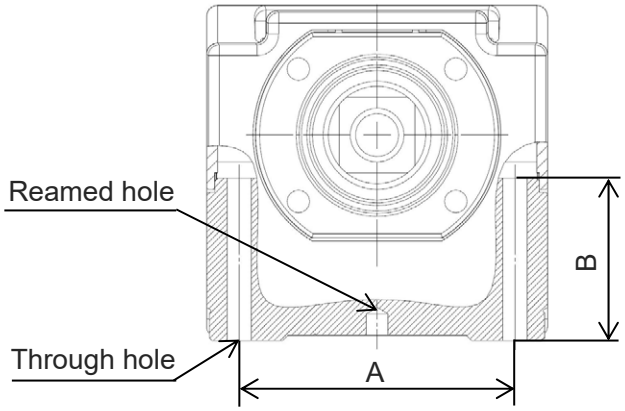


There are a reamed hole and an oblong hole for the positioning pins.
Use the reamed hole and oblong hole if mounting reproducibility after detachment is required.
When fine adjustment of angles, etc. is required, consider using only the reamed hole.

Reamed hole/oblong hole position dimensions



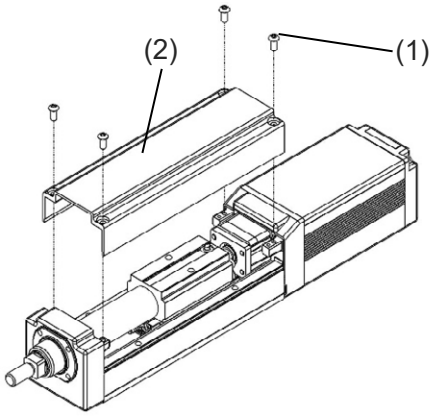
Through hole dimensions



Type	Through hole diameter	A	B	Reamed hole	Oblong hole
RR6(X)□AHB RR6□AHBR	ϕ4.5	51mm	30mm	ϕ4H7 depth 5	C: 4 $^{+0.012}_{0}$ D: 5 depth 5mm or more
RR7(X)□AHB RR7□AHBR	ϕ5.5	61mm	35mm	ϕ4H7 depth 5	C: 4 $^{+0.012}_{0}$ D: 5 depth 5mm or more

Procedure for removing the frame cover

- Remove bolts (1) and take off the (2).
  * For assembly, follow the procedure in reverse.

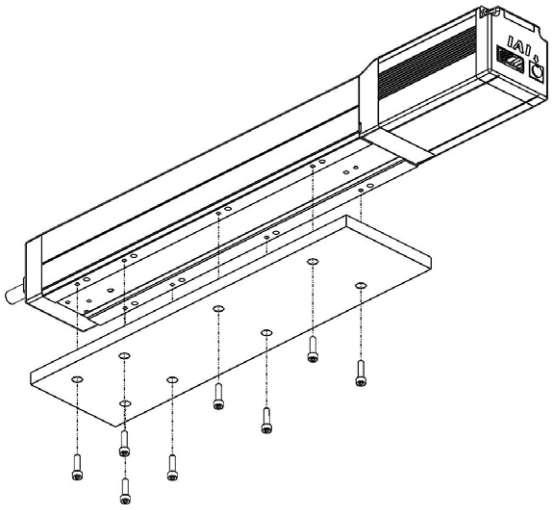


No.	Model	Part name	RR6□AHB	RR7□AHB
(1)	M4×10	Bolt	4 pcs	4 pcs
(2)	-	Frame cover	1 pc	1 pc

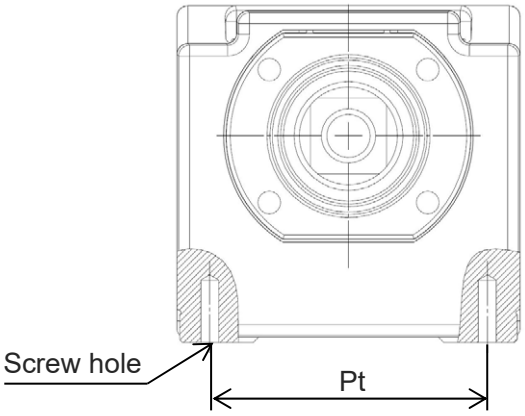
[When using the screw hole on the base bottom]

The unit has a screw hole at the bottom of the base for mounting.

For details regarding the position and dimensions, refer to [Chapter 5 External Dimensions].



Screw hole dimensions



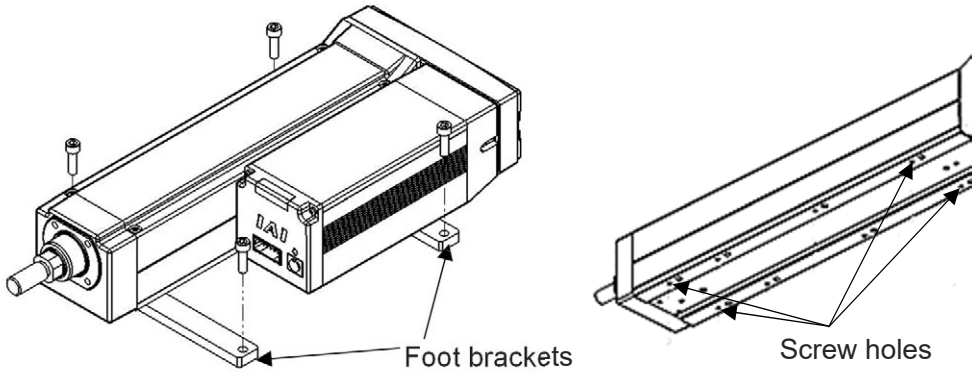
Type	Screw diameter	Pt	Effective thread depth
RR6(X)□AHB RR6□AHBR	M4	51mm	8mm
RR7(X)□AHB RR7□AHBR	M5	61mm	10mm

[When using foot brackets: Motor reversed]

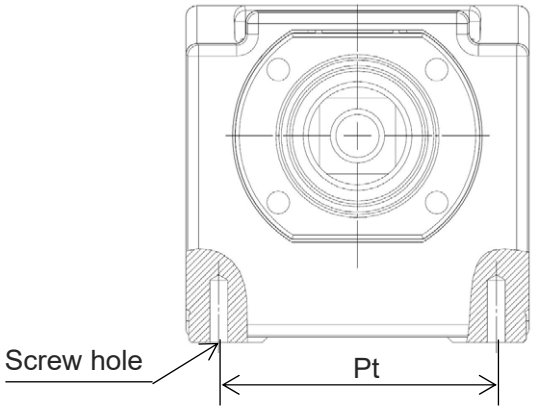
Mounting from the top is possible using foot brackets.

The foot brackets are to be affixed at the back with screws to the screw holes.

For details regarding the position and dimensions, refer to [Chapter 5 External Dimensions].



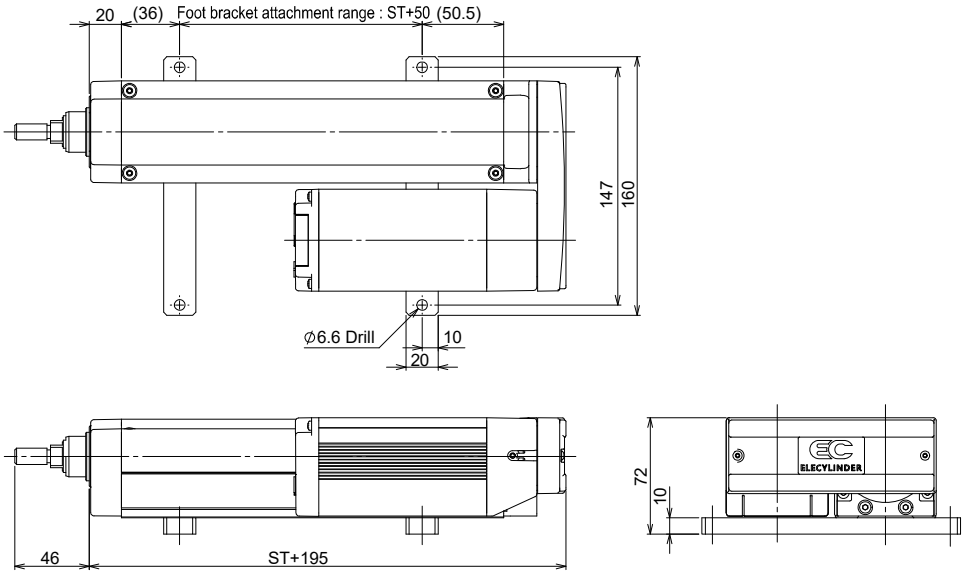
Screw hole dimensions



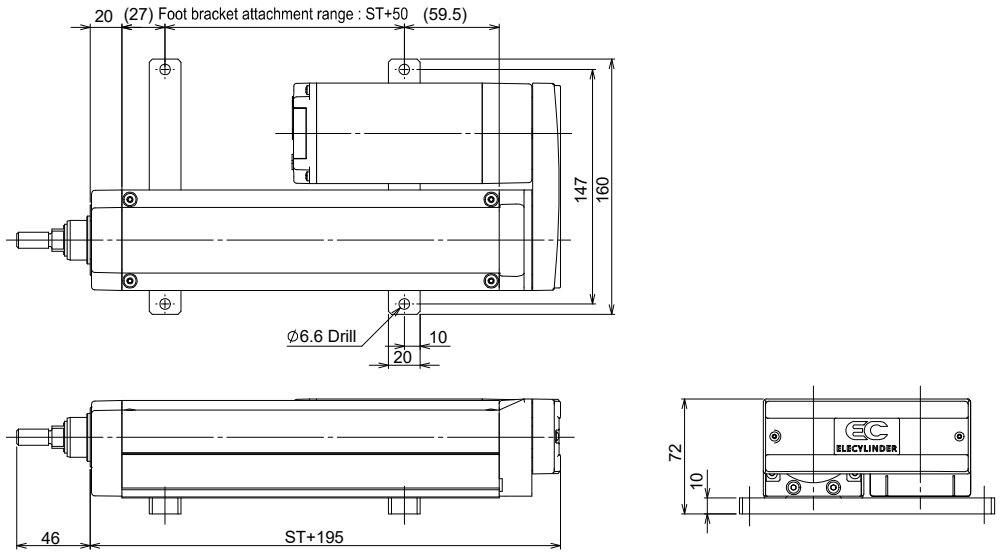
Type	Screw diameter	Pt	Effective thread depth
RR6□AHBR	M4	51mm	8mm
RR7□AHBR	M5	61mm	10mm

● EC-RR6□AHBR foot bracket mounting dimensions

Motor left reversed (ML)

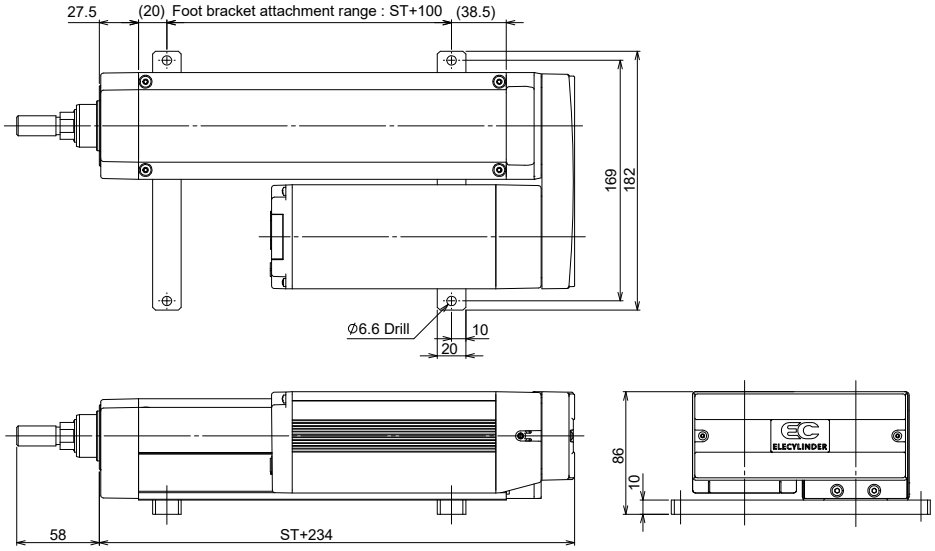


Motor right reversed (MR)

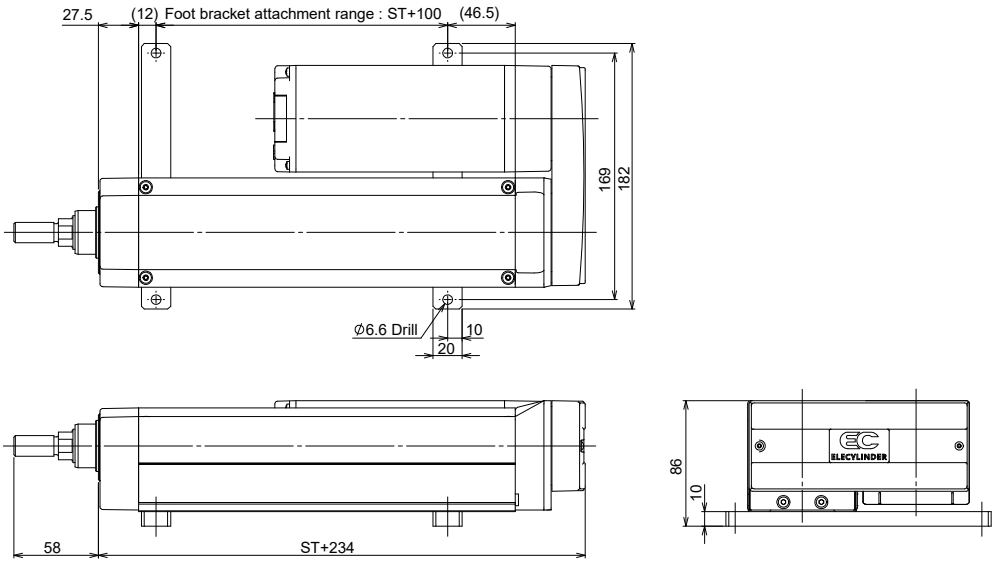


● EC-RR7□AHBR foot bracket mounting dimensions

Motor left reversed (ML)



Motor right reversed (MR)

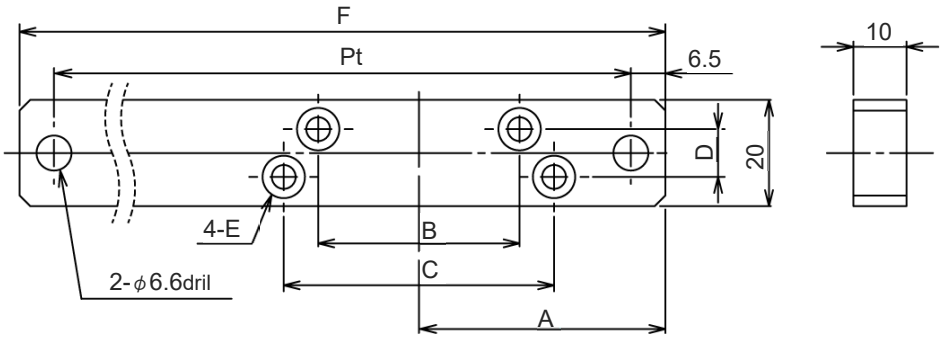


Quantity of foot brackets (pcs)

Type	Stroke [mm]									
	50	100	150	200	250	300	350	400	450	500
RR6□AHBR	2	2	2	2	2	2	3	3	-	-
RR7□AHBR	2	2	2	2	2	2	3	3	3	3

Foot bracket

(Note) When the foot bracket is ordered as a single product, it comes with a foot bracket (1 pc) and hex socket head bolts (2 pcs) as a set.



Type	Individual Model Code	A	B	C	D
RR6□AHBR	EC-FT-SRR6R	46.5mm	38mm	51mm	9mm
RR7□AHBR	EC-FT-SRR7R	52.5mm	46mm	61mm	8mm

Type	E	F	Pt
RR6□AHBR	ϕ4.5 drill ϕ8 counterbore, depth 5.5	160mm	147mm
RR7□AHBR	ϕ5.5 drill ϕ10 counterbore, depth 7	182mm	169mm

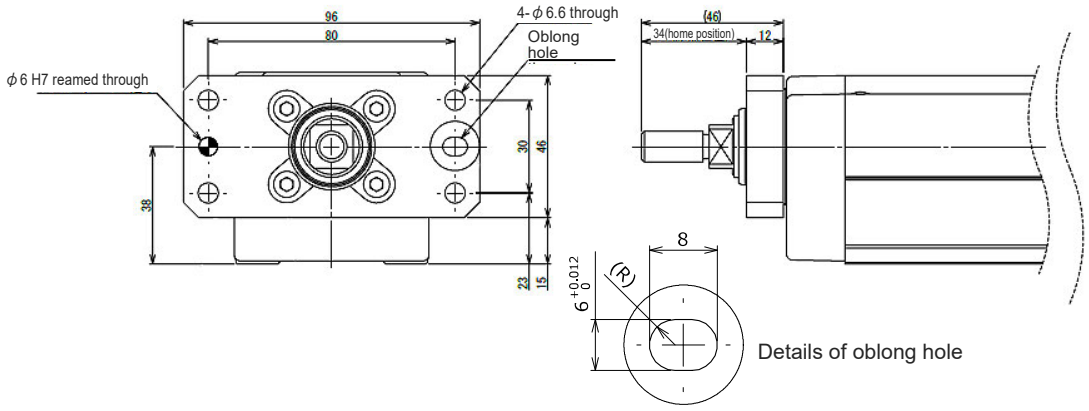
Attaching foot bracket to frame

Type	Screw size	Tightening torque
RR6□AHBR	M6	5.4N·m
RR7□AHBR	M6	5.4N·m

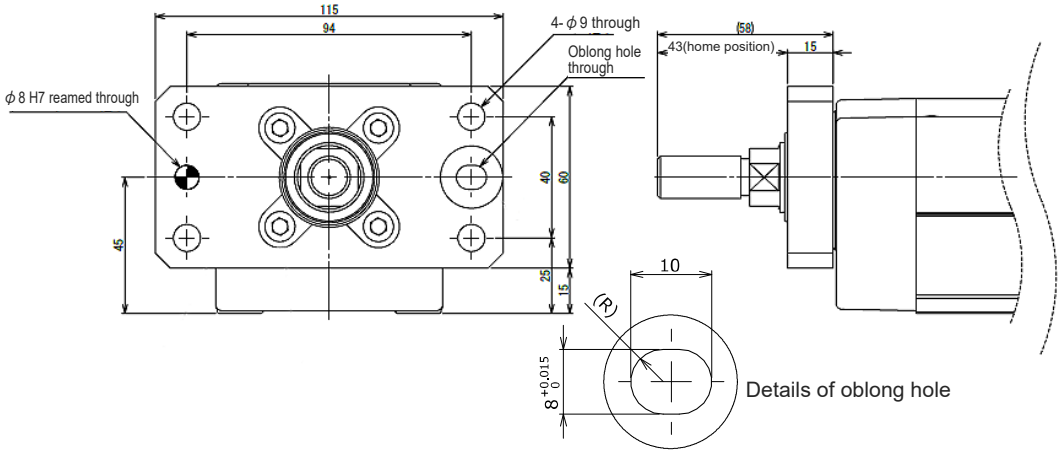
[When using flanges (front)]

ELECYLINDERs can be mounted with flanges (front) (option: model FL).
For precautions for mounting, refer to next page.

● For EC-RR6□AHB/RR6□AHBR (Part model number ECB-FL-RR6)



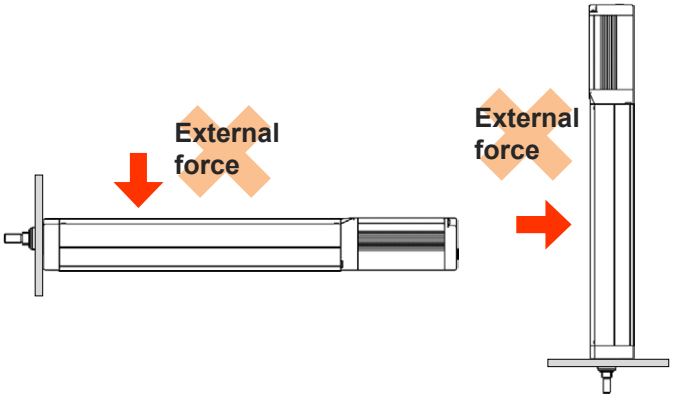
● For EC-RR7(X)□AHB/RR7□AHBR (Part model number ECB-FL-RR7)



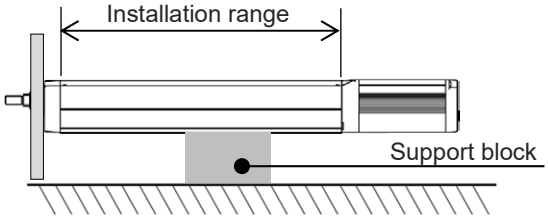
Type	Material	Tightening torque when mounting ELECYLINDER
RR6(X)□AHB RR6□AHBR	Iron (Nickel plating treatment)	3.4N·m
RR7(X)□AHB RR7□AHBR	Iron (Nickel plating treatment	5.4N·m

♦ Precautions

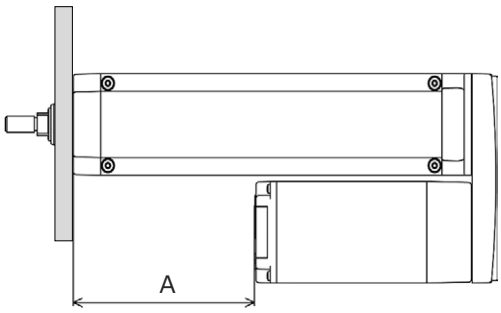
1) Do not apply external force to the ELECYLINDER body
External force may cause malfunctions or damage to parts.



2) ELECYLINDER is to be installed horizontally, have a support block prepared as shown in the figure to support the main unit.
- The support block should be installed on the frame motor side.
- We recommend either keeping the support block (aluminum alloy, etc.) close against the frame.



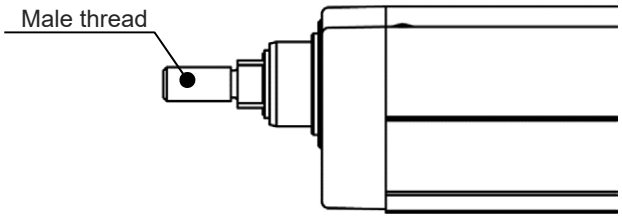
3) For models with stroke 50mm and equipped with the brake option, a screw to fix the flange cannot get in as there is no gap between the flange attachment surface and the motor (A).



2.5.5 Mounting transported objects

[When using the rod tip adapter male thread]

- Remove the male thread cap.
- Transported objects can be secured using the male thread of the rod tip adapter.
  * Fix the rod tip bracket width across flats with a wrench, etc., to prevent loads from being applied to the rod.

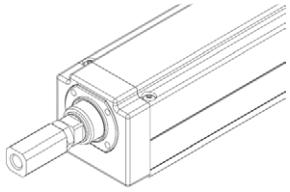


Type	Male thread dimensions	Tightening torque	Width across frats
RR6(X)□AHB RR6□AHBR	M10 × 1.25, effective thread length 20.0mm	30.0N·m	14
RR7(X)□AHB RR7□AHBR	M14 × 1.5, effective thread length 27.5mm	35.0N·m	19

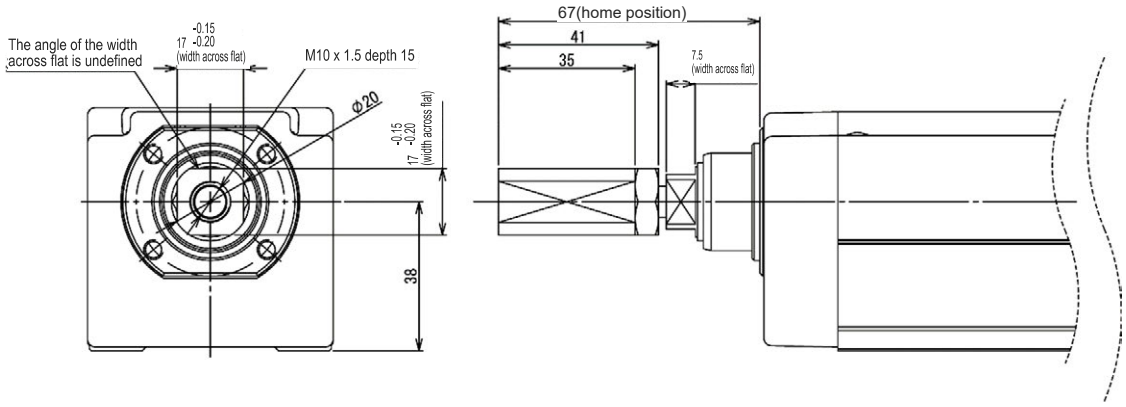
[When using tip adapter]

Transported objects can be secured using the internal thread of the tip adapter.

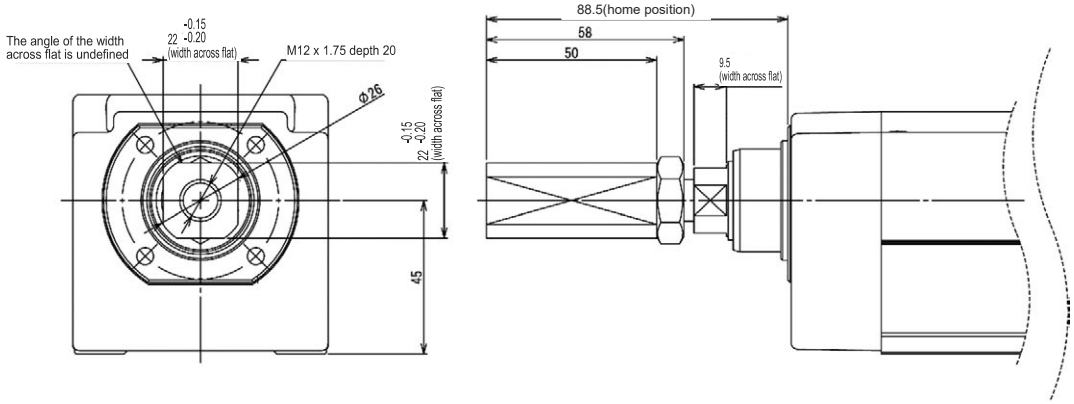
* Fix the rod tip bracket width across flats with a wrench, etc., to prevent loads from being applied to the rod.



● For EC-RR6(X)□AHB/RR6□AHBR (Part model number EC-NFA-R6)



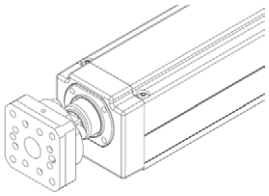
● For EC-RR7(X)□AHB/RR7□AHBR (Part model number EC-NFA-R7)



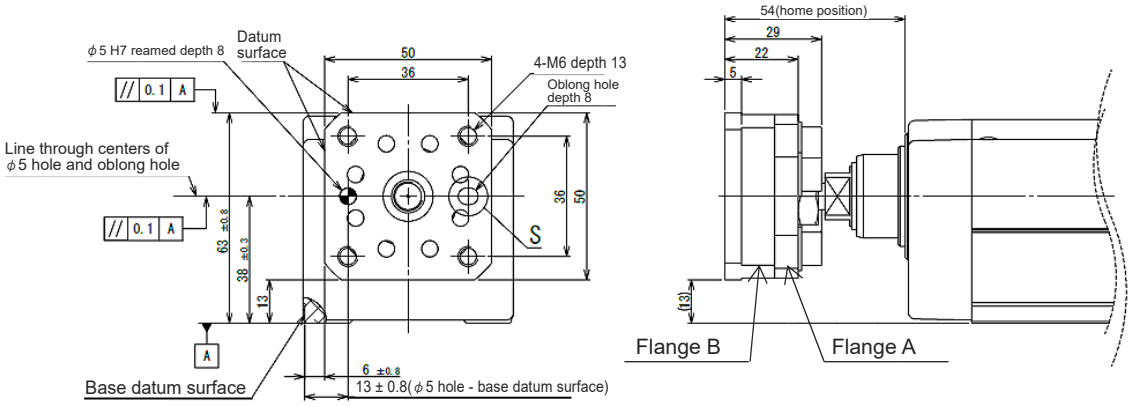
Type	Tightening torque when mounting ELECYLINDER
RR6(X)□AHB RR6□AHBR	30.0N·m
RR7(X)□AHB RR7□AHBR	35.0N·m

[When using tip flange]

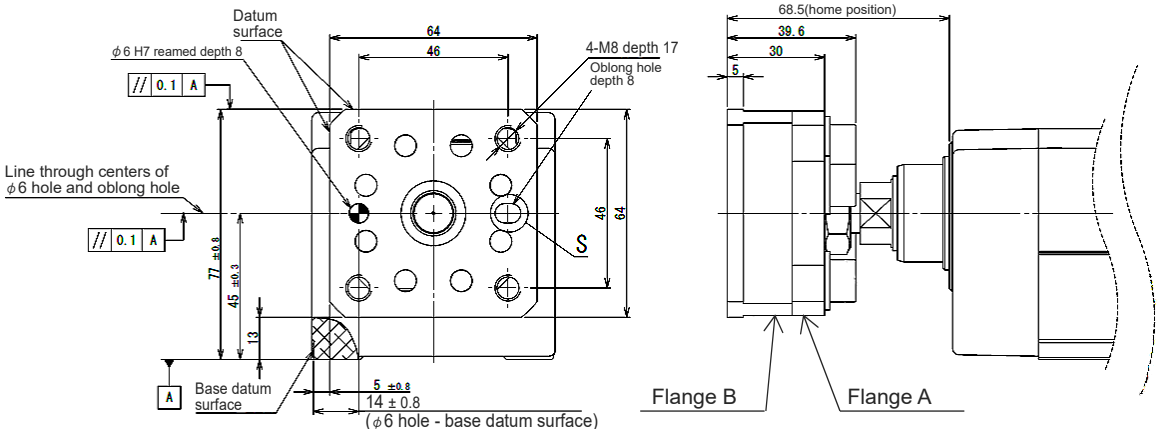
Transported objects can be secured using the tip adapter flange.



● For EC-RR(X)6□AHB/RR6 (Part model number: EC-FFA-RR6)



● For EC-RR7(X)□AHB/RR7□AHBR (Part model number: EC-FFA-RR7)



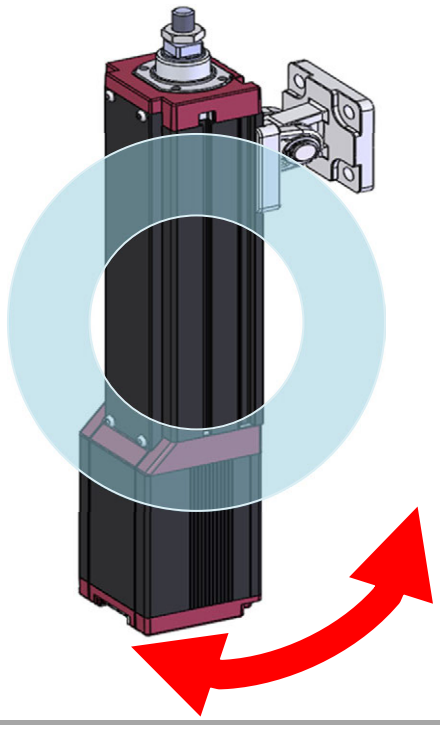
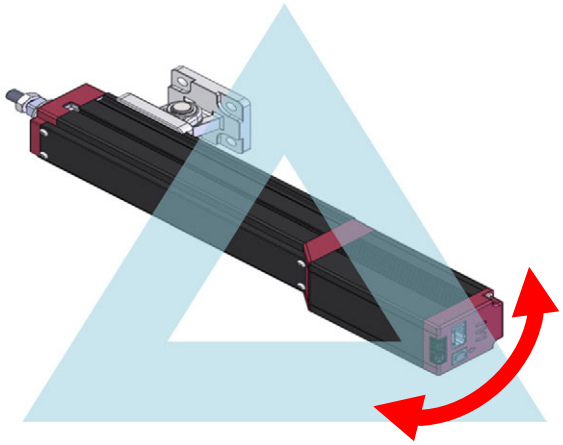
Type	Tightening torque when mounting flanges A and B	Tightening torque when mounting ELECYLINDER
RR6(X)□AHB RR6□AHBR	7.1N·m (M6)	30.0N·m
RR7(X)□AHB RR7□AHBR	17.2N·m (M8)	35.0N·m

2.5.6 Caution in Yawing operation

- When in use as the driving device for the link feature, the operational conditions should be determined from the thrust, not from the payload.
- When in use for yawing operation, high acceleration could generate vibration or impact load on a device or actuator, which may cause to drop life or malfunction the actuator.
  Have the acceleration at 0.3G or less (recommended) as a reference to avoid generating vibration or impact load.
- When in use for yawing operation, the maximum value for the acceleration should be 0.5G.

2.5.7 Mounting with oscillation

[Installation orientation for oscillation]

Vertical installation	Horizontal installation
	

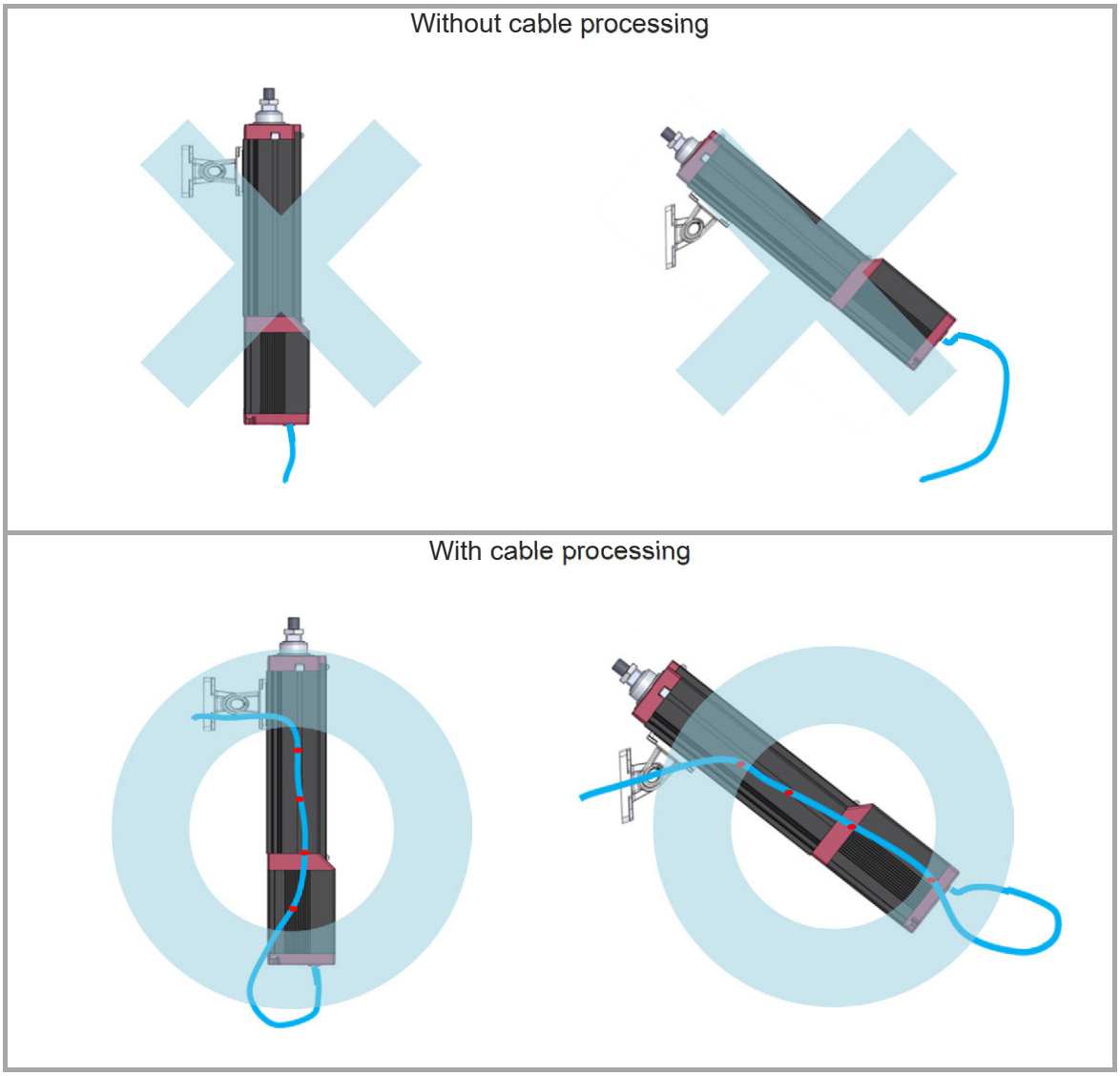
○ : Available for Installation

△ : Caution Needed

- We recommend vertical mounting for oscillation.
  When oscillation is performed with horizontal mounting, the product's self-weight causes moment loads to be applied to the joint, increasing the sliding friction on the joint and leading to thrust loss.
  As well, note that sliding in the joint may cause wear on the bracket.

[Cable processing for oscillation]

- For oscillation, use a robot cable with bending resistance.
  Fix the cable using the product body T-shaped slots, etc., so that oscillation of the body does not cause load to be applied to the connector.
  Be careful to arrange the cable so as not to exceed its flex radius allowable value. Because there is no T-shaped slot on the body side, use an adhesive wiring bracket or similar to fix the cable.



○ : Available for Installation

× : Unavailable for Installation

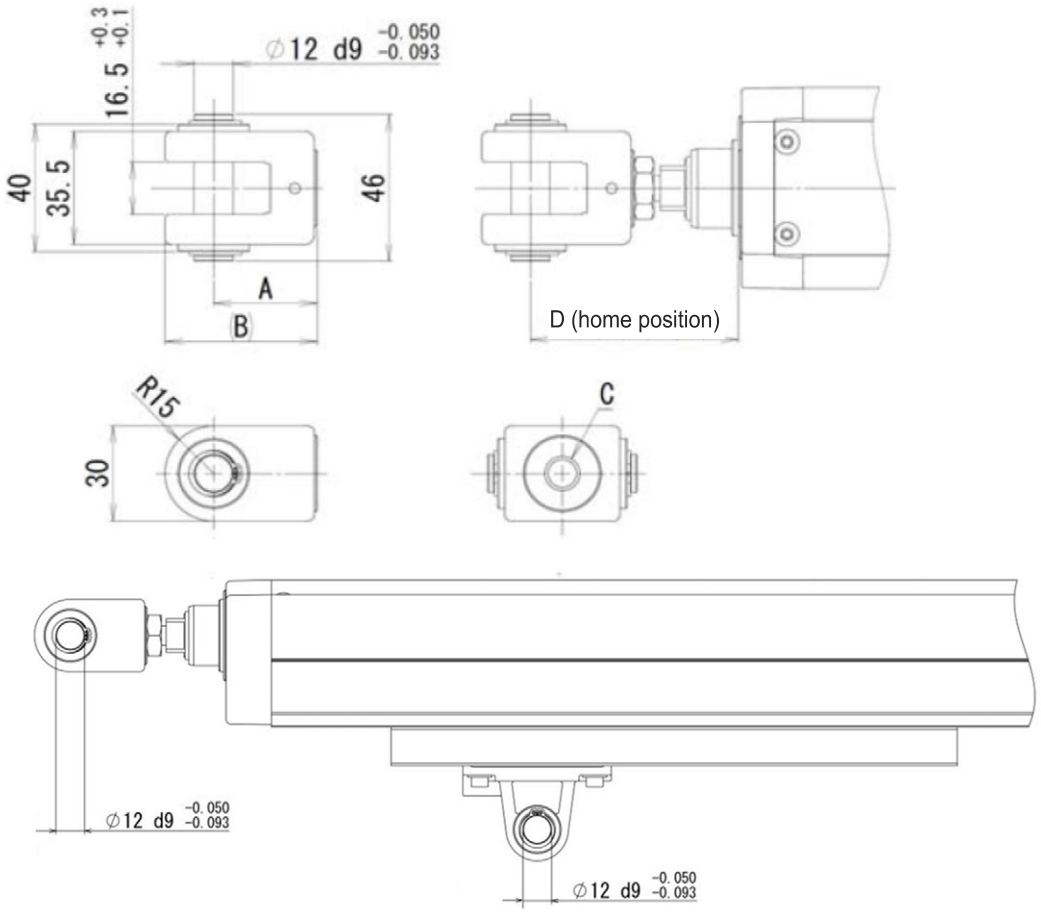
[Bracket mounting for oscillation]

Oscillation requires fixing the body with a joint able to move freely in the rotation direction. Configured options include the tip knuckle joint (-NJ), the body clevis (-QR), the tip knuckle joint + oscillation receiving bracket (-NJPB), and the body clevis + oscillation receiving bracket (-QRPB).

(Note) Only RR6 Type with stroke from 50 to 400mm and RR7 Type with stroke from 50 to 500mm are available to select from.

[Knuckle joint (-NJ) mounting method]

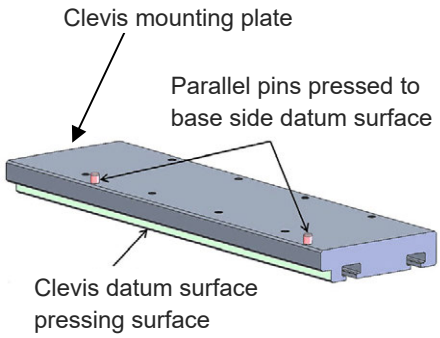
1) Pass the nut and knuckle joint through the rod tip male thread.
2) Adjust the knuckle joint position to the specified dimensions.
   * Adjust the knuckle joint angle so as to operate smoothly, with no load applied to the bracket or rod, when operating embedded in the equipment.
   * Mount with the geometric tolerance in the figure below as a guideline.
3) Fix by tightening the nut so that load is not applied to the rod.

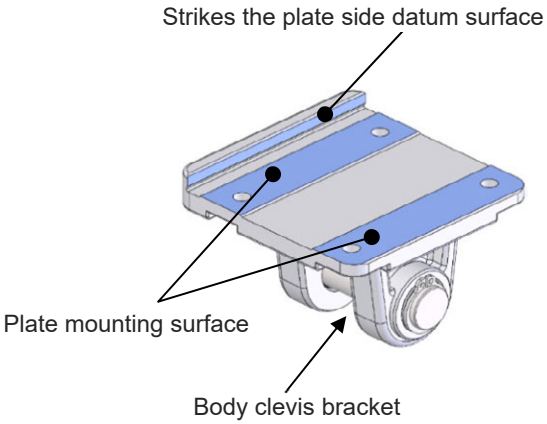


Type	A	B	C	D	Nut tightening torque
RR6(X)□AHB RR6□AHBR	32mm	47mm	M10×1.25	64mm	30.0N·m
RR7(X)□AHB RR7□AHBR	37.5mm	52.5mm	M14×1.5	76mm	35.0N·m

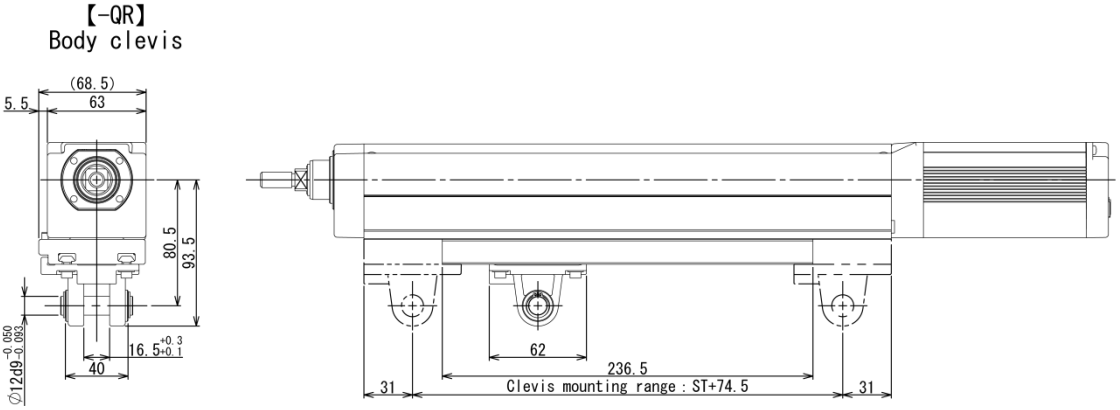
[Body clevis (-QR) mounting method and mounting dimensions]

1) Press the 2 parallel pins on the clevis mounting plate against the base side datum surface.
2) Mount the clevis mounting plate on the base.
   * Fix the clevis mounting plate with at least 4 bolts.
     The clevis mounting plate position can be adjusted at a 50mm pitch.
3) Insert 4 square nuts into the clevis mounting plate T-shaped slots.
4) Using the inserted square nuts, fix the body clevis bracket with the bolt. (temporary fixing)
5) Press the body clevis bracket datum surface against the clevis mounting plate datum surface.
6) Fully tighten the bolts to complete the fixation.

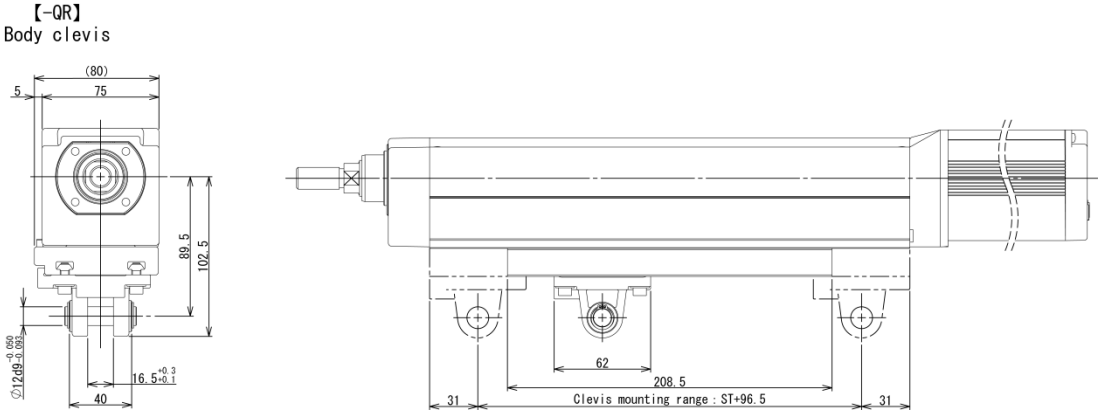




● For EC-RR6□AHB/RR6□AHBR

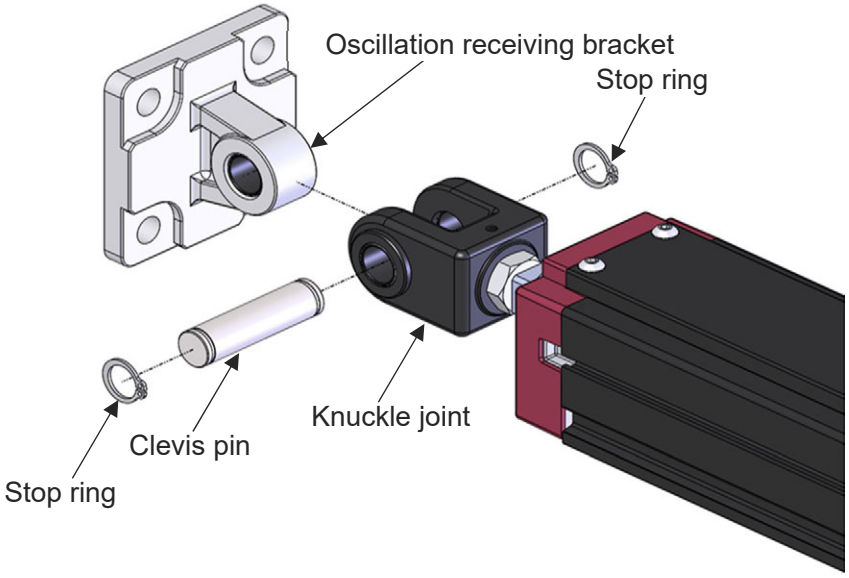


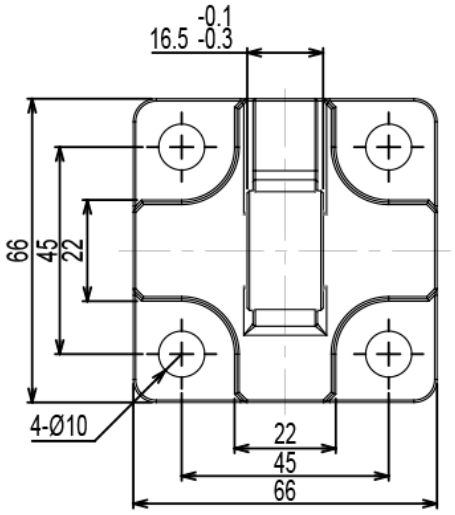
● For EC- RR7□AHB/RR7□AHBR

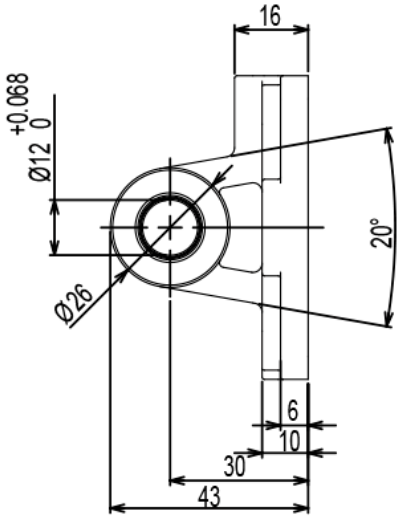


[Oscillation receiving bracket mounting method and component dimensions]

1) Insert the oscillation receiving bracket ridge between the knuckle joint and body clevis ridges.
2) Match the positions of the ridges and pass the clevis pin through.
3) Mount a stop ring on each end of the clevis pin.
   * Stop ring: C-shaped stop ring for shaft, nominal diameter 12
4) Mount the oscillation receiving bracket on the equipment.
   * Adjust so as to operate smoothly, with no load applied to the bracket or rod, when operating embedded in the equipment.

