Oriental motor

HL-80019

Motorized actuator

Hollow rotary actuator

● DGII Series

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.

Table of contents

1 Introduction

1-1 Before using the product

Only qualified personnel of electrical and mechanical engineering should work with the product.
Use the product correctly after thoroughly reading the section "Safety precautions" of the OPERATING MANUAL Actuator Edition. In addition, be sure to observe the contents described in caution and note in this manual.
The motorized actuator is 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 compensation for damage caused through failure to observe this warning.

Notation on this manual

⚠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.
memo	The items under this heading contain related information and contents to gain a further understanding of the text in this manual.

1-2 How to use this manual

This manual describes the parameters required to operate motorized actuators.
Use it in the following cases.

- To check the factory settings for parameters.
- To check the upper limit values for parameters.
- To change the travel direction of the moving part.

1-3 Related operating manuals

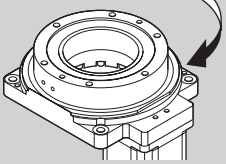
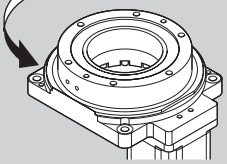
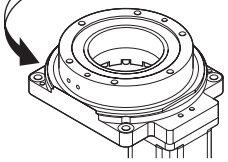
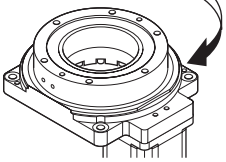
Download the operating manuals from Oriental Motor Website Download Page or contact your nearest Oriental Motor sales office.

Common to all products	• **DGII** Series OPERATING MANUAL Actuator Edition • Motorized Actuator Hollow Rotary Actuator OPERATING MANUAL Function Setting Edition (this document)

Products equipped with **AZ** Series	• **AZ** Series / Motorized Actuator equipped with **AZ** Series OPERATING MANUAL Function Edition Refer to the operating manuals of the driver for contents not described in the function edition.
Products equipped with **AZX** Series	• **AZX** Series / Motorized Actuator equipped with **AZX** Series OPERATING MANUAL Software Edition
Products equipped with **AR** Series	• **AR** Series / Motorized Actuator equipped with **AR** Series USER MANUAL
Products equipped with **RKII** Series	• **RKII** Series / Motorized Actuator equipped with **RKII** Series USER MANUAL

1-4 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. Check on the following table.
The table below describes examples when an actuator is used with the factory settings.

<table>
<tr><th>Setting</th><th>Actuators equipped with
AZ Series, AZX Series</th><th>Actuators equipped with
AR Series, RKII Series</th></tr>
<tr><td>When setting parameters to operate
Set the travel amount to the positive (+) side.</td><td rowspan="2">CW (Positive direction)
  </td><td rowspan="2">CCW (Positive direction)
  </td></tr>
<tr><td>When operating using the pulse signal*
• 2-pulse input mode
Input the pulse signal to the CW input
• 1-pulse input mode
Input the pulse signal to the PLS input when the DIR input is ON</td></tr>
<tr><td>When setting parameters to operate
Set the travel amount to the negative (-) side.</td><td rowspan="2">CCW (Negative direction)
  </td><td rowspan="2">CW (Negative direction)
  </td></tr>
<tr><td>When operating using the pulse signal*
• 2-pulse input mode
Input the pulse signal to the CCW input
• 1-pulse input mode
Input the pulse signal to the PLS input when the DIR input is OFF</td></tr>
</table>

* The **AZX** Series is excluded.

2 When using an actuator equipped with the AZ Series

2-1 Setting flow

The motorized actuator equipped with the AZ Series can be used with the parameters at the time of shipment.

1	**Install and connect a motorized actuator and a driver.**
2	**Connect a PC installed the support software MEXE02 to start.**
3	**Copy the ABZO information (fixed value) of the ABZO sensor to the driver.** Parameters such as the travel direction and minimum step angle have been set in the ABZO sensor at the time of shipment. Use the **MEXE02** software to match the ABZO information (fixed value) of the ABZO sensor and the setting value of the driver parameters.
4	**Set the software limit when no sensor is used.**
5	**Write the set data to the driver.**
6	**Check the movement of the motorized actuator.**
7	**Backup the data having set.**

2-2 Parameter list

■ How to read the table

This section describes parameters that have a value specific to the motorized actuator. Setting the specified values allows operation that satisfies the specifications of the motorized actuator.
The minimum step angle is set to "0.01 degrees" at the time of shipment. This makes it easier to calculate the travel amount, etc., since the actuator moves 0.01 degrees per step.

