



Motorized actuator

Function Setting Edition

Introduction

Motorized actuator
equipped the AR Series

Motorized actuator
equipped the AZ Series

Motorized actuator
equipped the RKII Series

Thank you for purchasing an Oriental Motor product.

This Manual describes product handling procedures and safety precautions.

- Please read it thoroughly to ensure safe operation.
- Always keep the manual where it is readily available.

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1 Introduction

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1 Introduction

1-1 Before use

Only qualified personnel of electrical and mechanical engineering should work with the product.

Use the product correctly after thoroughly reading the section "Safety precautions" on the actuator operating manual supplied with the product. In addition, be sure to observe the contents described in warning, caution, and note in this manual.

The motorized actuator has been designed and manufactured to be incorporated in general industrial equipment. Do not use for any other purpose. Oriental Motor Co., Ltd. is not responsible for any damage caused through failure to observe this warning.

Notation on this manual

 Danger	The instructions, which accompany a "Danger" symbol, indicate that mishandling the product may result in an imminent danger leading to immediate death or serious injury.
 Warning	Handling the product without observing the instructions that accompany a "Warning" symbol may result in serious injury or death.
 Caution	Handling the product without observing the instructions that accompany a "Caution" symbol may result in injury or property damage.
 Note	The items under this heading contain important handling instructions that the user should observe to ensure safe use of the product.

1-2 How to use operating manuals

Operating manuals for the motorized actuators are listed below. The operating manual supplied with the product varies depending on the type of the product. After reading these manuals, keep them in a convenient place so that you can reference them at any time.

Motorized actuator equipped the AR Series or RKII Series	
<ul style="list-style-type: none"> • OPERATING MANUAL Actuator (supplied with actuator) • OPERATING MANUAL Driver (supplied with driver) 	This manual explains the functions as well as the installation method and others.
<ul style="list-style-type: none"> • USER MANUAL 	This manual explains the equipped motor and driver functions, the installation and connection method, the data setting method, the operating method, as well as the troubleshooting and others.
<ul style="list-style-type: none"> • Function Setting Edition (this document) 	This manual explains the driver's parameters for when combining various motorized actuators.
<ul style="list-style-type: none"> • APPENDIX UL Standards for AR Series • APPENDIX UL Standards and CSA Standards for RKII Series (supplied with product) 	This appendix describes the information of the equipped motor required for recognition of UL Standards.

Motorized actuator equipped the AZ Series	
<ul style="list-style-type: none"> • OPERATING MANUAL Actuator (supplied with actuator) • OPERATING MANUAL Driver (supplied with driver) 	These manuals explain items from preparation to basic operations, etc.
<ul style="list-style-type: none"> • Function Edition 	This manual explains more detailed operations, functions, etc. that are not described in OPERATING MANUAL supplied with the product.
<ul style="list-style-type: none"> • Motorized actuator Function Setting Edition (this document) 	This manual explains the driver's parameters for when combining various motorized actuators.
<ul style="list-style-type: none"> • APPENDIX UL Standards for AZ Series AC power input type (supplied with product) 	This appendix describes the information of the equipped motor required for recognition of UL Standards.

1-3 Product lineup for motorized actuators

This manual explains the motorized actuators described in the table below. The setting of parameters for the motorized actuator is required according to the equipped motor, leads of the actuator, gear ratio, size and others.

Motorized actuator type	Series name	Equipped motor		
		AR Series	AZ Series	RKII Series
Motorized linear slide	EAS Series EZS Series EZSH Series	○	○	–
Motorized cylinder	EAC Series	○	○	–
Compact linear actuators	DRS2 Series	–	○	–
Hollow rotary actuator	DGII Series	○	○	○
Parameter setting		Necessary	Parameters have been set at the time of shipment.	Necessary

○: Available

2 Motorized actuator equipped the AR Series

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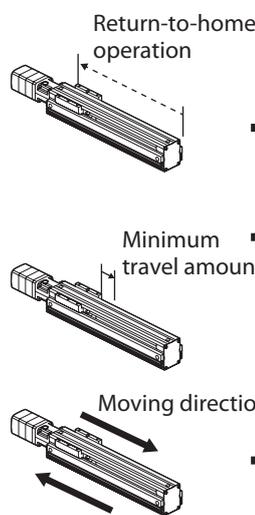
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1 Setting of the motorized linear slide and motorized cylinder

This chapter explains the parameters and operation functions of the motorized linear slide and motorized cylinder. (Hereinafter described as motorized actuator)

1-1 Setting flow

- 1 Install a motorized actuator.
- 2 Install and connect a driver.
- 3 Set parameters for the driver. (It is explained in this part.)



Home operation parameter	
• Home-seeking mode	Push mode
• Starting speed of home-seeking [Hz]	1000
• Position offset of home-seeking [step]	EAS2, EAC2 200
• Starting direction of home-seeking	Negative direction (Return-to-home operation starts to the motor side)

Coordinates parameter	
• Electronic gear A	10
• Electronic gear B	3
• Motor rotation direction	Positive direction=CW (Moves to opposite the motor side)
• Positive software limit [step]	(Stroke × 100) + 300
• Negative software limit [step]	-200

- 4 Completion of setting

■ About the setting file for motorized actuators

The setting file, which the recommended parameters are input in advance to operate the linear slides and cylinders equipped the **AR** Series, is provided in the download page of the **MEXE02**. Download the setting file suitable for the motorized actuator used.

Applicable product: **EAS** Series linear slide, **EZS** Series linear slide, **EAC** Series cylinder



- The setting file is created based on the contents of this manual.
- The minimum travel amount is 0.01 mm.
- The positive software limit is not input since it varies depending on the stroke. Input the value of "(stroke × 100) + 300" to the positive software limit before reading the setting file to the driver.

1-2 Parameter setting list

■ Built-in controller type



- Set the starting speed to 6 mm/s or less.
- Set the operating speed by checking the specification of the maximum speed.
- In the case of the motorized actuator of the DC power input type, the operating speed may not reach the maximum speed depending on the ambient temperature or motor cable length.
- AC power input type products of the **EAS6**, **EZS6**, or **EAC6** model;
If a load is operated in a vertical direction, an overvoltage alarm may generate depending on the driving condition. If the alarm was detected, review the operating condition or use an accessory regeneration unit.

● Lead: 3 mm

A setting example of the parameter for when setting the minimum travel amount to 0.01 mm is shown below.

□ represents parameters to be changed.

Item	Setting example		Initial value *1	
	Setting value	Converted value	Setting value	Converted value
• Lead [mm]	3	–	3	–
• Resolution (Minimum travel amount [mm])	300 (0.01)	–	1000 (0.003)	–
Operation data				
• Position [step]	1000	10 [mm]	0	0 [mm]
• Operating speed [Hz]	10000	100 [mm/s]	1000	3 [mm/s]
• Acceleration (Deceleration) [ms/kHz] *2	1	10 [m/s ²]	1	3 [m/s ²]
Operation parameter				
• JOG operating speed [Hz]	10000	100 [mm/s]	1000	3 [mm/s]
• Acceleration/deceleration rate of JOG [ms/kHz] *2	20	0.5 [m/s ²]	1	3 [m/s ²]
• JOG starting speed [Hz]	600	6 [mm/s]	500	1.5 [mm/s]
Home operation parameter				
• Home-seeking mode	Push mode	–	3-sensor mode	–
• Starting speed of home-seeking [Hz]	1000	10 [mm/s]	500	1.5 [mm/s]
• Position offset of home-seeking [step]	EAS2, EAC2 200	2 [mm]	0	0 [mm]
• Starting direction of home-seeking	Negative direction (Return-to-home operation starts to the motor side)	–	Positive direction (Return-to-home operation starts to opposite the motor side)	–
Coordinates parameter				
• Electronic gear A	10	–	1	–
• Electronic gear B	3	–	1	–
• Motor rotation direction	Positive direction=CW (Moves to opposite the motor side)	–	Positive direction=CW (Moves to opposite the motor side)	–
• Positive software limit [step]	(Stroke × 100) + 300	Stroke + 3 [mm]	8388607	25165.821 [mm]
• Negative software limit [step]	–200	–2 [mm]	–8388608	–25165.824 [mm]

*1 The values are the factory setting data or initialized data.

*2 When setting via RS-485 communication or industrial network, input integral number. Set by increasing the value calculated by the conversion formula to 1000 times.

● **Lead: 6 mm**

A setting example of the parameter for when setting the minimum travel amount to 0.01 mm is shown below.

□ represents parameters to be changed.

Item	Setting example		Initial value *1	
	Setting value	Converted value	Setting value	Converted value
● Lead [mm]	6	–	6	–
● Resolution (Minimum travel amount [mm])	600 (0.01)	–	1000 (0.006)	–
Operation data				
● Position [step]	1000	10 [mm]	0	0 [mm]
● Operating speed [Hz]	10000	100 [mm/s]	1000	6 [mm/s]
● Acceleration (Deceleration) [ms/kHz] *2	1	10 [m/s ²]	1	6 [m/s ²]
Operation parameter				
● JOG operating speed [Hz]	10000	100 [mm/s]	1000	6 [mm/s]
● Acceleration/deceleration rate of JOG [ms/kHz] *2	20	0.5 [m/s ²]	1	6 [m/s ²]
● JOG starting speed [Hz]	600	6 [mm/s]	500	3 [mm/s]
Home operation parameter				
● Home-seeking mode	Push mode	–	3-sensor mode	–
● Starting speed of home-seeking [Hz]	EAS2, EAC2	1000	500	3 [mm/s]
	EAS4, EAS6, EAC4, EAC6, EZS3, EZS4, EZS6	2500	500	3 [mm/s]
● Position offset of home-seeking [step]	EAS2, EAC2, EAC4, EAC6	200	0	0 [mm]
	EZS3, EZS4, EAS4	100		
	EAS6, EZS6	400		
● Starting direction of home-seeking	Negative direction (Return-to-home operation starts to the motor side)	–	Positive direction (Return-to-home operation starts to opposite the motor side)	–
Coordinates parameter				
● Electronic gear A	5	–	1	–
● Electronic gear B	3	–	1	–
● Motor rotation direction *3	Positive direction=CW (Moves to opposite the motor side)	–	Positive direction=CW (Moves to opposite the motor side)	–
● Positive software limit [step]	(Stroke × 100) + 300	Stroke + 3 [mm]	8388607	50331.642 [mm]
● Negative software limit [step]	–200	–2 [mm]	–8388608	–50331.648 [mm]

*1 The values are the factory setting data or initialized data.

*2 When setting via RS-485 communication or industrial network, input integral number. Set by increasing the value calculated by the conversion formula to 1000 times.

*3 This is the moving direction of the moving part for the in-line motor mounting type. For the parallel motor mounting type, the moving part moves in the opposite direction of the in-line motor mounting type.

- **Lead: 12 mm**

A setting example of the parameter for when setting the minimum travel amount to 0.01 mm is shown below.

□ represents parameters to be changed.

Item	Setting example		Initial value *1	
	Setting value	Converted value	Setting value	Converted value
● Lead [mm]	12	–	12	–
● Resolution (Minimum travel amount [mm])	1200 (0.01)	–	1000 (0.012)	–
Operation data				
● Position [step]	1000	10 [mm]	0	0 [mm]
● Operating speed [Hz]	10000	100 [mm/s]	1000	12 [mm/s]
● Acceleration (Deceleration) [ms/kHz] *2	1	10 [m/s ²]	1	12 [m/s ²]
Operation parameter				
● JOG operating speed [Hz]	10000	100 [mm/s]	1000	12 [mm/s]
● Acceleration/deceleration rate of JOG [ms/kHz] *2	20	0.5 [m/s ²]	1	12 [m/s ²]
● JOG starting speed [Hz]	600	6 [mm/s]	500	6 [mm/s]
Home operation parameter				
● Home-seeking mode	Push mode	–	3-sensor mode	–
● Starting speed of home-seeking [Hz]	2500	25 [mm/s]	500	6 [mm/s]
● Position offset of home-seeking [step]	EAC4, EAC6	200	0	0 [mm]
	EZS3, EZS4, EAS4	100		
	EAS6, EZS6	400		
● Starting direction of home-seeking	Negative direction (Return-to-home operation starts to the motor side)	–	Positive direction (Return-to-home operation starts to opposite the motor side)	–
Coordinates parameter				
● Electronic gear A	5	–	1	–
● Electronic gear B	6	–	1	–
● Motor rotation direction *3	Positive direction=CW (Moves to opposite the motor side)	–	Positive direction=CW (Moves to opposite the motor side)	–
● Positive software limit [step]	(Stroke × 100) + 300	Stroke + 3 [mm]	8388607	100663.284 [mm]
● Negative software limit [step]	–200	–2 [mm]	–8388608	–100663.296 [mm]

*1 The values are the factory setting data or initialized data.

*2 When setting via RS-485 communication or industrial network, input integral number. Set by increasing the value calculated by the conversion formula to 1000 times.

*3 This is the moving direction of the moving part for the in-line motor mounting type. For the parallel motor mounting type, the moving part moves in the opposite direction of the in-line motor mounting type.

- **Lead: 20 mm**

A setting example of the parameter for when setting the minimum travel amount to 0.01 mm is shown below.

represents parameters to be changed.

Item	Setting example		Initial value *1	
	Setting value	Converted value	Setting value	Converted value
● Lead [mm]	20	–	20	–
● Resolution (Minimum travel amount [mm])	2000 (0.01)	–	1000 (0.02)	–
Operation data				
● Position [step]	1000	10 [mm]	0	0 [mm]
● Operating speed [Hz]	10000	100 [mm/s]	1000	20 [mm/s]
● Acceleration (Deceleration) [ms/kHz] *2	1	10 [m/s ²]	1	20 [m/s ²]
Operation parameter				
● JOG operating speed [Hz]	10000	100 [mm/s]	1000	20 [mm/s]
● Acceleration/deceleration rate of JOG [ms/kHz] *2	1	10 [m/s ²]	1	20 [m/s ²]
● JOG starting speed [Hz]	600	6 [mm/s]	500	10 [mm/s]
Home operation parameter				
● Home-seeking mode	3-sensor mode	–	3-sensor mode	–
● Starting speed of home-seeking [Hz]	2500	25 [mm/s]	500	10 [mm/s]
● Starting direction of home-seeking	Negative direction (Return-to-home operation starts to the motor side)	–	Positive direction (Return-to-home operation starts to opposite the motor side)	–
Coordinates parameter				
● Electronic gear A	1	–	1	–
● Electronic gear B	2	–	1	–
● Motor rotation direction	Positive direction=CW (Moves to opposite the motor side)	–	Positive direction=CW (Moves to opposite the motor side)	–
● Positive software limit [step]	(Stroke × 100) + 300	Stroke + 3 [mm]	8388607	167772.14 [mm]
● Negative software limit [step]	–200	–2 [mm]	–8388608	–167772.16 [mm]

*1 The values are the factory setting data or initialized data.

*2 When setting via RS-485 communication or industrial network, input integral number. Set by increasing the value calculated by the conversion formula to 1000 times.

● **Lead: 30 mm**

A setting example of the parameter for when setting the minimum travel amount to 0.01 mm is shown below.
 represents parameters to be changed.



Danger

- Do not enter the moving range of the motorized actuator while the power is supplied. Doing so may result in serious injury.
- Be sure to provide a safety cage according to EN ISO 13857. Also, touching a table by hand may cause serious injury.
- Operate the data setter outside the safety cage. Failure to do so may result in injury.

Item	Setting example		Initial value *1	
	Setting value	Converted value	Setting value	Converted value
• Lead [mm]	30	–	30	–
• Resolution (Minimum travel amount [mm])	3000 (0.01)	–	1000 (0.02)	–
Operation data				
• Position [step]	1000	10 [mm]	0	0 [mm]
• Operating speed [Hz]	10000	100 [mm/s]	1000	30 [mm/s]
• Acceleration (Deceleration) [ms/kHz] *2	1	10 [m/s ²]	1	30 [m/s ²]
Operation parameter				
• JOG operating speed [Hz]	10000	100 [mm/s]	1000	30 [mm/s]
• Acceleration/deceleration rate of JOG [ms/kHz] *2	1	10 [m/s ²]	1	30 [m/s ²]
• JOG starting speed [Hz]	600	6 [mm/s]	500	15 [mm/s]
Home operation parameter				
• Home-seeking mode	3-sensor mode	–	3-sensor mode	–
• Starting speed of home-seeking [Hz]	2500	25 [mm/s]	500	15 [mm/s]
• Starting direction of home-seeking	Negative direction (Return-to-home operation starts to the motor side)	–	Positive direction (Return-to-home operation starts to opposite the motor side)	–
Coordinates parameter				
• Electronic gear A	1	–	1	–
• Electronic gear B	3	–	1	–
• Motor rotation direction	Positive direction=CW (Moves to opposite the motor side)	–	Positive direction=CW (Moves to opposite the motor side)	–
• Positive software limit [step]	(Stroke × 100) + 300	Stroke + 3 [mm]	8388607	251658.21 [mm]
• Negative software limit [step]	–200	–2 [mm]	–8388608	–251658.24 [mm]

*1 The values are the factory setting data or initialized data.

*2 When setting via RS-485 communication or industrial network, input integral number. Set by increasing the value calculated by the conversion formula to 1000 times.

■ Pulse input type



- Set the starting speed to 6 mm/s or less.
- Set the operating speed by checking the specification of the maximum speed.
- In the case of the motorized actuator of the DC power input type, the operating speed may not reach the maximum speed depending on the ambient temperature or motor cable length.
- AC power input type products of the **EAS6**, **EZS6**, **EZSH6** or **EAC6** model;
If a load is operated in a vertical direction, an overvoltage alarm may generate depending on the driving condition. If the alarm was detected, review the operating condition or use an accessory regeneration unit.

