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.

### Introduction

#### Before using the motor

Only qualified personnel of electrical and mechanical engineering should work with the product. Use the product correctly after thoroughly reading the section "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 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.

#### Related operating manuals

Operating manuals for this product are listed below.

- **Motor**
  - BLM Motor Connector Type JH Gearhead/ JB Gearhead/ JV Gearhead

- **Driver**
  - OPERATING MANUAL (included with the driver)
  - QUICK START GUIDE (included with the driver)
  - USER MANUAL

- **BMU Series**
  - OPERATING MANUAL (this document)

- **BLE2 Series**
  - OPERATING MANUAL (Basic Function) (included with the driver)
  - USER MANUAL

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.

### 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. Please read and understand these precautions thoroughly before using the product.

#### 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.

- The items under this heading contain important handling instructions that the user should observe to ensure safe use of the product.

#### Note

- Indicates "prohibited" actions that must not be performed.
- Indicates "compulsory" actions that must be performed.

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**Description of graphic symbols**

- **WARNING**
- **CAUTION**
- **Note**

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 contamination of the motor and gearhead are hot, and it may cause a skin burn(s).

- Do not leave anything around the motor that would obstruct ventilation. Doing so may result in damage to equipment.

- Do not carry the product by holding the output shaft for the motor and gearhead or any of the cables. Doing so may result in injury.

- Do not touch the output shaft (end of shaft) for the motor and gearhead with bare hands. Doing so may result in injury.

- When assembling the motor with the gearhead, exercise caution not to pinch your fingers or other parts of your body between the motor and gearhead. Injury may result.

- When installing the motor and gearhead in equipment, exercise caution not to pinch your fingers or other parts of your body between the product and equipment. Injury may result.

- Do not touch the rotating part (output shaft) when operating the motor. Doing so may result in injury.

- Do not step on the motor and gearhead or hang from them. Doing so may result in injury or damage to equipment.
Precautions for use
This chapter covers limitations and requirements the user should consider when using the product.

Be sure to match the motor output power with the driver output power.

Wiring
- Connecting the motor and driver
To connect the motor and driver, always use the dedicated connection cable (sold separately).
Limit the number of times so that attaching/detaching between the connection cable and the motor or driver will not exceed 100 times.
- Connection cable
Do not apply a strong force on the locking lever of the connector for motor connection. Applying a strong force on the locking lever may cause damage. Refer to p.7 for details.

Installation circumstances
- Grease measures
On rare occasions, grease may ooze out from the gearhead. 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. Grease leakage may lead to problems in the customer’s equipment or products.
- Note when using in low temperature environment
When an ambient temperature is low, since the load torque may increase by the oil seal or viscosity increment of grease used in the gearhead, the output torque may decrease or an overload alarm may generate. However, as time passes, the oil seal or grease is warmed up, and the motor can be driven without generating an overload alarm.

Insulation resistance measurement and dielectric strength test
- Do not conduct the insulation resistance measurement or dielectric strength test with the motor and driver connected
Conducting the insulation resistance measurement or dielectric strength test with the motor and driver connected may result in damage to the product.

Operations
- Instantaneous bidirectional operation
Do not perform instantaneous bidirectional operation when a BLM motor of 300 W or 400 W is operated using the BLE2 Series driver. Doing so may cause damage to the product.

Rotation direction of the gearhead output shaft
The rotation direction of the gearhead output shaft with respect to the motor output shaft is shown in the figure below. Check the operating manual included with the driver for the rotation direction of the motor output shaft and the setting method.

Right Angle Hollow Shaft Hypoid Gear JH Gearhead
The figure shows the rotation direction viewed from the gearhead flange surface.

<table>
<thead>
<tr>
<th>Motor output shaft</th>
<th>Gearhead output shaft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor output shaft</td>
<td>Gear ratio: 5 to 30</td>
</tr>
<tr>
<td>Gearhead output shaft</td>
<td>50 to 200</td>
</tr>
</tbody>
</table>

When viewing from the opposite side of the gearhead flange side, the gearhead output shaft rotates in the opposite direction to the above figure.

Foot Mount Gearhead JB Gearhead, Parallel Shaft Gearhead JV Gearhead
The figure shows the foot mount gearhead. The parallel shaft gearhead also rotates in the same direction.

