

Maintenance Part for Electric Actuator Motor Unit for EBS-M/EBR-M Series

INSTRUCTION MANUAL

SM-A24904-A

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

PREFACE

Thank you for purchasing CKD's "**Motor Unit for EBS-M/EBR-M Series**", a maintenance part for **electric actuator**.

This Instruction Manual contains basic matters such as installation and usage instructions in order to ensure optimal performance of the product. Please read this Instruction Manual thoroughly and use the product properly.

Keep this Instruction Manual in a safe place and be careful not to lose it.

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

- The product is intended for users who have basic knowledge of materials, wiring, electricity, and mechanisms. CKD shall not be responsible for accidents caused by persons who selected or used the product without knowledge or sufficient training.
- Since there are a wide variety of customer applications, it is impossible for CKD to be aware of all of them. Depending on the application or usage, the product may not be able to exercise its full performance or an accident may occur due to fluid, piping, or other conditions. It is the responsibility of the customer to check the product specifications and decide how the product shall be used in accordance with the application and usage.

SAFETY INFORMATION

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

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

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

**Thoroughly read and understand this Instruction Manual
before using the product.**

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

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

Precautions classified as "CAUTION" may still lead to serious results depending on the situation. All precautions are equally important and must be observed.

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



Indicates general precautions and tips on using the product.

Precautions on Product Use

DANGER

Do not use the product for the following applications:

- Medical equipment pertaining to sustainment and management of human life and body
- Mechanism and mechanical device for transferring and transporting people
- Critical parts for securing safety in a mechanical device

WARNING

Use the product within the specifications.

Precautions on Product Disposal

CAUTION

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

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1. PRODUCT OVERVIEW

1.1 Instruction Manuals Related to This Product

For the Instruction Manuals for actuators, controllers, and setting tools related to this product, refer to the following.

Part name	No.
Electric Actuator EBS-M Series (Slider Type) EBR-M Series (Rod with Built-in Guide Type)	SM-A11148
Electric Actuator - ECR (Controller)	SM-A10615
Electric Actuator - ECR (Controller) - IO-Link Specifications	SM-A10616
Electric Actuator - ECR (Controller) - CC-Link Specifications	SM-A10617
Electric Actuator - ECR (Controller) - EtherCAT Specifications	SM-A10618
Electric Actuator - S-Tools for ECR (Controller)	SM-A11147

1.2 Model Number Indication

1.2.1 Motor unit

Brake	Motor unit	Applicable model (Actuator model number)
Without brake	EBS-04ME-MOTORUNIT-N	EBS-04ME, EBR-04ME
	EBS-04MR-MOTORUNIT-N	EBS-04MR/D/L, EBR-04MR/D/L
	EBS-05ME-MOTORUNIT-N	EBS-05ME, EBR-05ME
	EBS-05MR-MOTORUNIT-N	EBS-05R/D/L, EBR-05MR/D/L
	EBS-08ME-MOTORUNIT-N	EBS-08ME, EBR-08ME
	EBS-08MR-MOTORUNIT-N	EBS-08MR/D/L, EBR-08MR/D/L
With brake	EBS-04ME-MOTORUNIT-B	EBS-04ME, EBR-04ME
	EBS-04MR-MOTORUNIT-B	EBS-04MR/D/L, EBR-04MR/D/L
	EBS-05ME-MOTORUNIT-B	EBS-05ME, EBR-05ME
	EBS-05MR-MOTORUNIT-B	EBS-05MR/D/L, EBR-05MR/D/L
	EBS-08ME-MOTORUNIT-B	EBS-08ME, EBR-08ME
	EBS-08MR-MOTORUNIT-B	EBS-08MR/D/L, EBR-08MR/D/L

1.3 Overview of Motor Unit Replacement Application

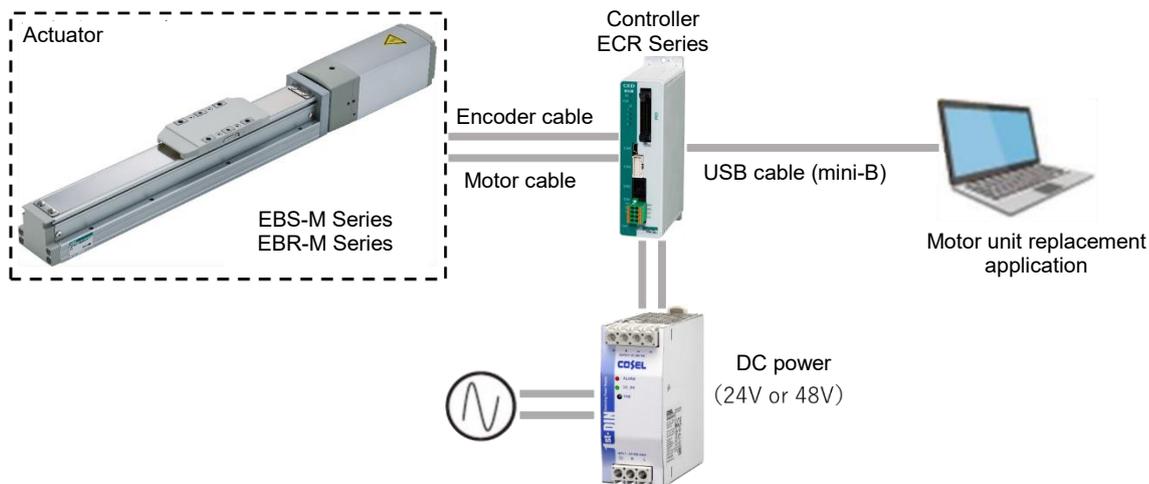


CKD has no warranty obligation whatsoever with respect to the information provided by the motor unit replacement application, including the contents, accuracy, safety, merchantability, and compatibility for a particular use or purpose. CKD Corporation shall not be responsible nor liable for any damage caused by this application.

1.3.1 Wiring for using the application

Use this application with the following connection.

Do not connect anything to the interface connector (CN5) of the controller (ECR Series).



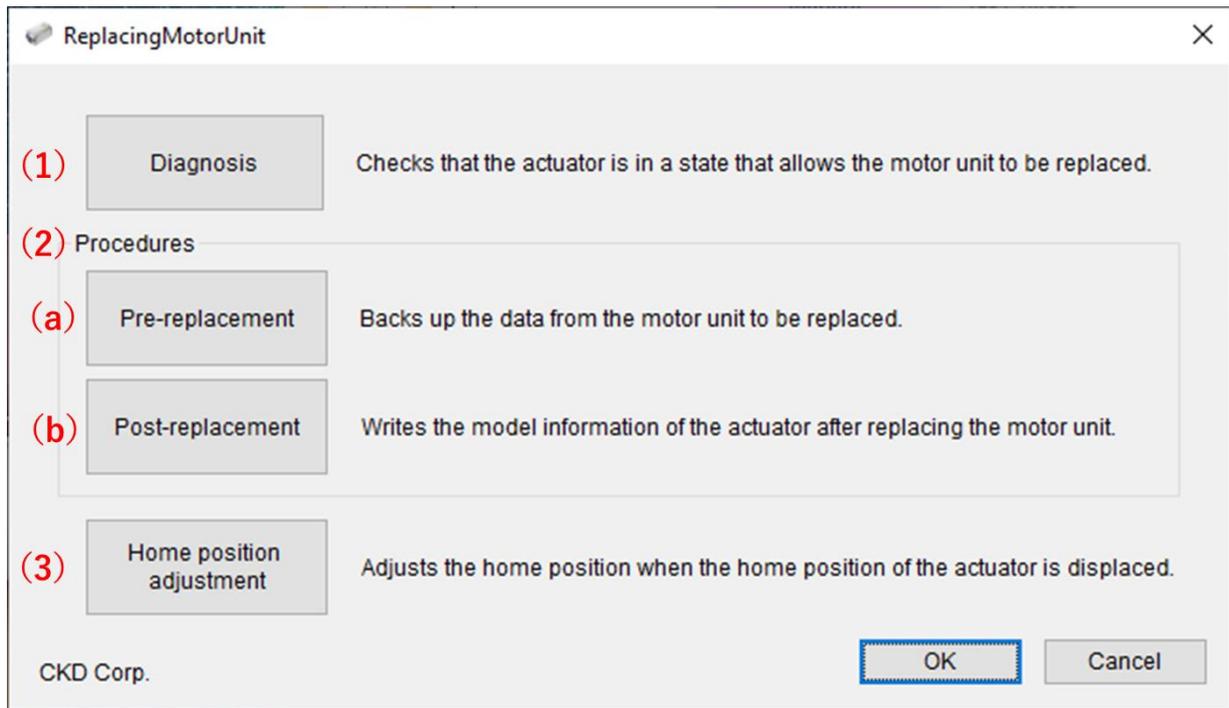
1.3.2 Starting the application

- 1** Download "Motor unit replacement application (for EBS-M_EBR-M Series).zip" from the CKD website. (URL: <https://www.ckd.co.jp>)
- 2** Unzip the downloaded zip file.
A folder with the following contents is generated.
 - SM-A24904.pdf
 - ReplacingMotorUnit.exe
- 3** Double-click "ReplacingMotorUnit.exe".
The motor unit replacement application starts.



