

# Oriental motor

## Hollow Rotary Actuators

# DGI Series

With Built-in AZ Series Battery-Free Absolute Sensor

### Additional Lineup

- DC-Input Type
- Pulse-Input Type with RS-485 Communication
- Cable Direction Rotated Type (Right/Left Direction)



Hollow Rotary Actuators

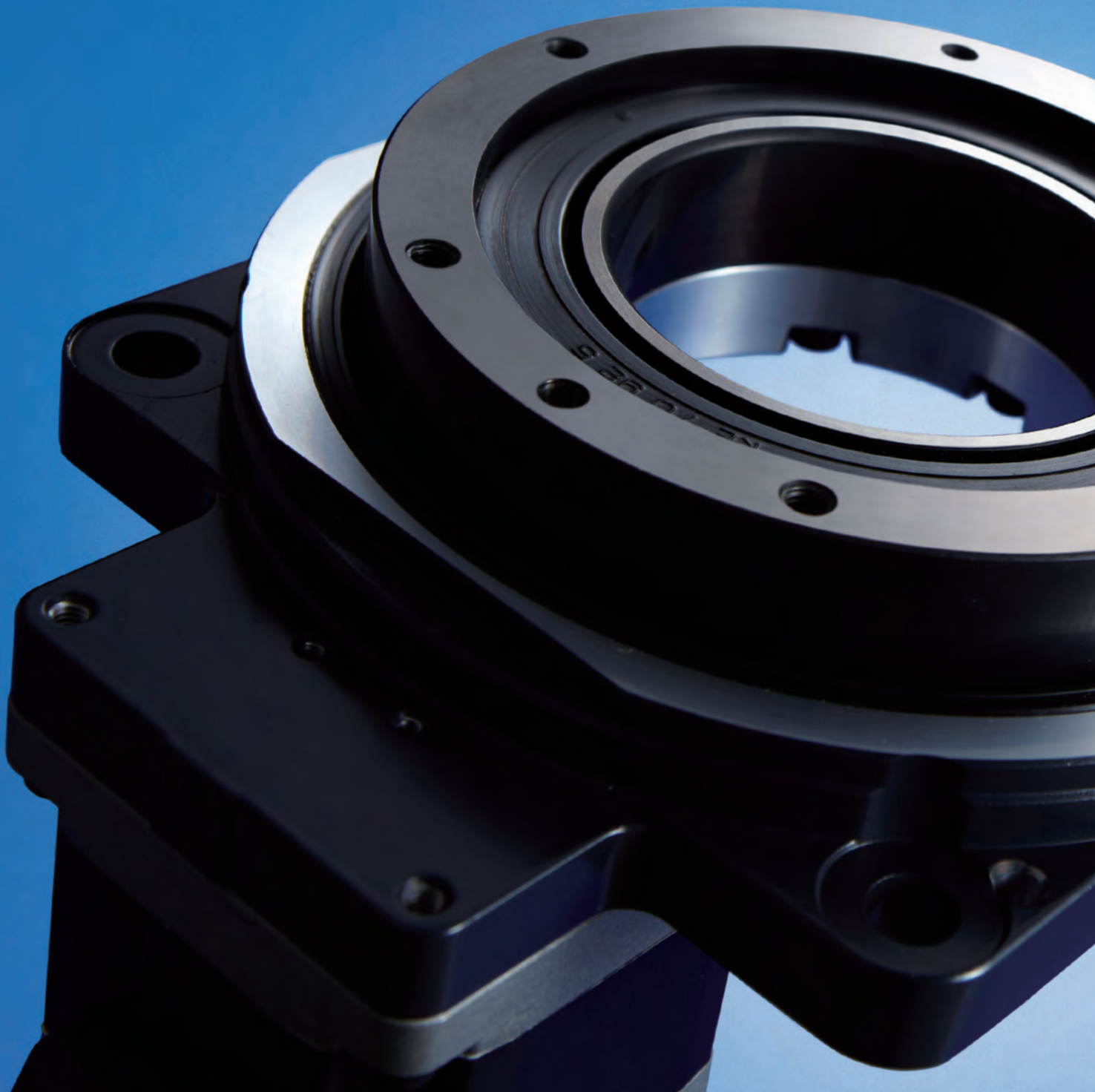
# DGII Series

With Built-in **AZ** Series Battery-Free Absolute Sensor

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The **DGII** Series integrated hollow rotary tables and stepper motor product lineup now includes models with built-in **AZ** Series products.

The battery-free absolute system positioning contributes to improved productivity and cost reduction. Presetting just once the home position and there is no need for repeatedly referencing.



Power Supply	Cable Direction Rotated Type	Hollow Rotary Actuator			Driver
		Frame Size			
		85mm	130mm	200mm	
AC-Input	down	●	●	●	Built-In Controller Type Pulse-Input Type with RS-485 Communication Pulse-Input Type
	right	-	●	●	
	left	-	●	●	
DC-Input	down	-	●	-	Built-In Controller Type Pulse-Input Type with RS-485 Communication Pulse-Input Type
	right	-	●	-	
	left	-	●	-	

## Hollow Rotary Actuators ▶ Page 4~5

- Simplified Design through Integrated Actuator and Motor Products
- Hollow Output Table:  
Maximum Diameter 100 mm
- Maximum Permissible Torque: 50 N·m
- Maximum Permissible Axial Load: 4000 N
- Repetitive Positioning Accuracy:  
±15 arc seconds (±0.004°)

## With Built-in AZ Series Battery-Free Absolute Sensor ▶ Page 6~7

- Uses Patented ABZO Sensor  
Mechanical Multi-Turn Absolute Sensor
- No Home Sensor Required
- High-Speed Return-to-Home Operation
- Battery-free Absolute System Configuration

## The AZ Series $\alpha$ STEP Stepper Motor and Driver Package Provides High Performance and High Reliability

▶ Page 8

- Quick Positioning through Agile Responsiveness
- Increased Reliability Through the Unique Closed Loop Control System
- Low Vibration Operation Possible Even at Low Speeds
- No Tuning Required

Drivers and cables to be combined with the actuators are common to **AZ Series**. For the contents below, please refer to the individual catalog of AZ Series or our website.

- Driver specifications
- RS-485 communication specifications
- Dimensions (driver, connection cable)
- Notes on using connection cables
- Connection and operation
- Options (extension cables)

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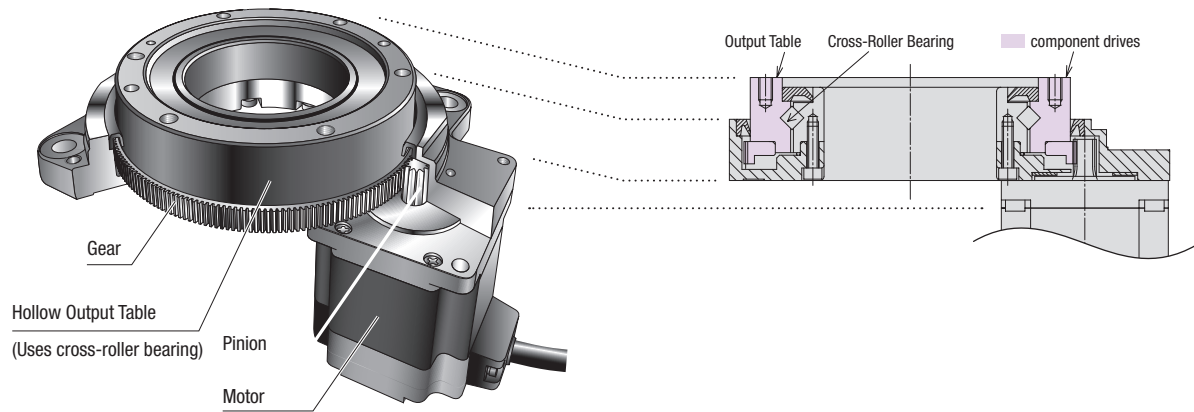


# Hollow Rotary Actuator Characteristics

The **DGII** Series is a line of integrated products that combines a hollow rotary table with a stepper motor. The actuator has an internal speed reduction mechanism (gear ratio 18), which makes high power driving possible.

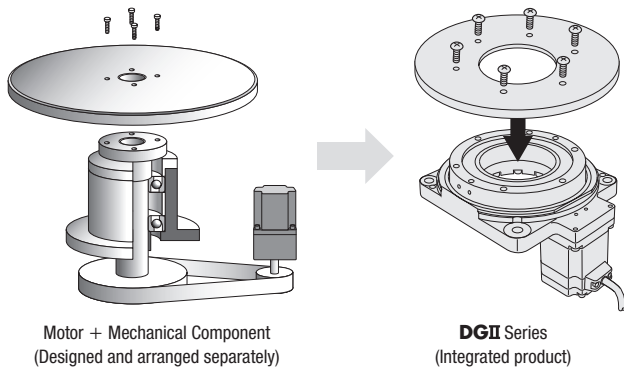
## Features

A cross-roller bearing is used on the output table, which allows for both high load and high rigidity.



### Simplified Design

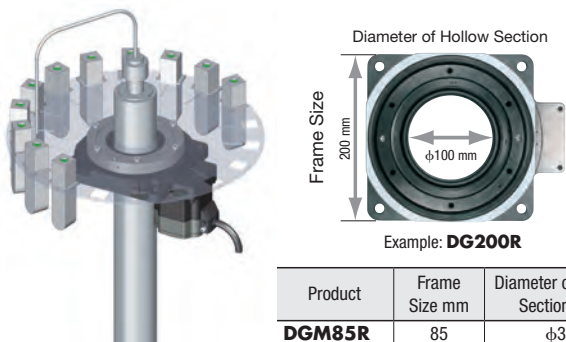
Tables and arms can be installed directly onto the output table. This saves the hassle and cost of designing an installation mechanism, arranging necessary mechanism parts, adjusting the belt tension, etc., when mechanical components such as a belt and pulley are used for installation.



### Large-Diameter, Hollow Output Table Makes Simple Wiring and Piping Possible

The large diameter hollow hole (through-hole) helps reduce the complexity of wiring and piping, thus simplifying equipment design.

- Filling equipment with piped-in liquid



Product	Frame Size mm	Diameter of Hollow Section mm
<b>DGM85R</b>	85	φ33
<b>DGM130R</b>	130	φ62
<b>DGM200R</b>	200	φ100

### High Positioning Accuracy with Non-Backlash

- Non-Backlash
- Repetitive Positioning Accuracy  $\pm 15$  arc seconds ( $\pm 0.004^\circ$ )

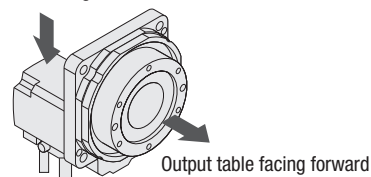
**Note** The repetitive positioning accuracy is measured at a constant temperature (normal temperature) under a constant load.

### Select Cable Direction Rotated Type According to Usage

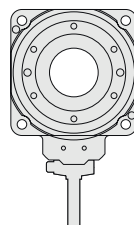
Select the motor cable direction rotated type from 3 directions according to the application.

- The cable direction rotated type is defined with the output table facing forward and the motor facing downward.

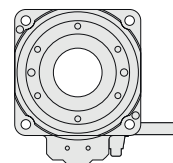
Motor facing downward



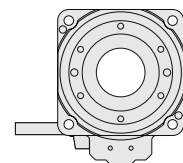
Cable downward



Cable right



Cable left



Power Supply	Cable Direction Rotated Type	Hollow Rotary Actuator		
		Frame Size		
		85mm	130mm	200mm
AC-Input	down	●	●	●
	right	-	●	●
	left	-	●	●
DC-Input	down	-	●	-
	right	-	●	-
	left	-	●	-

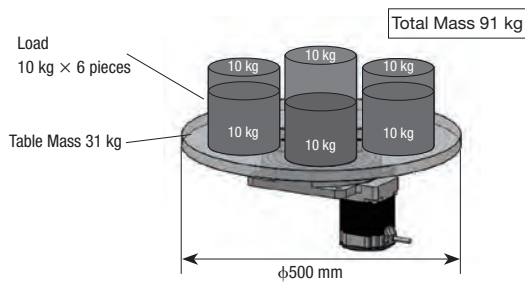
## High Load and High Rigidity

The standard type uses a cross-roller bearing on the output table bearing, which allows for both high load and high rigidity.

- Maximum Permissible Axial Load 4000 N
- Maximum Permissible Moment 100 N·m

### <Example Operation>

Product Name : **DGM200R-AZAC**  
 Power-Supply Input : 230 VAC  
 Load Mass : 91 kg (6 load pieces + table)  
 : Load 10 kg/piece × 6 pieces  
 : Table 31 kg  
 (Diameter 500 mm, thickness 20 mm, iron)  
 Overhang Distance : 160 mm  
 Installation Direction : Horizontal



### ● High Load

The axial load for a total mass of 91 kg is 893 N.  
 $(10 \text{ kg} \times 6 \text{ pieces} + 31 \text{ kg}) \times g \doteq 893 \text{ N}$   
 with  $g$  equals gravitational constant in  $\text{m/s}^2$   
 The permissible axial load of the **DGM200R** is 4000 N, so this is within the permissible value.

High Load Driving is Possible

### ● High Rigidity

#### [Load Moment]

When a 10 kg load is placed 160 mm from the center of the table, the moment is 15.7 N·m.

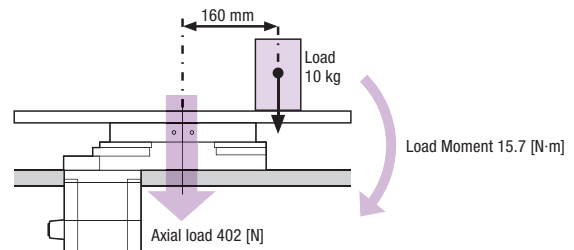
$10 \text{ kg} \times g \times 0.16 \text{ m} \doteq 15.7 \text{ N}\cdot\text{m}$  with  $g$  equals gravitational constant in  $\text{m/s}^2$

The permissible moment of the **DGM200R** is 100 N·m, so this is within the permissible value.

#### [Axial Load]

The axial load is: table + load  $(31 \text{ kg} + 10 \text{ kg}) \times g \doteq 402 \text{ N}$   
 with  $g$  equals gravitational constant in  $\text{m/s}^2$ .

The permissible axial load of the **DGM200R** is 4000 N, so this is within the permissible value.

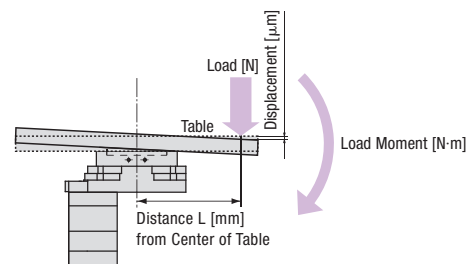


A high-rigidity rotary actuator allows a large load that is far away from the table center to be driven

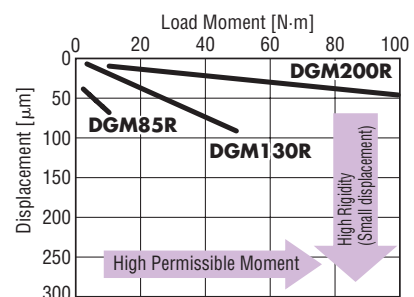
### ● Relationship Between Load Moment and Displacement when

Distance  $L=200$  mm from Center of Table

The larger the frame size, the received permissible moment increases, but the displacement caused by the load moment decreases.

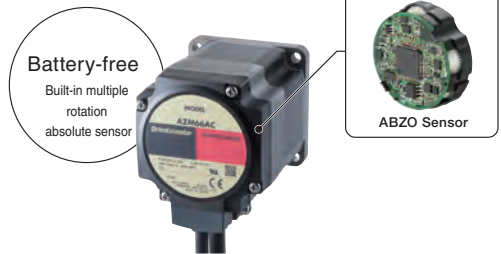


Displacement at Distance  $L = 200$  mm from Center of Table



# Simple Home Position Setting and Return-to-Home Thanks to Absolute System

The patented <ABZO Sensor>, a newly developed small mechanical multi-turn absolute sensor. Contributes to improved productivity and cost reduction.



## No Home Sensor Required

Because it is an absolute system, no home sensor is required.

## Reduced Cost

Sensor costs and wiring costs can be reduced, allowing for lower system costs.

## Simple Wiring

Wiring is simplified, and the degree of freedom for equipment design is increased.

## Not Affected by Sensor Malfunctions

No need to worry about sensor malfunctions, sensor damage or sensor disconnection.

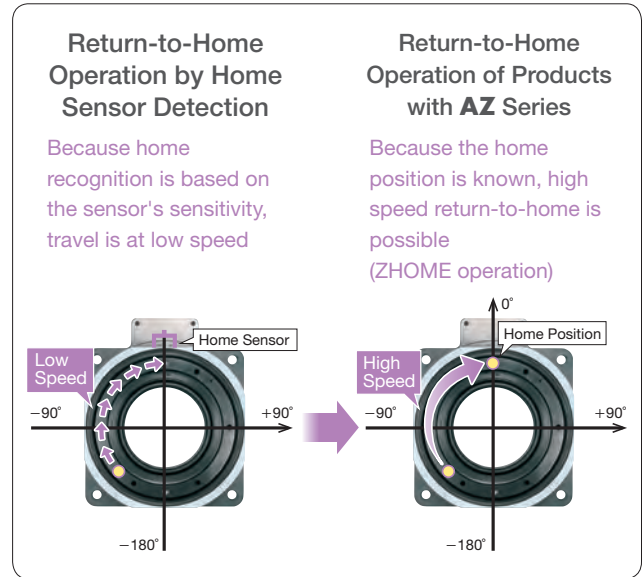
## Improved Return-to-Home Accuracy

Home position accuracy is increased because the return-to-home action is performed regardless of any variations in home sensor sensitivity.

\*If no limit sensor is installed, movements that exceed the limit values can be avoided through the use of the limits in the driver software.

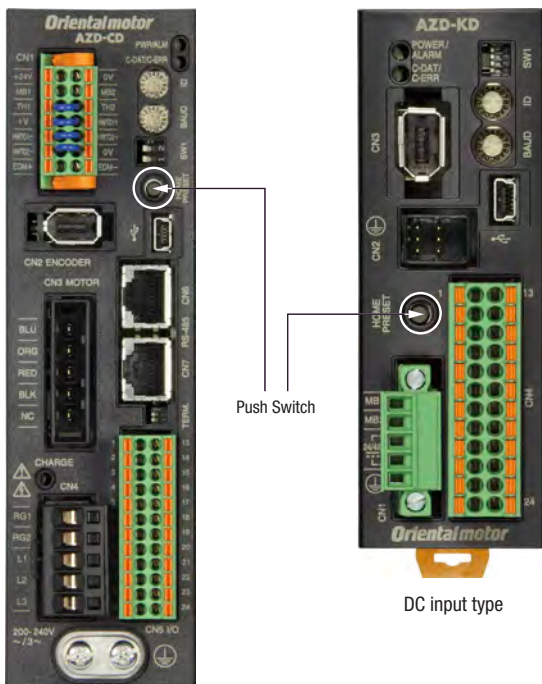
## High-Speed Return-to-Home Operation

Because return-to-home is possible without using a home sensor, return-to-home can be performed at high speed without taking the specifications for sensor sensitivity into account, allowing for a shortened machine cycle.



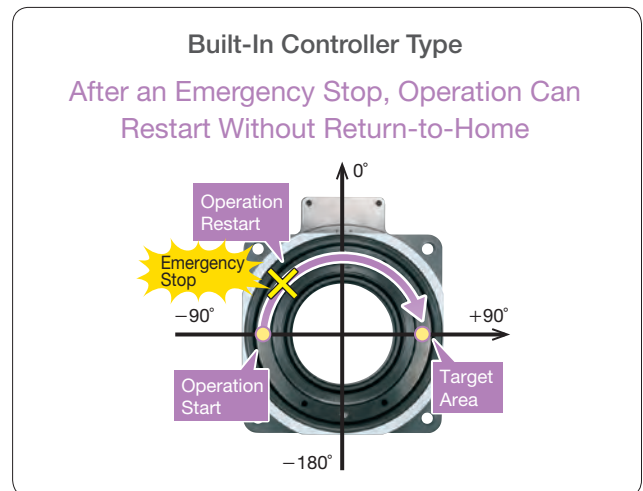
## Easy Home Position Setting

The home position can be easily set by pressing a switch on the driver's surface, which is saved by the ABZO sensor. In addition, home setting is possible with the **MEXE02** data setting software or by using an external input signal.



## Return-to-Home Not Required

Even if the power shuts down during a positioning operation, the positioning information is retained. Furthermore, for built-in controller types, positioning operations can restart without a return-to-home when recovering from an emergency stop of the production line or a blackout.



# Battery-Free Because it is a Mechanical-Type Sensor

## Battery-Free

No battery is required because it is a mechanical-type sensor. Because positioning information is managed mechanically by the ABZO sensor, the positioning information can be preserved, even if the power turns off, or if the cable between the motor and the driver is disconnected.

### Reduced Maintenance

Because there's no battery that needs replacing, maintenance time and costs can be reduced.

### Unlimited Driver Installation Possibilities

Because there is no need to secure space for battery replacement, there are no restrictions on the installation location of the driver, improving the flexibility and freedom of the layout design of the control box.



### Safe for Overseas Shipping

Normal batteries will self-discharge, so care must be taken when the equipment requires a long shipping time, such as when being sent overseas. The ABZO sensor does not require a battery, so there is no limit to how long the positioning information is maintained. In addition, there's no need to worry about various safety regulations, which must be taken into consideration when shipping a battery overseas.

### Position stored even if the cable between motor and driver is being disconnected

Positioning information is stored within the ABZO sensor.

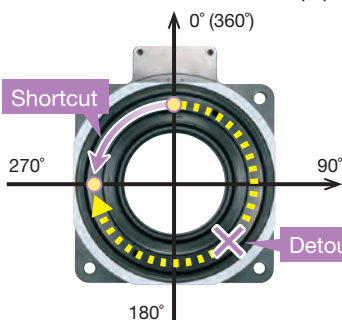
# Convenient Functions Thanks to the Use of the AZ Series

## Convenient Operation & Setting

By using models with **AZ** Series functions, coordinate management on the hollow rotary actuator output table can be carried out, and the follow operations are possible.

### Reduce takt time with short-cut operations

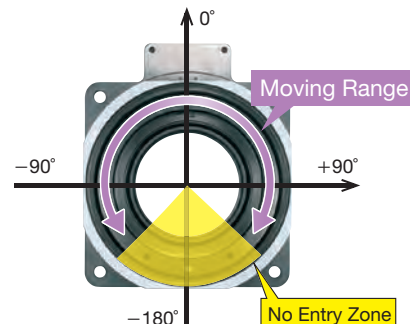
This is an operation method in which the actuator rotates in the direction that is the shortest distance to the target position. This can reduce the takt time of the equipment.



Example)  
When moving from the 0° position to 270° position, counterclockwise movement is automatically selected as the shortest rotation direction.

### Simple control by setting no-entry zones

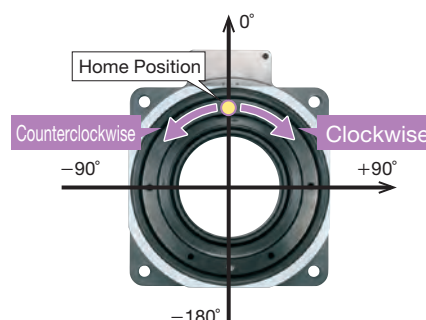
If there are obstructions on the equipment, it is possible to set a region on the output table that will be avoided.



## Reduced Equipment Setup Time

The necessary operation parameters for the hollow rotary actuator are set at the time of shipment, which contributes to reduced equipment setup time.

- Home Position
- Resolution Setting (0.01°/step)
- Output Table Rotation Direction Setting
- Round Setting  $\pm 180^\circ$
- All initial setting values can be changed.



# High Performance and High Reliability Thanks to Stepper Motor and Driver Packages $\alpha$ STEP

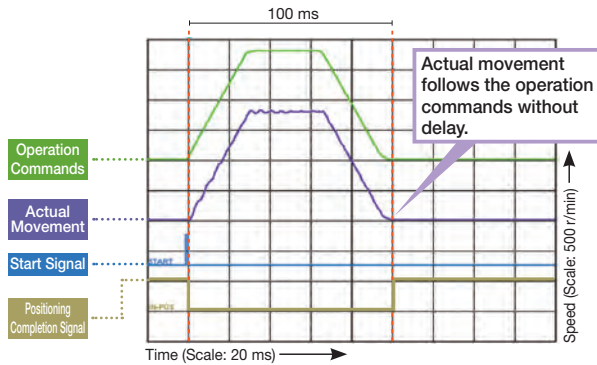
High reliability is provided by using stepper motor and driver packages that employ a control method unique to Oriental Motor, which combines the merits of both open loop control and closed loop control.

