Oriental motor

Brushless Motors

BLH Series

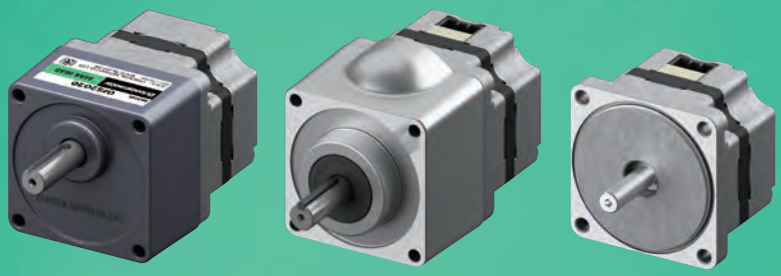
Improved DC Input drivers with more functionality and performance

Compact, Flat Motor and Driver with Enhanced Performance and Functionality

Brushless Motors DC Input
BLH Series

- Power supply voltage 24 VDC
- Output 15 W/30 W/50 W/100 W
- Speed control range 100 - 3000 r/min
- Compact, lightweight drivers
  (W 72 mm×D 55 mm×H 27 mm, mass 46 g)*

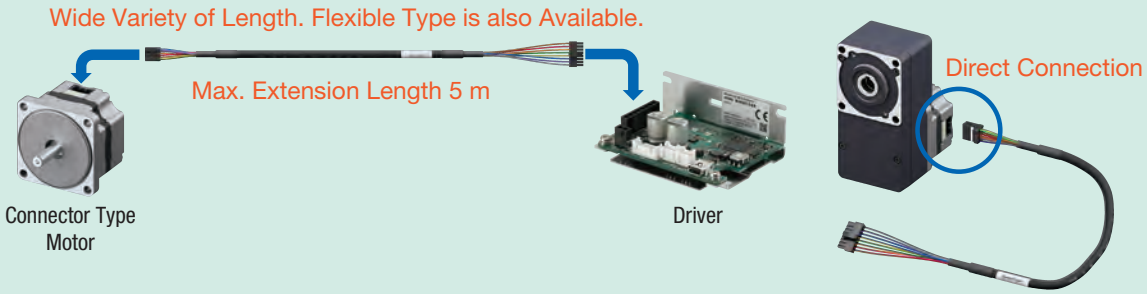
*For 15 - 50 W



New Connector Type Product Line

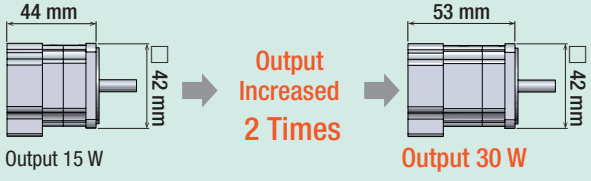
Connector Type Suitable for Embedded Design in Equipment

Direct Connection with One Cable, No Extension Required



Increased Output with the Same Frame Size

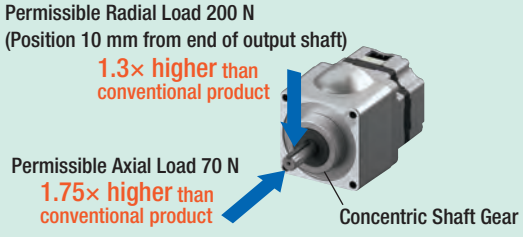
The motor product line has increased output with the same frame size!



● Compared to □42 mm round shaft type.

High-strength **CS** Geared Motor

Increased load bearing capacity. Concentric shaft gear makes for easy design and installation.



● Compared to □60 mm parallel shaft gearhead.

Select the Motor and Driver According to the Application

P.4-6

●Motors

●Output
15 W/30 W/50 W/100 W

●Motor Type
Connector type **IP40**
Cable type **IP65**
Electromagnetic Brake Motor **IP65**

●Output Shaft Type


Parallel Shaft Gearhead


CS Geared


Hollow Shaft Flat Gearhead

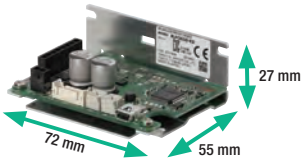

Round Shaft

●Drivers

●Analog Setting Type
· Speed setting by volume or external analog signal

●Digital Setting Type
· Speed setting using the support software **MEXE02**
· Enhanced functionality with torque limiting, load holding, etc.

●RS-485 Communication Type
· Speed setting by Modbus (RTU)
· Remote monitoring from host system possible
· Equipment wiring can be reduced



Mass 46 g
(For 15 ~ 50 W)

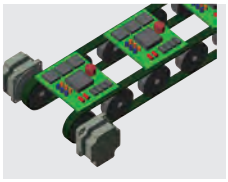
Optimal Control of the Compact Driver Adds Value to the Equipment

P.7-8

●Applies to digital setting type and RS-485 communication type.

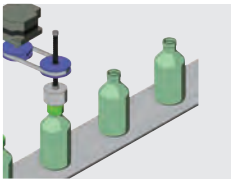
●Same speed operation and less speed fluctuation with digital setting

Can be set in 1 r/min increments.
Also has good speed reproducibility, making it ideal for two axes operating at the same speed.


Dual axis belt conveyor

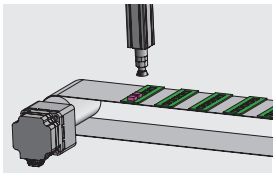
●Torque limiting function

Torque adjustment is possible.
Optimal for adjusting tightening torque, etc.


Lid tightening

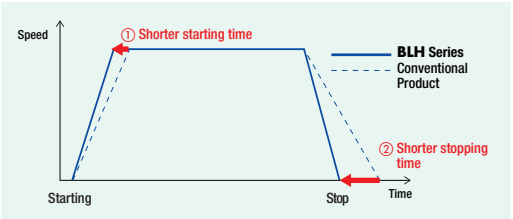
●Load holding function

The load is held with an electrical holding brake.


Holding a belt conveyor

●Shorter equipment takt time

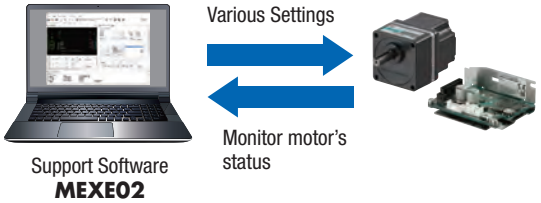
Shortening the start-up time by utilizing the maximum instantaneous torque and shortening the stop time by setting the deceleration time can shorten the equipment takt time.



Peace of Mind for both Startup and Maintenance with Support Software **MEXE02**

P.9

●Applies to digital setting type and RS-485 communication type.
●The support software **MEXE02** can be downloaded for free from the Oriental Motor website.

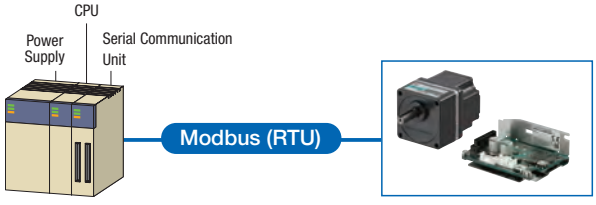


Common Setting and Centralized Management via Network Communication

P.9

●Applies to RS-485 communication type.

Control from PLC, touch screen, etc.
Modbus (RTU) control

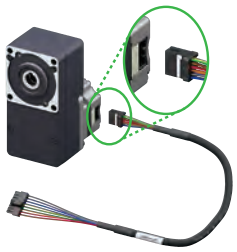


Broad Range of Brushless Motors

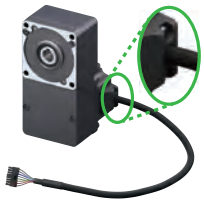
Select the Motor According to the Operating Environment

A range of connector types with different cable lengths and motor protection degree of IP65, etc. are available to suit a variety of environments.
Motors with an electromagnetic brake are available for applications requiring holding during horizontal operation.

Connector Type **IP40**



Cable Type **IP65**



Cable Type with Electromagnetic Brake **IP65**

Direct Connection with One Cable / No Extension Required Connector Type

Connector Type Motor

Driver

Wide Variety of Length. Flexible Type is also Available.

Connection Cable: 0.5 m~5.0 m
Flexible Connection Cable: 1.0 m~5.0 m

Achieves a Higher Degree of Output Connector Type

The output has been increased by thickening the motor iron plate portion without changing the motor's frame size.
The design for mounting on equipment remains unchanged, while meeting the need for higher output.

Output 15 W

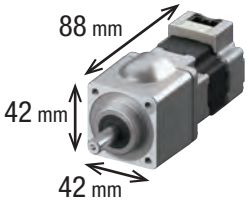
Output 30 W

●Compared to □42 mm round shaft type.

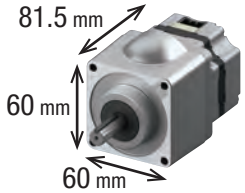
► Achieves Space Saving and Lighter Equipment

This enables smaller and lighter equipment while maintaining its power level.

30 W 0.44 kg



30 W 0.74 kg



Stop & Hold with Electromagnetic Brake Electromagnetic Brake Motor

► Position can be Held During Horizontal Operation

- The stop position can be held when the equipment is stopped for transshipment or processing of loads.
- When the power is accidentally cut off due to a power failure or other unexpected event, the electromagnetic brake holds the load in position.

Held by electromagnetic brake

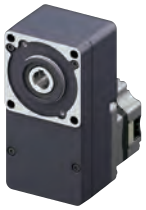
✻Cannot be used in vertical operations applications such as gravitation operation.
✻Electromagnetic brake control must be arranged by the customer.

When operating the electromagnetic brake, hold the load after the motor has stopped.
Operating the electromagnetic brake during rotation may cause damage to the product.

✻The digital setting type and RS-485 communication type can check the timing to turn off the electromagnetic brake using MOVE output.
✻The analog setting type does not have MOVE output.
An external sensor must be installed for rotation detection.

Broad Range of Gearheads

Gearhead Type

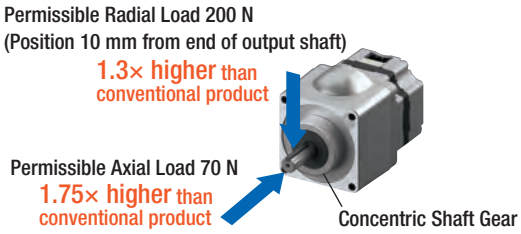
Product Line	Parallel Shaft Gearhead **GFS** Gear	**CS** Geared Motor*1	Hollow Shaft Flat Gearhead **FR** Gear
External View			
Features	- Broad range of gear ratios - Rated life of 10,000 hours*2	- Increased load bearing capacity (parallel shaft gear ratio) - Center shaft - Rated life of 10,000 hours	- Space saving, low cost - Permissible torque with no saturation - Rated life of 10,000 hours
Motor Output Power	15 W, 30 W, 50 W, 100 W	15 W, 30 W, 50 W	30 W, 50 W, 100 W
Gear Ratio	5 - 200*3	5 - 20	5 - 200

*1 Connector type only
*2 For 15 W, the rated life is 5,000 hours.
*3 For connector type, the gear ratio is 5 - 100.

Smaller Equipment with Increased Load Bearing Capacity **CS** Geared Motors

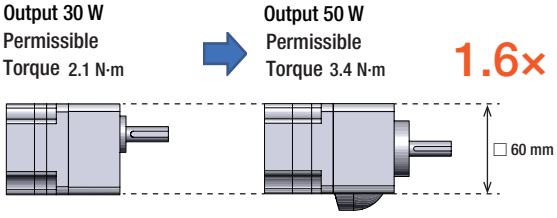
The **CS** geared type, with features like increased load bearing capacity, higher torque, and concentric shaft, contributes not only to faster and more compact equipment, but also to greater design freedom for customers.

●Increased load bearing capacity compared to parallel shaft gearheads.



●Compared to □60 mm parallel shaft gearhead.

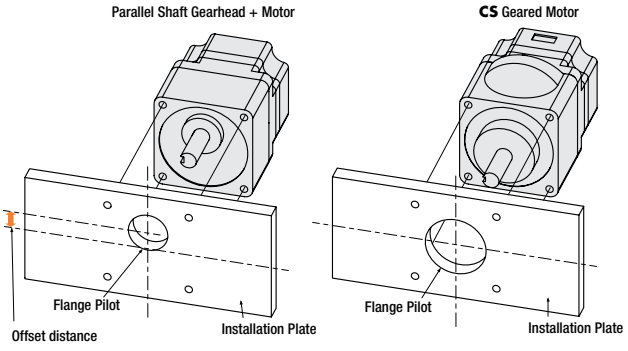
●Achieves increased torque with the same frame size.



●Compared to □60 mm parallel shaft gearhead.

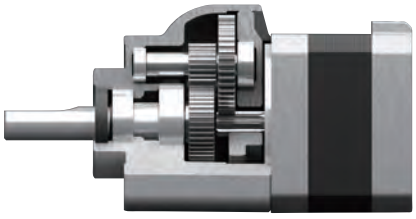
●Simplified design

There is no offset distance with **CS** geared motors, contributing to simpler equipment design.



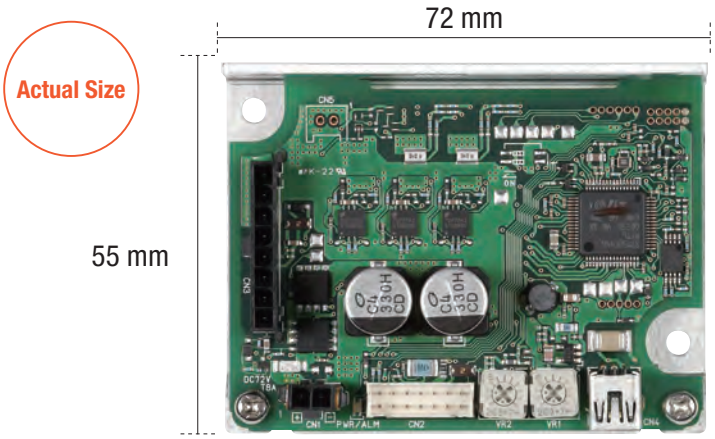
●Concentric shaft gear structure

Large gears are arranged such that they will not escape from the central shaft, creating a gearhead with a coaxial shaft.



Choose a Compact Driver by Setting Method and Functions

Smaller and Lighter Drivers than the Business Card Size



● Photo shows 15 W, 30W, and 50 W driver.

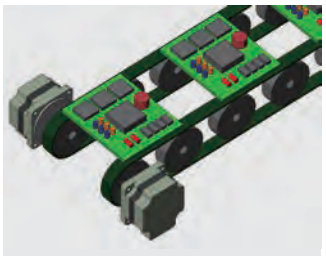
Choose from Three Drivers Different Setting Methods and Functions

Driver Type		Analog Setting Type	Digital Setting Type	RS-485 Communication Type
External View				
Features		Simple speed setting by volume or external analog signal	Setting from PC with support software **MEXE02**	Setting from network via Modbus communication
Output		15 W/30 W/50 W/100 W	15 W/30 W/50 W	15 W/30 W/50 W
Speed Control Range		100 - 3000 r/min	80 - 3000 r/min	80 - 3000 r/min
Speed Setting Method	Internal Speed Potentiometer	●	●	–
	External Speed Potentiometer	●	●	●
	External DC Voltage	●	●	●
	PWM Signal	–	●	●
	MEXE02	–	●	●
	RS-485 Communication	–	–	●
Function	Instantaneous Stop	●	●	●
	Acceleration and Deceleration Operation	●	●	●
	Multistep Speed-Change Operation	●	●	●
	Parallel-Motor Operation	●	●	●
	Load Factor Indication	–	●	●
	Torque Limiting	–	●	●
	Load Holding Function	–	●	●
	Deceleration Stop	–	●	●
	Information	–	●	●

Optimal Control of the Compact Driver Adds Value to the Equipment.

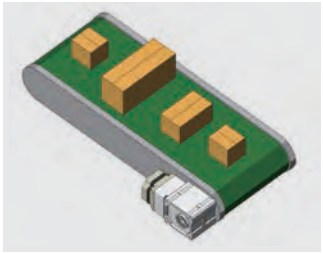
Synchronized Operation and Operation with Little Speed Fluctuation

► Synchronized Operation



●With digital settings, speeds can be set at 1 r/min increments. The reproduction of speeds is enhanced, and synchronized operations are made possible.

► Speed Stability



●Speed remains stable even if the weight of the work changes (Speed regulation ±0.2% max.)

●Speed Regulation

Speed Setting Method \ Driver Type	Analog Setting Type	Digital Setting Type RS-485 Communication Type
Analog Setting	±0.5% max.	
Digital Setting	–	**±0.2% max.**
PWM Input Setting	–	±0.5% max.

Great for Applications in Quiet Environments

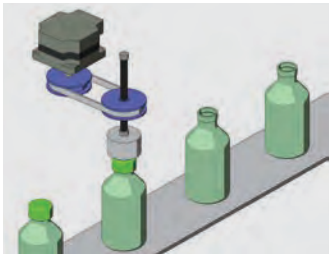
► Higher Quiet Performance

The **BLH** Series uses a sine wave drive system, resulting in low torque ripple and smooth, stable rotation even at low speeds. It also has better noise reduction compared to conventional products.

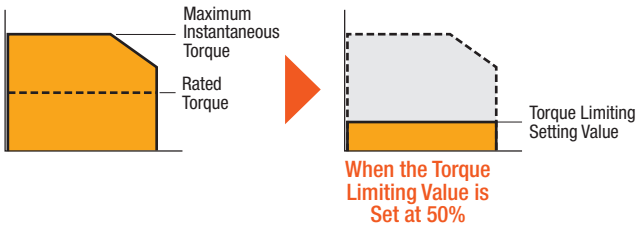
Torque Adjustment Digital Setting Type, RS-485 Communication Type

► Torque Limiting Function

It is a limiting function that suppresses the motor's torque by limiting the current to the motor.



●Adjustment of tightening force, etc.
●Damage prevention (Low thrust)
●Load factor monitoring is possible



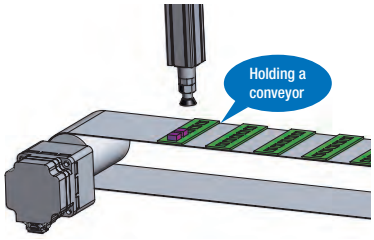
Besides applications such as adjustment of tightening force, it can also be used as a safety measure for pinching detection and equipment damage prevention. The max. instantaneous torque range can be set between 0 and 200% by assuming the rated torque to be 100%.

Generates Holding Force when External Force is Applied
Digital Setting Type, RS-485 Communication Type

► Load Holding Function

Can generate holding force when external force is applied.

The load holding function can be used as an electrical holding brake* when stopping without a mechanical brake.
For example, it is suitable for applications where work is performed while the conveyor is stopped.
*Can hold loads up to 50% of rated torque.



●No Maintenance Needed

No mechanical wear parts, contributing to a longer service life. Also suitable for applications that require frequent repetition of starting and stopping.

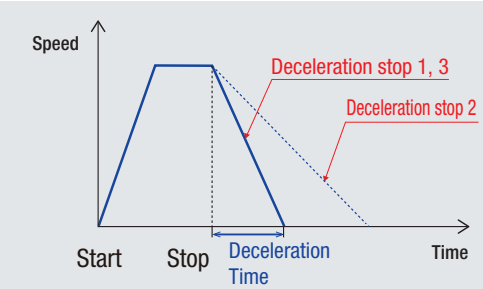
●Contributes to Equipment Space Saving

No mechanical brake is required, contributing to space saving and weight reduction of the equipment.

Selection of the Deceleration Stop Method

► Deceleration Stop

For the digital setting type and RS-485 communication type, select the “Deceleration stop operation selection” parameter to choose operation during deceleration stop.