Item	Factory setting	
	Unit of travel amount: Deg	Unit of travel amount: Step
(JOG) Operating speed	10 [deg/s]	1,000 [Hz]
(JOG) Acceleration/deceleration rate	10 [$\times 10^3$ deg/s^2]	1,000 [kHz/s]
(JOG) Starting speed	5 [deg/s]	500 [Hz]

This value is set at the time of shipment.

Set the value in this column when operating in a step unit.

■ Motor vertical mounting

● Product specifications

Item	Factory setting
Travel amount per revolution of output table [deg]	360
Resolution of output table (minimum step angle [deg])	36,000 (0.01)

● Motor & mechanism parameter

Item	Factory setting	
	Unit of travel amount: Deg	Unit of travel amount: Step
Mechanism settings	Prioritize ABZO setting	
Electronic gear A	1	
Electronic gear B*1	2	
Motor rotation direction*1	Positive direction=CCW	
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 range 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 sensors	
(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]

*1 A value different from the initial value of the motor by itself is written to the ABZO sensor. The output table rotates in the clockwise (CW) direction.

*2 The display unit can be switched to "deg" or "step" even while editing the data.

*3 The output table starts return-to-home operation to the positive side (CW).

■ Motor horizontal mounting

● Product specifications

Item	Factory setting
Travel amount per revolution of output table [deg]	360
Resolution of output table (minimum step angle [deg])	36,000 (0.01)

● Motor & mechanism parameter

Item		Factory setting	
		Unit of travel amount: Deg	Unit of travel amount: Step
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 direction=CW	
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 range 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 sensors	
(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]

*1 A value different from the initial value of the motor by itself is written to the ABZO sensor.

*2 The display unit can be switched to "deg" or "step" even while editing the data.

*3 The output table starts return-to-home operation to the positive side (CW).

2-3 Operation

Note Push-motion operation and push-motion return-to-home operation cannot be performed with the **DGII** Series. If these operations are attempted, an alarm of Operation data error is generated.

■ Setting of minimum step angle

The minimum step angle is set to 0.01 degrees at the time of shipment. Set the minimum step angle with the "Electronic gear A" and "Electronic gear B" parameters.
The formula for calculating the minimum step angle is as follows.

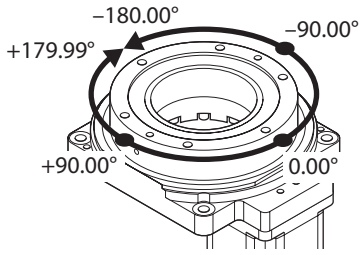
$$\text{Minimum step angle of output table (deg)} = \frac{360°}{\text{Gear ratio} \times 1{,}000 \times (\text{Electronic gear B} \div \text{Electronic gear A})}$$

Note For the pulse input type, use the function setting switches as they are in the factory settings. If they are changed, the ABZO information does not apply and the actuator will operate at a certain resolution.

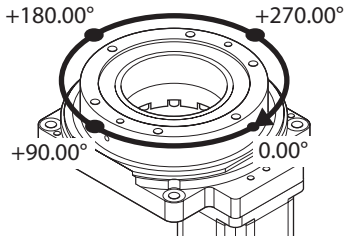
■ Coordinate management of output table

At the time of shipment, the coordinates are set to a range of minus 180 to plus 180 degrees centered on the mechanical home. The coordinates can be changed to a range of 0 to 360 degrees according to the application.

Coordinates are a range of ±180 ° at the time of shipment.



