



Hollow Rotary Actuator

DGII Series Actuator

OPERATING MANUAL

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Thank you for purchasing an Oriental Motor product.
This Operating Manual describes product handling procedures and safety precautions.

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

1 Introduction

1-1 Before use

Only qualified personnel of electrical and mechanical engineering should work with the product. Use the product correctly after thoroughly reading the "2 Safety precautions" on p.8. In addition, be sure to observe the contents described in warning, caution, and note in this manual. The product described in this manual has been designed and manufactured to be incorporated in general industrial equipment. Do not use for any other purpose. Oriental Motor Co., Ltd. is not responsible for any damage caused through failure to observe this warning.

1-2 How to use operating manuals

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

DGII Series equipped with the AZ Series	
• DGII Series OPERATING MANUAL Actuator (this document)	This manuals explain installation methods and others.
• AZ Series/ Motorized actuator equipped with AZ Series OPERATING MANUAL Driver (included with driver)	This manual explains the functions as well as the installation/connection method and others for the driver.
• AZ Series/ Motorized actuator equipped with AZ Series Function Edition *	This manual explains more detailed operations, functions, etc. that are not described in <u>OPERATING MANUAL</u> included with the product.
• Motorized actuator Function Setting Edition *	This manual explains settings of parameters required when the driver is combined with hollow rotary actuators.
• APPENDIX UL Standards for AZ Series (included with products conform to the UL Standards)	This appendix describes the information of the equipped motor required for recognition of UL Standards.

* This manual does not come with the product. For details, contact your nearest Oriental Motor sales office or download from Oriental Motor Website Download Page.

DGII Series equipped with the AR Series or RKII Series	
• DGII Series OPERATING MANUAL Actuator (this document)	This manuals explain installation methods and others.
• AR Series OPERATING MANUAL Driver (included with driver) • RKII Series OPERATING MANUAL Driver (included with driver)	This manual explains the functions as well as the installation/connection method and others for the driver.
• AR Series/ Motorized actuator equipped with AR Series USER MANUAL * • RKII Series/ Motorized actuator equipped with RKII Series USER MANUAL *	This manual explains the equipped motor and driver functions, the installation and connection method, the data setting method, the operating method, as well as the troubleshooting and others.
• Motorized actuator Function Setting Edition *	This manual explains settings of parameters required when the driver is combined with hollow rotary actuators.
• APPENDIX UL Standards for AR Series • APPENDIX UL Standards and CSA Standards for RKII Series (included with products conform to the UL Standards)	This appendix describes the information of the equipped motor required for recognition of UL Standards.

* This manual does not come with the product. For details, contact your nearest Oriental Motor sales office or download from Oriental Motor Website Download Page.

1-3 Checking the product

Verify that the items listed below are included. Report any missing or damaged items to the Oriental Motor sales office from which you purchased the product.

When purchasing a hollow rotary actuator and driver package	When purchasing a hollow rotary actuator only
<ul style="list-style-type: none"> • Hollow rotary actuator • Driver • OPERATING MANUAL Actuator (this document) • OPERATING MANUAL Driver • APPENDIX UL Standards (included with products conform to the UL Standards) • A bag of connectors • Cable for motor * • Cable for electromagnetic brake (included with an electromagnetic brake motor and driver package) * • Cable for encoder (included with products equipped with the AZ Series) * 	<ul style="list-style-type: none"> • Hollow rotary actuator • OPERATING MANUAL Actuator (this document) • APPENDIX UL Standards (included with products conform to the UL Standards)

* This does not come with the "products without cables."

1-4 How to identify the product model

■ Hollow rotary actuator and driver package model

● Actuators equipped with the AZ Series

The following products are not included as the actuator and driver package. Check with the actuator model name.

- DC power input type
- Hollow rotary actuators which cable outlet direction is **R** (right direction) and **L** (left direction)

D G 1 3 0 R - A Z A C D -3
 1 2 3 4 5 6 7 8

1	Series name	DG: DGII Series
2	Frame size	85: 85 mm (3.35 in.) 130: 130 mm (5.12 in.) 200: 200 mm (7.87 in.)
3	Output table supporting bearing type	R: Cross-roller bearing
4	Equipped motor	AZ: AZ Series
5	Motor type	A: Standard M: With electromagnetic brake
6	Power supply input	A: Single-phase 100-120 VAC C: Single-phase, Three-phase 200-240 VAC
7	Driver type	D: Built-in controller type Blank: Pulse input type
8	Connection cable	Number: Length of included connection cable -1: 1 m (3.3 ft.) -2: 2 m (6.6 ft.) -3: 3 m (9.8 ft.) Blank: Without cable

● Actuators equipped with the AR Series

D G 1 3 0 R - A R A C D 2 -3
 1 2 3 4 5 6 7 8 9

1	Series name	DG: DGII Series
2	Frame size	60: 60 mm (2.36 in.) 85: 85 mm (3.35 in.) 130: 130 mm (5.12 in.) 200: 200 mm (7.87 in.)
3	Output table supporting bearing type	R: Cross-roller bearing Blank: Deep-groove ball bearing
4	Equipped motor	AR: AR Series
5	Motor type	A: Standard B: Standard (double shaft) M: With electromagnetic brake
6	Power supply input	<ul style="list-style-type: none"> Built-in controller type <ul style="list-style-type: none"> A: Single-phase 100-120 VAC C: Single-phase 200-240 VAC K: 24 VDC (For DG60 type only) Pulse input type <ul style="list-style-type: none"> A: Single-phase 100-115 VAC C: Single-phase 200-230 VAC S: Three-phase 200-230 VAC K: 24 VDC (For DG60 type only)
7	Driver type	D: Built-in controller type Blank: Pulse input type
8	Reference number	2: Combination with the ARD driver Blank: Combination with the LSD driver
9	Connection cable	Number: Length of included connection cable -1: 1 m (3.3 ft.) -2: 2 m (6.6 ft.) -3: 3 m (9.8 ft.) Blank: Without cable

● Actuators equipped with the RKII Series

D G 1 3 0 - R K S A C D -3
 1 2 3 4 5 6 7

1	Series name	DG: DGII Series
2	Frame size	85: 85 mm (3.35 in.) 130: 130 mm (5.12 in.)
3	Equipped motor	RKS: RKII Series
4	Motor type	A: Standard
5	Power supply input	A: Single-phase 100-120 VAC C: Single-phase 200-240 VAC
6	Driver type	D: Built-in controller type Blank: Pulse input type
7	Connection cable	Number: Length of included connection cable -1: 1 m (3.3 ft.) -2: 2 m (6.6 ft.) -3: 3 m (9.8 ft.) Blank: Without cable

■ Hollow rotary actuator model

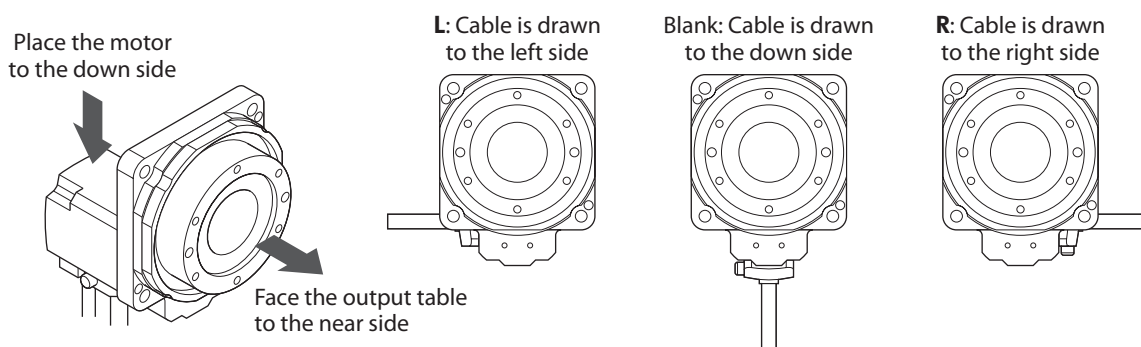
● Actuators equipped with the AZ Series

D G M 1 3 0 R - A Z A C R

1 2 3 4 5 6 7

1	Series name	DGM: DGII Series
2	Frame size	60: 60 mm (2.36 in.) 85: 85 mm (3.35 in.) 130: 130 mm (5.12 in.) 200: 200 mm (7.87 in.)
3	Output table supporting bearing type	R: Cross-roller bearing Blank: Deep-groove ball bearing
4	Equipped motor	AZ: AZ Series
5	Motor type	A: Standard M: With electromagnetic brake
6	Motor power supply type	C: AC power input K: DC power input
7	Cable outlet direction *	Blank: Down side R: Right side (For DGM130, DGM200 type only) L: Left side (For DGM130, DGM200 type only)

* The cable outlet direction represents the cable direction when the output table is faced to the near side and the motor is placed to the down side.



● Actuators equipped with the AR Series

D G M 1 3 0 R - A R A C

1 2 3 4 5 6

1	Series name	DGM: DGII Series
2	Frame size	60: 60 mm (2.36 in.) 85: 85 mm (3.35 in.) 130: 130 mm (5.12 in.) 200: 200 mm (7.87 in.)
3	Output table supporting bearing type	R: Cross-roller bearing Blank: Deep-groove ball bearing
4	Equipped motor	AR: AR Series
5	Motor type	A: Standard B: Standard (double shaft) M: With electromagnetic brake
6	Motor power supply type	C: AC power input K: DC power input (For DGM60 type only)

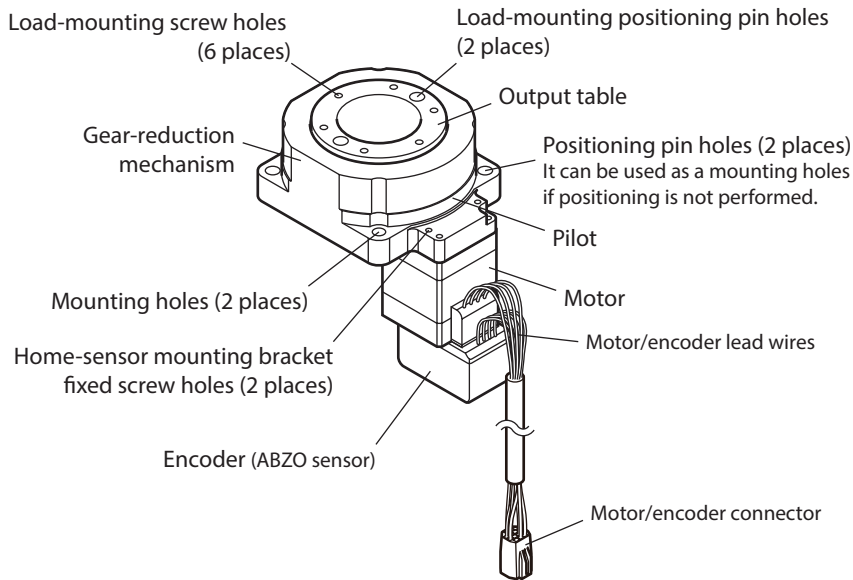
● Actuators equipped with the RKII Series

D G M 1 3 0 - 5 P K E A C
 1 2 3 4 5

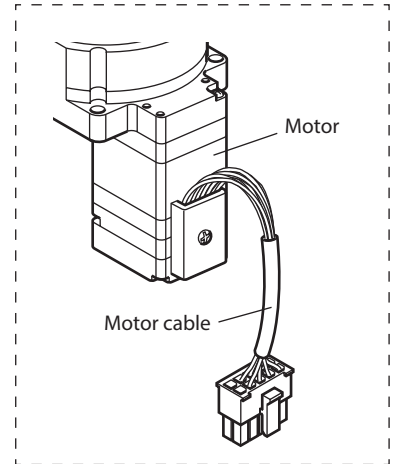
1	Series name	DGM: DGII Series
2	Frame size	85: 85 mm (3.35 in.), 130: 130 mm (5.12 in.)
3	Equipped motor	5PKE: 5-phase PKE motor
4	Motor type	A: Standard
5	Motor power supply type	C: AC power input

