

**(RoHS)** RoHS-Compliant

**Brushless DC Motor and Driver Package**

## **BLH Series**

**24 VDC Input 15W / 30W / 50W / 100W**

The Brushless DC Motor and Driver Package **BLH** Series is a 24 VDC Power supply input type, offering a wide speed range of 100 to 3000 r/min. The series consists of various models offering four motor output power of 15 to 100 W. You can choose from a wide variety that meets your specific application.



# BLH Series: 24 VDC Input, Speed-Control

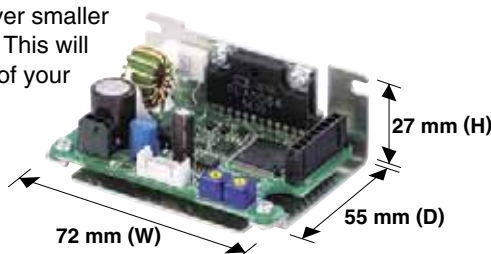
The **BLH** Series combines a slim, high-power brushless DC motor with a compact, needs. Choose from a wide variety offering different outputs of 15 to 100 W to meet The **BLH** Series is also available with a long-life, high-strength gearhead.



## ■ Compact Board-Type Driver

The models with an output of 15 to 50 W adopt a compact, board-type driver smaller than the size of a business card. This will certainly help to reduce the size of your equipment.

The 100 W driver has dimensions of 71 mm (D) × 131 mm (W) × 37.5 mm (H)



### ● Full Range of Driver Functions

The compact driver is packed with a full range of functions.

- Instantaneous stop
- Speed control via potentiometer
- Speed control by DC voltage
- Acceleration/deceleration time setting
- Alarm output

## ■ Wide Variety

The series offers a wide range of models from compact packages with a motor output of 15 W, to larger ones producing a high output of 100 W. Choose one that best suits your specific requirements.

## ■ Long Life Gearhead Rating of 10000 Hours\*

The high-strength gearhead is designed to withstand high-speed revolutions. The rated life of the gearhead is 10000 hours, which is twice as long as that of a conventional gearhead.

\*5000 hours for gearhead equipped with 15 W geared motor.

## Features of Brushless DC Motor

### ● Excellent Speed Stability

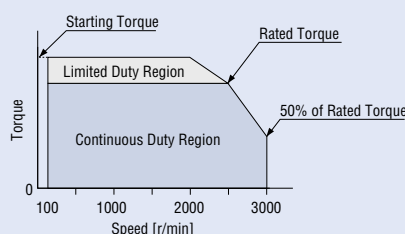
The driver adjusts the current flow to the motor by comparing the feedback signal of motor speed against the set speed, in order to stabilize the motor speed. This mechanism ensures stable driving speeds from low to high, even in situations where the load condition fluctuates.

With the **BLH** Series, the speed regulation is  $\pm 0.5\%$ .

### ● Wide Speed Control Range

In addition to feedback control, the **BLH** Series adopts a unique motor structure design to realize a wide speed variation range.

The motor in the **BLH** Series can be operated at varying speeds of 100 to 3000 r/min (speed ratio 1:30).



### ● Energy-Saving

The brushless DC motor has a permanent magnet assembled into the rotor, so it produces low secondary loss. The **BLH** will contribute to the energy-saving operation of your equipment.

# Motor

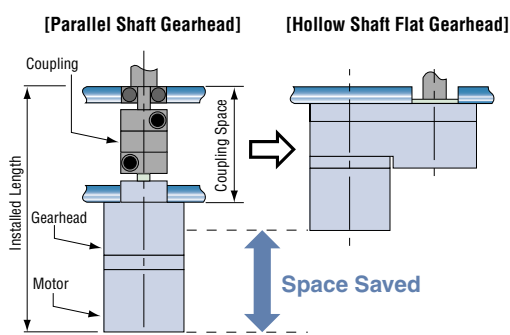
board-type driver to meet your space-saving  
your specific application.



## Features of Hollow Shaft Flat Gearhead

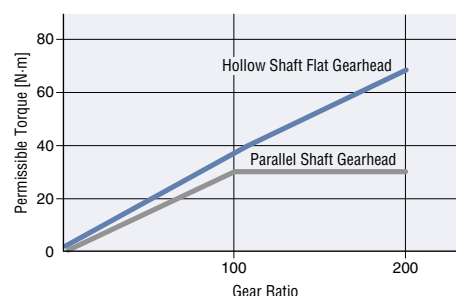
### Space-Saving and Low-Cost

The output shaft can be coupled directly to your drive shaft without using a coupling. The flexible installation modes, such as installation on either the front or rear face or by using the center shaft, allows you to reduce the size and installation space of your equipment. Since no shaft-coupling parts are needed, the parts cost and assembly man-hours will also decrease.



### High Permissible Torque

While the parallel shaft gearhead lets the permissible torque saturate at high gear ratios, the hollow shaft flat gearhead enables the motor torque to be utilized maximally.



## Lineup

● 15 W

● 30 W

● 50 W

● 100 W



|                      |                            |        |        |        |
|----------------------|----------------------------|--------|--------|--------|
| Output               | 15 W                       | 30 W   | 50 W   | 100 W  |
| Frame Size           | □42 mm                     | □60 mm | □80 mm | □90 mm |
| Power Supply Voltage | 24 VDC                     |        |        |        |
| Type                 | Parallel Shaft Gearhead    | ●      | ●      | ●      |
|                      | Hollow Shaft Flat Gearhead |        | ●      | ●      |
|                      | Round Shaft                | ●      | ●      | ●      |

●The □90 mm parallel shaft gearhead has a tapped hole at the shaft tip.

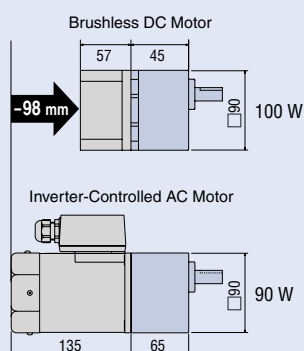
### Main Specifications

Speed Control Range: 100 to 3000 r/min (1:30)

Speed Regulation:  $\pm 0.5\%$

### Slim, Yet Powerful

A permanent magnet is assembled into the rotor, so the brushless DC motor can produce high power from its slim body. The compact unit fits perfectly in your small equipment.



### RoHS RoHS-Compliant

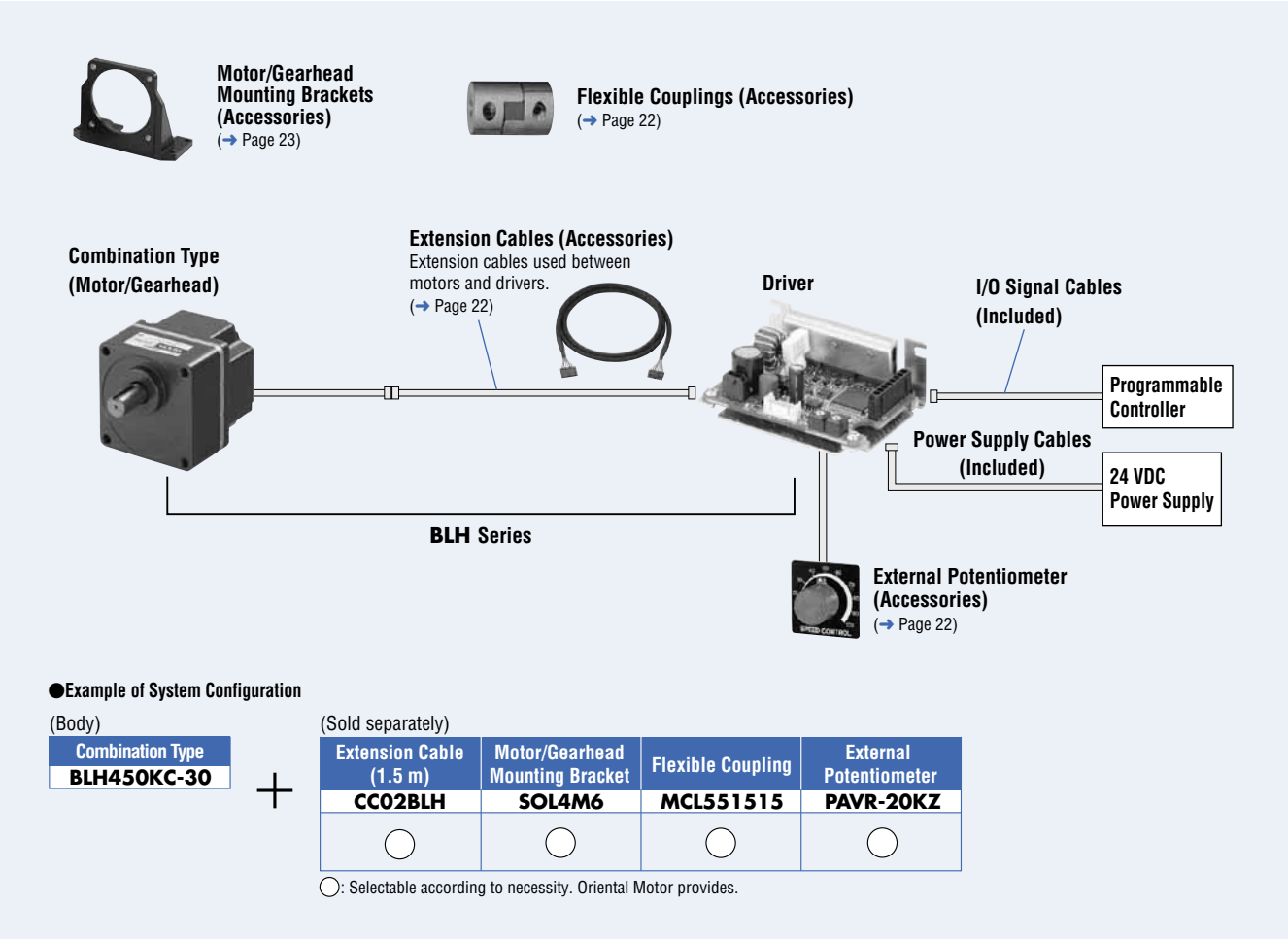
The BLH Series conforms to the RoHS Directive that prohibits the use of six chemical substances including lead and cadmium.

#### RoHS (Restriction of Hazardous Substances) Directive:

Directive on restriction of the use of certain hazardous substances in electrical and electronic equipment (2002/95/EC). The RoHS Directive prohibits the use of six chemical substances in electrical and electronic products sold in the E.U. member countries on or after July 1, 2006. The six controlled substances are: lead, hexavalent chromium, cadmium, mercury and two specific brominated flame-retardants (PBB and PBDE).