● Lead: 3 mm

A setting example of the parameter for when setting the minimum travel amount to 0.01 mm is shown below.

represents parameters to be changed.

Item	Setting example		Initial value *	
	Setting value	Converted value	Setting value	Converted value
• Lead [mm]	3	–	3	–
• Resolution (Minimum travel amount [mm])	300 (0.01)	–	1000 (0.003)	–
Return to electrical home operation				
• Operating speed of return to electrical home operation [r/min]	2000	100 [mm/s]	30	3 [mm/s]
• Acceleration/deceleration rate of return to electrical home operation [ms/(1000 r/min)]	100	0.5 [m/s ²]	100	0.5 [m/s ²]
• Starting speed of return operation [r/min]	120	6 [mm/s]	30	3 [mm/s]
Manual operation parameter				
• JOG operating speed [r/min]	2000	100 [mm/s]	30	3 [mm/s]
• Acceleration and deceleration rate of JOG operation [ms/(1000 r/min)]	100	0.5 [m/s ²]	100	0.5 [m/s ²]
• Starting speed of JOG operation [r/min]	120	6 [mm/s]	30	3 [mm/s]
Electronic gear parameter				
• Electronic gear A1	10	–	10	–
• Electronic gear B	3	–	10	–
Operation parameter				
• Motor rotation direction	Positive=CW (Moves to opposite the motor side)	–	Positive=CW (Moves to opposite the motor side)	–

* The values are the factory setting data or initialized data.

● **Lead: 6 mm**

A setting example of the parameter for when setting the minimum travel amount to 0.01 mm is shown below.

represents parameters to be changed.

Item	Setting example		Initial value *1	
	Setting value	Converted value	Setting value	Converted value
● Lead [mm]	6	–	6	–
● Resolution (Minimum travel amount [mm])	600 (0.01)	–	1000 (0.006)	–
Return to electrical home operation				
● Operating speed of return to electrical home operation [r/min]	1000	100 [mm/s]	30	3 [mm/s]
● Acceleration/deceleration rate of return to electrical home operation [ms/(1000 r/min)]	200	0.5 [m/s ²]	100	1 [m/s ²]
● Starting speed of return operation [r/min]	60	6 [mm/s]	30	3 [mm/s]
Manual operation parameter				
● JOG operating speed [r/min]	1000	100 [mm/s]	30	3 [mm/s]
● Acceleration and deceleration rate of JOG operation [ms/(1000 r/min)]	200	0.5 [m/s ²]	100	1 [m/s ²]
● Starting speed of JOG operation [r/min]	60	6 [mm/s]	30	3 [mm/s]
Electronic gear parameter				
● Electronic gear A1	5	–	10	–
● Electronic gear B	3	–	10	–
Operation parameter				
● Motor rotation direction *2	Positive=CW (Moves to opposite the motor side)	–	Positive=CW (Moves to opposite the motor side)	–

*1 The values are the factory setting data or initialized data.

*2 This is the moving direction of the moving part for the in-line motor mounting type. For the parallel motor mounting type, the moving part moves in the opposite direction of the in-line motor mounting type.

● **Lead: 12 mm**

A setting example of the parameter for when setting the minimum travel amount to 0.01 mm is shown below.
 represents parameters to be changed.

Item	Setting example		Initial value *1	
	Setting value	Converted value	Setting value	Converted value
● Lead [mm]	12	–	12	–
● Resolution (Minimum travel amount [mm])	1200 (0.01)	–	1000 (0.012)	–
Return to electrical home operation				
● Operating speed of return to electrical home operation [r/min]	500	100 [mm/s]	30	6 [mm/s]
● Acceleration/deceleration rate of return to electrical home operation [ms/(1000 r/min)]	400	0.5 [m/s ²]	100	2 [m/s ²]
● Starting speed of return operation [r/min]	30	6 [mm/s]	30	6 [mm/s]
Manual operation parameter				
● JOG operating speed [r/min]	500	100 [mm/s]	30	6 [mm/s]
● Acceleration and deceleration rate of JOG operation [ms/(1000 r/min)]	400	0.5 [m/s ²]	100	2 [m/s ²]
● Starting speed of JOG operation [r/min]	30	6 [mm/s]	30	6 [mm/s]
Electronic gear parameter				
● Electronic gear A1	5	–	10	–
● Electronic gear B	6	–	10	–
Operation parameter				
● Motor rotation direction *2	Positive=CW (Moves to opposite the motor side)	–	Positive=CW (Moves to opposite the motor side)	–

*1 The values are the factory setting data or initialized data.

*2 This is the moving direction of the moving part for the in-line motor mounting type. For the parallel motor mounting type, the moving part moves in the opposite direction of the in-line motor mounting type.

- **Lead: 20 mm**

A setting example of the parameter for when setting the minimum travel amount to 0.01 mm is shown below.

represents parameters to be changed.

Item	Setting example		Initial value *	
	Setting value	Converted value	Setting value	Converted value
● Lead [mm]	20	–	20	–
● Resolution (Minimum travel amount [mm])	2000 (0.01)	–	1000 (0.02)	–
Return to electrical home operation				
● Operating speed of return to electrical home operation [r/min]	300	100 [mm/s]	30	10 [mm/s]
● Acceleration/deceleration rate of return to electrical home operation [ms/(1000 r/min)]	166.6	2 [m/s ²]	100	3.33 [m/s ²]
● Starting speed of return operation [r/min]	18	6 [mm/s]	30	10 [mm/s]
Manual operation parameter				
● JOG operating speed [r/min]	300	100 [mm/s]	30	10 [mm/s]
● Acceleration and deceleration rate of JOG operation [ms/(1000 r/min)]	166.6	2 [m/s ²]	100	3.33 [m/s ²]
● Starting speed of JOG operation [r/min]	18	6 [mm/s]	30	10 [mm/s]
Electronic gear parameter				
● Electronic gear A1	1	–	10	–
● Electronic gear B	2	–	10	–
Operation parameter				
● Motor rotation direction	Positive=CW (Moves to opposite the motor side)	–	Positive=CW (Moves to opposite the motor side)	–

* The values are the factory setting data or initialized data.

● **Lead: 30 mm**

A setting example of the parameter for when setting the minimum travel amount to 0.01 mm is shown below.
 represents parameters to be changed.



Danger

- Do not enter the moving range of the motorized actuator while the power is supplied. Doing so may result in serious injury.
- Be sure to provide a safety cage according to EN ISO 13857. Also, touching a table by hand may cause serious injury.
- Operate the data setter outside the safety cage. Failure to do so may result in injury.

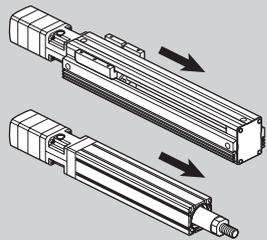
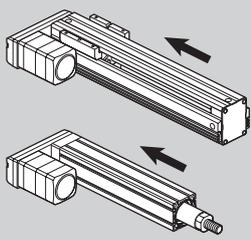
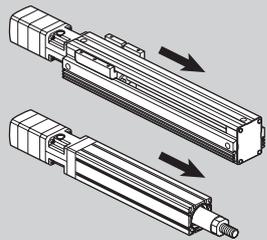
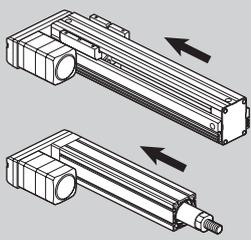
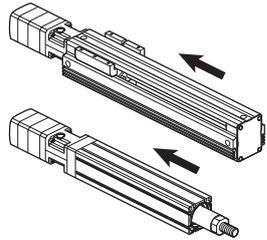
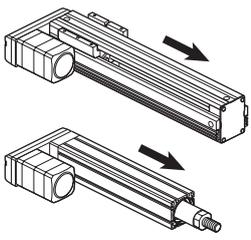
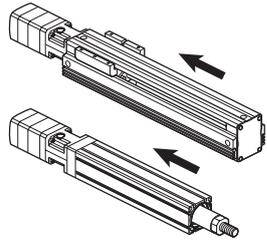
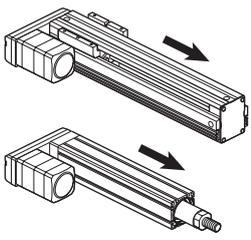
Item	Setting example		Initial value *	
	Setting value	Converted value	Setting value	Converted value
● Lead [mm]	30	–	30	–
● Resolution (Minimum travel amount [mm])	3000 (0.01)	–	1000 (0.03)	–
Return to electrical home operation				
● Operating speed of return to electrical home operation [r/min]	200	100 [mm/s]	30	15 [mm/s]
● Acceleration/deceleration rate of return to electrical home operation [ms/(1000 r/min)]	250	2 [m/s ²]	100	5 [m/s ²]
● Starting speed of return operation [r/min]	12	6 [mm/s]	30	15 [mm/s]
Manual operation parameter				
● JOG operating speed [r/min]	200	100 [mm/s]	30	15 [mm/s]
● Acceleration and deceleration rate of JOG operation [ms/(1000 r/min)]	250	2 [m/s ²]	100	5 [m/s ²]
● Starting speed of JOG operation [r/min]	12	6 [mm/s]	30	15 [mm/s]
Electronic gear parameter				
● Electronic gear A1	1	–	10	–
● Electronic gear B	3	–	10	–
Operation parameter				
● Motor rotation direction	Positive=CW (Moves to opposite the motor side)	–	Positive=CW (Moves to opposite the motor side)	–

* The values are the factory setting data or initialized data.

1-3 Moving direction of the moving part

The moving direction of the moving part varies depending on the setting of the travel amount or the input method of the pulse signal.

Warning Set various parameters such as the resolution and moving direction before operating the motorized actuator. Operating the actuator without setting parameters may cause it to move to unexpected directions or run at unexpected speeds, leading to injury or damage to equipment.

Setting	In-line motor mounting type	Parallel motor mounting type
<p>Operation by setting of parameter When setting the travel amount to the plus (+) side</p>	<p>The table moves to opposite the motor side.</p> 	<p>The table moves to the motor side.</p> 
<p>Operation by pulse signal</p> <ul style="list-style-type: none"> • 2-pulse input mode When inputting the pulse signal to the CW input • 1-pulse input mode When inputting the pulse signal to the PLS input while the DIR input is ON. 		
<p>Operation by setting of parameter When setting the travel amount to the minus (-) side</p>	<p>The table moves to the motor side.</p> 	<p>The table moves to opposite the motor side.</p> 
<p>Operation by pulse signal</p> <ul style="list-style-type: none"> • 2-pulse input mode When inputting the pulse signal to the CCW input. • 1-pulse input mode When inputting the pulse signal to the PLS input while the DIR input is OFF. 		

2 Motorized actuator equipped the AR Series

1-4 Operation setting

When the minimum travel amount, travel amount, operating speed, and acceleration/deceleration speed are set to the driver for the motorized actuator, the following calculation is required. This section explains the motorized linear slide as an example.

Warning Set various parameters such as the resolution and moving direction before operating the motorized actuator. Operating the actuator without setting parameters may cause it to move to unexpected directions or run at unexpected speeds, leading to injury or damage to equipment.

Minimum travel amount

The minimum travel amount can be changed using the driver switch or parameters. (electronic gear A, electronic gear B)

$$\text{Minimum travel amount (mm)} = \frac{\text{Ball screw lead (mm)}}{\text{Motor resolution (P/R)}}$$

$$\text{Motor resolution (P/R)} = 1000 \times (\text{Electronic gear B} \div \text{Electronic gear A})$$



Setting example:

When setting the minimum travel amount to 0.01 mm for 6 mm lead of the motorized linear slide

$$\text{Minimum travel amount (mm)} = \frac{6 \text{ mm}}{\text{Motor resolution (P/R)}} = 0.01 \text{ mm}$$

$$\text{Motor resolution (P/R)} = \frac{6 \text{ mm}}{0.01 \text{ mm}} = 600 \text{ P/R}$$

$$\text{Motor resolution (P/R)} = 1000 \times (\text{Electronic gear B} \div \text{Electronic gear A}) = 600 \text{ P/R}$$

$$\frac{\text{Electronic gear B}}{\text{Electronic gear A}} = \frac{600}{1000} = \frac{3}{5}$$

When setting the minimum travel amount to 0.01 mm, set the electronic gear A to 5 and the electronic gear B to 3.

Lead	Minimum travel amount	Motor resolution	Electronic gear A	Electronic gear B
3 mm	0.01 mm	300 P/R	10	3
6 mm	0.01 mm	600 P/R	5	3
12 mm	0.01 mm	1200 P/R	5	6
20 mm	0.01 mm	2000 P/R	1	2
30 mm	0.01 mm	3000 P/R	1	3

Travel amount

The travel amount is set by number of pulses. For the built-in controller type, the position (step) is used instead of number of pulses.

$$\text{Travel amount (mm)} = \text{Number of pulses (pulse)} \times \text{Minimum travel amount (mm)}$$

Setting example:

When the motorized linear slide which minimum travel amount is set to 0.01 mm is moved by 30 mm

$$\text{Travel amount (mm)} = \text{Number of pulses (pulse)} \times 0.01 \text{ mm} = 30 \text{ mm}$$

$$\text{Number of pulses (pulse)} = \frac{30 \text{ mm}}{0.01 \text{ mm}} = 3000 \text{ pulses}$$

When moving the motorized linear slide by 30 mm, set 3000 pulses.

■ Operating speed

The operating speed is set by the pulse speed. For the built-in controller type, the operating speed (Hz) is used instead of pulse speed.

$$\text{Operating speed (mm/s)} = \text{Pulse speed (Hz)} \times \text{Minimum travel amount (mm)}$$

● Setting example:

When the motorized linear slide which minimum travel amount is set to 0.01 mm is moved at the operating speed of 50 mm/s

$$\text{Operating speed (mm/s)} = \text{Pulse speed (Hz)} \times 0.01 \text{ mm} = 50 \text{ mm/s}$$

$$\text{Pulse speed (Hz)} = \frac{50 \text{ mm/s}}{0.01 \text{ mm}} = 5000 \text{ Hz}$$

When moving the motorized linear slide at the operating speed of 50 mm/s, set 5000 Hz.

■ Acceleration/deceleration speed

The acceleration/deceleration speed is set by any of the acceleration/deceleration rate (ms/kHz), acceleration/deceleration rate [ms/(1000 r/min)] or acceleration/deceleration time (s).

$$\text{Acceleration/deceleration speed (m/s}^2\text{)} = \frac{\text{Minimum travel amount (mm)} \times 1000}{\text{Acceleration/deceleration rate (ms/kHz)}}$$

$$\text{Acceleration/deceleration speed (m/s}^2\text{)} = \frac{\text{Lead (mm)} \times 1000}{60 \times \text{Acceleration/deceleration rate [ms/(1000 r/min)]}}$$

$$\text{Acceleration/deceleration speed (m/s}^2\text{)} = \frac{\text{Operating speed (mm/s)}}{\text{Acceleration/deceleration time (s)}}$$

● Setting example:

When the motorized linear slide which minimum travel amount is set to 0.01 mm is moved at the operating speed of 10 m/s²

$$\text{Acceleration/deceleration speed (m/s}^2\text{)} = \frac{0.01 \text{ mm} \times 1000}{\text{Acceleration/deceleration rate (ms/kHz)}} = 10 \text{ m/s}^2$$

$$\text{Acceleration/deceleration rate (ms/kHz)} = \frac{0.01 \text{ mm} \times 1000}{10 \text{ m/s}^2} = 1 \text{ ms/kHz}$$

When moving the motorized linear slide at the acceleration/deceleration speed of 10 m/s², set 1 ms/kHz.

1-5 Return-to-home operation

Return-to-home is an operation in which the reference point of positioning (home position) is detected. It is executed to return to the home position from the present position when the time of power-on and upon completion of positioning operation.

■ Built-in controller type

For details, refer to the [USER MANUAL](#) of the built-in controller type. Sensor set are available as accessories.

Item	Description	Features
3-sensor mode	The motor operates at the "operating speed of home-seeking." When the ON edge of the HOME sensor is detected, the motor will stop and the stop position will be the home position.	<ul style="list-style-type: none"> • Three external sensors are required. *3 • The operating speed is high. (operating speed of home-seeking)
2-sensor mode	The motor operates at the "starting speed of home-seeking." When the limit sensor is detected, the motor will rotate in the reverse direction and escape from the limit sensor. After escaping from the limit sensor, the motor will move 200 steps and stop, and then the stop position will be the home position. *1	<ul style="list-style-type: none"> • Two external sensors are required. • The operating speed is low. (starting speed of home-seeking)
Push mode *1	The motor operates at the "starting speed of home-seeking." When the moving part for the motor is pressed against a mechanical stopper etc., the motor will rotate in the reverse direction. After reversing, the motor will move 200 steps and stop, and then the stop position will be the home position. *2	<ul style="list-style-type: none"> • No external sensor is required. • The operating speed is low. (starting speed of home-seeking)
Position preset	When executing the P-PRESET at the position that the motor stops, the command position will be the value of the "preset position" parameter. The home position can be set to any position.	<ul style="list-style-type: none"> • No external sensor is required. • The home position can be set to any position.

*1 The offset setting is required according to an actuator.

*2 It moves 200 steps regardless of resolution. Therefore, the actual travel distance may vary according to resolution.

*3 When multiple external sensors cannot be installed, the home position can be detected with a single external sensor. In this case, connect the HOME sensor.

