Oriental motor

HL-17193-5

Motorized actuator

Function Setting Edition

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.

1 Introduction

2 Motorized actuator equipped the AZ Series

3 Motorized actuator equipped the AR Series

4 Motorized actuator equipped the RKII Series

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 OPERATING MANUAL Actuator. 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 Related operating manuals

For operating manuals not included with the product, contact your nearest Oriental Motor sales office or download from Oriental Motor Website Download Page.

■ Motorized actuator equipped with the AZ Series

Operating manual name	Included or not included with product
OPERATING MANUAL Actuator	Included
Motorized Actuator Function Setting Edition (this document)	Not included
AZ Series/Motorized Actuator equipped with **AZ** Series OPERATING MANUAL Function Edition	Not included
APPENDIX UL Standards for **AZ** Series	Included

Refer to the operating manual of the driver for contents not described in these manuals.

■ Motorized actuator equipped with the AR Series

Operating manual name	Included or not included with product
OPERATING MANUAL Actuator	Included
Motorized Actuator Function Setting Edition (this document)	Not included
AR Series/Motorized Actuator equipped with **AR** Series USER MANUAL	Not included
APPENDIX UL Standards for **AR** Series	Included

■ Motorized actuator equipped with the RKII Series

Operating manual name	Included or not included with product
OPERATING MANUAL Actuator	Included
Motorized Actuator Function Setting Edition (this document)	Not included
RKII Series/Motorized Actuator equipped with **RKII** Series USER MANUAL	Not included
APPENDIX UL Standards and CSA Standards for **RKII** Series	Included

1-3 Product lineup for motorized actuators

This manual explains the motorized actuators described in the table. 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		
		AZ Series	**AR** Series	**RKII** Series
Motorized linear slide	**EAS** Series **EZS** Series **EZSH** Series	○	○	–
Motorized cylinder	**EAC** Series	○	○	–
Hollow rotary actuator	**DGII** Series *	○ *	○	○
Parameter setting		Parameters have been set at the time of shipment.	Necessary	• Built-in Controller Type: Necessary • Pulse input type: Not necessary

○: Available

* Use the **DGII** Series of the motor horizontal mounting together with the support software **MEXE02** with software version 3.54 or later and the driver with software version 4.30 or later.
Using the **MEXE02** with software version 3.54 or later can update the version of the driver to the latest version.
Refer to the Support software **MEXE02** OPERATING MANUAL for details.

2 Motorized actuator equipped the AZ Series

◆Table of contents

1 Setting of the motorized linear slide, motorized cylinder

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

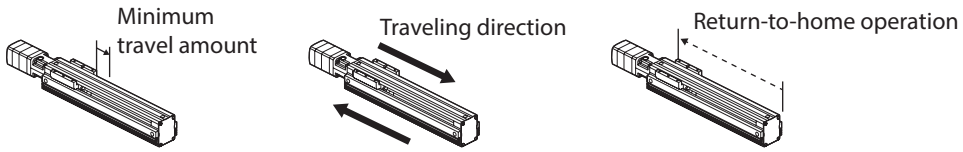
1-1 Setting flow

1 Install the motorized actuator.

2 Install and connect a driver.

3 Start the **MEXE02**.

4 Parameters such as the traveling direction and minimum travel amount have been set in 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.

5 Copy the ABZO information (fixed value) to the driver.

Using the **MEXE02**, match the ABZO information (fixed value) and the setting value of the driver parameter.

6 Create a recovery data file.

The ABZO information (fixed value) can be stored as the recovery data file.
Save the recovery data file in a PC as a data file. Refer to the OPERATING MANUAL **AZ** Series Function Edition for details.

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 OPERATING MANUAL **AZ** Series Function Edition for details.

Note

- 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 sales office when purchasing.

● **AC power input type**

Motorized actuator model	Motor model
EASM4○○○○○○○AZAC	**AZM46AC**
EASM4○○○○○○○AZMC	**AZM46MC**
EASM6○○○○○○○AZAC	**AZM66AC**
EASM6○○○○○○○AZMC	**AZM66MC**
EACM4○○○○○○AZAC-○	**AZM46AC**
EACM4○○○○○○AZMC-○	**AZM46MC**
EACM6○○○○○○AZAC-○	**AZM66AC**
EACM6○○○○○○AZMC-○	**AZM66MC**
EZSM3○○○○○○○AZAC	**AZM46AC**
EZSM3○○○○○○○AZMC	**AZM46MC**
EZSM4○○○○○○○AZAC	**AZM46AC**
EZSM4○○○○○○○AZMC	**AZM46MC**
EZSM6○○○○○○○AZAC	**AZM66AC**
EZSM6○○○○○○○AZMC	**AZM66MC**
EZSHM6○○○○○○AZAC	**AZM66AC**
EZSHM6○○○○○○AZMC	**AZM66MC**

● **DC power input type**

Motorized actuator model	Motor model
EASM2○○○○○○○AZAK	**AZM24AK**
EASM4○○○○○○○AZAK	**AZM46AK**
EASM4○○○○○○○AZMK	**AZM46MK**
EASM6○○○○○○○AZAK	**AZM66AK**
EASM6○○○○○○○AZMK	**AZM66MK**
EACM2○○○○○○AZAK-○	**AZM24AK**
EACM4○○○○○○AZAK-○	**AZM46AK**
EACM4○○○○○○AZMK-○	**AZM46MK**
EACM6○○○○○○AZAK-○	**AZM66AK**
EACM6○○○○○○AZMK-○	**AZM66MK**
EZSM3○○○○○○○AZAK	**AZM46AK**
EZSM3○○○○○○○AZMK	**AZM46MK**
EZSM4○○○○○○○AZAK	**AZM46AK**
EZSM4○○○○○○○AZMK	**AZM46MK**
EZSM6○○○○○○○AZAK	**AZM66AK**
EZSM6○○○○○○○AZMK	**AZM66MK**

1-3 Parameter setting list

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

memo

- 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. When the alarm has generated, reconsider the operating condition or use our regeneration resistor.

■ Lead: 3 mm

Item	**EAS**/**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 (1,000)
Base setting parameter		
• Electronic damper function	Enable (for motorized linear slide)	Enable (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	Positive side=Clockwise	Positive side=Clockwise
• Mechanism type	mm	step
• Mechanism lead [mm]	3	1
• Mechanism lead decimal digit setting	×1 [mm]	
• JOG/HOME/ZHOME operation setting	Prioritize ABZO setting *1	Manual setting
• (JOG) Operating speed	10 [mm/s]	1,000 [Hz]
• (JOG) Acceleration/deceleration	0.5 [m/s^2]	1,000 [kHz/s]
• (JOG) Starting speed	5 [mm/s]	500 [Hz]
• (JOG) Operating speed (high)	50 [mm/s]	5,000 [Hz]
• (ZHOME) Operating speed	50 [mm/s]	5,000 [Hz]
• (ZHOME) Acceleration/deceleration	0.5 [m/s^2]	1,000 [kHz/s]
• (ZHOME) Starting speed	5 [mm/s]	500 [Hz]
• (HOME) Home-seeking mode	Push-motion	3-sensor
• (HOME) Starting direction	Negative side	Positive side
• (HOME) Acceleration/deceleration	0.5 [m/s^2]	1,000 [kHz/s]
• (HOME) Starting speed	5 [mm/s]	500 [Hz]
• (HOME) Operating speed	50 [mm/s]	5,000 [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-home-seeking	This item has been set for each model.	100 [%]
• (HOME) Backward steps after first entry in push-home-seeking	4 [mm]	500 [step]

Item	**EAS**/**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 *3	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" parameter and "JOG/HOME/ZHOME operation setting" parameter to "Manual setting."

*2 Mechanism protection parameters cannot be set by customers.

*3 The push current actually usable is different from the push current having set. Check with the graph shown on p.23.

■ 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 (1,000)
Base setting parameter			
• Electronic damper function		Enable (for motorized linear slide)	Enable (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	Positive side=Clockwise	Positive side=Clockwise
	Parallel motor mounting type	Positive side=Counterclockwise	
• Mechanism type		mm	step
• Mechanism lead [mm]		6	1
• Mechanism lead decimal digit setting		×1 [mm]	
• JOG/HOME/ZHOME operation setting		Prioritize ABZO setting *1	Manual setting
• (JOG) Operating speed		10 [mm/s]	1,000 [Hz]
• (JOG) Acceleration/deceleration		0.5 [m/s^2]	1,000 [kHz/s]
• (JOG) Starting speed		5 [mm/s]	500 [Hz]
• (JOG) Operating speed (high)		50 [mm/s]	5,000 [Hz]
• (ZHOME) Operating speed		50 [mm/s]	5,000 [Hz]
• (ZHOME) Acceleration/deceleration		0.5 [m/s^2]	1,000 [kHz/s]
• (ZHOME) Starting speed		5 [mm/s]	500 [Hz]
• (HOME) Home-seeking mode		Push-motion	3-sensor
• (HOME) Starting direction	In-line motor mounting type	Negative side	Positive side
	Parallel motor mounting type	Negative side	
• (HOME) Acceleration/deceleration		0.5 [m/s^2]	1,000 [kHz/s]
• (HOME) Starting speed		5 [mm/s]	500 [Hz]
• (HOME) Operating speed		50 [mm/s]	5,000 [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-home-seeking		This item has been set for each model.	100 [%]
• (HOME) Backward steps after first entry in push-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 *3		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" parameter and "JOG/HOME/ZHOME operation setting" parameter to "Manual setting."

*2 Mechanism protection parameters cannot be set by customers.

*3 The push current actually usable is different from the push current having set. Check with the graph shown on p.23.

■ 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 (1,200)	0.012 (1,000)
Base setting parameter			
• Electronic damper function		Enable (for motorized linear slide)	Enable (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	Positive side=Clockwise	Positive side=Clockwise
	Parallel motor mounting type	Positive side=Counterclockwise	
• Mechanism type		mm	step
• Mechanism lead [mm]		12	1
• Mechanism lead decimal digit setting		×1 [mm]	
• JOG/HOME/ZHOME operation setting		Prioritize ABZO setting *1	Manual setting
• (JOG) Operating speed		10 [mm/s]	1,000 [Hz]
• (JOG) Acceleration/deceleration		0.5 [m/s^2]	1,000 [kHz/s]
• (JOG) Starting speed		5 [mm/s]	500 [Hz]
• (JOG) Operating speed (high)		50 [mm/s]	5,000 [Hz]

Item		**EAS**/**EZS**/**EAC** Series factory setting	Standard/geared motor for maintenance (When replacing the motor)
• (ZHOME) Operating speed		100 [mm/s]	5,000 [Hz]
• (ZHOME) Acceleration/deceleration		0.5 [m/s^2]	1,000 [kHz/s]
• (ZHOME) Starting speed		5 [mm/s]	500 [Hz]
• (HOME) Home-seeking mode		Push-motion	3-sensor
• (HOME) Starting direction	In-line motor mounting type	Negative side	Positive side
	Parallel motor mounting type	Negative side	
• (HOME) Acceleration/deceleration		0.5 [m/s^2]	1,000 [kHz/s]
• (HOME) Starting speed		5 [mm/s]	500 [Hz]
• (HOME) Operating speed		100 [mm/s]	5,000 [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-home-seeking		This item has been set for each model.	100 [%]
• (HOME) Backward steps after first entry in push-home-seeking	**EAS4**, **EZS3**, **EZS4**	3 [mm]	500 [step]
	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 *3		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" parameter and "JOG/HOME/ZHOME operation setting" parameter to "Manual setting."