1-5 Names of parts

■ **DGM60**

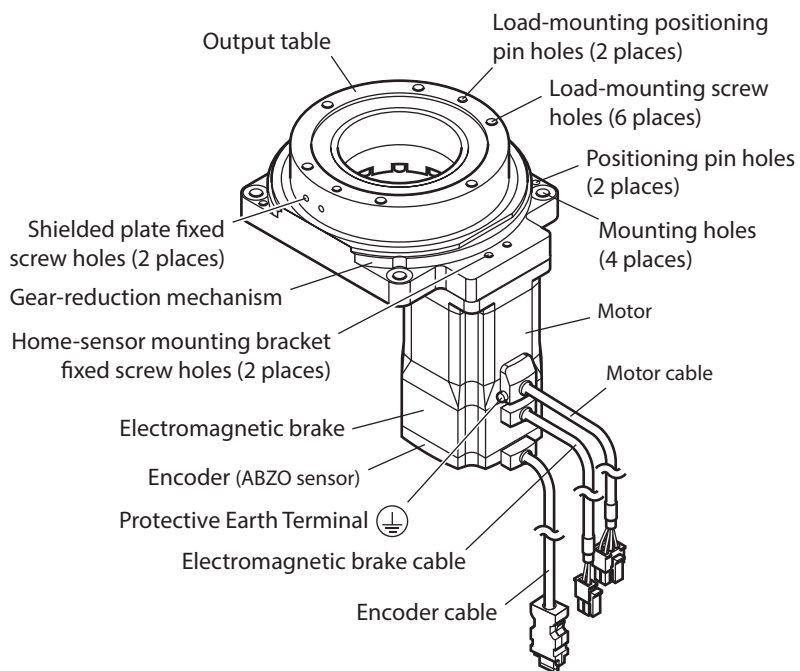


For the model DGM60-ARAK that equipped with the **AR** Series

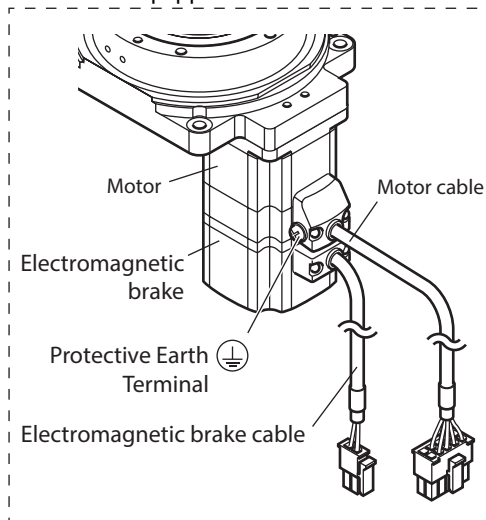


■ **DGM85, DGM130, DGM200**

This figure shows the **DGM130R-AZMC**.



For the model DGM130R-ARMC that equipped with the **AR Series**



2 Safety precautions




The precautions described below are intended to prevent danger or injury to the user and other personnel through safe, correct use of the product. Use the product only after carefully reading and fully understanding these instructions.

In regard to a hollow rotary actuator [hereinafter referred to as actuator], it is prohibited to start operating the actuator (i.e., to operate the device in accordance with the specified purpose) when the machine in which the actuator is incorporated does not satisfy any relevant safety standards.

The factory safety manager or safety personnel in charge of the applicable machine must ensure that the machine is operated only by qualified personnel who are familiar with the operation of electronic equipment, and thereby prevent injury or damage to the equipment.



The term "qualified personnel" refers to persons who have received the necessary training or education and have pertinent experience; who are familiar with the relevant standards, regulations, accident-prevention rules and inspection conditions; who are authorized by the factory safety manager to engage in the necessary activities; and who have the ability to discern and prevent potential dangers.

Description of signs

 WARNING	Handling the product without observing the instructions that accompany a "WARNING" symbol may result in death or serious bodily injury.
 CAUTION	Handling the product without observing the instructions that accompany a "CAUTION" symbol may result in bodily injury or property damage.
 Note	These notes appear throughout the manual and describe items that must be observed by the user to ensure correct use of the product.

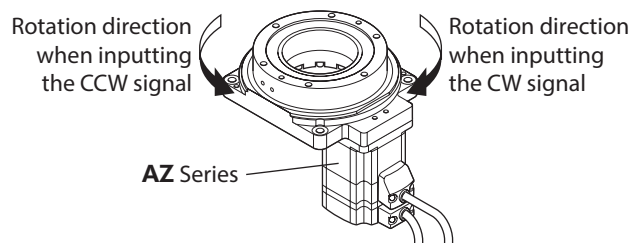
Description of graphic symbols

	Indicates "prohibited" actions that must not be performed.		Indicates "compulsory" actions that must be performed.
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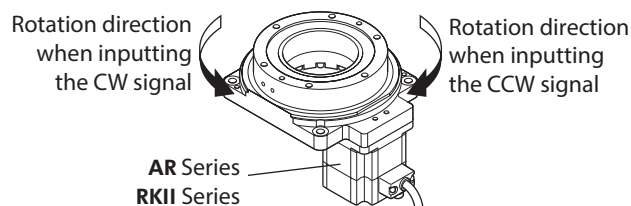
 WARNING	
	<ul style="list-style-type: none"> • Do not use the product in an atmosphere containing explosive, flammable or corrosive gases, in a place exposed to water, or near flammable objects. Doing so may result in fire, electric shock or injury. • Do not perform operations such as transportation, installation, connection, inspection or maintenance while the power is on. Doing so may result in electric shock. • Do not forcibly bend, pull or pinch the cable. Doing so may result in fire and electric shock. • Do not disassemble or modify the product. Doing so may result in injury or damage to equipment. • Never use an actuator in a medical device used in connection with the maintenance or management of human life or health, or in a transportation system whose purpose is to move or carry people. • Be sure to provide a safety cage conforming to EN ISO 13857 to prevent persons from entering the moving range of the actuator while power is supplied to the actuator. Turn off the main power to the driver before performing adjustment or inspection in which the output table is moved manually. Accidental contact may result in serious injury. • Do not use the electromagnetic brake to decelerate, nor use it as a safety brake. Doing so may result in injury or equipment damage.





⚠ WARNING

- Assign qualified personnel the task of installing, wiring, operating/controlling, inspecting and troubleshooting the product.
Failure to do so may result in fire, electric shock, injury or damage to equipment.
- If this product is used in a vertical application, be sure to provide a measure for the position retention of moving parts.
Failure to do so may result in injury or damage to equipment.
- Operate the data setter outside the safety fence.
Failure to do so may result in injury.
- When the driver generates an alarm (any of the driver's protective functions is triggered), take measures to hold the moving part in place since the motor stops and loses its holding torque.
Failure to do so may result in injury or damage to equipment.
- Install the products in the enclosure in order to prevent electric shock or injury.
- The products are designed with Class I equipment basic insulation. When installing the motor, do not touch the product or be sure to ground them.
Failure to do so may result in electric shock.
- Provide an emergency-stop device or emergency-stop circuit external to the equipment so that the entire equipment will operate safely in the event of a system failure or malfunction.
Failure to do so may result in injury.
- Perform the return-to-home operation after the power is restored. When an actuator equipped with the **AZ** Series is used, or when the absolute-position backup system is used in the built-in controller type driver with an actuator equipped with the **AR** Series, execute positioning operation of the absolute mode.
Failure to do so may result in injury or equipment damage.
- Operate the actuator after setting the resolution, moving direction and other parameters.
If the actuator is operated without setting parameters, the output table may move to unexpected directions or run at unexpected speeds, causing injury or damage to equipment. (A variety of parameters have been set to the actuator equipped with the **AZ** Series at the time of shipment.)
- After replacing the driver, set the resolution, moving (rotating) direction or other parameters before operating the actuator.
If the actuator is operated without setting parameters, the output table may move to unexpected directions or run at unexpected speeds, causing injury or damage to equipment.
- For the actuators equipped with the **AZ** Series, the output table rotates in the same direction to the CW input (or CCW input) of the driver input signal.



- For the actuators equipped with the **AR** Series or **RKII** Series, the output table rotates in the opposite direction to the CW input (or CCW input) of the driver input signal. When the CW signal is input, the output table rotates in the counterclockwise direction. When the CCW signal is input, the output table rotates in the clockwise direction.



 CAUTION	
	<ul style="list-style-type: none"> • Do not use the product beyond its specifications. Doing so may cause electric shock, injury or damage to equipment. • Keep your fingers and objects out of the openings in the product. Failure to do so may result in fire, electric shock or injury. • Do not touch the product while operating or immediately after stopping. Doing so may cause a skin burn(s). • Do not carry the actuator by holding its cables or its moving part. Doing so may cause injury. • Keep the area around the product free of combustible materials. Failure to do so may result in fire or a skin burn(s). • Leave nothing around the product that would obstruct ventilation. Failure to do so may result in damage to equipment. • Do not touch the moving part during operation. Doing so may cause injury. • Do not touch the terminals while conducting the insulation resistance measurement or dielectric strength test. Doing so may cause electric shock. • Do not use the home-sensor set (accessory) as safety components. Doing so may result in injury or equipment damage.
	<ul style="list-style-type: none"> • Use an actuator and driver only in the specified combination. An incorrect combination may cause a fire. • The motor surface temperature may exceed 70 °C (158 °F) even under normal operating conditions. If the operator is allowed to approach the running motor, attach a warning label as shown below in a conspicuous position. Failure to do so may result in a skin burn(s). • The actuator is very heavy. When transporting or installing the actuator, make sure two persons work together to carry out the necessary tasks. Failure to do so may result in injury. • Wear a helmet, safety shoes, gloves or other protective gear when transporting or installing the actuator. Failure to do so may result in injury. <div style="text-align: right; margin-top: 10px;">  Warning label </div>

3 Precautions for use

This section covers limitations and requirements the user should consider when using the product.

■ General

● Be sure to use the cable (included or accessory) to connect the actuator and driver.

In the following condition, an appropriate accessory cable must be purchased separately.

- If a flexible cable is to be used.
- If a cable of 3 m (9.8 ft.) or longer is to be used.
- If a motor and driver package without a cable was purchased.
- If an actuator only was purchased.

● When conducting the insulation resistance measurement or the dielectric strength test, be sure to separate the connection between the motor and the driver.

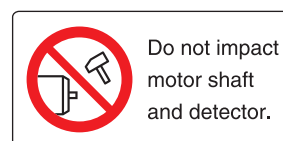
Conducting the insulation resistance measurement or dielectric strength test with the motor and driver connected may result in damage to the product.

● Do not make an impact on the actuator.

Do not drop the actuator. Also, do not hit the motor or gear-reduction mechanism on something hard. Doing so may cause the positioning accuracy decrease, the motor section damage or the product service life reduction.

● Make sure not to hit or apply a strong impact on the encoder (ABZO sensor).

- Making a strong impact on an encoder (ABZO sensor) may cause the motor malfunction or damage to the encoder (ABZO sensor).
- When transporting the actuator or installing a load, handle the actuator carefully not to make a strong impact on the moving part.
- The warning label shown in the right is indicated on the motor part of the actuators equipped with the **AZ** Series.



Warning label

● Do not move the encoder (ABZO sensor) toward a strong magnetic field.

A magnetic sensor is built into the encoder (ABZO sensor). If the motor is installed close to equipment which generates a strong magnetic field, the encoder (ABZO sensor) may break or malfunction. Especially, the **DGM60** is easily affected by a magnetic field, so make sure the environment at transportation and storage as well as the installation location in use. Keep the magnetic flux density on the surface of the encoder (ABZO sensor) so as not to exceed the values in the table.

Model	Magnetic flux density	
	When transporting and storing	When operating
DGM60	5 mT	2 mT *
DGM85, DGM130, DGM200	10 mT	10 mT

* When the magnetic flux density is exceeding 1 mT and 2 mT or less, use in an environment where the operating ambient temperature is exceeding 20 °C (68 °F) and 40 °C (104 °F) or less.

● Meshing noise of mechanical sensor

A gear type mechanical sensor is built into the encoder (ABZO sensor). Although the meshing noise of gears may generate, it is not malfunction.