Sensor set (accessories)

Sensor type	Applicable product		
	EAS Series	EZS Series	EZSH Series
NPN sensor	PAES-S-2X, PAES-S-2Y PAES-S-4X, PAES-S-4Y PAES-S-6X, PAES-S-6Y	PAES-S	PAES-S-6EZSH
PNP sensor	PAES-SY-2X, PAES-SY-2Y PAES-SY-4X, PAES-SY-4Y PAES-SY-6X, PAES-SY-6Y	PAES-SY	PAES-SY-6EZSH

■ Pulse input type

For details, refer to the [USER MANUAL](#) of the pulse input type.

Item	Description	Features
Return to electrical home operation	When the RETURN input is turned ON, the motor will start a return to electrical home operation. The electrical home (position) refers to the motor position effective when the driver power is turned on, or the position when the P-RESET input is turned ON.	<ul style="list-style-type: none"> • No external sensor is required. • The home position can be set to any position.

1-6 Push-motion return-to-home operation

Push-motion return-to-home operation can be performed when the built-in controller type is used.

⚠ Caution

- Perform push-motion return-to-home operation in the specification range of the dynamic permissible moment. Failure to do so may result in injury or damage to equipment.
- **EAC Series:**
If push-motion return-to-home operation is performed in the direction opposite the motor side, provide an external mechanism where the rod can press within the effective stroke. Pressing in excess of the effective stroke may result in injury or damage to equipment.

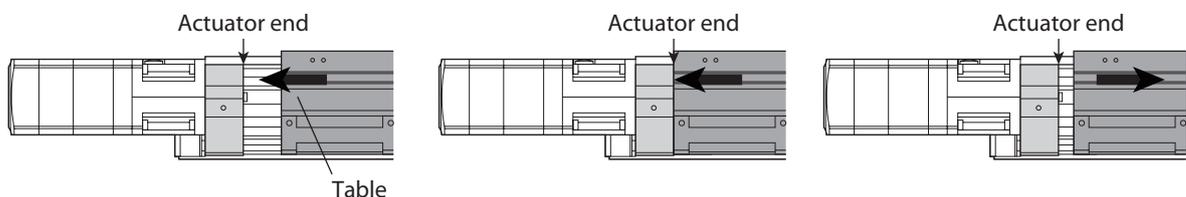
memo

- Set the value of the "position offset of home-seeking" for when performing push-motion operation to be larger than the "distance from the actuator end to the home position." If push-motion return-to-home operation is performed with keeping the initial value (0), the moving part becomes a state of contacting the stop buffer that is installed for the impact buffer, leading to a negative effect on the stopping accuracy of return-to-home.
- Lead 6 mm type products of the **EAS2** or **EAC2** model:
If a load is operated in a vertical direction, perform push-motion return-to-home operation to the downward direction. The home position may vary if you perform it to the upward direction.
- Lead 12 mm type products of the **EAS4**, **EZS4** or **EAC4** model:
If a load is operated in a vertical direction, perform push-motion return-to-home operation to the upward direction with a load mass of 4 kg or less. If the load is exceeded 4 kg, the home position may vary.

■ Movement of push-motion return-to-home operation

If push-motion return-to-home operation is performed with keeping the initial value (0) for the "position offset of home-seeking," the position, where the moving part moves 200 steps in the reverse direction after pressing against the actuator end and stops, will be determined as the home position.

- 1) When push-motion return-to-home operation is performed, the table moves toward the actuator end.
- 2) The table hits the actuator end.
- 3) The table moves 200 steps in the reverse direction and stops.

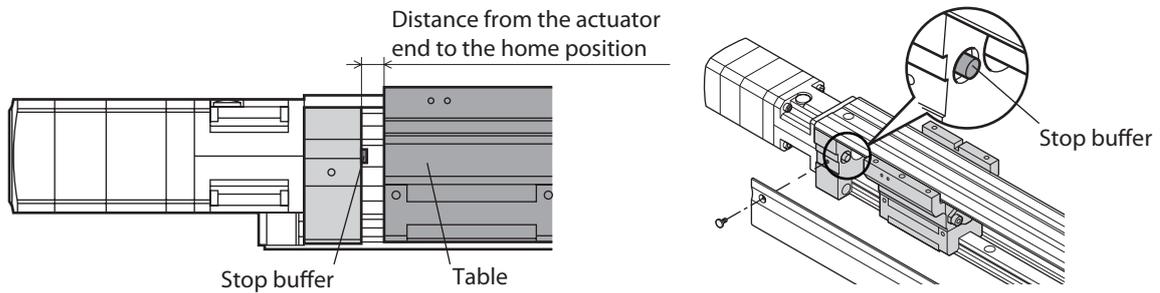


Operation data		Home operation
Home-seeking mode		Push mode
Operating speed of home-seeking [Hz]		1000
Acceleration/deceleration of home-seeking [ms/kHz] or [s]		1.000
Starting speed of home-seeking [Hz]		500
Position offset of home-seeking [step]		0
Starting direction of home-seeking		Positive direction
SLIT detection with home-seeking		Disable
TIM signal detection with home-seeking		Disable
Operating current of home-seeking with push-motion [%]		100.0

The motor moves 200 steps in the reverse direction and stops even if the setting is the initial value (0).

■ Position offset of push-motion return-to-home operation

Set the value of the "position offset of home-seeking" for when performing push-motion operation to be larger than the "distance from the actuator end to the home position." If push-motion return-to-home operation is performed with keeping the initial value (0), the moving part becomes a state of contacting the stop buffer that is installed for the impact buffer, leading to a negative effect on the stopping accuracy of return-to-home.

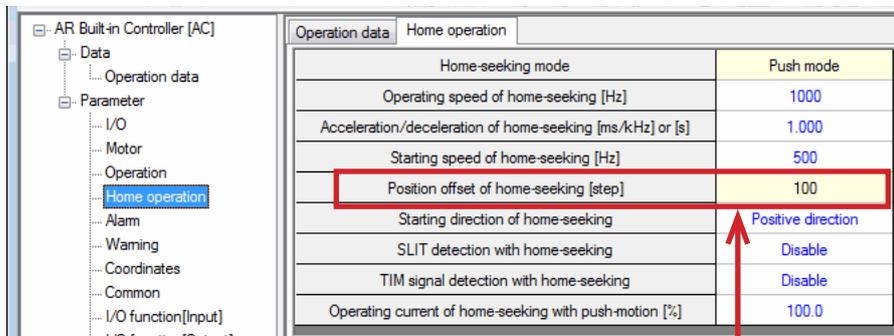


Series	Model	Distance from the actuator end to the home position
EAS	2	4 mm
	4	3 mm
	6	6 mm
EZS	3, 4	3 mm
	6	6 mm
EAC	2, 4, 6	4 mm

Setting example:

When the distance from the actuator end to the home position is set to 3 mm while the minimum travel amount of the motorized linear slide is 0.01 mm

Distance from the actuator end to the home position (mm) = [200 + offset value] (step) × 0.01 mm = 3 mm
Therefore, offset value = 100 step



If the "position offset of home-seeking" is set to 100 steps, the motor moves 300 steps (3 mm) in the reverse direction and stops.

■ Operating speed of push-motion return-to-home operation

The upper limit value for "operating speed of home-seeking" for when performing push-motion operation is as follows.

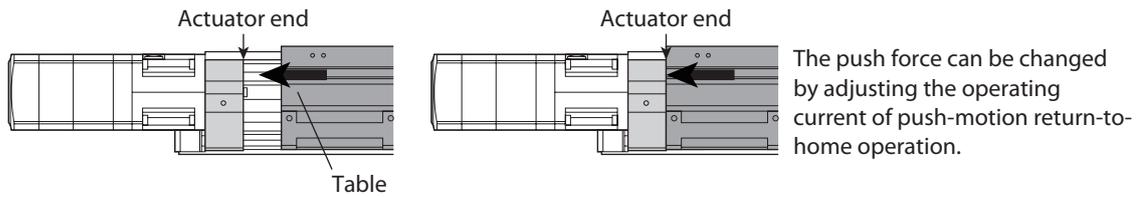
Series	Model	Upper limit of push-motion return-to-home speed
EAS	2	10 mm/s
	4, 6	25 mm/s
EAC	2	10 mm/s
	4, 6	25 mm/s
EZS	3, 4, 6	25 mm/s

■ Setting of the operating current of push-motion return-to-home operation (push force)

When performing push-motion return-to-home operation, you can set the push force to the actuator end using the "operating current of home-seeking with push-motion" parameter. Set according to the recommended value in the table below.

Note Be sure to set the operating current of push-motion return-to-home operation to less than the recommended value. Performing push-motion return-to-home operation with the current value exceeding the recommended value may cause damage to the actuator or equipment. This may also cause deterioration in actuator specification.

- 1) When push-motion return-to-home operation is performed, the table moves toward the actuator end.
- 2) The table hits the actuator end.



● Recommended value for operating current of push-motion return-to-home operation

AC power input type

Series	Model	Lead	Operating current of push-motion return-to-home operation
EAS	4	6 mm, 12 mm	100%
	6	6 mm	55%
		12 mm	85%
EAC	4	6 mm, 12 mm	100%
	6	6 mm	55%
		12 mm	85%
EZS	3, 4	6 mm, 12 mm	100%
	6	6 mm	55%
		12 mm	85%

DC power input type

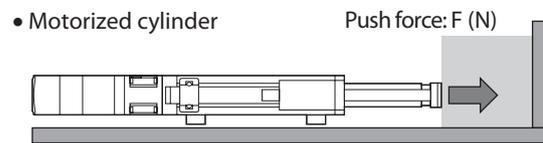
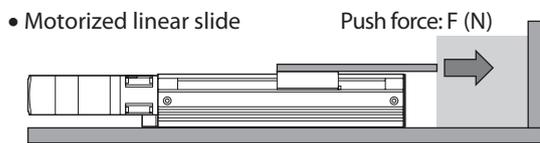
Series	Model	Lead	Operating current of push-motion return-to-home operation
EAS	2	3 mm, 6 mm	100%
	4	6 mm, 12 mm	100%
	6	6 mm	80%
12 mm		100%	
EAC	2	3 mm, 6 mm	100%
	4	6 mm, 12 mm	100%
	6	6 mm	80%
12 mm		100%	
EZS	3, 4	6 mm, 12 mm	100%
	6	6 mm	80%
		12 mm	100%

Home operation	
Home-seeking mode	Push mode
Operating speed of home-seeking [Hz]	1000
Acceleration/deceleration of home-seeking [ms/kHz] or [s]	1.000
Starting speed of home-seeking [Hz]	500
Position offset of home-seeking [step]	100
Starting direction of home-seeking	Positive direction
SLIT detection with home-seeking	Disable
TIM signal detection with home-seeking	Disable
Operating current of home-seeking with push-motion [%]	85.0

1-7 Push-motion operation

The push force for push-motion operation is set using the push current.

Note Be sure to set the push current so that the upper limit value is not exceeded. Performing push-motion operation with the current value exceeding the upper limit value may cause damage to the actuator or equipment. This may also cause deterioration in actuator specification.



Series	Model	Lead	Maximum push force
EAS EAC	2	3 mm	80 N
		6 mm	40 N
	4	6 mm	200 N
		12 mm	100 N
EVS	3, 4	6 mm	200 N
		12 mm	100 N
	6	6 mm	500 N
		12 mm	400 N
EZSH	6	10 mm	450 N
		20 mm	270 N

Home operation					
	Operation mode	Position [step]	Operating speed [Hz]	Operation function	Push current [%]
#0	Incremental (INC)	0	1000	Single-motion	20.0
#1	Incremental (INC)	0	1000	Single-motion	20.0
#2	Incremental (INC)	0	1000	Single-motion	20.0
#3	Incremental (INC)	0	1000	Single-motion	20.0
#4	Incremental (INC)	0	1000	Single-motion	20.0
#5	Incremental (INC)	0	1000	Single-motion	20.0
#6	Incremental (INC)	0	1000	Single-motion	20.0

1-8 Current setting of push-motion operation

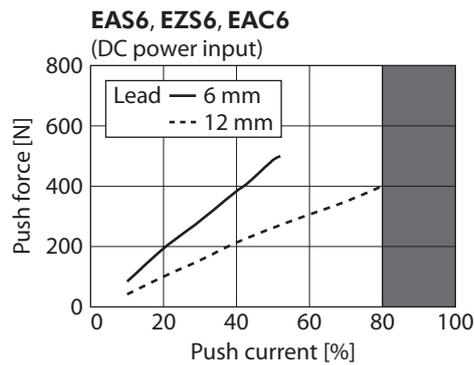
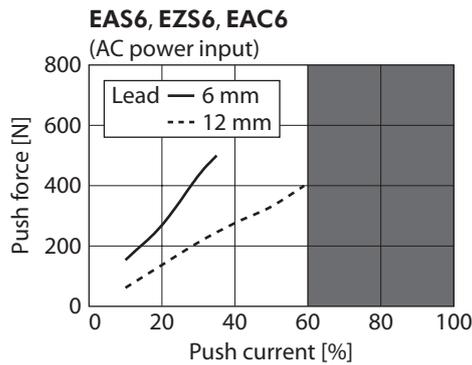
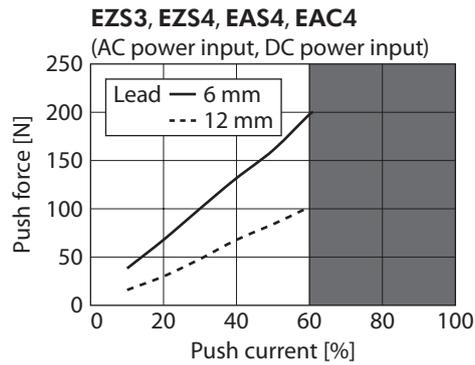
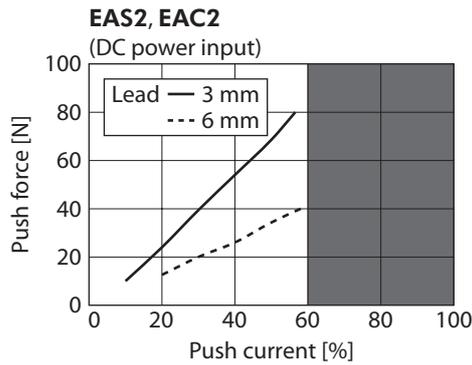
The reference value of the push current is shown below. Check the actual push force using the product.



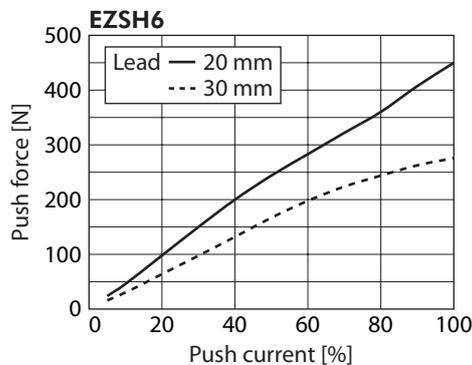
The relationship between the push force and push current varies depending on the following conditions. Check the actual push force using the equipment.

- Installation condition of the actuator (horizontal direction installation, vertical direction installation)
- Type of the motorized cylinder (motorized cylinder without a guided-shaft or with guided-shafts, stroke)
- Customer's load condition such as jig

- **Measurement result of the push force when the EAS/EZS/EAC Series is operated in the horizontal direction (average value)**



- **Measurement result of the push force when the EZSH Series is operated in the horizontal direction (average value)**



2 Motorized actuator equipped the AR Series

■ Push speed

The upper limit value of the push speed is shown below.

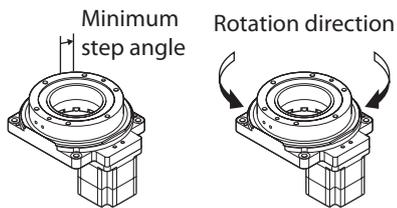
Series	Model	Upper limit of push speed
EAS	2	10 mm/s
	4, 6	25 mm/s
EAC	2	10 mm/s
	4, 6	25 mm/s
EZS	3, 4, 6	25 mm/s
EZSH	6	25 mm/s

2 Setting of the hollow rotary actuator

This chapter explains the parameters and operation functions of the hollow rotary actuator. (Hereinafter described as motorized actuator)

2-1 Setting flow

- 1 Install a motorized actuator.
- 2 Install and connect a driver.
- 3 Set parameters for the driver. (It is explained in this part.)



Coordinates parameter	
• Electronic gear A	5
• Electronic gear B	1
• Motor rotation direction	Positive direction=CCW

- 4 Completion of setting

2-2 Parameter setting list

■ Built-in controller type

A setting example of the parameter for when setting the minimum step angle to 0.1° is shown below.

■ represents parameters to be changed.

Item	Setting example		Initial value *	
	Setting value	Converted value	Setting value	Converted value
• Step angle per revolution [°]	360	–	360	–
• Resolution of output table (minimum step angle [°])	3600 (0.1)	–	18000 (0.02)	–
• Gear reduction ratio of output table	18	–	18	–
Operation parameter				
• JOG operating speed [Hz]	1000	100 [deg/s]	1000	20 [deg/s]
• Acceleration/deceleration rate of JOG [ms/kHz]	1	–	1	–
• JOG starting speed [Hz]	500	50 [deg/s]	500	10 [deg/s]
Home operation parameter				
• Home-seeking mode	3-sensor mode	–	3-sensor mode	–
• Operating speed of home-seeking [Hz]	1000	100 [deg/s]	1000	20 [deg/s]
• Acceleration/deceleration of home-seeking [ms/kHz]	1	–	1	–
• Starting speed of home-seeking [Hz]	500	50 [deg/s]	500	10 [deg/s]
Coordinates parameter				
• Electronic gear A	5	–	1	–
• Electronic gear B	1	–	1	–
• Motor rotation direction	Positive direction=CCW	–	Positive direction=CW	–

* The values are the factory setting data or initialized data.