*2 Mechanism protection parameters cannot be set by customers.

*3 The push current actually usable is different from the push current having set. Check with the graph shown on p.23.

■ 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 (2,000)	0.02 (1,000)
Base setting parameter		
• Electronic damper function	Enable	Enable
Motor & Mechanism parameter		
• Mechanism settings	Prioritize ABZO setting *1	Manual setting
• Electronic gear A	1	1
• Electronic gear B	2	1
• Motor rotation direction	Positive side=Clockwise	Positive side=Clockwise
• Mechanism type	mm	step
• Mechanism lead [mm]	20	1
• Mechanism lead decimal digit setting	×1 [mm]	
• Mechanism limit parameter setting	Follow ABZO setting	Disable
• Mechanism protection parameter setting	Follow ABZO setting	Disable
• JOG/HOME/ZHOME operation setting	Prioritize ABZO setting *1	Manual setting
• (JOG) Operating speed	10 [mm/s]	1,000 [Hz]
• (JOG) Acceleration/deceleration	0.5 [m/s^2]	1,000 [kHz/s]
• (JOG) Starting speed	5 [mm/s]	500 [Hz]
• (JOG) Operating speed (high)	50 [mm/s]	5,000 [Hz]
• (ZHOME) Operating speed	100 [mm/s]	5,000 [Hz]
• (ZHOME) Acceleration/deceleration	0.5 [m/s^2]	1,000 [kHz/s]
• (ZHOME) Starting speed	5 [mm/s]	500 [Hz]
• (HOME) Home-seeking mode	3-sensor	3-sensor
• (HOME) Starting direction	Negative side	Positive side
• (HOME) Acceleration/deceleration	0.5 [m/s^2]	1,000 [kHz/s]
• (HOME) Starting speed	5 [mm/s]	500 [Hz]
• (HOME) Operating speed	100 [mm/s]	5,000 [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	This item has been set for each model.	4,000,000 [Hz]
• Maximum pushing speed	25 [mm/s]	4,000,000 [Hz]
• Maximum push current *3	100 [%]	100 [%]

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

*2 Mechanism protection parameters cannot be set by customers.

*3 The push current actually usable is different from the push current having set. Check with the graph shown on p.23.

■ 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 (3,000)	0.03 (1,000)
Base setting parameter		
• Electronic damper function	Enable	Enable
Motor & Mechanism parameter		
• Mechanism settings	Prioritize ABZO setting *1	Manual setting
• Electronic gear A	1	1
• Electronic gear B	3	1
• Motor rotation direction	Positive side=Clockwise	Positive side=Clockwise
• Mechanism type	mm	step
• Mechanism lead [mm]	30	1
• Mechanism lead decimal digit setting	×1 [mm]	
• Mechanism limit parameter setting	Follow ABZO setting	Disable
• Mechanism protection parameter setting	Follow ABZO setting	Disable
• JOG/HOME/ZHOME operation setting	Prioritize ABZO setting *1	Manual setting
• (JOG) Operating speed	10 [mm/s]	1,000 [Hz]
• (JOG) Acceleration/deceleration	0.5 [m/s^2]	1,000 [kHz/s]
• (JOG) Starting speed	5 [mm/s]	500 [Hz]
• (JOG) Operating speed (high)	50 [mm/s]	5,000 [Hz]
• (ZHOME) Operating speed	100 [mm/s]	5,000 [Hz]
• (ZHOME) Acceleration/deceleration	0.5 [m/s^2]	1,000 [kHz/s]
• (ZHOME) Starting speed	5 [mm/s]	500 [Hz]
• (HOME) Home-seeking mode	3-sensor	3-sensor
• (HOME) Starting direction	Negative side	Positive side
• (HOME) Acceleration/deceleration	0.5 [m/s^2]	1,000 [kHz/s]
• (HOME) Starting speed	5 [mm/s]	500 [Hz]
• (HOME) Operating speed	100 [mm/s]	5,000 [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	This item has been set for each model.	4,000,000 [Hz]
• Maximum pushing speed	25 [mm/s]	4,000,000 [Hz]
• Maximum push current *3	100 [%]	100 [%]

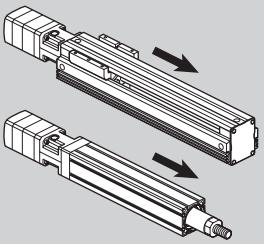
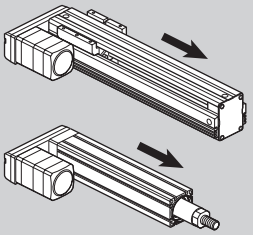
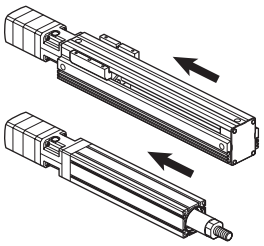
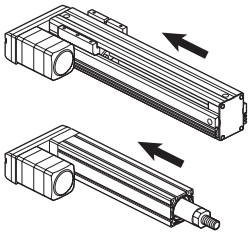
*1 When changing the factory setting of parameter items, change the setting for the "Mechanism settings" parameter and "JOG/HOME/ZHOME operation setting" parameter to "Manual setting."

*2 Mechanism protection parameters cannot be set by customers.

*3 The push current actually usable is different from the push current having set. Check with the graph shown on p.23.

1-4 Traveling direction of the moving part

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

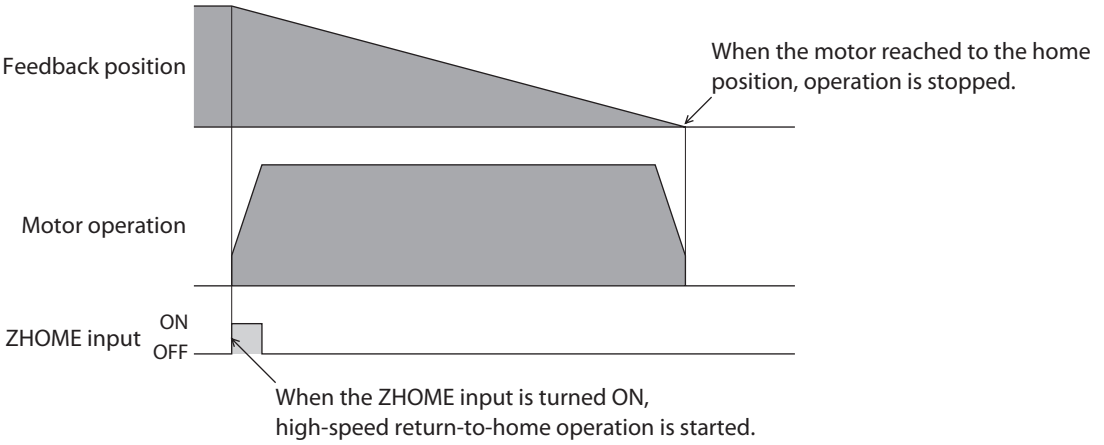
Setting	In-line motor mounting type	Parallel motor mounting type
Operation by setting of parameter When setting the travel amount to the positive (+) side **Operation by pulse signal** • 2-pulse input mode When inputting the pulse signal to the CW input • 1-pulse input mode When inputting the pulse signal to the PLS input while the DIR input is ON.	The table moves to opposite the motor side. 	The table moves to opposite the motor side. 
Operation by setting of parameter When setting the travel amount to the negative (–) side **Operation by pulse signal** • 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.	The table moves to the motor side. 	The table moves to the motor side. 

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. A sensor set is also provided as our product.
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.	• 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.	• Three external sensors are required. *2 • The operating speed is high. (return-to-home operation speed)
1-sensor 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.	• One external sensor is required. • The operating speed is high. (return-to-home operation speed) • Not rotate in the reverse direction.
Push-motion 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-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-home-seeking," and stops. The position at which the motor stopped becomes the home position.	• 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

Sensor output	Applicable product		
	EAS Series	**EZS** Series	**EZSH** Series
NPN	**PAES-S-2X**, **PAES-S-2Y** **PAES-S-4X**, **PAES-S-4Y** **PAES-S-6X**, **PAES-S-6Y**	**PAES-S**	**PAES-S-6EZSH**
PNP	**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.

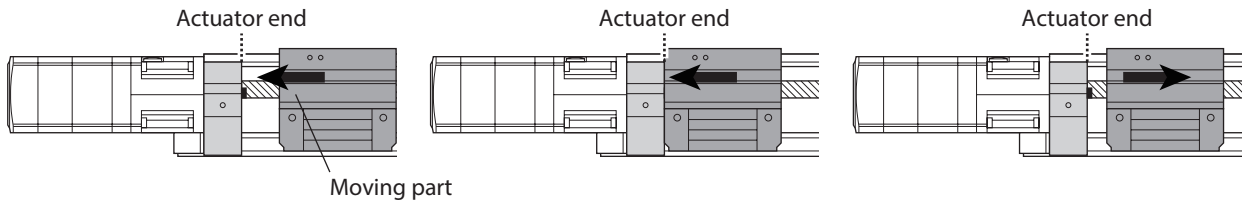
■ Movement of push-motion return-to-home operation

If push-motion return-to-home operation is performed with keeping the initial value (0) for the "(HOME) Position offset" parameter, the moving part returns to the home position to stop after hitting the actuator end. Refer to the "Distance from the actuator end to the home position" on p.21.

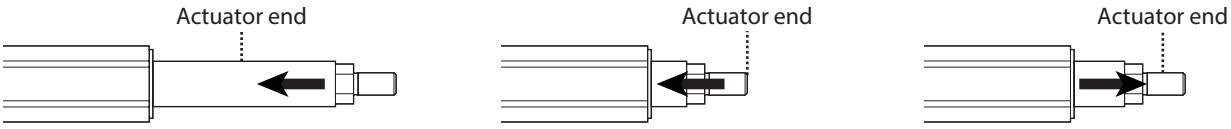
● EAS/EZS/EAC Series

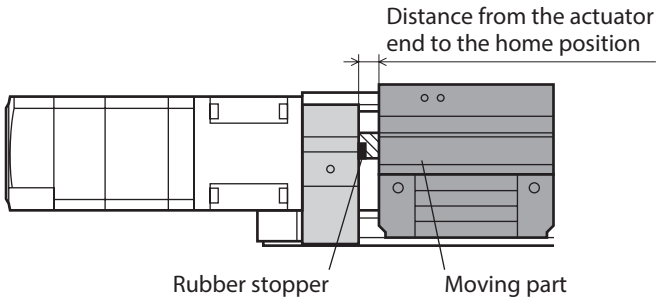
1. When push-motion return-to-home operation is performed, the moving part moves toward the actuator end.
2. The moving part hits the actuator end.
3. The moving part returns to the set home position and stops.

