Oriental motor

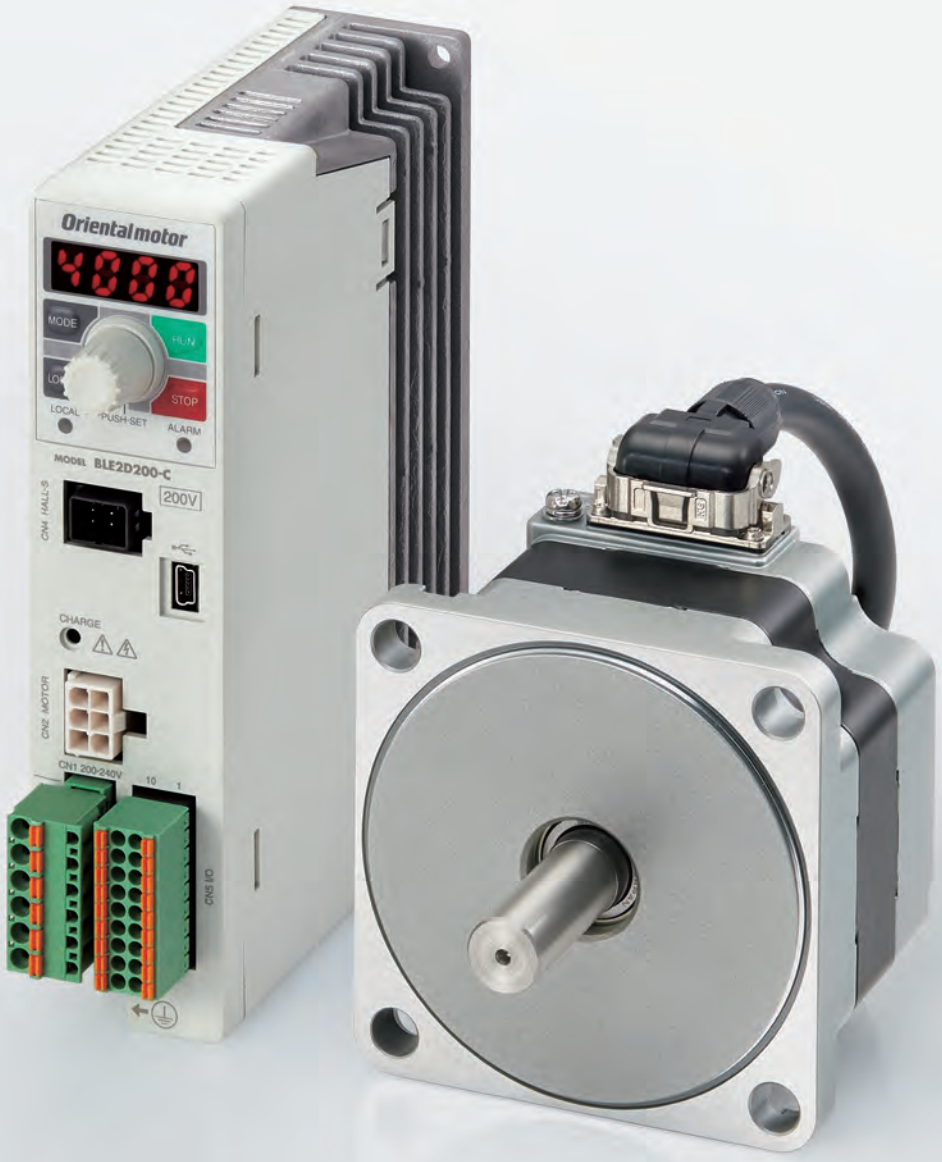
Brushless Motors

BLE2 Series

All New.

An advanced Brushless DC package,

which is both easy to use and feature rich.



Further Advanced Brushless Motors

BLE2 Series

The BLE2 series is now available with an electromagnetic brake, dustproof and waterproof motors and various other types of motors. These motors can be used for an even wider range of applications.

Product Line

Gearhead Type		Output Power					
		30W	60W	120W	200W	300W	400W
Parallel Shaft Gearhead							
 IP66	Parallel Shaft Gearhead **GFV** Gearhead	●	●	●	●	●	●
	H1 Grease	●	●	●			
	With Electromagnetic Brake	●	●	●	●		
 IP67	Water-Resistant Dust-Resistant				●	●	●
 IP66	Parallel Shaft Gearhead **JV** Gearhead				●	●	●
 IP44	Foot Mount Type Gearhead **JB** Gearhead				●	●	●
Hollow Shaft Flat FR Gearhead							
 IP65		●	●	●	●	●	●
	With Electromagnetic Brake	●	●	●	●		
Right-Angle Hollow Shaft Hypoid JH Gearhead							
 IP66			●	●	●	●	●
Round Shaft Type							
 IP66		●	●	●	●	●	●
	With Electromagnetic Brake	●	●	●	●		

Main Features

Full performance and function

- Speed control range 80 - 4000 r/min
- Multistep Speed-Change Operation Max. 16 speeds
- Torque limitation possible
- Load hold function

Motor selectable according to application

- Motor with electromagnetic brake for vertical drive
- IP67 Dust-/Water-Resistant
- Gearhead with H1 grease for food machinery

User friendly

- Connectors for direct connection
- Maximum extension of 20 m between motor and driver
- Digital setting and operation on the driver itself
- Speed can be set using a PC or external signals

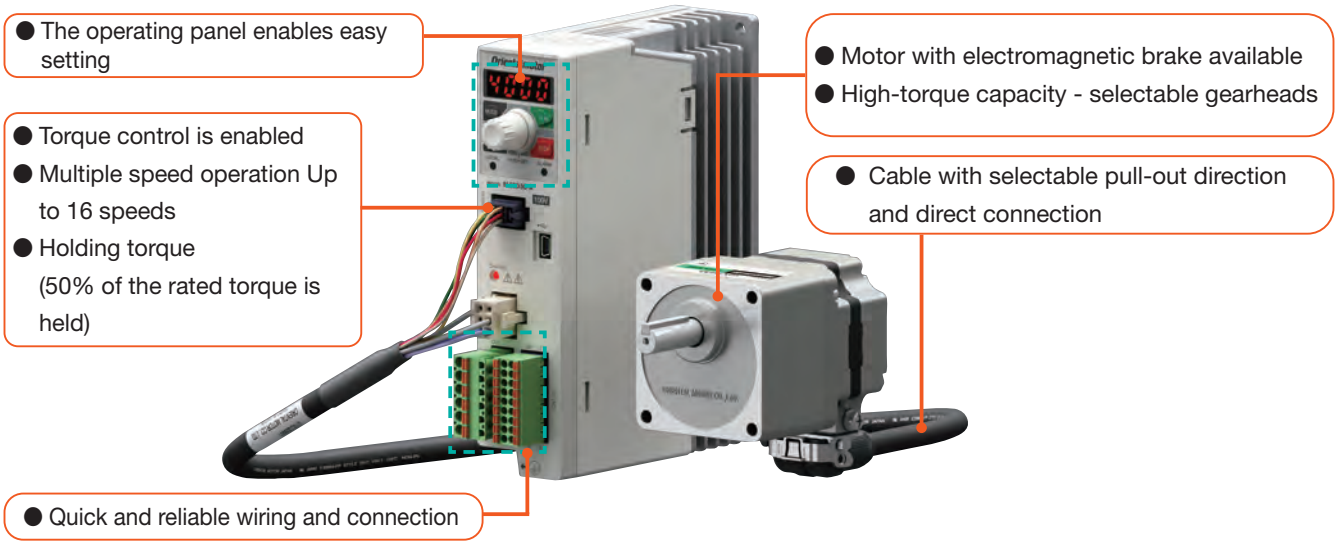
Supports high torque selectable gearheads

- **JB** gearhead up to 1/1200
- **JH** gearhead for space-saving installation

BLE2 Series Key Features

Overview

Overhauling the motor structure has made it even more compact, as well as increasing the power and efficiency.
The driver comes with a digital indication panel, that easily allows speed to be set via a single potentiometer.
Additionally, connection cables now come with the option to choose the pull-out direction and a max. distance of 20 m can be secured via direct connection.



The Control Panel allows for easy setting

A control panel is installed on the front face of the drive.
Operating data and parameters can be set via operation key and setting dial, whilst looking at the digital display.

● The operating panel cannot be detached from the driver.

● Speed Setting Range 80 - 4000 r/min*
*Depends on the gearhead

● Speed Regulation ±0.2%*
*Digital setting

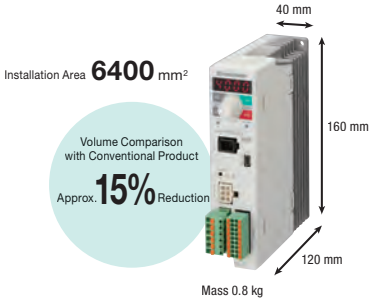
Quick and Accurate Wiring and Connection

Use of a spring-type connector allows for quick and accurate wiring.

Effective Utilization of Installation Space

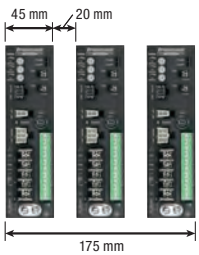
This new driver has a compact and slim body through optimal layout of its internal parts. Multiple drivers can now be installed in contact with each other, making it possible to reduce the amount of installation space or increase the number of axes within the same equipment space.

Compact, Slim-Body Driver

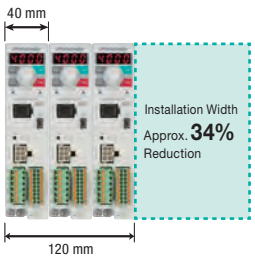


Side-by-Side Installation of Multiple Drivers

Conventional **BLE** Series Drivers



BLE2 Series Drivers

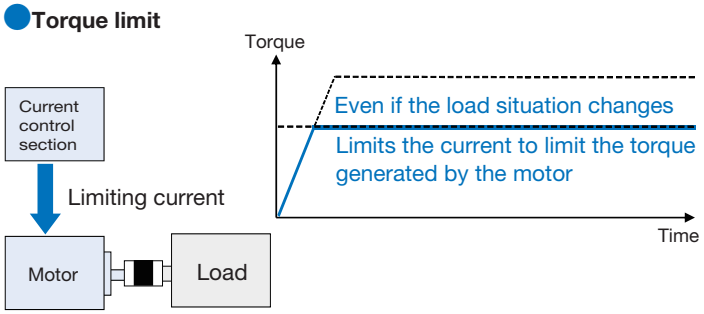


Condition for Contact Installation

● Ambient temperature 0 - +40 °C
● Please install it on a heat sink (Material: Aluminum, equivalent to 350×350×2 mm).

Torque limits that can be used as limit functions

This function allows the torque generated by the motor to be reduced by limiting the current flowing to the motor. This function can be used in applications to prevent the application of more force than necessary.



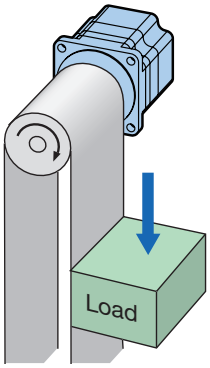
Motor with electromagnetic brake

The electromagnetic brake is designed to automatically turn ON/OFF simultaneously with the operation of the motor. When there is a loss of power scenario, or when the power is turned OFF, the motor stops instantaneously to hold the load in place. Stable speed control and position holding when stopped (vertical or horizontal) are possible.

● Vertical Operation (Gravitational operation)

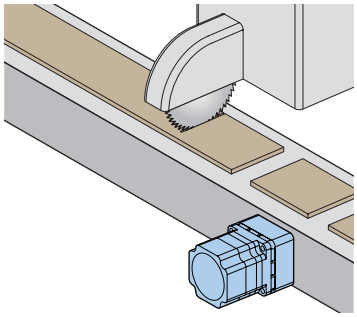
Perform stable speed control even during vertical operation. Even when there is a loss of power scenario, or when the power is turned OFF, the load is held in place.

✻Since regenerative energy is produced during vertical operation, a regeneration unit is required (sold separately).



● Position Can be Held when the Power is Off

The position can be held during both vertical operation and horizontal operation.

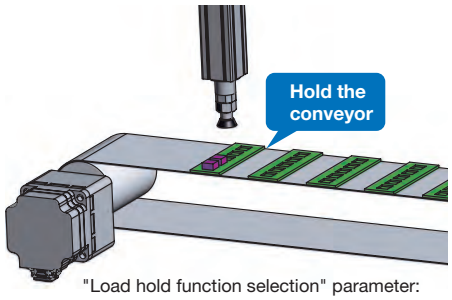


Can be held in place by electrical forces without the use of a mechanical brake.

The load hold function can be used as an electrical holding brake* when stopping without a mechanical brake.
It is suitable, for example, for applications where work is carried out while the conveyor is stopped.

✻The load can be held up to 50% of rated torque.

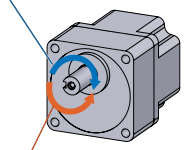
Memo
The holding force is lost when the power supply to the driver is switched off.
Therefore, it is not suitable to secure the load, when the power supply is switched off.



"Load hold function selection" parameter:
enabled ➡Holding force is generated when the motor is stopped.

● What is the Load Hold Function?

When the output shaft is turned



An electrical holding force is generated to prevent it from being turned.

Maintenance-free

Suitable for applications with frequent repeated operation and shutdown. Contributes to a longer service life as there are no mechanical wear parts.

Contributes to space saving in the equipment

As a mechanical brake is not required, it contributes to space and weight savings in the equipment.

Lock lever connectors for direct connection

Locking-lever connectors specially designed for small motors allow a direct connection between motor and driver.

Easy connection

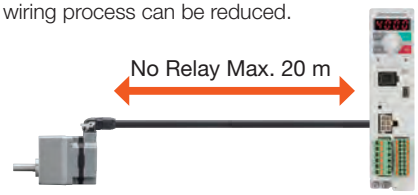
The lock lever system eliminates the need for screw fasteners, making it easy to connect the cable.

● Installation Method

Insert the connector　Fold down the lock lever　Connected

Connection with 1 Connection Cable No need for Relays

Because only 1 cable is required for the power line, signal line, and ground wire, wiring process can be reduced.



Selectable cable pull-out direction

Three different motor cable pull-out directions can be selected to suit the equipment.

Pull-out on output shaft side　Pull-out on rear of the motor　Vertical Pull-out

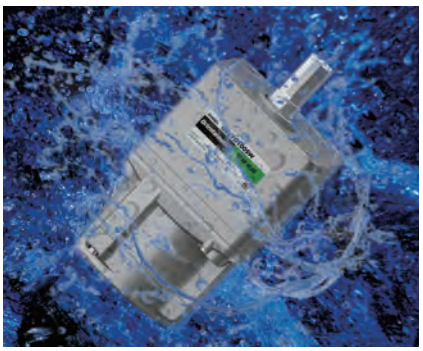
Flexible cables are also available

If the cable is repeatedly bent and stretched, use a flexible connection cable.

Features of Dust-/Water-Resistant motor IP67

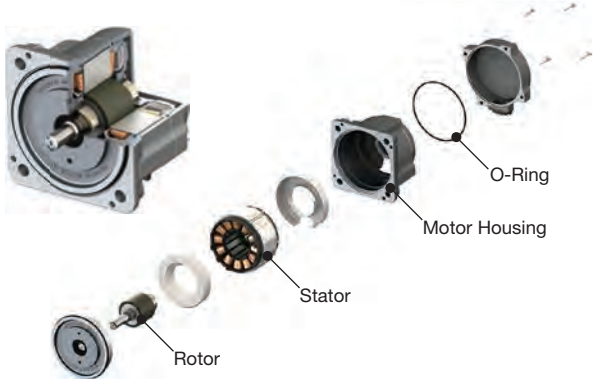
Water-resistant, dust-resistant brushless motors that withstand wet and dusty environments, and can be washed down with water.

- The entire motor can be washed down with water
- Resistant to water and dust
- IP67 construction including connectors
- Improved corrosion resistance



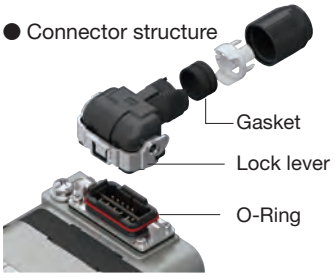
Excellent protective construction

Sealing parts (O-rings) are used on the mating parts to prevent water ingress into the motor. Can be used in applications where the product is to be washed down with water.



The connector structure incorporates a gasket and O-ring for improved water-resistant performance. The connector, including the connector part, complies with IP67.

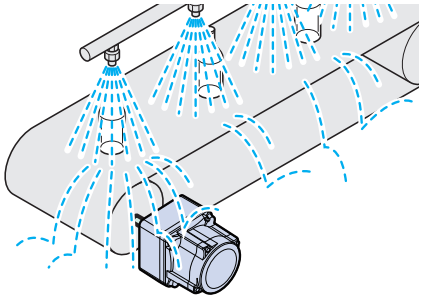
● Connector structure



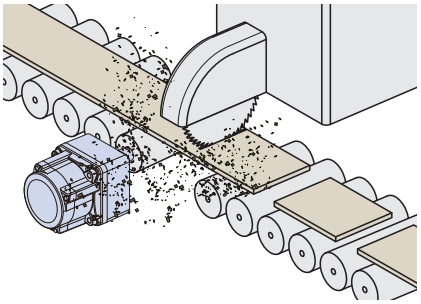
Degree of Protection IP67

Can be used in dusty and wet environments. Can be washed down with water. Designed to be mounted on equipment with no protective cover.

Can be washed down with water while mounted on equipment



Can be used in dusty environment



I P 6 7

- 7: Can be washed down with water while mounted on equipment
- 6: Completely dust-proof structure

(Water-resistant Test Conditions)
1 m below the surface of water for 30 minutes
* However, please do not use immersed in water or in high water pressure conditions.

'Water washdown waterproofing test' to take account of age-related deterioration

Our own evaluation*1

While the motor is in use, the sealing parts (O-rings) may deteriorate and the initial waterproofing may no longer be ensured. We have carried out our own evaluation standard, the 'water washout waterproofing test', which takes into account the age-related deterioration of the seal parts, and have confirmed that no water has entered the inside of the motor.

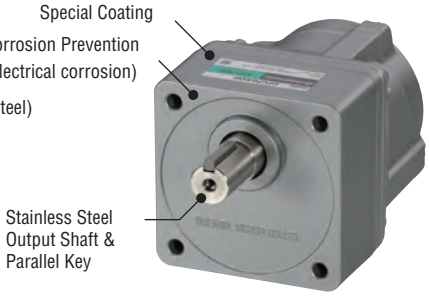
Our original "water wash-down waterproof test"

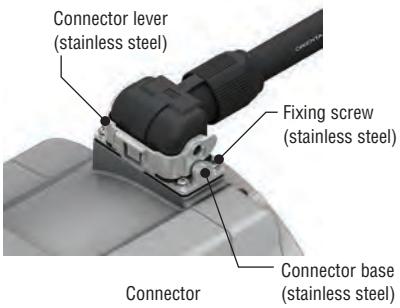
① Heat shock test: thermal deterioration equivalent to 5 years is applied to the sealing parts (O-rings)
② Vibration test: vibration is applied to the motor
③ Water discharge test: water pressure of 100 kPa is applied

*1 This is a test based on our original conditions and methods and does not guarantee no failure

Increased Environmental Resistance

The motor is covered with a special rust-resistant coating, with an output shaft and screws made of stainless steel. The installation surface is also painted, so it will be rust-resistant even when installed on stainless steel equipment.





Motor geometry with many inclines

The shape incorporates a lot of sloping to make it easier for water to flow when washing. Water flows easily no matter which direction it is installed.

Suitable for Clean Environments

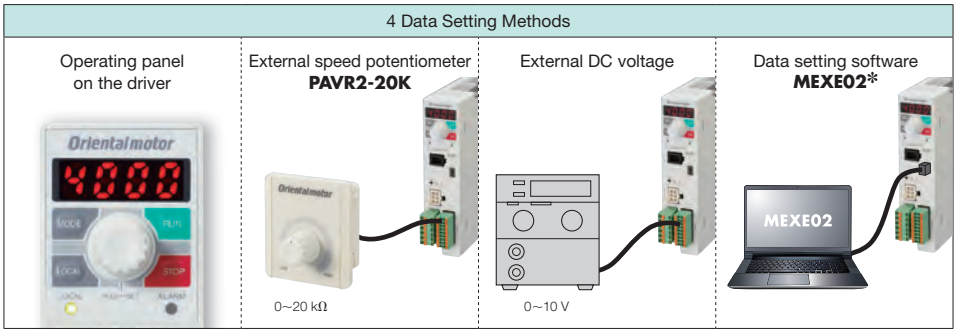
The high efficiency motor does not require a cooling fan.

Meeting Customer Needs with Enhanced Functions

The motor unit supports 4 data setting methods and provides various functions that can be used depending on purposes.
The use of data setting software are made easily use, allows checking of the startup and operating conditions of the equipment.

Operating Method

- Local operation: Operation with the operating panel. Can be applied to test operation.
- Remote operation: Operation with external signals or data setting software **MEXE02**.



*When using data setting software **MEXE02**, you can connect the driver to the PC with a commercially available USB cable.

Settable Contents

The motor unit provides functions that match the conditions of use by the customer.

Setting	Purpose/Objective	Parameter	Setting Method			
			Operating Panel	External Speed Potentiometer **PAVR2-20K**	External DC Voltage	Data Setting Software **MEXE02**
Speed	For operating at an arbitrary speed.	80 - 4000 r/min	●	●	●	●
Torque Limit	For suppressing the motor's max. output power for safety purpose or limiting it depending on the load.	0 - 300%	●	●	●	●
Acceleration/ Deceleration Time	For setting the acceleration time and deceleration time to prevent impact to the load when starting and stopping.	0 - 15.0 sec.	●	–	–	●
Multiple Speed Operation	For operating at more than 2 speeds.	Up to 16 speed	●	–	–	●
Multi-Motor Control	For operating multiple motors at the same speed.	Up to 20 motor units (when a potentiometer is used)	–	●	●	–

Main Software Functions

Below are the major functions that can be operated using the control panel and data setting software **MEXE02**.

Function	Applications and Purposes	Description
Load Factor Indication	Checking the Motor's Generated Torque.	It displays the load factor with the motor's rated torque as 100 %. (Indication range: 0 - 300 %)
Gear Ratio	Displays the Output Shaft Speed after the Gearhead.	When the gear ratio is set, it displays the converted speed.
Speed Limits Setting	Operating at a Speed within the Set Speed Control Range.	It sets the upper and lower limit values of the speed.
Speed Teaching	Changing the Speed while the Motor is Rotating.	Speed can be changed in the monitor mode while the motor is rotating.
Easy Holding Torque	Holding the Load during Standstill.	An electrical holding torque can be generated while the motor is stopped. (Holding force up to 50 % of rated torque) Note Since the holding force is canceled when the power supply to the driver is turned OFF, it cannot be used to prevent falls during standstill.
Shock Alleviation Filter	Reducing Shock during Starting and Stopping.	This function softens acceleration and deceleration so that the load being transported does not experience sudden movement.
Alarm	Checking the Reason for the Alarm Generation.	Alarm outputs include overload, incorrect connection, over voltage etc and can be identified easily. This allows for ease of fault finding and swift corrective action.
General Information	Information Status of the Motor and Driver.	Before an alarm is output, an information output can be set to enable maintenance teams to be made aware of situations when the motor maybe running outside of its normal conditions before going into alarm.
Edit Lock	Set Data is Protectable.	Set data is protectable, which prevents users from deleting or making unnecessary changes to data & parameters, from either the control panel or the local PLC.

Useful Functions Enabled by Data Setting Software **MEXE02**

The data setting software can be downloaded from the Oriental Motor website.

Data Setting software **MEXE02**

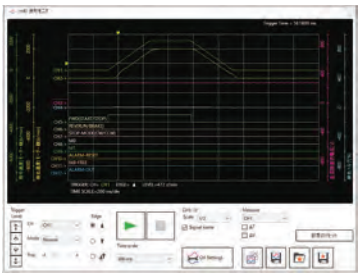
Monitor Functions

The software contains various monitor functions that enable checking of conditions such as motor operating conditions.
Using functions suitable for each condition may shorten the time for starting up or adjusting the equipment or lead to effective maintenance.

●Waveform Monitoring

At Set-up

Like an oscilloscope, the monitor allows you to check motor drive conditions and output signal status. Use this during the startup or adjustment of the attachment.



●Alarm Monitor

During operation For maintenance

If an error occurs, you can check the error details, operation conditions at the time of error occurrence, and measures to be taken. The checking of the measures facilitates response to the error.

Test Functions

These functions allow for the motor to be operated, controlled and adjusted via Oriental Motors MEXE02 Software. Additionally when directly connected to a PLC or controller the software can monitors the inputs and outputs sent to and from the BLE2 drive. This helps to reduce set-up time.

●Teaching and Remote Operation

At Set-up

The "Teaching and Remote Operation" Function allows for the motion variables to be changed and saved during testing, such as speed. Allowing for the machine to be set up before connecting it to the PLC or controller. This helps to reduce set-up time.

●I/O Monitor

At Set-up When Operating

This function allows us to monitor the digital I/O of the BLE2 driver as well as any external DC voltage. Additionally Inputs & Outputs can be forced. This function is useful for confirming that wiring is correct with the PLC or controller.

Types and Features of Gearheads

These high-strength gearheads support high-speed rotation and high outputs the brushless motors provide.
You can choose from various gearheads to meet your application, requirements, or installation.

Parallel Shaft Gearhead

Type

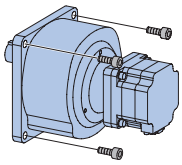
Parallel Shaft Gearhead **GFV**
H1 grease for food machinery

Parallel Shaft **JV** Gearhead

Foot Mount Type **JB** Gearhead

Installation Advantages

Installs on the Flange (JV Gear)

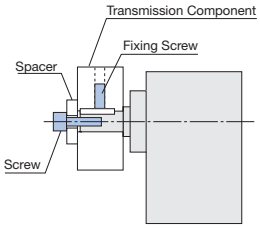


Improving the Installation Accuracy (GFV Gear)

Machined output shaft boss and mounting surface. Improves mounting accuracy with equipment.

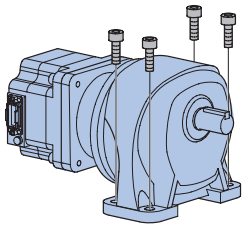
Tapped Hole on the Output Shaft End (GFV Gear, □ 80 mm or more)

The output shaft for the gearhead has a tapped hole at the end. The hole can be used for supporting the prevention of coming out of a transmission component.



Usage example of the screw hole on the output shaft end

No Mounting Bracket Required
The shape quickly attach to your device.



High Rigidity/Integral Structure

Allows you to easily design the shaft center with the integral installation surface structure.

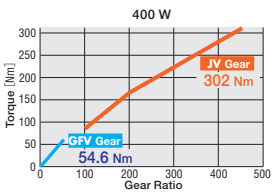
Features

High Strength Gearhead (GFV Gear)

A heat treatment strengthens the gears and the bearing diameter is enlarged for a higher strength. The gearhead has 2 to 3 times of the permissible torque than AC motor gearheads with the same frame size, contributing to downsized equipment.

High Permissible Torque

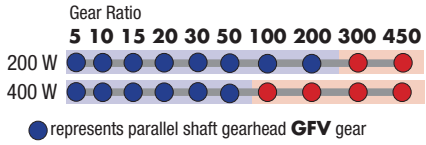
The torque is not saturated, allowing maximum utilisation of motor torque.



[at 3000 r/min]

High Gear Ratio (JV Gear)

This lineup has products with gear ratios up to 1/450.



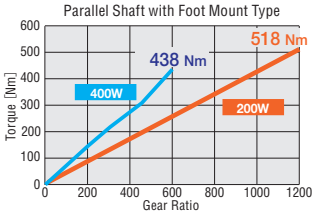
● represents parallel shaft gearhead **GFV** gear

Long Life (GFV Gear)

The gearhead has a long life using special bearings and grease for high-speed rotation. It achieves a rated life of 10,000 hours.

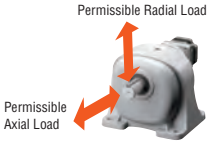
High Permissible Torque

The torque is not saturated and the motor torque can be maximized.



[at 3000 r/min]

High Strength

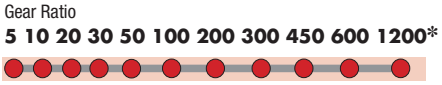


Permissible radial load
... ...3672 N
Permissible axial load
... ... 577 N

[1/1200 by 3000 r/min]

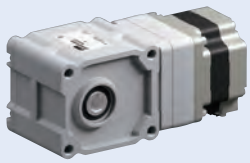
High Gear Ratio

Reduction ratios up to 1/1200 are available.



*200 W only

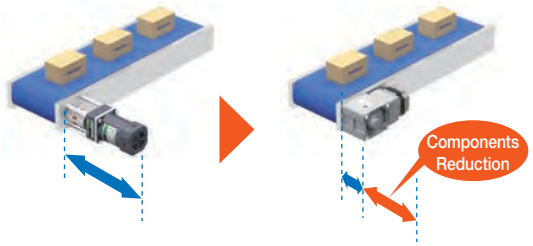
Right-Angle Hollow Shaft Gearhead



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

Space Saving

Placing the motor at right angles saves space.

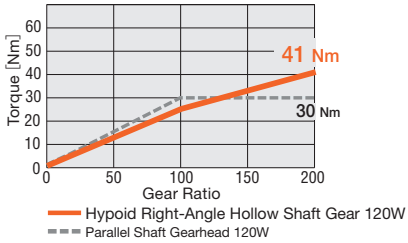


Cost Saving

Reduced couplings, belts, pulleys, and other parts contribute towards reduced parts costs and assembling steps.

Unsaturated Permissible Torque

The permissible torque is not saturated even at high gear ratio. Therefore, the benefit of the motor torque can be maximized.



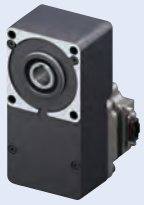
[at 3000 r/min]

High Strength

Comparison with parallel shaft gearhead

[1/200 by 3000 r/min]

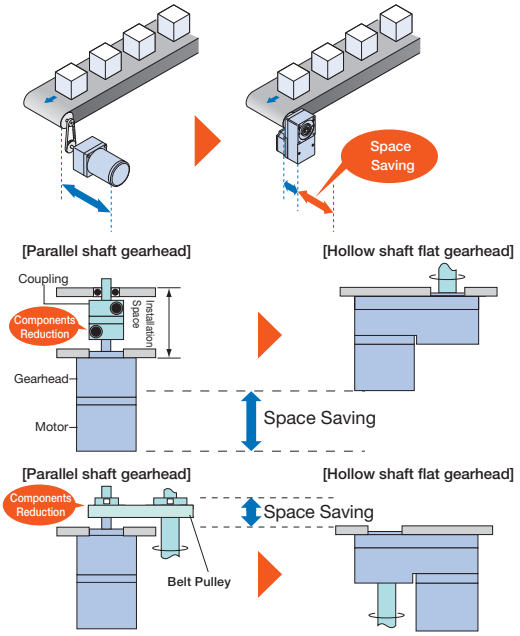
Hollow Shaft Flat Gearhead



Hollow Shaft Flat **FR** Gearhead

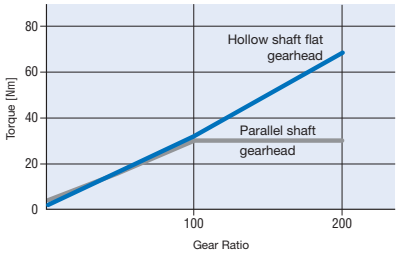
Space Saving

Direct connection to the drive shaft without the use of connecting parts saves space on the equipment.



Unsaturated Permissible Torque

Permissible torque is not saturated even at high reduction ratios. The torque of the motor can be utilised to the maximum extent.



[for 90 mm mounting angle dimension]

High permissible torque, long life

The gear case rigidity has been improved and the gears and bearings have been increased in diameter to achieve high allowable torque and long service life. A rated life of 10000 hours has been achieved.

High-strength, high reduction gearheads to suit the application

In addition to the conventional parallel shaft gearhead **GFV**, a line-up of gearheads with features such as high reduction ratio, high strength and space saving is available. The permissible load and maximum permissible torque of the output shaft have been significantly increased. They can also be used for equipment in a variety of environments.

Gearhead rated life of 10.000 hours
Compatible with H1 grease for food machinery and available in a dust-/water-resistant versions.

Gear shape for easy installation with a full range of high gear ratios.

Parallel Shaft Gearhead **GFV**

Dust-/Water-Resistant

Parallel Shaft Gearhead **JV**

Foot Mounting Type Gearhead **JB**

For applications where space saving is desired / Permissible torque without saturation

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

Hollow Shaft Flat **FR** Gearhead

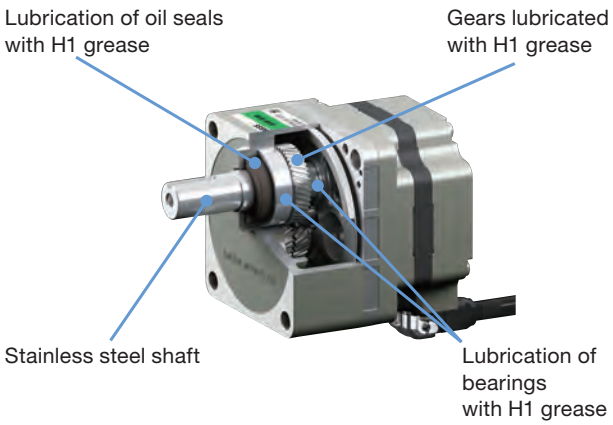
H1 grease compatible for food machinery (connector type parallel shaft gearhead **GFV**)

H1 grease for food machinery is used to lubricate the gear section.

- **What is H1 grease for food machinery?**
  Greases registered with the NSF in the category 'Lubricants for use in applications where accidental contact with food is possible'.

  What is NSF (NSF International)?
  The US-based international third-party certification organisation provides global services in standards development, product certification, auditing, education and risk management for public health and the environment.

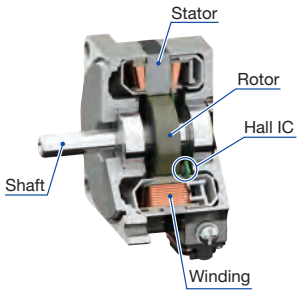
- **Rated life of the gearhead is 5.000 hours**



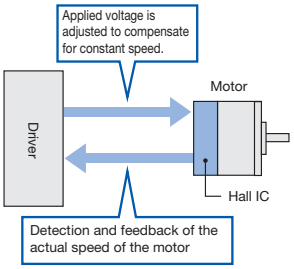
Features of brushless motors

Speed-controlled motors that combine a highly efficient, compact motor with a dedicated circuit (driver). The motor contributes to carbon neutral initiatives as it saves energy and resources.
The motor's rotor section incorporates permanent magnets and an optimised magnetic design ensures high efficiency.
The motor is equipped with a sensor (Hall IC) for feedback control, enabling accurate speed control to commands.
The torque rating is constant from low to high speeds without being limited by the operating torque at low speeds, as is the case when AC motors are inverter-controlled.

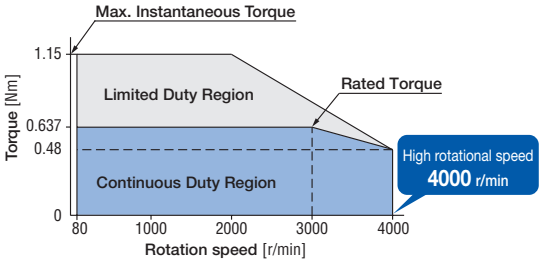
Motor structure



Motor control



Wide speed range, constant torque



IE4 equivalent*high-efficiency, energy-saving motors

Highly efficient motors that exceed IE4 standards - more efficient than AC motors (induction motors) with inverter control, reducing power consumption and CO_2 emissions.

Compact and lightweight, contributing to resource conservation

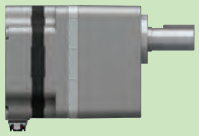
Brushless motors are compact and lightweight, saving space and reducing the size of equipment and contributing to resource conservation.

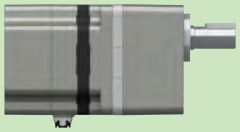
Stable speed control

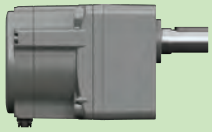
Brushless motors constantly monitors feedback signals from the motor and adjusts the applied voltage by comparing them against the set speed. This allows the motor to rotate at a stable speed from low to high speeds even when the load fluctuates.

Product Line

For the **BLE2** series the motor, driver and connection cables are sold separately. They can be purchased in combinations.

<table>
<tr><th>Type</th><th>Motor</th><th colspan="2">Connection Cable / Flexible Connection Cable</th><th>Driver</th></tr>
<tr><td rowspan="2">Connector Type</td><td>Motor
  </td><td> 
Connection Cable
0.5 - 20 m

Flexible Connection Cable
1 - 20 m</td><td rowspan="2">Pull-out on output shaft side
 
Pull-out on rear of the motor
 
Vertical Pull-out
  </td><td>  </td></tr>
<tr><td>Motor with
electromagnetic brake
  </td><td>For motors with electromagnetic brake
 
Connection Cable
0.5 - 20 m

Flexible Connection Cable
1 - 20 m</td><td>For motors with electromagnetic brake
  </td></tr>
<tr><td>Dust-/Water-
Resistant
Connector Type</td><td>Dust-Resistant
Water-Resistant
Motor
  </td><td> 
Connection Cable
0.5 - 20 m

Flexible Connection Cable
1 - 0 m</td><td></td><td>  </td></tr>
</table>

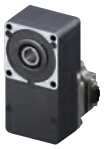
Connector Type

● Standard Motor

Output shaft type / Output shaft material		Frame Size [mm]	Output Power [W]	Gear Ratio	Degree of Protection	Power Supply Voltage [V]
Parallel Shaft Gearhead	**GFV** Gearhead / Stainless steel shaft 	60	30	**5 - 200**	IP66	Single-Phase 100-120 Single-Phase 200-240 Three-Phase 200-240
		80	60			
		90	120			
		110	200			Single-Phase 100-120 Single-Phase 200-240 Three-Phase 200-240
			300	**5 - 100**		
			400	**5 - 50**		
	GFV Gearhead H1 grease for food machinery / Stainless steel shaft	60	30	**5 - 200**		Single-Phase 100-120 Single-Phase 200-240 Three-Phase 200-240
		80	60			
		90	120			
	JV Gearhead / Stainless steel shaft 	✻1	200	**300 - 450**	IP66	Single-Phase 100-120 Single-Phase 200-240 Three-Phase 200-240
			300	**200 - 50**		
			400	**100 - 450**		
Foot Mounting Type **JB** Gearhead / Steel shaft 		✻1	200	**5 - 1200**	IP44	Single-Phase 100-120 Single-Phase 200-240 Three-Phase 200-240
			300	**5 - 600**		
			400			

✻See outline drawings on the product details page.

● Standard Motor

Output shaft type / Output shaft material	Frame Size [mm]	Output Power [W]	Gear Ratio	Degree of Protection	Power Supply Voltage [V]
Right-Angle Hollow Shaft Hypoid **JH** Gearhead / Stainless steel shaft 	✻1	60	**10 - 200**	IP66	Single-Phase 100-120 Single-Phase 200-240 Three-Phase 200-240
		120			
		200	**5 - 200**		Single-Phase 100-120 Single-Phase 200-240 Three-Phase 200-240
		300			
		400			
Hollow Shaft Flat **FR** Gearhead / Steel shaft 	✻1	30	**5 - 200**	IP65	Single-Phase 100-120 Single-Phase 200-240 Three-Phase 200-240
		60			
		120			
		200	**10 - 100**		Single-Phase 100-120 Single-Phase 200-240 Three-Phase 200-240
		300			
		400	**5 - 100**		
Round shaft type✻2 / Stainless steel shaft 	60	30	—	IP66	Single-Phase 100-120 Single-Phase 200-240 Three-Phase 200-240
		60			
	90	120			
		200			Single-Phase 100-120 Single-Phase 200-240 Three-Phase 200-240
		300			
		400			

● Motor with electromagnetic brake

Output shaft type / Output shaft material	Frame Size [mm]	Output Power [W]	Gear Ratio	Degree of Protection	Power Supply Voltage [V]
Parallel Shaft Gearhead **GFV** / Stainless steel shaft 	60	30	**5 - 100**	IP66	Single-Phase 100-120 Single-Phase 200-240 Three-Phase 200-240
	80	60			
	90	120	**5 - 200**		Single-Phase 100-120 Single-Phase 200-240 Three-Phase 200-240
	110	200			
Round shaft type✻2 / Stainless steel shaft 	60	30	—	IP66	Single-Phase 100-120 Single-Phase 200-240 Three-Phase 200-240
		60			
	90	120			
		200			Single-Phase 100-120 Single-Phase 200-240 Three-Phase 200-240
Hollow Shaft Flat **FR** Gearhead / Steel shaf 	✻1	30	**5 - 200**	IP65	Single-Phase 100-120 Single-Phase 200-240 Three-Phase 200-240
		60			
		120			Single-Phase 100-120 Single-Phase 200-240 Three-Phase 200-240
		200	**10 - 100**		

✻1 See outline drawing on the product details page.
✻2 The round shaft type is also available with milled shaft section.