■ Pulse input type

A setting example of the parameter for when setting the minimum step angle to 0.1° is shown below.

□ represents parameters to be changed.

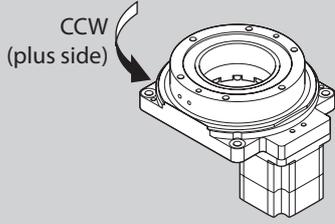
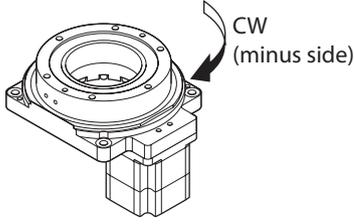
Item	Setting example		Initial value *	
	Setting value	Converted value	Setting value	Converted value
• Step angle per revolution [°]	360	–	360	–
• Resolution of output table (minimum step angle [°])	3600 (0.1)	–	18000 (0.02)	–
• Gear reduction ratio of output table	18	–	18	–
Manual operation parameter				
• JOG operating speed [r/min]	30	10 [deg/s]	30	10 [deg/s]
• Acceleration and deceleration rate of JOG operation [ms/(1000r/min)]	100	–	100	–
• Starting speed of JOG operation [r/min]	30	10 [deg/s]	30	10 [deg/s]
Electronic gear parameter				
• Electronic gear A1	5	–	10	–
• Electronic gear B	1	–	10	–
Operation parameter				
• Motor rotation direction	Positive direction=CCW	–	Positive direction=CW	–

* The values are the factory setting data or initialized data.

2-3 Rotation direction of output table

The rotation direction of the output table varies depending on the setting of the travel amount or the input method of the pulse signal.

Warning Set various parameters such as the resolution and moving direction before operating the motorized actuator. Operating the motorized actuator without setting parameters may cause it to move to unexpected directions or run at unexpected speeds, leading to injury or damage to equipment.

Setting	Rotation direction of output table
Operation by setting of parameter When setting the step angle to the plus (+) side	
Operation by pulse signal <ul style="list-style-type: none"> • 2-pulse input mode When inputting the pulse signal to the CW input • 1-pulse input mode When inputting the pulse signal to the PLS input while the DIR input is ON. 	
Operation by setting of parameter When setting the step angle to the minus (-) side	
Operation by pulse signal <ul style="list-style-type: none"> • 2-pulse input mode When inputting the pulse signal to the CCW input. • 1-pulse input mode When inputting the pulse signal to the PLS input while the DIR input is OFF. 	

2-4 Operation setting

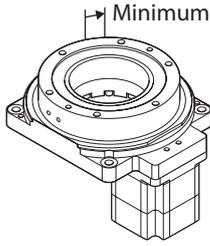
The factory setting of the minimum step angle is 0.02° (the resolution of the output table is 18000). The minimum step angle can be set using the resolution switches of the driver or parameters. (electronic gear A, electronic gear B) Refer to the USER MANUAL for how to set the resolution using the electronic gears.

Setting example (common to drivers of the built-in controller type and pulse input type)

	Output table		Motor		Setting example for MEXE02	
	Minimum step angle	Resolution	Minimum step angle	Resolution	Electronic gear A	Electronic gear B
Initial value	0.02°	18000 P/R	0.36°	1000 P/R	The setting is not required.	
Resolution switches *	0.04°	9000 P/R	0.72°	500 P/R		
	0.004°	90000 P/R	0.072°	5000 P/R		
	0.002°	180000 P/R	0.036°	10000 P/R		
Setting example	0.01°	36000 P/R	0.18°	2000 P/R	1	2
	0.1°	3600 P/R	1.8°	200 P/R	5	1

* This is only available to the pulse input type driver.

The calculation formula of the resolution using the electronic gears is as follows.

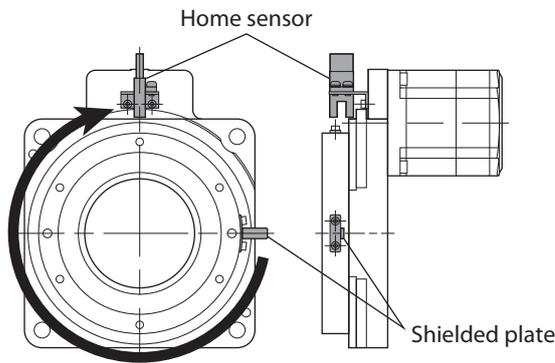


$$\begin{aligned} &\text{Minimum step angle of output table (}^\circ\text{)} \\ &= \frac{360^\circ}{18 (\text{Gear ratio}) \times 1000 \times (\text{Electronic gear B} \div \text{Electronic gear A})} = 0.1^\circ \\ &\frac{\text{Electronic gear B}}{\text{Electronic gear A}} = \frac{1}{5} \end{aligned}$$

When setting the minimum step angle of the output table to 0.1°, set the electronic gear A to 5 and the electronic gear B to 1.

2-5 Return-to-home operation

With the built-in controller type driver, return-to-home operation can be performed using a sensor installed externally. Set the "home-seeking mode" parameter to 3-sensors mode to start return-to-home operation. In addition, the high accuracy home detection is possible using the SLIT input and/or TIM signal. Home sensor set are available as accessories. Refer to page 36.



AR Built-in Controller [AC]	
Data	
Parameter	
Home operation	
Home-seeking mode	3-sensor mode
Operating speed of home-seeking [Hz]	1000
Acceleration/deceleration of home-seeking [ms/kHz] or [s]	1.000
Starting speed of home-seeking [Hz]	500
Position offset of home-seeking [step]	0
Starting direction of home-seeking	Positive direction
SLIT detection with home-seeking	Effective
TIM signal detection with home-seeking	Effective
Operating current of home-seeking with push-motion [%]	100.0

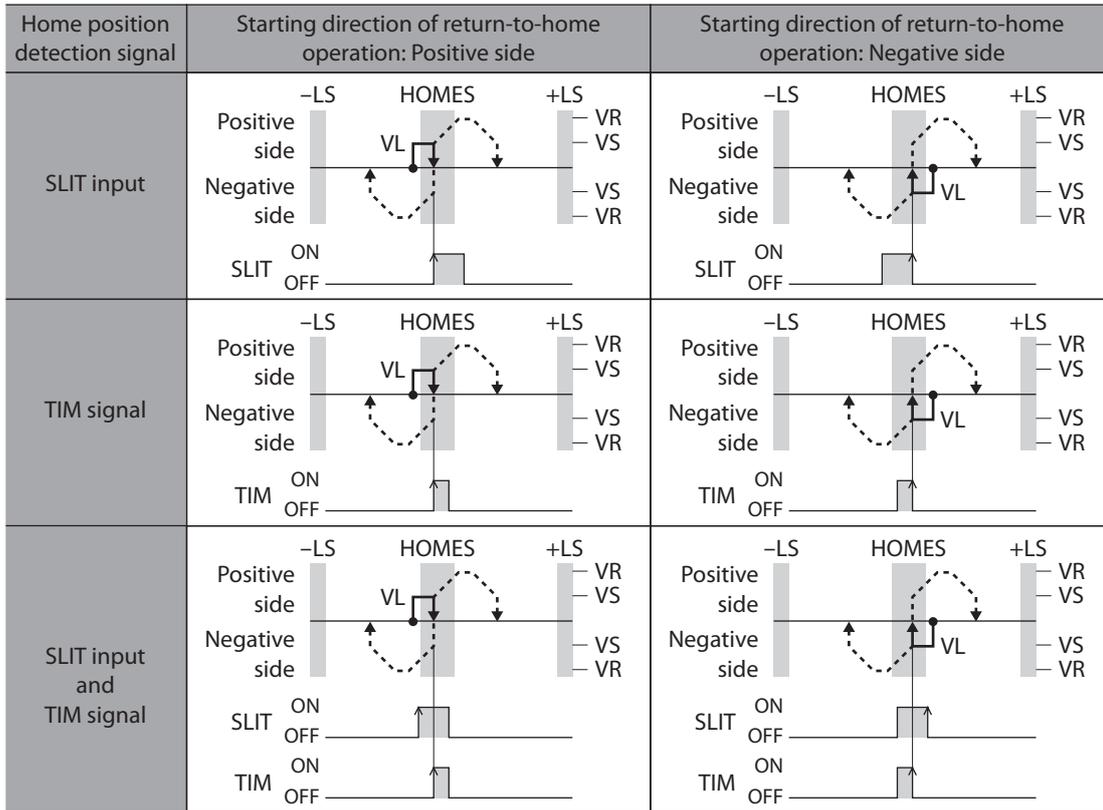
2 Motorized actuator equipped the AR Series

■ When concurrently using the SLIT input and/or TIM signal

With the ON edge of the HOME sensor (home position) is detected, the operation is continued until the external signal (SLIT input or TIM signal) is detected. The return-to-home operation will be complete when the external signal (SLIT input or TIM signal) is detected while the HOME sensor is being ON.

● Operation sequence (3-sensor mode)

- Explanation of alphabetical code
 VS: Starting speed of home-seeking
 VR: Operating speed of home-seeking
 VL: Last speed of return-to-home (When VS < 500 Hz: VS, When VS ≥ 500 Hz: 500 Hz)
 --- Broken line indicates a home offset move.



■ Home sensor set (accessories)

Sensor type	Applicable product	
	DG60	DG85R DG130R DG200R
NPN sensor	PADG-SA	PADG-SB
PNP sensor	PADG-SAY	PADG-SBY

3 Motorized actuator equipped the AZ Series

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1 Setting of the motorized linear slide, motorized cylinder and compact linear actuators

This chapter explains the parameters and operation functions of the motorized linear slide, motorized cylinder and compact linear actuators. (Hereinafter described as motorized actuator)

Parameters and operation data are set using the **MEXE02**. Note that the **OPX-2A** cannot be used to set the data.

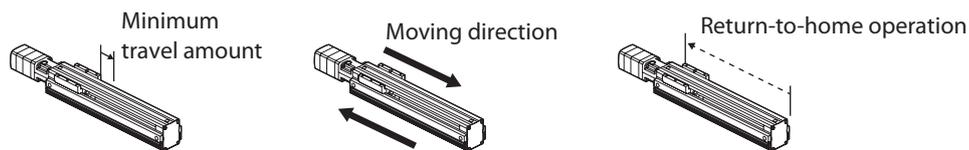
1-1 Setting flow

1 Install a motorized actuator.

2 Install and connect a driver.

3 Start the **MEXE02**.

4 Parameters of the driver have been set to the ABZO sensor at the time of shipment.



The operation data for the motorized actuator equipped the **AZ** Series is set on the millimeter unit.
The factory setting of the minimum travel amount is 0.01 mm.
(For the compact linear actuator, it is 0.001 mm.)

5 Copy the fixed value of the ABZO sensor to the driver.

Using the **MEXE02**, match the fixed value of the ABZO sensor and the setting value of the driver parameter.

6 Create the recovery data file.

Using the **MEXE02**, create the recovery data file saved the factory setting.

7 Set the software limit when no sensor is used.

8 Check the movement of the motorized actuator.

Using the "Teaching, remote operation" of the **MEXE02**, check the movement of the motorized actuator.

9 Save the set data.

1-2 Creating the recovery data file

The recovery data file represents a file saved the factory setting of the product.
Create the recovery data file initially in case of replacing the product for maintenance or product damage.
Save the recovery data file in a PC as a data file.
Refer to the **AZ Series** [Function Edition](#) for details.



- Be sure to create the recovery data file when the motorized actuator is used.
- Be sure to create the recovery data file before the motorized actuator is installed in equipment.

■ Motor for maintenance

The actuator model name indicated on the actuator nameplate and the corresponding motor model name for replacement are as follows.

Contact your nearest Oriental Motor office when purchasing.

● AC power input type

Motorized actuator model	Motor model
EASM40000000AZAC	AZM46AC
EASM40000000AZMC	AZM46MC
EASM60000000AZAC	AZM66AC
EASM60000000AZMC	AZM66MC
EACM40000000AZAC-O	AZM46AC
EACM40000000AZMC-O	AZM46MC
EACM60000000AZAC-O	AZM66AC
EACM60000000AZMC-O	AZM66MC
EZSM30000000AZAC	AZM46AC
EZSM30000000AZMC	AZM46MC
EZSM40000000AZAC	AZM46AC
EZSM40000000AZMC	AZM46MC
EZSM60000000AZAC	AZM66AC
EZSM60000000AZMC	AZM66MC
EZSHM60000000AZAC	AZM66AC
EZSHM60000000AZMC	AZM66MC

● DC power input type

Motorized actuator model	Motor model
EASM20000000AZAK	AZM24AK
EASM40000000AZAK	AZM46AK
EASM40000000AZMK	AZM46MK
EASM60000000AZAK	AZM66AK
EASM60000000AZMK	AZM66MK
EACM20000000AZAK-O	AZM24AK
EACM40000000AZAK-O	AZM46AK
EACM40000000AZMK-O	AZM46MK
EACM60000000AZAK-O	AZM66AK
EACM60000000AZMK-O	AZM66MK
EZSM30000000AZAK	AZM46AK
EZSM30000000AZMK	AZM46MK
EZSM40000000AZAK	AZM46AK
EZSM40000000AZMK	AZM46MK
EZSM60000000AZAK	AZM66AK
EZSM60000000AZMK	AZM66MK

1-3 Parameter setting list

Parameters for the motorized actuator are set as follows at the time of shipment.



- In the case of the motorized actuator of the DC power input type, the operating speed may not reach the maximum speed depending on the ambient temperature or motor cable length.
- In the case of the pulse input type driver, use the function setting switch in the state of the factory setting. If it is changed, the actuator operates with a certain number of resolution since the ABZO setting of the motor does not apply to the driver.
- AC power input type products of the **EAS6**, **EZS6**, **EZSH6** or **EAC6** model;
If a load is operated in a vertical direction, an overvoltage alarm may generate depending on the driving condition. If the alarm was detected, review the operating condition or use an accessory regeneration unit.
- **DRS2** Series non-guide type:
Set the home position before operating.

■ Lead: 2 mm

Item	DRS2 Series factory setting	
• Lead [mm]	2	
• Minimum travel amount [mm] (Resolution)	0.001 (2000)	
Motor & Mechanism parameter		
• Mechanism settings	Prioritize ABZO setting *	
• Electronic gear A	1	
• Electronic gear B	2	
• Motor rotation direction	Positive direction=CW	
• Mechanism type	mm	step
• Mechanism lead pitch [mm]	2	
• (JOG) Operating speed	2 [mm/s]	2000 [Hz]
• (JOG) Acceleration/deceleration rate	0.4 [m/s ²]	400 [kHz/s]
• (JOG) Starting speed	0.4 [mm/s]	400 [Hz]
• (JOG) Operating speed (high)	10 [mm/s]	10 [kHz]
• (ZHOME) Operation speed	10 [mm/s]	10 [kHz]
• (ZHOME) Acceleration/deceleration rate	0.4 [m/s ²]	400 [kHz/s]
• (ZHOME) Starting speed	0.4 [mm/s]	400 [Hz]
• (HOME) Home-seeking mode	Push	
• (HOME) Starting direction	Negative direction	
• (HOME) Acceleration/deceleration rate	0.4 [m/s ²]	400 [kHz/s]
• (HOME) Starting speed	0.4 [mm/s]	400 [Hz]
• (HOME) Operating speed	6 [mm/s]	6 [kHz]
• (HOME) Last speed	0.4 [mm/s]	400 [Hz]
• (HOME) Backward steps in 2 sensor home-seeking	0.4 [mm]	400 [step]
• (HOME) Operating amount in uni-directional home-seeking	0.4 [mm]	400 [step]
• (HOME) Operating current for push motion home-seeking	55 [%]	
• (HOME) Backward steps after first entry in push motion home-seeking	DRSM42	1 [mm] 1000 [step]
Mechanism limit parameter		
• Mechanism limit (distance from F home position) positive direction	With guided-shaft	41 [mm] 41000 [step]
	Without guided-shaft	Disable
• Mechanism limit (distance from F home position) negative direction	With guided-shaft	-1 [mm] -1000 [step]
	Without guided-shaft	Disable

Item	DRS2 Series factory setting	
Mechanism protection parameter		
• Maximum starting speed	6 [mm/s]	6 [kHz]
• Maximum operating speed	50 [mm/s]	50 [kHz]
• Maximum pushing speed	6 [mm/s]	6 [kHz]
• Maximum pushing return-to-home speed	6 [mm/s]	6 [kHz]
• Maximum push current	55 [%]	

* When changing the factory setting of parameter items, change the setting for the "Mechanism settings" and "JOG/HOME/ZHOME operation setting" to "Manual setting."