<table>
<thead>
<tr>
<th>Motor output shaft</th>
<th>Gearhead output shaft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor output shaft</td>
<td>Gear ratio: 5 to 10</td>
</tr>
<tr>
<td>Gearhead output shaft</td>
<td>100</td>
</tr>
<tr>
<td>Motor output shaft</td>
<td>Gear ratio: 15 to 20</td>
</tr>
<tr>
<td>Gearhead output shaft</td>
<td>200</td>
</tr>
<tr>
<td>Motor output shaft</td>
<td>Gear ratio: 30</td>
</tr>
<tr>
<td>Gearhead output shaft</td>
<td>50</td>
</tr>
<tr>
<td>Motor output shaft</td>
<td>Gear ratio: 50</td>
</tr>
<tr>
<td>Gearhead output shaft</td>
<td>100</td>
</tr>
<tr>
<td>Motor output shaft</td>
<td>Gear ratio: 100</td>
</tr>
<tr>
<td>Gearhead output shaft</td>
<td>200</td>
</tr>
</tbody>
</table>

About rotation speed and gear ratio
- Maximum rotation speed 3600 r/min
Use the motor in conditions where the motor rotation speed is 3600 r/min or lower.
- Gear ratio and actual reduction ratio
The gear ratio in the model name differs from the actual reduction ratio of the gearhead.
Check the actual reduction ratio in the table below.

Right Angle Hollow Shaft Hypoid Gear JH Gearhead
For 60 W, 120 W

<table>
<thead>
<tr>
<th>Gear ratio</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>30</th>
<th>50</th>
<th>100</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual reduction ratio</td>
<td>10.25</td>
<td>15.38</td>
<td>20.50</td>
<td>30.75</td>
<td>51.25</td>
<td>102.5</td>
<td>205.0</td>
</tr>
</tbody>
</table>

For 200 W or higher

<table>
<thead>
<tr>
<th>Gear ratio</th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>30</th>
<th>50</th>
<th>100</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual reduction ratio</td>
<td>5</td>
<td>10</td>
<td>15</td>
<td>20</td>
<td>30</td>
<td>50</td>
<td>98.95</td>
<td>200</td>
</tr>
</tbody>
</table>

Foot Mount Gearhead JB Gearhead, Parallel Shaft Gearhead JV Gearhead

<table>
<thead>
<tr>
<th>Gear ratio</th>
<th>5</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>50</th>
<th>100</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual reduction ratio</td>
<td>4.97</td>
<td>10.12</td>
<td>20.08</td>
<td>30.86</td>
<td>49.09</td>
<td>104.1</td>
<td>196.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gear ratio</th>
<th>300</th>
<th>450</th>
<th>600</th>
<th>1200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual reduction ratio</td>
<td>300.5</td>
<td>450.8</td>
<td>588.9</td>
<td>1178</td>
</tr>
</tbody>
</table>
Checking the product

This section explains the items you should check, as well as the names of each part.

- **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.

  Right Angle Hollow Shaft Hypoid Gear JH Gearhead
  - Motor..........................................................1 unit
  - Mounting screw........................................1 set
    Hexagonal socket head screw, plain washer, spring washer 4 pieces each
  - Parallel key................................................1 piece
  - Safety cover................................................1 piece
  - OPERATING MANUAL (this document).........1 copy

  Foot Mount Gearhead JB Gearhead
  - Motor..........................................................1 unit
  - OPERATING MANUAL (this document).........1 copy

  Parallel Shaft Gearhead JV Gearhead
  - Motor..........................................................1 unit
  - OPERATING MANUAL (this document).........1 copy

- **How to identify the product model**

  BLM 5 200 H P K - 5 A B 5 B - L

  ① Motor type
  BLM: Brushless Motor
  ② Frame size
  4: 80 mm (3.15 in.) S: 90 mm (3.54 in.)
  ③ Output power
  60: 60 W 120: 120 W 200: 200 W 300: 300 W 400: 400 W
  ④ Motor classification
  S
  ⑤ Motor connection method
  H: Connector type
  ⑥ Degree of protection for motor+1
  P: IP66
  ⑦ Combined motor
  K: Round shaft type (with key)
  ⑧ Frame size of combined motor
  4: 80 mm (3.15 in.) S: 90 mm (3.54 in.)
  ⑨ Gearhead size
  Code, blank (same width as motor)
  ⑩ Gearhead type
  H: JH gearhead B: JB gearhead V: JV gearhead
  ⑪ Gear ratio
  Number: Gear ratio of gearhead
  ⑫ Material of output shaft
  S: Stainless steel B: Carbon steel
  ⑬ Connector position+2
  Blank: Downward - L: Left side