Want to stop at set deceleration time

●Deceleration stop 1

This is a stopping method in which the regenerative power generated during a deceleration stop is consumed by the motor and driver so that it does not return to the power supply side. (When using a switching power supply)

●Deceleration stop 3

This is a stopping method in which the regenerative power generated during a deceleration stop is returned to the power supply side.
It is used when the regenerative capacity of the battery or other power supply is large, or when regenerative power is also used by other devices.

Want to stop naturally

●Deceleration stop 2

Stops naturally due to lack of brake force.
This is a gentle stopping method.

●Stop Method of the Analog Setting Type

The stop method of the analog setting type depends on the applicable motor type.
The stop method cannot be changed, since it is a factory setting.

Stop Method \ Motor Type	Connector Type Driver	Lead Wire Type/ Cable Type Driver
Deceleration Stop 1	●	–
Deceleration Stop 2	–	●

Peace of Mind for both Startup and Maintenance with Support Software **MEXE02**

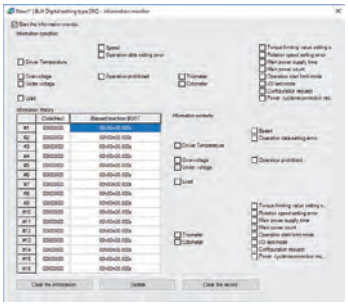
Predictive Maintenance with Visualization

The support software **MEXE02** can be downloaded for free from the Oriental Motor website.

► Status Monitoring

The load factor, driver temperature, and other such conditions can be constantly checked.

► Information Monitoring



By outputting an information signal with preset thresholds, this information can be used as reference for the maintenance period.

► Alarm Monitoring

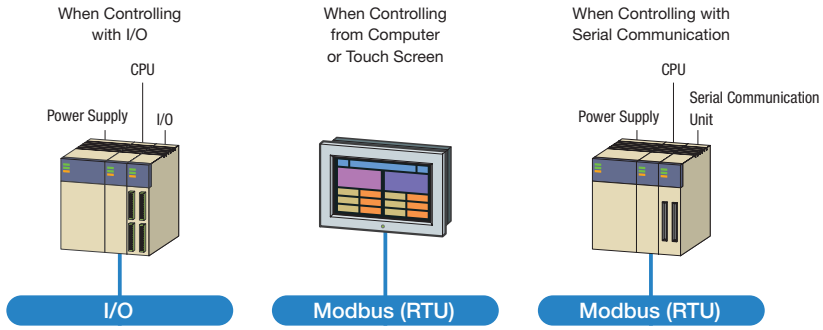
Alarm information can also be monitored. Besides being able to check for solutions to abnormalities, the cause of the alarm can be retained as a history.

Common Setting and Centralized Management via Network Communication RS-485 Communication Type Drivers

Supported by Modbus (RTU), and can be connected to and controlled by a touch screen or programmable controller.

*Operation commands can also be input via I/O, which is convenient for startup settings.

Operating Data can be Set and Changed Easily, with Simple Wiring

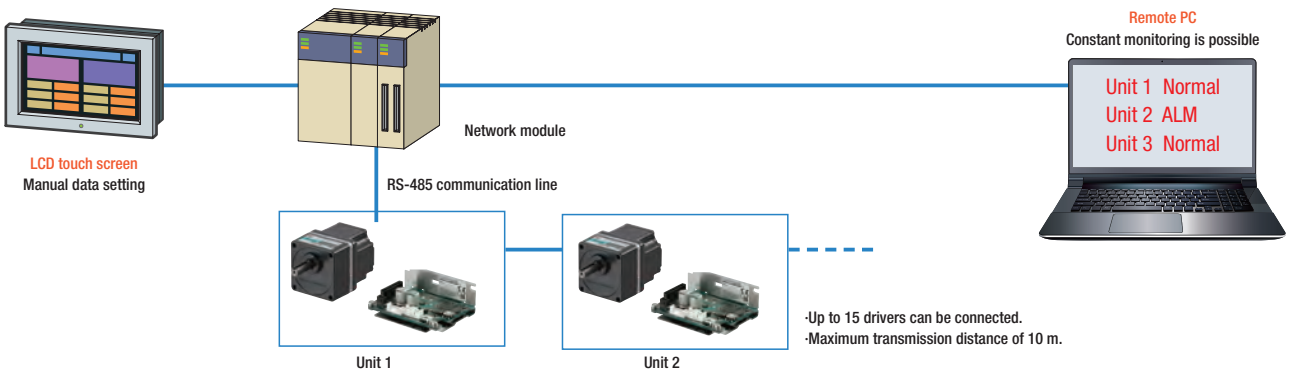


► Advantages

- Easy rewriting of operating data such as speed and torque limit value.
- Operating data and parameters can be set for multiple axes at once.
- Reduced wiring with remote I/O and serial communication.

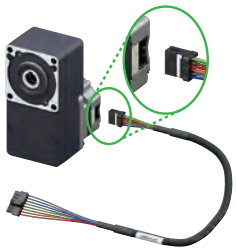
Constant Remote Monitoring

The contents of each monitor can be obtained via serial communication, allowing for constant remote monitoring of motor and driver status, speed, and load factor.



Product Line

Connector Type



Motors, drivers, connection cables (flexible connection cables), and cable sets (power supply cable/I/O signal cable) must be arranged individually.
Please purchase each of them.

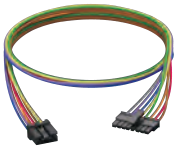
Motors

Output Shaft Type	Frame Size [mm]	Output [W]	Gear Ratio
Parallel Shaft Gearhead **GFS** Gear*1 IP40 	42	15	**5, 10, 15, 20, 30, 50, 100**
	60	30	
	80	50	
CS Geared Motor*2 IP40 	42	15	**5, 10, 15, 20**
		30	
	60	30	
		50	
Hollow Shaft Flat Gearhead **FR** Gear IP40 	60	30	**5, 10, 15, 20, 30, 50, 100, 200**
	80	50	
Round Shaft Type IP40 	42	15	–
		30	
	60	30	
		50	
	80	50	

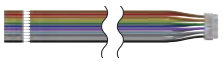
Drivers *3

Output [W]	Type
15	Analog Setting Type 
30	
50	
15	Digital Setting Type 
30	
50	
15	RS-485 Communication Type 
30	
50	

Cables

Connection Cable Flexible Connection Cable
Connection Cable 0.5 m 
Connection Cable Flexible Connection Cable 1 m/1.5 m/2 m/3 m/5 m 

Cable Set

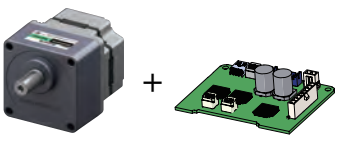
Power Supply Cable
 300 mm 1000 mm
I/O Signal Cable
 300 mm 1000 mm

*1 The 15 W is a geared motor in which the motor and gearhead are integrated.
*2 A geared motor in which the motor and gearhead are integrated.
*3 Drivers are arranged for each motor frame size.
Cannot be used on lead wire type/cable type motors.

Can also be driven by a driver designed by the customer. Allows a standalone motor to be purchased.

Can be driven in combination with a driver designed by the customer.

The motor specifications necessary for combination with a driver, such as winding resistance, inductance, maximum permissible current, and induced voltage constant are prepared.
For details, please contact an Oriental Motor sales office.



Driver designed by customer.

Cable Type

Cable Type

Motors, drivers, connection cables (flexible connection cables), and cable sets (power supply cable/I/O signal cable) must be arranged individually.
Please purchase each of them.

● Motors IP65 Cable Type

Output Shaft Type	Electromagnetic Brake	Frame Size [mm]	Output [W]	Gear Ratio
Parallel Shaft Gearhead **GFS** Gear*1 IP65 	–	42	15*2	**5**, **10**, **15** **20**, **30**, **50** **100**, **200** *15 W has no gear ratio **200** option
	IP65 	60	30	
		80	50	
		90	100	
Hollow Shaft Flat Gearhead **FR** Gear IP65 	IP65 	60	30	
		80	50	
		90	100	
Round Shaft Type IP65 	–	42	15*2	–
	IP65 	60	30	
		80	50	
		90	100	

● Drivers *4

Output [W]	Type
15	Analog Setting Type 
30	
50	
100*3	
15	Digital Setting Type 
30	
50	
15	RS-485 Communication Type 
30	
50	

● Cables *5

Connection Cable
Flexible Connection Cable

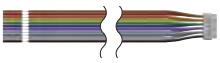
1.5 m/2.5 m/4.5 m

● Cable Set

Power Supply Cable

300 mm
1000 mm

I/O Signal Cable

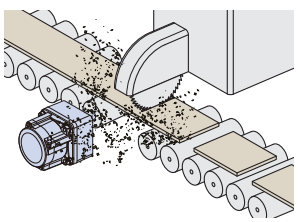


300 mm
1000 mm

*1 The 15 W is a geared motor in which the motor and gearhead are integrated.
*2 15 W is lead wire type (IP40) only.
*3 The 100 W driver comes with a power supply cable and I/O signal cable.
*4 Cannot be used on connector type motors.
*5 Only 1.5 m for 100 W.

◇In environments with dust and water showers
Cable type (Degree of protection IP65)

Cable type motors and electromagnetic brake motors are compliant with the IP65* degree of protection.
*Excluding installation surface of round shaft type. The shaft material is iron.



◇Permissible load greatly increased Flange drive adapter
(100 W Parallel shaft gearhead For **GFS** gear)

These products allow for greatly increased permissible load with the installation of a gearhead.
➜ Page 58

Features of Brushless Motors

Brushless motors have no brushes, which is a disadvantage of DC motors, and are therefore less noisy and maintenance-free.
They are compact, high-power, and high-efficiency thanks to the use of permanent magnets.

Wide Speed Control Range

Brushless motors offer a wider range of speed control than AC speed control motors or inverters. They are suitable for applications requiring constant torque from low to high speed.

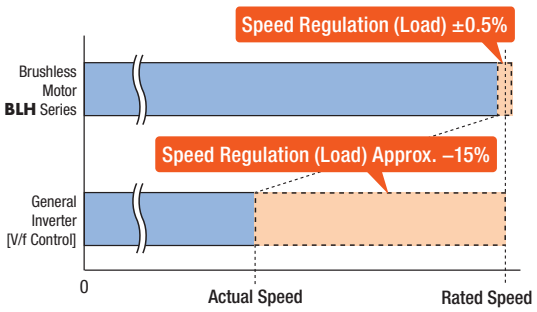
Product Group	Speed Control Range*	Speed Ratio
Brushless Motors (**BLH** Series)	100 - 3000 r/min	1:30
Inverter Control Three-Phase Induction Motor	200 - 2400 r/min	1:12
AC Speed Control Motors	50 Hz: 90 - 1400 r/min 60 Hz: 90 - 1600 r/min	1:15 1:17

*The speed control range varies depending on the model.

Stable Speed Control

Brushless motors constantly monitor the feedback signal from the motor and compare it to the set speed to adjust the applied voltage. For this reason, it rotates at a stable speed from low to high speed even when the load fluctuates.

●Comparison of Speed Variation (Reference value)



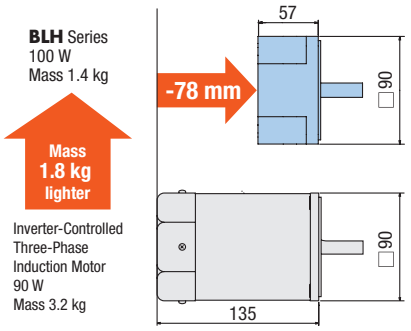
The speed regulation (load) of each model is shown in the table to the right. Indicates how much the speed changes when the load fluctuates from 0 to the rated torque.

Product Name	Speed Regulation with Respect to the Load	
		Conditions
BMU Series	±0.2%	0 - Rated torque At rated speed
BLE2 Series	±0.2%	
BLE Series	±0.5%	
BXII Series	±0.05%	
BLH Series	±0.5%*	

*When using digital setting, ±0.2%.

Flat, Lightweight, and High-power

Brushless motors use permanent magnets in the rotor, making them flat, lightweight, and high-power. They contribute to downsizing of equipment.



BLH Series Connector Type

System Configuration

◉ Required for Operation
○ Optional Accessory

● When Using Support Software **MEXE02**

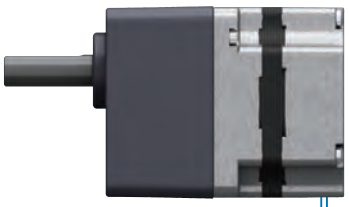
Support Software MEXE02

To USB Port

● Support software **MEXE02** can be downloaded from the website.

USB Cable — Not supplied.

◉ **Motor**

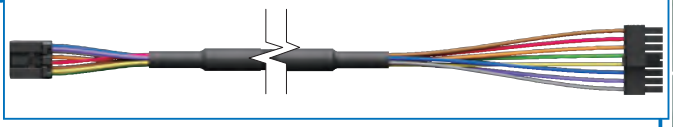


◉ **Driver**

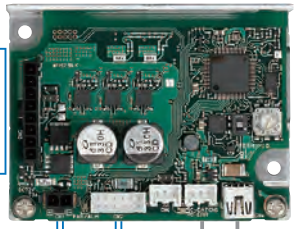
Note

The driver does not come with connectors for motors, power supplies, I/O signals, or for RS-485 communication. A power supply cable can be purchased from Oriental Motor. Alternatively a connector can be arranged by the customer. Please confirm the part number of the connector by referring to the part number on the dimension drawing for each cable or the instruction manual.
· Connection cable dimensions drawing ➜ Page 24
· Power supply, I/O signal cable dimensions drawing ➜ Page 57
· RS-485 communication cable dimensions drawing ➜ Page 58

◉ **Connection Cable/Flexible Connection Cable**
➜ Page 57



Max. Extension Length: 5 m



◉ **Cable Set (Power Supply Cable/I/O Signal Cable)**

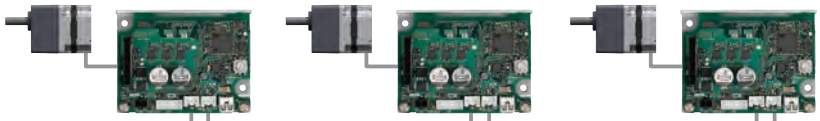
Not supplied.
24 VDC Power Supply (Main Power Supply)

· Power Supply Cable

· I/O Signal Cable

Host Control Device

● When Controlling with RS-485 Communication



Host Control Device

[Between Driver and Host] RS-485 Communication Cable (3.0 m)

[Between Drivers] RS-485 Communication Cable (0.15 m)

[Between Drivers] RS-485 Communication Cable (0.15 m)

○ Accessory for Motor

Mounting Brackets for Motor and Gearhead
➜ Page 58

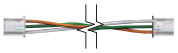
Flexible Couplings
➜ Page 58

○ Accessory for Driver

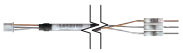
External Speed Potentiometer
➜ Page 58

DIN Rail Mounting Bracket
➜ Page 58

Driver Cover
➜ Page 58



RS-485 Communication Cable (0.15 m)
➜ Page 58



RS-485 Communication Cable (3.0 m)
➜ Page 58

●Example of System Configuration

Motor	Gearhead	Driver		Cables			Accessory		
				Connection Cables	Cables Sets		Motor/Gearhead Mounting Brackets	Flexible Couplings	DIN Rail Mounting Brackets
BLM230HK-GFS	**GFS2G5**	**BLH2D30H-KR**	+	**LCM005LAAF**	**LHS003CC**	+	**SOL2M4**	**MCL301010**	**MADP01**
◉	◉	◉		◉	◉		○	○	○

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

Product Code

Motor

BLM 2 50 D H K - 5 CS

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①	Motor Type	**BLM**: Brushless Motor
②	Frame Size	**0**: 42 mm **2**: 60 mm **4**: 80 mm
③	Output	(Example) **50**: 50 W
④	Identification Symbol	
⑤	Motor Connection Method	**H**: Connector Type
⑥	Power Supply Voltage	**K**: 24 VDC
⑦	Gear Ratio and Shaft Type	Number: Geared Motor Ratio **GFS**: **GFS** Pinion Shaft Type **A**: Round Shaft Type **AC**: Round Shaft Type (With Shaft Flat)
⑧	**CS**: **CS** Geared Motor	

Gearhead

GFS 2 G 5 FR

① ② ③ ④

①	Shaft Type	**GFS**: **GFS** Pinion
②	Combinable Motors Frame Size	**2**: 60 mm **4**: 80 mm
③	Gear Ratio	Number: Gearhead Gear Ratio
④	Gearhead Type	Blank: Parallel Shaft Gearhead **FR**: Hollow Shaft Flat Gearhead

Driver

BLH2D 50 D H - K D

① ② ③ ④ ⑤ ⑥

①	Driver Type	**BLH2D**: **BLH** Series Driver
②	Output	(Example) **50**: 50 W
③	Identification Symbol	
④	Applicable Motor Type	**H**: Connector Type
⑤	Power Supply Voltage	**K**: 24 VDC
⑥	Blank: Analog Setting Type **D**: Digital Setting Type **R**: RS-485 Communication Type	

Connection Cables, Flexible Connection Cables

CC M 020 LAA R

① ② ③ ④ ⑤

①	Cables	**CC**: Cable with Connector **LC**: Connector Leads
②	Cable Type	**M**: For Motor
③	Length	**005**: 0.5 m **010**: 1 m **015**: 1.5 m **020**: 2 m **030**: 3 m **050**: 5 m
④	Applicable Model	**LAA**: **BLH** Series (15 W, 30 W, 50 W)
⑤	**F**: Connection Cable **R**: Flexible Connection Cable	

Power Supply Cable and I/O Signal Cable Set

LH S 003 C D

① ② ③ ④ ⑤

①	Cable Type	**LH**: Cable
②	**S**: Parts Set	
③	Length	**003**: 0.3 m **010**: 1 m
④	**C**: Cable	
⑤	Applicable Type	**C**: Analog Setting Type, RS-485 Communication Type **D**: Digital Setting Type

Product Line

Please purchase the motor, driver, and cables separately.

Motor

◇Geared Motor*

Frame Size–Output	Product Name	Gear Ratio
□42 mm–15 W	**BLM015HK-□**	**5**, **10**, **15**, **20**
		30, **50**, **100**

*A geared motor in which the motor and gearhead are integrated.
The combination of motors and gearheads can cannot be changed.
● A number indicating the gear ratio is specified where the box □ is located in the product name.

◇**CS** Geared Motor*

Frame Size–Output	Product Name	Gear Ratio
□42 mm–15 W	**BLM015HK-□CS**	**5**, **10**, **15**, **20**
□42 mm–30 W	**BLM030DHK-□CS**	**5**, **10**, **15**, **20**
□60 mm–30 W	**BLM230HK-□CS**	**5**, **10**, **15**, **20**
□60 mm–50 W	**BLM250DHK-□CS**	**5**, **10**, **15**, **20**

*A geared motor in which the motor and gearhead are integrated.
The combination of motors and gearheads can cannot be changed.
● A number indicating the gear ratio is specified where the box □ is located in the product name.

◇Pinion Shaft Type

Frame Size–Output	Product Name
□60 mm–30 W	**BLM230HK-GFS**
□80 mm–50 W	**BLM450HK-GFS**

◇Round Shaft Type

Frame Size–Output	Product Name
□42 mm–15 W	**BLM015HK-A**
□42 mm–30 W	**BLM030DHK-A**
□60 mm–30 W	**BLM230HK-A**
□60 mm–50 W	**BLM250DHK-A**
□80 mm–50 W	**BLM450HK-A**

◇Other Product Line

Round Shaft Type
Output Shaft Flat

●For details, contact the Oriental Motor sales office.