■ Lead: 3 mm

Item		EAS/EZS/EAC Series factory setting	Standard/geared motor for maintenance (When replacing the motor)
• Lead [mm]		3	–
• Minimum travel amount [mm] (Resolution)		0.01 (300)	0.003 (1000)
Base setting parameter			
• Electronic damper function		Effective (for motorized linear slide)	Effective (for standard/geared motor)
Motor & Mechanism parameter			
• Mechanism settings		Prioritize ABZO setting *1	Manual setting
• Electronic gear A		10	1
• Electronic gear B		3	1
• Motor rotation direction	In-line motor mounting type	CW	CW
• Mechanism type		mm	step
• Mechanism lead pitch [mm]		3	1
• JOG/HOME/ZHOME operation setting		Prioritize ABZO setting *1	Manual setting
• (JOG) Operating speed		10 [mm/s]	1000 [Hz]
• (JOG) Acceleration/deceleration rate		0.5 [m/s ²]	1000 [kHz/s]
• (JOG) Starting speed		5 [mm/s]	500 [Hz]
• (JOG) Operating speed (high)		50 [mm/s]	5000 [Hz]
• (ZHOME) Operation speed		50 [mm/s]	5000 [Hz]
• (ZHOME) Acceleration/deceleration rate		0.5 [m/s ²]	1000 [kHz/s]
• (ZHOME) Starting speed		5 [mm/s]	500 [Hz]
• (HOME) Home-seeking mode		Push	3 sensors
• (HOME) Starting direction	In-line motor mounting type	Negative direction	Positive direction
• (HOME) Acceleration/deceleration rate		0.5 [m/s ²]	1000 [kHz/s]
• (HOME) Starting speed		5 [mm/s]	500 [Hz]
• (HOME) Operating speed		50 [mm/s]	5000 [Hz]
• (HOME) Last speed		5 [mm/s]	500 [Hz]
• (HOME) Backward steps in 2 sensor home-seeking		5 [mm]	500 [step]
• (HOME) Operating amount in uni-directional home-seeking		5 [mm]	500 [step]
• (HOME) Operating current for push motion home-seeking		This item has been set for each model.	100 [%]
• (HOME) Backward steps after first entry in push motion home-seeking	EAS2, EAC2	4 [mm]	500 [step]

Item	EAS/EZS/EAC Series factory setting	Standard/geared motor for maintenance (When replacing the motor)
Mechanism protection parameter *2		
• Maximum starting speed	50 [mm/s]	4,000,000 [Hz]
• Maximum operating speed	150 [mm/s]	4,000,000 [Hz]
• Maximum pushing speed	25 [mm/s]	4,000,000 [Hz]
• Maximum pushing return-to-home speed	50 [mm/s]	4,000,000 [Hz]
• Maximum push current	This item has been set for each model.	100 [%]

*1 When changing the factory setting of parameter items, change the setting for the “Mechanism settings” and “JOG/ HOME/ZHOME operation setting” to “Manual setting.”

*2 Mechanism protection parameters cannot be set by customers.

■ Lead: 4 mm

Item	DRS2 Series factory setting	
• Lead [mm]	4	
• Minimum travel amount [mm] (Resolution)	0.001 (4000)	
Motor & Mechanism parameter		
• Mechanism settings	Prioritize ABZO setting *	
• Electronic gear A	1	
• Electronic gear B	4	
• Motor rotation direction	Positive direction=CW	
• Mechanism type	mm	step
• Mechanism lead pitch [mm]	4	
• (JOG) Operating speed	2 [mm/s]	2000 [Hz]
• (JOG) Acceleration/deceleration rate	0.4 [m/s ²]	400 [kHz/s]
• (JOG) Starting speed	0.8 [mm/s]	800 [Hz]
• (JOG) Operating speed (high)	10 [mm/s]	10 [kHz]
• (ZHOME) Operation speed	10 [mm/s]	10 [kHz]
• (ZHOME) Acceleration/deceleration rate	0.4 [m/s ²]	400 [kHz/s]
• (ZHOME) Starting speed	0.8 [mm/s]	800 [Hz]
• (HOME) Home-seeking mode	Push	
• (HOME) Starting direction	Negative direction	
• (HOME) Acceleration/deceleration rate	0.4 [m/s ²]	400 [kHz/s]
• (HOME) Starting speed	0.8 [mm/s]	800 [Hz]
• (HOME) Operating speed	6 [mm/s]	6 [kHz]
• (HOME) Last speed	1 [mm/s]	1000 [Hz]
• (HOME) Backward steps in 2 sensor home-seeking	0.5 [mm]	500 [step]
• (HOME) Operating amount in uni-directional home-seeking	0.5 [mm]	500 [step]
• (HOME) Operating current for push motion home-seeking	75 [%]	
• (HOME) Backward steps after first entry in push motion home-seeking	DRSM60	1.6 [mm] 1600 [step]
Mechanism limit parameter		
• Mechanism limit (distance from F home position) positive direction	Disable	
• Mechanism limit (distance from F home position) negative direction	Disable	

Item	DRS2 Series factory setting	
Mechanism protection parameter		
• Maximum starting speed	6 [mm/s]	6 [kHz]
• Maximum operating speed	50 [mm/s]	50 [kHz]
• Maximum pushing speed	6 [mm/s]	6 [kHz]
• Maximum pushing return-to-home speed	6 [mm/s]	6 [kHz]
• Maximum push current	45 [%]	

* When changing the factory setting of parameter items, change the setting for the “Mechanism settings” and “JOG/HOME/ZHOME operation setting” to “Manual setting.”

■ Lead: 6 mm

Item		EAS/EZS/EAC Series factory setting	Standard/geared motor for maintenance (When replacing the motor)
• Lead [mm]		6	–
• Minimum travel amount [mm] (Resolution)		0.01 (600)	0.006 (1000)
Base setting parameter			
• Electronic damper function		Effective (for motorized linear slide)	Effective (for standard/geared motor)
Motor & Mechanism parameter			
• Mechanism settings		Prioritize ABZO setting *1	Manual setting
• Electronic gear A		5	1
• Electronic gear B		3	1
• Motor rotation direction	In-line motor mounting type	CW	CW
	Parallel motor mounting type	CCW	
• Mechanism type		mm	step
• Mechanism lead pitch [mm]		6	1
• JOG/HOME/ZHOME operation setting		Prioritize ABZO setting *1	Manual setting
• (JOG) Operating speed		10 [mm/s]	1000 [Hz]
• (JOG) Acceleration/deceleration rate		0.5 [m/s ²]	1000 [kHz/s]
• (JOG) Starting speed		5 [mm/s]	500 [Hz]
• (JOG) Operating speed (high)		50 [mm/s]	5000 [Hz]
• (ZHOME) Operation speed		50 [mm/s]	5000 [Hz]
• (ZHOME) Acceleration/deceleration rate		0.5 [m/s ²]	1000 [kHz/s]
• (ZHOME) Starting speed		5 [mm/s]	500 [Hz]
• (HOME) Home-seeking mode		Push	3 sensors
• (HOME) Starting direction	In-line motor mounting type	Negative direction	Positive direction
	Parallel motor mounting type	Negative direction	
• (HOME) Acceleration/deceleration rate		0.5 [m/s ²]	1000 [kHz/s]
• (HOME) Starting speed		5 [mm/s]	500 [Hz]
• (HOME) Operating speed		50 [mm/s]	5000 [Hz]
• (HOME) Last speed		5 [mm/s]	500 [Hz]
• (HOME) Backward steps in 2 sensor home-seeking		5 [mm]	500 [step]
• (HOME) Operating amount in uni-directional home-seeking		5 [mm]	500 [step]

Item		EAS/EZS/EAC Series factory setting	Standard/geared motor for maintenance (When replacing the motor)
• (HOME) Operating current for push motion home-seeking		This item has been set for each model.	100 [%]
• (HOME) Backward steps after first entry in push motion home-seeking	EAS4, EZS3, EZS4	3 [mm]	500 [step]
	EAS6, EZS6	6 [mm]	
	EAS2, EAC2 EAC4, EAC6	4 [mm]	
Mechanism protection parameter *2			
• Maximum starting speed		100 [mm/s]	4,000,000 [Hz]
• Maximum operating speed		This item has been set for each model.	4,000,000 [Hz]
• Maximum pushing speed		25 [mm/s]	4,000,000 [Hz]
• Maximum pushing return-to-home speed		50 [mm/s]	4,000,000 [Hz]
• Maximum push current		This item has been set for each model.	100 [%]

*1 When changing the factory setting of parameter items, change the setting for the “Mechanism settings” and “JOG/ HOME/ZHOME operation setting” to “Manual setting.”

*2 Mechanism protection parameters cannot be set by customers.

■ Lead: 8 mm

Item	DRS2 Series factory setting	
• Lead [mm]	8	
• Minimum travel amount [mm] (Resolution)	0.001 (8000)	
Motor & Mechanism parameter		
• Mechanism settings	Prioritize ABZO setting *	
• Electronic gear A	1	
• Electronic gear B	8	
• Motor rotation direction	Positive direction=CW	
• Mechanism type	mm	step
• Mechanism lead pitch [mm]	8	
• (JOG) Operating speed	2 [mm/s]	2000 [Hz]
• (JOG) Acceleration/deceleration rate	0.4 [m/s ²]	400 [kHz/s]
• (JOG) Starting speed	0.4 [mm/s]	400 [Hz]
• (JOG) Operating speed (high)	10 [mm/s]	10 [kHz]
• (ZHOME) Operation speed	10 [mm/s]	10 [kHz]
• (ZHOME) Acceleration/deceleration rate	0.4 [m/s ²]	400 [kHz/s]
• (ZHOME) Starting speed	0.4 [mm/s]	400 [Hz]
• (HOME) Home-seeking mode	Push	
• (HOME) Starting direction	Negative direction	
• (HOME) Acceleration/deceleration rate	0.4 [m/s ²]	400 [kHz/s]
• (HOME) Starting speed	0.4 [mm/s]	400 [Hz]
• (HOME) Operating speed	6 [mm/s]	6 [kHz]
• (HOME) Last speed	0.4 [mm/s]	400 [Hz]
• (HOME) Backward steps in 2 sensor home-seeking	0.4 [mm]	400 [step]
• (HOME) Operating amount in uni-directional home-seeking	0.4 [mm]	400 [step]
• (HOME) Operating current for push motion home-seeking	65 [%]	
• (HOME) Backward steps after first entry in push motion home-seeking	DRSM42	1 [mm] 1000 [step]

Item		DRS2 Series factory setting	
Mechanism limit parameter			
• Mechanism limit (distance from F home position) positive direction	With guided-shaft	41 [mm]	41000 [step]
	Without guided-shaft	Disable	
• Mechanism limit (distance from F home position) negative direction	With guided-shaft	-1 [mm]	-1000 [step]
	Without guided-shaft	Disable	
Mechanism protection parameter			
• Maximum starting speed		6 [mm/s]	6 [kHz]
• Maximum operating speed		200 [mm/s]	200 [kHz]
• Maximum pushing speed		6 [mm/s]	6 [kHz]
• Maximum pushing return-to-home speed		6 [mm/s]	6 [kHz]
• Maximum push current		65 [%]	

* When changing the factory setting of parameter items, change the setting for the "Mechanism settings" and "JOG/HOME/ZHOME operation setting" to "Manual setting."

■ Lead: 12 mm

Item		EAS/EZS/EAC Series factory setting	Standard/geared motor for maintenance (When replacing the motor)
• Lead [mm]		12	-
• Minimum travel amount [mm] (Resolution)		0.01 (1200)	0.012 (1000)
Base setting parameter			
• Electronic damper function		Effective (for motorized linear slide)	Effective (for standard/geared motor)
Motor & Mechanism parameter			
• Mechanism settings		Prioritize ABZO setting *1	Manual setting
• Electronic gear A		5	1
• Electronic gear B		6	1
• Motor rotation direction	In-line motor mounting type	CW	CW
	Parallel motor mounting type	CCW	
• Mechanism type		mm	step
• Mechanism lead pitch [mm]		12	1
• JOG/HOME/ZHOME operation setting		Prioritize ABZO setting *1	Manual setting
• (JOG) Operating speed		10 [mm/s]	1000 [Hz]
• (JOG) Acceleration/deceleration rate		0.5 [m/s ²]	1000 [kHz/s]
• (JOG) Starting speed		5 [mm/s]	500 [Hz]
• (JOG) Operating speed (high)		50 [mm/s]	5000 [Hz]
• (ZHOME) Operation speed		100 [mm/s]	5000 [Hz]
• (ZHOME) Acceleration/deceleration rate		0.5 [m/s ²]	1000 [kHz/s]
• (ZHOME) Starting speed		5 [mm/s]	500 [Hz]
• (HOME) Home-seeking mode		Push	3 sensors
• (HOME) Starting direction	In-line motor mounting type	Negative direction	Positive direction
	Parallel motor mounting type	Negative direction	
• (HOME) Acceleration/deceleration rate		0.5 [m/s ²]	1000 [kHz/s]
• (HOME) Starting speed		5 [mm/s]	500 [Hz]
• (HOME) Operating speed		100 [mm/s]	5000 [Hz]

Item	EAS/EZS/EAC Series factory setting	Standard/geared motor for maintenance (When replacing the motor)
• (HOME) Last speed	5 [mm/s]	500 [Hz]
• (HOME) Backward steps in 2 sensor home-seeking	5 [mm]	500 [step]
• (HOME) Operating amount in uni-directional home-seeking	5 [mm]	500 [step]
• (HOME) Operating current for push motion home-seeking	This item has been set for each model.	100 [%]
• (HOME) Backward steps after first entry in push motion home-seeking	EAS4, EZS3, EZS4	3 [mm]
	EAS6, EZS6	6 [mm]
	EAC4, EAC6	4 [mm]
Mechanism protection parameter *2		
• Maximum starting speed	200 [mm/s]	4,000,000 [Hz]
• Maximum operating speed	This item has been set for each model.	4,000,000 [Hz]
• Maximum pushing speed	25 [mm/s]	4,000,000 [Hz]
• Maximum pushing return-to-home speed	100 [mm/s]	4,000,000 [Hz]
• Maximum push current	This item has been set for each model.	100 [%]

*1 When changing the factory setting of parameter items, change the setting for the "Mechanism settings" and "JOG/HOME/ZHOME operation setting" to "Manual setting."

*2 Mechanism protection parameters cannot be set by customers.

■ Lead: 20 mm

Item	EZSH Series factory setting	Standard/geared motor for maintenance (When replacing the motor)
• Lead [mm]	20	-
• Minimum travel amount [mm] (Resolution)	0.01 (2000)	0.006 (1000)
Base setting parameter		
• Electronic damper function	Effective	Effective
Motor & Mechanism parameter		
• Mechanism settings	Prioritize ABZO setting *1	Manual setting
• Electronic gear A	1	1
• Electronic gear B	2	1
• Motor rotation direction	CW	CW
• Mechanism type	mm	step
• Mechanism lead pitch [mm]	20	1
• Mechanism limit parameter setting	Follow ABZO setting	Disable the encoder parameters
• Mechanism protection parameter setting	Follow ABZO setting	Disable the encoder parameters
• JOG/HOME/ZHOME operation setting	Prioritize ABZO setting *1	Manual setting
• (JOG) Operating speed	10 [mm/s]	1000 [Hz]
• (JOG) Acceleration/deceleration rate	0.5 [m/s ²]	1000 [kHz/s]
• (JOG) Starting speed	5 [mm/s]	500 [Hz]
• (JOG) Operating speed (high)	50 [mm/s]	5000 [Hz]
• (ZHOME) Operation speed	100 [mm/s]	5000 [Hz]
• (ZHOME) Acceleration/deceleration rate	0.5 [m/s ²]	1000 [kHz/s]
• (ZHOME) Starting speed	5 [mm/s]	500 [Hz]

Item	EZSH Series factory setting	Standard/geared motor for maintenance (When replacing the motor)
• (HOME) Home-seeking mode	3 sensors	3 sensors
• (HOME) Starting direction	Negative direction	Positive direction
• (HOME) Acceleration/deceleration rate	0.5 [m/s ²]	1000 [kHz/s]
• (HOME) Starting speed	5 [mm/s]	500 [Hz]
• (HOME) Operating speed	100 [mm/s]	5000 [Hz]
• (HOME) Last speed	5 [mm/s]	500 [Hz]
• (HOME) Backward steps in 2 sensor home-seeking	5 [mm]	500 [step]
• (HOME) Operating amount in uni-directional home-seeking	5 [mm]	500 [step]
Mechanism protection parameter *2		
• Maximum starting speed	200 [mm/s]	4,000,000 [Hz]
• Maximum operating speed	Maximum value of specifications	4,000,000 [Hz]
• Maximum pushing speed	25 [mm/s]	4,000,000 [Hz]
• Maximum pushing return-to-home speed	100 [mm/s]	4,000,000 [Hz]
• Maximum push current	100 [%]	100 [%]

*1 When changing the factory setting of parameter items, change the setting for the "Mechanism settings" and "JOG/HOME/ZHOME operation setting" to "Manual setting."

*2 Mechanism protection parameters cannot be set by customers.

■ Lead: 30 mm



Danger

- Do not enter the moving range of the motorized actuator while the power is supplied. Doing so may result in serious injury.
- Be sure to provide a safety cage according to EN ISO 13857. Also, touching a table by hand may cause serious injury.
- Operate the data setter outside the safety cage. Failure to do so may result in injury.