■ Temperature

- **Use the actuator equipped with the AZ Series in conditions where its surface temperature will not exceed 80 °C (176 °F).**

The motor surface temperature may exceed 80 °C (176 °F) under certain conditions (ambient temperature, operating speed, duty cycle, etc.). In order to protect the encoder (ABZO sensor), use the motor in a conditions where the surface temperature does not exceed 80 °C (176 °F). If the encoder (ABZO sensor) temperature reaches the upper limit, the motor overheat protection alarm will generate.

- **Use the actuator equipped with the AR Series or RKII Series in conditions where its surface temperature will not exceed 100 °C (212 °F).**

The motor does not have a function to protect from overheating. The motor surface temperature may exceed 100 °C (212 °F) under certain conditions (ambient temperature, operating speed, duty cycle, etc.). To prevent the motor bearings (ball bearings) from reaching its usable life quickly, use the motor in a conditions where the surface temperature does not exceed 100 °C (212 °F).

■ Operation

- **Do not apply a moment load or axial load in excess of the specified permissible limit.**

Operating the actuator under an excessive moment load or axial load may damage the bearings. Be sure to operate the actuator below the specified permissible limits of the moment load and axial load.

- **When the motor is the double shaft**

With these models, do not apply load torque, radial load or axial load to the back shaft of the motor.

- **Hollow hole section**

If the pipe or cable installed in the hollow hole section is rotated together with the output table, take measures not to rub or disconnect in contact with the inner wall of the hollow hole section.

- **Holding torque at standstill**

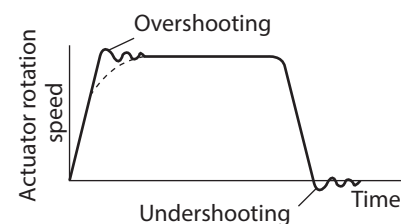
When the actuator stops, the holding torque of the output table will be reduced by the current cutback function of the driver. When selecting a actuator, check the holding torque at motor standstill in the specifications on the catalog.

- **Do not use the electromagnetic brake to reduce speed or as a safety brake.**

Do not use the electromagnetic brake as a means to decelerate and stop the actuator. The brake hub of the electromagnetic brake will wear significantly and the braking force will drop if used to stop the motor. The electromagnetic brake is a power-off activated type. This means that although it helps maintain the position of the load in the event of power outage, etc., this brake cannot securely hold the load in place. Accordingly, do not use the electromagnetic brake as a safety brake. To use the electromagnetic brake to hold the load in place, do so after the actuator has stopped.

- **Do not perform an operation to cause overshooting or undershooting.**

Operating the actuator under the condition that overshooting or undershooting occurs may cause damage to the gear-reduction mechanism. Review the operating condition or adjust the speed filter. Since the product equipped with the **RKII** Series pulse input type does not have the function of the speed filter, adjust to revise the operating condition.

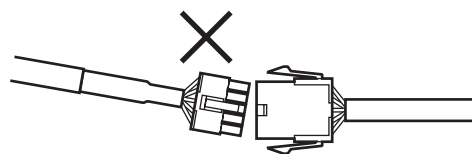


■ Notes when the connection cable is used

Note the following points when a included cable or an accessory cable is used.

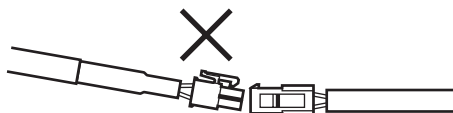
● When inserting the connector

Hold the connector main body, and insert it in straight securely. Inserting the connector in a inclined state may result in damage to terminals or a connection failure.



● When pulling out the connector

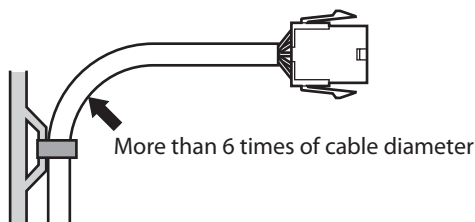
Pull out the connector in straight while releasing the lock part of the connector. Pulling out the connector with holding the cable (lead wires) may result in damage to the connector.



● Bending radius of cable

Use the cable in a state where the bending radius of the cable is more than six times of the cable diameter.

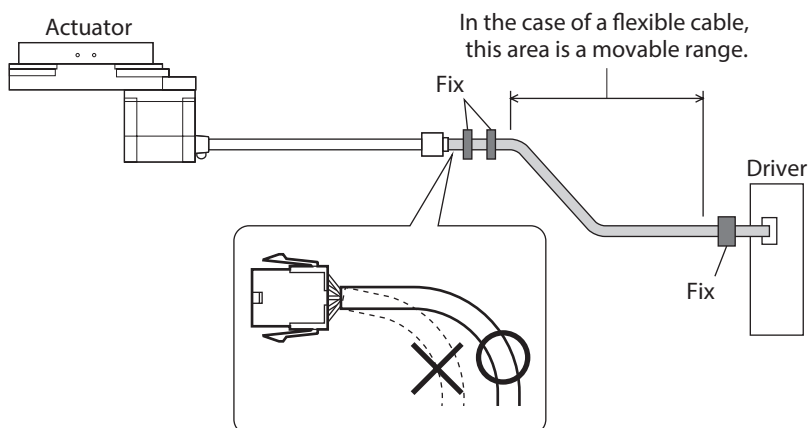
In the case of the lead wire type, use in a state where the bending radius is more than four times of the diameter of the lead wires.



● How to fix the cable

Fix the cable at the positions near the connector so as to apply no stress on the connector part.

Take measures so as to apply no stress on the connector by using wide clamps or by fixing at two places.



4 Installation

4-1 Location for installation

The actuator has been designed and manufactured to be incorporated in general industrial equipment. Install it in a well-ventilated location that provides easy access for inspection. The location must also satisfy the following conditions:

- Inside an enclosure that is installed indoors (provide vent holes)
- Operating ambient temperature
 - Actuator equipped with the **AZ** Series
0 to +40 °C (+32 to +104 °F) (Non-freezing)
 - Actuator equipped with the **AR** Series or **RKII** Series
When the home-sensor is not used: 0 to +50 °C (+32 to +122 °F) (Non-freezing)
When the home-sensor is use: 0 to +40 °C (+32 to +104 °F) (Non-freezing)
- Operating ambient humidity: 85% or less (non-condensing)
- Area that is free of explosive atmosphere or toxic gas (such as sulfuric gas) or liquid
- Area not exposed to direct sun
- Area free of excessive amount of dust, iron particles or the like
- Area not subject to splashing water (rain, water droplets), oil (oil droplets) or other liquids
- Area free of excessive salt
- Area not subject to continuous vibration or excessive shocks
- Area free of excessive electromagnetic noise (from welders, power machinery, etc.)
- Area free of radioactive materials, magnetic fields or vacuum
- Up to 1,000 m (3,300 ft.) above sea level

■ If an actuator equipped with the AZ Series is installed in an environment where a magnetic field is generated

A magnetic sensor is built into the encoder (ABZO sensor). If the motor is installed close to equipment which generates a strong magnetic field, the encoder (ABZO sensor) may break or malfunction. Keep the magnetic flux density on the surface of the encoder (ABZO sensor) so as not to exceed the values in the table.

Model	Magnetic flux density
DGM60	2 mT *
DGM85, DGM130, DGM200	10 mT

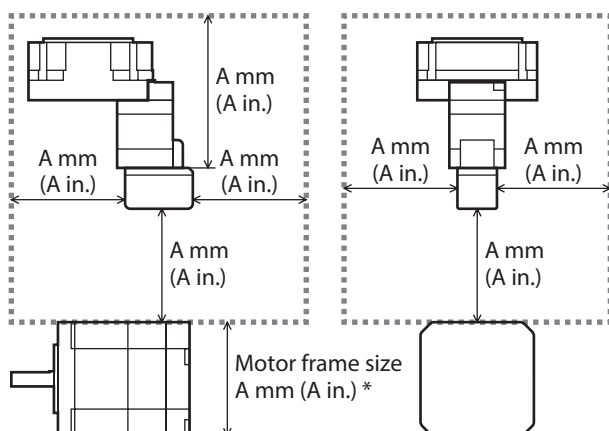
* When the magnetic flux density is exceeding 1 mT and 2 mT or less, use in an environment where the operating ambient temperature is exceeding 20 °C (68 °F) and 40 °C (104 °F) or less.

Note Do not install the actuator close to equipment which generates a strong magnetic field.

■ Installing the DGM60 equipped with the AZ Series

The encoder (ABZO sensor) of the **DGM60** equipped with the **AZ** Series is easily affected by a magnetic field, so make sure the installation location.

When motors are installed side by side, ensure distances in horizontal and vertical directions of more than the frame size of the other motor installed.



● Reference

Other motor	A
Frame size 20 mm (0.79 in.)	20 mm (0.79 in.)
Frame size 28 mm (1.10 in.)	28 mm (1.10 in.)
Frame size 42 mm (1.65 in.)	42 mm (1.65 in.)
Frame size 60 mm (2.36 in.)	60 mm (2.36 in.)

* Ensure distances of more than the frame size [A mm (A in.)] of the other motor.

4-2 Installation direction

The actuator can be installed in any direction.

To prevent vibration, install the actuator on a metal surface of sufficient strength.

Note

- On rare occasions, a small amount of grease may ooze out from the actuator. If there is concern over possible environmental damage resulting from the leakage of grease, check for grease stains during regular inspections. Alternatively, install an oil pan or other device to prevent leakage from causing further damage. Oil leakage may lead to problems in the user's equipment or products.
- Do not loosen or remove the screws of the actuator. Doing so may cause the positioning accuracy to drop or damage to the actuator.
- Be sure the positioning pins are secured to the mounting plate. Driving the pins into the actuator may damage the actuator due to impact.
- Do not drop the actuator. Also, do not hit the motor or gear-reduction mechanism on something hard. Doing so may cause the positioning accuracy decrease, the motor section damage or the product service life reduction.

4-3 Release the electromagnetic brake type

When moving the table of the electromagnetic brake type manually, connect the 24 VDC power supply for electromagnetic brake to release the electromagnetic brake.

● Specifications of a power supply for electromagnetic brake

Model	Voltage	Current capacity
DGM85	24 VDC±5% *	0.08 A or more
DGM130, DGM200		0.25 A or more

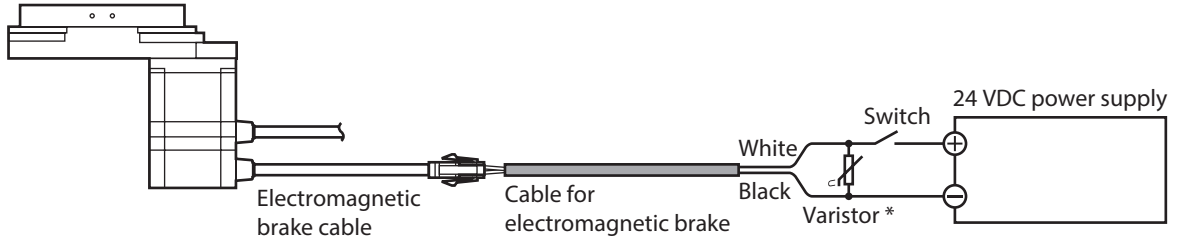
* If the distance between an actuator with an electromagnetic brake and driver is extended to the following length, use a power supply of 24±4% VDC.

Actuator equipped with the **AZ** Series : 20 m (65.6 ft.)

Actuator equipped with the **AR** Series : 20 to 30 m (65.6 to 98.4 ft.)

● **Releasing procedure**

1. Connect the "electromagnetic brake cable" and "cable for electromagnetic brake."
2. Connect the lead wires of the "cable for electromagnetic brake" to the 24 VDC power supply. Connect the white lead wire to the +24 VDC terminal, and the black lead wire to the GND terminal.
3. Turn on the 24 VDC power supply. The electromagnetic brake will be released and the table will be able to move by hand.



* Be sure to connect the varistor to protect the contact of the switch or to prevent electrical noise. [Recommended varistor: Z15D121 (SEMITEC Corporation)]

Note The lead wires of the "cable for electromagnetic brake" have polarities, so connect them in the correct polarities. If the lead wires are connected with their polarities reversed, the electromagnetic brake will not operate properly.