  +1 For the degree of protection for when the motor and the gearhead are assembled, refer to the "General specifications" on p.8.
  +2 The code (-L) at the end of the model name is changed for the product that the motor connector position has been changed.

- **Model**

  Verify the model number of the purchased product against the number shown on the package label.
  Check the model number of the motor and gearhead against the number shown on their nameplates, respectively.
  Enter the gear ratio in the box (⑩) within the model name.
  Enter the code (X, Y, A, C, E, D, K, S) representing the gearhead size in the box (⑨) within the model name.

- **Right Angle Hollow Shaft Hypoid Gear JH Gearhead**

<table>
<thead>
<tr>
<th>Output power</th>
<th>Model*</th>
<th>Motor model</th>
<th>Gearhead model</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 W</td>
<td>BMG600HP-4HC</td>
<td>BLM460HPK</td>
<td>4HC</td>
</tr>
<tr>
<td>120 W</td>
<td>BMG5120HPK-5HC</td>
<td>BLM5120HPK</td>
<td>5HC</td>
</tr>
<tr>
<td>200 W</td>
<td>BMG5200HPK-5HC</td>
<td>BLM5200HPK</td>
<td>5HC</td>
</tr>
<tr>
<td>300 W</td>
<td>BMG5300HPK-5HC</td>
<td>BLM5300HPK</td>
<td>5HC</td>
</tr>
<tr>
<td>400 W</td>
<td>BMG5400HPK-5HC</td>
<td>BLM5400HPK</td>
<td>5HC</td>
</tr>
</tbody>
</table>

  * A code is added to the end of the model name for the product that the motor connector position has been changed.

- **Foot Mount Gearhead JB Gearhead**

<table>
<thead>
<tr>
<th>Output power</th>
<th>Model*</th>
<th>Motor model</th>
<th>Gearhead model</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 W</td>
<td>BMG5200HPK-5B</td>
<td>BLM5200HPK</td>
<td>5B</td>
</tr>
<tr>
<td>300 W</td>
<td>BMG5300HPK-5B</td>
<td>BLM5300HPK</td>
<td>5B</td>
</tr>
<tr>
<td>400 W</td>
<td>BMG5400HPK-5B</td>
<td>BLM5400HPK</td>
<td>5B</td>
</tr>
</tbody>
</table>

  * The code (-L) at the end of the model name is changed for the product that the motor connector position has been changed against the output shaft.

- **Parallel Shaft Gearhead JV Gearhead**

<table>
<thead>
<tr>
<th>Output power</th>
<th>Model*</th>
<th>Motor model</th>
<th>Gearhead model</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 W</td>
<td>BMG5200HPK-5KV</td>
<td>BLM5200HPK</td>
<td>5KV</td>
</tr>
<tr>
<td>300 W</td>
<td>BMG5300HPK-5KV</td>
<td>BLM5300HPK</td>
<td>5KV</td>
</tr>
<tr>
<td>400 W</td>
<td>BMG5400HPK-5KV</td>
<td>BLM5400HPK</td>
<td>5KV</td>
</tr>
</tbody>
</table>

  * A code is added to the end of the model name for the product that the motor connector position has been changed against the mounting surface.

- **Type of gear ratio**

<table>
<thead>
<tr>
<th>Gearhead</th>
<th>Gear ratio+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right Angle Hollow Shaft</td>
<td>5, 10, 15, 20, 30, 50, 100, 200</td>
</tr>
<tr>
<td>Foot mount</td>
<td>5, 10, 20, 30, 50, 100, 200, 300, 450, 600, 1200</td>
</tr>
<tr>
<td>Parallel shaft</td>
<td>100, 200, 300, 450</td>
</tr>
</tbody>
</table>

  + The lineup of the gear ratio varies depending on the motor output power.