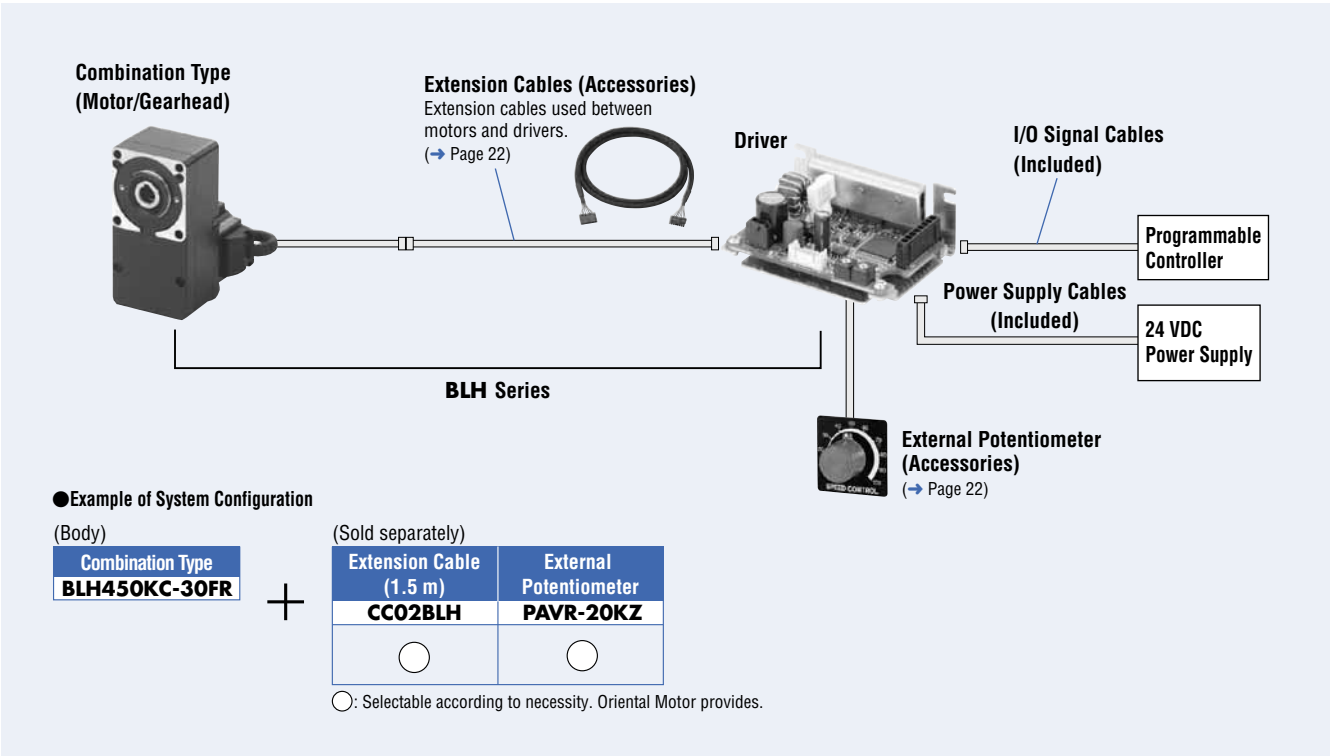
System Configuration

Geared Type/Combination Type–Parallel Shaft Gearhead/Round Shaft Type



\*The system configuration shown above is an example. Other combinations are available.

## ● Combination Type—Hollow Shaft Flat Gearhead



\*The system configuration shown above is an example. Other combinations are available.

## ■ Safety Standards and CE Marking

| Standards |                      | Certification Body | Standards File No. | CE Marking     |
|-----------|----------------------|--------------------|--------------------|----------------|
| Motor     | UL 60950-1           | UL                 | E208200            | EMC Directives |
|           | CSA C22.2 No.60950-1 |                    |                    |                |
| Driver    | UL 60950-1           | UL                 | E208200            |                |
|           | CSA C22.2 No.60950-1 |                    |                    |                |

● When the system is approved under various safety standards, the model names on the motor and driver nameplates are the approved model names.

**List of Motor and Driver Combinations** → Page 21

● The EMC value changes according to the wiring and layout. Therefore, the final EMC level must be checked with the motor/driver incorporated in the user's equipment.

## Product Number Code

**LH 2 30 K C - 5 FR**

① ② ③ ④ ⑤ ⑥ ⑦

|   |                       |                                                                                                                                                                                                                             |
|---|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ① | Series                | <b>BLH: BLH Series</b>                                                                                                                                                                                                      |
| ② | Motor Frame Size      | <b>0:</b> 42 mm <b>2:</b> 60 mm <b>4:</b> 80 mm <b>5:</b> 90 mm                                                                                                                                                             |
| ③ | Output Power (W)      | (Example) <b>30:</b> 30 W                                                                                                                                                                                                   |
| ④ | Power Supply Voltage  | <b>K:</b> 24 VDC                                                                                                                                                                                                            |
| ⑤ |                       | <b>C:</b> Cable Type                                                                                                                                                                                                        |
| ⑥ | Gear Ratio/Shaft Type | Number: Gear ratio for combination types: 8 types from <b>5</b> to <b>200</b><br>Gear ratio for geared types: 7 types from <b>5</b> to <b>100</b><br><b>A:</b> Round Shaft Type<br><b>GFS:</b> <b>GFS</b> Type Pinion Shaft |
| ⑦ |                       | Blank: Combination Type – Parallel Shaft Gearhead<br><b>FR:</b> Combination Type – Hollow Shaft Flat Gearhead                                                                                                               |

## Product Line

|                         |                                                                                                                                                                                                                              |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Combination Type</b> | The combination type comes with the motor and its dedicated gearhead already pre-assembled, which simplifies installation in equipment. Motors and gearheads are also available separately to facilitate changes or repairs. |
| <b>Geared Type</b>      | The geared type has an integrated motor and gearhead. The combination of motor and gearhead cannot be changed.                                                                                                               |

### Geared Type/Combination Type – Parallel Shaft Gearhead

| Type             | Output Power | Package Model      | Gear Ratio                             |
|------------------|--------------|--------------------|----------------------------------------|
| Geared Type      | 15 W         | <b>BLH015K-□</b>   | <b>5, 10, 15, 20, 30, 50, 100</b>      |
| Combination Type | 30 W         | <b>BLH230KC-□</b>  | <b>5, 10, 15, 20, 30, 50, 100, 200</b> |
|                  | 50 W         | <b>BLH450KC-□</b>  | <b>5, 10, 15, 20, 30, 50, 100, 200</b> |
|                  | 100 W        | <b>BLH5100KC-□</b> | <b>5, 10, 15, 20, 30, 50, 100, 200</b> |

● Enter the gear ratio in the box (□) within the model name.

### Round Shaft Type

| Output Power | Package Model      |
|--------------|--------------------|
| 15 W         | <b>BLH015K-A</b>   |
| 30 W         | <b>BLH230KC-A</b>  |
| 50 W         | <b>BLH450KC-A</b>  |
| 100 W        | <b>BLH5100KC-A</b> |

### Pinion Shaft Type

(Gearheads are sold separately)

| Output Power | Package Model        |
|--------------|----------------------|
| 30 W         | <b>BLH230KC-GFS</b>  |
| 50 W         | <b>BLH450KC-GFS</b>  |
| 100 W        | <b>BLH5100KC-GFS</b> |

### Gearhead

#### Parallel Shaft Gearhead

| Output Power of Applicable Motor (Pinion Shaft Type) | Gearhead Model | Gear Ratio                             |
|------------------------------------------------------|----------------|----------------------------------------|
| 30 W                                                 | <b>GFS2G-□</b> | <b>5, 10, 15, 20, 30, 50, 100, 200</b> |
| 50 W                                                 | <b>GFS4G-□</b> | <b>5, 10, 15, 20, 30, 50, 100, 200</b> |
| 100 W                                                | <b>GFS5G-□</b> | <b>5, 10, 15, 20, 30, 50, 100, 200</b> |

● Enter the gear ratio in the box (□) within the model name.

### Combination Type – Hollow Shaft Flat Gearhead

| Output Power | Package Model        | Gear Ratio                             |
|--------------|----------------------|----------------------------------------|
| 30 W         | <b>BLH230KC-□FR</b>  | <b>5, 10, 15, 20, 30, 50, 100, 200</b> |
| 50 W         | <b>BLH450KC-□FR</b>  | <b>5, 10, 15, 20, 30, 50, 100, 200</b> |
| 100 W        | <b>BLH5100KC-□FR</b> | <b>5, 10, 15, 20, 30, 50, 100, 200</b> |

● Enter the gear ratio in the box (□) within the model name.

#### Hollow Shaft Flat Gearhead

| Output Power of Applicable Motor (Pinion Shaft Type) | Gearhead Model   | Gear Ratio                             |
|------------------------------------------------------|------------------|----------------------------------------|
| 30 W                                                 | <b>GFS2G-□FR</b> | <b>5, 10, 15, 20, 30, 50, 100, 200</b> |
| 50 W                                                 | <b>GFS4G-□FR</b> | <b>5, 10, 15, 20, 30, 50, 100, 200</b> |
| 100 W                                                | <b>GFS5G-□FR</b> | <b>5, 10, 15, 20, 30, 50, 100, 200</b> |

● Enter the gear ratio in the box (□) within the model name.

## Specifications

● 15 W, 30 W, 50 W, 100 W (RoHS)



| Package Model                               | Geared Type/Combination Type–Parallel Shaft Gearhead |                                     | BLH015K-□                                                                                    | BLH230KC-□   | BLH450KC-□   | BLH5100KC-□   |
|---------------------------------------------|------------------------------------------------------|-------------------------------------|----------------------------------------------------------------------------------------------|--------------|--------------|---------------|
|                                             | Combination Type–Hollow Shaft Flat Gearhead          |                                     | —                                                                                            | BLH230KC-□FR | BLH450KC-□FR | BLH5100KC-□FR |
|                                             | Round Shaft Type                                     |                                     | BLH015K-A                                                                                    | BLH230KC-A   | BLH450KC-A   | BLH5100KC-A   |
| Rated Output Power (Continuous)             |                                                      | W                                   | 15                                                                                           | 30           | 50           | 100           |
| Power Source                                | Rated Voltage                                        |                                     | 24 VDC ±10%                                                                                  |              |              |               |
|                                             | Rated Input Current                                  |                                     | A                                                                                            | 1.0          | 2.1          | 3.1           |
|                                             | Maximum Input Current                                |                                     | A                                                                                            | 2.4          | 3.7          | 5.4           |
| Rated Torque                                |                                                      | N·m                                 | 0.05                                                                                         | 0.12         | 0.2          | 0.4           |
| Starting Torque*                            |                                                      | N·m                                 | 0.075                                                                                        | 0.15         | 0.24         | 0.5           |
| Rated Speed                                 |                                                      | r/min                               | 3000                                                                                         | 2500         |              |               |
| Variable Speed Range                        |                                                      | r/min                               | 100~3000                                                                                     |              |              |               |
| Round Shaft Type Permissible Load Inertia J |                                                      | ×10 <sup>-4</sup> kg·m <sup>2</sup> | 0.5                                                                                          | 1.8          | 3.3          | 5.6           |
| Rotor Inertia J                             |                                                      | ×10 <sup>-4</sup> kg·m <sup>2</sup> | 0.032                                                                                        | 0.086        | 0.234        | 0.611         |
| Speed Regulation                            | Load                                                 |                                     | ±0.5% max. (0~Rated torque, at rated speed, at rated voltage, at normal ambient temperature) |              |              |               |
|                                             | Voltage                                              |                                     | ±0.5% max. (Rated voltage ±10%, at rated speed, with no load, at normal ambient temperature) |              |              |               |
|                                             | Temperature                                          |                                     | ±0.5% max. (0°C~+50°C, at rated speed, with no load, at rated voltage)                       |              |              |               |

\*The time during which the starting torque is effective is no more than 5 seconds and at 2000 r/min or below.

● Enter the gear ratio in the box (□) within the model name.

● The values in the specifications are for the motor only.

## Common Specifications

| Item                           | Specifications                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Speed Setting Method           | Select one of the following methods:<br><ul style="list-style-type: none"> <li>Set using the internal potentiometer</li> <li>Set using an optional external potentiometer: <b>PAVR-20KZ</b> (20 kΩ, 1/4 W)</li> <li>Set using external DC voltage: 0~5 VDC, 1 mA or more (Input impedance 47 kΩ)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Acceleration/Deceleration Time | 0.5~10 sec.<br><b>BLH015</b> : at 3000 r/min with no load<br><b>BLH230, BLH450, BLH5100</b> : at 2500 r/min with no load (The actual speed may change by load condition.)<br>A common value is set using the acceleration/deceleration time potentiometer.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Multi-Speed Setting Method     | Switching between 2 speeds<br>One speed is set by the internal potentiometer (1 pc), while another speed is set by an external potentiometer (optional <b>PAVR-20KZ</b> ) or by external DC voltage (0~5 VDC).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Input Signal                   | C-MOS Negative Logic Input Operated by internal power supply<br>Common to Start/Stop Input, Run/Brake Input, Direction of Rotation Input, Speed Control Method Input and Alarm Reset Input                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Output Signal                  | Open Collector Output External Use Condition 26.4 VDC, 10 mA max.<br>Common to Alarm Output and Speed Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Protection Functions*          | When the following are activated, the ALARM output will be OFF and the motor will come to a stop.<br>The alarm LED on the driver will blink for the corresponding number of times shown in ( ).<br><ul style="list-style-type: none"> <li>Overload Protection (2): Activated when the motor load exceeds rated torque for a minimum of 5 seconds.</li> <li>Motor Sensor Error (3): Activated when the sensor wire inside the motor cable is disconnected during motor operation.</li> <li>Overvoltage Protection (4): Activated when the voltage applied to the driver exceeds 24 VDC by a minimum of 15%, a gravitational operation was performed or a load exceeding the allowable load inertia was driven.</li> <li>Undervoltage Protection (5): Activated when the voltage applied to the driver falls below 24 VDC by a minimum of 25%.</li> <li>Overspeed Protection (6): Activated when the motor speed exceeds 3500 r/min.</li> </ul> |
| Maximum Extension Distance     | Motor/Driver Distance: 2 m (when an optional extension cable is used)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Rating                         | Continuous                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

\*With the **BLH** Series, the motor speed cannot be controlled in a gravitational operation or other application where the motor shaft is turned by the load. When a load exceeding the allowable load inertia is driven or a gravitational operation is performed, the overvoltage protection function will actuate to cause the motor to decelerate to a stop.