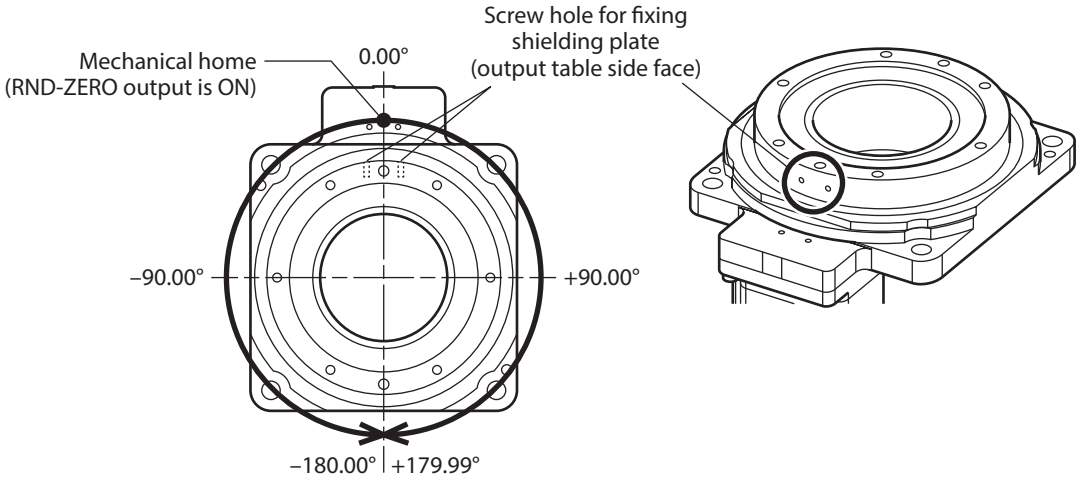
Coordinates can be changed to a range of 0 ° to 360 °.



■ Coordinate origin of output table

- **Mechanical home**

Performing the position preset can set the user home. When the mechanical home is preset, the RND-ZERO output is turned ON every time the mechanical home is passed.



- **Electrical home**

The electrical home is a home that is set in the driver. Turning the EL-PRST input ON sets the electrical home and OFF clears it.

■ Positioning operation by wrap function

Using the wrap function can perform the following operations.

Coordinate setting	Operation type	Details of operation
±180°	Absolute positioning	Specifies the coordinates of the target position.
	Incremental positioning	Specifies the distance to the target position.
0 to 360°	Wrap absolute positioning	Specifies the coordinates of the target position within the wrap range.
	Wrap proximity positioning	Specifies the coordinates of the target position where the travel distance is shorter within the wrap range.
	Wrap forward direction absolute positioning	Specifies the coordinates of the target position in the forward direction within the wrap range.
	Wrap reverse direction absolute positioning	Specifies the coordinates of the target position in the reverse direction within the wrap range.

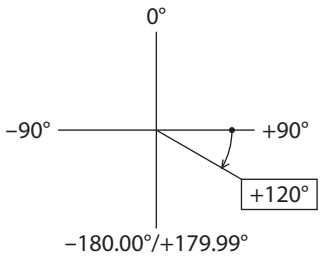
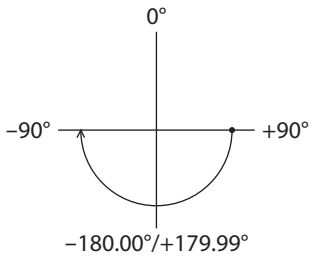
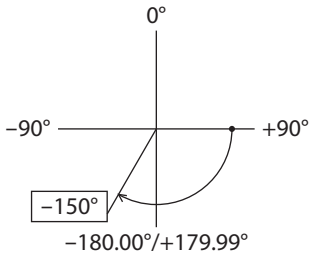
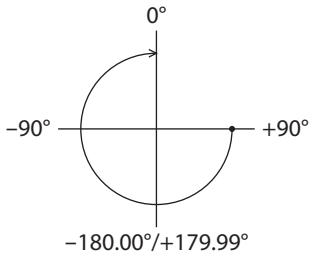
● Comparison of positioning SD (stored data) operation

The travel amount and travel direction of the output table varies depending on the operation type.

When the coordinates are set to a range of minus 180 to plus 180 degrees and operation is started from the position of 90 degrees.