If "S-Tools" is not installed, this application may fail to communicate with the controller (ECR). If communication fails, install "S-Tools".

1.3.3 Screen layout



No.	Function	Description	Clause
(1)	Diagnosis	Determines whether the actuator is in a state that allows the motor unit to be replaced.	3.2 Motor Unit Replacement Diagnosis
(2)	Procedures	Prepares the motor unit for replacement through pre- and post-replacement procedures.	3.3 Motor Unit Replacement Procedures
(a)	Pre-replacement	Backs up the data from the motor unit to be replaced.	
(b)	Post-replacement	Writes the actuator model information to the new motor unit and adjusts the home position.	
(3)	Home position adjustment	Adjusts the home position when the home position is displaced due to reasons such as removal of the motor unit or replacement of the timing belt.	4.1 Home Position Adjustment

2. INSTALLATION

DANGER

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

Ignition, inflammation, or explosion may occur.

Prevent water and oil from splashing onto the product.

A fire, electric leakage, or failure may occur. Even oil drops and oil mists are prohibited.

Make sure to hold and secure the product (including the workpiece) while installing the product.

An injury may occur if the product falls down, falls off, or operates abnormally.

Use a DC stabilized power supply (24 VDC/48 VDC \pm 10%) with sufficient capacity as a power supply for the controller and the input/output circuit.

If the product is directly connected to an AC power supply, a fire, burst or damage may occur.

Install overcurrent protective equipment (such as a breaker for wiring and a circuit protector) on the primary side of the power supply when wiring in accordance with "JIS B 9960-1:2008 Safety of machinery - Electrical equipment of machines - Part 1: General requirements".

Description from "7.2.1 General" of JIS B 9960-1:2008:

Overcurrent protection shall be provided where the current in a machine (equipment) circuit can exceed either the rating of any component or the current carrying capacity of the conductors, whichever is the lesser value. The ratings or settings to be selected are detailed in 7.2.10.

WARNING

Do not install the product to a combustible material.

If the product is installed directly to or near a combustible material, a fire may result.

If the system is such that the machine stops in the event of a system failure such as an emergency stop or a power failure, design and implement a safety circuit or a safety device to prevent damages to the devices and injuries to people.

Install the product indoors and in a dry place.

In a place where water can splash onto the product or where humidity is high (80% or more and with condensation), an electric leakage or fire accident may occur.

Perform class D grounding (ground resistance: 100 Ω or less) for the product.

An electric leakage may occur and cause an electric shock or malfunction.

When wiring the product, refer to this Instruction Manual or any other relevant instruction manuals to make sure that the connectors are firmly connected and the wires are properly insulated.

Make sure that the wires do not contact other circuits and there is no ground fault and insulation failure between terminals. Otherwise, an overcurrent may flow into the product and cause damage. This may result in an abnormal operation or fire.

Insulate unused wires.

A malfunction, failure, or electric shock may occur.

Do not damage or pinch the cables, apply unnecessary stress to the cables, or place heavy objects on the cables.

A conduction failure or electric shock may occur.

When installing and using the actuator in an orientation other than the horizontal, use an actuator equipped with a brake.

If using an actuator without a brake, the movable section may fall during servo off (including emergency stop and alarm) or while the power is turned off. This may result in an injury or damage to the workpiece.

Do not carry or install the product by holding the movable section or the cable.

An injury or cable disconnection may occur.

⚠ CAUTION**Install the wiring so that no induction noise is applied.**

- Avoid using the product in a place where a large current or strong magnetic field occurs.
- Do not pipe or wire the product in the same piping or wiring (with multi-conductor cables) as the power lines for other large motors.
- Do not pipe or wire the product in the same piping or wiring as the power supplies and wires for inverters used in robots. Frame ground the power supply and insert a filter into the output section.

Do not use the product in an environment where a strong magnetic field occurs.

A malfunction may occur.

Separate the power for the output section of the product from the power for inductive loads (such as a solenoid valve and a relay) that generate surge currents.

If the power is shared, a surge current will flow into the output section and cause damage.

If the power cannot be separated, connect the surge absorption elements in parallel directly to all the inductive loads.

Do not perform a withstand voltage test or an insulation resistance test in a device with the product installed.

A capacitor is connected between the circuit of the control board in the product and the metal body to prevent damages from static electricity. Therefore, performing the tests above will damage the product. If these tests are required for the device, remove the product beforehand.

Remove all the FG (frame ground) connections of the product before performing an electric welding on the device to which the product is installed.

If an electric welding is performed without removing the FG connections, the product may become damaged due to a welding current or excessive high voltage and surge voltage from welding.

Select a power that has sufficient capacity for the number of products installed.

If the capacity is not sufficient, a malfunction may occur.

Do not disassemble the product.**Do not bend the fixed cable repeatedly.**

If repetitive bending is unavoidable, use a movable cable.

Secure the movable cable so that it will not move easily. When securing the movable cable, do not bend it to an acute angle (a bending radius of 63 mm or less).**When installing an external stopper or a holding mechanism (such as a brake), place it at a position where it does not affect the detection of the home position.**

The home position is detected when the power is turned on. If the detection is interfered by an external stopper or a holding mechanism, an unintended position may be recognized as the home position.

Do not use the product in a place exposed to ultraviolet rays or in an atmosphere where corrosive gas and salt are present.

A performance degradation, abnormal operation or strength deterioration due to rust formation may occur.

Do not install the product in a place subjected to strong vibrations or shocks.

If the product is subjected to strong vibrations or shocks, a malfunction may occur.

Do not use the product in a place where condensation occurs due to a sudden change in the ambient temperature.**The customer is responsible for checking the compatibility of the product with the customer's system, machinery, and device.****Connect only cables designed for the product.**

A failure of the product or unexpected accident may occur.

2.1 Environment

- Check the environment temperature and atmosphere before using and storing the product.
- Use the product at an ambient temperature between 0°C and 40°C. Ventilate if heat can become trapped.
- Install the product where it is not subjected to direct sunlight and away from a heating element. Also, avoid dust, corrosive gas, explosive gas, inflammable gas, and combustible material. Chemical resistance has not been considered for the product.
- Install the actuator on a smooth and flat surface.
- In order to avoid operation fault and damage, do not install the actuator on a surface with dents.
- The controller is set using setting software (S-Tools). Leave a space of 70 mm or more in front of the controller so that the connector of the connection cable of the PC can be connected and disconnected.

2.2 Unpacking



- When carrying and handling the product, use extreme care not to apply impact to the product (for example, do not drop the product).
- Do not carry heavy products alone.
- Place the product horizontally when not in use.
- Do not stand on the package.
- In order to prevent deforming the package, do not place heavy objects and objects of which their load concentrates.
- Do not apply unnecessary force to any part of the motor unit.

- Check that the model number ordered and the model number indicated on the product are the same.
- Check the exterior of the product for any damage.
The marks on the connection between the actuator and the product are inspection marks and do not affect product specifications and performance.

3. USAGE

3.1 Safety Instructions

WARNING

Before supplying electricity to the product, check that the operation area of the device is safe.

If electricity is supplied without checking safety, an electric shock or injury may occur.

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

Do not enter the operating area of the device when the product is in an operational state.

The product may operate unexpectedly and an injury may occur.

When using the EBS-M Series, your fingers may get caught between the motor section and the slider.

Do not touch the product body during or immediately after operation.

A burn injury may occur.

Do not stand or put an object on the product.

A fall accident, injury due to the product falling down or off, or malfunction and runaway due to the product becoming damaged may occur.

Take measures to prevent damage to the human body and the device in case of power failures.

Before controlling the actuator from a position where it cannot be seen, check that it is safe for the actuator to operate.

Before setting the movable section of the product manually (direct teaching), use the setting software (S-Tools) to confirm that the servo is turned off.