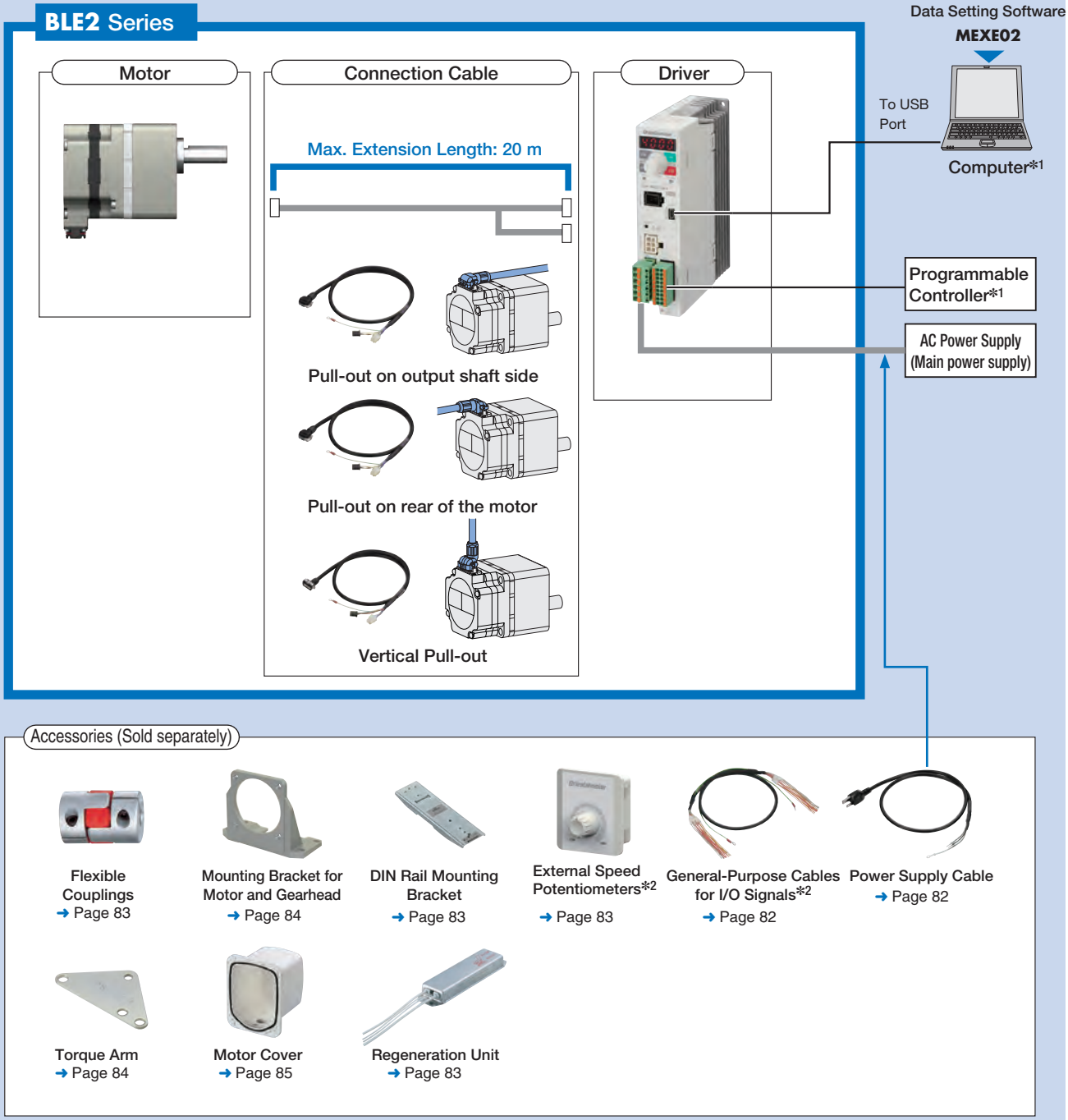
Dust-/Water-Resistant Connector Type

Output shaft type / Output shaft material	Frame Size [mm]	Output Power [W]	Gear Ratio	Degree of Protection	Power Supply Voltage [V]
Parallel Shaft Gearhead **GFV** / Stainless steel shaft 	110	200	**5 - 100**	IP67	Single-Phase 100-120 Single-Phase 200-240 Three-Phase 200-240
		300			
		400	**5 - 50**		

● Motors are available with or without mounting screws.

System Configuration

Motors, drivers and connection cables are sold separately.



*1 Not supplied.
*2 An external speed potentiometer (**PAVR2-20K**) and general-purpose cable for I/O signals cannot be used together.

Example of System Configuration

BLE2 Series				+	Accessories (Sold separately)		
Motor	Gearhead	Driver	Connection Cable (3m)		Mounting Bracket for Motor and Gearhead	Flexible Coupling	DIN Rail Mounting Bracket
BLM230HP-GFV	GFV2G10S	BLE2D30-A	CC030KHBLV		SOL2M4F	MCL301010	MADP02

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

Product Number

Motor

BLM 6 200 S H P M - GFV

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

BLM 5 200 □ H P K

① ② ③ ④ ⑤ ⑥ ⑧

①	Motor Type	**BLM**: Brushless Motor
②	Frame Size	**2**: 60 mm **4**: 80 mm **5**: 90 mm **6**: 104 mm **7**: 110 mm
③	Output Power	**30**: 30 W **60**: 60 W **120**: 120 W **200**: 200 W **300**: 300 W **400**: 400 W
④	Identification Number	**S**
⑤	Motor Connection Method	**H**: Connector Type
⑥	Degree of Motor Protection	**P**: IP66 rating* **W**: IP67 rating
⑦	**M**: Motor with electromagnetic brake	
⑧	Motor Shaft Type	**GFV**: **GFV** Pinion **K**: Round shaft type (with Parallel Key) **A**: Round shaft type **AC**: Round shaft type (with D-Cut)

*IP65 when combined with **FR** gearhead, IP44 when combined with the **JB** gearhead.

Gearhead

GFV 2 G 50 S □ F

① ② ④ ⑤ ⑥ ⑦

5 C B 50 B

② ③ ⑥ ④ ⑤

①	Motor Shaft Type	**GFV**: **GFV** Pinion **GFS**: **GFS** Pinion
②	Combinable Motors Frame Size	**2**: 60 mm **4**: 80 mm **5**: 90 mm **6**: 104 mm **7**: 110 mm
③	Gearhead Size	Code (Example) **C** For gearhead size symbols, see ■ Specifications (➜ pages 26, 27 and 29)
④	Gear Ratio	Number: Gearhead Gear Ratio
⑤	Output Shaft Material	Blank, **B**: Iron **S**: Stainless Steel
⑥	Gearhead Type	Blank: Parallel Shaft Gearhead **FR**: Hollow Shaft Flat Gearhead **H**: **JH** gear **B**: **JB** gear **V**: **JV** gear
⑦	**F**: H1 grease for food machinery **W**: Dust-/Water-Resistant	

Driver

BLE2D 200 - A M

① ② ③ ④

①	Driver Type	**BLE2D**: **BLE2** Series Driver
②	Output Power	**30**: 30 W **60**: 60 W **120**: 120 W **200**: 200 W **300**: 300 W **400**: 400 W
③	Power Supply Voltage	**A**: Single-Phase 100-120 VAC **C**: Single-Phase, Three-Phase 200-240 VAC **S**: Three-Phase 200-240 VAC
④	**M**: Motor with electromagnetic brake	

Connection Cable

CC 010 KH BL M R F

① ② ③ ④ ⑤ ⑥ ⑦

①	Cable Type	**CC**: Connection cable		
②	Length	**005**: 0.5 m	**010**: 1 m	**015**: 1.5 m
		020: 2 m	**025**: 2.5 m	**030**: 3 m
		040: 4 m	**050**: 5 m	**070**: 7 m
		100: 10 m	**150**: 15 m	**200**: 20 m
③	Motor Connection Method	**KH**: Metal connector type		
④	Applicable Model	**BL**: Brushless motors		
⑤	**M**: Motor with electromagnetic brake			
⑥	Blank: Connection Cable **R**: Flexible Connection Cable			
⑦	Cable Pull-out Direction	**F**: Pull-out on output shaft side **B**: Pull-out on rear of the motor **V**: Vertical direction		

Product Line

Motor

◇Pinion Shaft Type

Output Power	Product Name
30 W	**BLM230HP-GFV**
60 W	**BLM460SHP-GFV**
120 W	**BLM5120HP-GFV**
200 W	**BLM6200SHP-GFV**
300 W	**BLM6300SHP-GFV**
400 W	**BLM6400SHP-GFV**

◇Round Shaft Type (with Parallel Key)

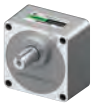
Output Power	Product Name
60 W	**BLM460SHPK**
120 W	**BLM5120HPK**
200 W	**BLM5200HPK**
300 W	**BLM5300HPK**
400 W	**BLM5400HPK**

Gearhead

◇Parallel Shaft Gearhead

Output Power	Product Name	Gear Ratio
30 W	**GFV2G□S**	**5, 10, 15, 20**
		30, 50, 100
		200
60 W	**GFV4G□S**	**5, 10, 15, 20**
		30, 50, 100
		200
120 W	**GFV5G□S**	**5, 10, 15, 20**
		30, 50, 100
		200
200 W 300 W 400 W	**GFV6G□S**	**5, 10, 15, 20**
		30, 50
		100, 200

◇Parallel Shaft Gearhead **H1** grease for food machinery



Output Power	Product Name	Gear Ratio
30 W	**GFV2G□SF**	**5, 10, 15, 20**
		30, 50, 100
		200
60 W	**GFV4G□SF**	**5, 10, 15, 20**
		30, 50, 100
		200
120 W	**GFV5G□SF**	**5, 10, 15, 20**
		30, 50, 100
		200

◇Hollow Shaft Flat **FR** Gearhead

Output Power	Product Name	Gear Ratio
30 W	**GFS2G□FR**	**5, 10, 15, 20**
		30, 50, 100
		200
60 W	**GFS4G□FR**	**5, 10, 15, 20**
		30, 50, 100
		200
120 W	**GFS5G□FR**	**5, 10, 15, 20**
		30, 50, 100
		200
200 W 300 W 400 W	**GFS6G□FR**	**5, 10, 15, 20**
		30, 50, 100

●A number in the box □ in the product name indicates the gear ratio.

◇**JV** Gear

Output Power	Product Name	Gear Ratio
200 W	**5KV□S**	**300, 450**
300 W	**5DV□S**	**100, 200**
400 W	**5KV□S**	**300, 450**

◇**JB** Gear

Output Power	Product Name	Gear Ratio
200 W 300 W 400 W	**5AB□B**	**5, 10, 20**
	5CB□B	**30, 50**
	5EB□B	**100, 200**
	5KB□B	**300, 450**
	5SB□B	**600, 1200**

◇**JH** Gear

Output Power	Product Name	Gear Ratio
60 W	**4H□S**	**10, 15, 20**
		30, 50, 100
		200
120 W	**5H□S**	**10, 15, 20**
		30, 50, 100
		200
200 W 300 W 400 W	**5XH□S**	**5, 10, 15, 20**
		30
		50
	5YH□S	**100**
		200

Dust-/Water-Resistant Motor

◇Pinion Shaft Type

Output Power	Product Name
200 W	**BLM7200HW-GFV**
300 W	**BLM7300HW-GFV**
400 W	**BLM7400HW-GFV**

Motor

◇Round Shaft Type

Output Power	Product Name
30 W	**BLM230HP-AS**
60 W	**BLM260HP-AS**
120 W	**BLM5120HP-AS**
200 W	**BLM5200HP-AS**
300 W	**BLM5300HP-AS**
400 W	**BLM5400HP-AS**

Dust-/Water-Resistant Gearhead

◇Parallel Shaft Gearhead

Output Power	Product Name	Gear Ratio
200 W 300 W 400 W	**GFV7G□SW**	**5**, **10**, **15**, **20**
		30, **50**
		100

Driver

Output Power	Power Supply Voltage	Product Name
30 W	Single-Phase 100-120 VAC	**BLE2D30-A**
	Single-Phase, Three-Phase 200-240 VAC	**BLE2D30-C**
60 W	Single-Phase 100-120 VAC	**BLE2D60-A**
	Single-Phase, Three-Phase 200-240 VAC	**BLE2D60-C**
120 W	Single-Phase 100-120 VAC	**BLE2D120-A**
	Single-Phase, Three-Phase 200-240 VAC	**BLE2D120-C**
200 W	Single-Phase 100-120 VAC	**BLE2D200-A**
	Single-Phase, Three-Phase 200-240 VAC	**BLE2D200-C**
300 W	Single-Phase, Three-Phase 200-240 VAC	**BLE2D300-C**
400 W	Three-Phase 200-240 VAC	**BLE2D400-S**
400 W	Single-Phase 200-240 VAC	**BLE2D400-C**

Connection Cable

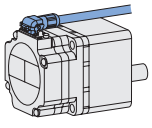
Length	Product Name
0.5 m	**CC005KHBL□**
1 m	**CC010KHBL□**
1.5 m	**CC015KHBL□**
2 m	**CC020KHBL□**
2.5 m	**CC025KHBL□**
3 m	**CC030KHBL□**
4 m	**CC040KHBL□**
5 m	**CC050KHBL□**
7 m	**CC070KHBL□**
10 m	**CC100KHBL□**
15 m	**CC150KHBL□**
20 m	**CC200KHBL□**

Flexible Connection Cable

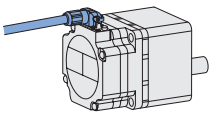
Length	Product Name
1 m	**CC010KHBLR□**
1.5 m	**CC015KHBLR□**
2 m	**CC020KHBLR□**
2.5 m	**CC025KHBLR□**
3 m	**CC030KHBLR□**
4 m	**CC040KHBLR□**
5 m	**CC050KHBLR□**
7 m	**CC070KHBLR□**
10 m	**CC100KHBLR□**
15 m	**CC150KHBLR□**
20 m	**CC200KHBLR□**

3 types of connection cables with different cable pull-out direction are available.

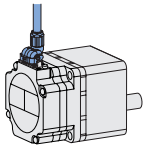
F: Pull-out on output shaft side



B: Pull-out on rear of the motor



V: Vertical Pull-out



Note

- For round shaft types, choose the direction of cable withdrawal in consideration of installation.
- The number □ in the part number indicates the gear ratio.

The ■ in the part number indicates the cable pull-out direction: **F**, **B** or **V**.

●Motor with electromagnetic brake

◇Pinion Shaft Type

Output Power	Product Name
30 W	**BLM230HPM-GFV**
60 W	**BLM460SHPM-GFV**
120 W	**BLM5120HPM-GFV**
200 W	**BLM6200SHPM-GFV**

◇Round Shaft Type

Output Power	Product Name
30 W	**BLM230HPM-AS**
60 W	**BLM260HPM-AS**
120 W	**BLM5120HPM-AS**
200 W	**BLM5200HPM-AS**

●Gearhead

◇Parallel Shaft Gearhead

Output Power	Product Name	Gear Ratio
30 W	**GFV2G□S**	**5, 10, 15, 20**
		30, 50, 100
60 W	**GFV4G□S**	**5, 10, 15, 20**
		30, 50, 100
120 W	**GFV5G□S**	**5, 10, 15, 20**
		30, 50, 100
		200
200 W	**GFV6G□S**	**5, 10, 15, 20**
		30, 50
		100, 200

◇Hollow Shaft Flat **FR** Gearhead

Output Power	Product Name	Gear Ratio
30 W	**GFS2G□FR**	**5, 10, 15, 20**
		30, 50, 100
		200
60 W	**GFS4G□FR**	**5, 10, 15, 20**
		30, 50, 100
		200
120 W	**GFS5G□FR**	**5, 10, 15, 20**
		30, 50, 100
		200
200 W	**GFS6G□FR**	**10, 15, 20**
		30, 50, 100

●Driver (for motors with electromagnetic brake)

Output Power	Power Supply Voltage	Product Name
30 W	Single-Phase 100-120 VAC	**BLE2D30-AM**
	Single-Phase, Three-Phase 200-240 VAC	**BLE2D30-CM**
60 W	Single-Phase 100-120 VAC	**BLE2D60-AM**
	Single-Phase, Three-Phase 200-240 VAC	**BLE2D60-CM**
120 W	Single-Phase 100-120 VAC	**BLE2D120-AM**
	Single-Phase, Three-Phase 200-240 VAC	**BLE2D120-CM**
200 W	Single-Phase 100-120 VAC	**BLE2D200-AM**
	Single-Phase, Three-Phase 200-240 VAC	**BLE2D200-CM**

●The number □ in the part number indicates the gear ratio.

Connection Cable

Length	Product Name
0.5 m	**CC005KHBLM■**
1 m	**CC010KHBLM■**
1.5 m	**CC015KHBLM■**
2 m	**CC020KHBLM■**
2.5 m	**CC025KHBLM■**
3 m	**CC030KHBLM■**
4 m	**CC040KHBLM■**
5 m	**CC050KHBLM■**
7 m	**CC070KHBLM■**
10 m	**CC100KHBLM■**
15 m	**CC150KHBLM■**
20 m	**CC200KHBLM■**

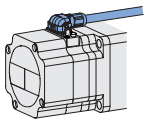
Flexible Connection Cable

Length	Product Name
1 m	**CC010KHBLMR■**
1.5 m	**CC015KHBLMR■**
2 m	**CC020KHBLMR■**
2.5 m	**CC025KHBLMR■**
3 m	**CC030KHBLMR■**
4 m	**CC040KHBLMR■**
5 m	**CC050KHBLMR■**
7 m	**CC070KHBLMR■**
10 m	**CC100KHBLMR■**
15 m	**CC150KHBLMR■**
20 m	**CC200KHBLMR■**

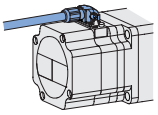
● Each ■ in the product name is marked with either **F**, **B** or **V**, indicating the cable pull-out direction.

3 types of connection cables with different cable pull-out direction are available.

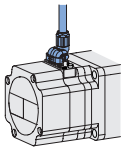
F: Pull-out on output shaft side



B: Pull-out on rear of the motor



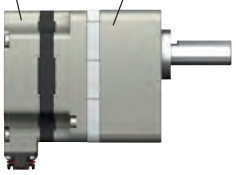
V: Vertical Pull-out



Note

● For round shaft types, choose the direction of cable withdrawal in consideration of installation.

Combination List



④
Connection Cable
Flexible Connection Cable

③
Driver

Motor

Output Power	Type	Motor ①	Gearhead ②	Driver ③	Connection Cable Flexible Connection Cable ④
30 W	Parallel Shaft Gearhead **GFV**	**BLM230HP-GFV**	**GFV2G□S**	**BLE2D30-A** **BLE2D30-C**	**CC◇KHBL■** **CC◇KHBLR■**
	Parallel Shaft Gearhead **GFV** H1 grease for food machinery		**GFV2G□SF**		
	Hollow Shaft Flat **FR** Gearhead		**GFS2G□FR**		
	Round Shaft Type	**BLM230HP-AS**	–		
60 W	Parallel Shaft Gearhead **GFV**	**BLM460SHP-GFV**	**GFV4G□S**	**BLE2D60-A** **BLE2D60-C**	
	Parallel Shaft Gearhead **GFV** H1 grease for food machinery		**GFV4G□SF**		
	Hollow Shaft Flat **FR** Gearhead		**GFS4G□FR**		
	Right-Angle Hollow Shaft Hypoid **JH** Gearhead	**BLM460SHPK**	**4H□S**		
	Round Shaft Type	**BLM260HP-AS**	–		
120 W	Parallel Shaft Gearhead **GFV**	**BLM5120HP-GFV**	**GFV5G□S**	**BLE2D120-A** **BLE2D120-C**	
	Parallel Shaft Gearhead **GFV** H1 grease for food machinery		**GFV5G□SF**		
	Hollow Shaft Flat **FR** Gearhead		**GFS5G□FR**		
	Right-Angle Hollow Shaft Hypoid **JH** Gearhead	**BLM5120HPK**	**5H□S**		
	Round Shaft Type	**BLM5120HP-AS**	–		
200 W	Parallel Shaft Gearhead **GFV**	**BLM6200SHP-GFV**	**GFV6G□S**	**BLE2D200-C**	
	Hollow Shaft Flat **FR** Gearhead		**GFS6G□FR**		
	Dust-/Water-Resistant Parallel Shaft Gearhead **GFV**	**BLM7200HW-GFV**	**GFV7G□SW**		
	Parallel Shaft Gearhead **JV**	**BLM5200HPK**	**5KV□S**		
	Foot Mount Type **JB** Gearhead		**5AB□B**		
			5CB□B		
			5EB□B		
			5KB□B		
			5SB□B		
	Right-Angle Hollow Shaft Hypoid **JH** Gearhead		**5XH□S**		
			5YH□S		
	Round Shaft Type	**BLM5200HP-AS**	–		
300 W	Parallel Shaft Gearhead **GFV**	**BLM6300SHP-GFV**	**GFV6G□S**	**BLE2D300-C**	
	Hollow Shaft Flat **FR** Gearhead		**GFS6G□FR**		
	Dust-/Water-Resistant Parallel Shaft Gearhead **GFV**	**BLM7300HW-GFV**	**GFV7G□SW**		
	Parallel Shaft Gearhead **JV**	**BLM5300HPK**	**5DV□S**		
			5KV□S		
	Foot Mount Type **JB** Gearhead		**5AB□B**		
			5CB□B		
			5EB□B		
			5KB□B		
			5SB□B		
	Right-Angle Hollow Shaft Hypoid **JH** Gearhead		**5XH□S**		
			5YH□S		
	Round Shaft Type	**BLM5300HP-AS**	–		
400 W	Parallel Shaft Gearhead **GFV**	**BLM6400SHP-GFV**	**GFV6G□S**	**BLE2D400-C** **BLE2D400-S**	
	Hollow Shaft Flat **FR** Gearhead		**GFS6G□FR**		
	Dust-/Water-Resistant Parallel Shaft Gearhead **GFV**	**BLM7400HW-GFV**	**GFV7G□SW**		
	Parallel Shaft Gearhead **JV**	**BLM5400HPK**	**5DV□S**		
			5KV□S		
	Foot Mount Type **JB** Gearhead		**5AB□B**		
			5CB□B		
			5EB□B		
			5KB□B		
			5SB□B		
	Right-Angle Hollow Shaft Hypoid **JH** Gearhead		**5XH□S**		
			5YH□S		
	Round Shaft Type	**BLM5400HP-AS**	–		

● □ in the part number indicates the reduction ratio.
◇ in the part number indicates the cable length.
■ in the part number indicates the pull-out direction of the cable: **F**, **B** or **V**.

●Motor with electromagnetic brake

Output Power	Type	Motor	Gearhead	Driver	Connection Cable Flexible Connection Cable
		①	②	③	④
30 W	Parallel Shaft Gearhead **GFV**	**BLM230HPM-GFV**	**GFV2G□S**	**BLE2D30-AM** **BLE2D30-CM**	**CC◇KHBLM■** **CC◇KHBLMR■**
	Right-Angle Hollow Shaft Hypoid **JH** Gearhead		**GFS2G□FR**		
	Round Shaft Type	**BLM230HPM-AS**	–		
60 W	Parallel Shaft Gearhead **GFV**	**BLM460SHPM-GFV**	**GFV4G□S**	**BLE2D60-AM** **BLE2D60-CM**	
	Right-Angle Hollow Shaft Hypoid **JH** Gearhead		**GFS4G□FR**		
	Round Shaft Type	**BLM260HPM-AS**	–		
120 W	Parallel Shaft Gearhead **GFV**	**BLM5120HPM-GFV**	**GFV5G□S**	**BLE2D120-AM** **BLE2D120-CM**	
	Right-Angle Hollow Shaft Hypoid **JH** Gearhead		**GFS5G□FR**		
	Round Shaft Type	**BLM5120HPM-AS**	–		
200 W	Parallel Shaft Gearhead **GFV**	**BLM6200SHPM-GFV**	**GFV6G□S**	**BLE2D200-AM** **BLE2D200-CM**	
	Right-Angle Hollow Shaft Hypoid **JH** Gearhead		**GFS6G□FR**		
	Round Shaft Type	**BLM5200HPM-AS**	–		

● □ in the part number indicates the reduction ratio.
◇ in the part number indicates the cable length.
■ in the part number indicates the pull-out direction of the cable: **F**, **B** or **V**.

Parallel Shaft Gearhead GFV 30 W, 60 W, 120 W

Specifications

Product Name			BLM230HP-GFV / GFV2G□S (F)		BLM460SHP-GFV / GFV4G□S (F)		BLM5120HP-GFV / GFV5G□S (F)	
	Motor/ Gearhead	With electromagnetic brake	BLM230HPM-GFV / GFV2G□S		BLM460SHPM-GFV / GFV4G□S		BLM5120HPM-GFV / GFV5G□S	
	Driver		BLE2D30-A	BLE2D30-C	BLE2D60-A	BLE2D60-C	BLE2D120-A	BLE2D120-C
		With electromagnetic brake	BLE2D30-AM	BLE2D30-CM	BLE2D60-AM	BLE2D60-CM	BLE2D120-AM	BLE2D120-CM
Rated Output Power (Continuous)		W	30		60		120	
Power Supply Input	Rated Voltage	V	Single-Phase 100-120	Single-Phase 200-240 / Three-Phase 200-240	Single-Phase 100-120	Single-Phase 200-240 / Three-Phase 200-24	Single-Phase 100-120	Single-Phase 200-240 / Three-Phase 200-240
	Permissible Voltage Range		−15～+10%		−15～+10%		−15～+10%	
	Frequency	Hz	50 / 60		50 / 60		50 / 60	
	Permissible Frequency Range		±5%		±5%		±5%	
	Rated Input Current✻1	A	1.1 (1.2)	Single-Phase: 0.67 (0.71)/ Three-Phase: 0.39 (0.40)	1.7	Single-Phase: 1.0 (1.1)/ Three-Phase: 0.61	2.7 (2.8)	Single-Phase: 1.7/ Three-Phase: 1.02
	Maximum Input Current	A	3.3	Single-Phase: 2.2/ Three-Phase: 1.2	5.4	Single-Phase: 3.5/ Three-Phase: 2.0	7.4	Single-Phase: 4.8/ Three-Phase: 3.3
Rated Speed		r/min	3000					
Speed control range			80～4000 r/min (speed ratio 1: 50)					
Speed Regulation✻2	Load		±0.2% (±0.5%) or less: conditions 0 ～ rated torque, rated speed, rated voltage, normal ambient temperature					
	Voltage		±0.2% (±0.5%) or less: Conditions Rated voltage -15 to +10%, rated speed, no load, normal ambient temperature					
	Temperature		±0.2% (±0.5%) or less: Operating ambient temperature 0 ～ + 50°C, rated speed, no load, rated voltage					
Motor with Electromagnetic Brake	Type		Power off activated type, automatically controlled by the driver					
	Static Friction Torque	Nm	0.096		0.191		0.382	
Gravitational Operation Capability ✻3	Continuous Regenerative Power	W	70					
	Instantaneous Regenerative Power	W	720					
	Applicable Regeneration Resistor		**RGB100** (Sold Separately)					

✻1 Values in brackets ( ) are specifications for motors with electromagnetic brake.
✻2 Values in brackets ( ) are specifications for analogue setting.
✻3 Values when a regenerative resistor is used. Install the regenerative resistor in a location with heat radiation capacity equivalent to that of a heat sink (material: aluminium 350 x 350 mm, 3 mm thick).
● Each specification and characteristic is a value for the motor alone.
● The □ in the product name indicates the reduction ratio.

Gear Ratio				5	10	15	20	30	50	100	200✻1
Rotation Direction				Same direction as the motor				Opposite direction to the motor			Same direction as the motor
Output Shaft Rotation Speed [r/min]✻2			80 r/min	16	8	5.3	4	2.7	1.6	0.8	0.4
			4000 r/min	800	400	267	200	133	80	40	20
Permissible Torque [N·m]		30 W	At 80 ~ 2500 r/min	0.54	1.1	1.6	2.2	3.1	5.2	6	6
			At 3000 r/min	0.43	0.86	1.3	1.7	2.5	4.1	6	6
			At 4000 r/min	0.32	0.65	0.97	1.3	1.9	3.1	5.4	5.4
		60 W	At 80 ~ 2000 r/min	0.9	1.8	2.7	3.6	5.2	8.6	16	16
			At 3000 r/min	0.86	1.7	2.6	3.4	4.9	8.2	16	16
			At 4000 r/min	0.65	1.3	1.9	2.6	3.7	6.2	12.4	14
		120 W	At 80 ~ 2000 r/min	2.0	4.1	6.1	8.1	11.6	19.4	30	30
			At 3000 r/min	1.7	3.4	5.2	6.9	9.9	16.4	30	30
			At 4000 r/min	1.3	2.6	3.9	5.2	7.4	12.3	24.7	27
Permissible Radial Load [N]	10 mm from output shaft end✻3	30 W	At 80 ~ 3000 r/min	100	150			200			
			At 4000 r/min	90	130			180			
		60 W	At 80 ~ 3000 r/min	200	300			450			
			At 4000 r/min	180	270			420			
		120 W	At 80 ~ 3000 r/min	300	400			500			
			At 4000 r/min	230	370			450			
	20 mm from output shaft end✻3	30 W	At 80 ~ 3000 r/min	150	200			300			
			At 4000 r/min	110	170			230			
		60 W	At 80 ~ 3000 r/min	250	350			550			
			At 4000 r/min	220	330			500			
		120 W	At 80 ~ 3000 r/min	400	500			650			
			At 4000 r/min	300	430			550			
Permissible Axial Load [N]		30 W		40							
		60 W		100							
		120 W		150							
Permissible Load Inertia J [$\times 10^{-4}$kg·m^2]		30 W		12	50	110	200	370	920	2500	5000
		60 W		22	95	220	350	800	2200	6200	12000
		120 W		45	190	420	700	1600	4500	12000	25000
	At instantaneous stop, instantaneous bi-directional operation✻4	30 W		1.55	6.2	14	24.8	55.8	155		
		60 W		5.5	22	49.5	88	198	550		
		120 W		25	100	225	400	900	2500		

✻1 Reduction ratio **200** excludes motors with electromagnetic brake 30 W and 60 W.
✻2 The output shaft speed is calculated by dividing the speed by the gear ratio.
✻3 For load position ➜ page 25
✻4 Also applicable when digitally setting the deceleration time to below 0.1 seconds.

Speed – Torque Characteristics

➜Page 35

Parallel Shaft Gearhead GFV 200 W, 300 W, 400 W

Specifications

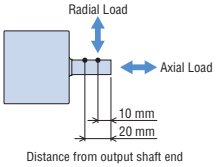
Product Name			BLM6200SHP-GFV / GFV6G□S		BLM6300SHP-GFV / GFV6G□S	BLM6400SHP-GFV / GFV6G□S	
	Motor/ Gearhead	With electromagnetic brake	BLM6200SHPM-GFV / GFV6G□S		–	–	
		With electromagnetic brake	BLM7200HW-GFV / GFV7G□SW		BLM7300HW-GFV / GFV7G□SW	BLM7400HW-GFV / GFV7G□SW	
	Driver		BLE2D200-A	BLE2D200-C	BLE2D300-C	BLE2D400-C	BLE2D400-S
		With electromagnetic brake	BLE2D200-AM	BLE2D200-CM	–	–	
Rated Output Power (Continuous)		W	200		300	400	
Power Supply Input	Rated Voltage	V	Single-Phase 100-120	Single-Phase 200-240 / Three-Phase 200-240	Single-Phase200-240 / Three-Phase200-240	Single-Phase 200-240	Three-Phase 200-240
	Permissible Voltage Range		−15～+10%		−15～+10%	−15～+10%	
	Frequency	Hz	50 / 60		50 / 60	50 / 60	
	Permissible Frequency Range		±5%		±5%	±5%	
	Rated Input Current*1	A	4.3 (4.4)	Single-Phase: 2.4 (2.5) / Three-Phase: 1.4 (1.5)	Single-Phase: 3.2 / Three-Phase: 1.8	4.6	2.3
	Maximum Input Current	A	11.5	Single-Phase: 6.5 / Three-Phase: 4.3	Single-Phase: 8.5 / Three-Phase: 6.0	9.9	6.1
Rated Speed		r/min	3000				
Speed control range			80～4000 r/min (speed ratio 1: 50)				
Speed Regulation*2	Load		±0.2% (±0.5%) or less: conditions 0 ~ rated torque, rated speed, rated voltage, normal ambient temperature				
	Voltage		±0.2% (±0.5%) or less: Conditions Rated voltage -15 to +10%, rated speed, no load, normal ambient temperature				
	Temperature		±0.2% (±0.5%) or less: Operating ambient temperature 0 ~ + 50°C, rated speed, no load, rated voltage				
Motor with Electromagnetic Brake	Type		Power off activated type, automatically controlled by the driver		–	–	
	Static Friction Torque	Nm	0.637		–	–	
Gravitational Operation Capability*3	Continuous Regenerative Power	W	70		–	–	
	Instantaneous Regenerative Power	W	720		–	–	
	Applicable Regeneration Resistor		**RGB100** (Sold Separately)		–	–	

*1 Values in brackets ( ) are specifications for motors with electromagnetic brake.
*2 Values in brackets ( ) are specifications for analogue setting.
*3 Values when a regenerative resistor is used. Install the regenerative resistor in a location with heat radiation capacity equivalent to that of a heat sink (material: aluminium 350 x 350 mm, 3 mm thick).
● Each specification and characteristic is a value for the motor alone.
● The □ in the product name indicates the reduction ratio.

Gear Ratio			5	10	15	20	30	50	100*1	200*1
Rotation Direction			Same direction as the motor				Opposite direction to the motor		Same direction as the motor	
Output Shaft Rotation Speed [r/min]*2		80 r/min	16	8	5.3	4	2.7	1.6	0.8	0.4
		4000 r/min	800	400	267	200	133	80	40	20
Permissible Torque [N·m]	200 W	At 80 ~ 3000 r/min	2.9	5.7	8.6	11.5	16.4	27.4	51.6	70
		At 4000 r/min	2.2	4.3	6.5	8.6	12.4	20.6	38.9	63
	300 W	At 80 ~ 3000 r/min	4.3	8.6	12.9	17.2	24.6	41.1	70	–
		At 4000 r/min	3.2	6.4	9.7	12.9	18.5	30.8	58	–
	400 W	At 80 ~ 3000 r/min	5.7	11.4	17.1	22.9	32.8	54.6	–	–
		At 4000 r/min	4.3	8.6	12.9	17.2	24.6	41.1	–	–
Permissible Radial Load [N]	10 mm from output shaft end	At 80 ~ 3000 r/min	550				1000		1400	
		At 4000 r/min	500				900		1200	
	20 mm from output shaft end	At 80 ~ 3000 r/min	800				1250		1700	
		At 4000 r/min	700				1100		1400	
Permissible Axial Load [N]			200				300		400	
Permissible Load Inertia J [×10^{-4}kg·m^2]			100	460	1000	1700	3900	9300	18000	37000
	At instantaneous stop, instantaneous bi-directional operation*3		50	200	450	800	1800	5000		

*1 Reduction ratio **100** is available for 200 W and 300 W output types.
Reduction ratio **200** is only available for 200 W output types (excluding dust-/water-resistant versions).
*2 The output shaft speed is calculated by dividing the speed by the gear ratio.
*3 Also applicable when digitally setting the deceleration time to below 0.1 seconds.

◇About Load Position



Speed – Torque Characteristics

→Page 35

Parallel Shaft JV Gearhead 200 W, 300 W, 400W

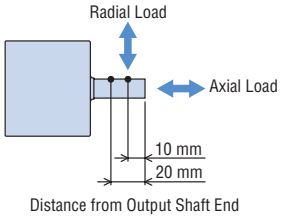
Specifications

Product Name	Motor / Gearhead		BLM5200HPK / 5KV□S		BLM5300HPK / 5□V□S	BLM5400HPK / 5□V□S	
	Driver		BLE2D200-A	BLE2D200-C	BLE2D300-C	BLE2D400-C	BLE2D400-S
Rated Output Power (Continuous)		W	200		300	400	
Power Supply Voltage	Rated Voltage	V	Single-Phase 100-120	Single-Phase 200-240 / Three-Phase 200-240	Single-Phase 200-240 / Three-Phase 200-240	Single-Phase 200-240	Three-Phase 200-240
	Permissible Voltage Range		−15～+10%		−15～+10%	−15～+10%	
	Frequency	Hz	50 / 60		50 / 60	50 / 60	
	Permissible Frequency Range		±5%		±5%	±5%	
	Rated Input Current	A	4.3	Single-Phase: 2.4 / Three-Phase: 1.4	Single-Phase: 3.2 / Three-Phase: 1.8	4.6	2.3
	Max. Input Current	A	11.5	Single-Phase: 6.5 / Three-Phase: 4.3	Single-Phase: 8.5 / Three-Phase: 6.0	9.9	6.1
Rated Speed		r/min	3000				
Speed Control Range			80~3600 r/min (Speed ratio 1: 45)				
Speed Regulation*1	Load		±0.2% (±0.5%) or less: Conditions 0~rated torque, rated speed, rated voltage, normal ambient temperature				
	Voltage		±0.2% (±0.5%): Conditions Rated voltage −15 - +10 %, rated speed, no load, normal ambient temperature				
	Temperature		±0.2% (±0.5%): Conditions Operating ambient temperature 0 - +50 °C, rated speed, no load, rated voltage ±0.2% (±0.5%): Conditions Operating ambient temperature 0 - +50 °C, rated speed, no load, rated voltage				

*1 Values in brackets ( ) are specifications for analogue settings.
● The values correspond to each specification and characteristic of a stand-alone motor.

Gear Ratio			100*1	200*1	300	450
(Actual Gear Ratio)			(104.1)	(196.4)	(300.5)	(450.8)
Gearhead Size			D		K	
Direction of rotation			Opposite Direction of Motor		Direction of Motor	
Output Shaft Speed [r/min]*2		80 r/min	0.8	0.4	0.27	0.18
		3600 r/min	36	18	12	8
Permissible Torque [Nm]	200 W	At 80～3000 r/min	–	–	132	198
		At 3600 r/min	–	–	92.3	138
	300 W	At 80～3000 r/min	–	137	198	297
		At 3600 r/min	–	117	157	216
	400 W	At 80～1500 r/min	108	205	298	431
		At 3000 r/min	81.9	164	219	302
		At 3600 r/min	58.5	117	157	216
Permissible Radial Load [N]	10 mm from End of Output Shaft	At 80～1500 r/min	2888	3483	4461	
		At 3000 r/min	2022	2438	3123	
		At 3600 r/min	1444	1742	2231	
	20 mm from End of Output Shaft	At 80～1500 r/min	3496	4216	5174	
		At 3000 r/min	2447	2951	3622	
		At 3600 r/min	1748	2108	2587	
Permissible Axial Load [N]		At 80～1500 r/min	422	461	686	
		At 3000 r/min	295	323	480	
		At 3600 r/min	211	231	343	
Permissible Inertia J [×10^{-4}kg·m^2]		At 80～1500 r/min	100000	400000	900000	2025000
		At 3000 r/min	36000	144000	324000	729000
		At 3600 r/min	20250	81000	182250	410063
	When Instantaneous Stop or Bi-Directional Operation is performed*3	At 80～1500 r/min	33333	133333	300000	675000
		At 3000 r/min	12000	48000	108000	243000
		At 3600 r/min	6750	27000	60750	136688

◇Load Position



*1 Gear ratio **100** is only available for 400 W output types. Gear ratio **200** is available for 300 W and 400 W output types.
*2 The rotational speed of the output shaft is the rotational speed divided by the gear ratio.
*3 This also applies if the deceleration time is set to less than 0.1 s in the digital setting. For 300 W and 400 W output types, do not perform instantaneous forward and reverse operation.

Speed – Torque Characteristics

→Page 35

● The symbol □ in the part number indicates the gear head size (**D**, **K**).
The symbol □ in the part number indicates the gear ratio.