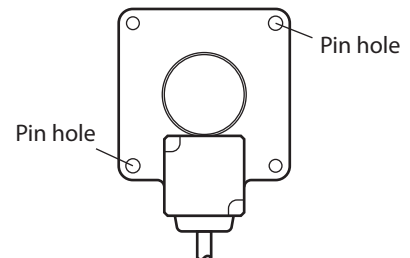
4-4 Installation method of DGM60 type

Position the actuator using two positioning pin holes, and secure the mounting holes with screws (two pieces). Provide screw hole machining in the mounting plate since the mounting holes are through holes. The positioning pin holes can be used as mounting holes when they are not used. As with the above case, provide screw hole machining in the mounting plate.

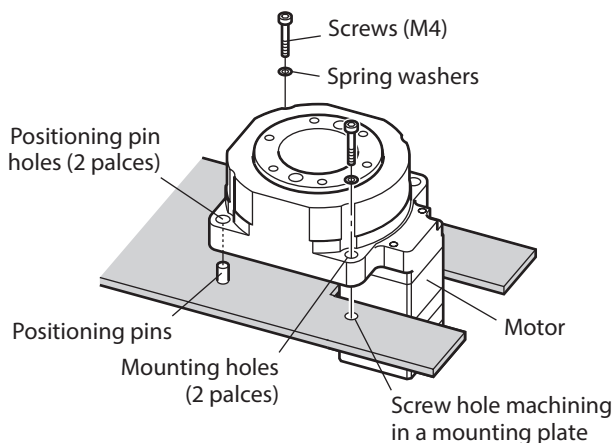
● **Specifications for mounting plate, mounting hole, and positioning pin hole**

Mounting plate	<ul style="list-style-type: none"> ● Thickness: 5 mm (0.20 in.) or more ● Material: Steel plate or aluminum plate
Pin hole diameter	<ul style="list-style-type: none"> ● Mounting hole: $\varnothing 4.5$ mm ($\varnothing 0.18$ in.) ● Positioning pin hole: $\varnothing 5^{+0.012}_0$ mm ($\varnothing 0.1969^{+0.0005}_0$ in.)
Pin hole depth	10 mm (0.39 in.), Through hole
Nominal size	M4
Tightening torque	2 N·m (284 oz-in)

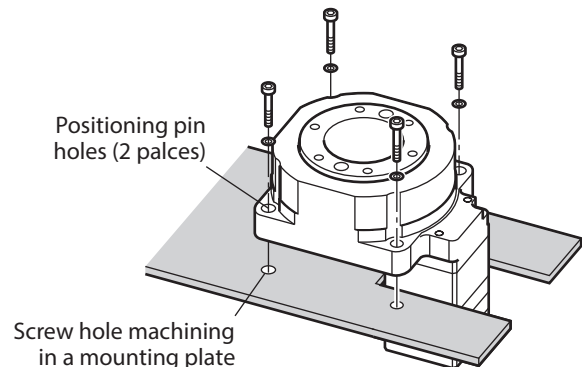
● **Positioning pin hole (viewing from the motor side)**



■ **When a mounting plate with cutout is used**



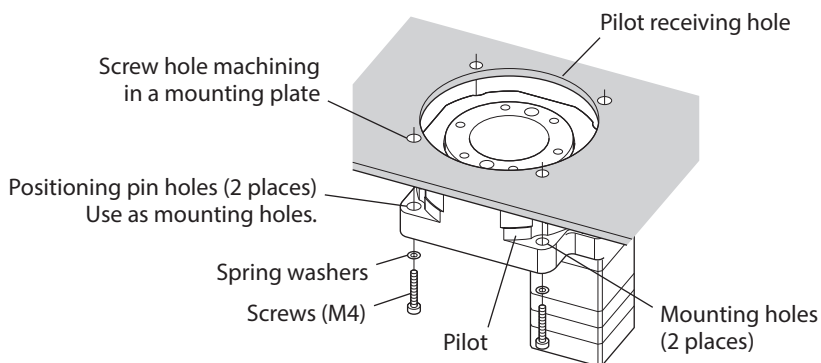
● **When the positioning pin holes are used as mounting holes**



■ When installing from below the mounting plate

Use the positioning pin holes as mounting holes.

Fit the pilot of the actuator into the pilot-receiving hole having performed through-hole machining, and secure the mounting holes with screws (four pieces). Provide screw hole machining in the mounting plate since the positioning pin holes and the mounting holes are through holes.

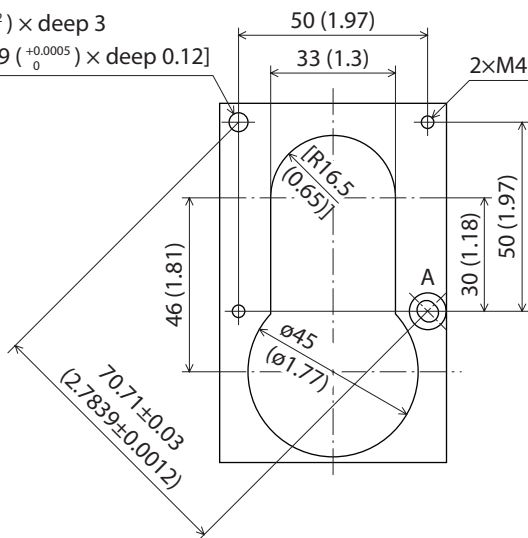


■ When a mounting plate with through-hole is used

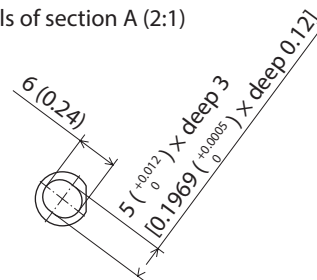
● Design for mounting plate [reference] [unit: mm (in.)]

$\varnothing 5 \left(\begin{smallmatrix} +0.012 \\ 0 \end{smallmatrix} \right) \times \text{deep } 3$

$[\varnothing 0.1969 \left(\begin{smallmatrix} +0.0005 \\ 0 \end{smallmatrix} \right) \times \text{deep } 0.12]$

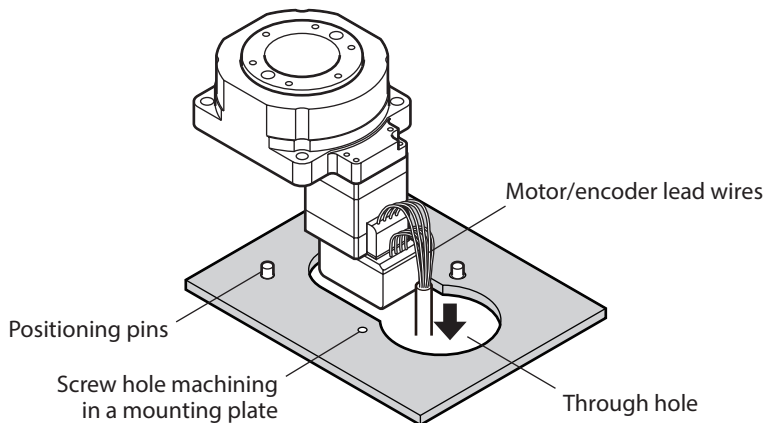


Details of section A (2:1)

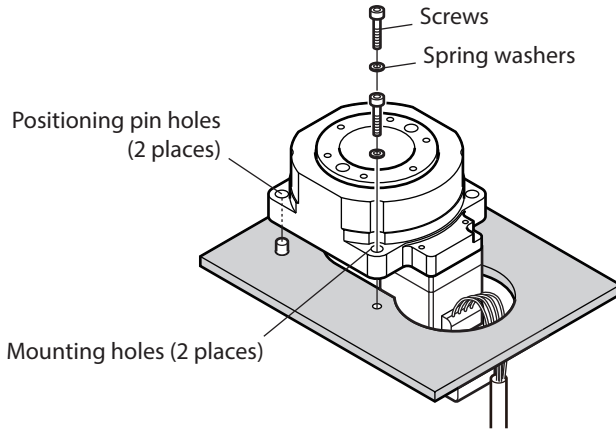


● Installation method

1. Pass the motor/encoder lead wires through the through hole of the mounting plate.



2. Move the actuator to the through hole which diameter is larger, and secure the mounting holes with screws (two pieces).



4-5 Installation method of DGM85, DGM130, and DGM200 types

Perform cutout machining or through-hole machining on a mounting plate when installing the actuator. Use two positioning pin holes when positioning the actuator. When designing a mounting plate, take into account the shape of the motor.

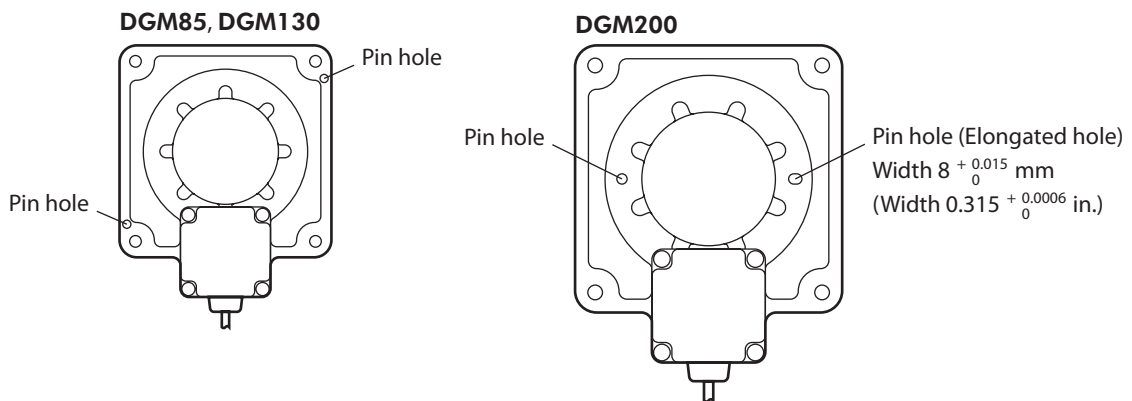
- Specifications of mounting plate

Model	Thickness	Material
DGM85	8 mm (0.31 in.) or more	Steel or aluminum
DGM130	10 mm (0.39 in.) or more	
DGM200	15 mm (0.59 in.) or more	

- Specifications for mounting hole and positioning pin hole

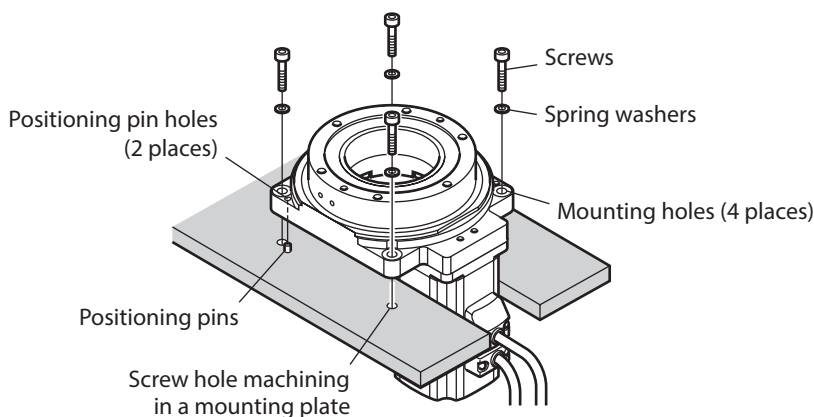
Model	Mounting hole			Positioning pin hole	
	Pin hole diameter	Nominal size	Tightening torque	Pin hole diameter	Pin hole depth
DGM85	ø6.5 mm (ø0.26 in.)	M6	6 N·m (53 lb-in)	ø5 ^{+0.012} ₀ mm (ø0.1969 ^{+0.0005} ₀ in.)	10.5 mm (0.41 in.), Through hole
DGM130	ø9 mm (ø0.35 in.)	M8	13 N·m (115 lb-in)		12 mm (0.47 in.), Through hole
DGM200	ø11 mm (ø0.43 in.)	M10	25 N·m (220 lb-in)	ø8 ^{+0.015} ₀ mm (ø0.3150 ^{+0.0006} ₀ in.)	8 mm (0.31 in.), Blind hole

- Positioning pin hole (viewing from the motor side)



■ **When a mounting plate with cutout is used**

Secure the mounting holes with screws (four pieces). Provide screw hole machining in the mounting plate since the mounting holes are through holes. The figure shows the DGM1 30R-ARMC.