## General Specifications

| Item                            |                     | Motor                                                                                                                                                                                                                                                             | Driver                                                                                                                                                                                              |
|---------------------------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Insulation Resistance           |                     | 100 M $\Omega$ or more when 500 VDC megger is applied between the windings and the frame after continuous operation under normal ambient temperature and humidity.                                                                                                | 100 M $\Omega$ or more when 500 VDC megger is applied between the power supply terminal and heat radiation plate after continuous operation under normal ambient temperature and humidity.          |
| Dielectric Strength             |                     | Sufficient to withstand 0.5 kVAC at 50 Hz applied between the windings and the frame for 1 minute after continuous operation under normal ambient temperature and humidity.                                                                                       | Sufficient to withstand 0.5 kVAC at 50 Hz applied between the power supply terminal and heat radiation plate for 1 minute after continuous operation under normal ambient temperature and humidity. |
| Temperature Rise                |                     | 50°C or less in the windings, and 40°C or less in the frame <sup>*1</sup> , as measured by the thermocouple method after continuous operation under normal ambient temperature and humidity.                                                                      | 50°C or less in the heat radiation plate, as measured by the thermocouple method after continuous operation under normal ambient temperature and humidity.                                          |
| Operating Environment Condition | Ambient Temperature | 0°C ~ +50°C (nonfreezing)                                                                                                                                                                                                                                         |                                                                                                                                                                                                     |
|                                 | Humidity            | 85% max. (noncondensing)                                                                                                                                                                                                                                          |                                                                                                                                                                                                     |
|                                 | Altitude            | 1000 m max.                                                                                                                                                                                                                                                       |                                                                                                                                                                                                     |
|                                 | Atmosphere          | No corrosive gases or dust. Cannot be used in a radioactive area, magnetic field, vacuum or other special environment                                                                                                                                             |                                                                                                                                                                                                     |
|                                 | Vibration           | Not subject to continuous vibration or excessive impact<br>In conformance with JIS C 60068-2-6, "Sine-Wave Vibration Test Method"<br>Frequency Range: 10~55 Hz Pulsating Amplitude: 0.15 mm<br>Sweep Direction: 3 directions (X, Y, Z) Number of Sweeps: 20 times |                                                                                                                                                                                                     |
| Storage Condition <sup>*2</sup> | Ambient Temperature | -25°C ~ +70°C (nonfreezing)                                                                                                                                                                                                                                       |                                                                                                                                                                                                     |
|                                 | Humidity            | 85% max. (noncondensing)                                                                                                                                                                                                                                          |                                                                                                                                                                                                     |
|                                 | Altitude            | 3000 m max.                                                                                                                                                                                                                                                       |                                                                                                                                                                                                     |
| Insulation Class                |                     | UL, CSA: Class A (105°C) EN: Class E (120°C)                                                                                                                                                                                                                      | —                                                                                                                                                                                                   |
| Degree of Protection            |                     | 15W: IP40; 30/50/100 W: IP65 <sup>*3</sup>                                                                                                                                                                                                                        | IP00                                                                                                                                                                                                |

<sup>\*1</sup> For round shaft types, please attach to the following sizes of heat radiation plate (material: aluminum) to maintain a maximum motor frame temperature of 90°C. (Except for **BLH015K-A**)  
**BLH230KC-A**: 115 mm × 115 mm, 5 mm thick **BLH450KC-A**: 135 mm × 135 mm, 5 mm thick **BLH5100KC-A**: 200 mm × 200 mm, 5 mm thick

<sup>\*2</sup> The storage condition applies to a short period such as a period during transportation.

<sup>\*3</sup> Excluding the round shaft type mounting surface and connectors.

### Note

● Do not measure insulation resistance or perform the dielectric strength test while the motor and driver are connected.

## Gearmotor – Torque Table for Geared Type/Combination Type

### Geared Type/Combination Type – Parallel Shaft Gearhead

Unit = N·m

| Package Model | Gear Ratio  |                | 5      | 10     | 15      | 20    | 30     | 50   | 100  | 200      |
|---------------|-------------|----------------|--------|--------|---------|-------|--------|------|------|----------|
|               | Speed Range | 100~2500 r/min | 20~500 | 10~250 | 6.7~167 | 5~125 | 3.3~83 | 2~50 | 1~25 | 0.5~12.5 |
|               |             | 3000 r/min     | 600    | 300    | 200     | 150   | 100    | 60   | 30   | 15       |
| BLH015K-□     |             | 100~3000 r/min | 0.23   | 0.45   | 0.68    | 0.86  | 1.3    | 2    | 2    | —        |
| BLH230KC-□    |             | 100~2500 r/min | 0.54   | 1.1    | 1.6     | 2.2   | 3.1    | 5.2  | 6    | 6        |
|               |             | 3000 r/min     | 0.27   | 0.54   | 0.81    | 1.1   | 1.5    | 2.6  | 5.2  | 6        |
| BLH450KC-□    |             | 100~2500 r/min | 0.9    | 1.8    | 2.7     | 3.6   | 5.2    | 8.6  | 16   | 16       |
|               |             | 3000 r/min     | 0.45   | 0.9    | 1.4     | 1.8   | 2.6    | 4.3  | 8.6  | 16       |
| BLH5100KC-□   |             | 100~2500 r/min | 1.8    | 3.6    | 5.4     | 7.2   | 10.3   | 17.2 | 30   | 30       |
|               |             | 3000 r/min     | 0.9    | 1.8    | 2.7     | 3.6   | 5.2    | 8.6  | 17.2 | 30       |

● Enter the gear ratio in the box (☐) within the model name.

● A colored background indicates gear shaft rotation in the same direction as the motor shaft; a white background indicates rotation in the opposite direction.

### Combination Type – Hollow Shaft Flat Gearhead

Unit = N·m

| Package Model                          | Gear Ratio  |                | 5      | 10     | 15      | 20    | 30     | 50   | 100  | 200      |
|----------------------------------------|-------------|----------------|--------|--------|---------|-------|--------|------|------|----------|
|                                        | Speed Range | 100~2500 r/min | 20~500 | 10~250 | 6.7~167 | 5~125 | 3.3~83 | 2~50 | 1~25 | 0.5~12.5 |
|                                        |             | 3000 r/min     | 600    | 300    | 200     | 150   | 100    | 60   | 30   | 15       |
| BLH230KC- <input type="checkbox"/> FR  |             | 100~2500 r/min | 0.48   | 1      | 1.5     | 2     | 3.1    | 5.1  | 10.2 | 17       |
|                                        |             | 3000 r/min     | 0.24   | 0.51   | 0.77    | 1     | 1.5    | 2.6  | 5.1  | 10.2     |
| BLH450KC- <input type="checkbox"/> FR  |             | 100~2500 r/min | 0.85   | 1.7    | 2.6     | 3.4   | 5.1    | 8.5  | 17   | 34       |
|                                        |             | 3000 r/min     | 0.43   | 0.85   | 1.3     | 1.7   | 2.6    | 4.3  | 8.5  | 17       |
| BLH5100KC- <input type="checkbox"/> FR |             | 100~2500 r/min | 1.7    | 3.4    | 5.1     | 6.8   | 10.2   | 17   | 34   | 68       |
|                                        |             | 3000 r/min     | 0.85   | 1.7    | 2.6     | 3.4   | 5.1    | 8.5  | 17   | 34       |

● Enter the gear ratio in the box (☐) within the model name.

● The flat gearhead rotates in the opposite direction to the motor when viewed from the front of the gearhead. It rotates in the same direction as the motor when viewed from the rear (motor mounting surface) of the gearhead. Rotation Direction of Hollow Shaft Flat Gearhead → Page 19

## Permissible Overhung Load and Permissible Thrust Load

### Geared Type/Combination Type – Parallel Shaft Gearhead

| Package Model                              | Gear Ratio                        | Permissible Overhung Load |                           | Permissible Thrust Load<br>N |
|--------------------------------------------|-----------------------------------|---------------------------|---------------------------|------------------------------|
|                                            |                                   | 10 mm from shaft end<br>N | 20 mm from shaft end<br>N |                              |
| <b>BLH015K-</b> <input type="checkbox"/>   | <b>5, 10, 15, 20, 30, 50, 100</b> | 50                        | —                         | 30                           |
| <b>BLH230KC-</b> <input type="checkbox"/>  | <b>5</b>                          | 100                       | 150                       | 40                           |
|                                            | <b>10, 15, 20</b>                 | 150                       | 200                       |                              |
|                                            | <b>30, 50, 100, 200</b>           | 200                       | 300                       |                              |
| <b>BLH450KC-</b> <input type="checkbox"/>  | <b>5</b>                          | 200                       | 250                       | 100                          |
|                                            | <b>10, 15, 20</b>                 | 300                       | 350                       |                              |
|                                            | <b>30, 50, 100, 200</b>           | 450                       | 550                       |                              |
| <b>BLH5100KC-</b> <input type="checkbox"/> | <b>5</b>                          | 300                       | 400                       | 150                          |
|                                            | <b>10, 15, 20</b>                 | 400                       | 500                       |                              |
|                                            | <b>30, 50, 100, 200</b>           | 500                       | 650                       |                              |

● Enter the gear ratio in the box (☐) within the model name.

## ● Combination Type–Hollow Shaft Flat Gearhead

| Package Model        | Gear Ratio                      | Permissible Overhung Load                                 |                                                           | Permissible Thrust Load<br>N |
|----------------------|---------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|------------------------------|
|                      |                                 | 10 mm from mounting surface of hollow shaft gearhead<br>N | 20 mm from mounting surface of hollow shaft gearhead<br>N |                              |
| <b>BLH230KC-□FR</b>  | <b>5, 10</b>                    | 450                                                       | 370                                                       | 200                          |
|                      | <b>15, 20, 30, 50, 100, 200</b> | 500                                                       | 400                                                       |                              |
| <b>BLH450KC-□FR</b>  | <b>5, 10</b>                    | 800                                                       | 660                                                       | 400                          |
|                      | <b>15, 20, 30, 50, 100, 200</b> | 1200                                                      | 1000                                                      |                              |
| <b>BLH5100KC-□FR</b> | <b>5, 10</b>                    | 900                                                       | 770                                                       | 500                          |
|                      | <b>15, 20</b>                   | 1300                                                      | 1110                                                      |                              |
|                      | <b>30, 50, 100, 200</b>         | 1500                                                      | 1280                                                      |                              |

● Enter the gear ratio in the box (□) within the model name.