Foot Mount Type JB Gearhead 200 W, 300 W, 400W

Specifications

Product Name			BLM5200HPK / 5□B□B		BLM5300HPK / 5□B□B	BLM5400HPK / 5□B□B	
	Driver		BLE2D200-A	BLE2D200-C	BLE2D300-C	BLE2D400-C	BLE2D400-S
Rated Output Power (Continuous)		W	200		300	400	
Power Supply Voltage	Rated Voltage	V	Single-Phase 100-120	Single-Phase 200-240 / Three-Phase 200-240	Single-Phase 200-240 / Three-Phase 200-240	Single-Phase 200-240	Three-Phase 200-240
	Permissible Voltage Range		−15～+10%		−15～+10%	−15～+10%	
	Frequency	Hz	50 / 60		50 / 60	50 / 60	
	Permissible Frequency Rang		±5%		±5%	±5%	
	Rated Input Current	A	4.3	Single-Phase: 2.4 / Three-Phase: 1.4	Single-Phase: 3.2 / Three-Phase: 1.8	4.6	2.3
	Max. Input Current	A	11.5	Single-Phase: 6.5 / Three-Phase: 4.3	Single-Phase: 8.5 / Three-Phase: 6.0	9.9	6.1
Rated Speed		r/min	3000				
Speed Control Range			80～3600 r/min (Speed ratio 1: 45)				
Speed Regulation ✻1	Load		±0.2% (±0.5%) or less: Conditions 0~rated torque, rated speed, rated voltage, normal ambient temperature				
	Voltage		±0.2% (±0.5%): Conditions Rated voltage −15 - +10 %, rated speed, no load, normal ambient temperature				
	Temperature		±0.2% (±0.5%): Conditions Operating ambient temperature 0 - +50 °C, rated speed, no load, rated voltage				

✻1 Values in brackets ( ) are specifications for analogue settings.

●The values correspond to each specification and characteristic of a stand-alone motor.

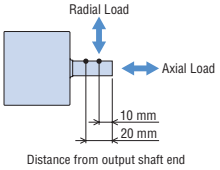
Gear Ratio			5	10	20	30	50	100	200	300	450	600	1200✻1
(Actual Gear Ratio)			(4.97)	(10.12)	(20.08)	(30.86)	(49.09)	(104.1)	(196.4)	(300.5)	(450.8)	(588.9)	(1178)
Gearhead Size			A			C		E		K		S	
Direction of rotation			Direction of Motor				Opposite Direction of Motor			Direction of Motor			
Output Shaft Speed [r/min] ✻2		80 r/min	16	8	4	2.7	1.6	0.8	0.4	0.27	0.18	0.13	0.07
		3600 r/min	720	360	180	120	72	36	18	12	8	6	3
Permissible Torque [Nm]	200 W	At 80～3000 r/min	2.4	4.9	9.7	13.0	22.5	48.4	91.3	132	198	259	518
		At 3600 r/min	1.7	3.4	6.8	8.2	15.6	32.0	60.3	92.3	138	181	362
	300 W	At 80～3000 r/min	3.6	7.3	14.6	19.4	33.8	72.6	137	198	297	388	–
		At 3600 r/min	2.5	5.1	10.1	12.2	23.2	47.7	90	138	207	270	–
	400 W	At 80～1500 r/min	5.4	10.9	21.7	31.7	49.9	108	205	298	431	583	–
		At 3000 r/min	4.3	8.3	17.2	25.4	41.2	81.9	164	219	302	438	–
		At 3600 r/min	3.1	5.9	12.3	18.2	29.4	58.5	117	157	216	313	–
Permissible Radial Load [N]	10 mm from End of Output Shaft	At 80～1500 r/min	521	977	1243	1824	2032	2888	3483	4461		5245	
		At 3000 r/min	365	684	870	1277	1422	2022	2438	3123		3672	
		At 3600 r/min	261	489	622	912	1016	1444	1742	2231		2623	
	20 mm from End of Output Shaft	At 80～1500 r/min	663	1244	1582	2280	2540	3496	4216	5174		5921	
		At 3000 r/min	464	871	1107	1596	1778	2447	2951	3622		4145	
		3600 r/min	332	622	791	1140	1270	1748	2108	2587		2961	
Permissible Axial Load [N]		At 80～1500 r/min	39	88	177	255	275	422	461	686		824	
		At 3000 r/min	27.3	61.6	124	179	193	295	323	480		577	
		At 3600 r/min	19.5	44	88.5	128	138	211	231	343		412	
Permissible Inertia J [$\times 10^{-4}$kg·m^2]		At 80～1500 r/min	250	1000	4000	9000	25000	100000	400000	900000	2025000	3600000	14400000
		At 3000 r/min	90	360	1440	3240	9000	36000	144000	324000	729000	1296000	5184000
		At 3600 r/min	50.6	203	810	1823	5063	20250	81000	182250	410063	729000	2916000
	When Instantaneous Stop or Bi-Directional Operation is performed	At 80～1500 r/min	83.3	333	1333	3000	8333	33333	133333	300000	675000	1200000	4800000
		At 3000 r/min	30	120	480	1080	3000	12000	48000	108000	243000	432000	1728000
		At 3600 r/min	16.9	67.5	270	608	1688	6750	27000	60750	136688	243000	972000

✻1 Only 200 W output type

✻2 The rotational speed of the output shaft is the rotational speed divided by the gear ratio.

✻3 This also applies if the deceleration time is set to less than 0.1 s in the digital setting.
For 300 W and 400 W output types, do not perform instantaneous forward and reverse operation.

◇Load Position



Speed – Torque Characteristics

→Page 35

●The □ in the product name contains a symbol (**A, C, E, K, S**) indicating the gear head size.

●The symbol □ in the part number indicates the gear ratio.

Right-Angle Hollow Shaft Hypoid JH Geared 60 W, 120 W

Specifications

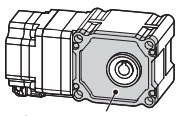
Product Name			BLM460SHPK / 4H□S		BLM5120HPK / 5H□S	
	Motor / Gearhead					
	Driver		BLE2D60-A	BLE2D60-C	BLE2D120-A	BLE2D120-C
Rated Output Power (Continuous)		W	60		120	
Power Supply Voltage	Rated Voltage	V	Single-Phase 100-120	Single-Phase 200-240 / Three-Phase 200-240	Single-Phase 100-120	Single-Phase 200-240 / Three-Phase 200-240
	Permissible Voltage Range		−15～+10%		−15～+10%	
	Frequency	Hz	50 / 60		50 / 60	
	Permissible Frequency Range		±5%		±5%	
	Rated Input Current	A	1.7	Single-Phase: 1.0 / Three-Phase: 0.61	2.7	Single-Phase: 1.7/Three-Phase: 1.02
	Max. Input Current	A	5.4	Single-Phase: 3.5 / Three-Phase: 2.0	7.4	Single-Phase: 4.8/Three-Phase: 3.3
Rated Speed		r/min	3000			
Speed Control Range			80～3600 r/min (Speed ratio 1: 45)			
Speed Regulation*	Load		±0.2% (±0.5%) or less: Conditions 0～rated torque, rated speed, rated voltage, normal ambient temperature			
	Voltage		±0.2% (±0.5%): Conditions Rated voltage −15 - +10 %, rated speed, no load, normal ambient temperature			
	Temperature		±0.2% (±0.5%): Conditions Operating ambient temperature 0 - +50 °C, rated speed, no load, rated voltage			

*Values in brackets ( ) are specifications for analogue settings.
●The values correspond to each specification and characteristic of a stand-alone motor.

Gear Ratio				10	15	20	30	50	100	200
(Actual Gear Ratio)				(10.25)	(15.38)	(20.50)	(30.75)	(51.25)	(102.5)	(205.0)
Direction of rotation*1				Direction of the motor					Opposite direction of the motor	
Output Shaft Speed [r/min]*2			80 r/min	8	5.3	4	2.7	1.6	0.8	0.4
			3600 r/min	360	240	180	120	72	36	18
Permissible Torque [Nm]		60 W	At 80～1500 r/min	1.2	1.8	2.7	4.0	6.7	13.3	20.6
			At 3000 r/min	1.2	1.8	2.5	3.8	6.4	12.7	15.6
			At 3600 r/min	0.74	1.1	1.8	2.7	4.4	8.9	11.5
		120 W	At 80～1500 r/min	3.2	4.8	6.5	9.7	16.0	32.3	53.9
			At 3000 r/min	2.5	3.8	5.1	7.6	12.7	25.5	41.0
			At 3600 r/min	1.8	2.6	3.5	5.3	8.8	17.7	30.2
Permissible Radial Load [N]*3	20 mm from End of Output Shaft	60 W	At 80～1500 r/min	265	341	417	531	682	758	836
			At 3000 r/min	201	259	317	404	518	576	635
			At 3600 r/min	148	191	234	297	382	424	468
		120 W	At 80～1500 r/min	363	484	605	806	971	1045	1127
			At 3000 r/min	276	368	460	613	738	794	857
			At 3600 r/min	203	271	339	451	544	585	631
Permissible Axial Load [N]		60 W	At 80～1500 r/min	88	108	137	177	226	245	275
			At 3000 r/min	67	82	104	135	172	186	209
			At 3600 r/min	49	60	77	99	127	137	154
		120 W	At 80～1500 r/min	108	147	186	245	294	324	343
			At 3000 r/min	82	112	141	186	223	246	261
			At 3600 r/min	60	82	104	137	165	181	192
Permissible Inertia J [$\times10^{-4}$kg·m^2]		60 W	At 80～1500 r/min	100	225	400	900	2500	10000	40000
			At 3000 r/min	36	81	144	324	900	3600	14400
			At 3600 r/min	20.3	45.6	81	182	506	2025	8100
		120 W	At 80～1500 r/min	200	450	800	1800	5000	20000	80000
			At 3000 r/min	72	162	288	648	1800	7200	28800
			At 3600 r/min	40.5	91.1	162	365	1013	4050	16200
	When Instantaneous Stop or Bi-Directional Operation is performed	60 W	At 80～1500 r/min	33.3	75	133	300	833	3333	13333
			At 3000 r/min	12	27	48	108	300	1200	4800
			At 3600 r/min	6.8	15.2	27	60.8	169	675	2700
		120 W	At 80～1500 r/min	66.7	150	267	600	1667	6667	26667
			At 3000 r/min	24	54	96	216	600	2400	9600
			At 3600 r/min	13.5	30.4	54	122	338	1350	5400

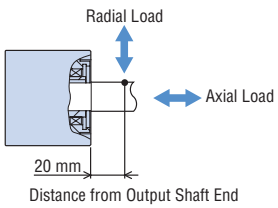
*1 The rotation direction is viewed from the gear flange side (see illustration on the right).
*2 The rotational speed of the output shaft is the rotational speed divided by the gear ratio.
*3 The radial load from each distance can also be calculated from a formula. ➜ Page 78
*4 This also applies if the deceleration time is set to less than 0.1 s in the digital settings.

◇Gear Flange Position



Gear Flange

◇Load Position



Speed – Torque Characteristics

➜Page 35

Right-Angle Hollow Shaft Hypoid JH Gearhead 200 W, 300 W, 400 W

Specifications

Product Name	Motor / Gearhead		BLM5200HPK / 5□H□S		BLM5300HPK / 5□H□S	BLM5400HPK / 5□H□S	
	Driver		BLE2D200-A	BLE2D200-C	BLE2D300-C	BLE2D400-C	BLE2D400-S
Rated Output Power (Continuous)		W	200		300	400	
Power Supply Voltage	Rated Voltage	V	Single-Phase100-120	Single-Phase 200-240 / Three-Phase 200-240	Single-Phase 200-240 / Three-Phase 200-240	Single-Phase 200-240	Three-Phase 200-240
	Permissible Voltage Range		−15～+10%		−15～+10%	−15～+10%	
	Frequency	Hz	50 / 60		50 / 60	50 / 60	
	Permissible Frequency Range		±5%		±5%	±5%	
	Rated Input Current	A	4.3	Single-Phase: 2.4 / Three-Phase: 1.4	Single-Phase: 3.2 / Three-Phase: 1.8	4.6	2.3
	Max. Input Current	A	11.5	Single-Phase: 6.5 / Three-Phase: 4.3	Single-Phase: 8.5 / Three-Phase: 6.0	9.9	6.1
Rated Speed		r/min	3000				
Speed Control Range			80～3600 r/min (Speed ratio1: 45)				
Speed Regulation*1	Load		±0.2% (±0.5%) or less: Conditions 0~rated torque, rated speed, rated voltage, normal ambient temperature				
	Voltage		±0.2% (±0.5%): Conditions Rated voltage −15 - +10 %, rated speed, no load, normal ambient temperature				
	Temperature		±0.2% (±0.5%): Conditions Operating ambient temperature 0 - +50 °C, rated speed, no load, rated voltage				

*1 Values in brackets ( ) are specifications for analogue settings.

●The values correspond to each specification and characteristic of a stand-alone motor.

Gear Ratio			5	10	15	20	30	50	100	200
(Actual Gear Ratio)			(5)	(10)	(15)	(20)	(30)	(50)	(98.95)	(200)
Gearhead Size			X						Y	
Direction of rotation*1			Direction of the motor						Opposite direction of the motor	
Output Shaft Speed [r/min]*2		80 r/min	16	8	5.3	4	2.7	1.6	0.8	0.4
		3600 r/min	720	360	240	180	120	72	36	18
Permissible Torque [Nm]	200 W	At 80～3000 r/min	2.1	4.1	6.2	8.3	13.4	22.3	41.0	82.8
		At 3600 r/min	1.3	2.6	4.0	5.3	9.4	15.6	28.5	57.6
	300 W	At 80～1500 r/min	3.3	6.7	10.0	13.4	21.5	35.8	66.2	134
		At 3000 r/min	3.3	6.7	10.0	13.4	21.5	35.8	66.2	128
		At 3600 r/min	2.3	4.7	7.0	9.3	15.0	25.1	46.1	92.0
	400 W	At 80～1500 r/min	4.8	9.5	14.3	19.1	30.5	50.8	88.0	178
		At 3000 r/min	3.8	7.7	11.9	16.1	23.1	38.5	73.5	128
		At 3600 r/min	2.7	5.5	8.5	11.5	16.5	27.5	52.5	92.0
Permissible Radial Load [N]*3	20 mm from End of Output Shaft	At 80～1500 r/min	1346	1663	1882	2035	2309	2681	3436	
		At 3000 r/min	942	1164	1317	1425	1616	1877	2405	
		At 3600 r/min	673	832	941	1018	1155	1341	1718	
Permissible Axial Load [N]		At 80～1500 r/min	307	380	429	466	527	613	785	
		At 3000 r/min	215	266	300	326	369	429	550	
		At 3600 r/min	154	190	215	233	264	307	393	
Permissible Inertia J [$\times 10^{-4}$kg·m^2]	When Instantaneous Stop or Bi-Directional Operation is performed*4	At 80～1500 r/min	250	1000	2250	4000	9000	25000	100000	400000
		At 3000 r/min	90	360	810	1440	3240	9000	36000	144000
		At 3600 r/min	50.6	203	456	810	1823	5063	20250	81000
		At 80～1500 r/min	83.3	333	750	1333	3000	8333	33333	133333
		At 3000 r/min	30	120	270	480	1080	3000	12000	48000
		At 3600 r/min	16.9	67.5	152	270	608	1688	6750	27000

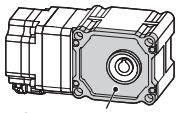
*1 The rotation direction is viewed from the gear flange side (see illustration on the right).

*2 The rotational speed of the output shaft is the rotational speed divided by the gear ratio.

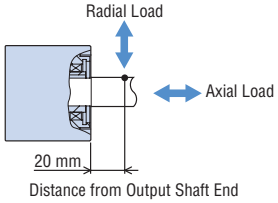
*3 The radial load from each distance can also be calculated from a formula. ➜ Page 78

*4 This also applies if the deceleration time is set to less than 0.1 s in the digital setting.
For 300 W and 400 W output types, do not perform instantaneous forward and reverse operation.

◇Gear Flange Position



◇Load Position



Speed – Torque Characteristics

➜ Page 35

●The □ in the product name contains a symbol (X, Y) indicating the gear head size.
The symbol □ in the part number indicates the gear ratio.

Hollow Shaft Flat FR Gearhead

30 W, 60 W, 120 W

Specifications

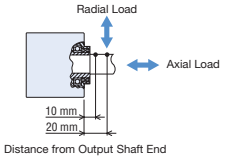
Product Name	Motor / Gearhead		BLM230HP-GFV / GFS2G□FR		BLM460SHP-GFV / GFS4G□FR		BLM5120HP-GFV / GFS5G□FR	
		with electromagnetic brake	BLM230HPM-GFV/ GFS2G□FR		BLM460SHPM-GFV / GFS4G□FR		BLM5120HPM-GFV / GFS5G□FR	
	Driver		BLE2D30-A	BLE2D30-C	BLE2D60-A	BLE2D60-C	BLE2D120-A	BLE2D120-C
		with electromagnetic brake	BLE2D30-AM	BLE2D30-CM	BLE2D60-AM	BLE2D60-CM	BLE2D120-AM	BLE2D120-CM
Rated Output Power (Continuous)		W	30		60		120	
Power Supply Voltage	Rated Voltage	V	Single-Phase 100-120	Single-Phase 200-240 / Three-Phase 200-240	Single-Phase100-120	Single-Phase 200-240 / Three-Phase 200-240	Single-Phase100-120	Single-Phase200-240 / Three-Phase 200-240
	Permissible Voltage Range		−15～+10%		−15～+10%		−15～+10%	
	Frequency	Hz	50 / 60		50 / 60		50 / 60	
	Permissible Frequency Range		±5%		±5%		±5%	
	Rated Input Current*1	A	1.1 (1.2)	Single-Phase: 0.67 (0.71)/ Three-Phase: 0.39 (0.40)	1.7	Single-Phase: 1.0 (1.1)/ Three-Phase: 0.61	2.7 (2.8)	Single-Phase: 1.7/ Three-Phase: 1.02
	Max. Input Current	A	3.3	Single-Phase: 2.2/ Three-Phase: 1.2	5.4	Single-Phase: 3.5/ Three-Phase: 2.0	7.4	Single-Phase: 4.8/ Three-Phase: 3.3
Rated Speed		r/min	3000					
Speed Control Range			80~4000 r/min (Speed ratio 1: 50)					
Speed Regulation*2		Load	±0.2% (±0.5%) or less: Conditions 0~rated torque, rated speed, rated voltage, normal ambient temperature					
		Voltage	±0.2% (±0.5%): Conditions Rated voltage −15 - +10 %, rated speed, no load, normal ambient temperature					
		Temperature	±0.2% (±0.5%): Conditions Operating ambient temperature 0 - +50 °C, rated speed, no load, rated voltage					
Electromagnetic Brake	Type		Power off activated type, automatically controlled by the driver					
	Static Friction Torque	Nm	0.096		0.191		0.382	
Gravitational Operation Capability*3	Continuous Regenerative Power	W	70					
	Instantaneous Regenerative Power	W	720					
	Applicable Regeneration Resistor		**RGB100** (Sold separately)					

*1 Values in brackets ( ) are specifications for motors with electromagnetic brake.
*2 Values in brackets ( ) are specifications for analogue settings.
*3 Values when a regenerative resistor is used.
The regenerative resistor should be installed in a location with a heat dissipation capacity equivalent to that of the heat sink (material: aluminium 350 x 350 mm, 3 mm thick).
● The values correspond to each specification and characteristic of a stand-alone motor.
● The symbol □ in the part number indicates the gear ratio.

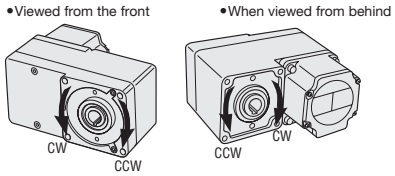
Gear Ratio				5	10	15	20	30	50	100	200
Output Shaft Speed [r/min]*1			80 r/min	16	8	5.3	4	2.7	1.6	0.8	0.4
			4000 r/min	800	400	267	200	133	80	40	20
Permissible Torque [Nm]		30 W	At 80~2000 r/min	0.40	0.85	1.3	1.7	2.6	4.3	8.5	17
			At 3000 r/min	0.38	0.82	1.2	1.6	2.4	4.1	8.2	16
			At 4000 r/min	0.29	0.61	0.92	1.2	1.8	3.1	6.1	12
		60 W	80~2000 r/min	0.85	1.7	2.6	3.4	5.1	8.5	17	34
			At 3000 r/min	0.81	1.6	2.4	3.2	4.9	8.1	16	32
			At 4000 r/min	0.61	1.2	1.8	2.4	3.7	6.1	12	24
		120 W	At 80~2000 r/min	1.9	3.8	5.7	7.7	11	19	38	77
			At 3000 r/min	1.6	3.2	4.9	6.5	9.7	16	32	65
			At 4000 r/min	1.2	2.4	3.7	4.9	7.3	12	24	49
Permissible Radial Load [N] *2	10 mm from End of Output Shaft	30 W	At 80~3000 r/min	450		500					
			At 4000 r/min	410		460					
		60 W	At 80~3000 r/min	800		1200					
			At 4000 r/min	730		1100					
		120 W	At 80~3000 r/min	900		1300		1500			
			At 4000 r/min	820		1200		1400			
	20 mm from End of Output Shaft	30 W	At 80~3000 r/min	370		400					
			At 4000 r/min	330		370					
		60 W	At 80~3000 r/min	660		1000					
			At 4000 r/min	600		910					
		120 W	At 80~3000 r/min	770		1110		1280			
			At 4000 r/min	700		1020		1200			
Permissible Axial Load [N]		30 W		200							
		60 W		400							
		120 W		500							
Permissible Inertia J [$\times 10^{-4}$kg·m^2]		30 W		12	50	110	200	370	920	2500	5000
		60 W		22	95	220	350	800	2200	6200	12000
		120 W		45	190	420	700	1600	4500	12000	25000
	When Instantaneous Stop or Bi-Directional Operation is performed*3	30 W		1.55	6.2	14	24.8	55.8	155		
		60 W		5.5	22	49.5	88	198	550		
		120 W		25	100	225	400	900	2500		

*1 The rotational speed of the output shaft is the rotational speed divided by the gear ratio.
*2 The radial load from each distance can also be calculated from a formula. ➜ Page 80
*3 This also applies if the deceleration time is set to less than 0.1 s in the digital settings.

◇Load Position



◇Direction of rotation



Speed – Torque Characteristics

➜Page 35

Hollow Shaft Flat FR Gearhead

200 W, 300 W, 400 W

Specifications

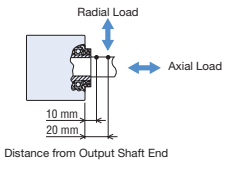
Product Name			BLM6200SHP-GFV / GFS6G□FR		BLM6300SHP-GFV / GFS6G□FR	BLM6400SHP-GFV / GFS6G□FR	
	Motor / Gearhead	with electromagnetic brake	BLM6200SHPM-GFV / GFS6G□FR		–	–	
	Driver		BLE2D200-A	BLE2D200-C	BLE2D300-C	BLE2D400-C	BLE2D400-S
		with electromagnetic brake	BLE2D200-AM	BLE2D200-CM	–	–	
Rated Output Power (Continuous)		W	200		300	400	
Power Supply Voltage	Rated Voltage	V	Single-Phase100-120	Single-Phase 200-240 / Three-Phase 200-240	Single-Phase 200-240 / Three-Phase 200-240	Single-Phase 200-240	Three-Phase 200-240
	Permissible Voltage Range		−15 to +10%		−15 to +10%	−15 to +10%	
	Frequency	Hz	50 / 60		50 / 60	50 / 60	
	Permissible Frequency Range		±5%		±5%	±5%	
	Rated Input Current*1	A	4.3 (4.4)	Single-Phase: 2.4 (2.5) / Three-Phase: 1.4 (1.5)	Single-Phase: 3.2 / Three-Phase: 1.8	4.6	2.3
	Max. Input Current	A	11.5	Single-Phase: 6.5 / Three-Phase: 4.3	Single-Phase: 8.5 / Three-Phase: 6.0	9.9	6.1
Rated Speed		r/min	3000				
Speed Control Range			80~4000 r/min (Speed ratio 1: 50)				
Speed Regulation*2	Load		±0.2% (±0.5%) or less: Conditions 0~rated torque, rated speed, rated voltage, normal ambient temperature				
	Voltage		±0.2% (±0.5%): Conditions Rated voltage −15 - +10 %, rated speed, no load, normal ambient temperature				
	Temperature		±0.2% (±0.5%): Conditions Operating ambient temperature 0 - +50 °C, rated speed, no load, rated voltage				
Electromagnetic Brake	Type		Power off activated type, automatically controlled by the driver		–	–	
	Static Friction Torque	Nm	0.637		–	–	
Gravitational Operation Capability*3	Continuous Regenerative Power	W	70		–	–	
	Instantaneous Regenerative Power	W	720		–	–	
	Applicable Regeneration Resistor		**RGB100** (Sold separately)		–	–	

*1 Values in brackets ( ) are specifications for motors with electromagnetic brake.
*2 Values in brackets ( ) are specifications for analogue settings.
*3 Values when a regenerative resistor is used.
The regenerative resistor should be installed in a location with a heat dissipation capacity equivalent to that of the heat sink (material: aluminium 350 x 350 mm, 3 mm thick).
●The values correspond to each specification and characteristic of a stand-alone motor.

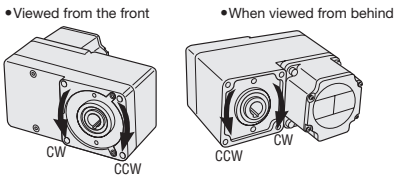
Gear Ratio				5*1	10	15	20	30	50	100
Output Shaft Speed [r/min]*2			80 r/min	16	8	5.3	4	2.7	1.6	0.8
			4000 r/min	800	400	267	200	133	80	40
Permissible Torque [Nm]		200 W	At 80 - 3000 r/min	–	5.4	8.1	10.8	16.2	27	54
			At 4000 r/min	–	4.0	6.1	8.1	12.2	20.4	40.8
		300 W	At 80 - 3000 r/min	–	8.1	12.1	16.2	24.3	40.5	81
			At 4000 r/min	–	6.0	9.1	12.1	18.2	30.4	60
		400 W	At 80 - 3000 r/min	5.3	10.7	16.1	21.5	32.3	53	107
			At 4000 r/min	4.0	8.1	12.1	16.2	24.3	40.5	81
Permissible Radial Load [N]*3	10 mm from End of Output Shaft		At 80 - 3000 r/min	1230		1680		2040		
			At 4000 r/min	1130		1550		1900		
	20 mm from End of Output Shaft		At 80 - 3000 r/min	1070		1470		1780		
			At 4000 r/min	990		1360		1660		
Permissible Axial Load [N]				800						
Permissible Inertia J [×10^{-4}kg·m^2]				100	460	1000	1700	3900	9300	18000
	When Instantaneous Stop or Bi-Directional Operation is performed*4			50	200	450	800	1800	5000	

*1 Reduction ratio **5** only available for 400 W type.
*2 The rotational speed of the output shaft is the rotational speed divided by the gear ratio.
*3 The radial load from each distance can also be calculated from a formula. ➜Page 80
*4 This also applies if the deceleration time is set to less than 0.1 s in the digital settings.

◇Load Position



◇Direction of rotation



Speed – Torque Characteristics

➜Page 35

●The symbol □ in the part number indicates the gear ratio.

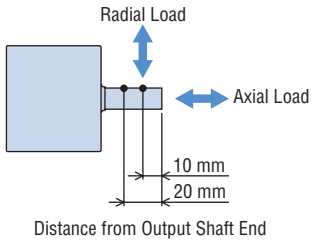
Round Shaft Type 30 W, 60 W, 120 W

Specifications

Product Name			BLM230HP-AS		BLM260HP-AS		BLM5120HP-AS	
	Motor	with electromagnetic brake	BLM230HPM-AS		BLM260HPM-AS		BLM5120HPM-AS	
			BLE2D30-A	BLE2D30-C	BLE2D60-A	BLE2D60-C	BLE2D120-A	BLE2D120-C
	Driver	with electromagnetic brake	BLE2D30-AM	BLE2D30-CM	BLE2D60-AM	BLE2D60-CM	BLE2D120-AM	BLE2D120-CM
Rated Output Power (Continuous)		W	30		60		120	
Power Supply Input	Rated Voltage	V	Single-Phase 100-120	Single-Phase 200-240 / Three-Phase 200-240	Single-Phase 100-120	Single-Phase 200-240 / Three-Phase 200-240	Single-Phase100-120	Single-Phase 200-240 / Three-Phase 200-240
	Permissible Voltage Range		−15 to +10%		−15 to +10%		−15 to +10%	
	Frequency	Hz	50 / 60		50 / 60		50 / 60	
	Permissible Frequency Range		±5%		±5%		±5%	
	Rated Input Current✻1	A	1.1 (1.2)	Single-Phase: 0.67(0.71)/ Three-Phase: 0.39 (0.40)	1.7	Single-Phase: 1.0 (1.1)/ Three-Phase: 0.61	2.7 (2.8)	Single-Phase: 1.7 / Three-Phase: 1.02
	Max. Input Current	A	3.3	Single-Phase: 2.2/ Three-Phase: 1.2	5.4	Single-Phase: 3.5/ Three-Phase: 2.0	7.4	Single-Phase: 4.8/ Three-Phase: 3.3
Rated Speed		r/min	3000					
Speed Control Range			80～4000 r/min (Speed ratio 1: 50)					
Rated Torque		Nm	0.096		0.191		0.382	
Maximum Instantaneous Torque		Nm	0.2		0.4		0.8	
Permissible Radial Load	10 mm from End of Output Shaft	N	80		80		150	
	20 mm from End of Output Shaft	N	100		100		170	
Permissible Axial Load		N	20		20		25	
Rotor Inertia J✻1		$\times 10^{-4}$kgm^2	0.042		0.082		0.23 (0.25)	
Permissible Inertia J		$\times 10^{-4}$kgm^2	1.8		3.75		5.6	
Speed Regulation✻2	Load		Max. ±0.2% (±0.5%): No torque to rated torque, rated speed, rated voltage, normal temperature					
	Voltage		Max. ±0.2% (±0.5%): Rated voltage -15 to +10%, rated speed, no load, normal temperature					
	Temperature		Max. ±0.2% (±0.5%): Operating ambient temperature 0 to +50˚C, rated speed, no load, rated voltage					
Electromagnetic Brake	Type		Power off activated type, automatically controlled by the driver					
	Static Friction Torque	Nm	0.096		0.191		0.382	
Gravitational Operation Capability ✻3	Continuous Regenerative Power	W	70					
	Instantaneous Regenerative Power	W	720					
	Applicable Regeneration Resistor		**RGB100** (Sold Separately)					

✻1 The value in brackets ( ) is the specification for motors with electromagnetic brake.
✻2 The value in brackets ( ) is the specification for an analog setting.
✻3 Values when regeneration unit is used.
Install the regeneration unit in a location which has the same heat radiation capability as a heat radiation plate (material: aluminum 350×350 mm, 3 mm thick).

◇Load Position



Speed - Torque Characteristics

➜Page 35

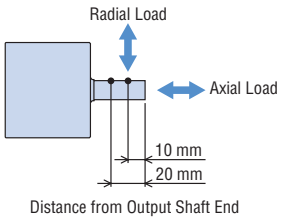
Round Shaft Type 200 W, 300 W, 400 W

Specifications

Product Name			BLM5200HP-AS		BLM5300HP-AS	BLM5400HP-AS	
	Motor	with electromagnetic brake	BLM5200HPM-AS		–	–	
	Driver		BLE2D200-A	BLE2D200-C	BLE2D300-C	BLE2D400-C	BLE2D400-S
		with electromagnetic brake	BLE2D200-AM	BLE2D200-CM	–	–	
Rated Output Power (Continuous)		W	200		300	400	
Power Supply Input	Rated Voltage	V	Single-Phase100-120	Single-Phase 200-240 / Three-Phase 200-240	Single-Phase 200-240 / Three-Phase 200-240	Single-Phase 200-240	Three-Phase 200-240
	Permissible Voltage Range		−15 to +10%		−15 to +10%	−15 to +10%	
	Frequency	Hz	50 / 60		50 / 60	50 / 60	
	Permissible Frequency Range		±5%		±5%	±5%	
	Rated Input Current*1	A	4.3 (4.4)	Single-Phase: 2.4 (2.5) / Three-Phase: 1.4 (1.5)	Single-Phase: 3.2 / Three-Phase: 1.8	4.6	2.3
	Maximum Input Current	A	11.5	Single-Phase: 6.5 / Three-Phase: 4.3	Single-Phase: 8.5 / Three-Phase: 6.0	9.9	6.1
Rated Speed		r/min	3000				
Speed Control Range			80 - 4000 r/min (Speed ratio 1: 50)				
Rated Torque		Nm	0.637		0.955	1.27	
Maximum Instantaneous Torque		Nm	1.15		1.72	2.28	
Permissible Radial Load	10 mm from End of Output Shaft	N	150				
	20 mm from End of Output Shaft	N	170				
Permissible Axial Load		N	25				
Rotor Inertia J*1		$\times 10^{-4}$kgm^2	0.454 (0.47)		0.67	0.67	
Permissible Inertia J*2		$\times 10^{-4}$kgm^2	8.75		12	15	
Speed Regulation*3	Load		Max. ±0.2% (±0.5%): No torque to rated torque, rated speed, rated voltage, normal temperature				
	Voltage		Max. ±0.2% (±0.5%): Rated voltage -15 to +10%, rated speed, no load, normal temperature				
	Temperature		Max. ±0.2% (±0.5%): Operating ambient temperature 0 to +50˚C, rated speed, no load, rated voltage				
Electromagnetic Brake	Type		Power off activated type, automatically controlled by the driver		–	–	
	Static Friction Torque	Nm	0.637		–	–	
Gravitational Operation Capability*4	Continuous Regenerative Power	W	70		–	–	
	Instantaneous Regenerative Power	W	720		–	–	
	Applicable Regeneration Resistor		**RGB100** (sold separately)		–	–	

*1 The value in brackets is the specification for motors with electromagnetic brake.
*2 When operating inertial loads with round shaft 300 W and 400 W types, use the regenerative resistor **RGB100** (sold separately). Regenerative resistor ➜ Page 83
*3 The value in brackets is the specification for an analog setting.
*4 Values when regeneration unit is used.
Install the regeneration unit in a location which has the same heat radiation capability as a heat radiation plate (material: aluminum 350×350 mm, 3 mm thick).

◇Load Position



Speed – Torque Characteristics

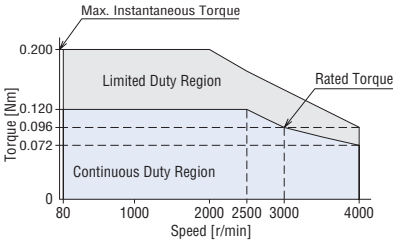
➜Page 35

Speed – Torque Characteristics

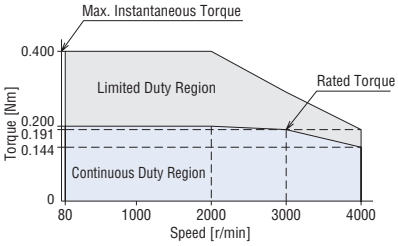
Continuous Duty Region: Continuous operation is possible in this region.
Limited Duty Region: This region is used primarily when accelerating.

Parallel Shaft Gearhead **GFV**, Hollow Shaft Flat **FR** Gearhead, Round Shaft Type

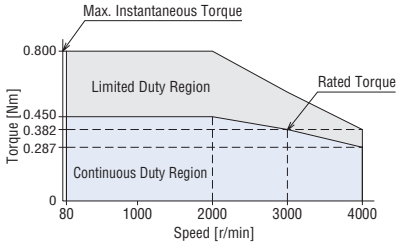
30 W



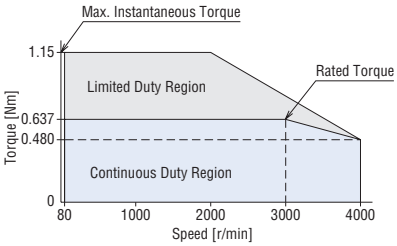
60 W



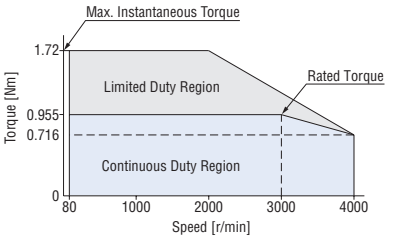
120 W



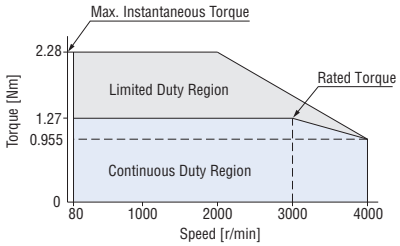
200 W



300 W

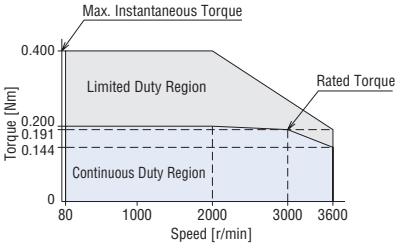


400 W

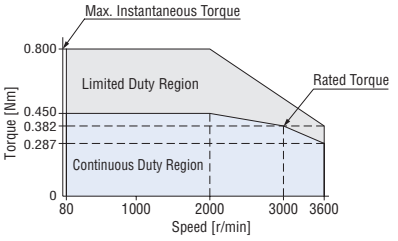


Parallel Shaft **JV** Gearhead, Foot Mounted **JB** Gearhead, Right-Angle Hollow Shaft Hypoid **JH** Gearhead

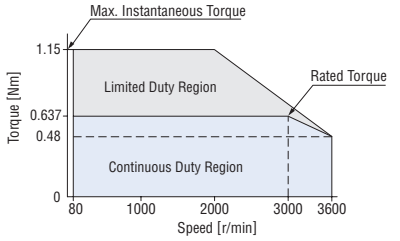
60 W



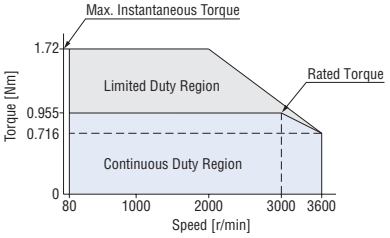
120 W



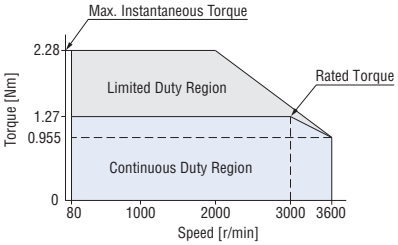
200 W



300 W



400 W



● The values correspond to each specification and characteristics of a stand-alone motor. The speed – torque characteristics show the values when rated voltage is applied.

Vertical Operation (Gravitational Operation)

The **BLE2** Series provides stable speed control during gravitational operation. During vertical operation shown in the figure to the right, normally an external force causes the motor to rotate and function as a power generator. If this energy is applied to the driver, an error will occur. The regeneration unit accessory (sold separately) can convert regenerative energy into thermal energy to be dissipated. Use the regeneration unit accessory when using the motor for vertical applications or when braking a large inertial load quickly.

Regeneration Unit Product Name	Motor Output Power	Continuous Regenerative Power	Instantaneous Regenerative Power
RGB100	30 W, 60 W, 120 W, 200 W	70 W	720 W

- Install the regeneration unit in a location which has the same heat radiation capability as a heat radiation plate (material: aluminum 350×350 mm, 3 mm thick).

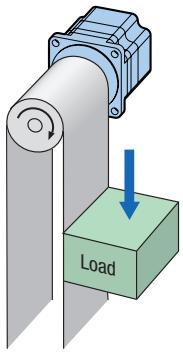
- Regenerative Power

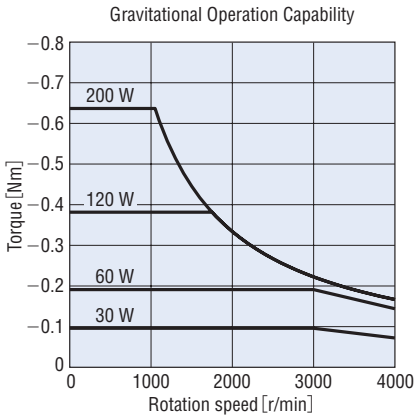
  The regenerative power can be estimated using the formula below. Use the calculated value as a guideline.

  Regenerative Power (W)=0.1047×T_L [Nm]×N [r/min]

  T_L: Load torque N: Speed

Gravitational Operation Capacity





- Gravitational operation exceeding the range of continuous regeneration capability will trigger the built-in thermal protector (150℃).
- Use the electromagnetic brake type for gravitational operation.

