Oriental motor

HG-9039-2

Worm Gearhead

OPERATING MANUAL

Thank you for purchasing an Oriental Motor product.

This Operating Manual describes product handling procedures and safety precautions.

- Please read the operating manual (this document) and the operating manual of the combined motor thoroughly to ensure safe operation.
- Always keep the manual where it is readily available.

1 Before using the product

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

Related operating manual

The operating manual (this document) is not included with the product. Download it from Oriental Motor Website Download Page or contact your nearest Oriental Motor sales office.

RoHS Directive

This product does not contain the substances exceeding the restriction values.

2 Safety precautions

The precautions described below are intended to ensure the safe and proper use of the product and to prevent the user and other personnel from exposure to the risk of injury. Use the product only after carefully reading and fully understanding these instructions.

Description of signs

⚠ WARNING	Handling the product without observing the instructions that accompany a "WARNING" symbol may result in serious injury or death.
⚠ CAUTION	Handling the product without observing the instructions that accompany a "CAUTION" symbol may result in injury or property damage.
Note	The items under this heading contain important handling instructions that the user should observe to ensure safe use of the product.

Explanation of graphic symbols

Indicates "prohibited" actions that must not be performed.

Indicates "compulsory" actions that must be performed.

⚠ WARNING	
	• Do not disassemble or modify the worm gearhead. Doing so may result in injury or damage to equipment. Refer all such internal inspections and repairs to the branch or sales office from which you purchased the product.
	• Be sure to install the parallel key on the gearhead output shaft to be combined. A load may fall, causing injury or damage to equipment. • Check the rotation direction of the output shaft before installing the product on equipment. Failure to do so may result in injury or damage to equipment. • The worm gearhead is not completely self-locking. When using the product in a vertical drive application such as elevating equipment, provide a safety device to prevent a load from falling. Failure to do so may result in injury or damage to equipment.

⚠ CAUTION	
	• Do not use the worm gearhead beyond the specifications. Doing so may result in injury or damage to equipment. • Do not touch the rotating part during operation. Doing so may result in injury. • Do not remove the motor (with gearhead) in a condition where a load is installed. Doing so may result in injury or damage to equipment.
	• Install the included safety cover on the rotating part. Failure to do so may result in injury. • When assembling the worm gearhead with the motor (with gearhead), exercise caution not to pinch your fingers or other parts of your body. This may cause injury. • When installing the worm gearhead on the mounting plate, exercise caution not to pinch your fingers or other parts of your body. This may cause injury. • Securely assemble the worm gearhead with the motor before operating it. Failure to do so may result in injury or damage to equipment. • Before installing the product on equipment to start operation, make sure that the motor can be stopped in case of an emergency. Failure to do so may result in injury.

3 Precautions for use

This chapter covers restrictions and requirements the user should consider when using the product.

Installation

Grease

On rare occasions, grease may ooze out from the worm gearhead. If there is concern over possible environmental contamination resulting from the leakage of grease, check for grease stains during regular inspections. Alternatively, install an oil pan or other device to prevent damage resulting from contamination. Grease leakage may lead to problems in the user's equipment or products.

When using in low temperature environment

When used in environments with low ambient temperatures, the motor may take a long time to start rotating or the speed may drop. This is due to an increase in the friction torque of the oil seal used for the worm gearhead. As the operation time passes, the sliding part of the oil seal will warm up and fit, and the friction torque decreases, allowing operation at the required speed.

To prevent seizure

When assembling the worm gearhead with the motor (with gearhead), apply molybdenum disulfide grease to the inserting section of the output shaft.