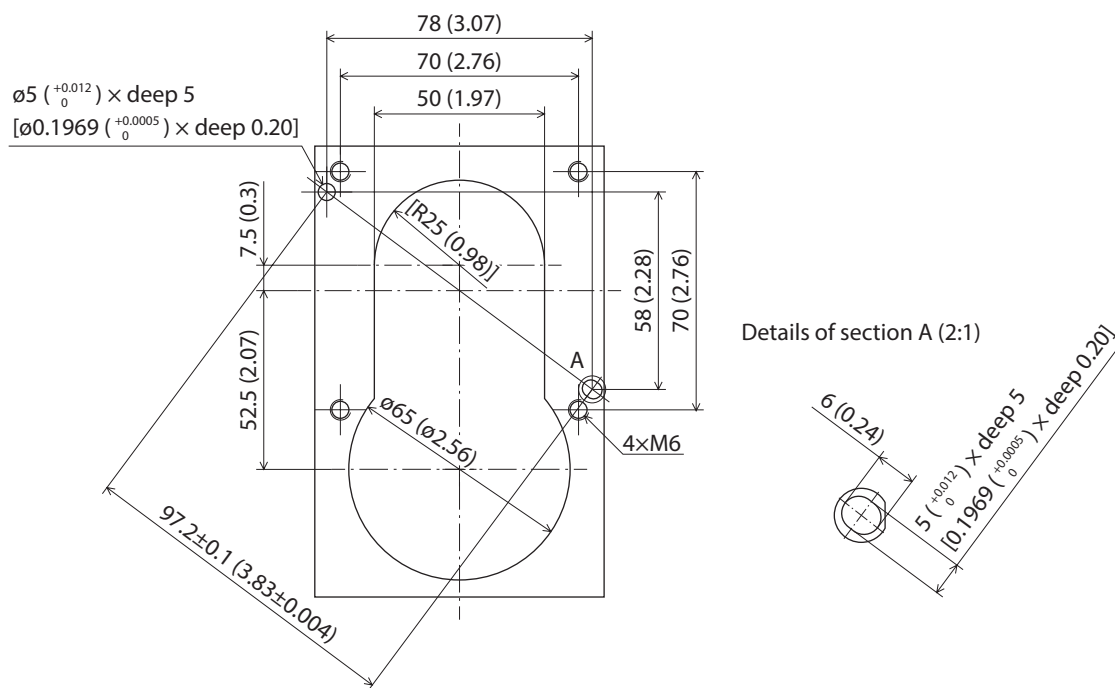


Be sure to install the actuator from the upper side of the mounting plate. It cannot be installed from below the mounting plate.

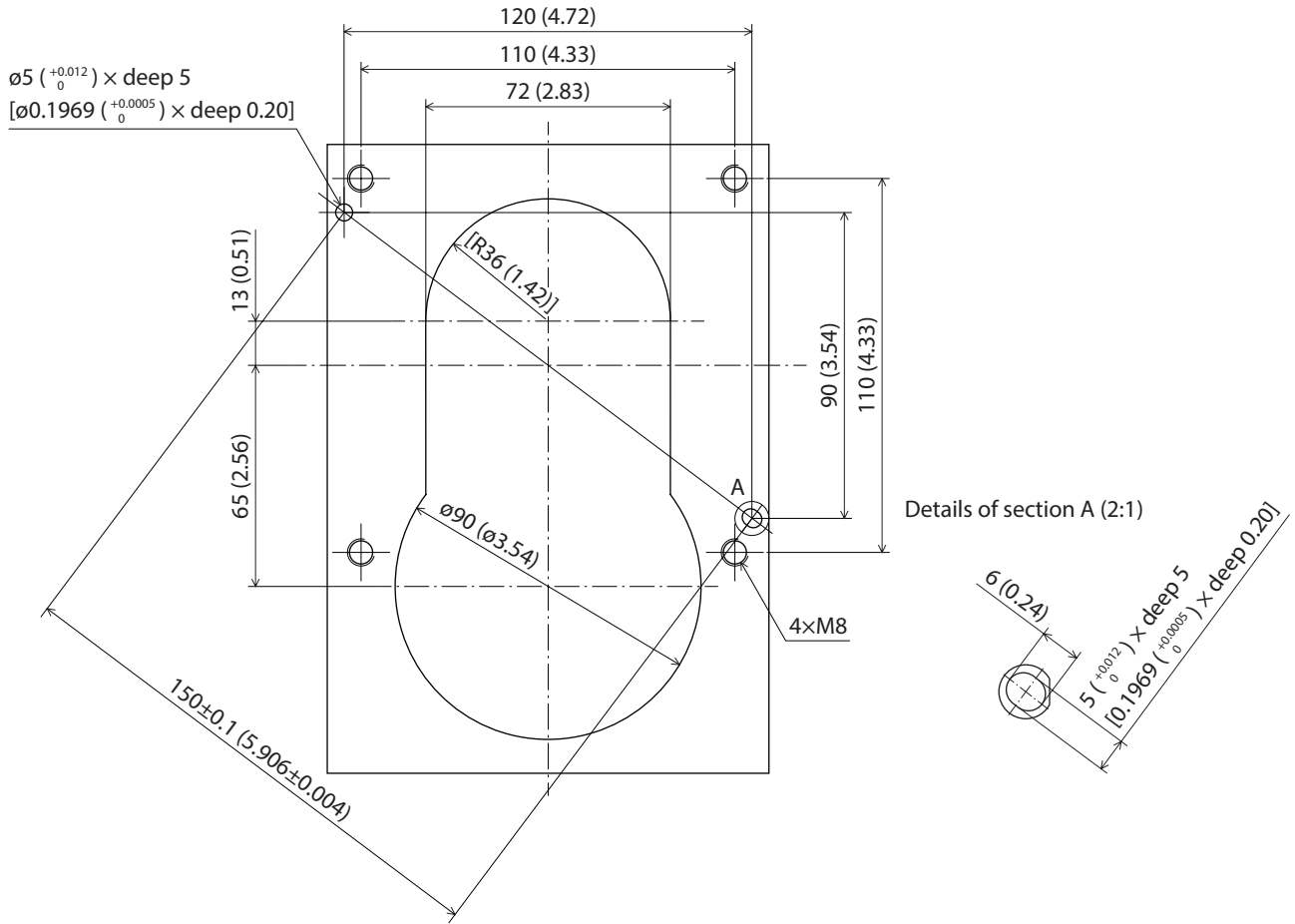
■ **When a mounting plate with through-hole is used**

- Design for mounting plate [reference] [unit: mm (in.)]

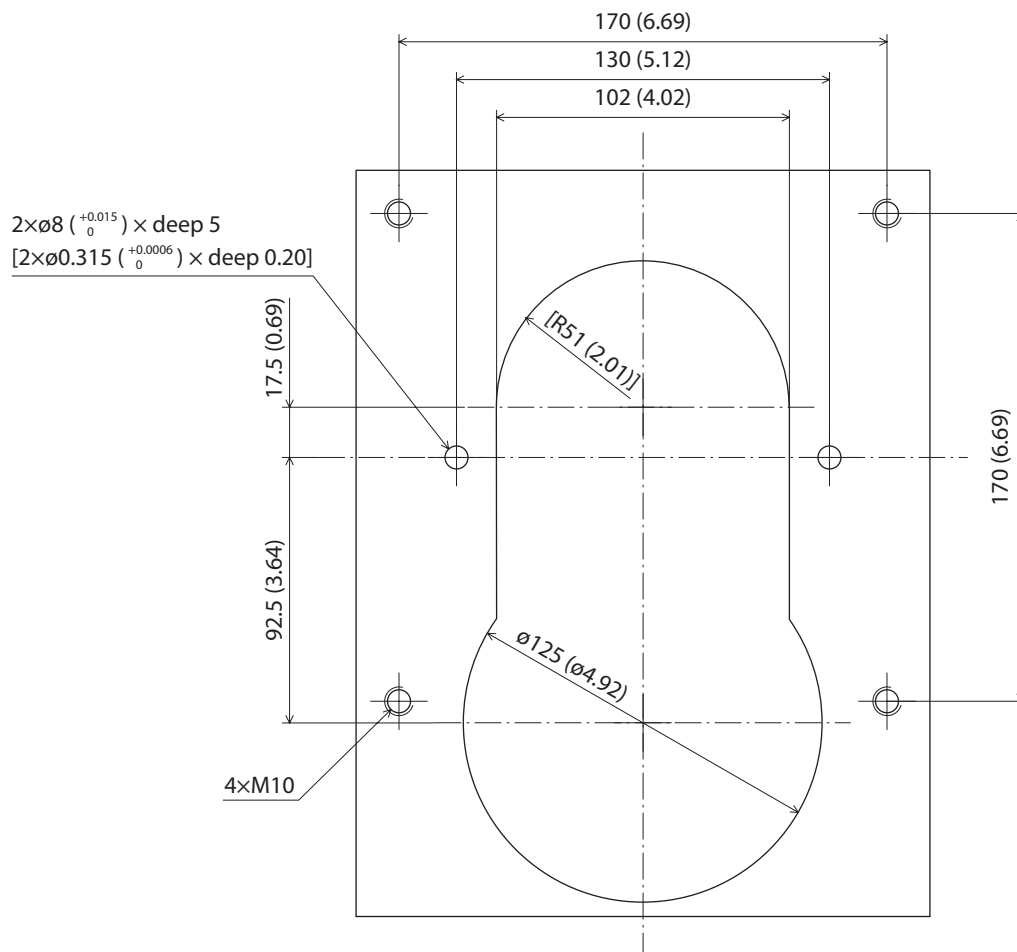
DGM85



DGM130



DGM200

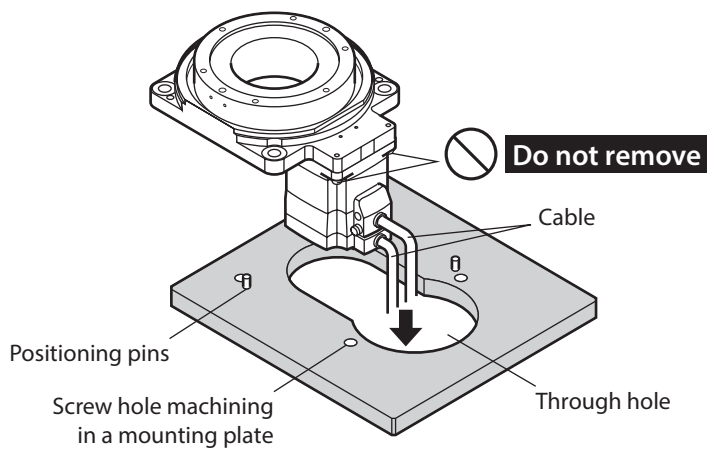


● When installing an actuator which cable outlet direction is downward

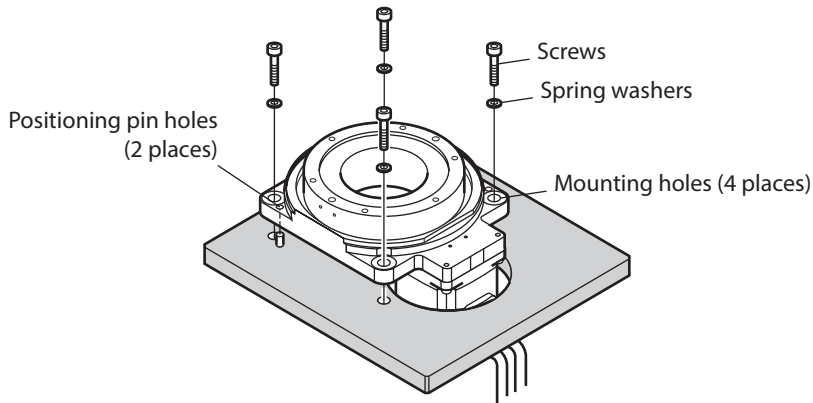
The figure shows the **DGM130R-AZAC**.

Note Be sure to install the actuator from the upper side of the mounting plate. It cannot be installed from below the mounting plate.

1. Pass the motor cable through the through hole of the mounting plate.



2. Move the actuator to the through hole which diameter is larger, and secure the mounting holes with screws (four pieces).