## ● Round Shaft Type

| Package Model      | Permissible Overhung Load |                           | Permissible Thrust Load                                                   |
|--------------------|---------------------------|---------------------------|---------------------------------------------------------------------------|
|                    | 10 mm from shaft end<br>N | 20 mm from shaft end<br>N |                                                                           |
| <b>BLH015K-A</b>   | 50                        | —                         | The permissible thrust load shall be no greater than half the motor mass. |
| <b>BLH230KC-A</b>  | 70                        | 100                       |                                                                           |
| <b>BLH450KC-A</b>  | 120                       | 140                       |                                                                           |
| <b>BLH5100KC-A</b> | 160                       | 170                       |                                                                           |

## ■ Permissible Load Inertia J for Geared Type/Combination Type

### ● Geared Type/Combination Type–Parallel Shaft Gearhead

Unit =  $\times 10^{-4} \text{kg} \cdot \text{m}^2$

| Package Model \ Gear Ratio | 5    | 10  | 15   | 20   | 30   | 50   | 100  | 200  |
|----------------------------|------|-----|------|------|------|------|------|------|
| <b>BLH015K-□</b>           | 0.4  | 1.7 | 3.9  | 7    | 15.7 | 43.7 | 43.7 | —    |
| <b>BLH230KC-□</b>          | 1.55 | 6.2 | 14   | 24.8 | 55.8 | 155  | 155  | 155  |
| <b>BLH450KC-□</b>          | 5.5  | 22  | 49.5 | 88   | 198  | 550  | 550  | 550  |
| <b>BLH5100KC-□</b>         | 25   | 100 | 225  | 400  | 900  | 2500 | 2500 | 2500 |

● Enter the gear ratio in the box (□) within the model name.

### ● Combination Type–Hollow Shaft Flat Gearhead

Unit =  $\times 10^{-4} \text{kg} \cdot \text{m}^2$

| Package Model \ Gear Ratio | 5    | 10  | 15   | 20   | 30   | 50   | 100  | 200  |
|----------------------------|------|-----|------|------|------|------|------|------|
| <b>BLH230KC-□FR</b>        | 1.55 | 6.2 | 14   | 24.8 | 55.8 | 155  | 155  | 155  |
| <b>BLH450KC-□FR</b>        | 5.5  | 22  | 49.5 | 88   | 198  | 550  | 550  | 550  |
| <b>BLH5100KC-□FR</b>       | 25   | 100 | 225  | 400  | 900  | 2500 | 2500 | 2500 |

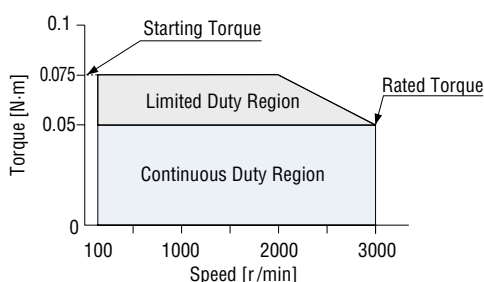
● Enter the gear ratio in the box (□) within the model name.

## ■ Speed–Torque Characteristics

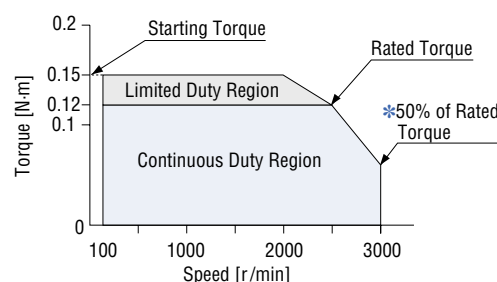
Continuous Duty Region: Continuous operation is possible in this region.

Limited Duty Region: This region is used primarily when accelerating. When a load that exceeds the rated torque is applied continuously for approximately 5 seconds, overload protection is activated and the motor comes to a stop.

### BLH015K-□/BLH015K-A

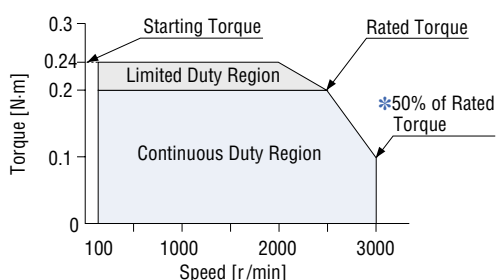


### BLH230KC-□/BLH230KC-□FR/BLH230KC-A

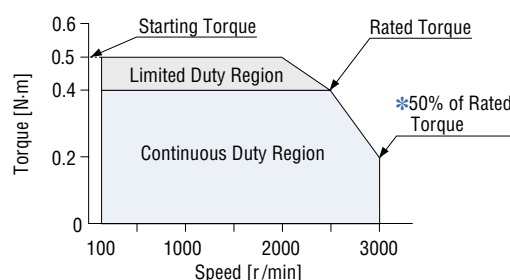


\*Value for 24 VDC with no extension cable

### BLH450KC-□/BLH450KC-□FR/BLH450KC-A



### BLH5100KC-□/BLH5100KC-□FR/BLH5100KC-A



\*Value for 24 VDC with no extension cable

● For geared types and combination types, the values are for the motor only.

● Enter the gear ratio in the box (□) within the model name.

\*Value for 24 VDC with no extension cable

## ■ Dimensions (Unit = mm)

● Mounting screws are included with the combination type.

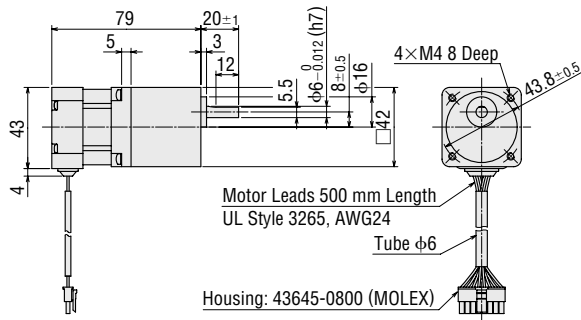
### ● 15 W

#### ◇ Geared Type

**BLH015K-□**

Geared Motor: BLHM015K-□

Mass: 0.5 kg

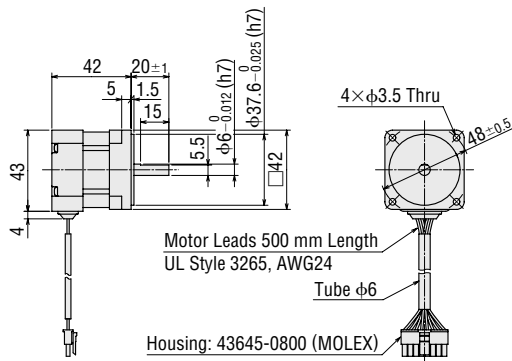


#### ◇ Round Shaft Type

**BLH015K-A**

Motor: BLHM015K-A

Mass: 0.25 kg

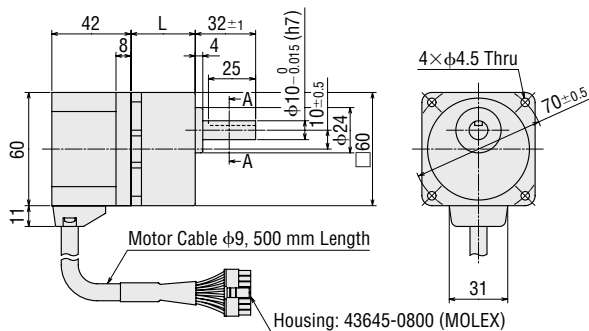


### ● 30 W

#### ◇ Motor/Parallel Shaft Gearhead

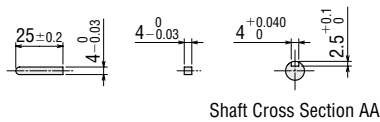
| Package Model     | Motor Model   | Gearhead Model | Gear Ratio    | L  |
|-------------------|---------------|----------------|---------------|----|
| <b>BLH230KC-□</b> | BLHM230KC-GFS | GFS2G□         | <b>5~20</b>   | 34 |
|                   |               |                | <b>30~100</b> | 38 |
|                   |               |                | <b>200</b>    | 43 |

Mass: 1.0 kg (Including Gearhead)



#### ◇ Key and Key Slot

(The key is included with the gearhead)



Shaft Cross Section AA

● Enter the gear ratio in the box (□) within the model name.

**BLH230KC-□FR**

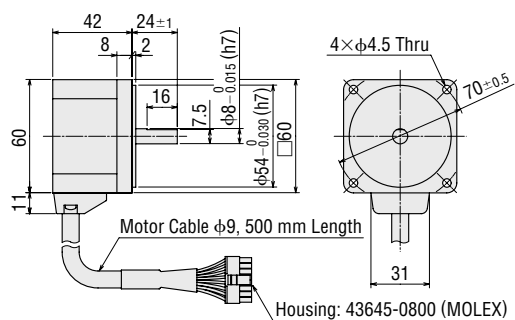
Gearhead: GFS2G□FR

Mass: 1.3 kg (Including Gearhead)



**BLH230KC-A**

Mass: 0.5 kg



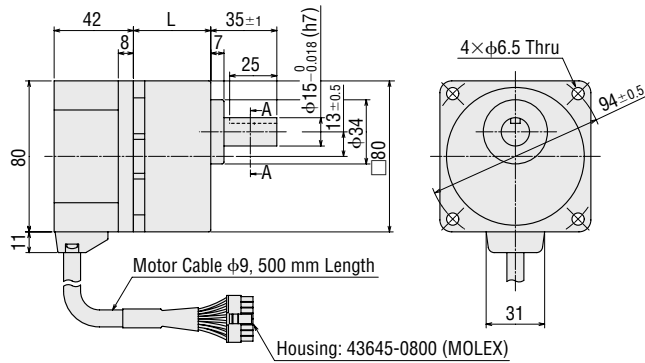
11

● 50 W

◇ Motor/Parallel Shaft Gearhead

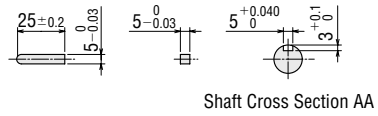
| Package Model      | Motor Model   | Gearhead Model | Gear Ratio    | L  |
|--------------------|---------------|----------------|---------------|----|
| <b>BLH450KC</b> -□ | BLHM450KC-GFS | GFS4G□         | <b>5~20</b>   | 41 |
|                    |               |                | <b>30~100</b> | 46 |
|                    |               |                | <b>200</b>    | 51 |

Mass: 1.8 kg (Including Gearhead)



◇ Key and Key Slot

(The key is included with the gearhead)



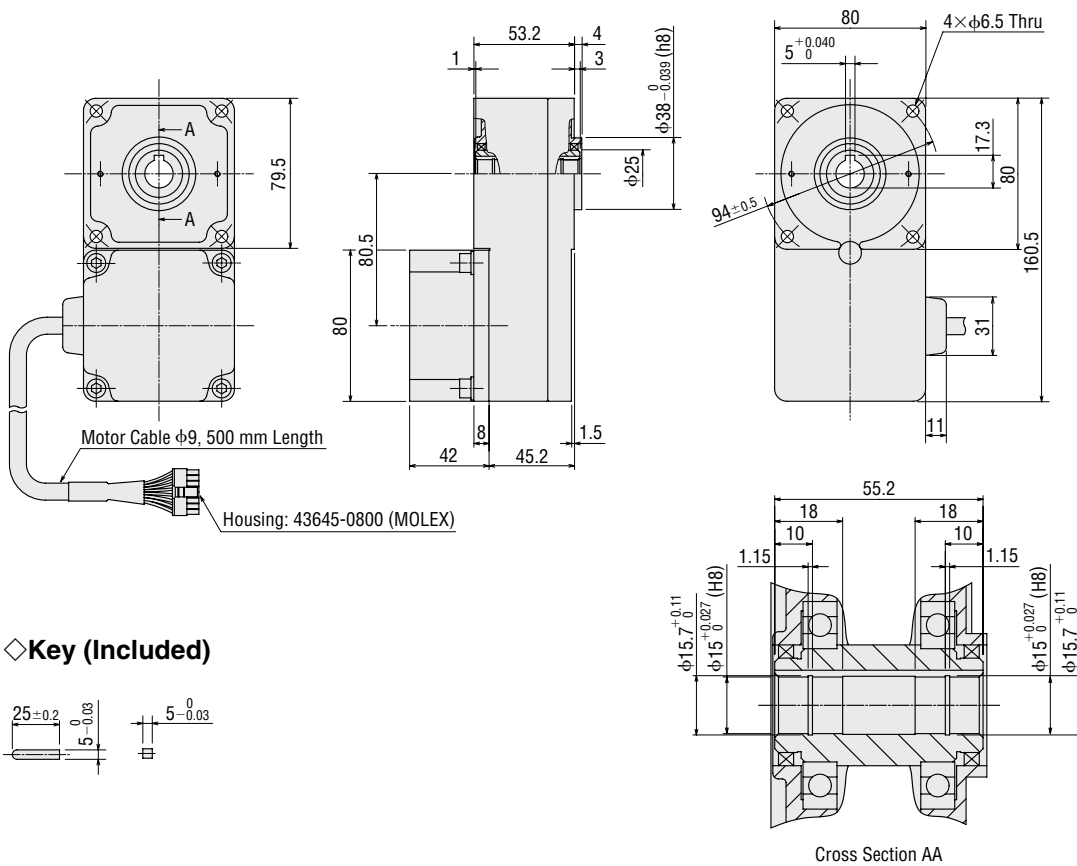
◇ Motor/Hollow Shaft Flat Gearhead

**BLH450KC**-□FR

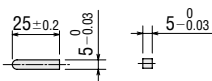
Motor: BLHM450KC-GFS

Gearhead: GFS4G□FR

Mass: 2.4 kg (Including Gearhead)