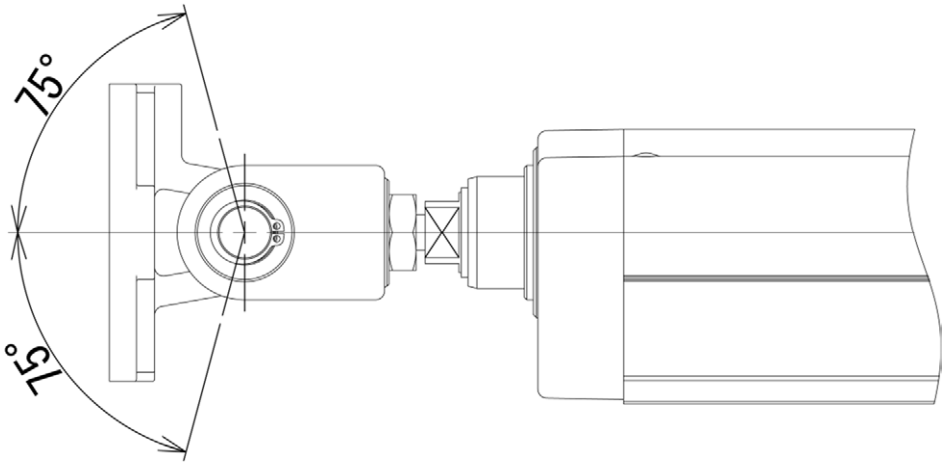




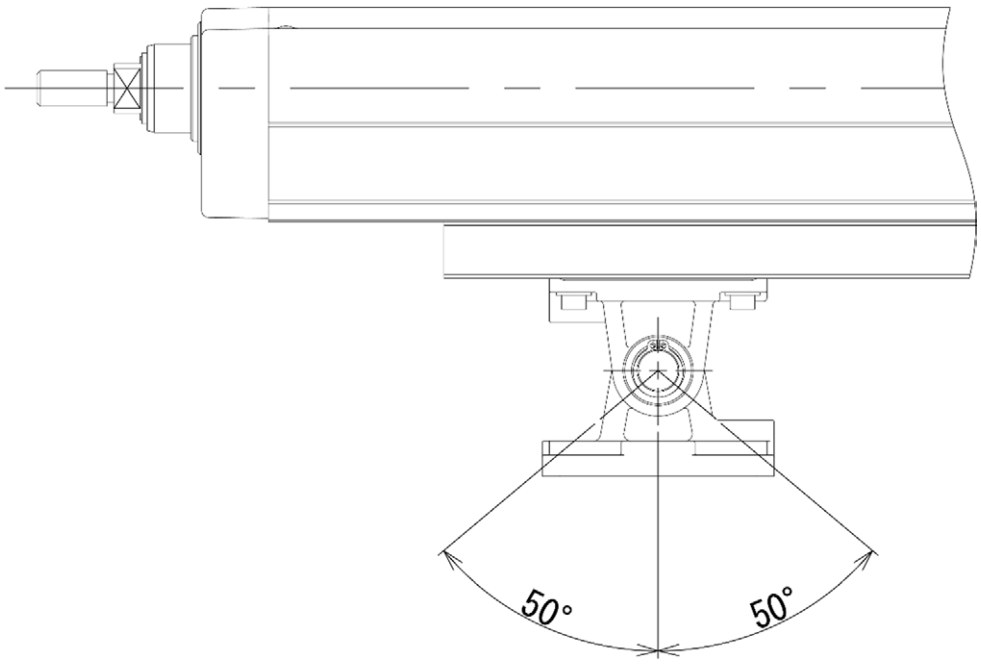


[Oscillation receiving bracket movable range]

-NJPB

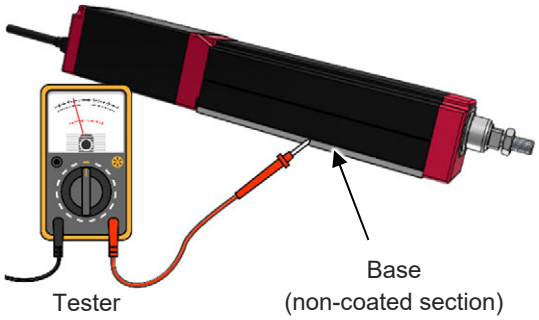


-QRPB



2.6 Frame grounding wiring

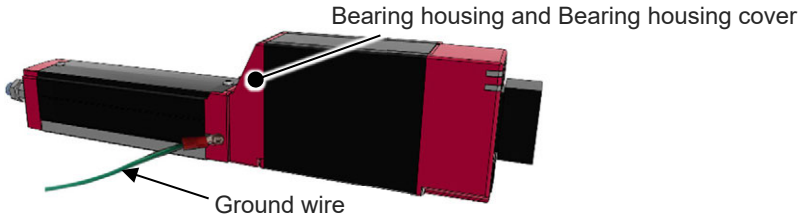
The ELECYLINDER has a built-in controller circuit board.
The controller frame grounding line is connected to the ELECYLINDER body and through to ground via the ELECYLINDER mounting surface.
Use a tester to measure the continuity between the fixing screws and grounding surface to check whether it is grounded or not.
Conductivity can be checked at a point where there is no paint on the base bottom.



[When Grounding not Conducted at Attachment Surface]

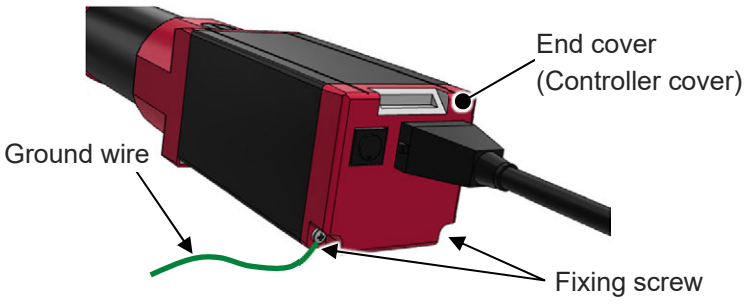
♦EC-RR3□B/RR4□B

Insert a M3 square nut in the T-shaped slot on the bearing housing and the side face of the bearing housing cover and put through a ground wire perform grounding.
Check again for the conductivity.



♦EC- RR6 Type/RR7 Type/RR8 Type/RR10 Type

Connect the ground line to one of the screws on the end cover to perform grounding.
Check again for the conductivity.
Refer to [4.6 Component replacement] for how to attach the fixing screws.



ELECYLINDER

Chapter 3

Electrical and Controls

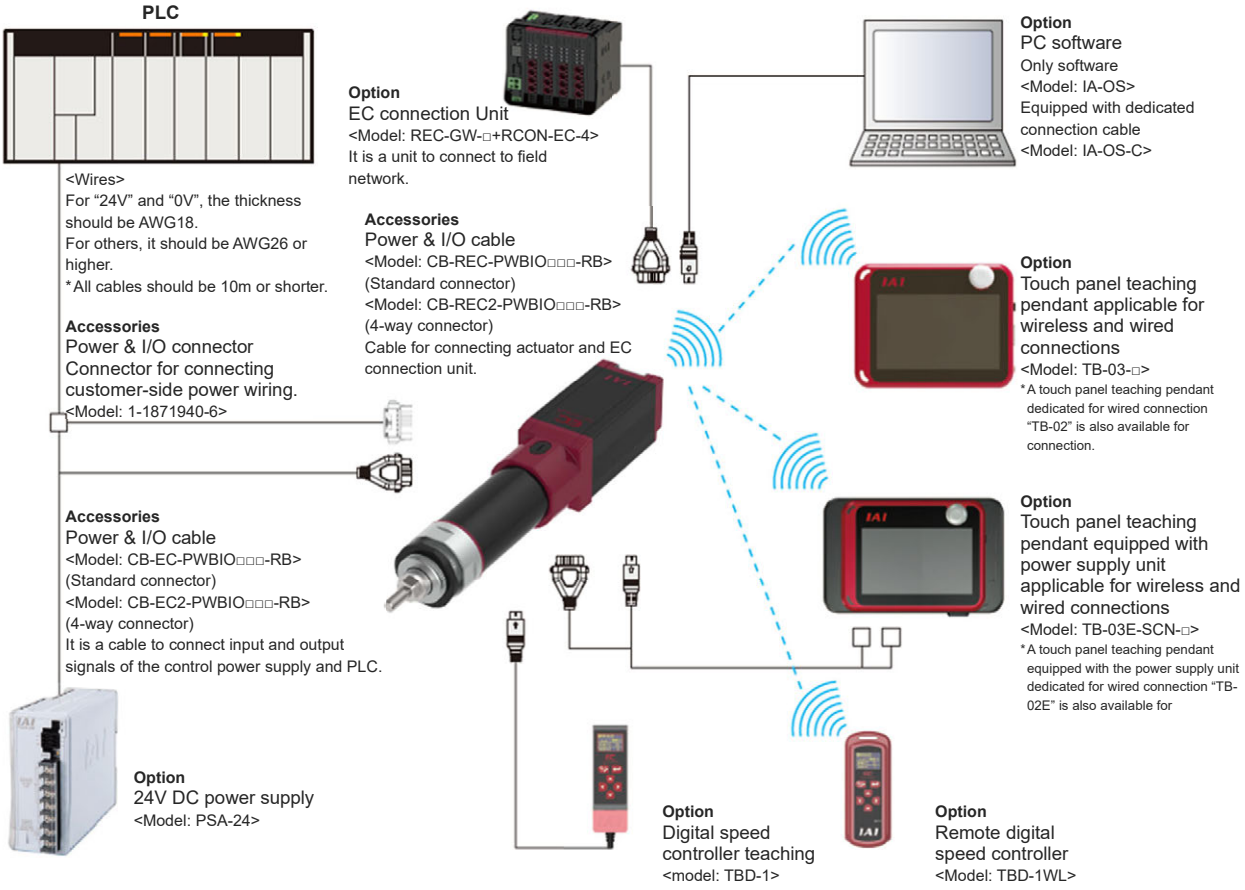
3.1 System configuration ····· 3-1
3.2 Cable and Connector ····· 3-2
3.2.1 Power & I/O Cable ····· 3-2
3.2.2 Power & I/O Connector ····· 3-3
3.2.3 RCON-EC connection specification / Power & I/O Cable ····· 3-4
3.2.4 Power & I/O cable connection ····· 3-6
3.3 Basic operation ····· 3-7
3.4 Teaching tool ····· 3-8
3.5 Preventive/Predictive maintenance ····· 3-9
3.6 Troubleshooting confirmations ····· 3-10

3.1 System configuration

Reference

- For electric / control details such as electrical specification, wiring, connection, parameters and how to control, and also trouble shooting, refer to [ELECYLINDER Electric Section Instruction Manual (ME3816)] provided separately.

The following shows the system configuration.



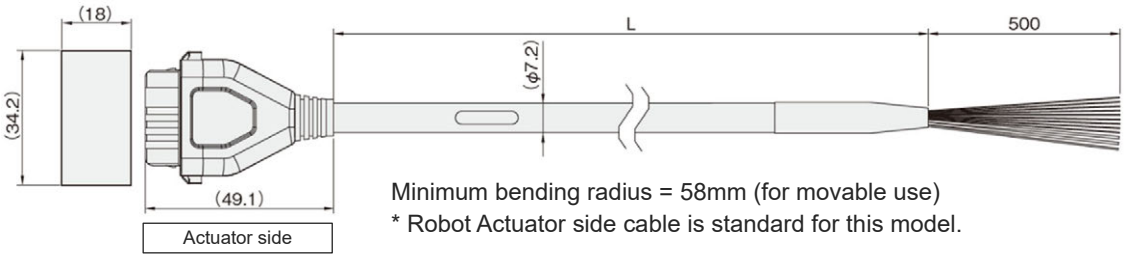
Supply 24V DC to the ELECYLINDER and input a signal from a master device to the ELECYLINDER.
This enables the ELECYLINDER to operate.
This manual introduces an example using a PLC connected as the master device.

3.2 Cable and Connector

3.2.1 Power & I/O Cable

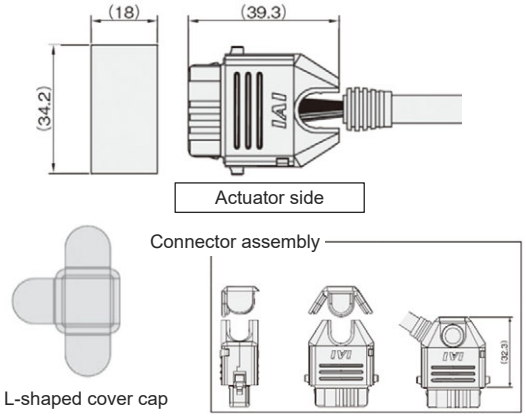
♦ Model CB-EC-PWBIO□□□-RB (Standard connector)
CB-EC2-PWBIO□□□-RB (4-way connector)

● Standard connector



Minimum bending radius = 58mm (for movable use)
* Robot Actuator side cable is standard for this model.

●4-way connector

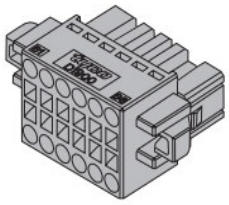


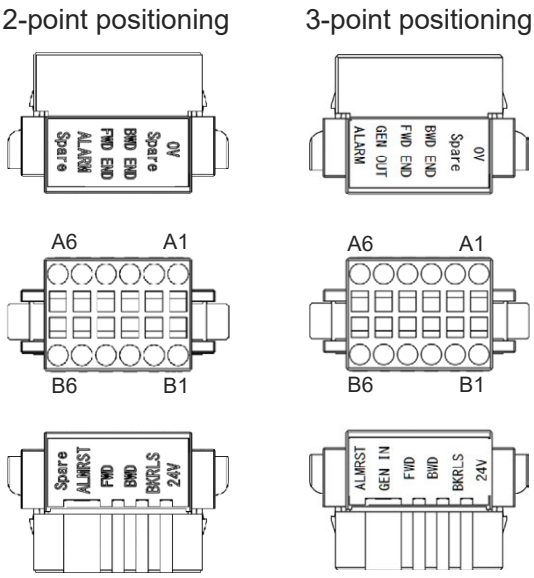
Color	Signal name		Pin No.
	2-point positioning	3-point positioning	
Black (AWG18)	0V	0V	A1
Red (AWG18)	24V	24V	B1
Light blue (AWG22)	(Reserve) (Note 1)	(Reserve) (Note 1)	A2
Orange (AWG26)	ST0	ST0	B3
Yellow (AWG26)	ST1	ST1	B4
Green (AWG26)	RES	(Reserve)	B5
Pink (AWG26)	(Reserve)	RES	B6
Blue (AWG26)	LS0/PE0	LS0/PE0	A3
Purple (AWG26)	LS1/PE1	LS1/PE1	A4
Gray (AWG26)	*ALM	LS2	A5
White (AWG26)	(Reserve)	*ALM	A6
Brown (AWG26)	BKRLS	BKRLS	B2

Note 1 24V (control) when 2-circuit power supply specification (TMD2) are selected.
(Note) Cable in yellow green and light gray not in use
(Note) The signal name of Pin No. B3 is FWBW and Pin No. B4 is not for use in the single solenoid type.

- The wiring on the opposite side of the connector has not been processed.
- The cable length (L) is available from 1m to 10m. Specify the length in increments of 1m.
- Sample model number: Cable length **3**m → CB-EC(2)-PWBIO**030**-RB

3.2.2 Power & I/O Connector





Name	Model	Quantity
Power & I/O connector	1-1871940-6 (Tyco Electronics)	1 pc

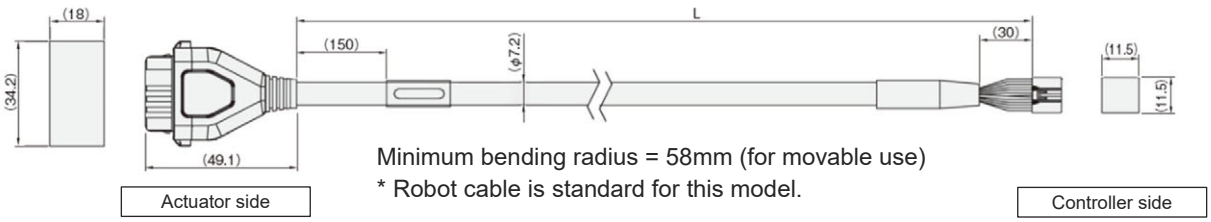
Pin No.	Signal name		Function
A1	0V		Ground
A2	Reserve (CP: 2-circuit power supply specification)		Reserve (24V for control power supply when power supply 2-system specification)
A3	Backward completion		Backward completion (Pressing complete 0 when pressing operation)
A4	Forward completion		Forward completion (Pressing complete 1 when pressing operation)
A5	2-point positioning	Alarm	Alarm output
	3-point positioning	General OUT	Intermediate position completion
A6	2-point positioning	Spare	Spare
	3-point positioning	Alarm	Alarm output
B1	24V (MP: 2-circuit power supply specification)		24V power supply (24V for motor power supply when power supply 2-system specification)
B2	Brake release		Brake release input
B3	Backward (Note 1)		Backward command
B4	Forward (Note 1)		Forward command
B5	2-point positioning	ALMRST	Alarm release signal input
	3-point positioning	General IN	Spare
B6	2-point positioning	Spare	Spare
	3-point positioning	ALMRST	Alarm release signal input

Note 1: B4 should not be used and B3 should be the forward/backward command in the single solenoid system.

3.2.3 RCON-EC connection specification / Power & I/O Cable

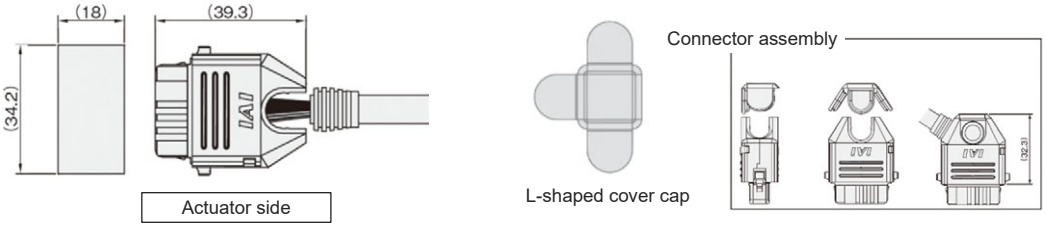
♦ Model CB-REC-PWBIO□□□-RB (Standard connector)
CB-REC2-PWBIO□□□-RB (4-way connector)

●Standard connector

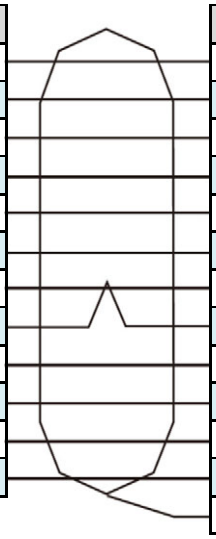


Minimum bending radius = 58mm (for movable use)
* Robot cable is standard for this model.

●4-way connector



Color	Signal name	Pin No.
Black (AWG18)	0V	A1
Red (AWG18)	24V (MP)	B1
Light blue (AWG22)	24V (CP)	A2
Orange (AWG26)	IN0	B3
Yellow (AWG26)	IN1	B4
Green (AWG26)	IN2	B5
Yellow green (AWG26)	SD+	B6
Light gray (AWG26)	SD-	A6
Blue (AWG26)	OUT0	A3
Purple (AWG26)	OUT1	A4
Gray (AWG26)	OUT2	A5
Brown (AWG26)	BKRLS	B2



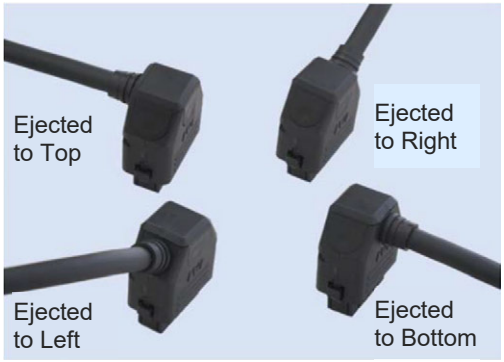
Pin No.	Signal name	Color
2	0V	Black (AWG18)
1	24V (MP)	Red (AWG18)
12	24V (CP)	Light blue (AWG22)
7	OUT0	Orange (AWG26)
8	OUT1	Yellow (AWG26)
9	OUT2	Green (AWG26)
6	SD+	Yellow green (AWG26)
10	SD-	Light gray (AWG26)
3	IN0	Blue (AWG26)
4	IN1	Purple (AWG26)
5	IN2	Gray (AWG26)
11	BKRLS	Brown (AWG26)
13	FG	Green (AWG26)

- The wiring on the opposite side of the connector has not been processed.
- The cable length (L) is available from 1m to 10m. Specify the length in increments of 1m.
- Sample model number: Cable length **3**m → CB-REC(2)-PWBIO**030**-RB

■ About 4-way Connector

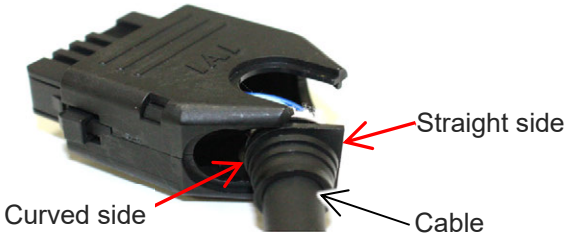
It is a cable capable to change the orientation of the connector in four ways.



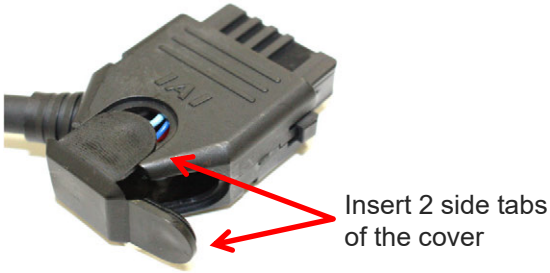


Follow the process bellow to build up the connector in the orientation of your demand.

1) Insert the cable by sliding it from the curved side of the cable-end to your desire direction.



2) Be sure to check that the cable is settled firmly and insert two tabs of the cover along the slits of socket.

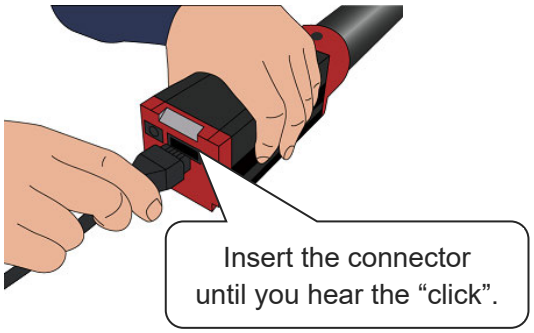


3) Then, push the last tab to the socket.



3.2.4 Power & I/O cable connection

Connect the power & I/O cable.
Have the convex on the connector facing down, insert the connector till it makes a “click” noise.



Caution

- The connector must be inserted in a given direction.
  Have the convex on the connector facing down, insert the connector till it makes a “click” noise.
- Take appropriate care to prevent unused wiring in the loose wire end on the cable from shorting out other wires by protecting them with insulation tape.

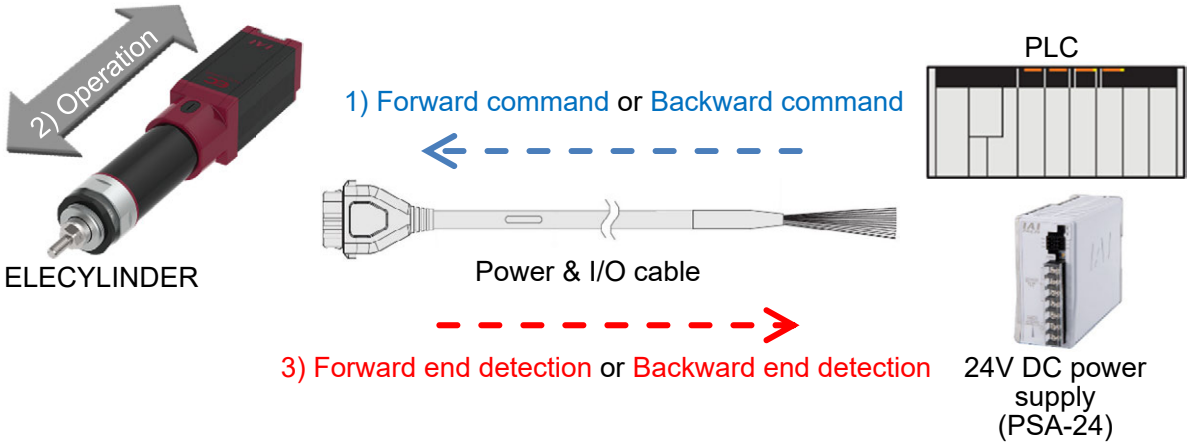
3.3 Basic operation

An input signal from a master device to the ELECYLINDER triggers operation of the ELECYLINDER.
The ELECYLINDER status can also be determined when the master device receives signal output from the ELECYLINDER.

Control is just as simple as when using a solenoid valve (SOL valve) and air cylinder drive.
Shown below is an image when connecting ELECYLINDER with PLC as the host device.

● PLC/ELECYLINDER connection (movement between 2-points)

1) Input a movement command signal from the PLC. (forward or backward)
2) The ELECYLINDER operates.
3) A position detection signal is output from the ELECYLINDER. (forward end or backward end)



Reference

- Refer to [ELECYLINDER Electric Section Instruction Manual (ME3816)] provided separately for the details how to control.

3.4 Teaching tool

For setup and operation of ELECYLINDER, the following teaching tools are to be used.

♦ **Digital Speed Controller Teaching / Remote digital speed controller**



Digital Speed Controller
Teaching (Wired)
TBD-1



Remote digital speed
controller (Wireless)
TBD-1WL

Refer to [Digital Speed Controller / Digital Speed Controller Teaching / Remote Speed Controller (ME3818)] for how to use them.

♦ **Touch Panel Teaching Pendant**



TB-03 (Wireless / wired)



TB-02 (Wired)

Refer to [ELECYLINDER Applicable Teaching Pendant TB-03 (Wireless: ME0375 / Wired: ME0376)] or [ELECYLINDER Applicable Teaching Pendant TB-02 (ME0355)] for how to use them.

♦ **IA-OS (PC Software)**



IA-OS

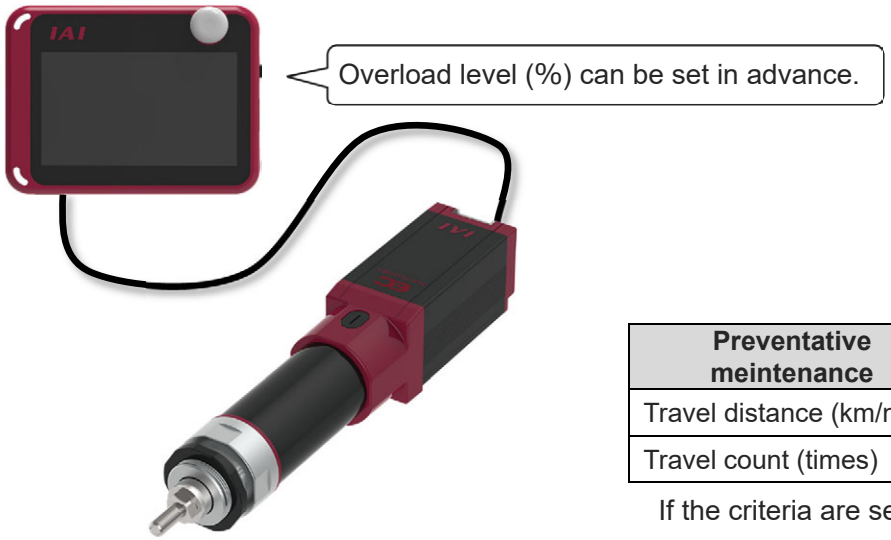
Install to PC



For how to install, refer to [IA-OS Fast Step Guide (ME0391)].
For how to use, refer to [the Help window in IA-OS].

3.5 Preventive/Predictive maintenance

The ELECYLINDER has a **predictive maintenance function** that notifies the user with an "overload warning" when the load exceeds normal status.
It also has a **preventive maintenance function** that prompts the user to perform maintenance if the travel count or the travel distance exceeds the set values.



Preventative meintenance	Predictive maintenance
Travel distance (km/m)	Overload warning
Travel count (times)	

If the criteria are set in advance, the LED built into the body will flash green/red to notify that the maintenance period is up.

Preventative maintenance
• Regular maintenance that is performed based on a reference period regardless of whether or not there are equipment breakdowns. • Prevents unexpected breakdowns. • Extends service life.

Predictive maintenance
• Maintenance that is performed when, based on regular equipment monitoring, an abnormality is predicted to occur. • Predicts unexpected breakdowns. • Prevents sudden line stoppages.

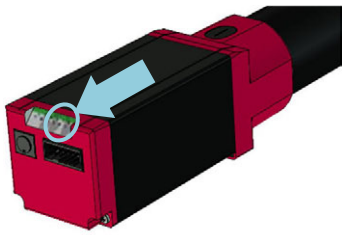
Reference

- For how to set up or how to use preventive maintenance or predictive maintenance, refer to [ELECYLINDER Electricity Section Instruction Manual (ME3816)] provided separately.

3.6 Troubleshooting confirmations

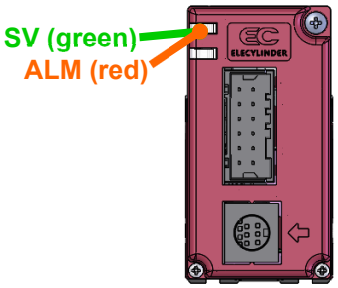
If a problem occurs, check the following points first in order to ensure quick recovery and prevent recurrence of the problem.

(1) Check status indicator LED (SV/ALM LED) of the ELECYLINDER body

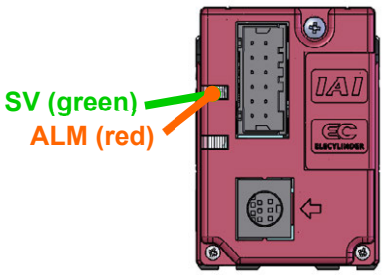


○: Light ON ×: Light OFF ★: Blinking

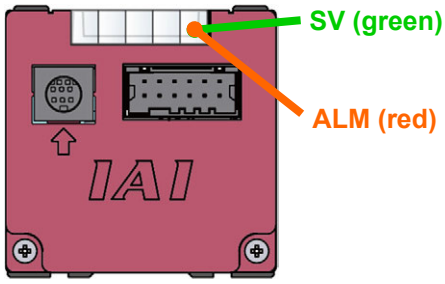
SV/ALM LED		Operation status	* ALM signal output status
SV (green)	ALM (red)		
×	×	Power OFF, Servo OFF	OFF
×	○	Alarm generated	OFF
		Stop switch ON (When using teaching tool)	ON
○	×	Power ON, Servo ON	ON
★ (Green 500ms ⇔ Red 500ms alternate blinking in 1 Hz cycle)		Maintenance warning generated (When the travel count or the travel distance has exceeded the set value, or when overload warning is generated)	ON
★ Alternate blinking in cycle of green for 1s and 0.5 Hz	×	Automatic servo-off	ON
○ (both green & red ON)		Initializing when power comes ON	OFF



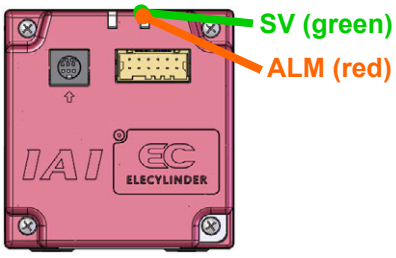
EC-RR3□B/RR3□BR



EC-RR4□B/RR4□BR

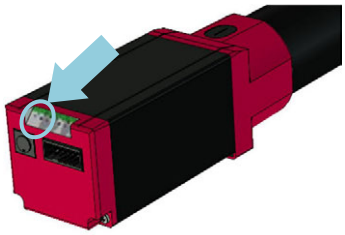


Models starting with EC-RR6/RR7



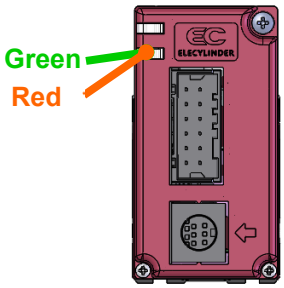
EC-RR8□B/RR8□BR/RR10□B/RR10□BR

(2) Check status indicator LED (wireless status LED) of the ELECYLINDER body

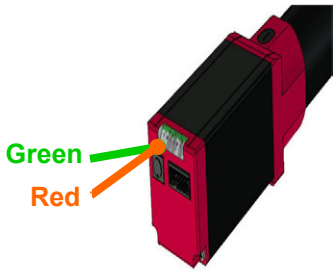


○: Light ON ×: Light OFF ★: Blinking

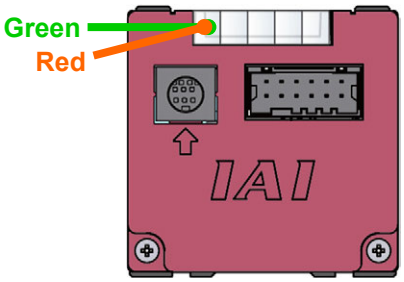
Wireless status LED		Motor power status
Green	Red	
×	×	Wireless hardware initializing Wireless not connected (transmitting monitor data) Connecting from wired teaching pendant
×	★ (ON 200ms/ OFF 200ms alternate blinking)	Wireless hardware error
★ (ON 150ms/ OFF 150ms alternate blinking)	×	Connecting through wireless



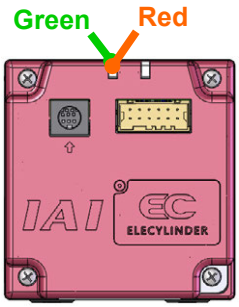
EC-RR3□B/RR3□BR



EC-RR4□B/RR4□BR



Models starting with EC-RR6/RR7



EC-RR8□B/RR8□BR/RR10□B/RR10□BR

(3) Check for abnormality in the master device (PLC, etc.)

(4) Check the voltage of the main power supply (24V DC)

Check for momentary power failure, voltage drop, power failure, etc.

(5) Confirm the generated alarm

Check the alarm information with the teaching tool.

(6) Check the connectors for disconnection or incomplete connection

(7) Check the cables for connection error, disconnection or snagging

Cut off the main power supply of the equipment (to avoid electric shock) and remove the cables around the measurement point (to avoid conductivity through the surrounding circuit) before checking the conductivity.

(8) Check the I/O signals

Use the master device and ELECYLINDER teaching tool to check for inconsistency or abnormality in the input/output signal status of the two units.

(9) Check the noise elimination measures (grounding, connection of noise suppressor, etc.)

(10) Check the events leading to the occurrence of the problem, as well as the operating conditions at the time of occurrence

(11) Analyze the cause

(12) Countermeasures



Caution

- When troubleshooting, exclude normally functioning parts from the targets to narrow down the causes.
- First, check (1) to (10) so that countermeasures can be taken swiftly.

Reference

- For how to diagnose troubles, details and how to deal with generated alarms, refer to [ELECYLINDER Electricity Section Instruction Manual (ME3816)] provided separately.
- For details and how to deal with generated alarms, it is also available to check in the Help window in IA-OS or a touch panel teaching tool.

ELECYLINDER

Chapter 4

Maintenance and Inspection

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4.1 Precautions for maintenance and inspection work

Make sure to read the following precautions before conducting any maintenance or inspection work.

Warning

- Do not climb on or put anything on the ELECYLINDER.
  Otherwise, this may lead to accidental falling, injury or damage to the product due to falling objects, product loss of function or performance degradation, or shortening of product life.
- Before releasing the brake, make sure to check there is nothing that will interfere with moving parts within the operation range.
  The rod may fall, possibly injuring the operator or people nearby and damaging the ELECYLINDER, workpiece or equipment.

Caution

- Check that the power to the ELECYLINDER is OFF before conducting any maintenance or inspections.
- Be careful not to lose the cover or any removed screws.
  Be sure to return the product to the original condition after maintenance and inspection work.
  Mounting in an incomplete state may cause injuries or damage to the product.
- Do not modify, disassemble/assemble, or use maintenance parts not specified on your own discretion under any circumstances.

Notice

- First, be sure to wipe off the old grease, and then supply new grease.
- The degradation speed of grease may differ depending on the operating environment (temperature, humidity and ambient atmosphere).
  It is recommended to shorten the grease supply period if the actuator is used under poor environmental conditions such as high temperatures, high humidity or dusty atmospheres.
- Also, it is recommended to improve the environmental conditions in case the grease changes color notably due to poor operating conditions.
- Base oil may separate from the grease due to the mounting orientation or operating conditions.
  Base oil may also leak from the inside of the ELECYLINDER to the exterior through gaps.
  Check visually for oil drips when supplying grease.
  Wipe it off in case of any dripping.
- An ELECYLINDER stored for 6 months or more may suffer from grease degradation.
  Supply grease before the start of use.
  For details, refer to [4.5 Grease supply].

4.2 Inspection

Follow the maintenance inspection schedule below.
It is assumed that the equipment is operating 8 hours per day.
If the equipment is running continuously night and day or otherwise running at a high operating rate, inspect more often.

4.2.1 Inspection items and schedule

♦ Rod type



Inspection period	External inspection	Greasing	
		Rod sliding surface	Frame interior
Start of work inspection	○	○	-
1-month inspection	○	-	-
3-month inspection	○	○	○
3-month inspection on	○	Every 3 months	Grease supply timing (Guideline) dependent
6-month inspection	○	-	
Every 6 months thereafter	○	-	

♦ Radial cylinder motor straight type, Motor reversed type
High rigidity radial cylinder motor straight type / Motor reversed type



Inspection period	External inspection	Internal inspection	Greasing		
			Ball screw	Guide	Rod sliding surface
Start of work inspection	○	-	-	-	○
1-month inspection	○	-	-	-	-
3-month inspection	○	-	○	○	○
3-month inspection on	○	-	Depends on greasing timing (guideline)		Every 3 months
6-month inspection	○	○			-
Every 6 months thereafter	○	○			-

4.2.2 Grease supply timing (Guideline)

Rod type, Radial cylinder type, High rigidity radial cylinder type

Maximum operating speed [mm/s]	Grease supply timing (Guideline)	
	Operation distance	Period
0 to 750 or less	1,250km	6 months
Over 750 to 860	2,500km	

Caution

- ELECYLINDER stored for six months or more may have the grease deteriorated. Supply grease before use.
- The speed of degradation of grease may vary depending on the environment of use (temperature, humidity or ambient conditions).
  It is recommended to shorten the length of period for grease supply in case of use in any adverse environment such as high temperature, high humidity or high amount of dust flowing around.
- It is recommended that you improve the environment if the color of grease changes tremendously due to the adverse environment.

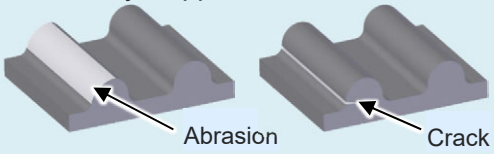
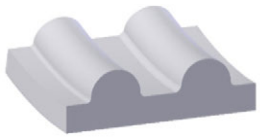
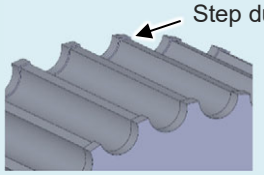
4.3 Visual inspection

Refer to [4.5 Grease supply] for detailed information about the greasing method.
Refer to [4.6 Component replacement] for detailed information about specific component replacement and adjustment methods.

4.3.1 External visual inspection

Inspection items	Maintenance work
Is abnormal noise or vibration generated?	Refer to [ELECYLINDER Electricity Section Instruction Manual (ME3816) Maintenance Section 1.4 Troubleshooting with no alarm generated] for help.
Are ELECYLINDER mounting bolts loose?	Tighten them further. Refer to the tightening torque described in [Chapter 2 Installation].
Is the cable scratched?	Replace if the damage is severe.
Is the connector loose?	Re-insert correctly.
Is grease dripping out? (especially if vertically mounted)	Clean up any drips. Replenish the grease.
Is the rod sliding surface grease not lubricating well?	Wipe away the old grease, then replenish with new grease.
Is there foreign matter or dust adhered to the rod sliding surface?	Clean the rod sliding surface, then replenish with new grease.

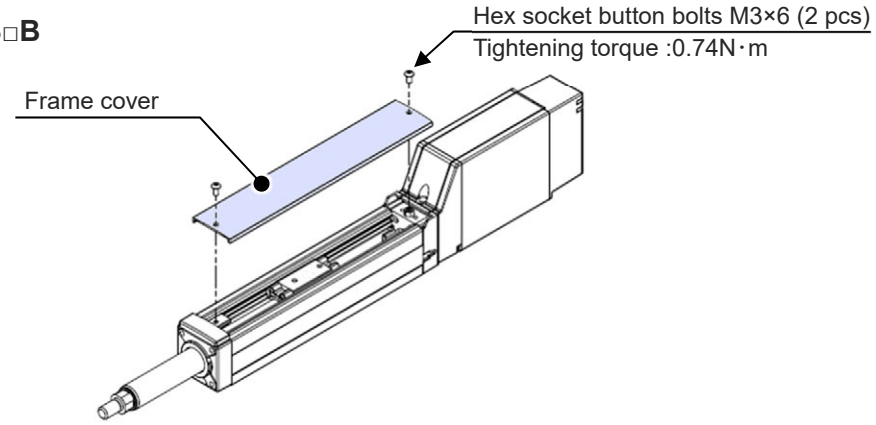
4.3.2 Internal visual inspection

Inspection items	Maintenance work
Is play or dust generated?	The ball screw guide may be damaged. Contact IAI.
Has foreign matter penetrated inside?	Remove the foreign matter, clean, and inspect the interior for any damage.
Is the ball screw or guide grease not lubricating well? (Even if the grease is brown, lubrication is adequate if the running surface is shiny)	Wipe away the old grease, then replenish with new grease. (Replenishment only for rod type)
Is dust or foreign matter adhered to the ball screw or guide?	Replenish with new grease after cleaning.
EC-RR□X□AHB Equipped with Support Is there any considerable abrasion, crack or chipping on the support cushions?	Replace a support cushion if anything abnormal is found.
Is the Timing belt significantly worn out on the teeth area? Is there any crack on the teeth area? Is there any chipped tooth? 	Replace the belt in case any of those stated on the left is found. Refer to [4.6.5 Timing belt replacement]. Applicable Models: Motor reversed (EC-RR□□BR, EC-RR□□AHBR)
Is the Timing belt hardened, softened or deformed (shrunk or expanded)? 	Replace the belt in case any of those stated on the left is found. Refer to [4.6.5 Timing belt replacement]. Applicable Models: Motor reversed (EC-RR□□BR, EC-RR□□AHBR)
Is there any significant abrasion on pulley teeth? 	When abnormality stated on the left is found: Consult with IAI. Applicable Models: Motor reversed (EC-RR□□BR, EC-RR□□AHBR)

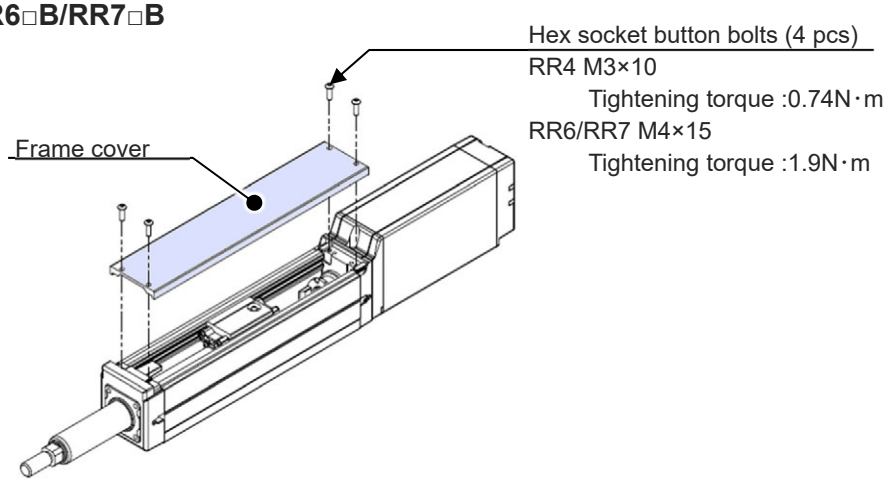
[1] How to inspect inside radial cylinder type

1) Remove the hex socket button head bolts and take off the frame cover.
2) Inspect inside.
3) Mount the frame cover on the base and fix it with hex socket button bolts.

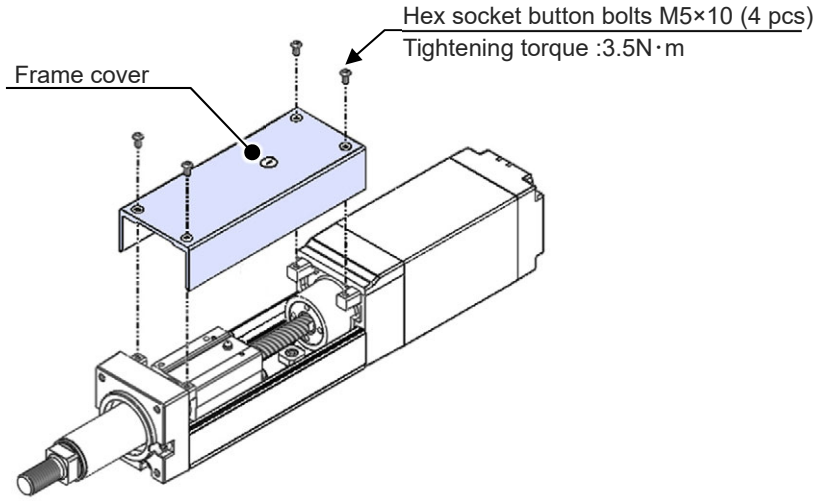
♦RR3□B



♦RR4□B/RR6□B/RR7□B



♦RR8□B/RR10□B



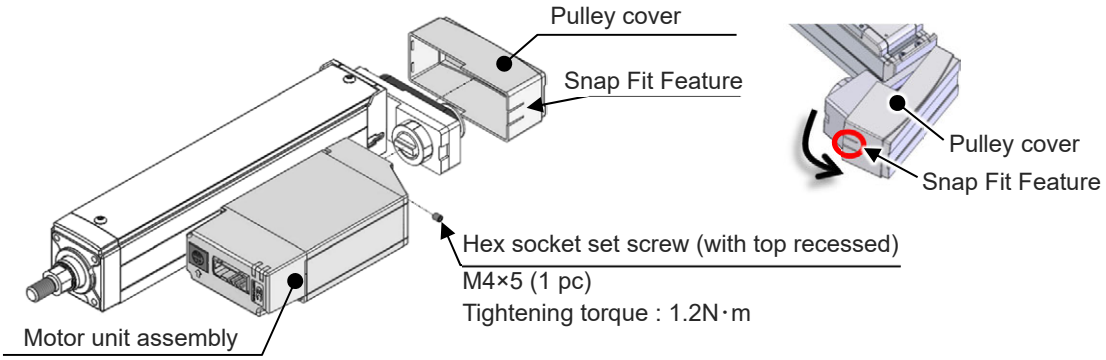
* To release the brake, refer to [ELECYLINDER Electricity Section Instruction Manual (ME3816) Startup Section]

[2] How to inspect inside radial cylinder type reversed

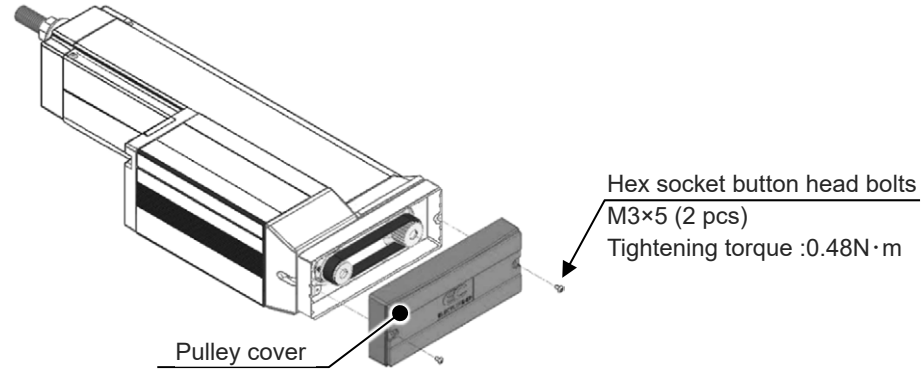
1) Remove the pulley cover.
2) Inspect the timing belt.
3) Put the pulley cover back on.