## Quick Positioning through Agile Responsiveness

With stepper motors, short distance positioning is carried out in a short period of time.

Stepper motors are operated synchronously with pulse commands, and while they are compact, they still generate high torque and offer excellent acceleration performance and response.

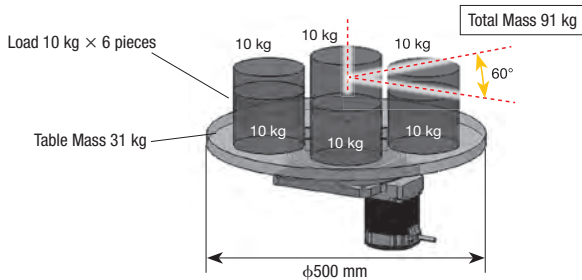
Actual stepper motor movement in response to operation commands



### <Example Operation>

Product Name : **DGM200R-AZAC**  
 Power-Supply Input : 230 VAC  
 Load Mass : 91 kg (6 load pieces + table)  
 : Load 10 kg/piece  $\times$  6 pieces  
 : Table 31 kg (Diameter 500 mm, thickness 20 mm, iron)  
 Installation Direction : Horizontal  
 Traveling Amount : 60°

Total inertia of table and load =  $2633 \times 10^{-3} \text{ kg}\cdot\text{m}^2$

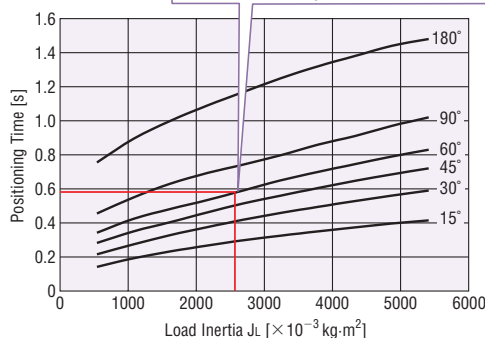


### ● Quick Positioning

With the **DGM200R**, 60° rotation of a total mass of 91 kg is possible in 0.59 seconds.

Load Inertia – Positioning Time (Reference value)

**DGM200R** 60° rotation is possible in 0.59 seconds.



The positioning time can be inferred using catalog data.

Quick positioning is possible even with large loads.



Stepper Motor and Driver Packages  $\alpha$ STEP

## AZ Series

With built-in battery-free absolute sensor

## Continues Operation Even with Sudden Load Fluctuation and Sudden Acceleration

In normal conditions, it operates synchronously with pulse commands under open loop control, and because of its compact size and high torque generation, it has excellent acceleration performance and responsiveness. In an overload condition, it switches immediately to closed loop control to correct the position.

## Low Vibration Even at Low Speed

Thanks to the microstep drive system and smooth drive function\* of the stepper motor, resolution can be improved without mechanical elements such as a speed reduction mechanism. As a result, speed fluctuation is minimal even at low speeds, leading to improved stability.

### \*About the Smooth Drive Function

The smooth drive function automatically microsteps based on the same traveling amount and traveling speed used in the full step mode, without changing the pulse input settings.

## Alarm Signal Output in Case of Abnormality

If a continuous overload is applied, an alarm signal is output. Also, when the positioning is completed, a signal is output. This provides high reliability.

## No Tuning Required

Because it is normally operated with open loop control, even when the load fluctuates, no tuning is needed to obtain movement exactly as set.

## Maintains Stop Position Without Hunting

Thanks to the normally open loop control, there is no hunting, the minute shaft movements that occur during stopping. Because the stop location is securely maintained, it is best suited for applications that undergo vibration during stops.



# Applications & Uses

## Applications that Require High Rigidity

- Applications in which a Moment Load is Applied (Ceiling mounted)



## Applications that Require High Performance Motors

- High Positioning Accuracy Applications (Image inspection equipment)



- Applications with Load Fluctuations (Disc manufacturing equipment)

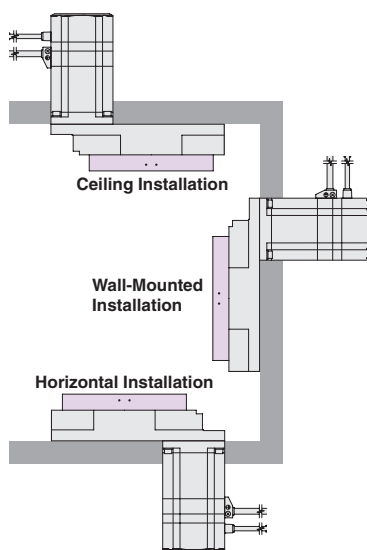


## Installation Direction

In addition to horizontal installation, the **DGI** Series can also be ceiling-mounted or wall-mounted, expanding the possibilities of equipment design.

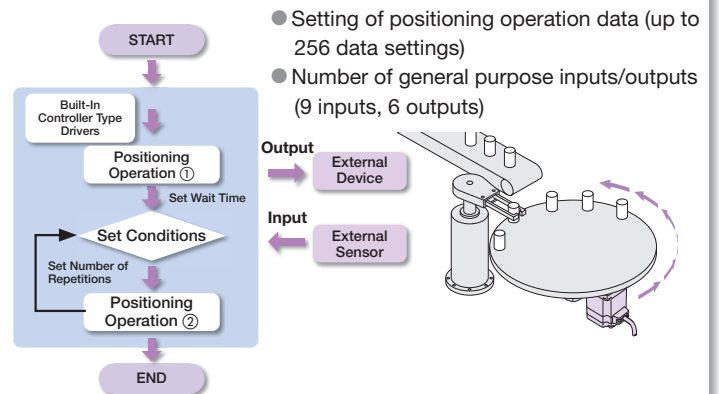
### Note

A small amount of grease will occasionally seep out of the hollow rotary actuator. If a grease leak would cause a contamination issue near the machine, either perform routine inspections, or install protective equipment such as an oil sump.



## Example Use of Simple Sequence Function (Built-in Controller Type)

The built-in controller type can simplify sequence control programming by outputting control signals to other devices, and incorporating external input signals from sensors, etc.



# 3 Driver Types Selectable to Match System Configuration

Three types of **DGII** Series drivers are available, depending on the master control system in use.

## Built-In Controller Type **FLEX**

● When Controlling with I/O

① I/O

● When Controlling from Computer or Touchscreen

② Modbus (RTU)

● When Controlling with Serial Communication

② Modbus (RTU)

● When Controlling with FA Network

③ FA Network  
② RS-485

With this type, the operating data is set in the driver, which can then be selected and executed from the host system. Host system connection and control are performed with ① I/O, ② Modbus (RTU)/RS-485 or ③ FA network.

● CC-Link is a registered trademark of CC-Link Partner Association. ● MECHATROLINK is a registered trademark of MECHATROLINK Members Association. ● EtherCAT is a registered trademark licensed by Beckhoff Automation GmbH in Germany.

## Pulse Input Type

This type executes operations by inputting pulses into the driver. Control the motor using a separately obtained positioning unit (pulse generator).

By using a network converter (sold separately), CC-Link communication, MECHATROLINK communication or EtherCAT communication are possible. Operating data, parameter settings and operation commands can be input via various communication types. Its ability to flexibly accommodate the network being used results in a shortened design time.

# Pulse-Input Type with RS-485 Communication **FLEX**

This type executes operations by inputting pulses into the driver. It controls the motor using a pulse generator. By using RS-485 communication motor status information (position, speed, torque, alarm, temperature, etc.) can be monitored.

When Controlling from a Computer or Touch Screen

Basic Settings (setting when shipped)

Operating Data Settings  
Parameter Settings Data setting software **MEXE02**

Motor      Driver

By using the MEXE02 data setting software, the alarm history can be displayed and a variety of monitoring can be customized according to the customer's needs.

# Simple Operation with Data Setting Software (MEXE02)

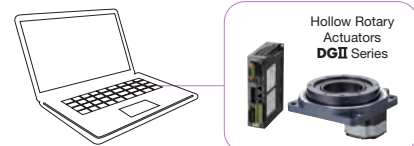
Easy to use data setting software enables data setting and verification of the actual drive by using a computer.

### ● Operating Data and Parameter Settings

Setting of operation data and parameters is easily performed via computer. Because the setting data can be saved, when the driver is replaced, the same settings can be used by transferring the saved data.

### ● Teaching and Remote Operation

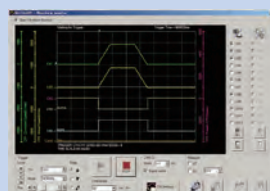
By using the data setting software and manual positioning, the operation command information can be input into the driver. Use when setting up equipment.



## Various Monitoring Functions

### ● I/O Monitoring

The state of I/O wiring to the driver can be verified by computer. This can be used for post-wiring I/O checks or I/O checks during operation.



### ● Waveform Monitoring

The operational state of the motor (such as command speed and motor load factor), can be checked by an oscilloscope-like image. This can be used for equipment start-up and adjustment.







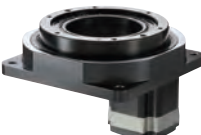


### ● Alarm Monitoring

When an abnormality occurs, the details of the abnormality and the solution can be checked.

# Product Lineup

Hollow rotary actuator **DGII** series  
 Built-in battery-less absolute sensor Built-in **AZ** series

**AC** Single-Phase 200-240 VAC  
**DC** 24 VDC /48 VDC

Actuator										Driver					
Product Rotary Actuator Frame Size Power Supply Input	Diameter of Hollow Section [mm]	Permissible Torque [Nm]	Permissible Moment [Nm]				Permissible Axial Load				Lost Motion [arcmin]	Backlash [arcmin]	Angular Transmission Accuracy [arcmin]	Repetitive Positioning Accuracy [arcsec]	Type
			20	40	60	80	500	1000	2000	3000					
<b>DGM85R</b> 85 mm  <b>AC</b> <b>DC</b>	φ33	4.5		10					500				4 [0.067°]		Built-in Controller Type <b>FLEX</b>  
<b>DGM130R</b> 130 mm  <b>AC</b> <b>DC</b> Selection of cable direction rotated type	φ62	12			50				2000	2 [0.033°]	Non-Backlash	3 [0.05°]	±15 [± 0.004°]	Pulse-Input Type with RS-485 Communication <b>FLEX</b>  	
<b>DGM200R</b> 200 mm  <b>AC</b> Selection of cable direction rotated type	φ100	50				100			4000			2 [0.033°]		Pulse Input Type  	

If you want to get more information about **AZ Multi-Axis Driver** and other products please have a look at the **AZ Catalogue**.



## Hollow rotary actuator **DGII** Series – Other lineup

Products equipped with stepper motor unit **AR** Series equipped with rotor position detection sensor (resolver) are also available. Please choose according to your purpose.

On-Board Motor Series	Actuator Frame Size			
	60 mm	85mm	130 mm	200 mm
Stepper Motor and Driver Packages <b>αSTEP</b> <b>AR</b> Series Equipped *The <b>DG60</b> is with deep groove ball bearing				
 	●	●	●	●

# How to Read Specifications

## ● Hollow Rotary Actuators Specifications

Frame Size		85 mm	130 mm	200 mm		
Product Name		<b>DGM85R-AZ</b> □□	<b>DGM130R-AZ</b> □□	<b>DGM200R-AZ</b> □ <b>C</b>		
Driver product name	Built-in Controller	<b>AZD-CD, AZD-KD</b>		<b>AZD-CD</b>		
	Pulse Input Type with RS-485 Communication	<b>AZD-CX, AZD-KX</b>		<b>AZD-CX</b>		
	Pulse Input Type	<b>AZD-C, AZD-K</b>		<b>AZD-C</b>		
Built-In Motor		<b>AZ Series</b>				
①	Type of Output Table Supporting Bearing	Cross-Roller Bearing				
②	Inertia J: kgm <sup>2</sup>	$21120 \times 10^{-7}$ [26304 × 10 <sup>-7</sup> ]*1	$147380 \times 10^{-7}$ [199220 × 10 <sup>-7</sup> ]*1	$916400 \times 10^{-7}$ [968240 × 10 <sup>-7</sup> ]*1		
	Gear Ratio	18				
③	Minimum Traveling Amount of the Output Table deg/STEP	0.01				
④	Permissible Torque Nm	4.5	12	50		
⑤	Holding Torque at Motor Standstill	Power ON Nm	2.7	12		
		Electromagnetic Brake Nm	2.7	12		
⑥	Max. Speed deg/seconds	1200 (200 r/min)		660 (110 r/min)		
⑦	Repetitive Positioning Accuracy arc second	±15 (±0.004°)				
⑧	Lost Motion arc minute	2 (0.033°)				
⑨	Angular Transmission Accuracy arc minute	4 (0.067°)	3 (0.05°)	2 (0.033°)		
⑩	Permissible Axial Load N	500	2000	4000		
⑪	Permissible Moment Nm	10	50	100		
⑫	Runout of Output Table Surface mm	0.015				
⑬	Runout of Output Table Inner (Outer) Diameter mm	0.015		0.030		
⑭	Parallelism of Output Table mm	0.030		0.050		
⑮	Degree of Protection	IP40 (IP20 for motor connector)				
Power-Supply Input	Voltage and Frequency	Single-Phase 200-240 VAC -15 % to +6 % 50/60 Hz	24 VDC / 48 VDC	Single-Phase 200-240 VAC -15 % to +6 % 50/60 Hz	24 VDC / 48 VDC	Single-Phase 200-240 VAC -15 % to +6 % 50/60 Hz
	Input Current A	1.7	1.72[1.8]*1	2.3	3.55[3.8]*1	3.9

● Either **A** (single shaft) or **M** (electromagnetic brake) indicating the configuration is entered where the box □ is located within the product name.

● Either **C** (single-phase 200-240 VAC) or **K** (24/48 VDC) indicating the power supply input is entered where the box □ is located within the product name.

\*1 The brackets [ ] indicate the specifications for the electromagnetic brake type.

### ① Type of Output Table Supporting Bearing

This is the type of the bearing used for the output table.

### ② Inertial Moment

This is the total sum of the rotor inertial moment of the motor and the inertial moment of the speed reduction mechanism converted to a moment on the output table.

### ③ Minimum Traveling Amount of the Output Table

This is the minimum traveling amount that can be set. (Factory setting)

### ④ Permissible Torque

This is the limit of mechanical strength of the speed reduction mechanism. Make sure the applied torque, including the acceleration torque and load fluctuation, does not exceed the permissible torque.

### ⑤ Holding Torque at Motor Standstill

Power ON: This is the maximum torque with which to hold the output table in position if it stops when the power is on.

Electromagnetic Brake: This is the maximum torque with which to hold the output table in position using an electromagnetic brake when it stops.

### ⑥ Max. Speed

This is the output table speed that the mechanical strength of the speed reduction mechanism can tolerate.

### ⑦ Repetitive Positioning Accuracy

This is a value indicating the degree of error that generates when positioning is performed repeatedly to the same position in the same direction.

### ⑧ Lost Motion

This is the difference in stopped angles achieved when the output table is positioned to the same position in the forward and reverse directions.

### ⑨ Angular Transmission Accuracy

This is the difference between the theoretical rotation angle of the output table as calculated from the input pulse counter, and the actual rotation angle.

### ⑩ Permissible Axial Load

This is the permissible value of axial load applied to the output table in the axial direction.

### ⑪ Permissible Moment

When a load is applied to a position away from the center of the output table, the output table receives a tilting force. The permissible moment load refers to the permissible value of moment load calculated by multiplying the offset distance from the center by the applied load.

### ⑫ Runout of Output Table Surface

This is the maximum value of runout of the installation surface of the output table when the output table is rotated under no load.

### ⑬ Runout of Output Table Inner (Outer) Diameter

This is the maximum value of runout of the inner diameter or outer diameter of the table when the output table is rotated under no load.

### ⑭ Parallelism of Output Table

This is the inclination of the installation surface of the output table compared with the actuator installation surface on the equipment side.

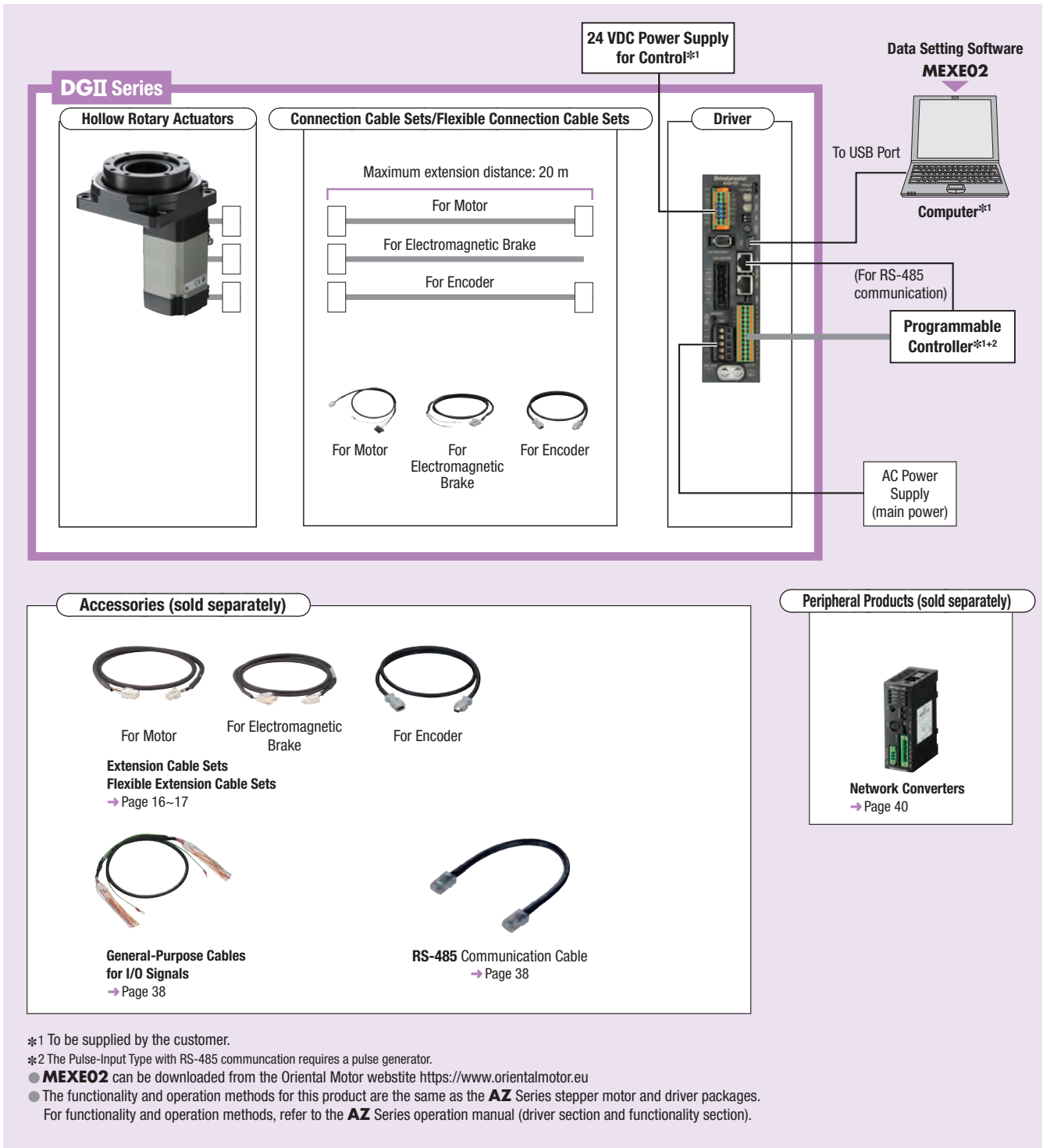
### ⑮ Degree of Protection

Based on IEC60529 and EN60034-5 (=IEC60034-5), dust-resistance and waterproofing regarding the degree of protection of the device is classified using a grade.

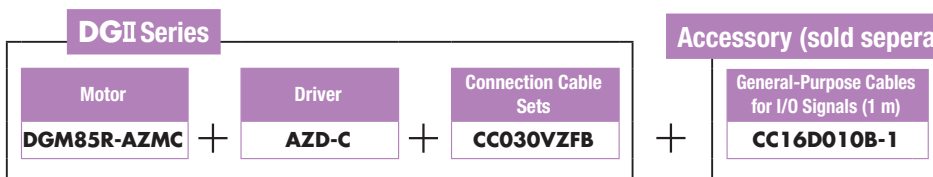
## System Configuration

- Combination of Electric Actuator with Electromagnetic Brake and Built-In Controller Type Driver or Pulse-Input Type Driver with RS-485 Communication

An example of a configuration using I/O control or RS-485 communication is shown below.



### ● Example of System Configuration



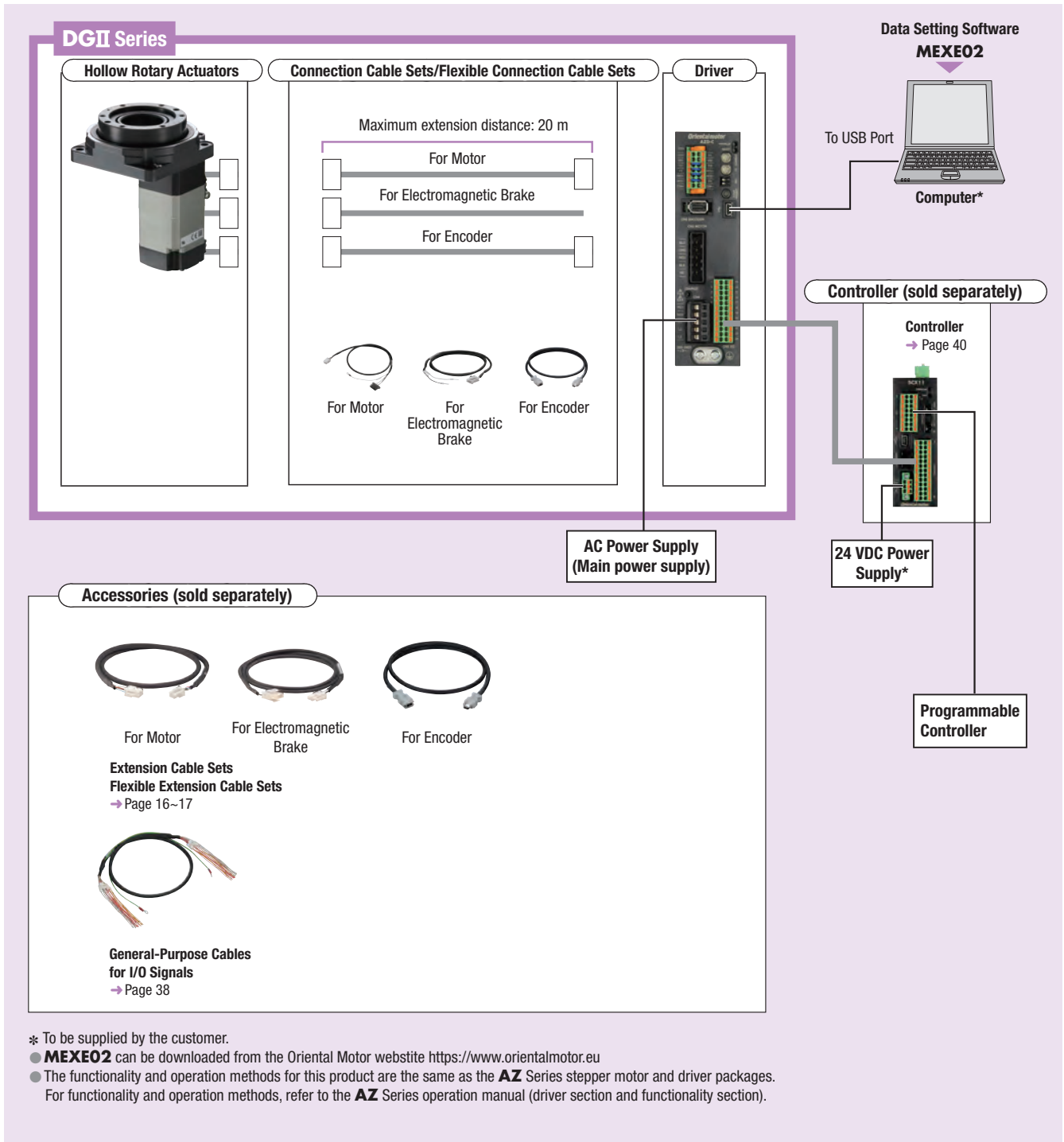
● The system configuration shown above is an example. Other combinations are also available.