◇ Key (Included)



Cross Section AA

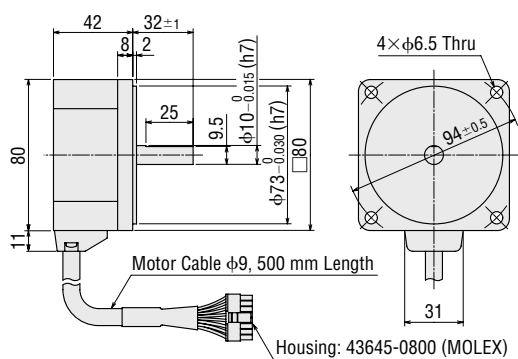
● Enter the gear ratio in the box (□) within the model name.

## ◆ Round Shaft Type

### BLH450KC-A

Motor: BLHM450KC-A

Mass: 0.8 kg

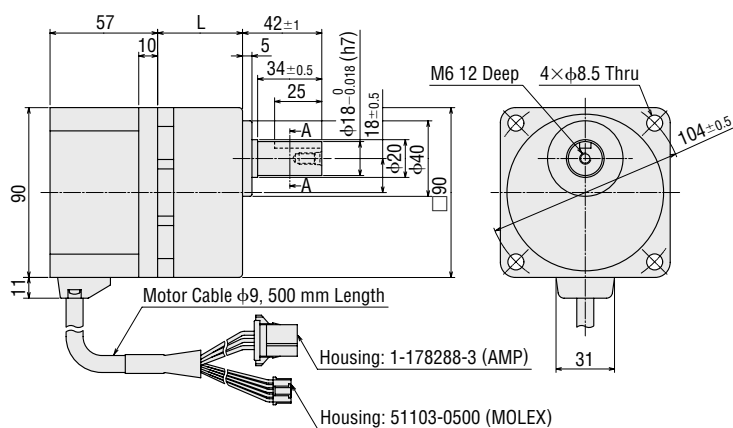


## ● 100 W

### ◆ Motor/Parallel Shaft Gearhead

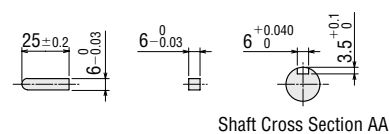
| Package Model | Motor Model    | Gearhead Model | Gear Ratio | L  |
|---------------|----------------|----------------|------------|----|
| BLH5100KC-□   | BLHM5100KC-GFS | GFS5G□         | 5~20       | 45 |
|               |                |                | 30~100     | 58 |
|               |                |                | 200        | 64 |

Mass: 2.9 kg (Including Gearhead)



## ◆ Key and Key Slot

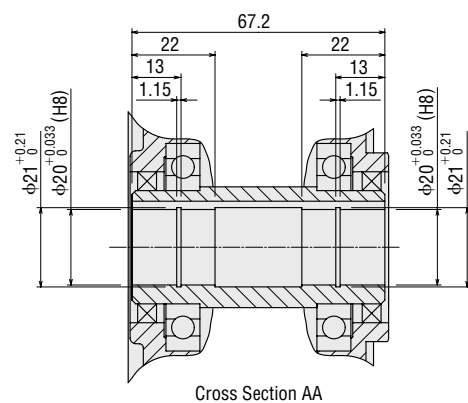
(The key is included with the gearhead)



**BLH5100KC-□FR**

Gearhead: GFS5G□FR

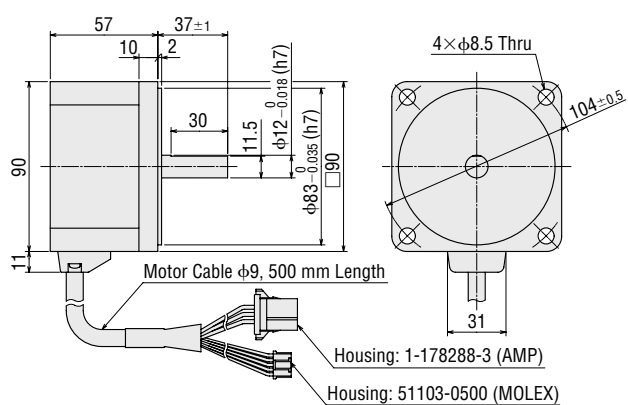
Mass: 3.6 kg (Including Gearhead)



Technical drawing showing a shaft and a hole. The shaft has a diameter of  $25 \pm 0.2$  mm and a length of  $6^{+0}_{-0.03}$  mm. The hole has a diameter of  $6^{-0.03}_0$  mm.

**BLH5100KC-A**

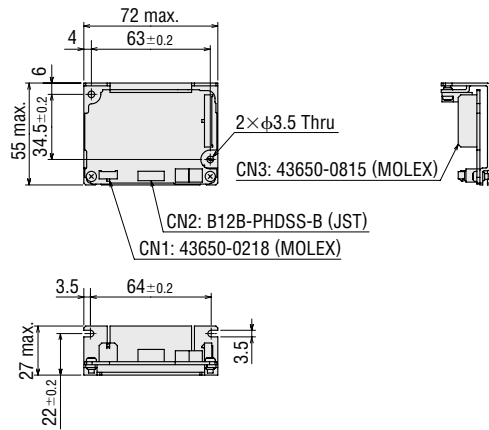
Mass: 1.4 kg



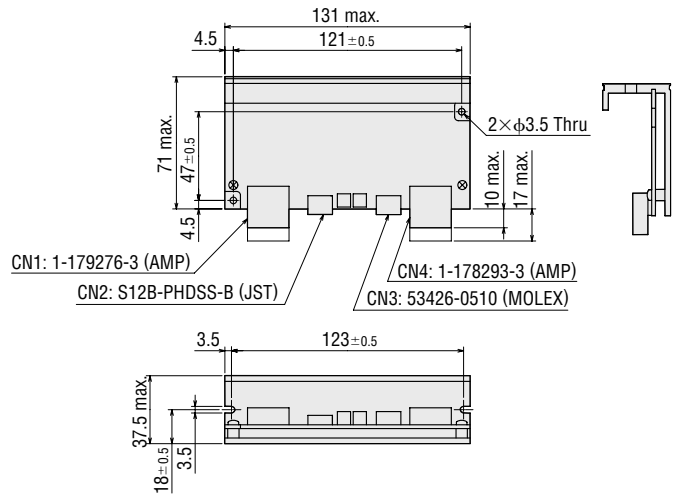
14

### ◇ Driver

BLHD15K, BLHD30K, BLHD50K  
Mass: 0.1 kg

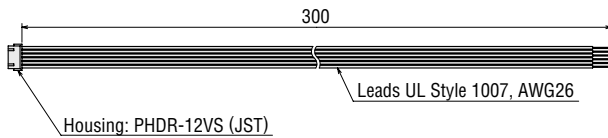


BLHD100K  
Mass: 0.3 kg



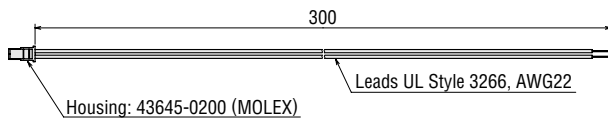
### ◇ Driver Input Signal Cable (Included)

● For 15W / 30W / 50W / 100W

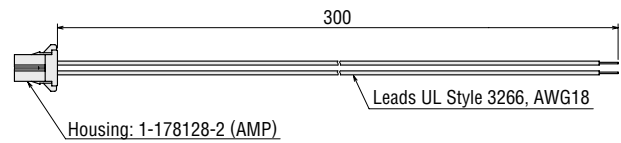


### ◇ Driver Power Supply Cable (Included)

● For 15W / 30W / 50W



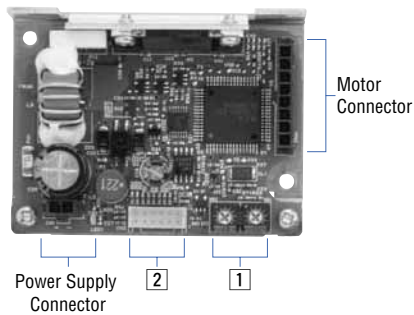
● For 100W



## Connection and Operation

### Names and Functions of Driver

◇15W / 30W / 50W

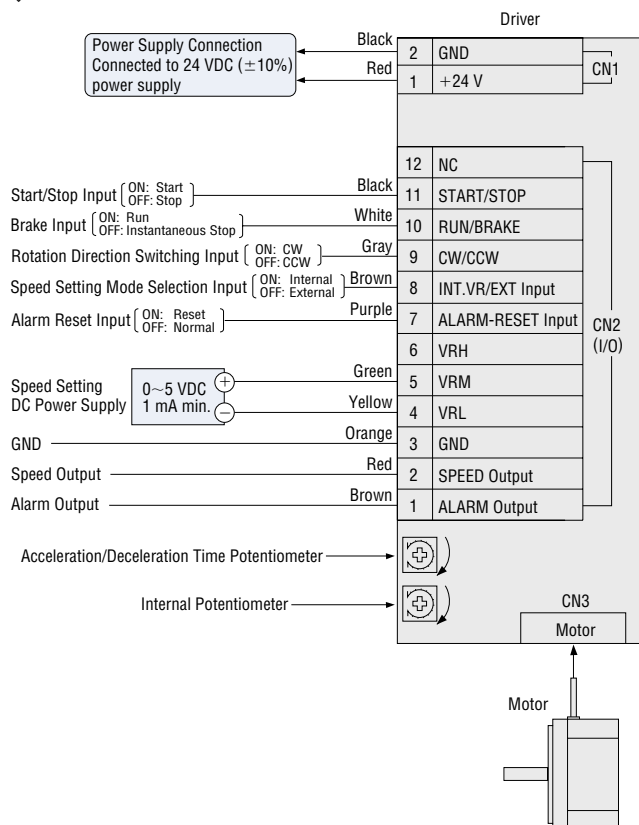


#### 1 Speed Potentiometers

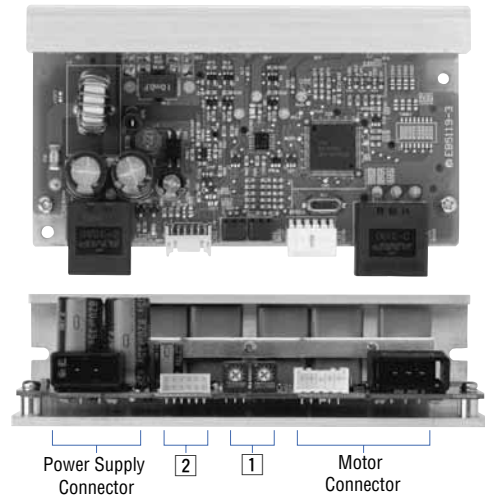
| Display | Potentiometer Name                           | Function                                                                     |
|---------|----------------------------------------------|------------------------------------------------------------------------------|
| VR1     | Internal Potentiometer                       | Set and adjust the operating speed of the motor.                             |
| VR2     | Acceleration/Deceleration Time Potentiometer | Set a common acceleration/deceleration time in a range of 0.5 to 10 seconds. |