Item	EZSH Series factory setting	Standard/geared motor for maintenance (When replacing the motor)
• Lead [mm]	30	–
• Minimum travel amount [mm] (Resolution)	0.01 (3000)	0.006 (1000)
Base setting parameter		
• Electronic damper function	Effective	Effective
Motor & Mechanism parameter		
• Mechanism settings	Prioritize ABZO setting *1	Manual setting
• Electronic gear A	1	1
• Electronic gear B	3	1
• Motor rotation direction	CW	CW
• Mechanism type	mm	step
• Mechanism lead pitch [mm]	30	1
• Mechanism limit parameter setting	Follow ABZO setting	Disable the encoder parameters
• Mechanism protection parameter setting	Follow ABZO setting	Disable the encoder parameters
• JOG/HOME/ZHOME operation setting	Prioritize ABZO setting *1	Manual setting
• (JOG) Operating speed	10 [mm/s]	1000 [Hz]
• (JOG) Acceleration/deceleration rate	0.5 [m/s ²]	1000 [kHz/s]
• (JOG) Starting speed	5 [mm/s]	500 [Hz]

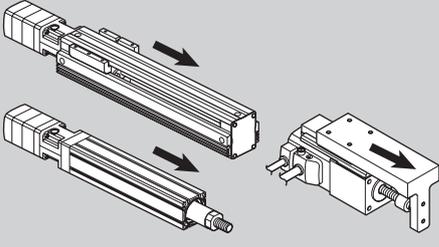
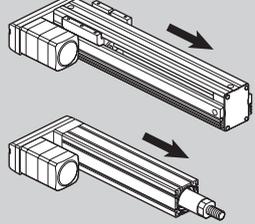
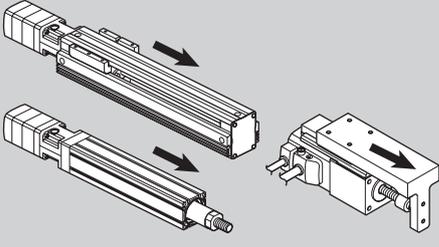
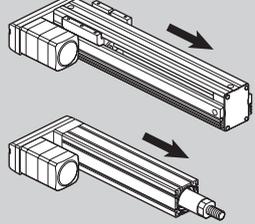
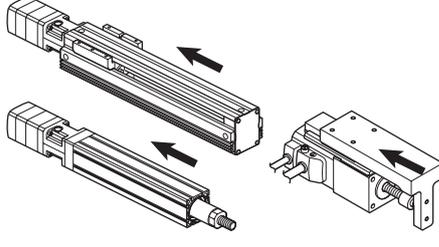
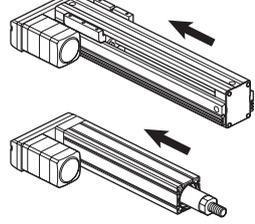
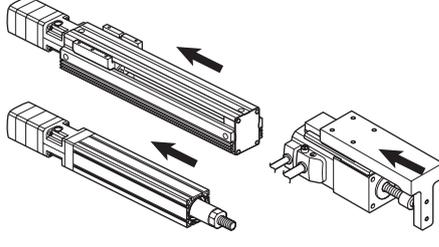
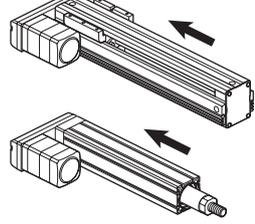
Item	EZSH Series factory setting	Standard/geared motor for maintenance (When replacing the motor)
• (JOG) Operating speed (high)	50 [mm/s]	5000 [Hz]
• (ZHOME) Operation speed	100 [mm/s]	5000 [Hz]
• (ZHOME) Acceleration/deceleration rate	0.5 [m/s ²]	1000 [kHz/s]
• (ZHOME) Starting speed	5 [mm/s]	500 [Hz]
• (HOME) Home-seeking mode	3 sensors	3 sensors
• (HOME) Starting direction	Negative direction	Positive direction
• (HOME) Acceleration/deceleration rate	0.5 [m/s ²]	1000 [kHz/s]
• (HOME) Starting speed	5 [mm/s]	500 [Hz]
• (HOME) Operating speed	100 [mm/s]	5000 [Hz]
• (HOME) Last speed	5 [mm/s]	500 [Hz]
• (HOME) Backward steps in 2 sensor home-seeking	5 [mm]	500 [step]
• (HOME) Operating amount in uni-directional home-seeking	5 [mm]	500 [step]
Mechanism protection parameter *2		
• Maximum starting speed	200 [mm/s]	4,000,000 [Hz]
• Maximum operating speed	Maximum value of specifications	4,000,000 [Hz]
• Maximum pushing speed	25 [mm/s]	4,000,000 [Hz]
• Maximum pushing return-to-home speed	100 [mm/s]	4,000,000 [Hz]
• Maximum push current	100 [%]	100 [%]

*1 When changing the factory setting of parameter items, change the setting for the "Mechanism settings" and "JOG/HOME/ZHOME operation setting" to "Manual setting."

*2 Mechanism protection parameters cannot be set by customers.

1-4 Moving direction of the moving part

The moving direction of the moving part varies depending on the setting of the travel amount or the input method of the pulse signal.

Setting	In-line motor mounting type	Parallel motor mounting type
<p>Operation by setting of parameter When setting the travel amount to the plus (+) side</p>	<p>The table moves to opposite the motor side.</p> 	<p>The table moves to opposite the motor side.</p> 
<p>Operation by pulse signal</p> <ul style="list-style-type: none"> • 2-pulse input mode When inputting the pulse signal to the CW input • 1-pulse input mode When inputting the pulse signal to the PLS input while the DIR input is ON. 		
<p>Operation by setting of parameter When setting the travel amount to the minus (-) side</p>	<p>The table moves to the motor side.</p> 	<p>The table moves to the motor side.</p> 
<p>Operation by pulse signal</p> <ul style="list-style-type: none"> • 2-pulse input mode When inputting the pulse signal to the CCW input. • 1-pulse input mode When inputting the pulse signal to the PLS input while the DIR input is OFF. 		

1-5 Return-to-home operation

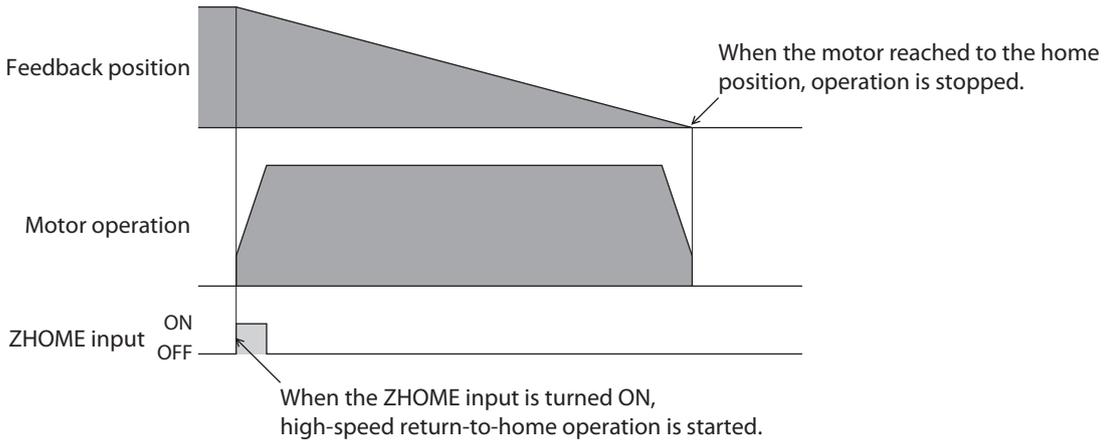
Return-to-home is an operation in which the reference point of positioning (home position) is detected. It is executed to return to the home position from the present position when the time of power-on and upon completion of positioning operation.

■ High-speed return-to-home operation

High-speed return-to-home operation is an operation to return to the mechanical home position on the absolute position coordinate set in advance.

Since the home position is recognized by the ABZO sensor, return-to-home operation can be executed at the same speed as that of the normal positioning operation without using an external sensor.

When the ZHOME input is turned ON, high-speed return-to-home operation is started. The motor stops when the operation stop signal is turned ON while the motor is operating.



■ Return-to-home operation

Return-to-home operation is an operation to detect the home position by using an external sensor. It is executed to return from the present position to the home position at the time of power-on and upon completion of positioning operation. Sensor set are available as accessories. Refer to page 51.

Return-to-home operation can be performed in the following four patterns.

Item	Description	Features
2-sensor mode	When the limit sensor is detected, the motor rotates in the reverse direction and pulls out of the limit sensor. After pulling out of the limit sensor, the motor moves to stop according to the value set in the "(HOME) Backward steps in 2 sensor home-seeking" parameter. The position at which the motor stopped becomes the home position.	<ul style="list-style-type: none"> • Two external sensors are required. • The operating speed is low. (return-to-home starting speed)
3-sensor mode	When the limit sensor is detected, the motor rotates in the reverse direction and pulls out of the limit sensor. After that, the motor stops when the ON edge of the HOME sensor is detected. The position at which the motor stopped becomes the home position.	<ul style="list-style-type: none"> • Three external sensors are required. *2 • The operating speed is high. (return-to-home operation speed)
One-way rotation mode	The motor stops when the ON edge of the HOME sensor is detected. After that, the motor pulls out at the speed set in the "(HOME) Last speed" parameter until the OFF edge of the HOME sensor is detected. After pulling out of the limit sensor, the motor moves to stop according to the value set in the "(HOME) Operating amount in uni-directional home-seeking" parameter. The position at which the motor stopped becomes the home position.	<ul style="list-style-type: none"> • One external sensor is required. • The operating speed is high. (return-to-home operation speed) • Not rotate in the reverse direction.

Item	Description	Features
Push mode *1	The motor rotates in the reverse direction when a mechanism installed to the motor presses against a stopper, etc. on the machine. After that, the motor moves according to the value of "(HOME) Backward steps after first entry in push motion home-seeking," rotates in the reverse direction, and is operated at the home position detection speed. The motor rotates in the reverse direction when a mechanism installed to the motor presses against a stopper, etc. on the machine, moves according to the value of "(HOME) Backward steps in push motion home-seeking," and stops. The position at which the motor stopped becomes the home position.	<ul style="list-style-type: none"> • An external sensor is not required. • The operating speed is high. (return-to-home operation speed)

*1 Do not perform push-motion return-to-home operation with the **EZSH** Series.

*2 When multiple external sensors cannot be installed to a motorized linear actuator and a rotational mechanism, the home position can be detected with a single external sensor.

Sensor set (accessories)

Sensor type	Applicable product		
	EAS Series	EZS Series	EZSH Series
NPN sensor	PAES-S-2X, PAES-S-2Y PAES-S-4X, PAES-S-4Y PAES-S-6X, PAES-S-6Y	PAES-S	PAES-S-6EZSH
PNP sensor	PAES-SY-2X, PAES-SY-2Y PAES-SY-4X, PAES-SY-4Y PAES-SY-6X, PAES-SY-6Y	PAES-SY	PAES-SY-6EZSH

1-6 Push-motion return-to-home operation

 **Caution**

- Perform push-motion return-to-home operation in the specification range of the dynamic permissible moment. Failure to do so may result in injury or damage to equipment.
- **EAC** Series:
If push-motion return-to-home operation is performed in the direction opposite the motor side, provide an external mechanism where the rod can press within the effective stroke. Pressing in excess of the effective stroke may result in injury or damage to equipment.

 **memo**

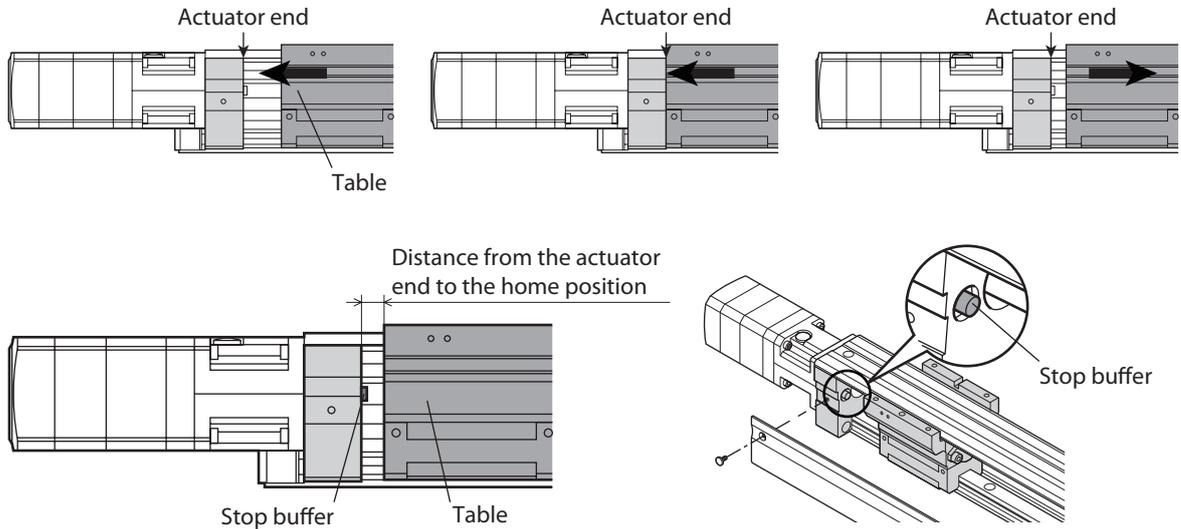
- Lead 6 mm type products of the **EAS2** or **EAC2** model:
If a load is operated in a vertical direction, perform push-motion return-to-home operation to the downward direction. The home position may vary if you perform it to the upward direction.
- Lead 12 mm type products of the **EAS4**, **EZS4** or **EAC4** model:
If a load is operated in a vertical direction, perform push-motion return-to-home operation to the upward direction with a load mass of 4 kg or less. If the load is exceeded 4 kg, the home position may vary.
- **DRS2** Series:
Push-motion return-to-home operation can be performed only when the moving direction of the set collar is the motor side.
- **DRSM60**:
When operating in a vertical direction, perform push-motion return-to-home operation to the downward direction.

■ Movement of push-motion return-to-home operation

If push-motion return-to-home operation is performed with keeping the initial value (0) for the “(HOME) Position offset,” the moving part returns to the home position to stop after hitting the actuator end. Refer to the table next for the distance from the actuator end to the home position.

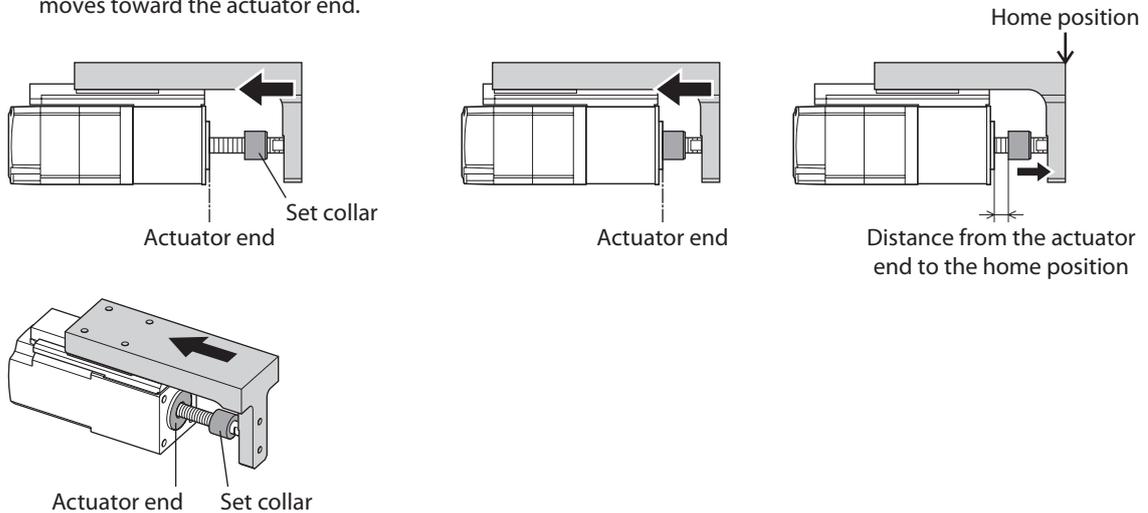
● EAS/EZS/EAC Series

- 1) When push-motion return-to-home operation is performed, the table moves toward the actuator end.
- 2) The table hits the actuator end.
- 3) The table returns to the set home position and stops.



● DRS2 Series

- 1) When push-motion return-to-home operation is performed, the set collar moves toward the actuator end.
- 2) The set collar hits the actuator end.
- 3) The set collar returns to the set home position and stops.



● Distance from the actuator end to the home position

Series	Model	Distance from the actuator end to the home position
EAS	2	4 mm
	4	3 mm
	6	6 mm
EZS	3, 4	3 mm
	6	6 mm

Series	Model	Distance from the actuator end to the home position
EAC	2, 4, 6	4 mm
DRS2	42	1 mm
	60	1.6 mm

■ Operating current of push-motion return-to-home

The push force for push-motion return-to-home operation is set in each actuator at the time of shipment.

■ Operating speed of push-motion return-to-home

The upper limit value for operating speed of push-motion return-to-home operation is shown below.

Series	Lead	Upper limit of push-motion return-to-home speed
EAS EZS EAC	3 mm	25 mm/s
	6 mm	50 mm/s
	12 mm	100 mm/s
DRS2	2 mm	6 mm/s
	4 mm	
	8 mm	

1-7 Push-motion operation

The push force for push-motion operation is set using the push current. The maximum push force are shown in the table below.



Series	Model	Lead	Maximum push force
EAS EAC	2	3 mm	80 N
		6 mm	40 N
	4	6 mm	200 N
		12 mm	100 N
	6	6 mm	500 N
		12 mm	400 N
EZS	3, 4	6 mm	200 N
		12 mm	100 N
	6	6 mm	500 N
		12 mm	400 N
EZSH	6	10 mm	450 N
		20 mm	270 N
DRS2	42	2 mm	400 N
		8 mm	100 N
	60	4 mm	500 N

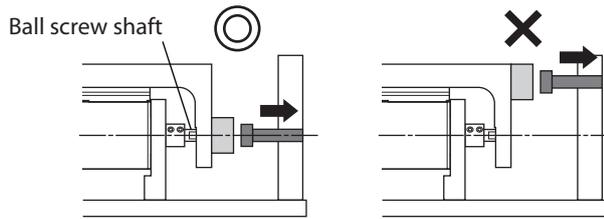


Be sure to set the push current so that the upper limit value is not exceeded. Performing push-motion operation with the current value exceeding the upper limit value may cause damage to the actuator or equipment. This may also cause deterioration in actuator specification.