Operations

Self locking

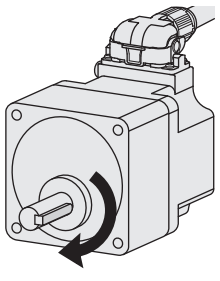
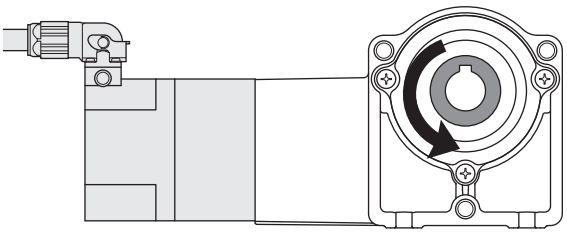
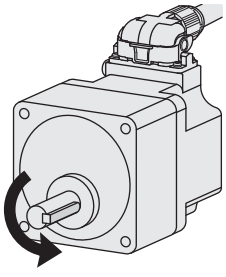
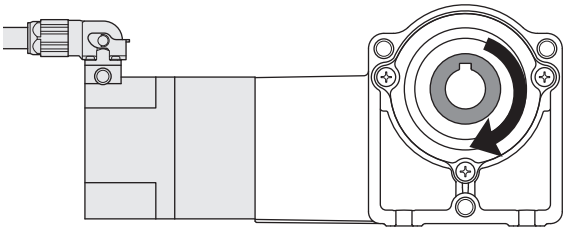
Self-locking refers to the condition in which the input shaft does not rotate when the output shaft is attempted to rotate from the outside in a stopped state due to the mechanism of the worm gearhead.
The effect of the self-locking may be reduced when shock or vibration is applied.
The worm gearhead does not provide a complete self-locking effect. When using the product in a vertical drive application such as elevating equipment, provide a safety device to prevent a load from falling.

Do not perform instantaneous bidirectional operation of the motor.

This may cause damage to the product.

Rotation direction of the worm gearhead output shaft and the motor (with gearhead) output shaft

The rotation direction of the parallel shaft gearheads varies depending on the gear ratio. Refer to the operating manual of the motor combined.

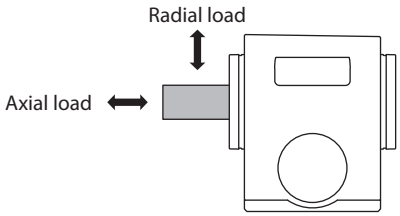
Parallel shaft gearhead Rotation direction of output shaft	Rotation direction of worm gearhead output shaft
	
	

● Use an electromagnetic brake motor in a vertical drive application such as elevating equipment.

To hold the position of a load, use an electromagnetic brake motor in a vertical drive application such as elevating equipment.

● Permissible radial load and permissible axial load

The radial load and the axial load have a great influence on the life of the bearings and the strength of the shaft. Make sure that the permissible radial load and the permissible axial load are not exceeded.



Note Failure due to fatigue may occur when the bearings and output shaft are repeatedly subjected to a radial or axial load that exceeds the permissible limit.

● About push-motion operation

Do not perform push-motion operation. This may cause damage to the product.

4 Checking the product

This chapter explains the items you should check and the name and function of each part.

4-1 Package contents

Verify that the items listed below are included.

Report any missing or damaged items to the branch or sales office from which you purchased the product.

☐ Worm Gearhead..... 1 unit
☐ Parallel key..... 1 piece
☐ Safety cover..... 1 piece
☐ Instructions and Precautions for Safe Use..... 1 copy

4-2 How to identify the product model

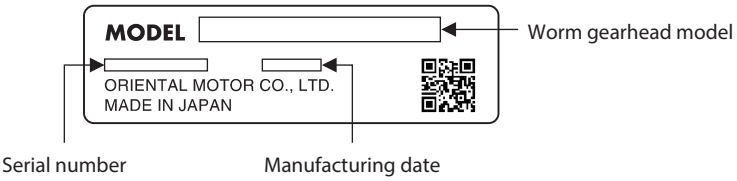
Verify the model name of the worm gearhead against the model shown on the package label or the nameplate of the product.