#### Note

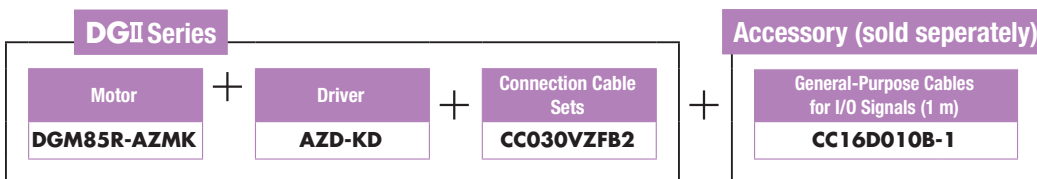
● The motor cable and electromagnetic brake cable from the motor cannot be connected directly to the driver. When connecting to a driver, use a connection cable.

● **Combination of Electric Actuator with Electromagnetic Brake and Pulse-Input Driver**

A single-axis system configuration with the **SCX11** Series controller is shown below.



● **Example of System Configuration**



● The system configuration shown above is an example. Other combinations are also available.

**Note**

● The motor cable and electromagnetic brake cable from the motor cannot be connected directly to the driver. When connecting to a driver, use a connection cable.

## Product Number Code

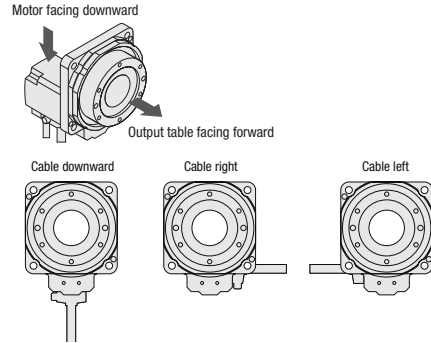
### Motor

**DGM 130 R - AZ A C R**

① ② ③ ④ ⑤ ⑥ ⑦

①	Series	<b>DGM: DGI</b> Series
②	Frame Size	<b>85:</b> 85 mm <b>130:</b> 130 mm <b>200:</b> 200 mm
③	Type of Output Table Supporting Bearing	<b>R:</b> Cross-Roller Bearing
④	Motor Type	<b>AZ: AZ</b> Series
⑤	Motor Shaft	<b>A:</b> Single Shaft <b>M:</b> With Electromagnetic Brake
⑥	Power Supply Input	<b>C:</b> Single-Phase 200-240 VAC <b>K:</b> 24/48 VDC
⑦	Cable Withdrawing Direction*	<b>R:</b> Right Direction <b>L:</b> Left Direction

\*The cable withdrawing direction is defined with the output table facing forward and the motor facing downward.



### Driver

**AZD - C D**

① ② ③

①	Driver Type	<b>AZD: AZ</b> Series Driver
②	Power Supply Input	<b>C:</b> Single-Phase 200-240 VAC <b>K:</b> 24/48 VDC
③	Type	<b>D:</b> Built-in Controller Type <b>X:</b> Pulse Input Type with RS-485 Communication Blank: Pulse Input Type

### Connection Cable Sets/Flexible Connection Cable Sets

**CC 050 V Z F B 2**

① ② ③ ④ ⑤ ⑥ ⑦

①		<b>CC:</b> Cable
②	Length	<b>005:</b> 0.5 m <b>010:</b> 1 m <b>015:</b> 1.5 m <b>020:</b> 2 m <b>025:</b> 2.5 m <b>030:</b> 3 m <b>040:</b> 4 m <b>050:</b> 5 m <b>070:</b> 7 m <b>100:</b> 10 m <b>150:</b> 15 m <b>200:</b> 20 m
③	Reference Number	
④	Applicable Models	<b>Z: AZ</b> Series
⑤	Cable Type	<b>F:</b> Connection Cable Sets <b>R:</b> Flexible Connection Cable Sets
⑥	Electromagnetic Brake	Blank: Without Electromagnetic Brake <b>B:</b> With Electromagnetic Brake
⑦	Cable Specifications	Blank: AC Power Supply Input <b>2:</b> DC Power Supply Input

## Product Line (Single-Phase 200-240 VAC)

### Hollow Rotary Actuators

#### Standard Type

Frame Size	Product Name
85 mm	<b>DGM85R-AZAC</b>
130 mm	<b>DGM130R-AZAC</b>
	<b>DGM130R-AZACR</b>
	<b>DGM130R-AZACL</b>
200 mm	<b>DGM200R-AZAC</b>
	<b>DGM200R-AZACR</b>
	<b>DGM200R-AZACL</b>
	<b>DGM200R-AZACL</b>



#### Standard Type with Electromagnetic Brake

Frame Size	Product Name
85 mm	<b>DGM85R-AZMC</b>
130 mm	<b>DGM130R-AZMC</b>
	<b>DGM130R-AZMCR</b>
	<b>DGM130R-AZMCL</b>
200 mm	<b>DGM200R-AZMC</b>
	<b>DGM200R-AZMCR</b>
	<b>DGM200R-AZMCR</b>
	<b>DGM200R-AZMCL</b>



### Driver

#### Built-In Controller Type

Power Supply Input	Product Name
Single-Phase 200-240 VAC	<b>AZD-CD</b>



#### Pulse Input Type

Power Supply Input	Product Name
Single-Phase 200-240 VAC	<b>AZD-C</b>



#### Pulse Input Type with RS-485 Communication

Power Supply Input	Product Name
Single-Phase 200-240 VAC	<b>AZD-CX</b>



● Cable

◇ Without Electromagnetic Brake



Product Line	Length L [m]	Product Name
Connection Cable Sets	0.5	<b>CC005VZF</b>
	1	<b>CC010VZF</b>
	1.5	<b>CC015VZF</b>
	2	<b>CC020VZF</b>
	2.5	<b>CC025VZF</b>
	3	<b>CC030VZF</b>
	4	<b>CC040VZF</b>
	5	<b>CC050VZF</b>
	7	<b>CC070VZF</b>
	10	<b>CC100VZF</b>
	15	<b>CC150VZF</b>
	20	<b>CC200VZF</b>

Product Line	Length L [m]	Product Name
Flexible Connection Cable Sets	0.5	<b>CC005VZR</b>
	1	<b>CC010VZR</b>
	1.5	<b>CC015VZR</b>
	2	<b>CC020VZR</b>
	2.5	<b>CC025VZR</b>
	3	<b>CC030VZR</b>
	4	<b>CC040VZR</b>
	5	<b>CC050VZR</b>
	7	<b>CC070VZR</b>
	10	<b>CC100VZR</b>
	15	<b>CC150VZR</b>
	20	<b>CC200VZR</b>

◇ Type with an Electromagnetic Brake



Product Line	Length L (m)	Product Name
Connection Cable Sets	0.5	<b>CC005VZFB</b>
	1	<b>CC010VZFB</b>
	1.5	<b>CC015VZFB</b>
	2	<b>CC020VZFB</b>
	2.5	<b>CC025VZFB</b>
	3	<b>CC030VZFB</b>
	4	<b>CC040VZFB</b>
	5	<b>CC050VZFB</b>
	7	<b>CC070VZFB</b>
	10	<b>CC100VZFB</b>
	15	<b>CC150VZFB</b>
	20	<b>CC200VZFB</b>

Product Line	Length L (m)	Product Name
Flexible Connection Cable Sets	0.5	<b>CC005VZRB</b>
	1	<b>CC010VZRB</b>
	1.5	<b>CC015VZRB</b>
	2	<b>CC020VZRB</b>
	2.5	<b>CC025VZRB</b>
	3	<b>CC030VZRB</b>
	4	<b>CC040VZRB</b>
	5	<b>CC050VZRB</b>
	7	<b>CC070VZRB</b>
	10	<b>CC100VZRB</b>
	15	<b>CC150VZRB</b>
	20	<b>CC200VZRB</b>

■ Product Line (24 VDC / 48 VDC)

● Hollow Rotary Actuators

◇ Standard Type

Frame Size	Product Name
85 mm	<b>DGM85R-AZAK</b>
130 mm	<b>DGM130R-AZAK</b>
	<b>DGM130R-AZAKR</b>
	<b>DGM130R-AZAKL</b>



◇ Standard Type with Electromagnetic Brake

Frame Size	Product Name
85 mm	<b>DGM85R-AZMK</b>
130 mm	<b>DGM130R-AZMK</b>
	<b>DGM130R-AZMKR</b>
	<b>DGM130R-AZMKL</b>



● Driver

◇ Built-In Controller Type

Power Supply Input	Product Name
24 VDC / 48 VDC	<b>AZD-KD</b>



◇ Pulse Input Type

Power Supply Input	Product Name
24 VDC / 48 VDC	<b>AZD-K</b>



◇ Pulse-Input Type with RS-485 Communication

Power Supply Input	Product Name
24 VDC / 48 VDC	<b>AZD-KX</b>



● Cable

◇ Without Electromagnetic Brake



Product Line	Length L [m]	Product Name
Connection Cable Sets	0.5	<b>CC005VZF2</b>
	1	<b>CC010VZF2</b>
	1.5	<b>CC015VZF2</b>
	2	<b>CC020VZF2</b>
	2.5	<b>CC025VZF2</b>
	3	<b>CC030VZF2</b>
	4	<b>CC040VZF2</b>
	5	<b>CC050VZF2</b>
	7	<b>CC070VZF2</b>
	10	<b>CC100VZF2</b>
	15	<b>CC150VZF2</b>
	20	<b>CC200VZF2</b>

Product Line	Length L [m]	Product Name
Flexible Connection Cable Sets	0.5	<b>CC005VZR2</b>
	1	<b>CC010VZR2</b>
	1.5	<b>CC015VZR2</b>
	2	<b>CC020VZR2</b>
	2.5	<b>CC025VZR2</b>
	3	<b>CC030VZR2</b>
	4	<b>CC040VZR2</b>
	5	<b>CC050VZR2</b>
	7	<b>CC070VZR2</b>
	10	<b>CC100VZR2</b>
	15	<b>CC150VZR2</b>
	20	<b>CC200VZR2</b>





### ◇ Type with an Electromagnetic Brake

Product Line	Length L [m]	Product Name
Connection Cable Sets	0.5	<b>CC005VZFB2</b>
	1	<b>CC010VZFB2</b>
	1.5	<b>CC015VZFB2</b>
	2	<b>CC020VZFB2</b>
	2.5	<b>CC025VZFB2</b>
	3	<b>CC030VZFB2</b>
	4	<b>CC040VZFB2</b>
	5	<b>CC050VZFB2</b>
	7	<b>CC070VZFB2</b>
	10	<b>CC100VZFB2</b>
	15	<b>CC150VZFB2</b>
20	<b>CC200VZFB2</b>	

Product Line	Length L [m]	Product Name
Flexible Connection Cable Sets	0.5	<b>CC005VZRB2</b>
	1	<b>CC010VZRB2</b>
	1.5	<b>CC015VZRB2</b>
	2	<b>CC020VZRB2</b>
	2.5	<b>CC025VZRB2</b>
	3	<b>CC030VZRB2</b>
	4	<b>CC040VZRB2</b>
	5	<b>CC050VZRB2</b>
	7	<b>CC070VZRB2</b>
	10	<b>CC100VZRB2</b>
	15	<b>CC150VZRB2</b>
20	<b>CC200VZRB2</b>	

## Specifications

### ● Hollow Rotary Actuators Specifications



Frame Size		85 mm	130 mm	200 mm		
Product Name		<b>DGM85R-AZ</b> □□◇	<b>DGM130R-AZ</b> □□◇	<b>DGM200R-AZ</b> □□◇		
Driver product name	Built-in Controller	<b>AZD-CD, AZD-KD</b>		<b>AZD-CD</b>		
	Pulse Input Type with RS-485 Communication	<b>AZD-CX, AZD-KX</b>		<b>AZD-CX</b>		
	Pulse Input Type	<b>AZD-C, AZD-K</b>		<b>AZD-C</b>		
Built-in Motor		<b>AZ Series</b>				
Type of Output Table Supporting Bearing		Cross-Roller Bearing				
Inertia	J: kgm <sup>2</sup>	21120 × 10 <sup>-7</sup> [26304 × 10 <sup>-7</sup> ]*1	147380 × 10 <sup>-7</sup> [199220 × 10 <sup>-7</sup> ]*1	916400 × 10 <sup>-7</sup> [968240 × 10 <sup>-7</sup> ]*1		
Gear Ratio		18				
Minimum Traveling Amount of the Output Table		deg/STEP 0.01				
Permissible Torque		Nm 4.5      12      50				
Holding Torque at Motor Standstill	Power ON	Nm 2.7      12      36 [20]*2				
	Electromagnetic Brake	Nm 2.7      12      20				
Max. Speed		deg/seconds 1200 (200 r/min)      660 (110 r/min)				
Repetitive Positioning Accuracy		arc second ±15 (±0.004°)				
Lost Motion		arc minute 2 (0.033°)				
Angular Transmission Accuracy		arc minute 4 (0.067°)      3 (0.05°)      2 (0.033°)				
Permissible Axial Load		N 500      2000      4000				
Permissible Moment		Nm 10      50      100				
Runout of Output Table Surface		mm 0.015				
Runout of Output Table Inner (Outer) Diameter		mm 0.015      0.030				
Parallelism of Output Table		mm 0.030      0.050				
Degree of Protection		IP40 (IP20 for motor connector)				
Power-Supply Input	Voltage and Frequency	Single-Phase 200-240 VAC -15 % to +6 % 50/60 Hz	VDC24 ±5%*2 VDC48 ±5%*3	Single-Phase 200-240 VAC -15 % to +6 % 50/60 Hz	VDC24 ±5%*2 VDC48 ±5%*3	Single-Phase 200-240 VAC -15 % to +6 % 50/60 Hz
	Input Current A	1.7	1.72[1.8]*1	2.3	3.55[3.8]*1	3.9

- Either **A** (single shaft) or **M** (electromagnetic brake) indicating the configuration is entered where the box □ is located within the product name.
- Either **C** (single-phase 200-240 VAC) or **K** (24/48 VDC) indicating the power supply input is entered where the box □ is located within the product name.
- Either **R** (right) or **L** (left) is entered for the cable withdrawing direction in ◇ in the product name.
- \*1 The brackets [ ] indicate the specifications for the electromagnetic brake type.
- \*2 Changes to 24 VDC ±4% if the electromagnetic brake type has been extended with the 20 m accessory cable.
- \*3 When operating with 48 VDC, please keep the load inertia up to 10 times the rotor inertia, and keep the torque safety factor 2 or more when calculating the acceleration torque (excluding **DGM85** type)

#### Note

- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Please keep the motor case temperature at a maximum of 80°C to protect the AB20 sensor. (When conforming to the UL Standards, the temperature of the motor case must be kept at 75°C or less, since the motor is recognized as heat-resistant class A.)
- The repetitive positioning accuracy is measured at a constant temperature (normal temperature) under a constant load.

### ● Electromagnetic brake specification

Product Name	<b>DGM85</b>	<b>DGM130</b>	<b>DGM200</b>
Operation Mode	Power Off Activated Type		
Input voltage	24VDC±5%*		
Input current	A 0.08	0.25	
Brake operation time	ms 20		
Brake time releasing	ms 30		
Rating	Continuous		

\*Changes to 24 VDC ± 4% if the electromagnetic brake type has been extended with the 20 m accessory cable.

● General Specifications

		Actuator Built-in Motor: <b>AZ</b> Series	Driver	
			Built-In Controller Type Pulse Input Type with RS-485 Communication	Pulse Input Type
Heat-Resistant Class		130 (B) [Recognized as 105 (A) by the UL Standards]	-	
Insulation Resistance		The measured value is 100 MΩ or more when a 500 VDC megger is applied between the following locations: · Case – Motor windings · Case – Electromagnetic brake windings*1	The measured value is 100 MΩ or more when a 500 VDC megger is applied between the following locations: · Protective earth terminal – Power supply terminal	
Dielectric Voltage		Sufficient to withstand the following for 1 minute: · Case – Motor windings 1.0 kVAC, 50 Hz or 60 Hz · Case – Electromagnetic brake windings*1 1.0 kVAC, 50 Hz or 60 Hz		
Operating Environment (In operation)	Ambient Temperature	0 - +40°C (Non-freezing)	0 - +50°C (non-freezing)	
	Ambient Humidity	85% or less (Non-condensing)		
	Atmosphere	Use in an area without corrosive gases and dust. The product should not be exposed to water, oil or other liquids.		
Degree of Protection		IP40 (IP20 for motor connector)	IP10	
Multiple rotation detection range in non-electrified state (Motor output shaft)		±900 rotations (1800 rotations)		

\*1 Only for electromagnetic brake type

**Note**

- Do not perform the insulation resistance measurement or dielectric voltage withstand test while the actuator and driver are connected. Also, do not conduct these tests on the motor ABZO sensor component.

● Driver Specifications

Classification	Name		Built-In Controller Type	Pulse Input Type
Input/Output Function	Pulse Input		-	Max. Input Pulse Frequency Line driver output by programmable controller: 1 MHz (When the pulse duty is 50%) Open-collector output by programmable controller: 250 kHz (When the pulse duty is 50%) Negative Logic Pulse Input (Initial value)
	Direct Input		Number of Inputs: 10 points	
	Direct Output		Number of Outputs: 6 points	
	RS-485 Communication	Network Input	16 Points	-
Network Output		16 Points	-	

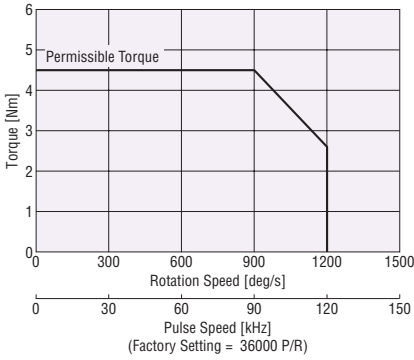
● Built-In Controller Type RS-485 Communication Specification

Protocol	Modbus RTU Mode
Electrical Characteristics	EIA-485 Based, Straight Cable Use shielded twisted-pair cables (TIA/EIA-568B CAT5e or better recommended). The maximum total extension length is 50 m.
Communication Mode	Half duplex and start-stop synchronization (data: 8 bits, stop bit: 1 bit or 2 bits, parity: none, even, or odd)
Baud Rate	Select from 9600 bps / 19200 bps / 38400 bps / 57600 bps / 115200 bps / 230400 bps
Connection Type	Up to 31 units can be connected to a single programmable controller (master unit).

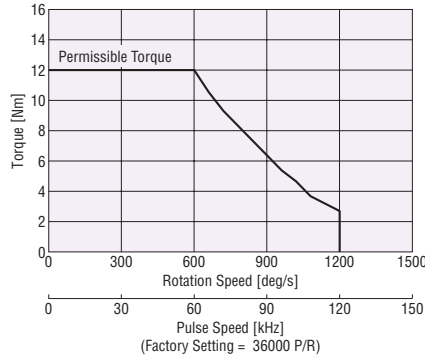
## Speed – Torque Characteristics (Reference values)

### Single-Phase 200-240 VAC

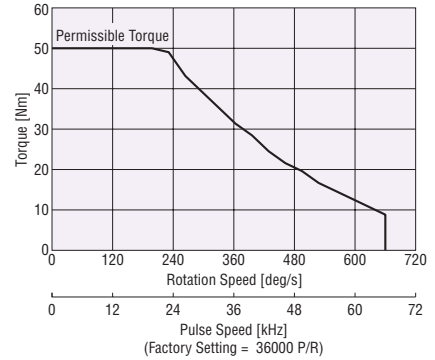
#### DGM85R-AZ



#### DGM130R-AZ

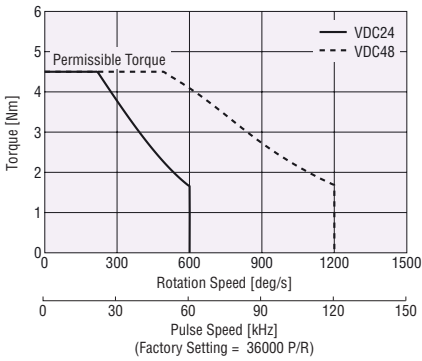


#### DGM200R-AZ

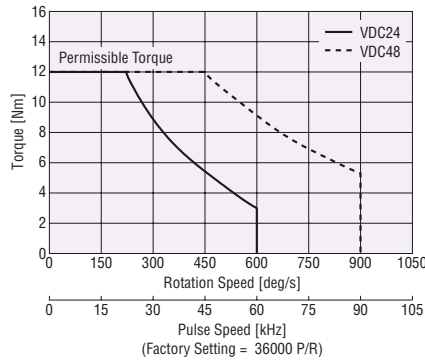


### 24 VDC / 48 VDC

#### DGM85R-AZ



#### DGM130R-AZ



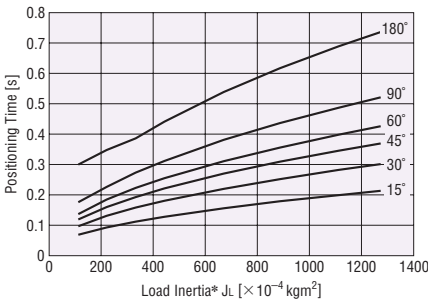
#### Note

- Data for the speed – torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Please keep the motor case temperature at a maximum of 80°C to protect the ABZO sensor. (When conforming to the UL Standards, the temperature of the motor case must be kept at 75°C or less, since the motor is recognized as heat-resistant class A.)

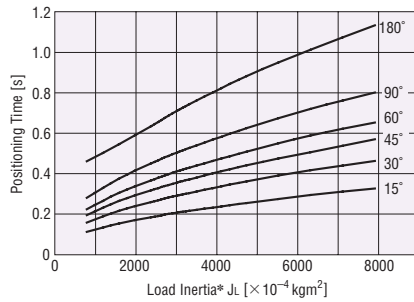
## Load Inertia – Positioning Time (Reference value)

### Single-Phase 200-240 VAC

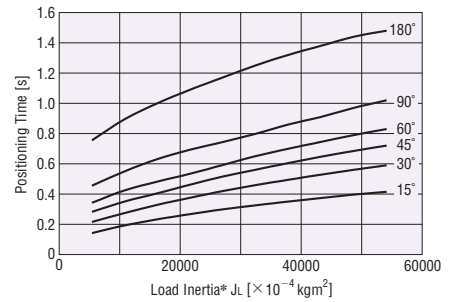
#### DGM85R-AZ



#### DGM130R-AZ

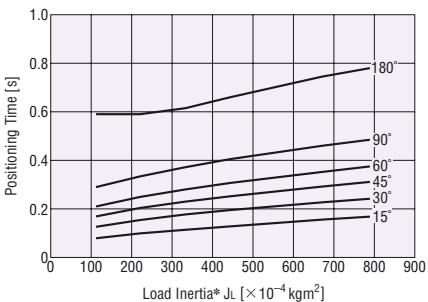


#### DGM200R-AZ

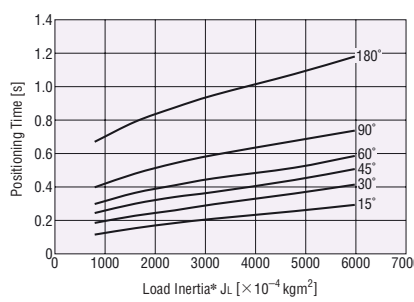


### 24 VDC

#### DGM85R-AZ



#### DGM130R-AZ

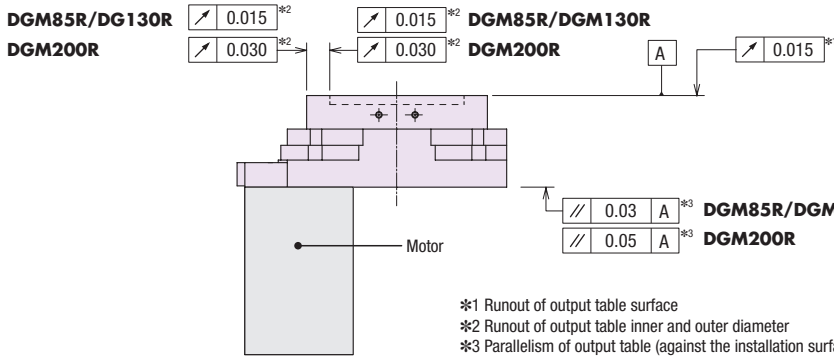


\*The load inertia refers to the inertia of the customer's load.