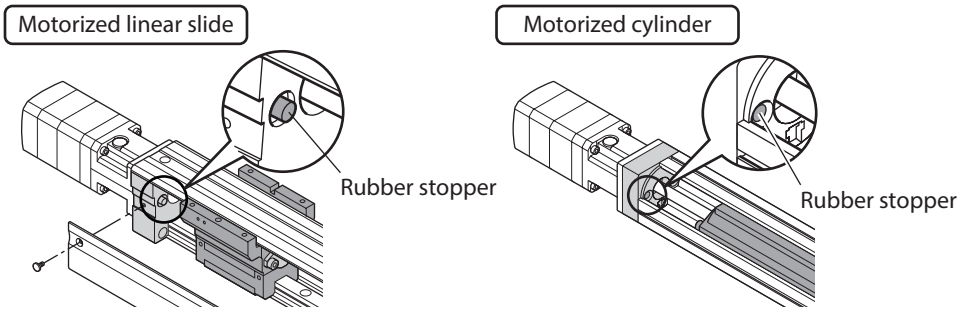
Motorized linear slide



Motorized cylinder







- **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
EAC	**2**, **4**, **6**	4 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

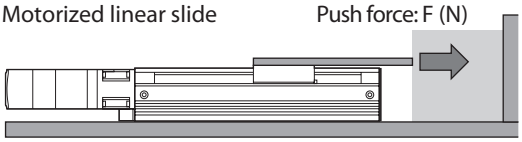
The upper limit value of the push-motion return-to-home speed is shown next.

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

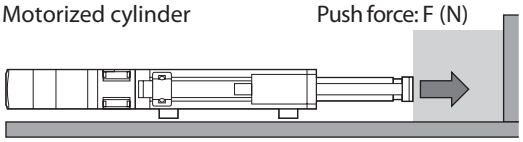
1-7 Push-motion operation

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

• Motorized linear slide Push force: F (N)



• Motorized cylinder Push force: F (N)



Series	Model	Lead	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	20 mm	325 N
		30 mm	220 N

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.

Operation data

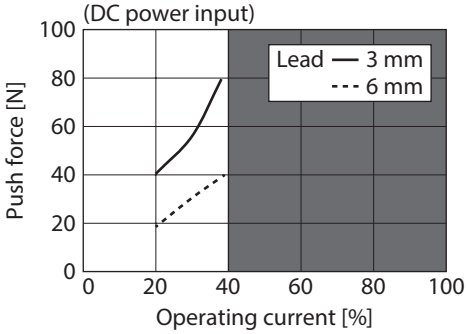
	Operation type	Operating current [%]
#0	Absolute push-motion	60.0
#1	Incremental positioning (based on command position)	100.0
#2	Incremental positioning (based on command position)	100.0
#3	Incremental positioning (based on command position)	100.0
#4	Incremental positioning (based on command position)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

1-8 Current setting of push-motion operation

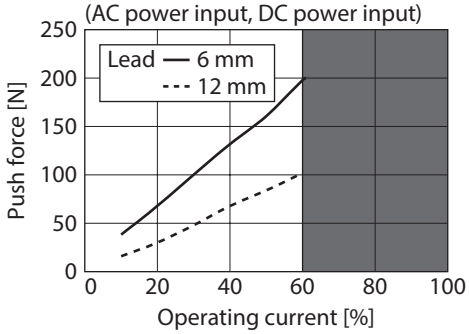
The reference value of the push current is shown next. Check the actual push force using the product.

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

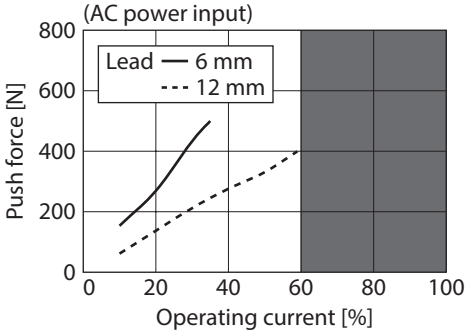
EAS2, EAC2
(DC power input)



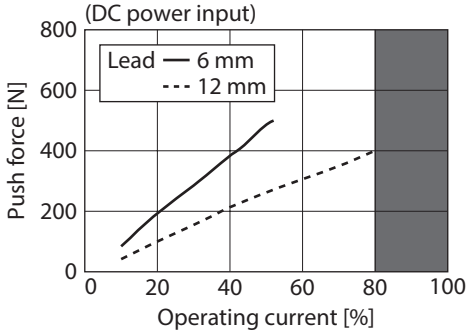
EAS4, EZS3, EZS4, EAC4
(AC power input, DC power input)



EAS6, EZS6, EAC6
(AC power input)

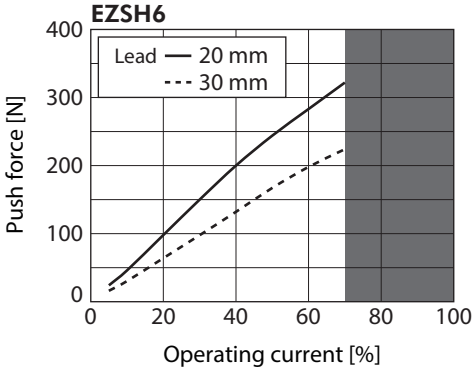


EAS6, EZS6, EAC6
(DC power input)



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

EZSH6



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 direction 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
- Cable length
- Ambient temperature

■ Push speed

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

Series	Upper limit of push speed
EAS, EAC EZS, EZSH	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)

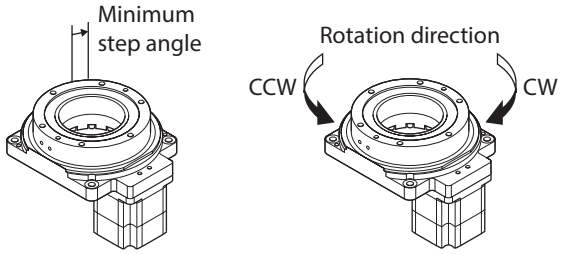
2-1 Setting flow

1 Install the 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.

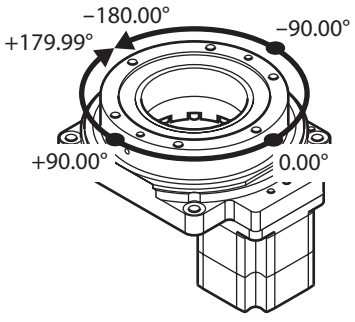
5 Copy the ABZO information (fixed value) to the driver.

Using the **MEXE02**, match the ABZO information (fixed value) and the setting value of the driver parameter.

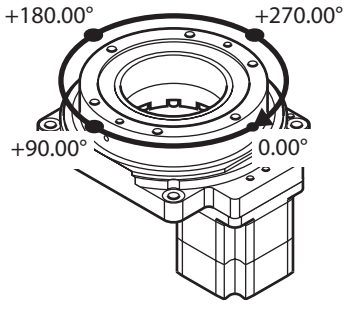
memo The ABZO information (fixed value) can be stored as the recovery data file.
Save the recovery data file in a PC as a data file. Refer to the OPERATING MANUAL **AZ** Series Function Edition for details.

6 Set the coordinate.

The coordinate has been set to ±180° at the time of shipment.



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



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.

2-2 Parameter setting list

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

■ DGII Series Motor vertical mounting

Item	Factory setting	
• Step angle per revolution [°]	360	
• Resolution of output table (minimum step angle [°])	36,000 (0.01)	
Motor & Mechanism parameter		
• Mechanism settings	Prioritize ABZO setting	
• Electronic gear A	1	
• Electronic gear B *1	2	
• Motor rotation direction *1	Positive side=Counterclockwise	
• Mechanism type	deg *2	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	Enable	
• 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]	1,000 [Hz]
• (JOG) Acceleration/deceleration	10 [$\times 10^3$deg/s^2]	1,000 [kHz/s]
• (JOG) Starting speed	5 [deg/s]	500 [Hz]
• (JOG) Operating speed (high)	50 [deg/s]	5,000 [Hz]
• (ZHOME) Operating speed	50 [deg/s]	5,000 [Hz]
• (ZHOME) Acceleration/deceleration	10 [$\times 10^3$deg/s^2]	1,000 [kHz/s]
• (ZHOME) Starting speed	5 [deg/s]	500 [Hz]
• (HOME) Home-seeking mode	3-sensor	
• (HOME) Starting direction	Positive side *3	
• (HOME) Acceleration/deceleration	10 [$\times 10^3$deg/s^2]	1,000 [kHz/s]
• (HOME) Starting speed	5 [deg/s]	500 [Hz]
• (HOME) Operating speed	10 [deg/s]	1,000 [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.

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

Note Push-motion operation as well as push-motion return-to-home operation cannot be performed with the **DGII** Series. If tried to perform these operations, an alarm of operation data error is generated.

■ DGII Series Motor horizontal mounting

Item		Factory setting	
• Step angle per revolution [°]		360	
• Resolution of output table (minimum step angle [°])		36,000 (0.01)	
Motor & Mechanism parameter			
• Mechanism settings		Prioritize ABZO setting	
• Electronic gear A		1	
• Electronic gear B *1	Gear ratio 12	3	
	Gear ratio 18	2	
	Gear ratio 36	1	
• Motor rotation direction		Positive side=Clockwise	
• Mechanism type		deg *2	step *2
• Initial coordinate generation & wrap setting range [rev] *1	Gear ratio 12	12	
	Gear ratio 18	18	
	Gear ratio 36	36	
• Initial coordinate generation & wrap range offset ratio [%]		50	
• Initial coordinate generation & wrap coordinate offset value [deg]		0	
• Wrap setting		Enable	
• 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]	1,000 [Hz]
• (JOG) Acceleration/deceleration *1		0.05 [$\times 10^3$deg/s^2]	5 [kHz/s]
• (JOG) Starting speed		5 [deg/s}	500 [Hz]
• (JOG) Operating speed (high)		50 [deg/s]	5,000 [Hz]
• (ZHOME) Operating speed		50 [deg/s]	5,000 [Hz]
• (ZHOME) Acceleration/deceleration *1		0.45 [$\times 10^3$deg/s^2]	45 [kHz/s]
• (ZHOME) Starting speed		5 [deg/s]	500 [Hz]
• (HOME) Home-seeking mode		3-sensor	
• (HOME) Starting direction		Positive side *3	
• (HOME) Acceleration/deceleration *1		0.05 [$\times 10^3$deg/s^2]	5 [kHz/s]
• (HOME) Starting speed		5 [deg/s]	500 [Hz]
• (HOME) Operating speed		10 [deg/s]	1,000 [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.

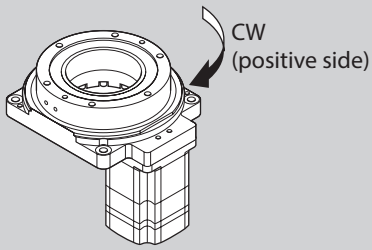
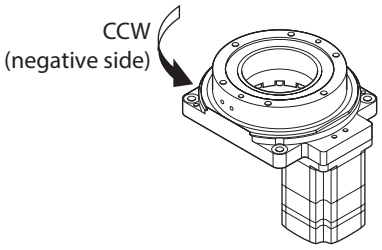
*2 The unit of display on the **MEXE02** can be switched to "deg" or "step" while the data is editing.

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

Note Do not perform push-motion operation or push-motion return-to-home operation with the **DGII** Series.

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 positive (+) side	
Operation by pulse signal • 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 negative (–) side	
Operation by pulse signal • 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

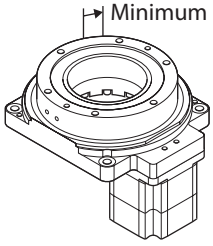
The factory setting of the minimum step angle is 0.01°.
The minimum step angle can be set using the "Electronic gear A," "Electronic gear B" parameters.
Refer to the OPERATING MANUAL **AZ** Series Function Edition for how to set the resolution using the electronic gears.