●Gearhead

◇Parallel Shaft Gearhead **GFS** Gear

Applicable Motor Frame Size–Output	Product Name	Gear Ratio
□60 mm–30 W	**GFS2G□**	**5**, **10**, **15**, **20**
		30, **50**, **100**
□80 mm–50 W	**GFS4G□**	**5**, **10**, **15**, **20**
		30, **50**, **100**

●A number indicating the gear ratio is specified where the box □ is located in the product name.

◇Hollow Shaft Flat Gearhead **FR** Gear

Applicable Motor Frame Size–Output	Product Name	Gear Ratio
□60 mm–30 W	**GFS2G□FR**	**5**, **10**, **15**, **20**
		30, **50**, **100**
		200
□80 mm–50 W	**GFS4G□FR**	**5**, **10**, **15**, **20**
		30, **50**, **100**
		200

●A number indicating the gear ratio is specified where the box □ is located in the product name.

●Driver

Combined Motor Frame Size	Output Power	Type	Product Name
□42 mm	15 W	Analog Setting Type	**BLH2D15H-K**
		Digital Setting Type	**BLH2D15H-KD**
		RS-485 Communication Type	**BLH2D15H-KR**
	30 W	Analog Setting Type	**BLH2D30DH-K**
		Digital Setting Type	**BLH2D30DH-KD**
		RS-485 Communication Type	**BLH2D30DH-KR**
□60 mm	30 W	Analog Setting Type	**BLH2D30H-K**
		Digital Setting Type	**BLH2D30H-KD**
		RS-485 Communication Type	**BLH2D30H-KR**
	50 W	Analog Setting Type	**BLH2D50DH-K**
		Digital Setting Type	**BLH2D50DH-KD**
		RS-485 Communication Type	**BLH2D50DH-KR**
□80 mm	50 W	Analog Setting Type	**BLH2D50H-K**
		Digital Setting Type	**BLH2D50H-KD**
		RS-485 Communication Type	**BLH2D50H-KR**

●Connection Cables, Flexible Connection Cables

Product Line	Length	Product Name
Connection Cable	0.5 m	**LCM005LAAF**
	1.0 m	**CCM010LAAF**
	1.5 m	**CCM015LAAF**
	2.0 m	**CCM020LAAF**
	3.0 m	**CCM030LAAF**
	5.0 m	**CCM050LAAF**
Flexible Connection Cable	1.0 m	**CCM010LAAR**
	1.5 m	**CCM015LAAR**
	2.0 m	**CCM020LAAR**
	3.0 m	**CCM030LAAR**
	5.0 m	**CCM050LAAR**

●Power Supply Cable and I/O Signal Cable Set

A power supply cable and I/O signal cable come as a set.

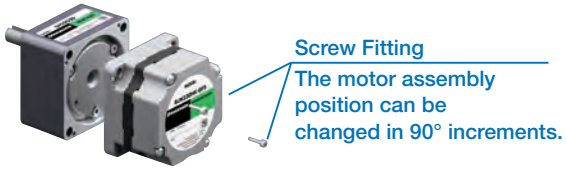
Product Line	Length	Product Name
For Analog Setting Type For RS-485 Communication Type	0.3 m	**LHS003CC**
	1 m	**LHS010CC**
For Digital Setting Type	0.3 m	**LHS003CD**
	1 m	**LHS010CD**

■Included Items

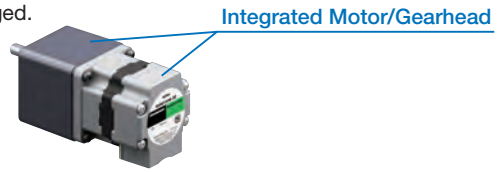
Type	Parallel Key	Safety Cover	Installation Screws
Geared Motor **CS** Geared Motor (□42 mm) Pinion Shaft Round Shaft	–	–	–
CS Geared Motor (□60 mm)	1	–	1 set
Parallel Shaft Gearhead	1	–	1 set
Hollow Shaft Flat Gearhead	1	1 set	1 set
Driver	–	–	–

Explanation of Gearheads

●Parallel Shaft Gearhead **GFS** Gear
●Hollow Shaft Flat Gearhead **FR** Gear
When assembling the motor and gearhead, the motor assembly position can be changed in 90° increments.

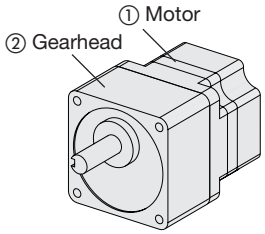


●Geared Motor
●**CS** Geared Motor
The motor and gearhead are integrated.
The combination of motors and gearheads can cannot be changed.

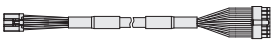


List of Combinations

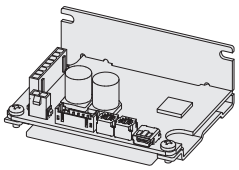
- The drivers are connector type only. Check the table below for the motor and driver combination before use.
- Geared motors have an integrated motor and gearhead. The combination of motors and gearheads can cannot be changed.
- A number indicating the gear ratio is specified where the box □ is located in the product name.



④ Connection Cable
Flexible Connection Cable



③ Driver



⑤ Power Supply Cable and I/O Signal Cable Set

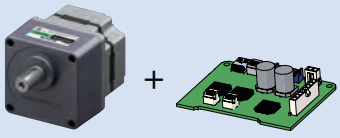
Power Supply Cable

I/O Signal Cable

Frame Size–Output	Type	Motor	Gearhead	Driver			Connection Cable Flexible Connection Cables	Power Supply Cables/ I/O Signals Cables Sets
				Analog Setting Type	Digital Setting Type	RS-485 Communication Type		
		①	②	③			④	⑤
□42 mm –15 W	Geared Motor	**BLM015HK-□**	–	**BLH2D15H-K**	**BLH2D15H-KD**	**BLH2D15H-KR**	**LCM005LAAF** **CCM010LAAF** **CCM015LAAF** **CCM020LAAF** **CCM030LAAF** **CCM050LAAF** **CCM010LAAR** **CCM015LAAR** **CCM020LAAR** **CCM030LAAR** **CCM050LAAR**	Analog Setting Type, RS-485 Communication Type **LHS003CC** **LHS010CC** Digital Setting Type **LHS003CD** **LHS010CD**
	CS Geared Motor	**BLM015HK-□CS**	–					
	Round Shaft Type	**BLM015HK-A**	–					
□42 mm –30 W	**CS** Geared Motor	**BLM030DHK-□CS**	–	**BLH2D30DH-K**	**BLH2D30DH-KD**	**BLH2D30DH-KR**		
	Round Shaft Type	**BLM030DHK-A**	–					
□60 mm –30 W	Parallel Shaft Gearhead **GFS** Gear	**BLM230HK-GFS**	**GFS2G□**	**BLH2D30H-K**	**BLH2D30H-KD**	**BLH2D30H-KR**		
	Hollow Shaft Flat Gearhead **FR** Gear	**BLM230HK-GFS**	**GFS2G□FR**					
	CS Geared Motor	**BLM230HK-□CS**	–					
	Round Shaft Type	**BLM230HK-A**	–					
□60 mm –50 W	**CS** Geared Motor	**BLM250DHK-□CS**	–	**BLH2D50DH-K**	**BLH2D50DH-KD**	**BLH2D50DH-KR**		
	Round Shaft Type	**BLM250DHK-A**	–					
□80 mm –50 W	Parallel Shaft Gearhead **GFS** Gear	**BLM450HK-GFS**	**GFS4G□**	**BLH2D50H-K**	**BLH2D50H-KD**	**BLH2D50H-KR**		
	Hollow Shaft Flat Gearhead **FR** Gear	**BLM450HK-GFS**	**GFS4G□FR**					
	Round Shaft Type	**BLM450HK-A**	–					

Can also be driven by a driver designed by the customer. Allows a standalone motor to be purchased.

Can be driven in combination with a driver designed by the customer. The motor specifications necessary for combination with a driver, such as winding resistance, inductance, maximum permissible current, and induced voltage constant are prepared. For details, please contact an Oriental Motor sales office.



Driver designed by customer.

Parallel Shaft Gearhead

15 W, 30 W, 50 W

Specifications

Motor Frame Size			mm	□42	□60	□80
Product Name	Motor	Connector Type		**BLM015HK-□**	**BLM230HK-GFS**	**BLM450HK-GFS**
	Gearhead			–	**GFS2G□**	**GFS4G□**
	Driver	Analog Setting Type		**BLH2D15H-K**	**BLH2D30H-K**	**BLH2D50H-K**
		Digital Setting Type		**BLH2D15H-KD**	**BLH2D30H-KD**	**BLH2D50H-KD**
		RS-485 Communication Type		**BLH2D15H-KR**	**BLH2D30H-KR**	**BLH2D50H-KR**
Rated Output Power (Continuous)			W	15	30	50
Power Supply Input	Rated Voltage		V	DC 24		
	Permissible Voltage Range			−10 to +10%		
	Rated Input Current		A	0.96	1.8	2.9
	Maximum Input Current ✻1		A	2.5 (2.7)	3.9 (3.9)	5.9 (6.9)
Rated Speed			r/min	3000	2500	
Speed Control Range				100 - 3000 r/min (Speed ratio 1:30) [80 - 3000 r/min (Speed ratio 1:37.5)✻2]		
Speed Regulation		Load		±0.5% (±0.2%✻2) or less: Conditions 0 - rated torque, rated speed, rated voltage, normal ambient temperature		
		Voltage		±0.5% (±0.2%✻2) or less: Conditions Rated voltage±10%, rated speed, no load, normal ambient temperature		
		Temperature		±0.5% (±0.2%✻2) or less: Conditions Operating ambient temperature 0 to +50°C, rated speed, no load, rated voltage		

✻1 Values in parentheses are for use with at least 3 m between the motor and driver.

✻2 Specification for digital setting.

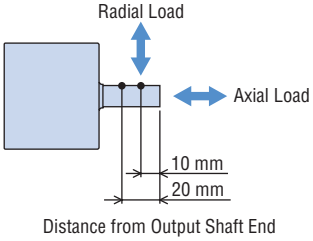
● The values correspond to each specification and characteristics of a stand-alone motor.

● A number indicating the gear ratio is specified where the box □ is located in the product name.

Gear Ratio				**5**	**10**	**15**	**20**	**30**	**50**	**100**
Rotation Direction			15 W	Same direction as the motor			Opposite direction to the motor		Same direction as the motor	
			30 W 50 W	Same direction as the motor				Opposite direction to the motor		
Output Shaft Speed [r/min]✻			80 r/min	16	8	5.3	4	2.7	1.6	0.8
			2500 r/min	500	250	167	125	83	50	25
			3000 r/min	600	300	200	150	100	60	30
Permissible Torque [N·m]		15 W	At 80 - 3000 r/min	0.22	0.43	0.65	0.83	1.2	1.9	2
		30 W	At 80 - 2500 r/min	0.52	1.0	1.6	2.1	3.0	4.9	6
			At 3000 r/min	0.43	0.86	1.3	1.7	2.5	4.1	6
		50 W	At 80 - 2500 r/min	0.86	1.7	2.6	3.4	4.9	8.2	16
			At 3000 r/min	0.72	1.4	2.1	2.9	4.1	6.8	13.7
Permissible Radial Load [N]	From the end of the output shaft 10 mm	15 W		50						
		30 W		100	150			200		
		50 W		200	300			450		
	From the end of the output shaft 20 mm	30 W		150	200			300		
		50 W		250	350			550		
Permissible Axial Load [N]		15 W		30						
		30 W		40						
		50 W		100						
Permissible Inertia J [×10^{-4}kg·m^2]		15 W		3	14	30	50	120	300	600
		30 W		12	50	110	200	370	920	2500
		50 W		22	95	220	350	800	2200	6200
	Instantaneous Stop, Instantaneous Bi-Directional Operation	15 W		0.4	1.7	3.9	7.0	15.7	43.7	
		30 W		1.55	6.2	14.0	24.8	55.8	155	
		50 W		5.5	22	49.5	88	198	550	

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

◇Load Position



Speed – Torque Characteristics

➜ Page 20

CS Geared Motor

15 W, 30 W, 50W

Specifications

Motor Frame Size			mm	□42		□60	
Product Name	Motor	Connector Type		BLM015HK-□CS	BLM030DHK-□CS	BLM230HK-□CS	BLM250DHK-□CS
	Driver	Analog Setting Type		BLH2D15H-K	BLH2D30DH-K	BLH2D30H-K	BLH2D50DH-K
		Digital Setting Type		BLH2D15H-KD	BLH2D30DH-KD	BLH2D30H-KD	BLH2D50DH-KD
		RS-485 Communication Type		BLH2D15H-KR	BLH2D30DH-KR	BLH2D30H-KR	BLH2D50DH-KR
Rated Output Power (Continuous)			W	15	30		50
Power Supply Input	Rated Voltage		V	DC24			
	Permissible Voltage Range			−10 to +10%			
	Rated Input Current		A	0.96	1.8	1.8	2.9
	Max. Input Current*1		A	2.5 (2.7)	4.4 (4.5)	3.9 (3.9)	5.8 (7.0)
Rated Speed			r/min	3000		2500	
Speed Control Range				100 - 3000 r/min (Speed ratio 1:30) [80 - 3000 r/min (Speed ratio 1:37.5)*2]			
Speed Regulation		Load		±0.5% (±0.2%*2) or less: Conditions 0 - rated torque, rated speed, rated voltage, normal ambient temperature			
		Voltage		±0.5% (±0.2%*2) or less: Conditions Rated voltage±10%, rated speed, no load, normal ambient temperature			
		Temperature		±0.5% (±0.2%*2) or less: Conditions Operating ambient temperature 0 to +50°C, rated speed, no load, rated voltage			

*1 Values in parentheses are for use with at least 3 m between the motor and driver.

*2 Specification for digital setting.

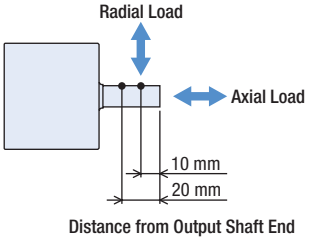
●The values correspond to each specification and characteristics of a stand-alone motor.

●A number indicating the gear ratio is specified where the box □ is located in the product name.

Gear Ratio				5	10	15	20
Rotation Direction				Same direction as motor			
Output Shaft Speed [r/min]*			80 r/min	16	8	5.3	4
			2500 r/min	500	250	167	125
			3000 r/min	600	300	200	150
Permissible Torque [Nm]		□42 mm–15 W	At 80 - 3000 r/min	0.22	0.43	0.65	0.86
		□42 mm–30 W	At 80 - 3000 r/min	0.43	0.86	1.3	1.7
		□60 mm–30 W	At 80 - 2500 r/min	0.52	1.0	1.6	2.1
			At 3000 r/min	0.43	0.86	1.3	1.7
		□60 mm–50 W	At 80 - 2500 r/min	0.86	1.7	2.6	3.4
			At 3000 r/min	0.72	1.4	2.1	2.9
Permissible Radial Load [N]	From the end of the output shaft 10 mm	□42 mm–15 W □42 mm–30 W		50	80		
		□60 mm–30 W □60 mm–50 W		150	200		
	From the end of the output shaft 20 mm	□60 mm–30 W □60 mm–50 W		190	260		
Permissible Axial Load [N]		□42 mm–15 W □42 mm–30 W		40			
		□60 mm–30 W □60 mm–50 W		70			
Permissible Inertia J [×10^{-4}kgm^2]		□42 mm–15 W □42 mm–30 W		12	50	110	200
		□60 mm–30 W □60 mm–50 W		22	95	220	350
	Instantaneous Stop, Instantaneous Bi-Directional Operation	□42 mm–15 W □42 mm–30 W		0.8	3.4	7.8	14
		□60 mm–30 W □60 mm–50 W		3.1	12.4	28	49.6

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

◇Load Position

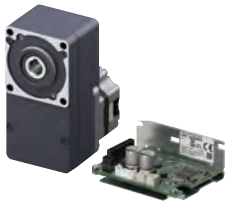


Speed – Torque Characteristics

→ Page 20

Hollow Shaft Flat Gearhead

30 W, 50 W



Specifications

Motor Frame Size			mm	□60	□80
Product Name	Motor	Connector Type		**BLM230HK-GFS**	**BLM450HK-GFS**
	Gearhead			**GFS2G□FR**	**GFS4G□FR**
	Driver	Analog Setting Type		**BLH2D30H-K**	**BLH2D50H-K**
		Digital Setting Type		**BLH2D30H-KD**	**BLH2D50H-KD**
		RS-485 Communication Type		**BLH2D30H-KR**	**BLH2D50H-KR**
Rated Output Power (Continuous)			W	30	50
Power Supply Input	Rated Voltage		V	DC24	
	Permissible Voltage Range			−10 to +10%	
	Rated Input Current		A	1.8	2.9
	Max. Input Current✻1		A	3.9 (3.9)	5.9 (6.9)
Rated Speed			r/min	2500	
Speed Control Range				100 - 3000 r/min (Speed ratio 1:30) [80 - 3000 r/min (Speed ratio 1:37.5)✻2]	
Speed Regulation		Load		±0.5% (±0.2%✻2) or less: Conditions 0 - rated torque, rated speed, rated voltage, normal ambient temperature	
		Voltage		±0.5% (±0.2%✻2) or less: Conditions Rated voltage±10%, rated speed, no load, normal ambient temperature	
		Temperature		±0.5% (±0.2%✻2) or less: Conditions Operating ambient temperature 0 to +50°C, rated speed, no load, rated voltage	

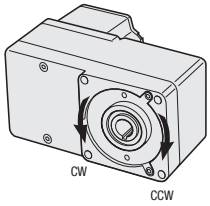
✻1 Values in parentheses are for use with at least 3 m between the motor and driver.
✻2 Specification for digital setting.
●The values correspond to each specification and characteristics of a stand-alone motor.
●A number indicating the gear ratio is specified where the box □ is located in the product name.