#### Note

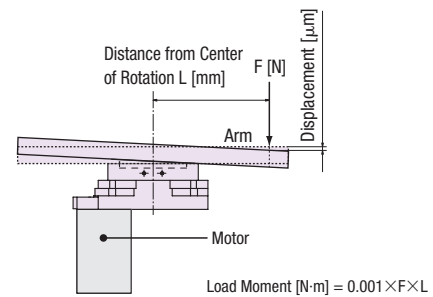
- The load inertia - positioning time is the theoretical value under normal temperature with a safety factor of 1.5 for torque. If the condition changes, the positioning time may change.

## Mechanical Precision (At no load)

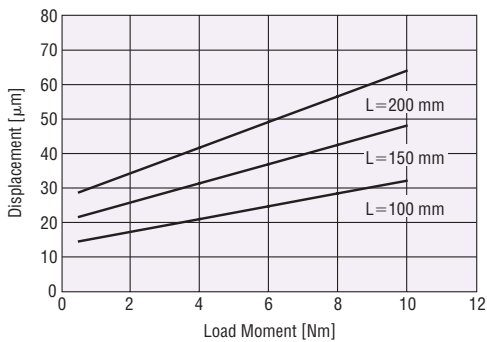


## Displacement by Load Moment (Reference value)

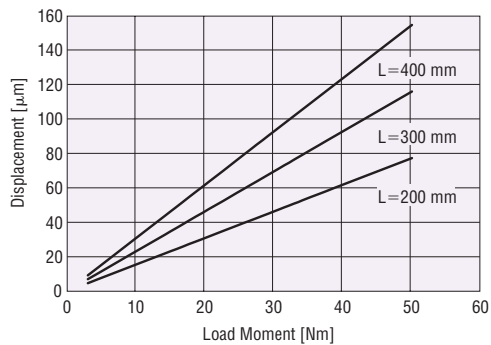
The output table will be displaced when it receives a load moment.  
 The graph plots the table displacement that occurs at distance L from the rotation center of the output table when a given load moment is applied in one direction.  
 The displacement becomes approximately twice the size when the load moment is applied in both the positive and negative directions.



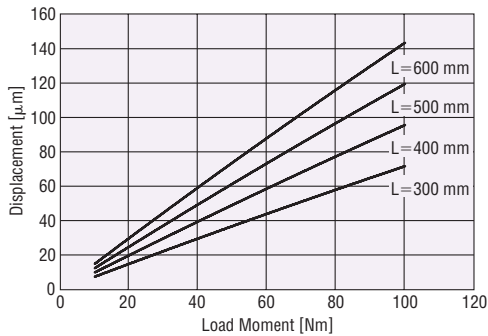
**DGM85R**



**DGM130R**



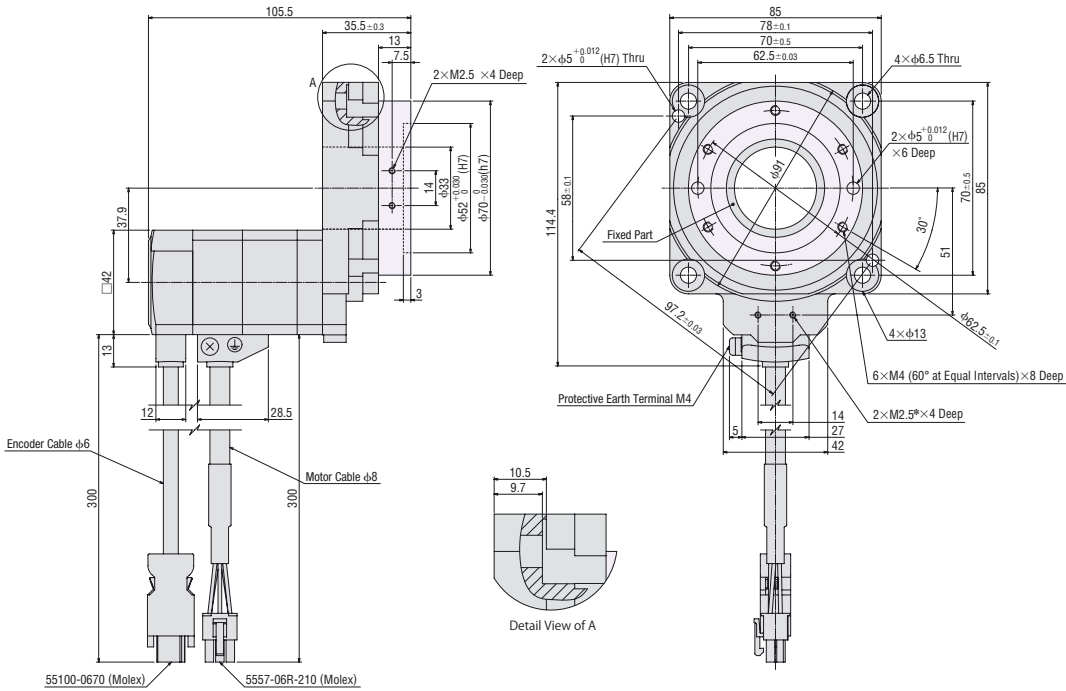
**DGM200R**



# Dimensions (Unit = mm)

## ● Actuator

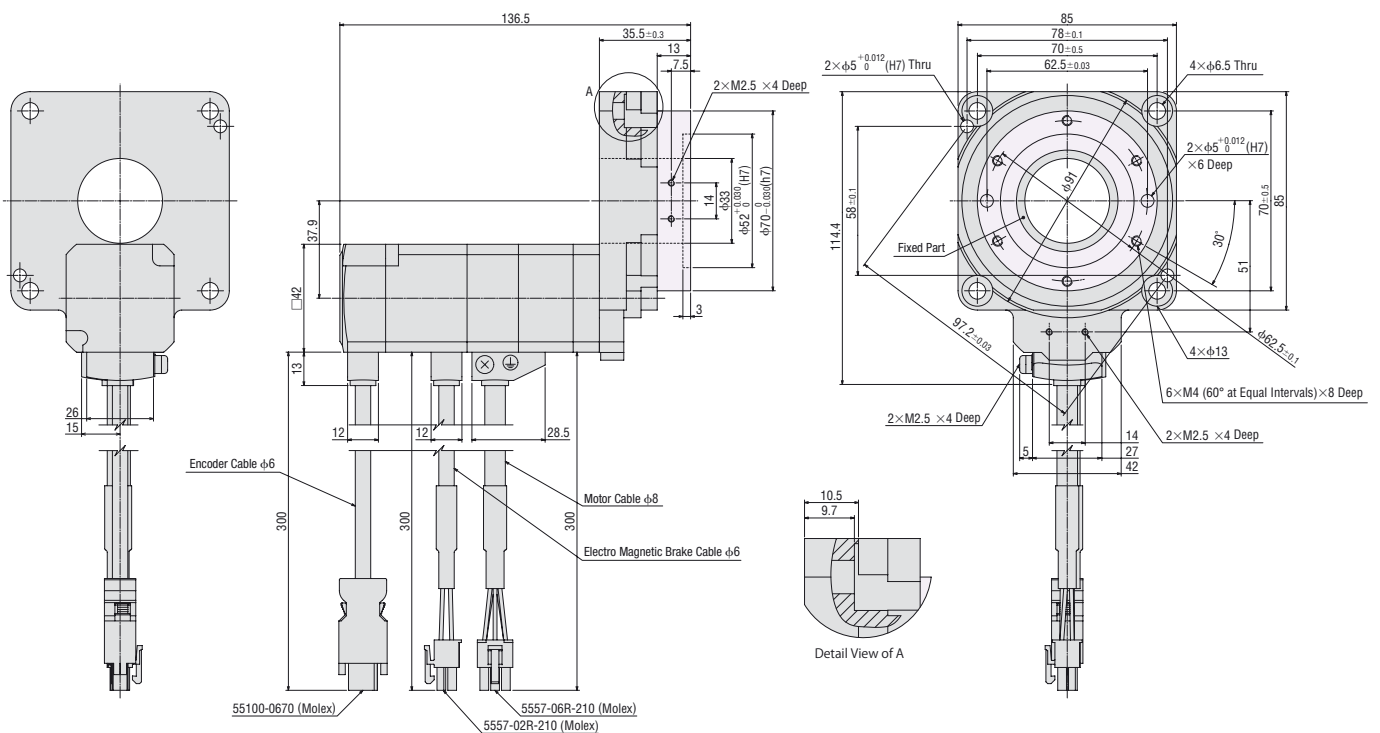
Product Name	Mass
<b>DGM85R-AZAC</b>	1.1 kg
<b>DGM85R-AZAK</b>	



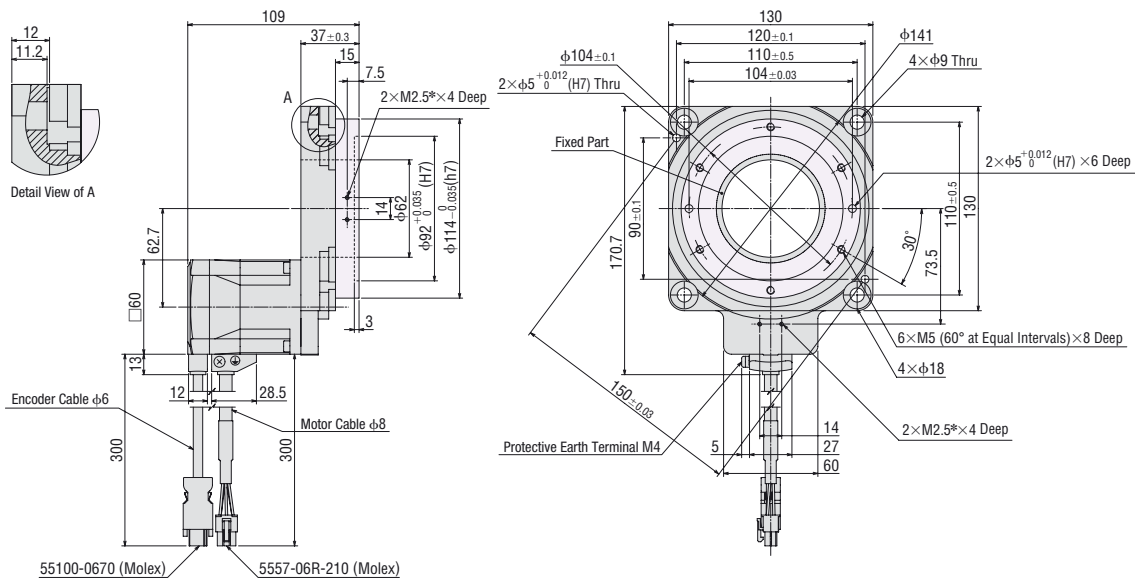
● The shaded areas are rotating parts.

\*Use M2.5 screw holes when installing the home sensor set (sold separately).  
Do not use these holes for any purpose other than to install the home sensor.

Product Name	Mass
<b>DGM85R-AZMC</b>	1.1 kg
<b>DGM85R-AZMK</b>	



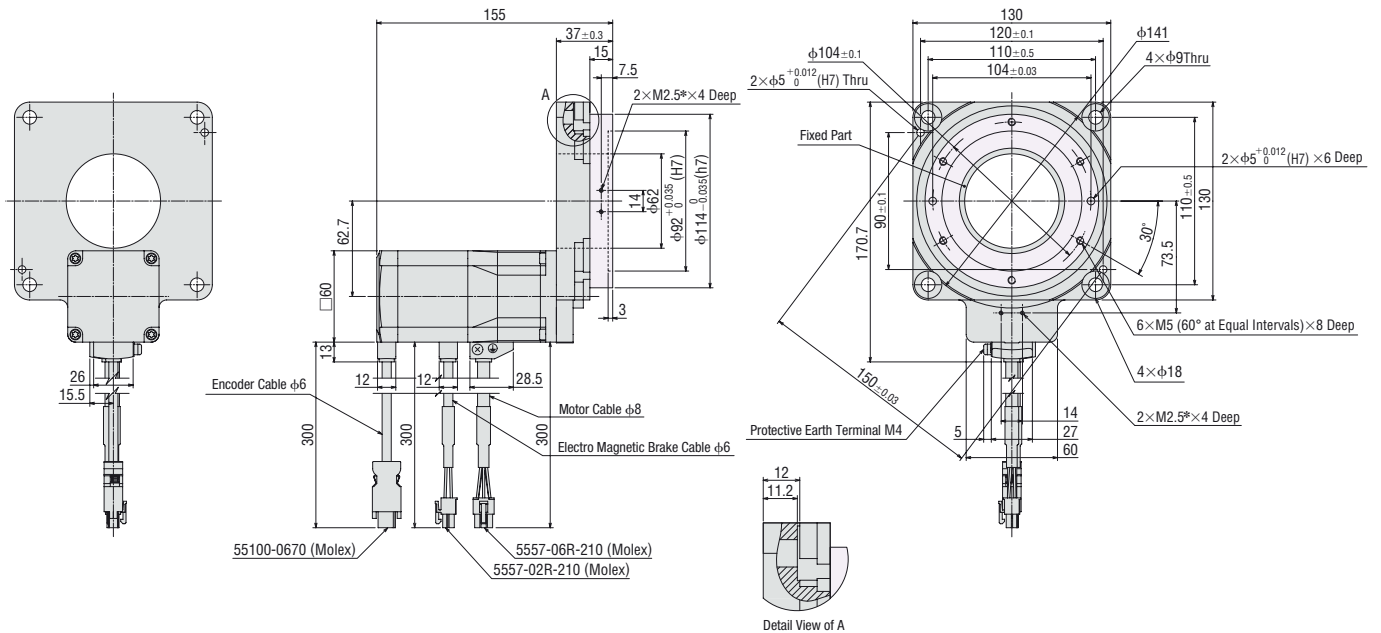
Product Name			Mass
<b>DGM130R-AZAC</b>	<b>DGM130R-AZACR</b>	<b>DGM130R-AZACL</b>	2.7 kg
<b>DGM130R-AZAK</b>	<b>DGM130R-AZAKR</b>	<b>DGM130R-AZAKL</b>	



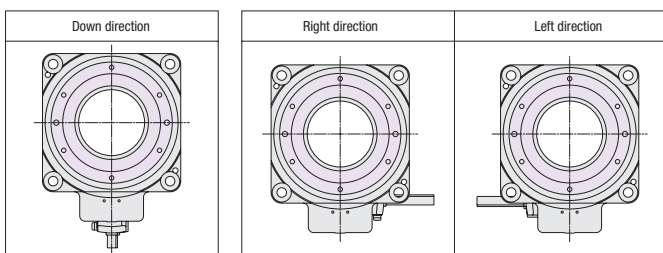
● The shaded areas are rotating parts.

\*Use M2.5 screw holes when installing the home sensor set (sold separately).  
Do not use these holes for any purpose other than to install the home sensor.

Product Name			Mass
<b>DGM130R-AZMC</b>	<b>DGM130R-AZMCR</b>	<b>DGM130R-AZMCL</b>	3.1 kg
<b>DGM130R-AZMK</b>	<b>DGM130R-AZMKR</b>	<b>DGM130R-AZMKL</b>	



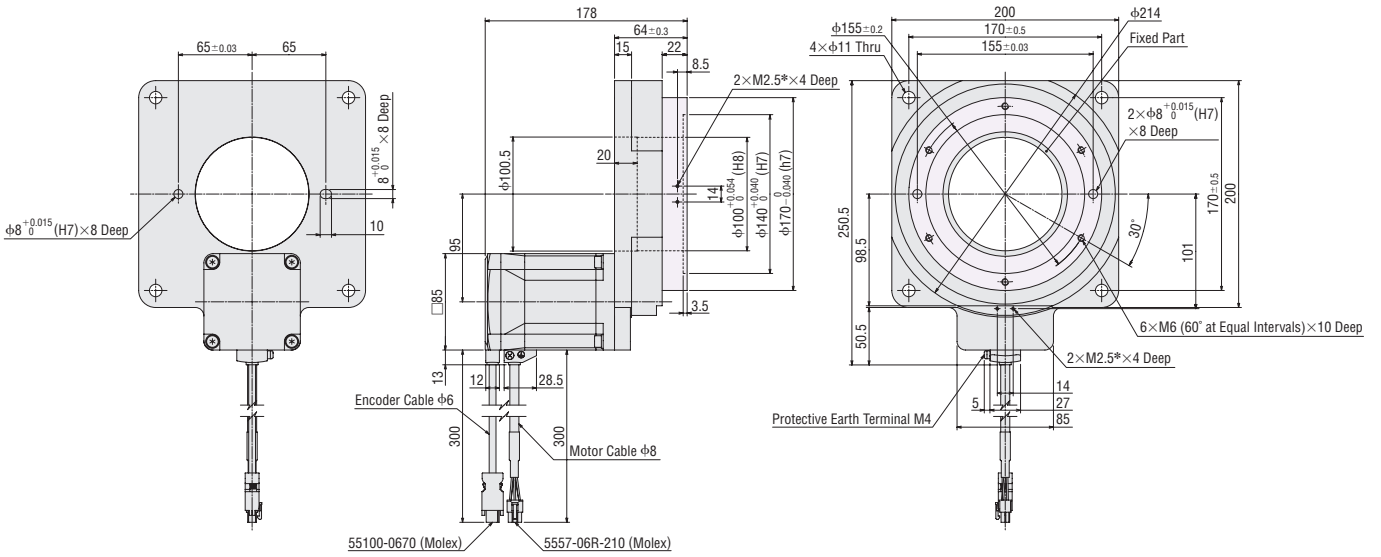
Cable Direction



● The shaded areas are rotating parts.

\*Use M2.5 screw holes when installing the home sensor set (sold separately).  
Do not use these holes for any purpose other than to install the home sensor.

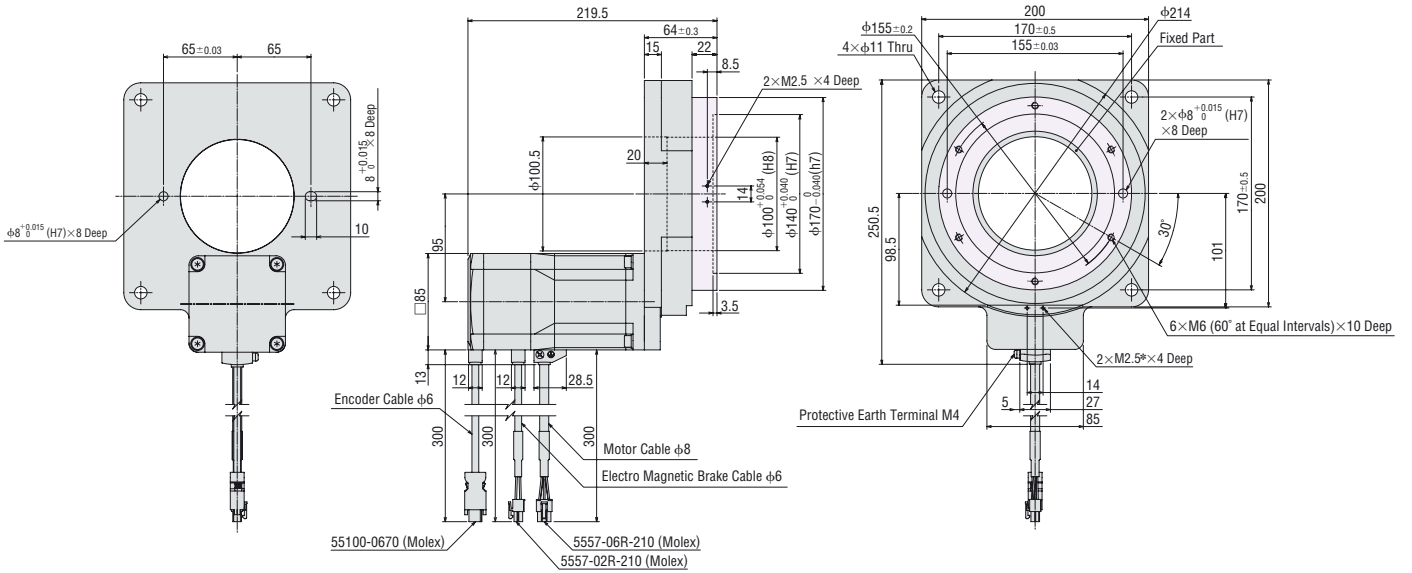
Product Name			Mass
<b>DGM200R-AZAC</b>	<b>DGM200R-AZACR</b>	<b>DGM200R-AZACL</b>	9.4 kg



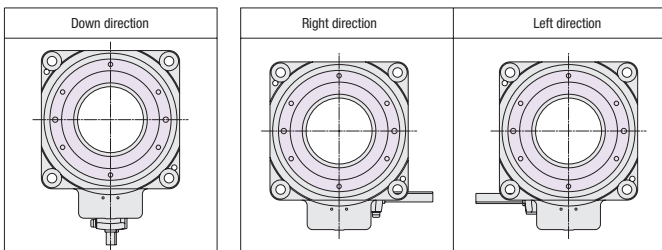
● The shaded areas are rotating parts.

\*Use M2.5 screw holes when installing the home sensor set (sold separately).  
Do not use these holes for any purpose other than to install the home sensor.

Product Name			Mass
<b>DGM200R-AZMC</b>	<b>DGM200R-AZMCR</b>	<b>DGM200R-AZMCL</b>	10 kg



Cable Direction



● The shaded areas are rotating parts.

\*Use M2.5 screw holes when installing the home sensor set (sold separately).  
Do not use these holes for any purpose other than to install the home sensor.

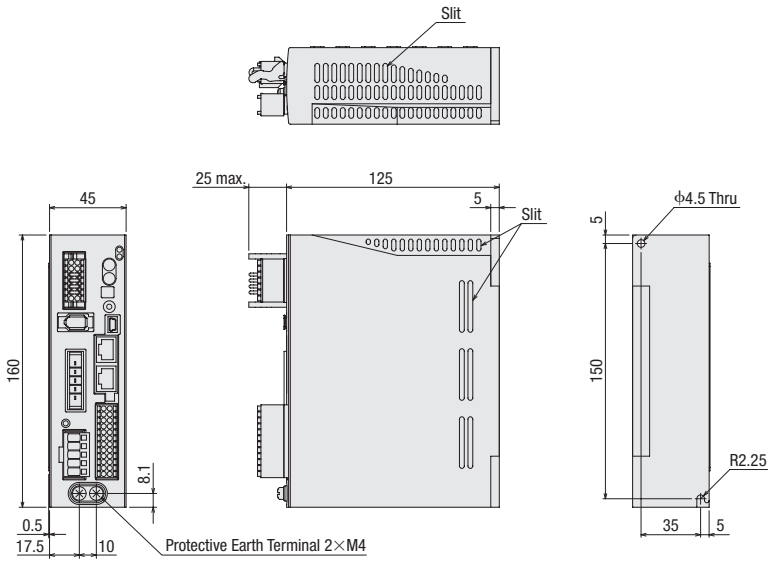
● Driver

◇ Built-In Controller Type (Single-Phase 200-240 VAC)

◇ Pulse-Input Type with RS-485 Communication (Single-Phase 200-240 VAC)

Driver Product Name: AZD-CD, AZD-CX

Mass: 0.65 kg



● Included

Main Power/Regeneration Unit Connector (CN4)  
Connector: 05JFAT-SAXGDK-H5.0  
(J.S.T. Mfg. Co., Ltd.)