♦RR3□BR/RR4□BR

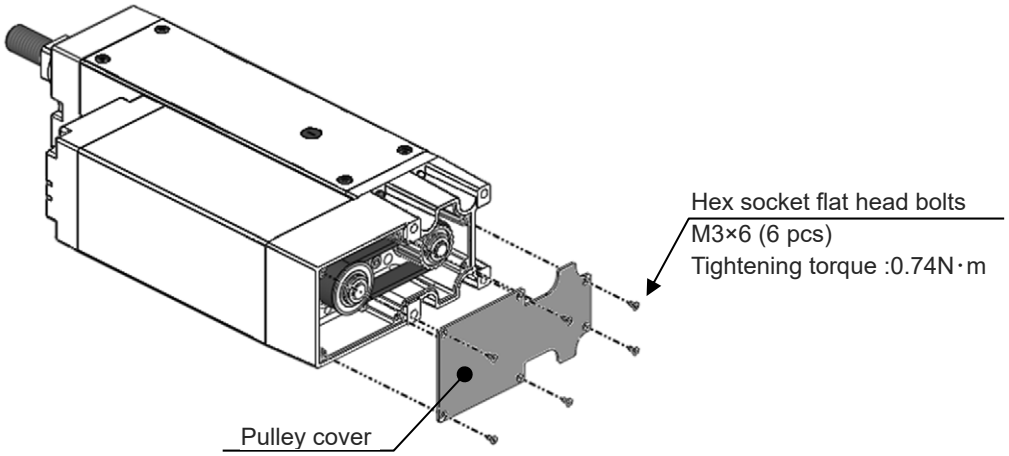
Remove the hex socket set screw (1 pc), take the motor unit assembly off, open the snap fit features on the pulley cover softly and slide the cover in the direction shown in the figure to take it off.



♦RR6□BR/RR7□BR



♦RR8□BR/RR10□BR



4.4 Cleaning

4.4.1 External cleaning

- Clean exterior surfaces as necessary.
- For the rod type, if grease base oil etc. drips on the rod sliding surface and its periphery, wipe it off with a soft cloth, etc.
- Use a soft cloth to wipe away dirt and buildup.
- Do not blow too hard with compressed air, as it may cause dust to get in through gaps.
- Do not use petroleum-based solvents as they can harm resin and painted surfaces.
- To remove severe buildup, wipe gently with a soft cloth soaked in a neutral detergent or alcohol.

4.4.2 Internal cleaning

- Use a soft cloth to wipe away dirt and buildup.
- Do not blow too hard with compressed air, as it may cause dust to get in through gaps.
- Do not use petroleum-based solvents, neutral detergent or alcohol.

4.5 Grease supply

4.5.1 Radial cylinder motor straight type / Motor reversed type

[1] Preparation

- ●Hex wrench and torque wrench Opposite side: 2.5mm, 3mm
- ●Protection equipment (Rubber gloves, etc.)
- ●Syringe RR3□B(R)
- ●Grease gun RR4□B(R)/RR6□B(R)/RR7□B(R)/RR8□B(R)/RR10□B(R)

Type	Recommended Grease Gun	Nozzle	Nozzle manufacturer
RR4□B(R) RR6□B(R) RR7□B(R)	With attachment screw R1/8 (eg.) GC-57K (Yamada)	NZ3	NSK
RR8□B(R) RR10□B(R)		N Type + Dedicated Nozzle U Type	THK

●Grease

♦**Standard specifications** Use an equivalent product

Type	Application location	Recommended Grease
RR3□B(R) RR4□B(R) RR6□B(R) RR7□B(R) RR8□B(R) RR10□B(R)	Rod sliding surface	IAI CORPORATION IAGR-LDP01-400
	Ball screw	
	Guide	

Caution

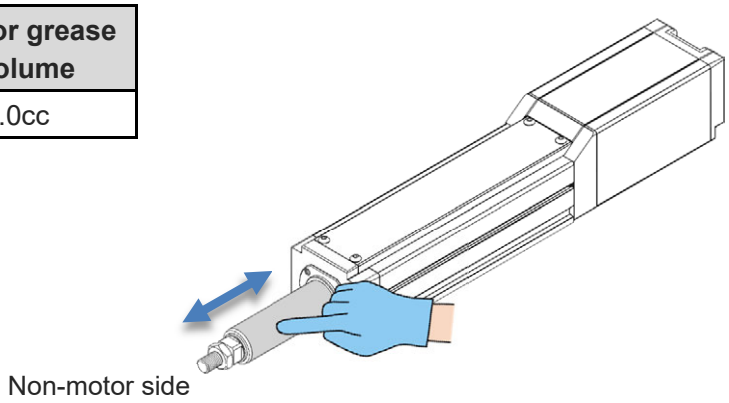
- Do not attempt to apply any grease other than lithium grease.
- Mixing with other types of grease not only reduces the performance of the grease, it may even cause damage to the ELECYLINDER.
- Applying too much grease can cause it to leak out and lead to malfunctions.
- If the grease enters your eye, immediately see a specialist physician for appropriate care.
- After finishing the grease replenishment, wash your hands carefully with water and soap to rinse the grease off.

[2] Greasing method

♦**Rod sliding surface** (In common for each type)

1) Pull the rod towards the non-motor side.
   * To release the brake, refer to [ELECYLINDER Electricity Section Instruction Manual (ME3816) Startup Section]
2) Clean the rod sliding surface and apply the grease by hand.
3) Move the rod full-stroke to apply the grease thoroughly.

Reference for grease supply volume
0.5 to 1.0cc

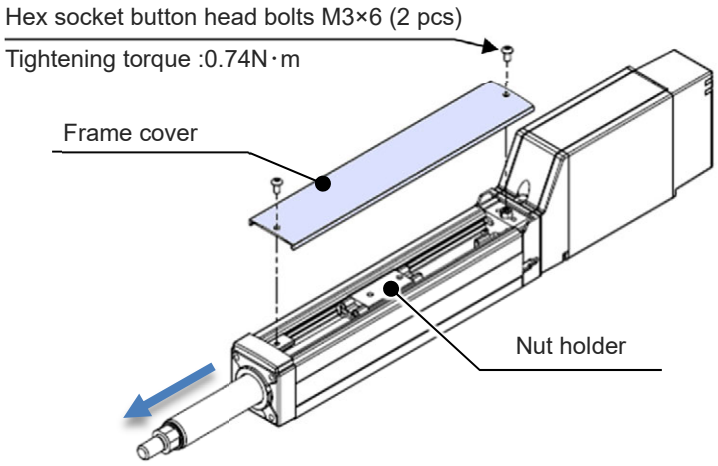


♦Ball screw Guide

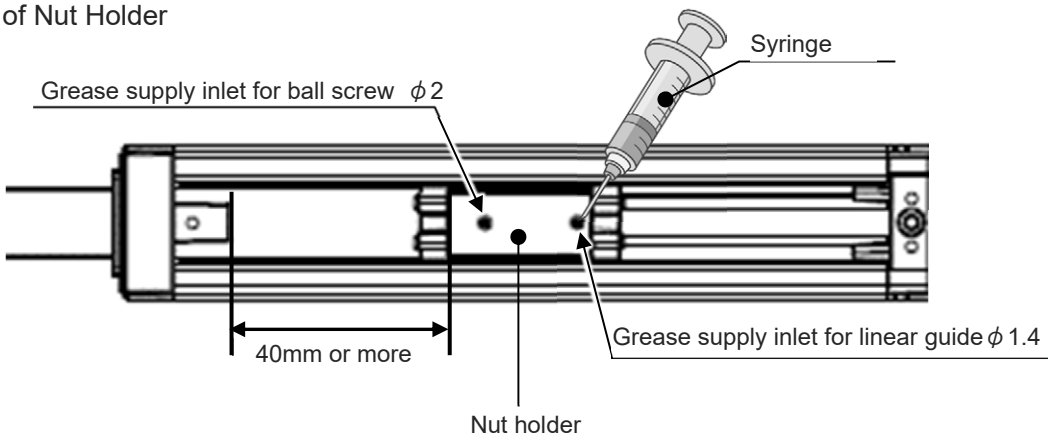
●EC-RR3□B/RR3□BR

1) Remove the hex socket button head bolts (2 pcs) and take off the frame cover.
2) Move the nut holder to a position away from the mechanical end opposite the motor for 40mm or more.
3) Use a tool such as a syringe and supply grease at the grease supply inlet equipped on the top of the nut holder.
   Pay attention so the grease would not leak out of the inlet.
4) Move the rod full-stroke to apply the grease thoroughly.
   * To release the brake, refer to [ELECYLINDER Electricity Section Instruction Manual (ME3816) Startup Section]
5) Affix the frame cover with the hex socket button head bolts (2pcs).

Reference for grease supply volume
0.2 to 0.5cc



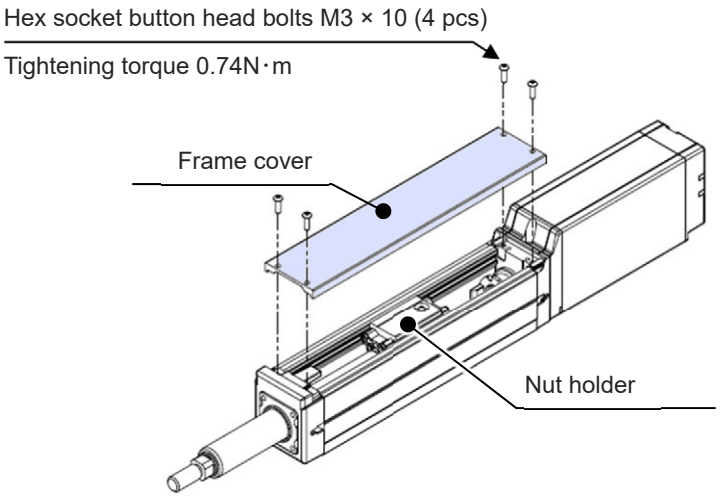
Detail View of Nut Holder



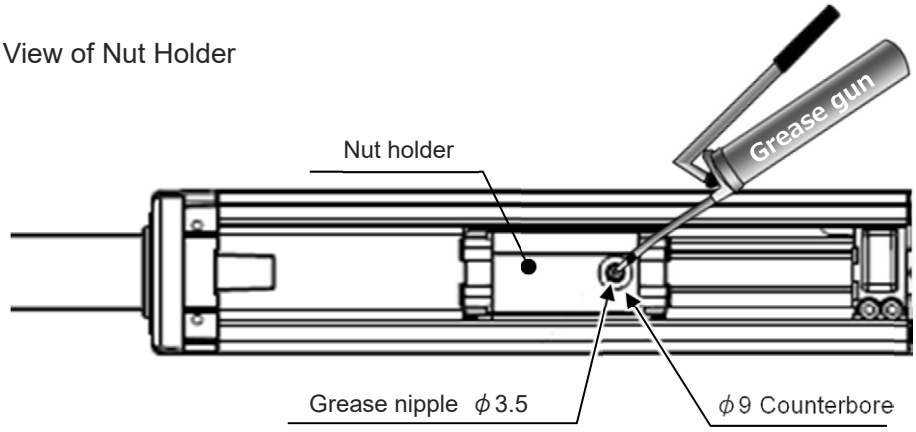
●EC-RR4□B/RR4□BR

1) Remove the hex socket button head bolts (4 pcs) and take off the frame cover.
2) Supply grease at the grease nipple equipped on the top of the nut holder using a grease gun.
3) Move the rod full-stroke to apply the grease thoroughly.
   * To release the brake, refer to [ELECYLINDER Electricity Section Instruction Manual (ME3816) Startup Section]
4) Affix the frame cover with the hex socket button head bolts (4 pcs).

Grease Nipple Diameter	Reference for grease supply volume
ϕ3.5	0.5 to 1.0cc



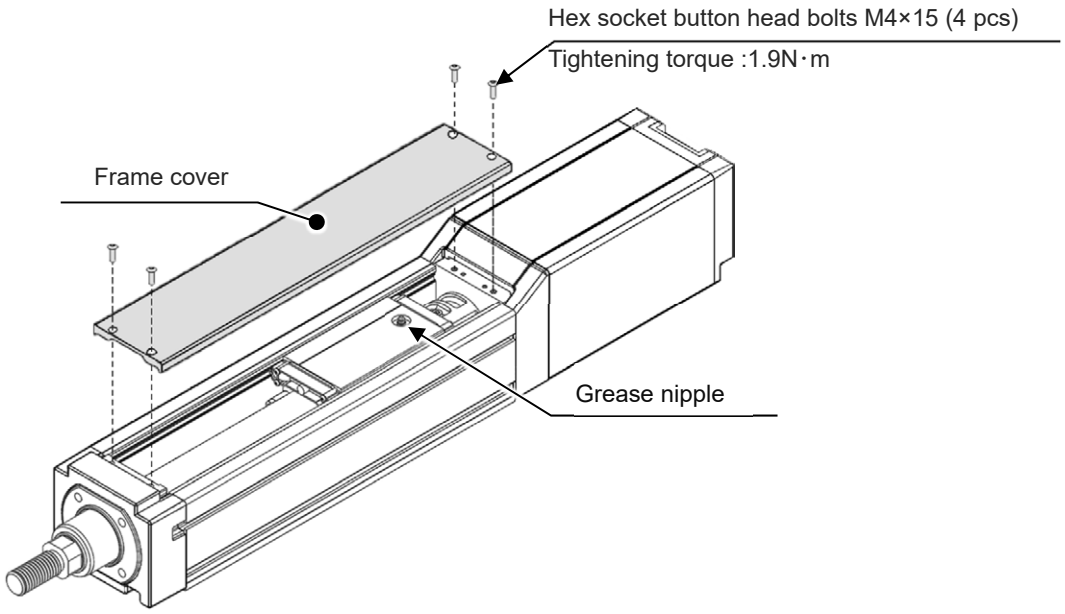
Detail View of Nut Holder



♦EC-RR6□B/RR7□B/RR6□BR/RR7□BR

1) Remove the hex socket button head bolts (4 pcs) and take off the frame cover.
2) Supply grease at the grease nipple equipped on the top of the nut holder using a grease gun.
3) Move the nut holder throughout the full stroke to apply the grease thoroughly.
   * To release the brake, refer to [ELECYLINDER Electricity Section Instruction Manual (ME3816) Startup Section]
4) Mount the frame cover on the base and fix it with hex socket button head bolts (4 pcs)

Grease Nipple Diameter	Reference for grease supply volume
ϕ3.5	1.0 to 2.0cc

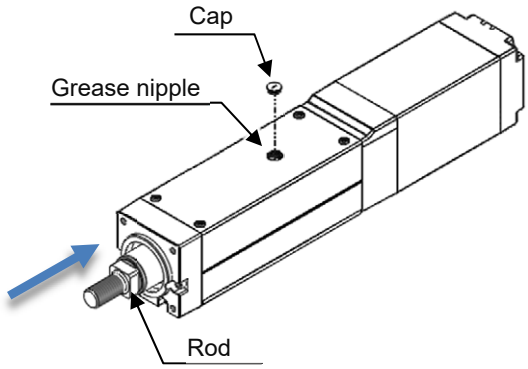


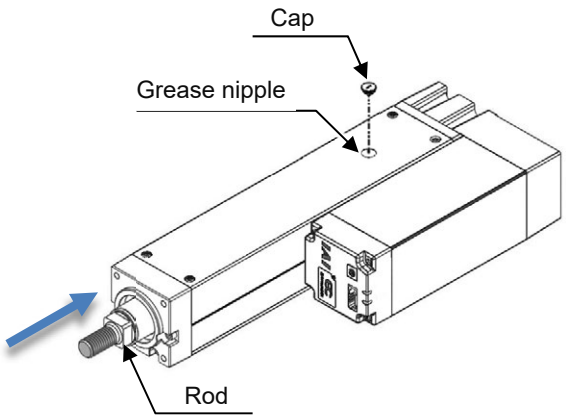
♦EC-RR8□B/RR10□B/RR8□BR/RR10□BR

1) Push the rod in until it hits the end.
   * To release the brake, refer to [ELECYLINDER Electricity Section Instruction Manual (ME3816) Startup Section]
2) Take the cap off and supply grease using a grease gun.
3) Move the rod in the whole area of stroke to spread the grease evenly.
4) Mount the cap

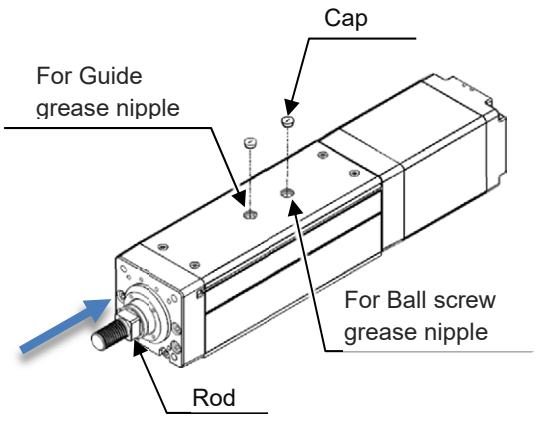
Type	Grease Nipple Diameter	Reference for grease supply volume
RR8□B/RR8□BR	ϕ6	3.5 to 4.0cc
RR10□B/RR10□BR	ϕ6	0.5 to 1.0cc to each

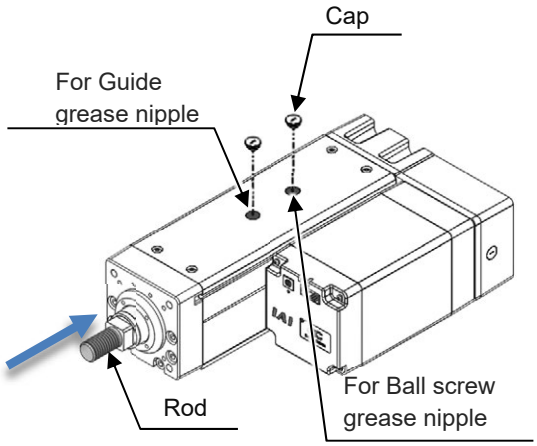
●RR8□B/RR8□BR





●RR10□B/RR10□BR





4.5.2 High rigidity radial cylinder type / Motor reversed type

[1] Preparation

●Protection equipment (Rubber gloves, etc.)

●Grease gun

Recommended Grease Gun	Nozzle	Nozzle manufacturer
Grease gun with attachment screw R1/8 (eg.) GC-57K (Yamada)	NZ3	NSK

●Grease

Type	Application location	Recommended Grease
RR6□AHB(R) RR6X□AHB RR7□AHB(R) RR7X□AHB	Rod sliding surface	IAI CORPORATION IAGR-LDP01-400
	Ball screw	
	Guide	

Caution

- Do not attempt to apply any grease other than lithium grease.
- Mixing with other types of grease not only reduces the performance of the grease, it may even cause damage to the ELECYLINDER.
- Applying too much grease can cause it to leak out and lead to malfunctions.
- If the grease enters your eye, immediately see a specialist physician for appropriate care.
- After finishing the grease replenishment, wash your hands carefully with water and soap to rinse the grease off.

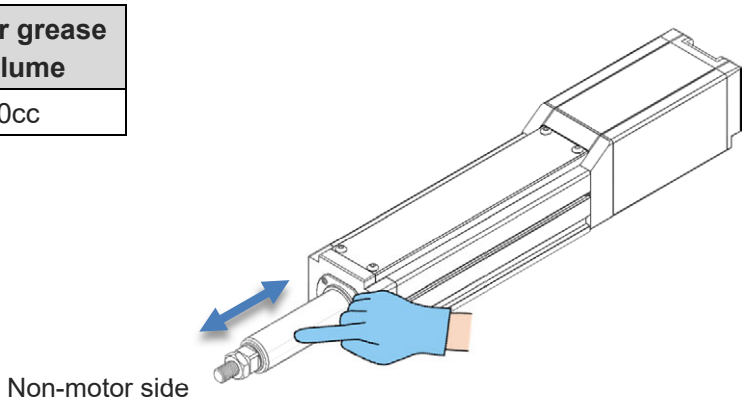
[2] Greasing method

♦Rod sliding surface

1) Pull the rod towards the non-motor side.
   * To release the brake, refer to [ELECYLINDER Electricity Section Instruction Manual (ME3816) Startup Section]
2) Clean the rod sliding surface and apply the grease by hand.
3) Move the rod full-stroke to apply the grease thoroughly.

Reference for grease supply volume

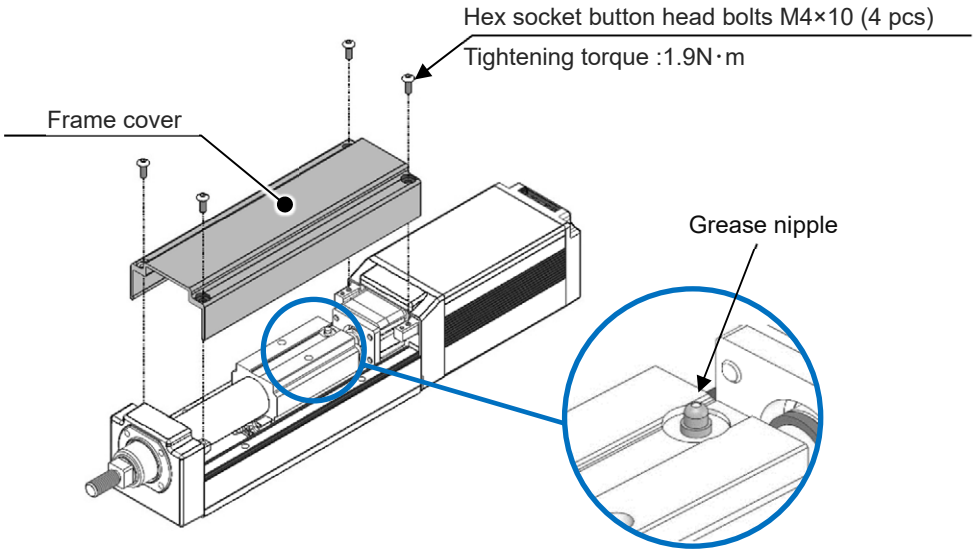
Reference for grease supply volume
0.5 to 1.0cc



♦Ball screw Guide (Can be supplied to both through grease nipple)

1) Remove the hex socket button head bolts (4 pcs) and take off the frame cover.
2) Using a grease gun, supply grease through the grease nipple on top of the nut holder.
3) Move the nut holder throughout the full stroke to apply the grease thoroughly.
   * To release the brake, refer to [ELECYLINDER Electricity Section Instruction Manual (ME3816) Startup Section]
4) Mount the frame cover on the base and fix it with hex socket button head bolts (4 pcs)

Grease Nipple Diameter	Reference for grease supply volume
ϕ3.5	3.0 to 4.0cc



4.6 Component replacement

4.6.1 Controller replacement (motor cover assembly replacement)

It is necessary to replace the motor cover assembly for EC-RR6□B(R)/ RR7□B(R)

♦ Preparation

- Phillips screwdriver
- Hex wrench and torque wrench Opposite side: 3mm, 4mm
- Protection equipment (e.g. Cotton Work Gloves)
- Motor cover assembly for replacement

[Model Code Structure] Base Model Code - (When ACR Selected) - (When TMD2 Selected) (When MF Selected) - (When WL2 Selected)

(eg.) Digital Speed Controller Type - TMD2 Selected - WL2 Selected
Model code: MWB-EC-DSR6-TMD2-WL2

Type	Brake	I/O	Standard Model Code	RCON-EC connection specification*	2-circuit power supply specification*	3 position mode specification*	Wireless axis operation specification
				Model code: ACR	Model code: TMD2	Model Code: MF	Model code: WL2
RR6□B(R)	No	NPN	MWB-EC-SR6	ACR (I/O is only NPN)	TMD2	MF	WL2
		PNP	MWB-EC-SR6-P				
	Yes	NPN	MWB-EC-SR6-B				
		PNP	MWB-EC-SR6-B-P				
RR7□B(R)	No	NPN	MWB-EC-SR7				
		PNP	MWB-EC-SR7-P				
	Yes	NPN	MWB-EC-SR7-B				
		PNP	MWB-EC-SR7-B-P				

* It is in common when the wireless communication type (model code: WL) is selected.
(Note) Wireless communication PC board is not enclosed.

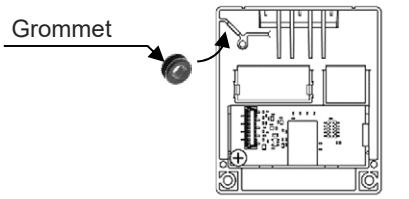
Motor cover assembly



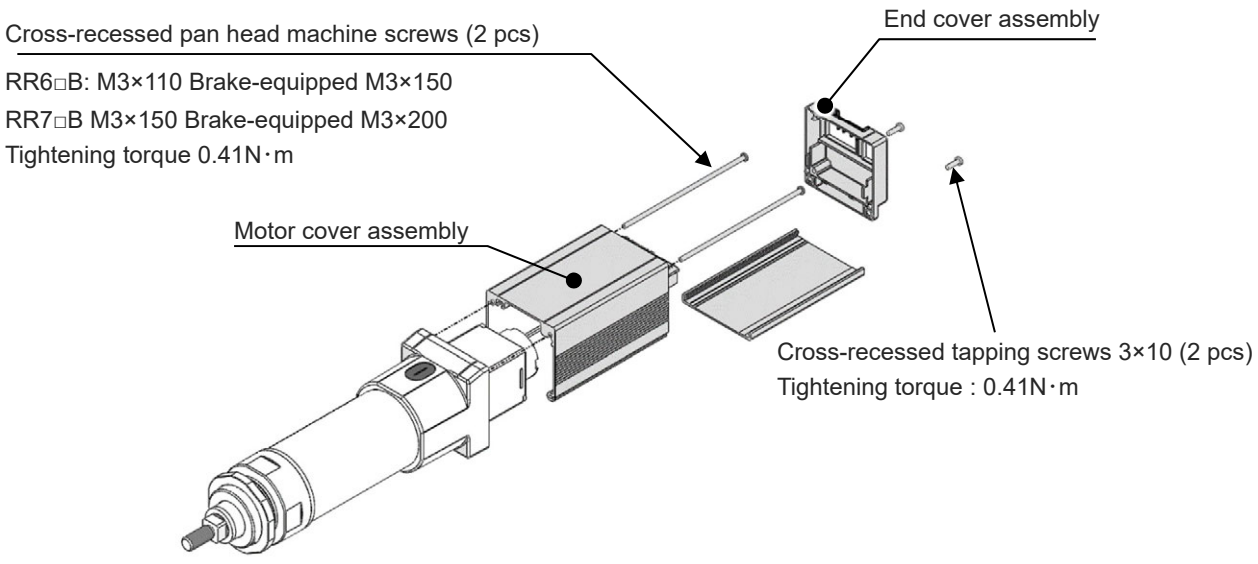
♦ Replacement procedure

[1] EC-RR6□B/RR7□B

1. Remove the cross-recessed tapping screws (2 pcs) and take off the end cover assembly.
2. Remove the cross-recessed pan head machine screws (2 pcs) to remove the wiring/connectors, then take off the used motor cover assembly.
3. Mount the wiring/connectors to the motor cover assembly for replacement and return it to the original state.
   * The cables to the digital speed controller go through the grommet at the cutout on the digital speed controller.

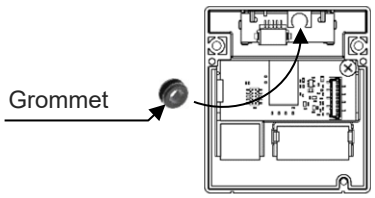


4. Mount the end cover assembly.
   * Refer to [4.6.1 [5] Precautions for connectors/wiring] about connectors and cables.



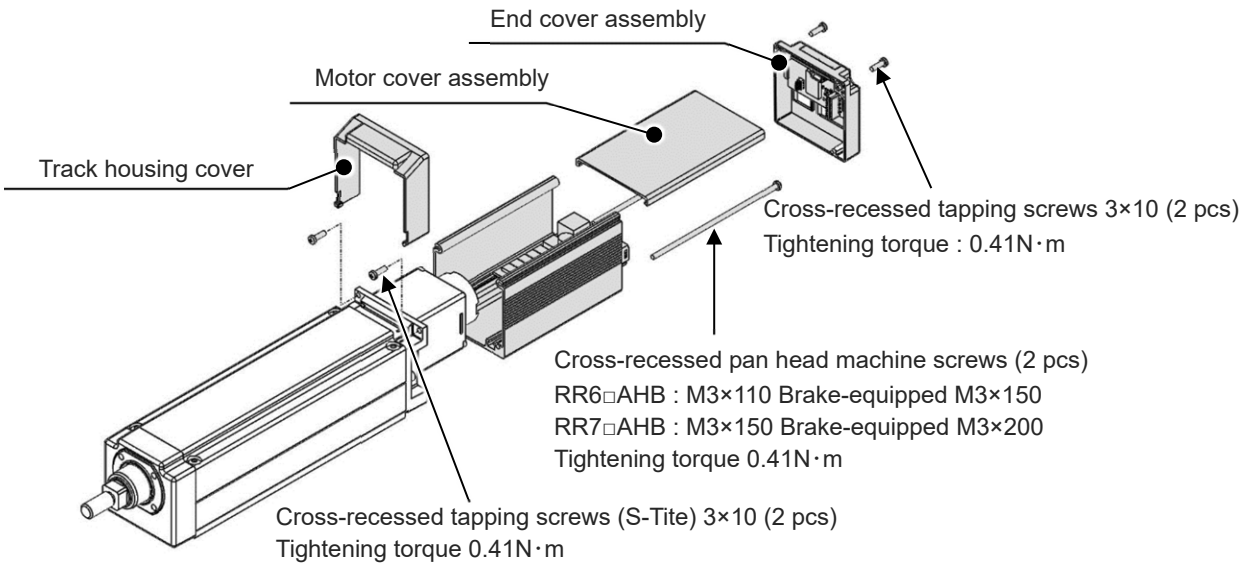
[2] EC-RR6(X)□AHB/RR7(X)□AHB

1. Remove the cross-recessed tapping screws (2 pcs) and take off the end cover assembly.
2. Take off the track housing cover, take off the cross-recessed pan screws (2 pcs), the cross-recessed tapping screws (S-tite) (2 pcs) and the cables and connectors and take off the motor cover assembly.
   Take off also the cables and connectors to the LED PC board on the end cover.
3. Mount the wiring/connectors to the motor cover assembly for replacement and return it to the original state.
   Put back on also the cables and connectors to the LED PC board on the end cover.
   * The cables to the digital speed controller go through the grommet at the cutout on the digital speed controller.



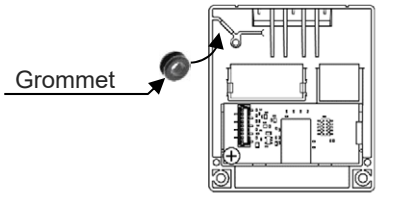
End cover assembly

4. Mount the end cover assembly.
   * Refer to [4.6.1 [5] Precautions for connectors/wiring] about connectors and cables.

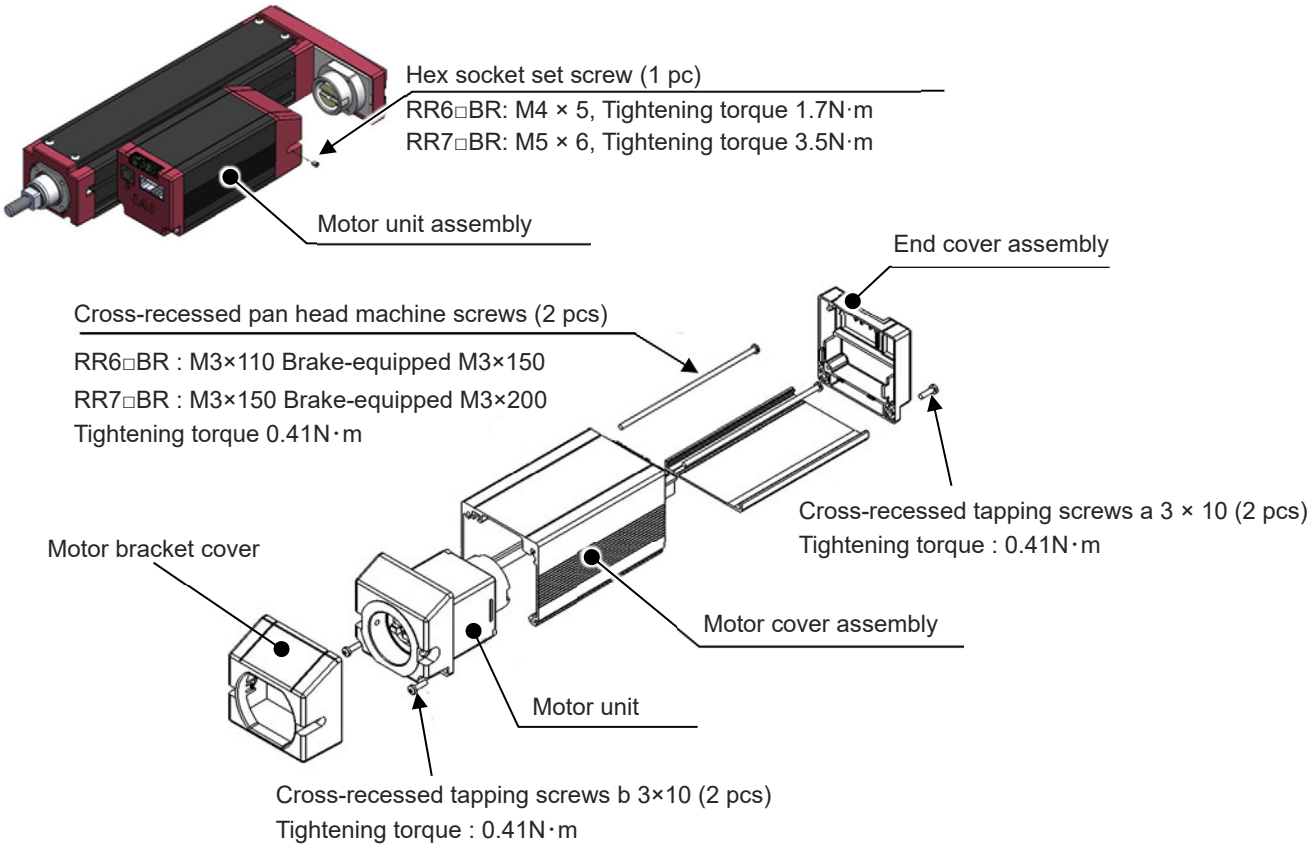


[3] EC-RR6□BR/RR7□BR

1. Remove the hex socket set screw (1 pc) and take off the motor unit assembly.
2. Take off the motor bracket cover.
3. Remove the cross-recessed tapping screws (2 pcs) and take off the end cover assembly.
4. Remove the cross-recessed pan head machine screws (2 pcs) and the cross-recessed tapping screws b (2 pcs) on the motor unit side and disconnect the cables and connectors to take off the motor cover assembly.
5. Mount the wiring/connectors to a motor cover assembly for replacement and return it to the original state.
   * The cables to the digital speed controller go through the grommet at the cutout on the digital speed controller.

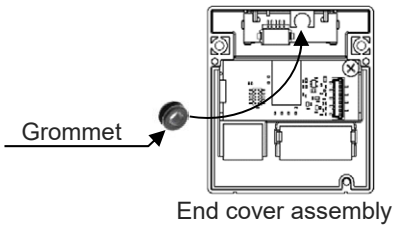


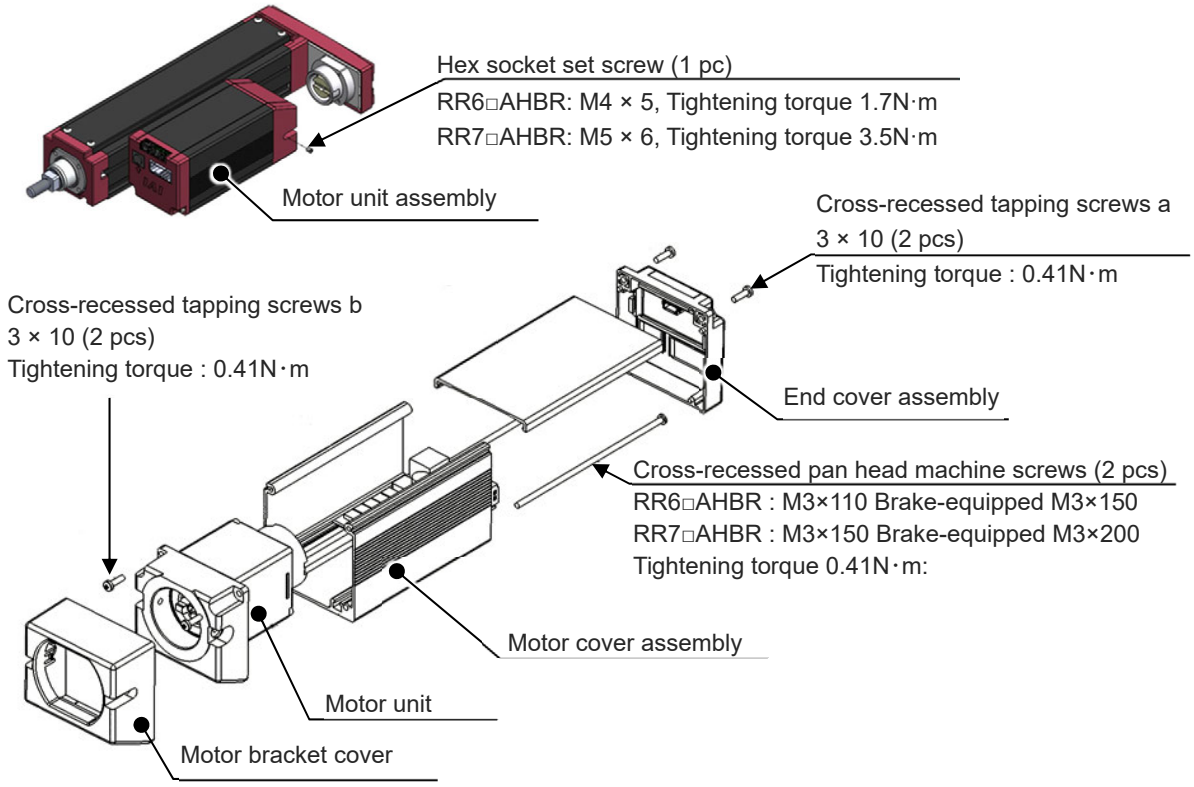
6. Mount the end cover assembly.
7. Put the motor bracket cover on.
8. Attach the motor unit assembly.
   * Refer to [4.6.1 [5] Precautions for connectors/wiring] about connectors and cables.



[4] EC-RR6□AHBR/RR7□AHBR

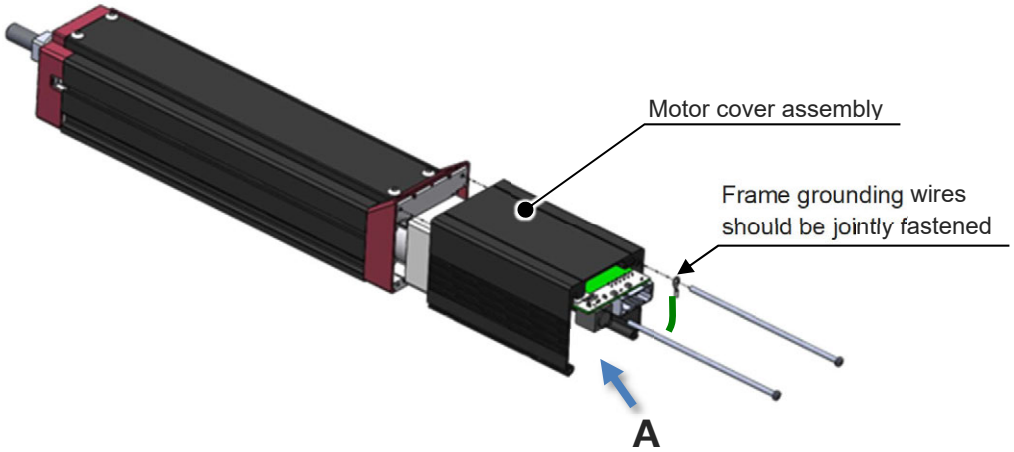
1. Remove the hex socket set screw (1 pc)and take off the motor unit assembly.
2. Take off the motor bracket cover.
3. Remove the cross-recessed tapping screws (2 pcs) and take off the end cover assembly.
4. Remove the cross-recessed pan head machine screws (2 pcs) and the cross-recessed tapping screws b (2 pcs) on the motor unit side and disconnect the cables and connectors to take off the motor cover assembly.
   Take off also the cables and connectors to the LED PC board on the end cover.
5. Mount the wiring/connectors to a motor cover assembly for replacement and return it to the original state.
   Put back on also the cables and connectors to the LED PC board on the end cover.
   * The cables to the digital speed controller go through the grommet at the cutout on the digital speed controller.
6. Mount the end cover assembly.
7. Put the motor bracket cover on.
8. Attach the motor unit assembly.
   * Refer to [4.6.1 [5] Precautions for connectors/wiring] about connectors and cables.

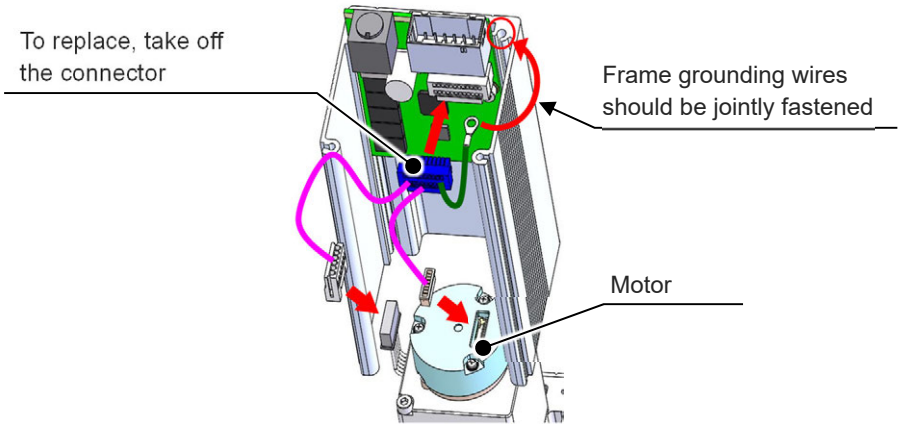




[5] Precautions for connectors/wiring

♦ **Motor cover assembly**



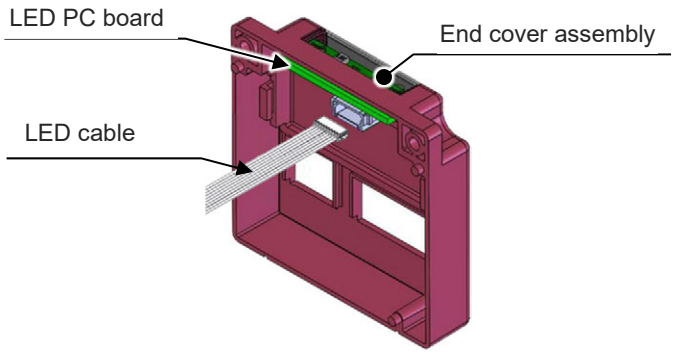


Motor cover assembly interior
(A arrow view)

* Before pulling off the motor cover assembly, make sure to remove the connector.
* Be careful not to snag the cables.

♦ **Wiring on High Stiffness Radial Cylinder End Cover Assembly LED PC Board**

EC-RR6□AHBR/RR7□AHBR



* Do not attempt to put the LED cable forcefully.
* Insert the connector on the LED cable certainly till it reaches the end inside.

4.6.2 Controller replacement (controller assembly replacement)

It is necessary to replace the controller assembly for EC-RR3□B(R)/RR4□B(R)

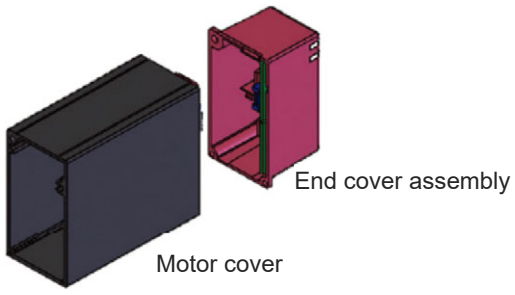
♦ **Preparation**

- Phillips screwdriver
- Hex wrench and torque wrench Opposite side: 2mm
- Protection equipment (e.g. Cotton Work Gloves)
- Controller assembly for replacement

Type	Encoder	Blake	I/O	Standard Model Code	RCON-EC connection specification* Model code: ACR	2-circuit power supply specification* Model code: TMD2	3 position mode specification* Model Code: MF	Wireless axis operation specification Model code: WL2
RR3□B RR3□BR	Incremental	No	NPN	MWB-EC-SRR3	ACR (I/O is only NPN)	TMD2	MF	WL2
			PNP	MWB-EC-SRR3-P				
		Yes	NPN	MWB-EC-SRR3-B				
			PNP	MWB-EC-SRR3-B-P				
	Battery-less absolute	No	NPN	MWB-EC-SRR3-WA				
			PNP	MWB-EC-SRR3-WA-P				
		Yes	NPN	MWB-EC-SRR3-WA-B				
			PNP	MWB-EC-SRR3-WA-B-P				
RR4□B RR4□BR	Incremental	No	NPN	MWB-EC-SRR4				
			PNP	MWB-EC-SRR4-P				
		Yes	NPN	MWB-EC-SRR4-B				
			PNP	MWB-EC-SRR4-B-P				
	Battery-less absolute	No	NPN	MWB-EC-SRR4-WA				
			PNP	MWB-EC-SRR4-WA-P				
		Yes	NPN	MWB-EC-SRR4-WA-B				
			PNP	MWB-EC-SRR4-WA-B-P				

*It is in common when the wireless communication type (model code: WL) is selected.
(Note) Wireless communication PC board is not enclosed.