Common Specifications

Item		Specifications
Speed Setting Methods	Digital Setting	・Control Panel ・Data Setting Software **MEXE02**
	Analog Setting	・Set using an External Speed Potentiometer **PAVR2-20K** (Sold separately): 0 - 20 kOhm, 0.05 W min. ・Set using External DC Voltage: 0 - 10 VDC, 1 mA min. (Factory setting: 0 - 5 VDC)
Acceleration/ Deceleration Time	Setting Range	0.0 - 15.0 s (Factory setting: 0.5 s)
	Setting Method	・Control Panel ・Data Setting Software **MEXE02**
Torque Limiting*1	Setting Range	0 - 300% (Factory setting: 300 %)
	Digital Setting	・Control Panel ・Data Setting Software **MEXE02**
	Analog Setting	・Set with an External Speed Potentiometer **PAVR2-20K** (Sold separately): 0 - 20 kOhm 0.05 W min. ・Set using External DC Voltage: 0 - 10 VDC, 1 mA min. (Factory setting: 0 - 5 VDC)
Operating Data Setting Number		Max. 16 points (Factory setting: 4 points)
Input Signals		Photocoupler Input Input Resistance: 6.6 kΩ Connectable External DC Power Supply: 24 VDC −15～+20% Current 100 mA or more. Sink Input/Source Input Supports External Wiring
		Arbitrary signal assignment to IN0 - IN6 input (7 points) is possible [ ]: Initial Setting [FWD], [REV], [STOP-MODE], [M0], [M1], [ALARM-RESET], [MB-FRE]*2, M2, M3, H-FREE, TL, INFO-CLR, HMI, EXT-ERROR, START /STOP*3, RUN /BRAKE*3, CW /CCW*3
Output Signal		Photocoupler and Open-Collector Output (ON Power supply: 1.6 V max.) External Power Supply: 4.5 - 30 VDC 100 mA max. (5 mA min. for SPEED-OUT output power) Sink Output/Source Output Supported through external wiring
		Arbitrary signal assignment to OUT0, OUT1 (2 points) is possible. [ ]: Initial setting [SPEED-OUT], [ALARM-OUT], MOVE, INFO, TLC, VA, DIR
Protective Function		When the following protective functions are activated, the output from ALARM-OUT will turn OFF and the motor will preform a coasting stop. At the same time, the alarm code will be displayed and the ALARM LED will blink. Overcurrent, main circuit overheat, overvoltage, undervoltage, sensor error, main circuit output error, overload, over-speed, EEPROM error, initial sensor error, initial operation prohibited, external stop
General Information		When general information is generated, the INFO output will turn ON. The motor will continue to operate. Overvoltage, undervoltage, overload, operation start restriction mode, I/O test mode, configuration request, power on request, operation prohibited
Max. Extension Length		Motor and driver distance: 20.5 m [when an accessory connection cable (for relaying) is used]
Time Rating		Continuous

*1 For the torque limit, an error up to a max. of approximately ±10 % (at rated torque and rated speed) may occur between the setting value and generated torque due to the setting speed, power supply voltage and motor cable extension length.

*2 Only valid for drivers for motors with electromagnetic brake.

*3 Can be used when 3 wire input method is selected.

General Specifications

Item		Motor	Driver
Insulation Resistance		100 MΩ or more when 500 VDC megger is applied between the windings and the case after continuous operation under normal ambient temperature and humidity.	The measured value is 100 MΩ or more when a 500 VDC megger is applied between the power supply terminal and the protective earth terminal and between the power supply terminal and the signal I/O terminal after continuous operation under normal ambient temperature and humidity.
Dielectric Voltage		Sufficient to withstand 1.5 kVAC at 50 Hz applied between the windings and the case for 1 minute after continuous operation under normal ambient temperature and humidity.	Sufficient to withstand the application of 1.5 kVAC at 50 Hz between the power supply terminal and the protective earth terminal for 1 minute, and with application of 1.5 kVAC at 50 Hz between the power supply terminal and the signal I/O terminal for 1 minute after continuous operation under normal ambient temperature and humidity.
Temperature Rise		The temperature rise of the windings is 50 °C max. (less than 60˚C for 300 W and 400 W) and that of the case surface is 40 °C max (less than 50˚C for 300 W and 400 W), measured by the thermocouple method after rated continuous operation under normal ambient temperature and humidity.*1	The temperature rise of the heat sink is 50 °C max., measured by the thermocouple method after rated continuous operation under normal ambient temperature and humidity.
Operating Environment*2	Ambient Temperature	0 - +40 °C (Non-freezing)	0 - +50°C*3 (Non-freezing)
	Ambient Humidity	85 % max. (Non-condensing)	
	Altitude	Max. of 1000 m above sea level	
	Atmosphere	No corrosive gases or dust. No oil splashing. Cannot be used in a radioactive area, magnetic field, vacuum, or other special environments.	
	Vibration	Not subject to continuous vibration or excessive shock. Conforms to IEC 60068-2-6, “Sine-wave vibration test method” Frequency Range: 10 - 55 Hz, Half Amplitude: 0.15 mm: Sweep Direction: 3 directions (X, Y, Z) Number of Sweeps: 20 times	
Storage Conditions*4	Ambient Temperature	−20 to +70˚C (**JV** Gear, **JB** Gear, **JH** Gear, −10 to +60˚C) (Non-freezing)	–25 to +70˚C (Non-freezing)
	Ambient Humidity	85 % max. (Non-condensing)	
	Altitude	3000 m or less above sea level (**JV** gear, **JB** gear and **JH** gear are 1000 m or less above sea level).	
	Atmosphere	No corrosive gases, dust or oil. Cannot be stored in a radioactive area, magnetic field, vacuum, or other special environments.	
Heat-Resistant Class		UL/CSA Standards: 105 (A), EN Standards: 120 (E)	–
Degree of Protection*5		Dust-/Water-Resistant Type (**GFV** Gear): IP67 **GFV** Gear, **JH** Gear, **JV** Gear: IP66 (except round shaft type mounting surfaces) **FR** Gear: IP65 **JB** Gear: IP44	IP20

*1 For round shaft types, install on a heat sink (material: aluminum) of one of the following sizes to maintain a motor case surface temperature of 90°C or less.
30 W type: 115×115 mm thickness 5 mm, 60 W type: 135×135 mm thickness 5 mm
120 W type: 165×165 mm thickness 5 mm, 200 W type: 200×200 mm thickness 5 mm, 300 W and 400 W type: 250×250 mm thickness 6 mm

*2 Install the driver to a location that has the same heat radiation capability as an aluminum metal plate.
Installation of a stand-alone driver 200×200 mm thickness 2 mm
Installation of multiple drivers 350×350 mm thickness 2 mm

*3 0 to +40˚C for close mounting (200 W, 300 W and 400 W only) and DIN rail mounting.

*4 The storage condition applies to short periods such as the period during transport.

*5 The IP display indicating watertight and dust-resistant performance is regulated by IEC 60529 and IEC 60034-5.

Note

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

Dimensions (Unit = mm)

- The motor outline diagram shows the motor when the optional connecting cable (coloured part ▭) is fitted.
  The weight shown does not include the mass of the connection cable. External dimensions and mass of the connecting cable ➜ Page 70
- The □ in the product name indicates the number for the gear ratio.
  The symbol ■ in the part number indicates the gearhead size.

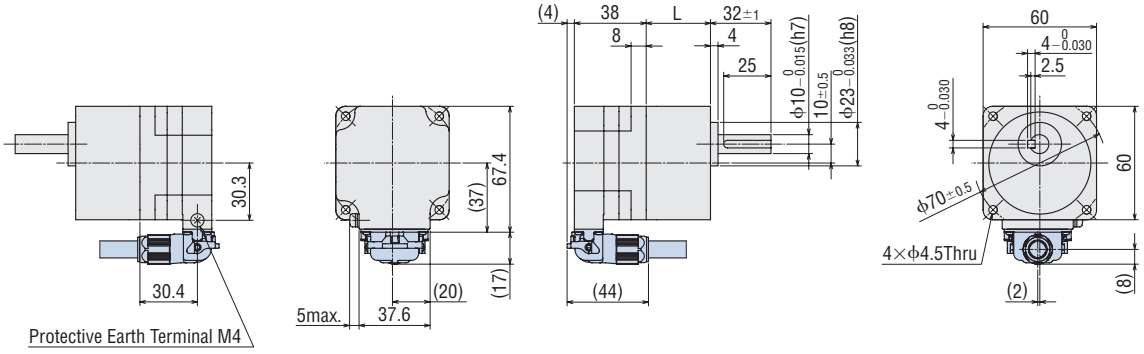
Motor

◇Parallel Shaft Gearhead **GFV** · 30 W

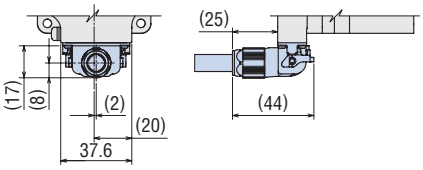
CAD

Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass [kg]		CAD		
				Motor	Gearhead	Pull-out On The Output Shaft Side	Pull-out On The Rear Of The Motor	Vertical Direction
BLM230HP-GFV	**GFV2G□S** **GFV2G□SF**	**5 - 20**	34	0.35	0.28	A1728A_F	A1728A_B	A1728A_V
		30 - 100	38		0.33	A1728B_F	A1728B_B	A1728B_V
		200	43		0.38	A1728C_F	A1728C_B	A1728C_V

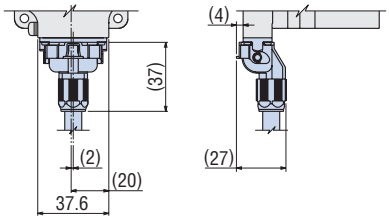
•When connection cable is attached for pull-out on output shaft side



•When connection cable is attached for pull-out on rear of the motor



•For vertical pull-out

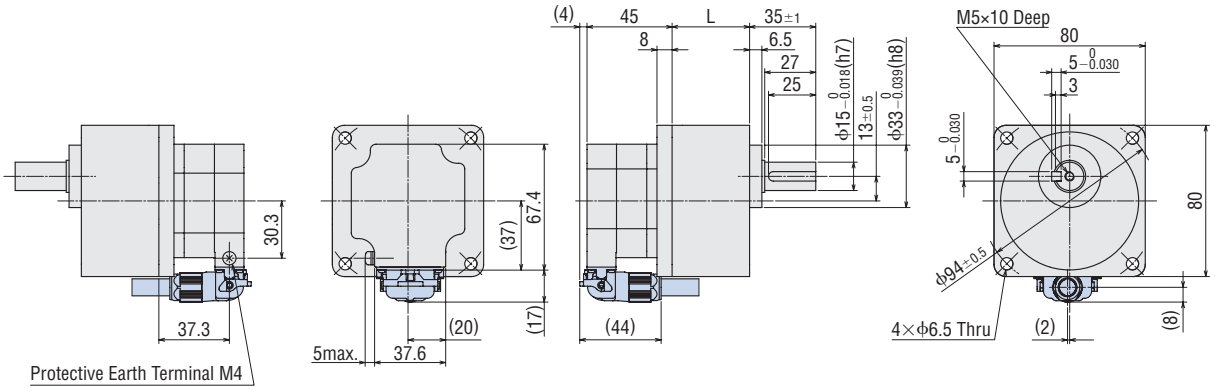


◇Parallel Shaft Gearhead **GFV** · 60 W

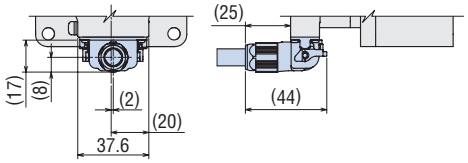
CAD

Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass [kg]		CAD		
				Motor	Gearhead	Pull-out On The Output Shaft Side	Pull-out On The Rear Of The Motor	Vertical Direction
BLM460SHP-GFV	**GFV4G□S** **GFV4G□SF**	**5 - 20**	41	0.59	0.67	A1729A_F	A1729A_B	A1729A_V
		30 - 100	46		0.79	A1729B_F	A1729B_B	A1729B_V
		200	51		0.89	A1729C_F	A1729C_B	A1729C_V

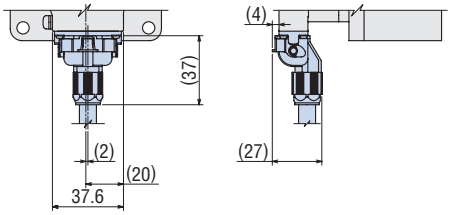
•When connection cable is attached for pull-out on output shaft side



•When connection cable is attached for pull-out on rear of the motor



•For vertical pull-out

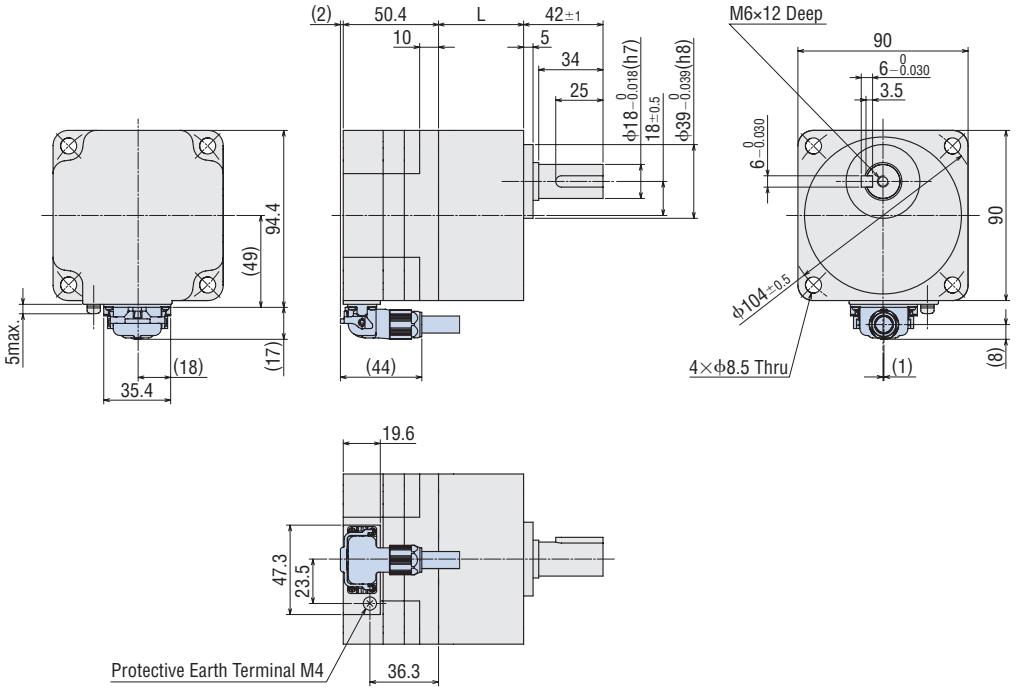


◇Parallel Shaft Gearhead **GFV** · 120 W

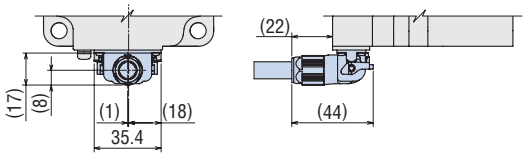
CAD

Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass [kg]		CAD		
				Motor	Gearhead	Pull-out On The Output Shaft Side	Pull-out On The Rear Of The Motor	Vertical Direction
BLM5120HP-GFV	**GFV5G□S** **GFV5G□SF**	**5 - 20**	45	1.1	0.95	A1730A_F	A1730A_B	A1730A_V
		30 - 100	58		1.3	A1730B_F	A1730B_B	A1730B_V
		200	64		1.4	A1730C_F	A1730C_B	A1730C_V

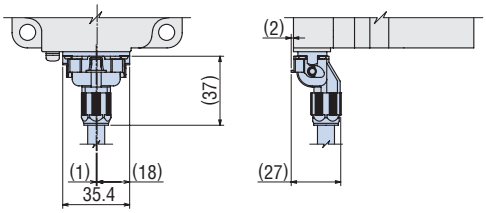
- When connection cable is attached for pull-out on output shaft side



- When connection cable is attached for pull-out on rear of the motor



- For vertical pull-out

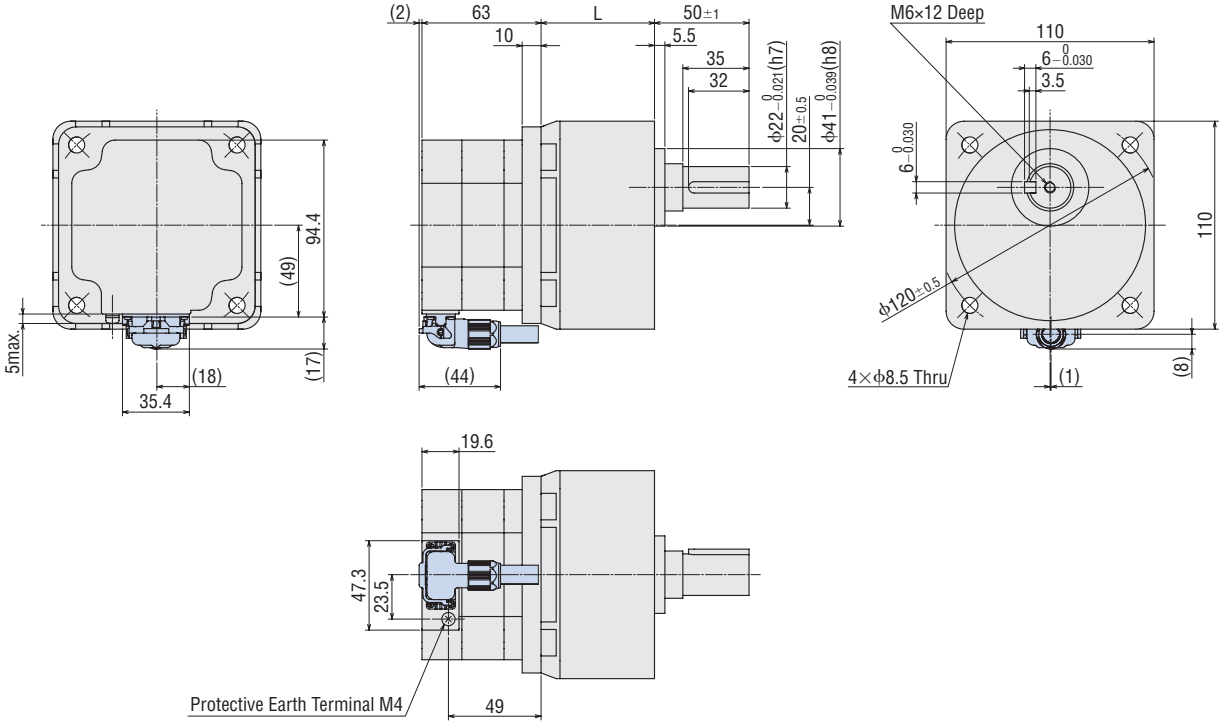


◇Parallel shaft gearhead **GFV** · 200 W

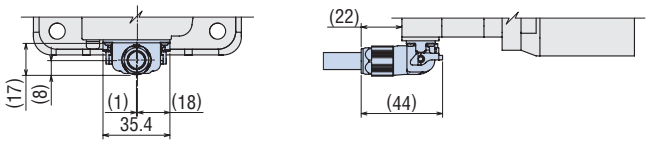
CAD

Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass [kg]		CAD		
				Motor	Gearhead	Pull-out On The Output Shaft Side	Pull-out On The Rear Of The Motor	Vertical Direction
BLM6200SHP-GFV	**GFV6G□S**	**5 - 20**	60	1.7	1.9	A1731A_F	A1731A_B	A1731A_V
		30, **50**	72		2.4	A1731B_F	A1731B_B	A1731B_V
		100, **200**	86		3.0	A1731C_F	A1731C_B	A1731C_V

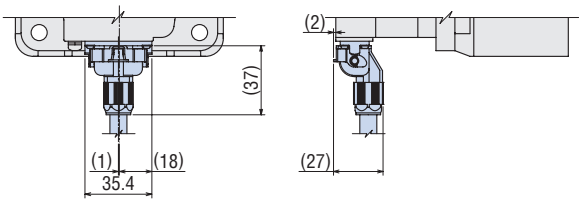
•When connection cable is attached for pull-out on output shaft side



•When connection cable is attached for pull-out on rear of the motor



•For vertical pull-out

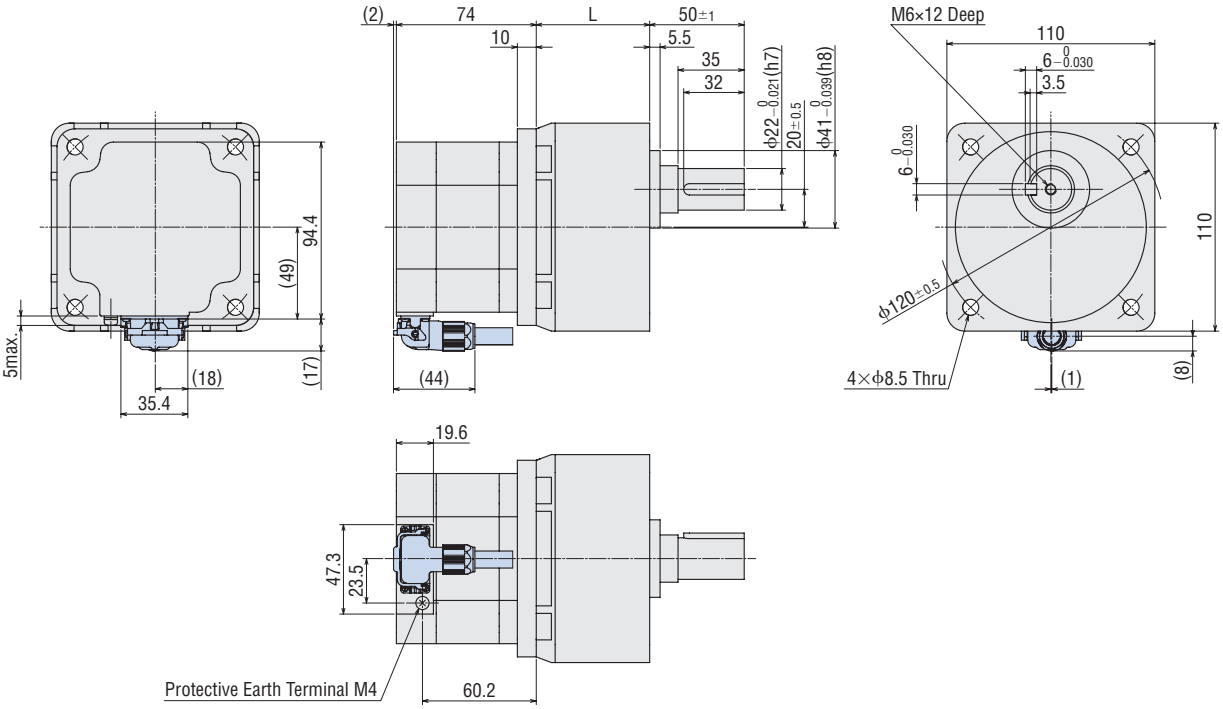


◇Parallel shaft gearhead **GFV** · 300 W, 400 W

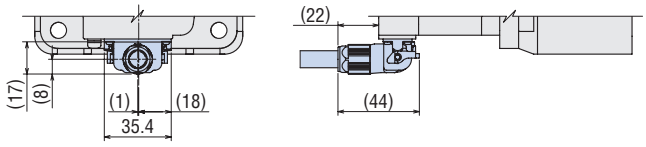
CAD

Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass [kg]		CAD		
				Motor	Gearhead	Pull-out On The Output Shaft Side	Pull-out On The Rear Of The Motor	Vertical Direction
BLM6300SHP-GFV **BLM6400SHP-GFV**	**GFV6G□S**	**5 - 20**	60	2.2	1.9	A1732A_F	A1732A_B	A1732A_V
		30, **50**	72		2.4	A1732B_F	A1732B_B	A1732B_V
		100	86		3.0	A1732C_F	A1732C_B	A1732C_V

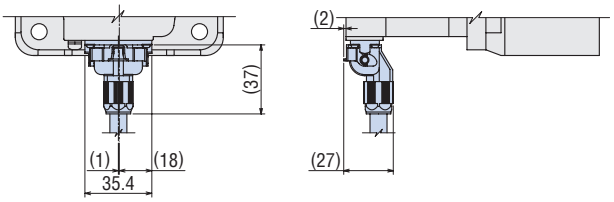
• When connection cable is attached for pull-out on output shaft side



• When connection cable is attached for pull-out on rear of the motor



• For vertical pull-out

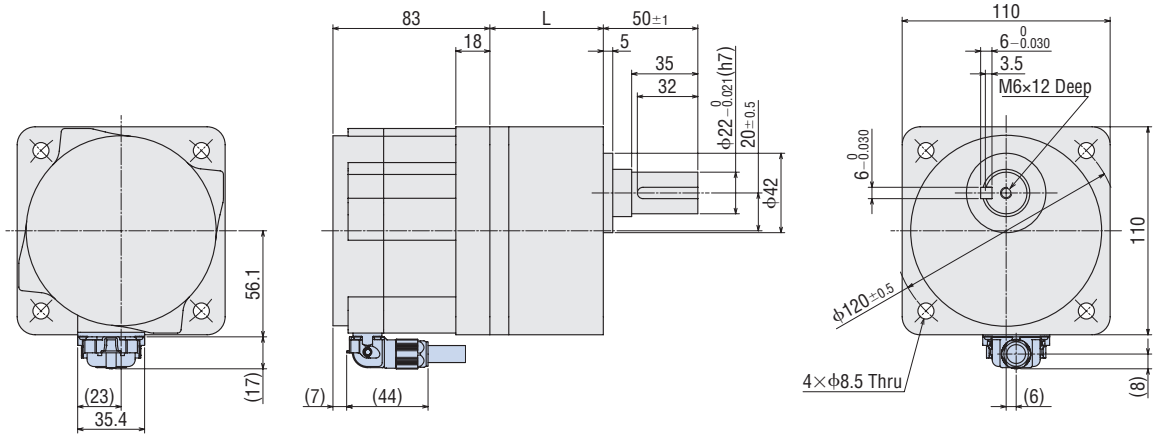


◇Dust-/Water-Resistant Parallel Shaft Gearhead **GFV** · 200 W, 300 W, 400 W

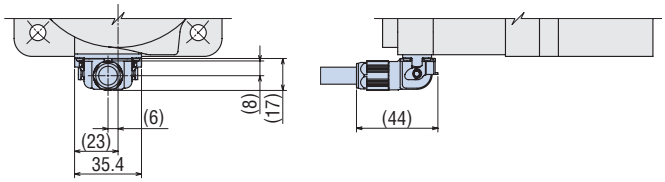
CAD

Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass [kg]		CAD		
				Motor	Gearhead	Pull-out On The Output Shaft Side	Pull-out On The Rear Of The Motor	Vertical Direction
BLM7200HW-GFV	**GFV7G□SW**	**5 - 20**	60	1.9	1.9	A1711A_F	A1711A_B	A1711A_V
		30, **50**	72		2.4	A1711B_F	A1711B_B	A1711B_V
		100	86		3.0	A1711C_F	A1711C_B	A1711C_V
BLM7300HW-GFV **BLM7400HW-GFV**	**GFV7G□SW**	**5 - 20**	60	2.3	1.9	A1711A_F	A1711A_B	A1711A_V
		30, **50**	72		2.4	A1711B_F	A1711B_B	A1711B_V
		100	86		3.0	A1711C_F	A1711C_B	A1711C_V

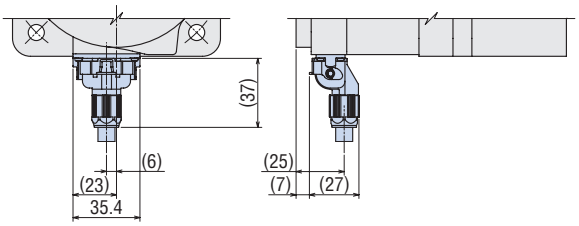
•When connection cable is attached for pull-out on output shaft side



•When connection cable is attached for pull-out on rear of the motor



•For vertical pull-out

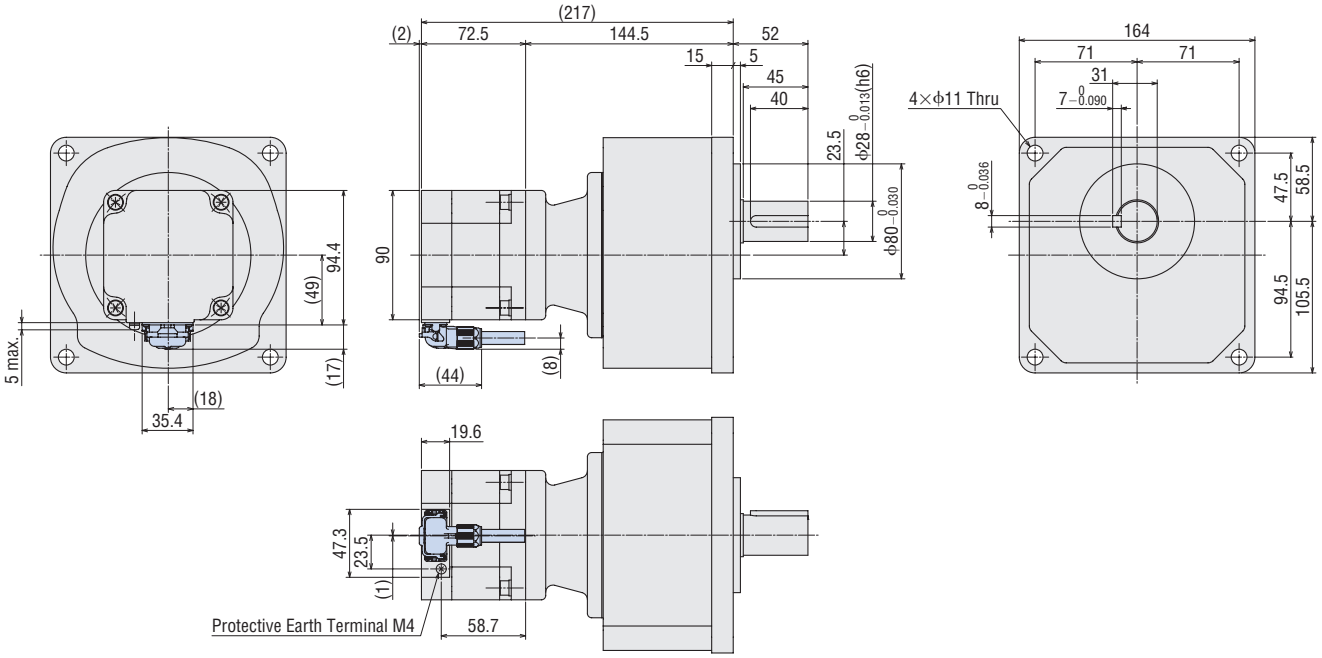


◇Parallel Shaft Gearhead **JV** · 300 W, 400 W

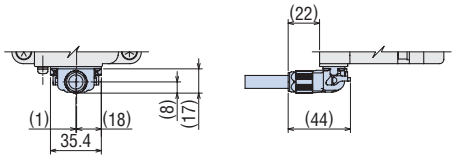
CAD

Motor Product Name	Gearhead Product Name	Gear Ratio	Mass [kg]		CAD		
			Motor	Gearhead	Pull-out On The Output Shaft Side	Pull-out On The Rear Of The Motor	Vertical Direction
BLM5300HPK	**5DV□S**	**200**	2.1	6.5	A1750_F	A1750_B	A1750_V
BLM5400HPK	**5DV□S**	**100, 200**					

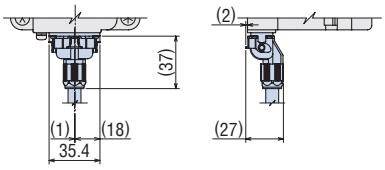
- When connection cable is attached for pull-out on output shaft side



- When connection cable is attached for pull-out on rear of the motor



- For vertical pull-out

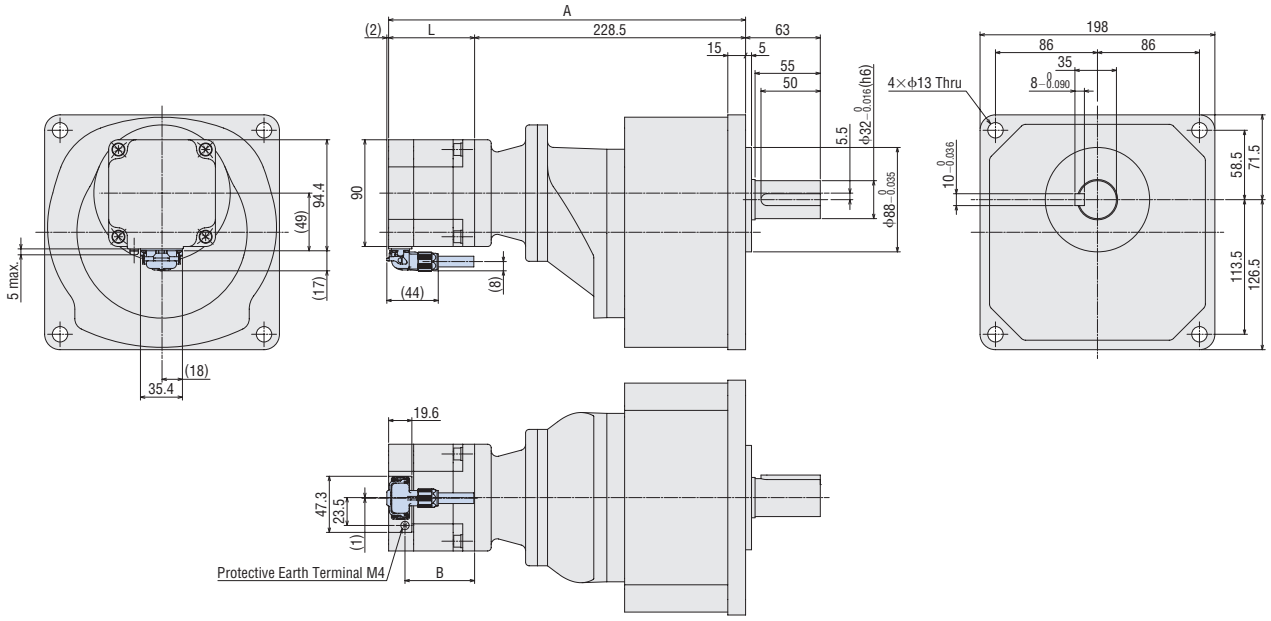


◇Parallel Shaft Gearhead **JV** · 200 W, 300 W, 400 W

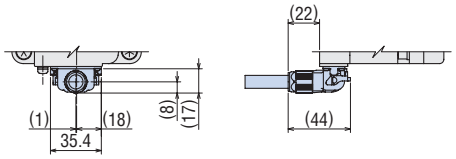
CAD

Motor Product Name	Gearhead Product Name	Gear Ratio	Dimensions			Mass [kg]		CAD		
			A	L	B	Motor	Gearhead	Pull-out On The Output Shaft Side	Pull-out On The Rear Of The Motor	Vertical Direction
BLM5200HPK	**5KV□S**	**300**, **450**	(290.1)	61.6	47.5	1.6	10.5	A1749_F	A1749_B	A1749_V
BLM5300HPK **BLM5400HPK**	**5KV□S**	**300**, **450**	(301)	72.5	58.7	2.1	10.5	A1751_F	A1751_B	A1751_V

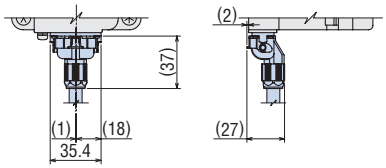
- When connection cable is attached for pull-out on output shaft side



- When connection cable is attached for pull-out on rear of the motor



- For vertical pull-out



◇Foot Mount Type **JB** Gearhead · 200 W, 300 W, 400 W

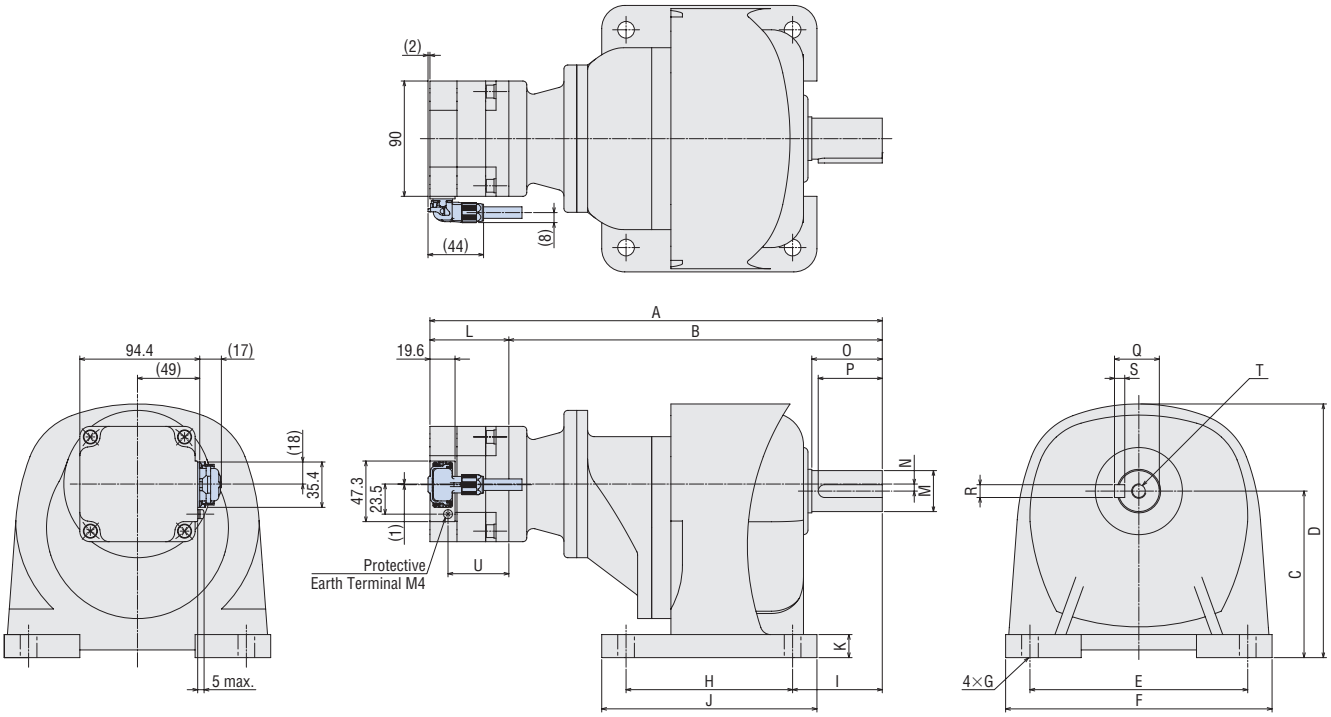
CAD

Motor Product Name	Gearhead Product Name	Gear Ratio	Dimension Number	L	U	Mass [kg]		CAD		
						Motor	Gearhead	Pull-out On The Output Shaft Side	Pull-out On The Rear Of The Motor	Vertical Direction
BLM5200HPK	**5**■**B**□**B**	**5**, **10**, **20**	①	61.6	47.5	1.6	3.0	A1739_F	A1739_B	A1739_V
		30, **50**	③				4.0	A1740_F	A1740_B	A1740_V
		100, **200**	⑤				6.0	A1741_F	A1741_B	A1741_V
		300, **450**	⑦				10.0	A1742_F	A1742_B	A1742_V
		600, **1200**	⑨				16.5	A1743_F	A1743_B	A1743_V
BLM5300HPK **BLM5400HPK**	**5**■**B**□**B**	**5**, **10**, **20**	②	72.5	58.7	2.1	3.0	A1744_F	A1744_B	A1744_V
		30, **50**	④				4.0	A1745_F	A1745_B	A1745_V
		100, **200**	⑥				6.0	A1746_F	A1746_B	A1746_V
		300, **450**	⑧				10.0	A1747_F	A1747_B	A1747_V
		600	⑩				16.5	A1748_F	A1748_B	A1748_V

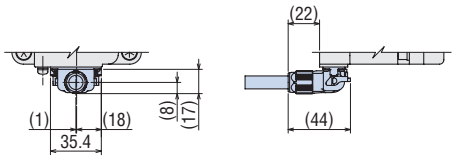
Dimension Number	Total Length	Gearhead Dimensions										Output Shaft Dimensions							Output shaft end threaded hole dimensions
	A	B	C	D	E	F	G	H	I	J	K	M	N	O	P	Q	R	S	T
①	(219.1)	157.5	85±0.2	131	110	134	ϕ9	40	45	64	10	ϕ18 $^{0}_{-0.011}$ (h6)	16.5✻	30	27	20.5	6 $^{0}_{-0.030}$	6 $^{0}_{-0.030}$	M6 x 15 Deep
②	(230)																		
③	(245.1)	183.5	90±0.2	139	130	154	ϕ11	65	55	90	12	ϕ22 $^{0}_{-0.013}$ (h6)	19✻	40	35	24.5	6 $^{0}_{-0.030}$	6 $^{0}_{-0.030}$	M8 x 20 Deep
④	(256)																		
⑤	(258.1)	196.5	110±0.2	167	140	175	ϕ11	90	65	125	15	ϕ28 $^{0}_{-0.013}$ (h6)	23.5✻	45	40	31	8 $^{0}_{-0.036}$	7 $^{0}_{-0.090}$	M8 x 20 Deep
⑥	(269)																		
⑦	(353.1)	291.5	130±0.2	198	170	208	ϕ13	130	70	168	18	ϕ32 $^{0}_{-0.016}$ (h6)	5.5	55	50	35	10 $^{0}_{-0.036}$	8 $^{0}_{-0.090}$	M10 x 25 Deep
⑧	(364)																		
⑨	(375.1)	313.5	150±0.2	230	210	254	ϕ15	150	90	196	20	ϕ40 $^{0}_{-0.016}$ (h6)	0	65	60	43	12 $^{0}_{-0.043}$	8 $^{0}_{-0.090}$	M10 x 25 Deep
⑩	(386)																		

✻The centre position of the gearhead output shaft is offset above the centre position of the motor.