Do not give commands that are smaller than the minimum resolution and the repetitive positioning accuracy of the encoder.

The positioning control may not be performed properly.

CAUTION

Do not move the movable section of the product with external force and do not use the product in an application that requires the movable section to decelerate suddenly.

A malfunction or damage may occur due to regenerative currents.

Except when returning to the home position or when clamping, do not allow the piston rod and the table to hit parts such as the mechanical stopper.

The feed screw may become damaged due to impacts and an operation fault may occur.

Do not put dents and scratches on the movable section.

An operation fault may occur.

Leave a margin for the transfer load since the product life changes depending on the transfer load and the environment.

Do not subject the movable section to impact.

Do not subject the product to external force when returning to the home position.

The home position may not be recognized correctly.

Do not turn off the servo while gravity or force of inertia is applied.

The slider or the rod may continue to move or fall off if the servo is turned off. Turn off the servo in an equilibrium state where no gravity and force of inertia are applied or after safety is ensured.

Do not stop the product while it is accelerating or decelerating.

It may lead to a change in speed (acceleration) and cause a risk.

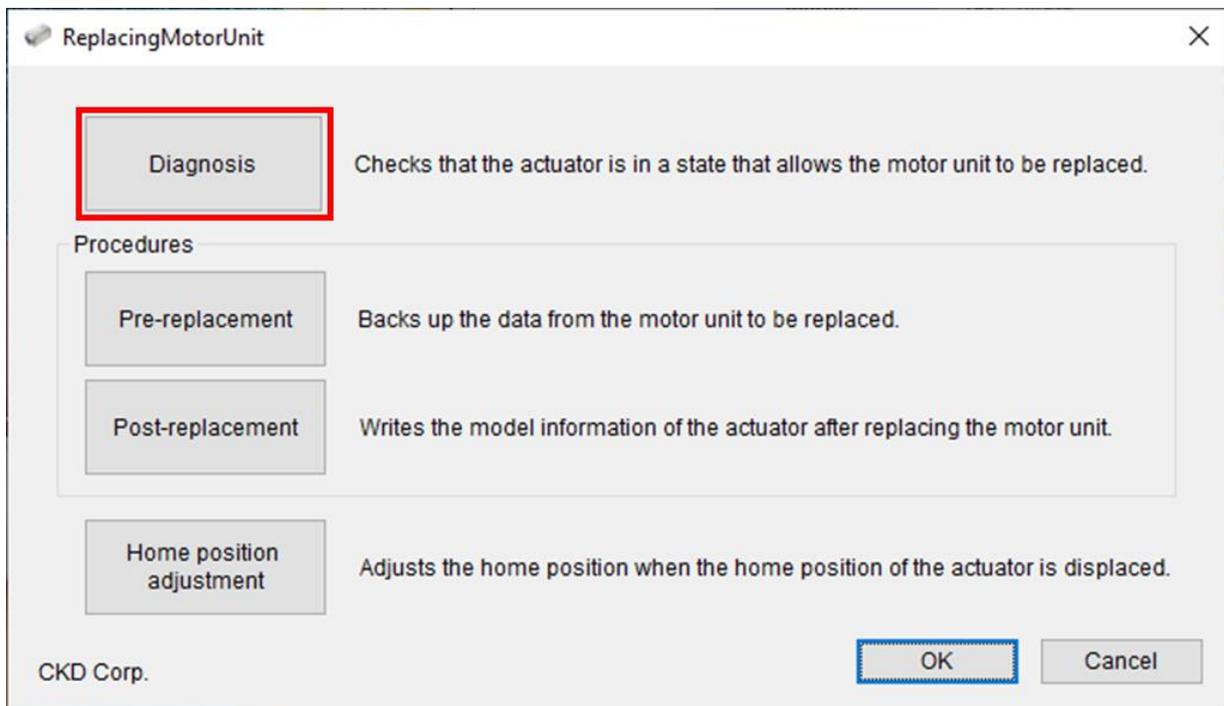
3.2 Motor Unit Replacement Diagnosis



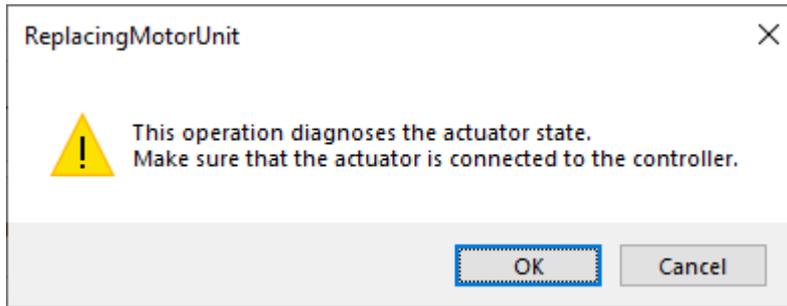
It is recommended to place the actuator (with no load attached and no objects blocking the movable section) horizontally while performing motor unit replacement. Make sure that the actuator is in this detachable state before beginning motor unit replacement.

Follow the steps below to confirm that the actuator is in a state that allows the motor unit to be replaced.

- 1 Connect the actuator to be diagnosed to the controller and turn on the power.
- 2 Make sure that the controller is connected to the PC with a USB cable and start the motor unit replacement application (ReplacingMotorUnit.exe).
- 3 Select "Diagnosis".



- 4** Follow the instructions on the screen and then select "OK".



- 5** Replace the motor unit according to the result of the diagnosis.

Diagnosis result	Description
Can be replaced.	The motor unit replacement can be performed by the customer. Replace the motor unit according to "3.3 Motor Unit Replacement Procedures".
Cannot be replaced.	The motor unit replacement cannot be performed by the customer. Contact CKD if the motor unit needs to be replaced.

3.3 Motor Unit Replacement Procedures

Caution

Follow the relevant Instruction Manuals for the handling of the controller (ECR) and actuator.

Refer to "1.1 Instruction Manuals Related to This Product".

Secure sufficient space for performing motor unit replacement.

Remove the actuator (with no load attached) from equipment and place it horizontally before performing motor unit replacement.

The actuator may move due to its own weight during replacement and may cause damage to peripheral equipment and injury to workers.

Since this replacement work involves movement from the actuator, stay away from the actuator when it is in operation.

Injury to workers may result.

Do not cause any damage to the cables or allow foreign matters in the connectors when connecting cables.

A malfunction may occur.

There are 3 steps to complete the motor unit replacement.

Step 1: Pre-replacement procedure

Step 2: Removing and attaching procedure

Step 3: Post-replacement procedure

3.3.1 Items and tools necessary for replacement

Prepare the following items before beginning motor unit replacement.

- New motor unit
- Hex key set ^{Note 1}
- Tension gauge (capable of providing tension of 40 N) ^{Note 2}
- Cable tie or cord ^{Note 2}
- Controller (ECR Series)
- DC power (24 V or 48 V)
- Encoder cable
- Motor cable
- USB cable (mini-B)
- ReplacingMotorUnit.exe (motor unit replacement application)

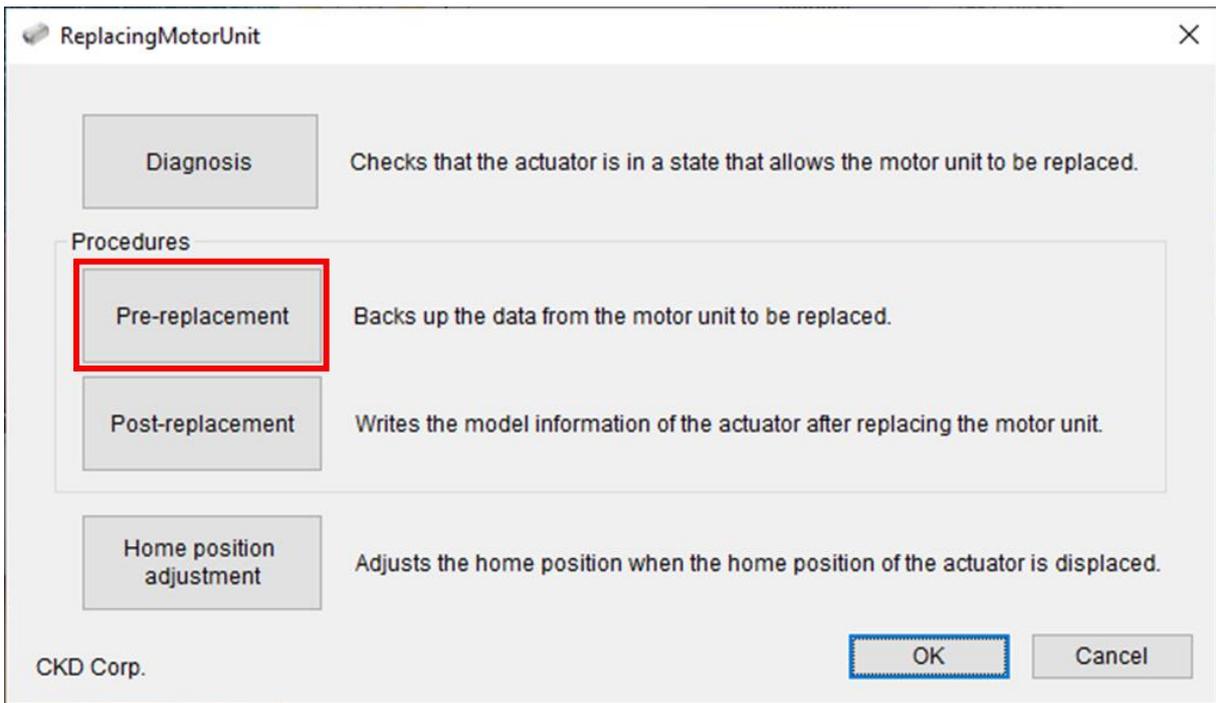
Note 1: Refer to the following table.