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)

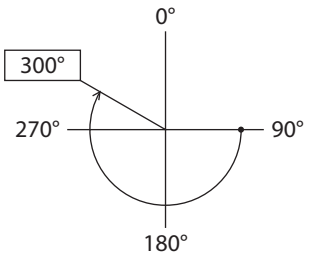
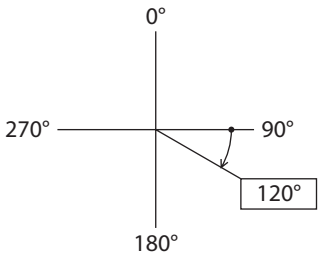
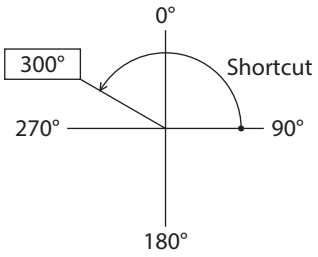
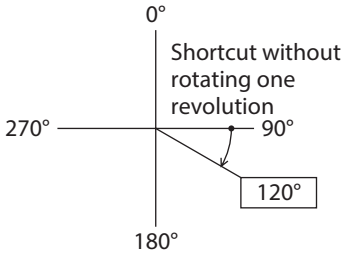
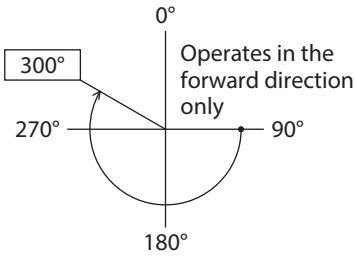
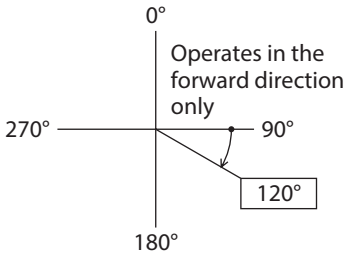
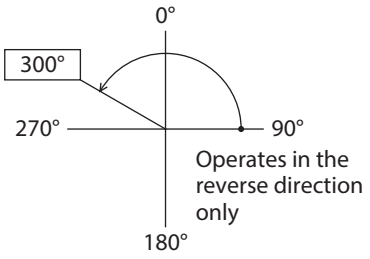
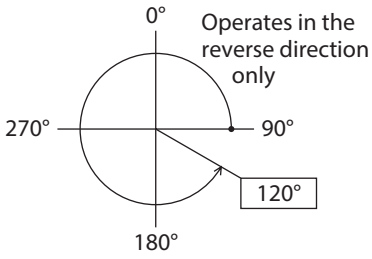
Operation type	When setting the operation data to 120 degrees	When setting the operation data to 270 degrees
Absolute positioning (based on command position) Specifies the coordinates of the target position		
Incremental positioning (based on command position) Incremental positioning (based on feedback position) Specifies the distance to the target position		

When the coordinates are set to a range of 0 to 360 degrees and operation is started from the position of 90 degrees.

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

memo Set the gear ratio of the product in use to the "Initial coordinate generation & wrap setting range" parameter.

Operation type	When setting the operation data to 300 degrees	When setting the operation data to 480 degrees
Wrap absolute positioning Specifies the coordinates of the target position Operates within the wrap range		
Wrap proximity positioning Specifies the coordinates of the target position Operates within the wrap range Operates in the direction where the travel distance is shorter		
Wrap forward direction absolute positioning Specifies the coordinates of the target position Operates within the wrap range Operates in the forward direction only		
Wrap reverse direction absolute positioning Specifies the coordinates of the target position Operates within the wrap range Operates in the reverse direction only		

3 When using an actuator equipped with the AZX Series

3-1 Setting flow

The motorized actuator equipped with the AZX Series can be used with the parameters at the time of shipment.

1	**Install and connect a motorized actuator and a driver.**
2	**Connect a PC installed the support software MEXE02 to start.**
3	**Copy the ABZO information (fixed value) of the ABZO sensor to the driver.** Parameters such as the travel direction and minimum step angle have been set in the ABZO sensor at the time of shipment. Use the **MEXE02** software to match the ABZO information (fixed value) of the ABZO sensor and the setting value of the driver parameters.
4	**Set the home.**
5	**Set the software limit when no sensor is used.**
6	**Write the set data to the driver.**
7	**Check the movement of the motorized actuator.**
8	**Backup the data having set.**

3-2 Parameter list

■ How to read the table

This section describes parameters that have a value specific to the motorized actuator. Setting the specified values allows operation that satisfies the specifications of the motorized actuator.
The minimum step angle is set to "0.01 degrees" at the time of shipment. This makes it easier to calculate the travel amount, etc., since the actuator moves 0.01 degrees per step.