I/O Signals Connector (CN5)  
Connector: DFMC1, 5/12-ST-3, 5  
(Phoenix Contact)

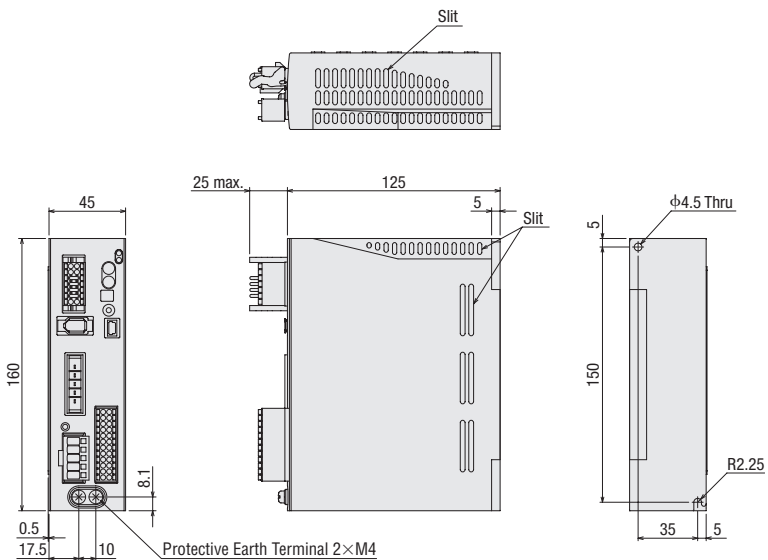
24 VDC Power Supply Input/Electromagnetic Brake Connection/  
Regeneration Unit Thermal Input/Power Cutoff Signal I/O Connector  
(CN1)  
Connector: DFMC1, 5/7-ST-3, 5-LR  
(Phoenix Contact)

Connector Wiring Lever: J-FAT-OT  
(J.S.T. Mfg. Co., Ltd.)

◇ Pulse Input Type (Single-Phase 200-240 VAC)

Driver Product Name: AZD-C

Mass: 0.65 kg



● Included

Main Power/Regeneration Unit Connector (CN4)  
Connector: 05JFAT-SAXGDK-H5.0  
(J.S.T. Mfg. Co., Ltd.)

I/O Signals Connector (CN5)  
Connector: DFMC1, 5/12-ST-3, 5  
(Phoenix Contact)

24 VDC Power Supply Input/Electromagnetic Brake Connection/  
Regeneration Unit Thermal Input/Power Cutoff Signal I/O Connector  
(CN1)  
Connector: DFMC1, 5/7-ST-3, 5-LR  
(Phoenix Contact)

Connector Wiring Lever: J-FAT-OT  
(J.S.T. Mfg. Co., Ltd.)

**Note**

The motor cable and electromagnetic brake cable from the hollow rotary actuator cannot be connected directly to the driver. When connecting to a driver, use the accessory connection cable (sold separately) or use the included connection cable (for products which include a connection cable).

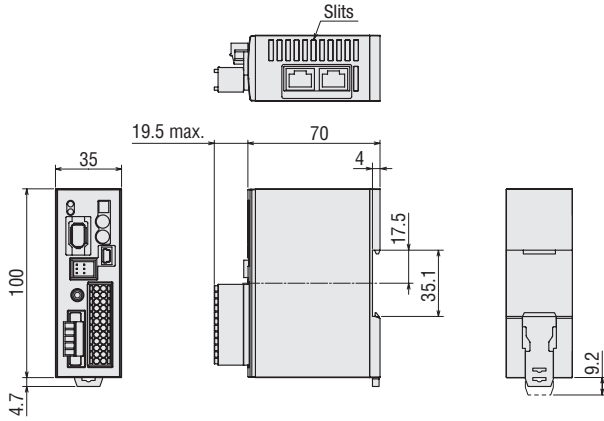


◇ Built-In Controller Type (24 VDC / 48 VDC)

◇ Pulse-Input Type with RS-485 Communication (24 VDC / 48 VDC)

Driver Product Name: AZD-KD, AZD-KX

Mass: 0.15kg



● Accessories

Connector form in power/electromagnetic brake connections (CN1)

Connector: MC1,5/5-STF-3,5  
(PHOENIX CONTACT GmbH & Co. KG)

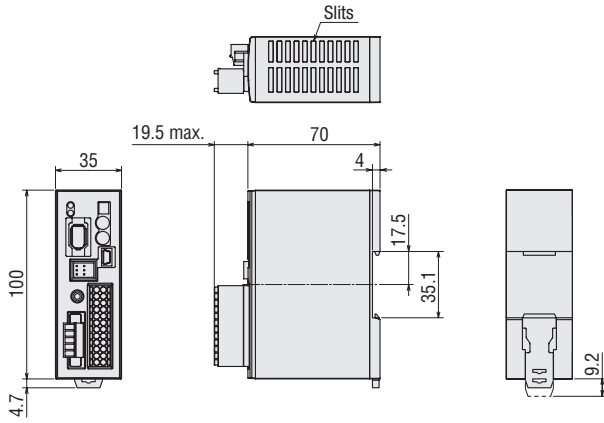
Connector for Input/Output Signal (CN4)

Connector: DFMC1,5/12-ST-3,5  
(PHOENIX CONTACT GmbH & Co. KG)

◇ Pulse Input Type (24 VDC / 48 VDC)

Driver Product Name: AZD-K

Mass: 0.15kg



● Accessories

Connector form in power/electromagnetic brake connections (CN1)

Connector: MC1,5/5-STF-3,5  
(PHOENIX CONTACT GmbH & Co. KG)

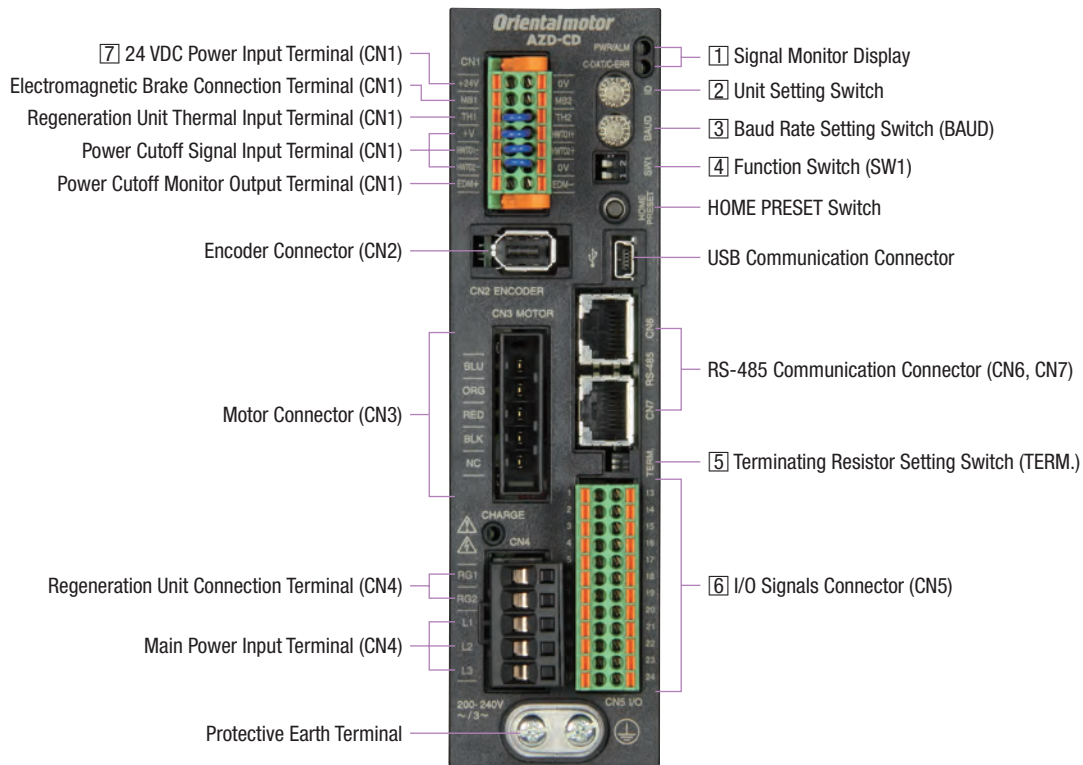
Connector for Input/Output Signal (CN4)

Connector: DFMC1,5/12-ST-3,5  
(PHOENIX CONTACT GmbH & Co. KG)

## Connection and Operation (Single-Phase 200-240 VAC)

### Built-In Controller Type and Pulse Input Type with RS-485 Communication

#### Names and Functions of Driver Parts



Driver Product Name: AZD-CD

#### 1 Signal Monitor Displays

##### LED Indicators

Indication	Color	Function	Lighting Condition
PWR	Green	Power supply indication	When 24 VDC power supply is input
ALM	Red	Alarm indication	When a protective function is activated (blinking)
C-DAT	Green	Communication indication	When communication data is being sent or received
C-ERR	Red	Communication error indication	When communication data is in error

#### 2 Unit Setting Switch

Indication	Function
ID	Set this when RS-485 communication is used. Set the unit number (factory setting: 0).

#### 3 Baud Rate Setting Switch

Indication	Function
BAUD	Set this when RS-485 communication is used. Set the baud rate (factory setting: 7).

#### 4 Function Switch

Indication	No.	Function
SW1	1	Use in combination with the unit setting switch (ID) to set the unit number (factory setting: OFF).
	2	Set the RS-485 communication protocol (factory setting: OFF).

#### RS-485 Baud Rate Setting

No.	Baud Rate (bps)
0	9600
1	19200
2	38400
3	57600
4	115200
5	230400
6	Not used
7	Network Converters
8 - F	Not used

## 5 Terminating Resistor Setting Switch

Indication	No.	Function
TERM.	1	Set the RS-485 communication termination resistance (120 Ω) (factory setting: OFF).
	2	OFF: Terminating resistor not used, ON: Terminating resistor used

● Configure both No. 1 and No. 2 to the same setting.

## 6 I/O Signal Connector (CN5)

Indication	Pin No.	Signal Name	Description
CN5	1	IN0	START This signal is used to start positioning operation.
	2	IN2	M1 Use 3 bits (M0, M1, M2) to select the operating data number.
	3	IN4	ZHOME Travels to home location set via HOME PRESET switch.
	4	IN6	STOP Stop the motor.
	5	IN-COM [0-7]*1	Input common for IN0~IN7
	6	IN8	FW-JOG Starts the JOG operation.
	7	OUT0	HOME-END When home is determined, output when the high speed return-to-home operation is completed.
	8	OUT2	PLS-RDY Not used.
	9	OUT4	MOVE Output when the motor is operating.
	10	OUT-COM*1	Output Common
	11	ASG+	A-Phase Pulse Output+
	12	BSG+	B-Phase Pulse Output+
	13	IN1	M0 Use 3 bits (M0, M1, M2) to select the operating data number.
	14	IN3	M2 Use 3 bits (M0, M1, M2) to select the operating data number.
	15	IN5	FREE Switches the motor into its non-excitation state.
	16	IN7	ALM-RST Resets the alarm.
	17	IN-COM [8-9]*1	IN8 and IN9 input common
	18	IN9	RV-JOG Starts the JOG operation.
	19	OUT1	IN-POS Output when motor operation is completed.
	20	OUT3	READY Output when the driver is ready for operation.
	21	OUT5	ALM-B Outputs the alarm status for the driver (normal close).
	22	GND*1	Ground
	23	ASG-	A-Phase Pulse Output-
	24	BSG-	B-Phase Pulse Output-

● Functions to assign can be set by specifying parameters. Initial values are shown above. For details, please refer to the **AZ** Series operating manual (functionality section).

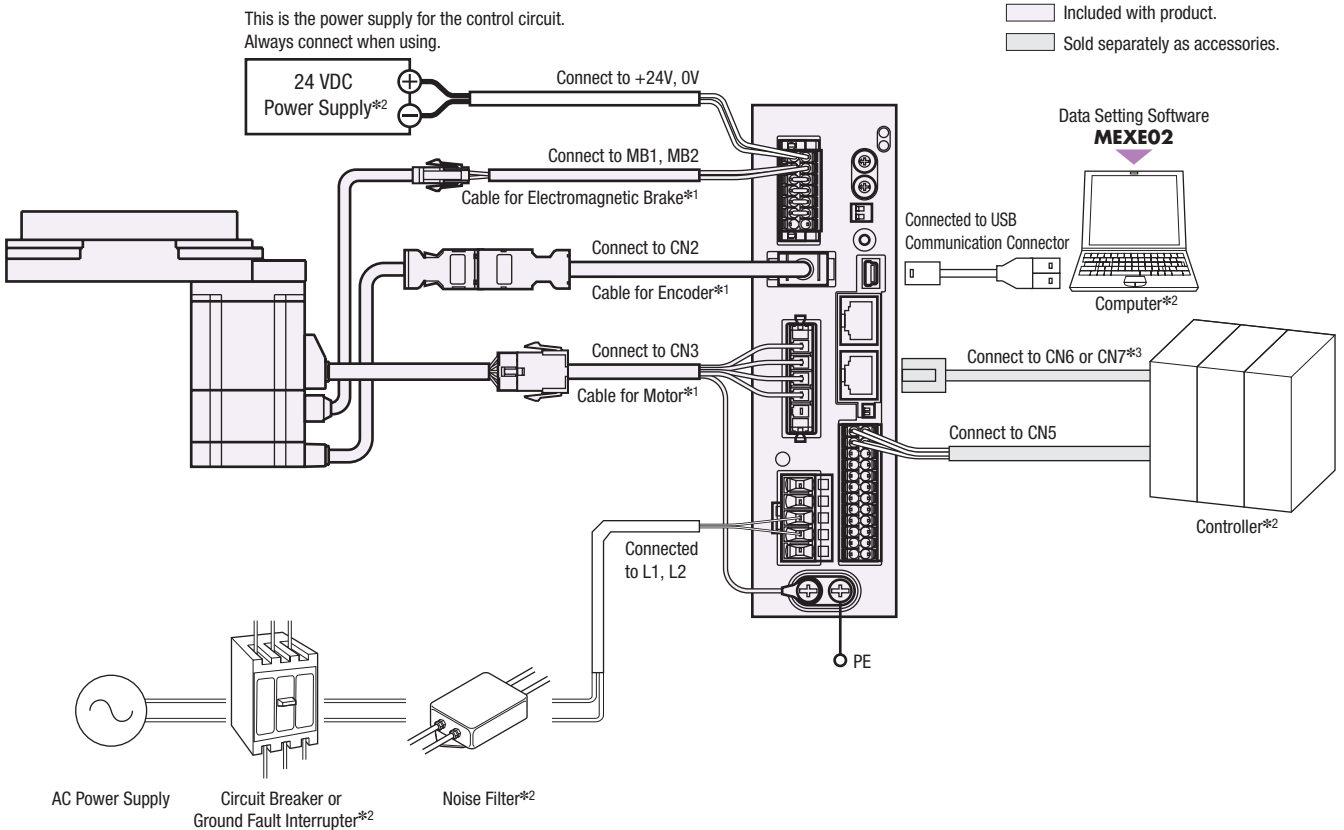
\*1 Initial setting values cannot be changed.

## 7 24 VDC Power Supply Input Terminal / Electromagnetic Brake Connection Terminal / Regeneration Unit Thermal Input Terminal / Power Cutoff Signal Input Terminal / Power Cutoff Monitor Output Terminal (CN1)

Indication	I/O	Terminal Name	Description
+24 V	Input	24 VDC Power Supply Input Terminal +	The power supply for the driver control circuit. Always connect when using.
0 V		24 VDC Power Supply Input Terminal -	
MB1	Output	Electromagnetic brake terminal -	Connect the electromagnetic brake cable for motors with the electromagnetic brake.
MB2		Electromagnetic brake terminal +	
TH1	Input	Regeneration Unit Thermal Input Terminal	Connect the accessory (sold separately) regeneration unit ( <b>RGB100</b> ). When not connecting a regeneration unit, short these 2 terminals to each other.
TH2		Regeneration Unit Thermal Input Terminal	
HWT01+	Input	Power Cutoff Signal Input Terminal 1+	Connects to switch and host controller. If either HWT01 input or HWT02 input is OFF, the motor power supply is cut off directly via hardware (CPU bypassed).
HWT01-		Power Cutoff Signal Input Terminal 1-	
HWT02+		Power Cutoff Signal Input Terminal 2+	
HWT02-		Power Cutoff Signal Input Terminal 2-	
EDM+	Output	Power Cutoff Monitor Output Terminal +	Connects to host controller. If both HWT01 input HWT02 input are OFF, the EDM output turns ON.
EDM-		Power Cutoff Monitor Output Terminal -	

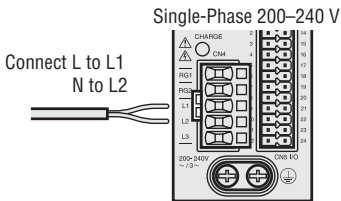
● Connection Diagram

◇ Connections with Peripheral Equipment



- \*1 Products are available with a 1 m, 2 m or 3 m cable for motor and driver, and also without. If cables longer than 3 m or flexible cables are required, select the appropriate cables from the accessories (sold separately). When wiring the motor and the driver, keep a maximum distance of 20 m.
- \*2 Not supplied.
- \*3 Connect to controller when controlling the system via RS-485 communication.

◇ Connecting the Main Power Supply



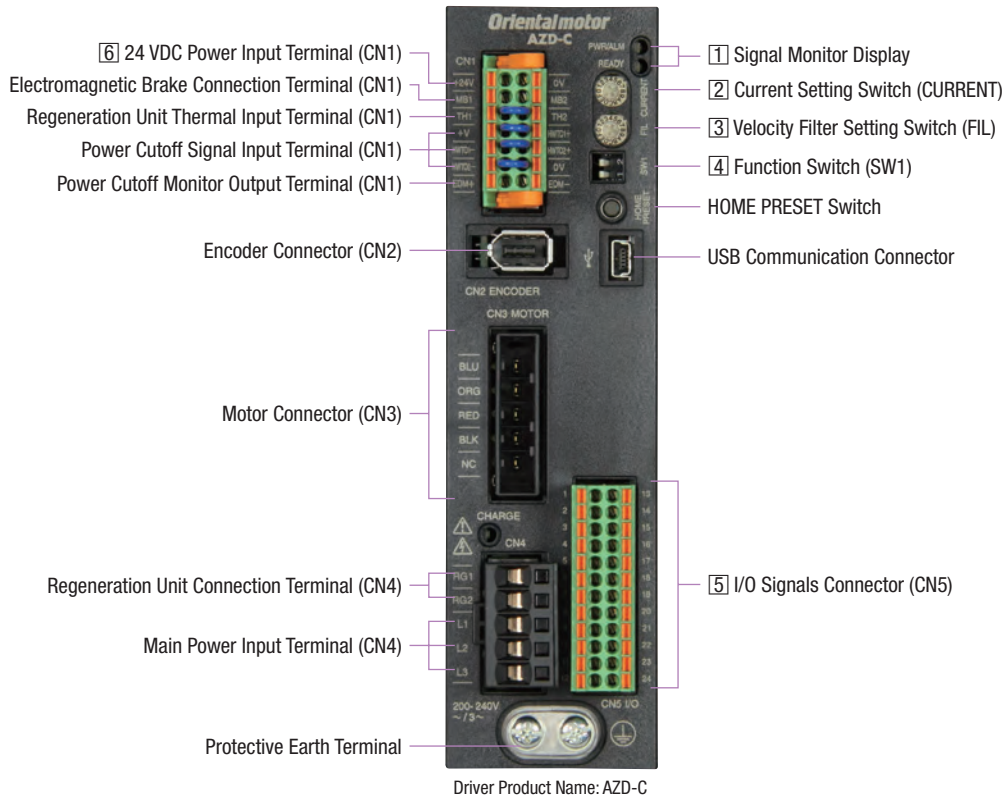
◇ USB Cable Connection

Connect to the computer on which the data setting software **MEXEO2** is installed to the driver with a USB cable. Please use USB cables which meet the follow specifications.

Specifications	USB2.0 (Full speed)
Cable	Length: 3 m or less
	Type: A-mini-B

● Pulse Input type

◇ Names and Functions of Driver Parts



1] Signal Monitor Displays

◇ LED Indicators

Indication	Color	Function	Lighting Condition
PWR	Green	Power supply indication	When 24 VDC power supply is input
ALM	Red	Alarm indication	When a protective function is activated (blinking)
READY	Green	READY Output	When READY output is ON

2] Current Setting Switch

Indication	Function
CURRENT	Sets the basis current used by the operating current and motor standstill current (factory setting: F)

3] Command Filter Setting Switch

Indication	Function
FIL	Adjusts the responsiveness of the motor (factory setting: 1).

4] Function Switch

Indication	No.	Function
SW1	1	Sets the resolution per one rotation of the motor output shaft (factory setting: OFF [1000 p/r]).*
	2	Switches the pulse input mode between 1-pulse input mode and 2-pulse input mode. (Factory setting: OFF [2-pulse input Mode])

\* For details, please refer to the **DGII** Series operating manual.

## 5 I/O Signal Connector (CN5)

Indication	Pin No.	Signal Name	Description
CN5	1	CW+ [PLS+] <sup>*1</sup>	CW pulse input+ [pulse input+]
	2	CCW+ [DIR+] <sup>*1</sup>	CCW pulse input+ [Rotation Direction Input+]
	3	IN4	ZHOME Travels to home location set via HOME PRESET switch.
	4	IN6	STOP Stop the motor.
	5	IN-COM [4-7] <sup>*1</sup>	Input common for IN4~IN7
	6	IN8	FW-JOG Starts the JOG operation.
	7	OUT0	HOME-END When home is determined, output when the high speed return-to-home operation is completed.
	8	OUT2	PLS-RDY Output when pulse input preparation is completed.
	9	OUT4	MOVE Output when the motor is operating.
	10	OUT-COM <sup>*1</sup>	Output Common
	11	ASG+	A-Phase Pulse Output+
	12	BSG+	B-Phase Pulse Output+
	13	CW- [PLS-] <sup>*1</sup>	CW pulse input- [pulse input-]
	14	CCW- [DIR-] <sup>*1</sup>	CCW pulse input- [Rotation Direction Input-]
	15	IN5	FREE Switches the motor into its non-excitation state.
	16	IN7	ALM-RST Resets the alarm.
	17	IN-COM [8-9] <sup>*1</sup>	IN8 and IN9 input common
	18	IN9	RV-JOG Starts the JOG operation.
	19	OUT1	IN-POS Output when motor operation is completed.
	20	OUT3	READY Output when the driver is ready for operation.
	21	OUT5	ALM-B Outputs the alarm status for the driver (normal close).
	22	GND <sup>*1</sup>	Ground
	23	ASG-	A-Phase Pulse Output-
	24	BSG-	B-Phase Pulse Output-

● Functions to assign can be set by specifying parameters. Initial values are shown above. For details, please refer to the **AZ** Series operating manual (functionality section).

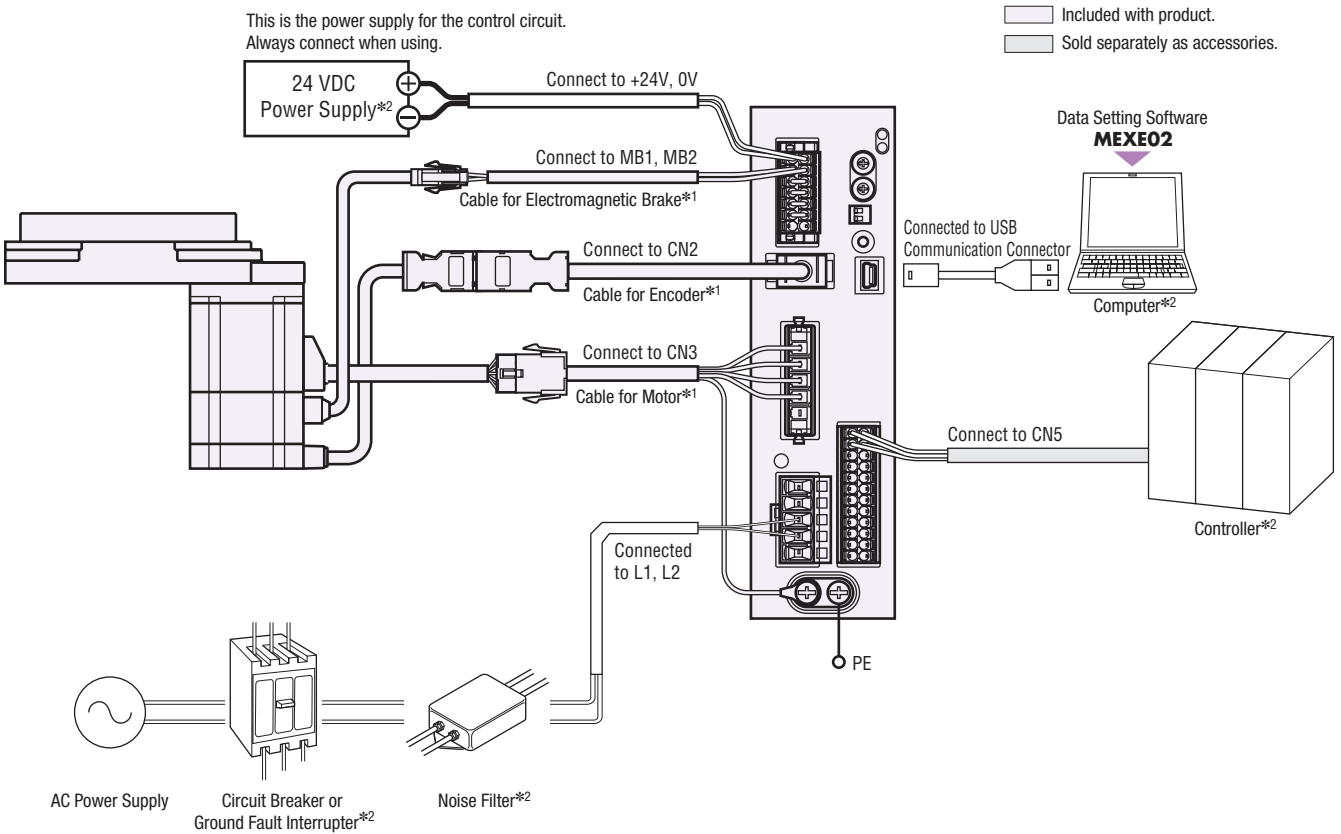
\*1 Initial setting values cannot be changed.