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:
When the initial values of the gear ratio and resolution are "18" and "36,000 P/R" respectively

	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°	36,000 P/R	0.18°	2,000 P/R	The setting is not required.	
Setting example	0.01°	36,000 P/R	0.18°	2,000 P/R	1	2
	0.1°	3,600 P/R	1.8°	200 P/R	5	1

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



$$\text{Minimum step angle of output table (°)} = \frac{360°}{18\ (\text{Gear ratio}) \times 1{,}000 \times (\text{Electronic gear B} \div \text{Electronic gear A})} = 0.1°$$

$$\frac{\text{Electronic gear B}}{\text{Electronic gear A}} = \frac{1}{5}$$

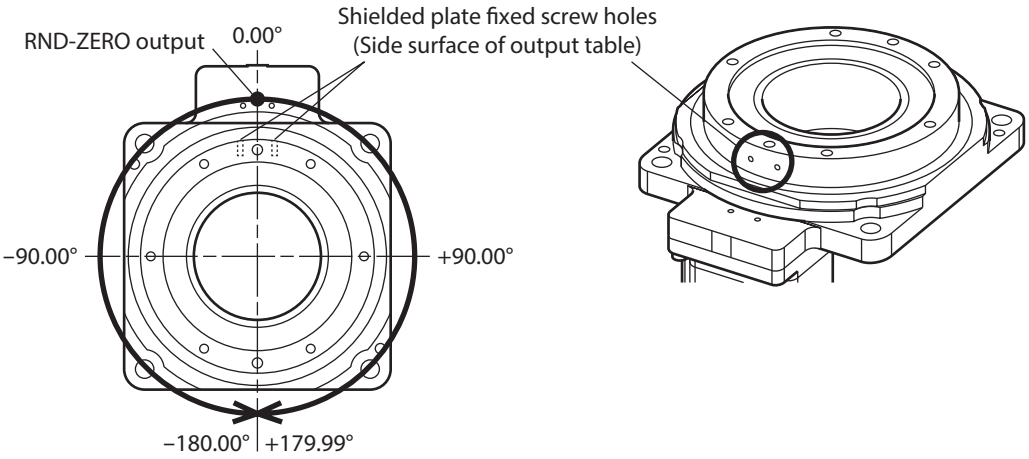
When setting the minimum step angle of the output table to 0.1°, set the electronic gear A to 5 and the electronic gear B to 1.

2-5 Position coordinate management of the output table

A mechanical home position and electrical home position can be set for motorized 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 ±180° as shown in the figure next.

■ 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.
The figure shows the **DGM130R-AZMC**.



■ 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 OPERATING MANUAL **AZ** Series Function Edition for details.

Coordinate setting	Operation mode
±180°	• Absolute positioning Specifies the position coordinate of the target position. • Incremental positioning Specifies the distance to the target position.
0 to 360°	• 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.

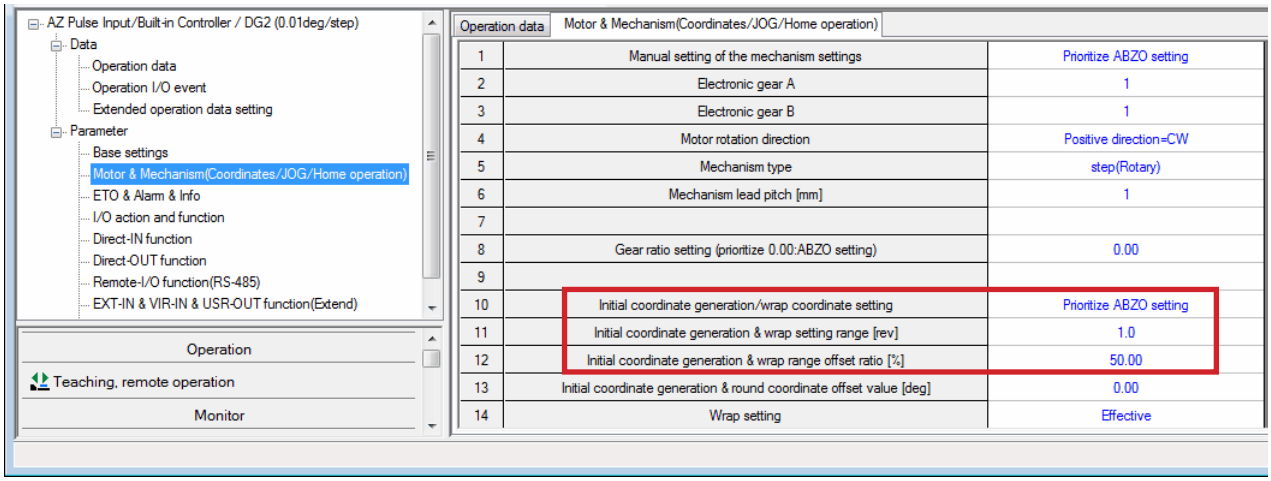
■ Comparison of positioning SD (stored data) operation

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

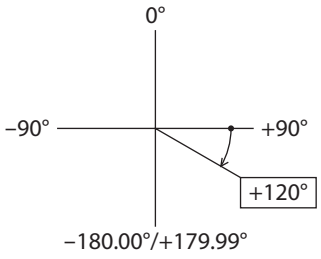
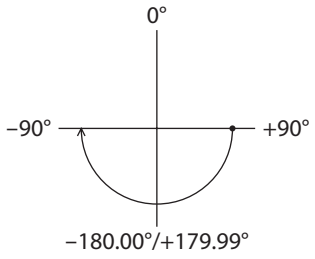
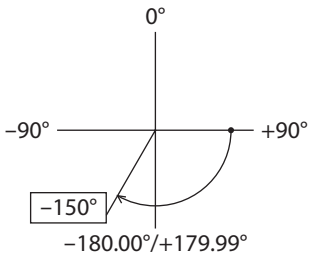
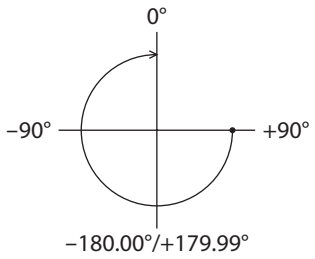
● When operating from the 90° position after setting the position coordinate of "±180°"

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)

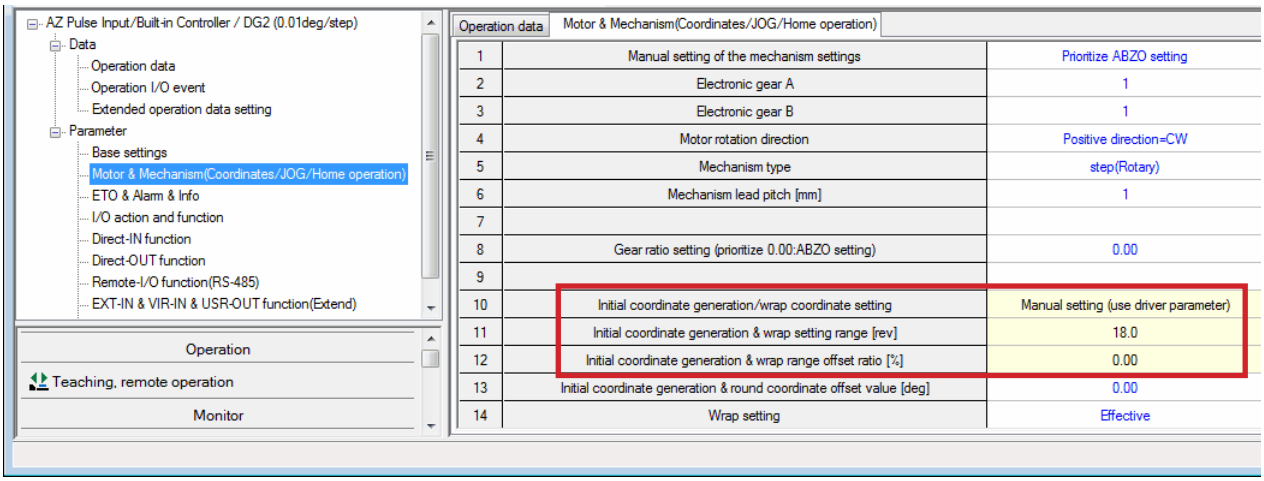


1	Manual setting of the mechanism settings	Prioritize ABZO setting
2	Electronic gear A	1
3	Electronic gear B	1
4	Motor rotation direction	Positive direction=CW
5	Mechanism type	step(Rotary)
6	Mechanism lead pitch [mm]	1
7		
8	Gear ratio setting (prioritize 0.00:ABZO setting)	0.00
9		
10	Initial coordinate 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

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

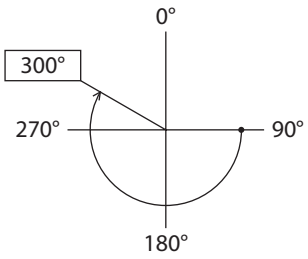
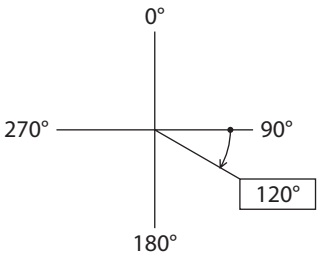
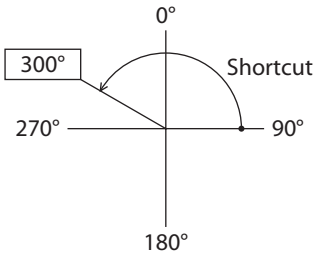
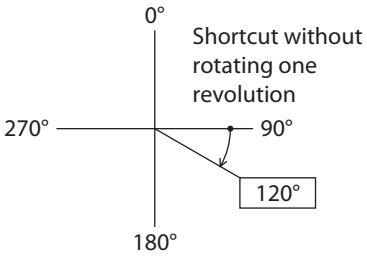
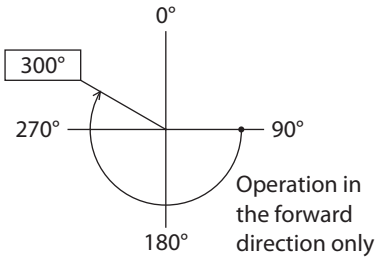
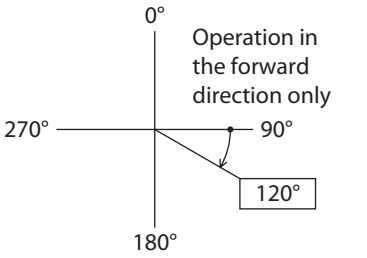
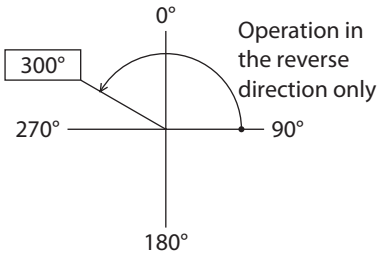
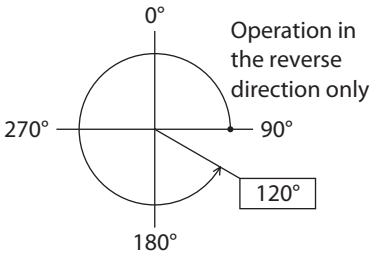
- **When operating from the 90° position after setting the position coordinate to "0 to 360°"**

  This is a setting example when connecting the product which gear ratio is 18.
  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



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	Manual setting (use driver parameter)
11	Initial coordinate generation & wrap setting range [rev]	18.0
12	Initial coordinate generation & wrap range offset ratio [%]	0.00
13	Initial coordinate generation & round coordinate offset value [deg]	0.00
14	Wrap setting	Effective

memo Set the gear ratio of your product used in the “Initial coordinate generation & wrap setting range” parameter.