- **Information about nameplate**

  - Model
  - BLM5200HPK
  - Motor model
  - Serial number
  - Specification
  - BRUSHLESS MOTOR
  - Manufacturing date

- **Drivers possible to combine**

  Products with which the motors can be combined are listed below.

- **BMU Series**

<table>
<thead>
<tr>
<th>Output power</th>
<th>Model</th>
<th>Driver model</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 W</td>
<td>BMG600</td>
<td>Single-phase 100-120 VAC</td>
</tr>
<tr>
<td></td>
<td>BMG660-A2</td>
<td>Single-phase 200-240 VAC</td>
</tr>
<tr>
<td>120 W</td>
<td>BMG5120</td>
<td>Three-phase 200-240 VAC</td>
</tr>
<tr>
<td></td>
<td>BMG5120-A2</td>
<td>Three-phase 200-240 VAC</td>
</tr>
<tr>
<td>200 W</td>
<td>BMG5200</td>
<td>Three-phase 200-240 VAC</td>
</tr>
<tr>
<td></td>
<td>BMG5200-A</td>
<td>Three-phase 200-240 VAC</td>
</tr>
<tr>
<td>300 W</td>
<td>BMG5300</td>
<td>Three-phase 200-240 VAC</td>
</tr>
<tr>
<td></td>
<td>BMG5300-C</td>
<td>Three-phase 200-240 VAC</td>
</tr>
<tr>
<td>400 W</td>
<td>BMG5400</td>
<td>Three-phase 200-240 VAC</td>
</tr>
<tr>
<td></td>
<td>BMG400-S</td>
<td>Three-phase 200-240 VAC</td>
</tr>
</tbody>
</table>

  * The power supply voltage is three-phase 200-240 VAC only.
## BLE2 Series

<table>
<thead>
<tr>
<th>Output power</th>
<th>Model</th>
<th>Driver model</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 W</td>
<td>BLM460S</td>
<td>BLE2D60-A        BLE2D60-C</td>
</tr>
<tr>
<td>120 W</td>
<td>BLM5120</td>
<td>BLE2D120-A       BLE2D120-C</td>
</tr>
<tr>
<td>200 W</td>
<td>BLM5200</td>
<td>–                 BLE2D200-C</td>
</tr>
<tr>
<td>300 W</td>
<td>BLM5300</td>
<td>–                 BLE2D300-C</td>
</tr>
<tr>
<td>400 W</td>
<td>BLM5400</td>
<td>–                 BLE2D400-C</td>
</tr>
</tbody>
</table>

* The power supply voltage is three-phase 200-240 VAC only.

### Connection cable (sold separately)

To connect the motor and driver, the dedicated connection cable (sold separately) is needed. The connection cables are provided up to 20 m (65.6 ft.). The cable length that can be connected varies depending on the driver used. Check the operating manual included with the driver.

#### Model name and type

**CC 005 HBL F**

- **Cable outlet direction**
  - **F**: Output shaft direction
  - **B**: Opposite to output shaft direction
  - **V**: Vertical direction

- **Cable classification**
  - □: Cable classification

- **Cable length**
  - 005 : 0.5 m (1.6 ft.)
  - 010 : 1 m (3.3 ft.)
  - 015 : 1.5 m (4.9 ft.)
  - 020 : 2 m (6.6 ft.)
  - 025 : 2.5 m (8.2 ft.)
  - 030 : 3 m (9.8 ft.)
  - 040 : 4 m (13.1 ft.)
  - 050 : 5 m (16.4 ft.)
  - 060 : 6 m (19.7 ft.)
  - 070 : 7 m (23.0 ft.)
  - 100 : 10 m (32.8 ft.)
  - 150 : 15 m (49.2 ft.)
  - 200 : 20 m (65.6 ft.)

#### Names of parts

- **Motor**
- **Right Angle Hollow Shaft Hypoid Gear JH Gearhead**

#### Right Angle Hollow Shaft Hypoid Gear JH Gearhead

- **Connector for cable connection**
- **Gearhead**
- **Output shaft**
- **Mounting holes (4 places)**

#### Foot Mount Gearhead JB Gearhead

- **Connector for cable connection**
- **Protective Earth Terminal**
- **Ground terminal**
- **Power connector**
- **Sensor connector (black)**
- **Connectors for driver connection**

### Installation

**This section explains the installation method of a load in addition to the installation location and installation method of the product.**

#### Installation location

Install the product in a well-ventilated location that provides easy access for inspection.