## 6 24 VDC Power Supply Input Terminal / Electromagnetic Brake Connection Terminal / Regeneration Unit Thermal Input Terminal / Power Cutoff Signal Input Terminal / Power Cutoff Monitor Output Terminal (CN1)

Indication	I/O	Terminal Name	Description
+24 V	Input	24 VDC Power Supply Input Terminal +	The power supply for the driver control circuit. Always connect when using.
0 V		24 VDC Power Supply Input Terminal -	
MB1	Output	Electromagnetic brake terminal -	Connects the electromagnetic brake cable on motors with electromagnetic brake.
MB2		Electromagnetic brake terminal +	
TH1	Input	Regeneration Unit Thermal Input Terminal	Connect the accessory (sold separately) regeneration unit ( <b>RGB100</b> ). When not connecting a regeneration unit, short these 2 terminals to each other.
TH2		Regeneration Unit Thermal Input Terminal	
HWT01+	Input	Power Cutoff Signal Input Terminal 1+	Connects to switch and host controller. If either HWT01 input or HWT02 input is OFF, the motor power supply is cut off directly via hardware (CPU bypassed).
HWT01-		Power Cutoff Signal Input Terminal 1-	
HWT02+		Power Cutoff Signal Input Terminal 2+	
HWT02-		Power Cutoff Signal Input Terminal 2-	
EDM+	Output	Power Cutoff Monitor Output Terminal +	Connects to host controller. If both HWT01 input HWT02 input are OFF, the EDM output turns ON.
EDM-		Power Cutoff Monitor Output Terminal -	

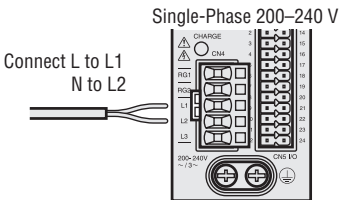
● Connection Diagram

◇ Connections with Peripheral Equipment



- \*1 Products are available with a 1 m, 2 m or 3 m cable for motor and driver, and also without.  
If cables longer than 3 m or flexible cables are required, select the appropriate cables from the accessories (sold separately).  
When wiring the motor and the driver, keep a maximum distance of 20 m.
- \*2 Not supplied.

◇ Connecting the Main Power Supply



◇ USB Cable Connection

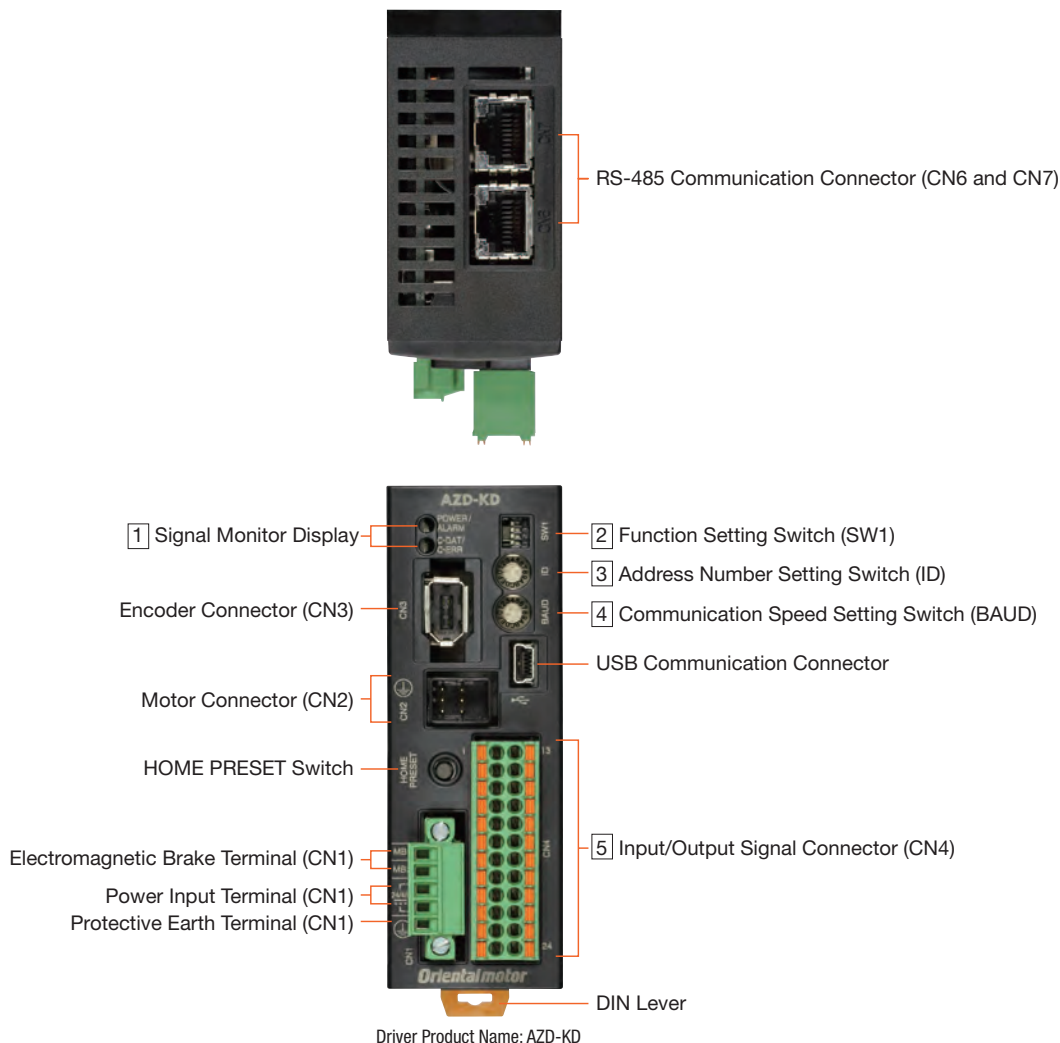
Connect to the computer on which the data setting software **MEXE02** is installed to the driver with a USB cable.  
Please use USB cables which meet the follow specifications.

Specifications	USB2.0 (Full speed)
Cable	Length: 3 m or less
	Type: A-mini-B

## Connection and Operation (24 VDC / 48 VDC)

### Built-In Controller Type and Pulse Input Type with RS-485 Communication

#### Name and Functions of Driver Parts



#### 1 Signal Monitor Display

##### LED Display

Display	Colour	Function	When Activated
POWER	Green	Power Display	When power is on.
ALARM	Red	Alarm Display	Blinks when protective functions are activated.
C-DAT	Green	Communication Display	When communication data is received or sent.
C-ERR	Red	Communication Error Display	When there is an error with communication data.

#### 2 Function Setting Switch

Display	No.	Function
SW1	1	This sets the address number in combination with the address number setting switch (ID) (Factory Setting: OFF).
	2	This sets the protocol for RS-485 communication (Factory Setting: OFF).
	3	Set the RS-485 communication terminal resistor (120Ω) (Factory Setting: OFF).
	4	OFF: no terminal resistor, ON: terminal resistor connected.

\*Please use the same settings for both No. 3 and No. 4.

#### 3 Address Number Setting Switch (ID)

Display	Function
ID	Set the address number for RS-485 communication (Factory Setting: 0).



#### 4 Communication Speed Setting Switch

Display	Function
BAUD	Set this when using RS-485 communications. Set the communication speed (Factory Setting: 7).

#### ◇ Settings of the RS-485 Communication Speed

No.	Baud Rate (bps)
0	9600
1	19200
2	38400
3	57600
4	115200
5	230400
6	Not used
7	Network Converter
8-F	Not used

#### 5 Input/Output Signal Connector (CN4)

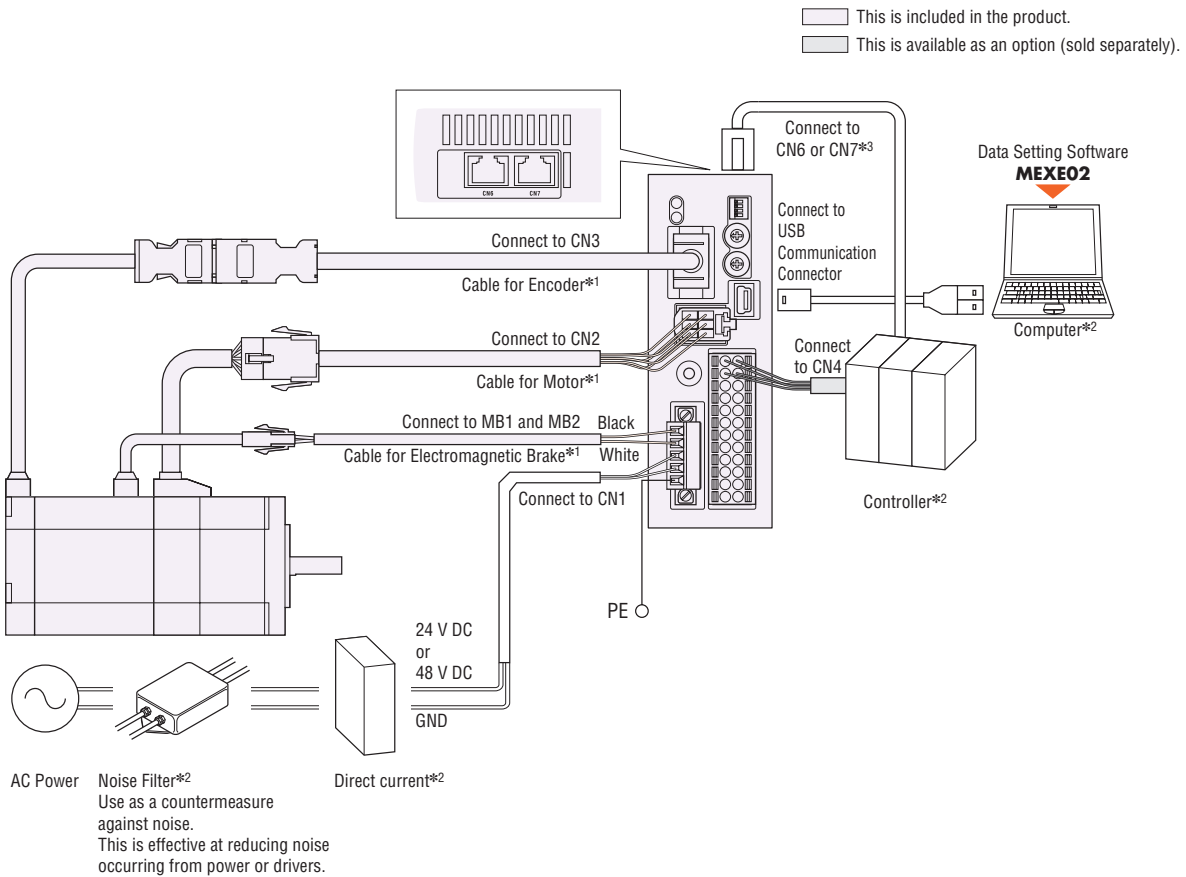
Display	Pin Number	Signal Name	Content
CN4	1	IN0	START This signal is used to start positioning operation.
	2	IN2	M1 Use the 3 bits of M0, M1, M2, to select the drive data No.
	3	IN4	ZHOME Move to the home position set with the HOME PRESET switch.
	4	IN6	STOP Stop the motor.
	5	IN-COM [0-7]*1	IN0-IN7 input common
	6	IN8	FW-JOG Start JOG operation.
	7	OUT0	HOME-END Output when determining the home position or completing high speed point of return-to-home operation.
	8	OUT2	PLS-RDY Not used
	9	OUT4	MOVE Output while operating the motor.
	10	OUT-COM*1	Output common
	11	ASG+	A phase pulse output+
	12	BSG+	B phase pulse output+
	13	IN1	M0 Use the 3 bits of M0, M1, M2, to select the drive data No.
	14	IN3	M2 Use the 3 bits of M0, M1, M2, to select the drive data No.
	15	IN5	FREE The motor is set to non-excitation.
	16	IN7	ALM-RST Reset the alarm.
	17	IN-COM [8-9]*1	IN8, IN9 input common
	18	IN9	RV-JOG Start JOG operation.
	19	OUT1	IN-POS Output when the motor operation is complete.
	20	OUT3	READY Output when the driver is ready for operation.
	21	OUT5	ALM-B Output the driver alarm state (normal close).
	22	GND*1	Ground
	23	ASG-	A phase pulse output-
	24	BSG-	B phase pulse output-

● Assigned functions are set by means of the parameter settings. The above is the initial value. For details, refer to the User's Manual.

\*1 The initial value setting cannot be changed.

● Connection Diagram

◇ Connection to Peripheral Equipment



\*1 Products with cable for connecting between motor and driver (1 m, 2 m, 3 m) are available as well as those to which such cable is not attached. Cables longer than 3 m or flexible cables can be selected as an option (sold separately). Make sure a cabling distance between the motor and the driver is 20 m or less.  
 \*2 Prepared by the customer.  
 \*3 When controlling with RS-485 communications, connect to the controller.

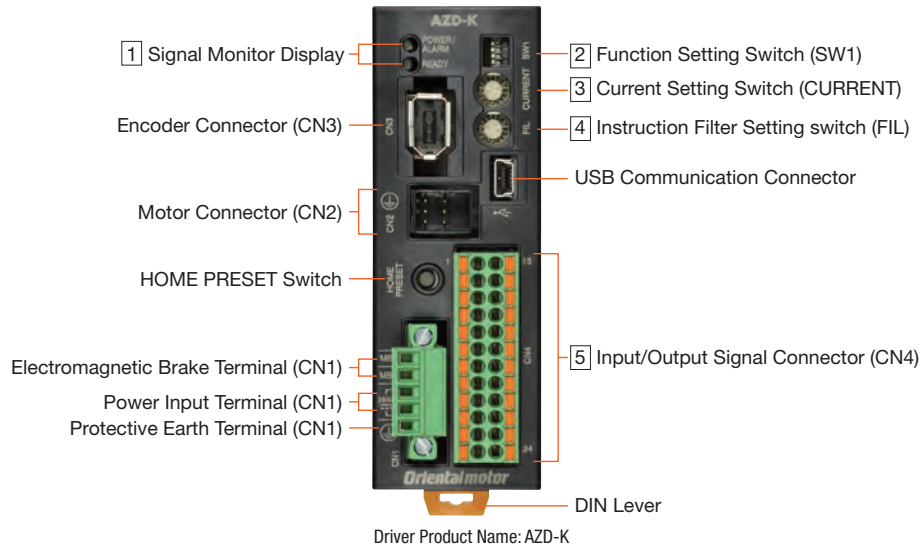
◇ USB Cable Connection

The computer on which the data setting software **MEXE02** is installed and driver are connected with a USB cable. Use the following specifications for the USB cable.

Specification	USB2.0 (full speed)
Cable	Length: 3 m (or less)
	Format: A-mini-B

● Pulse Input type

◇ Names and Functions of Driver Parts



1 Signal Monitor Display

◇ LED Display

Display	Colour	Function	When Activated
POWER	Green	Power Display	When power is on.
ALARM	Red	Alarm Display	Blinks when protective functions are activated.
READY	Green	READY output	When READY output is set to ON

2 Function Setting Switch

Display	No.	Function
SW1	1	Set the resolution for each motor output axis rotation (Factory Setting : OFF [1000p/r]).
	2	Set the pulse input format to 1 pulse input mode or 2 pulse input mode. (Factory Setting: OFF [2 pulse input mode])
	3, 4	Not used

3 Current Setting Switch

Display	Function
CURRENT	Set basic current that is the base for the operation current and stop current (Factory Setting: F).

4 Command Filter Setting Switch

Display	Function
FIL	Adjust the responsiveness of the motor (Factory Setting: 1).

5 Input/Output Signal Connector (CN4)

Display	Pin Number	Signal Name	Content	
CN4	1	CW+[PLS+]*1	CW pulse input+ [pulse input+]	
	2	CCW+[DIR+]*1	CCW pulse input+ [rotation direction input+]	
	3	IN4	ZHOME	Move to the home position set with the HOME PRESET switch.
	4	IN6	STOP	Stop the motor.
	5	IN-COM [4-7]*1	IN4-IN7 input common	
	6	IN8	FW-JOG	Start JOG operation.
	7	OUT0	HOME-END	Output when determining the home position or completing high speed home position return operation.
	8	OUT2	PLS-RDY	Output when the pulse input preparation is complete.
	9	OUT4	MOVE	Output while operating the motor.
	10	OUT-COM*1	Output common	
	11	ASG+	A phase pulse output+	
	12	BSG+	B phase pulse output+	
	13	CW-[PLS-]*1	CW pulse input- [pulse input-]	
	14	CCW-[DIR-]*1	CCW pulse input- [rotation direction input-]	
	15	IN5	FREE	The motor is set to non-excitation.
	16	IN7	ALM-RST	Reset the alarm.
	17	IN-COM [8-9]*1	IN8, IN9 input common	
	18	IN9	RV-JOG	Start JOG operation.
	19	OUT1	IN-POS	Output when the motor operation is complete.
	20	OUT3	READY	Outputs when the driver is ready for operation.
	21	OUT5	ALM-B	Output the driver alarm state (normal close).
	22	GND*1	Ground	
	23	ASG-	A phase pulse output-	
	24	BSG-	B phase pulse output-	

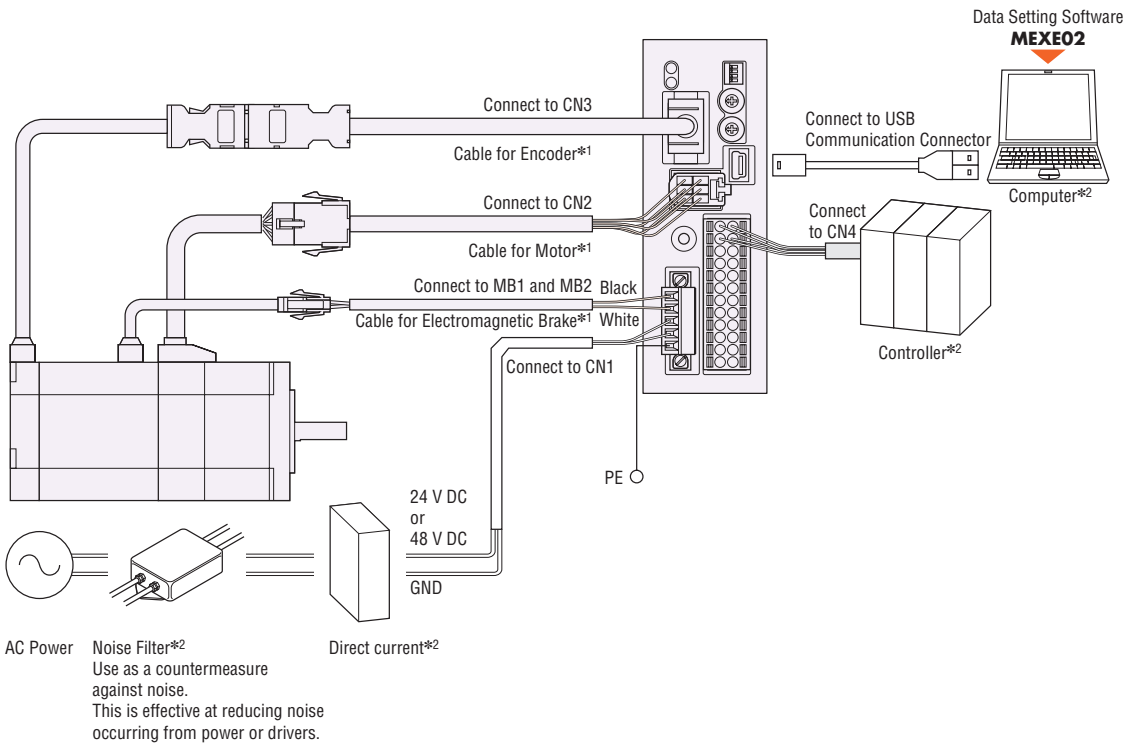
● Assigned functions are set by means of the parameter settings. The above is the initial value. For details, refer to the User's Manual.

\*1 The initial value setting cannot be changed.

● Connection Diagram

◇ Connection to Peripheral Equipment

□ This is included in the product.  
 □ This is available as an option (sold separately).



\*1 Products with cable for connecting between motor and driver (1 m, 2 m, 3 m) are available as well as those to which such cable is not attached.

Cables longer than 3 m or flexible cables can be selected as an option (sold separately).

Make sure a cabling distance between the motor and the driver is 20 m or less.

\*2 Prepared by the customer.

◇ USB Cable Connection

The computer on which the data setting software **MEXE02** is installed and driver are connected with a USB cable.

Use the following specifications for the USB cable.

Specification	USB2.0 (full speed)
Cable	Length: 3 m (or less)
	Format: A-mini-B

# Accessories (sold separately)

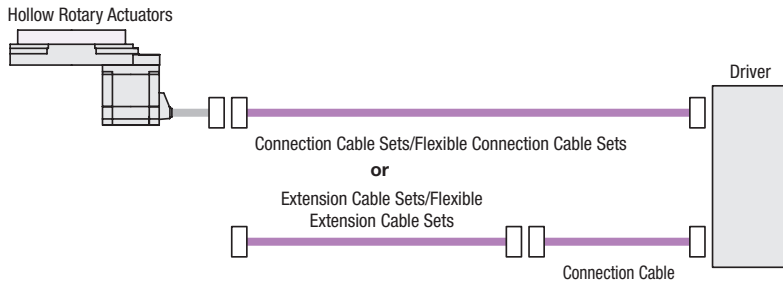
## Connection Cable Sets, Flexible Connection Cable Sets Extension Cable Sets, Flexible Extension Cable Sets

If the distance between the motor and driver is extended to 3 m or longer, a connection cable set or extension cable set must be used. The maximum length of the cable extension is 20 m (using included connection cable).

For the single shaft motors, cables come as a set of motor and encoder cables. For the electromagnetic brake type motor, cables come as a set of motor, encoder and electromagnetic brake cables.

Use a flexible connection cable set or flexible extension cable set if the cable will be bent repeatedly.

### Connection Example:



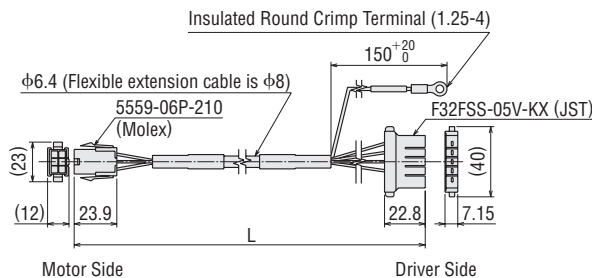
### Note

● The motor cable and electromagnetic brake cable from the motor cannot be connected directly to the driver. When connecting to a driver, use the accessory connection cable (sold separately) or use the included connection cable (for types which include a connection cable).