Operation mode	When setting the operation data to 300°	When setting the operation data to 480°
Wrap absolute positioning (RND-ABS) • Specifies the position coordinate of the target position • Movement within the wrap range		
Wrap shortcut positioning (Round proximity positioning) • Specifies the position coordinate of the target position • Movement within the wrap range • Operation in the shorter direction of the traveling distance		
Wrap forward direction absolute positioning (RND-ABS (FWD)) • Specifies the position coordinate of the target position • Movement within the wrap range • Operation in the forward direction only		
Wrap reverse direction absolute positioning (RND-ABS (RVS)) • Specifies the position coordinate of the target position • Movement within the wrap range • Operation in the reverse direction only		

3 Motorized actuator equipped the AR Series

◆Table of contents

1 Setting of the motorized linear slide and motorized cylinder

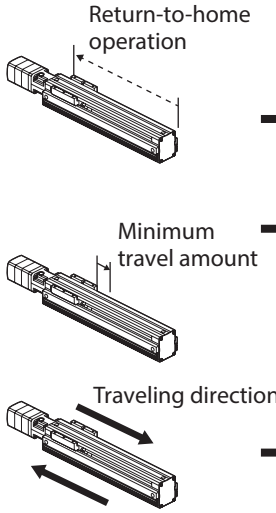
This chapter explains the parameters and operation functions of the motorized linear slide and motorized cylinder. (Hereinafter described as motorized actuator)

1-1 Setting flow

1 Install the motorized actuator.

2 Install and connect a driver.

3 Set parameters for the driver. (It is explained in this part.)



Home ooperation parameter		
• Home-seeking mode		Push mode
• Starting speed of home-seeking [Hz]		1,000
• 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, **EZSH** Series linear slide, **EAC** Series cylinder

memo
- 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 example

■ Built-in controller type

memo

- 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. When the alarm has generated, reconsider the operating condition or use our regeneration resistor.

● Lead: 3 mm

A setting example of the parameter for when setting the minimum travel amount to 0.01 mm is shown next.
☐ 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)	–	1,000 (0.003)	–
Operation data				
• Position [step]	1,000	10 [mm]	0	0 [mm]
• Operating speed [Hz]	10,000	100 [mm/s]	1,000	3 [mm/s]
• Acceleration (Deceleration) [ms/kHz] *2	1	10 [m/s^2]	1	3 [m/s^2]
Operation parameter				
• JOG operating speed [Hz]	10,000	100 [mm/s]	1,000	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]	1,000	10 [mm/s]	500	1.5 [mm/s]
• Position offset of home-seeking [step]	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]	8,388,607	25,165.821 [mm]
• Negative software limit [step]	−200	−2 [mm]	−8,388,608	−25,165.824 [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 1,000 times.

- **Lead: 6 mm**

A setting example of the parameter for when setting the minimum travel amount to 0.01 mm is shown next.
☐ 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)	–	1,000 (0.006)	–
Operation data					
• Position [step]		1,000	10 [mm]	0	0 [mm]
• Operating speed [Hz]		10,000	100 [mm/s]	1,000	6 [mm/s]
• Acceleration (Deceleration) [ms/kHz] *2		1	10 [m/s^2]	1	6 [m/s^2]
Operation parameter					
• JOG operating speed [Hz]		10,000	100 [mm/s]	1,000	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**	1,000	10 [mm/s]	500	3 [mm/s]
	EAS4, **EAS6**, **EAC4**, **EAC6**, **EZS3**, **EZS4**, **EZS6**	2,500	25 [mm/s]	500	3 [mm/s]
• Position offset of home-seeking [step]	**EAS2**, **EAC2**, **EAC4**, **EAC6**	200	2 [mm]	0	0 [mm]
	EZS3, **EZS4**, **EAS4**	100	1 [mm]		
	EAS6, **EZS6**	400	4 [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		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]	8,388,607	50,331.642 [mm]
• Negative software limit [step]		−200	−2 [mm]	−8,388,608	−50,331.648 [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 1,000 times.

*3 This is the traveling 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 next.
☐ 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])		1,200 (0.01)	–	1,000 (0.012)	–
Operation data					
• Position [step]		1,000	10 [mm]	0	0 [mm]
• Operating speed [Hz]		10,000	100 [mm/s]	1,000	12 [mm/s]
• Acceleration (Deceleration) [ms/kHz] *2		1	10 [m/s^2]	1	12 [m/s^2]
Operation parameter					
• JOG operating speed [Hz]		10,000	100 [mm/s]	1,000	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]		2,500	25 [mm/s]	500	6 [mm/s]
• Position offset of home-seeking [step]	**EAC4**, **EAC6**	200	2 [mm]	0	0 [mm]
	EZS3, **EZS4**, **EAS4**	100	1 [mm]		
	EAS6, **EZS6**	400	4 [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		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]	8,388,607	100,663.284 [mm]
• Negative software limit [step]		–200	–2 [mm]	–8,388,608	–100,663.296 [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 1,000 times.

*3 This is the traveling 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 next.
  ☐ 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])	2,000 (0.01)	–	1,000 (0.02)	–
Operation data				
• Position [step]	1,000	10 [mm]	0	0 [mm]
• Operating speed [Hz]	10,000	100 [mm/s]	1,000	20 [mm/s]
• Acceleration (Deceleration) [ms/kHz] *2	1	10 [m/s^2]	1	20 [m/s^2]
Operation parameter				
• JOG operating speed [Hz]	10,000	100 [mm/s]	1,000	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]	2,500	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]	8,388,607	167,772.14 [mm]
• Negative software limit [step]	−200	−2 [mm]	−8,388,608	−167,772.16 [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 1,000 times.

- **Lead: 30 mm**

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

⚠DANGER

- Do not enter the moving range of the product while the power is supplied. Be sure to provide a safety cage according to EN ISO13857. If the motorized linear slide moved to unexpected directions or ran at unexpected speeds during operation, serious injury may result.
- 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])	3,000 (0.01)	–	1,000 (0.03)	–
Operation data				
• Position [step]	1,000	10 [mm]	0	0 [mm]
• Operating speed [Hz]	10,000	100 [mm/s]	1,000	30 [mm/s]
• Acceleration (Deceleration) [ms/kHz] *2	1	10 [m/s^2]	1	30 [m/s^2]
Operation parameter				
• JOG operating speed [Hz]	10,000	100 [mm/s]	1,000	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]	2,500	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]	8,388,607	251,658.21 [mm]
• Negative software limit [step]	−200	−2 [mm]	−8,388,608	−251,658.24 [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 1,000 times.

■ Pulse input type

memo

- 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. When the alarm has generated, reconsider the operating condition or use our regeneration resistor.

● Lead: 3 mm

A setting example of the parameter for when setting the minimum travel amount to 0.01 mm is shown next.
☐ 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)	–	1,000 (0.003)	–
Return to electrical home operation parameter				
• Operating speed of return to electrical home operation [r/min]	2,000	100 [mm/s]	30	3 [mm/s]
• Acceleration/deceleration rate of return to electrical home operation [ms/(1,000 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]	2,000	100 [mm/s]	30	3 [mm/s]
• Acceleration and deceleration rate of JOG operation [ms/(1,000 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 next.
☐ 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)	–	1,000 (0.006)	–
Return to electrical home operation parameter				
• Operating speed of return to electrical home operation [r/min]	1,000	100 [mm/s]	30	3 [mm/s]
• Acceleration/deceleration rate of return to electrical home operation [ms/(1,000 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]	1,000	100 [mm/s]	30	3 [mm/s]
• Acceleration and deceleration rate of JOG operation [ms/(1,000 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 traveling 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 next.
☐ 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])	1,200 (0.01)	–	1,000 (0.012)	–
Return to electrical home operation parameter				
• 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/(1,000 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/(1,000 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 traveling 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 next.
☐ 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])	2,000 (0.01)	–	1,000 (0.02)	–
Return to electrical home operation parameter				
• 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/(1,000 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/(1,000 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 next.
☐ represents parameters to be changed.

⚠DANGER

- Do not enter the moving range of the product while the power is supplied. Be sure to provide a safety cage according to EN ISO13857. If the motorized linear slide moved to unexpected directions or ran at unexpected speeds during operation, serious injury may result.
- Operate the data setter outside the safety cage. Failure to do so may result in injury.

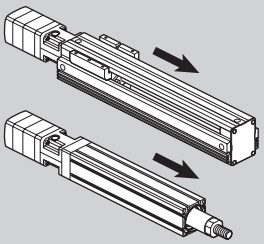
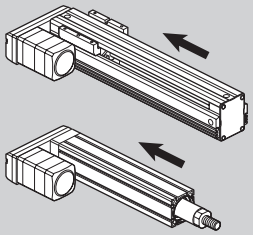
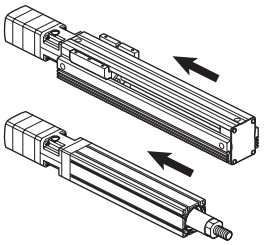
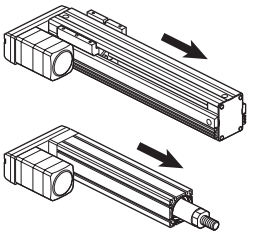
Item	Setting example		Initial value *	
	Setting value	Converted value	Setting value	Converted value
• Lead [mm]	30	–	30	–
• Resolution (Minimum travel amount [mm])	3,000 (0.01)	–	1,000 (0.03)	–
Return to electrical home operation parameter				
• Operating speed of return to electrical home operation [r/min]	200	100 [mm/s]	30	15 [mm/s]
• Acceleration/deceleration rate of return to electrical home operation [ms/(1,000 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/(1,000 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 Traveling direction of the moving part

The traveling 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 traveling 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
Operation by setting of parameter When setting the travel amount to the positive (+) side **Operation by pulse signal** • 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.	The table moves to opposite the motor side. 	The table moves to the motor side. 
Operation by setting of parameter When setting the travel amount to the negative (–) side **Operation by pulse signal** • 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.	The table moves to the motor side. 	The table moves to opposite the motor side. 

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.

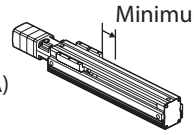
⚠WARNING Set various parameters such as the resolution and traveling direction before operating the motorized actuator. Operating the actuator without setting parameters may cause it to move to unexpected directions or run at unexpected speeds, leading to injury or damage to equipment.

■ Minimum travel amount

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

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

Motor resolution (P/R) = 1,000 × (Electronic gear B ÷ Electronic gear A)



- **Setting example:**
  When setting the minimum travel amount to 0.01 mm for 6 mm lead of the motorized linear slide

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

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

Motor resolution (P/R) = 1,000 × (Electronic gear B ÷ Electronic gear A) = 600 P/R

$$\frac{\text{Electronic gear B}}{\text{Electronic gear A}} = \frac{600}{1{,}000} = \frac{3}{5}$$

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	1,200 P/R	5	6
20 mm	0.01 mm	2,000 P/R	1	2
30 mm	0.01 mm	3,000 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.