**[Common conditions]**
- Indoors
- Operating ambient temperature: 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 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
- Altitude: Up to 1000 m (3300 ft.) above sea level

**[Right Angle Hollow Shaft Hypoid Gear JH Gearhead, Parallel Shaft Gearhead JV Gearhead]**
- Area not subject to oil (oil droplets) or chemicals
- The motor can be used in an environment that is splashed with water (excluding the part of the connector for driver connection).

**[Foot Mount Gearhead JB Gearhead]**
- Area not subject to splashing water (rain, water droplets), oil (oil droplets) or other liquids
### Installation method

#### Right Angle Hollow Shaft Hypoid Gear JH Gearhead

Secure the motor through four mounting holes using the included mounting screw set. Do not leave a gap between the motor and mounting plate.

#### Foot Mount Gearhead JB Gearhead, Parallel Shaft Gearhead JV Gearhead

Secure the motor onto a flat and smooth mounting plate having excellent vibration resistance with 4 bolts. Do not leave a gap between the motor and mounting plate. Bolts for mounting the product are not included. Provide them separately.

---

#### Foot Mount Gearhead JB Gearhead, Parallel Shaft Gearhead JV Gearhead

<table>
<thead>
<tr>
<th>Gearhead</th>
<th>Gear ratio</th>
<th>Screw size</th>
<th>Material</th>
<th>Tightening torque [N·m (lb-in)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foot mount</td>
<td>5, 10, 20</td>
<td>M8</td>
<td>Stainless steel</td>
<td>5, 10, 20</td>
</tr>
<tr>
<td></td>
<td>30, 50, 100, 200</td>
<td>M10</td>
<td>Stainless steel</td>
<td>15, 50, 100, 200</td>
</tr>
<tr>
<td></td>
<td>300, 450</td>
<td>M12</td>
<td>Stainless steel</td>
<td>45, 220</td>
</tr>
<tr>
<td></td>
<td>600, 1200</td>
<td>M14</td>
<td>Stainless steel</td>
<td>60, 300</td>
</tr>
<tr>
<td>Parallel shaft</td>
<td>100, 200</td>
<td>M10</td>
<td>Stainless steel</td>
<td>100, 200</td>
</tr>
<tr>
<td></td>
<td>300, 450</td>
<td>M12</td>
<td>Stainless steel</td>
<td>300, 450</td>
</tr>
</tbody>
</table>

---

#### Right Angle Hollow Shaft Hypoid Gear JH Gearhead

<table>
<thead>
<tr>
<th>Output power</th>
<th>Gear ratio</th>
<th>Hexagonal socket head screw</th>
<th>Material</th>
<th>Tightening torque [N·m (lb-in)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 W</td>
<td>10 to 200</td>
<td>M6</td>
<td>Stainless steel</td>
<td>95 (3.74) 11 (0.43) 5 (44)</td>
</tr>
<tr>
<td>120 W</td>
<td>10 to 200</td>
<td>M8</td>
<td>Stainless steel</td>
<td>110 (4.33) 10 (0.39) 12 (106)</td>
</tr>
<tr>
<td>200 W or higher</td>
<td>5 to 50</td>
<td>M8</td>
<td>Stainless steel</td>
<td>120 (4.72) 16 (0.63) 12 (106)</td>
</tr>
<tr>
<td>200 W or higher</td>
<td>100, 200</td>
<td>M10</td>
<td>Stainless steel</td>
<td>130 (5.12) 19.5 (0.77) 24 (210)</td>
</tr>
</tbody>
</table>

---

#### Removing/assembling the gearhead

See the following steps to replace the gearhead or to change the position of the connector for cable connection.

**Removing the gearhead from the motor**

Remove the hexagonal socket head screws (4 places) assembling the motor and gearhead, and detach the gearhead from the motor.