### Connection Diagrams

◇15W / 30W / 50W



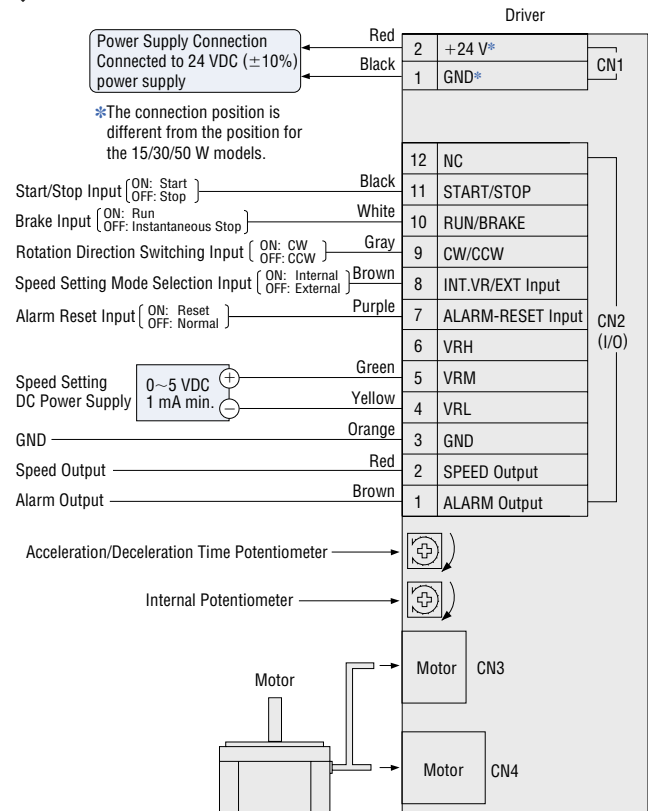
◇100W



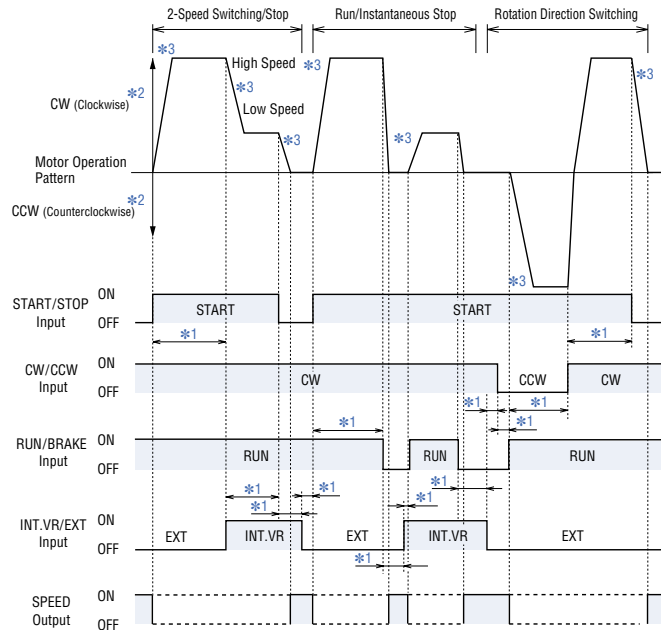
#### 2 Input and Output Signals

| Display | Signal            | Pin No. | Function          |
|---------|-------------------|---------|-------------------|
| CN2     | Output            | 1       | ALARM Output      |
|         |                   | 2       | SPEED Output      |
|         | I/O Signal Common | 3       | GND               |
|         |                   | 4       | VRL Input         |
|         | Analog Input      | 5       | VRM Input         |
|         |                   | 6       | VRH Input         |
|         | Input             | 7       | ALARM-RESET Input |
|         |                   | 8       | INT.VR/EXT Input  |
|         |                   | 9       | CW/CCW Input      |
|         |                   | 10      | RUN/BRAKE Input   |
|         |                   | 11      | START/STOP Input  |
|         |                   | 12      | NC                |

◇100W



## Timing Chart



\*1 At least 10 ms

\*2 The direction applies to the motor alone. The specific direction will vary depending on the gear ratio.

\*3 The motor will start/stop over the time set by the acceleration/deceleration time potentiometer.

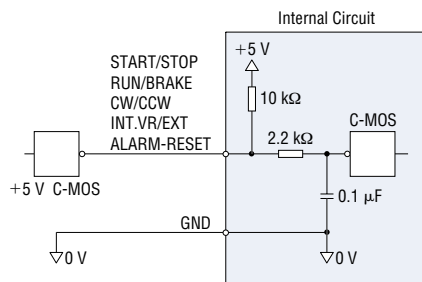
## Input/Output Signal Circuits

### Input Circuit

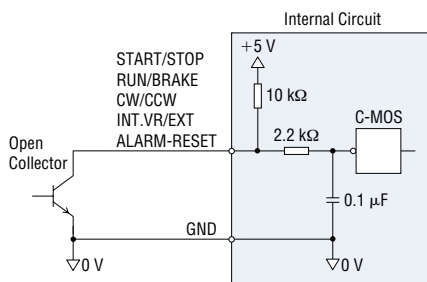
The driver's signal inputs use the C-MOS input method.

The signal status indicates a voltage level of 0 to 0.5 V when the signal is ON, or 4 to 5 V when it is OFF.

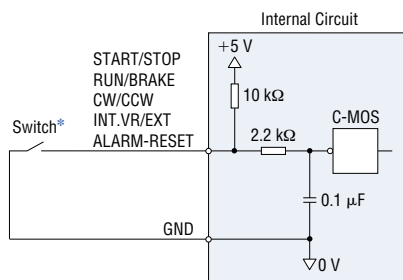
#### 5V C-MOS output from controller



#### Open collector output from controller



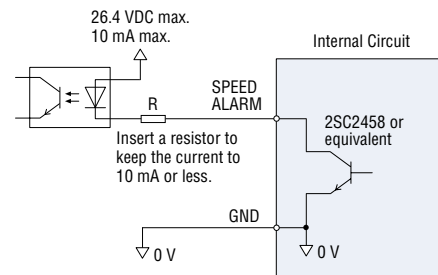
#### Switch connection



\*Use a switch capable of opening/closing the current flow at 5 VDC, 1 mA maximum.

- All operations of run/stop, instantaneous stop and rotation direction switching operations can be controlled with the START/STOP, RUN/BRAKE and CW/CCW signals.
- If both the START/STOP signal and the RUN/BRAKE signal are set to ON, the motor rotates. The motor will accelerate over the time set by the acceleration/deceleration time potentiometer. During this time, if the CW/CCW signal is set to ON, the motor rotates clockwise as viewed from the shaft end from the motor; if the CW/CCW signal is set to OFF, the motor rotates in the counterclockwise direction.
- If the RUN/BRAKE signal is set to OFF while the START/STOP signal is ON, the motor stops instantaneously. If the START/STOP signal is set to OFF while the RUN/BRAKE signal is ON, the motor will stop with deceleration time set by the acceleration/deceleration time potentiometer.
- The duration of each input signal must be 10 msec or longer.
- Do not operate (turn ON/OFF) two or more input signals simultaneously. There must be a minimum interval of 10 msec before another input signal can be operated after an input signal had been operated.

### Output Circuit



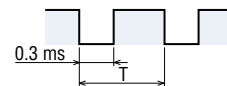
### SPEED Output

The system outputs pulse signals (with a width of 0.3 ms) at a rate of 30 pulses per revolution of the motor output shaft synchronized with the motor operation.

You can measure the SPEED output frequency and calculate the motor speed.

$$\text{Motor Speed (r/min)} = \frac{\text{SPEED Output Frequency [Hz]}}{30} \times 60$$

$$\text{SPEED Output Frequency (Hz)} = \frac{1}{T}$$



### ALARM Output

The ALARM output is normally ON and goes OFF when there is an alarm.

### ALARM-RESET

When the motor is stopped, setting this signal ON, then returning it to OFF resets the alarm.

Please return either the START/STOP input or the RUN/BRAKE input to OFF before inputting the ALARM-RESET. The ALARM-RESET is not accepted if both these signals are ON.

#### Notes

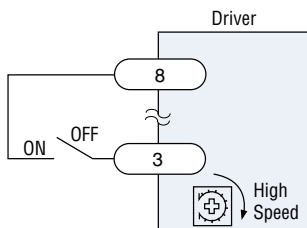
- Output signal is open collector output, so an external power supply (Vcc) is required.
  - Use a power supply of no more than 26.4 VDC and connect a limit resistor (R) such that the output current does not exceed 10 mA.
- When using neither the speed output function nor the alarm output function, this connection is not required.

## ●Speed Setting Method

### ◇Internal Potentiometer

When INT.VR/EXT input is set to ON, the speed can be set with the internal potentiometer.

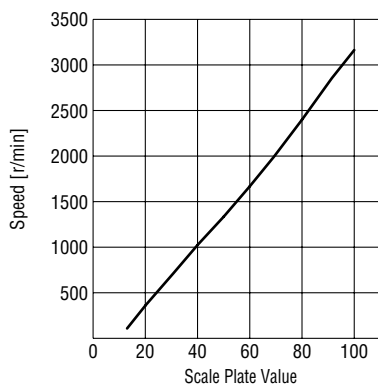
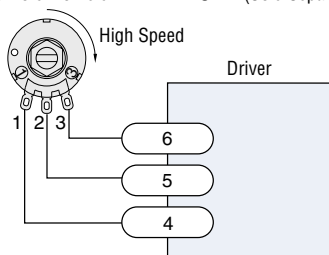
There is no need for this connection when the internal potentiometer is not used.



### ◇External Potentiometer (Sold Separately)

When separating the motor speed setting from the driver, connect the optional external potentiometer as follows.

External Potentiometer **PAVR-20KZ** (Sold Separately)



**External Potentiometer Scale—Speed Characteristics  
(Representative Values)**

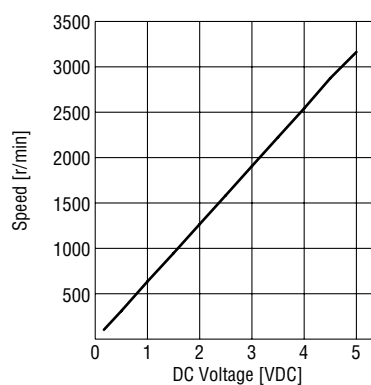
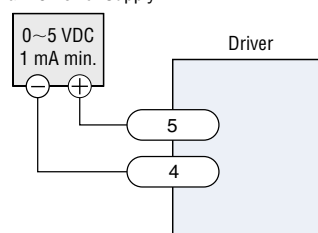
#### Note:

- The speed in the graph represents the speed of a motor alone. The gearhead output shaft speed of the combination type or geared type is calculated by dividing the graph speed by the gear ratio.

### ◇External DC Voltage

When setting the motor speed with an external DC voltage, do so in the following manner.

External DC Power Supply



**External DC Voltage—Speed Characteristics  
(Representative Values)**

#### Note:

- The speed in the graph represents the speed of a motor alone. The gearhead output shaft speed of the combination type or geared type is calculated by dividing the graph speed by the gear ratio.

## Multi-Motor Control

Two or more sets of motor and driver can be operated at the same speed by using a DC power supply or an external potentiometer.

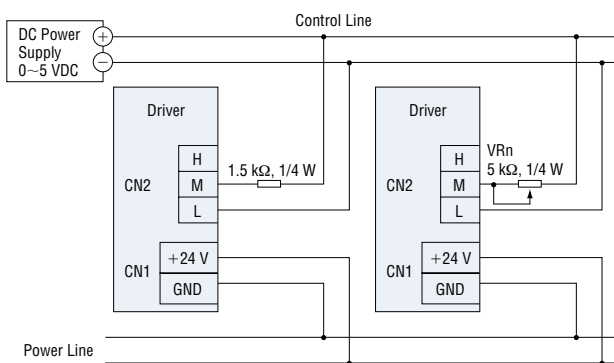
### When External DC Power Supply is Used

- Use a DC power supply with current capacity is equal to or greater than the value obtained by the following expression.