Travel amount (mm) = Number of pulses (pulse) × 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

Travel amount (mm) = Number of pulses (pulse) × 0.01 mm = 30 mm

$$\text{Number of pulses (pulse)} = \frac{30\text{ mm}}{0.01\text{ mm}} = 3{,}000\text{ pulses}$$

When moving the motorized linear slide by 30 mm, set 3,000 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.

Operating speed (mm/s) = Pulse speed (Hz) × 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

Operating speed (mm/s) = Pulse speed (Hz) × 0.01 mm = 50 mm/s

$$\text{Pulse speed (Hz)} = \frac{50 \text{ mm/s}}{0.01 \text{ mm}} = 5{,}000 \text{ Hz}$$

When moving the motorized linear slide at the operating speed of 50 mm/s, set 5,000 Hz.

■ Acceleration/deceleration speed

The acceleration/deceleration speed is set by any of the acceleration/deceleration rate (ms/kHz), acceleration/deceleration rate [ms/(1,000 r/min)] or acceleration/deceleration time (s).

$$\text{Acceleration/deceleration speed (m/s}^2\text{)} = \frac{\text{Minimum travel amount (mm)} \times 1{,}000}{\text{Acceleration/deceleration rate (ms/kHz)}}$$

$$\text{Acceleration/deceleration speed (m/s}^2\text{)} = \frac{\text{Lead (mm)} \times 1{,}000}{60 \times \text{Acceleration/deceleration rate [ms/(1,000 r/min)]}}$$

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

- **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/s^2

$$\text{Acceleration/deceleration speed (m/s}^2\text{)} = \frac{0.01 \text{ mm} \times 1{,}000}{\text{Acceleration/deceleration rate (ms/kHz)}} = 10 \text{ m/s}^2$$

$$\text{Acceleration/deceleration rate (ms/kHz)} = \frac{0.01 \text{ mm} \times 1{,}000}{10 \text{ m/s}^2} = 1 \text{ ms/kHz}$$

When moving the motorized linear slide at the acceleration/deceleration speed of 10 m/s^2, 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. A sensor set is also provided as our product.

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.	• Three external sensors are required. *4 • 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. *3	• Two external sensors are required. • The operating speed is low. (starting speed of home-seeking)
Push mode *1 *2	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 rotates in the reverse direction. After reversing, the motor will move 200 steps and stop, and then the stop position will be the home position. *3	• 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.	• 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 Do not perform push-motion return-to-home operation with the **EZSH** Series.
*3 It moves 200 steps regardless of resolution. Therefore, the actual travel distance may vary according to resolution.
*4 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

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

■ Pusle 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-PRESET input is turned ON.	• 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

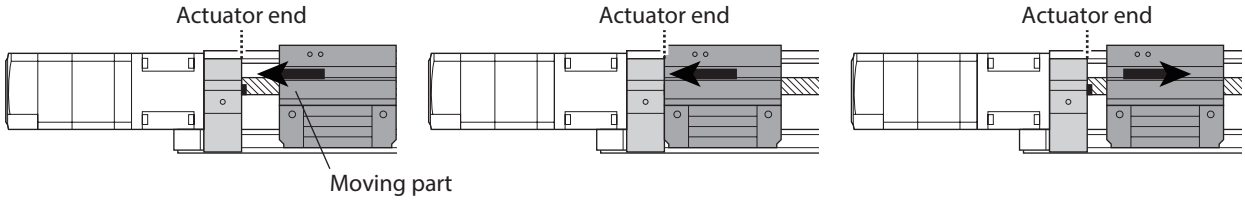
- Set the value of the "position offset of home-seeking" for when performing push-motion operation to be larger than the "distance from the actuator end to the home position." If push-motion return-to-home operation is performed with keeping the initial value (0), the moving part becomes a state of contacting 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

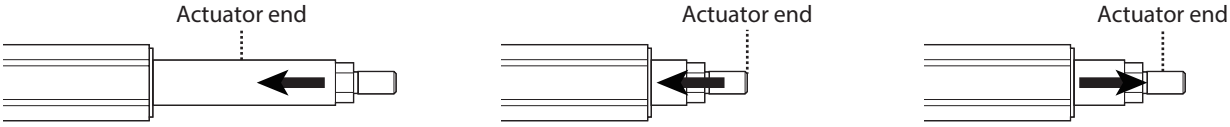
If push-motion return-to-home operation is performed with keeping the initial value (0) for the "Position offset of home-seeking" parameter, the position, where the moving part moves 200 steps in the reverse direction after pressing against the actuator end and stops, will be determined as the home position.

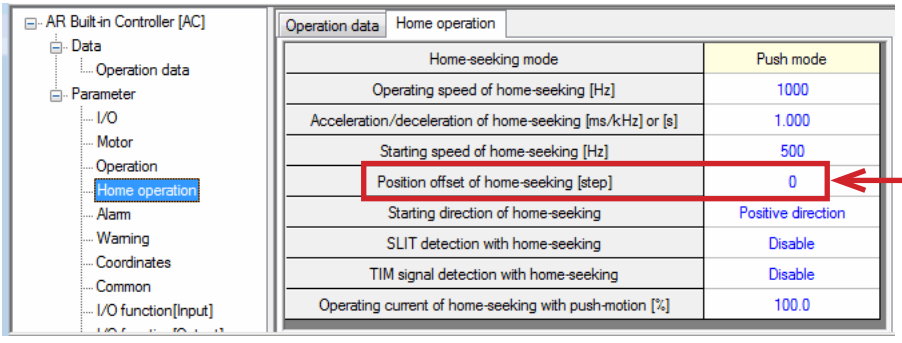
1. When push-motion return-to-home operation is performed, the moving part moves toward the actuator end.
2. The moving part hits the actuator end.
3. The moving part moves 200 steps in the reverse direction and stops.

Motorized linear slide



Motorized cylinder

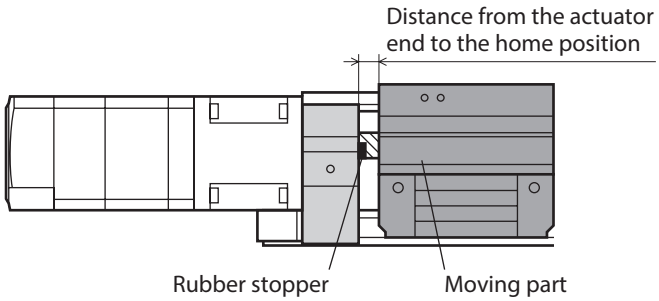




The motor moves 200 steps in the reverse direction and stops even if the setting is the initial value (0).

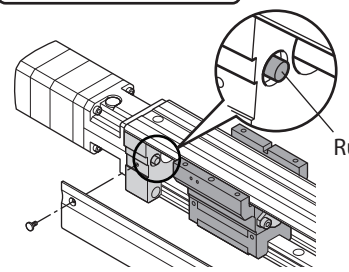
■ Position offset of push-motion return-to-home operation

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.

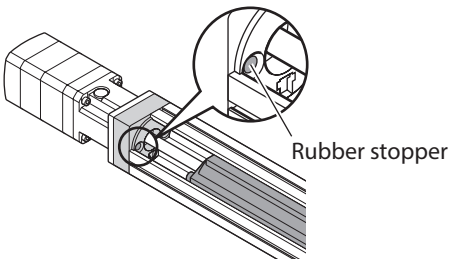


Series	Model	Distance from the actuator end to the home position
EAS	2	4 mm
	4	3 mm
	6	6 mm
EZS	3, 4	3 mm
	6	6 mm
EAC	2, 4, 6	4 mm

Motorized linear slide

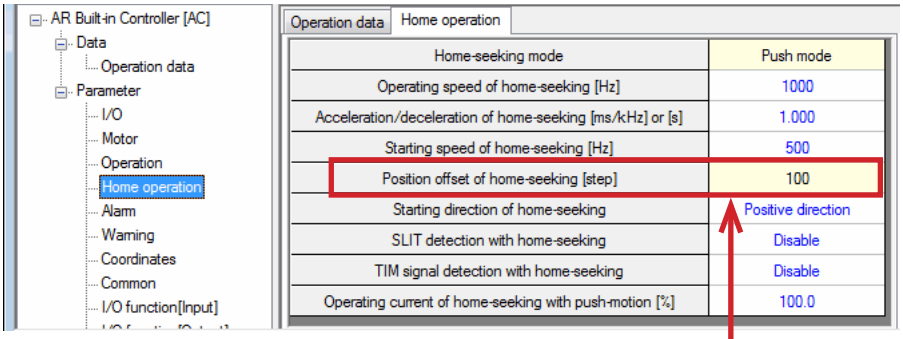


Motorized cylinder



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 steps



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 of the push-motion return-to-home speed is shown next.

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

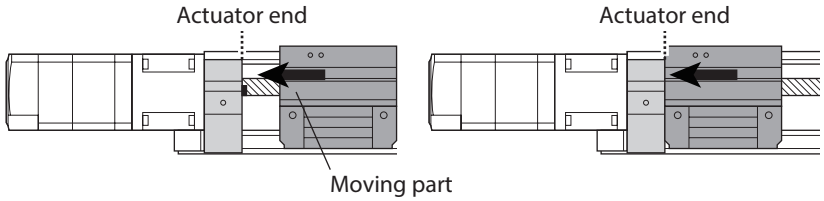
■ Setting of the operating current of push-motion return-to-home operation (push force)

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 next.

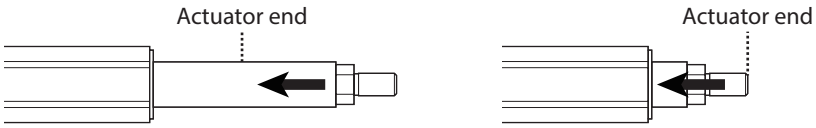
Note Be sure to set the operating current of push-motion return-to-home operation to less than the recommended value. Performing push-motion return-to-home operation with the current value exceeding the recommended value may cause damage to the actuator or equipment. This may also cause deterioration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

1. When push-motion return-to-home operation is performed, the moving part moves toward the actuator end.
2. The moving part hits the actuator end. The push force can be changed by adjusting the operating current of push-motion return-to-home operation.

Motorized linear slide



Motorized cylinder



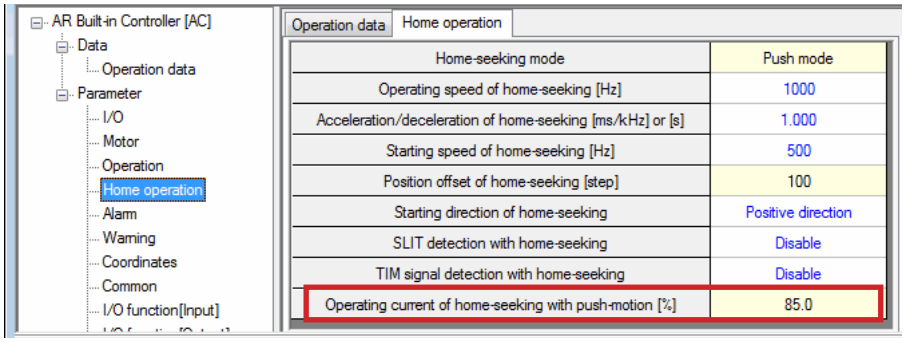
● **Recommended value for operating current of push-motion return-to-home operation**

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%

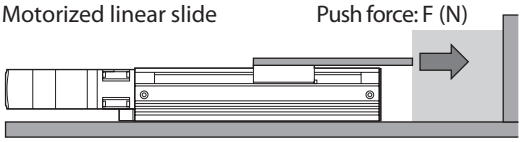


1-7 Push-motion operation

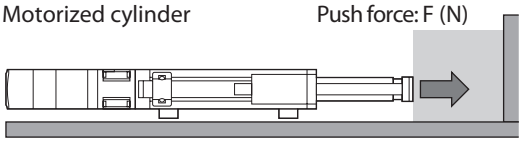
The push force for push-motion operation is set using the push current.