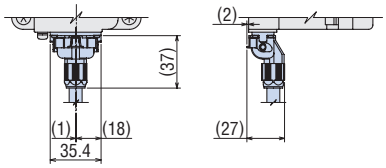
•When connection cable is attached for pull-out on output shaft side



•When connection cable is attached for pull-out on rear of the motor



•For vertical pull-out

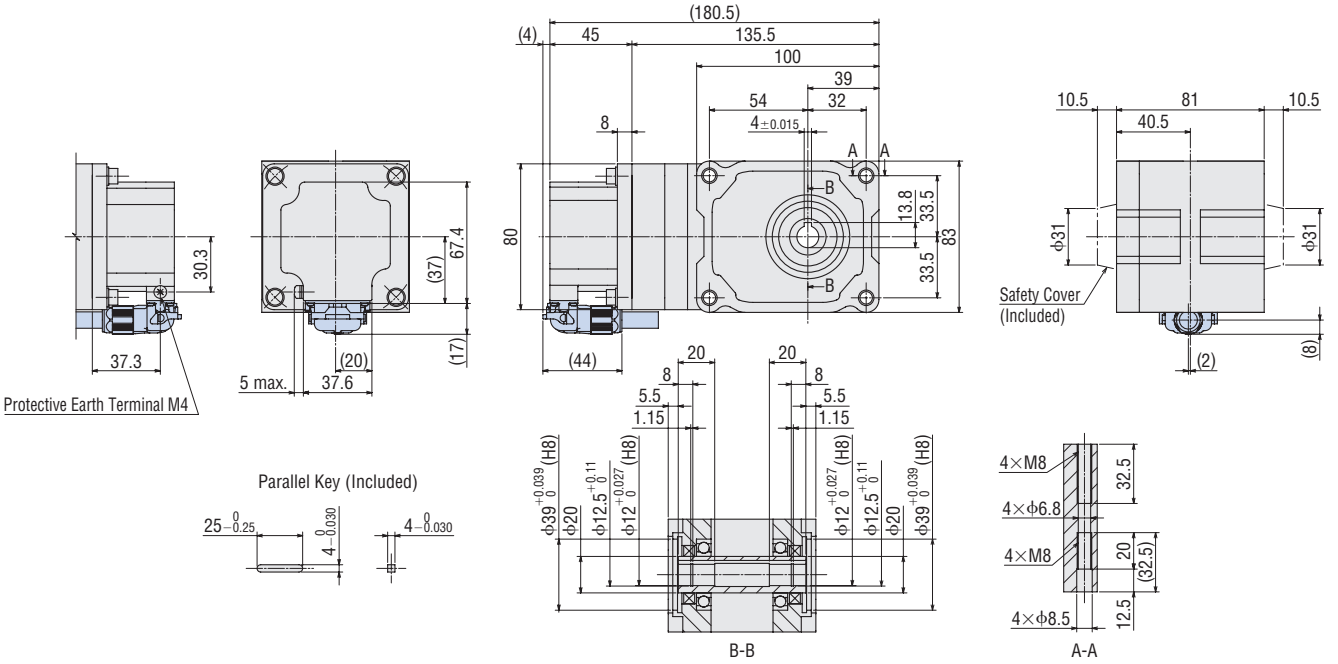


◇Right-Angle Hollow Shaft Hypoid **JH** Gearhead · 60 W

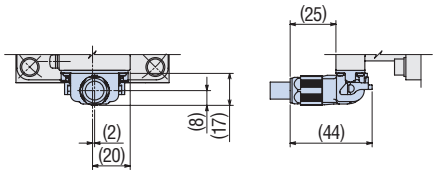
CAD

Motor Product Name	Gearhead Product Name	Mass [kg]		CAD		
		Motor	Gearhead	Pull-out On The Output Shaft Side	Pull-out On The Rear Of The Motor	Vertical Direction
BLM460SHPK	**4H□S**	0.59	2.0	A1733_F	A1733_B	A1733_V

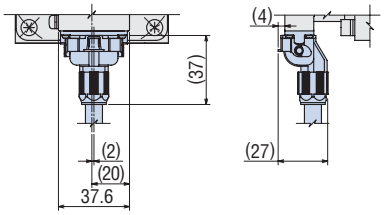
•When connection cable is attached for pull-out on output shaft side



•When connection cable is attached for pull-out on rear of the motor



•For vertical pull-out

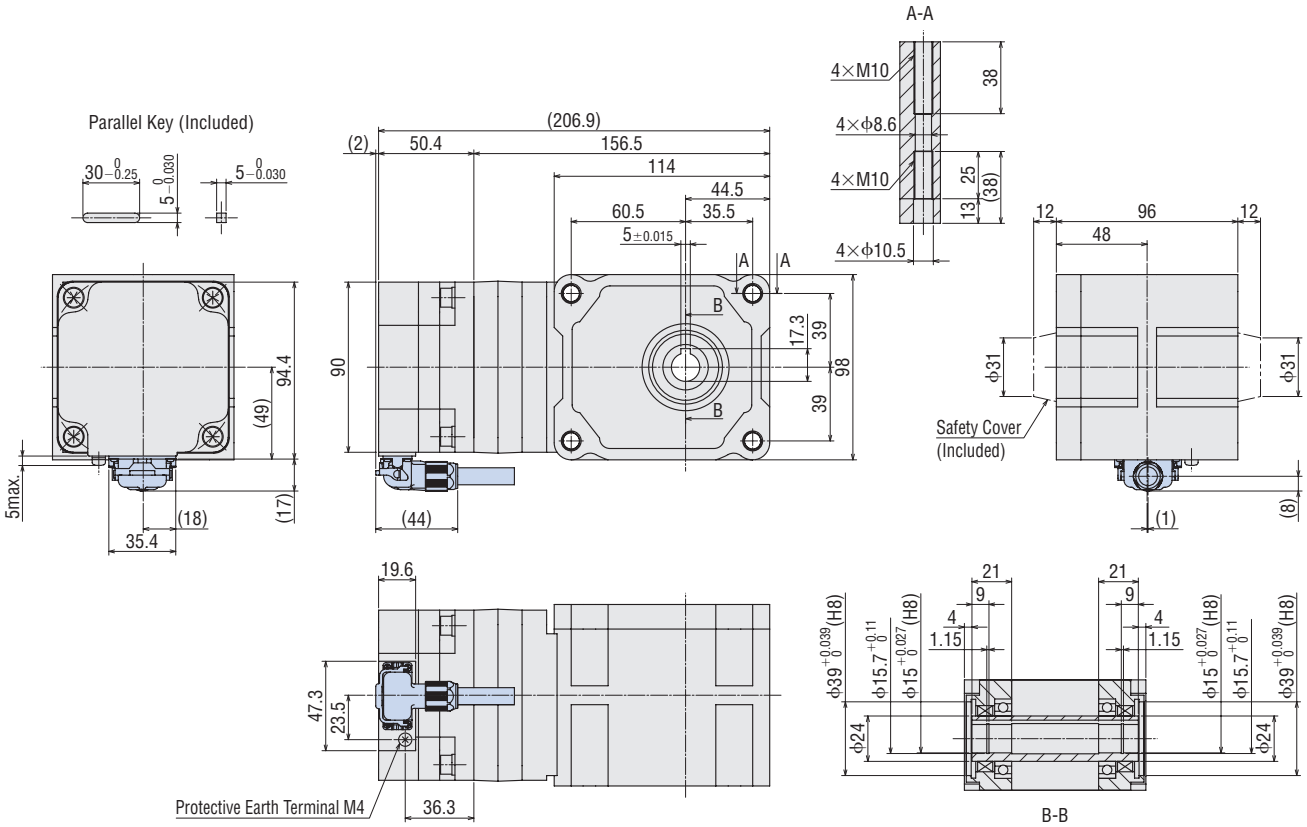


◇Right-Angle Hollow Shaft Hypoid **JH** Gearhead · 120 W

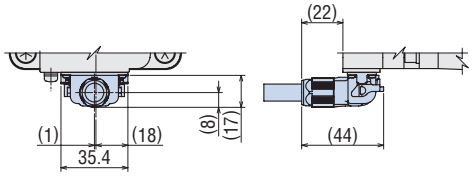
CAD

Motor Product Name	Gearhead Product Name	Mass [kg]		CAD		
		Motor	Gearhead	Pull-out On The Output Shaft Side	Pull-out On The Rear Of The Motor	Vertical Direction
BLM5120HPK	**5H□S**	1.1	3.0	A1734_F	A1734_B	A1734_V

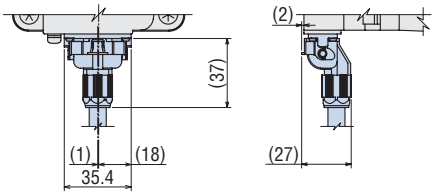
●When connection cable is attached for pull-out on output shaft side



●When connection cable is attached for pull-out on rear of the motor



●For vertical pull-out

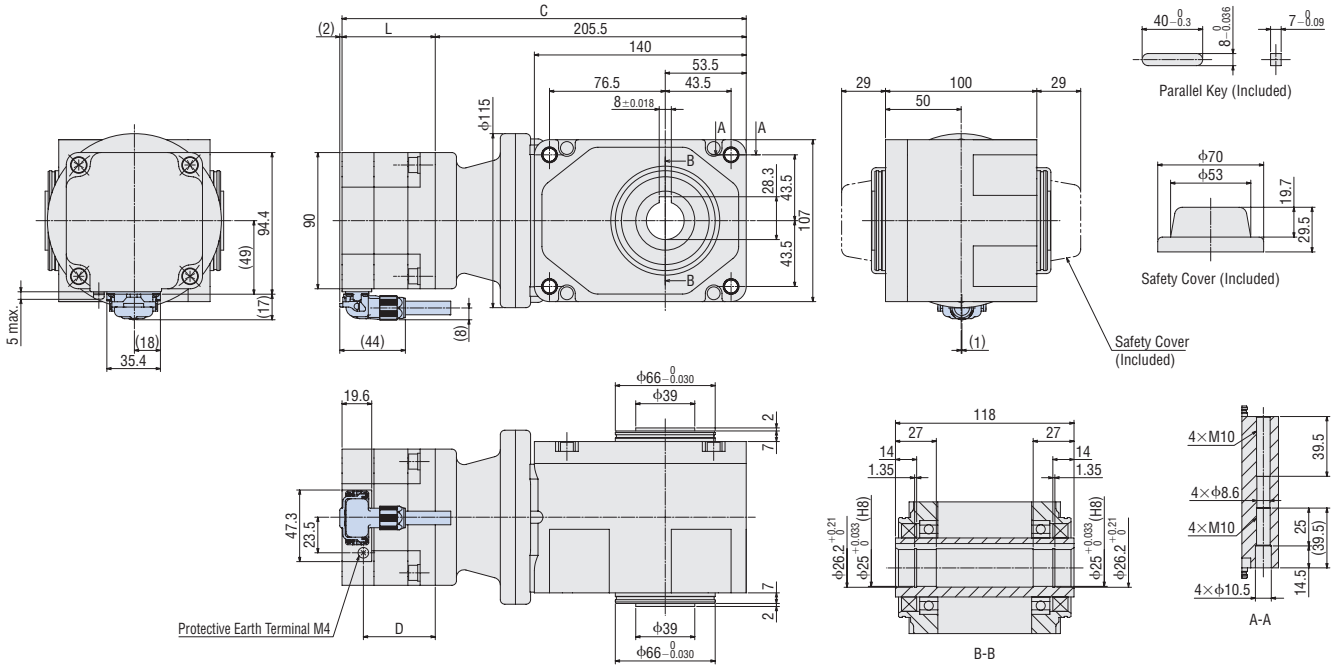


◇Right-Angle Hollow Shaft Hypoid **JH** Gearhead · 200 W, 300 W, 400 W

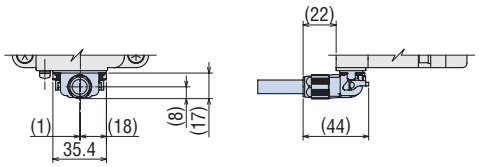
CAD

Motor Product Name	Gearhead Product Name	Gear Ratio	Dimensions			Mass [kg]		CAD		
			C	L	D	Motor	Gearhead	Pull-out On The Output Shaft Side	Pull-out On The Rear Of The Motor	Vertical Direction
BLM5200HPK	**5XH□S**	**5**, **10**, **15** **20**, **30**, **50**	(267.1)	61.6	47.5	1.6	5.0	A1735_F	A1735_B	A1735_V
BLM5300HPK **BLM5400HPK**	**5XH□S**	**5**, **10**, **15** **20**, **30**, **50**	(278)	72.5	58.7	2.1	5.0	A1737_F	A1737_B	A1737_V

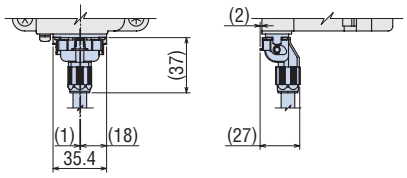
●When connection cable is attached for pull-out on output shaft side



●When connection cable is attached for pull-out on rear of the motor



●For vertical pull-out

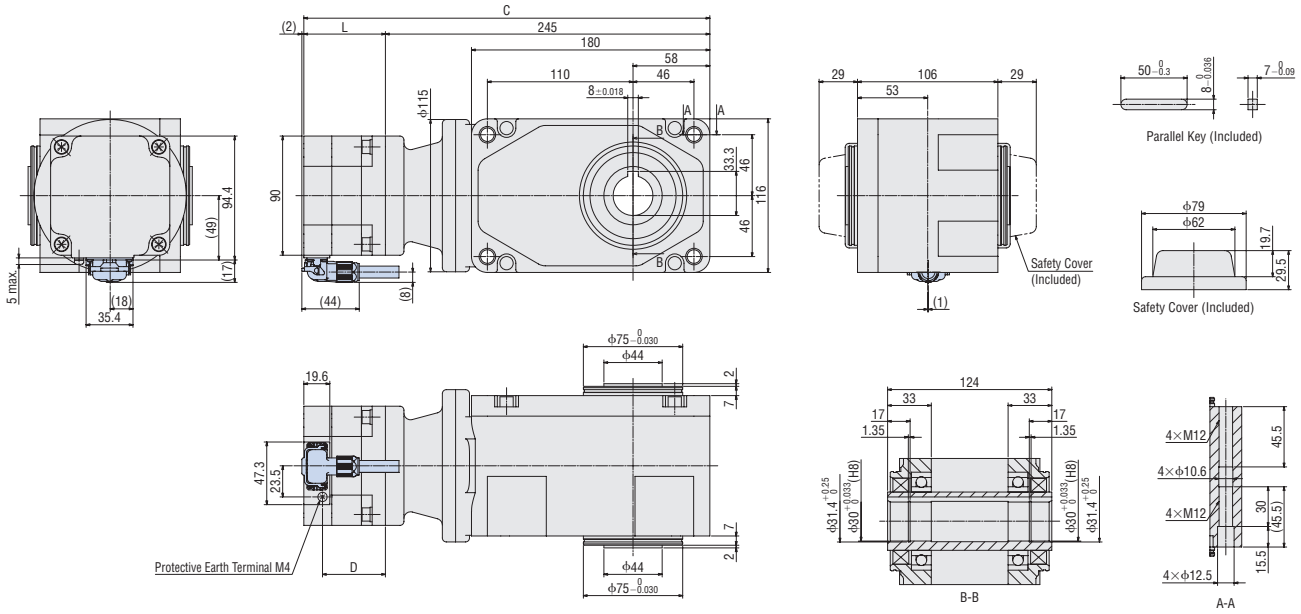


◇Right-Angle Hollow Shaft Hypoid **JH** Gearhead · 200 W, 300 W, 400 W

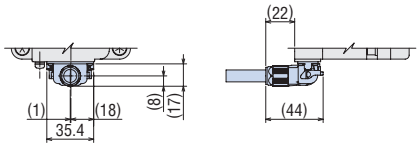
CAD

Motor Product Name	Gearhead Product Name	Gear Ratio	Dimensions			Mass [kg]		CAD		
			C	L	D	Motor	Gearhead	Pull-out On The Output Shaft Side	Pull-out On The Rear Of The Motor	Vertical Direction
BLM5200HPK	**5YH□S**	**100**, **200**	(306.6)	61.6	47.5	1.6	6.5	A1736_F	A1736_B	A1736_V
BLM5300HPK BLM5400HPK	**5YH□S**	**100**, **200**	(317.5)	72.5	58.7	2.1	6.5	A1738_F	A1738_B	A1738_V

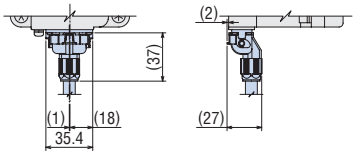
- When connection cable is attached for pull-out on output shaft side



- When connection cable is attached for pull-out on rear of the motor



- For vertical pull-out

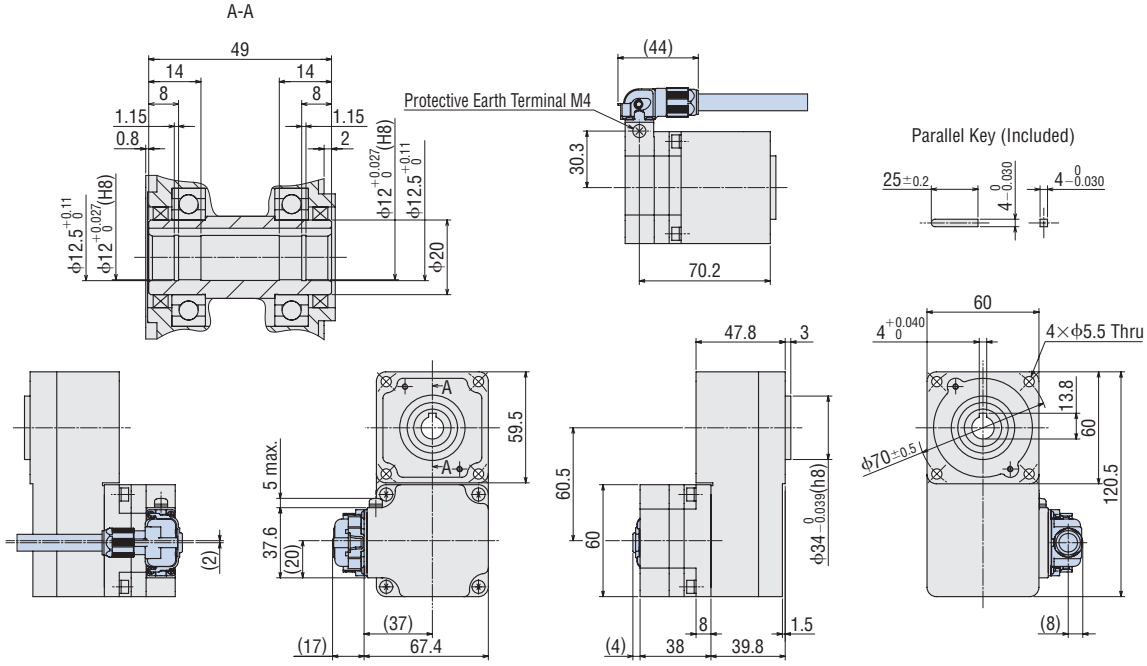


◇Hollow Shaft Flat **FR** Gearhead · 30 W

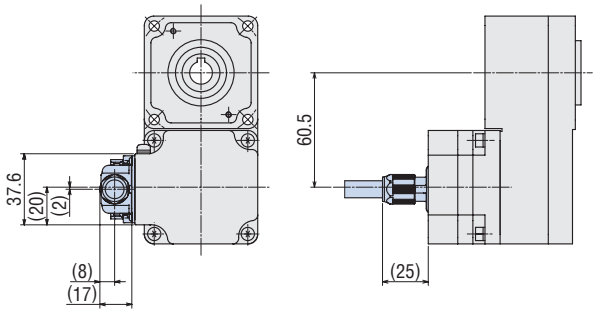
CAD

Motor Product Name	Gearhead Product Name	Mass [kg]		CAD		
		Motor	Gearhead	Pull-out On The Output Shaft Side	Pull-out On The Rear Of The Motor	Vertical Direction
BLM230HP-GFV	**GFS2G□FR**	0.35	0.8	A1725_F	A1725_B	A1725_V

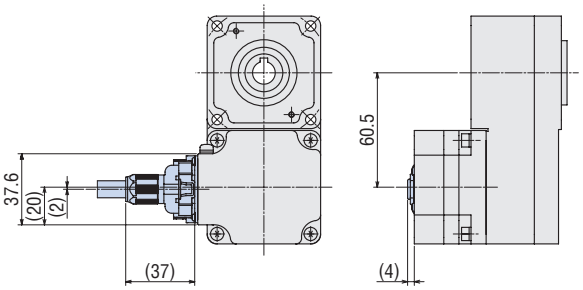
•When connection cable is attached for pull-out on output shaft side



•When connection cable is attached for pull-out on rear of the motor



•For vertical pull-out

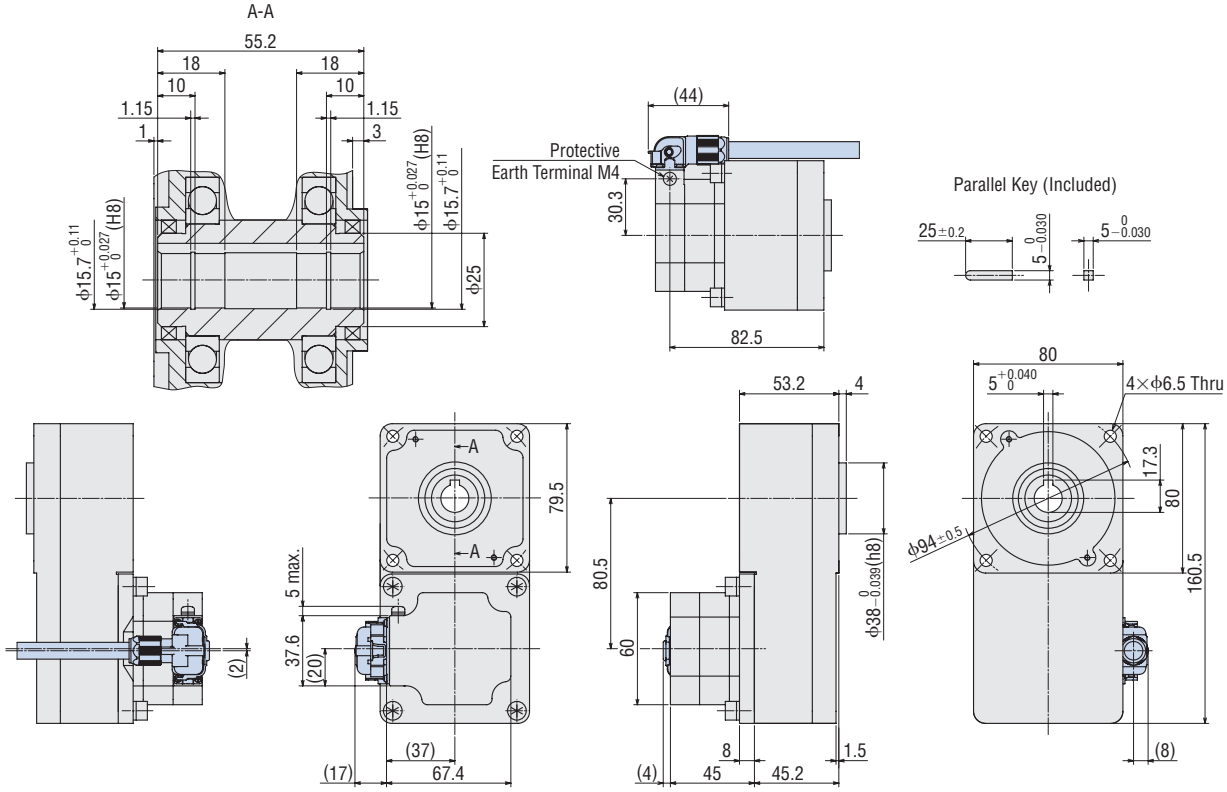


◇Hollow Shaft Flat **FR** Gearhead · 60 W

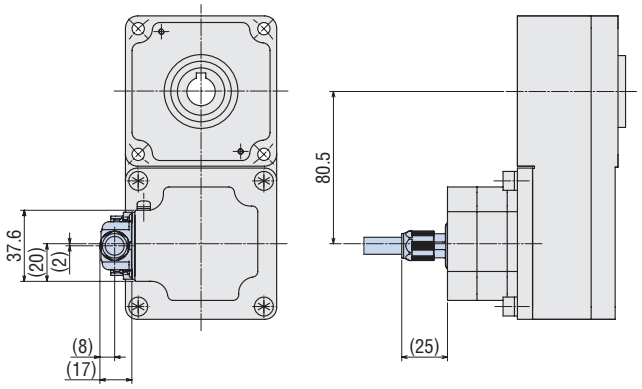
CAD

Motor Product Name	Gearhead Product Name	Mass [kg]		CAD		
		Motor	Gearhead	Pull-out On The Output Shaft Side	Pull-out On The Rear Of The Motor	Vertical Direction
BLM460SHP-GFV	**GFS4G□FR**	0.59	1.6	A1726_F	A1726_B	A1726_V

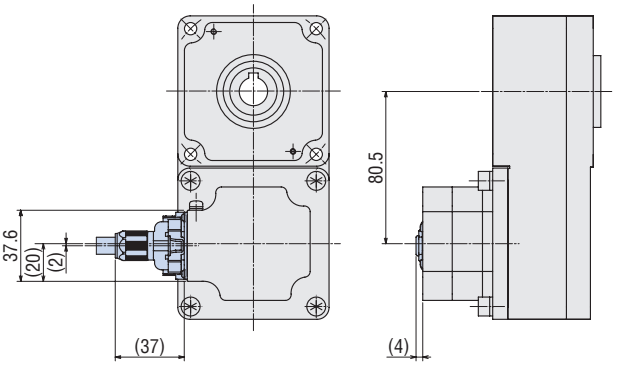
•When connection cable is attached for pull-out on output shaft side



•When connection cable is attached for pull-out on rear of the motor



•For vertical pull-out

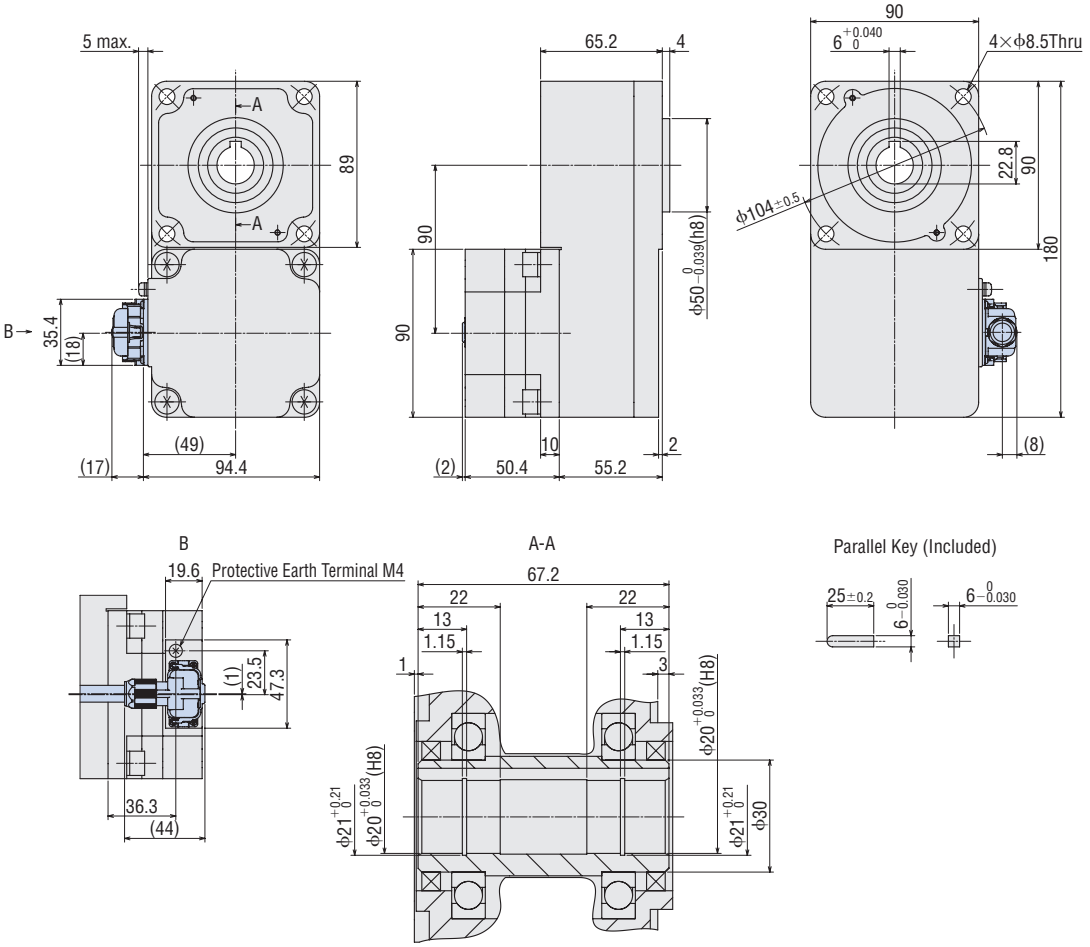


◇Hollow Shaft Flat **FR** Gearhead · 120 W

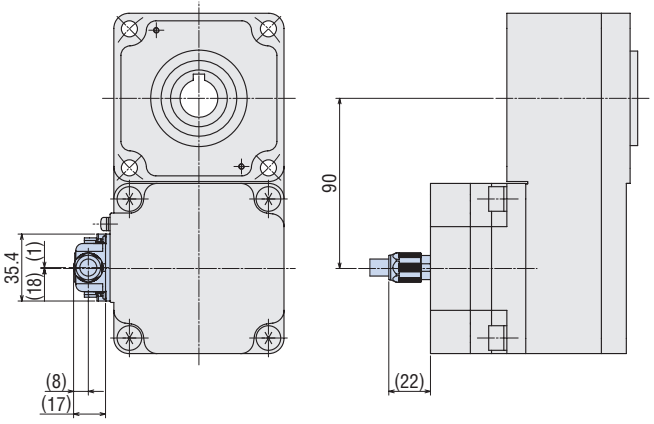
CAD

Motor Product Name	Gearhead Product Name	Mass [kg]		CAD		
		Motor	Gearhead	Pull-out On The Output Shaft Side	Pull-out On The Rear Of The Motor	Vertical Direction
BLM5120HP-GFV	**GFS5G□FR**	1.1	2.2	A1727_F	A1727_B	A1727_V

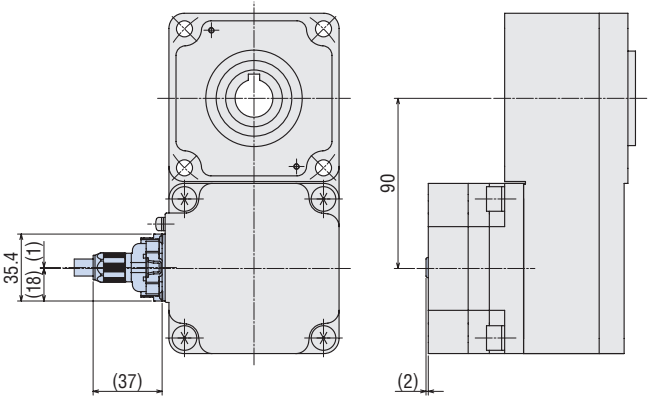
•When connection cable is attached for pull-out on output shaft side



•When connection cable is attached for pull-out on rear of the motor



•For vertical pull-out

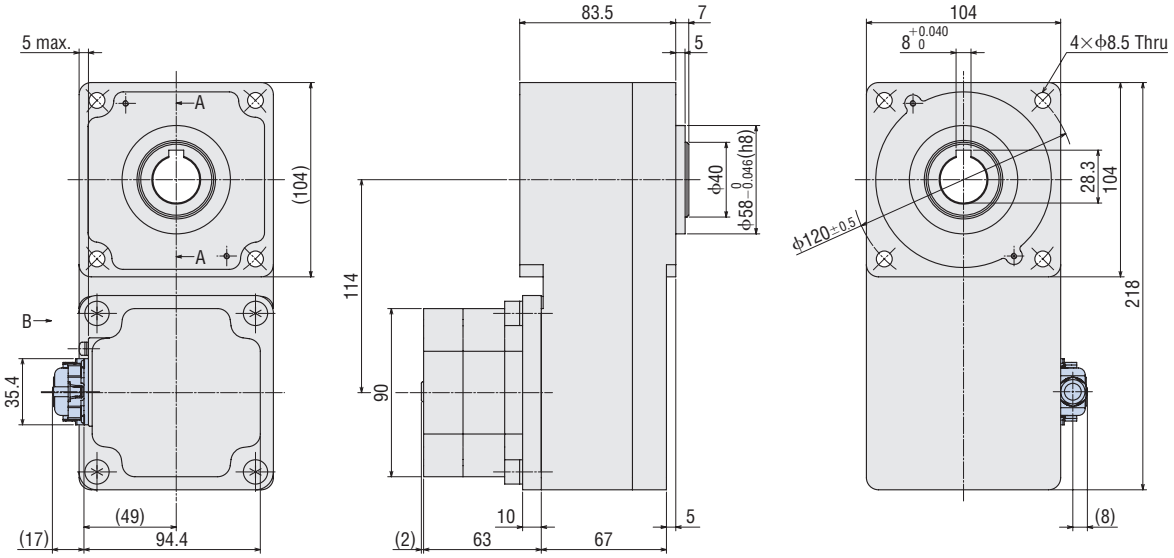


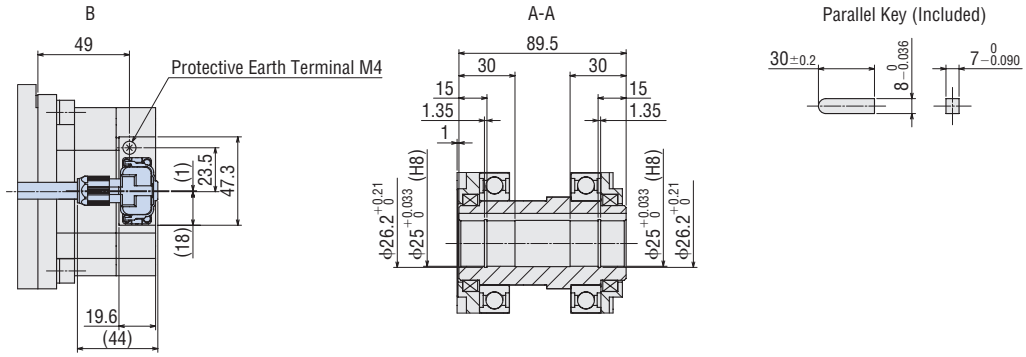
◇Hollow Shaft Flat **FR** Gearhead · 200 W

CAD

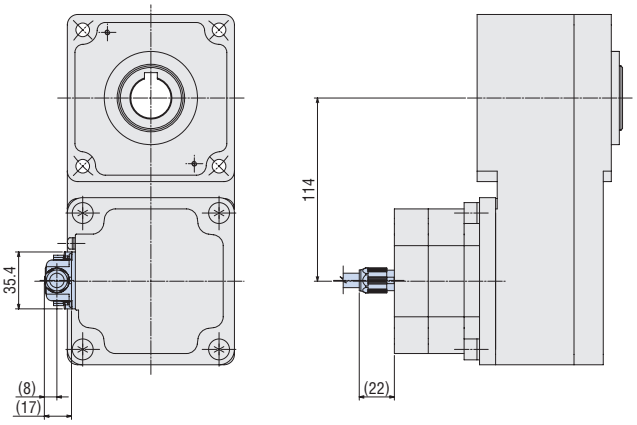
Motor Product Name	Gearhead Product Name	Mass [kg]		CAD		
		Motor	Gearhead	Pull-out On The Output Shaft Side	Pull-out On The Rear Of The Motor	Vertical Direction
BLM6200SHP-GFV	**GFS6G□FR**	1.7	4.8	A1798_F	A1798_B	A1798_V

•When connection cable is attached for pull-out on output shaft side

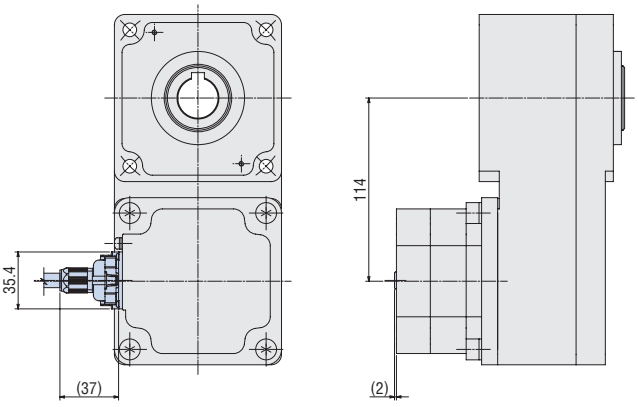




•When connection cable is attached for pull-out on rear of the motor



•For vertical pull-out

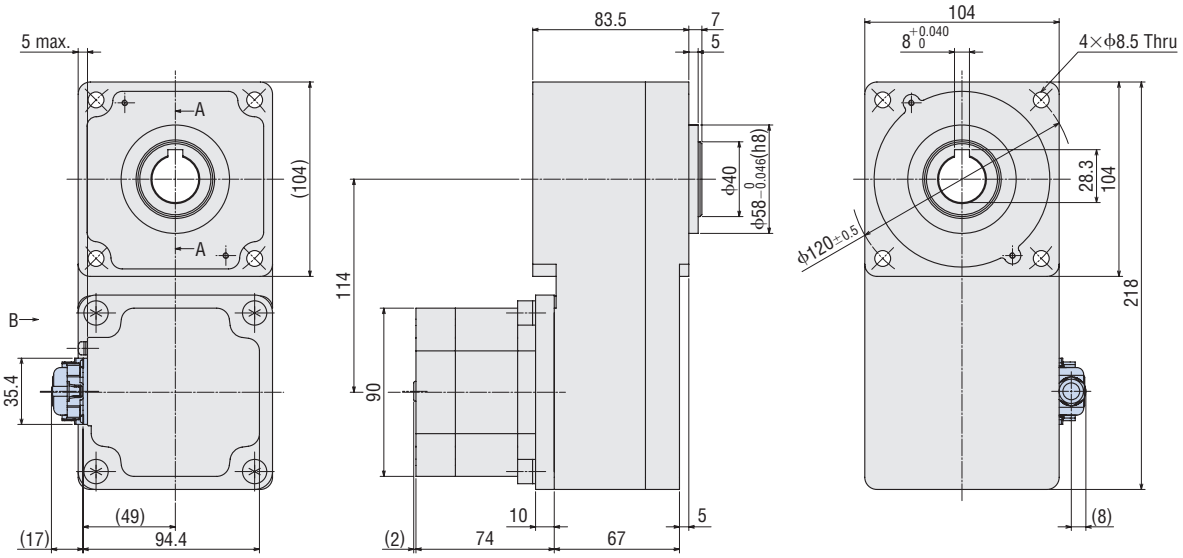


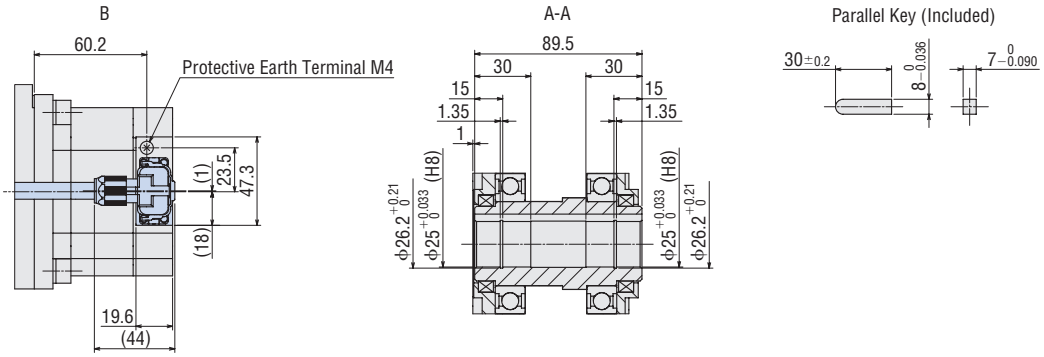
◇Hollow Shaft Flat **FR** Gearhead · 300 W, 400 W