AGW	2	G	10	H	-	B
1	2		3	4		5

1	Gearhead type	**AGW**: Worm gearhead
2	Frame size of combined product	**2**: 60 mm (2.36 in.)
3	Gear ratio	Number: Gear ratio of worm gearhead
4	Output shaft shape	**H**: Hollow shaft gearhead
5	Output shaft diameter of combined product	**B**: Ø10 mm (Ø0.39 in.), key width 4 mm (0.1575 in.) [parallel shaft gear head]

4-3 Information about nameplate

The figure shows an example.



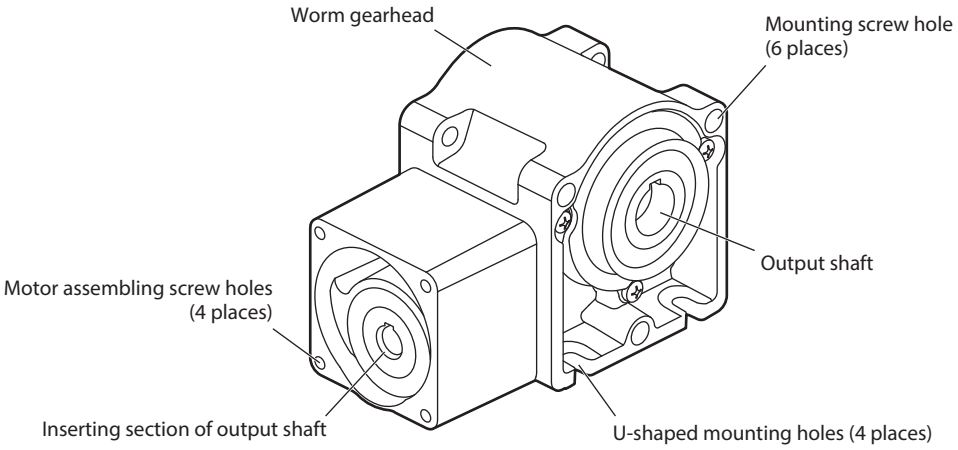
4-4 Products that can be combined

Products that can be combined with the worm gearhead are shown below.
Refer to the operating manual of the motor combined.

Worm gearhead model	Products that can be combined		
	Series name		Gear ratio
AGW2G10H-B	**BMU** Series **BLE2** Series **BX**Ⅱ Series **BLH** Series	Parallel shaft gearhead frame size 60 mm (2.36 in.)	**5**, **10**, **15**, **20**, **30**
AGW2G20H-B			**5**, **10**, **15**, **20**

Note If the gear ratio other than the one described is combined, a torque exceeding the permissible torque will be generated. Therefore, be sure to use the product in combination with the gear ratio described in the table above. Failure to do so may result in damage to the product.

4-5 Names of parts



5 Installation

This chapter explains the installation location, the installation method, and how to install a load.

5-1 Installation location

The installation conditions are shown below. Refer to the operating manual of the motor combined.
The worm gearhead is designed and manufactured to be incorporated in 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: 0* to +50 °C (+32 to 122 °F) [non-freezing]
- Operating ambient humidity: 85 % or less [non-condensing]
- Area free of explosive atmosphere, 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 (3,000 ft.) above sea level