Operation data			
	Operation type	Pos. [m/s ²]	Operating current [%]
#0	Absolute push-motion		60.0
#1	Incremental positioning (based on command position)		100.0
#2	Incremental positioning (based on command position)		100.0
#3	Incremental positioning (based on command position)		100.0
#4	Incremental positioning (based on command position)		100.0
#5	Incremental positioning (based on command position)		100.0



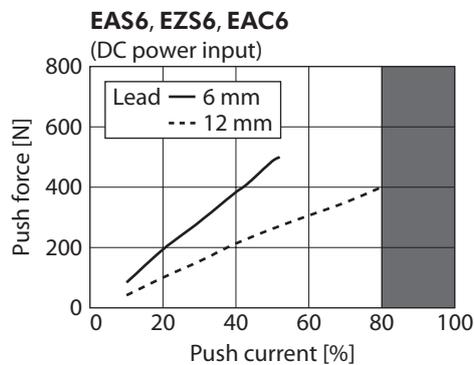
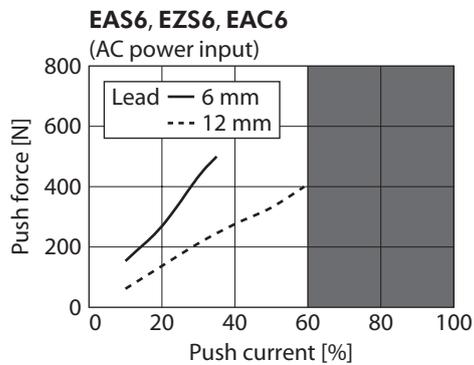
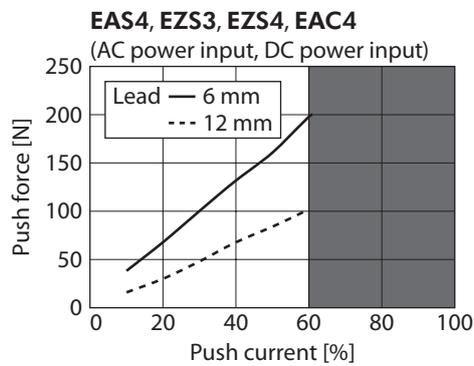
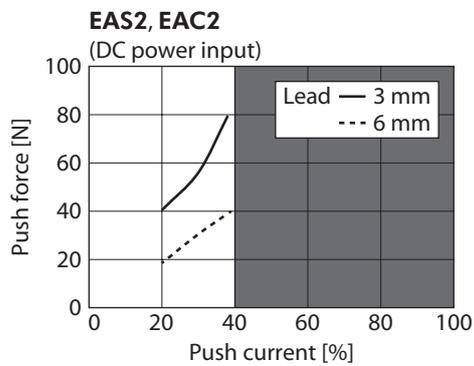
With the **DRS2** Series, perform push-motion operation on an extension of the ball screw shaft. Performing push-motion operation at positions deviating from the extension of the ball screw shaft may cause damage to the product.



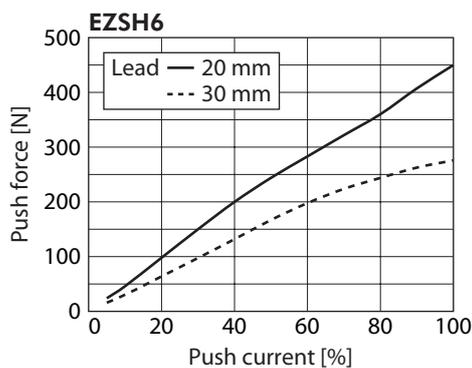
1-8 Current setting of push-motion operation

The reference value of the push current is shown below. Check the actual push force using the product.

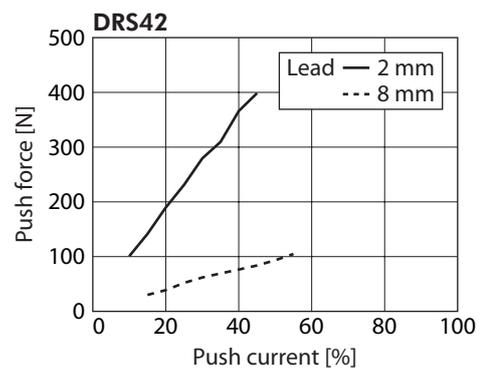
- Measurement result of the push force when the **EAS/EZS/EAC** Series is operated in the horizontal direction (average value)



- Measurement result of the push force when the **EZSH** Series is operated in the horizontal direction (average value)



- Measurement result of the push force when the **DRS2** Series is operated in the horizontal direction (average value)



memo The relationship between the push force and push current varies depending on the following conditions. Check the actual push force using the equipment.

- Installation condition of the actuator (horizontal direction installation, vertical direction installation)
- Type of the motorized cylinder (motorized cylinder without a guided-shaft or with guided-shafts, stroke)
- Customer's load condition such as jig

■ Push speed

The upper limit value of the push speed is shown below.

Series	Upper limit of push speed
EAS EAC EZS EZSH	25 mm/s
DRS2	6 mm/s

memo With the **DRS2** Series, if push-motion operation is performed at the speed exceeding the upper limit value of the push speed, the ball-screw shaft may bite the nut, causing to stop moving. In this case, return the ball-screw shaft at the recommended starting speed in the table below, and check whether the ball-screw shaft and the load are not damaged.

Recommended starting speed

Model	Lead	Recommended starting speed
DRSM42	2 mm	0.4 mm/s
	8 mm	1.6 mm/s
DRSM60	4 mm	0.8 mm/s

2 Setting of the hollow rotary actuator

This chapter explains the parameters and operation functions of the hollow rotary actuator. (Hereinafter described as motorized actuator)

Parameters and operation data are set using the **MEXE02**. Note that the **OPX-2A** cannot be used to set the data.

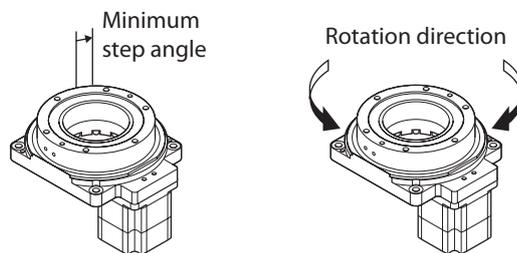
2-1 Setting flow

1 Install a motorized actuator.

2 Install and connect a driver.

3 Start the **MEXE02**.

4 Parameters of the driver have been set to the ABZO sensor at the time of shipment.



The operation data for the motorized actuator equipped the **AZ** Series is set on the degree unit. The factory setting of the minimum travel amount is 0.01°.

5 Copy the fixed value of the ABZO sensor to the driver.

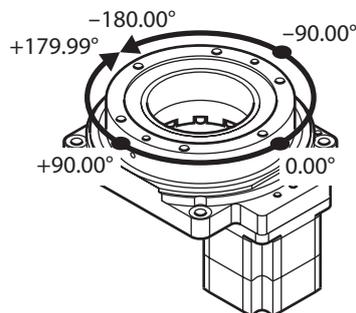
Using the **MEXE02**, match the fixed value of the ABZO sensor and the setting value of the driver parameter.

6 Create the recovery data file.

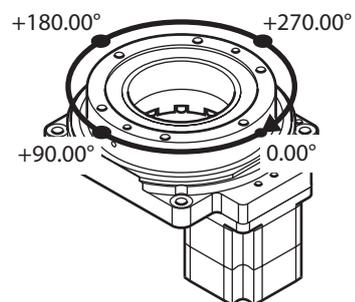
Using the **MEXE02**, create the recovery data file saved the factory setting.

7 Set the coordinate.

The coordinate has been set to $\pm 180^\circ$ at the time of shipment.



The coordinate can be changed from 0° to 360° according to your application.



8 Set the software limit when no sensor is used.

9 Check the movement of the motorized actuator.

Using the "Teaching, remote operation" of the **MEXE02**, check the movement of the motorized actuator.

10 Save the set data.

2-2 Parameter setting list

Parameters for the motorized actuator are set as follows at the time of shipment.

Item	Factory setting	
• Step angle per revolution [°]	360	
• Resolution of output table (minimum step angle [°])	36000 (0.01)	
Motor & Mechanism parameter		
• Mechanism settings	Prioritize ABZO setting	
• Electronic gear A	1	
• Electronic gear B *1	2	
• Motor rotation direction *1	Positive direction=CCW	
• Mechanism type	deg *3	step *2
• Initial coordinate generation & wrap setting range [rev] *1	18	
• Initial coordinate generation & wrap range offset ratio [%]	50	
• Initial coordinate generation & wrap coordinate offset value [deg]	0	
• Wrap setting	Effective	
• The number of the RND-ZERO output in wrap range	1	
• (JOG) Travel amount	0.01 [deg]	1 [step]
• (JOG) Operating speed	10 [deg/s]	1000 [Hz]
• (JOG) Acceleration/deceleration rate	10 [$\times 10^3$ deg/s ²]	1000 [kHz/s]
• (JOG) Starting speed	5 [deg/s]	500 [Hz]
• (JOG) Operating speed (high)	50 [deg/s]	5000 [Hz]
• (ZHOME) Operation speed	50 [deg/s]	5000 [Hz]
• (ZHOME) Acceleration/deceleration rate	10 [$\times 10^3$ deg/s ²]	1000 [kHz/s]
• (ZHOME) Starting speed	5 [deg/s]	500 [Hz]
• (HOME) Home-seeking mode	3 sensors	
• (HOME) Starting direction	Positive direction *3	
• (HOME) Acceleration/deceleration rate	10 [$\times 10^3$ deg/s ²]	1000 [kHz/s]
• (HOME) Starting speed	5 [deg/s]	500 [Hz]
• (HOME) Operating speed	10 [deg/s]	1000 [Hz]
• (HOME) Last speed	5 [deg/s]	500 [Hz]
• (HOME) Position offset	0 [deg]	0 [step]

*1 The value, which is different from the initial value of the **MEXE02**, is written to the ABZO.

*2 The unit of display on the **MEXE02** can be switched to "deg" or "step" while the data is editing.

Wizard | unit of display step mm deg

Operation data			
	Operation type	Position [deg]	Speed [deg/s]
#0	Incremental positioning (based on command position)	90.00	30.00
#1	Incremental positioning (based on command position)	0.00	10.00

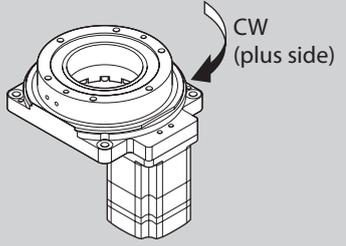
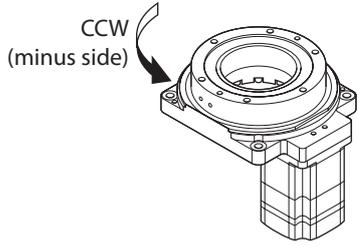
Wizard | unit of display step mm deg

Operation data			
	Operation type	Position [step]	Speed [Hz]
#0	Incremental positioning (based on command position)	9000	3000
#1	Incremental positioning (based on command position)	0	1000

*3 The return-to-home rotation-direction of the output table is positive side (CW).

2-3 Rotation direction of output table

The rotation direction of the output table varies depending on the setting of the travel amount or the input method of the pulse signal.

Setting	Rotation direction of output table
Operation by setting of parameter When setting the step angle to the plus (+) side	
Operation by pulse signal <ul style="list-style-type: none"> • 2-pulse input mode When inputting the pulse signal to the CW input • 1-pulse input mode When inputting the pulse signal to the PLS input while the DIR input is ON. 	
Operation by setting of parameter When setting the step angle to the minus (-) side	
Operation by pulse signal <ul style="list-style-type: none"> • 2-pulse input mode When inputting the pulse signal to the CCW input. • 1-pulse input mode When inputting the pulse signal to the PLS input while the DIR input is OFF. 	

2-4 Operation setting

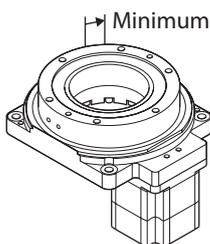
The factory setting of the minimum step angle is 0.01° (the resolution of the output table is 36000). The minimum step angle can be set using the "electronic gear A," "electronic gear B" parameters. Refer to the **AZ Series Function Edition** for how to set the resolution using the electronic gears.

Note In the case of the pulse input type driver, use the function setting switch in the state of the factory setting. If it is changed, the actuator operates with a certain number of resolution since the ABZO setting of the motor does not apply to the driver.

Setting example

	Output table		Motor		Setting example for MEXE02	
	Minimum step angle	Resolution	Minimum step angle	Resolution	Electronic gear A	Electronic gear B
Initial value	0.01°	36000 P/R	0.18°	2000 P/R	The setting is not required.	
Setting example	0.01°	36000 P/R	0.18°	2000 P/R	1	2
	0.1°	3600 P/R	1.8°	200 P/R	5	1

The calculation formula of the resolution using the electronic gears is as follows.



$$\begin{aligned} &\text{Minimum step angle of output table (°)} \\ &= \frac{360^\circ}{18 (\text{Gear ratio}) \times 1000 \times (\text{Electronic gear B} \div \text{Electronic gear A})} = 0.1^\circ \\ &\frac{\text{Electronic gear B}}{\text{Electronic gear A}} = \frac{1}{5} \end{aligned}$$

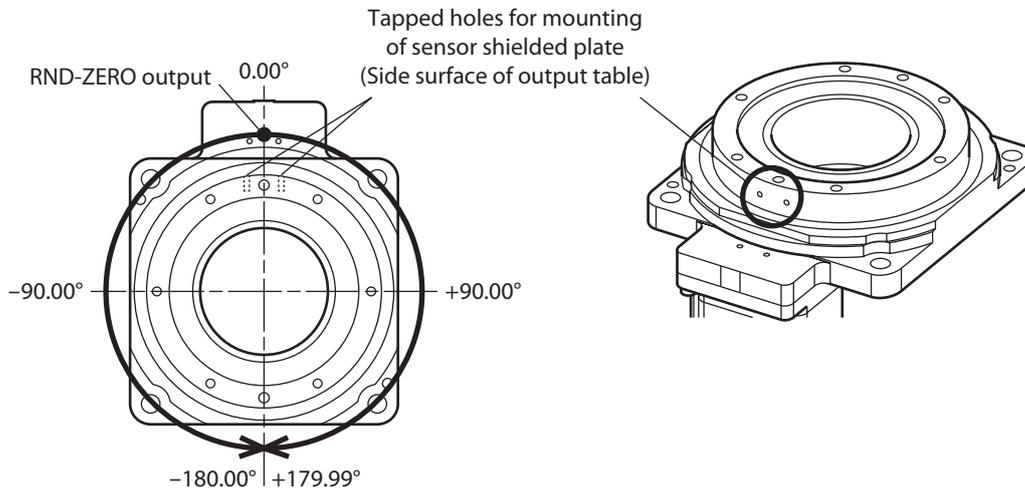
When setting the minimum step angle of the output table to 0.1°, set the electronic gear A to 5 and the electronic gear B to 1.

2-5 Position coordinate management of the output table

A mechanical home position and electrical home position can be set for actuators equipped the **AZ** Series. When SD (stored data) operation is performed, either of the home positions is required to set before operation. The position coordinate at the factory setting is $\pm 180^\circ$ as the illustration below.

■ Mechanical home position

The "user home position" can be set by presetting the position. If the mechanical home position is preset, the RND-ZERO output will be turned ON when the table passes through the mechanical home position.



■ Electrical home position

The electrical home position is the home position to set in the driver. It is set while the EL-PRST input is turned ON, and it is reset if the EL-PRST input is turned OFF.

2-6 Positioning operation using the wrap function

The following operations can be performed using the wrap function. Refer to the **AZ** Series [Function Edition](#) for details.

Coordinate setting	Operation mode
$\pm 180^\circ$	<ul style="list-style-type: none"> • Absolute positioning Specifies the position coordinate of the target position. • Incremental positioning Specifies the distance to the target position.
0 to 360°	<ul style="list-style-type: none"> • Wrap absolute positioning Specifies the position coordinate of the target position within the wrap range. • Wrap proximity positioning Specifies the position coordinate of the target position in the shortest distance within the wrap range. • Wrap forward direction absolute positioning Specifies the position coordinate of the target position in the forward direction within the wrap range. • Wrap reverse direction absolute positioning Specifies the position coordinate of the target position in the reverse direction within the wrap range.

■ Comparison of positioning SD (stored data) operation

The step angle and moving direction of the output table vary depending on the operation mode.