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
			2500 r/min	500	250	167	125	83	50	25	12.5
			3000 r/min	600	300	200	150	100	60	30	15
Permissible Torque [Nm]		30 W	At 80 - 2500 r/min	0.46	0.98	1.5	2.0	2.9	4.9	9.8	17
			At 3000 r/min	0.38	0.82	1.2	1.6	2.4	4.1	8.2	16.3
		50 W	At 80 - 2500 r/min	0.81	1.6	2.4	3.2	4.9	8.1	16.2	32.5
			At 3000 r/min	0.68	1.4	2.0	2.7	4.1	6.8	13.5	27
Permissible Radial Load [N]✻2	From installation surface 10 mm	30 W		450		500					
		50 W		800		1200					
	From installation surface 20 mm	30 W		370		400					
		50 W		660		1000					
Permissible Axial Load [N]		30 W		200							
		50 W		400							
Permissible Inertia J [×10^{-4}kgm^2]		30 W		12	50	110	200	370	920	2500	5000
		50 W		22	95	220	350	800	2200	6200	12000
	Instantaneous Stop, Instantaneous Bi-Directional Operation	30 W		1.55	6.2	14.0	24.8	55.8	155		
		50 W		5.5	22	49.5	88	198	550		

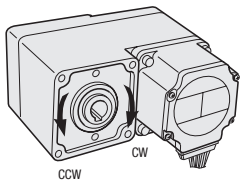
✻1 The output shaft speed is the speed divided by the gear ratio.
✻2 The radial load at each distance can also be calculated with a formula. ➜ Page 60

◇Rotation Direction

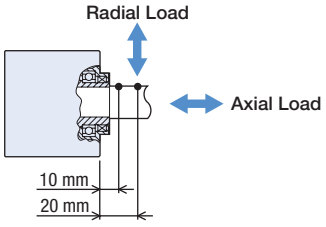
•Viewed from front face



•Viewed from back face



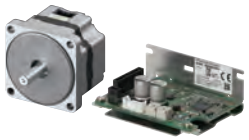
◇Load Position



Speed – Torque Characteristics

➜ Page 20

Round Shaft 15 W, 30 W, 50 W

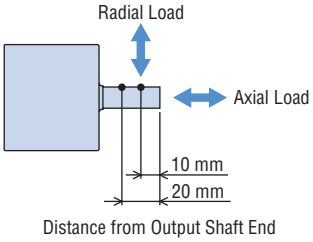


Specifications

Motor Frame Size			mm	□42		□60		□80
Product Name	Motor	Connector Type		BLM015HK-A	BLM030DHK-A	BLM230HK-A	BLM250DHK-A	BLM450HK-A
	Driver	Analog Setting Type		BLH2D15H-K	BLH2D30DH-K	BLH2D30H-K	BLH2D50DH-K	BLH2D50H-K
		Digital Setting Type		BLH2D15H-KD	BLH2D30DH-KD	BLH2D30H-KD	BLH2D50DH-KD	BLH2D50H-KD
		RS-485 Communication Type		BLH2D15H-KR	BLH2D30DH-KR	BLH2D30H-KR	BLH2D50DH-KR	BLH2D50H-KR
Rated Output Power (Continuous)			W	15	30		50	
Power Supply Input	Rated Voltage		V	DC 24				
	Permissible Voltage Range			−10 to +10%				
	Rated Input Current		A	0.96	1.8	1.8	2.9	2.9
	Maximum Input Current*1		A	2.5 (2.7)	4.4 (4.5)	3.9 (3.9)	5.8 (7.0)	5.9 (6.9)
Rated Speed			r/min	3000		2500		
Speed Control Range				100 - 3000 r/min (Speed ratio 1:30) [80 - 3000 r/min (Speed ratio 1:37.5) *2]				
Rated Torque			Nm	0.048	0.096	0.115	0.191	0.191
Maximum Instaneous Torque			Nm	0.072	0.144	0.173	0.287	0.287
Permissible Radial Load		From the end of the output shaft 10 mm	N	50	50	70	70	120
		From the end of the output shaft 20 mm	N	–	–	100	100	140
Permissible Axial Load			N	5	5	15	15	20
Rotor Inertia J			$\times 10^{-4}$kgm^2	0.016	0.027	0.058	0.098	0.16
Permissible Inertia J			$\times 10^{-4}$kgm^2	0.5	1.8	1.8	3.3	3.3
Speed Regulation	Load			±0.5% (±0.2%*2) or less: Conditions 0~rated torque, rated speed, rated voltage, normal ambient temperature				
	Voltage			±0.5% (±0.2%*2) or less: Conditions Rated voltage±10%, rated speed, no load, normal ambient temperature				
	Temperature			±0.5% (±0.2%*2) or less: Conditions Operating ambient temperature 0 to +50°C, rated speed, no load, rated voltage				

*1 Values in parentheses are for use with at least 3 m between the motor and driver.
*2 Specification for digital setting.

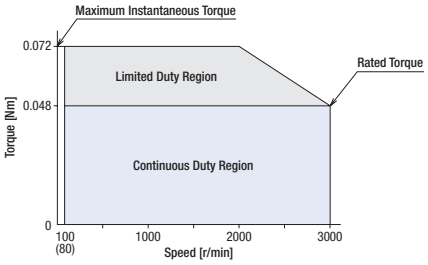
◇Load Position



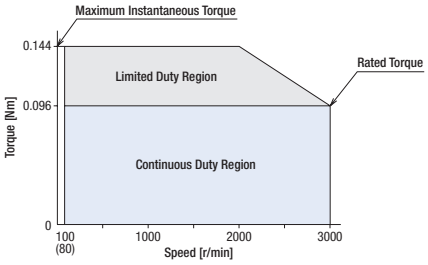
Speed - Torque Characteristics

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

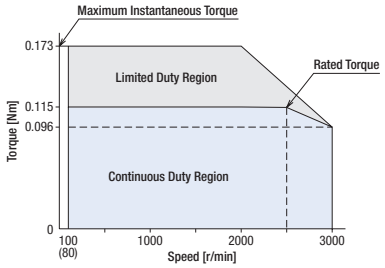
●□42 mm–15 W



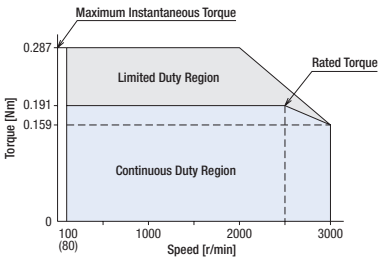
●□42 mm–30 W



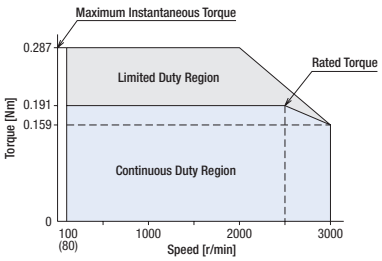
●□60 mm–30 W



●□60 mm–50 W



●□80 mm–50 W



●Each specification and characteristic is the value when 24 VDC and a cable length of 0.5 m is used.

Dimensions (Unit = mm)

● Check "■ Included" for the products that include the installation screws. Included ➜ Page 15 Installation Screw Dimensions ➜ Page 25
● A number indicating the gear ratio is specified where the box □ is located in the product name.

●Motor (Connector Type)

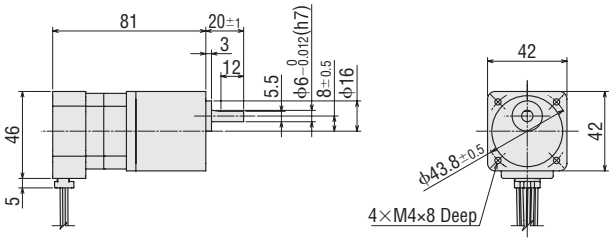
◇Geared Motor

•□42 mm-15 W

BLM015HK-□

Mass: 0.39 kg

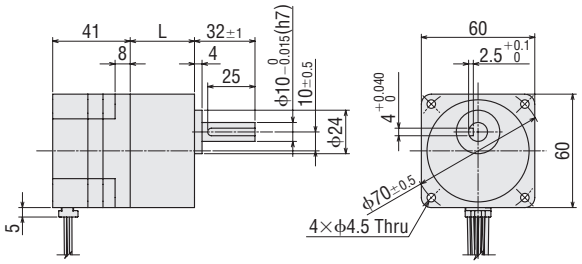
2D CAD A1820 3D CAD



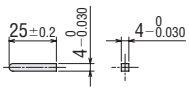
◇Parallel Shaft Gearhead **GFS** Gear

•□60 mm-30 W 2D & 3D CAD

Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass [kg]		CAD
				Motor	Gearhead	
BLM230HK-GFS	**GFS2G□**	**5 - 20**	34	0.34	0.28	A1824A
		30 - 100	38		0.33	A1824B

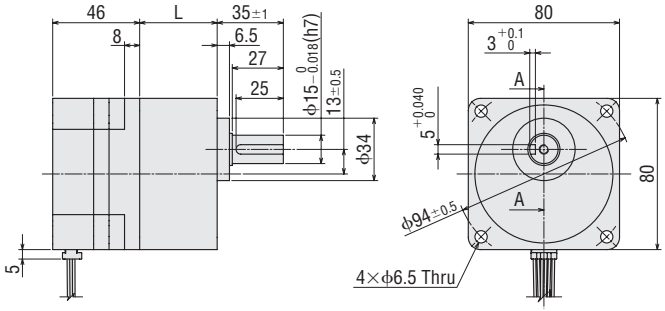


Parallel Key (Included)

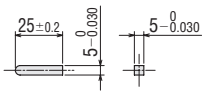


•□80 mm-50 W 2D & 3D CAD

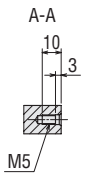
Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass [kg]		CAD
				Motor	Gearhead	
BLM450HK-GFS	**GFS4G□**	**5 - 20**	41	0.65	0.67	A1832A
		30 - 100	46		0.79	A1832B



Parallel Key (Included)



A-A



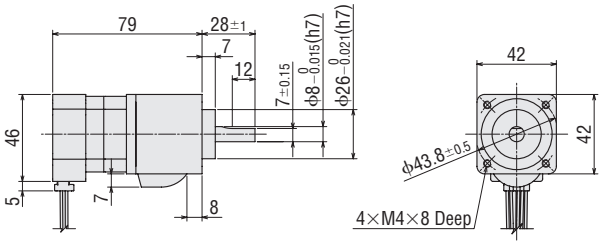
◇**CS** Geared Motor

●□42 mm-15 W

BLM015HK-□CS

Mass: 0.36 kg

2D CAD A1821 3D CAD

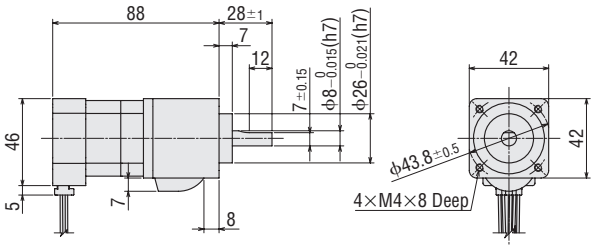


●□42 mm-30 W

BLM030DHK-□CS

Mass: 0.44 kg

2D CAD A1829 3D CAD

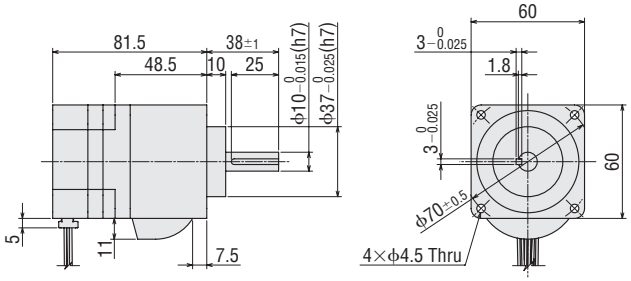


●□60 mm-30 W

BLM230HK-□CS

Mass: 0.74 kg

2D CAD A1828 3D CAD

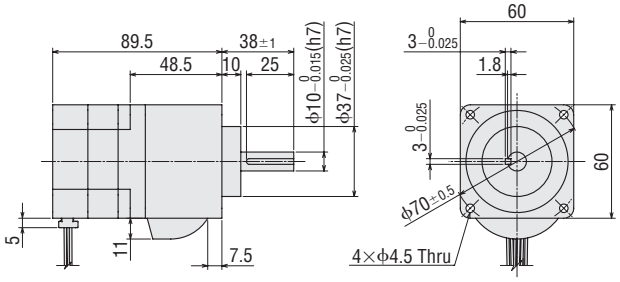


●□60 mm-50 W

BLM250DHK-□CS

Mass: 0.87 kg

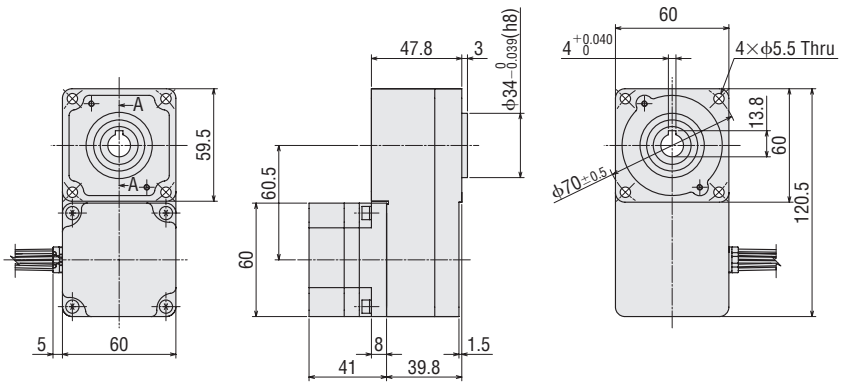
2D CAD A1836 3D CAD



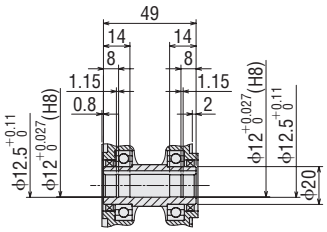
◇Hollow Shaft Flat Gearhead **FR** Gear

●□60 mm-30 W

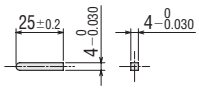
Motor: **BLM230HK-GFS**
Gearhead: **GFS2G□FR**
Motor Mass: 0.34 kg
Gearhead Mass: 0.8 kg
2D CAD A1825 3D CAD



A-A

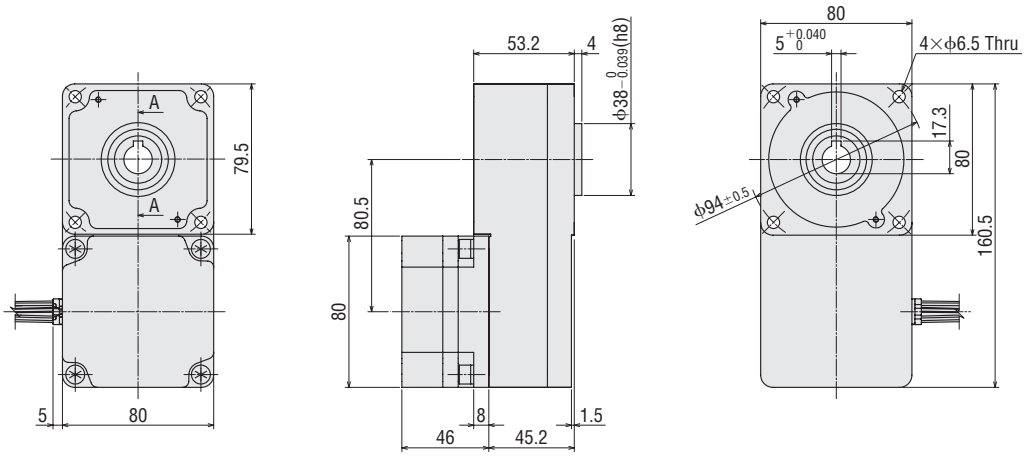


Parallel Key (Included)

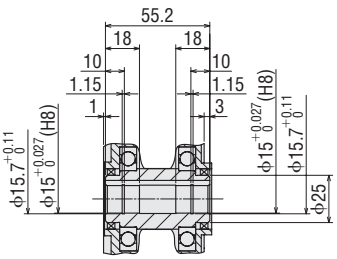


●□80 mm-50 W

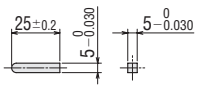
Motor: **BLM450HK-GFS**
Gearhead: **GFS4G□FR**
Motor Mass: 0.65 kg
Gearhead Mass: 1.6 kg
2D CAD A1833 3D CAD



A-A



Parallel Key (Included)



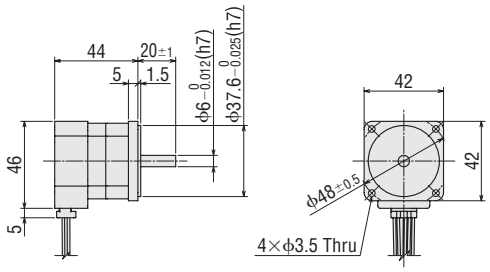
◇Round Shaft Type

●□42 mm-15 W

BLM015HK-A

Mass: 0.19 kg

2D CAD A1822 3D CAD

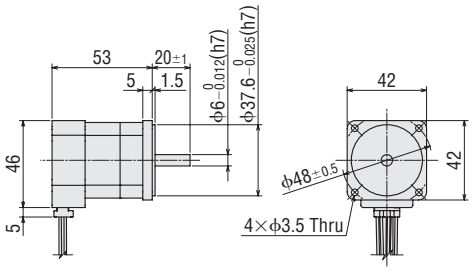


●□42 mm-30 W

BLM030DHK-A

Mass: 0.27 kg

2D CAD A1830 3D CAD

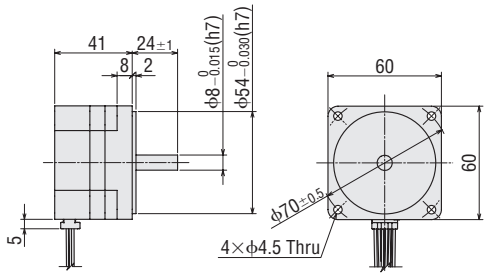


●□60 mm-30 W

BLM230HK-A

Mass: 0.34 kg

2D CAD A1826 3D CAD

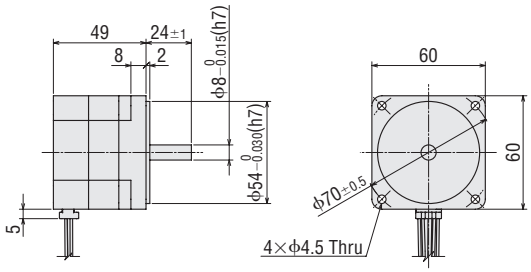


●□60 mm-50 W

BLM250DHK-A

Mass: 0.47 kg

2D CAD A1837 3D CAD

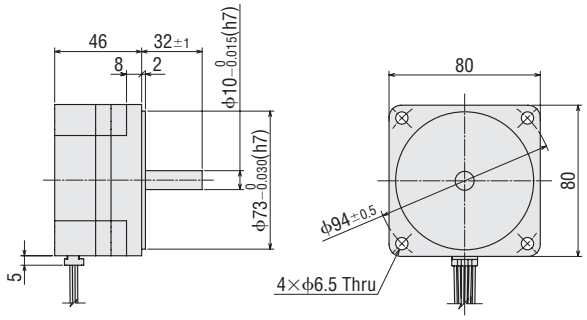


●□80 mm-50 W

BLM450HK-A

Mass: 0.65 kg

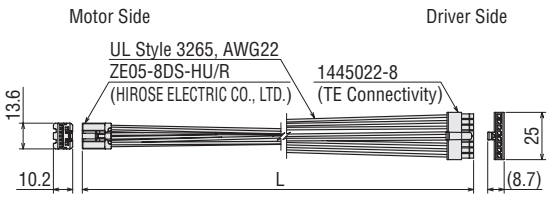
2D CAD A1834 3D CAD



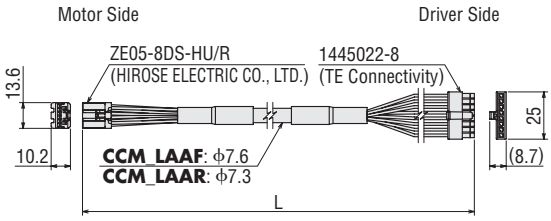
●Connection Cables, Flexible Connection Cables

Product Line	Length L [m]	Product Name	Mass [kg]
Connection Cable	0.5	**LCM005LAAF**	0.03
	1	**CCM010LAAF**	0.07
	1.5	**CCM015LAAF**	0.11
	2	**CCM020LAAF**	0.15
	3	**CCM030LAAF**	0.22
	5	**CCM050LAAF**	0.37
Flexible Connection Cable	1	**CCM010LAAR**	0.07
	1.5	**CCM015LAAR**	0.11
	2	**CCM020LAAR**	0.14
	3	**CCM030LAAR**	0.21
	5	**CCM050LAAR**	0.35

LCM■LAAF



CCM■LAAF, **CCM■LAAR**



●A number indicating the cable length is specified where the box ■ is located in the product name.