**Assembling the gearhead to the motor**

1. Check the key is fitted to the motor output shaft before assembling the gearhead to the motor.
2. Check that there is no gap between the motor and gearhead, and tighten them with hexagonal socket head screws (4 pieces).

---

#### Assembling the gearhead to the motor

<table>
<thead>
<tr>
<th>Screw size</th>
<th>Material</th>
<th>Tightening torque [N·m (lb-in)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>M6</td>
<td>Stainless steel</td>
<td>5 (44)</td>
</tr>
</tbody>
</table>

---

#### Foot Mount Gearhead JB Gearhead, Parallel Shaft Gearhead JV Gearhead

<table>
<thead>
<tr>
<th>Gearhead</th>
<th>Gear ratio</th>
<th>Screw size</th>
<th>Material</th>
<th>Tightening torque [N·m (lb-in)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foot mount</td>
<td>5, 10, 20</td>
<td>M8</td>
<td>Stainless steel</td>
<td>5, 10, 20</td>
</tr>
<tr>
<td></td>
<td>30, 50, 100, 200</td>
<td>M10</td>
<td>Stainless steel</td>
<td>15, 50, 100, 200</td>
</tr>
<tr>
<td></td>
<td>300, 450</td>
<td>M12</td>
<td>Stainless steel</td>
<td>45, 220</td>
</tr>
<tr>
<td></td>
<td>600, 1200</td>
<td>M14</td>
<td>Stainless steel</td>
<td>60, 300</td>
</tr>
<tr>
<td>Parallel shaft</td>
<td>100, 200</td>
<td>M10</td>
<td>Stainless steel</td>
<td>100, 200</td>
</tr>
<tr>
<td></td>
<td>300, 450</td>
<td>M12</td>
<td>Stainless steel</td>
<td>300, 450</td>
</tr>
</tbody>
</table>

---

#### Note

- Do not forcibly assemble the motor and gearhead. The motor output shaft or the gearhead input part may be damaged, resulting in noise or shorter service life.
- Do not allow dust to attach to the pilot sections of the motor and gearhead. Pinching the O-ring at the motor pilot section. Pinching the O-ring may cause to infiltrate foreign objects such as water into the product.
Installing a load

Right Angle Hollow Shaft Hypoid Gear JH Gearhead

Mounting method of the load varies depending on the load shaft conditions. See the following figures.

The hollow output shaft inside dimension is processed to a tolerance of H8, and incorporates a key slot for load shaft attachment. A load shaft tolerance of h7 is recommended. Also, apply anti-seizing agent such as molybdenum disulfide grease on the surface of the load shaft and the bore of the hollow output shaft.

A load can be installed to the hollow output shaft from either right face or left face in the following figure.

- Stepped load shaft
  Mounting method using end plate

- Non-stepped load shaft
  Mounting method using retaining ring

**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 cause damage to the gearhead internal bearings.

**Recommended load shaft installation dimensions**

<table>
<thead>
<tr>
<th>Output power</th>
<th>60 W</th>
<th>120 W</th>
<th>200 W or higher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gear ratio</td>
<td>10 to 200</td>
<td>10 to 200</td>
<td>5 to 50</td>
</tr>
<tr>
<td>Inner diameter of hollow shaft (H8)</td>
<td>( \phi 12 +0.027 -0.006 )</td>
<td>( \phi 15 +0.027 -0.001 )</td>
<td>( \phi 25 +0.033 -0.001 )</td>
</tr>
<tr>
<td>Recommended load shaft dimensions (h7)</td>
<td>( \phi 12 +0.026 -0.006 )</td>
<td>( \phi 15 +0.027 -0.004 )</td>
<td>( \phi 25 +0.033 -0.004 )</td>
</tr>
<tr>
<td>Length of stepped shaft La</td>
<td>55 (2.17)</td>
<td>72 (2.83)</td>
<td>96 (3.78)</td>
</tr>
<tr>
<td>Screw size</td>
<td>M5</td>
<td>M6</td>
<td>M6</td>
</tr>
<tr>
<td>Spacer dimension</td>
<td>Outer diameter</td>
<td>( \phi 11.5 (0.45) )</td>
<td>( \phi 14.5 (0.57) )</td>
</tr>
<tr>
<td>Inner diameter</td>
<td>( \phi 6 (0.24) )</td>
<td>( \phi 7 (0.28) )</td>
<td>( \phi 7 (0.28) )</td>
</tr>
<tr>
<td>Width</td>
<td>3 (0.12)</td>
<td>3 (0.12)</td>
<td>4 (0.16)</td>
</tr>
<tr>
<td>Nominal diameter of retaining ring (C-type retaining ring)</td>
<td>( \phi 12 +0.047 -0.006 )</td>
<td>( \phi 15 +0.059 -0.006 )</td>
<td>( \phi 25 +0.098 -0.006 )</td>
</tr>
<tr>
<td>End plate thickness</td>
<td>3 (0.12)</td>
<td>3 (0.12)</td>
<td>4 (0.16)</td>
</tr>
</tbody>
</table>