Item	Factory setting	
	Unit of travel amount: Deg	Unit of travel amount: Step
(JOG) Operating speed	10 [deg/s]	1,000 [Hz]
(JOG) Acceleration/deceleration rate	10 [$\times 10^3$ deg/s^2]	1,000 [kHz/s]
(JOG) Starting speed	5 [deg/s]	500 [Hz]

This value is set at the time of shipment.

Set the value in this column when operating in a step unit.

■ Parameter list

● Product specifications

Item	Factory setting
Travel amount per revolution of output table [deg]	360
Resolution of output table (minimum step angle [deg])	36,000 (0.01)

● Motor & mechanism parameter

Item	Factory setting	
	Unit of travel amount: Deg	Unit of travel amount: Step
Mechanism settings	Prioritize ABZO setting	
Electronic gear A	1	
Electronic gear B*1	2	
Motor rotation direction*1	Positive direction=CCW	
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 range 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 sensors	
(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]

*1 A value different from the initial value of the motor by itself is written to the ABZO sensor. The output table rotates in the clockwise (CW) direction.

*2 The display unit can be switched to "deg" or "step" even while editing the data.

*3 The output table starts return-to-home operation to the positive side (CW).

3-3 Operation

Note Push-motion operation and push-motion return-to-home operation cannot be performed with the **DGII** Series. If these operations are attempted, an alarm of Operation data error is generated.

■ Setting of minimum step angle

The minimum step angle is set to 0.01 degrees at the time of shipment. Set the minimum step angle with the "Electronic gear A" and "Electronic gear B" parameters.
The formula for calculating the minimum step angle is as follows.

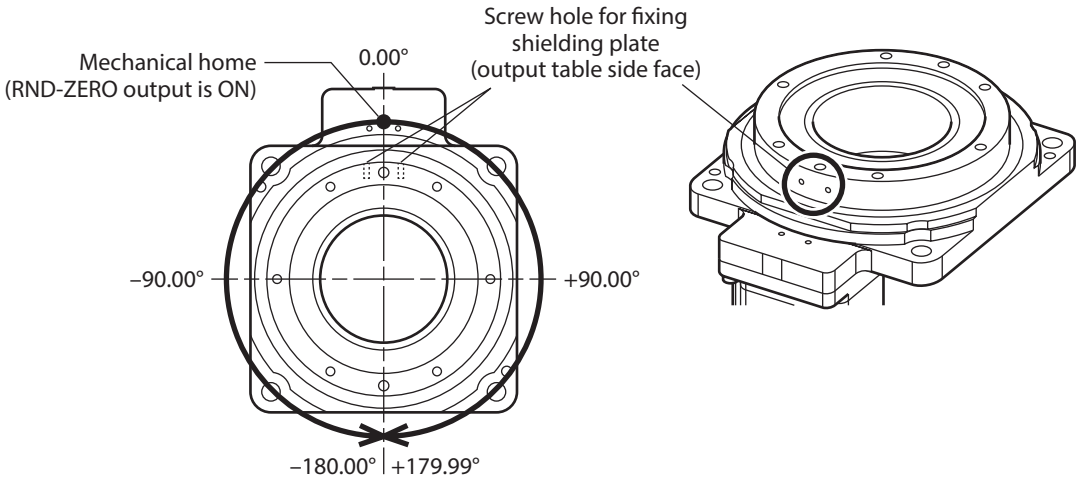
$$\text{Minimum step angle of output table (deg)} = \frac{360^\circ}{\text{Gear ratio} \times 1{,}000 \times (\text{Electronic gear B} \div \text{Electronic gear A})}$$

Note For the pulse input type, use the function setting switches as they are in the factory settings. If they are changed, the ABZO information does not apply and the actuator will operate at a certain resolution.

■ Coordinate origin of output table

- **Mechanical home**

Performing the position preset can set the user home. When the mechanical home is preset, the RND-ZERO output is turned ON every time the mechanical home is passed.



- **Electrical home**

The electrical home is a home that is set in the driver. Turning the EL-PRST input ON sets the electrical home and OFF clears it.

■ Positioning operation by wrap function

Using the wrap function can perform the following operations.