CAD

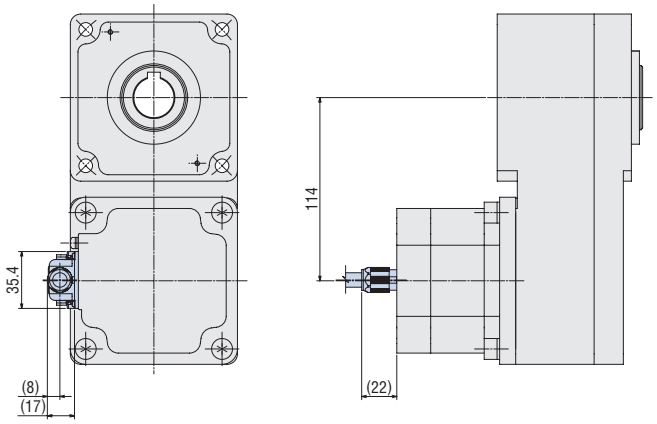
Motor Product Name	Gearhead Product Name	Mass [kg]		CAD		
		Motor	Gearhead	Pull-out On The Output Shaft Side	Pull-out On The Rear Of The Motor	Vertical Direction
BLM6300SHP-GFV **BLM6400SHP-GFV**	**GFS6G□FR**	2.2	4.8	A1799_F	A1799_B	A1799_V

•When connection cable is attached for pull-out on output shaft side

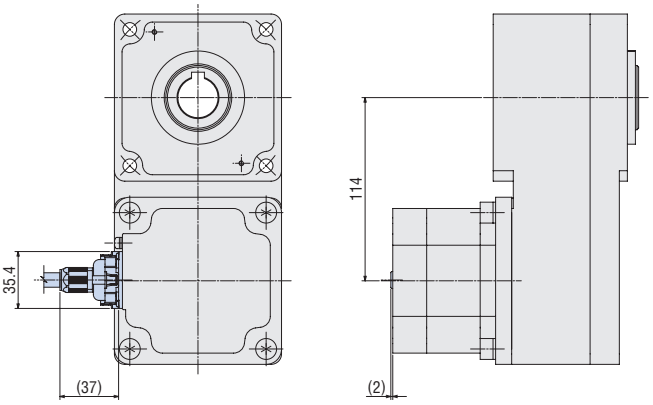




•When connection cable is attached for pull-out on rear of the motor



•For vertical pull-out

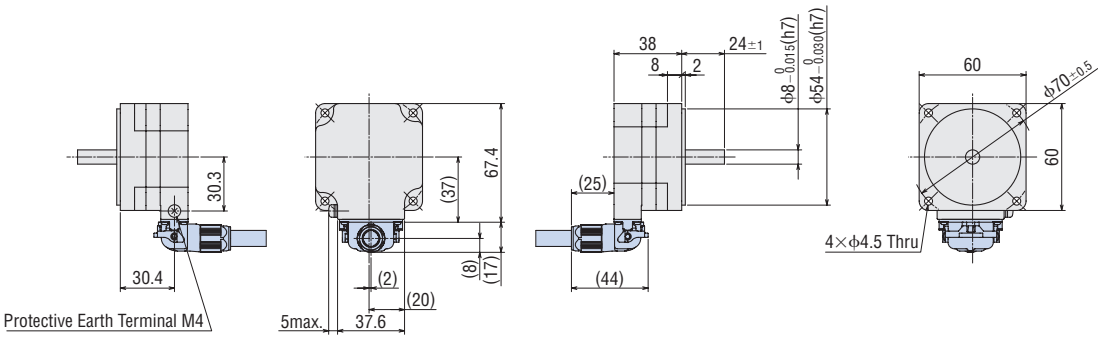


◇Round Shaft Type · 30 W

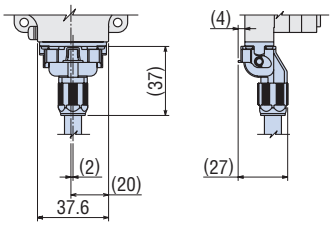
BLM230HP-AS

Mass: 0.35 kg

- When connection cable is attached for pull-out on rear of the motor



- For vertical pull-out

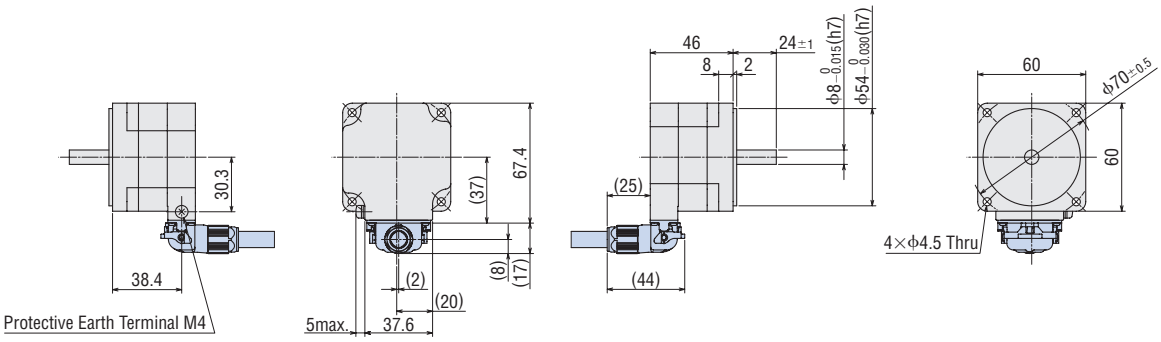


◇Round Shaft Type · 60 W

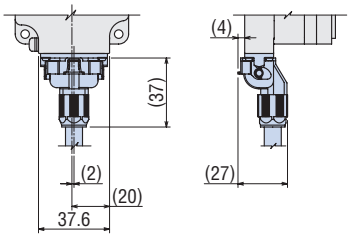
BLM260HP-AS

Mass: 0.52 kg

- When connection cable is attached for pull-out on rear of the motor



- For vertical pull-out

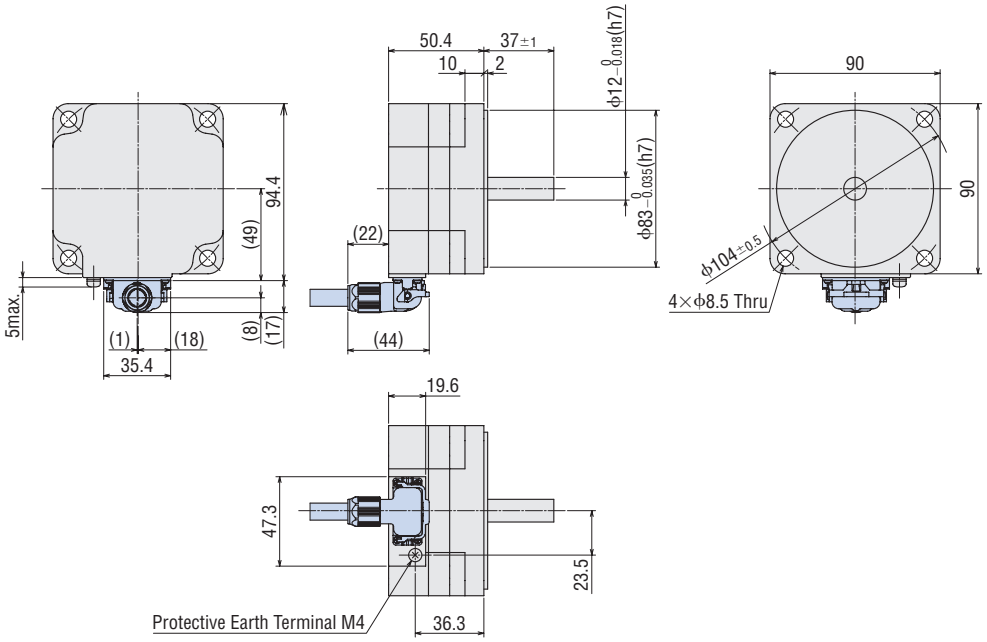


◇Round Shaft Type · 120 W

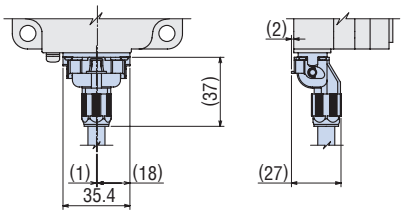
BLM5120HP-AS

Mass: 1.1 kg

- When connection cable is attached for pull-out on rear of the motor



- For vertical pull-out

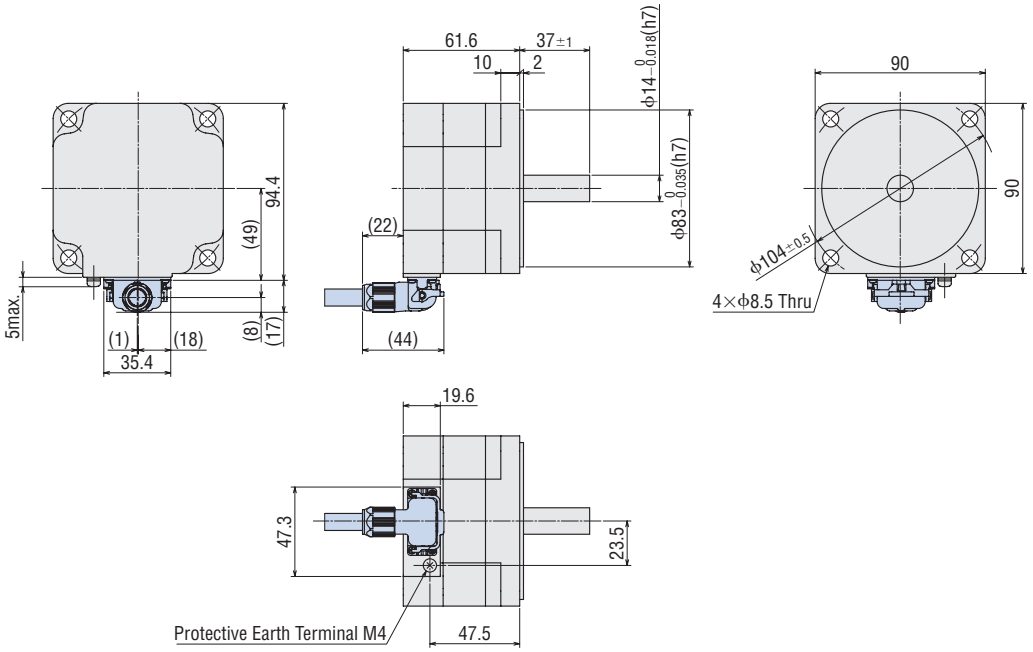


◇Round Shaft Type · 200 W

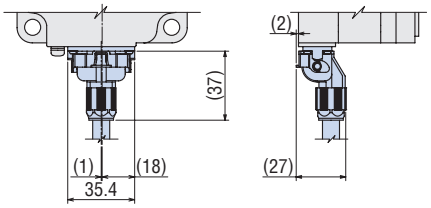
BLM5200HP-AS

Mass: 1.6 kg

- When connection cable is attached for pull-out on rear of the motor



- For vertical pull-out

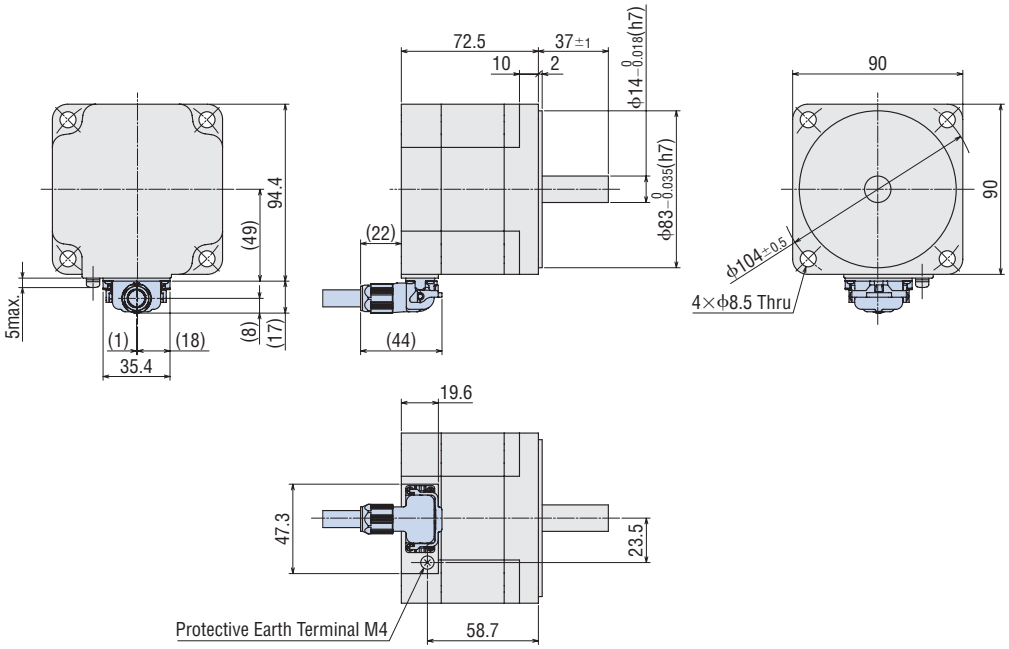


◇Round Shaft Type · 300 W, 400 W

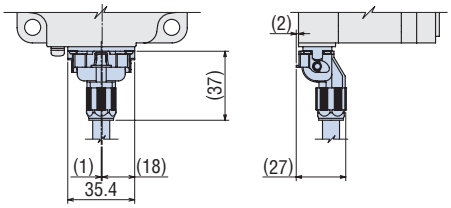
BLM5300HP-AS, **BLM5400HP-AS**

Mass: 2.1 kg

•When connection cable is attached for pull-out on rear of the motor



•For vertical pull-out



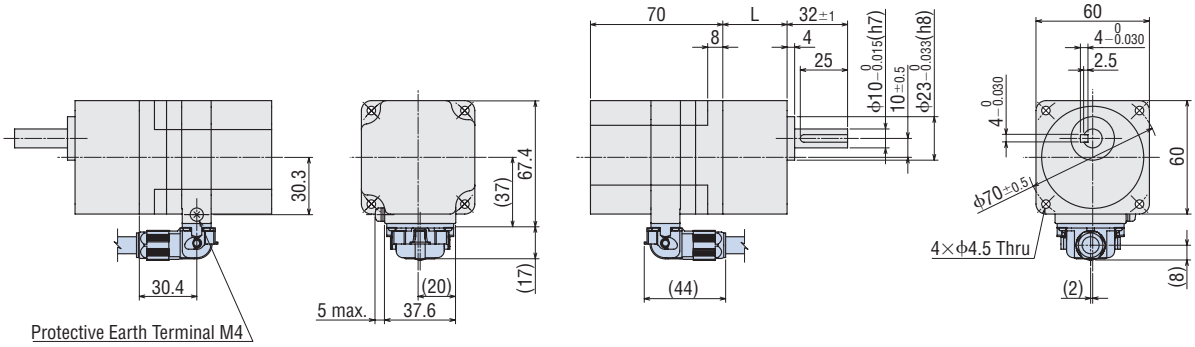
●Motor with electromagnetic brake

◇Parallel Shaft Gearhead **GFV** · 30 W

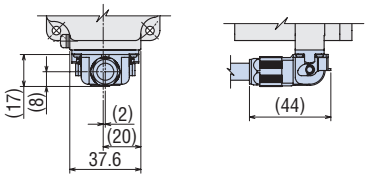
CAD

Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass [kg]		CAD		
				Motor	Gearhead	Pull-out On The Output Shaft Side	Pull-out On The Rear Of The Motor	Vertical Direction
BLM230HPM-GFV	**GFV2G□S**	**5 - 20**	34	0.65	0.28	A1840A_F	A1840A_B	A1840A_V
		30 - 100	38	0.65	0.33	A1840B_F	A1840B_B	A1840B_V

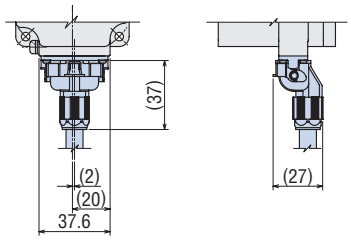
●When connection cable is attached for pull-out on output shaft side



●When connection cable is attached for pull-out on rear of the motor



●For vertical pull-out

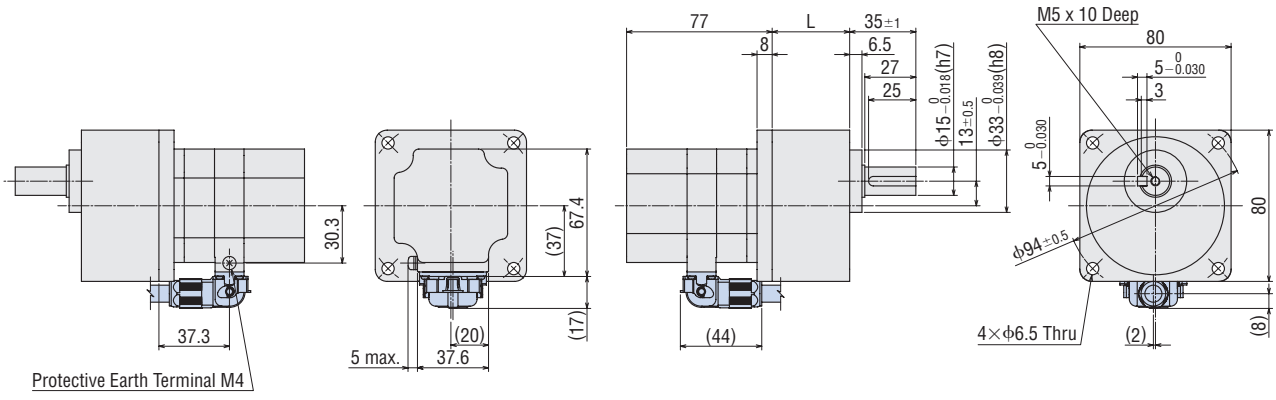


◇Parallel Shaft Gearhead **GFV** · 60 W

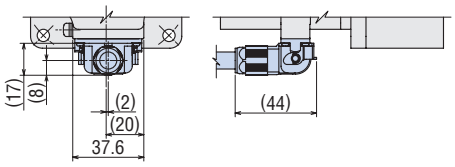
CAD

Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass [kg]		CAD		
				Motor	Gearhead	Pull-out On The Output Shaft Side	Pull-out On The Rear Of The Motor	Vertical Direction
BLM460SHPM-GFV	**GFV4G□S**	**5~20**	41	0.86	0.67	A1842A_F	A1842A_B	A1842A_V
		30~100	46		0.79	A1842B_F	A1842B_B	A1842B_V

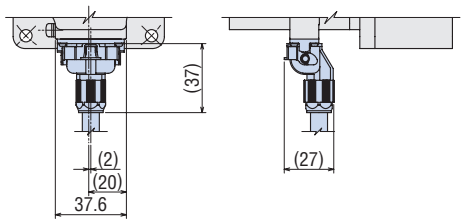
●When connection cable is attached for pull-out on output shaft side



●When connection cable is attached for pull-out on rear of the motor



●For vertical pull-out

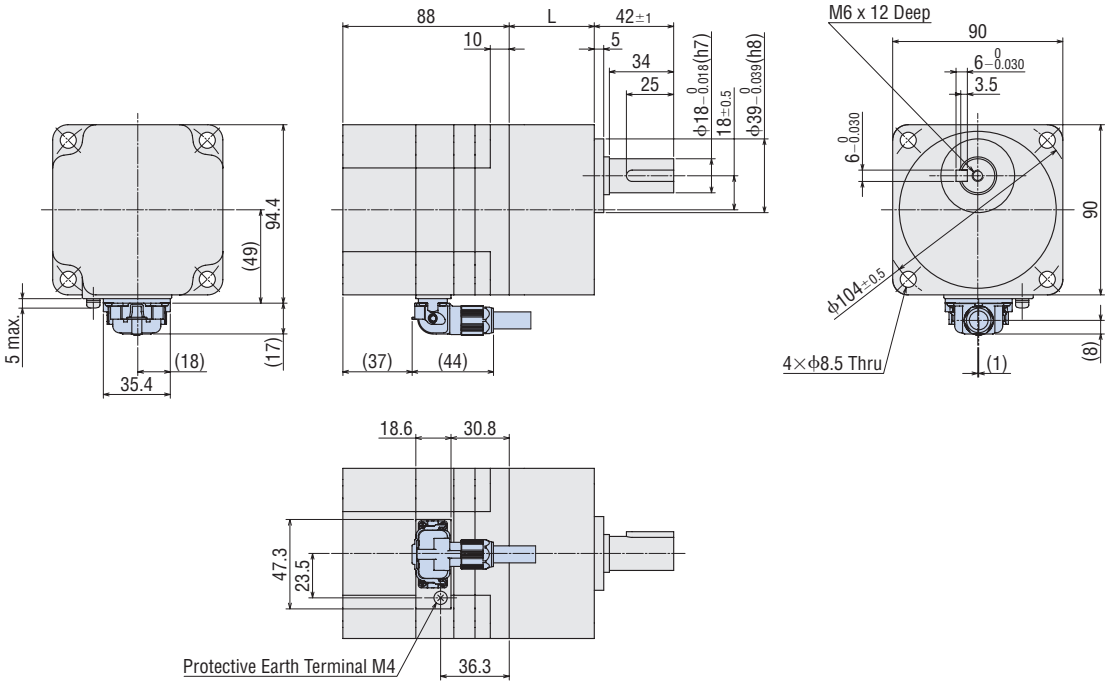


◇Parallel Shaft Gearhead **GFV** · 120 W

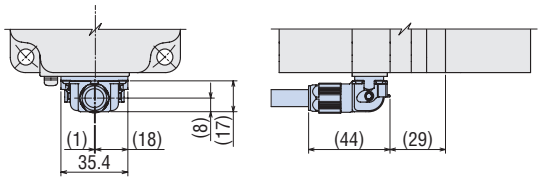
CAD

Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass [kg]		CAD		
				Motor	Gearhead	Pull-out On The Output Shaft Side	Pull-out On The Rear Of The Motor	Vertical Direction
BLM5120HPM-GFV	**GFV5G□S**	**5 - 20**	45	1.7	0.95	A1696A	A1697A	A1698A
		30 - 100	58		1.3	A1696B	A1697B	A1698B
		200	64		1.4	A1696C	A1697C	A1698C

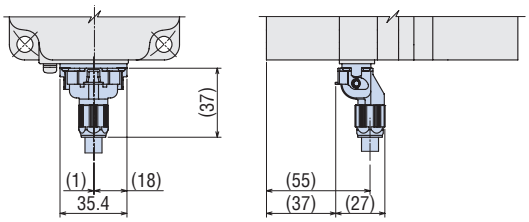
•When connection cable is attached for pull-out on output shaft side



•When connection cable is attached for pull-out on rear of the motor



•For vertical pull-out

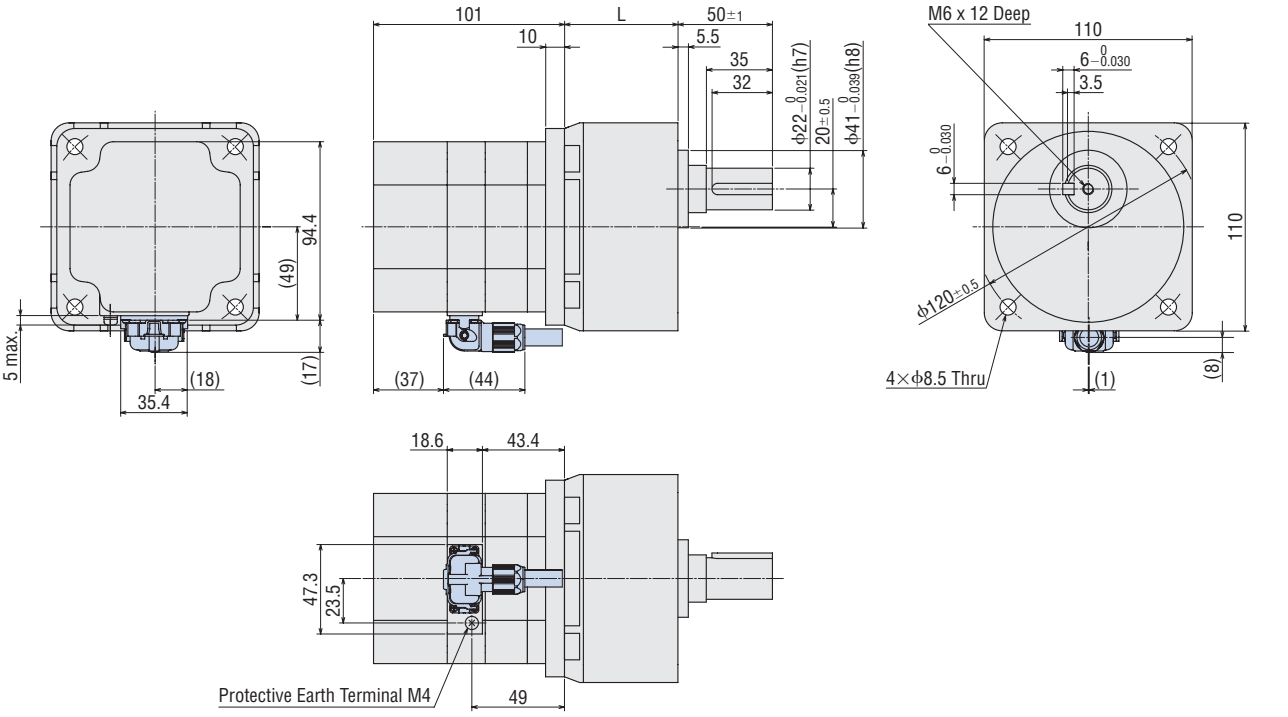


◇Parallel Shaft Gearhead **GFV** · 200 W

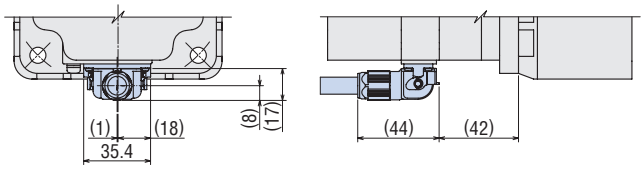
CAD

Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass [kg]		CAD		
				Motor	Gearhead	Pull-out On The Output Shaft Side	Pull-out On The Rear Of The Motor	Vertical Direction
BLM6200SHPM-GFV	**GFV6G□S**	**5 - 20**	60	2.2	1.9	A1699A	A1700A	A1701A
		30, **50**	72		2.4	A1699B	A1700B	A1701B
		100, **200**	86		3.0	A1699C	A1700C	A1701C

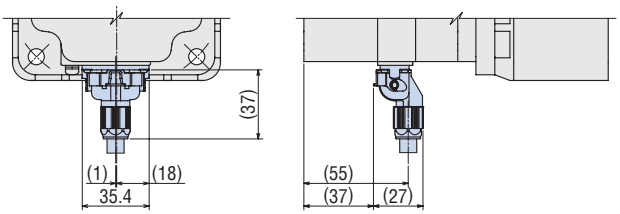
●When connection cable is attached for pull-out on output shaft side



●When connection cable is attached for pull-out on rear of the motor



●For vertical pull-out

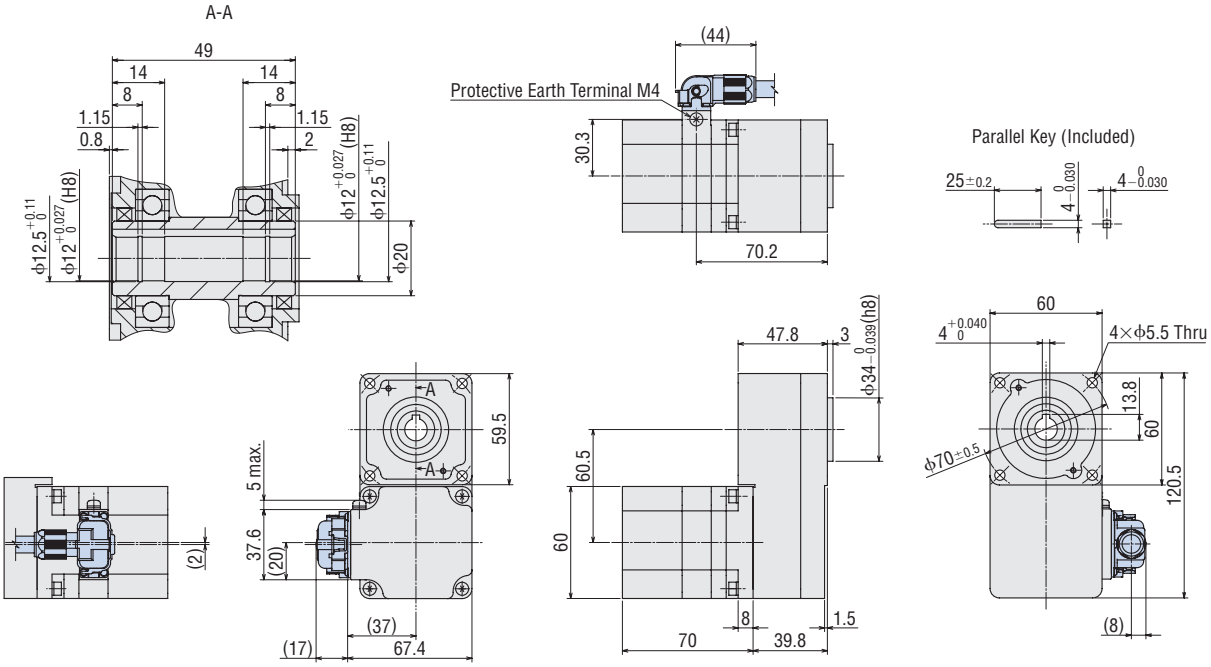


◇Hollow Shaft Flat **FR** Gearhead · 30 W

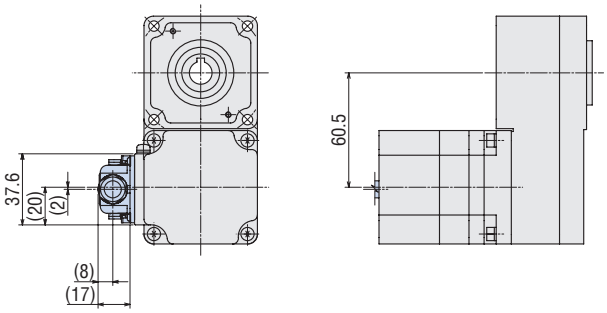
CAD

Motor Product Name	Gearhead Product Name	Mass [kg]		CAD		
		Motor	Gearhead	Pull-out On The Output Shaft Side	Pull-out On The Rear Of The Motor	Vertical Direction
BLM230HPM-GFV	**GFS2G□FR**	0.65	0.8	A1841_F	A1841_B	A1841_V

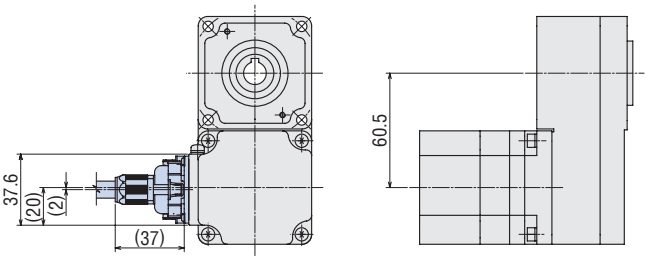
•When connection cable is attached for pull-out on output shaft side



•When connection cable is attached for pull-out on rear of the motor



•For vertical pull-out

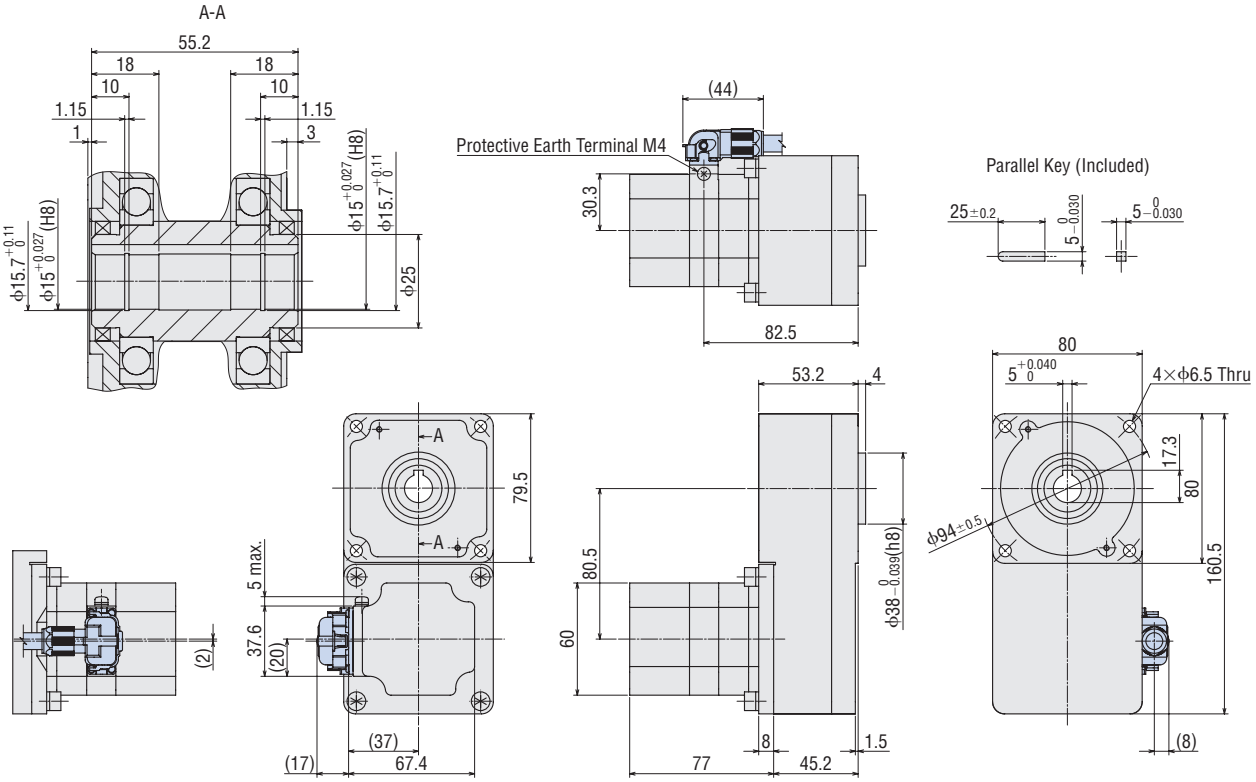


◇Hollow Shaft Flat **FR** Gearhead · 60 W

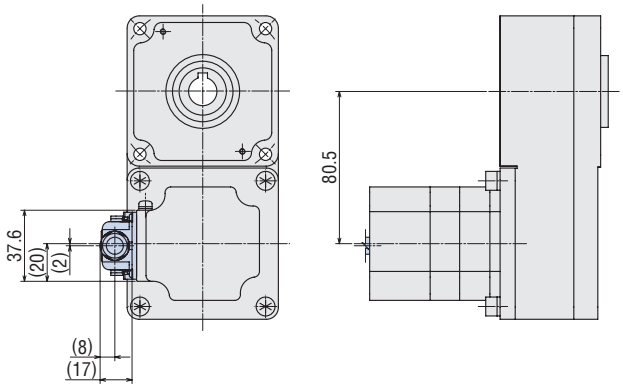
CAD

Motor Product Name	Gearhead Product Name	Mass [kg]		CAD		
		Motor	Gearhead	Pull-out On The Output Shaft Side	Pull-out On The Rear Of The Motor	Vertical Direction
BLM460SHPM-GFV	**GFS4G□FR**	0.86	1.6	A1843_F	A1843_B	A1843_V

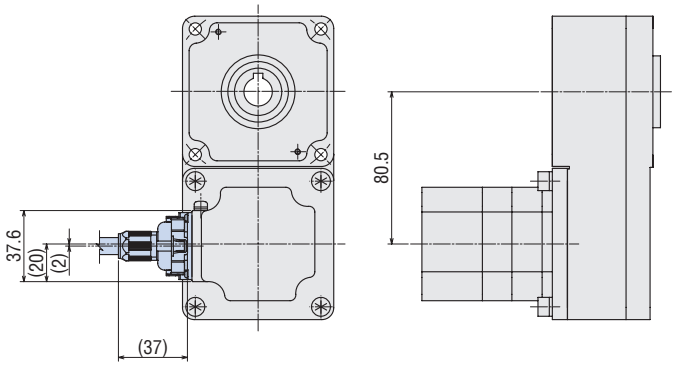
•When connection cable is attached for pull-out on output shaft side



•When connection cable is attached for pull-out on rear of the motor



•For vertical pull-out

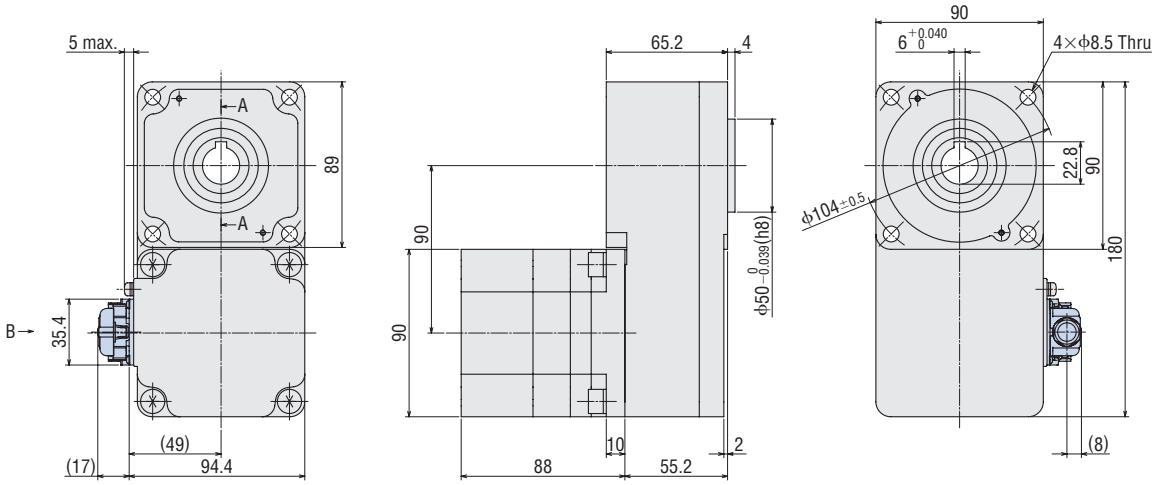


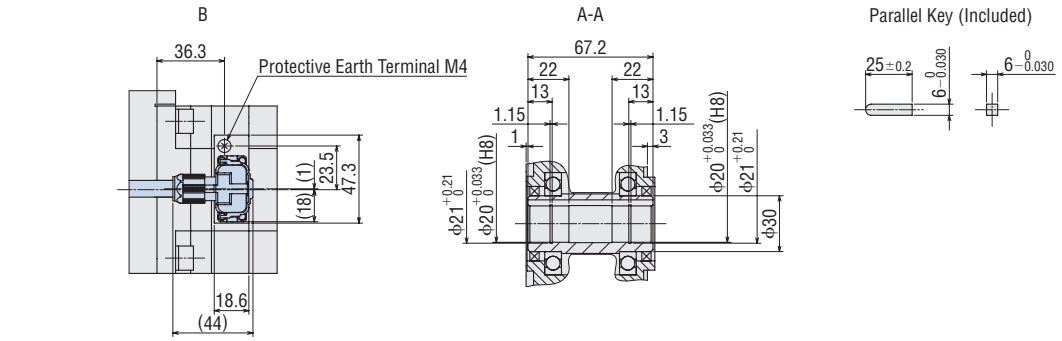
◇Hollow Shaft Flat **FR** Gearhead · 120 W