● When operating from the 90° position after setting the position coordinate of "±180°"

Set the parameters as follows;

- Initial coordinate generation/wrap coordinate setting: Prioritize ABZO setting (factory setting)
- Initial coordinate generation & wrap setting range [rev]: 1.0 (factory setting)
- Initial coordinate generation & wrap range offset ratio [%]: 50.00 (factory setting)

AZ Pulse Input/Built-in Controller / DG2 (0.01deg/step)		Operation data	Motor & Mechanism(Coordinates/JOG/Home operation)
1	Manual setting of the mechanism settings		Prioritize ABZO setting
2	Electronic gear A		1
3	Electronic gear B		1
4	Motor rotation direction		Positive direction=CW
5	Mechanism type		step(Rotary)
6	Mechanism lead pitch [mm]		1
7			
8	Gear ratio setting (prioritize 0.00:ABZO setting)		0.00
9			
10	Initial coordinate generation/wrap coordinate setting		Prioritize ABZO setting
11	Initial coordinate generation & wrap setting range [rev]		1.0
12	Initial coordinate generation & wrap range offset ratio [%]		50.00
13	Initial coordinate generation & round coordinate offset value [deg]		0.00
14	Wrap setting		Effective

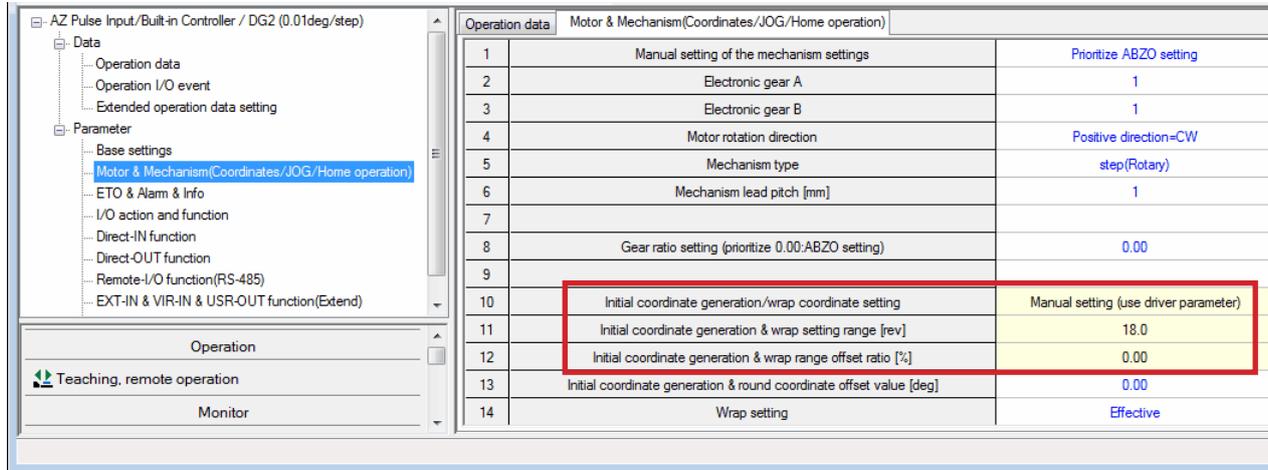
3 Motorized actuator equipped the AZ Series

Operation mode	When setting the operation data to 120°	When setting the operation data to 270°
<p>Absolute positioning (POS-ABS) (CPOS)</p> <p>Specifies the position coordinate of the target position</p>		
<p>Incremental positioning (INC-POS) (CPOS)</p> <p>Incremental positioning (INC-POS) (FBPOS)</p> <p>Specifies the distance to the target position</p>		

● When operating from the 90° position after setting the position coordinate to "0 to 360°"

Set the parameters as follows;

- Initial coordinate generation/wrap coordinate setting: Manual setting
- Initial coordinate generation & wrap setting range [rev]: 18
- Initial coordinate generation & wrap range offset ratio [%]: 0.00



Operation mode	When setting the operation data to 300°	When setting the operation data to 480°
<p>Wrap absolute positioning (RND-ABS)</p> <ul style="list-style-type: none"> • Specifies the position coordinate of the target position • Movement within the wrap range 		
<p>Wrap shortcut positioning (Round proximity positioning)</p> <ul style="list-style-type: none"> • Specifies the position coordinate of the target position • Movement within the wrap range • Operation in the shorter direction of the traveling distance 		
<p>Wrap forward direction absolute positioning (RND-ABS (FWD))</p> <ul style="list-style-type: none"> • Specifies the position coordinate of the target position • Movement within the wrap range • Operation in the forward direction only 		
<p>Wrap reverse direction absolute positioning (RND-ABS (RVS))</p> <ul style="list-style-type: none"> • Specifies the position coordinate of the target position • Movement within the wrap range • Operation in the reverse direction only 		



3 Motorized actuator equipped the AZ Series

4 Motorized actuator equipped the RKII Series

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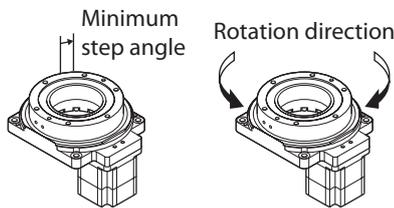
1 Setting of the hollow rotary actuator

This chapter explains the parameters and operation functions of the hollow rotary actuator. (Hereinafter described as motorized actuator)

1-1 Setting flow

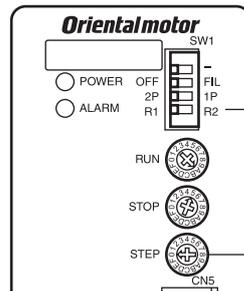
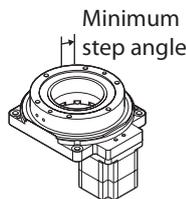
- 1 Install a motorized actuator.
- 2 Install and connect a driver.
- 3 Set parameters for the driver. (It is explained in this part.)

■ Built-in controller type



Coordinates parameter	
• Electronic gear A	5
• Electronic gear B	1
• Motor rotation direction	Positive direction=CCW

■ Pulse input type



Function setting switch (SW1)
R1/R2: Selects the step angle type.

Step angle setting switch (STEP)

To set the minimum step angle with the pulse input type driver, use the step angle setting switch (STEP).
The **MEXE02** and **OPX-2A** cannot be used.

- 4 Completion of setting

1-2 Parameter setting list

■ Built-in controller type

A setting example of the parameter for when setting the minimum step angle to 0.1° is shown below.

■ represents parameters to be changed.

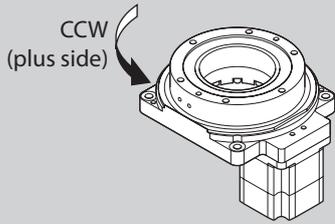
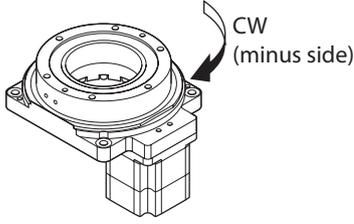
Item	Setting example		Initial value *	
	Setting value	Converted value	Setting value	Converted value
• Step angle per revolution [°]	360	–	360	–
• Resolution of output table (minimum step angle [°])	3600 (0.1)	–	9000 (0.04)	–
• Gear reduction ratio of output table	18	–	18	–
Operation parameter				
• JOG operating speed [Hz]	1000	100 [deg/s]	1000	40 [deg/s]
• JOG acceleration [ms/kHz]	30	–	30	–
• JOG starting speed [Hz]	100	10 [deg/s]	100	4 [deg/s]
Home operation parameter				
• Home-seeking mode	3-sensor mode	–	3-sensor mode	–
• Operating speed of home-seeking [Hz]	1000	100 [deg/s]	1000	40 [deg/s]
• Acceleration/deceleration of home-seeking [ms/kHz]	30	–	30	–
• Starting speed of home-seeking [Hz]	100	10 [deg/s]	100	4 [deg/s]
Coordinates parameter				
• Electronic gear A	5	–	1	–
• Electronic gear B	2	–	1	–
• Motor rotation direction	Positive direction=CCW	–	Positive direction=CW	–

* The values are the factory setting data or initialized data.

1-3 Rotation direction of output table

The rotation direction of the output table varies depending on the setting of the travel amount or the input method of the pulse signal.

Warning Set various parameters such as the resolution and moving direction before operating the motorized actuator. Operating the motorized actuator without setting parameters may cause it to move to unexpected directions or run at unexpected speeds, leading to injury or damage to equipment.

Setting	Rotation direction of output table
Operation by setting of parameter When setting the step angle to the plus (+) side	 <p>CCW (plus side)</p>
Operation by pulse signal <ul style="list-style-type: none"> • 2-pulse input mode When inputting the pulse signal to the CW input • 1-pulse input mode When inputting the pulse signal to the PLS input while the DIR input is ON. 	
Operation by setting of parameter When setting the step angle to the minus (-) side	 <p>CW (minus side)</p>
Operation by pulse signal <ul style="list-style-type: none"> • 2-pulse input mode When inputting the pulse signal to the CCW input. • 1-pulse input mode When inputting the pulse signal to the PLS input while the DIR input is OFF. 	

1-4 Operation setting

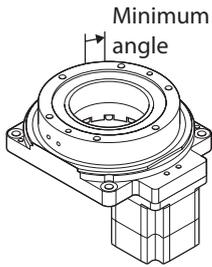
■ Built-in controller type

The factory setting of the minimum step angle is 0.04° (the resolution of the output table is 9000). The minimum step angle can be set using the "electronic gear A," "electronic gear B" parameters. Refer to the USER MANUAL for how to set the resolution using the electronic gears.

Setting example

	Output table		Motor		Setting example for MEXE02	
	Minimum step angle	Resolution	Minimum step angle	Resolution	Electronic gear A	Electronic gear B
Initial value	0.04°	9000 P/R	0.72°	500 P/R	The setting is not required.	
Setting example	0.01°	36000 P/R	0.18°	2000 P/R	1	4
	0.1°	3600 P/R	1.8°	200 P/R	5	2

The calculation formula of the resolution using the electronic gears is as follows.



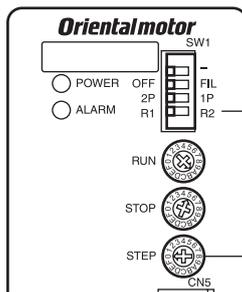
$$\text{Minimum step angle of output table (}^\circ\text{)} = \frac{360^\circ}{18 (\text{Gear ratio}) \times 500 \times (\text{Electronic gear B} \div \text{Electronic gear A})} = 0.1^\circ$$

$$\frac{\text{Electronic gear B}}{\text{Electronic gear A}} = \frac{2}{5}$$

When setting the minimum step angle of the output table to 0.1°, set the electronic gear A to 5 and the electronic gear B to 2.

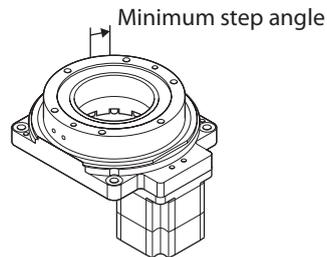
■ Pulse input type

The minimum step angle can be set using the step angle setting switch (STEP) of the driver. The factory setting of the minimum step angle is 0.04° (the resolution of the output table is 9000).



Function setting switch (SW1)
R1/R2: Selects the step angle type.

Step angle setting switch (STEP)



● Function setting switch (SW1-No.1): When R1 is selected

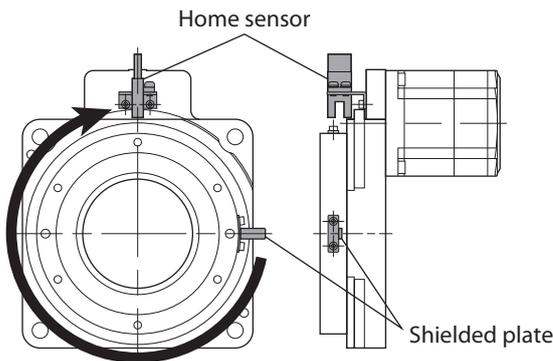
Step angle setting switch (STEP) dial setting	Minimum step angle	Motor resolution	Motor step angle
0	0.04°	500 P/R	0.72°
1	0.02°	1000 P/R	0.36°
2	0.016°	1250 P/R	0.288°
3	0.01°	2000 P/R	0.18°
4	0.008°	2500 P/R	0.144°
5	0.005°	4000 P/R	0.09°
6	0.004°	5000 P/R	0.072°
7	0.002°	10000 P/R	0.036°
8	0.0016°	12500 P/R	0.0288°
9	0.001°	20000 P/R	0.018°
A	0.0008°	25000 P/R	0.0144°
B	0.0005°	40000 P/R	0.009°
C	0.0004°	50000 P/R	0.0072°
D	0.00032°	62500 P/R	0.00576°
E	0.0002°	100000 P/R	0.0036°
F	0.00016°	125000 P/R	0.00288°

● **Function setting switch (SW1-No.1): When R2 is selected**

Step angle setting switch (STEP) dial setting	Minimum step angle	Motor resolution	Motor step angle
0	0.1°	200 P/R	1.8°
1	0.05°	400 P/R	0.9°
2	$\frac{0.6}{18}$ (0.0333...°)	600 P/R	0.6°
3	0.025°	800 P/R	0.45°
4	$\frac{0.3}{18}$ (0.0166...°)	1200 P/R	0.3°
5	0.0125°	1600 P/R	0.225°
6	0.00625°	3200 P/R	0.1125°
7	$\frac{0.06}{18}$ (0.00333...°)	6000 P/R	0.06°
8	0.003125°	6400 P/R	0.05625°
9	$\frac{0.05}{18}$ (0.00277...°)	7200 P/R	0.05°
A	0.0025°	8000 P/R	0.045°
B	$\frac{0.03}{18}$ (0.00166...°)	12000 P/R	0.03°
C	0.0015625°	12800 P/R	0.028125°
D	0.00125°	16000 P/R	0.0225°
E	0.00078125°	25600 P/R	0.0140625°
F	0.0001°	200000 P/R	0.0018°

1-5 Return-to-home operation

With the built-in controller type driver, return-to-home operation can be performed using a sensor installed externally. Set the "home-seeking mode" parameter to 3-sensors mode to start return-to-home operation. In addition, the high accuracy home detection is possible using the SLIT input and/or TIM signal. Home sensor set are available as accessories.



RK2 Built-in Controller [AC]	
Data	Operation data
Parameter	Home operation
I/O	
Motor	
Operation	
Home operation	
Alarm	
Warning	
Coordinates	
Common	
I/O function[Input]	
I/O function[Output]	

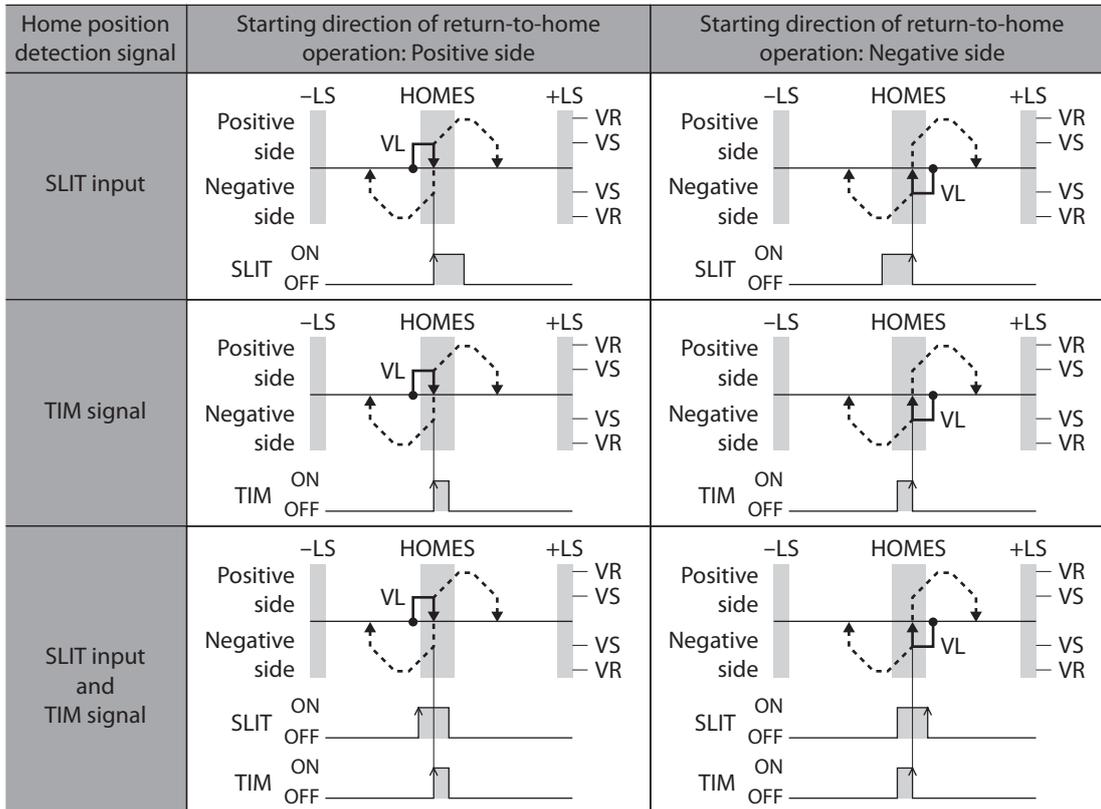
Home operation	
Home-seeking mode	3-sensor mode
Operating speed of home-seeking [Hz]	1000
Acceleration/deceleration of home-seeking [ms/kHz] or [s]	30.000
Starting speed of home-seeking [Hz]	100
Position offset of home-seeking [step]	0
Starting direction of home-seeking	Positive direction
SLIT detection with home-seeking	Effective
TIM signal detection with home-seeking	TIM signal enable
Backward steps in 2 sensor home-seeking [step]	200

■ When concurrently using the SLIT input and/or TIM signal

With the the ON edge of the HOME sensor (home position) is detected, the operation is continued until the external signal (SLIT input or TIM signal) is detected. The return-to-home operation will be complete when the external signal (SLIT input or TIM signal) is detected while the HOME sensor is being ON.

● Operation sequence (3-sensor mode)

- Explanation of alphabetical code
 VS: Starting speed of home-seeking
 VR: Operating speed of home-seeking
 VL: Last speed of return-to-home (When VS < 500 Hz: VS, When VS ≥ 500 Hz: 500 Hz)
 - - - Broken line indicates a home offset move.



■ Home sensor set (accessories)

Sensor type	Model
NPN sensor	PADG-SB
PNP sensor	PADG-SBY

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