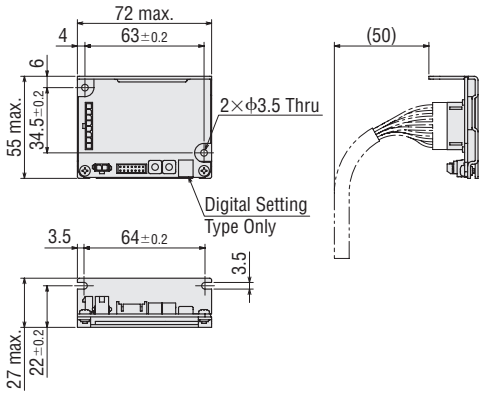
Driver

BLH2D15H-K, **BLH2D30(D)H-K**, **BLH2D50(D)H-K**
BLH2D15H-KD, **BLH2D30(D)H-KD**, **BLH2D50(D)H-KD**
BLH2D15H-KR, **BLH2D30(D)H-KR**, **BLH2D50(D)H-KR**
Mass: 46 g

Analog Setting Type
2D CAD A1678 3D CAD

Digital Setting Type
2D CAD A1679 3D CAD

RS-485 Communication Type
2D CAD A1722 3D CAD

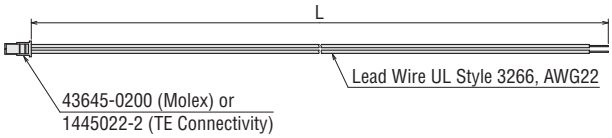


Power Supply Cable and I/O Signal Cable Set

Length L [m]	Product Name	Components	
		Power Supply Cable	I/O Signal Cable
0.3	**LHS003CC**	**LH003C1**	**LH003C3**
	LHS003CD	**LH003C1**	**LH003C4**
1	**LHS010CC**	**LH010C1**	**LH010C3**
	LHS010CD	**LH010C1**	**LH010C4**

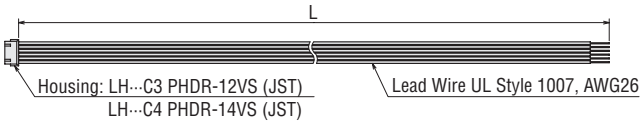
◇Power Supply Cable

LH003C1/LH010C1



◇I/O Signal Cable

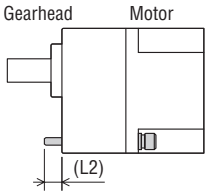
LH003C3/LH003C4/LH010C3/LH010C4



Installation Screw Dimensions

L2 is the dimensions when a flat washer and spring washer are installed on the head side of the screw.

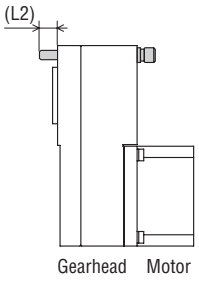
◇Parallel Shaft Gearhead



Product Name	Gear Ratio	Installation Screws		L2 [mm]
		Type of Screw	L1 [mm]	
GFS2G□	**5 - 20**	M4	50	6
	30 - 100		55	7
GFS4G□	**5 - 20**	M6	60	8
	30 - 100		65	8
BLM230HK-□CS **BLM250DHK-□CS**	**5 - 20**	M4	60	10

- Installation screws: 4 flat washers and spring washers are included, Materials: Stainless steel
- A number indicating the gear ratio is specified where the box □ is located in the product name.

◇Hollow Shaft Flat Gearhead



Product Name	Gear Ratio	Installation Screws		L2 [mm]
		Type of Screw	L1 [mm]	
GFS2G□FR	**5 - 200**	M5	65	15
GFS4G□FR	**5 - 200**	M6	70	14
GFS5G□FR	**5 - 200**	M8	90	21

- Installation screws: 4 flat washers, spring washers and hexagonal nuts are included.
- A number indicating the gear ratio is specified where the box □ is located in the product name.

BLH Series Cable Type

System Configuration

◉ Required for Operation
○ Optional Accessory

● When Using Support Software **MEXE02**

Support Software MEXE02

To USB Port

● Support software **MEXE02** can be downloaded from the website.

USB Cable Not supplied.

◉ Motor

◉ Driver

Note

The driver does not come with connectors for motors, power supplies, I/O signals, or for RS-485 communication. A power supply cable can be purchased from Oriental Motor. Alternatively a connector can be arranged by the customer. Please confirm the part number of the connector by referring to the product name on the dimension drawing for each cable or the Operating Manual.
· Connection cable dimensions drawing ➜ Page 43
· Power supply, I/O signal cable dimensions drawing ➜ Page 57
· RS-485 communication cable dimensions drawing ➜ Page 58

○ Connection Cable/Flexible Connection Cable
➜ Page 57

Max. Extension Length: 5 m* (Including 0.5 m motor cable)

*2 m for the 100 W type.

◉ Cable Set (Power Supply Cable/I/O Signal Cable)

Not supplied.
24 VDC Power Supply (Main Power Supply)

Host Control Device

· Power Supply Cable

· I/O Signal Cable

● When Controlling with RS-485 Communication

Host Control Device

[Between Driver and Host] RS-485 Communication Cable (3.0 m)

[Between Drivers] RS-485 Communication Cable (0.15 m)

[Between Drivers] RS-485 Communication Cable (0.15 m)

○ Accessory for Motor

Mounting Brackets for Motor and Gearhead
➜ Page 58

Flexible Couplings
➜ Page 58

○ Accessory for Driver

External Speed Potentiometer
➜ Page 58

DIN Rail Mounting Bracket
➜ Page 58

Driver Cover
➜ Page 58

RS-485 Communication Cable (0.15 m)
➜ Page 58

RS-485 Communication Cable (3.0 m)
➜ Page 58

○ **Flange Drive Adapter** ➜ Page 58

These products allow for greatly increased permissible load with the installation of a gearhead.
For use with parallel shaft gearhead GFS gears with an output power 100 W.

●Example of System Configuration

Motor	Gearhead	Driver		Cables			Accessory		
				Connection Cable	Cable Set		Motor/Gearhead Mounting Brackets	Flexible Couplings	DIN Rail Mounting Brackets
BLHM230K-GFS	**GFS2G5**	**BLH2D30-KR**	+	**CC02BLH**	**LHS003CC**	+	**SOL2M4**	**MCL301010**	**MADP01**
◉	◉	◉		○	◉		○	○	○

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

Product Code

Motor

BLHM 4 50 K C M-GFS

① ② ③ ④ ⑤ ⑥ ⑦

①	Motor Type	**BLHM**: Brushless Motors
②	Frame Size	**0**: 42 mm **2**: 60 mm **4**: 80 mm **5**: 90 mm
③	Output	(Example) **50**: 50 W
④	Power Supply Voltage	**K**: 24 VDC
⑤	**C**: Cable Type	
⑥	**M**: Electromagnetic Brake Motor	
⑦	Gear Ratio and Shaft Type	Number: Geared Motor Ratio **GFS**: **GFS** Pinion Shaft Type **A**: Round Shaft Type

Gearhead

GFS 4 G 5 FR

① ② ③ ④

①	Shaft Type	**GFS**: **GFS** Pinion
②	Combinable Motors Frame Size	**2**: 60 mm **4**: 80 mm **5**: 90 mm
③	Gear Ratio	Number: Gearhead Gear Ratio
④	Gearhead Type	Blank: Parallel Shaft Gearhead **FR**: Hollow Shaft Flat Gearhead

Driver

BLH2D 50 - K D

① ② ③ ④

①	Driver Type	**BLH2D**: **BLH** Series Driver (15 W, 30 W, 50 W) **BLHD**: **BLH** Series Driver (100 W)
②	Output	(Example) **50**: 50 W
③	Power Supply Voltage	**-K**: 24 VDC (15 W, 30 W, 50 W) **K**: 24 VDC (100 W)
④	Blank: Analog Setting Type **D**: Digital Setting Type **R**: RS-485 Communication Type	

Connection Cables, Flexible Connection Cables

CC 02 BLH R

① ② ③ ④

①	Cable Type	**CC**: Connection Cable
②	Length	**02**: 1.5 m **03**: 2.5 m **05**: 4.5 m
③	Applicable Model	**BLH**: Brushless Motor (15 W, 30 W, 50 W) **AXH2**, **BLH2**: Brushless Motor (100 W)
④	Blank: Connection Cable **R**: Flexible Connection Cable	

Power Supply Cable and I/O Signal Cable Set (for 15 W, 30 W, 50 W)

LH S 003 C D

① ② ③ ④ ⑤

①	Cable Type	**LH**: Cable
②	**S**: Parts Set	
③	Length	**003**: 0.3 m **010**: 1 m
④	**C**: Cable	
⑤	Applicable Type	**C**: Analog Setting Type, RS-485 Communication Type **D**: Digital Setting Type

Product Line

Please purchase the motor, driver, and cables separately.

Motor (Lead Wire Type)

◇Geared Motor*

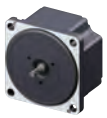
Output Power	Product Name	Gear Ratio
15 W	**BLHM015K-□**	**5, 10, 15, 20**
		30, 50, 100

*A geared motor in which the motor and gearhead are integrated.
The combination of motors and gearheads can cannot be changed.

●A number indicating the gear ratio is specified where the box □ is located in the product name.

◇Round Shaft Type

Output Power	Product Name
15 W	**BLHM015K-A**
30 W	**BLHM230K-A**
50 W	**BLHM450K-A**
100 W	**BLHM5100K-A**



◇Pinion Shaft Type

Output Power	Product Name
30 W	**BLHM230K-GFS**
50 W	**BLHM450K-GFS**
100 W	**BLHM5100K-GFS**

Motor (Cable Type)

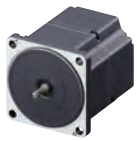
◇Pinion Shaft Type

Output Power	Product Name
30 W	**BLHM230KC-GFS**
50 W	**BLHM450KC-GFS**
100 W	**BLHM5100KC-GFS**

◇Round Shaft Type

Output Power	Product Name
30 W	**BLHM230KC-A**
50 W	**BLHM450KC-A**
100 W	**BLHM5100KC-A**

Electromagnetic Brake Motor (Cable type)



◇Pinion Shaft Type

Output Power	Product Name
30 W	**BLHM230KCM-GFS**
50 W	**BLHM450KCM-GFS**
100 W	**BLHM5100KCM-GFS**

◇Round Shaft Type

Output Power	Product Name
30 W	**BLHM230KCM-A**
50 W	**BLHM450KCM-A**
100 W	**BLHM5100KCM-A**

Gearhead

◇Parallel Shaft Gearhead **GFS** Gear

Applicable Motor Output Power	Product Name	Gear Ratio
30 W	**GFS2G□**	**5, 10, 15, 20**
		30, 50, 100
		200
50 W	**GFS4G□**	**5, 10, 15, 20**
		30, 50, 100
		200
100 W	**GFS5G□**	**5, 10, 15, 20**
		30, 50, 100
		200

●A number indicating the gear ratio is specified where the box □ is located in the product name.

◇Hollow Shaft Flat Gearhead **FR** Gear

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

●A number indicating the gear ratio is specified where the box □ is located in the product name.

●Driver

◇Analog Setting Type

Output Power	Product Name
15 W	**BLH2D15-K**
30 W	**BLH2D30-K**
50 W	**BLH2D50-K**
100 W	**BLHD100K**

◇Digital Setting Type

Output Power	Product Name
15 W	**BLH2D15-KD**
30 W	**BLH2D30-KD**
50 W	**BLH2D50-KD**

◇RS-485 Communication Type

Output Power	Product Name
15 W	**BLH2D15-KR**
30 W	**BLH2D30-KR**
50 W	**BLH2D50-KR**

●Connection Cables, Flexible Connection Cables

Used to extend the distance between the motor and the driver.

◇For 15 W, 30 W, and 50 W

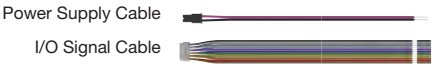
Product Line	Length	Product Name
Connection Cable	1.5 m	**CC02BLH**
	2.5 m	**CC03BLH**
	4.5 m	**CC05BLH**
Flexible Connection Cable	1.5 m	**CC02BLHR**
	2.5 m	**CC03BLHR**
	4.5 m	**CC05BLHR**

◇For 100 W

Product Line	Length	Product Name
Connection Cable	1.5 m	**CC02AXH2**
Flexible Connection Cable		**CC02BLH2R**

●Power Supply Cable and I/O Signal Cable Set (for 15 W, 30 W, 50 W)

A power supply cable and I/O signal cable come as a set.



Product Line	Length	Product Name
For Analog Setting Type For RS-485 Communication Type	0.3 m	**LHS003CC**
	1 m	**LHS010CC**
For Digital Setting Type	0.3 m	**LHS003CD**
	1 m	**LHS010CD**

■Included Items

●Motor, Gearhead

Type	Varistor	Parallel Key	Safety Cover	Installation Screws
Motor	–	–	–	–
Electromagnetic Brake Motor	1 piece	–	–	–
Parallel Shaft Gearhead **GFS** Gear	–	1	–	1 set
Hollow Shaft Flat Gearhead **FR** Gear	–	1	1 set	1 set

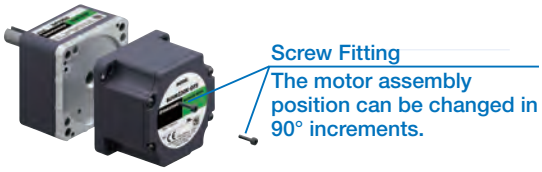
●Driver

Output Power	Power Supply Cable	I/O Signal Cable
15 W 30 W 50 W	–	–
100 W	1	1

Explanation of Gearheads

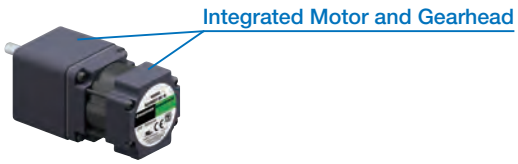
●Parallel Shaft Gearhead **GFS** Gear
●Hollow Shaft Flat Gearhead **FR** Gear

When assembling the motor and gearhead, the motor assembly position can be changed in 90° increments.



●Geared Motor

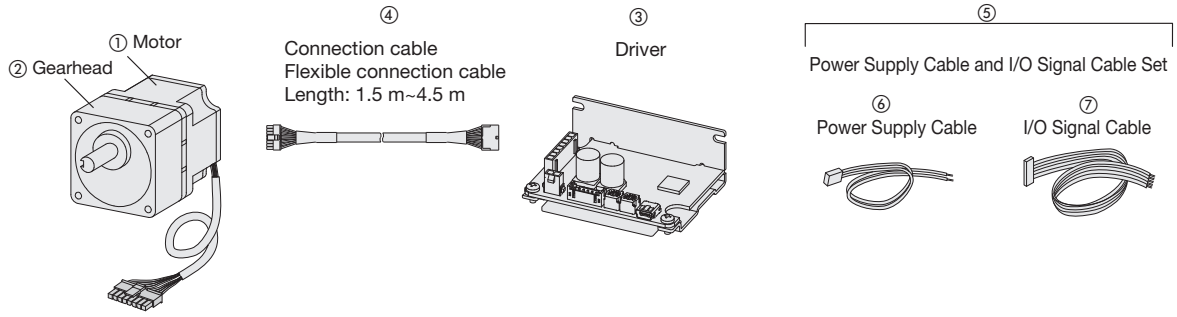
The geared motor has an integrated motor and gearhead.
Motor and gearhead combinations cannot be changed.



List of Combinations

The drivers are specifically for lead wire type and cable type. Check the table below for the motor and driver combination before use.

15 W, 30 W, 50 W



◇Analog Setting Type

Output Power	Type	Motor	Gearhead	Driver	Connection Cable Flexible Connection Cable	Power Supply Cables/ I/O Signal Cable Sets		
		Product Name	Product Name	Product Name	Product Name	Product Name	Component Name	
		①	②	③	④	⑤	⑥	⑦
15 W	Geared Motor*	**BLHM015K-□**	–	**BLH2D15-K**	**CC02BLH** **CC03BLH** **CC05BLH** **CC02BLHR** **CC03BLHR** **CC05BLHR**	**LHS003CC** **LHS010CC**	**LH003C1** **LH010C1**	**LH003C3** **LH010C3**
	Round Shaft Type	**BLHM015K-A**	–					
30 W	Parallel Shaft Gearhead **GFS** Gear	**BLHM230K□-GFS**	**GFS2G□**	**BLH2D30-K**				
	Hollow Shaft Flat Gearhead **FR** Gear	**BLHM230K□-GFS**	**GFS2G□FR**					
	Round Shaft Type	**BLHM230K□-A**	–					
50 W	Parallel Shaft Gearhead **GFS** Gear	**BLHM450K□-GFS**	**GFS4G□**	**BLH2D50-K**				
	Hollow Shaft Flat Gearhead **FR** Gear	**BLHM450K□-GFS**	**GFS4G□FR**					
	Round Shaft Type	**BLHM450K□-A**	–					

◇Digital Setting Type

Output Power	Type	Motor	Gearhead	Driver	Connection Cable Flexible Connection Cable	Power Supply Cables/ I/O Signal Cable Sets		
		Product Name	Product Name	Product Name	Product Name	Product Name	Component Name	
		①	②	③	④	⑤	⑥	⑦
15 W	Geared Motor*	**BLHM015K-□**	–	**BLH2D15-KD**	**CC02BLH** **CC03BLH** **CC05BLH** **CC02BLHR** **CC03BLHR** **CC05BLHR**	**LHS003CD** **LHS010CD**	**LH003C1** **LH010C1**	**LH003C4** **LH010C4**
	Round Shaft Type	**BLHM015K-A**	–					
30 W	Parallel Shaft Gearhead **GFS** Gear	**BLHM230K□-GFS**	**GFS2G□**	**BLH2D30-KD**				
	Hollow Shaft Flat Gearhead **FR** Gear	**BLHM230K□-GFS**	**GFS2G□FR**					
	Round Shaft Type	**BLHM230K□-A**	–					
50 W	Parallel Shaft Gearhead **GFS** Gear	**BLHM450K□-GFS**	**GFS4G□**	**BLH2D50-KD**				
	Hollow Shaft Flat Gearhead **FR** Gear	**BLHM450K□-GFS**	**GFS4G□FR**					
	Round Shaft Type	**BLHM450K□-A**	–					

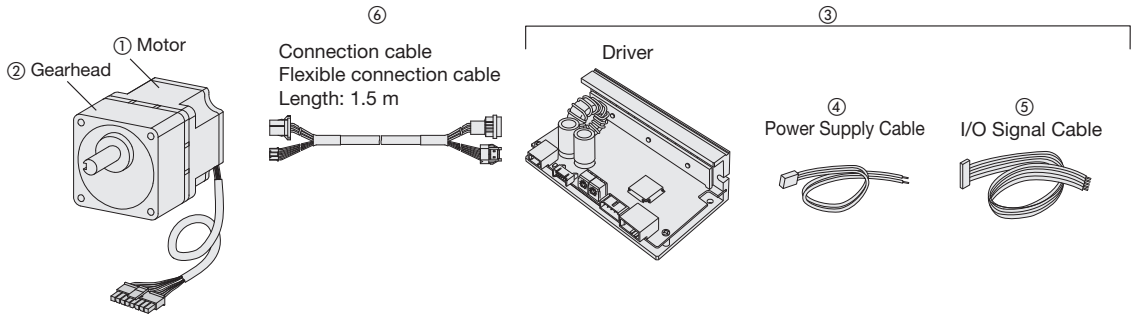
◇RS-485 Communication Type

Output Power	Type	Motor	Gearhead	Driver	Connection Cable Flexible Connection Cable	Power Supply Cables/ I/O Signal Cable Sets		
		Product Name	Product Name	Product Name	Product Name	Product Name	Component Name	
		①	②	③	④	⑤	⑥	⑦
15 W	Geared Motor*	**BLHM015K-□**	–	**BLH2D15-KR**	**CC02BLH** **CC03BLH** **CC05BLH** **CC02BLHR** **CC03BLHR** **CC05BLHR**	**LHS003CC** **LHS010CC**	**LH003C1** **LH010C1**	**LH003C3** **LH010C3**
	Round Shaft Type	**BLHM015K-A**	–					
30 W	Parallel Shaft Gearhead **GFS** Gear	**BLHM230K□-GFS**	**GFS2G□**	**BLH2D30-KR**				
	Hollow Shaft Flat Gearhead **FR** Gear	**BLHM230K□-GFS**	**GFS2G□FR**					
	Round Shaft Type	**BLHM230K□-A**	–					
50 W	Parallel Shaft Gearhead **GFS** Gear	**BLHM450K□-GFS**	**GFS4G□**	**BLH2D50-KR**				
	Hollow Shaft Flat Gearhead **FR** Gear	**BLHM450K□-GFS**	**GFS4G□FR**					
	Round Shaft Type	**BLHM450K□-A**	–					

*A geared motor in which the motor and gearhead are integrated. The combination of motors and gearheads can cannot be changed.