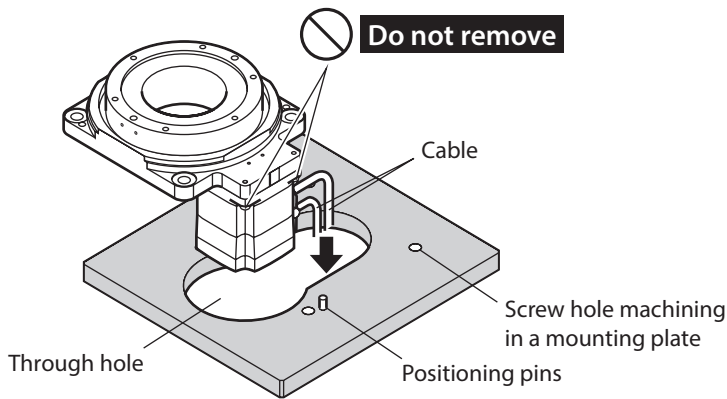


● **When installing an actuator which cable outlet direction is rightward or leftward**

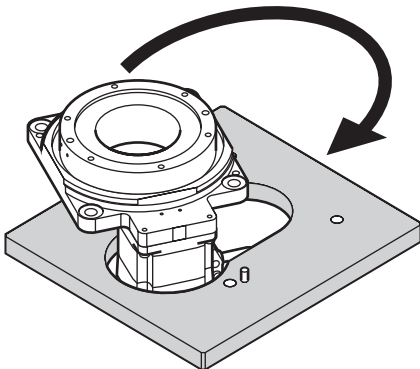
This section explains based on an example when the cable outlet direction is rightward. The figure shows the **DGM130R-AZACR**.

Note Be sure to install the actuator from the upper side of the mounting plate. It cannot be installed from below the mounting plate.

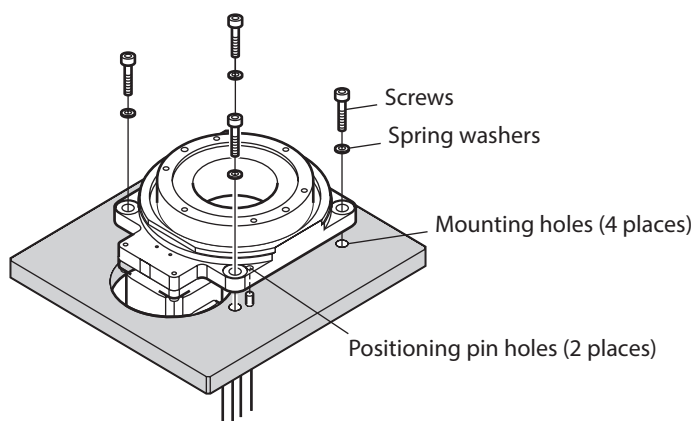
1. Pass the motor cable through the through hole of the mounting plate.



2. Rotate the actuator by 90 degrees.



3. Secure the mounting holes with screws (four pieces).



4-6 How to install a load

Install a load with screws using the load-mounting screw holes (six places) onto the output table. Use the load-mounting pin holes (two places) of the output table when positioning a load.

Model	Output table supporting bearing	Nominal size	Tightening torque	Effective depth of screw thread	Material of load
DGM60	Deep-groove ball bearing	M3	1 N·m (142 oz-in)	8 mm (0.31 in.)	Steel or aluminum
DGM85	Deep-groove ball bearing	M4	2 N·m (280 oz-in)	6 mm (0.24 in.)	
DGM85R	Cross-roller bearing			8 mm (0.31 in.)	
DGM130	Deep-groove ball bearing	M5	3.5 N·m (490 oz-in)	8 mm (0.31 in.)	
DGM130R	Cross-roller bearing				
DGM200R	Cross-roller bearing	M6	6 N·m (850 oz-in)	10 mm (0.39 in.)	

Model	Pin hole diameter	Pin hole depth
DGM60 DGM85 DGM85R DGM130 DGM130R	$\varnothing 5^{+0.012}_0$ mm ($\varnothing 0.1969^{+0.0005}_0$ in.)	6 mm (0.24 in.)
DGM200R	$\varnothing 8^{+0.015}_0$ mm ($\varnothing 0.3150^{+0.0006}_0$ in.)	8 mm (0.31 in.)

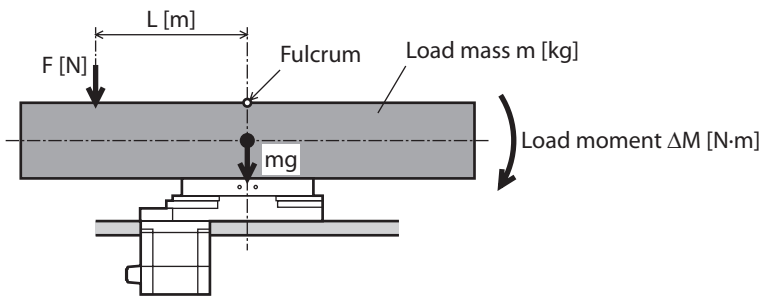
Note Be sure the positioning pins are secured to the load. Driving the pins into the output table may damage the bearing due to impact or an excessive moment of inertia.

4-7 Permissible moment, permissible axial load

The permissible moment and permissible axial load should not exceed the permissible value specified in the table.

Model	Output table supporting bearing	Permissible moment	Permissible axial load
DGM60	Deep-groove ball bearing	2 N·m	100 N
DGM85	Deep-groove ball bearing	6 N·m	200 N
DGM85R	Cross-roller bearing	10 N·m	500 N
DGM130	Deep-groove ball bearing	20 N·m	300 N
DGM130R	Cross-roller bearing	50 N·m	2,000 N
DGM200R	Cross-roller bearing	100 N·m	4,000 N

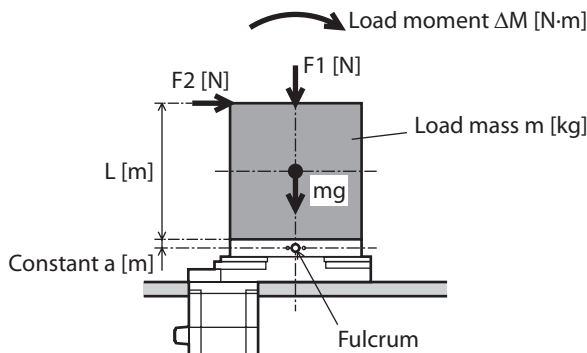
- **Example 1: When external force F is applied at distance L from the center of the output table**



Load moment [N·m]: $\Delta M = F \times L$

Axial load [N]: $F_s = F + m \text{ (load mass)} \times g \text{ (gravitational acceleration)}$

- **Example 2: When external forces F1 and F2 are applied at distance L from the mounting face of the output table**



Load moment [N·m]: $\Delta M = F_2 \times (L + \text{constant } a)$

Axial load [N]: $F_s = F_1 + m \text{ (load mass)} \times g \text{ (gravitational acceleration)}$

Model	Output table supporting bearing	Constant a
DGM60	Deep-groove ball bearing	0.01 m
DGM85	Deep-groove ball bearing	0.015 m
DGM85R	Cross-roller bearing	0.02 m
DGM130	Deep-groove ball bearing	0.016 m
DGM130R	Cross-roller bearing	0.03 m
DGM200R	Cross-roller bearing	0.04 m

5 Connection

5-1 Connecting the driver

Refer to the OPERATING MANUAL Driver for how to connect with the driver.

5-2 Grounding the actuator

Use a round terminal when grounding, and make sure to secure with a screw and washer. Ground wires and crimp terminals are not included.

- memo**
- When multiple actuators are used in combination, ground each actuator.
 - Do not share the grounding wire with a welder or any other power equipment.

■ Actuator equipped with the AZ Series

The grounding method of the motor varies depending on the driver input power. Check the table and ground using a suitable method.

Be sure to ground the driver.

Ddriver input voltage	100-120 VAC 200-240 VAC	24 VDC	48 VDC
Grounding procedure			
1) Protective Earth Terminal of the driver	Required to ground	Required to ground	Required to ground
2) Grounding wire of the motor	Required to ground	Not required	Not required
3) Protective Earth Terminal of the motor	*	Not required	*

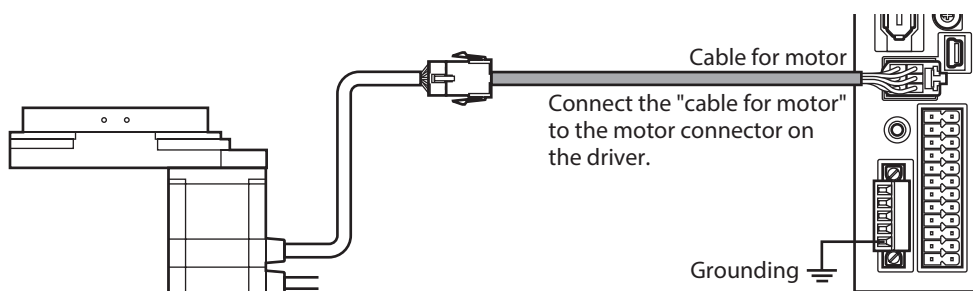
* Ground if the grounding resistance of the standards that applies to the equipment is not satisfied.

Reference: Grounding wire of the "cable for motor"

- Conductor size: AWG18 (0.75 mm²)
- Maximum conductor resistance: 21.8 Ω/km (25.6 Ω/km for flexible cable)

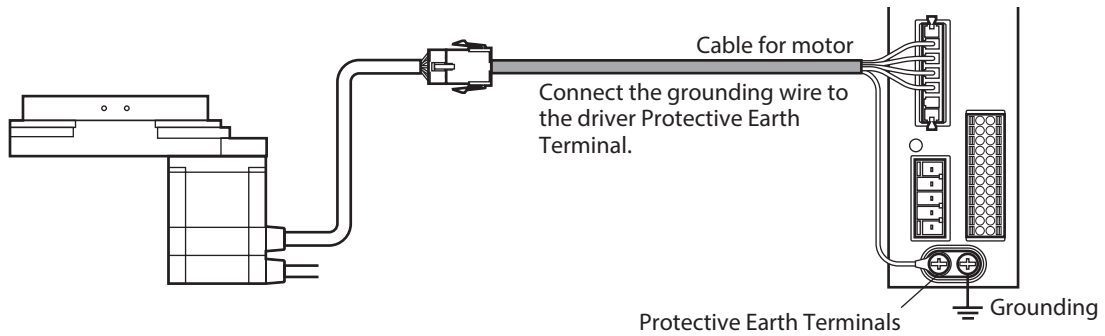
● 1) Grounding the Protective Earth Terminal of the driver

Connect the motor to the driver, and surely ground the Protective Earth Terminal of the driver. Refer to the OPERATING MANUAL Driver for how to ground. The figure shows the DC power input type.



● **2) Grounding the grounding wire of the motor [AC power input type only]**

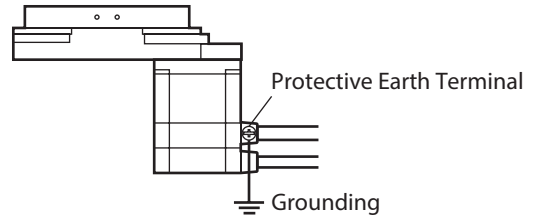
Connect the grounding wire of the "cable for motor" to the Protective Earth Terminal of the driver.



● **3) Grounding the Protective Earth Terminal of the motor**

Be sure to ground the Protective Earth Terminal of the motor.

- Grounding wire: AWG18 (0.75 mm²) or more
- Screw size of Protective Earth Terminal: M4
- Tightening torque: 1.2 N·m (170 oz-in)

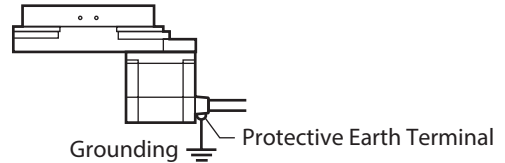


■ **Actuator equipped with the AR Series or RKII Series**

Securely ground the Protective Earth Terminal of the AC input type motor.

Protective earth for the DC power input type is not required.