- Parts for installing a load shaft including a retaining ring for hole, a spacer, a screw, are not included. The are to be supplied by the customer.

**Foot Mount Gearhead JB Gearhead, Parallel Shaft Gearhead JV Gearhead**

When installing a load on the motor, make sure the following points.

- **Direct connection**
  Shaft center of other equipment
  Align the shaft centers in a straight line.

- **Attaching chains, V-belts, gears, etc.**
  ① Shaft center of other equipment
  ② Tension of chains and V-belts
  ③ Tension of V-belt

**Recommended load shaft length**

Options: La or more

- Installing the safety cover
  After installing the load, attach the included safety cover. The safety cover can be attached to either face.

- **Par**
  Parts for installing a load shaft including a retaining ring for hole, a spacer, a screw, are not included. The are to be supplied by the customer.

- **Improper use example**
  The sprocket is positioned in the reverse direction and the load point moves to the end of the shaft.
**Permissible radial load and permissible axial load**

The radial load and axial load have a great influence on the life of the bearings and strength of the shaft. Do not exceed the permissible radial load and permissible axial load. Check on the Oriental Motor Website for details.

![Permissible loads diagram]

**Note**

Failure due to fatigue may occur when the gearhead bearings and output shaft are subject to repeated loading by a radial or axial load that is in excess of the permissible limit.

**Connection**

**Connecting the motor and driver**

Connect the motor and driver using the connection cable (sold separately).

There are three types of connection cables which cable outlet directions are different.

![Connection cable diagram]

**Note**

Do not apply a strong force on the locking lever of the connector for motor connection. Applying a strong force on the locking lever may cause damage.

**Connection procedures of the motor and connection cable**

The following example explains using the connection cable of “cable outlet in output shaft direction.”

1. **Remove**

   ![Remove connector cap]

   **Connector cap**

2. **Attach**

   Check the cable direction and insert the connector securely.

   ![Attach connector]

   **Position of locking lever**

   **Locking lever**

   **The connector cannot be inserted if the locking lever is turned down.**

3. **Secure**

   Secure the cable with the locking lever so that the cable does not come off.

   ![Secure connection]

   **Be sure to turn down the locking lever till the position shown in the figure.**

   **Secure the connector by turning down the locking lever completely.**

   **Note**

   Do not lift up the product by holding the connection cable. Doing so may cause damage to the product.

**Detaching the connection cable**

Turn up the locking lever to detach the cable.

**The connection cable for relay can be used by connecting up to 2 pieces. Check the operating manual included with the driver.**
Grounding

Ground using the Protective Earth Terminals  of the motor and driver, as well as on the ground terminal of the connection cable. Check the operating manual of the driver for how to ground.

*Note*
Be sure to ground the motor and driver. Failure to do so may result in electric shock or damage to the product.
Static electricity may cause damage to the product if the Protective Earth Terminals are not grounded.

Inspection and maintenance

**Inspection**

It is recommended that periodic inspections for the items listed below are conducted after each operation of the motor. If an abnormal condition is noted, discontinue any use and contact your nearest Oriental Motor sales office.

*Note*
Do not conduct the insulation resistance measurement or dielectric strength test with the motor and driver connected. Doing so may result in damage to the product.

- Inspection item
  - Are any of the mounting screws of the motor and gearhead loose?
  - Are there any abnormal noises from inside of the motor or gearhead?
  - Are the gearhead output shaft and load shaft out of alignment?
  - Are there any scratches, signs of stress or loose driver connections in the cable?