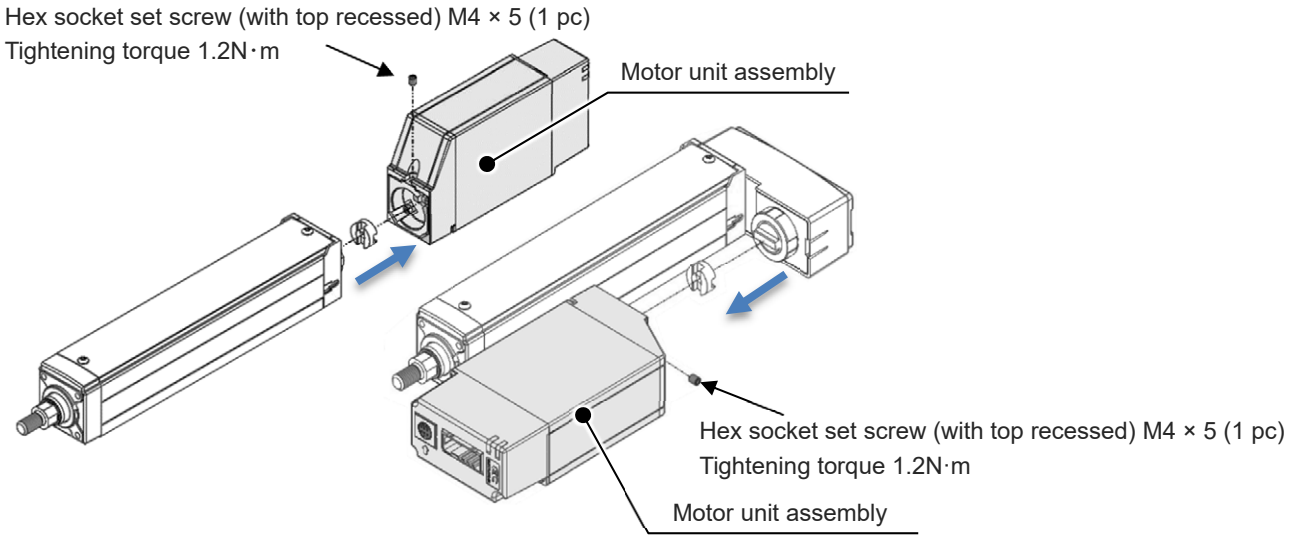
Controller assembly



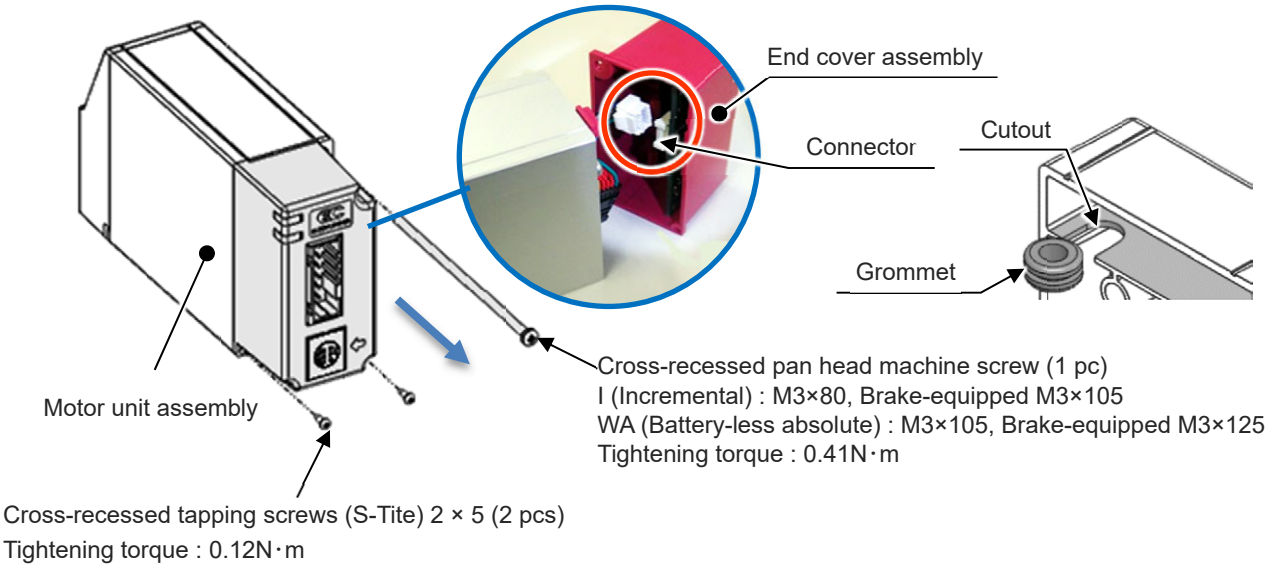
♦ Replacement procedure

[1] EC-RR3□B/RR3□BR

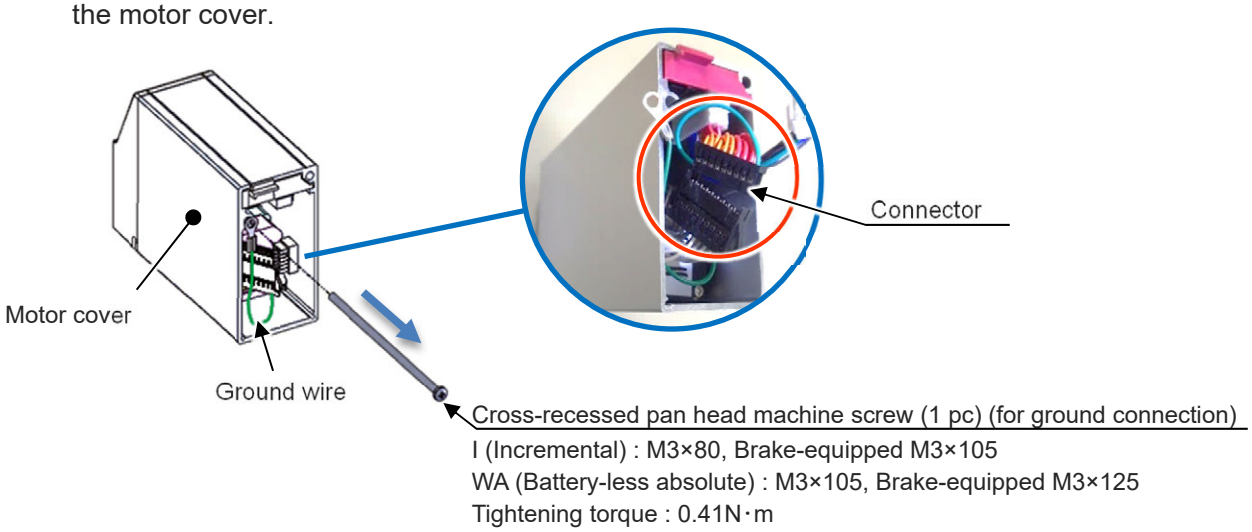
1. Remove the hex socket set screw (1 pc) and take off the motor unit assembly.



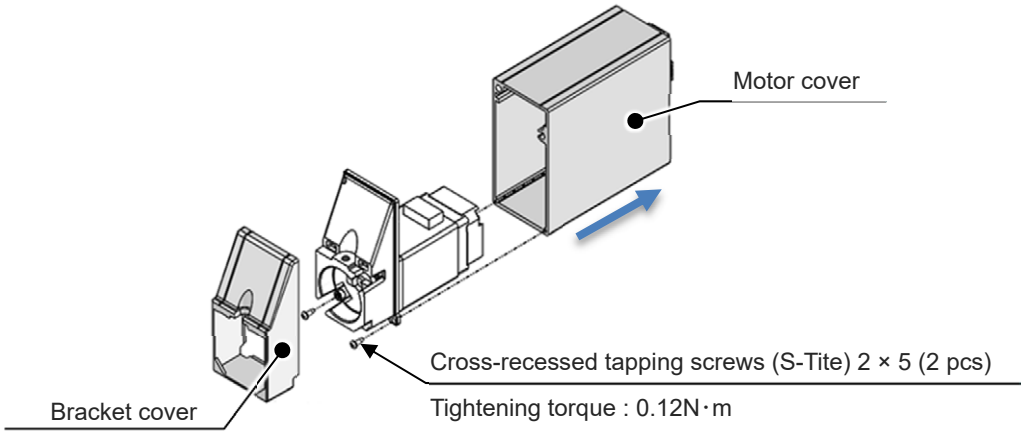
2. Take off the cross-recessed pan head machine screw (1 pc) and the cross-recessed tapping screws (2 pcs) from the motor unit assembly.
3. Take off the connectors on the wires from the controller circuit board in the end cover assembly.
   * The cables to the digital speed controller go through the grommet at the cutout on the digital speed controller.



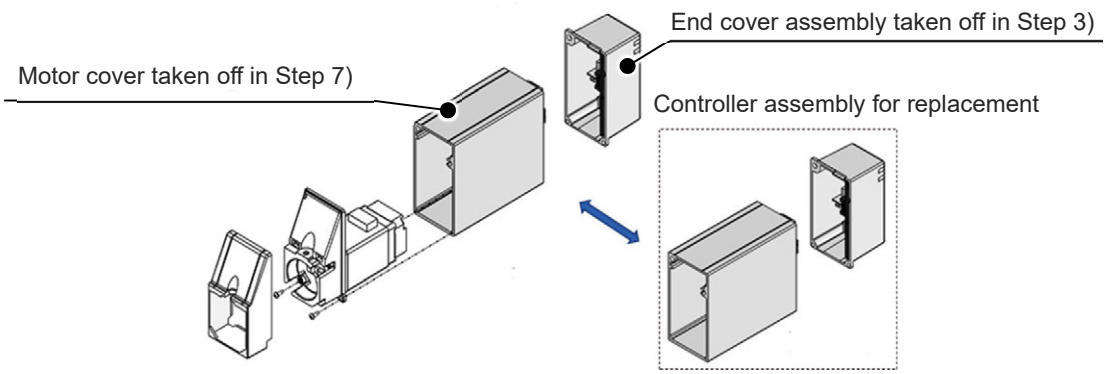
4. Remove the cross-recessed pan head machine screw (1 pc) for ground connection.
5. Remove the connector joining the motor/encoder to the controller circuit board in the motor cover.



6. Take off the bracket cover and remove the cross-recessed tapping screws (S-Tite) (2 pcs).
7. Take off the motor cover.

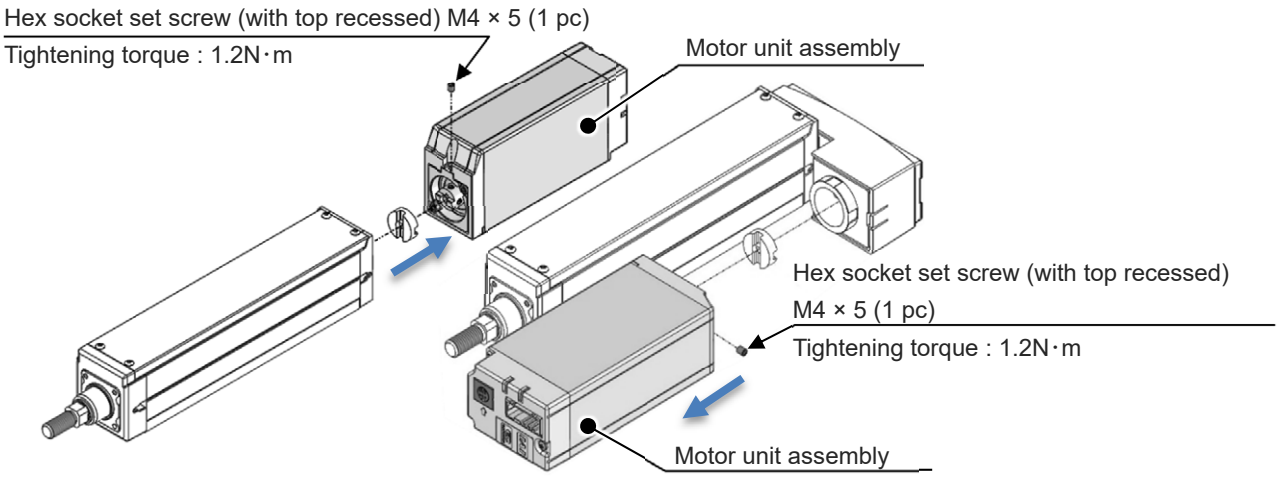


8. Replace the controller assembly (motor cover assembly and end cover assembly) with the one for replacement and set all the components up in the back order.



[2] EC-RR4□B/RR4□BR

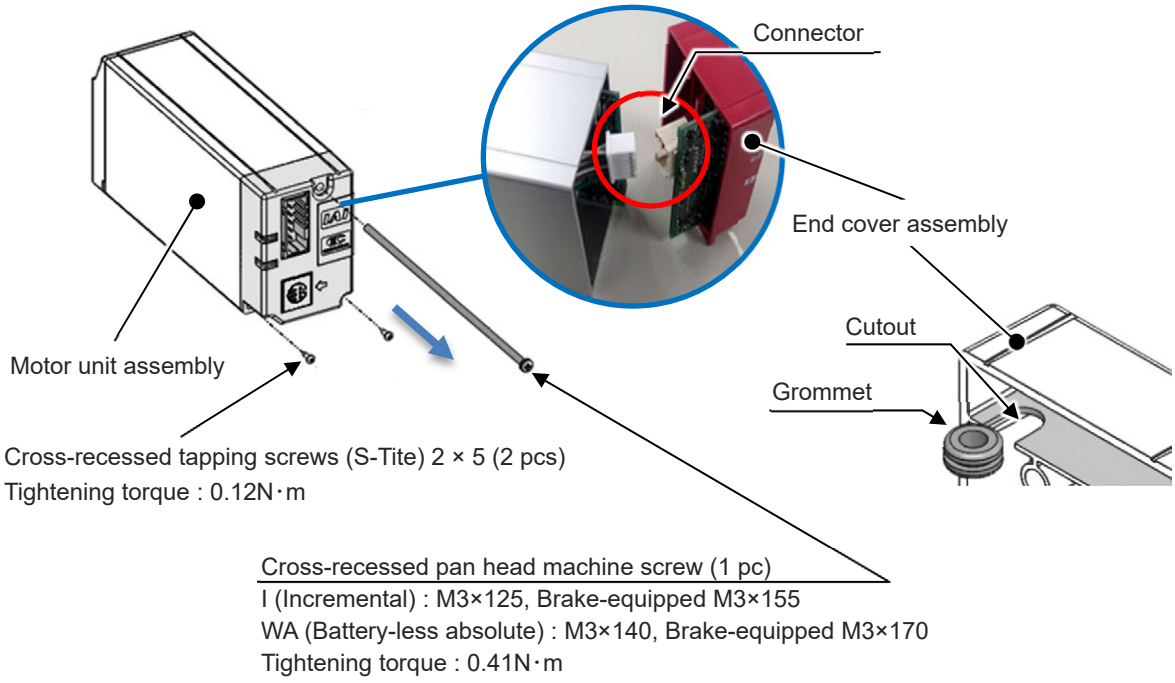
1. Remove the hex socket set screw (1 pc) and take off the motor unit assembly.



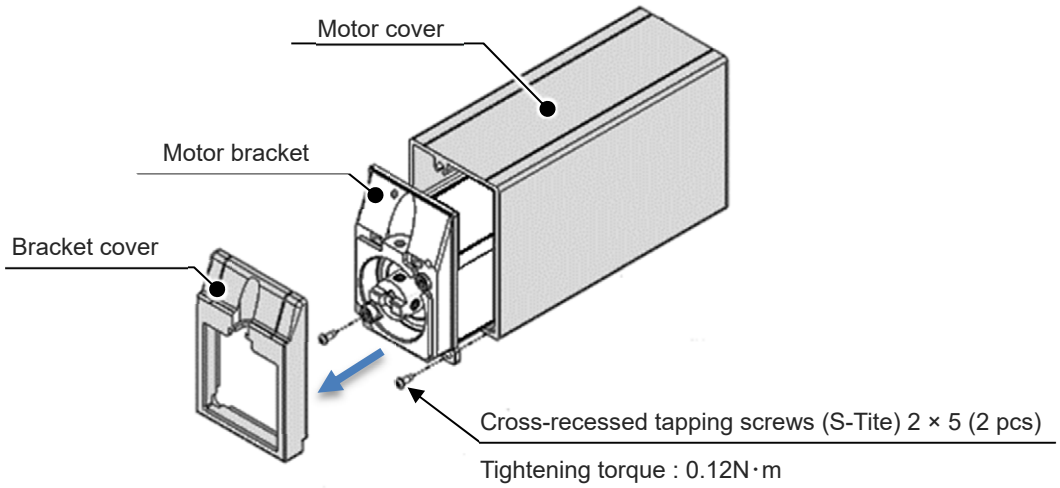
2. Take off the cross-recessed pan head machine screw (1 pc) and the cross-recessed tapping screws (S-Tite) (2 pcs) from the motor unit assembly.

3. Take off the connectors on the wires from the controller circuit board in the end cover assembly.

* The cables to the digital speed controller go through the grommet at the cutout on the digital speed controller.

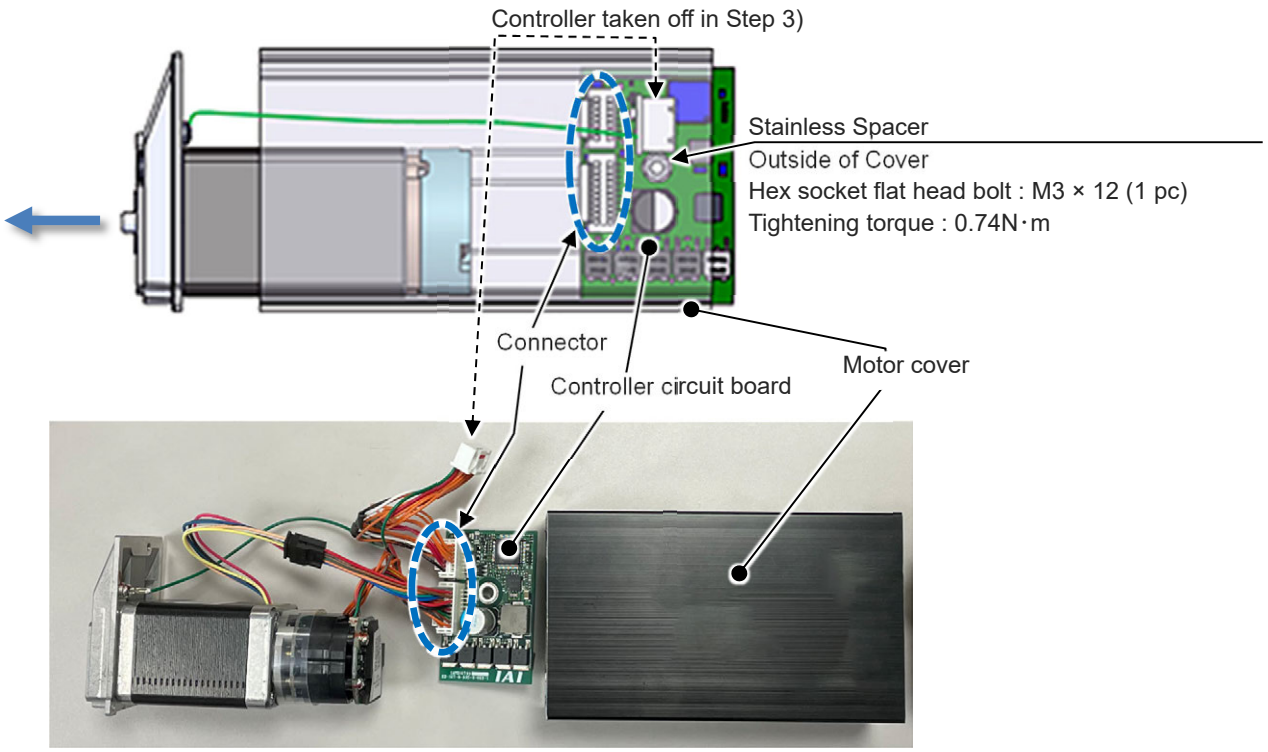


4. Remove the bracket cover and take off the cross-recessed tapping screws (S-Tite) (2 pcs).

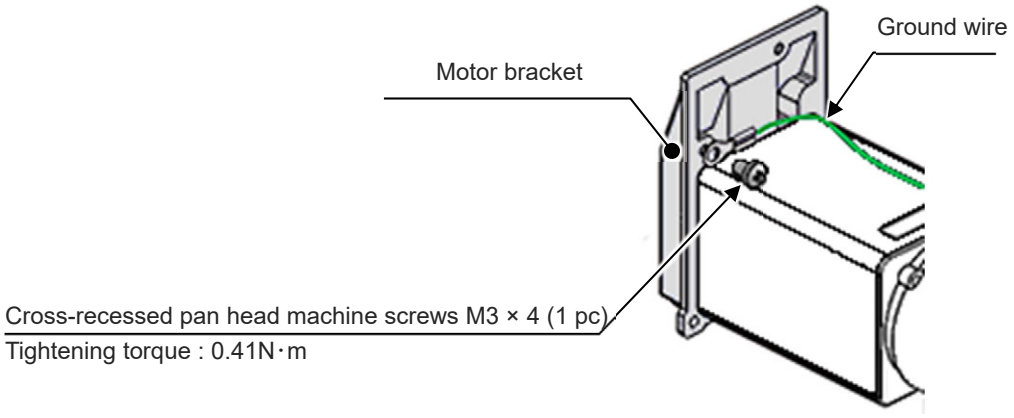


5. Take off the cross-recessed pan head machine screws and the cross-recessed tapping screws from the controller assembly.

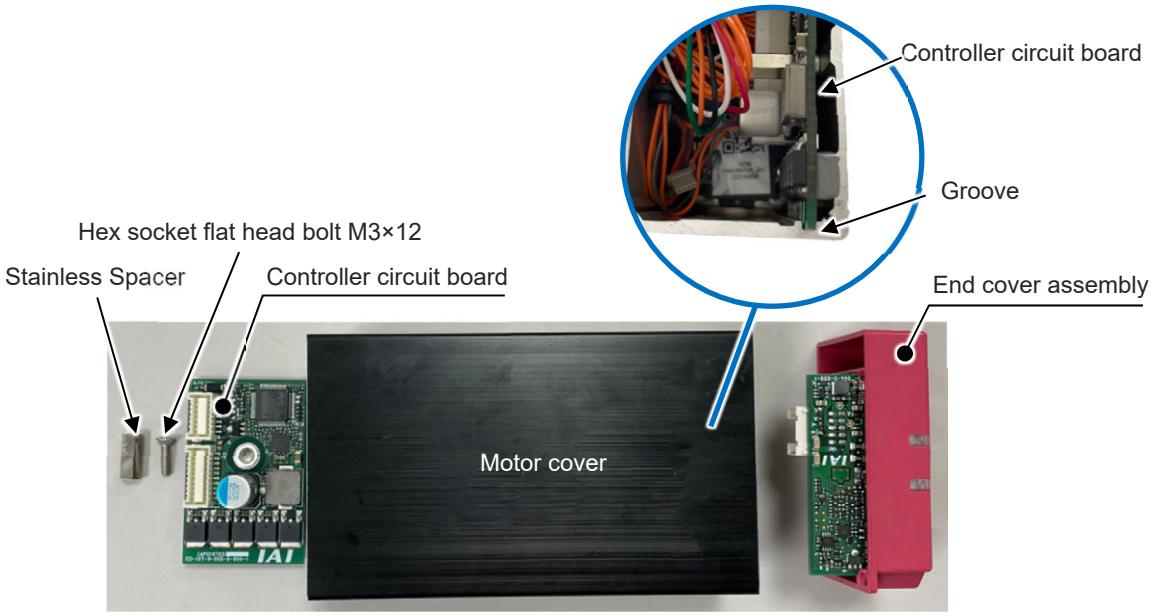
- Take off the hex socket flat head bolt (1 pc) at the outside of the motor cover while holding the stainless spacers (hex, double-end internal threaded) inside the motor cover.
- Pull the motor unit off the motor cover together with the controller PC board.
- Take off the connector joining the controller circuit board and the motor/encoder.



6. Remove the cross-recessed pan head machine screw (1 pc) for grounding connection and take off the controller circuit board on the motor cover from the motor bracket.



7. Take the controller PC board off the controller assembly. Refer to [Procedure 3 and 5].
Assemble the controller for replacement in the order of procedures from 6 to 1.
* The controller PC board is to be put in the groove on the controller cover.
* Pay attention to cables so they will not get pinched.



4.6.3 Controller replacement (controller cover assembly replacement)

It is necessary to replace the controller cover assembly for EC-RR8□/RR10□

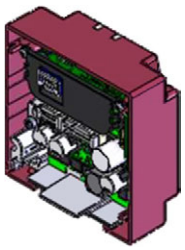
♦ **Preparation**

- Phillips screwdriver
- Protection equipment (e.g. Cotton Work Gloves)
- Controller cover assembly for replacement

Type	I/O	Standard Model Code	RCON-EC connection specification*	2-circuit power supply specification*	3 position mode specification	Applicable for Wireless
			Model Code: ACR	Model Code: TMD2	Model Code: MF	Model Code: WL/WL2
RR8□B RR8□BR	NPN	CCA-EC-RRB8	ACR (I/O is only NPN)	TMD2	MF	WL (Wireless communication specification) WL2 (Wireless axis operation specification)
	PNP	CCA-EC-RRB8-P				
RR10□B RR10□BR	NPN	CCA-EC-RR10				
	PNP	CCA-EC-RR10-P				

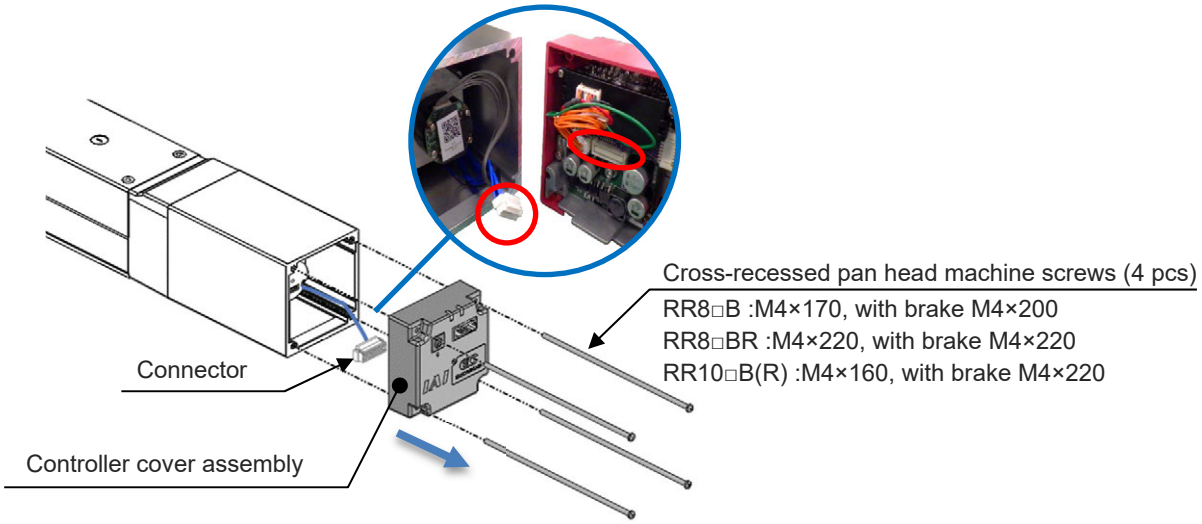
* ACR and TMD2 cannot be selected at the same time.

Controller Cover Assembly

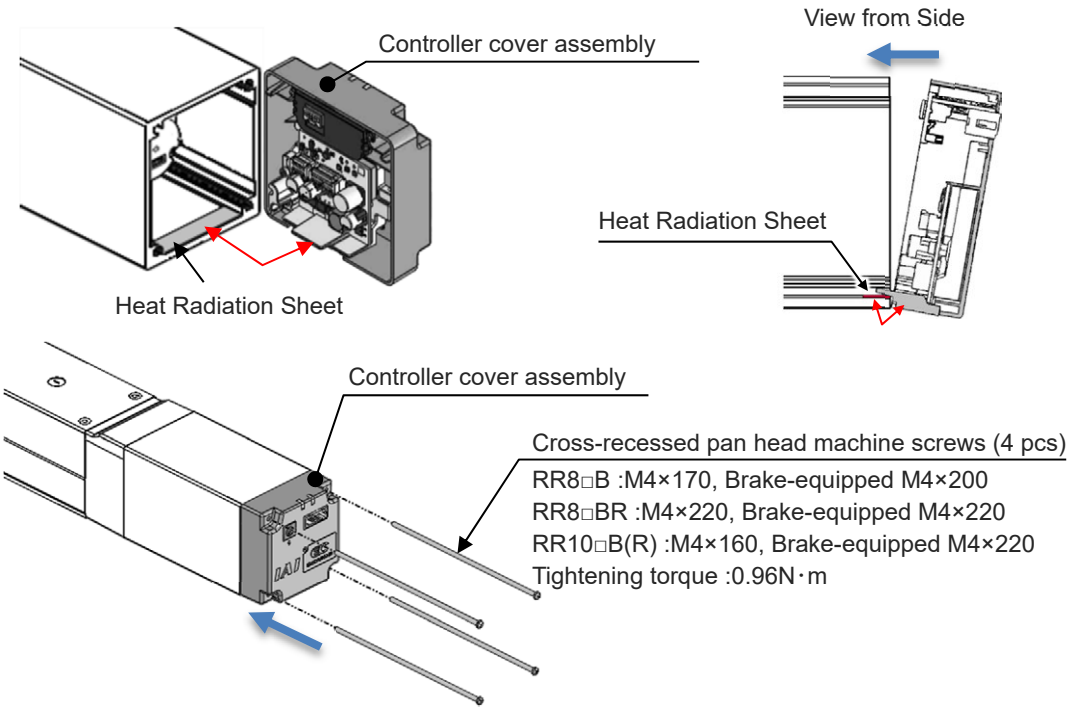


♦ Replacement procedure

1. Remove the cross-recessed pan head machine screws (4 pcs) and slide the controller cover assembly.
2. Take off the connector on the motor / encoder cable connected to the controller cover assembly.



3. Join the connector on the motor / encoder cable to a controller cover assembly for replacement.
4. Put the controller cover assembly on while it is kept on the heat radiation sheet, and fix it with the cross recessed pan head machine screws (4 pcs).
   * Be careful not to pinch cables.



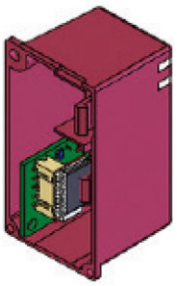
4.6.4 Wireless communication circuit board replacement (end cover assembly replacement)

♦ Preparation

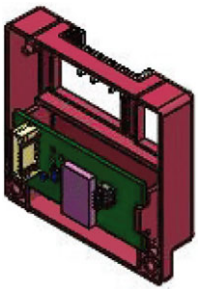
- Phillips screwdriver
- Hex wrench and torque wrench Opposite side: 2mm, 3mm, 4mm
- Protection equipment (e.g. Cotton Work Gloves)
- End cover assembly for replacement (Wireless communication circuit board with cable)

Type	End cover assembly model number
RR3□B/RR3□BR	EWB-EC-SRR3
RR4□B/RR4□BR	EWB-EC-SRR4
R6□B/RR6□B(R)	EWB-EC-SR6
RR6(X)□AHB	EWB-ECH-SRR6
RR6□AHBR	EWB-ECH-SRR6
R7□B/RR7□B(R)	EWB-EC-SR7
RR7(X)□AHB	EWB-ECH-SRR7
RR7□AHBR	EWB-ECH-SRR7

End cover assembly



RR3/RR4 type

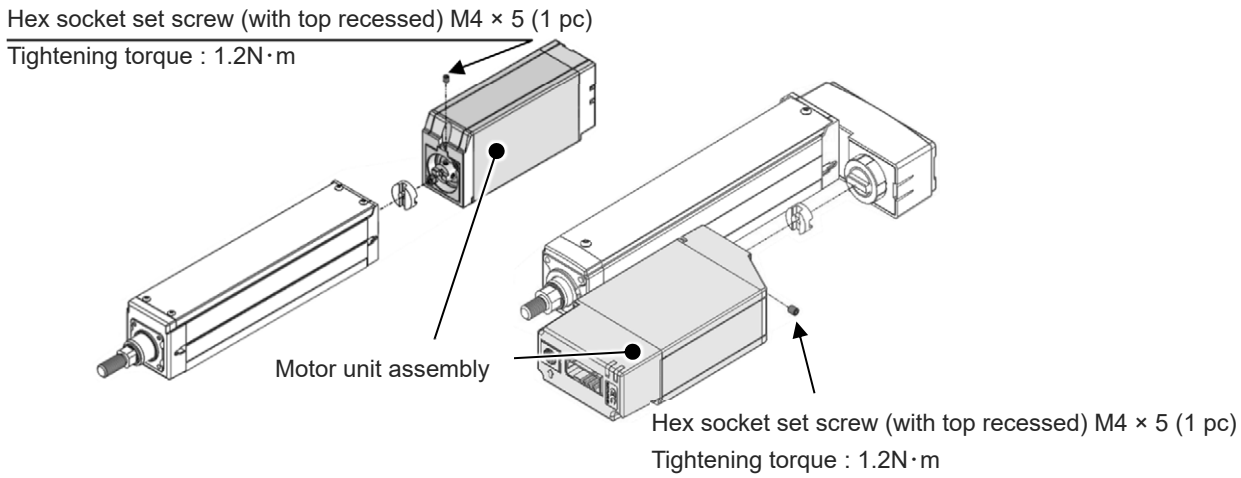


RR6/RR7 type

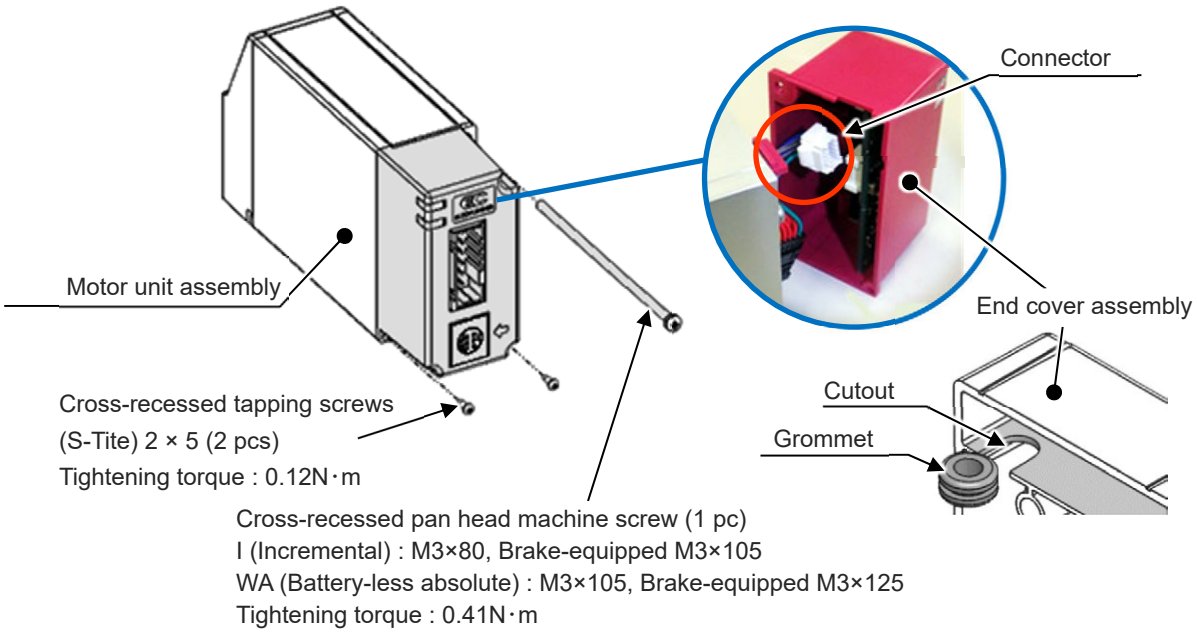
♦ Replacement procedure

[1] EC-RR3□B/RR3□BR

1. Remove the hex socket set screw (1 pc) and take off the motor unit assembly.

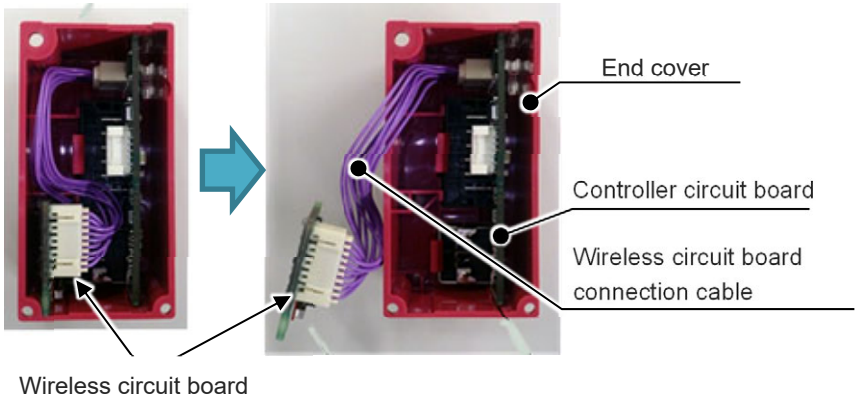


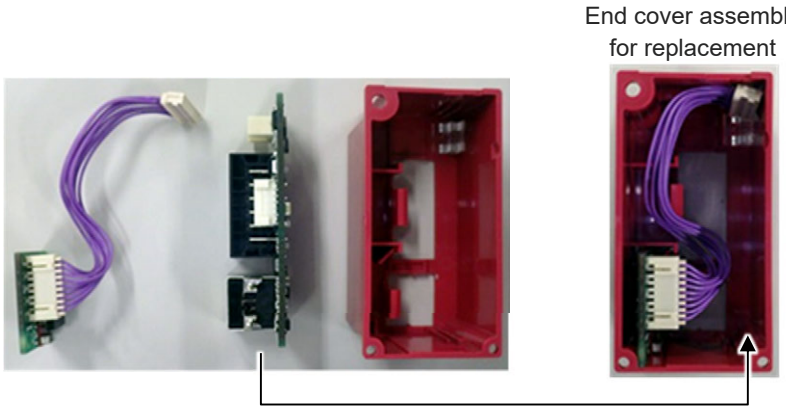
2. Take off the cross-recessed pan head machine screw (1 pc) and the cross-recessed tapping screws (S-Tite) (2 pcs) from the motor unit assembly.
3. Take off the connectors on the wires from the controller circuit board in the end cover assembly.
   * The cables to the digital speed controller go through the grommet at the cutout on the digital speed controller.



* There is only wireless circuit board mounted on the end cover assembly for replacement. There is no controller circuit board mounted.

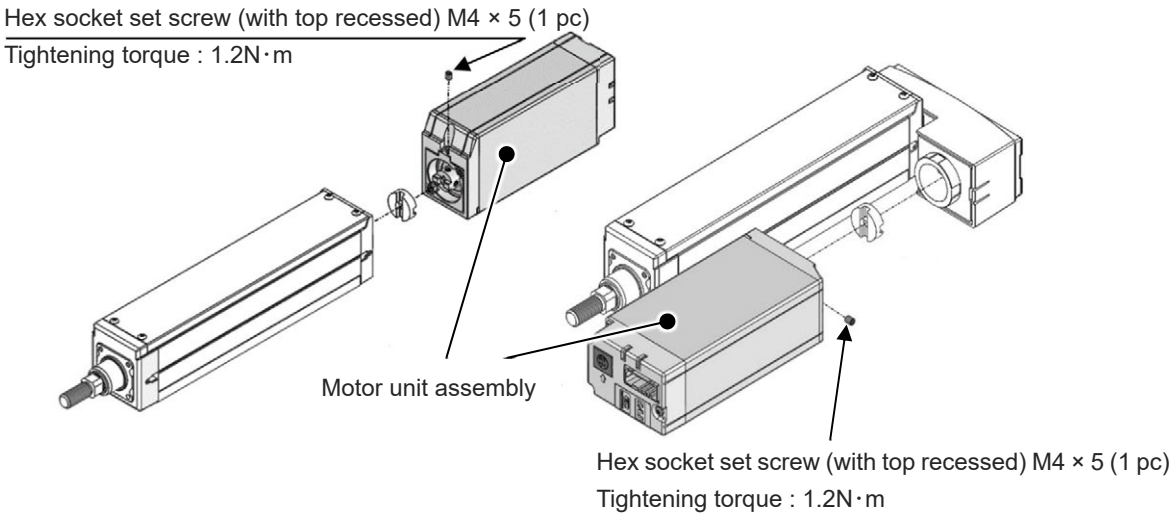
4. Pull off the connector on the cable for wireless PC board connection from the controller PC board.
5. Take the controller PC board off the end cover assembly.
6. Put on the controller PC board that was taken off to the end cover assembly for replacement and plug in the connector on the cable for wireless PC board connection to the controller PC board.
7. Put the end cover assembly on the main unit of ELECYLINDER in the order from 3 to 1.





[2] EC-RR4□B/RR4□BR

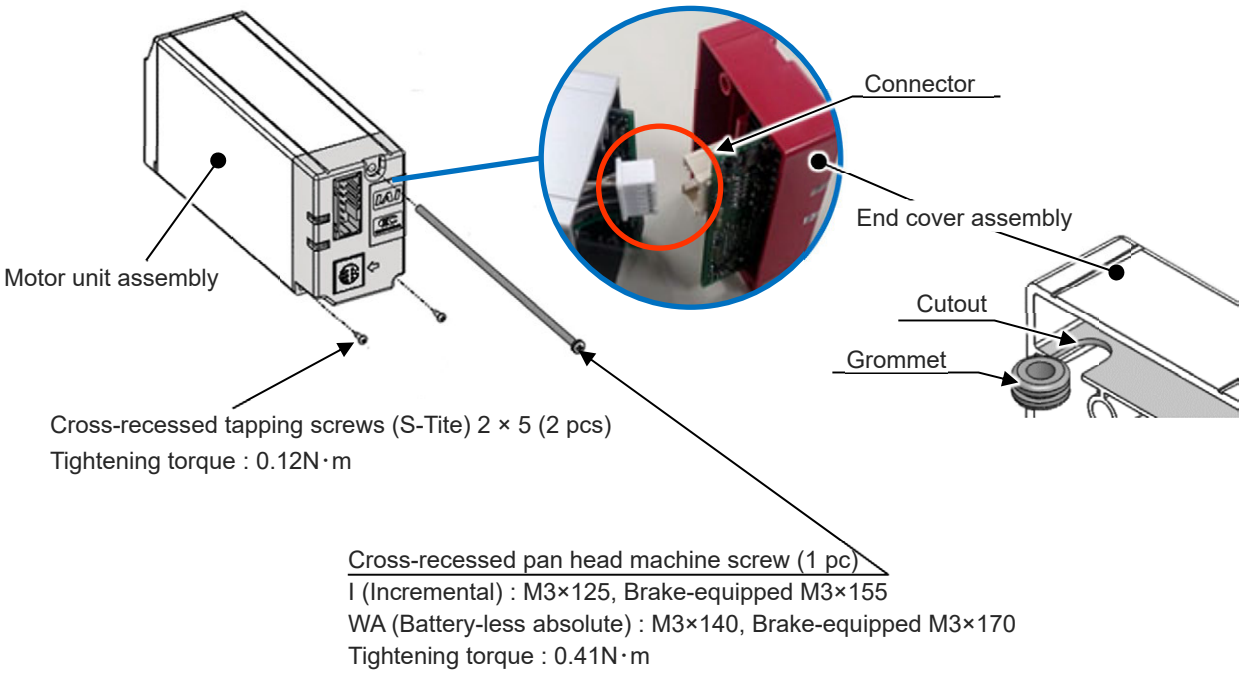
1. Remove the hex socket set screw (1 pc) and take off the motor unit assembly.



2. Take off the cross-recessed pan head machine screw (1 pc) and the cross-recessed tapping screws (S-Tite) (2 pcs) from the motor unit assembly.

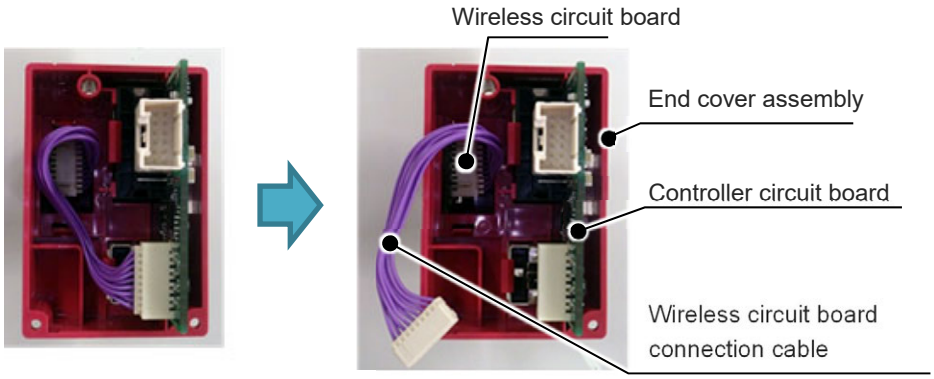
3. Take off the connectors on the wires from the controller circuit board in the end cover assembly.

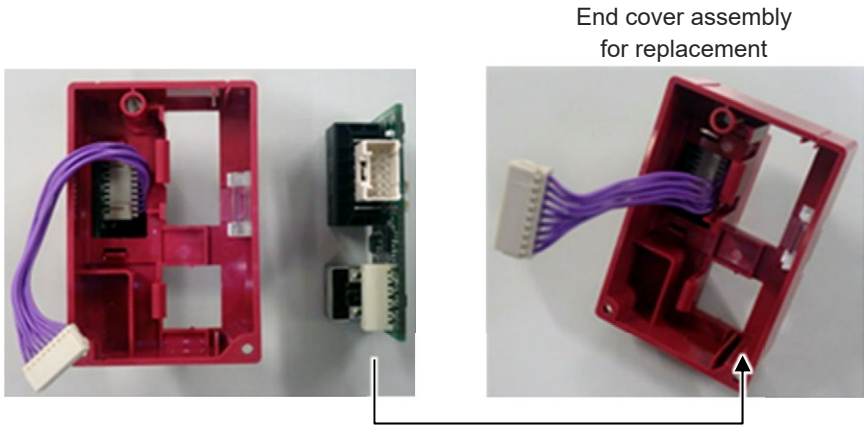
   * The cables to the digital speed controller go through the grommet at the cutout on the digital speed controller.



* There is only wireless circuit board mounted on the end cover assembly for replacement. There is no controller circuit board mounted.

4. Pull off the connector on the cable for wireless PC board connection from the controller PC board.
5. Take the controller PC board off the end cover assembly.
6. Put on the controller PC board that was taken off to the end cover assembly for replacement and plug in the connector on the cable for wireless PC board connection to the controller PC board.
7. Put the end cover assembly on the main unit of ELECYLINDER in the order from 3 to 1.

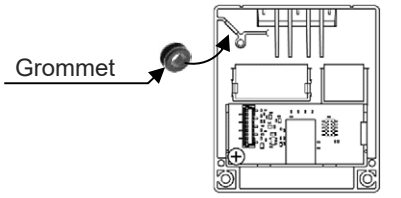




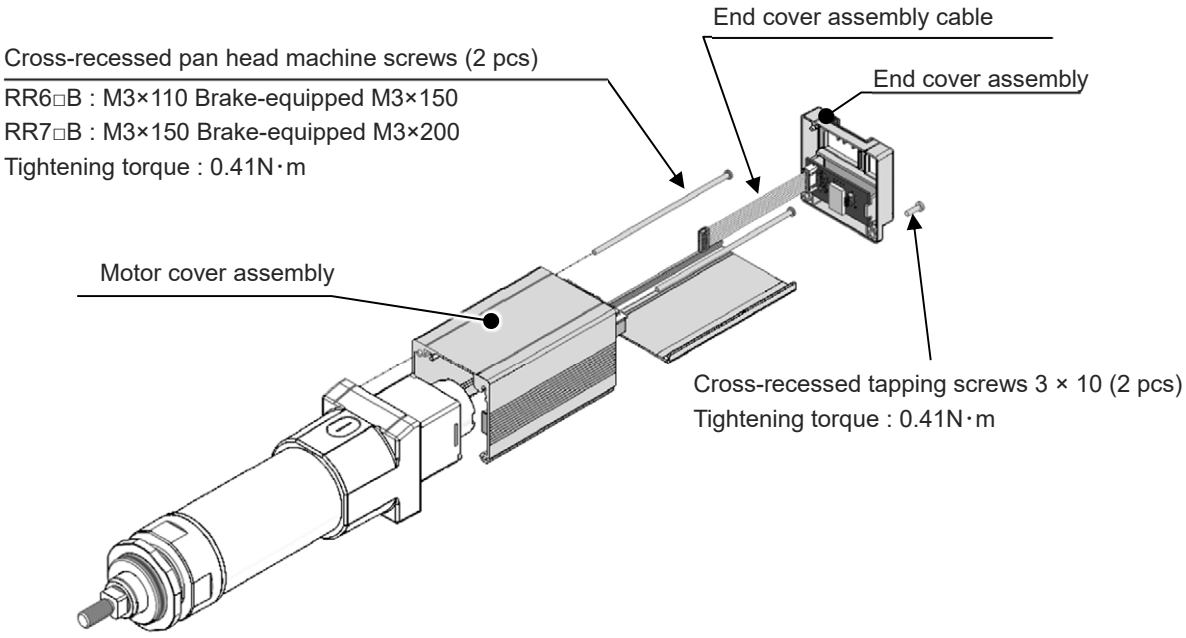
Put the taken off controller PC board on the end cover assembly for replacement.

[3] EC- RR6□B/RR7□B

1. Remove the cross-recessed tapping screws (2 pcs) and take off the old end cover assembly.
2. Remove the cross-recessed pan head machine screws (2 pcs) and slide the motor cover assembly.
   Do not pull off the cable connected on the motor cover assembly.
3. Remove the cable connector for the old end cover assembly from the controller circuit board inside the motor cover assembly
4. Attach the cable connector for the end cover assembly for replacement to the controller circuit board inside the motor cover assembly.
   * The cables to the digital speed controller go through the grommet at the cutout on the digital speed controller.