Coordinate setting	Operation type	Details of operation
±180 °	Absolute positioning	Specifies the coordinates of the target position.
	Incremental positioning	Specifies the distance to the target position.
0 to 360 °	Wrap absolute positioning	Specifies the coordinates of the target position within the wrap range.
	Wrap proximity positioning	Specifies the coordinates of the target position where the travel distance is shorter within the wrap range.
	Wrap forward direction absolute positioning	Specifies the coordinates of the target position in the forward direction within the wrap range.
	Wrap reverse direction absolute positioning	Specifies the coordinates of the target position in the reverse direction within the wrap range.

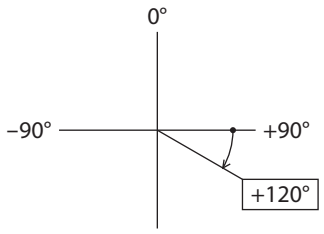
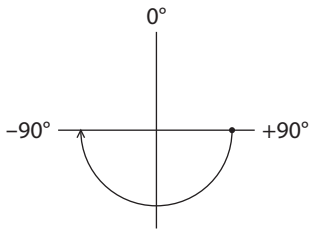
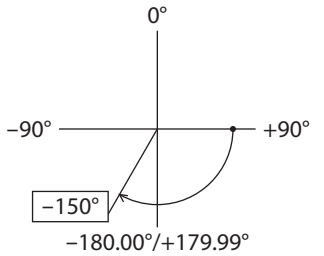
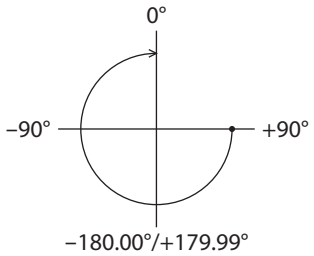
● Comparison of positioning SD (stored data) operation

The travel amount and travel direction of the output table varies depending on the operation type.

When the coordinates are set to a range of minus 180 to plus 180 degrees and operation is started from the position of 90 degrees.

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)

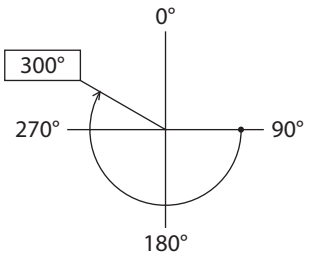
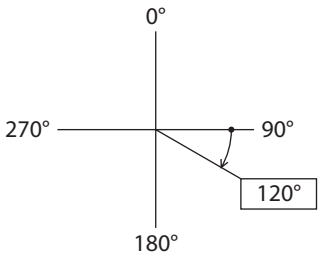
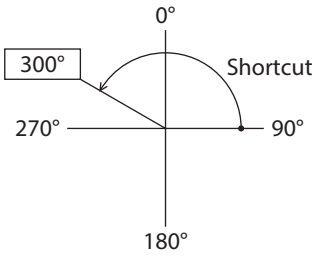
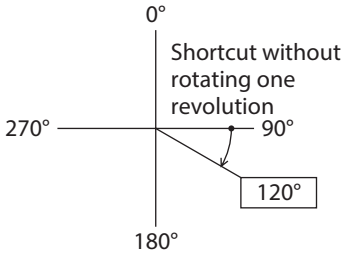
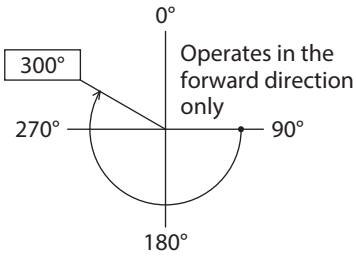
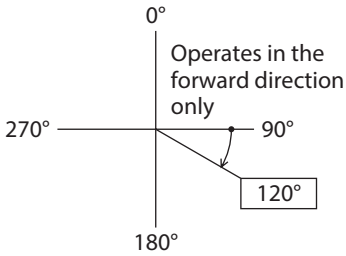
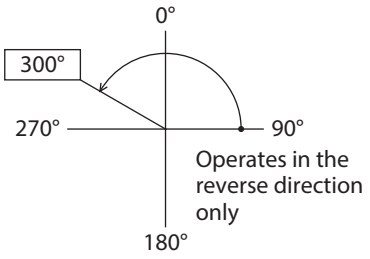
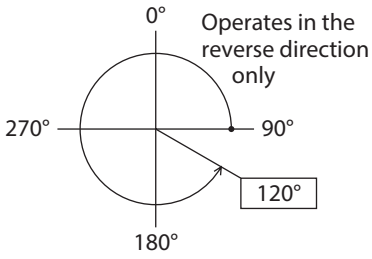
Operation type	When setting the operation data to 120 degrees	When setting the operation data to 270 degrees
Absolute positioning (based on command position) Specifies the coordinates of the target position		
Incremental positioning (based on command position) Incremental positioning (based on feedback position) Specifies the distance to the target position		

When the coordinates are set to a range of 0 to 360 degrees and operation is started from the position of 90 degrees.