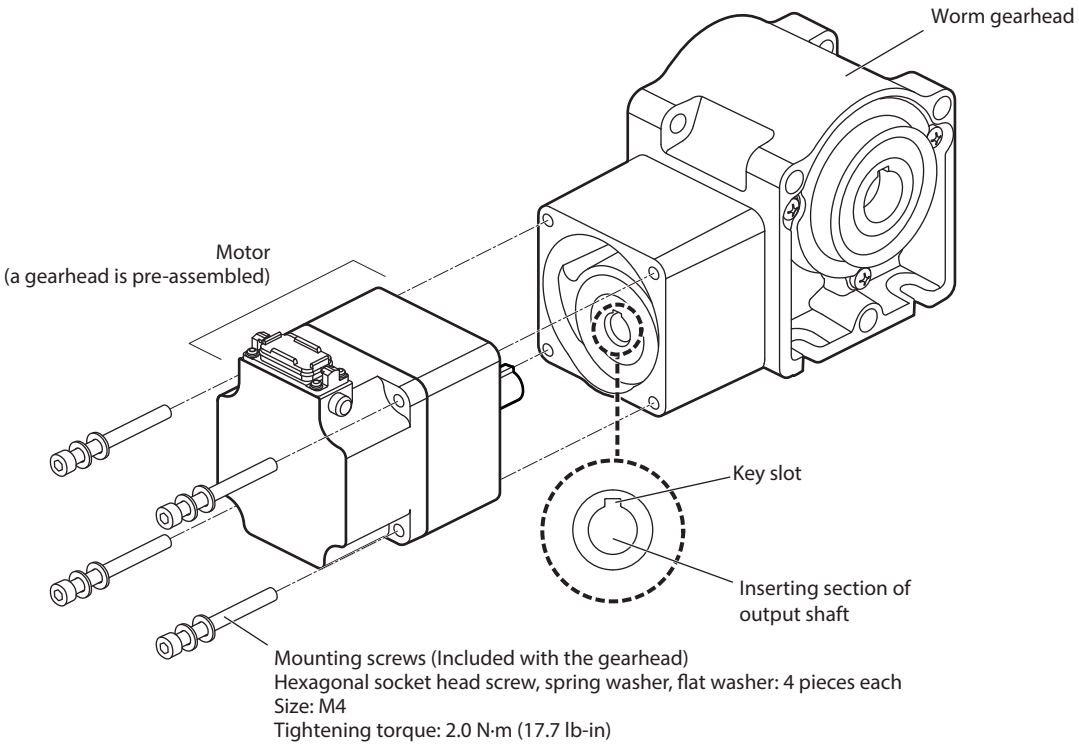
* Use at an operating ambient temperature of +10 °C (+50 °F) or higher for the following combination.
Parallel shaft gearhead: Gear ratio "**5**"
Worm gearhead: Gear ratio "**10**"

5-2 Installation method of worm gearhead

In this section, the term "motor" refers to the condition in which the motor and gearhead are assembled.

Assembling the motor

1. Check that the parallel key is fitted to the output shaft of the motor before assembling the worm gearhead with the motor.
2. Check that there is no gap between the worm gearhead and the motor, and assemble them using the mounting screws (4 pieces).

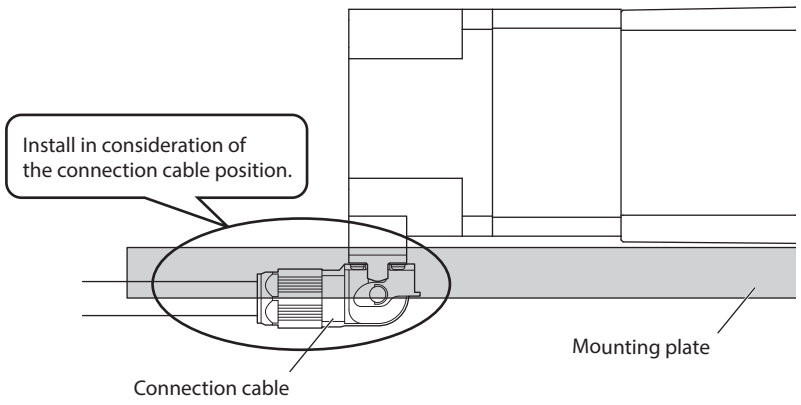


Note

- Do not forcibly assemble the worm gearhead with the motor. Doing so may result in abnormal noise or shorter service life.
- When assembling the motor, exercise caution not to pinch your fingers or other parts of your body. This may cause injury.
- When using the tapped holes, do not use screws which length exceeds the effective depth. This may cause damage to the product.

Cable outlet position

If the worm gearhead is assembled with the motor using the U-shaped mounting holes in a state where the motor cable outlet is downward, the connection cable interferes with the mounting plate.