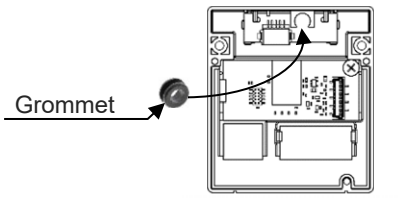


5. Mount the motor cover assembly.
6. Mount the new end cover assembly.
   * Refer to [4.6.4 [7] Precautions for connectors/wiring] about connectors and cables.

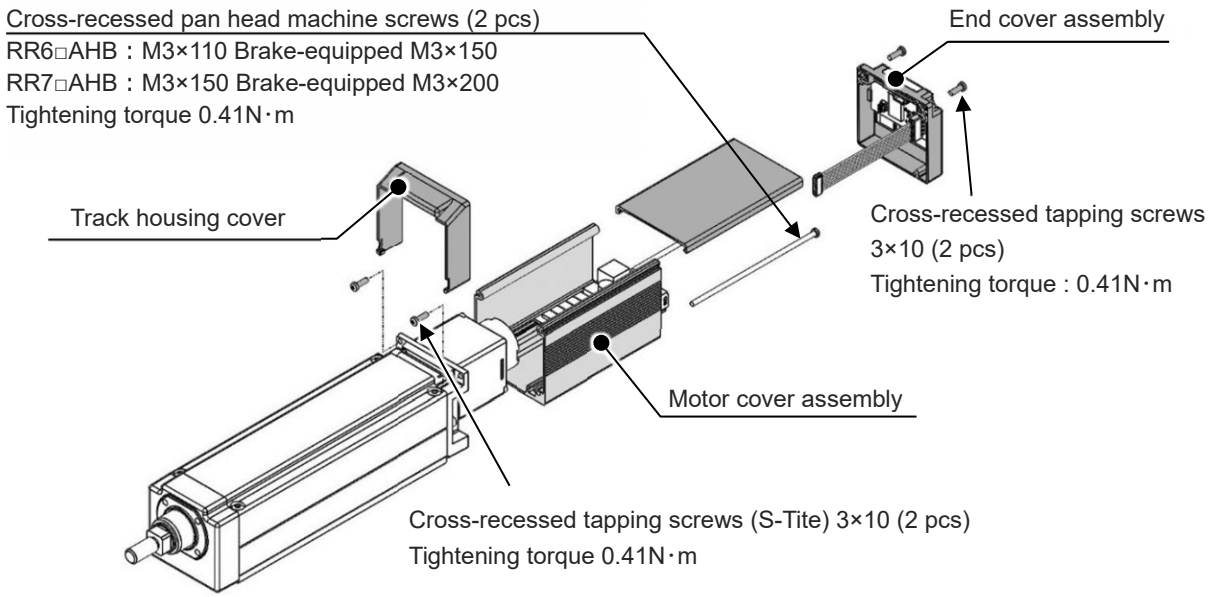


[4] EC-RR6(X)□AHB/RR7(X)□AHB

1. Remove the cross-recessed tapping screw (1 pc), pull off the cable on the LED PC board from the end cover assembly and take off the end cover assembly.
2. Remove the track housing cover, Remove the cross-recessed pan head machine screws (2 pcs) and the cross-recessed tapping screws (S-tite) (2 pcs) and slide the motor cover assembly.
   Do not pull off the cable connected on the motor cover assembly.
3. Remove the cable connector for the end cover assembly from the controller circuit board inside the motor cover assembly.
4. Attach the cable connector for the end cover assembly for replacement to the controller circuit board inside the motor cover assembly.
   * The cables to the digital speed controller go through the grommet at the cutout on the digital speed controller.

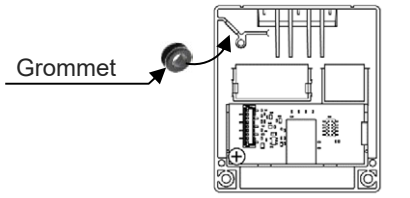


5. Mount the motor cover assembly.
6. Join the connectors to the LED PC board on the end cover for replacement and put on the end cover assembly.
   * Refer to [4.6.4 [7] Precautions for connectors/wiring] about connectors and cables.

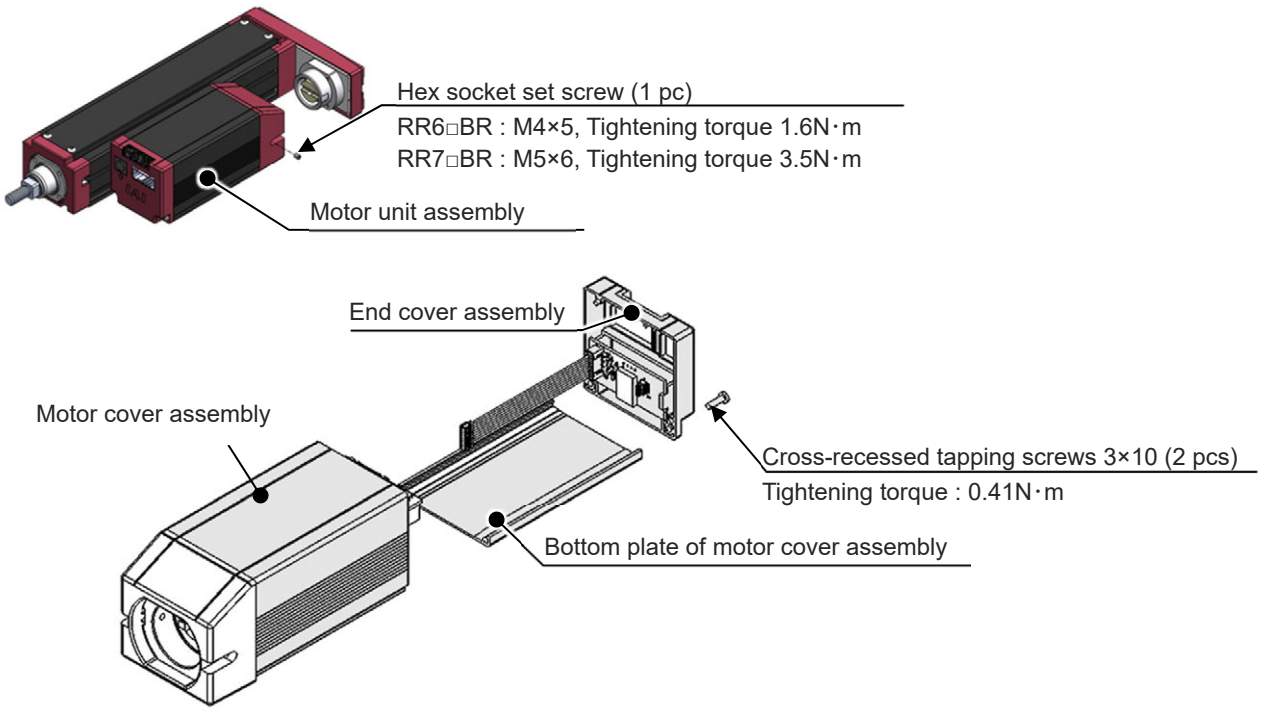


[5] EC-RR6□ R/RR7□BR

1. Remove the hex socket set screw (1 pc) and take off the old motor unit assembly.
2. Remove the cross-recessed tapping screws (2 pcs) and take off the old end cover assembly.
3. Slide the bottom plate on the motor cover assembly to take it off.
4. Take the wireless circuit board and the connection cable connector off the controller circuit board.
5. Join the connection cable connector on a end cover for replacement.
   * The cables to the digital speed controller go through the grommet at the cutout on the digital speed controller.

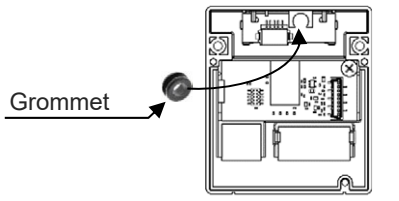


6. Attach the bottom plate of the motor cover assembly.
7. Attach the end cover assembly for replacement to the motor cover assembly.
8. Attach the motor unit assembly.
   * Refer to [4.6.4 [7] Precautions for connectors/wiring] about connectors and cables.

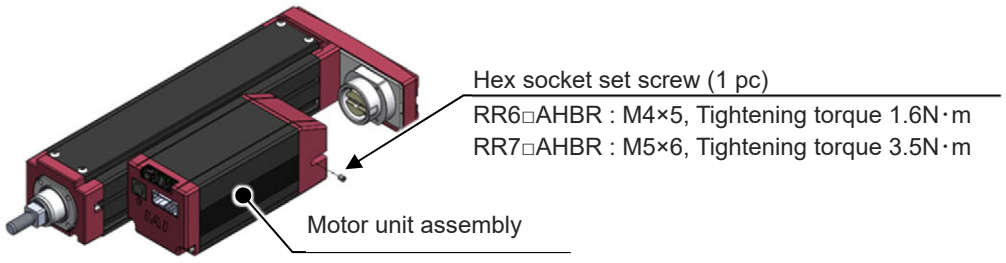


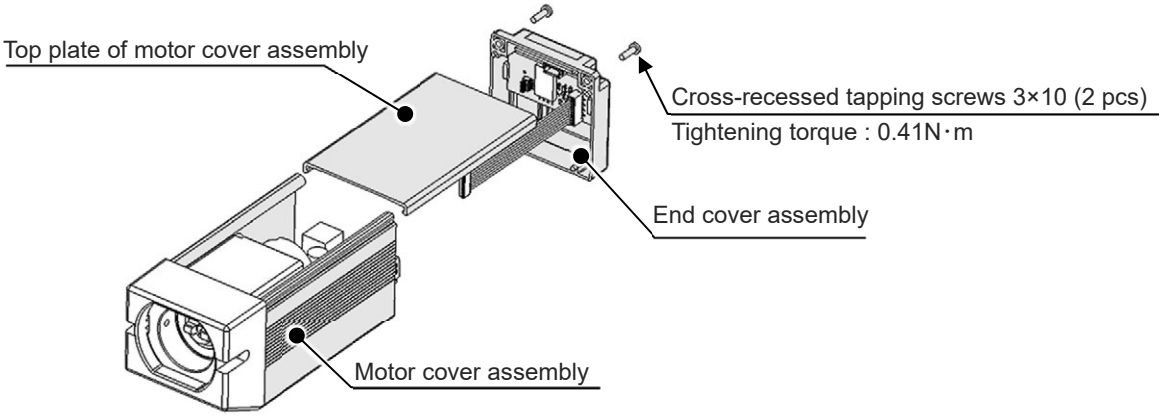
[6] EC-RR6□AHBR/RR7□AHBR

1. Remove the hex socket set screw (1 pc) and take off the old motor unit assembly.
2. Remove the cross-recessed tapping screws (2 pcs) pull off the cable on the LED PC board from the end cover assembly and take the end cover assembly off.
3. Slide the top plate on the motor cover assembly to take it off.
4. Take the wireless circuit board and the connection cable connector off the controller circuit board.
5. Join the connection cable connector on a end cover assembly for replacement.
   * The cables to the digital speed controller go through the grommet at the cutout on the digital speed controller.



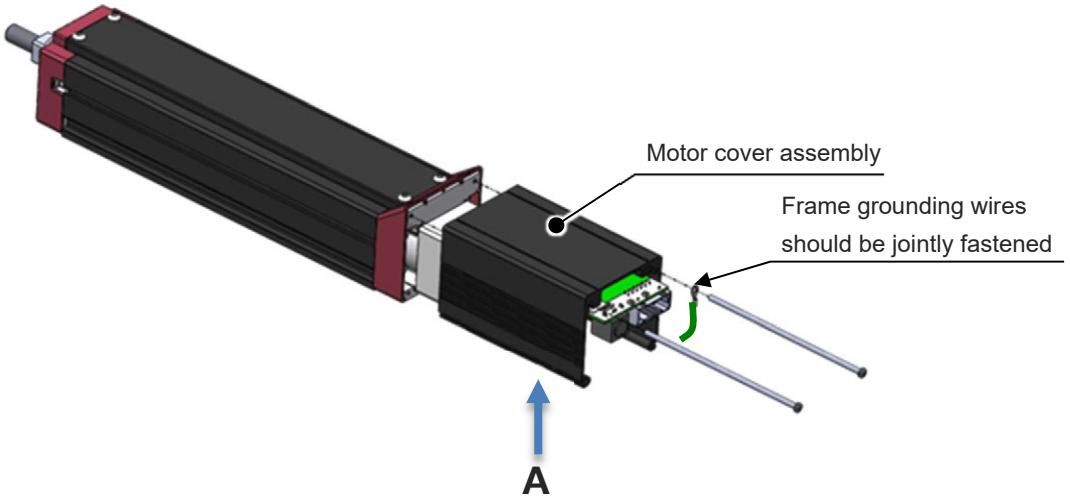
6. Attach the top plate of the motor cover assembly.
7. Attach the end cover assembly for replacement to the motor cover assembly.
8. Attach the motor unit assembly.
   * Refer to [4.6.4 [7] Precautions for connectors/wiring] about connectors and cables.



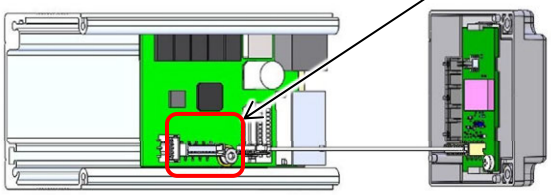


[7] Precautions for connectors/wiring

♦ **Motor cover assembly**



For replacement, remove the old end cover assembly connector
and mount the end cover assembly for replacement connector

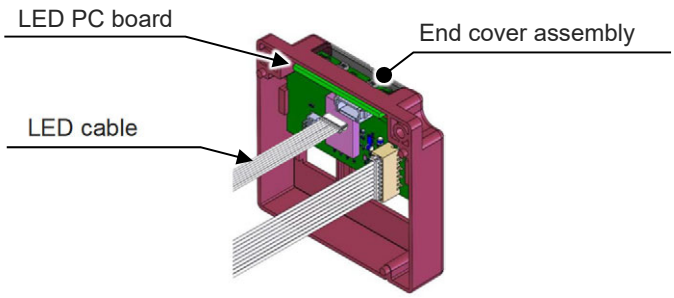


Motor cover assembly interior
(A arrow view)

End cover assembly interior
Wireless communication circuit board

♦ **Wiring on High Stiffness Radial Cylinder End Cover Assembly LED PC Board**

EC-RR6□AHBR/RR7□AHBR



* Do not attempt to put the LED cable forcefully.
* Insert the connector on the LED cable certainly till it reaches the end inside.

4.6.5 Timing belt replacement

♦ **Preparation**

- Phillips screwdriver
- Hex wrench and torque wrench Opposite side: 2mm, 2.5mm, 3mm, 4mm, 5mm
- Tension gauge
  * RR8□B/RR10□B are available for use of sonic belt tension meter.
- Long string such as wire (For Tension gauge)
- Protection equipment (e.g. Cotton Work Gloves)
- Timing belt for replacement

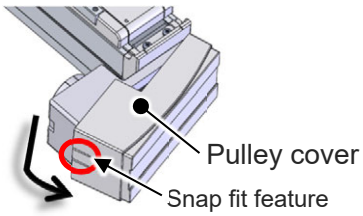
Type	Timing belt model number
RR3□BR	TB-RCP6-STRA4R
RR4□BR	TB-RCP5-SA4R
RR6□BR/RR6□AHBR	TB-EC-SRR6R
RR7□BR/RR7□AHBR	TB-EC-SRR7R
RR8□BR	TB-RCP6-RA8R
RR10□BR	TB-EC-RR10

Timing belt



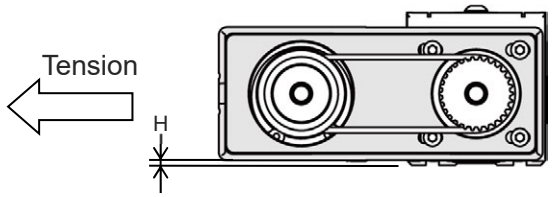
♦ Replacement procedure

[1] EC-RR3□BR/RR4□BR



1. Remove the hex socket set screw (1 pc) and take off the motor unit assembly.
2. Open the snap fit features on the pulley cover softly to take the pulley cover off.
3. Remove the hex socket head bolts (4 pcs) and slide the reversing bracket assembly. Take off the old belt.
4. Put on a timing belt for replacement.
5. Hang such as a zip ties on the reversing bracket assembly and apply the specified load (tensile force) using a tension gauge to adjust the timing belt tension.

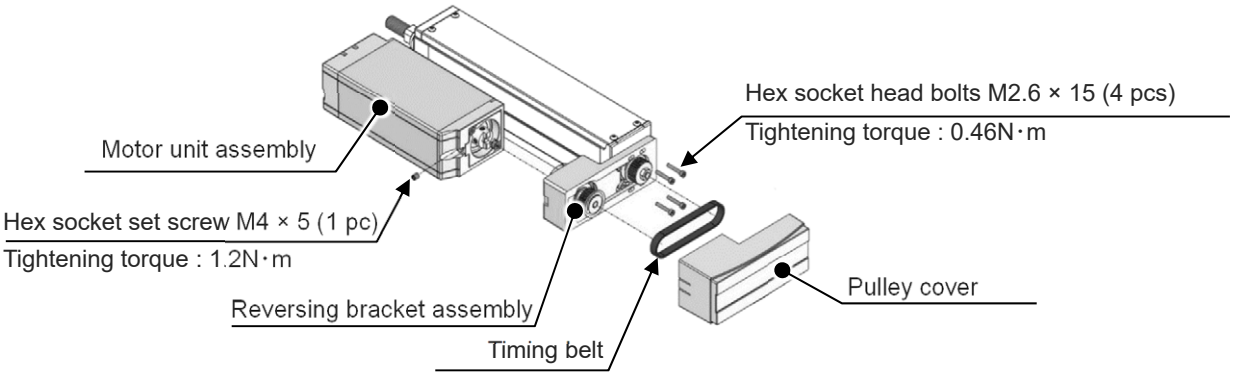
RR3□BR: Load (Tensile force) 10 to 15N
RR4□BR: Load (Tensile force) 20 to 25N



Bracket position dimensions (from seating surface)

Measurement point	H
Seating surface - Bracket surface	3.0 to 3.5mm

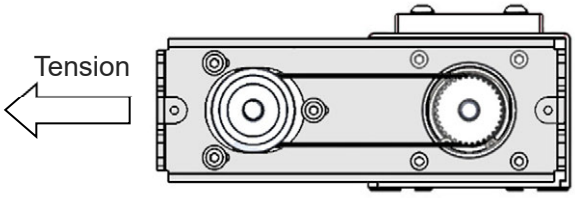
6. With the specified load (tensile force) being applied, tighten up the hex socket head bolts (4 pcs) to affix the reversing bracket assembly.
7. Put the pulley cover on.
8. Attach the motor unit assembly and fix it using the hex socket set screws.



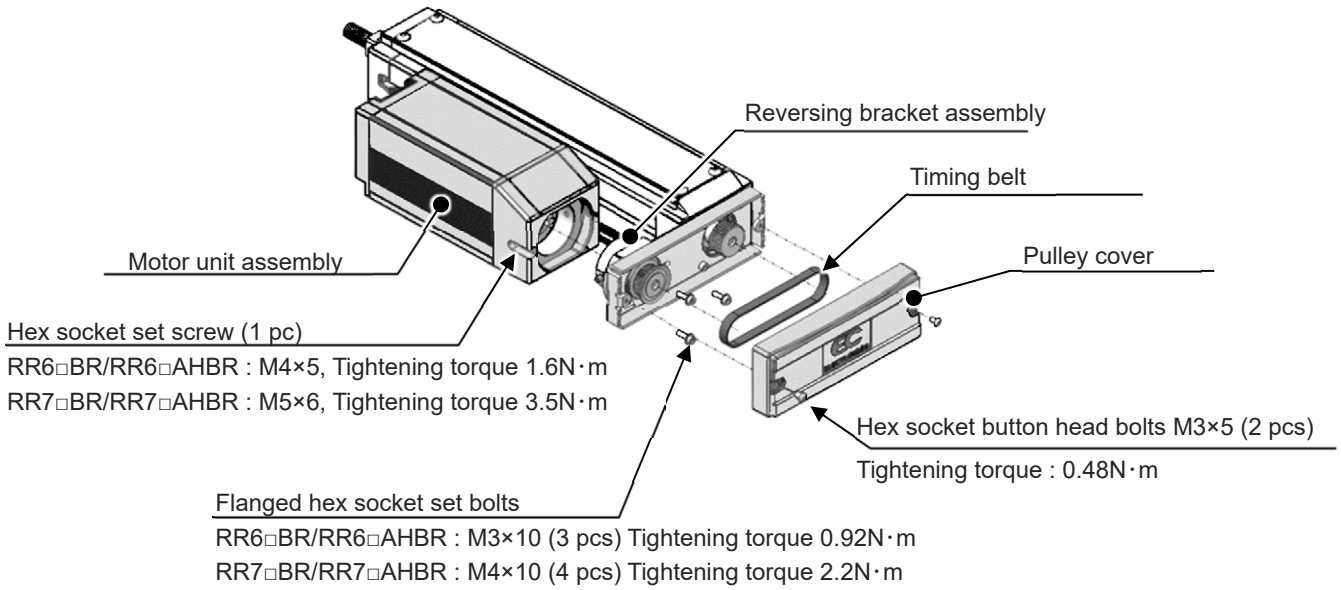
[2] EC-RR6□BR/RR7□BR, EC-RR6□AHBR/RR7□AHBR

1. Remove the set hex socket set screw (1 pc) and take off the motor unit assembly.
2. Remove the hex socket button head bolts (2 pcs) to take off the pulley cover.
3. Remove the flanged hex socket set bolts (3 pcs or 4 pcs) and slide the reversing bracket assembly to take off the old belt.
4. Put on a timing belt for replacement.
5. Hang such as a zip ties on the reversing bracket assembly and apply the specified load (tensile force) using a tension gauge to adjust the timing belt tension.

RR6□BR/RR6□AHBR: Load (Tensile force) 25 to 30N
RR7□BR/RR7□AHBR: Load (Tensile force) 80 to 90N

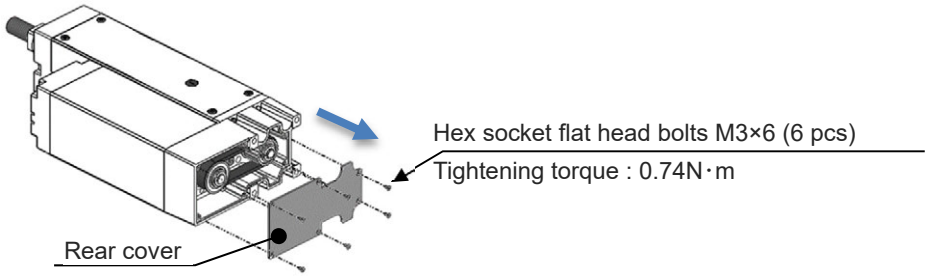


6. With the specified load (tensile force) being applied, tighten up the flanged hex socket set bolts (3 pcs or 4 pcs) to affix the reversing bracket assembly.
7. Put the pulley cover on and fix it using the hex socket head bolts (2 pcs).
8. Attach the motor unit assembly and fix it using the hex socket set screws (1 pc).



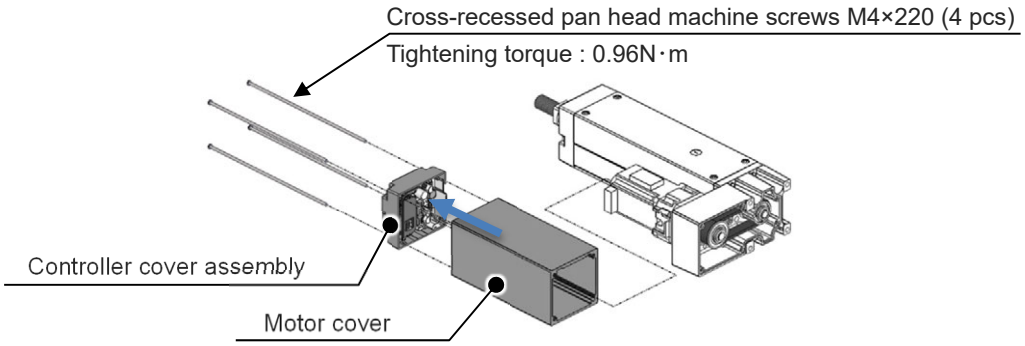
[3] EC-RR8□BR

1. Remove the hex socket flat head bolts (6 pcs) and take the rear cover off.

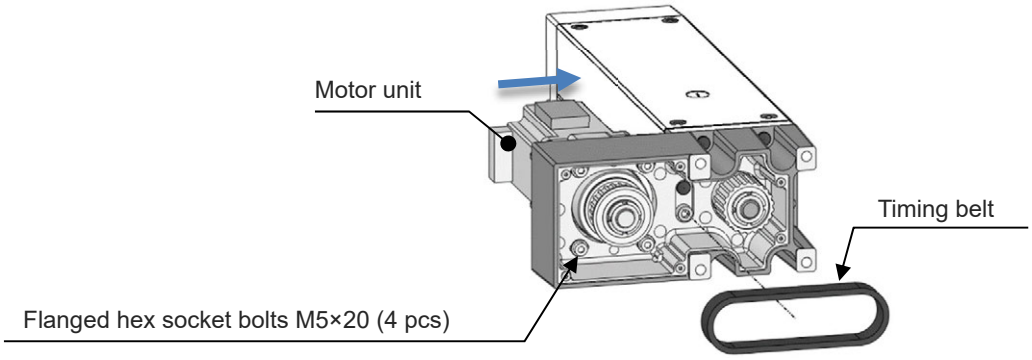


2. Remove the cross recessed pan head machine screws (4 pcs), and take off the connector on the motor / encoder cable connected to the controller cover assembly.

3. Remove the motor cover.



4. Loosen the flanged hex socket bolts (4 pcs), slide the motor unit to the actuator main body side, and take the timing belt off.

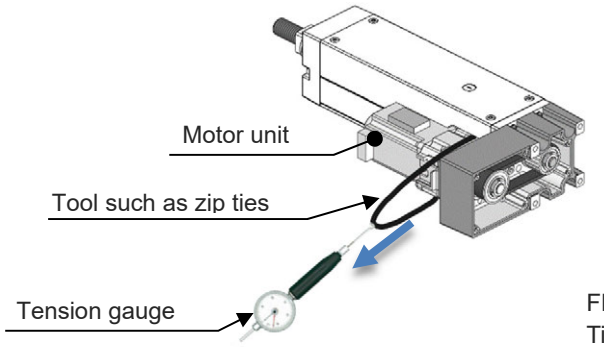


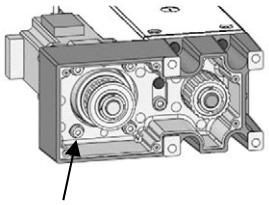
5. Put on a timing belt for replacement.

6. Adjust the timing belt tension.

<When Putting Load on Motor Part>

1) Hang such as a zip ties on the motor unit.
2) Apply load of 180 to 200N with a tension gauge.
3) With load being applied, tighten up the flanged hex socket bolts (4 pcs).

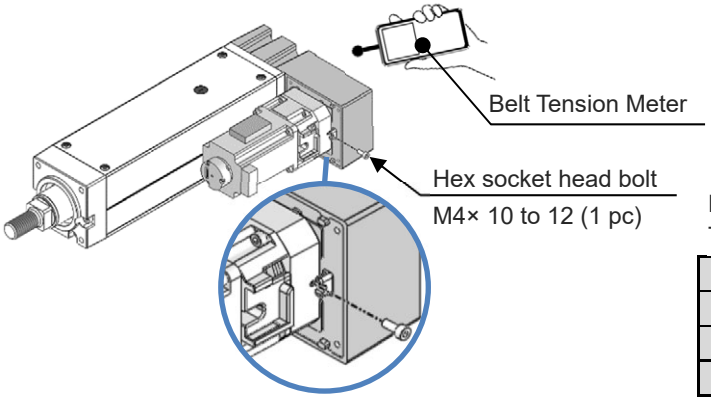


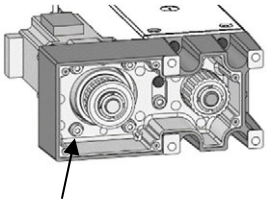


Flanged hex socket bolts M5×20 (4 pcs)
Tightening torque : 4.4N·m

<When Using Sonic Belt Tension Meter>

1) Put a hex socket head bolt with M4 x 10 to 12 (1 pcs) on the protruded part of the reversing bracket.
2) Adjust the hex socket head bolt to get 90 to 100N for the measurement on a tension meter.
3) Tighten up the flanged hex socket bolts (4 pcs).
4) Remove the hex socket head bolt (1 pc) attached in 1).



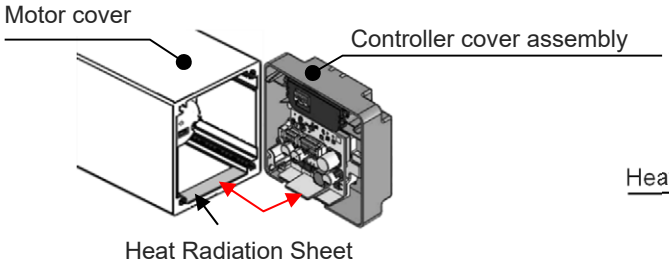


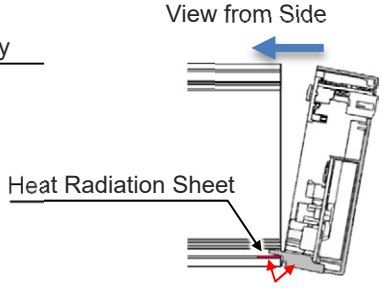
Flanged hex socket bolts M5×20 (4 pcs)
Tightening torque : 4.4N·m

Manufacturer	Gates Unitta Asia
Belt type	EV5GT
Width [mm]	15
Span [mm]	82.5

7. Attach the motor cover, controller cover assembly and rear cover.

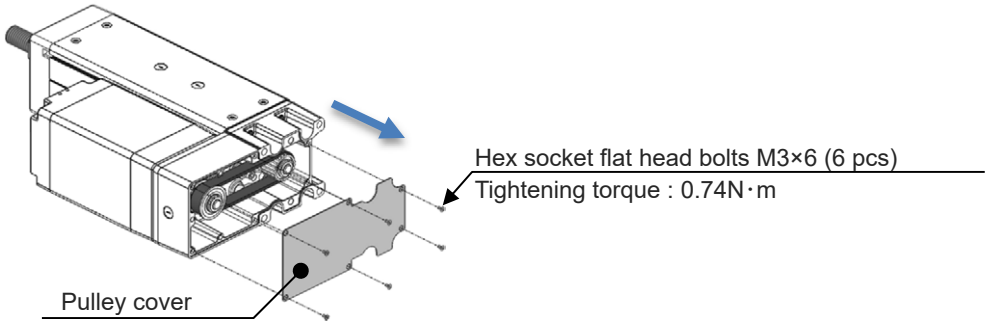
* The motor cover is to be put on while it is kept on the heat radiation sheet.
* The controller cover assembly is to be put on while it is kept on the heat radiation sheet.
* Be careful not to pinch cables



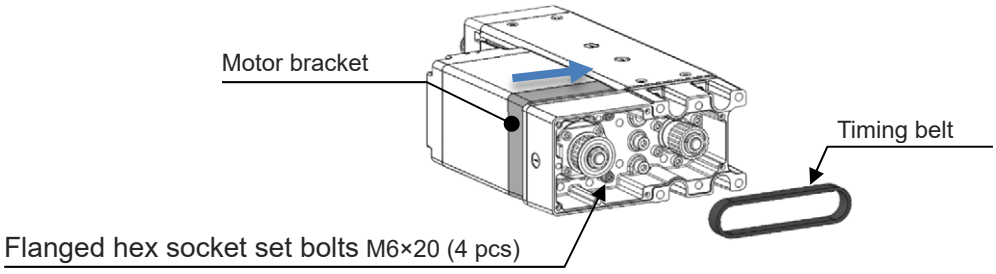


[4] EC-RR10□BR

1. Remove the hex socket flat head bolts (6 pcs) and take the pulley cover off.



2. Loosen the flanged hex socket set bolts (4 pcs), slide the motor bracket to the actuator main body side, and take the timing belt off.

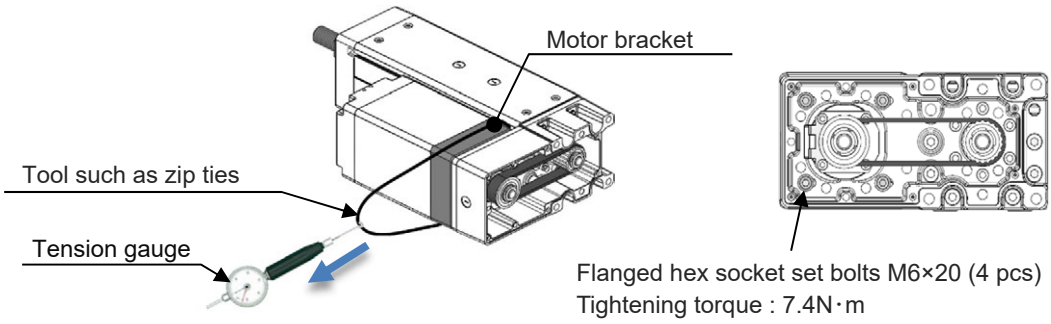


3. Put on a timing belt for replacement.

4. Adjust the timing belt tension.

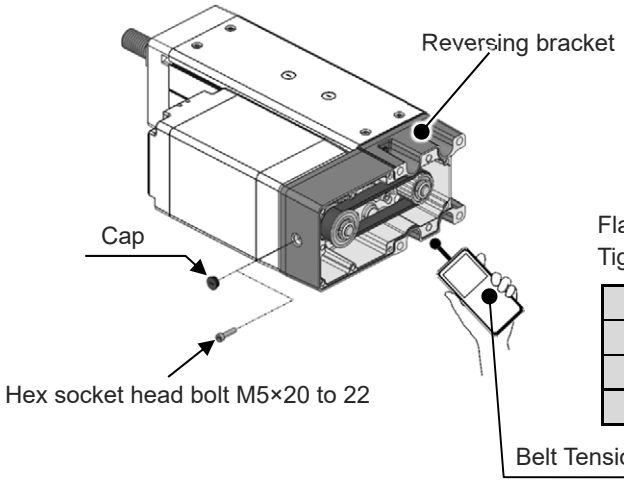
<When Putting Load on Motor Part>

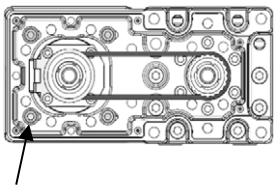
1) Hang such as a zip ties on the motor unit.
2) Apply load of 170 to 210N with a tension gauge.
3) With load being applied, tighten up the flanged hex socket set bolts (4 pcs).



<When Using Sonic Belt Tension Meter>

1) Take off the cap on the side of the reversing bracket and put a hex socket head bolt with M5 x 20 to 22 (1 pcs).
2) Adjust the hex socket head bolt to get 85 to 105N for the measurement on a tension meter.
3) Tighten up the flanged hex socket set bolts (4 pcs).
4) Remove the hex socket head bolt (1 pc) attached in 1) and put the cap on.





Flanged hex socket set bolts M6×20 (4 pcs)
Tightening torque : 7.4N·m

Manufacturer	Gates Unitta Asia
Belt type	EV5GT
Width (mm)	15
Span (mm)	115

5. Put the pulley cover on.

4.6.6 Replacing intermediate support cushion

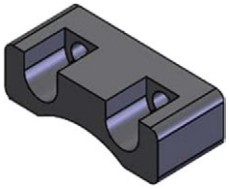
♦ **Preparation**

- Hex wrench and torque wrench Opposite side: 2.5mm, 3mm
- Protection equipment (e.g. Cotton Work Gloves)
- Intermediate support cushion model code for replacement

Type	Intermediate support cushion model code
RR6X□AHB/RR7X□AHB	IMSC-ECB-RR6RR7

* One model code for the intermediate support cushion comes with one piece. Order four sets for one unit.
2 pieces of rolled bush are enclosed in one model.

Intermediate support cushion



Intermediate support cushion

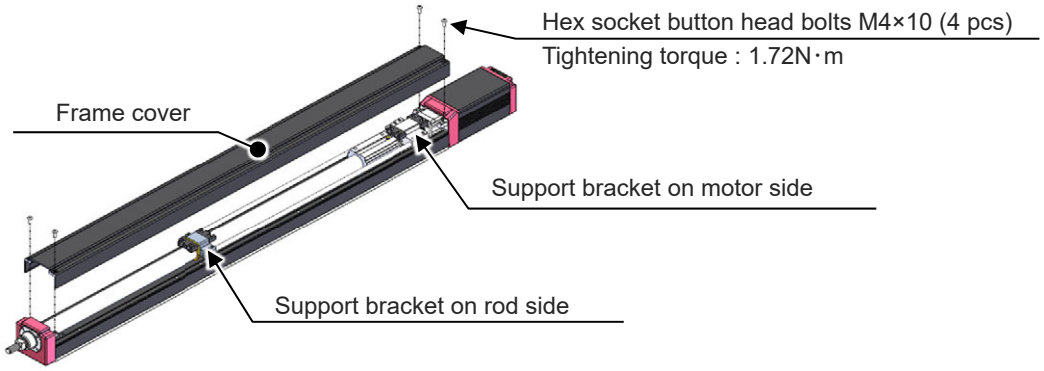


Rolled bush Enclosed

♦ Replacement procedure

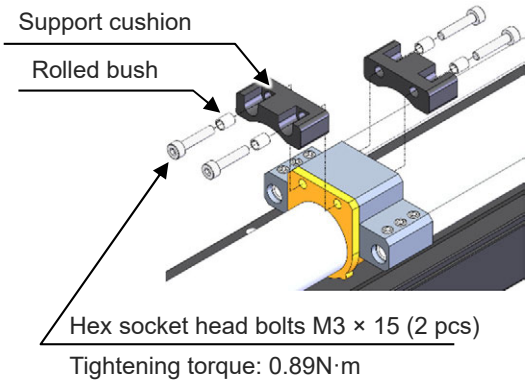
[1] EC-RR6X□AHB/RR7X□AHB

1. Remove the hex socket button head bolts (4 pcs), and take the frame cover off.

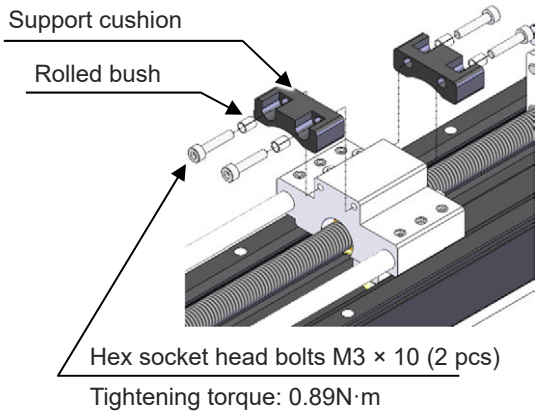


2. Remove the hex socket head bolts affixing the support cushion (2 pcs), and take the support cushions off.
   * For replacement work of the support cushion on the motor end, pull out the rod to have space between the support bracket and motor to make work operation.
3. Insert a rolled bush for replacement to the attachment holes on the intermediate support cushion.
   Affix a support cushion for replacement with hex socket head bolts (2 pcs).

[Support Bracket on Rod Side]



[Support Bracket on Motor Side]



4. Put the frame cover on, and fix the hex socket button head bolts (4 pcs).

4.6.7 Motor unit replacement (including coupling spacer replacement)

♦ Preparation

- Phillips screwdriver
- Hex wrench and torque wrench Opposite side: 2mm, 2.5mm, 3mm, 4mm, 5mm
- Tension gauge (RR8□BR/RR10□BR)
  * RR8□BR/RR10□BR are available for use of sonic belt tension meter.
- Long string such as wire (RR8□BR/RR10□BR)
- Protection equipment (e.g. Cotton Work Gloves)
- Motor unit and Coupling spacer for replacement

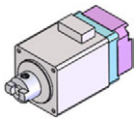
Type	Motor unit model number	Coupling spacer model number
RR3□B/RR3□BR	EC-MUSRR3(-WA)(-B)	CPG-EC-SRR3
RR4□B/RR4□BR	EC-MUSRR4(-WA)(-B)	CPG-EC-SRR4
RR6□B/ RR6□AHB/RR6X□AHB/ RR6□BR/RR6□AHBR	EC-MUSR6(-WA)(-B)	CPG-EC-SR6
RR7□B/ RR7□AHB/RR7X□AHB/ RR7□BR/RR7□AHBR	EC-MUR7(-WA)(-B)	CPG-EC-SR7
RR8□B	EC-MURR8(-WA)(-B)	CPG-RCP6-L
RR8□BR	EC-MURR8R(-WA)(-B)	-
RR10□B/RR10□BR (Incremental)	EC-MURR10(-B)	CPG-RCP6-L
RR10□B/RR10□BR (Battery-less)	RCP5-MURA-10A(-B)	CPG-RCP6-L

WA: Battery-less absolute specification, B: Brake

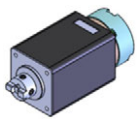
Coupling spacer



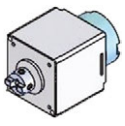
Motor unit * Image shows types not equipped with brake.



RR3□B(R)



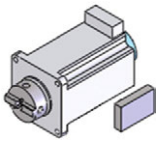
RR4□B(R)



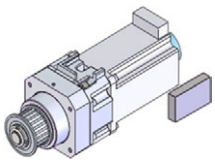
RR6□B(R)/
RR6(X)□AHB(R)



RR7□B(R)/
RR7(X)□AHB(R)



RR8□B
Heat Radiation
Sheet Enclosed



RR8□BR
Heat Radiation
Sheet Enclosed

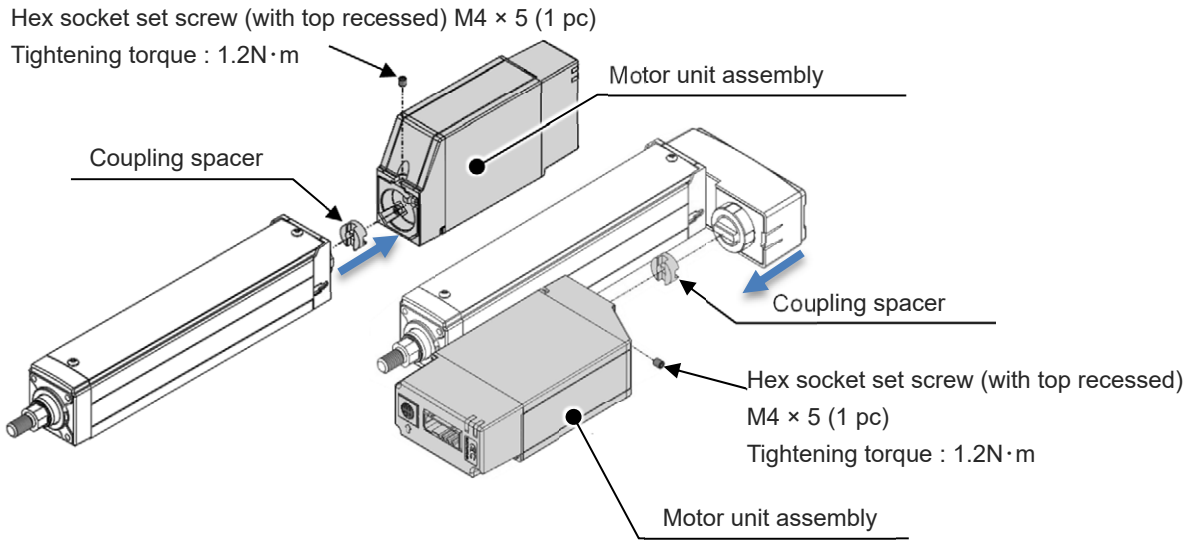


RR10□B(R)
Coupling spacer
Enclosed

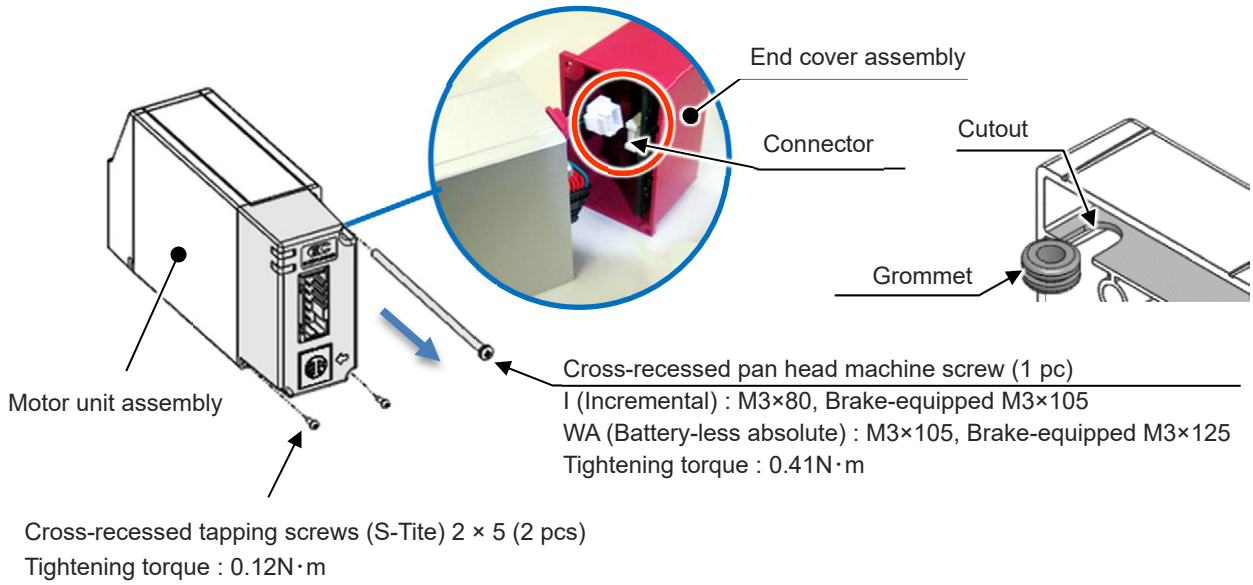
♦ Replacement procedure

[1] EC-RR3□B/RR3□BR

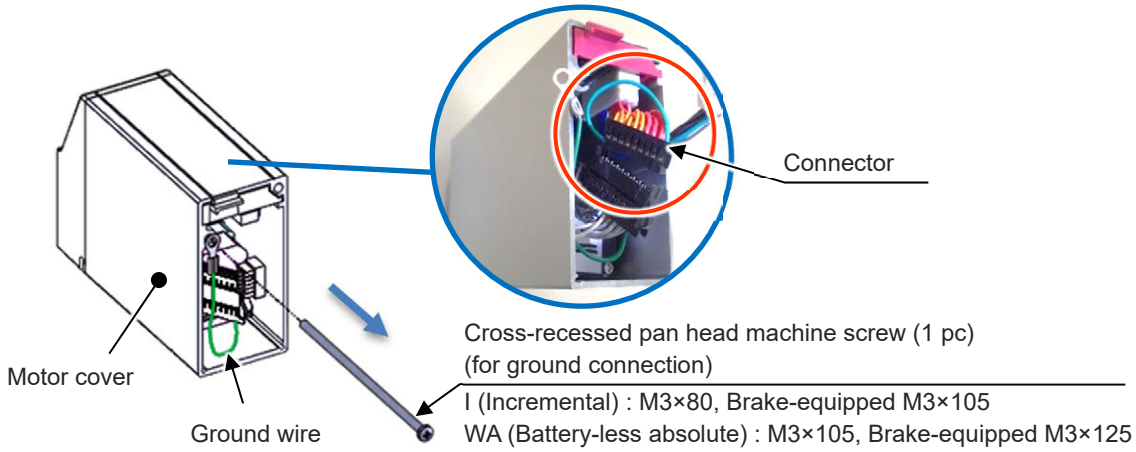
1. Remove the hex socket set screw (1 pc) and take off the motor unit assembly.
2. Replace the coupling spacer.