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

memo Set the gear ratio of the product in use to the "Initial coordinate generation & wrap setting range" parameter.

Operation type	When setting the operation data to 300 degrees	When setting the operation data to 480 degrees
Wrap absolute positioning Specifies the coordinates of the target position Operates within the wrap range		
Wrap proximity positioning Specifies the coordinates of the target position Operates within the wrap range Operates in the direction where the travel distance is shorter		
Wrap forward direction absolute positioning Specifies the coordinates of the target position Operates within the wrap range Operates in the forward direction only		
Wrap reverse direction absolute positioning Specifies the coordinates of the target position Operates within the wrap range Operates in the reverse direction only		

4 When using an actuator equipped with the AR Series

4-1 Setting flow

1	**Install and connect a motorized actuator and a driver.**
2	**Set the minimum step angle.**
3	**Check the movement of the motorized actuator.**

4-2 Parameter list

■ How to read the table

This section describes parameters that have a value specific to the motorized actuator. Setting the specified values allows operation that satisfies the specifications of the motorized actuator. The parameters are set in the frequency unit at the time of shipment. To convert from the frequency unit to the angular speed unit, refer to the "Converted value" column.

Type	Item	Factory setting	Converted value
Operation parameters	JOG operating speed	1,000 [Hz]	20 [deg/s]
	Acceleration/deceleration rate of JOG	1 [ms/kHz]	–
	JOG starting speed	500 [Hz]	10 [deg/s]

A value of the frequency unit is set at the time of shipment.

This is a value converted from the frequency unit to the angular speed unit.

■ Built-in controller type

● Product specifications

Item	Factory setting
Travel amount per revolution of output table [deg]	360
Resolution of output table (minimum step angle [deg])	18,000 (0.02)
Mechanism reduction ratio	18

● Related parameters

Type	Item	Factory setting	Converted value
Operation parameters	JOG operating speed	1,000 [Hz]	20 [deg/s]
	Acceleration/deceleration rate of JOG	1 [ms/kHz]	–
	JOG starting speed	500 [Hz]	10 [deg/s]
Home operation parameters	Home-seeking mode	3-sensor mode	–
	Operating speed of home-seeking	1,000 [Hz]	20 [deg/s]
	Acceleration/deceleration of home-seeking	1 [ms/kHz]	–
	Starting speed of home-seeking	500 [Hz]	10 [deg/s]
Coordinates parameters	Electronic gear A	1	–
	Electronic gear B	1	–
	Motor rotation direction	Positive direction=CW*	–

* The output table rotates in the counterclockwise (CCW) direction.

■ Pulse input type

● Product specifications

Item	Factory setting
Travel amount per revolution of output table [deg]	360
Resolution of output table (minimum step angle [deg])	18,000 (0.02)
Mechanism reduction ratio	18

● Related parameters

Type	Item	Initial value	Converted value
Manual operation parameters	JOG operating speed	30 [r/min]	10 [deg/s]
	Acceleration and deceleration rate of JOG operation	100 [ms/(1,000 r/min)]	–
	Starting speed of JOG operation	30 [r/min]	10 [deg/s]
Electronic gear parameters	Electronic gear A1	10	–
	Electronic gear B	10	–
Operation parameters	Motor rotation direction	Positive=CW*	–

* The output table rotates in the counterclockwise (CCW) direction.

4-3 Operation

Note Push-motion operation and push-motion return-to-home operation cannot be performed with the **DGII** Series. Performing these operations may cause damage to the motorized actuator.

■ Setting of minimum step angle

The minimum step angle is set to 0.02 degrees (resolution 18,000) at the time of shipment.
The minimum step angle can be changed using the "Electronic gear" parameters or the driver's switches for changing the resolution.
The formula for calculating the minimum step angle is as follows.