Screw, bolt	Hex key
Hexagon socket head locking screw M4	For M4 (across flats: 2 mm)
Hexagon socket head locking screw M5	For M5 (across flats: 2.5 mm)
Hexagon socket head bolt M3	For M3 (across flats: 2.5 mm)
Hexagon socket head bolt M4	For M4 (across flats: 3 mm)

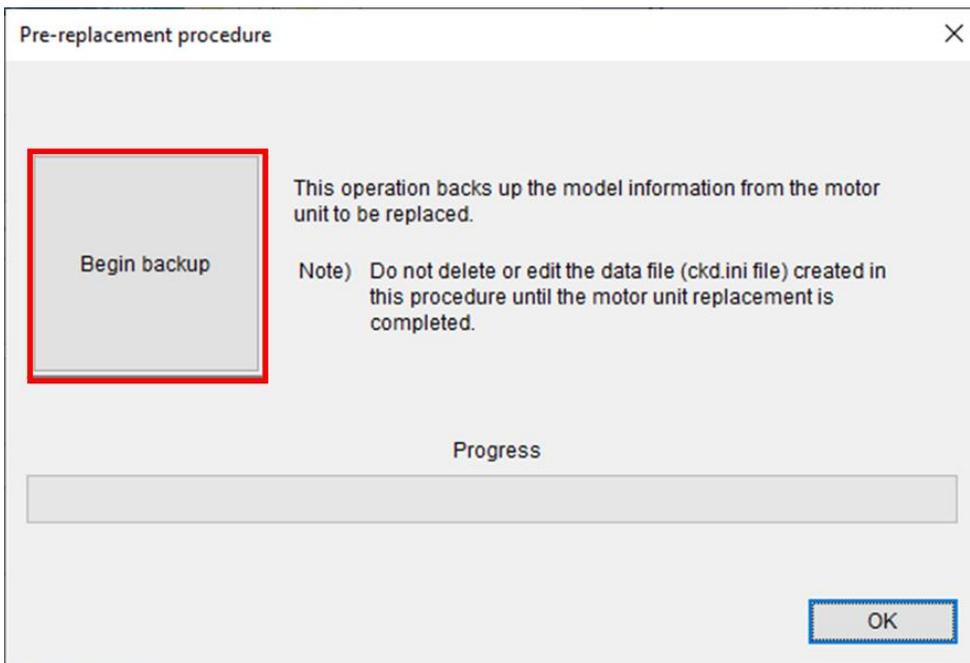
Note 2: This item is necessary for replacing the motor unit of the motor mounting on side/bottom type actuator (EBS-MR/L/D, EBR-MR/L/D).

3.3.2 Step 1: Pre-replacement procedure

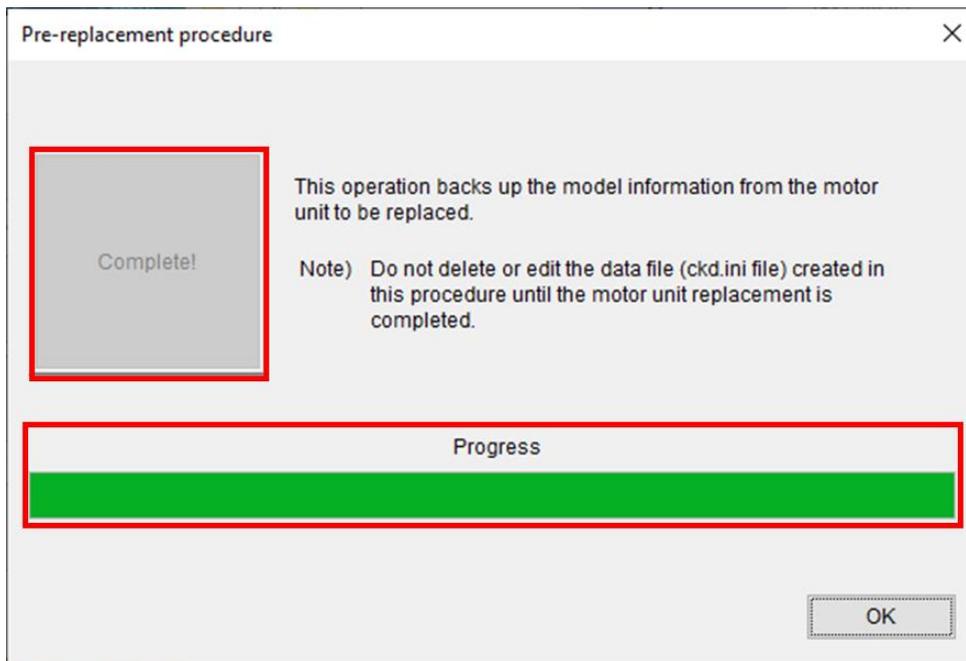
- 1 Connect the motor unit to be replaced to the controller and turn on the power.
- 2 Make sure that the controller is connected to the PC with a USB cable and start the motor unit replacement application (ReplacingMotorUnit.exe).
- 3 Select "Pre-replacement".



- 4 Select "Begin backup".



- 5** When "Complete!" appears, select "OK".



- 6** Close the application.
- 7** Check that "ckd.ini" file is generated in the same folder as ReplacingMotorUnit.exe. Do not delete or edit the created "ckd.ini" file until the motor unit replacement is completed.

Name	Date modified	Type
ckd		Configuration settings
ReplacingMotorUnit		Application

- 8** Turn off the power and remove the encoder cable and motor cable from the actuator.

3.3.3 Step 2: Removing and attaching procedure

⚠ Caution

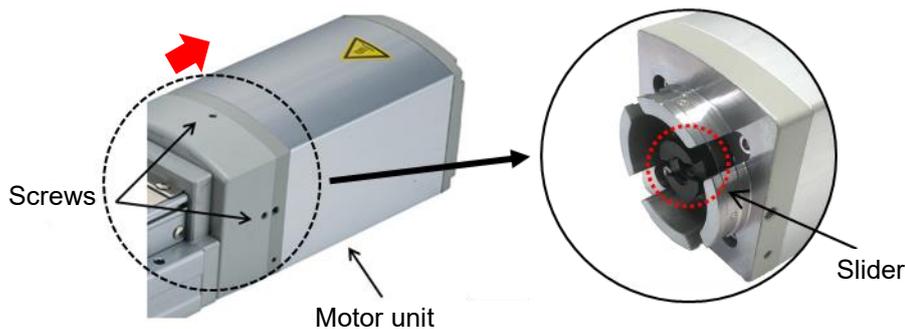
Keep the parts which are removed when replacing the motor unit where they can be found easily.

Be careful not to lose any parts that were removed (such as screws) since they are used again during assembly.