Either **C** for cable type or **CM** for electromagnetic brake motor is specified where the box □ is located in the product name.
A number indicating the gear ratio is specified where the box □ is located in the product name.

●100 W



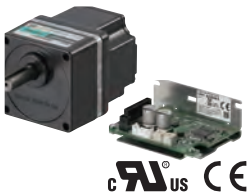
◇Analog Setting Type

Output Power	Type	Motor	Gearhead	Driver			Connection Cable Flexible Connection Cable
		Product Name	Product Name	Product Name	Power Supply Cable (Included)	I/O Signal Cable (Included)	Product Name
		①	②	③	④	⑤	⑥
100 W	Parallel Shaft Gearhead **GFS** Gear	**BLHM5100K□-GFS**	**GFS5G□**	**BLHD100K**	**LH003C2**	**LH003C3**	**CC02AXH2** **CC02BLH2R**
	Hollow Shaft Flat Gearhead **FR** Gear	**BLHM5100K□-GFS**	**GFS5G□FR**				
	Round Shaft Type	**BLHM5100K□-A**	–				

●Either **C** for cable type or **CM** for electromagnetic brake motor is specified where the box □ is located in the product name.
A number indicating the gear ratio is specified where the box □ is located in the product name.

Parallel Shaft Gearhead

15 W, 30 W, 50 W, 100 W



Specifications

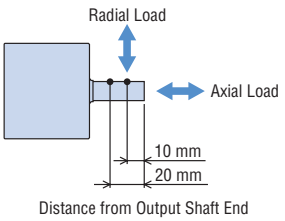
Product Name	Motor	Cable Type	–	BLHM230KC-GFS	BLHM450KC-GFS	BLHM5100KC-GFS
		With Electromagnetic Brake	–	BLHM230KCM-GFS	BLHM450KCM-GFS	BLHM5100KCM-GFS
	Gearhead		–	GFS2G□	GFS4G□	GFS5G□
	Driver	Analog Setting Type	BLH2D15-K	BLH2D30-K	BLH2D50-K	BLHD100K
		Digital Setting Type	BLH2D15-KD	BLH2D30-KD	BLH2D50-KD	–
		RS-485 Communication Type	BLH2D15-KR	BLH2D30-KR	BLH2D50-KR	–
Rated Output Power (Continuous) W			15	30	50	100
Power Supply Input	Rated Voltage V		DC 24			
	Permissible Voltage Range		−10 to +10%			
	Rated Input Current A		0.93	1.9	2.9	6.0
	Maximum Input Current*1 A		2.3 (2.4)	4.1 (4.2)	5.4 (6.1)	9.8
Rated Speed r/min			3000	2500		
Speed Control Range			100 - 3000 r/min (Speed ratio 1:30) [80 - 3000 r/min (Speed ratio 1:37.5)*2]			
Speed Regulation	Load		±0.5% (±0.2%*2) or less: Conditions 0~rated torque, rated speed, rated voltage, normal ambient temperature			
	Voltage		±0.5% (±0.2%*2) or less: Conditions Rated voltage±10%, rated speed, no load, normal ambient temperature			
	Temperature		±0.5% (±0.2%*2) or less: Conditions Operating ambient temperature 0 to +50°C, rated speed, no load, rated voltage			
Electromagnetic Brake	Type		–	Power Off Activated Type		
	Static Friction Torque Nm		–	0.12	0.2	0.4

*1 Values in parentheses are for use with at least 3 m between the motor and driver.
*2 Specification for digital setting.
● The values correspond to each specification and characteristics of a stand-alone motor.
● A number indicating the gear ratio is specified where the box □ is located in the product name.

Gear Ratio				5	10	15	20	30	50	100	200
Rotation Direction			15 W	Same direction as the motor			Opposite direction to the motor		Same direction as the motor		–
			30 W 50 W 100 W	Same direction as the motor				Opposite direction to the motor			Same direction as the motor
Output Shaft Speed [r/min]*			80 r/min	16	8	5.3	4	2.7	1.6	0.8	0.4
			2500 r/min	500	250	167	125	83	50	25	12.5
			3000 r/min	600	300	200	150	100	60	30	15
Permissible Torque [Nm]			15 W At 80 - 3000 r/min	0.22	0.43	0.65	0.83	1.2	1.9	2	–
			30 W At 80 - 2500 r/min	0.52	1.0	1.6	2.1	3.0	4.9	6	6
			30 W At 3000 r/min	0.43	0.86	1.3	1.7	2.5	4.1	6	6
			50 W At 80 - 2500 r/min	0.86	1.7	2.6	3.4	4.9	8.2	16	16
			50 W At 3000 r/min	0.72	1.4	2.1	2.9	4.1	6.8	13.7	16
			100 W At 100 - 2500 r/min	1.8	3.6	5.4	7.2	10.3	17.2	30	30
			100 W At 3000 r/min	0.90	1.8	2.7	3.6	5.2	8.6	17.2	30
Permissible Radial Load [N]	From the end of the output shaft 10 mm		15 W	50							–
			30 W	100	150			200			
			50 W	200	300			450			
			100 W	300	400			500			
	From the end of the output shaft 20 mm		30 W	150	200			300			
			50 W	250	350			550			
			100 W	400	500			650			
Permissible Axial Load [N]			15 W	30							
			30 W	40							
			50 W	100							
			100 W	150							
Permissible Inertia J [×10^{-4}kgm^2]			15 W	3	14	30	50	120	300	600	–
			30 W	12	50	110	200	370	920	2500	5000
			50 W	22	95	220	350	800	2200	6200	12000
			100 W	45	190	420	700	1600	4500	12000	25000
	Instantaneous Stop, Instantaneous Bi-Directional Operation		15 W	0.4	1.7	3.9	7.0	15.7	43.7		–
			30 W	1.55	6.2	14.0	24.8	55.8	155		
			50 W	5.5	22	49.5	88	198	550		
			100 W	25	100	225	400	900	2500		

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

◇Load Position



Speed – Torque Characteristics

➜ Page 34

Hollow Shaft Flat Gearhead

30 W, 50 W, 100 W

Specifications

Product Name	Motor	Cable Type	**BLHM230KC-GFS**	**BLHM450KC-GFS**	**BLHM5100KC-GFS**
		With Electromagnetic Brake	**BLHM230KCM-GFS**	**BLHM450KCM-GFS**	**BLHM5100KCM-GFS**
	Gearhead		**GFS2G□FR**	**GFS4G□FR**	**GFS5G□FR**
	Driver	Analog Setting Type	**BLH2D30-K**	**BLH2D50-K**	**BLHD100K**
		Digital Setting Type	**BLH2D30-KD**	**BLH2D50-KD**	–
		RS-485 Communication Type	**BLH2D30-KR**	**BLH2D50-KR**	–
Rated Output Power (Continuous)		W	30	50	100
Power Supply Input	Rated Voltage	V	DC 24		
	Permissible Voltage Range		−10 to +10%		
	Rated Input Current	A	1.9	2.9	6.0
	Maximum Input Current*1	A	4.1 (4.2)	5.4 (6.1)	9.8
Rated Speed		r/min	2500		
Speed Control Range			100 - 3000 r/min (Speed ratio 1:30) [80 - 3000 r/min (Speed ratio 1:37.5)*2]		
Speed Regulation	Load		±0.5% (±0.2%*2) or less: Conditions 0~rated torque, rated speed, rated voltage, normal ambient temperature		
	Voltage		±0.5% (±0.2%*2) or less: Conditions Rated voltage±10%, rated speed, no load, normal ambient temperature		
	Temperature		±0.5% (±0.2%*2) or less: Conditions Operating ambient temperature 0 to +50°C, rated speed, no load, rated voltage		
Electromagnetic Brake	Type		Power Off Activated Type		
	Static Friction Torque	Nm	0.12	0.2	0.4

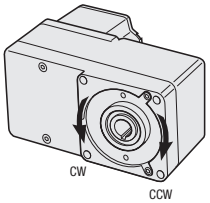
*1 Values in parentheses are for use with at least 3 m between the motor and driver.
*2 Specification for digital setting.
●The values correspond to each specification and characteristics of a stand-alone motor.
●A number indicating the gear ratio is specified where the box □ is located in the product name.

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
			2500 r/min	500	250	167	125	83	50	25	12.5
			3000 r/min	600	300	200	150	100	60	30	15
Permissible Torque [Nm]		30 W	At 80 - 2500 r/min	0.46	0.98	1.5	2.0	2.9	4.9	9.8	17
			At 3000 r/min	0.38	0.82	1.2	1.6	2.4	4.1	8.2	16.3
		50 W	At 80 - 2500 r/min	0.81	1.6	2.4	3.2	4.9	8.1	16.2	32.5
			At 3000 r/min	0.68	1.4	2.0	2.7	4.1	6.8	13.5	27
		100 W	At 100 - 2500 r/min	1.7	3.4	5.1	6.8	10.2	17	34	68
			At 3000 r/min	0.85	1.7	2.6	3.4	5.1	8.5	17	34
Permissible Radial Load [N]*2	From installation surface 10 mm	30 W		450		500					
		50 W		800		1200					
		100 W		900		1300		1500			
	From installation surface 20 mm	30 W		370		400					
		50 W		660		1000					
		100 W		770		1110		1280			
Permissible Axial Load [N]		30 W		200							
		50 W		400							
		100 W		500							
Permissible Inertia J [$\times 10^{-4}$kgm^2]		30 W		12	50	110	200	370	920	2500	5000
		50 W		22	95	220	350	800	2200	6200	12000
		100 W		45	190	420	700	1600	4500	12000	25000
	Instantaneous Stop, Instantaneous Bi-Directional Operation	30 W		1.55	6.2	14.0	24.8	55.8	155		
		50 W		5.5	22	49.5	88	198	550		
		100 W		25	100	225	400	900	2500		

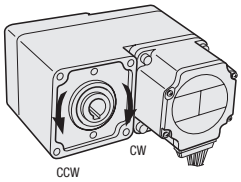
*1 The output shaft speed is the speed divided by the gear ratio.
*2 The radial load at each distance can be calculated with a formula. ➜ Page 60

◇Rotation Direction

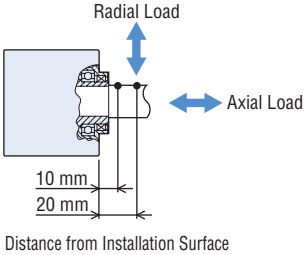
●Viewed from front face



●Viewed from back face



◇Load Position



Speed – Torque Characteristics

➜ Page 34

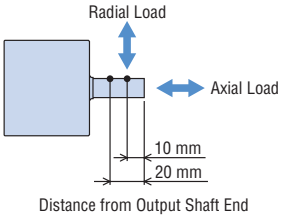
Round Shaft 15 W, 30 W, 50 W, 100 W

Specifications

Product Name	Motor	Cable Type	–	BLHM230KC-A	BLHM450KC-A	BLHM5100KC-A
		With Electromagnetic Brake	–	BLHM230KCM-A	BLHM450KCM-A	BLHM5100KCM-A
	Driver	Analog Setting Type	BLH2D15-K	BLH2D30-K	BLH2D50-K	BLHD100K
		Digital Setting Type	BLH2D15-KD	BLH2D30-KD	BLH2D50-KD	–
		RS-485 Communication Type	BLH2D15-KR	BLH2D30-KR	BLH2D50-KR	–
Rated Output Power (Continuous) W			15	30	50	100
Power Supply Input	Rated Voltage V		DC 24			
	Permissible Voltage Range		−10 to+10%			
	Rated Input Current A		0.93	1.9	2.9	6.0
	Maximum Input Current*1 A		2.3 (2.4)	4.1 (4.2)	5.4 (6.1)	9.8
Rated Speed r/min			3000	2500		
Speed Control Range			100 - 3000 r/min (Speed ratio 1:30) [80 - 3000 r/min (Speed ratio 1:37.5)*3]			
Rated Torque Nm			0.048	0.115	0.191	0.4
Maximum Instaneous Torque Nm			0.072	0.173	0.287	0.5
Permissible Radial Load	From the end of the output shaft 10 mm N		50	70	120	160
	From the end of the output shaft 20 mm N		–	100	140	170
Permissible Axial Load*2 N			5	15 (10)	20	25
Rotor Inertia J*2 $\times 10^{-4}$kgm^2			0.032	0.087 (0.0096)	0.23 (0.025)	0.61 (0.62)
Permissible Inertia J $\times 10^{-4}$kgm^2			0.5	1.8	3.3	5.6
Speed Regulation	Load		±0.5% (±0.2%*2) or less: Conditions 0 - rated torque, rated speed, rated voltage, normal ambient temperature			
	Voltage		±0.5% (±0.2%*2) or less: Conditions Rated voltage±10%, rated speed, no load, normal ambient temperature			
	Temperature		±0.5% (±0.2%*2) or less: Conditions Operating ambient temperature 0 to +50°C, rated speed, no load, rated voltage			
Electromagnetic Brake	Type		–	Power Off Activated Type		
	Static Friction Torque Nm		–	0.12	0.2	0.4

*1 Values in parentheses are for use with at least 3 m between the motor and driver.
*2 The brackets ( ) indicate the specifications for the electromagnetic brake motor.
*3 Specification for digital setting.

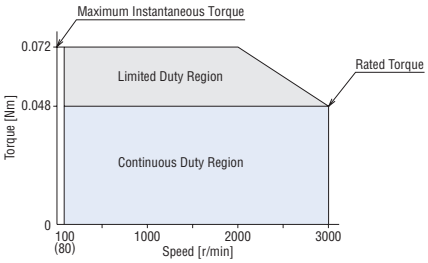
◇Load Position



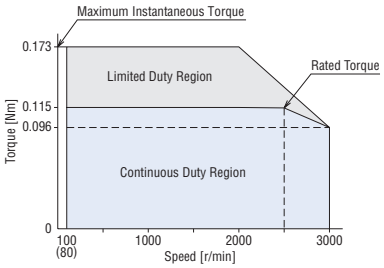
Speed - Torque Characteristics

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

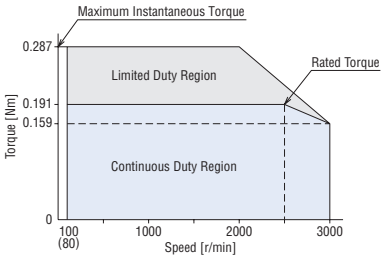
●15 W



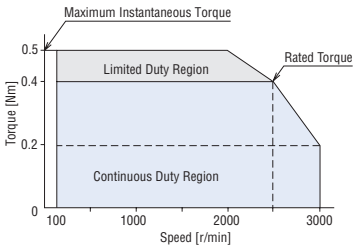
●30 W



●50 W



●100 W



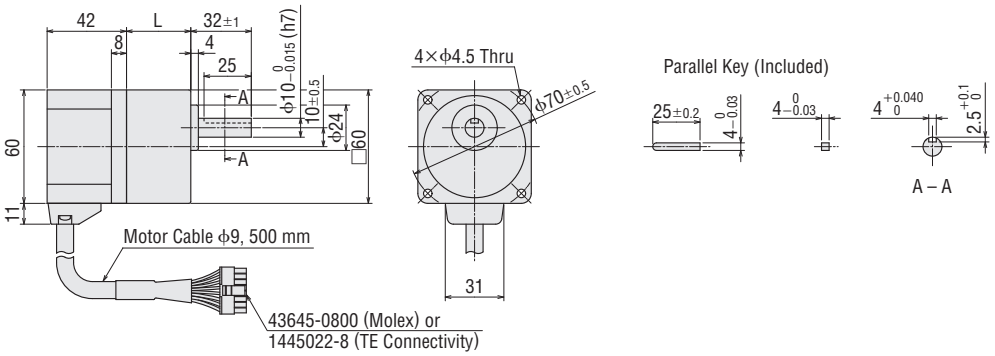
●The values correspond to each specification and characteristic of the stand-alone motor at 24 VDC with no extension cable.