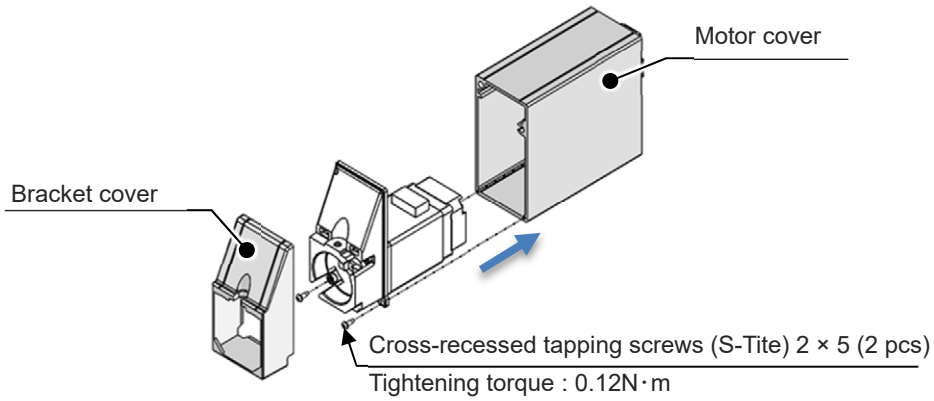
3. Take off the cross-recessed pan head machine screw (1 pc) and the cross-recessed tapping screws (S-Tite) (2 pcs) from the motor unit assembly.
4. Take off the connectors on the wires from the controller circuit board in the end cover assembly.
   * The cables to the digital speed controller go through the grommet at the cutout on the digital speed controller.



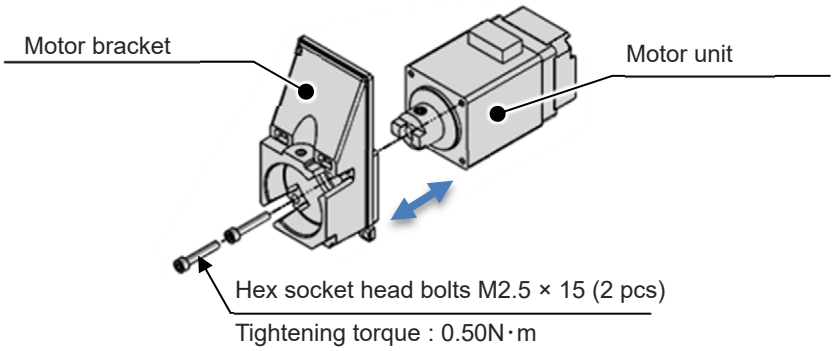
5. Remove the cross-recessed pan head machine screw (1 pc) for ground connection.
6. Take off the connector joining the motor/encoder to the controller circuit board in the motor cover assembly.



7. Take off the bracket cover and remove the cross-recessed tapping screws (S-Tite) (2 pcs).
8. Take off the motor cover.

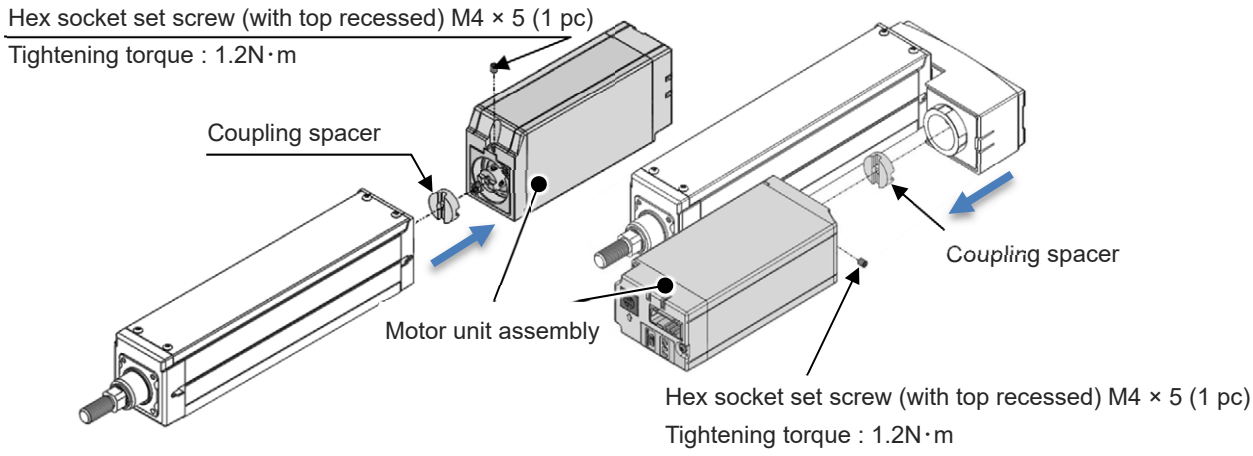


9. Remove the hex socket head bolts to take the motor off the motor bracket.
10. Replace the motor unit with the one for replacement and set all the components up in the back order.

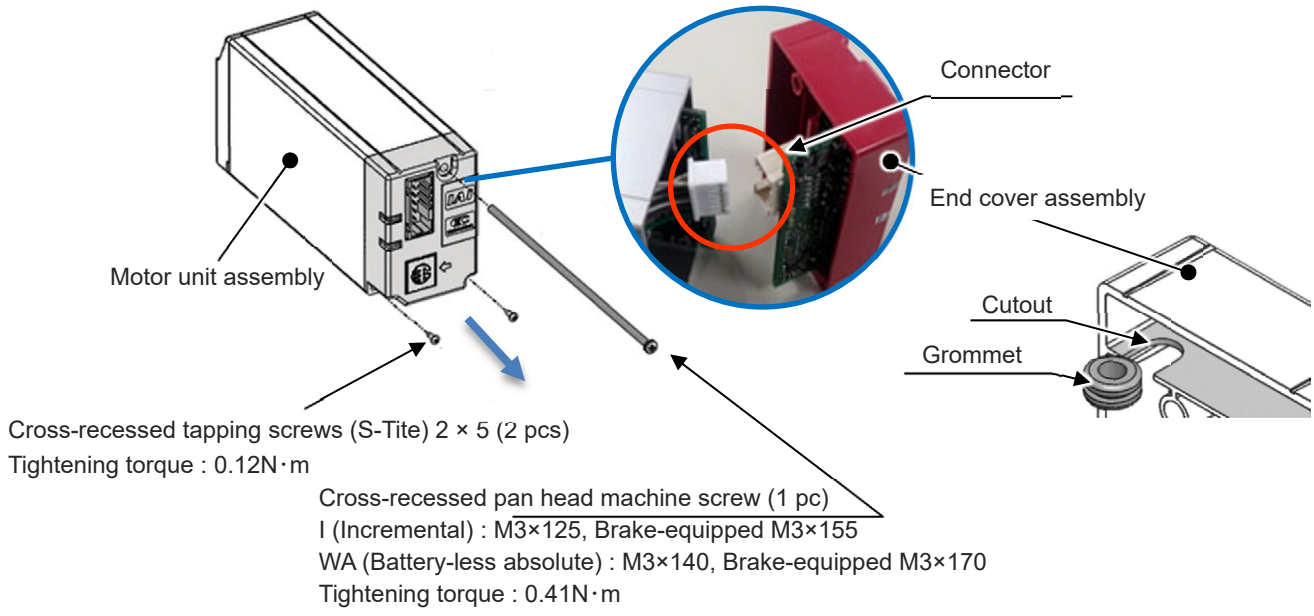


[2] EC-RR4□B/RR4□BR

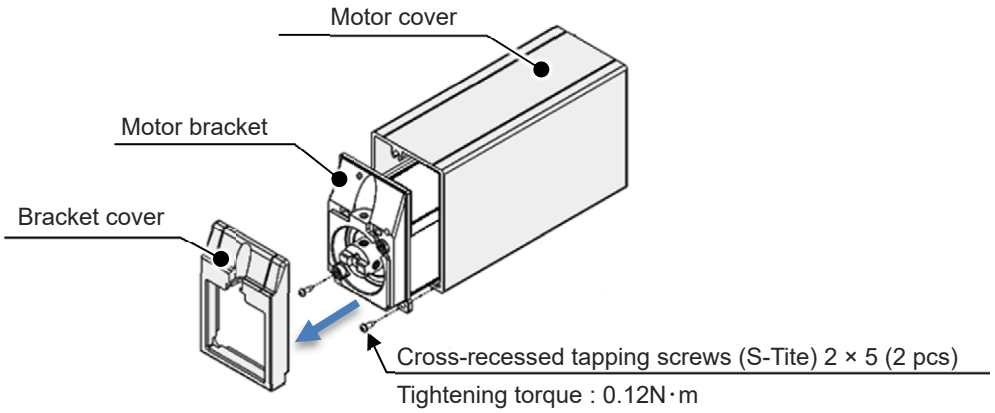
1. Remove the hex socket set screw (1 pc) and take off the motor unit assembly.
2. Replace the coupling spacer.



3. Take off the cross-recessed pan head machine screw (1 pc) and the cross-recessed tapping screws (S-Tite) (2 pcs) from the motor unit assembly.
4. Take off the connectors on the wires from the controller circuit board in the end cover assembly.
   * The cables to the digital speed controller go thro ugh the grommet at the cutout on the digital speed controller.

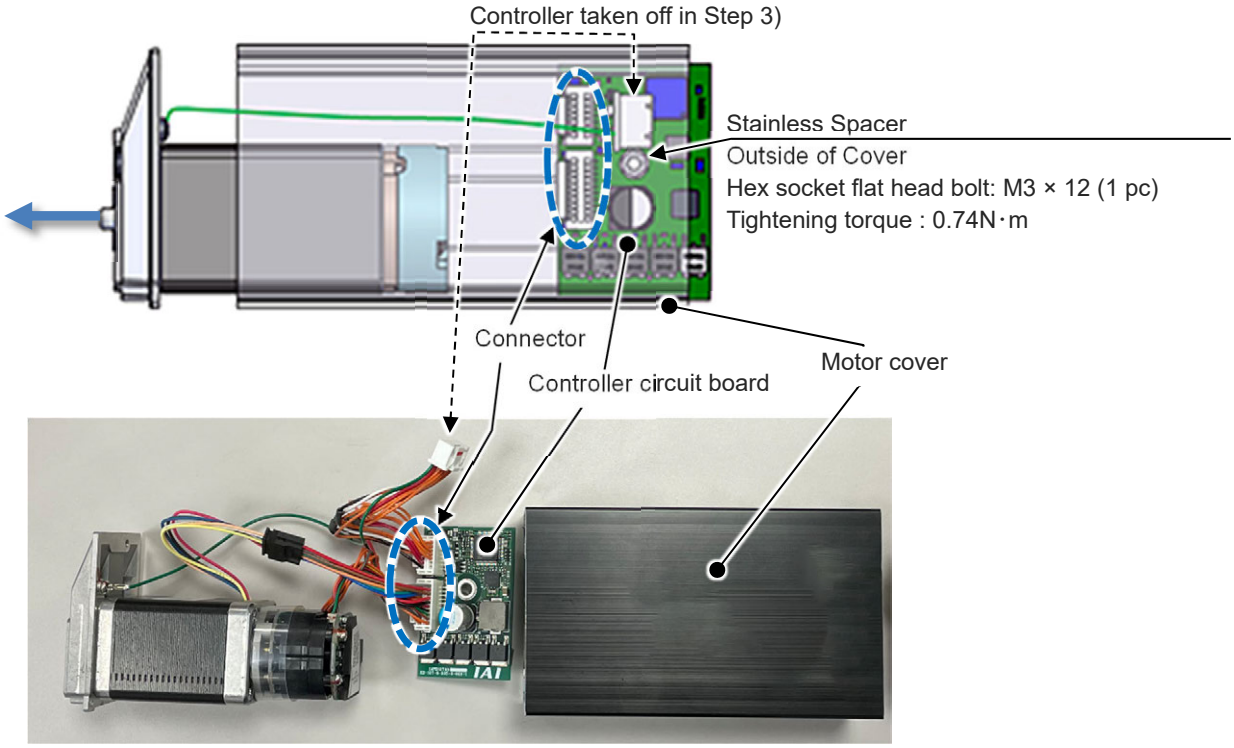


5. Take off the bracket cover and remove the cross-recessed tapping screws (S-Tite) (2 pcs).

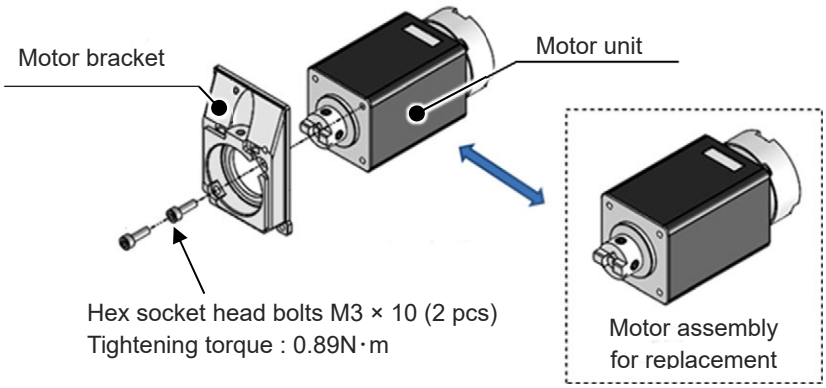


6. Take off the cross-recessed pan head machine screws and the cross-recessed tapping screws from the controller assembly.

- Take off the cross-recessed pan hex socket flat head bolt (1 pc) at the outside of the motor cover while holding the stainless spacers (hex, double-end internal threaded) inside the motor cover.
- Pull the motor unit off the motor cover together with the controller PC board.
- Take off the connector joining the controller circuit board and the motor/encoder.



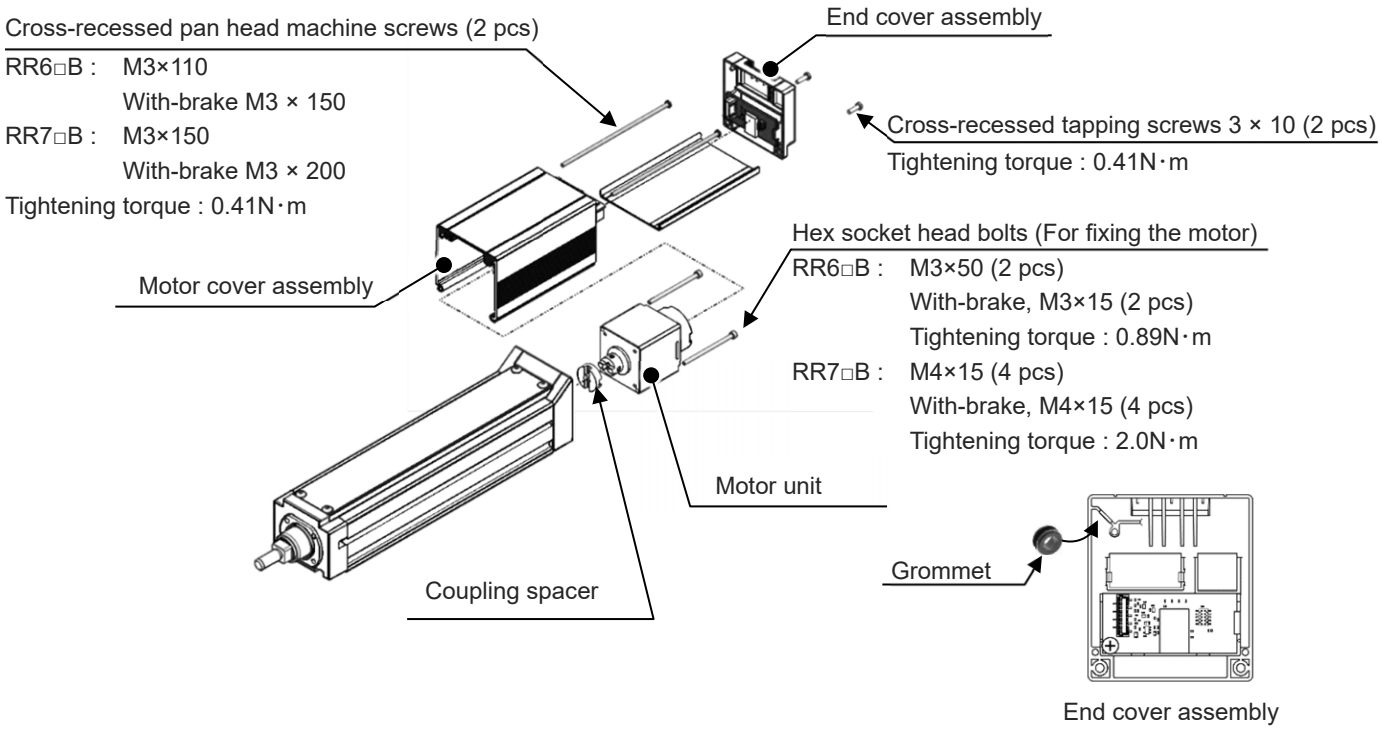
7. Remove the hex socket head bolts to take the motor unit off the motor bracket.
8. Replace the motor assembly with the one for replacement and set all the components up in the back order.



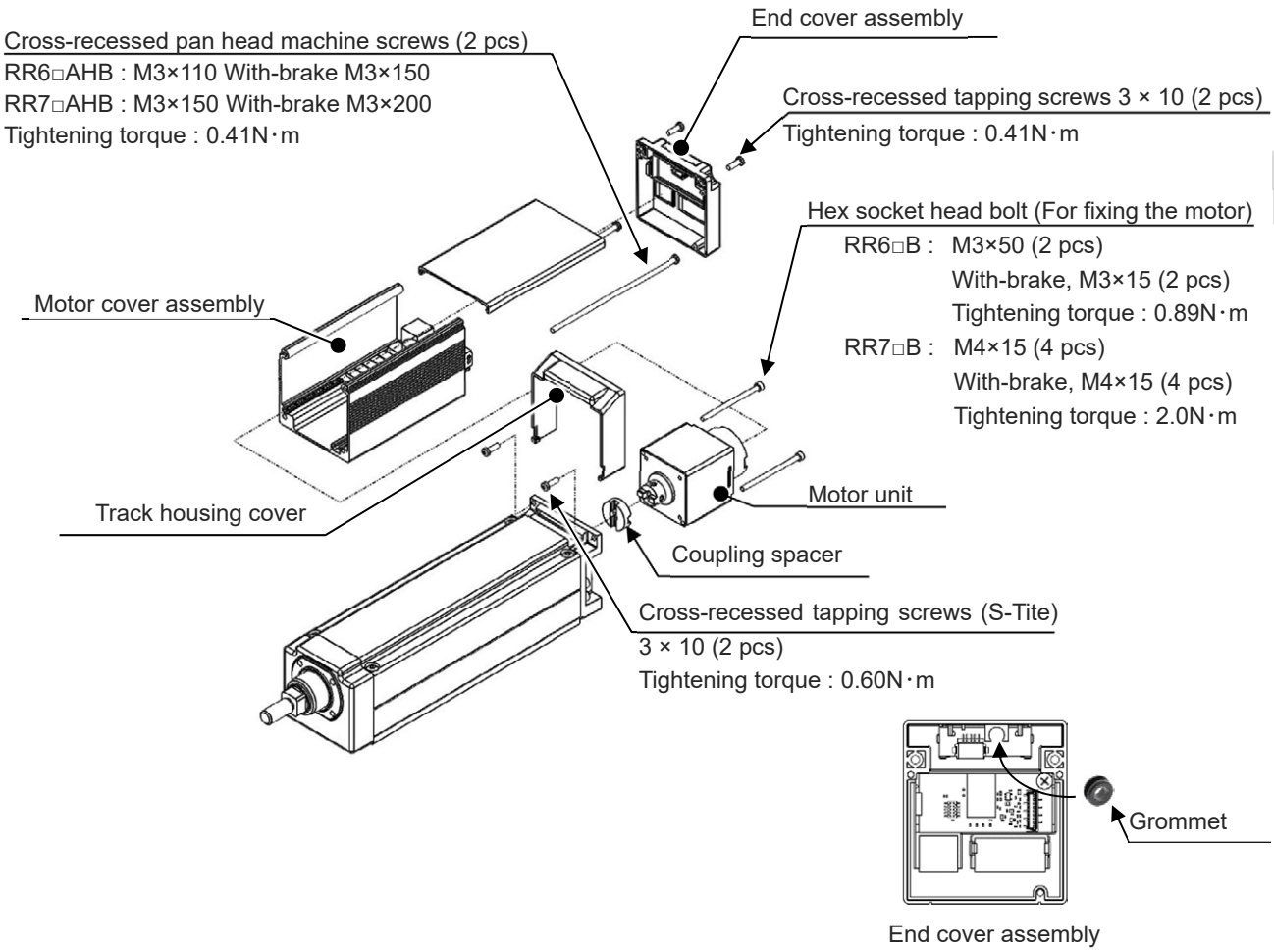
[3] EC-RR6□B/RR7□B, EC-RR6(X)□AHB/RR7(X)□AHB

1. Remove the cross-recessed tapping screws (2 pcs) and take off the end cover.
   For the high rigidity radial cylinder, take off also the cables and connectors to the LED PC board on the end cover.
2. Remove the cross-recessed pan head machine screws (2 pcs) to remove the wiring/connectors, then remove the motor cover assembly.
   For the high-stiffness radial cylinder, take off the track housing cover and also Remove the cross-recessed tapping screws (S-Tite) (2 pcs).
3. Take off the motor and coupling spacer.
4. Mount the motor and coupling spacer for replacement.
5. Return the wiring, connectors and motor cover assembly to their original state.
   For the high rigidity radial cylinder, put back on also the cables and connectors to the LED PC board on the end cover.
   * The cables to the digital speed controller go through the grommet at the cutout on the digital speed controller.
6. Attach the end cover assembly.
   * Refer to [4.6.1 [5] Precautions for connectors/wiring] about connectors and cables.

♦EC-RR6□B/RR7□B



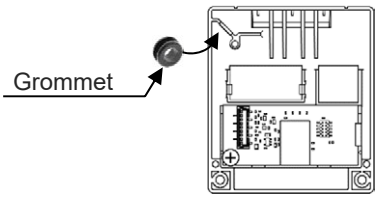
♦EC-RR6(X)□AHB/RR7(X)□AHB (High-stiffness radial cylinder)



[4] EC-RR6□BR/RR7□BR, EC-RR6□AHBR/RR7□AHBR

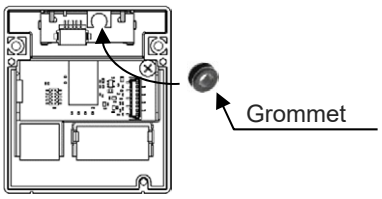
1. Remove the hex socket set screw (1 pc) and take off the motor unit assembly and coupling spacer.
2. Take off the motor bracket cover.
3. Remove the cross-recessed tapping screws a (2 pcs) and take off the end cover assembly. Also, pull off the cable on the LED PC board in the end cover assembly for the high-stiffness radial cylinder.
4. Remove the cross-recessed pan head machine screws (2 pcs) and the cross-recessed tapping screws b (2 pcs) on the motor unit side and disconnect the cables and connectors to take off the motor cover assembly.
5. Remove the hex socket head bolts (2 pcs or 4 pcs) and take off the motor unit.
6. Mount a motor unit for replacement and coupling spacer.
7. Mount the wiring/connectors to the motor cover assembly and return it to the original state.
   * The cables to the digital speed controller go through the grommet at the cutout on the digital speed controller.
8. Mount the end cover assembly.
9. Put the motor bracket cover on.
10. Attach the motor unit assembly.
    * Refer to [4.6.1 [5] Precautions for connectors/wiring] about connectors and cables.

EC-RR6□BR/EC-RR7□BR



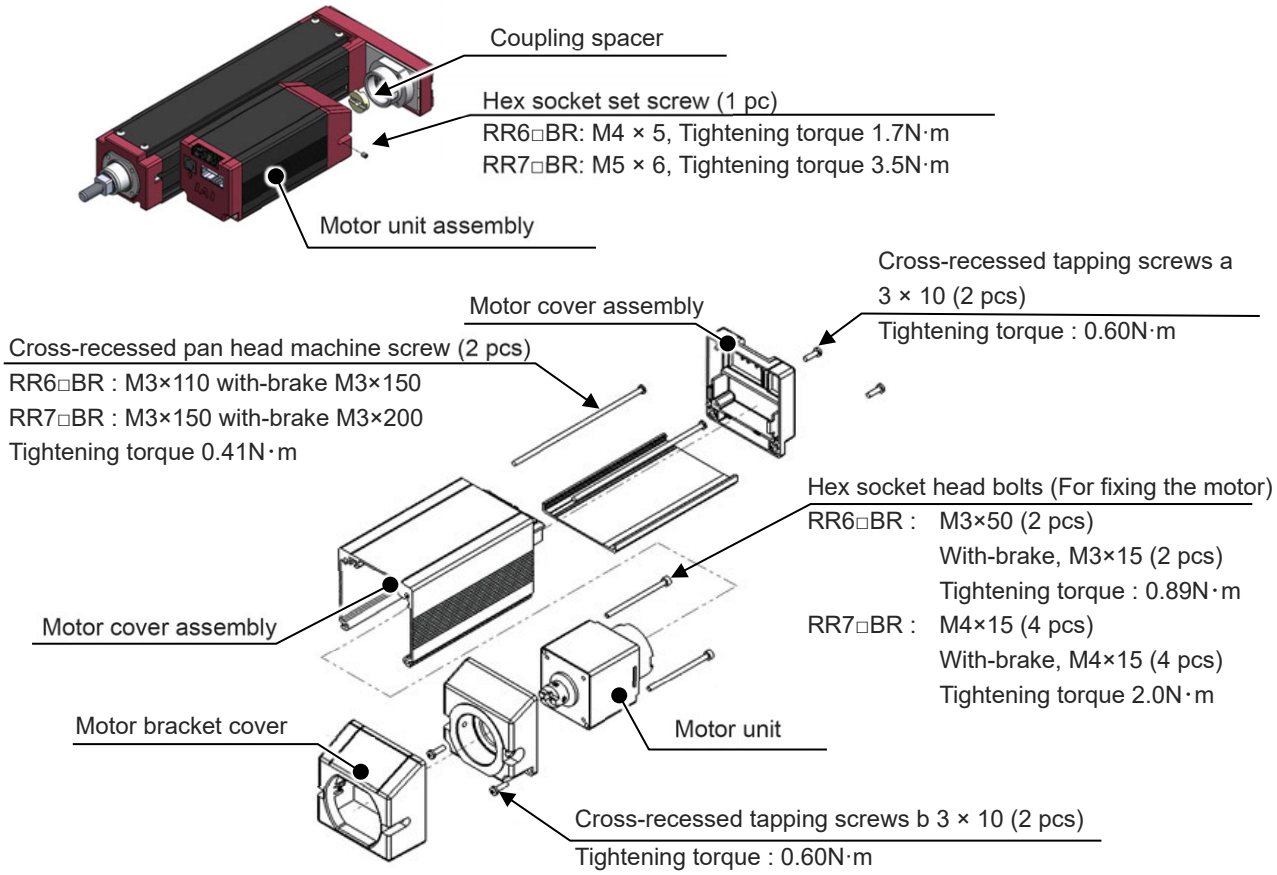
End cover assembly

RR6□AHBR/RR7□AHBR

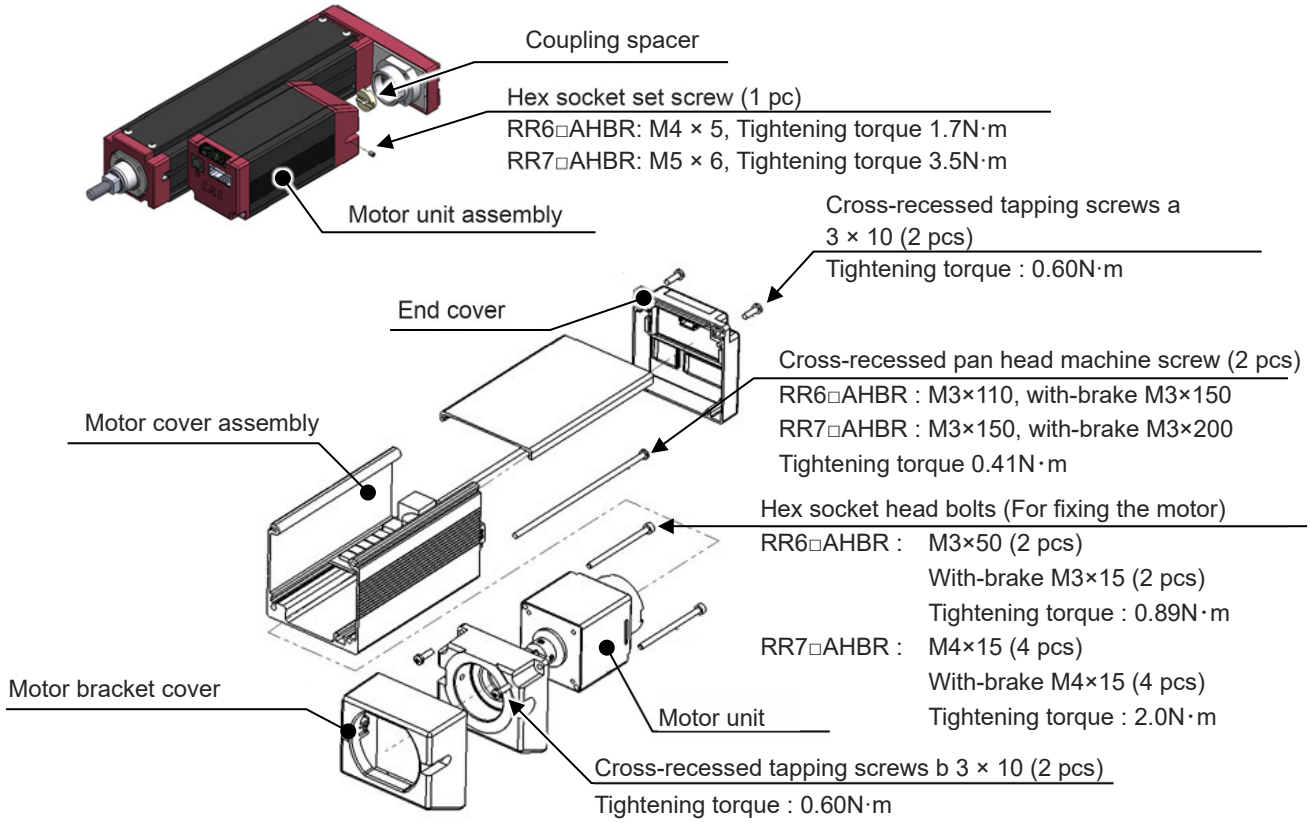


End cover assembly

◆EC-RR6□BR/RR7□BR

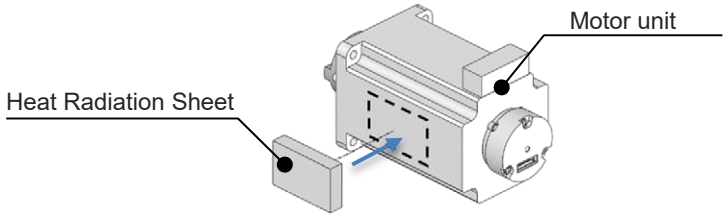


◆EC-RR6□AHBR/RR7□AHBR (High-stiffness radial cylinder)



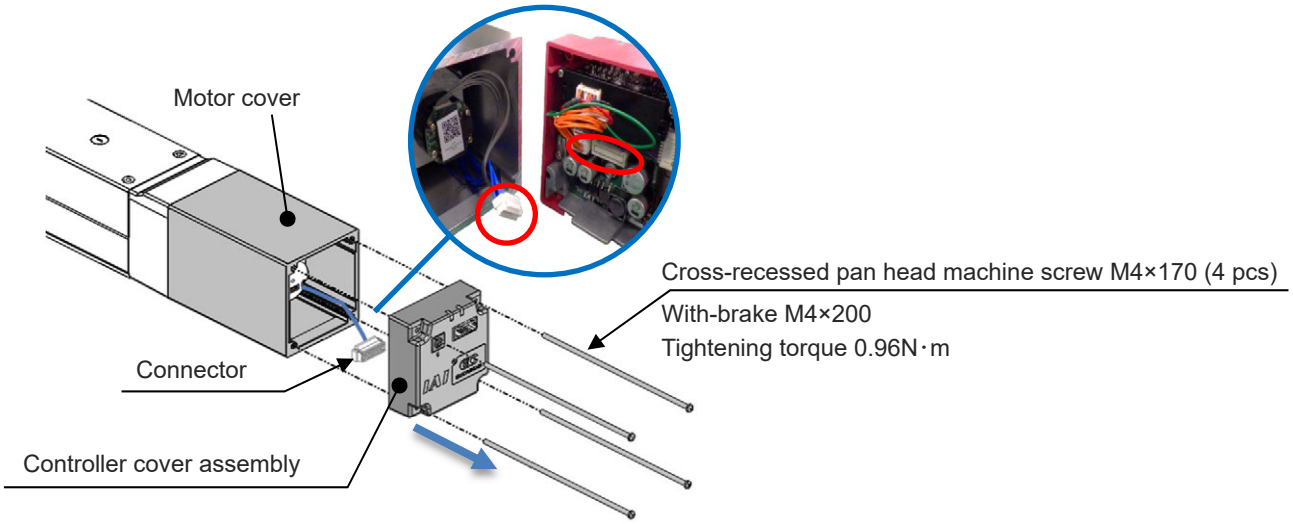
[5] EC-RR8□B

1. Apply the enclosed heat radiation sheet on a motor unit for replacement.

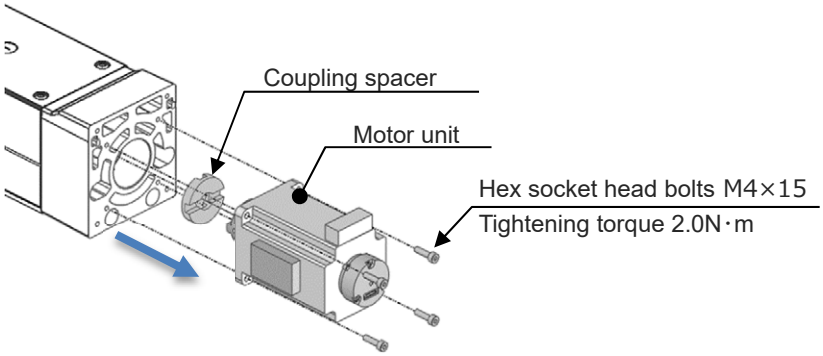


2. Remove the cross-recessed pan head machine screws (4 pcs) and slide the motor cover assembly.

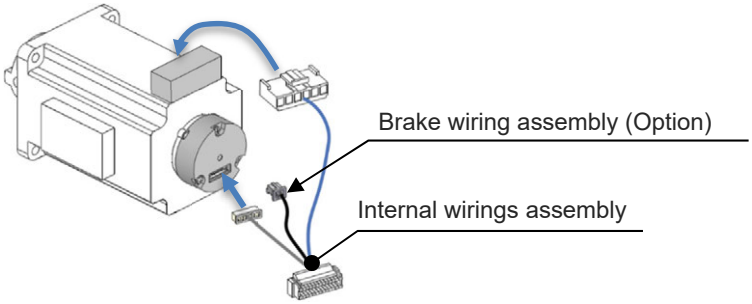
3. Take off the connector on the motor / encoder cable connected to the controller cover assembly to take off the controller cover assembly and motor cover.



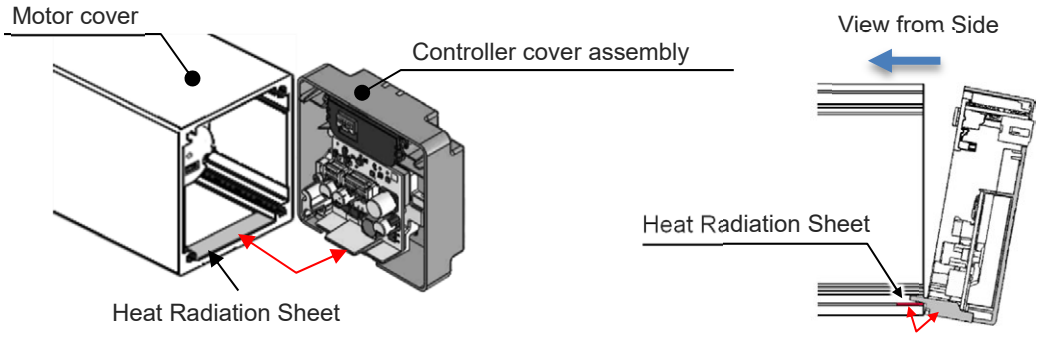
4. Remove the hex socket head bolts (4 pcs) and take off the motor unit and coupling spacer.



5. Take the internal cable assembly off the motor unit that was taken off, and put it on a motor unit for replacement.

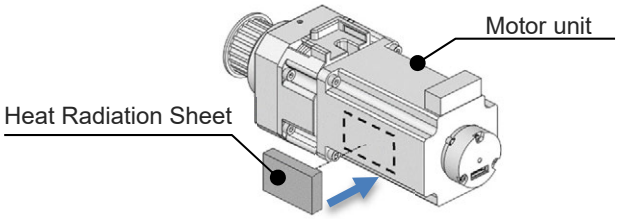


6. Put on a coupling spacer for replacement and a motor unit for replacement in the back order.
   * The motor cover is to be put on while it is kept on the heat radiation sheet.
   * The controller cover assembly is to be put on while it is kept on the heat radiation sheet.
   * Be careful not to pinch cables.

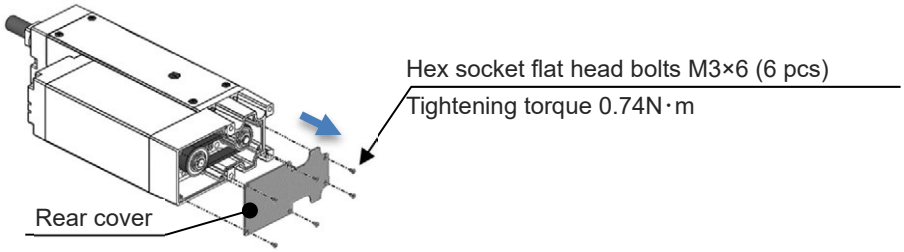


[6] EC-RR8□BR

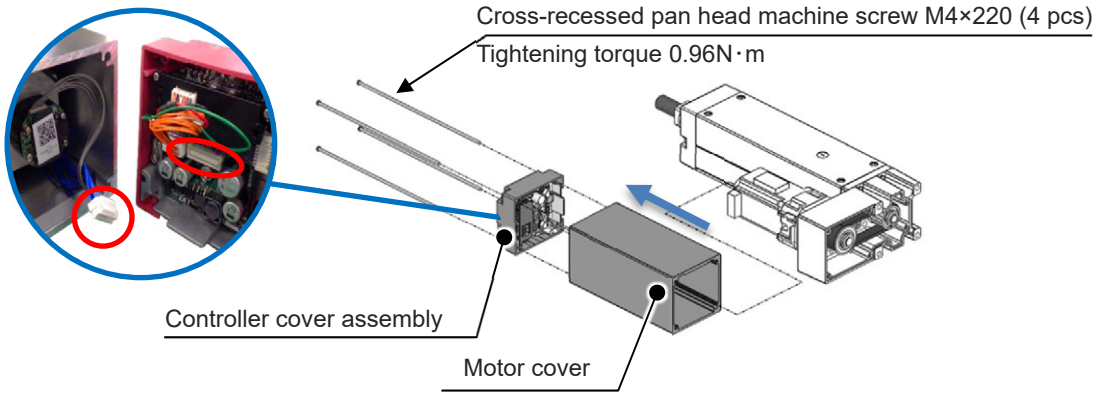
1. Apply the enclosed heat radiation sheet on a motor unit for replacement.



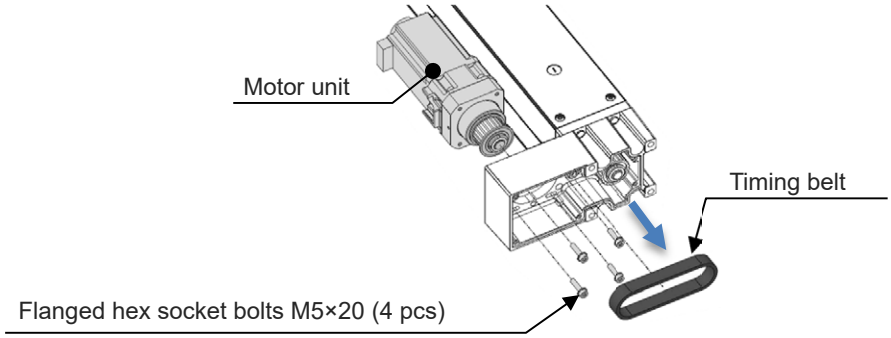
2. Remove the hex socket flat head bolts (6 pcs) and take the rear cover off.



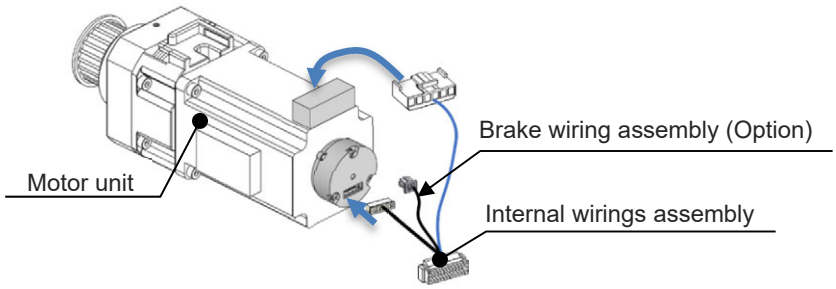
3. Remove the cross recessed pan head machine screws (4 pcs), and take off the connector on the motor / encoder cable connected to the controller cover assembly.
4. Take off the motor cover.



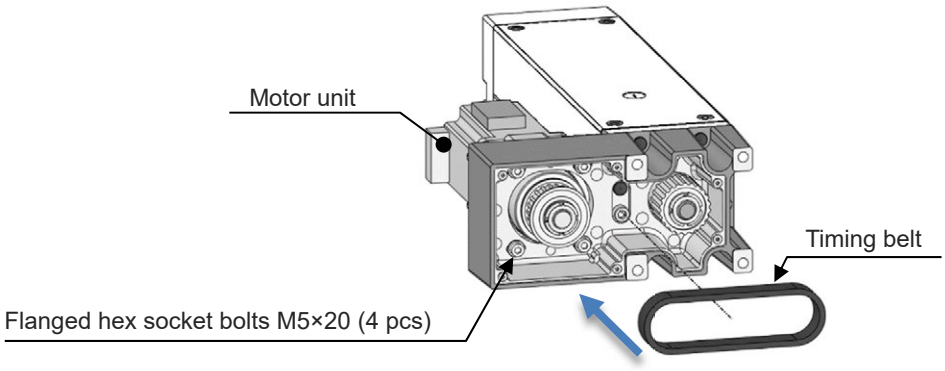
5. Remove the flanged hex socket bolts (4 pcs) and take off the timing belt and motor unit.



6. Take the internal cable assembly off the motor unit that was taken off, and put it on a motor unit for replacement.



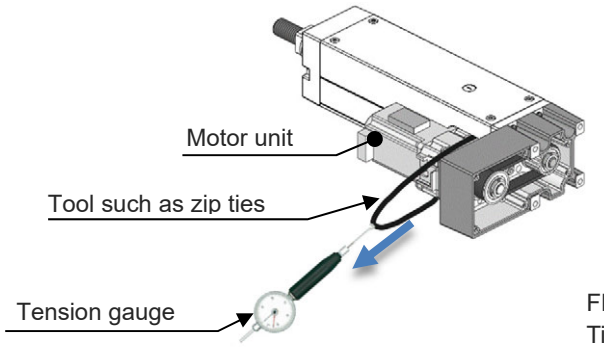
7. Tighten the motor unit for replacement loosely with the flanged hex socket bolts (4 pcs) and put the timing belt on.

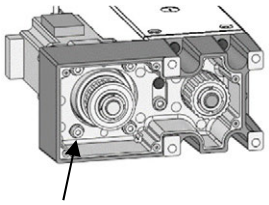


8. Adjust the timing belt tension.

<When Putting Load on Motor Part>

1) Hang such as a zip ties on the motor unit.
2) Apply load of 180 to 200N with a tension gauge.
3) With load being applied, tighten up the flanged hex socket bolts (4 pcs).

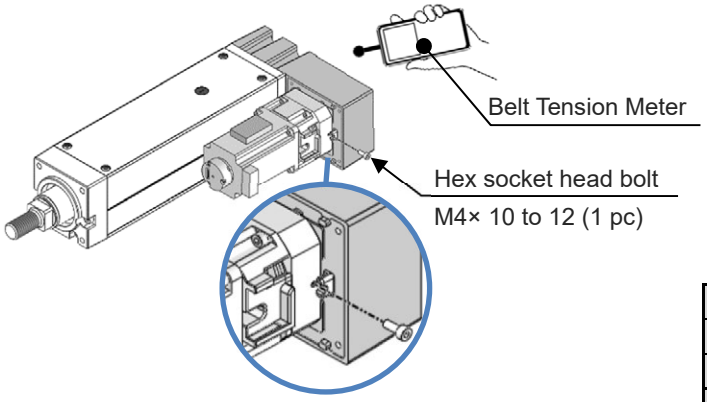


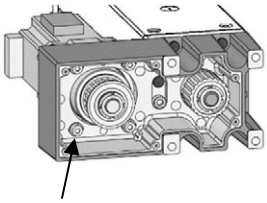


Flanged hex socket bolts M5×20 (4 pcs)
Tightening torque : 4.4N·m

<When Using Sonic Belt Tension Meter>

1) Put a hex socket head bolt with M4 x 10 to 12 (1 pcs) on the protruded part of the reversing bracket.
2) Adjust the hex socket head bolt to get 90 to 100N for the measurement on a tension meter.
3) Tighten up the flanged hex socket bolts (4 pcs).
4) Remove the hex socket head bolt (1 pc) attached in 1).



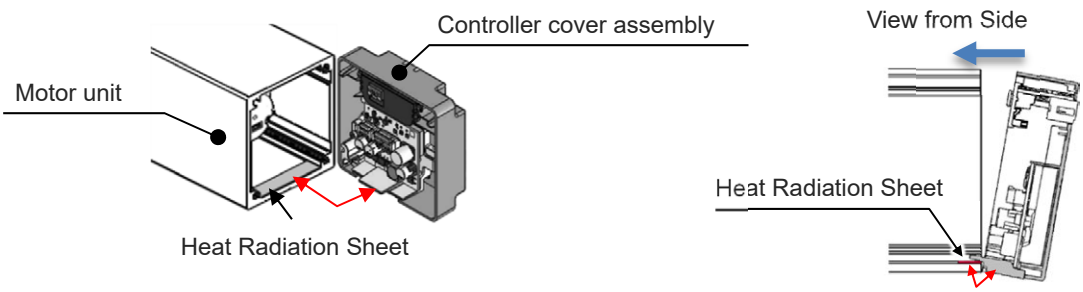


Flanged hex socket bolts M5×20 (4 pcs)
Tightening torque : 4.4N·m

Manufacturer	Gates Unitta Asia
Belt type	EV5GT
Width (mm)	15
Span (mm)	82.5

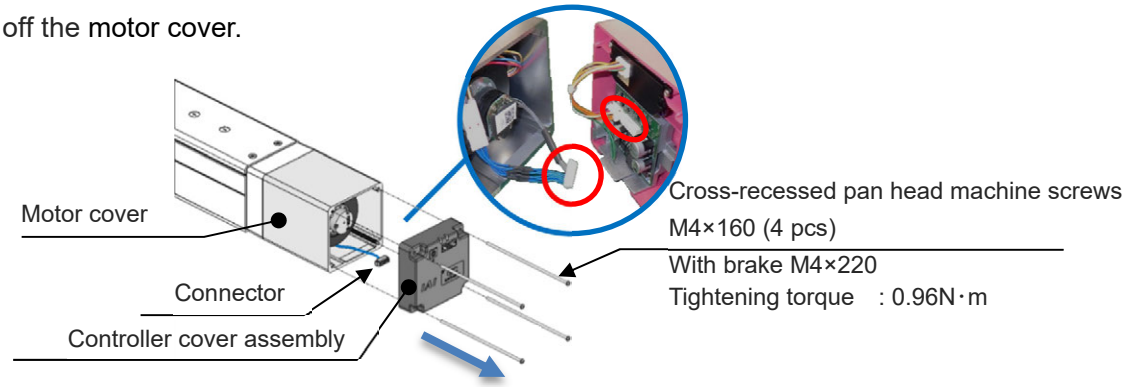
9. Put on the motor cover, controller cover assembly and rear cover in the procedures from 4 to 2.

* The motor cover is to be put on while it is kept on the heat radiation sheet.
* The controller cover assembly is to be put on while it is kept on the heat radiation sheet.
* Be careful not to pinch cables.