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.

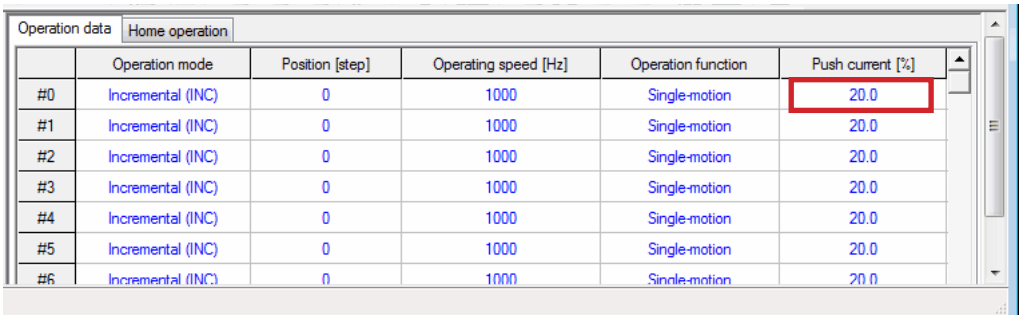
• Motorized linear slide Push force: F (N)



• Motorized cylinder Push force: F (N)



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	20 mm	325 N
		30 mm	220 N



	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

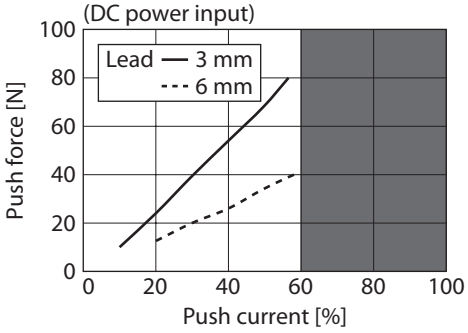
The reference value of the push current is shown next. Check the actual push force using the product.

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

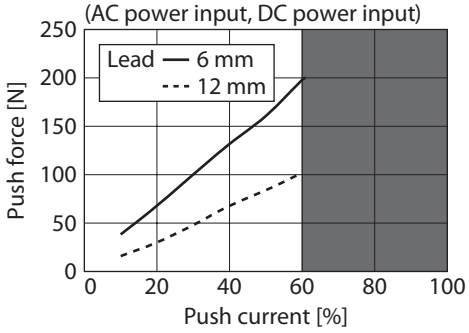
- Installation direction of the actuator (horizontal direction installation, vertical direction installation)
- Type of the motorized cylinder (motorized cylinder without a guided-shaft or with guided-shafts, stroke)
- Customer's load condition such as jig
- Cable length
- Ambient temperature

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

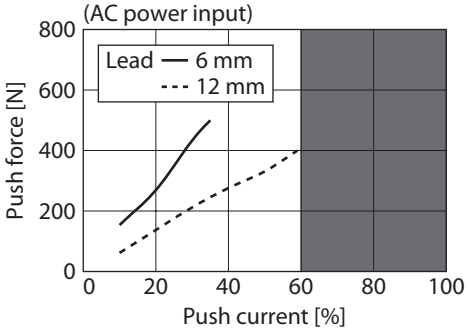
EAS2, EAC2
(DC power input)



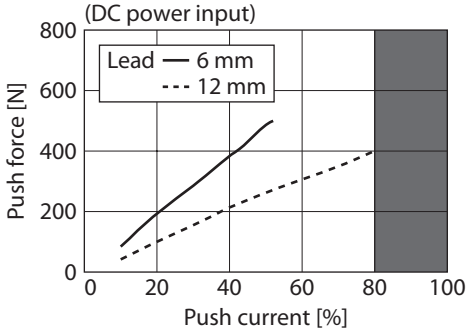
EZS3, EZS4, EAS4, EAC4
(AC power input, DC power input)



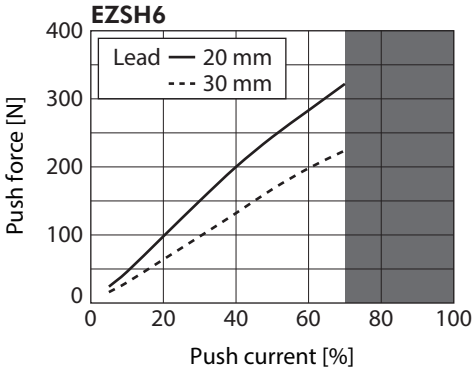
EAS6, EZS6, EAC6
(AC power input)



EAS6, EZS6, EAC6
(DC power input)



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



■ Push speed

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

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

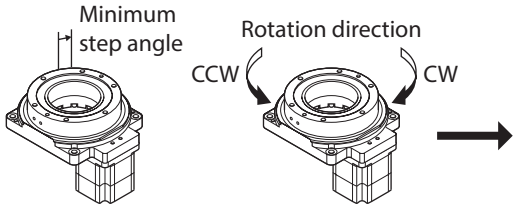
This chapter explains the parameters and operation functions of the hollow rotary actuator. (Hereinafter described as motorized actuator)

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 next.
☐ 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 [°])	3,600 (0.1)	–	18,000 (0.02)	–
• Gear reduction ratio of output table	18	–	18	–
Operation parameter				
• JOG operating speed [Hz]	1,000	100 [deg/s]	1,000	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]	1,000	100 [deg/s]	1,000	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.

Note Do not perform push-motion operation or push-motion return-to-home operation with the **DGII** Series. Performing these operations may cause damage to the motorized actuator.

■ Pulse input type

A setting example of the parameter for when setting the minimum step angle to 0.1° is shown next.
☐ 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 [°])	3,600 (0.1)	–	18,000 (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/(1,000r/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=CCW	–	Positive=CW	–

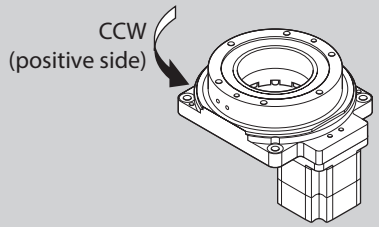
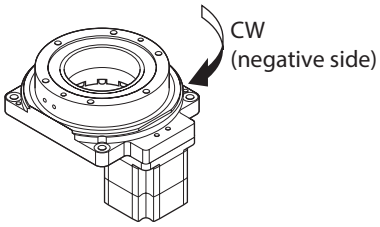
* The values are the factory setting data or initialized data.

Note Do not perform push-motion operation with the **DGII** Series. Performing push-motion operation may cause damage to the motorized actuator.

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 rotation 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 positive (+) side	
Operation by pulse signal • 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 negative (–) side	
Operation by pulse signal • 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

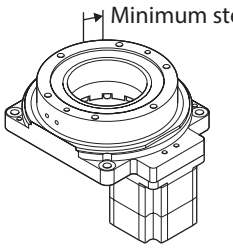
The factory setting of the minimum step angle is 0.02° (the resolution of the output table is 18,000).
The minimum step angle can be set using the resolution switches of the driver or parameters. (electronic gear A, electronic gear B) Refer to the USER MANUAL for how to set the resolution using the electronic 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°	18,000 P/R	0.36°	1,000 P/R	The setting is not required.	
Resolution switches *	0.04°	9,000 P/R	0.72°	500 P/R		
	0.004°	90,000 P/R	0.072°	5,000 P/R		
	0.002°	180,000 P/R	0.036°	10,000 P/R		
Setting example	0.01°	36,000 P/R	0.18°	2,000 P/R	1	2
	0.1°	3,600 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.



Minimum step angle of output table (°)

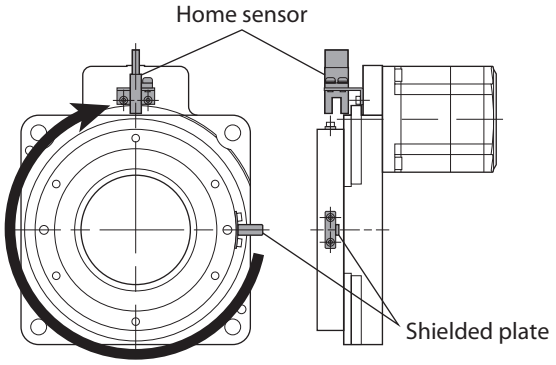
$$= \frac{360°}{18\ (\text{Gear ratio}) \times 1{,}000 \times (\text{Electronic gear B} \div \text{Electronic gear A})} = 0.1°$$

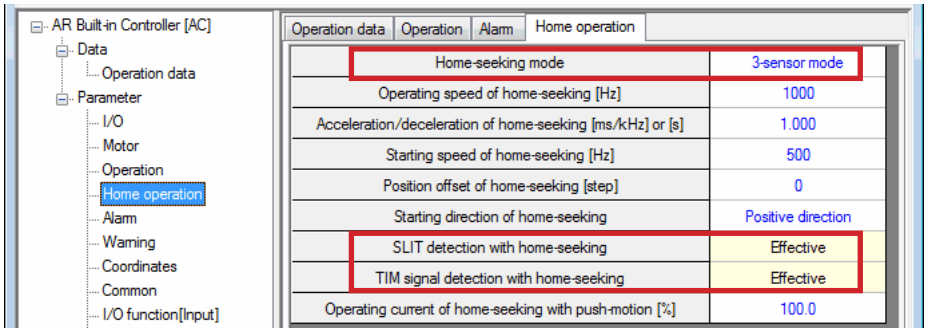
$$\frac{\text{Electronic gear B}}{\text{Electronic gear A}} = \frac{1}{5}$$

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 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.
A home sensor set is also provided as our product. Refer to p.60.