■ Straight motor mounting type (EBS-ME, EBR-ME)

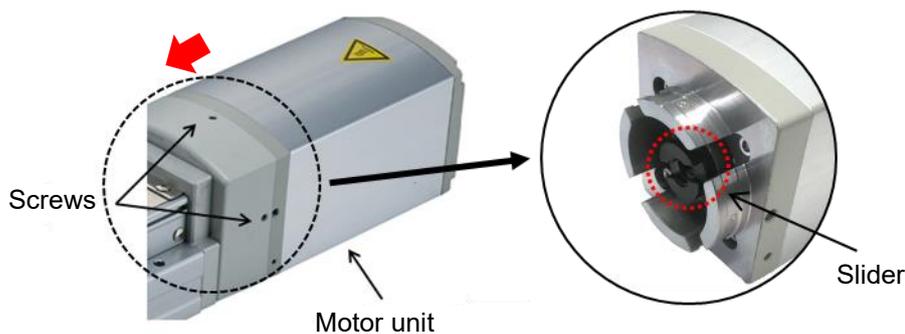
<Removing the motor to be replaced from the actuator>

- 1 Remove two screws and remove the motor unit.
 - Screw: Hexagon socket head locking screw (EBS/EBR-04: M4 x 3L, EBS/EBR-05/08: M4 x 4L) x 2 pieces
 - Tool: Hex key for M4 (across flats: 2 mm)
- 2 Remove the slider (black part) from the coupling between the motor unit and the actuator.



<Attaching the new motor unit to the actuator>

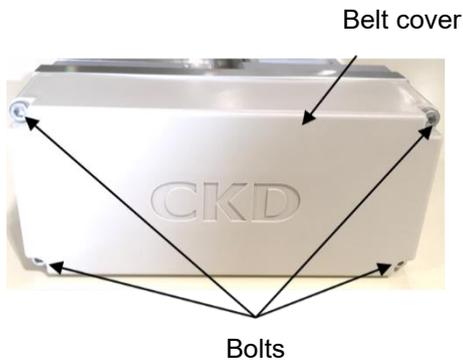
- 1 Attach the slider (black part) to the coupling and insert the new motor unit so that there is no gap with the actuator.
- 2 Tighten two screws with the specified tightening torque and attach the new motor unit.
 - Screw: Hexagon socket head locking screw (EBS/EBR-04: M4 x 3L, EBS/EBR-05/08: M4 x 4L) x 2 pieces
 - Tool: Hex key for M4 (across flats: 2 mm)
 - Tightening torque: EBS/EBR-04/05/08: 0.6 N·m



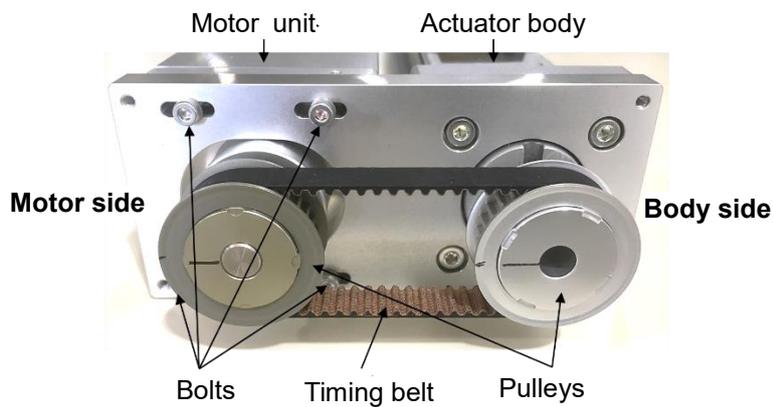
■ Motor mounting on side/bottom type (EBS-MR/L/D, EBR-MR/L/D)

<Removing the motor to be replaced from the actuator>

- 1** Remove four bolts and remove the belt cover.
 - Bolt: Hexagon socket head bolt (M3 x 30L) x 4 pieces
 - Tool: Hex key for M3 (across flats: 2.5 mm)



- 2** Remove four bolts, slide the motor unit toward the body side, and remove the timing belt from the pulleys.
 - Bolt: Hexagon socket head bolt (EBS/EBR-04/05: M3 x 16L, EBS/EBR-08: M4 x 18L) x 4 pieces
 - Tool: Hex key for M3 (across flats: 2.5 mm) or for M4 (across flats: 3 mm)

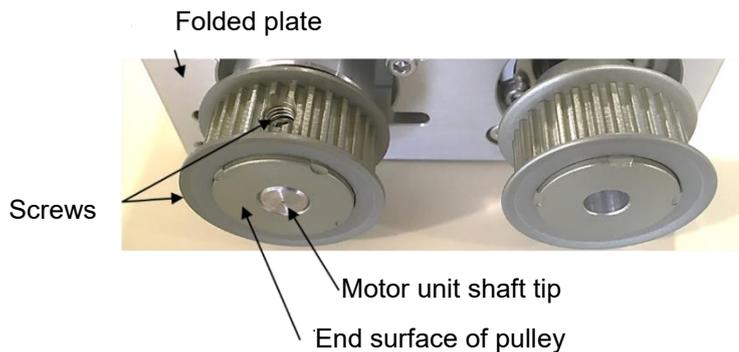


- 3** Loosen the screws of the pulley. Remove the pulley from the motor unit shaft and remove the motor unit from the actuator.
 - Screw: Hexagon socket head locking screw (M5 x 6L) x 2 pieces
 - Tool: Hex key for M5 (across flats: 2.5 mm)

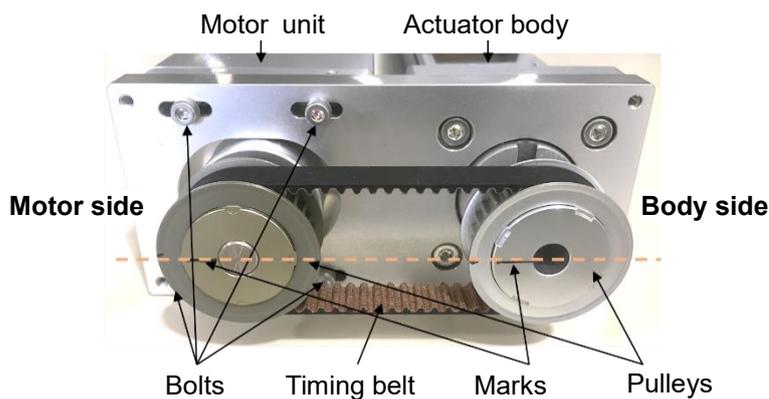


<Attaching the new motor unit to the actuator>

- 1** Insert the shaft of the new motor unit into the folded plate and attach the pulley so that the end surface of the pulley and the motor unit shaft tip are aligned.
- 2** Align one screw of the pulley with the flat of the D-shaped cut of the motor unit shaft tip and tighten it with the specified tightening torque. After that, tighten the other screw with the same tightening torque.
 - Screw: Hexagon socket head locking screw (M5 x 6L) x 2 pieces
 - Tool: Hex key for M5 (across flats: 2.5 mm)
 - Tightening torque: 3.0 N·m

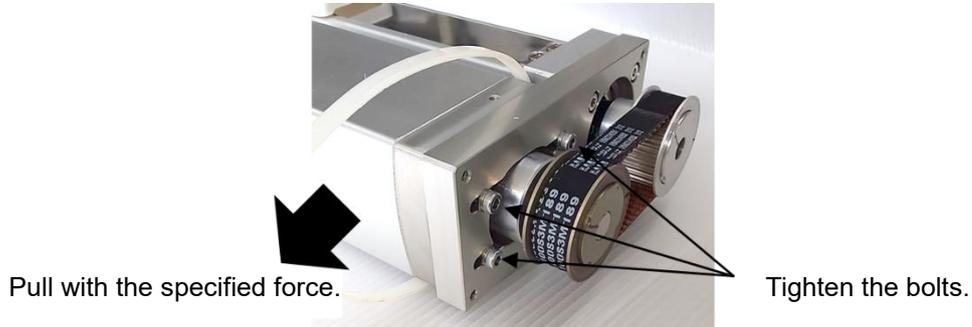


- 3** Attach four bolts to a degree that allows the motor unit to slide.
 - Bolt: Hexagon socket head bolt (EBS/EBR-04/05: M3 x 16L, EBS/EBR-08: M4 x 18L) x 4 pieces
 - Tool: Hex key for M3 (across flats: 2.5 mm) or for M4 (across flats: 3 mm)
- 4** Attach the timing belt to the pulleys. Apply tension to the timing belt and adjust it so that the marks on the pulleys are aligned and facing the motor side.