Current capacity (N is the number of drivers)  $I=1 \times N$  (mA)

Example: When two drivers are used, current capacity should be at least 2 mA.

- The lines for other input/output signals should be connected to each driver individually.
- Motor speed differences can be adjusted by connecting a resistor of 1.5 k $\Omega$ , 1/4 W to the M terminal of the first driver, and a 5 k $\Omega$ , 1/4 W variable resistor (VRn) to the M terminals of the other drivers.



### When External Potentiometer is Used

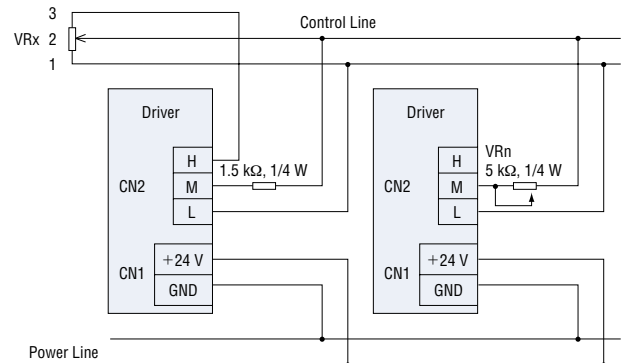
As shown below, make the power line and the speed control line common to set the speed at VRx.

- The required resistance of the external potentiometer is calculated by the following expression.

Resistance value (N is the number of drivers)  $VRx=20/N$  (k $\Omega$ ),  $N/4$  (W)

Example: When two drivers are used, the resistance is 10 k $\Omega$ , 1/2 W.

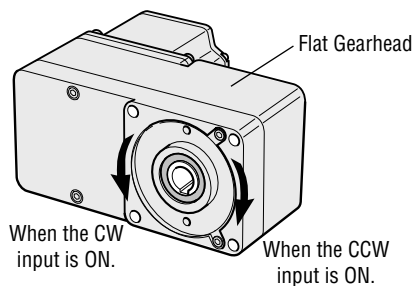
- Connect the other input/output lines to each driver individually.
- Motor speed differences can be adjusted by connecting a resistor of 1.5 k $\Omega$ , 1/4 W to the M terminal of the first driver, and a 5 k $\Omega$ , 1/4 W variable resistor (VRn) to the M terminals of the other drivers.
- No more than five motors should be operated simultaneously when using the external potentiometer.



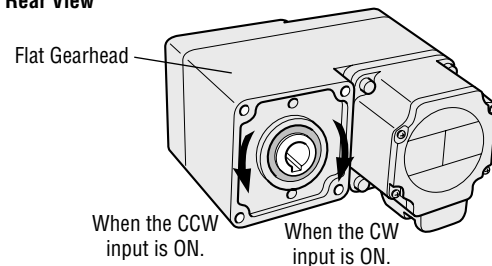
## Rotation Direction of the Hollow Shaft Flat Gearhead

The hollow shaft flat gearhead of the combination type rotates in the direction as shown below, with respect to the direction input from the driver.

Front View



Rear View



## Installation of the Hollow Shaft Flat Gearhead

### Installing the Load Shaft

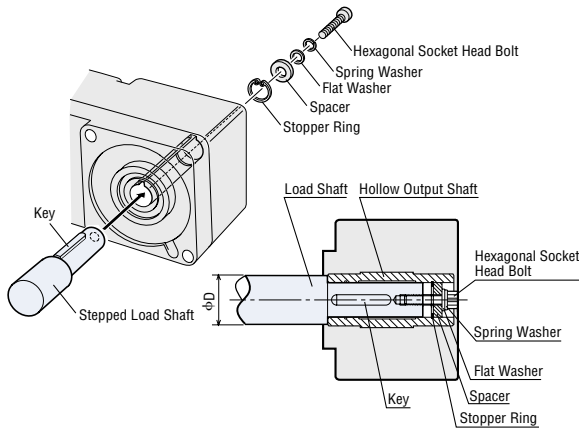
- Install the load shaft to the hollow output shaft by aligning the center of the hollow shaft with that of the load shaft.
- The hollow output shaft has a key slot. Machine a matching key slot on the load shaft and use the supplied key to affix the two shafts across the slots.
- A recommended tolerance of the load shaft is h7.
- If the motor is intended to receive large impacts due to frequent instantaneous stops or carry a large overhung load, use a stepped load shaft.

#### Notes:

- When installing the load shaft to the hollow output shaft, be careful not to damage the hollow output shaft or bearing.
- To prevent seizure, apply a coat of molybdenum disulfide grease on the exterior surface of the load shaft and interior surface of the hollow output shaft.
- Do not attempt to modify or machine the hollow output shaft. Doing so may damage the bearing and cause the hollow shaft flat gearhead to break.

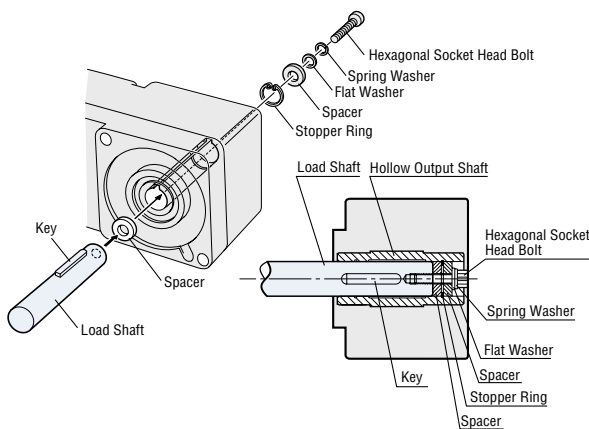
### Stepped Load Shaft

Install a hexagonal socket head bolt over a stopper ring, spacer, flat washer and spring washer, and tighten the bolt to affix the load shaft.



### Straight Load Shaft

Install a hexagonal socket head bolt over a stopper ring, spacer, flat washer and spring washer, with a spacer also inserted underneath the load shaft, and tighten the bolt to affix the load shaft.



## Recommended Load Shaft Installation Dimensions

Unit = mm

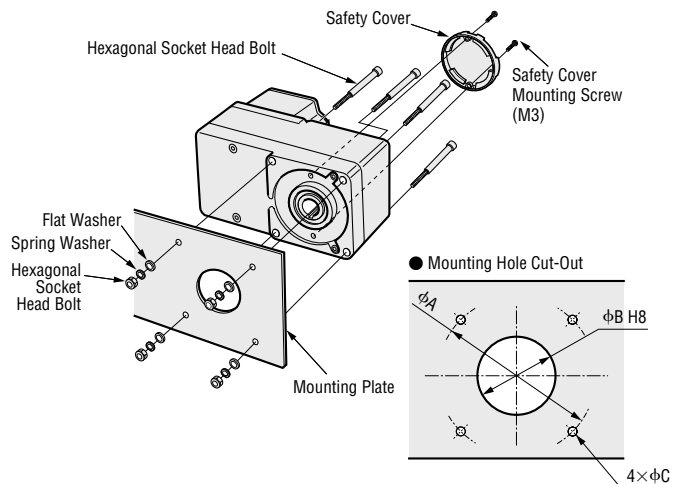
| Model                                    | BLH230               | BLH450               | BLH5100              |
|------------------------------------------|----------------------|----------------------|----------------------|
| Inner Diameter of Hollow Shaft (H8)      | $\phi 12^{+0.027}_0$ | $\phi 15^{+0.027}_0$ | $\phi 20^{+0.033}_0$ |
| Recommended Tolerance of Load Shaft (h7) | $\phi 12^{+0.018}_0$ | $\phi 15^{+0.018}_0$ | $\phi 20^{+0.021}_0$ |
| Nominal Diameter of Stopper Ring         | $\phi 12$ , C-shaped | $\phi 15$ , C-shaped | $\phi 20$ , C-shaped |
| Applicable Bolt                          | M4                   | M5                   | M6                   |
| Spacer Thickness*                        | 3                    | 4                    | 5                    |
| Outer Diameter of Step Part $\phi D$     | 20                   | 25                   | 30                   |

\*Determine the spacer thickness in conformance with the table. If the spacer is thicker than the specified dimension, the bolt will project from the surface and interfere with the safety cover.

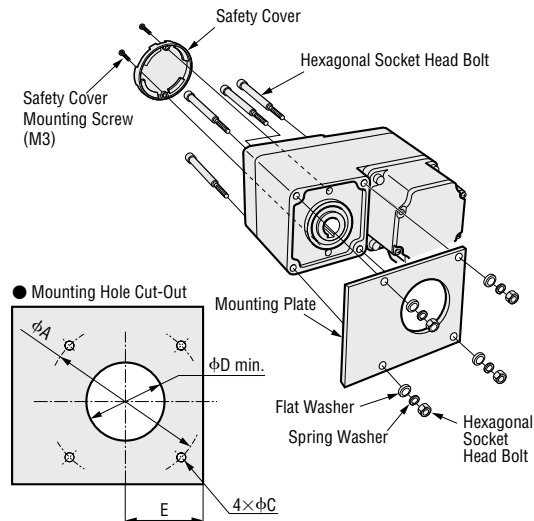
### Installing the Hollow Shaft

#### Installing from the Front Face

The output shaft boss (h8) can be used to align the shaft.



#### Installing from the Rear Face



#### Note:

- When installing the hollow shaft flat gearhead from the rear face, provide dimension E to prevent the mounting plate from contacting the motor.

## Mounting Hole Dimensions

Unit = mm

| Model             | BLH230          | BLH450          | BLH5100         |
|-------------------|-----------------|-----------------|-----------------|
| Nominal Bolt Size | M5              | M6              | M8              |
| $\phi A$          | 70              | 94              | 104             |
| $\phi B$ H8       | $34^{+0.039}_0$ | $38^{+0.039}_0$ | $50^{+0.039}_0$ |
| $\phi C$          | 5.5             | 6.5             | 8.5             |
| $\phi D$          | 25              | 30              | 35              |
| E                 | 29              | 39              | 44              |

## List of Motor and Driver Combinations

### Geared Type

The geared type has an integrated motor and gearhead. The combination of motor and gearhead cannot be changed.

| Output Power | Package Model                        | Geared Motor Model             | Driver Model |
|--------------|--------------------------------------|--------------------------------|--------------|
| 15 W         | <b>BLH015K-</b> <input type="text"/> | BLHM015K- <input type="text"/> | BLHD15K      |

Enter the gear ratio in the box () within the model name.

### Combination Type—Parallel Shaft Gearhead

The combination type comes with the motor and parallel shaft gearhead already assembled.

| Output Power | Package Model                          | Motor Model    | Gearhead Model             | Driver Model |
|--------------|----------------------------------------|----------------|----------------------------|--------------|
| 30 W         | <b>BLH230KC-</b> <input type="text"/>  | BLHM230KC-GFS  | GFS2G <input type="text"/> | BLHD30K      |
| 50 W         | <b>BLH450KC-</b> <input type="text"/>  | BLHM450KC-GFS  | GFS4G <input type="text"/> | BLHD50K      |
| 100 W        | <b>BLH5100KC-</b> <input type="text"/> | BLHM5100KC-GFS | GFS5G <input type="text"/> | BLHD100K     |

Enter the gear ratio in the box () within the model name.

### Combination Type—Hollow Shaft Flat Gearhead

The combination type comes with the motor and hollow shaft flat gearhead already assembled.

| Output Power | Package Model                                    | Motor Model    | Gearhead Model                       | Driver Model |
|--------------|--------------------------------------------------|----------------|--------------------------------------|--------------|
| 30 W         | <b>BLH230KC-</b> <input type="text"/> <b>FR</b>  | BLHM230KC-GFS  | GFS2G <input type="text"/> <b>FR</b> | BLHD30K      |
| 50 W         | <b>BLH450KC-</b> <input type="text"/> <b>FR</b>  | BLHM450KC-GFS  | GFS4G <input type="text"/> <b>FR</b> | BLHD50K      |
| 100 W        | <b>BLH5100KC-</b> <input type="text"/> <b>FR</b> | BLHM5100KC-GFS | GFS5G <input type="text"/> <b>FR</b> | BLHD100K     |

Enter the gear ratio in the box () within the model name.