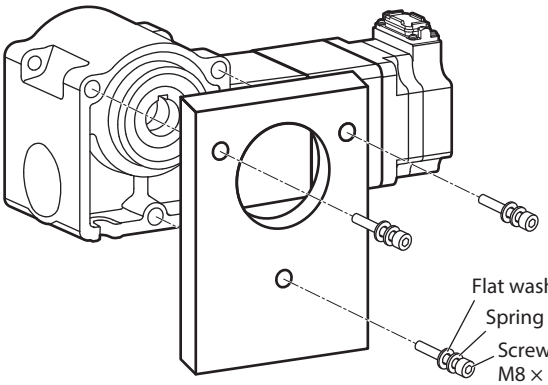
Installing to equipment

Use one of the following methods to install the product.

Make sure that there is no gap between the mounting plate having excellent vibration resistance and the worm gearhead before installing the product.

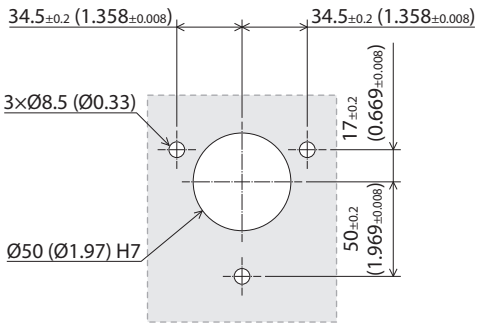
Screws for mounting are required separately.

● Flange mount



Reference mounting hole dimensions

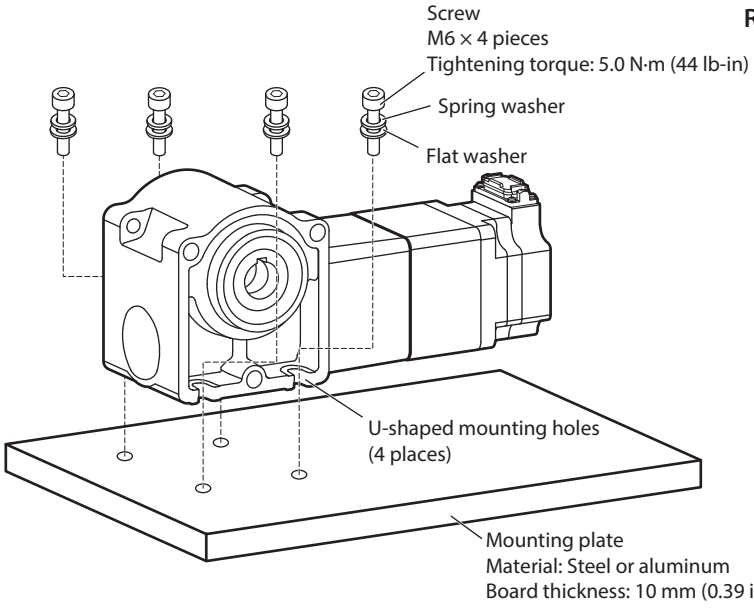
[Unit: mm (in.)]



Note

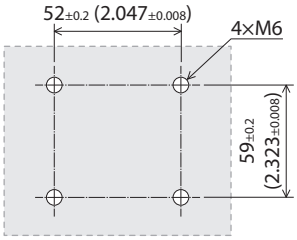
When using the gearhead flange to install the product to equipment, proper alignment between the inner walls of the hollow output shaft and the load shaft is required. Keep the alignment tolerance within 0.02 mm (0.0008 in.). Insufficient alignment may result in damage to the gearhead internal bearings.

● Foot mount



Reference mounting hole dimensions

[Unit: mm (in.)]