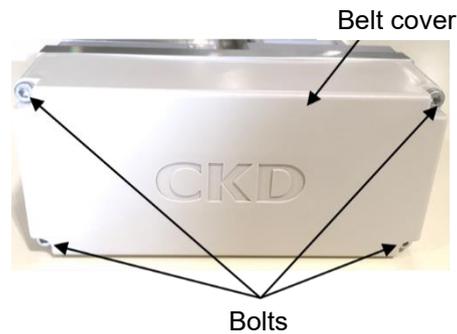


- 5** Put a cable tie or a cord around the base of the motor section.

- 6** While pulling the cable tie or the cord with the specified force (40 N for all models), tighten four bolts with the specified tightening torque.
- Bolt: Hexagon socket head bolt (EBS/EBR-04/05: M3 x 16L, EBS/EBR-08: M4 x 18L) x 4 pieces
 - Tool: Hex key for M3 (across flats: 2.5 mm) or for M4 (across flats: 3 mm)
 - Tightening torque: EBS/EBR-04/05: 0.3 N·m, EBS/EBR-08: 0.7 N·m



- 7** Tighten four bolts with the specified tightening torque and attach the belt cover.
- Bolt: Hexagon socket head bolt (M3 x 30L) x 4 pieces
 - Tool: Hex key for M3 (across flats: 2.5 mm)
 - Tightening torque: 0.3 N·m



3.3.4 Step 3: Post-replacement procedure

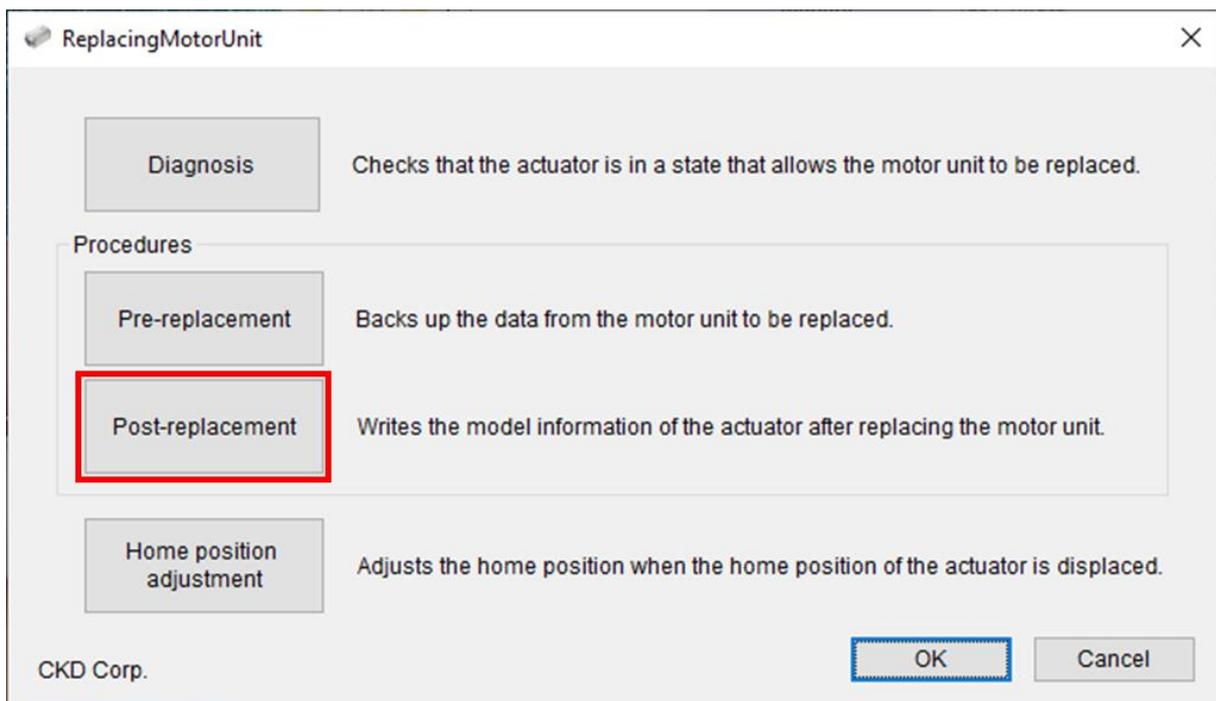
Caution

Make sure that the actuator has no load attached and no objects blocking the movable section before performing this procedure.

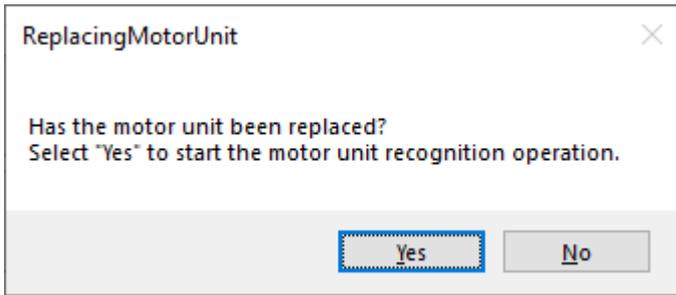
During the post-replacement procedure, the actuator performs a home position return operation. This may cause an unexpected behavior and an injury may occur.

Stay away from the actuator during the home position return operation. Do not touch the actuator while it is in operation.

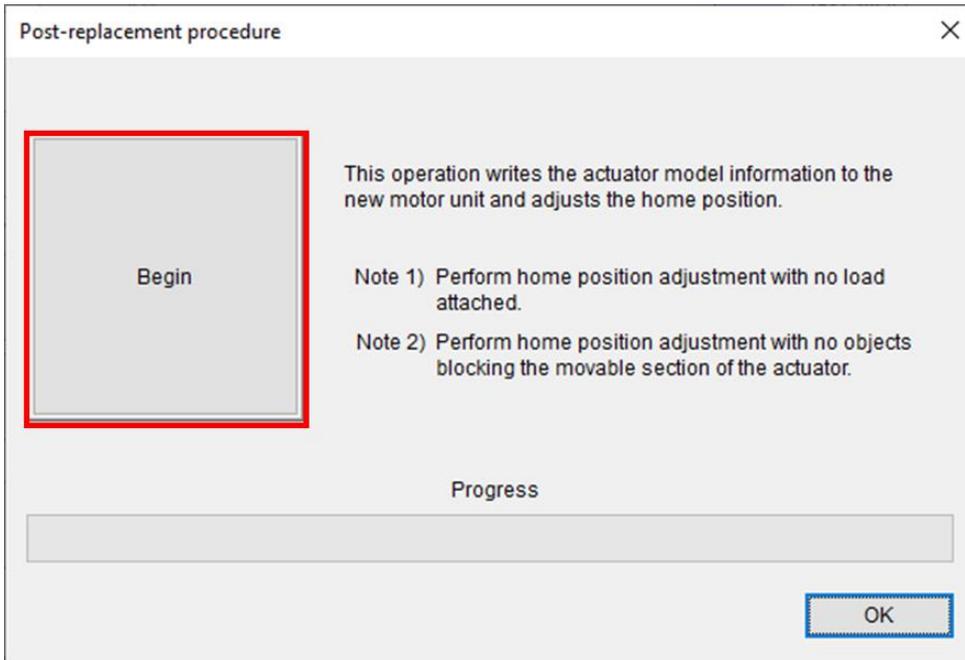
- 1 Connect the actuator whose motor unit was replaced to a new one in Step 2 to the controller and turn on the power.
The alarm lamp on the controller will light up, but this is normal. Go on to the next step.
- 2 Make sure that the "ckd.ini" file created in Step 1 exists in the same folder as ReplacingMotorUnit.exe and start the motor unit replacement application (ReplacingMotorUnit.exe).
- 3 Select "Post-replacement".



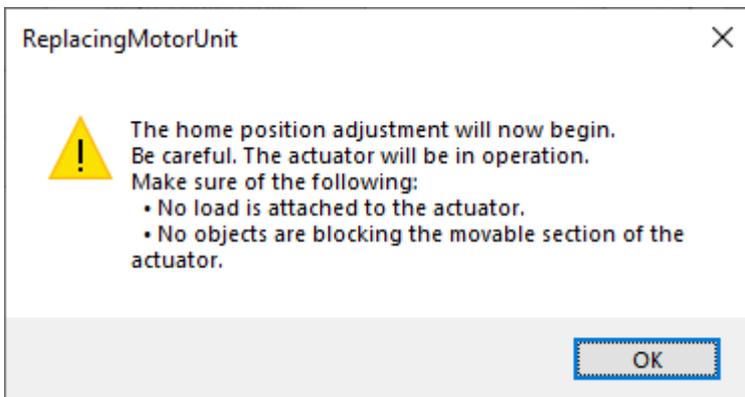
4 Follow the instructions on the screen and then select "Yes".