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

■ Return-to-home operation

With the built-in controller type, installing only one sensor externally can perform return-to-home operation. Set the "Home-seeking mode" parameter to "3-sensor mode." Using the SLIT input or the TIM signal concurrently can detect the home more accurately.
Home sensor sets are also available as our product.

Home sensor set model

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

5 When using an actuator equipped with the RKII Series

5-1 Setting flow

1	**Install and connect a motorized actuator and a driver.**
2	**Set the minimum step angle.** Pulse input type: Set with the switches of the driver. Built-in controller type: Set with the parameters.
3	**Check the movement of the motorized actuator.**

5-2 Parameter list

■ How to read the table

This section describes parameters that have a value specific to the motorized actuator. Setting the specified values allows operation that satisfies the specifications of the motorized actuator. The parameters are set in the frequency unit at the time of shipment. To convert from the frequency unit to the angular speed unit, refer to the "Converted value" column.

Type	Item	Factory setting	Converted value
Operation parameters	JOG operating speed	1,000 [Hz]	40 [deg/s]
	Acceleration/deceleration rate of JOG	30 [ms/kHz]	–
	JOG starting speed	100 [Hz]	4 [deg/s]

A value of the frequency unit is set at the time of shipment.

This is a value converted from the frequency unit to the angular speed unit.

■ Built-in controller type

● Product specifications

Item	Factory setting
Travel amount per revolution of output table [deg]	360
Resolution of output table (minimum step angle [deg])	9,000 (0.04)
Mechanism reduction ratio	18

● Related parameters

Type	Item	Initial value	Converted value
Operation parameters	JOG operating speed	1,000 [Hz]	40 [deg/s]
	JOG acceleration	30 [ms/kHz]	–
	JOG starting speed	100 [Hz]	4 [deg/s]
Home operation para meters	Home-seeking mode	3-sensor mode	–
	Operating speed of home-seeking	1,000 [Hz]	40 [deg/s]
	Acceleration/deceleration of home-seeking	30 [ms/kHz]	–
	Starting speed of home-seeking	100 [Hz]	4 [deg/s]
Coordinates parameters	Electronic gear A	1	–
	Electronic gear B	1	–
Coordinates parameters	Motor rotation direction	Positive direction=CW*	–

* The output table rotates in the counterclockwise (CCW) direction.

5-3 Operation

■ Setting of minimum step angle

● Built-in controller type

The minimum step angle is set to 0.04 degrees (resolution 9,000) at the time of shipment. Set the minimum step angle with the "Electronic gear A" and "Electronic gear B" parameters.
The formula for calculating the resolution is as follows.

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

● Pulse input type

Set the minimum step angle with the function setting switch (SW1-No. 1) and step angle setting switch (STEP) of the driver. The minimum step angle is set to 0.04 degrees (resolution of output table: 9,000) at the time of shipment.

Minimum step angle list

Step angle setting Switch (STEP) scale	Function setting switch (SW1-No.1)	
	R1	R2
0	0.04 °	0.1 °
1	0.02 °	0.05 °
2	0.016 °	$\frac{0.6°}{18}$(0.0333…°)
3	0.01 °	0.025 °
4	0.008 °	$\frac{0.3°}{18}$(0.0166…°)
5	0.005 °	0.0125 °
6	0.004 °	0.00625 °

Step angle setting Switch (STEP) scale	Function setting switch (SW1-No.1)	
	R1	R2
7	0.002°	$\frac{0.06°}{18}$(0.00333…°)
8	0.0016°	0.003125°
9	0.001°	$\frac{0.05°}{18}$(0.00277…°)
A	0.0008°	0.0025°
B	0.0005°	$\frac{0.03°}{18}$(0.00166…°)
C	0.0004°	0.0015625°
D	0.00032°	0.00125°
E	0.0002°	0.00078125°
F	0.00016°	0.0001°

■ Return-to-home operation

With the built-in controller type, installing only one sensor externally can perform return-to-home operation. Set the "Home-seeking mode" parameter to "3-sensor mode." Using the SLIT input or the TIM signal concurrently can detect the home more accurately.
Home sensor sets are also available as our product.

Home sensor sets

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

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