5-3 Installing a load

Refer to the table below for the hollow output shaft inner diameter and the recommended load shaft dimensions. Installation of a load varies depending on the shape of the load shaft.
Refer to the figures below.
The hollow output shaft is machined to an inner diameter tolerance of H8 and is provided with a key slot for installing a load shaft. A load shaft tolerance of h7 is recommended. Apply molybdenum disulfide grease on the surface of the load shaft and on the inner walls of the hollow output shaft to prevent seizure. Install the included safety cover as a protection cover for the rotating part of the gearhead.
A retaining ring for hole, spacer, and screw for fixing the load shaft are not included with the product. Provide them separately.

Note

- Do not apply excessive or abrupt force to the hollow output shaft when inserting a load shaft into the hollow output shaft. Excessive or abrupt force may damage the gearhead internal bearings.
- Be sure to fix the parallel key to the load shaft to be inserted into the hollow output shaft.
- Do not remove the motor in a state where a load is installed. This may cause a load to fall.
- Worm gearhead: The output shaft of the gear ratio "**20**" cannot be rotated from the outside. Operate the motor for position adjustment and alignment to equipment. Also, be careful not to pinch.

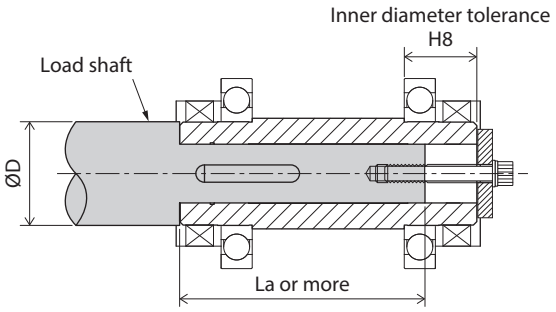
Hollow output shaft inner diameter and recommended load shaft dimensions [Unit: mm (in.)]

Inner diameter of hollow shaft (H8)	Load shaft diameter (h7)
Ø17 $^{+0.027}_{0}$ (Ø0.6693 $^{+0.0011}_{0}$)	Ø17 $^{0}_{-0.018}$ (Ø0.6693 $^{0}_{-0.0007}$)

Nominal diameter of retaining ring for hole	Applicable screws
Ø17 (Ø0.6693) C type retaining ring	M5

Spacer thickness	Stepped shaft outer diameter ØD
4 (0.16)	30 (1.18)

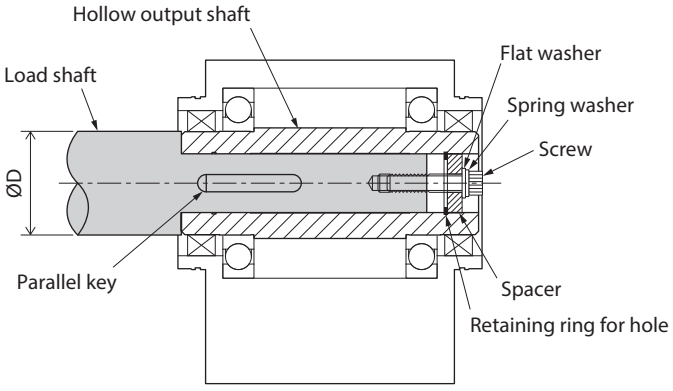
Stepped shaft length La	End plate thickness
71 (2.80)	3 (0.12)



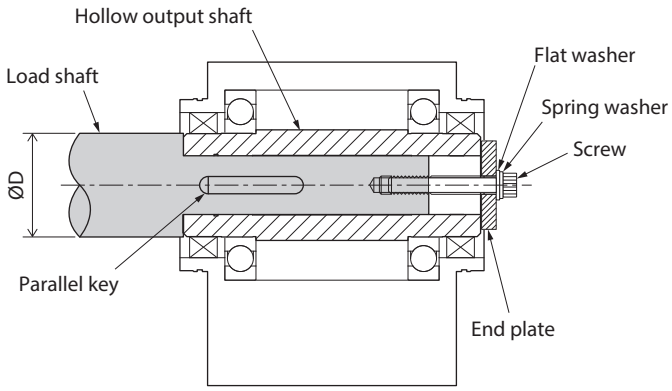
It is recommended that the load shaft be inserted at least 5 mm (0.20 in.) into the part of the inner diameter tolerance H8 of the fixed side.