**Warranty**

Check on the Oriental Motor Website for the product warranty.

**Disposal**

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

Peripheral equipment (sold separately)

Peripheral equipment such as couplings and torque arms can be checked on the Oriental Motor Website.

Specifications

Check on the Oriental Motor Website for the product specifications.

General specifications

<table>
<thead>
<tr>
<th>Operation environment</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>0 to +40 °C (+32 to +104 °F) (non-freezing)</td>
<td></td>
</tr>
<tr>
<td>Ambient Humidity</td>
<td>85% or less (non-condensing)</td>
<td></td>
</tr>
<tr>
<td>Altitude</td>
<td>Up to 1000 m (3300 ft.) above sea level</td>
<td></td>
</tr>
<tr>
<td>Surrounding atmosphere</td>
<td>No corrosive gas or dust. Cannot be used in radioactive materials, magnetic field, vacuum or other special environment. Details about the installation location are described on p.4.</td>
<td></td>
</tr>
<tr>
<td>Vibration</td>
<td>Not subject to continuous vibrations or excessive impact. In conformance with JIS C 60068-2-6 “Sinewave vibration test method” Frequency range: 10 to 55 Hz Pulsating amplitude: 0.15 mm (0.006 in.) Sweep direction: 3 directions (X, Y, Z) Number of sweeps: 20 times</td>
<td></td>
</tr>
</tbody>
</table>

Storage environment

| Ambient temperature | −10 to +60 °C (+14 to +140 °F) (non-freezing) |
| Ambient Humidity | 85% or less (non-condensing) |
| Altitude | Up to 1000 m (3300 ft.) above sea level |
| Surrounding atmosphere | No corrosive gas, dust, water or oil. Cannot be used in radioactive materials, magnetic field, vacuum or other special environment. |

Shipping environment

| Degree of protection | Foot mount: IP44 Right angle hollow shaft, parallel shaft: IP66 (IP66 for when the connection cable is attached to the motor. Excluding the connectors for driver connection of the connection cable.) |

Regulations and standards

**UL Standards and CSA Standards**

This product is recognized by UL under the UL and CSA standards. The motor model name represents the model that conforms to the standards.

<table>
<thead>
<tr>
<th>Applicable Standards</th>
<th>Certification Body</th>
<th>Standards File No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL 1004-1</td>
<td>UL</td>
<td>E335369</td>
</tr>
</tbody>
</table>

**E Marking**

This product is affixed the CE Marking under the Low Voltage Directive. The motor model names are the models conform to the directive (CE Marking).

**Low Voltage Directive**

- This product is designed and manufactured to be incorporated in equipment.
- This product cannot be used in IT power distribution systems.
- Install the product within the enclosure in order to avoid contact with hands.
- Ground the Protective Earth Terminals for the motor (or connection cable) and driver securely.
- Isolate the connection cable, power-supply cable and other drive cables from the signal cables by means of double insulation.

**Applicable Standards**

EN 60034-1, EN 60034-5, EN 60664-1

**Installation conditions (EN Standard)**

- For incorporating in equipment
  - Overvoltage category: II
  - Protection against electric shock: Class I
  - Thermal class EN Standards: 120(E)

**The motor temperature rise tests**

The temperature rise tests stipulated in the above standards are conducted in a state where a motor is mounted on a heat radiation plate instead of attaching a gearhead. The size, thickness and material of the heatsink plates are as follows.

<table>
<thead>
<tr>
<th>Model</th>
<th>Size (mm [in.])</th>
<th>Thickness (mm [in.])</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLM460S</td>
<td>135×135 (5.31×5.31)</td>
<td>5 (0.20)</td>
<td>Aluminum alloy</td>
</tr>
<tr>
<td>BLM5120</td>
<td>165×165 (6.50×6.50)</td>
<td>6 (0.24)</td>
<td></td>
</tr>
<tr>
<td>BLM5200</td>
<td>200×200 (7.87×7.87)</td>
<td>6 (0.24)</td>
<td></td>
</tr>
<tr>
<td>BLM5300</td>
<td>250×250 (9.84×9.84)</td>
<td>6 (0.24)</td>
<td></td>
</tr>
</tbody>
</table>

**RoHS Directive**

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

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