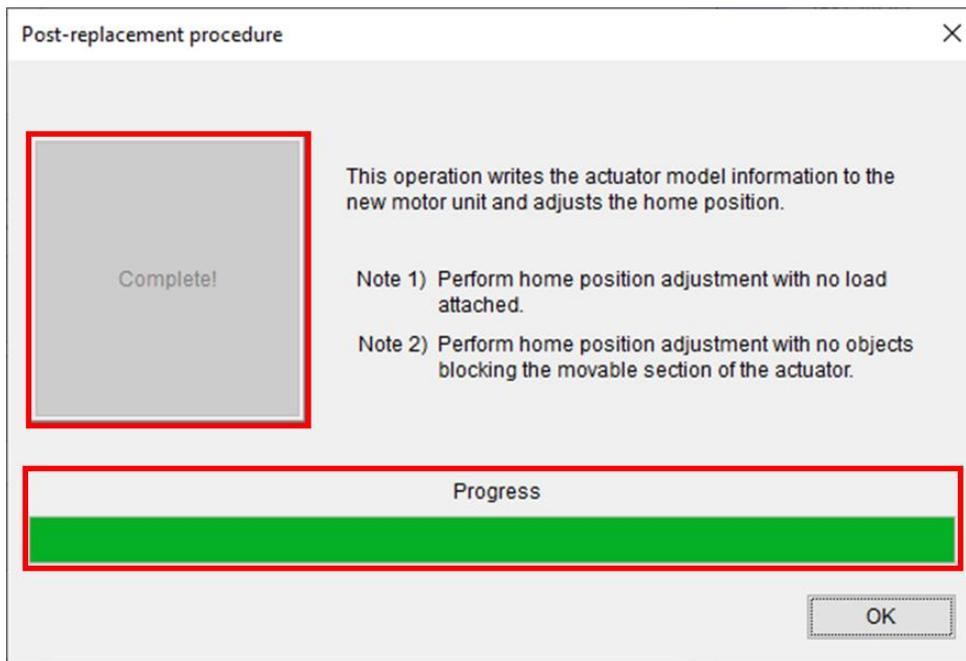
5 Select "Begin".



6 Follow the instructions on the screen and then select "OK". Stay away from the actuator while it is in operation.



- 7** When "Complete!" appears, select "OK".



- 8** Close the application and turn off the power.
The motor unit replacement is now complete.



Check that there is no abnormality by performing full stroke operation with S-Tools.

4. MAINTENANCE AND INSPECTION

WARNING

Install the product before wiring.

An electric shock may occur.

Do not work with wet hands.

An electric shock may occur.

Before performing wiring and inspection, wait five minutes or longer after turning off the power and check the voltage with a tester.

An electric shock may occur.

Do not attach or remove wires and connectors with the power turned on.

A malfunction, failure, or electric shock may occur.

Do not disassemble or modify the product.

An injury, accident, malfunction, or failure may occur.

CAUTION

Wiring and inspection must be performed by specialists.

For the lead wires used for the power cable, use wires with a sufficient diameter that can allow the instantaneous maximum current to flow.

A heat generation or damage may occur during operation.

Perform periodic inspections (two to three times a year) to confirm that the product operates properly.

Generally, grease the product every 100 km.

Since the greasing interval depends on the conditions of use, determine the appropriate interval when performing initial inspection.

Turn off the power immediately if abnormal heat, smoke, odor, sound, or vibration occurs in the product.

The product may become damaged or the continuous flow of currents may cause a fire.

Stop supplying power to the product before performing maintenance, inspection, and repair.

Take measures to prevent a third person from turning on the power unexpectedly.

4.1 Home Position Adjustment

⚠ CAUTION

Make sure that the actuator has no load attached and no objects blocking the movable section before performing this procedure.

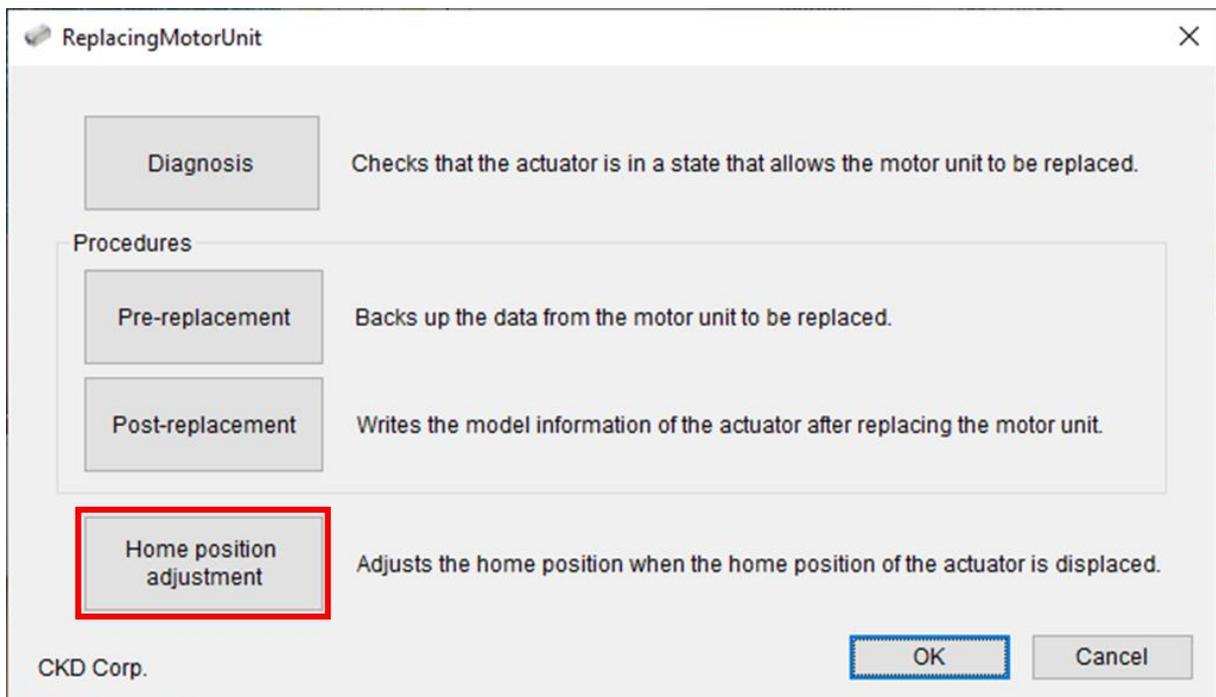
During home position adjustment, the actuator performs a home position return operation to reset its home position. This may cause an unexpected behavior and an injury may occur.

Stay away from the actuator during the home position return operation. Do not touch the actuator while it is in operation.

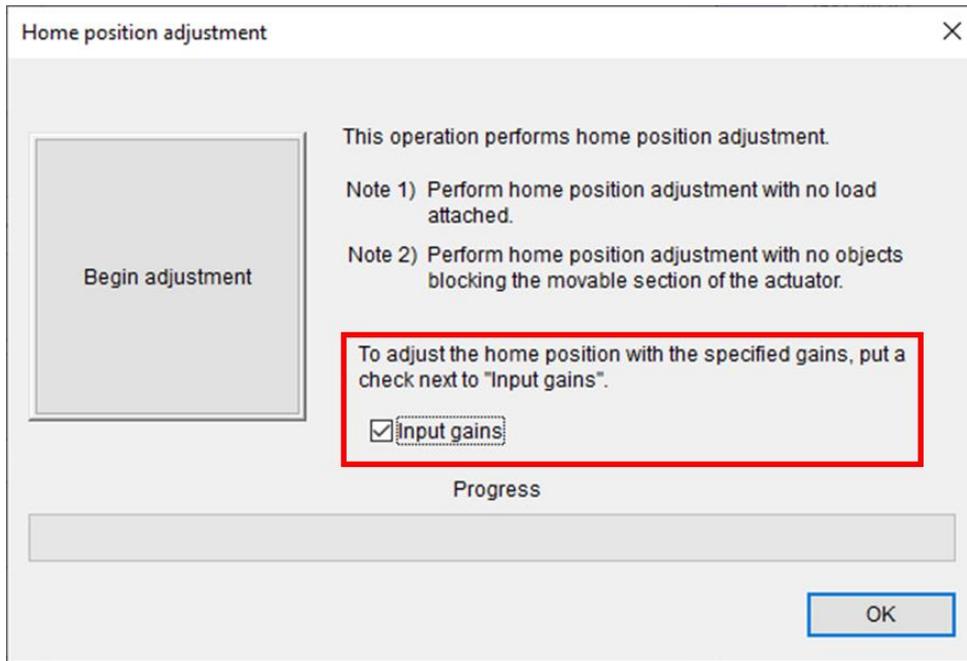
Removal of the motor unit or replacement of the timing belt may cause the home position of the actuator to become displaced.