### Round Shaft Type

| Output Power | Package Model      | Gearhead Model | Driver Model |
|--------------|--------------------|----------------|--------------|
| 15 W         | <b>BLH015K-A</b>   | BLHM015K-A     | BLHD15K      |
| 30 W         | <b>BLH230KC-A</b>  | BLHM230KC-A    | BLHD30K      |
| 50 W         | <b>BLH450KC-A</b>  | BLHM450KC-A    | BLHD50K      |
| 100 W        | <b>BLH5100KC-A</b> | BLHM5100KC-A   | BLHD100K     |

### Pinion Shaft Type

| Output Power | Package Model        | Gearhead Model | Driver Model |
|--------------|----------------------|----------------|--------------|
| 30 W         | <b>BLH230KC-GFS</b>  | BLHM230KC-GFS  | BLHD30K      |
| 50 W         | <b>BLH450KC-GFS</b>  | BLHM450KC-GFS  | BLHD50K      |
| 100 W        | <b>BLH5100KC-GFS</b> | BLHM5100KC-GFS | BLHD100K     |

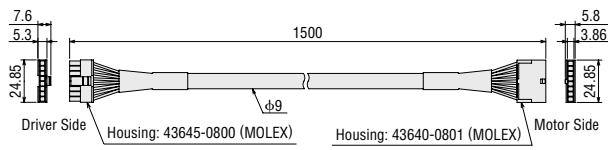
## Accessories (Sold Separately)

### Extension Cables (RoHS)

These cables are used to connect motor and driver. The maximum extension length is 2 meters.

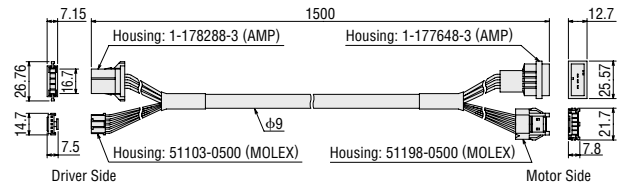
#### For 15W / 30W / 50W

**CC02BLH** (1.5 m)



#### For 100W

**CC02AXH2** (1.5 m)



### External Potentiometer (RoHS)

Motor speed can be set at a location away from the driver using an external potentiometer.

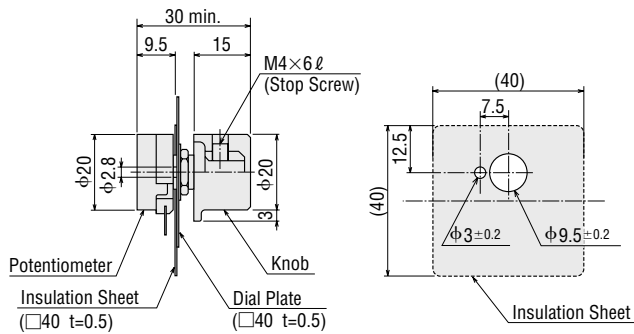
Model **PAVR-20KZ**

(20 kΩ, 1/4 W, with a linear resistance vs. angle curve)



### Dimensions (Unit = mm)

Mass: 20 g



Recommended thickness of a mounting plate is maximum 4.5 mm.

### Flexible Couplings (RoHS)

These products are the clamping type couplings to connect between the shaft of motor/gearhead and the shaft of the equipment to be connected. Couplings come with shaft holes and have standardized combinations for different diameter shaft holes.



| Applicable Product | Shaft Diameter (mm) | Type of Load | Coupling Type |
|--------------------|---------------------|--------------|---------------|
| <b>BLH015K-□</b>   | φ6                  | Regular Load | <b>MCL20</b>  |
|                    |                     | Shock Load   |               |
| <b>BLH015K-A</b>   | φ6                  | Regular Load | <b>MCL20</b>  |
|                    |                     | Shock Load   |               |
| <b>BLH230KC-□</b>  | φ10                 | Regular Load | <b>MCL30</b>  |
|                    |                     | Shock Load   |               |
| <b>BLH230KC-A</b>  | φ8                  | Regular Load | <b>MCL20</b>  |
|                    |                     | Shock Load   |               |
| <b>BLH450KC-□</b>  | φ15                 | Regular Load | <b>MCL40</b>  |
|                    |                     | Shock Load   |               |
| <b>BLH450KC-A</b>  | φ10                 | Regular Load | <b>MCL30</b>  |
|                    |                     | Shock Load   |               |
| <b>BLH5100KC-□</b> | φ18                 | Regular Load | <b>MCL55</b>  |
|                    |                     | Shock Load   |               |
| <b>BLH5100KC-A</b> | φ12                 | Regular Load | <b>MCL30</b>  |
|                    |                     | Shock Load   |               |

● Enter the gear ratio in the box (□) within the model name.

● Choose from a range of flexible couplings with various shaft hole diameters. These couplings can also be used with round-shaft motors having the corresponding shaft diameter.

## ● Motor/Gearhead Mounting Brackets (RoHS)

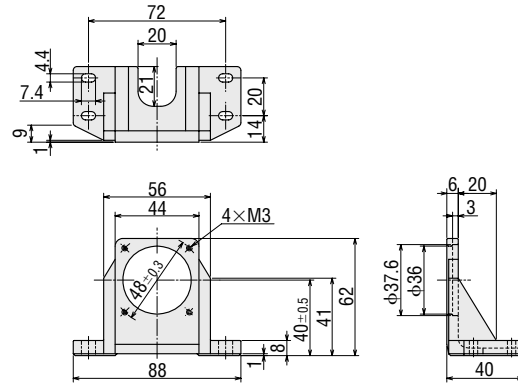
High-strength installation fittings are available for handling high-output motors and gearheads.



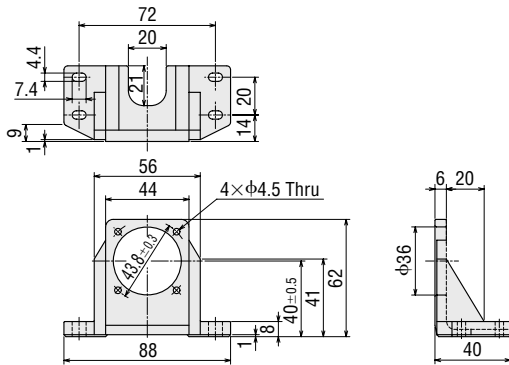
| Model         | Applicable Product                       |
|---------------|------------------------------------------|
| <b>SOL0B</b>  | <b>BLH015K-□</b>                         |
| <b>SOL0M3</b> | <b>BLH015K-A</b>                         |
| <b>SOL2M4</b> | <b>BLH230KC-□</b><br><b>BLH230KC-A</b>   |
| <b>SOL4M6</b> | <b>BLH450KC-□</b><br><b>BLH450KC-A</b>   |
| <b>SOL5M8</b> | <b>BLH5100KC-□</b><br><b>BLH5100KC-A</b> |

- Enter the gear ratio in the box (□) within the model name.
- These brackets come with tapped holes. To mount the motor and gearhead, simply fasten with the screws provided to the gearhead. To mount the motor alone, mounting screws must be provided separately.
- Please note that these mounting brackets cannot be used with hollow shaft flat gearheads.

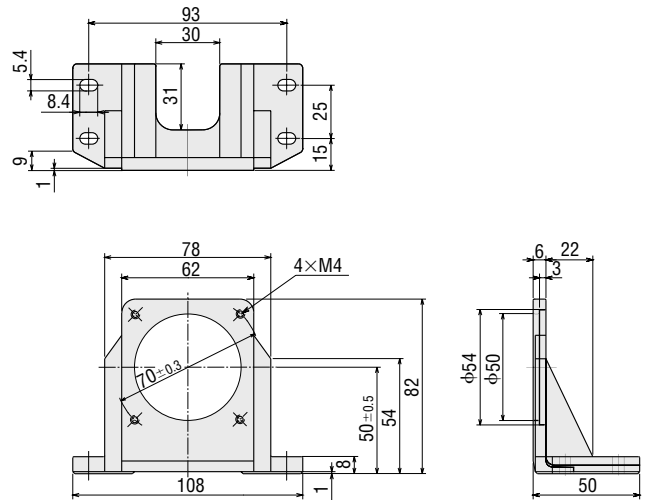
Model: **SOL0M3**  
Mass: 85 g Material: Aluminum



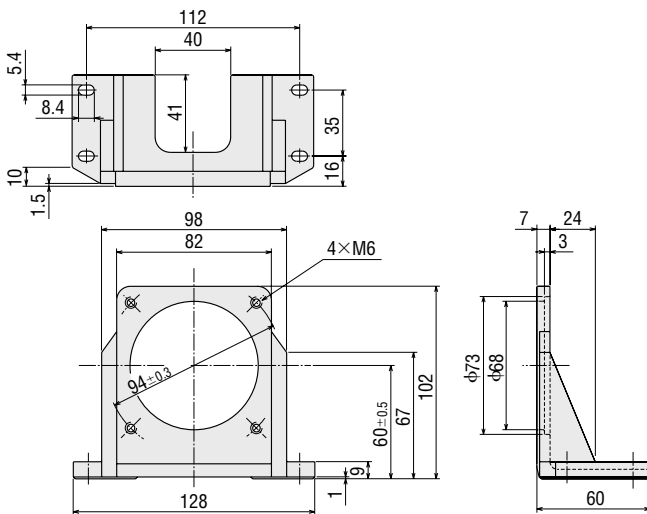
Model: **SOL0B**  
Mass: 85 g Material: Aluminum



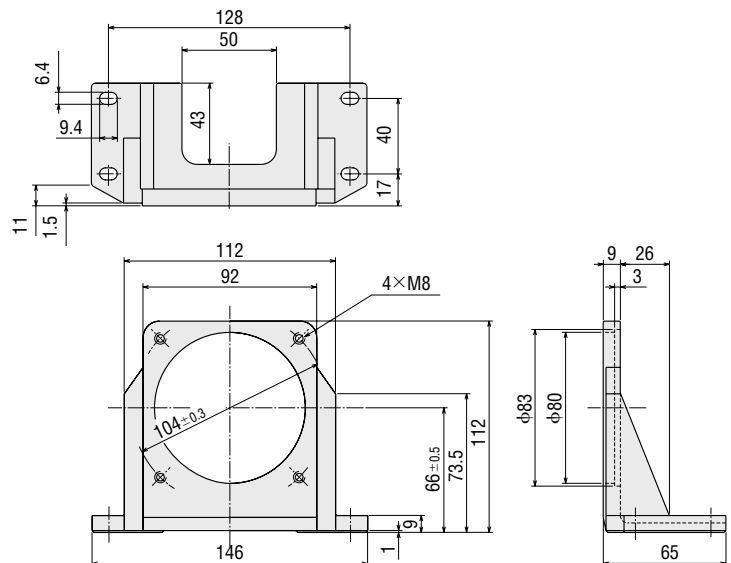
Model: **SOL2M4**  
Mass: 135 g Material: Aluminum



Model: **SOL4M6**  
Mass: 210 g Material: Aluminum



Model: **SOL5M8**  
Mass: 270 g Material: Aluminum



# Oriental Motor's Brushless DC Motor and Driver Packages

## Meeting All Your Motion Control Needs

### Built-In Digital Operator

Brushless DC Motor and Driver Package

## BLF Series

This unit combines a brushless DC motor with a maximum speed of 4000 r/min with a driver offering built-in digital setting/display functions.



- Output: 30 to 120 W
- Speed Control Range: 80 to 4000 r/min

### Easy-Wiring, Easy-Operation

Brushless DC Motor and Driver Package

## BLU Series

An easy-wiring, easy-operation unit combining a brushless DC motor with a panel-installation type driver.



- Output: 20 to 90 W
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This product is manufactured at a plant certified with the international standards **ISO 9001** (for quality assurance) and **ISO 14001** (for systems of environmental management).

# Orientalmotor

Specifications are subject to change without notice.  
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