Installation method for stepped load shaft

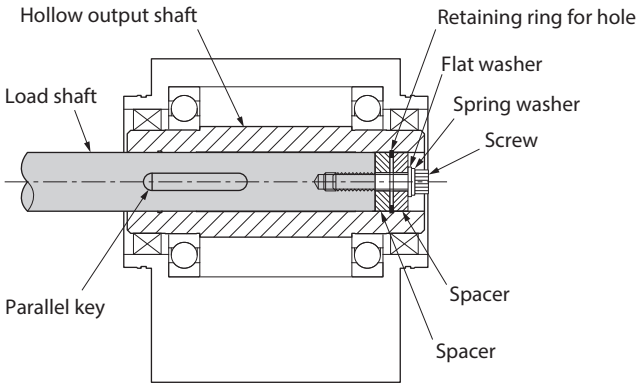
● Mounting method using retaining ring for hole



● **Mounting method using end plate**



Installation method for non-stepped load shaft

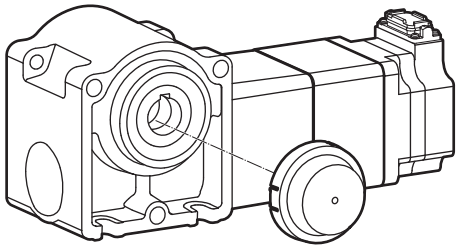


Installing the safety cover

After installing a load, install the included safety cover.

The safety cover can be installed on either side.

When removing the safety cover, insert a plastic stick with a flat tip into the cutout of the safety cover, and remove.



Safety cover
(included)

6 Inspection and maintenance

6-1 Inspection

It is recommended that the following items be checked periodically after each operation of the product. If any abnormality occurs, discontinue use of the product and contact your nearest Oriental Motor sales office.

Inspection items

- Check to see if any of the mounting screws of the worm gearhead are loose.
- Check to see if the meshing part of the bearing part (ball bearings) of the worm gearhead is making unusual noises.
- Check to see if the load mounting screw is loose.
- Check to see if the output shaft of the worm gearhead is misaligned with a load shaft

6-2 Warranty

Check on the Oriental Motor Website for the product warranty.

6-3 Disposal

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

7 Specifications

7-1 Product specifications

Model	AGW2G10H-B	AGW2G20H-B
Gear ratio	10	20
Maximum input speed [r/min]	800	
Maximum input torque [N·m (lb-in)]	3.3 (29)	2.5 (22)
Maximum permissible torque [N·m (lb-in)]	20 (177)	
Permissible radial load [N (lb.)] [Distance from flange-mounting surface 20 mm (0.79 in.)]	900 (200)	
Permissible axial load [N (lb.)]	250 (56)	
Mass [kg (lb)]	1.9 (4.2)	

Self-locking torque (reference value) **AGW2G20H-B**: 20 N·m (177 lb-in)

The value may decrease if shock or vibration is applied.

• Transmission efficiency

Model	Rotation speed of motor output shaft	Gear ratio to be combined				
		5	10	15	20	30
AGW2G10H-B	2 r/min or more	44 %	55 %	60 %		
	3000 r/min					
	4000 r/min	32 %				
AGW2G20H-B	2 r/min or more	32 %	37 %	40 %		–
	3000 r/min					
	4000 r/min	29 %				

The transmission efficiency shown in the table above is the value at a normal temperature. The transmission efficiency of the gearhead varies depending on the ambient temperature.

When used in a low temperature environment, the transmission efficiency may decrease and the output torque may become small.

The output shaft speed and permissible torque of the worm gearhead vary depending on the gear ratio of the parallel shaft gearhead to be combined.