## Dimensions (Unit: mm)

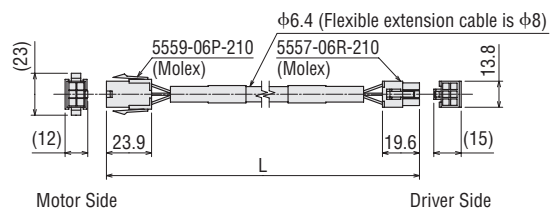
### ● Connection Cable

#### ◇ Cable for Motor

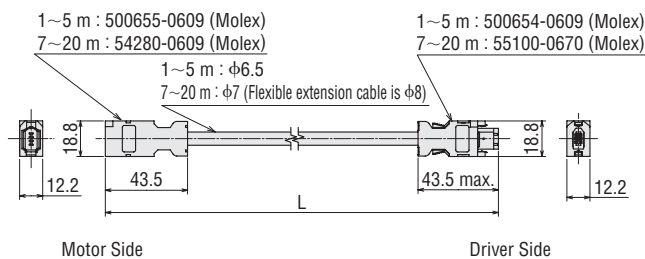


### ● Extension Cable

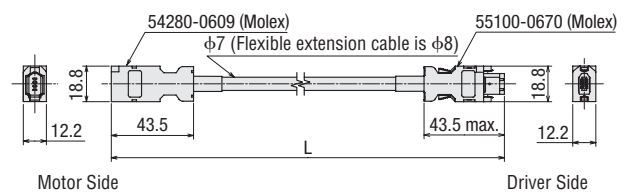
#### ◇ Cable for Motor



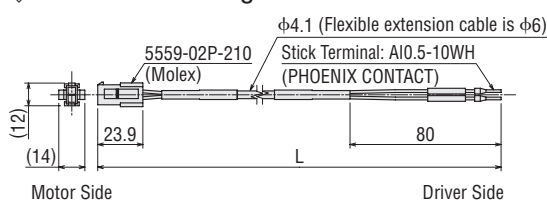
#### ◇ Cable for Encoder



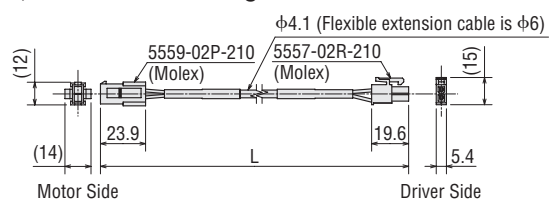
#### ◇ Cable for Encoder



#### ◇ Cable for Electromagnetic Brake

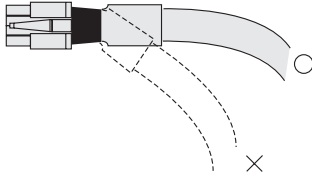


#### ◇ Cable for Electromagnetic Brake

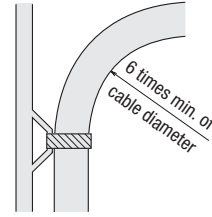


## Notes on Use of Flexible Cable

① Do not allow the cable to bend at the cable connector.

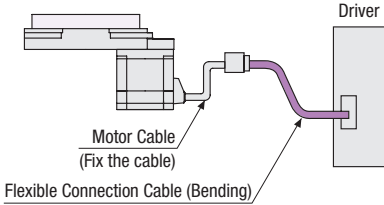


② Bending radius should be at least 6 times the cable diameter.

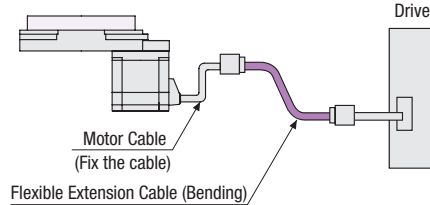


③ The actuator cable and supplied connection cable is not flexible. If your application requires flexibility a flexible cable will be required.

### • Flexible Connection Cable



### • Flexible Extension Cable



## General-Purpose Cables for I/O Signals

General-purpose multiconductor cable which is convenient for connection between the driver and the host controller.

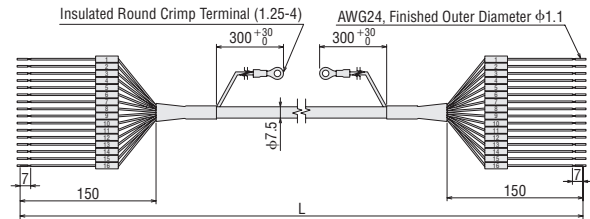


### Product Line

Product Name	Length L [m]
<b>CC16D005B-1</b>	0.5
<b>CC16D010B-1</b>	1.0
<b>CC16D015B-1</b>	1.5
<b>CC16D020B-1</b>	2.0

● The products above are 16 core. 6, 10 and 12 core types are also available.

### Dimensions (Unit: mm)



## RS-485 Communication Cable

This cable is used to link drivers in multi-axis operations with the built-in controller type.

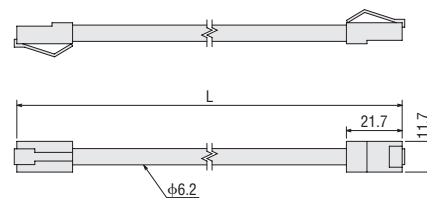
It also connects the network converter to the driver.



### Product Line

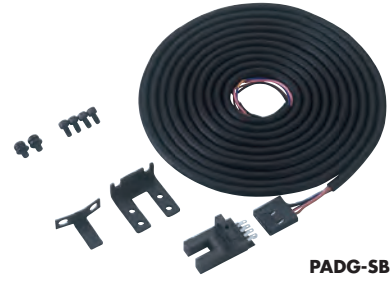
Product Name	Length L [m]
<b>CC001-RS4</b>	0.1
<b>CC002-RS4</b>	0.25

### Dimensions (Unit: mm)



# Home Sensor Sets

A home sensor set, which consists of a photomicro sensor, cable type connector, sensor mounting bracket, shield plate and installation screws, is provided.



**PADG-SB**

## Product Line

Product Name	Sensor Type	Applicable
<b>PADG-SB</b>	NPN (for sourcing Input)	<b>DGM85R-AZ</b> <b>DGM130R-AZ</b> <b>DGM200R-AZ</b>
<b>PADG-SBY</b>	PNP (for sinking Input)	

### PNP type

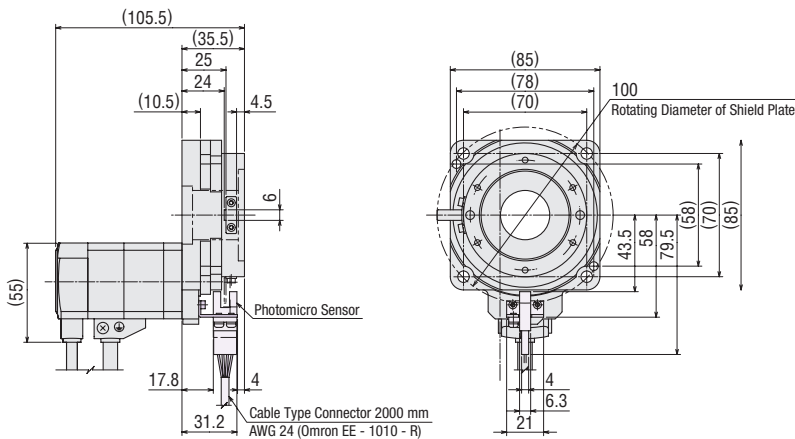
Product	<b>DGM85, DGM130, DGM200:</b> EE-SX673R (manufactured by Omron)
Power Supply	5 - 24 VDC±10%, ripple (P-P) 10% or less
Current Consumption	30mA or less
Control Output	PNP open-collector output, 5 - 24 VDC, 50 mA or less Residual voltage 1.3 VDC or less (at load current of 50 mA)
Indicator LED	Detection display (red)
Sensor Logic	Normally open/normally closed (selectable, depending on connection)

### NPN type

Product	<b>DGM85, DGM130, DGM200:</b> EE-SX 673 A (manufactured by Omron)
Power Supply	5 - 24 VDC±10%, ripple (P-P) 10% or less
Current Consumption	35 mA or less
Control Output	NPN open-collector output, 5~24 VDC, 100 mA or less Residual voltage 0.8 VDC or less (at load current of 100 mA)
Indicator LED	Detection indicator (red)
Sensor Logic	Normally open/normally closed (selectable, depending on connection)

## Reference Point when Mounting the Home-Sensor Set (Unit mm)

The figure below shows the dimensions when the home-sensor set is attached to the **DGM 85**. For the dimensions of other models please visit our website.



Applicable products
<b>DGM85R-AZA</b> <input type="checkbox"/>
<b>DGM85R-AZM</b> <input type="checkbox"/>
<b>DGM130R-AZA</b> <input type="checkbox"/>
<b>DGM130R-AZA</b> <input type="checkbox"/> R
<b>DGM130R-AZA</b> <input type="checkbox"/> L
<b>DGM130R-AZM</b> <input type="checkbox"/>
<b>DGM130R-AZM</b> <input type="checkbox"/> R
<b>DGM130R-AZM</b> <input type="checkbox"/> L
<b>DGM200R-AZAC</b>
<b>DGM200R-AZACR</b>
<b>DGM200R-AZACL</b>
<b>DGM200R-AZMC</b>
<b>DGM200R-AZMCR</b>
<b>DGM200R-AZMCL</b>

● Either **C** (AC power supply input) or **K** (DC power supply input) is entered in the box  within the product name.

# Regeneration Unit

During vertical drive (gravitational operation) or sudden start/stop in high inertia, an external force causes the motor to rotate and function as a power generator. When the regenerative power exceeds the driver's regenerative power absorption capacity, it may cause damage to the motor.

In such a case, the regeneration unit is connected to the driver to convert regenerative energy into thermal energy for dissipation.



## Product Line

Product Name
<b>RGB100</b>

## Specifications

Item	Description
Continuous Regenerative Power	50 W
Resistance Value	150 Ω
Thermostat Operating Temperature	Open: 150±7°C Close: 145±12°C (Normally closed)
Thermostat Electrical Rating	120 VAC 4 A 30 VDC 4 A (Min. current 5 mA)

● Attach the regeneration unit to a location that has the same heat radiation capability as an aluminum heat radiation plate that is 350×350 mm and 3 mm thick.

# Network-Compatible Products (sold separately)

## Network Converters

Network converters convert host communication protocol to Oriental Motor's original RS-485 communication protocol. You can use a network converter to control Oriental Motor's RS-485-compatible products within the host communication environment.

### Product Line

Network Type	Product Name
CC-Link Ver.1.1-Compatible	<b>NETC01-CC</b>
CC-Link Ver.2-Compatible	<b>NETC02-CC</b>
MECHATROLINK-IICompatible	<b>NETC01-M2</b>
MECHATROLINK-IIICompatible	<b>NETC01-M3</b>
EtherCAT-Compatible	<b>NETC01-ECT</b>



## Universal Controller

### SCX11

Equipped with program editing and execution functions, the highly-functional and sophisticated **SCX11** controller is now available. Use the **SCX11** as a stored program controller to connect to any of Oriental Motor's standard pulse input drivers. The **SCX11** is also able to control the motor via various serial ports such as USB, RS-232C and **CANopen**.

- 100 Sequence Programs can be Stored
- Easy Operation
- Intelligent Setting



### Product Line

Product Name	Compatible Driver
<b>SCX11</b>	AZD-C, AZD-K

# Orientalmotor

These products are manufactured at plants certified with the international standards **ISO 9001** (for quality assurance) and **ISO 14001** for systems of environmental management).

Specifications are subject to change without notice. This catalogue was published in January 2024.

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## DC Supplied Hollow Rotary Actuator

# DGII Series

With Built-in AZ Series Motor 60 mm Frame Size



Built-in closed loop feedback system

### Save Money

Integrated ABZO sensor ensures huge money saving potential in planning- and installation phase.

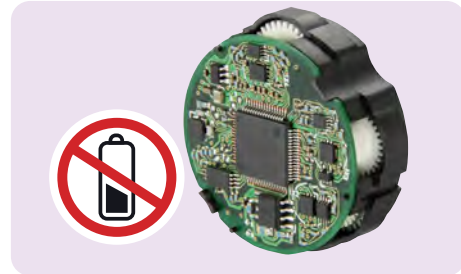
### No need for battery

Operate absolute positioning without battery backup. Position monitoring and correction.

### High Connectivity

Profinet, EtherCAT, EtherNet/IP, Built-in Controller, Pulse-Input with RS-485 communication and Pulse-Input.

ABZO Sensor (patented)



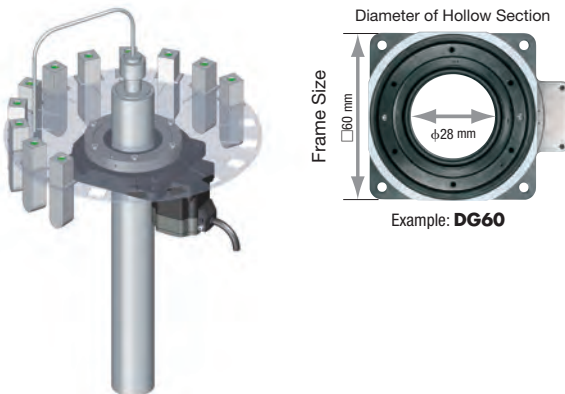
## Features

- Actuator with High Strength, Accuracy and Reliability

### Large-Diameter, Hollow Output Table Makes Simple Wiring and Piping Possible

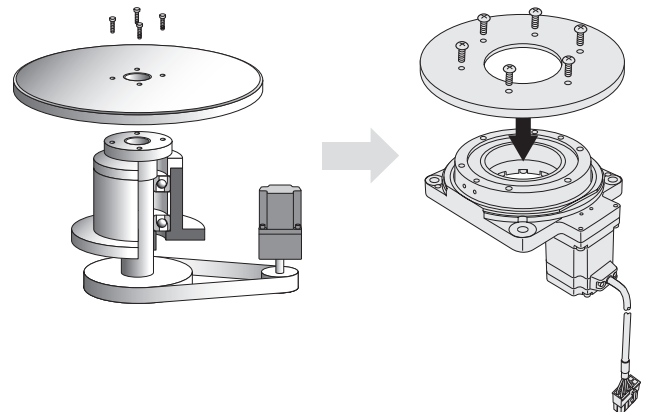
The large diameter hollow shaft (through-hole) helps reduce the complexity of wiring and piping, thus simplifying equipment design.

- Filling equipment with piped-in liquid



### Direct Coupling for Higher Reliability

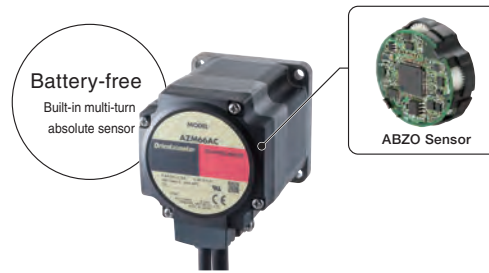
Equipment tables and arms can be installed directly on the output table. This saves you the hassle and cost of designing an installation mechanism, arranging necessary mechanism parts, adjusting the belt tension, etc., when mechanical components such as a belt and pulley are used for installation.



Product	Frame Size [mm]	Diameter of Hollow Section [mm]
<b>DG60</b>	60	φ28

● Simple Home Position Setting and Return-to-Home thanks to Absolute System

The patented <ABZO Sensor>, a newly developed small mechanical multi-turn absolute sensor, contributes to improved productivity and cost reduction.



**No Home Sensor Required**

**Easy Home Position Setting**

The home position can be easily set by pressing a switch on the driver's surface, which is saved by the ABZO sensor. In addition, home setting is possible with the **MEXE02** data setting software or by using an external input signal.

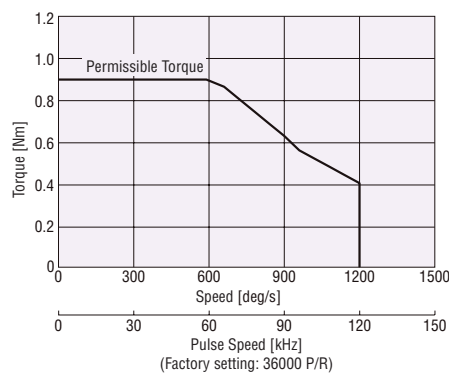
**High-Speed Return-to-Home Operation**

Because return-to-home is possible without using a home sensor, return-to-home can be performed at high speed without taking the specifications for sensor sensitivity into account, allowing for a shortened machine cycle.

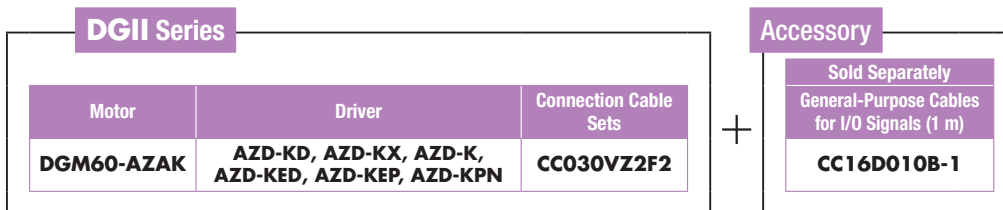
**Hollow Rotary Actuators**

Frame Size	mm	60
Actuator Product Name	Single shaft	<b>DGM60-AZAK</b>
Driver Product Name	Built-in Controller	<b>AZD-KD</b>
	Pulse Input Type with RS-485 Communication	<b>AZD-KX</b>
	Pulse Input	<b>AZD-K</b>
	EtherCAT Compatible	<b>AZD-KED</b>
	EtherNet/IP Compatible	<b>AZD-KEP</b>
	PROFINET Compatible	<b>AZD-KPN</b>
Type of Output Table Supporting Bearing		Deep-Groove Ball Bearing
Inertia	J: kgm <sup>2</sup>	3700×10 <sup>-7</sup>
Gear Ratio		18
Minimum Traveling Amount of the Output Table	deg/Step	0.01
Permissible Torque	Nm	0.9
Holding Torque at Motor Standstill	Nm	0.45
Max. Speed	deg/seconds	1200 (200 r/min)
Repetitive Positioning Accuracy	arc second	±15 (±0.004°)
Lost Motion	arc minute	2 (0.033°)
Angular Transmission Accuracy	arc minute	4 (0.067°)
Permissible Axial Load	N	100
Permissible Moment Load	Nm	2
Runout of Output Table Surface	mm	0.030
Runout of Output Inner (Outer) Diameter	mm	0.030
Parallelism of Output Table	mm	0.050
Degree of Protection		IP40 (IP20 for motor connector)
Power-Supply	Input Voltage	DC24 V ±5%
	Input Current	1.6 A

**Speed – Torque Characteristic**



● System Configuration Example



● The system configuration shown above is an example. Other combinations are also available. In this example the length of connection cable set is 3 m.



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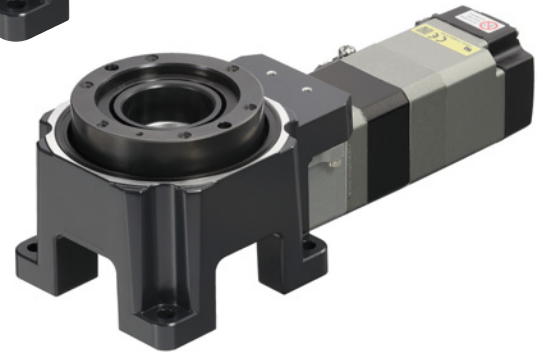
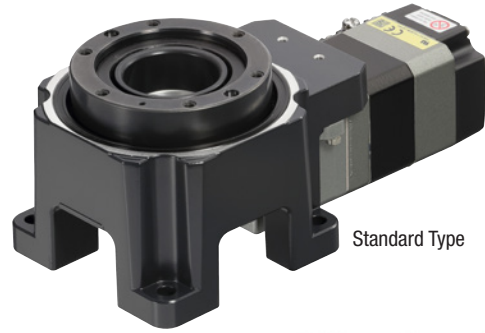
These products are manufactured at plants certified with the international standards ISO 9001 (for quality assurance) and ISO 14001 (for systems of environmental management).

## Hollow Shaft Rotary Actuators

# DGI Series

With horizontally mounted motor  
Frame Size 85 mm

The **DGI** Series has been extended by actuators with 85 mm frame size where the motor is mounted horizontally.



### Features

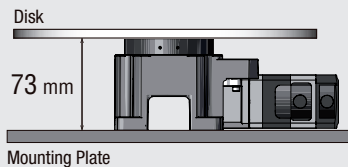
#### Flexible Use Depending on Space Requirements

(Example for Standard Type with 85 mm frame size)

#### NEW Type

- Less mounting height due to an integrated pedestal.
- Possible to use the space under the mounting plate effectively.

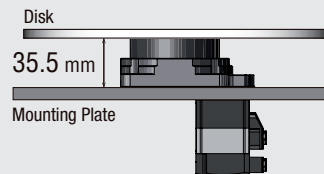
#### ▶ Horizontally Mounted Motor



#### Existing Type

- Possible to minimize the height from the mounting plate.

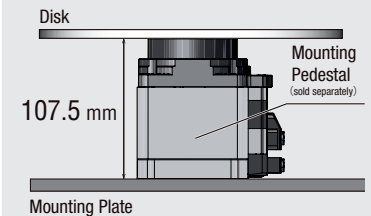
#### ▶ Vertically Mounted Motor



#### Existing Type

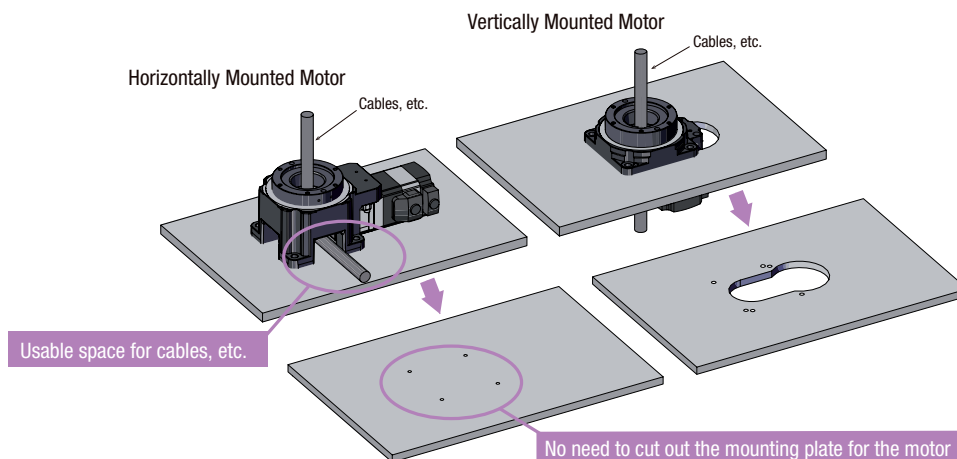
- Possible to use the space under the mounting plate effectively.

#### ▶ Vertically Mounted Motor



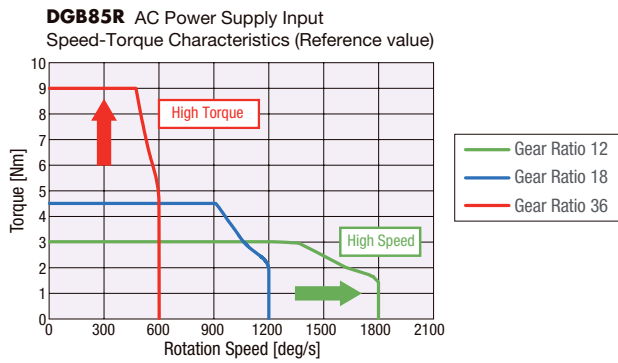
### Simplified Installation

- Mounting holes are not required for the motor, so the mounting plate can be simplified.
- An additional mounting pedestal is not required, so mounting is improved.
- Cables and piping can be routed through the legs of the mounting pedestal.



## Different Gear Ratios Available

For the new types the gear ratios 12, 18 and 36 are available. This makes the selection regarding speed and torque more flexible.



## Product Code

**DGB 85 R 12 - AZ A C R**

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①	Series Name	<b>DGB: DGII</b> Series
②	Frame Size	<b>85</b> : 85 mm
③	Table Support	<b>R</b> : Cross-Roller Bearing
④	Gear Ratio	
⑤	Motor Type	<b>AZ: AZ</b> Series
⑥	Configuration	<b>A</b> : Standard <b>M</b> : With Electromagnetic Brake
⑦	Motor Specification	<b>C</b> : Single-Phase 200-240 VAC <b>K</b> : 24 VDC/48 VDC
⑧	Cable Direction	<b>R</b> : Right <b>L</b> : Left

## Product Line

### Actuators

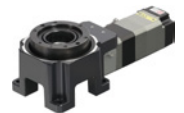
#### Standard

Frame Size [mm]	Product Name
85	<b>DGB85R12-AZA</b> □ <b>R</b>
	<b>DGB85R12-AZA</b> □ <b>L</b>
	<b>DGB85R18-AZA</b> □ <b>R</b>
	<b>DGB85R18-AZA</b> □ <b>L</b>
	<b>DGB85R36-AZA</b> □ <b>R</b>
	<b>DGB85R36-AZA</b> □ <b>L</b>



#### With Electromagnetic Brake

Frame Size [mm]	Product Name
85	<b>DGB85R12-AZMCR</b>
	<b>DGB85R12-AZMCL</b>
	<b>DGB85R18-AZMCR</b>
	<b>DGB85R18-AZMCL</b>
	<b>DGB85R36-AZMCR</b>
	<b>DGB85R36-AZMCL</b>



For the power supply input a **C** (Single-Phase 200-240 VAC) or a **K** (24 VDC/48 VDC) is indicated where the box □ is located in the product name.