●Motor (Cable type)

◇Parallel Shaft Gearhead **GFS** Gear • 30 W

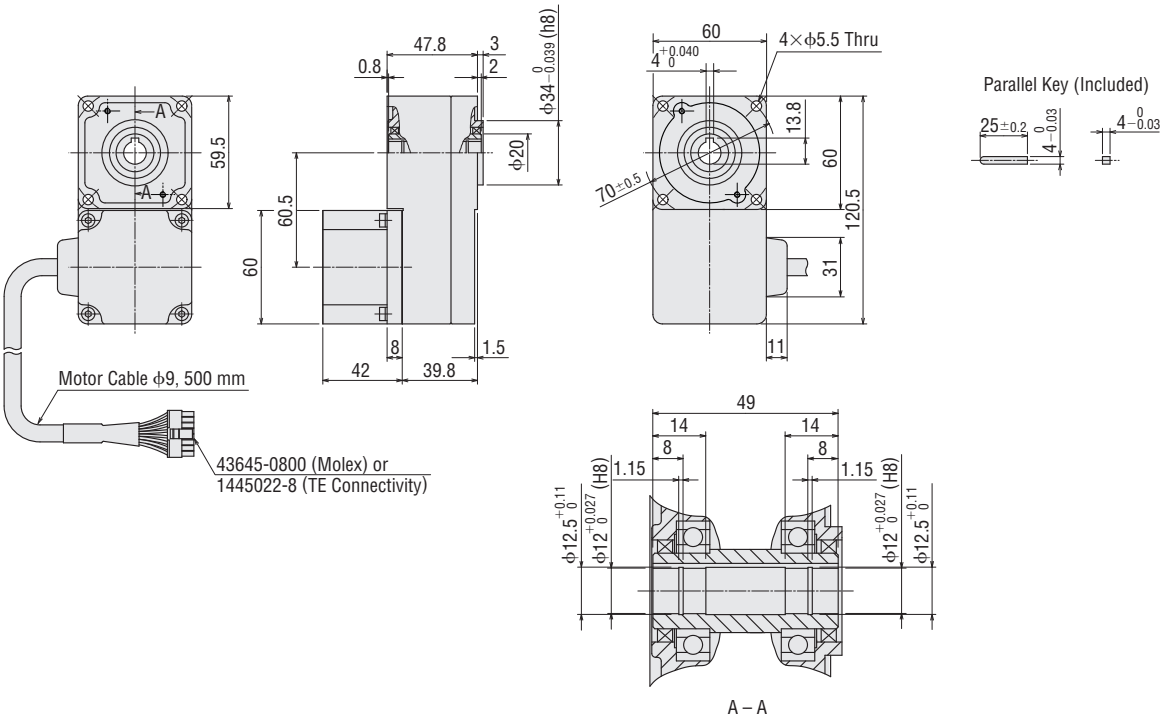
2D & 3D CAD

Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass [kg]		CAD
				Motor	Gearhead	
BLHM230KC-GFS	**GFS2G□**	**5 - 20**	34	0.5	0.28	A1762A
		30 - 100	38		0.33	A1762B
		200	43		0.38	A1762C



◇Hollow Shaft Flat Gearhead **FR** Gear • 30 W

Motor: **BLHM230KC-GFS**
Gearhead: **GFS2G□FR**
Motor Mass: 0.5 kg
Gearhead Mass: 0.8 kg
2D CAD A1765 3D CAD

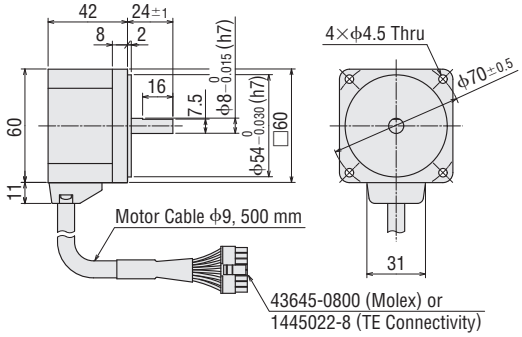


◇Round Shaft Type • 30 W

BLHM230KC-A

Mass: 0.5 kg

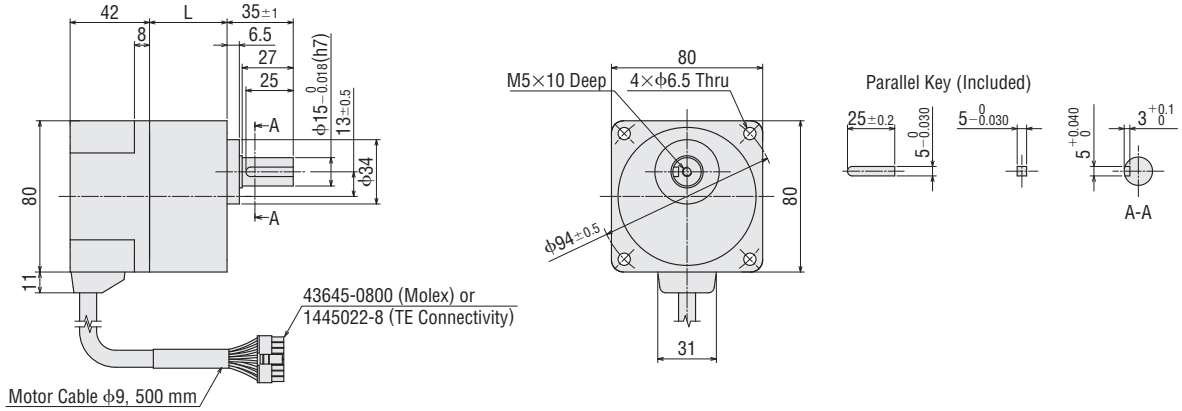
2D CAD A1768 3D CAD



◇Parallel Shaft Gearhead **GFS** Gear • 50 W

2D & 3D CAD

Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass [kg]		CAD
				Motor	Gearhead	
BLHM450KC-GFS	**GFS4G□**	**5** - **20**	41	0.8	0.67	A1763A
		30 - **100**	46		0.79	A1763B
		200	51		0.89	A1763C



◇Hollow Shaft Flat Gearhead **FR** Gear • 50 W

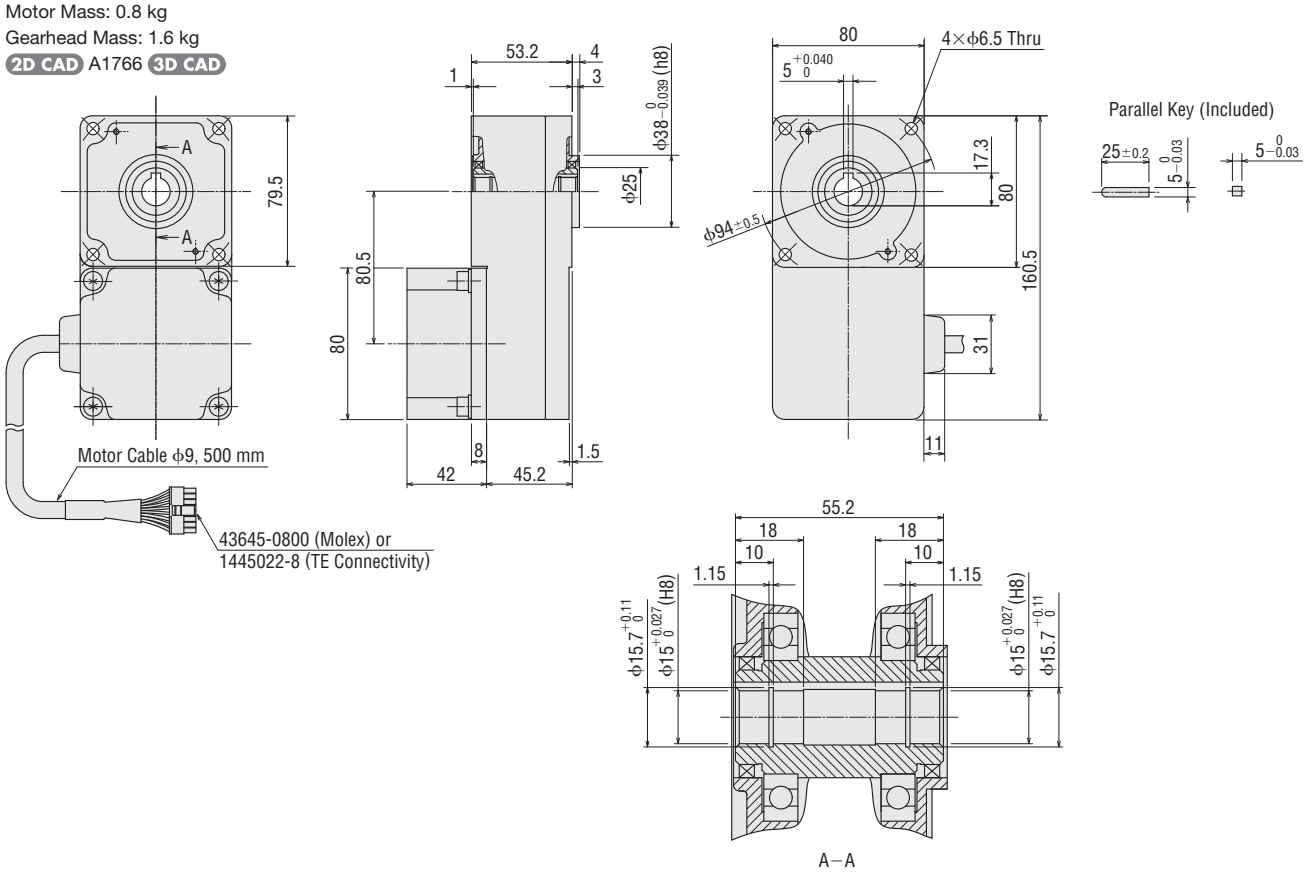
Motor: **BLHM450KC-GFS**

Gearhead: **GFS4G□FR**

Motor Mass: 0.8 kg

Gearhead Mass: 1.6 kg

2D CAD A1766 3D CAD

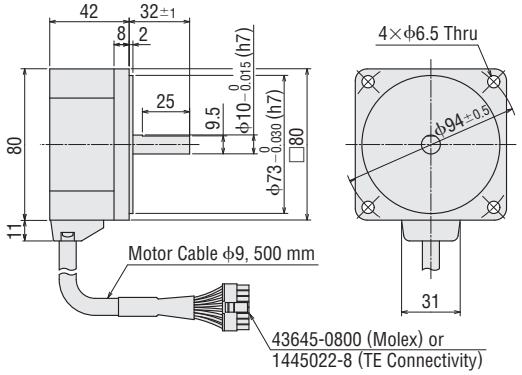


◇Round Shaft Type • 50 W

BLHM450KC-A

Mass: 0.8 kg

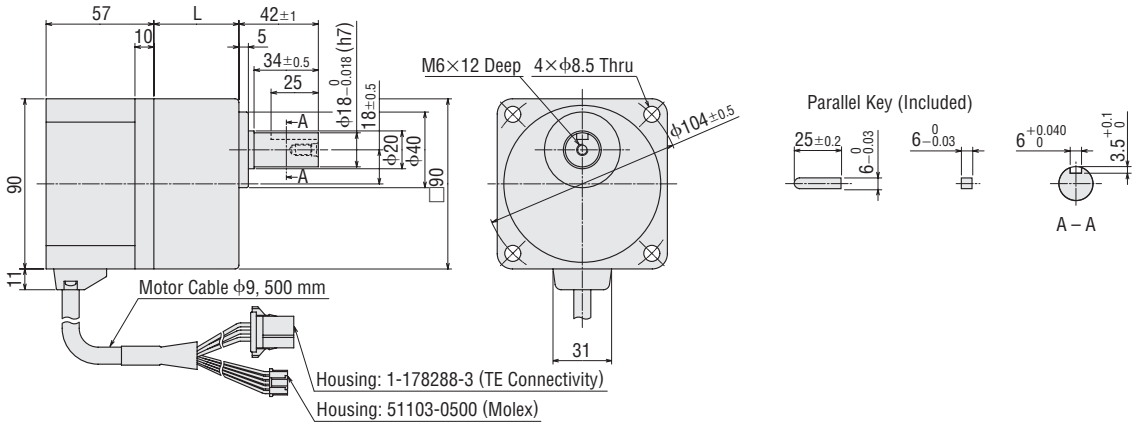
2D CAD A1769 3D CAD



◇Parallel Shaft Gearhead **GFS** Gear • 100 W

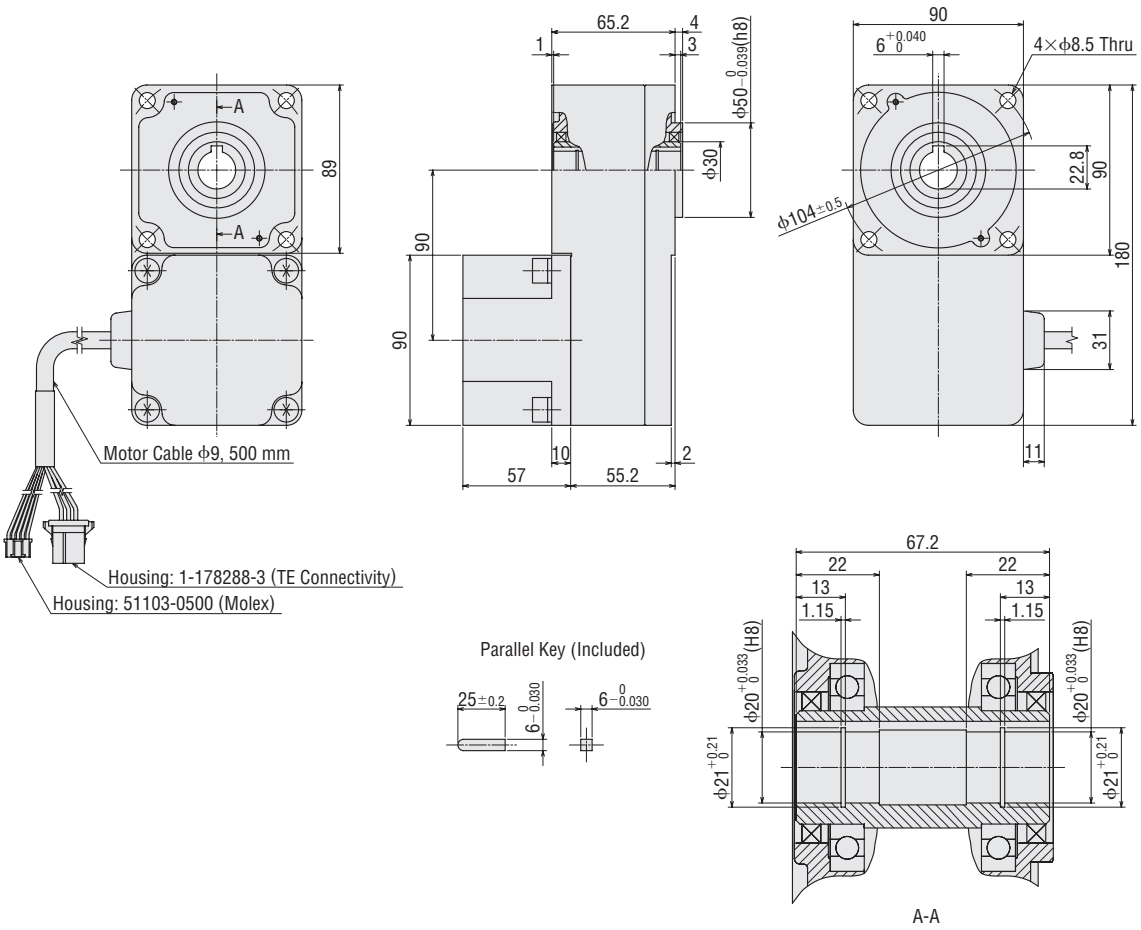
2D & 3D CAD

Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass [kg]		CAD
				Motor	Gearhead	
BLHM5100KC-GFS	**GFS5G□**	**5 - 20**	45	1.4	0.95	A1764A
		30 - 100	58		1.3	A1764B
		200	64		1.4	A1764C



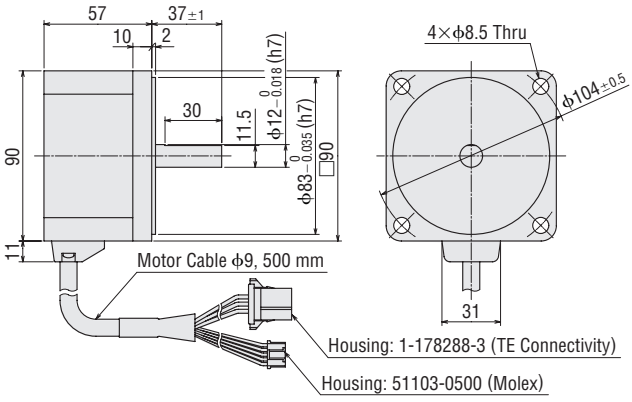
◇Hollow Shaft Flat Gearhead **FR** Gear • 100 W

Motor: **BLHM5100KC-GFS**
Gearhead: **GFS5G□FR**
Motor Mass: 1.4 kg
Gearhead Mass: 2.2 kg
2D CAD A1767 3D CAD



◇Round Shaft Type • 100 W

BLHM5100KC-A
Mass: 1.4 kg
2D CAD A1770 3D CAD

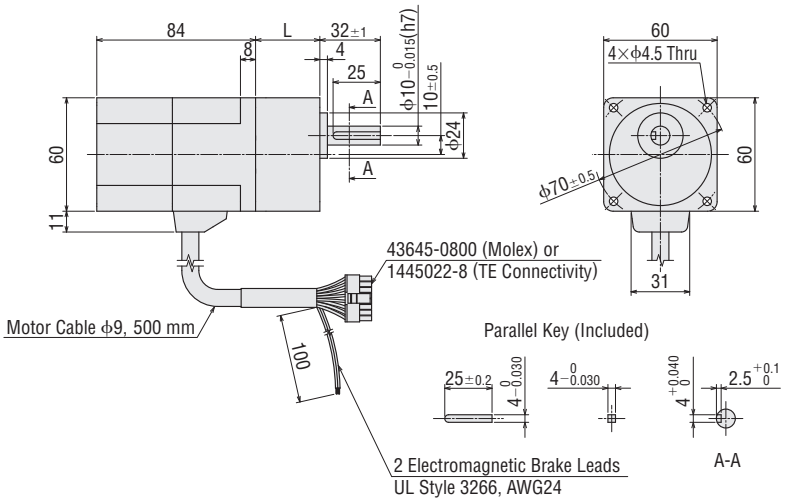


●Electromagnetic Brake Motors

◇Parallel Shaft Gearhead **GFS** Gear • 30 W

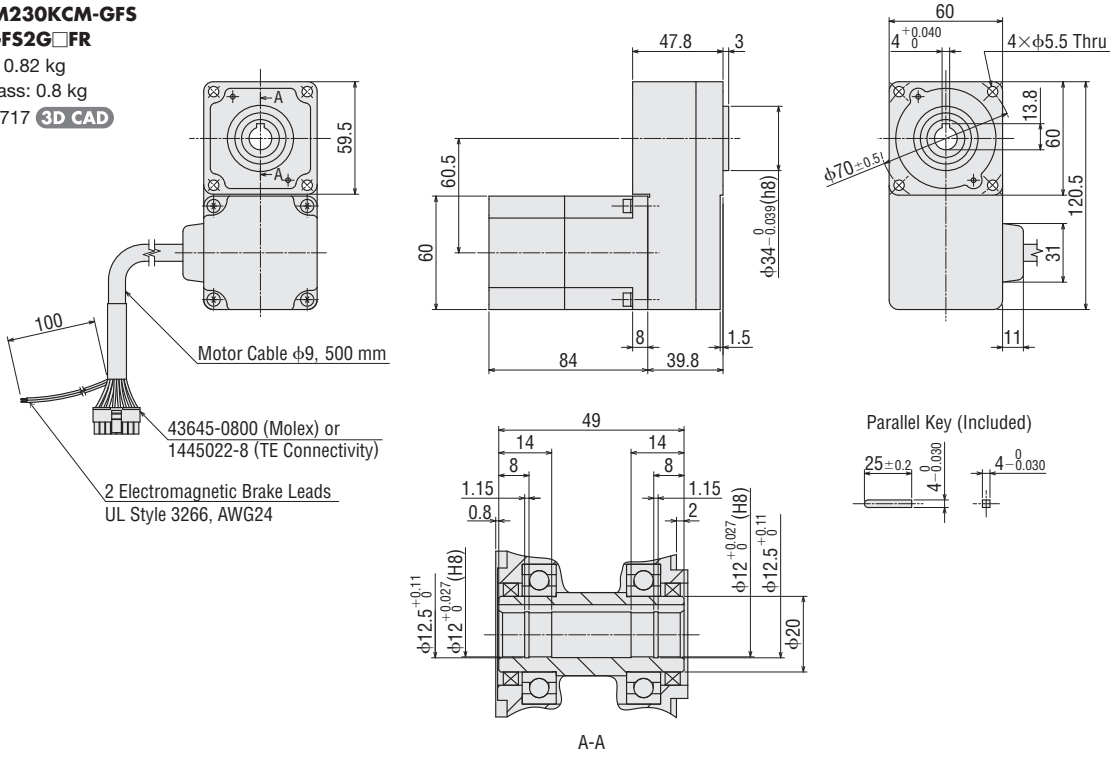
2D & 3D CAD

Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass [kg]		CAD
				Motor	Gearhead	
BLHM230KCM-GFS	**GFS2G□**	**5 - 20**	34	0.82	0.28	A1716A
		30 - 100	38		0.33	A1716B
		200	43		0.38	A1716C



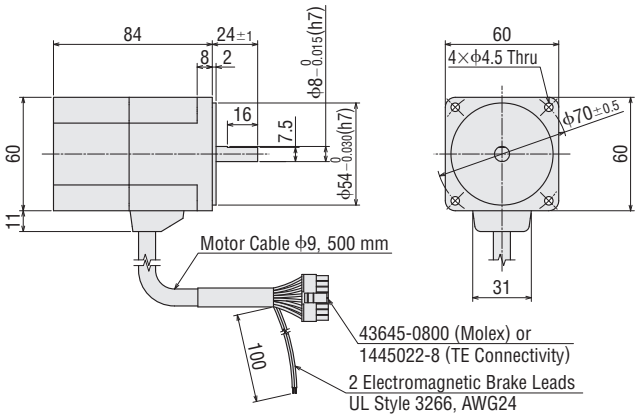
◇Hollow Shaft Flat Gearhead **FR** Gear • 30 W