Follow the steps below to perform home position adjustment to reset the home position.

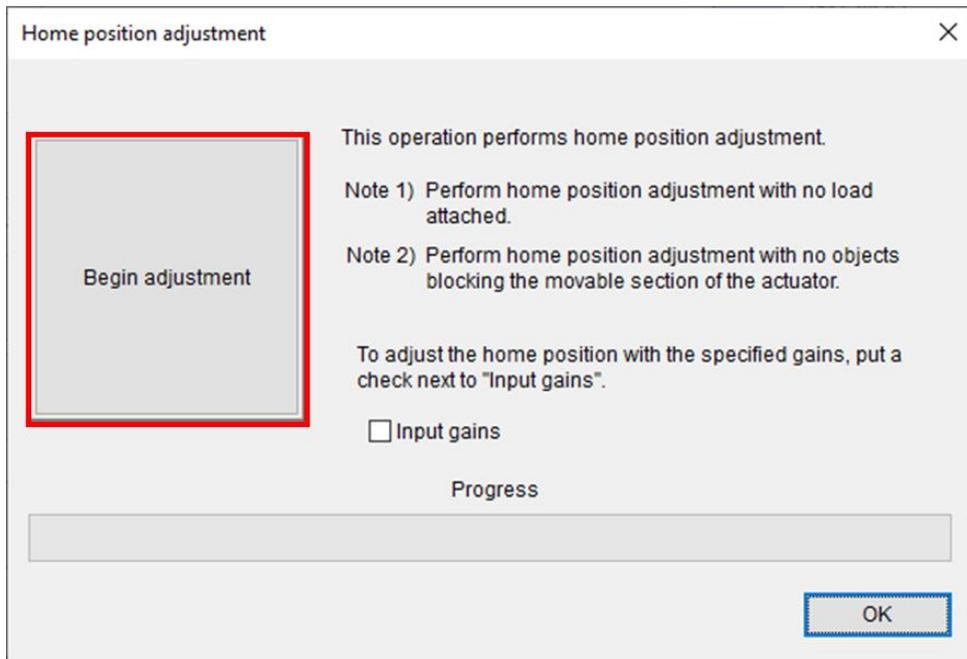
- 1 Connect the actuator whose home position is to be adjusted to the controller and turn on the power.
- 2 Make sure that the controller is connected to the PC with a USB cable and start the motor unit replacement application (ReplacingMotorUnit.exe).
- 3 Select "Home position adjustment".



- 4 If a 48 V power supply is used, put a check next to "Input gains".
If a 48 V power supply is not used, go to Step 5.



- 5 Select "Begin adjustment".



- 6** If "Input gains" is checked in Step 4, the following screen appears. Refer to "Adjusting the gains" in the "Controller Instruction Manual (SM-A10615)" and input the gains.
After inputting the gains, select "OK".

Input a value for each gain.
For the values that can be input for gains, refer to "Adjusting the gains" in the "Controller Instruction Manual (SM-A10615)".

G1 gain: G2 gain:

- 7** Follow the instructions on the screen and then select "OK". Stay away from the actuator while it is in operation.

ReplacingMotorUnit

! The home position adjustment will now begin. Be careful. The actuator will be in operation. Make sure of the following:

- No load is attached to the actuator.
- No objects are blocking the movable section of the actuator.

- 8** When "Complete!" appears, select "OK".

Home position adjustment

This operation performs home position adjustment.

Note 1) Perform home position adjustment with no load attached.

Note 2) Perform home position adjustment with no objects blocking the movable section of the actuator.

To adjust the home position with the specified gains, put a check next to "Input gains".

Input gains

Progress

- 9** Close the application and turn off the power. The home position adjustment is now complete.

5. TROUBLESHOOTING

5.1 Items to Check When a Problem Occurs

When a problem occurs, ensure safety and follow the procedure below.

1	<p>Check the LED indicator on the controller.</p> <ul style="list-style-type: none"> Green light: Motor energized (servo on) Green blinking: Motor de-energized (servo off) Red light: Unreleasable alarm issued Red blinking (Blink every second): Releasable alarm issued Red blinking (Blink every two seconds): Releasable alarm issued Off: Control power turned off
2	Check if there is an abnormality with the higher-level controller.
3	Check the voltage of the control power (24 VDC or 48 VDC).
4	<p>Check the details of the alarm.</p> <p>The details of the alarm can be checked with the setting software (S-Tools).</p>
5	<p>Check that there is no disconnection or pinching of the cables and that they are connected correctly.</p> <p>Before checking the continuity, turn off the power and remove the cables to prevent an electric shock.</p>
6	Check that measures (such as connecting the ground wire and attaching the surge suppressor) have been taken against noise.
7	Check the course of events and the operating conditions at the time the problem occurred.
8	Check the serial number of the product.

If the problem persists, refer also to "5.2 Problems, Causes, and Solutions".

5.2 Problems, Causes, and Solutions

If the product does not operate as intended, check the table below for a possible solution.

Problem	Cause	Solution
Even when power is turned on, LED indicator on controller does not light up.	Wiring is not correct.	Check the wiring to the power.
	Wiring is disconnected.	Check for pinching and disconnection of cables and check the connection of connectors and terminals.
	Product is malfunctioning or is damaged.	Repair or replace the product. Refer to "5.1 Items to Check When a Problem Occurs" and contact your nearest CKD sales office or distributor.
LED indicator on controller remains lit in red	Alarm has been issued.	Refer to the setting software (S-Tools) to find and remove the cause of the alarm.
	There is an abnormality in system.	Repair or replace the product. Refer to "5.1 Items to Check When a Problem Occurs" and contact your nearest CKD sales office or distributor.
Home position return operation does not begin with the motor unit replacement application.	Wiring for emergency stop signal is NO contact connection.	Change the wiring for emergency stop (EMG) to NC contact connection.
	Wiring is not correct.	Refer to Chapter 4 in "Controller Instruction Manual (SM-A10615)" and check the wiring.
After performing home position return operation with the motor unit replacement application, the returned home position is largely displaced.	A load is attached.	Remove the load and perform "4.1 Home Position Adjustment".
	There is an object blocking the movable section of the actuator.	Remove the object blocking the movable section of the actuator and perform "4.1 Home Position Adjustment".
	The motor unit is not attached correctly to the actuator.	Follow the assembling instructions (such as specified tightening torque and specified tension of the timing belt) in "3.3 Motor Unit Replacement Procedures" and redo the attachment procedure. Then, perform "4.1 Home Position Adjustment".

If you have any other questions or concerns, contact your nearest CKD sales office or distributor.

6. WARRANTY PROVISIONS

6.1 Warranty Conditions

■ Warranty coverage

If the product specified herein fails for reasons attributable to CKD within the warranty period specified below, CKD will promptly provide a replacement for the faulty product or a part thereof or repair the faulty product at one of CKD's facilities free of charge.

However, following failures are excluded from this warranty:

- Failure caused by handling or use of the product under conditions and in environments not conforming to those stated in the catalog, the Specifications, or this Instruction Manual.
- Failure caused by incorrect use such as careless handling or improper management.
- Failure not caused by the product.
- Failure caused by use not intended for the product.
- Failure caused by modifications/alterations or repairs not carried out by CKD.
- Failure that could have been avoided if the customer's machinery or device, into which the product is incorporated, had functions and structures generally provided in the industry.
- Failure caused by reasons unforeseen at the level of technology available at the time of delivery.
- Failure caused by acts of nature and disasters beyond control of CKD.

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

■ Confirmation of product compatibility

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

■ Others

The terms and conditions of this warranty stipulate basic matters.

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

6.2 Warranty Period

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

6.3 Remarks

- Warranty period specified in "6.2 Warranty Period" is based on the assumption that the product is operated for not more than eight (8) hours a day. If the product reaches the end of its service life within one (1) year, the warranty shall expire at that time.
- If the product is exported outside Japan by the customer, it shall be repaired if returned to CKD's facility or a company or plant specified by CKD. Work and cost associated with the return shall not be covered by the warranty. The repaired product shall be delivered to a place in Japan specified by the customer in a package appropriate for delivery in Japan.