CAD

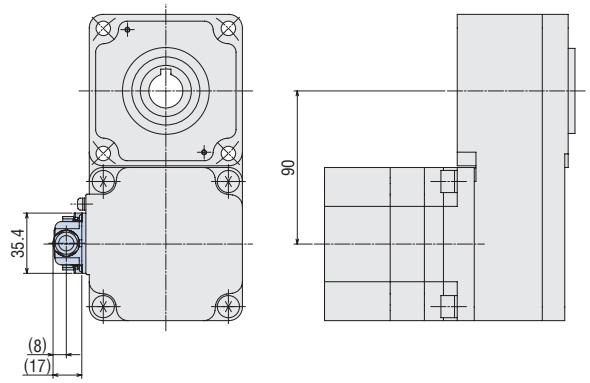
Motor Product Name	Gearhead Product Name	Mass [kg]		CAD		
		Motor	Gearhead	Pull-out On The Output Shaft Side	Pull-out On The Rear Of The Motor	Vertical Direction
BLM5120HPM-GFV	**GFS5G□FR**	1.7	2.2	A1800_F	A1800_B	A1800_V

•When connection cable is attached for pull-out on output shaft side

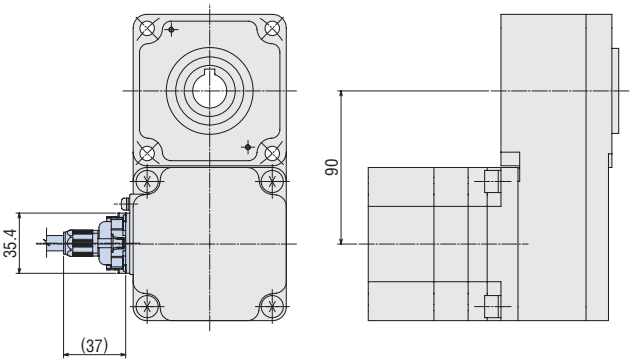




•When connection cable is attached for pull-out on rear of the motor



•For vertical pull-out

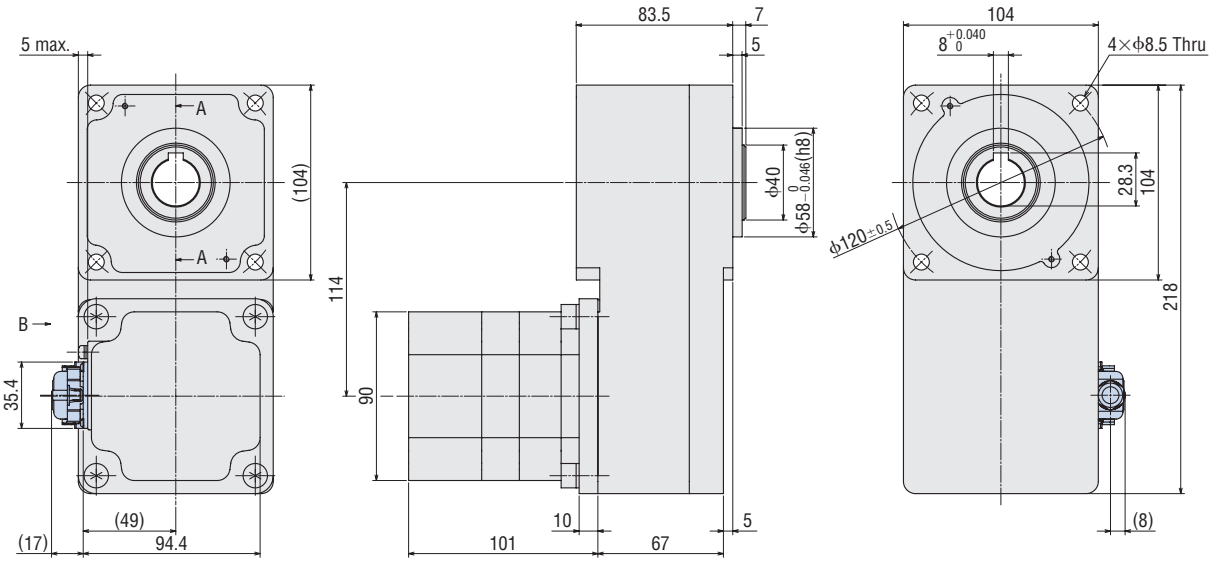


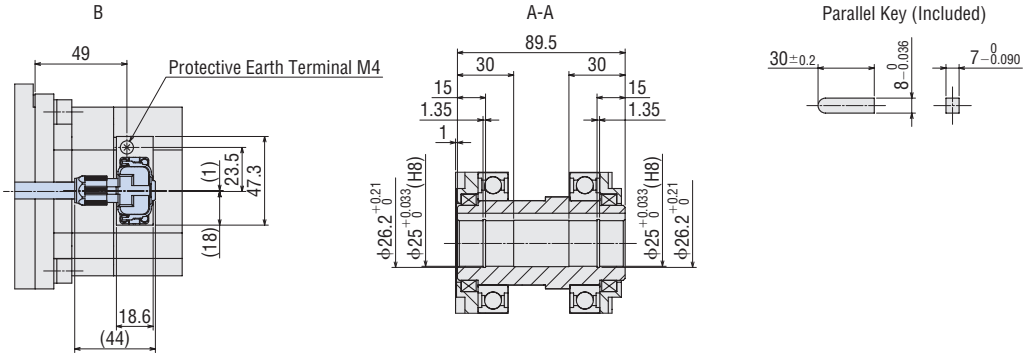
◇Hollow Shaft Flat **FR** Gearhead · 200 W

CAD

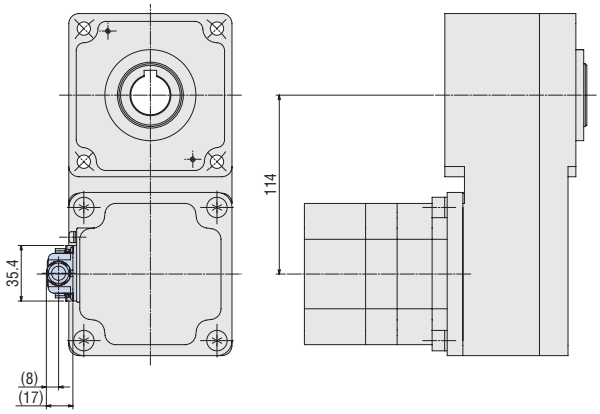
Motor Product Name	Gearhead Product Name	Mass [kg]		CAD		
		Motor	Gearhead	Pull-out On The Output Shaft Side	Pull-out On The Rear Of The Motor	Vertical Direction
BLM6200SHPM-GFV	**GFS6G□FR**	2.2	4.8	A1801_F	A1801_B	A1801_V

●When connection cable is attached for pull-out on output shaft side

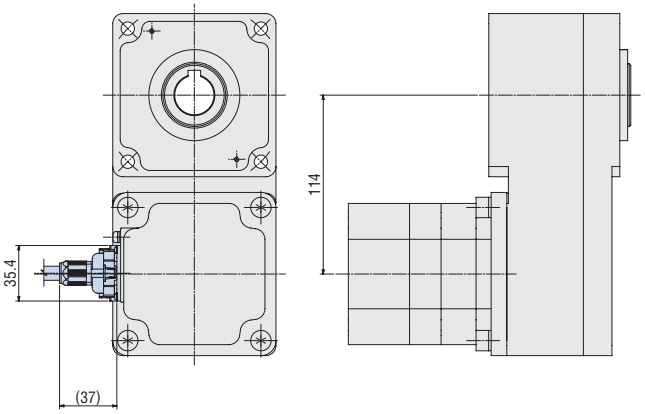




●When connection cable is attached for pull-out on rear of the motor



●For vertical pull-out

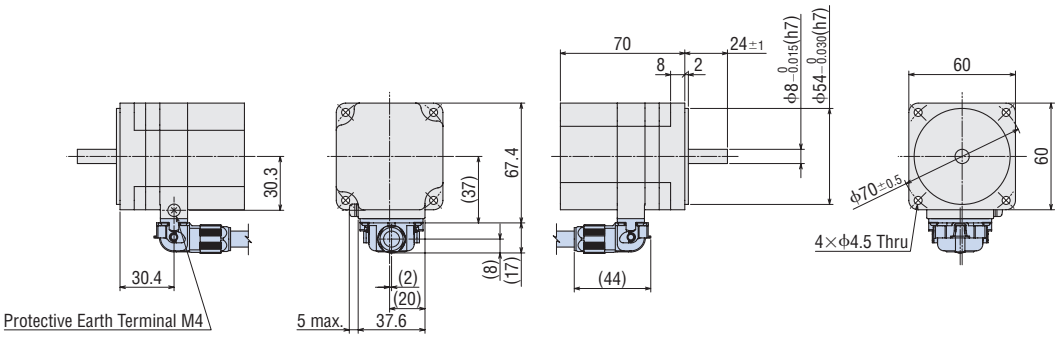


◇Round Shaft Type · 30 W

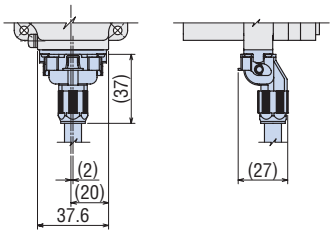
BLM230HPM-AS

Mass: 0.65 kg

•When connection cable is attached for pull-out on rear of the motor



•For vertical pull-out

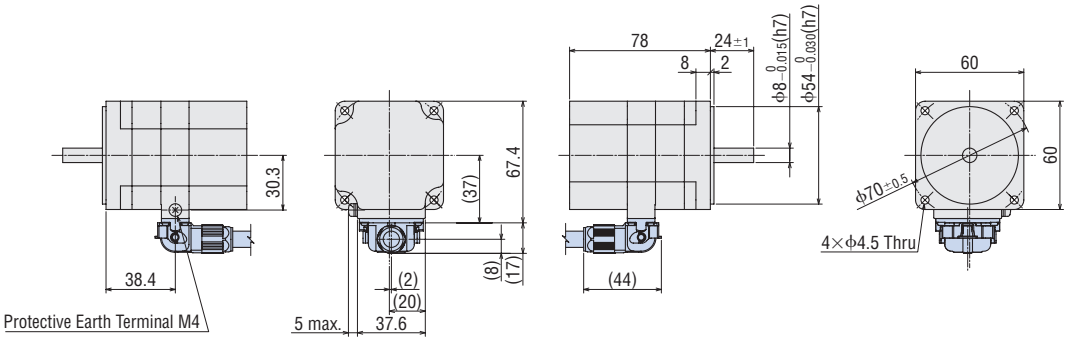


◇Round Shaft Type · 60 W

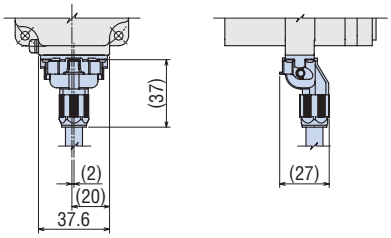
BLM260HPM-AS

Mass: 0.80 kg

•When connection cable is attached for pull-out on rear of the motor



•For vertical pull-out

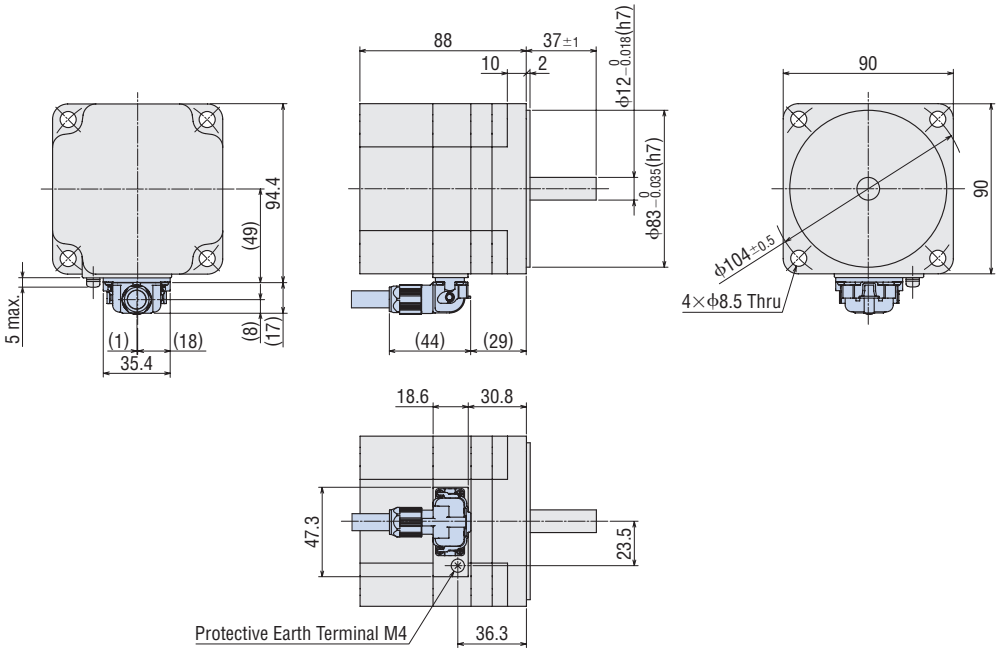


◇Round Shaft Type · 120 W

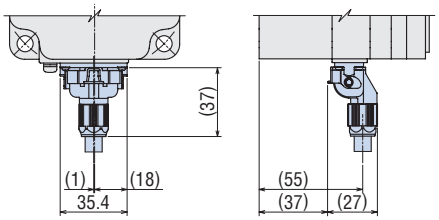
BLM5120HPM-AS

Mass: 1.7 kg

- When connection cable is attached for pull-out on rear of the motor



- For vertical pull-out

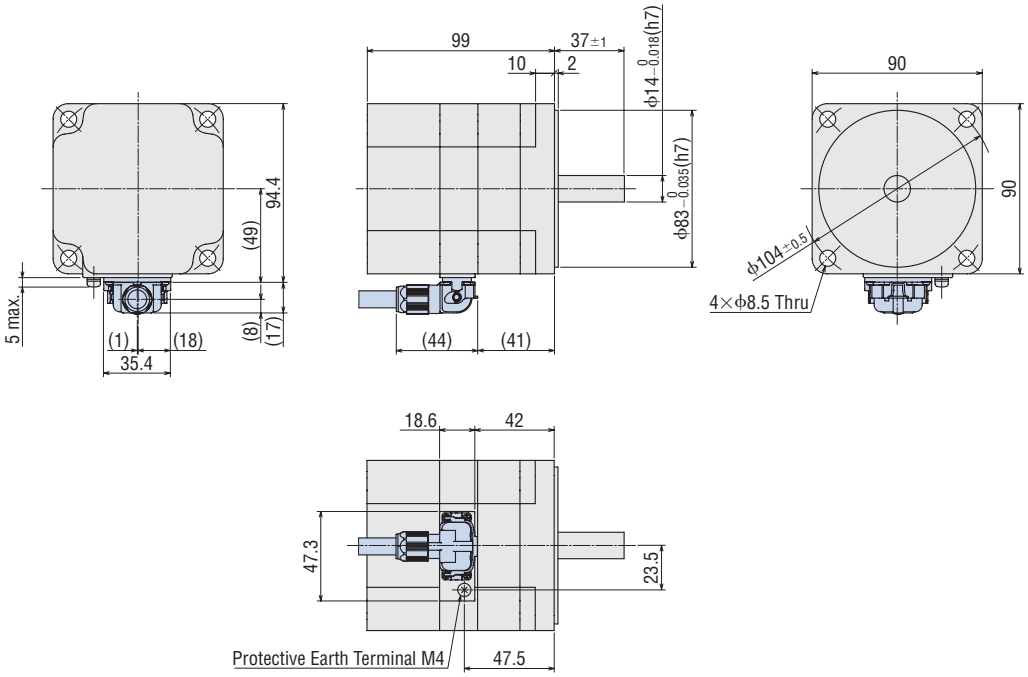


◇Round Shaft Type · 200 W

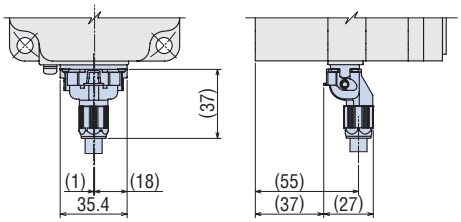
BLM5200HPM-AS

Mass: 2.1 kg

•When connection cable is attached for pull-out on rear of the motor



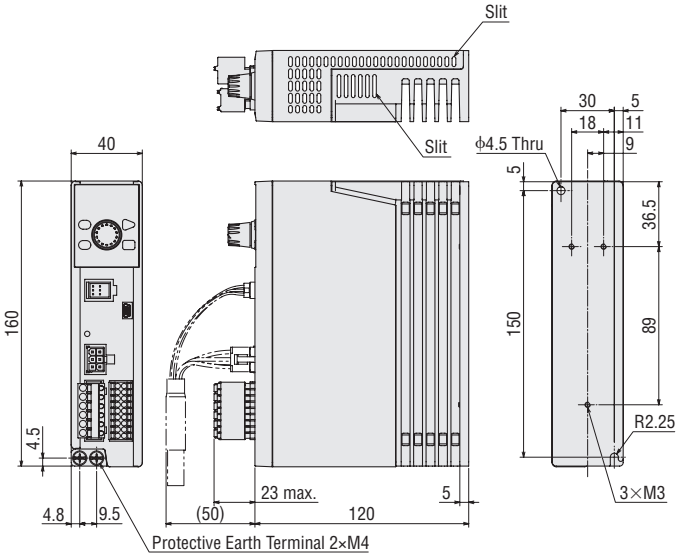
•For vertical pull-out



Driver

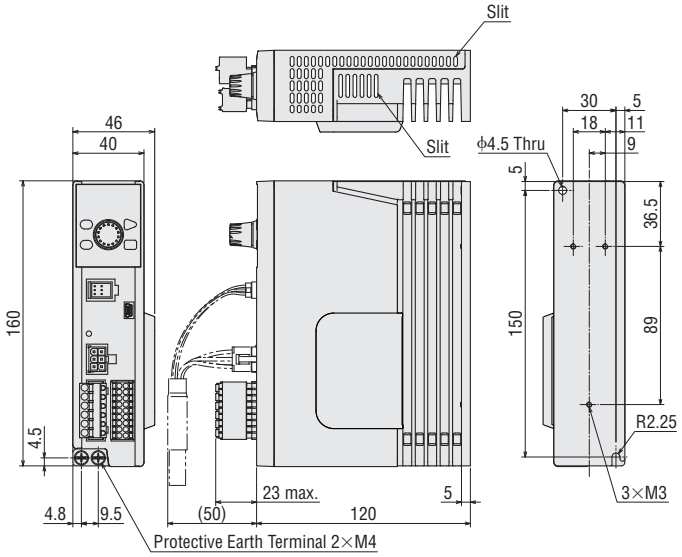
BLE2D30-A, **BLE2D30-C**, **BLE2D60-A**, **BLE2D60-C**, **BLE2D120-A**, **BLE2D120-C**, **BLE2D200-C**, **BLE2D300-C**, **BLE2D400-S**

Mass: 0.8 kg



BLE2D200-A, **BLE2D400-C**

Mass: 0.8 kg



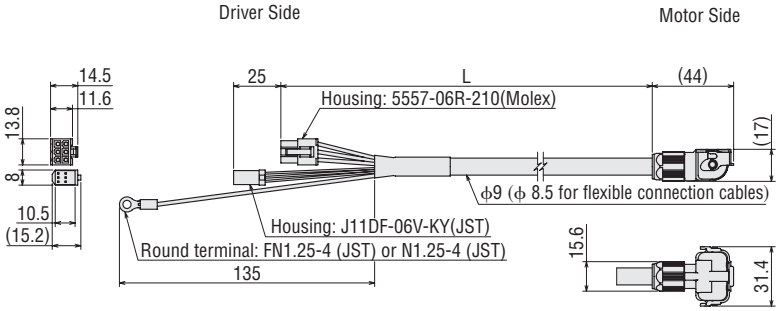
Connection Cable

Length L [m]	Product Name			Mass [kg]
	Pull-out on output shaft side	Pull-out on rear of the motor	Vertical Direction	
0.5	**CC005KHBLF**	**CC005KHBLB**	**CC005KHBLV**	0.08
1	**CC010KHBLF**	**CC010KHBLB**	**CC010KHBLV**	0.14
1.5	**CC015KHBLF**	**CC015KHBLB**	**CC015KHBLV**	0.20
2	**CC020KHBLF**	**CC020KHBLB**	**CC020KHBLV**	0.25
2.5	**CC025KHBLF**	**CC025KHBLB**	**CC025KHBLV**	0.32
3	**CC030KHBLF**	**CC030KHBLB**	**CC030KHBLV**	0.38
4	**CC040KHBLF**	**CC040KHBLB**	**CC040KHBLV**	0.49
5	**CC050KHBLF**	**CC050KHBLB**	**CC050KHBLV**	0.62
7	**CC070KHBLF**	**CC070KHBLB**	**CC070KHBLV**	0.86
10	**CC100KHBLF**	**CC100KHBLB**	**CC100KHBLV**	1.2
15	**CC150KHBLF**	**CC150KHBLB**	**CC150KHBLV**	1.8
20	**CC200KHBLF**	**CC200KHBLB**	**CC200KHBLV**	2.4

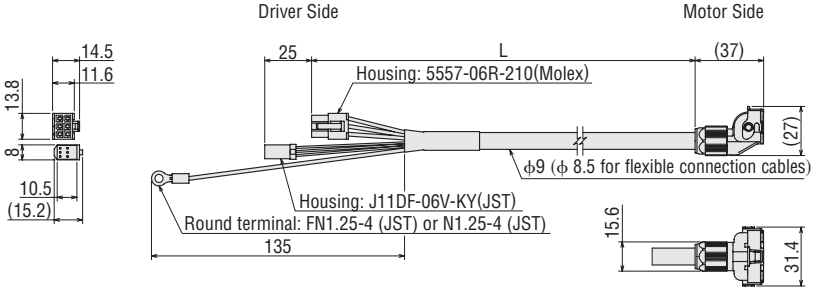
Flexible Connection Cable

Length L [m]	Product Name			Mass [kg]
	Pull-out on output shaft side	Pull-out on rear of the motor	Vertical Direction	
1	**CC010KHBLRF**	**CC010KHBLRB**	**CC010KHBLRV**	0.14
1.5	**CC015KHBLRF**	**CC015KHBLRB**	**CC015KHBLRV**	0.20
2	**CC020KHBLRF**	**CC020KHBLRB**	**CC020KHBLRV**	0.26
2.5	**CC025KHBLRF**	**CC025KHBLRB**	**CC025KHBLRV**	0.32
3	**CC030KHBLRF**	**CC030KHBLRB**	**CC030KHBLRV**	0.38
4	**CC040KHBLRF**	**CC040KHBLRB**	**CC040KHBLRV**	0.50
5	**CC050KHBLRF**	**CC050KHBLRB**	**CC050KHBLRV**	0.62
7	**CC070KHBLRF**	**CC070KHBLRB**	**CC070KHBLRV**	0.87
10	**CC100KHBLRF**	**CC100KHBLRB**	**CC100KHBLRV**	1.2
15	**CC150KHBLRF**	**CC150KHBLRB**	**CC150KHBLRV**	1.8
20	**CC200KHBLRF**	**CC200KHBLRB**	**CC200KHBLRV**	2.4

◇Pull-out on output shaft side, Pull-out on rear of the motor



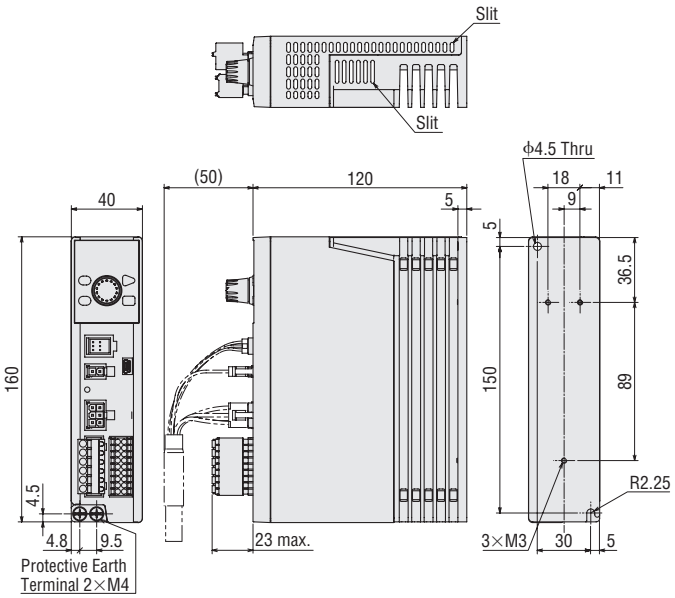
◇Vertical pull-out



Driver for electromagnetic brake

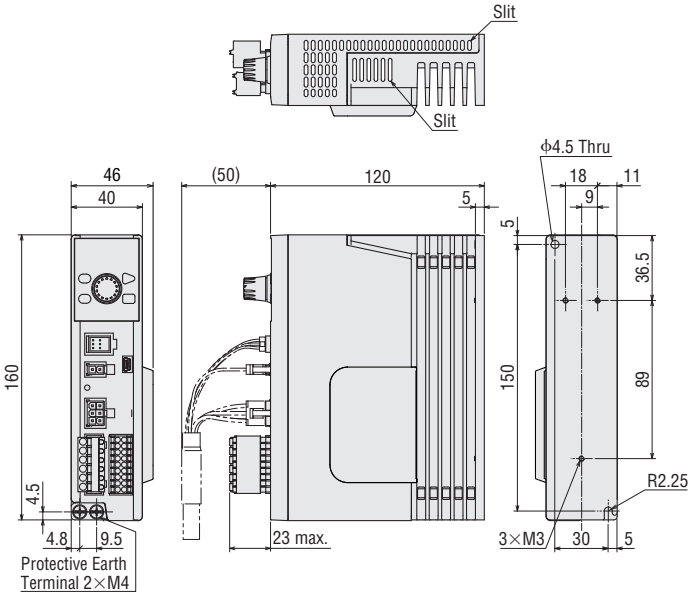
BLE2D30-AM, **BLE2D30-CM**, **BLE2D60-AM**, **BLE2D60-CM**, **BLE2D120-AM**, **BLE2D120-CM**, **BLE2D200-CM**

Mass: 0.8 kg



BLE2D200-AM

Mass: 0.8 kg



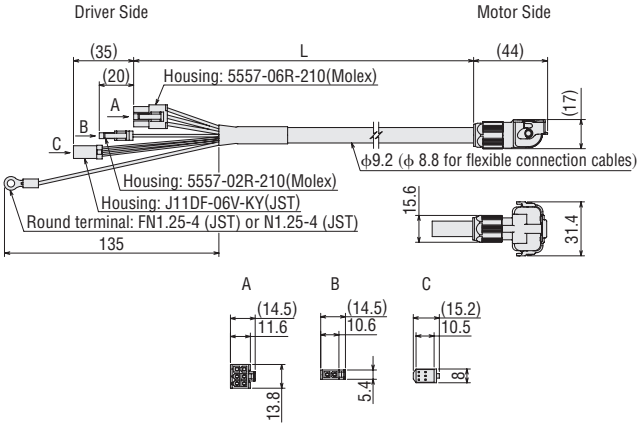
Connection Cable

Length L [m]	Product Name			Mass [kg]
	Pull-out on output shaft side	Pull-out on rear of the motor	Vertical direction	
0.5	**CC005KHBLMF**	**CC005KHBLMB**	**CC005KHBLMV**	0.08
1	**CC010KHBLMF**	**CC010KHBLMB**	**CC010KHBLMV**	0.14
1.5	**CC015KHBLMF**	**CC015KHBLMB**	**CC015KHBLMV**	0.20
2	**CC020KHBLMF**	**CC020KHBLMB**	**CC020KHBLMV**	0.25
2.5	**CC025KHBLMF**	**CC025KHBLMB**	**CC025KHBLMV**	0.32
3	**CC030KHBLMF**	**CC030KHBLMB**	**CC030KHBLMV**	0.38
4	**CC040KHBLMF**	**CC040KHBLMB**	**CC040KHBLMV**	0.49
5	**CC050KHBLMF**	**CC050KHBLMB**	**CC050KHBLMV**	0.62
7	**CC070KHBLMF**	**CC070KHBLMB**	**CC070KHBLMV**	0.86
10	**CC100KHBLMF**	**CC100KHBLMB**	**CC100KHBLMV**	1.2
15	**CC150KHBLMF**	**CC150KHBLMB**	**CC150KHBLMV**	1.8
20	**CC200KHBLMF**	**CC200KHBLMB**	**CC200KHBLMV**	2.4

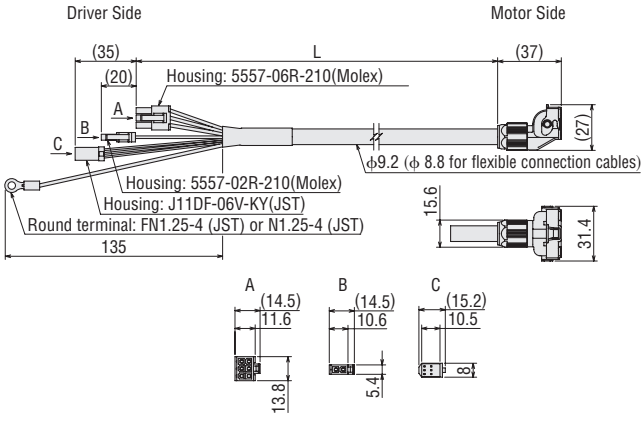
Flexible Connection Cable

Length L [m]	Product Name			Mass [kg]
	Pull-out on output shaft side	Pull-out on rear of the motor	Vertical direction	
1	**CC010KHBLMRF**	**CC010KHBLMRB**	**CC010KHBLMRV**	0.14
1.5	**CC015KHBLMRF**	**CC015KHBLMRB**	**CC015KHBLMRV**	0.20
2	**CC020KHBLMRF**	**CC020KHBLMRB**	**CC020KHBLMRV**	0.26
2.5	**CC025KHBLMRF**	**CC025KHBLMRB**	**CC025KHBLMRV**	0.32
3	**CC030KHBLMRF**	**CC030KHBLMRB**	**CC030KHBLMRV**	0.38
4	**CC040KHBLMRF**	**CC040KHBLMRB**	**CC040KHBLMRV**	0.50
5	**CC050KHBLMRF**	**CC050KHBLMRB**	**CC050KHBLMRV**	0.62
7	**CC070KHBLMRF**	**CC070KHBLMRB**	**CC070KHBLMRV**	0.87
10	**CC100KHBLMRF**	**CC100KHBLMRB**	**CC100KHBLMRV**	1.2
15	**CC150KHBLMRF**	**CC150KHBLMRB**	**CC150KHBLMRV**	1.8
20	**CC200KHBLMRF**	**CC200KHBLMRB**	**CC200KHBLMRV**	2.4

◇Pull-out on output shaft side, Pull-out on rear of the motor



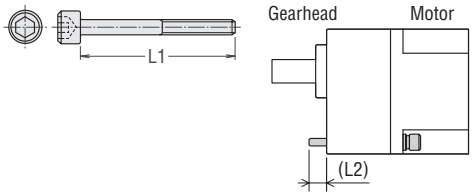
◇Vertical pull-out



Installation Screw Dimensions

L2 is the dimension when a flat or spring washer is fitted on the head side of the screw.

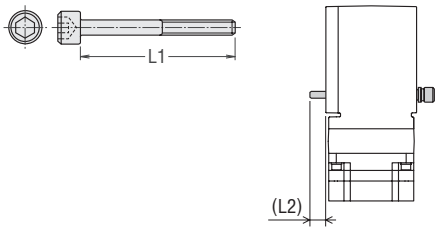
Parallel Shaft Gearhead



Gearhead Product Name	Gear Ratio	Installation Screw		L2 [mm]
		Screw Size	L1 [mm]	
GFV2G□ **GFV2G□S (F)**	**5 - 20**	M4	50	6
	30 - 100		55	7
	200		60	7
GFV4G□ **GFV4G□S (F)**	**5 - 20**	M6	60	8
	30 - 100		65	8
	200		70	8
GFV5G□ **GFV5G□S (F)**	**5 - 20**	M8	70	11.5
	30 - 100		85	13.5
	200		90	12.5
GFV6G□ **GFV6G□S**	**5 - 20**	M8	85	11
	30, 50		100	14
	100, 200		110	10
GFV7G□SW	**5 - 20**	M8	95	13
	30, 50		110	16
	100		120	12

● Mounting screws: 4 each of flat washers and spring washers included.
Mounting screws are made of stainless steel.

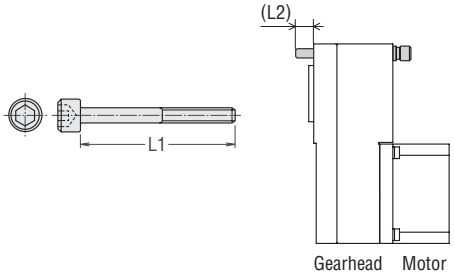
Right-Angle Hollow Shaft Hypoid Gearhead



Gearhead Product Name	Gear Ratio	Installation Screw		L2 [mm]
		Screw Size	L1 [mm]	
4H□S	**10 - 200**	M6	95	11
5H□S	**10 - 200**	M8	110	10
5XH□S	**5 - 50**	M8	120	16
5YH□S	**100, 200**	M10	130	19.5

● Mounting screws: 4 each of flat washers and spring washers included.
Mounting screws are made of stainless steel.

Hollow Shaft Flat Gearhead



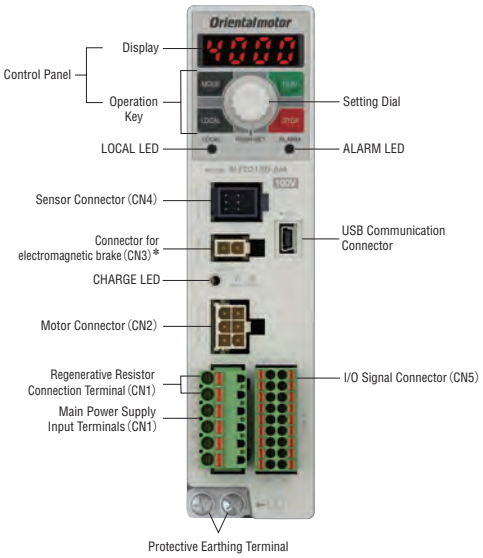
Gearhead Product Name	Gear Ratio	Installation Screw		L2 [mm]
		Screw Size	L1 [mm]	
GFS2G□FR	**5 - 200**	M5	65	15
GFS4G□FR	**5 - 200**	M6	70	14
GFS5G□FR	**5 - 200**	M8	90	21
GFS6G□FR	**5 - 100**	M8	100	13

● Mounting screws: 4 each of flat washers, spring washers and hexagon nuts included.
GFS6G□FR is not supplied with hexagonal nuts.

● The □ in the gearhead product name indicates the gear ratio.

Connection and Operation

Names and Functions of Driver Parts



Name	Indication	Description
Control Panel	-	Indicator: Displays monitor contents, setting screen, alarm, etc.
	MODE LOCAL RUN STOP	Operation Key: Switches operation modes and changes parameters Operates and stops the motor using RUN key and STOP key during local control operation
	PUSH-SET	Sets the speed and parameters
LOCAL LED	LOCAL	Illuminates during local control operation
ALARM LED	ALARM	Blinks when an alarm occurs
CHARGE LED	CHARGE	Illuminates when the main power supply is turned on Turns off after the main power supply is turned off and internal residual voltage is reduced to a stable level
Main Power Supply Input Terminals (CN1)	-	Connects the main power supply
	L, N, NC	Single-Phase 100-120 VAC: Connects 100-120 VAC to L and N. NC is not used.
	L1, L2, NC L1, L2, L3	Single-Phase 200-240 VAC: Connects 200-240 VAC to L1 and L2. NC is not used.
		Three-Phase 200-240 VAC: Connects three-phase 200-240 VAC to L1, L2, L3
	L1, L2, L3	Three-Phase 200-240 VAC: Connects three-phase 200-240 VAC to L1, L2, L3
Regenerative Resistor Connection Terminal (CN1)	RG1, RG2	Connect regenerative resistor (sold separately)
Motor Connector (CN2)	MOTOR	Connects a connection cable's power connector (white)
Electromagnetic Brake Connector (CN3)*	MB	Connects a connection cable's electromagnetic brake connector (white)
Sensor Connector (CN4)	HALL-S	Connects a connection cable's sensor connector (black)
USB Communication Connector		Connects a PC that has data setting software **MEXE02** installed
I/O Signal Connector (CN5)	I/O	Connects input signals
		Connects accessories such as external speed potentiometer (sold separately) and external DC power supply
		Connects output signals
Protective Earth Terminal	⏚	Connects the protective earth terminal of a connection cable and a grounding conductor

*Driver for motors with electromagnetic brake only.

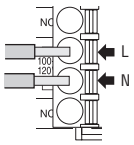
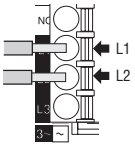
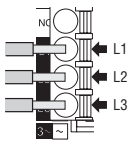
◇Operation Key

BLE2 Series has 4 operating modes.

Operating Mode	Description	Setting Items
Monitoring Mode	This mode is displayed when the power is turned on.	Speed, load factor, operating data number, alarm, general information, I/O monitor
Data Mode	It sets a max. of 16 speeds of operating data.	Speed, torque limiting value, acceleration time, deceleration time, reset
Parameter Mode	It sets various parameters.	Basic setting parameter, speed and torque limiting adjustment parameter, alarm and general information setting parameter, operation setting parameter, I/O operation parameter, I/O function selection parameter, I/F function parameter, reset, configuration
Test Mode	It is used to check the connection status of the I/O signals.	

◇Main Power Supply Input Terminals (CN1)

Connects the main power supply. Connect a power supply that matches the power supply voltage to be used.

• Single-Phase 100-120 VAC	• Single-Phase 200-240 VAC	• Three-Phase 200-240 VAC
		

•Applicable Lead Wire Size

AWG18~14 (0.75~2.0 mm^2)

◇USB Cable Connection

Please use a USB cable which meets the following specifications.

Specifications	USB2.0 (Full Speed)
Cable	Length: 3 m max.
	Configuration: A - mini-B

Operation Using the Control Panel

◇Selection of the Operation Control

Pressing the "LOCAL key" will illuminate the LOCAL LED and the control panel can be used to operate.

◇Selection of the Rotation Direction

The rotation direction of a motor will change every time the "MODE key" is pressed.

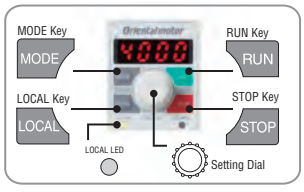
◇Starting and Stopping a Motor

Motor rotates when "RUN" is pressed.
Motor stops when "STOP" is pressed.

◇Speed Setting Method

The display will flash when "Setting Dial" is pressed, and the speed increases when it is turned clockwise. Turning it counterclockwise will decelerate. Pressing the "Setting Dial" will set the speed.

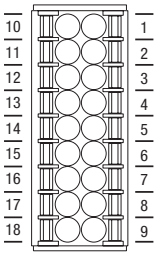
•Control Panel



●Operation by External Signals

◇I/O Signal Connector (CN5)

Pin No.	Signal Type	Signal Name	Function*1	Description	
1	Input	IN-COM0	IN-COM0	Input signal common (for external power supply)	
2		IN0	FWD	The motor rotates when FWD input or REV input is turned ON. Turning it OFF decelerates the motor to a stop.	2-wire input method
3		IN1	REV		
4		IN2	STOP-MODE	Selects the method for stopping the motor.	
5		IN3	M0	Selects the operation data number through the selection of M0, M1 input ON/OFF.	
6		IN4	M1		
7		IN5	ALARM-RESET	Alarms are reset.	
8		IN6	MB-FREE*2	Selects the operation (hold/release) of the electromagnetic brake when the motor is stopped. Turning it ON allows the electromagnetic brake to be released.	
9		IN-COM1	IN-COM1	Input signal common (for internal power supply: 0 V)	
10		TH	TH	If a regenerative resistor is used, connect the thermostat output of the regenerative resistor (normally closed). If the regenerative resistor overheats and the thermostat output is switched off, the 'regenerative resistor overheat' alarm occurs.	
11					
12		VH	External Analog Setting Input	It is connected when speed and torque limiting value are set externally using an external speed potentiometer or external DC voltage.	
13		VM			
14		VL			
15	Output	OUT0+	SPEED-OUT	30 pulses are output with each rotation of the motor output shaft.	
16		OUT0−			
17		OUT1+	ALARM-OUT	Output when an alarm activates. (Normally closed)	
18		OUT1−			



•Applicable / Lead Size

AWG24 - 18
(0.2 - 0.75 mm²)

*1 [ ] The text inside the BLUE FIELD represents the factory default function assignment. Pin No. 2 - 8, 15 - 18 can change the assigned functions. Assignment points are 7 points for the 12 types of input signal and 2 points for the 7 types of output signal.