• Output shaft speed

$$N_W = \frac{N_G}{i_W}$$

N_W : Output shaft speed

N_G : Rotation speed of parallel-shaft gearhead to be combined

i_W : Gear ratio of worm gearhead

• Permissible torque

$$T_W = T_G \times i_W \times \eta_W$$

T_W : Permissible torque

T_G : Permissible torque of parallel shaft gearhead to be combined ≤ Permissible input torque

i_W : Gear ratio of worm gearhead

η_W : Transmission efficiency of worm gearhead

7-2 General specifications

Operating environment	Ambient temperature	0* to +50 °C (+32 to +122 °F) [non-freezing]
	Ambient humidity	85 % or less [non-condensing]
	Altitude	Up to 1000 m (3000 ft.) above sea level
	Surrounding atmosphere	No corrosive gas or dust. No water or oil.
Storage environment Shipping environment	Ambient temperature	−20 to +70 °C (−4 to +158 °F) [non-freezing]
	Ambient humidity	85 % or less (non-condensing)
	Altitude	Up to 3000 m (10000 ft.) above sea level
	Surrounding atmosphere	No corrosive gas or dust. No water or oil.

* Use at an operating ambient temperature of +10 °C (+50 °F) or higher for the following combination.
Parallel shaft gearhead: Gear ratio "**5**"
Worm gearhead: Gear ratio "**10**"

- Unauthorized reproduction or copying of all or part of this manual is prohibited.
  If a new copy is required to replace an original manual that has been damaged or lost, please contact your nearest Oriental Motor sales office.
- Oriental Motor shall not be liable whatsoever for any problems relating to industrial property rights arising from use of any information, circuit, equipment or device provided or referenced in this manual.
- Characteristics, specifications and dimensions are subject to change without notice.
- While we make every effort to offer accurate information in the manual, we welcome your input. Should you find unclear descriptions, errors or omissions, please contact the nearest office.
- ***Orientalmotor*** is a registered trademark or trademark of Oriental Motor Co., Ltd., in Japan and other countries.
  Other product names and company names mentioned in this manual may be registered trademarks or trademarks of their respective companies and are hereby acknowledged. The third-party products mentioned in this manual are recommended products, and references to their names shall not be construed as any form of performance guarantee. Oriental Motor is not liable whatsoever for the performance of these third-party products.

Published in June 2025

• Please contact your nearest Oriental Motor office for further information.

ORIENTAL MOTOR U.S.A. CORP.
Technical Support Tel:800-468-3982
8:30am EST to 5:00pm PST (M-F)

ORIENTAL MOTOR (EUROPA) GmbH
Schiessstraße 44, 40549 Düsseldorf, Germany
Technical Support Tel:00 800/22 55 66 22

ORIENTAL MOTOR (UK) LTD.
Blythe Valley Business Park,
Central Blvd Blythe Valley Park,
Solihull B90 8AG, United Kingdom
Tel:+44-1926-671220

ORIENTAL MOTOR (FRANCE) SARL
Tel:+33-1 47 86 97 50

ORIENTAL MOTOR ITALIA s.r.l.
Tel:+39-02-93906347

ORIENTAL MOTOR ASIA PACIFIC PTE. LTD.
Singapore
Tel:1800-842-0280

ORIENTAL MOTOR (MALAYSIA) SDN. BHD.
Tel:1800-806-161

ORIENTAL MOTOR (THAILAND) CO., LTD.
Tel:1800-888-881

ORIENTAL MOTOR (INDIA) PVT. LTD.
Tel:1800-120-1995 (For English)
1800-121-4149 (For Hindi)

TAIWAN ORIENTAL MOTOR CO., LTD.
Tel:0800-060708

SHANGHAI ORIENTAL MOTOR CO., LTD.
Tel:400-820-6516

INA ORIENTAL MOTOR CO., LTD.
Korea
Tel:080-777-2042

ORIENTAL MOTOR CO., LTD.
4-8-1 Higashiueno, Taito-ku, Tokyo
110-8536 Japan
Tel:+81-3-6744-0361
www.orientalmotor.co.jp/ja