- Grounding wire: AWG18 (0.75 mm²) or more
- Screw size of Protective Earth Terminal: M4
- Tightening torque: 1.2 N·m (170 oz-in)



5-3 Connection for home-sensor

Installation method of an accessory home-sensor set and connection example of the driver are explained here.

■ **Home-sensor set description**

The following parts are used for the accessory home-sensor set.

Actuator model	Home-sensor set model	Sensor output	Photomicrosensor model
DGM60	PADG-SA	NPN	EE-SX672A (OMRON Corporation)
DGM85, DGM130, DGM200	PADG-SB		EE-SX673A (OMRON Corporation)
DGM60	PADG-SAY	PNP	EE-SX672R (OMRON Corporation)
DGM85, DGM130, DGM200	PADG-SBY		EE-SX673R (OMRON Corporation)

- Photomicrosensor..... 1 pc.
- Flexible cable with connector..... 1 pc. EE-1010-R (OMRON Corporation) length 2 m (6.6 ft.)
- Sensor mounting bracket..... 1 pc.
- Shielded plate..... 1 pc.
- Screw (M3, spring washer, plain washer)..... 2 pcs.
- Hexagonal socket head screw (M2.5)..... 4 pcs.

■ **Installing the sensor**

CAUTION

Do not install the home-sensor set while the power is being supplied. Doing so may result in injury or damage to equipment.

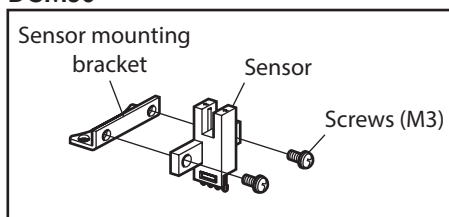
Note

- Be sure to install the sensor and shielded plate in the direction shown in the figure. Installing them in the wrong direction may disable sensor detection or cause the shielded plate to contact the sensor, resulting in sensor damage.
- When installing the sensor bracket and shielded plate to the actuator, be sure to use the included screws.

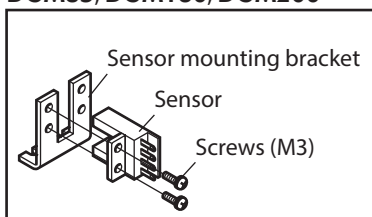
1. Secure the sensor to the sensor bracket using the included screws (M3×2).
Tightening torque: 0.6 N·m (85 oz-in)

For the **DGM85**, **DGM130** and **DGM200** types, the screw holes are provided on two places (right and left) of the sensor bracket. The sensor can be installed to either of the screw holes (right or left). Install it to the position in which an indicating light can be seen.

DGM60

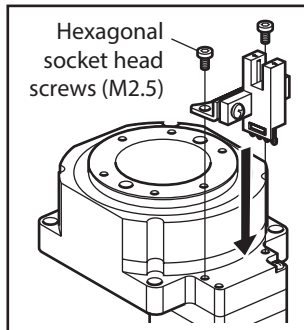


DGM85, DGM130, DGM200

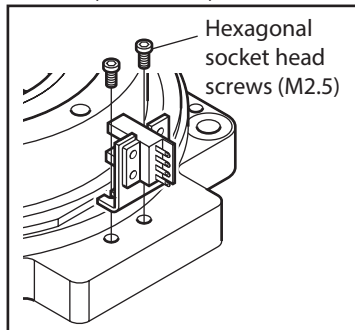


2. Secure the bracket and sensor assembly to the gear-reduction mechanism of the actuator using the included hexagonal socket head screws (M2.5×2).
Tightening torque: 0.5 N·m (71 oz-in)

DGM60



DGM85, DGM130, DGM200

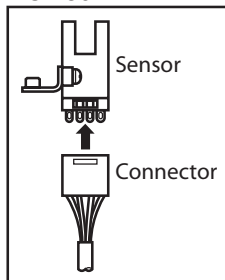


Note

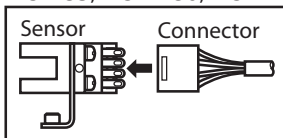
Do not use the screw holes (M2.5) for the home-sensor of the actuator for any other purpose.

3. Connect the flexible cable with connector to the sensor.

DGM60



DGM85, DGM130, DGM200



Note

- Do not connect or remove the flexible cable with connector while the power is being supplied. Doing so may cause damage to the sensor.
- Wire the flexible cable in such a way that it will not contact the actuator.

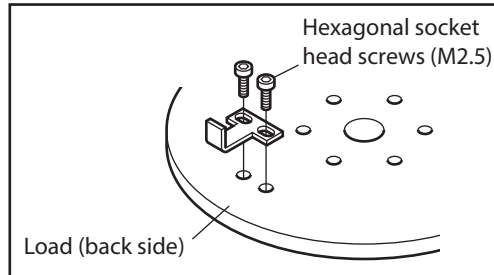
memo When removing the flexible cable with connector, pull out the connector while pressing it firmly from the top and bottom.

4. Secure the shielded plate using the included hexagonal socket head screws (M2.5×2).
Tightening torque: 0.5 N·m (71 oz-in)

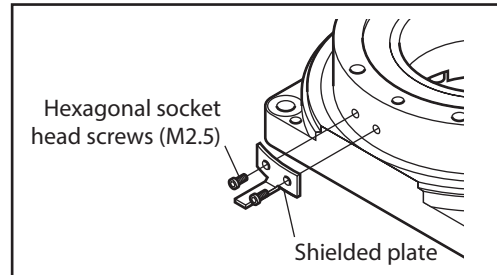
For the **DGM60** type, secure the shielded plate to the back side of the load.

For the **DGM85**, **DGM130** and **DGM200** types, secure the shielded plate to the output table.

DGM60

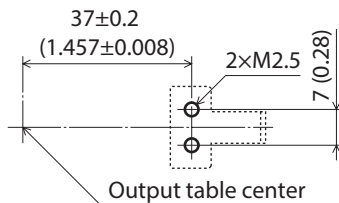


DGM85, DGM130, DGM200

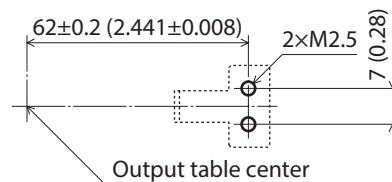


5. In the case of the **DGM60** type, secure the load being attached the shielded plate onto the output table.
Machining dimensions of shielded plate for installation (for the **DGM60** type only)

- When providing mounting holes on the table center side [mm (in.)]



- When providing mounting holes on the opposite side of the table center [mm (in.)]

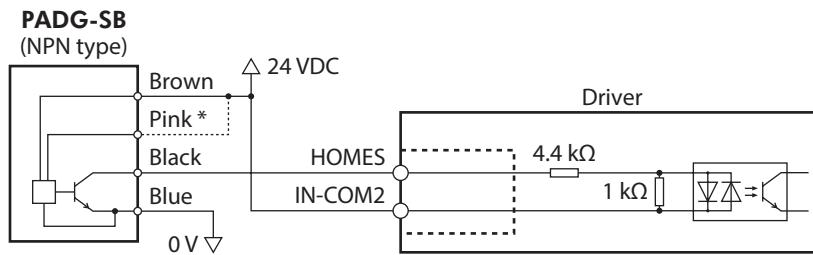


- memo**
- The photomicrosensor is designed for use inside equipment and therefore has no special means of protection against disturbance light. If the actuator is to be used under an incandescent lamp or in conditions that are subject to disturbances from external light, provide the means to prevent such interference.
 - Use the product after checking the sensor is installed securely.
 - Place the power cables such as the motor cable or power supply cable as far apart as possible from the sensor cable. If the power cables and sensor cable have to cross, cross them at a right angle.
 - To prevent sensor deterioration due to temperature, operate the actuator under the following conditions.
 - Actuators equipped with the **AZ** Series:
Ambient operating temperature 0 to +40 °C (+32 to +104 °F), motor surface temperature 80 °C (176 °F) or lower
 - Actuators equipped with the **AR** Series or **RKII** Series:
Ambient operating temperature 0 to +40 °C (+32 to +104 °F), motor surface temperature 90 °C (194 °F) or lower
 - Adhesion of dust on the sensor may cause actuator malfunction. Clean and/or replace the sensor regularly.
 - Use a common GND for the sensor power and user's controller power. Any difference in GND potential will result in a sensor malfunction.

■ Connection example for the home-sensor set PADG-SB (NPN type)

The connection example is shown based on the following conditions.

- Return-to-home mode: 3-sensor mode
- HOMES output logic: Normally open
- Driver: **AR** Series FLEX Built-in Controller Type

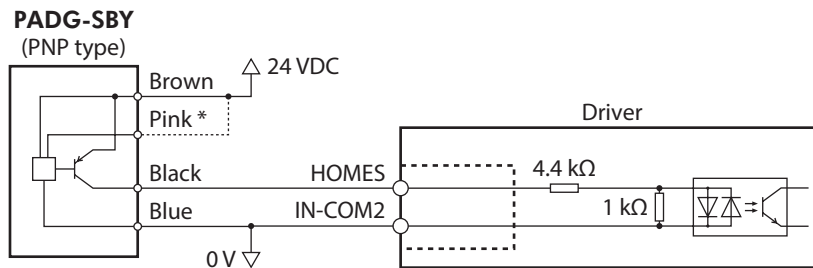


* The logic of the sensor varies depending on the connection method. When the pink color lead is connected to the brown color lead, the sensor logic will be “normally closed.”

■ Connection example for the home-sensor set PADG-SBY (PNP type)

The connection example is shown based on the following conditions.

- Return-to-home mode: 3-sensor mode
- HOMES output logic: Normally open
- Driver: **AR** Series FLEX Built-in Controller Type



* The logic of the sensor varies depending on the connection method. When the pink color lead is connected to the brown color lead, the sensor logic will be “normally closed.”

6 Maintenance and inspection

6-1 Inspection

This chapter explains the maintenance items in order to operate an actuator safely and efficiently. If an abnormal condition is noted on the actuator, discontinue any use and contact your nearest Oriental Motor sales office.

■ Inspection interval

If the actuator is operated eight hours a day, perform maintenance according to the applicable period specified in the table.

Reduce maintenance intervals accordingly if the operating rate is high such as continuous operation for twenty-four hours.

Maintenance timing	Inspection	Cleaning
When operated for the first time	○	–
Six months after initial operation	○	–
Every six months thereafter	○	–
As needed	–	○

■ During inspection

- Check if any of the screws having installed the actuator comes loose.
- Check if any of the screws having installed a load comes loose.
- Check if a damage or stress is applied on the cable.
- Check if the connection part between the motor and driver comes loose.
- Check if an unusual noise or vibration is generated from a bearing part (ball bearings).

■ Cleaning

- Wipe off any dirt and stains using a soft cloth. To remove stubborn stains, wipe the area using a soft cloth moistened with neutral detergent.
- Do not apply compressed air. Dust may enter through gaps.
- Do not use petroleum solvents, since they will damage the coated surface.

6-2 Warranty

Check on the Oriental Motor Website or General Catalog for the product warranty.

6-3 Disposal

Dispose the product correctly in accordance with laws and regulations, or instructions of local governments.

7 Standards, general specifications

7-1 Standards

■ UL Standard and CSA Standard

Check the "APPENDIX UL Standards" of each product for recognition information about UL Standards of the equipped motor.

■ EU Directives

● CE Marking

Low Voltage Directive

Motors of AC power input type are affixed the CE Marking under the Low Voltage Directive.

Applicable Standards	EN 60034-1, EN 60034-5, EN 60664-1
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For the actuators equipped with the **AR** Series, they are certified by TÜV Rheinland under the EN 60034-1. (Except for the model DGM200R-ARMC.)

● EMC Directive

The equipped motor conforms to the EMC Directive in a state where the motor is connected with the driver. Refer to the OPERATING MANUAL Driver for details.

■ RoHS Directive

The products do not contain the substances exceeding the restriction values of RoHS Directive (2011/65/EU).

7-2 Specifications

Check on the Oriental Motor Website for the product specifications.

7-3 General specifications

■ Installation conditions

The product described in this manual has been designed and manufactured to be incorporated in general industrial equipment.