*2 Only valid for drivers for motors with electromagnetic brake.

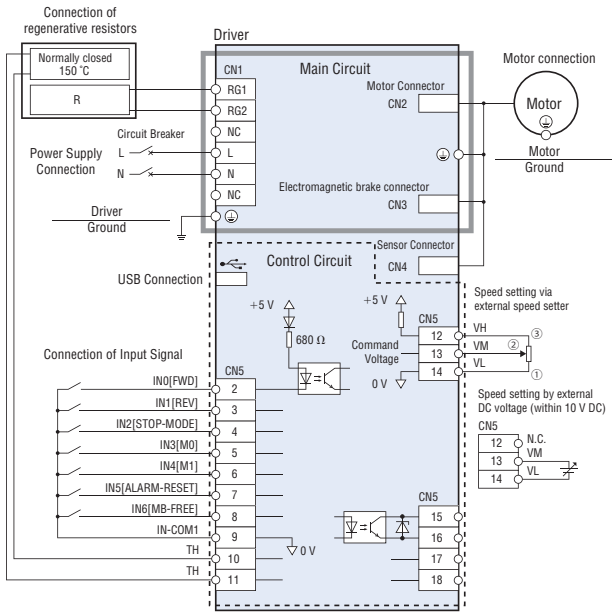
◇Reassignable Signals

Signal Type	Function	Description	
Input	START/STOP	The motor rotates when the START/STOP input and RUN/BRAKE input are ON. The motor decelerates to a stop when START/STOP input is turned OFF. The motor comes to an instantaneous stop when RUN/BRAKE input is turned OFF.	3-wire input R method
	RUN/BRAKE		
	CW/CCW	This signal switches the motor's rotation direction.	
	M2	This signal selects the operating data number.	
	M3		
	H-FREE	The easy hold is cancelled when the H-FREE input is ON.	
	TL	This signal enables and disables torque limiting from the outside.	
	INFO-CLR	Signal to cancel information that is being generated.	
	HMI	This signal limits the operation that uses a control panel or data setting software MEXE02.	
	EXT-ERROR	This signal forcefully stops the motor from the outside.	
Output	MOVE	This signal is output when the motor is rotating with the operation input turned ON.	
	INFO	This signal is output when general information is generated.	
	TLC	This signal is output when the motor's output torque has reached the torque limiting value.	
	VA	This signal is output when the motor's detection speed has reached the setting speed ±VA detection width.	
	DIR	This signal outputs the motor's rotation direction.	

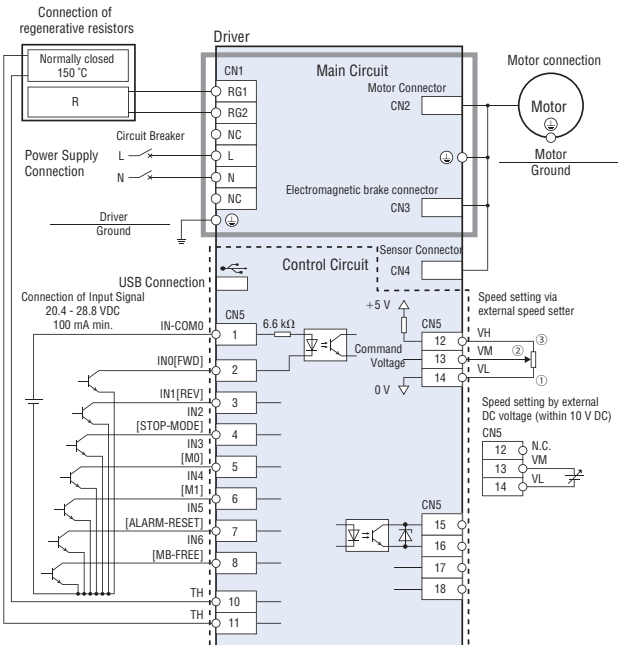
●Connection Diagram

This is a connection example for single-phase 200-240 VAC when setting the speed from the outside.
The I/O signal inside [ ] is the factory setting.

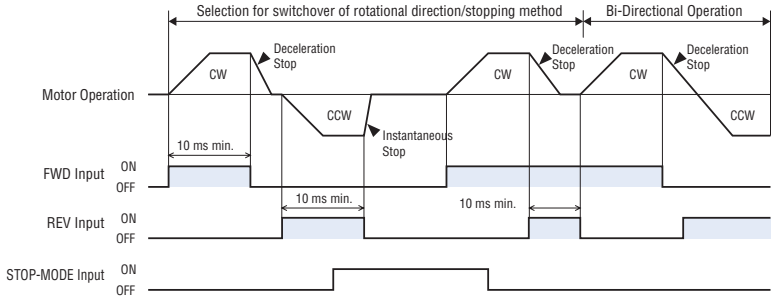
◇Using Built-in Power Supply



◇Using External Power Supply



●Timing Chart (2-wire input method)



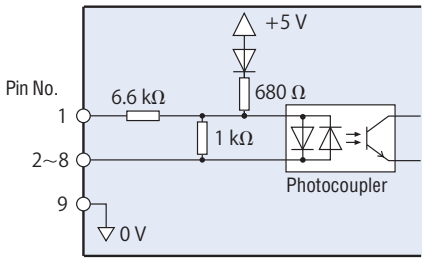
●FFWD Input, REV Input
When FWD input is ON, it rotates in CW direction (clockwise). Turning it OFF decelerates the motor to a stop. When REV input is ON, it rotates in CCW direction (counterclockwise). Turning it OFF decelerates the motor to a stop.

●STOPSTOP-MODE Input It selects the method for stopping the motor when FWD input and REV input are turned OFF. When the STOP-MODE input is OFF, the motor decelerates to a stop according to the deceleration stop of the operating data number. When STOP-MODE is ON, it stops at the shortest time (instantaneous stop).

●I/O Signal Circuits

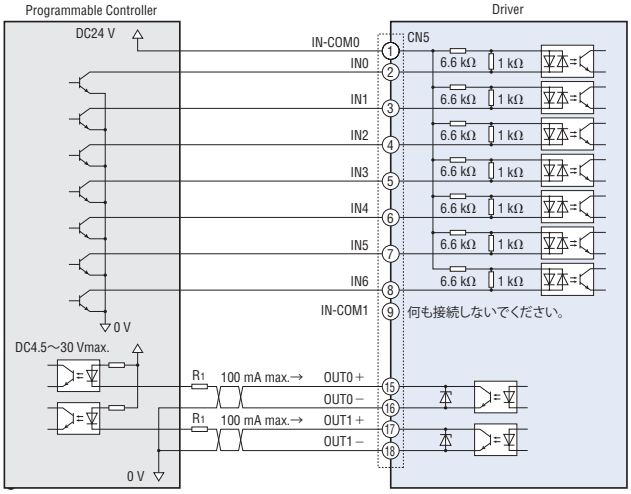
Select the sink logic or source logic wiring according to the external control device that will be used.

◇Input Signals

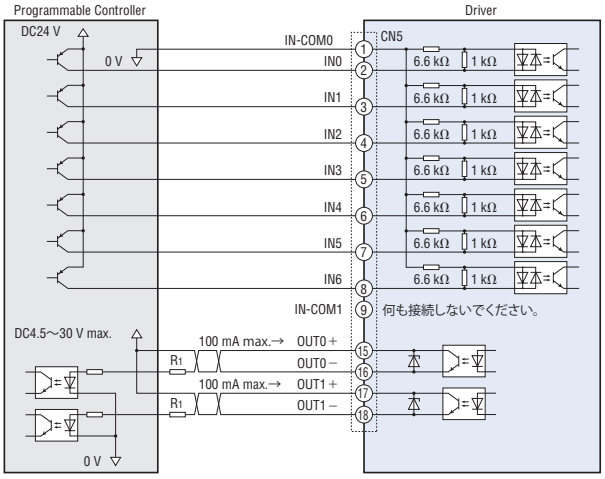


◇Programmable Controller Connection Examples

•Sink Logic

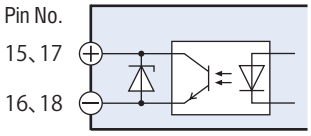


•Source Logic



✻Recommended resistance value when connecting limiting resistor R1 24 V DC: 680 Ω ~ 2.7 kΩ (2 W); 5 V DC: 150 Ω ~ 560 Ω (0.5 W).

◇Output Circuit

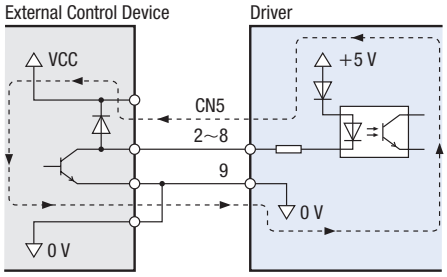


◇When an External Control Device with a Built-In Clamp Diode is Used

If an external control device with a built-in clamp diode is connected and the external control device is turned off when the driver power is on, current may flow in and rotate the motor. Because the current capacity of the driver and external control device is different, the motor may also rotate when their power supplies are turned ON or OFF simultaneously.

To turn the power off, turn off the driver and then the external control device. To turn the power on, turn on the external control device and then the driver.

•Example of Sink Logic



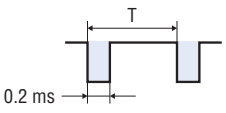
◇SPEED-OUT

Pulse signals of 30 pulses (pulse width: 0.2 ms) are output per each rotation of the motor output shaft in synchronization with the motor operation.

The speed output frequency can be measured and the approximate motor speed calculated.

$$\text{SPEED-OUT Frequency [Hz]} = \frac{1}{\text{T [s]}}$$

$$\text{Motor Shaft Speed [r/min]} = \frac{\text{SPEED-OUT Frequency [Hz]}}{30} \times 60$$



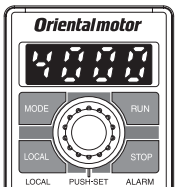
◇ALARM-OUT

When any of the driver's protective functions is activated, the output turns OFF and the ALARM LED blinks. An alarm code will be displayed on the control panel and the motor will coast to a stop.

●Speed Setting Methods

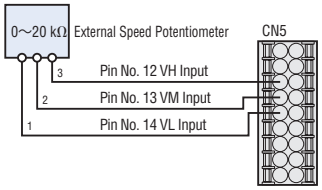
Speed can be set using the following 4 methods.

◇Using the control panel

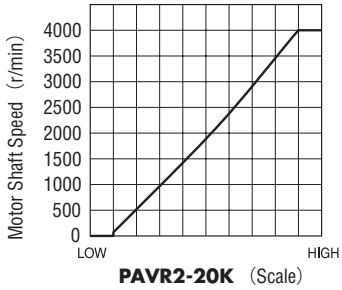


◇Using the external speed potentiometer

Connect an external speed potentiometer to the I/O signal connector (CN5) of the driver.



• External Speed Potentiometer — Speed Characteristics (Representative values)

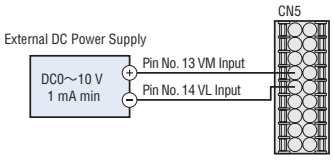


Note

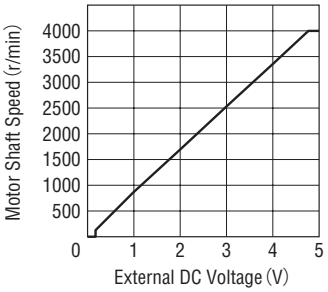
- The speed in the graph represents the speed of the motor alone. The output gear shaft speed of the combination type is calculated by dividing the graph speed by the gear ratio.

◇Set using external DC voltage

Connect external voltage to the I/O signal connector (CN5) of the driver.



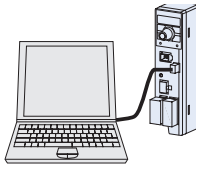
• External DC Voltage - Speed Characteristics (Representative values)
Example: 0 - 5 VDC



Note

- It can be set at 0 - 10 VDC.
- The speed in the graph represents the speed of the motor alone. The output gear shaft speed of the combination type is calculated by dividing the graph speed by the gear ratio.

◇Using Data Setting Software (**MEXE02**) PC that has data setting software (**MEXE02**) installed



●Multiple Speed-Change Operation (Max. 16 speeds)

Operation data number is selected by combining the M0 - M3 input ON/OFF.

Operating Data Number	M3	M2	M1	M0
0	OFF	OFF	OFF	OFF
1	OFF	OFF	OFF	ON
2	OFF	OFF	ON	OFF
3	OFF	OFF	ON	ON
4	OFF	ON	OFF	OFF
5	OFF	ON	OFF	ON
6	OFF	ON	ON	OFF
7	OFF	ON	ON	ON
8	ON	OFF	OFF	OFF
9	ON	OFF	OFF	ON
10	ON	OFF	ON	OFF
11	ON	OFF	ON	ON
12	ON	ON	OFF	OFF
13	ON	ON	OFF	ON
14	ON	ON	ON	OFF
15	ON	ON	ON	ON

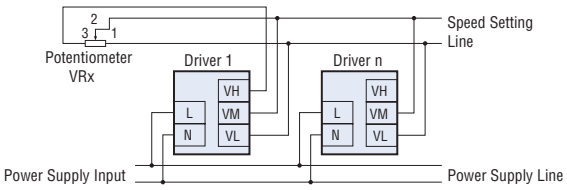
●Parallel-Motor Operation

Multiple motors can be operated at the same speed using 1 potentiometer or external DC voltage.
The figure below shows an example of the single-phase power supply specification. For a three-phase specification, change the power supply line to a three-phase power supply. The motor operation control unit is not illustrated in the figure.

◇Using a Potentiometer

When using a potentiometer (VRx), operate with 20 units or less.

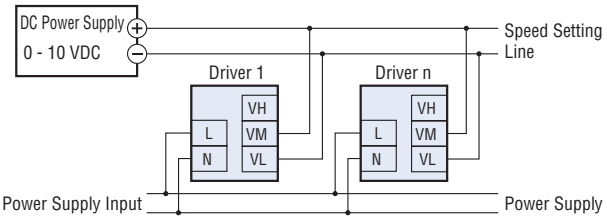
Resistance value when the number of drivers is n: VRx=20/n (kΩ), n/4 (W)
Example: When 2 drivers are connected
VRx = 20 kOhm/3 = 6,67 kΩ; P = 3/20 W = 0,15 W
Selected potentiometer: 6,8 kΩ; 0,25 W.



◇Using External DC Voltage

The power supply capacity of the external DC power supply is determined as follows.

Power supply capacity when the number of drivers is n: I=1×n (mA)
Example: When 2 drivers are connected
I=1×2=2 (mA)
Power supply capacity is 2 mA min.



Installation of Hollow Shaft Load

Example of load shaft installation method (**JH** gearhead)

The load mounting method depends on the shape of the load shaft. Refer to the diagram below.

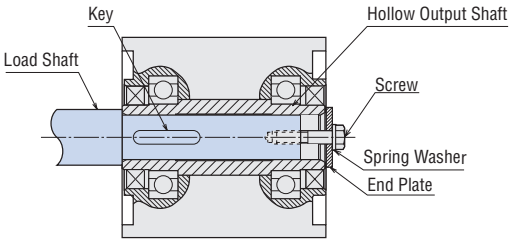
- The hollow output shaft is processed to a tolerance of the inner diameter H8, and incorporates a key slot for load shaft installation.
- The recommended tolerance of the load shaft is h7.

Note

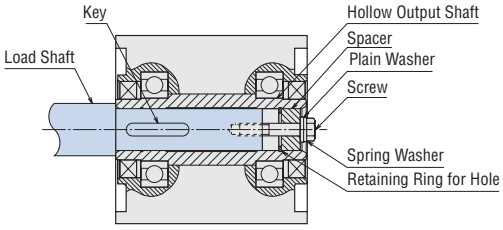
- To prevent sticking, apply a coat of grease on the exterior surface of the load shaft and interior surface of the hollow output shaft.

◇Stepped Load Shaft

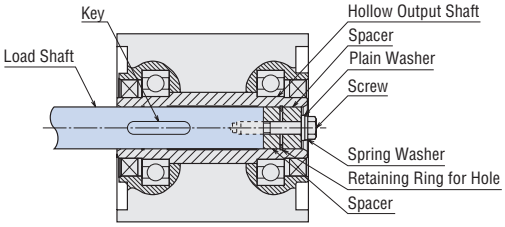
•Fixing Method Using the End Plate



•Fixing Method Using the Retaining Ring for Hole



◇For Non-Stepped Load Shaft



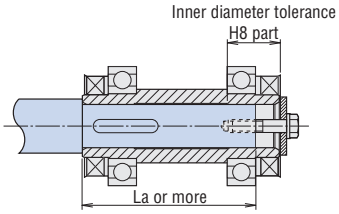
◇Recommended Load Shaft Installation Method

Unit: mm

Output Power		60W	120W	200 W, 300 W, 400 W	
Recommended Tolerance of Load Shaft (h7)		**10 - 200**	**10 - 200**	**5 - 50**	**100, 200**
Inner Diameter of Hollow Output Shaft (H8)		$\phi 12\ ^{+0.027}_{0}$	$\phi 15\ ^{+0.027}_{0}$	$\phi 25\ ^{+0.033}_{0}$	$\phi 30\ ^{+0.033}_{0}$
Recommended Tolerance of Load Shaft (h7)		$\phi 12\ ^{0}_{-0.018}$	$\phi 15\ ^{0}_{-0.018}$	$\phi 25\ ^{0}_{-0.021}$	$\phi 30\ ^{0}_{-0.021}$
Screw Size		M5	M6	M6	M8
Spacer Dimensions	Outer Diameter	ϕ11.5	ϕ14.5	ϕ24.5	ϕ29.5
	Inner Diameter	ϕ6	ϕ7	ϕ7	ϕ9
	Width	3	3	4	5
Nominal Hole Diameter of Retaining Ring (C type retaining ring)		ϕ12	ϕ15	ϕ25	ϕ30
End Plate Thickness		3	3	4	5
Stepped Shaft La length		55	72	96	96

- Retaining rings for holes, spacers, screws or other parts used to install the load shaft are not supplied.

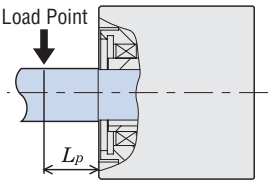
◇Recommended Load Shaft Length



●Permissible radial load calculations for **JH** gearhead

Formulas to calculate permissible radial loads vary depending on the mechanism.

◇When One End of the Load Shaft is Not Supported by a Bearing Unit



●60 W

Permissible Radial Load W [N]$= \dfrac{\mathbf{68.5}}{\mathbf{48.5}+Lp} \times F_0$

●120 W

Permissible Radial Load W [N]$= \dfrac{\mathbf{79}}{\mathbf{59}+Lp} \times F_0$

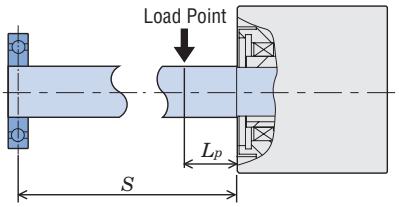
●200 W, 300 W, 400 W (Gear ratio **5**~**50**)

Permissible Radial Load W [N]$= \dfrac{\mathbf{95.5}}{\mathbf{75.5}+Lp} \times F_0$

●200 W, 300 W, 400 W (Gear ratio **100**, **200**)

Permissible Radial Load W [N]$= \dfrac{\mathbf{102}}{\mathbf{82}+Lp} \times F_0$

◇When One End of the Load Shaft is Supported by a Bearing Unit



●60 W

Permissible Radial Load W [N]$= \dfrac{\mathbf{68.5}\,(S+\mathbf{5.5})}{\mathbf{53}\,(S-Lp)} \times F_0$

●120 W

Permissible Radial Load W [N]$= \dfrac{\mathbf{79}\,(S+\mathbf{4})}{\mathbf{65}\,(S-Lp)} \times F_0$

●200 W, 300 W, 400 W (Gear ratio **5**~**50**)

Permissible Radial Load W [N]$= \dfrac{\mathbf{95.5}\,(S-\mathbf{9})}{\mathbf{104.5}\,(S-Lp)} \times F_0$

●200 W, 300 W, 400 W (Gear ratio **100**, **200**)

Permissible Radial Load W [N]$= \dfrac{\mathbf{102}\,(S-\mathbf{9})}{\mathbf{111}\,(S-Lp)} \times F_0$

F_0 [**N**]: Permissible radial load when the reference point is at 20 mm from the installation surface
Lp [**mm**]: Distance from the installation surface to the load point
S [**mm**]: Distance from the installation surface to the bearing unit

●For details on the permissible radial load when the reference position is 20 mm away from the flange installation surface, see the specifications table. Page 28, 29

●Example of load shaft installation method (**FR** gearhead)

- When attaching a load shaft to a hollow output shaft, align the shaft centreline of the hollow shaft with that of the load shaft.
- The hollow output shaft is key-trilled. The load shaft should also be key-trilled and secured with the supplied key.
- Tolerance for the load shaft should be h7.
- Use a stepped load shaft when there is a large impact due to frequent momentary stoppages or a large radial load.
- The load shaft can be mounted from both the front and rear of the hollow shaft flat gear head.

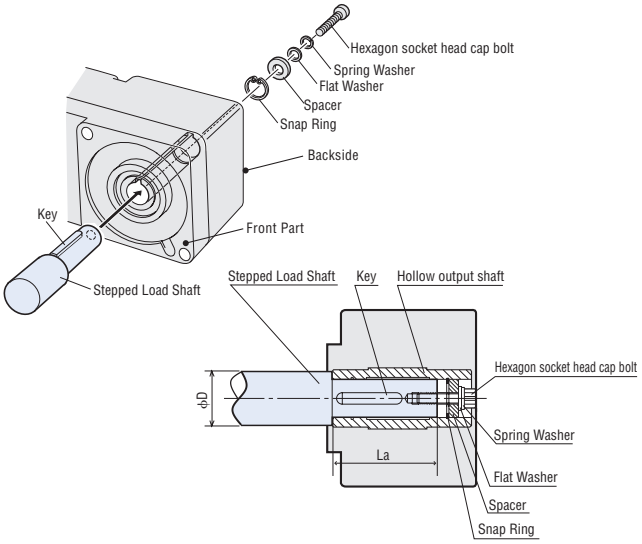
Note

- When mounting the load shaft on the hollow output shaft, avoid damaging the hollow output shaft and bearings.
- Apply molybdenum disulphide grease to the surface of the load shaft and the inner surface of the hollow output shaft to prevent seizure.
- Do not modify or machine the hollow output shaft. Doing so may damage the bearings and cause damage to the hollow shaft flat gear head.

◇For Non-Stepped Load Shaft

Use spacers, flat washers or spring washers on the retaining ring for the hole and tighten with a hexagon socket head bolt.

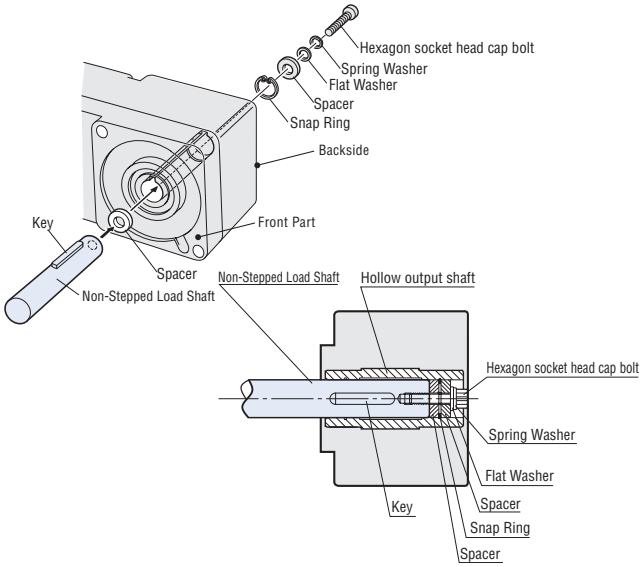
•Example of installation at the front



◇For Non-Stepped Load Shaft

Put a spacer in the load shaft side as well, use a spacer, flat washer or spring washer on the retaining ring for the hole and tighten it with a hexagon socket head cap bolt.

•Example of installation at the front



◇Recommended mounting dimensions of the load shaft

Unit: mm

Product Name	**GFS2G□FR**	**GFS4G□FR**	**GFS5G□FR**	**GFS6G□FR**
Hollow shaft bore diameter (H8)	$\phi 12^{+0.027}_{0}$	$\phi 15^{+0.027}_{0}$	$\phi 20^{+0.033}_{0}$	$\phi 25^{+0.033}_{0}$
Load shaft shaft diameter (h7)	$\phi 12^{0}_{-0.018}$	$\phi 15^{0}_{-0.018}$	$\phi 20^{0}_{-0.021}$	$\phi 25^{0}_{-0.021}$
Bolt size	M4	M5	M6	M8
Spacer thickness*	3	4	5	Front installation: 6 Rear installation: 3
Nominal diameter of retaining ring for hole	ϕ12 C Snap Ring	ϕ15 C Snap Ring	ϕ20 C Snap Ring	ϕ25 C Snap Ring
Stepped shaft outer diameterϕD	20	25	30	40
Stepped shaft length La	39	43	52	71

*The spacer thickness must be of the dimensions given in the table. If this dimension is exceeded, the bolts may protrude outwards and the safety cover may not be fitted.

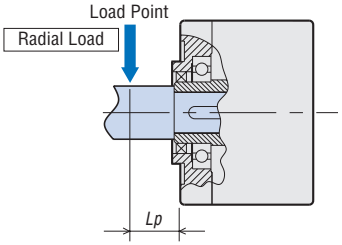
- The hole retaining rings, spacers and bolts for mounting the load shaft are not included. Please provide these items by the customer.

●Permissible radial load calculations for **FR** gearhead

The formula for calculating the permissible radial load depends on the mechanism.

◇When One End of the Load Shaft is Not Supported by a Bearing Unit

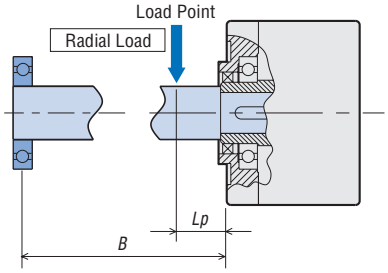
This is the mechanism with the most severe radial load. A stepped load shaft is recommended.



F_0 [N]: permissible radial load at the position of the flange mounting surface
Lp [mm]: distance from flange mounting surface to radial load point
B [mm]): distance from flange mounting surface to bearing unit

Product Name	Permissible radial load
GFS2G□FR	$W = \frac{36}{36+Lp} \times F_0$ [N]
GFS4G□FR	$W = \frac{40}{40+Lp} \times F_0$ [N]
GFS5G□FR	$W = \frac{50}{50+Lp} \times F_0$ [N]
GFS6G□FR	$W = \frac{60}{60+Lp} \times F_0$ [N]

◇When One End of the Load Shaft is Supported by a Bearing Unit



Product Name	Permissible radial load
GFS2G□FR **GFS4G□FR** **GFS5G□FR** **GFS6G□FR**	$W = \frac{B}{B-Lp} \times F_0$ [N]

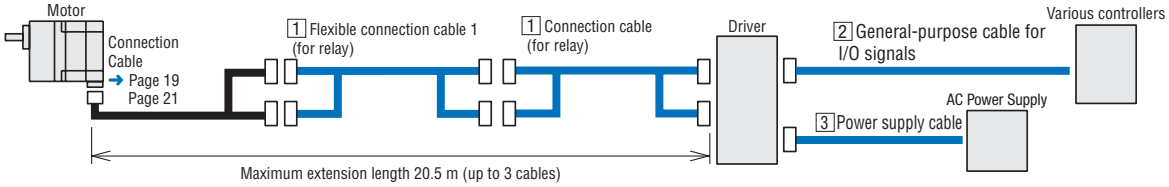
Product Name	Rotational Speed	Gear ratio	F_0 [N]
GFS2G□FR	At 80 - 3000 r/min	**5, 10**	570
		15 - 200	630
	At 4000 r/min	**5, 10**	520
		15 - 200	580
GFS4G□FR	At 80 - 3000 r/min	**5, 10**	1000
		15 - 200	1500
	At 4000 r/min	**5, 10**	910
		15 - 200	1370
GFS5G□FR	At 80 - 3000 r/min	**5, 10**	1080
		15, 20	1550
		30 - 200	1800
	At 4000 r/min	**5, 10**	980
		15, 20	1430
		30 - 200	1680
GFS6G□FR	At 80 - 3000 r/min	**5, 10**	1430
		15, 20	1960
		30 - 100	2380
	At 4000 r/min	**5, 10**	1320
		15, 20	1810
		30 - 100	2210

● The □ in the product name indicates the gear ratio.

Accessories (Sold separately)

■Cable

●Cable System Configuration



1 Connection Cable (for relaying), Flexible Connection Cable (for relaying)

When extending the cable by adding connection cables (for relaying)/flexible connection cables (for relaying), ensure that the overall length of the cable is 20.5 m max (up to a total of 3 cables).

●Product Line

◇Connection Cables

Product Name	Length L [m]
CC01BL2	1
CC02BL2	2
CC03BL2	3
CC05BL2	5
CC07BL2	7
CC10BL2	10

◇Flexible Connection Cables

Product Name	Length L [m]
CC01BL2R	1
CC02BL2R	2
CC03BL2R	3
CC05BL2R	5
CC07BL2R	7
CC10BL2R	10

●Product Line

◇Connection Cables (for electromagnetic brake)

Product Name	Length L [m]
CC010BL2M	1
CC020BL2M	2
CC030BL2M	3
CC050BL2M	5
CC070BL2M	7
CC100BL2M	10

◇Flexible Connection Cables (for electromagnetic brake)

Product Name	Length L [m]
CC010BL2MR	1
CC020BL2MR	2
CC030BL2MR	3
CC050BL2MR	5
CC070BL2MR	7
CC100BL2MR	10

For details, check the website or contact the customer support center.
http://www.orientalmotor.eu

2 General-Purpose Cables for I/O Signals

Double-shielded cable (AWG24 core) with discrete wire shields on both sides and round terminals for easy grounding.

Product Line

Product Name	Length L [m]	Number of Lead Wire Cores	Outer Dimensions D [mm]	AWG
CC06D005B-1	0.5	6	ϕ5.4	24
CC06D010B-1	1			
CC06D015B-1	1.5			
CC06D020B-1	2			
CC10D005B-1	0.5	10	ϕ6.7	
CC10D010B-1	1			
CC10D015B-1	1.5			
CC10D020B-1	2			
CC12D005B-1	0.5	12	ϕ7.5	
CC12D010B-1	1			
CC12D015B-1	1.5			
CC12D020B-1	2			
CC16D005B-1	0.5	16	ϕ7.5	
CC16D010B-1	1			
CC16D015B-1	1.5			
CC16D020B-1	2			

Note

- An external speed potentiometer (**PAVR2-20K**) and a general-purpose cable for I/O signals cannot be used together.

3 Power Supply Cable

These cables are used to connect the driver and the AC power supply. Cables are available with or without a power supply plug.

Product Line

Product Name	Power Supply Voltage	Length L [m]
CC01AC03N	Single-Phase 100-120 VAC Single-Phase 200-240 VAC	1
CC02AC03N		2
CC03AC03N		3
CC01AC04N	Three-Phase 200-240 VAC	1
CC02AC04N		2
CC03AC04N		3

For details, check the website or contact the customer support center.
http://www.orientalmotor.eu

Flexible Coupling

Clamping type couplings for connecting motor/gearhead shafts to the driven shaft. Couplings are available for use with parallel shaft gearhead **GFV** and round shaft types.

- It can be used on a round shaft type as well. Please select a coupling with an inner diameter that matches the motor shaft's diameter.

Product Line

Applicable Product	Load Type	Couplings Type
GFV2G□■	Uniform Load	**MCL30** Type
	Impact Load	
GFV4G□■	Uniform Load	**MCL40** Type
	Impact Load	**MCL55** Type
GFV5G□■	Uniform Load	**MCL55** Type
	Impact Load	
GFV6G□■	Uniform Load	**MCL65** Type
	Impact Load	

- The □ of the applicable product contains a number indicating the reduction ratio. The symbol ■ on the applicable product indicates the output shaft material.

Regeneration Unit

Used for continuous regenerative operation, such as winding-down operation during up-and-down drives, or when operating inertial loads with round shaft types of 300 W or more.

Product Line

Product Name
RGB100

Specifications

Continuous Regenerative Power	70 W
Instantaneous Regenerative Power	720 W
Resistance Value	150 Ω
Thermal Protector Operating Temperature	Open: 150 ±7 °C Close: 145 ±12 °C (Normally closed))

DIN Rail Mounting Bracket

Use DIN rail mounting brackets to install a driver to a DIN rail.

Product Line

Product Name
MADP02

External Speed Potentiometer

Features

- A Potentiometer that can adjust speed and torque.
- Easy Installation
  Simply insert it into the installation hole without using any tools. It can also be removed easily.
- Easy Wiring
  It uses terminal blocks. It requires no soldering for connecting lead wires.
  This improves the work efficiency of the wiring.

<Front Face>

<Rear Face>

Product Line

Product Name
PAVR2-20K

Note

- An external speed potentiometer (**PAVR2-20K**) and general-purpose cable for I/O signals cannot be used together.

Specifications

Resistance	: 0 - 20 kΩ
Rated Power	: 0.05 W
Resistor Variable Characteristics	: B curve

•Applicable Lead Wire Size*

AWG22~18 (0.3 - 0.75 mm^2)

*When combined with **BLE2** Series

For details, check the website or contact the customer support center.

http://www.orientalmotor.eu

Motor and Gearhead Installation Bracket

Special mounting bracket for mounting and fixing parallel shaft gearhead **GFV** and round shaft types.

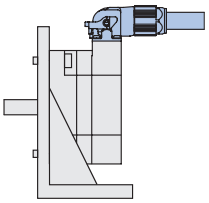
Product Line

Product Name	Applicable Product
SOL2M4F	**BLM230**, **BLM260**, **GFV2G□S**
SOL4M6F	**BLM460**, **GFV4G□S**
SOL5M8F	**BLM5120**, **BLM5200**, **BLM5300**, **BLM5400**, **GFV5G□S**
SOL6M8F	**BLM6200**, **BLM6300**, **BLM6400**, **GFV6G□S**

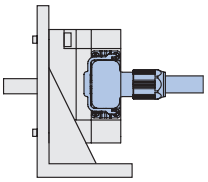
● The □ of the applicable product indicated the gear ratio.

Note

● Installing with the motor connector facing downwards is not recommended as this will interfere with the mounting brackets and installation surface.
Installing with the motor connector facing downwards is not recommended as this will interfere with the mounting brackets and installation surface.



Upwards connector

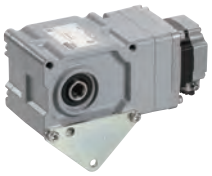


Sideways connector

Torque Arms

In order to prevent gearheads from rotating due to the reactive force of the shaft being driven, the torque arm acts as an anti-spin mechanism when a right-angle, hollow shaft hypoid JH gearhead is installed.

TAF2S-12-NS



(Application Example)

Product Line

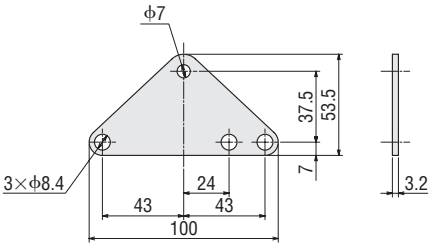
Product Name	Applicable Product	Main Specifications
TAF2S-12-NS	**BLM460SHPK / 4H□**	Material: SS400 Surface treatment: Trivalent chromate
TAF2S-15-NS	**BLM5120HPK / 5H□**	
TAF3S-25-2-NS	**BLM5200HPK / 5XH□** **BLM5300HPK / 5XH□** **BLM5400HPK / 5XH□**	
TAF3S-30-3-NS	**BLM5200HPK / 5YH□** **BLM5300HPK / 5YH□** **BLM5400HPK / 5YH□**	

● A number indicating the gear ratio is entered where the box □ is located within the applicable product name.

Dimensions (Unit: mm)

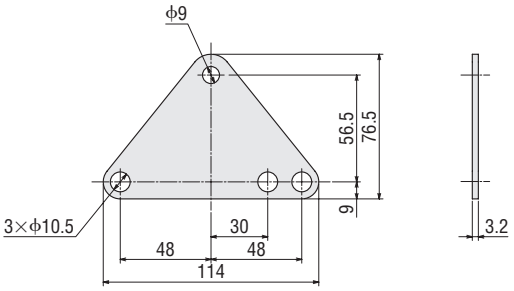
◇TAF2S-12-NS

Mass: 75 g



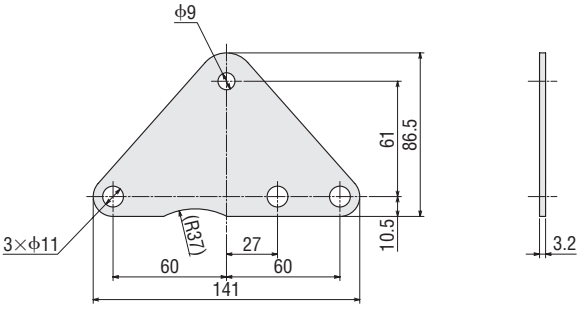
◇TAF2S-15-NS

Mass: 125 g



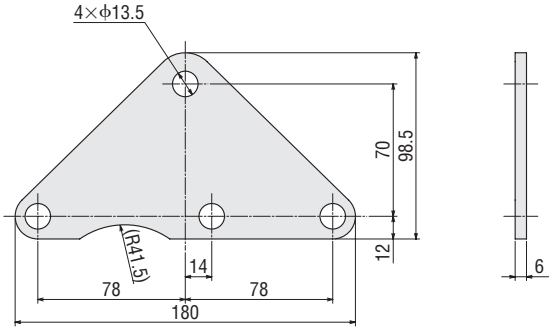
◇TAF3S-25-2-NS

Mass: 200 g



◇TAF3S-30-3-NS

Mass: 400 g



For details, check the website or contact the customer support center.
http://www.orientalmotor.eu

Product Line

This cover protects the motor. They are compatible with the degree of protection IP66 specification, and can be used in wet and dusty environments.

With Brush Cap
PCM5

With a Cable Gland
PCM5-C

Product Line

◇Motor Cover

Product Name
PCM5
PCM5-C

◇Replacement Gasket

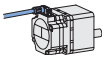
Replace the gasket approximately once a year.

Product Name	Set contents
PCMP5	Set of 2 gaskets

Applicable Product

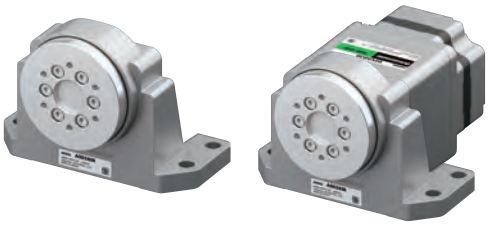
Output Power	Motor	Cable Pull-out Direction
30 W 60 W 120 W	Parallel Shaft Combination Type*	Pull-out on output shaft side 
	Round Shaft Type	Pull-out on rear of the motor 

*In the case of a combination type, the cable with pull-out on rear of the motor cannot be used.



Flange Drive Adapter

These products allow for greatly increased permissible load with the installation on a gearhead.
It can be used with parallel shaft gearheads **GFV** with an output power of 120 W.



<Application Example>

Product Line

Product Name
AGD580B

For details, check the website or contact the customer support center.
http://www.orientalmotor.eu

Oriental motor

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

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

ORIENTAL MOTOR (EUROPA) GmbH

European Headquarters
Schiessstraße 44
40549 Düsseldorf, Germany
Tel: 0211 5206700 Fax: 0211 52067099

Spanish Office
Ronda de Poniente 2, Ed. 12, 2ª planta
28109 Tres Cantos (Madrid), Spain
Tel: +34 919 61 06 76

ORIENTAL MOTOR (UK) LTD.

UK Headquarters
Unit 5, Faraday Office Park,
Rankine Road, Basingstoke,
Hampshire RG24 8AH, U.K.
Tel: +44 1256 347090 Fax: +44 1256 347099

ORIENTAL MOTOR ITALIA s.r.l.

Italy Headquarters
Via XXV Aprile 5
20016 Pero (MI), Italy
Tel: +39 2 93906346 Fax: +39 2 93906348

Customer Service Center
(Support in German & English)

00800 22 55 66 22*
Mon - Thu: 08:00 - 16:30 CET
Friday: 08:00 - 15:00 CET
*Free Call Europe

info@orientalmotor.de

WWW.ORIENTALMOTOR.EU

EN | DE | UK | IT | FR | ES

UK/102024/VERS01

Printed in Germany.