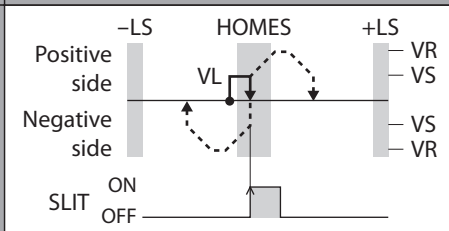
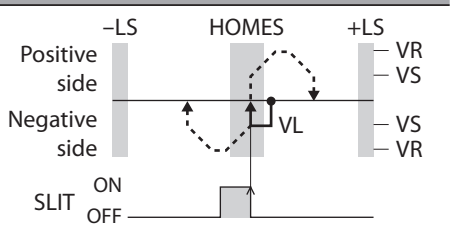
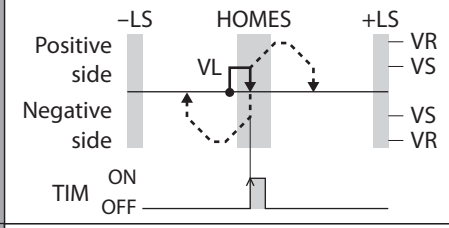
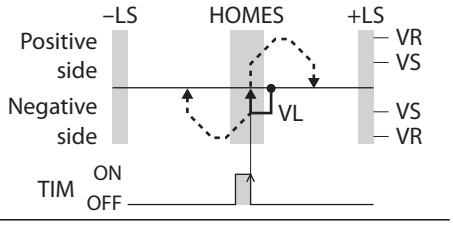
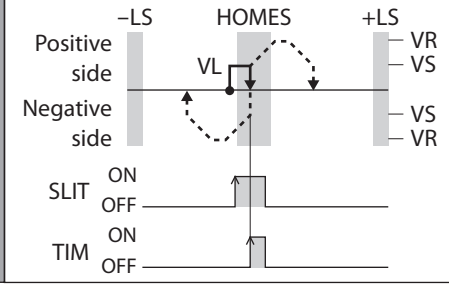
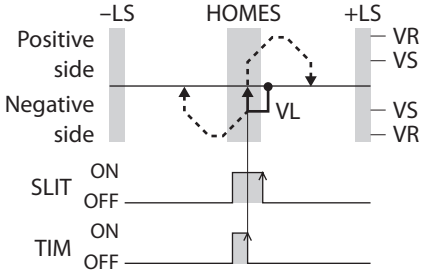


■ When concurrently using the SLIT input and/or TIM signal

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 position detection signal	Starting direction of return-to-home operation: Positive side	Starting direction of return-to-home operation: Negative side
SLIT input		
TIM signal		
SLIT input and TIM signal		

■ Home sensor set

Sensor output	Applicable product	
	DG60	**DG85R DG130R DG200R**
NPN	**PADG-SA**	**PADG-SB**
PNP	**PADG-SAY**	**PADG-SBY**

4 Motorized actuator equipped the RKII Series

◆Table of contents

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)

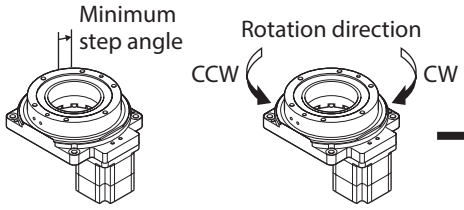
1-1 Setting flow

1 Install the motorized actuator.

2 Install and connect a driver.

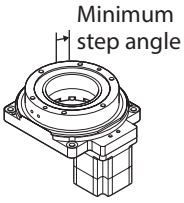
3 Set parameters for the driver. (It is explained in this part.)

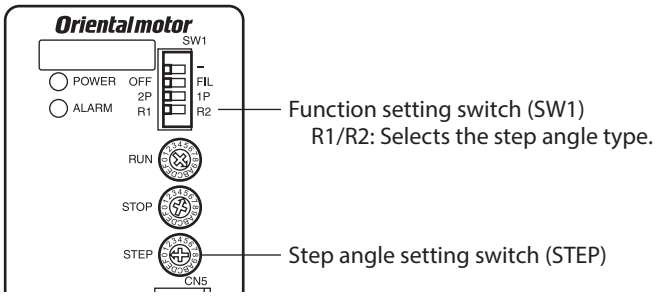
■ Built-in controller type



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

■ Pulse input type





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 next.
☐ represents parameters to be changed.

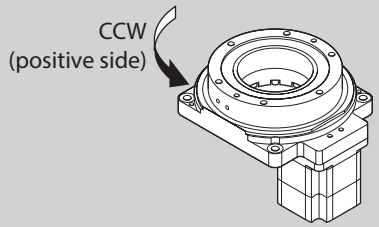
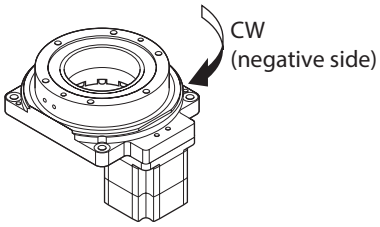
Item	Setting example		Initial value *	
	Setting value	Converted value	Setting value	Converted value
• Step angle per revolution [°]	360	–	360	–
• Resolution of output table (minimum step angle [°])	3,600 (0.1)	–	9,000 (0.04)	–
• Gear reduction ratio of output table	18	–	18	–
Operation parameter				
• JOG operating speed [Hz]	1,000	100 [deg/s]	1,000	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]	1,000	100 [deg/s]	1,000	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 rotation 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 positive (+) side **Operation by pulse signal** • 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 negative (–) side **Operation by pulse signal** • 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

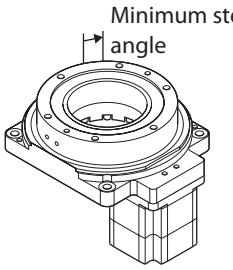
■ Built-in controller type

The factory setting of the minimum step angle is 0.04° (the resolution of the output table is 9,000). 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°	9,000 P/R	0.72°	500 P/R	The setting is not required.	
Setting example	0.01°	36,000 P/R	0.18°	2,000 P/R	1	4
	0.1°	3,600 P/R	1.8°	200 P/R	5	2

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



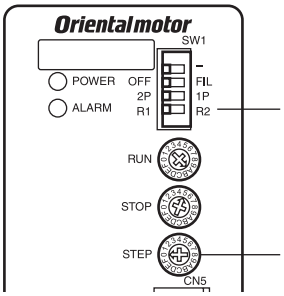
$$\text{Minimum step angle of output table (°)} = \frac{360°}{18\ (\text{Gear ratio}) \times 500 \times (\text{Electronic gear B} \div \text{Electronic gear A})} = 0.1°$$

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

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.

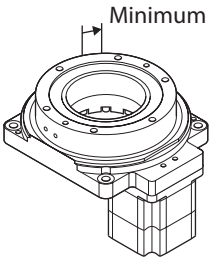
■ Pulse input type

The minimum step angle can be set using the step angle setting switche (STEP) of the driver.
The factory setting of the minimum step angle is 0.04° (the resolution of the output table is 9,000).



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**

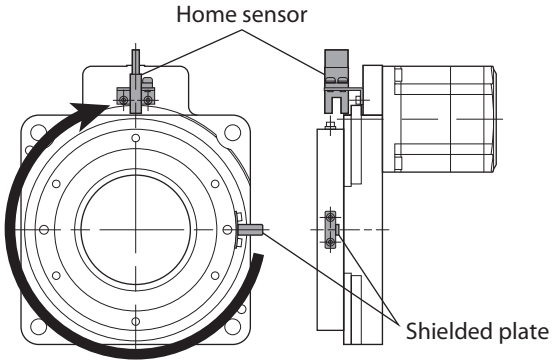
Step angle setting switch (STEP) dial setting	Minimum step angle	Motor resolution	Motor step angle
0	0.04°	500 P/R	0.72°
1	0.02°	1,000 P/R	0.36°
2	0.016°	1,250 P/R	0.288°
3	0.01°	2,000 P/R	0.18°
4	0.008°	2,500 P/R	0.144°
5	0.005°	4,000 P/R	0.09°
6	0.004°	5,000 P/R	0.072°
7	0.002°	10,000 P/R	0.036°
8	0.0016°	12,500 P/R	0.0288°
9	0.001°	20,000 P/R	0.018°
A	0.0008°	25,000 P/R	0.0144°
B	0.0005°	40,000 P/R	0.009°
C	0.0004°	50,000 P/R	0.0072°
D	0.00032°	62,500 P/R	0.00576°
E	0.0002°	100,000 P/R	0.0036°
F	0.00016°	125,000 P/R	0.00288°

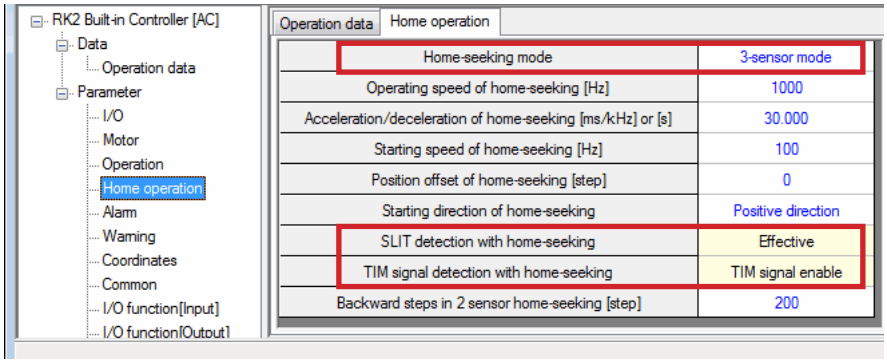
- **Function setting switch (SW1-No.1): When R2 is selected**

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…°)	1,200 P/R	0.3°
5	0.0125°	1,600 P/R	0.225°
6	0.00625°	3,200 P/R	0.1125°
7	$\frac{0.06}{18}$ (0.00333…°)	6,000 P/R	0.06°
8	0.003125°	6,400 P/R	0.05625°
9	$\frac{0.05}{18}$ (0.00277…°)	7,200 P/R	0.05°
A	0.0025°	8,000 P/R	0.045°
B	$\frac{0.03}{18}$ (0.00166…°)	12,000 P/R	0.03°
C	0.0015625°	12,800 P/R	0.028125°
D	0.00125°	16,000 P/R	0.0225°
E	0.00078125°	25,600 P/R	0.0140625°
F	0.0001°	200,000 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.
A home sensor set is also provided as our product.



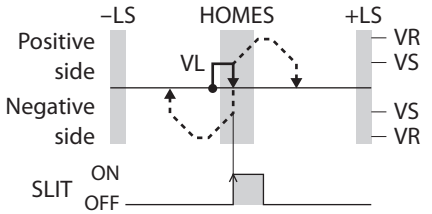
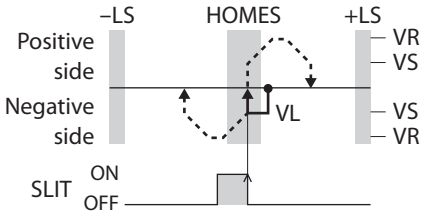
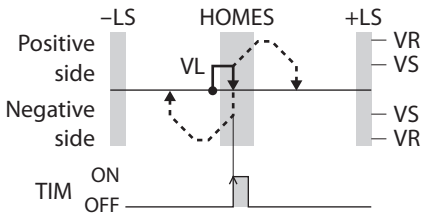
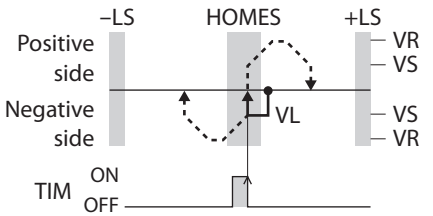
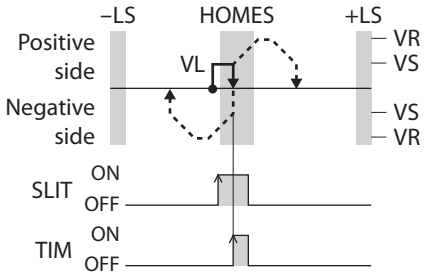
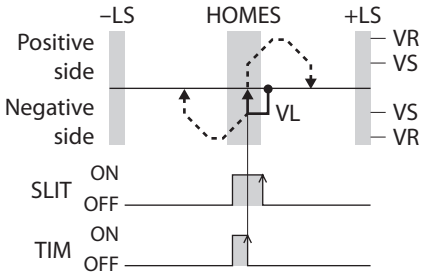


■ When concurrently using the SLIT input and/or TIM signal

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 position detection signal	Starting direction of return-to-home operation: Positive side	Starting direction of return-to-home operation: Negative side
SLIT input		
TIM signal		
SLIT input and TIM signal		

■ Home sensor set

Sensor output	Model
NPN	**PADG-SB**
PNP	**PADG-SBY**

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