	Actuators equipped with the AZ Series, RKII Series		Actuators equipped with the AR Series	
	DC power supply	AC power supply	DC power supply	AC power supply
Input power supply	DC power supply	AC power supply	DC power supply	AC power supply
Overvoltage category	I	II	I	II
Protection against electric shock	Class I equipment		Class III equipment	Class I equipment
Pollution degree	2			
Degree of protection	IP40 (IP20 for the motor connector)		IP40 [IP20 for the standard (double shaft) and motor connector]	

■ Environmental conditions

	Operating environment	Storage environment	Shipping environment
Ambient temperature	<ul style="list-style-type: none"> • Actuators equipped with the AZ Series 0 to +40 °C (+32 to +104 °F) (Non-freezing) • Actuators equipped with the AR Series, RKII Series When the home-sensor is not used: 0 to +50 °C (+32 to 122 °F) (Non-freezing) When the home-sensor is used: 0 to +40 °C (+32 to +104 °F) (Non-freezing) 	-20 to +60 °C (-4 to +140 °F) (Non-freezing)	
Ambient humidity	85% or less (Non-condensing)		
Altitude	Up to 1,000 m (3,300 ft.) above sea level	Up to 3,000 m (10,000 ft.) above sea level	

8 Power supply current capacity

8-1 Actuator equipped with the AZ Series

■ AC power input type

Model	Actuator model	Driver			Control power supply 24 VDC±5% *	
		Driver model	Power supply input voltage	Frequency		
DG85R-AZ□A-□	DGM85R-AZ□C	AZD-A	Single-phase 100-120 V -15 to +6%	50/60 Hz	2.7 A or more	0.25 A or more (0.33 A or more)
DG130R-AZ□A-□	DGM130R-AZ□C				3.8 A or more	0.25 A or more (0.5 A or more)
-	DGM130R-AZ□C□				6.4 A or more	0.25 A or more (0.5 A or more)
DG200R-AZ□A-□	DGM200R-AZ□C					
-	DGM200R-AZ□C□	AZD-C	Single-phase / Three-phase 200-240 V -15 to +6%		Single-phase 1.7 A or more Three-phase 1.0 A or more	0.25 A or more (0.33 A or more)
DG85R-AZ□C-□	DGM85R-AZ□C				Single-phase 2.3 A or more Three-phase 1.4 A or more	0.25 A or more (0.5 A or more)
DG130R-AZ□C-□	DGM130R-AZ□C				Single-phase 3.9 A or more Three-phase 2.3 A or more	0.25 A or more (0.5 A or more)
-	DGM130R-AZ□C□					
DG200R-AZ□C-□	DGM200R-AZ□C	AZD-AD	Single-phase 100-120 V -15 to +6%		2.7 A or more	0.25 A or more (0.33 A or more)
-	DGM200R-AZ□C□				3.8 A or more	0.25 A or more (0.5 A or more)
DG85R-AZ□AD-□	DGM85R-AZ□C				6.4 A or more	0.25 A or more (0.5 A or more)
DG130R-AZ□AD-□	DGM130R-AZ□C					
-	DGM130R-AZ□C□	AZD-CD	Single-phase / Three-phase 200-240 V -15 to +6%	Single-phase 1.7 A or more Three-phase 1.0 A or more	0.25 A or more (0.33 A or more)	
DG200R-AZ□AD-□	DGM200R-AZ□C			Single-phase 2.3 A or more Three-phase 1.4 A or more	0.25 A or more (0.5 A or more)	
-	DGM200R-AZ□C□			Single-phase 3.9 A or more Three-phase 2.3 A or more	0.25 A or more (0.5 A or more)	
DG85R-AZ□CD-□	DGM85R-AZ□C					
DG130R-AZ□CD-□	DGM130R-AZ□C	AZD-AX	Single-phase 100-120 V -15 to +6%	2.7 A or more	0.25 A or more (0.33 A or more)	
-	DGM130R-AZ□C			3.8 A or more	0.25 A or more (0.5 A or more)	
-	DGM130R-AZ□C□			6.4 A or more	0.25 A or more (0.5 A or more)	
-	DGM200R-AZ□C					
-	DGM200R-AZ□C□	AZD-CX	Single-phase / Three-phase 200-240 V -15 to +6%	Single-phase 1.7 A or more Three-phase 1.0 A or more	0.25 A or more (0.33 A or more)	
-	DGM85R-AZ□C			Single-phase 2.3 A or more Three-phase 1.4 A or more	0.25 A or more (0.5 A or more)	
-	DGM130R-AZ□C			Single-phase 3.9 A or more Three-phase 2.3 A or more	0.25 A or more (0.5 A or more)	
-	DGM130R-AZ□C□					
-	DGM200R-AZ□C	Single-phase 3.9 A or more Three-phase 2.3 A or more	0.25 A or more (0.5 A or more)			
-	DGM200R-AZ□C□					

* The 24 VDC power supply is the power supply for the control circuit. Be sure to connect it.

If the distance between an actuator with an electromagnetic brake and driver is extended to 20 m (65.6 ft.), use a power supply of 24 VDC±4%.

The parentheses () indicate the value for the electromagnetic brake type.

■ DC power input type

Model	Actuator model	Driver		
		Driver model	Power supply input voltage	Power supply current capacity *2
-	DGM60-AZAK	AZD-K AZD-KX AZD-KD	24 VDC±5%	1.6 A or more
		AZD□A-KS3 AZD□A-KM3 AZD□A-KED		7.0 A or more
-	DGM85R-AZ□K	AZD-K AZD-KX AZD-KD	24 VDC±5% *1 48 VDC±5%	1.72 A or more (1.8 A or more)
		AZD□A-KS3 AZD□A-KM3 AZD□A-KED		7.0 A or more
-	DGM130R-AZ□K□	AZD-K AZD-KX AZD-KD	24 VDC±5% *1 48 VDC±5%	3.55 A or more (3.8 A or more)
		AZD□A-KS3 AZD□A-KM3 AZD□A-KED		7.0 A or more

*1 If the distance between an actuator with an electromagnetic brake and driver is extended to 20 m (65.6 ft.), use a power supply of 24 VDC±4%.

*2 The parentheses () indicate the value for the electromagnetic brake type.

8-2 Actuator equipped with the AR Series

■ AC power input type

● Built-in controller type

Model	Actuator model	Driver				Control power supply 24 VDC±5% *
		Driver model	Power supply input voltage	Frequency	Power supply current capacity	
DG85R-AR□AD□-□	DGM85R-AR□C	ARD-AD LSD-AD	Single-phase 100-120 V -15 to +6%	50/60 Hz	2.4 A or more	0.25 A or more
DG130R-AR□AD□-□	DGM130R-AR□C				3.6 A or more	0.25 A or more (0.5 A or more)
DG200R-AR□AD□-□	DGM200R-AR□C				5.9 A or more	0.25 A or more (0.5 A or more)
DG85R-AR□CD□-□	DGM85R-AR□C	ARD-CD LSD-CD	Single-phase 200-240 V -15 to +6%	50/60 Hz	1.5 A or more	0.25 A or more
DG130R-AR□CD□-□	DGM130R-AR□C				2.3 A or more	0.25 A or more (0.5 A or more)
DG200R-AR□CD□-□	DGM200R-AR□C				3.7 A or more	0.25 A or more (0.5 A or more)

* The 24 VDC power supply is the power supply for the control circuit. Be sure to connect it.

If the distance between an actuator with an electromagnetic brake and driver is extended to 20 m (65.6 ft.) to 30 m (98.4 ft.), use a power supply of 24 VDC±4%.

The parentheses () indicate the value for the electromagnetic brake type.

● Pulse input type

Model	Actuator model	Driver				Control power supply 24 VDC±5% *
		Driver model	Power supply input voltage	Frequency	Power supply current capacity	
DG85R-AR□A□-□	DGM85R-AR□C	ARD-A LSD-A	Single-phase 100-115 V -15 to +10%	50/60 Hz	2.9 A or more	0.5 A or more
DG130R-AR□A□-□	DGM130R-AR□C				4.4 A or more	0.5 A or more (0.75 A or more)
DG200R-AR□A□-□	DGM200R-AR□C				6.5 A or more	0.5 A or more (0.75 A or more)
DG85R-AR□C□-□	DGM85R-AR□C	ARD-C LSD-C	Single-phase 200-230 V -15 to +10%		1.9 A or more	0.5 A or more
DG130R-AR□C□-□	DGM130R-AR□C				2.7 A or more	0.5 A or more (0.75 A or more)
DG200R-AR□C□-□	DGM200R-AR□C				4.1 A or more	0.5 A or more (0.75 A or more)
DG85R-AR□S□-□	DGM85R-AR□C	ARD-S LSD-S	Three-phase 200-230 V -15 to +10%		1.0 A or more	0.5 A or more
DG130R-AR□S□-□	DGM130R-AR□C				1.4 A or more	0.5 A or more (0.75 A or more)
DG200R-AR□S□-□	DGM200R-AR□C				2.2 A or more	0.5 A or more (0.75 A or more)

* If an actuator with an electromagnetic brake is used, be sure to connect a 24 VDC power supply as the electromagnetic brake power.

If the distance between an actuator with an electromagnetic brake and driver is extended to 20 m (65.6 ft.) to 30 m (98.4 ft.), use a power supply of 24 VDC±4%.

The parentheses () indicate the value for the electromagnetic brake type.

■ DC power input type

Model	Actuator model	Driver		
		Driver model	Power supply input voltage	Power supply current capacity
DG60-AR□K□-□	DGM60-AR□K	ARD-K LSD-K	24 VDC±10%	0.9 A or more
DG60-AR□KD□-□	DGM60-AR□K	ARD-KD LSD-KD	24 VDC±5%	1.25 A or more

8-3 Actuator equipped with the RKII Series

■ AC power input type

Model	Actuator model	Driver				Control power supply
		Driver model	Power supply input voltage	Frequency	Power supply current capacity	
DG85-RKSAA-□	DGM85-5PKEAC	RKSD503-A	Single-phase 100-120 V -15 to +10%	50/60 Hz	1.9 A or more	-
DG130-RKSAA-□	DGM130-5PKEAC	RKSD507-A			3.8 A or more	
DG85-RKSAC-□	DGM85-5PKEAC	RKSD503-C	Single-phase 200-240 V -15 to +10%		1.2 A or more	
DG130-RKSAC-□	DGM130-5PKEAC	RKSD507-C			2.4 A or more	
DG85-RKSAAD-□	DGM85-5PKEAC	RKSD503-AD	Single-phase 100-120 V -15 to +10%		1.9 A or more	24 VDC± 5% 0.2 A or more
DG130-RKSAAD-□	DGM130-5PKEAC	RKSD507-AD			3.8 A or more	
DG85-RKSACD-□	DGM85-5PKEAC	RKSD503-CD	Single-phase 200-240 V -15 to +10%		1.2 A or more	
DG130-RKSACD-□	DGM130-5PKEAC	RKSD507-CD			2.4 A or more	

9 Accessories

■ Home-sensor set

Home-sensor set model	Applicable product	Sensor output
PADG-SA	DGM60	NPN
PADG-SB	DGM85, DGM130, DGM200	
PADG-SAY	DGM60	PNP
PADG-SBY	DGM85, DGM130, DGM200	

■ Installation pedestal

Check in the table for applicable products of the installation pedestals.

● Equipped with the AZ Series

Installation pedestal model name	Actuator model	Standard	With electromagnetic brake
MDG60B	DGM60	✓	
MDG85A2	DGM85	✓	
MDG85B2		✓	✓
MDG130A2	DGM130	✓*	
MDG130B2		✓*	✓*
MDG200A	DGM200	✓*	
MDG200B		✓*	✓*

* The cable outlet direction is downward only.

● Equipped with the AR Series

Installation pedestal model name	Actuator model	Standard	Standard (double shaft) With electromagnetic brake
MDG60A	DGM60	✓	
MDG60B		✓	✓
MDG85A2	DGM85	✓	
MDG85B2		✓	✓
MDG130A2	DGM130	✓	
MDG130B2		✓	✓
MDG200A	DGM200	✓	
MDG200B		✓	✓

● Equipped with the RKII Series

Installation pedestal model name	Actuator model	Standard
MDG85A2	DGM85	✓
MDG85B2		✓
MDG130A2	DGM130	✓
MDG130B2		✓

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