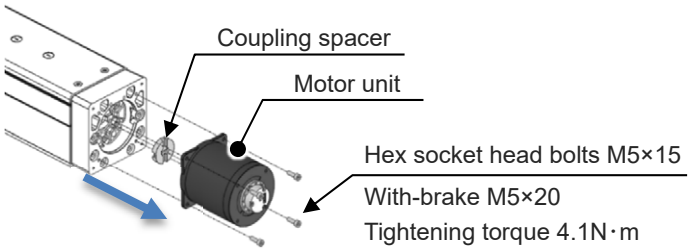


[7] EC-RR10□B with/without Brake, EC-RR10□BR without Brake

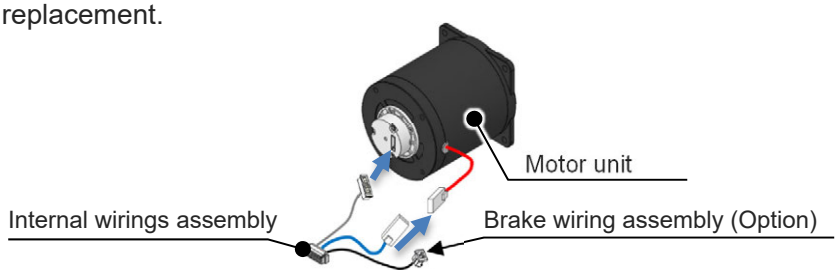
1. Remove the cross-recessed pan head machine screws (4 pcs) and slide the controller cover assembly.
2. Take off the connector on the motor / encoder cable connected to the controller cover assembly.
3. Take off the motor cover.



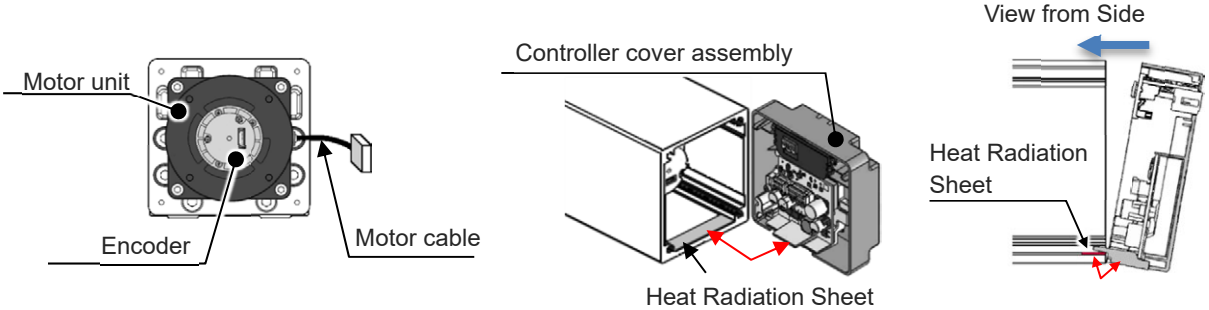
4. Remove the hex socket head bolts (4 pcs) and take off the motor unit and coupling spacer.



5. Take the internal cable assembly off the motor unit that was taken off, and put it on a motor unit for replacement.

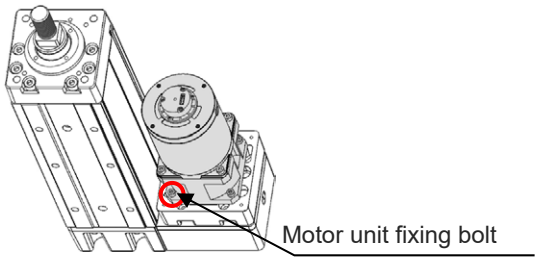


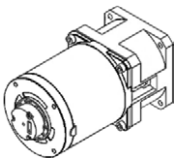
6. Put on the motor unit, coupling spacer, motor cover and controller cover assembly in the procedures from 4 to 1.
   * The motor unit is to be put on with the motor cable on the right hand side from the view on the encoder side.
   * The controller cover assembly is to be put on while it is kept on the heat radiation sheet.
   * Be careful not to pinch cables.



[8] EC-RR10□BR with brake

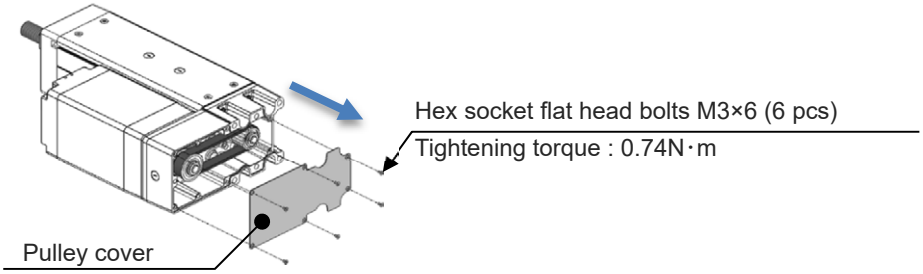
In those models equipped with brake, when it is difficult to access your tool to the motor unit fixing screw shown in the figure, have the replacement work done in the following procedures. When your tool is available to access the screw, have the replacement work in the procedure of [7].



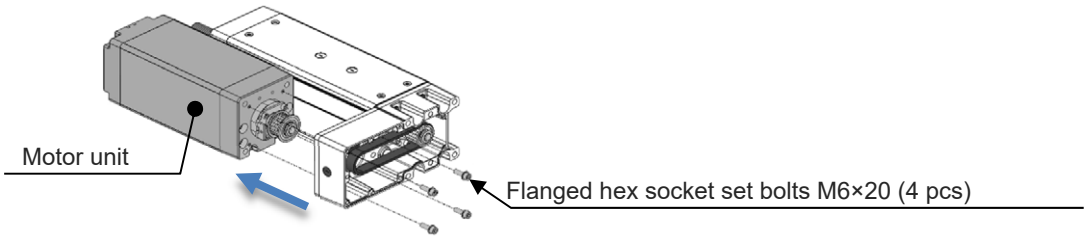


With brake motor unit

1. Remove the hex socket flat head bolts (6 pcs) and take the pulley cover off.

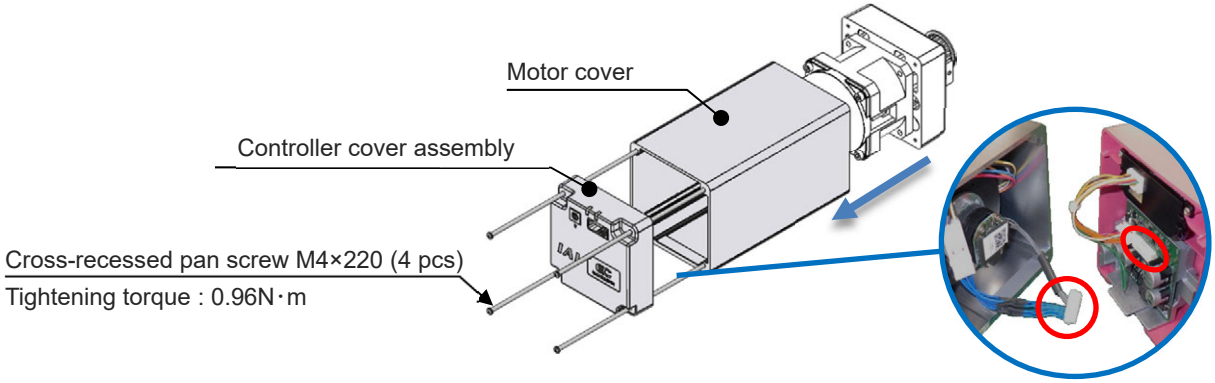


2. Remove the flanged hex socket set bolts (4 pcs) and take the motor unit off.

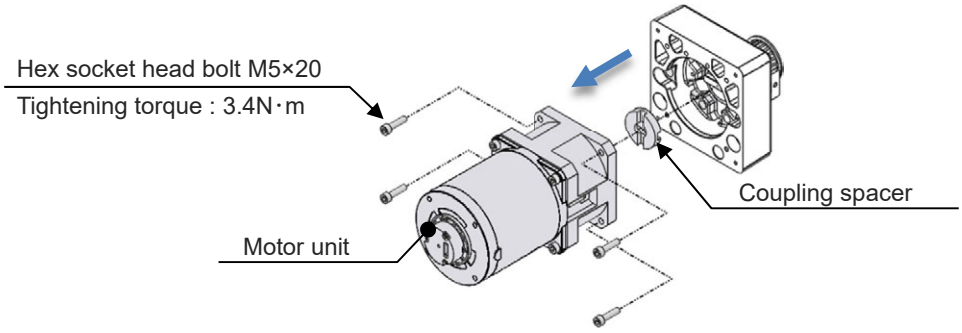


3. Remove the cross-recessed pan head machine screws (4 pcs) and slide the controller cover assembly.

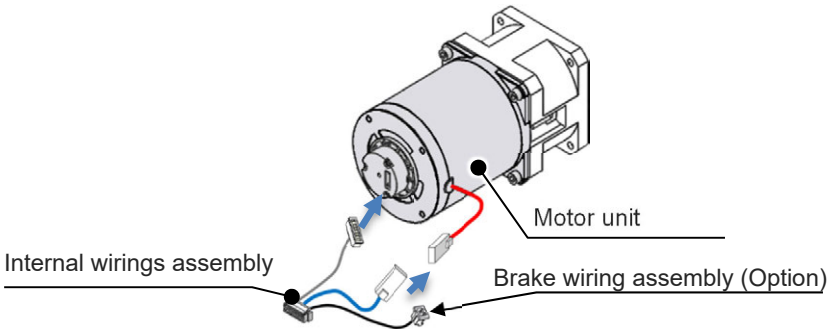
4. Take off the connector on the motor / encoder cable connected to the controller cover assembly to take off the motor cover.



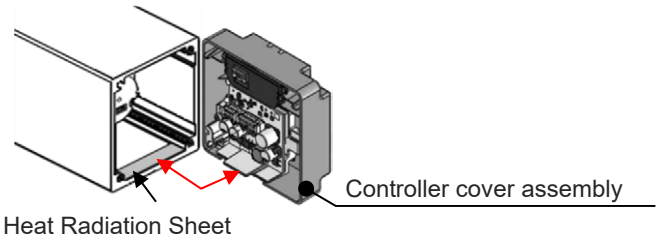
5. Remove the hex socket head bolts (4 pcs) and slide the controller cover assembly.

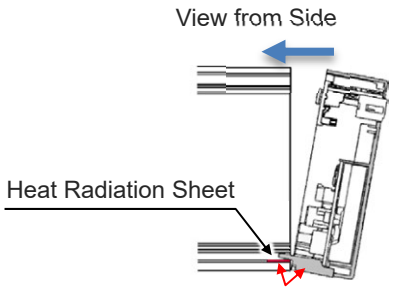


6. Take the internal cable assembly off the motor unit that was taken off, and put it on a motor unit for replacement.

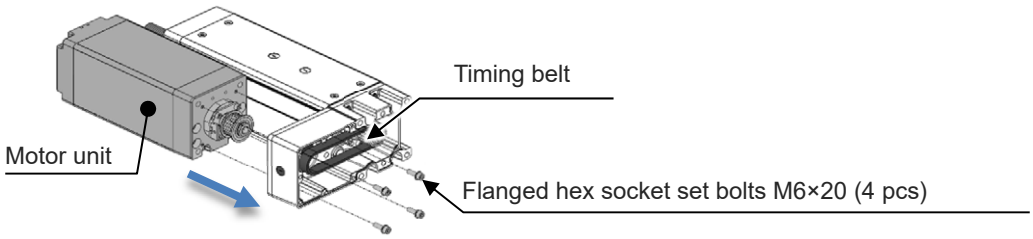


7. Put on the motor unit, coupling spacer, controller cover assembly and motor cover in the procedures from 4 to 3.
   * The controller cover assembly is to be put on while it is kept on the heat radiation sheet.
   * Be careful not to pinch cables.





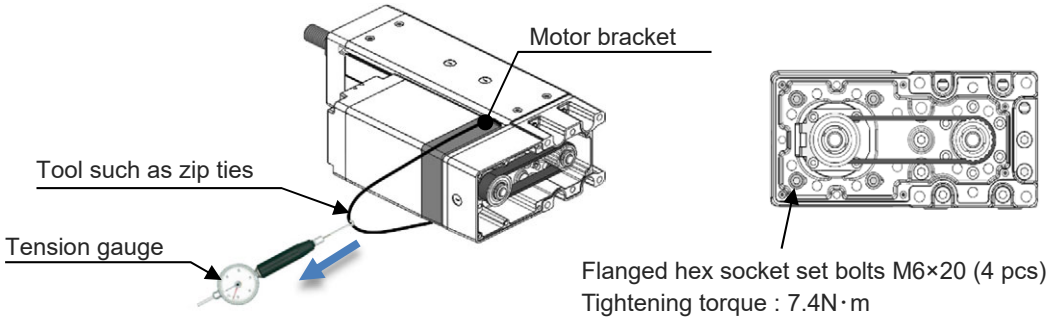
8. Put the motor unit and the timing belt on and tighten them loosely with the flanged hex socket set bolts (4 pcs).



9. Adjust the timing belt tension.

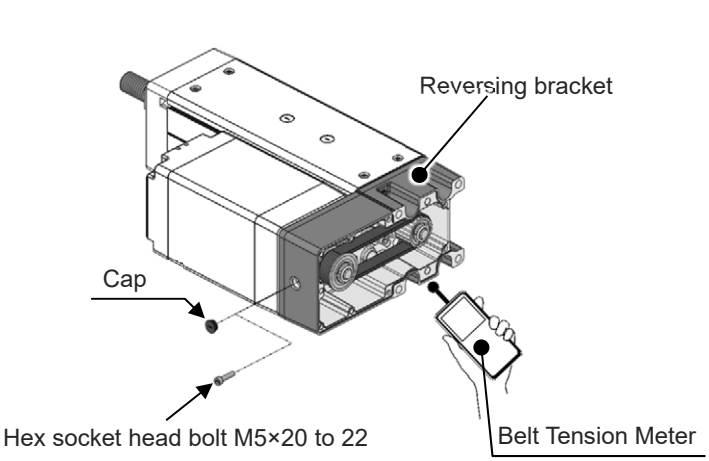
<When Putting Load on Motor Part>

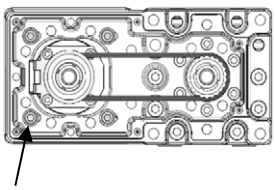
1) Hang such as a zip ties on the motor unit.
2) Apply load of 170 to 210N with a tension gauge.
3) With load being applied, tighten up the flanged hex socket set bolts (4 pcs).



<When Using Sonic Belt Tension Meter>

1) Take off the cap on the side of the reversing bracket and put a hex socket head bolt with M5 x 20 to 22 (1 pc).
2) Adjust the hex socket head bolt to get 85 to 105N for the measurement on a tension meter.
3) Tighten up the flanged hex socket bolts (4 pcs).
4) Remove the hex socket head bolt (1 pc) attached in 1) and put the cap on.





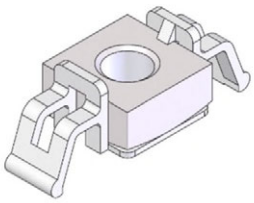
Manufacturer	Gates Unitta Asia
Belt type	EV5GT
Width (mm)	15
Span (mm)	115

10. Attach the pulley cover

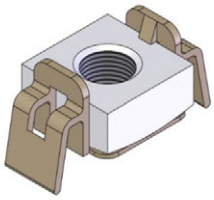
4.6.8 Model code for maintenance of square nut holder

Type	Square Nut Individually	Square Nut Holder Set 6-piece Set / 12-piece Set
RR3□B/RR3□BR	SNH-M3	SNHB6P-M3/SNH12P-M3
RR4□B/RR4□BR	SNH-M4	SNHB6P-M4/SNH12P-M4
RR6□B/RR6□BR	SNH-M4	SNHB6P-M4/SNH12P-M4
RR7□B/RR7□BR	SNH-M5	SNHB6P-M5/SNH12P-M5

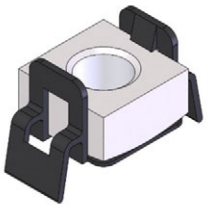
* Material of square nut holder: PA6 (Nylon 6)



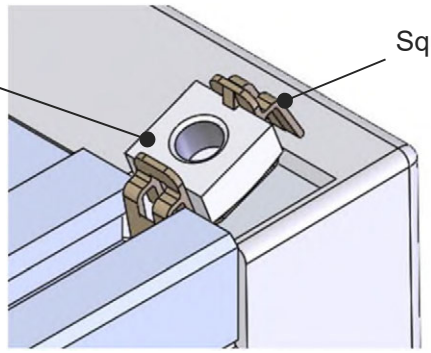
For M3 (White)



For M4 (Gray)

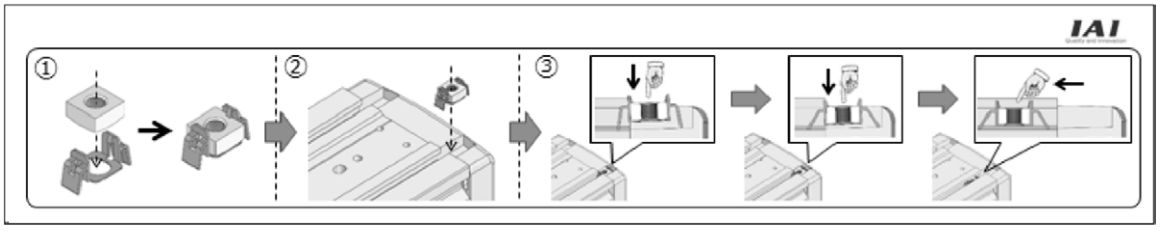


For M5 (Black)



Example of Insertion

* Refer to the instruction manual enclosed with the product for how to mount it.



ELECYLINDER

Chapter 5

External Dimensions

5.1 Radial cylinder type external dimensions (EC-RR□□B) ····5-1
- 5.1.1 EC-RR3□B ····5-1
- 5.1.2 EC-RR4□B ····5-2
- 5.1.3 EC-RR6□B ····5-3
- 5.1.4 EC-RR7□B ····5-4
- 5.1.5 EC-RR8□B ····5-5
- 5.1.6 EC-RR10□B ····5-6

5.2 High rigidity radial cylinder type external dimensions (EC-RR□□AHB) ····5-7
- 5.2.1 EC-RR6□AHB ····5-7
- 5.2.2 EC-RR7□AHB ····5-8

5.3 High rigidity radial cylinder type equipped with support (EC-RR□X□AHB) ····5-9
- 5.3.1 EC-RR6X□AHB ····5-9
- 5.3.2 EC-RR7X□AHB ····5-10

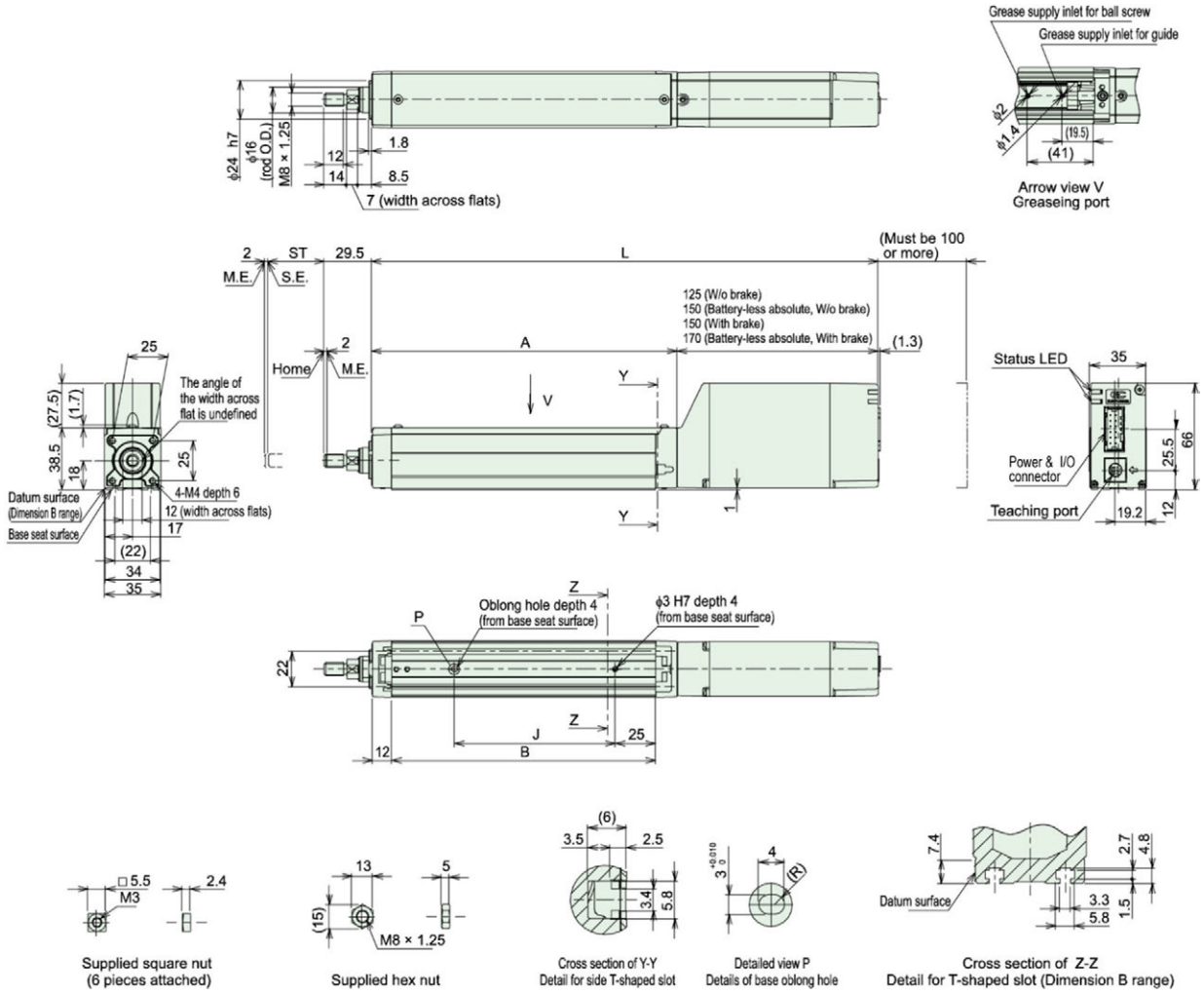
5.4 Radial cylinder type reversed external dimensions (EC-RR□□BR) ····5-11
- 5.4.1 EC-RR3□BR ····5-11
- 5.4.2 EC-RR4□BR ····5-12
- 5.4.3 EC-RR6□BR ····5-13
- 5.6.4 EC-RR7□BR ····5-14
- 5.4.5 EC-RR8□BR ····5-15
- 5.4.6 EC-RR10□BR ····5-16

5.5 High rigidity radial cylinder type reversed external dimensions (EC-RR□□AHBR) ····· 5-17
5.5.1 EC-RR6□AHBR ····· 5-17
5.5.2 EC-RR7□AHBR ····· 5-18

5.1 Radial cylinder type external dimensions (EC-RR□□B)

5.1.1 EC-RR3□B

M.E.: Mechanical end,
S.E.: Stroke end
ST: Stroke



■ Dimensions by Stroke

Unit: [mm]

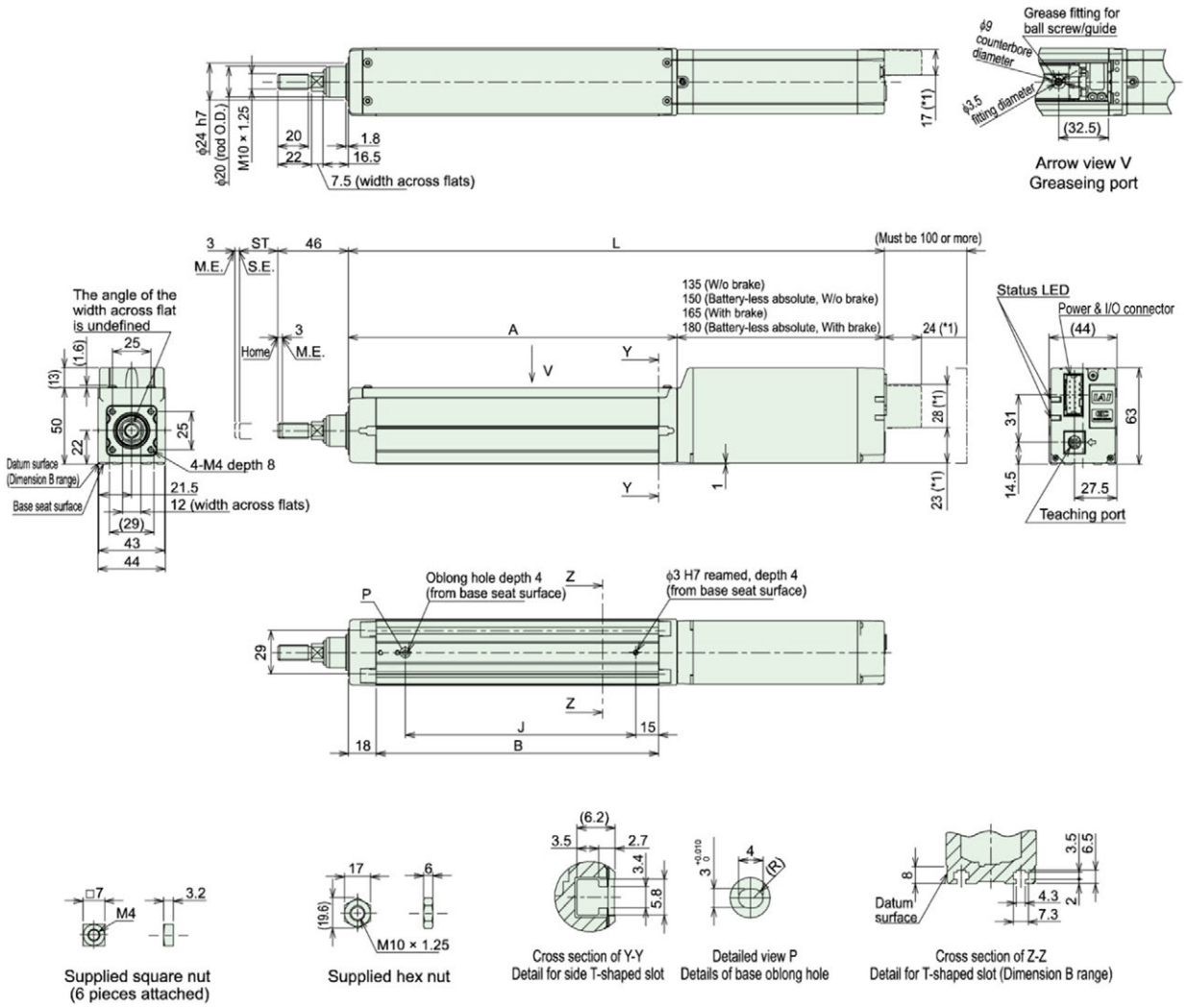
Stroke		50	100	150	200	250	300
L	W/o Brake	265	315	365	415	465	515
	With Brake	290	340	390	440	490	540
	WA, W/o Brake	290	340	390	440	490	540
	WA, With Brake	310	360	410	460	510	560
A		140	190	240	290	340	390
B		114	164	214	264	314	364
J		50	100	150	200	250	300

■Mass by Stroke

Stroke		50	100	150	200	250	300
Mass [kg]	W/o Brake	0.8	0.9	1.0	1.1	1.2	1.3
	With Brake	0.9	1.0	1.1	1.2	1.3	1.4

5.1.2 EC-RR4□B

M.E.: Mechanical end,
S.E.: Stroke end
ST: Stroke



*1 The dimensions shown apply when the WL/WL2 option is selected.

■ Dimensions by Stroke

Unit: [mm]

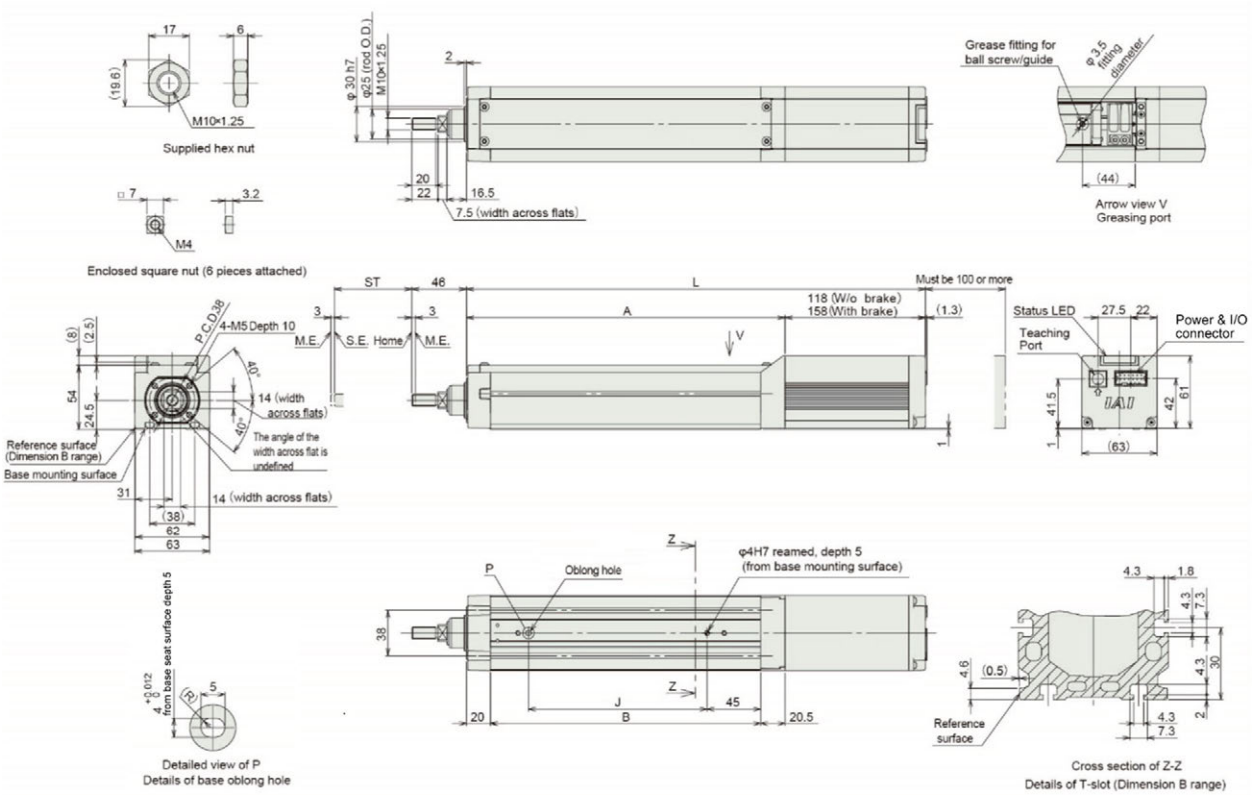
Stroke		50	100	150	200	250	300
L	W/o Brake	299	349	399	449	499	549
	With Brake	329	379	429	479	529	579
	WA, W/o Brake	314	364	414	464	514	564
	WA, With Brake	344	394	444	494	544	594
A		164	214	264	314	364	414
B		134	184	234	284	334	384
J		100	150	200	250	300	350

■ Mass by Stroke

Stroke		50	100	150	200	250	300
Mass [kg]	W/o Brake	1.3	1.5	1.7	1.9	2.1	2.3
	With Brake	1.5	1.7	1.9	2.1	2.2	2.4

5.1.3 EC-RR6□B

M.E.: Mechanical end,
S.E.: Stroke end
ST: Stroke



■ Dimensions by Stroke

Unit: [mm]

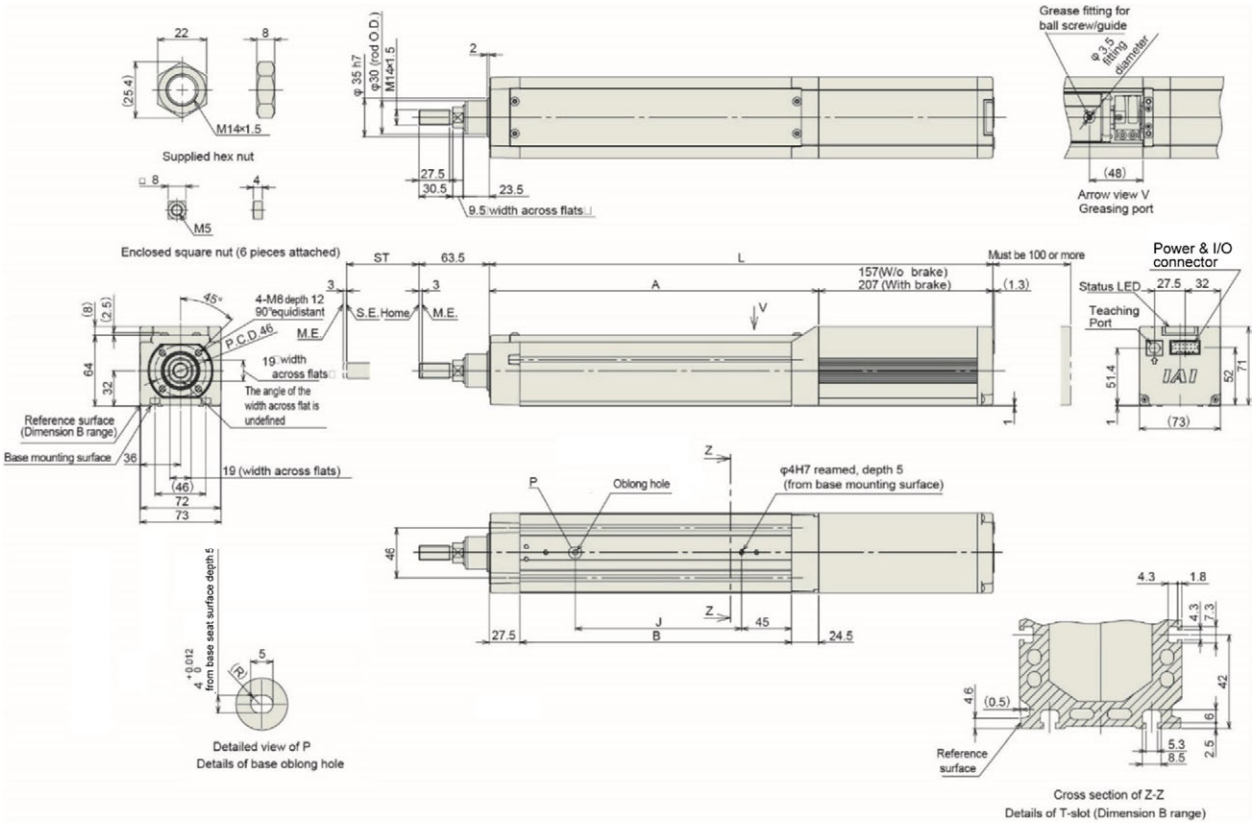
Stroke		65	115	165	215	265	315
L	W/o Brake	335.5	385.5	435.5	485.5	535.5	585.5
	With Brake	375.5	425.5	475.5	525.5	575.5	625.5
A		217.5	267.5	317.5	367.5	417.5	467.5
B		177	227	277	327	377	427
J		100	150	200	250	300	350

■ Mass by Stroke

Stroke		65	115	165	215	265	315
Mass [kg]	W/o Brake	1.7	2.0	2.2	2.5	2.7	3.0
	With Brake	1.9	2.2	2.4	2.7	3.0	3.2

5.1.4 EC-RR7□B

M.E.: Mechanical end,
S.E.: Stroke end
ST: Stroke



■ Dimensions by Stroke

Unit: [mm]

Stroke		65	115	165	215	265	315
L	W/o Brake	404	454	504	554	604	654
	With Brake	454	504	554	604	654	704
A		247	297	347	397	447	497
B		195	245	295	345	395	445
J		100	150	200	250	300	350

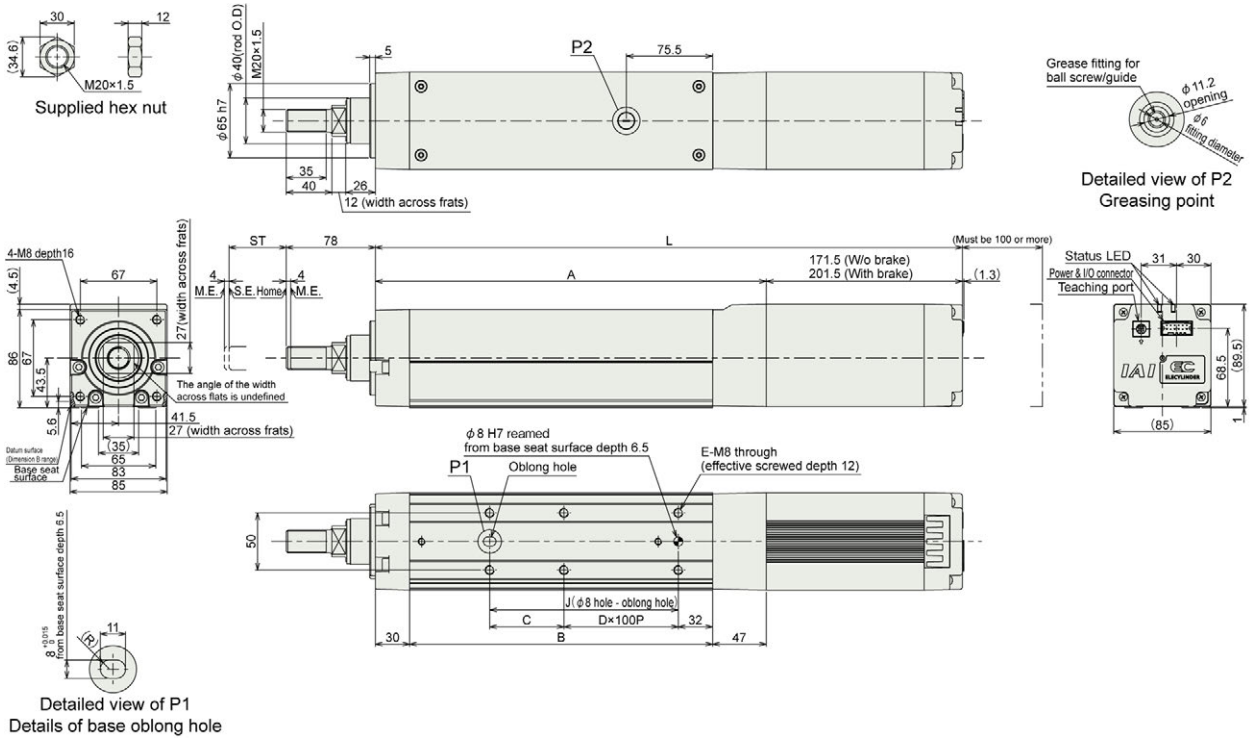
■Mass by Stroke

Stroke		65	115	165	215	265	315
Mass [kg]	W/o Brake	3.7	4.1	4.4	4.8	5.2	5.5
	With Brake	4.3	4.6	5.0	5.3	5.7	6.1

5.1.5 EC-RR8□B

M.E.: Mechanical end,
S.E.: Stroke end
ST: Stroke

(Note) The rod should move to M.E. when the home-return operation gets performed. Pay attention to interference peripherals.



■ Dimensions by Stroke

Unit: [mm]

Stroke		50	100	150	200	250	300	350	400	450	500	550	600	650	700
L	W/o Brake	463.5	513.5	563.5	613.5	663.5	713.5	763.5	813.5	863.5	913.5	963.5	1013.5	1063.5	1113.5
	With Brake	493.5	543.5	593.5	643.5	693.5	743.5	793.5	843.5	893.5	943.5	993.5	1043.5	1093.5	1143.5
A		292	342	392	442	492	542	592	642	692	742	792	842	892	942
B		215	265	315	365	415	465	515	565	615	665	715	765	815	865
C		115	65	115	65	115	65	115	65	115	65	115	65	115	65
D		0	1	1	2	2	3	3	4	4	5	5	6	6	7
E		4	6	6	8	8	10	10	12	12	14	14	16	16	18
J		115	165	215	265	315	365	415	465	515	565	615	665	715	765

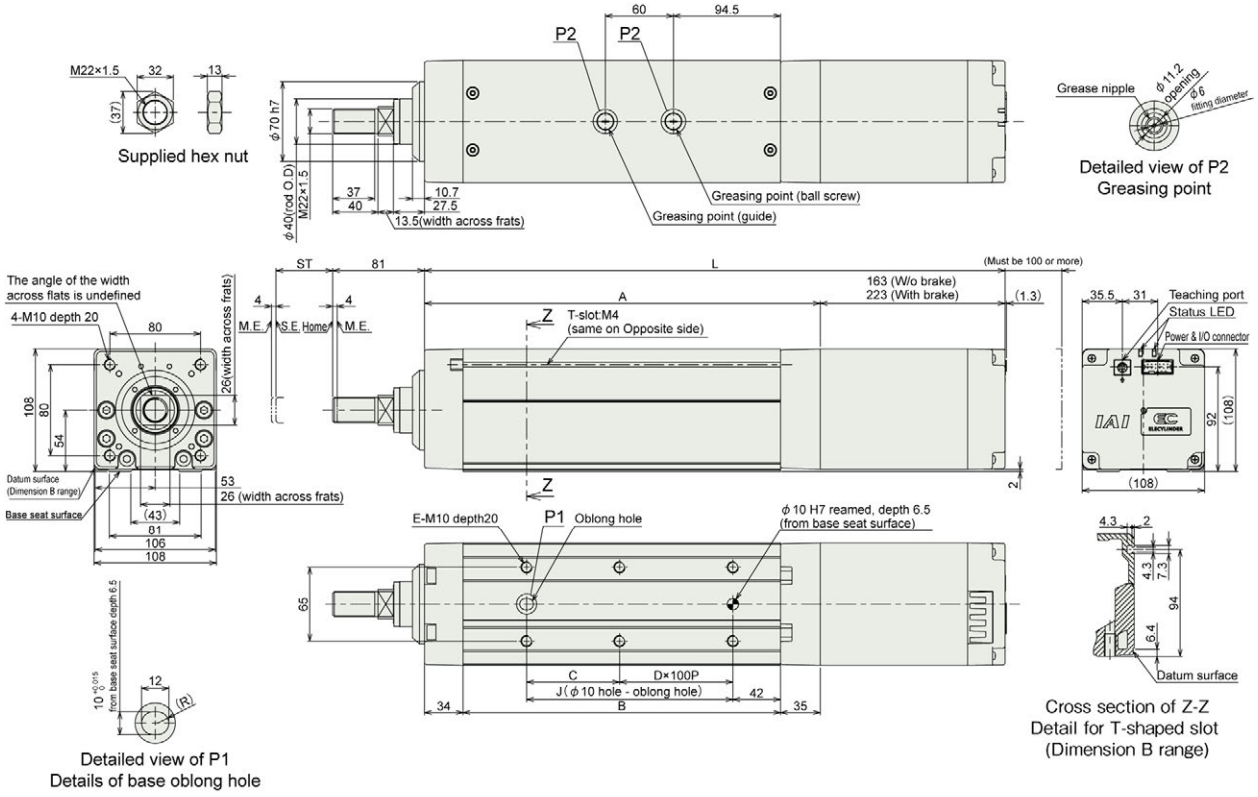
■Mass by Stroke

Stroke		50	100	150	200	250	300	350	400	450	500	550	600	650	700
Mass [kg]	W/o Brake	6.7	7.2	7.6	8.1	8.6	9.1	9.6	10.1	10.5	11.0	11.5	12.0	12.5	13.0
	With Brake	7.3	7.8	8.2	8.7	9.2	9.7	10.2	10.7	11.1	11.6	12.1	12.6	13.1	13.6

5.1.6 EC-RR10□B

M.E.: Mechanical end,
S.E.: Stroke end
ST: Stroke

(Note) The rod should move to M.E. when the home-return operation gets performed. Pay attention to interference peripherals.