### Drivers

#### Built-in Controller Type

Power Supply	Product Name
Single-Phase 200-240 VAC	<b>AZD-CD</b>
24 VDC/48 VDC	<b>AZD-KD</b>



#### Pulse Input Type with RS-485 Communication

Power Supply	Product Name
Single-Phase 200-240 VAC	<b>AZD-CX</b>
24 VDC/48 VDC	<b>AZD-KX</b>



#### Pulse Input Type

Power Supply	Product Name
Single-Phase 200-240 VAC	<b>AZD-C</b>
24 VDC/48 VDC	<b>AZD-K</b>



#### EtherNet/IP™ compatible

Power Supply	Product Name
Single-Phase 200-240 VAC	<b>AZD-CEP</b>



#### EtherCAT compatible

Power Supply	Product Name
Single-Phase 200-240 VAC	<b>AZD-CED</b>
24 VDC/48 VDC	<b>AZD-KED</b>



#### PROFINET compatible

Power Supply	Product Name
Single-Phase 200-240 VAC	<b>AZD-CPN</b>
24 VDC/48 VDC	<b>AZD-KPN</b>



● For the connection cables please refer to the main DGII-catalogue.

# Specifications



## AC Input

Frame Size		85 mm		
Product Name	Standard	<b>DGB85R12-AZAC</b> <input type="checkbox"/>	<b>DGB85R18-AZAC</b> <input type="checkbox"/>	<b>DGB85R36-AZAC</b> <input type="checkbox"/>
	With Electromagnetic Brake	<b>DGB85R12-AZMC</b> <input type="checkbox"/>	<b>DGB85R18-AZMC</b> <input type="checkbox"/>	<b>DGB85R36-AZMC</b> <input type="checkbox"/>
Driver Product Name	Built-in Controller	<b>AZD-CD</b>		
	Pulse Input Type with RS-485 Communication	<b>AZD-CX</b>		
	Pulse Input Type	<b>AZD-C</b>		
	EtherNet/IP Type	<b>AZD-CEP</b>		
	EtherCAT Type	<b>AZD-CED</b>		
	PROFINET Type	<b>AZD-CPN</b>		
Built-In Motor		<b>AZM46</b>		
Table Support		Cross-Roller Bearing		
Inertia	J: kgm <sup>2</sup>	$11200 \times 10^{-7}$ [ $13500 \times 10^{-7}$ ]*1	$21100 \times 10^{-7}$ [ $26300 \times 10^{-7}$ ]*1	$74500 \times 10^{-7}$ [ $95300 \times 10^{-7}$ ]*1
Gear Ratio		12	18	36
Minimum Traveling Amount of the Output Table	deg/STEP	0.01		
Permissible Torque	Nm	3	4.5	9
Holding Torque at Motor Standstill	Power ON	Nm	1.8	2.7
	Electromagnetic Brake	Nm	1.8	2.7
Max. Speed	deg/seconds	1800 (300 r/min)	1200 (200 r/min)	600 (100 r/min)
Repetitive Positioning Accuracy	arc second	$\pm 30 (\pm 0.008^\circ)$ *2		
Backlash	arc minute	6 (0.1°)		
Angular Transmission Accuracy	arc minute	6 (0.1°)		
Permissible Axial Load	N	500		
Permissible Moment	Nm	10		
Runout of Output Table Surface	mm	0.015		
Runout of Output Table Inner (Outer) Diameter	mm	0.015		
Parallelism of Output Table	mm	0.030		
Degree of Protection		IP40 (IP20 for motor connector)		
Power-Supply Input	Voltage and Frequency	Single-Phase 200-240 VAC -15 - +6% 50/60 Hz		
	Input Current	A	1.7	
Control Power-Supply		24 VDC $\pm 5\%$ *3 0.25 A [0.33 A]*1		

● Either **R** (right) or **L** (left) is entered for the cable withdrawing direction in  in the product name.

\*1 The brackets [ ] indicate the specifications for the electromagnetic brake type.

\*2 For gear ratio 18 the accuracy might be lower when the operating range of the output table exceeds one rotation.

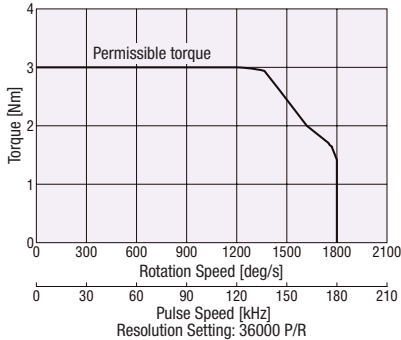
\*3 Changes to 24 VDC  $\pm 4\%$  if the electromagnetic brake type has been extended with the 20 m accessory cable.

### Note

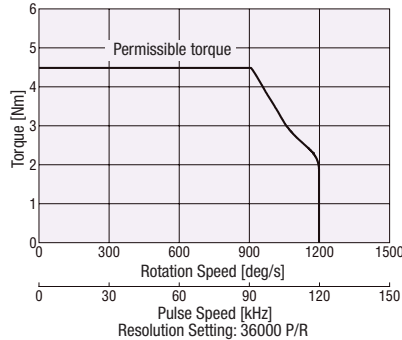
- The repetitive positioning accuracy is measured at a constant temperature (normal temperature) under a constant load.
- It is not possible to disassemble the motor part.

## Speed - Torque Characteristics (Reference Value)

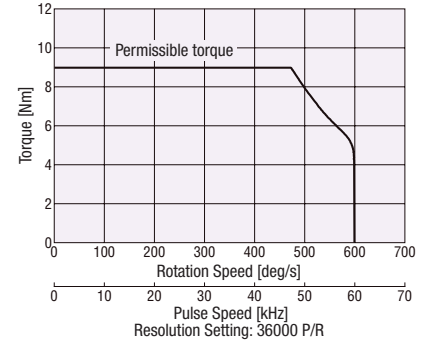
**DGB85R12**



**DGB85R18**



**DGB85R36**

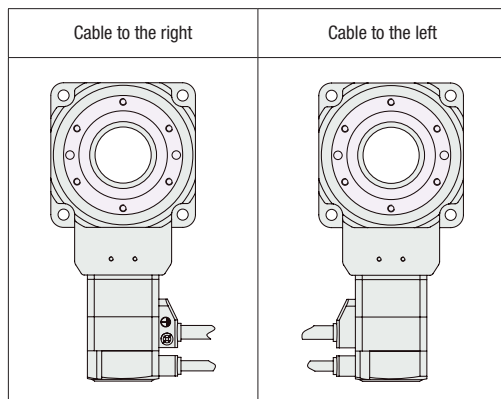
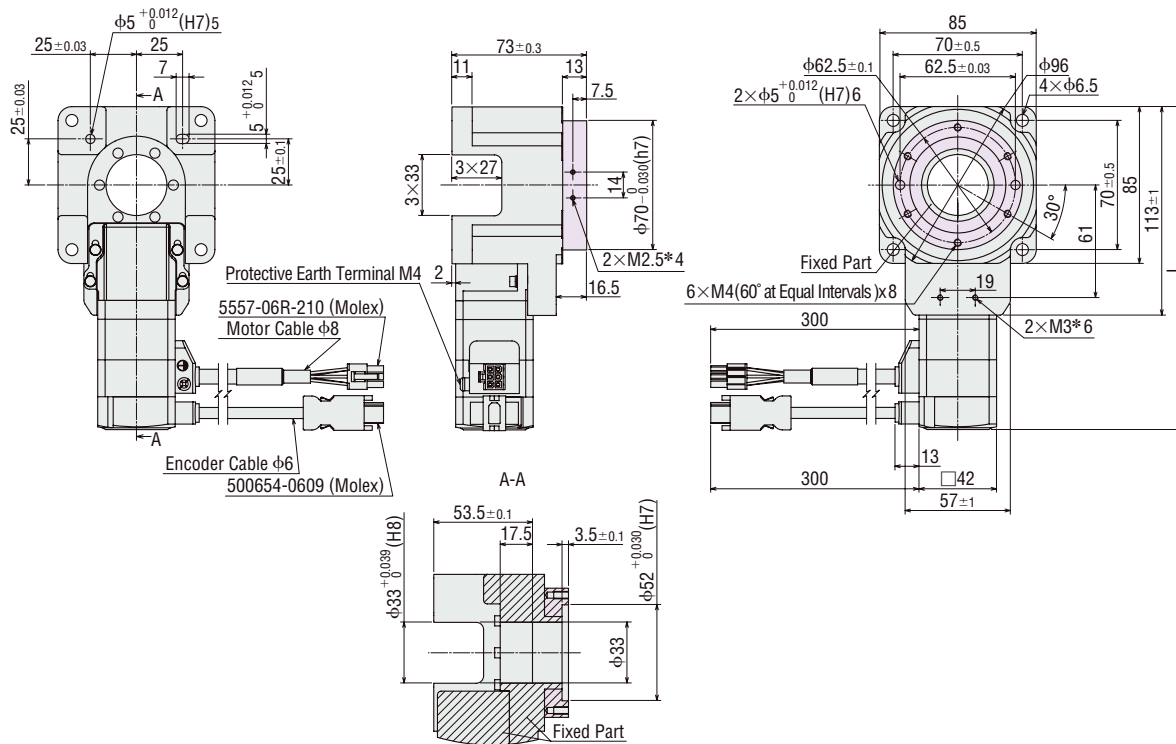


### Note

- Data for the speed – torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Please keep the motor case temperature at a maximum of 80°C to protect the ABZO sensor. (When conforming to the UL Standards, the temperature of the motor case must be kept at 75°C or less, since the motor is recognized as heat-resistant class A.)

◇ Standard Type Frame Size 85 mm

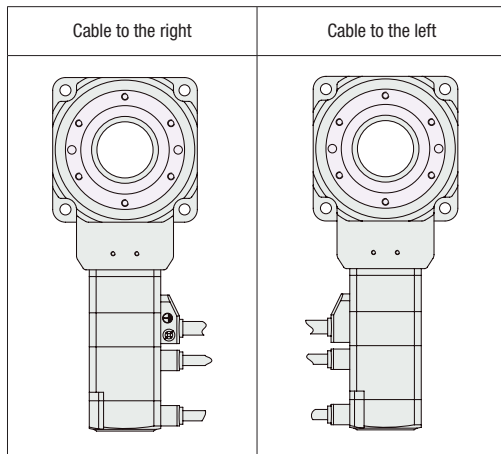
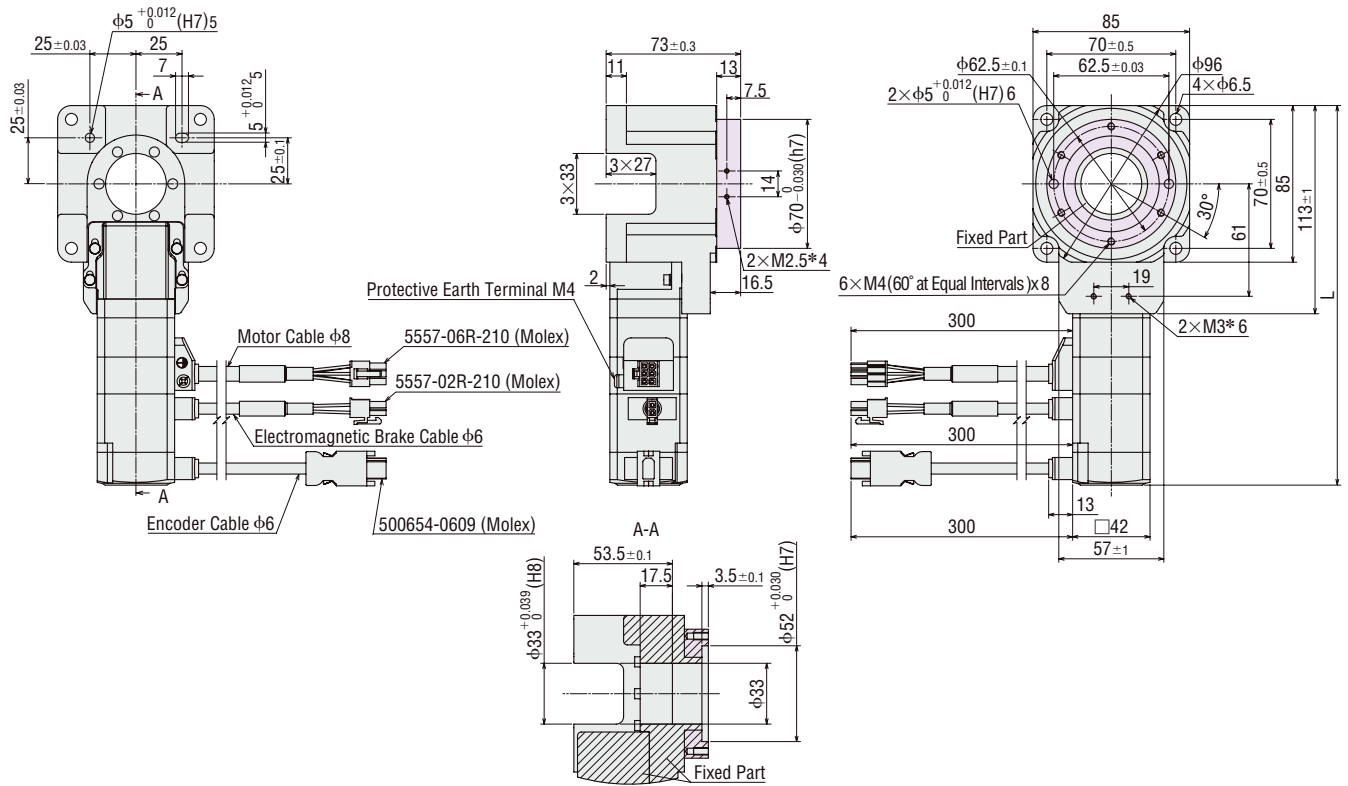
Cable Withdrawing Direction	Product Name	L	Mass [kg]
Cable to the right	<b>DGB85R12-AZACR</b>	182	1.5
Cable to the left	<b>DGB85R12-AZACL</b>		
Cable to the right	<b>DGB85R18-AZACR</b>	178	
Cable to the left	<b>DGB85R18-AZACL</b>		
Cable to the right	<b>DGB85R36-AZACR</b>	175	
Cable to the left	<b>DGB85R36-AZACL</b>		



● The  shaded areas are rotating parts.  
 \*The home sensor set cannot be used.

◇ With Electromagnetic Brake Frame Size 85 mm

Cable Withdrawing Direction	Product Name	L	Mass [kg]
Cable to the right	<b>DGB85R12-AZMCR</b>	213	1.7
Cable to the left	<b>DGB85R12-AZMCL</b>		
Cable to the right	<b>DGB85R18-AZMCR</b>	209	
Cable to the left	<b>DGB85R18-AZMCL</b>		
Cable to the right	<b>DGB85R36-AZMCR</b>	206	
Cable to the left	<b>DGB85R36-AZMCL</b>		



● The shaded areas are rotating parts.  
 \* The home sensor set cannot be used.

# Specifications

## DC Input

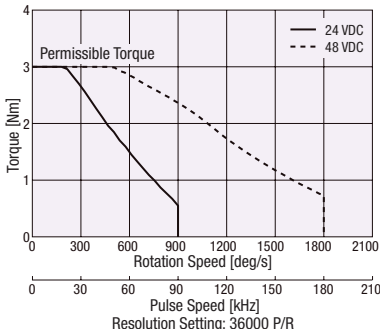


Frame Size		85 mm		
Product Name	Single Shaft	<b>DGB85R12-AZAK</b> <input type="checkbox"/>	<b>DGB85R18-AZAK</b> <input type="checkbox"/>	<b>DGB85R36-AZAK</b> <input type="checkbox"/>
Driver Product Name	Built-in Controller Type	<b>AZD-KD</b>		
	Pulse Input Type with RS-485 Communication	<b>AZD-KX</b>		
	Pulse Input Type	<b>AZD-K</b>		
	EtherNet/IP Type	<b>AZD-CEP</b>		
	EtherCAT Type	<b>AZD-CED</b>		
	PROFINET Type	<b>AZD-CPN</b>		
Built-In Motor	AZM46			
Table Support	Cross-Roller Bearing			
Inertia	J: kgm <sup>2</sup>	11200 × 10 <sup>-7</sup>	21100 × 10 <sup>-7</sup>	74500 × 10 <sup>-7</sup>
Gear Ratio		12	18	36
Minimum Traveling Amount of the Output Table	deg/STEP	0.01		
Permissible Torque	Nm	3	4.5	9
Holding Torque at Motor Standstill	Nm	1.8	2.7	5.4
Max. Speed	deg/seconds	1800 (300 r/min)	1200 (200 r/min)	600 (100 r/min)
Repetitive Positioning Accuracy	arc second	±30 (±0.008°) *2		
Backlash	arc minute	6 (0.1°)		
Angular Transmission Accuracy	arc minute	6 (0.1°)		
Permissible Axial Load	N	500		
Permissible Moment	Nm	10		
Runout of Output Table Surface	mm	0.015		
Runout of Output Table Inner (Outer) Diameter	mm	0.015		
Parallelism of Output Table	mm	0.030		
Degree of Protection		IP40 (IP20 for motor connector)		
Power-Supply Input	Voltage	24 VDC ± 5% / 48 VDC ± 5%		
	Input Current	A	1.72	

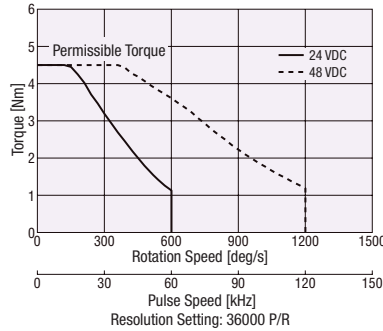
- Either **R** (right) or **L** (left) is entered for the cable withdrawing direction in  in the product name.
- The repetitive positioning accuracy is measured at a constant temperature (normal temperature) under a constant load.
- It is not possible to disassemble the motor part.
- \*1 Only for the Actuator.
- \*2 For gear ratio 18 the accuracy might be lower when the operating range of the output table exceeds one rotation.

## Speed - Torque Characteristics (Reference Value)

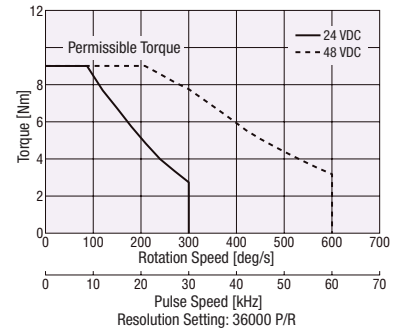
**DGB85R12**



**DGB85R18**



**DGB85R36**



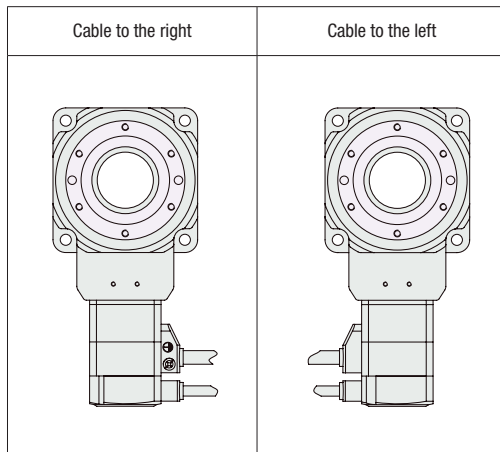
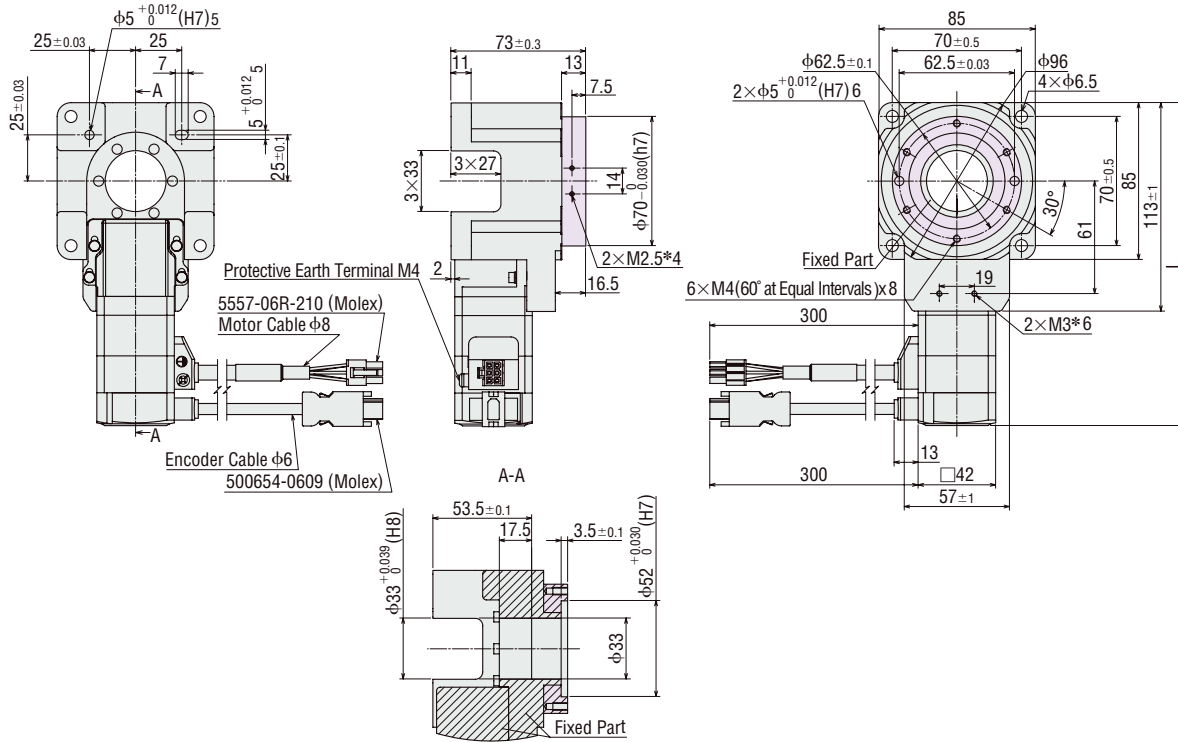
**Note**

- Data for the speed – torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Please keep the motor case temperature at a maximum of 80°C to protect the ABZO sensor. (When conforming to the UL Standards, the temperature of the motor case must be kept at 75°C or less, since the motor is recognized as heat-resistant class A.)



◇ Standard Type Frame Size 85 mm

Cable Withdrawing Direction	Product Name	L	Mass [kg]
Cable to the right	<b>DGB85R12-AZAKR</b>	182	1.5
Cable to the left	<b>DGB85R12-AZAKL</b>		
Cable to the right	<b>DGB85R18-AZAKR</b>	178	
Cable to the left	<b>DGB85R18-AZAKL</b>		
Cable to the right	<b>DGB85R36-AZAKR</b>	175	
Cable to the left	<b>DGB85R36-AZAKL</b>		



● The shaded areas are rotating parts.  
 \* The home sensor set cannot be used.

Please see the separate catalog for the **DGII** Series product line-up.  
 To select a product, refer to the separate catalog, or see our website.

# AZ Multi-Axis-Driver

DC Power supply

Supports EtherCAT Drive Profiles

The multi-axis driver corresponds to the EtherCAT communication drive profile CiA402. Two, three or four **AZ** motors with DC power supply, as well as actuators equipped with them, can be connected. This includes the **DGB85** types.

EtherCAT®



## Types

Product Name	Number of axes
<b>AZD2B-KED</b>	2
<b>AZD3A-KED</b>	3
<b>AZD4A-KED</b>	4

# Oriental motor

These products are manufactured at plants certified with the international standards **ISO 9001** (for quality assurance) and **ISO 14001** for systems of environmental management).

Specifications are subject to change without notice. This catalogue was published in January 2024.

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