■ Dimensions by Stroke

Unit: [mm]

Stroke		50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
L	W/o Brake	462	512	562	612	662	712	762	812	862	912	962	1012	1062	1112	1162	1212
	With Brake	522	572	622	672	722	772	822	872	922	972	1022	1072	1122	1172	1222	1272
A		299	349	399	449	499	549	599	649	699	749	799	849	899	949	999	1049
B		230	280	330	380	430	480	530	580	630	680	730	780	830	880	930	980
C		132	82	132	82	132	82	132	82	132	82	132	82	132	82	132	82
D		0	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8
E		4	6	6	8	8	10	10	12	12	14	14	16	16	18	18	20
J		132	182	232	282	332	382	432	482	532	582	632	682	732	782	832	882

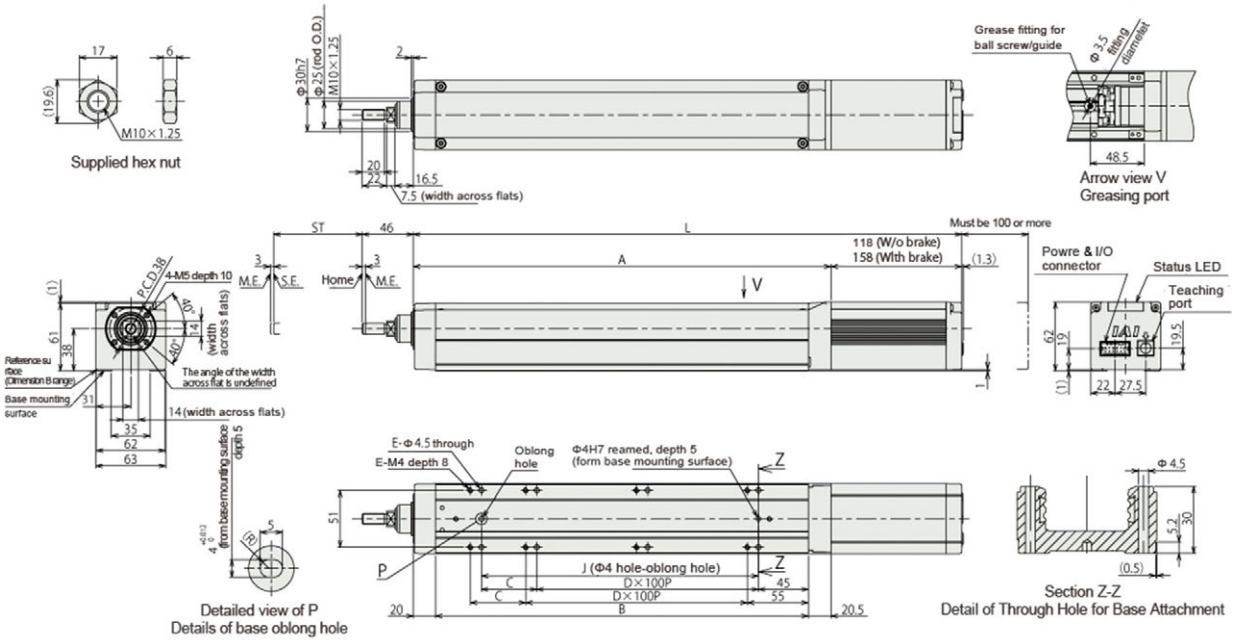
■Mass by Stroke

Stroke		50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
Mass [kg]	W/o Brake	10.5	11.2	12.0	12.8	13.6	14.4	15.2	16.0	16.8	17.6	18.4	19.1	19.9	20.7	21.5	22.3
	With Brake	12.0	12.8	13.6	14.4	15.2	16.0	16.7	17.5	18.3	19.1	19.9	20.7	21.5	22.3	23.1	23.9

5.2 High rigidity radial cylinder type external dimensions (EC-RR□□AHB)

5.2.1 EC-RR6□AHB

M.E.: Mechanical end,
S.E.: Stroke end
ST: Stroke



■ Dimensions Stroke

Unit: [mm]

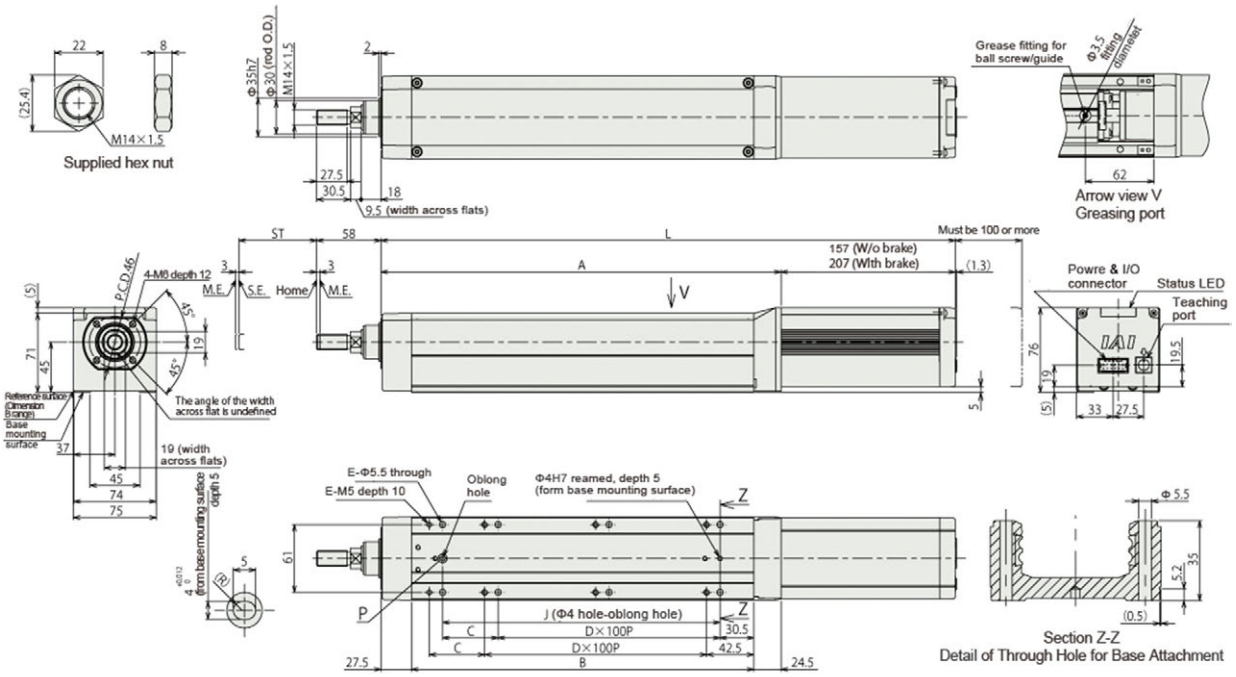
Stroke		50	100	150	200	250	300	350	400	450	500	550
L	W/o Brake	345	395	445	495	545	595	695	645	745	795	845
	With Brake	385	435	485	535	585	635	735	685	785	835	885
A		227	277	327	377	427	477	527	577	627	677	727
B		186.5	236.5	286.5	336.5	386.5	436.5	486.5	536.5	586.5	636.5	686.5
C		0	50	0	50	0	50	0	50	0	50	0
D		1	1	2	2	3	3	4	4	5	5	6
E		4	6	6	8	8	10	10	12	12	14	14
J		100	150	200	250	300	350	400	450	500	550	600

■ Mass by Stroke

Stroke		50	100	150	200	250	300	350	400	450	500	550
Mass [kg]	W/o Brake	2.0	2.2	2.5	2.8	3.0	3.3	3.8	3.6	4.1	4.4	4.7
	With Brake	2.3	2.5	2.8	3.1	3.3	3.6	4.1	3.9	4.4	4.6	4.9

5.2.2 EC-RR7□AHB

M.E.: Mechanical end,
S.E.: Stroke end
ST: Stroke



■ Dimensions by Stroke

Unit: [mm]

Stroke		50	100	150	200	250	300	350	400	450	500	550	600	650	700
L	W/o Brake	417.5	467.5	517.5	567.5	617.5	667.5	717.5	767.5	817.5	867.5	917.5	967.5	1017.5	1067.5
	With Brake	467.5	517.5	567.5	617.5	667.5	717.5	767.5	817.5	867.5	917.5	967.5	1017.5	1067.5	1117.5
A		260.5	310.5	360.5	410.5	460.5	510.5	560.5	610.5	660.5	710.5	760.5	810.5	860.5	910.5
B		208.5	258.5	308.5	358.5	408.5	458.5	508.5	558.5	608.5	658.5	708.5	758.5	808.5	858.5
C		50	0	50	0	50	0	50	0	50	0	50	0	50	0
D		1	2	2	3	3	4	4	5	5	6	6	7	7	8
E		6	6	8	8	10	10	12	12	14	14	16	16	18	18
J		150	200	250	300	350	400	450	500	550	600	650	700	750	800

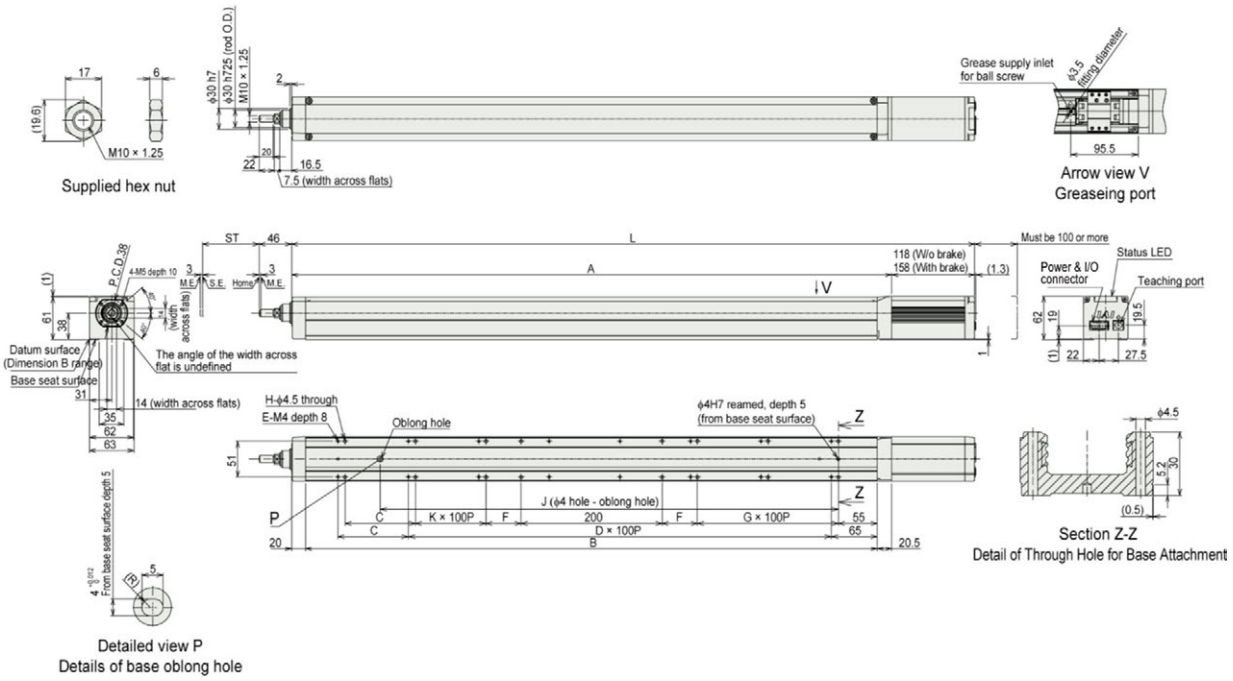
■Mass by Stroke

Stroke		50	100	150	200	250	300	350	400	450	500	550	600	650	700
Mass [kg]	W/o Brake	4.0	4.4	4.7	5.0	5.4	5.7	6.0	6.4	6.7	7.0	7.5	7.8	8.2	8.6
	With Brake	4.5	4.9	5.2	5.5	5.9	6.2	6.5	6.9	7.2	7.5	8.0	8.3	8.7	9.1

5.3 High rigidity radial cylinder type equipped with support (EC-RR□X□AHB)

5.3.1 EC-RR6X□AHB

M.E.: Mechanical end,
S.E.: Stroke end
ST: Stroke



■ Dimensions by Stroke

Unit: [mm]

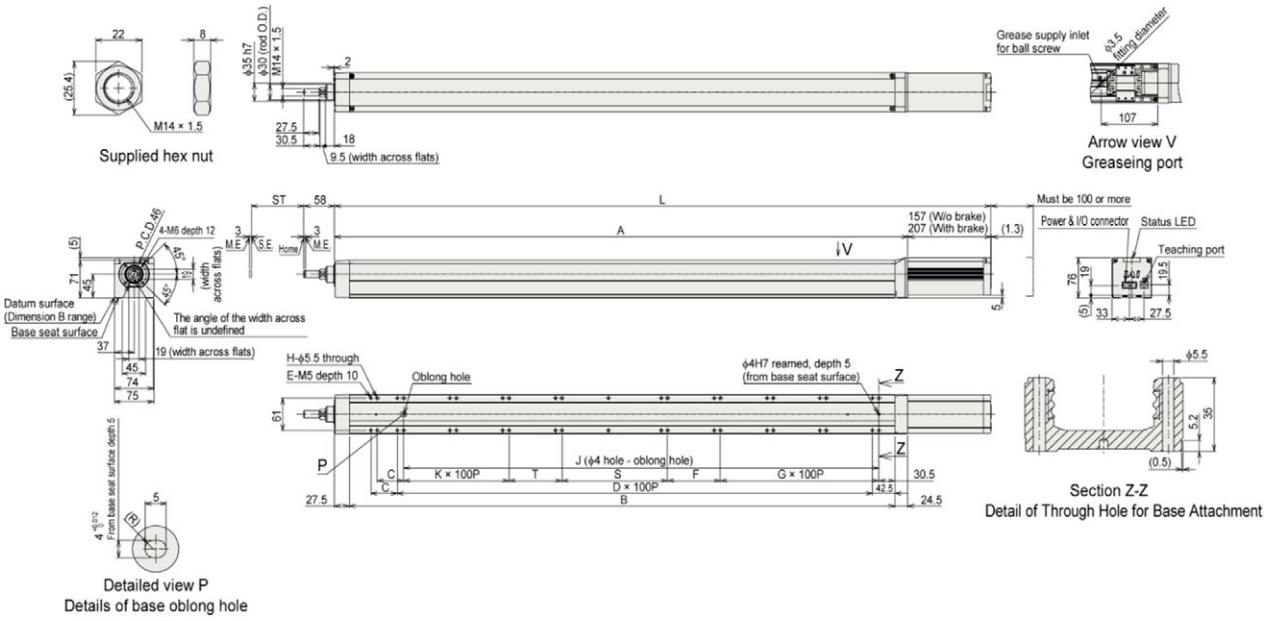
Stroke		600	650	700	750	800	850	900	950	1000
L	W/o Brake	969.5	1019.5	1069.5	1119.5	1169.5	1219.5	1269.5	1319.5	1369.5
	With Brake	1009.5	1059.5	1109.5	1159.5	1209.5	1259.5	1309.5	1359.5	1409.5
A		851.5	901.5	951.5	1001.5	1051.5	1101.5	1151.5	1201.5	1251.5
B		811	861	911	961	1011	1061	1111	1161	1211
C		100	50	100	50	100	50	100	50	100
D		6	7	7	8	8	9	9	10	10
E		16	18	18	20	20	22	22	24	24
F		50	0	0	50	50	0	0	50	50
G		2	3	3	3	3	4	4	4	4
H		16	16	16	20	20	20	20	24	24
J		650	700	750	800	850	900	950	1000	1050
K		1	2	2	2	2	3	3	3	3

■ Mass by Stroke

Stroke		600	650	700	750	800	850	900	950	1000
Mass [kg]	W/o Brake	5.6	5.9	6.2	6.5	6.8	7.0	7.3	7.6	7.9
	With Brake	5.9	6.2	6.5	6.8	7.1	7.3	7.6	7.9	8.2

5.3.2 EC-RR7X□AHB

M.E.: Mechanical end,
S.E.: Stroke end
ST: Stroke



■ Dimensions by Stroke

Unit: [mm]

Stroke		750	800	850	900	950	1000
L	W/o Brake	1192.5	1242.5	1292.5	1342.5	1392.5	1442.5
	With Brake	1242.5	1292.5	1342.5	1392.5	1442.5	1492.5
A		1035.5	1085.5	1135.5	1185.5	1235.5	1285.5
B		983.5	1033.5	1083.5	1133.5	1183.5	1233.5
C		0	50	0	50	0	50
D		9	9	10	10	11	11
E		20	22	22	24	24	26
F		50	0	0	50	50	0
G		3	4	4	4	4	5
H		18	20	20	22	22	24
J		850	900	950	1000	1050	1100
K		3	3	3	3	4	4
S		250	200	250	250	250	200
T		0	0	50	0	0	0

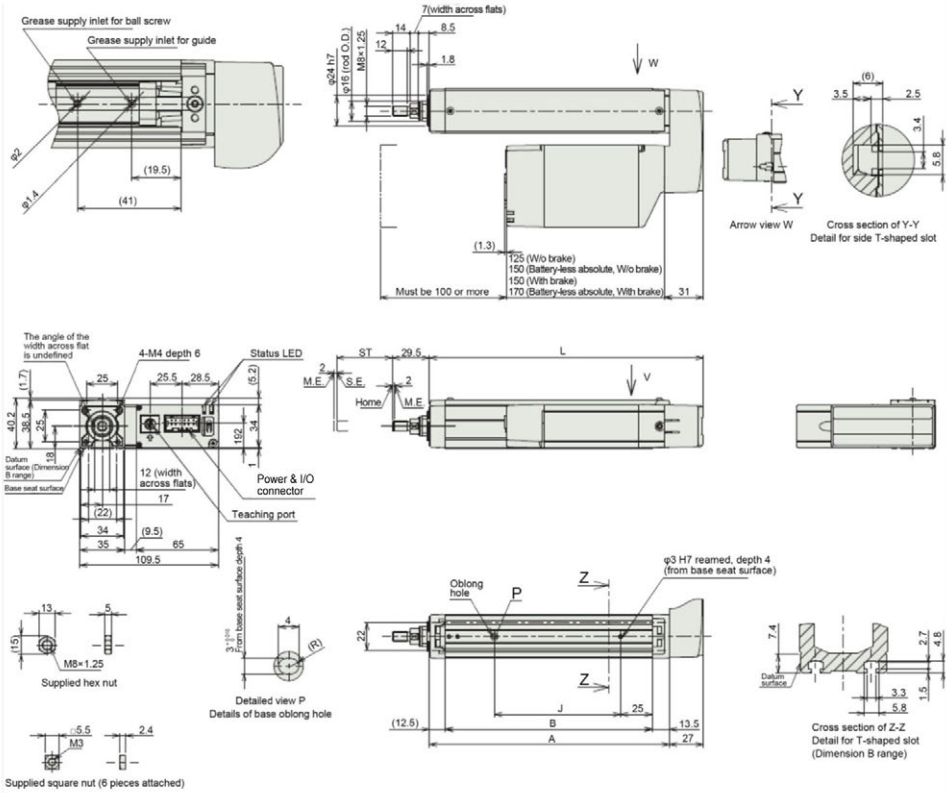
■Mass by Stroke

Stroke		750	800	850	900	950	1000
Mass [kg]	W/o Brake	9.6	10.0	10.3	10.7	11.0	11.4
	With Brake	10.1	10.5	10.8	11.2	11.5	11.9

5.4 Radial cylinder type reversed external dimensions (EC-RR□□BR)

5.4.1 EC-RR3□BR

M.E.: Mechanical end,
S.E.: Stroke end
ST: Stroke



■ Dimensions by Stroke

Unit: [mm]

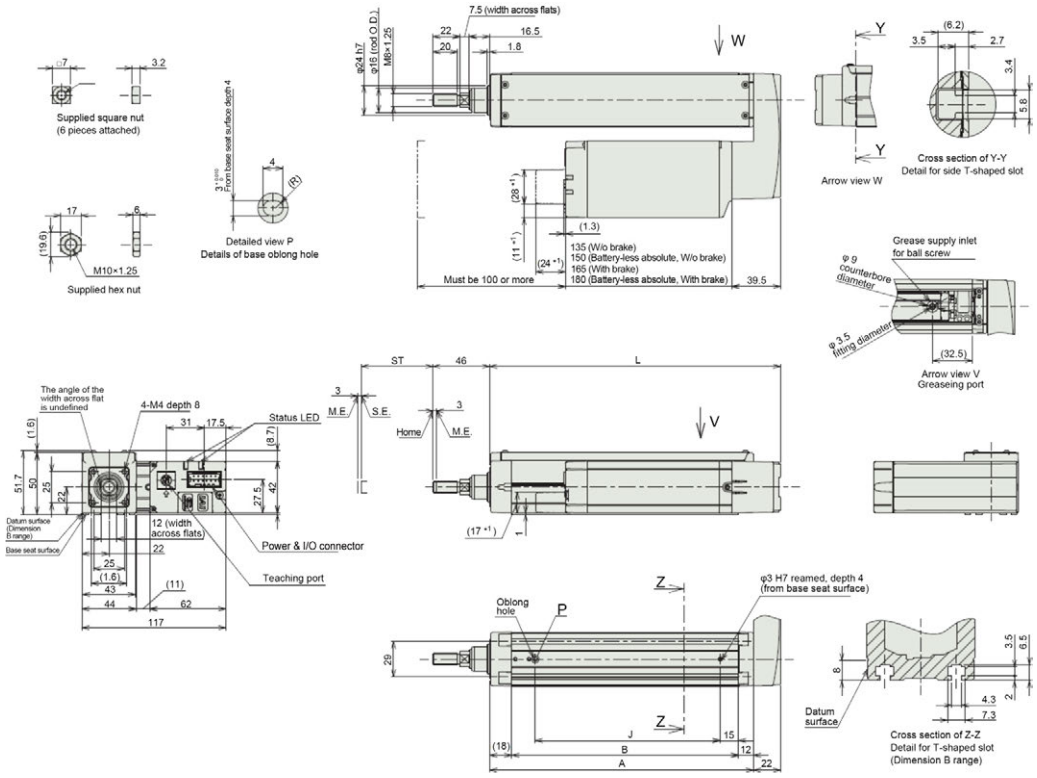
Stroke	50	100	150	200	250	300
L	167	217	267	317	367	417
A	140	190	240	290	340	390
B	114	164	214	264	314	364
J	50	100	150	200	250	300

■Mass by Stroke

Stroke		50	100	150	200	250	300
Mass [kg]	W/o Brake	0.9	1.0	1.1	1.2	1.3	1.4
	With Brake	1.0	1.1	1.2	1.3	1.4	1.5

5.4.2 EC-RR4□BR

M.E.: Mechanical end,
S.E.: Stroke end
ST: Stroke



■ Dimensions by Stroke

Unit: [mm]

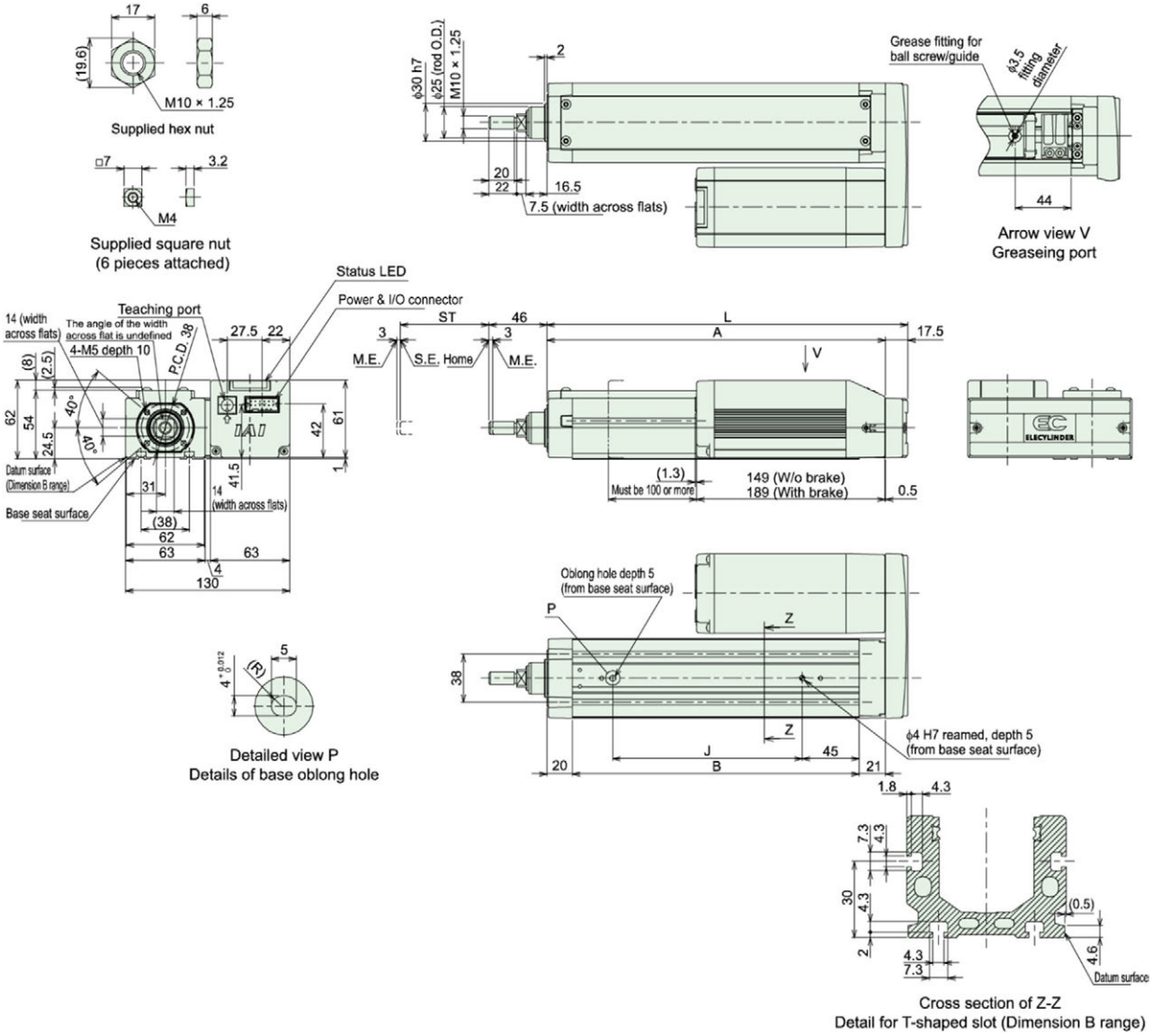
Stroke	50	100	150	200	250	300
L	186	236	286	336	386	436
A	164	214	264	314	364	414
B	134	184	234	284	334	384
J	100	150	200	250	300	350

■Mass by Stroke

Stroke		50	100	150	200	250	300
Mass [kg]	W/o Brake	1.4	1.6	1.8	2.0	2.2	2.4
	With Brake	1.6	1.8	2.0	2.2	2.3	2.5

5.4.3 EC-RR6□BR

M.E.: Mechanical end,
S.E.: Stroke end
ST: Stroke



■ Dimensions by Stroke

Unit: [mm]

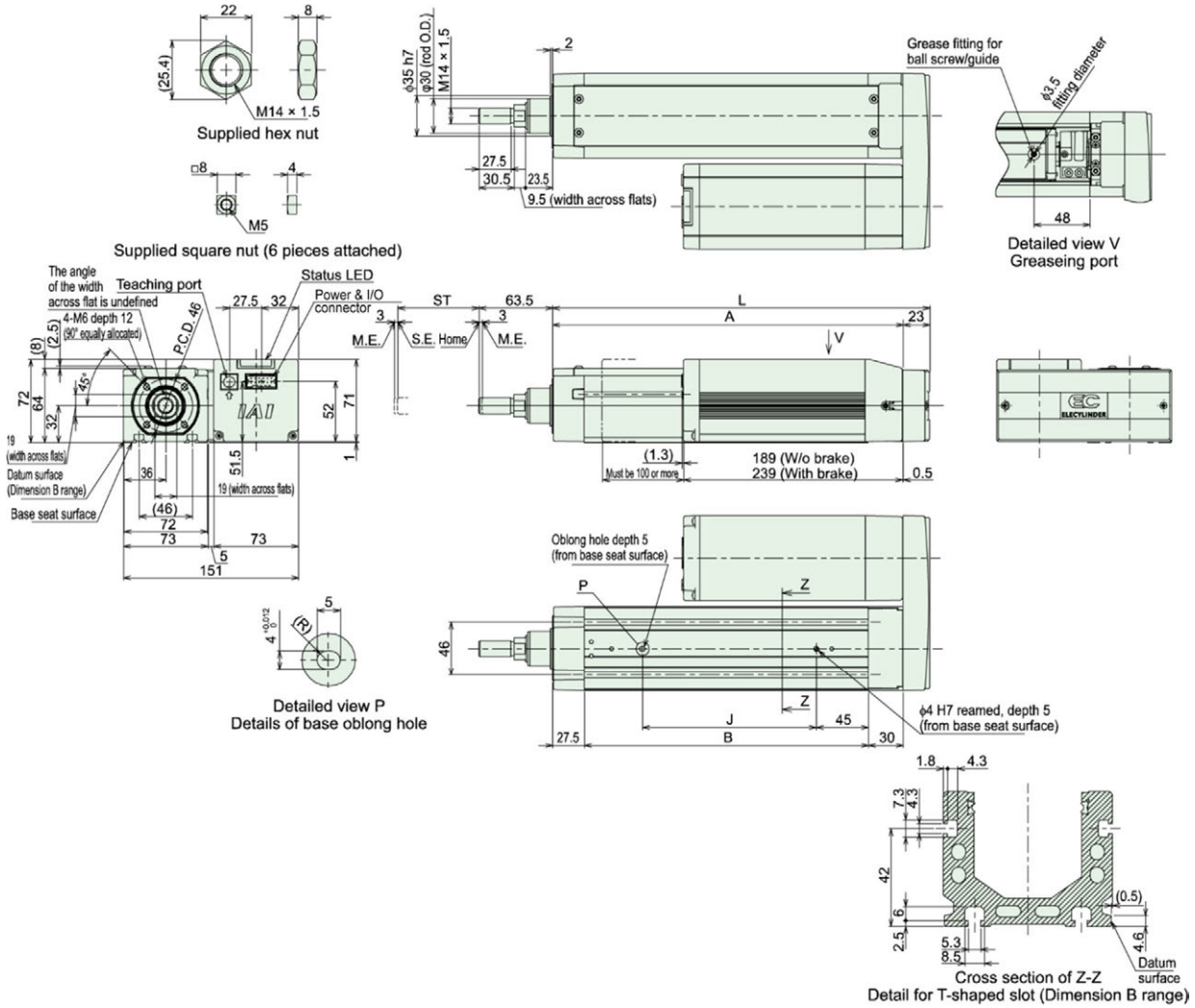
Stroke	65	115	165	215	265	315
L	235.5	285.5	335.5	385.5	435.5	485.5
A	218	268	318	368	418	468
B	177	227	277	327	377	427
J	100	150	200	250	300	350

■Mass by Stroke

Stroke		65	115	165	215	265	315
Mass [kg]	W/o Brake	2.1	2.4	2.6	2.9	3.1	3.4
	With Brake	2.3	2.6	2.8	3.1	3.3	3.6

5.6.4 EC-RR7□BR

M.E.: Mechanical end,
S.E.: Stroke end
ST: Stroke



■ Dimensions by Stroke

Unit: [mm]

Stroke	65	115	165	215	265	315
L	275.5	325.5	375.5	425.5	475.5	525.5
A	252.5	302.5	352.5	402.5	452.5	502.5
B	195	245	295	345	395	445
J	100	150	200	250	300	350

■Mass by Stroke

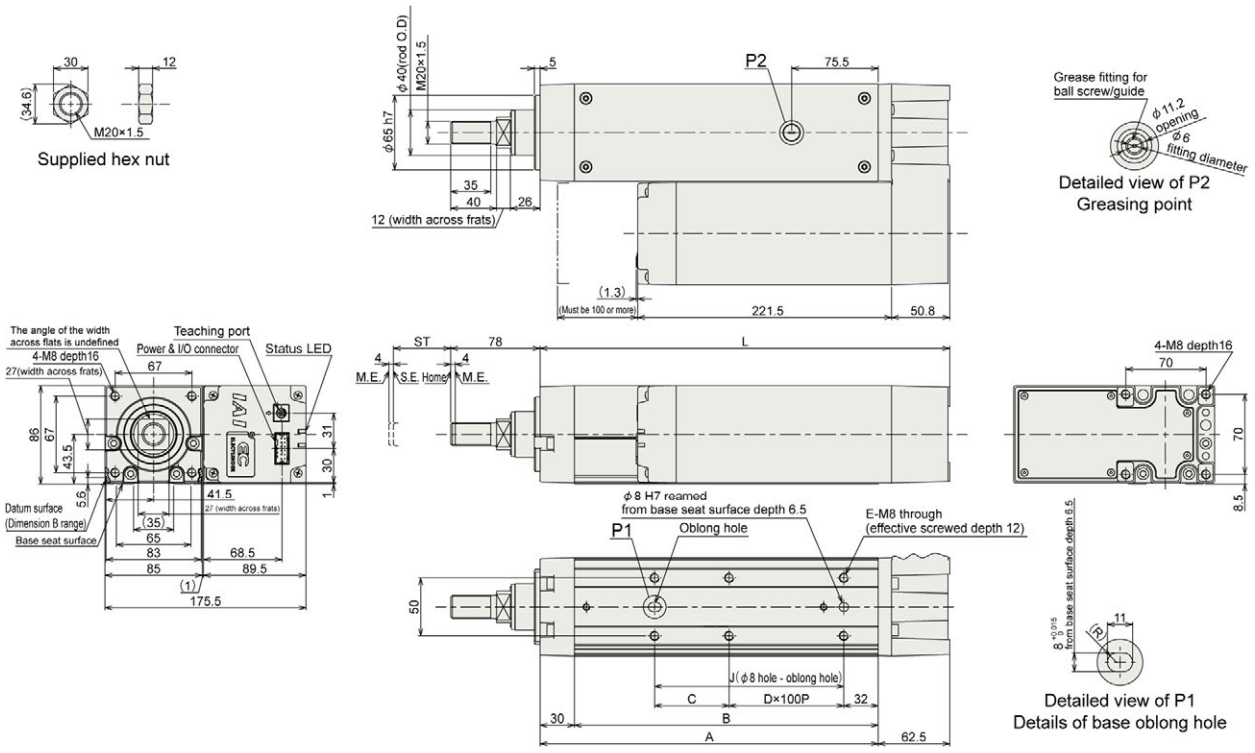
Stroke		65	115	165	215	265	315
Mass [kg]	W/o Brake	4.4	4.8	5.1	5.5	5.8	6.2
	With Brake	4.9	5.3	5.6	6.0	6.3	6.7

5.4.5 EC-RR8□BR

M.E.: Mechanical end,
S.E.: Stroke end
ST: Stroke

(Note) The rod should move to M.E. when the home-return operation gets performed. Pay attention to interference peripherals.

(Note) The figure below shows the motor left reversed type (ML).



■ Dimensions Stroke

Unit: [mm]

Stroke	50	100	150	200	250	300	350	400	450	500	550	600	650	700
L	307.5	357.5	407.5	457.5	507.5	557.5	607.5	657.5	707.5	757.5	807.5	857.5	907.5	957.5
A	245	295	345	395	445	495	545	595	645	695	745	795	845	895
B	215	265	315	365	415	465	515	565	615	665	715	765	815	865
C	115	65	115	65	115	65	115	65	115	65	115	65	115	65
D	0	1	1	2	2	3	3	4	4	5	5	6	6	7
E	4	6	6	8	8	10	10	12	12	14	14	16	16	18
J	115	165	215	265	315	365	415	465	515	565	615	665	715	765

■Mass by Stroke

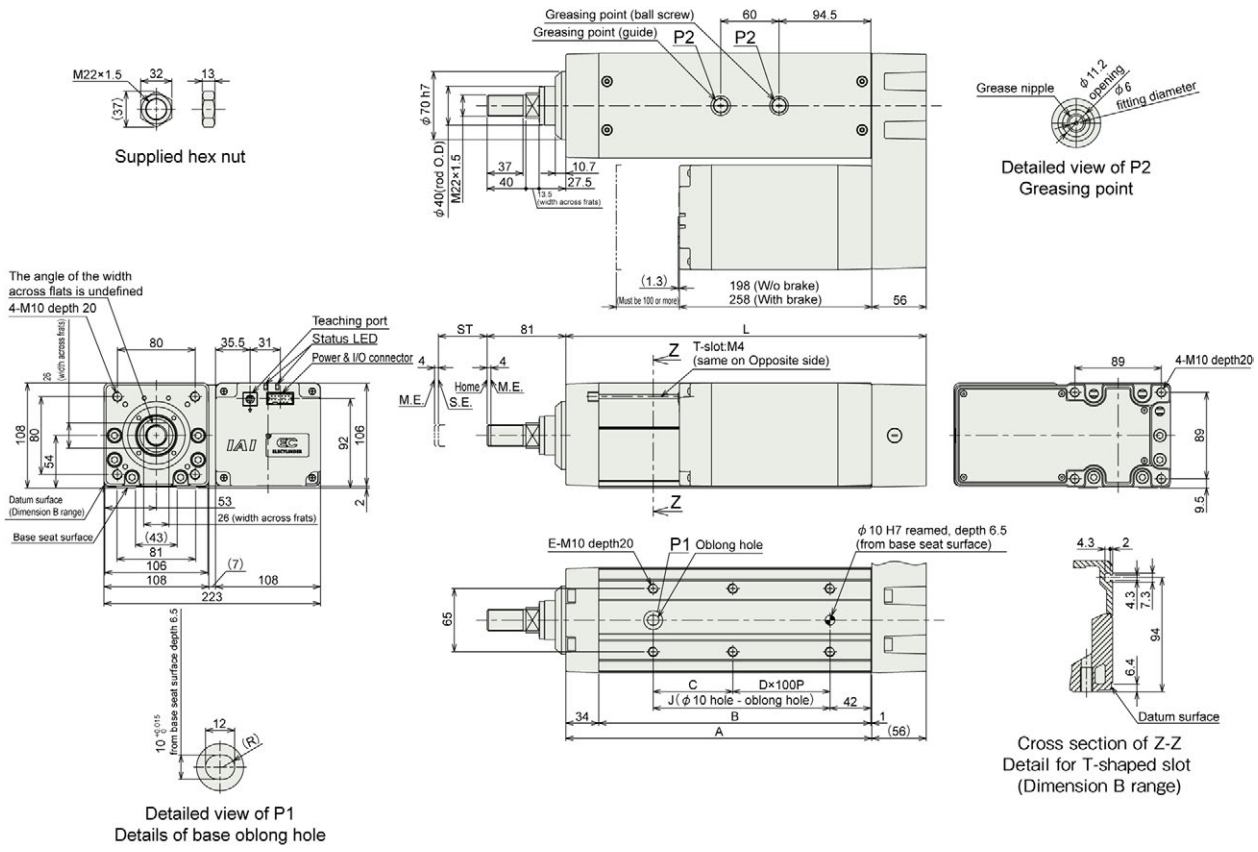
Stroke		50	100	150	200	250	300	350	400	450	500	550	600	650	700
Mass [kg]	W/o Brake	7.7	8.2	8.7	9.2	9.7	10.1	10.6	11.1	11.6	12.1	12.6	13.0	13.5	14.0
	With Brake	7.9	8.4	8.9	9.4	9.9	10.3	10.8	11.3	11.8	12.3	12.8	13.2	13.7	14.2

5.4.6 EC-RR10□BR

M.E.: Mechanical end,
S.E.: Stroke end
ST: Stroke

(Note) The rod should move to M.E. when the home-return operation gets performed. Pay attention to interference peripherals.

(Note) The figure below shows the motor left reversed type (ML).



■ Dimensions by Stroke

Unit: [mm]

Stroke	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
L	321	371	421	471	521	571	621	671	721	771	821	871	921	971	1021	1071
A	265	315	365	415	465	515	565	615	665	715	765	815	865	915	965	1015
B	230	280	330	380	430	480	530	580	630	680	730	780	830	880	930	980
C	132	82	132	82	132	82	132	82	132	82	132	82	132	82	132	82
D	0	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8
E	4	6	6	8	8	10	10	12	12	14	14	16	16	18	18	20
J	132	182	232	282	332	382	432	482	532	582	632	682	732	782	832	882

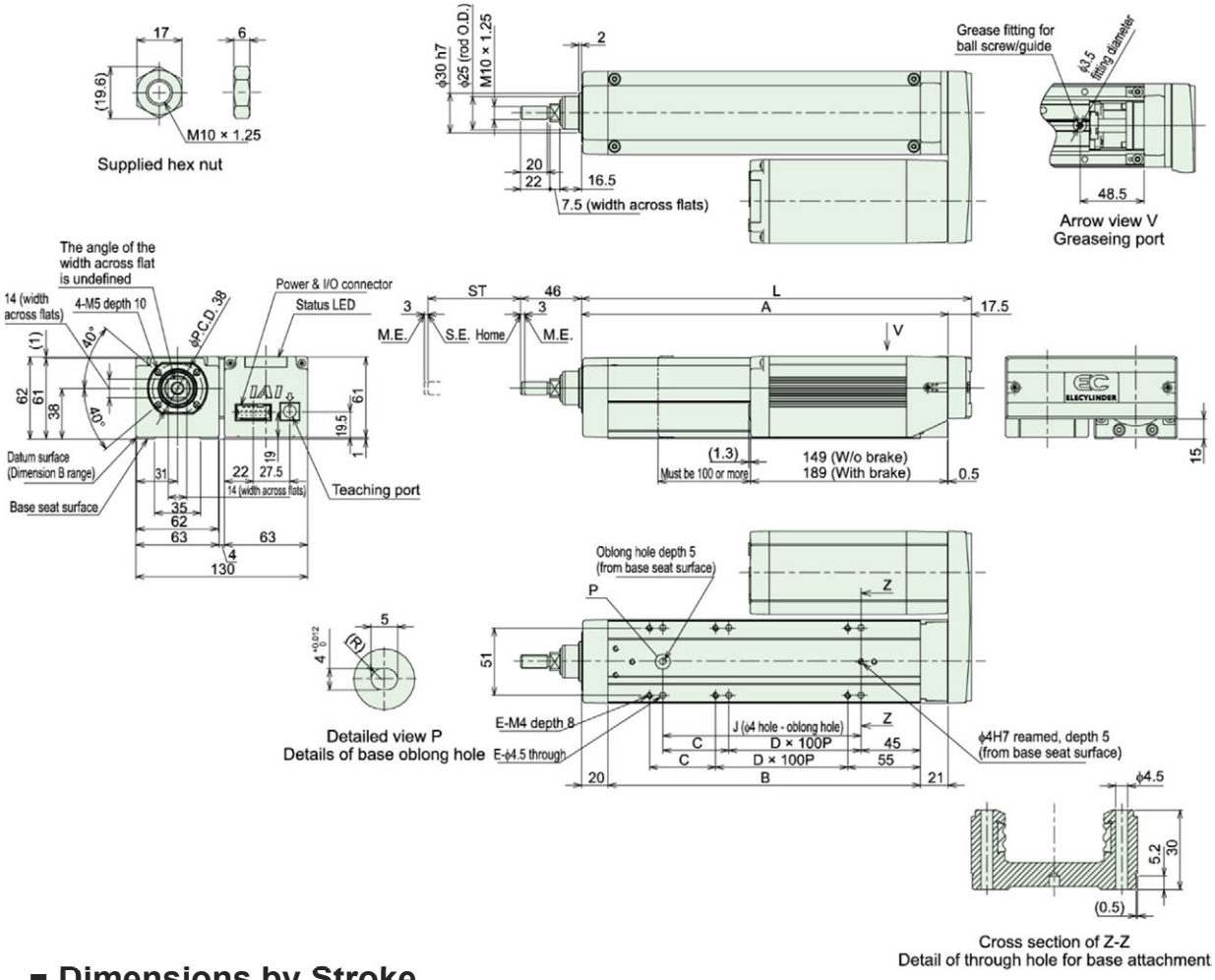
■Mass by Stroke

Stroke		50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
Mass [kg]	W/o Brake	12.2	13.0	13.8	14.5	15.3	16.1	16.9	17.7	18.5	19.3	20.1	20.9	21.7	22.4	23.2	24.0
	With Brake	13.7	14.5	15.3	16.1	16.9	17.7	18.5	19.3	20.0	20.8	21.6	22.4	23.2	24.0	24.8	25.6

5.5 High rigidity radial cylinder type reversed external dimensions (EC-RR□□AHBR)

5.5.1 EC-RR6□AHBR

M.E.: Mechanical end,
S.E.: Stroke end
ST: Stroke



■ Dimensions by Stroke

Unit: [mm]

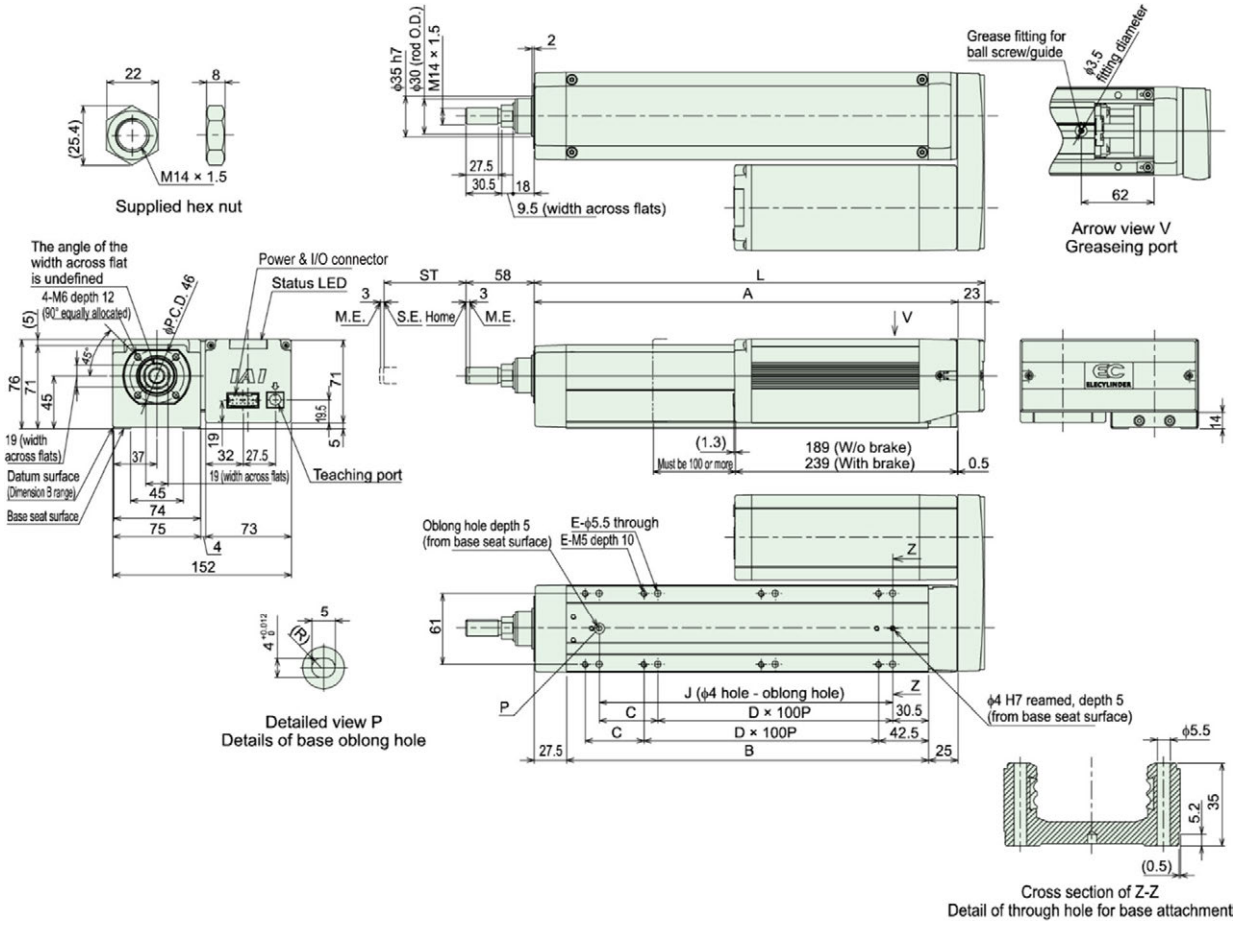
Stroke	50	100	150	200	250	300	350	400
L	245	295	345	395	445	495	545	595
A	227.5	277.5	327.5	377.5	427.5	477.5	527.5	577.5
B	186.5	236.5	286.5	336.5	386.5	436.5	486.5	536.5
C	0	50	0	50	0	50	0	50
D	1	1	2	2	3	3	4	4
E	4	6	6	8	8	10	10	12
J	100	150	200	250	300	350	400	450

■ Mass by Stroke

Stroke		50	100	150	200	250	300	350	400
Mass [kg]	W/o Brake	2.3	2.5	2.8	3.1	3.3	3.6	3.9	4.1
	With Brake	2.6	2.8	3.1	3.4	3.6	3.9	4.2	4.4

5.5.2 EC-RR7□AHBR

M.E.: Mechanical end,
S.E.: Stroke end
ST: Stroke



■ Dimensions by Stroke

Unit: [mm]

Stroke	50	100	150	200	250	300	350	400	450	500
L	284	334	384	434	484	534	584	634	684	734
A	261	311	361	411	461	511	561	611	661	711
B	208.5	258.5	308.5	358.5	408.5	458.5	508.5	558.5	608.5	658.5
C	50	0	50	0	50	0	50	0	50	0
D	1	2	2	3	3	4	4	5	5	6
E	6	6	8	8	10	10	12	12	14	14
J	150	200	250	300	350	400	450	500	550	600

■Mass by Stroke

Stroke		50	100	150	200	250	300	350	400	450	500
Mass [kg]	W/o Brake	4.6	5	5.3	5.6	6	6.3	6.6	7	7.3	7.6
	With Brake	5.1	5.5	5.8	6.1	6.5	6.8	7.1	7.5	7.8	8.1

ELECYLINDER

Chapter 6

Life

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6.1 Concept of life for rod type

6.1.1 Life (Guideline)

The service life of radial cylinder type (EC-RR□□B), high rigidity radial cylinder type (EC-RR□(X)□AHB), radial cylinder type reversed (EC-RR□□BR) and high rigidity radial cylinder type reversed (EC-RR□□AHBR) is about 5,000km (guideline) when it is operated under maximum payload and acceleration/deceleration.

(*1) The fluctuates drastically depending on the condition of use, environment and condition of maintenance.

As EC-RR10B/RR10□BR possess high thrust, the product life may vary widely depending on the payload when it is installed in the vertical orientation. The reference of the product life in operational conditions with no vibration or impact should be shown below.

Vertical Payload [kg]	Operation Life [km]	
	Lead 5	Lead 2.5
0	5000	5000
26	5000	5000
27	5000	4958
30	5000	4072
40	5000	2252
50	5000	1350
59	5000	900
60	4868	863
70	3127	581
80		408
90		297
100		222
105		194

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Chapter 7

Warranty

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7.1 Warranty period

Whichever of the following periods is shorter:

- 18 months after shipment from IAI
- 12 months after delivery to a specified location
- 2,500 operational hours

7.2 Scope of the warranty

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

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

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

- Anything other than our product
- Modification or repair performed by a party other than IAI (unless approved by IAI)
- Anything that could not be easily predicted with the level of science and technology available at the time of shipment from IAI
- Natural disaster, unnatural disaster, incident or accident for which we are not liable
- Natural fading of paint or other symptoms of aging
- Wear, depletion or other expected results of use
- Operation noise, vibration or other subjective sensations not affecting function or maintenance

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

7.3 Honoring the warranty

As a rule, the product must be consigned to IAI for repair under warranty.

7.4 Limited liability

(1) We assume no liability for any special damage, consequential loss or passive loss such as a loss of expected profit arising from or in connection with our product.
(2) We assume no liability for any program or control method created by the customer to operate our product or for the results of any such program or control method.

7.5 Conformance with applicable standards/regulations, etc., and application conditions

(1) If our product is combined with another product or any system, equipment, etc., used by the customer, the customer must first check the applicable standards, regulations and/or rules.
The customer is also responsible for confirming that such combination with our product conforms to the applicable standards, etc.
In such a case we assume no liability for the conformance of our product with the applicable standards, etc.
(2) Our product is for general industrial use. It is not intended or designed for the applications specified below, which require a high level of safety. Accordingly, as a rule our product cannot be used in these applications. Contact IAI if you must use our product for any of these applications:
- Medical equipment used to maintain, control or otherwise affect human life or physical health
- Mechanisms and machinery designed for the purpose of moving or transporting people (vehicles, railway facilities, aviation facilities etc.)
- Machinery components essential for safety (safety devices etc.)
- Equipment used to handle cultural assets, art or other irreplaceable items

(3) Contact IAI in advance if our product is to be used in any condition or environment that differs from that specified in the catalog or instruction manual.

7.6 Other items excluded from warranty

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

- Guidance for mounting/adjustment and witnessing of test operation
- Maintenance and inspection
- Technical guidance and education on operating/wiring methods, etc.
- Technical guidance and education on programming and other items related to programs

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Revision history

Revision date	Revised content
2026.05	First Edition

Manual No.: ME3841-1A (May 2026)

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