Motor: **BLHM230KCM-GFS**
Gearhead: **GFS2G□FR**
Motor Mass: 0.82 kg
Gearhead Mass: 0.8 kg
2D CAD A1717 3D CAD



◇Round Shaft Type • 30 W

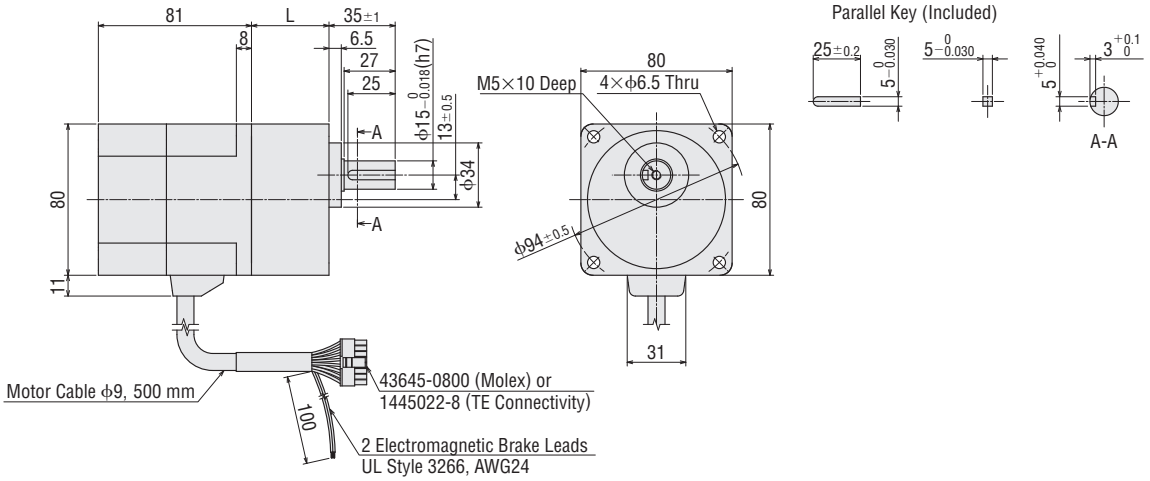
BLHM230KCM-A
Mass: 0.82 kg
2D CAD A1802 3D CAD



◇Parallel Shaft Gearhead **GFS** Gear • 50 W

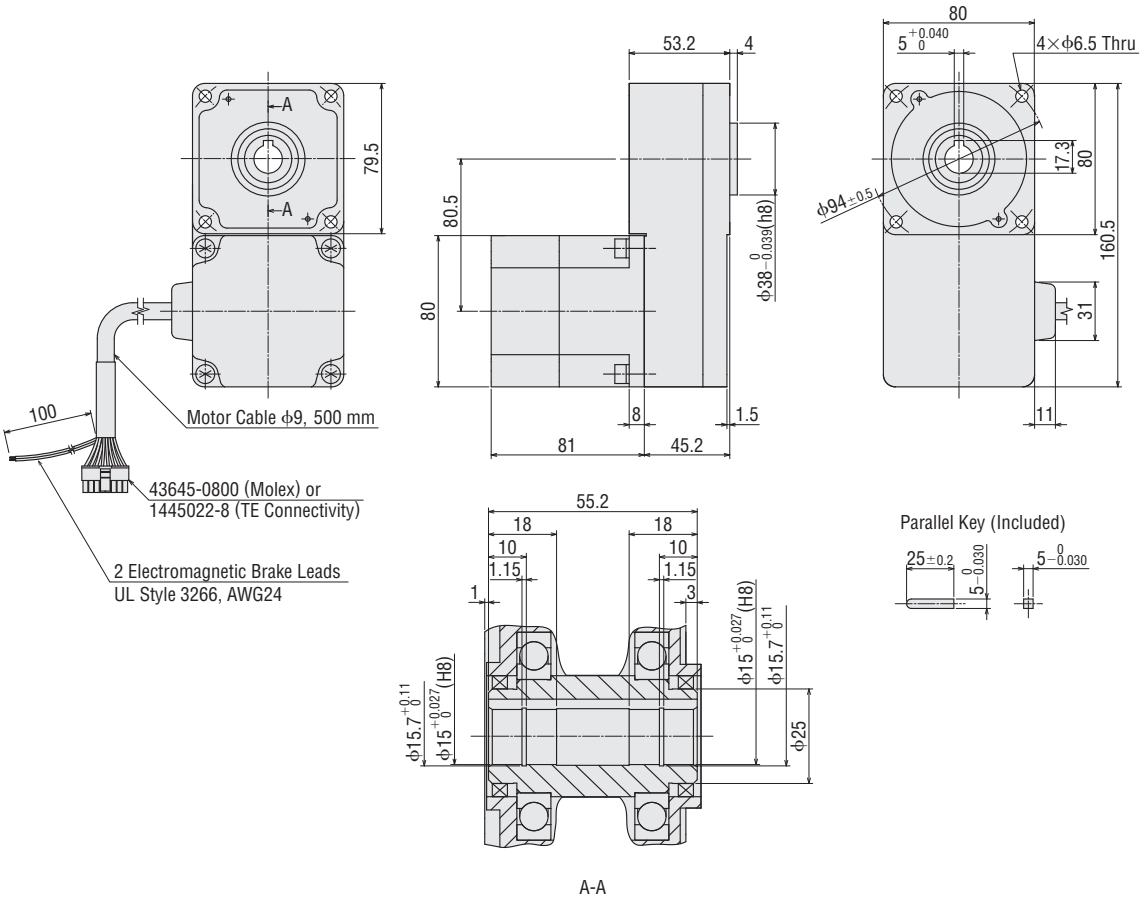
2D & 3D CAD

Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass [kg]		CAD
				Motor	Gearhead	
BLHM450KCM-GFS	**GFS4G□**	**5 - 20**	41	1.3	0.67	A1718A
		30 - 100	46		0.79	A1718B
		200	51		0.89	A1718C



◇Hollow Shaft Flat Gearhead **FR** Gear • 50 W

Motor: **BLHM450KCM-GFS**
Gearhead: **GFS4G□FR**
Motor Mass: 1.3 kg
Gearhead Mass: 1.6 kg
2D CAD A1719 3D CAD

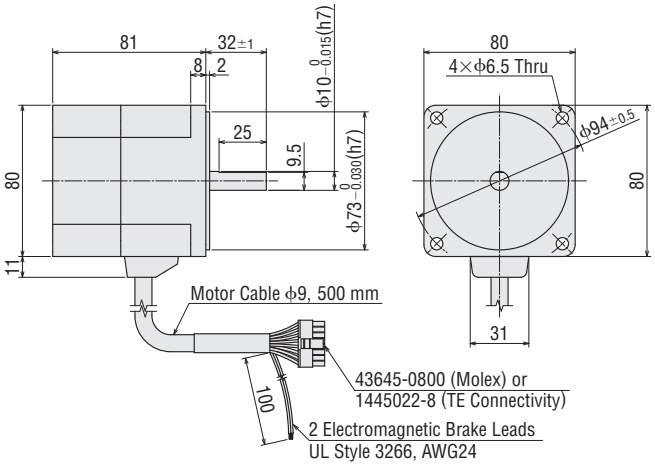


◇Round Shaft Type • 50 W

BLHM450KCM-A

Mass: 1.3 kg

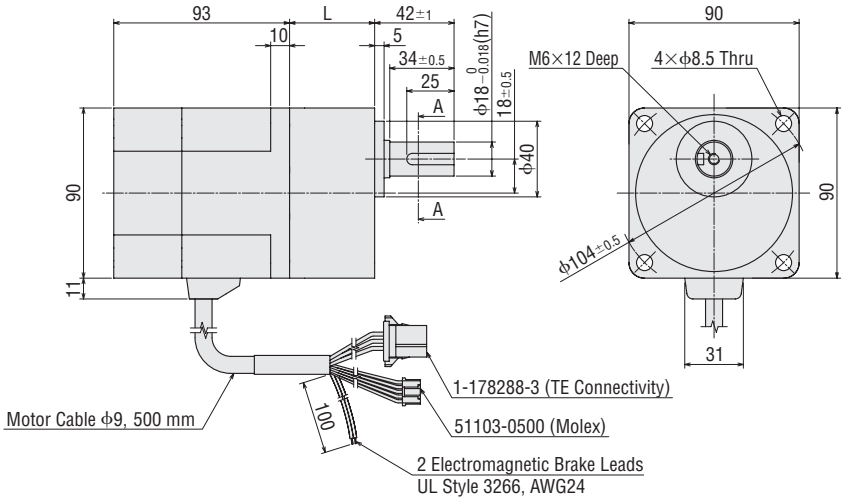
2D CAD A1803 3D CAD

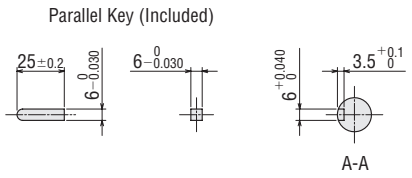


◇Parallel Shaft Gearhead **GFS** Gear • 100 W

2D & 3D CAD

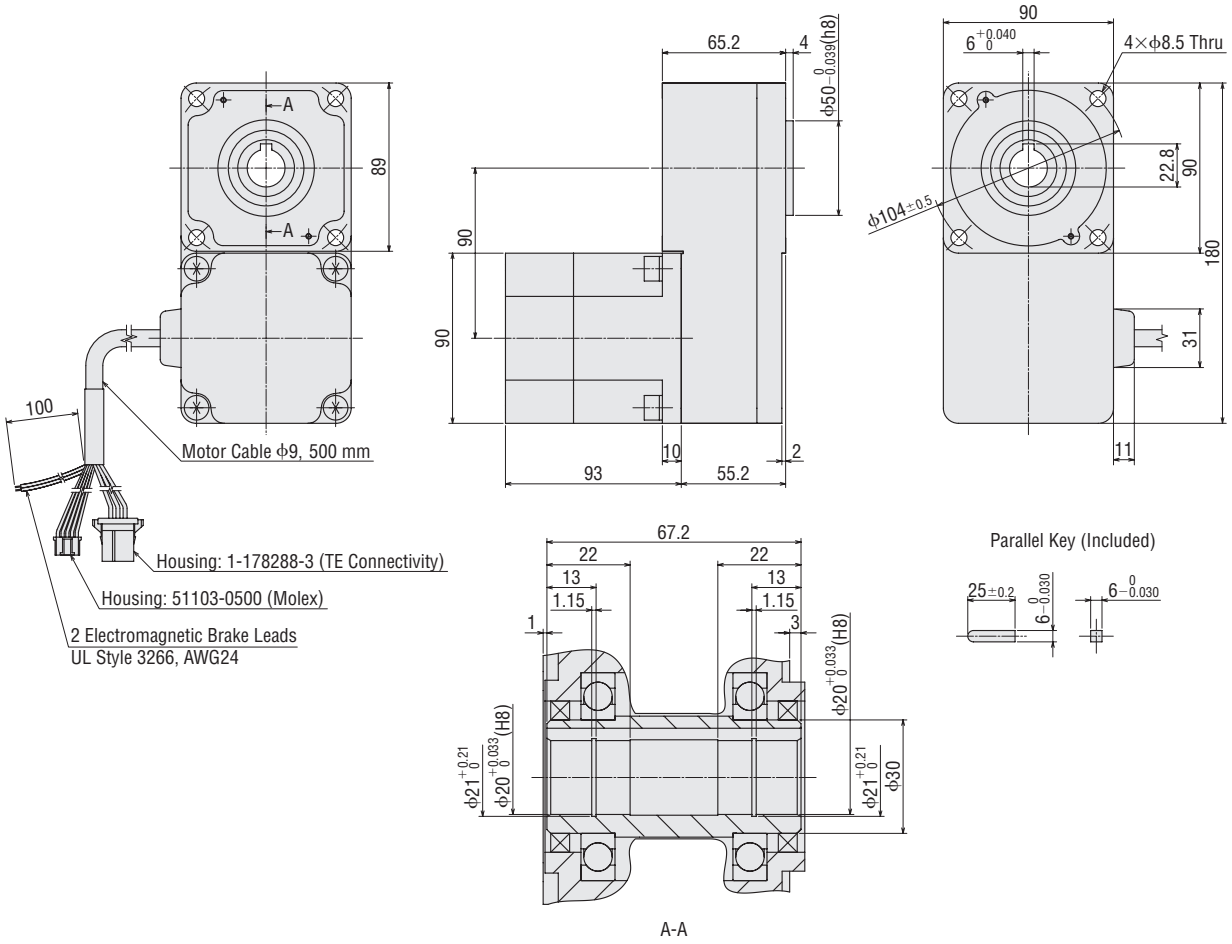
Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass [kg]		CAD
				Motor	Gearhead	
BLHM5100KCM-GFS	**GFS5G□**	**5 - 20**	45	2.0	0.95	A1720A
		30 - 100	58		1.3	A1720B
		200	64		1.4	A1720C





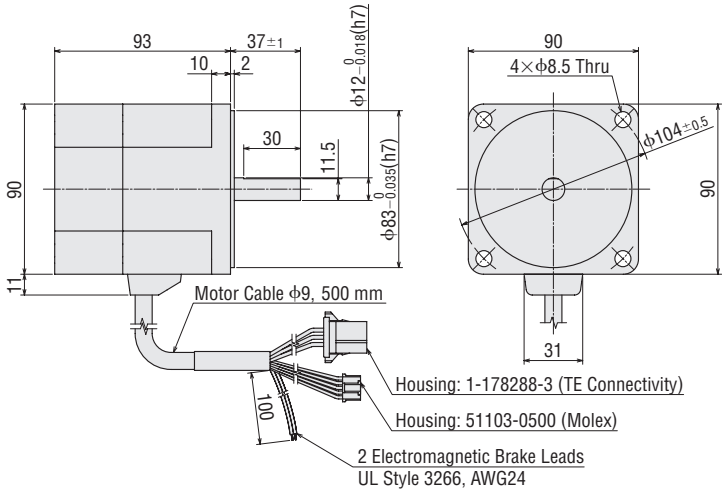
◇Hollow Shaft Flat Gearhead **FR** Gear • 100 W

Motor: **BLHM5100KCM-GFS**
Gearhead: **GFS5G□FR**
Motor Mass: 2.0 kg
Gearhead Mass: 2.2 kg
2D CAD A1721 3D CAD



◇Round Shaft Type • 100 W

BLHM5100KCM-A
Mass: 2.0 kg
2D CAD A1804 3D CAD



Driver

◇15 W, 30 W, 50 W

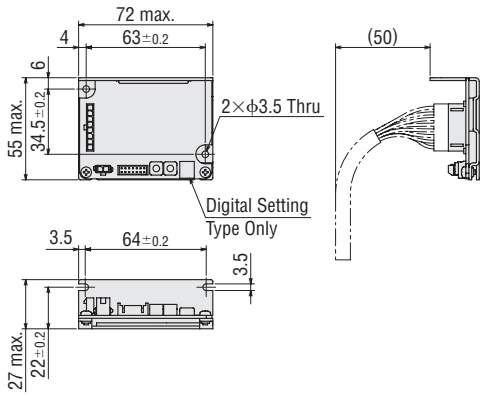
BLH2D15-K, **BLH2D30-K**, **BLH2D50-K**
BLH2D15-KD, **BLH2D30-KD**, **BLH2D50-KD**
BLH2D15-KR, **BLH2D30-KR**, **BLH2D50-KR**

Mass: 46 g

Analog Setting Type: 2D CAD A1678 3D CAD

Digital Setting Type: 2D CAD A1679 3D CAD

RS-485 Communication Type: 2D CAD A1722 3D CAD

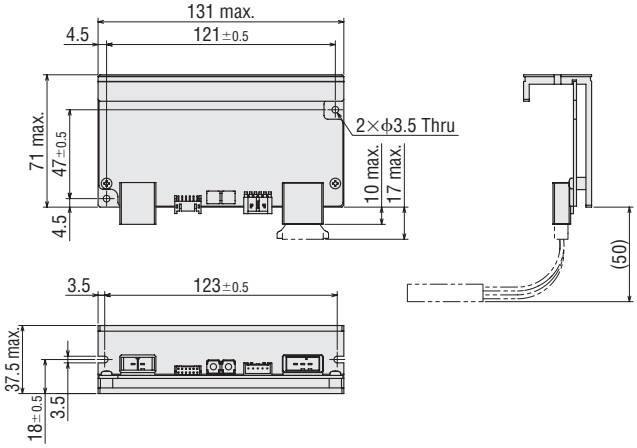


◇100 W

BLHD100K

Mass: 0.3 kg

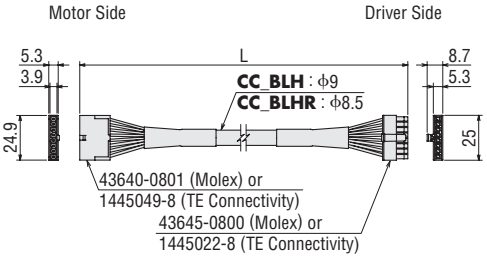
2D CAD A440 3D CAD



Connection Cables, Flexible Connection Cables

◇15W, 30W, 50W

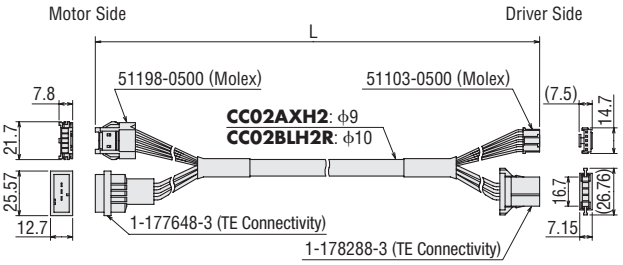
Product Line	Length L [m]	Product Name	Mass [kg]
Connection Cable	1.5	**CC02BLH**	0.16
	2.5	**CC03BLH**	0.25
	4.5	**CC05BLH**	0.45
Flexible Connection Cable	1.5	**CC02BLHR**	0.16
	2.5	**CC03BLHR**	0.27
	4.5	**CC05BLHR**	0.48



The connector dimensions shown here are for the TE Connectivity connectors.

◇100W

Product Line	Length L [m]	Product Name	Mass [kg]
Connection Cable	1.5	**CC02AXH2**	0.20
Flexible Connection Cable	1.5	**CC02BLH2R**	0.21

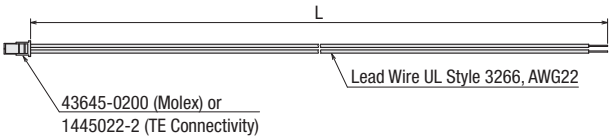


●Power Supply Cable and I/O Signal Cable Set (for 15 W, 30 W, 50 W)

Length L [m]	Product Name	Components	
		Power Supply Cable	I/O Signal Cable
0.3	**LHS003CC**	**LH003C1**	**LH003C3**
	LHS003CD	**LH003C1**	**LH003C4**
1	**LHS010CC**	**LH010C1**	**LH010C3**
	LHS010CD	**LH010C1**	**LH010C4**

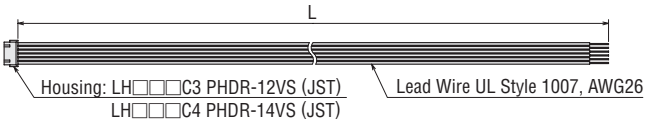
◇Power Supply Cable

LH003C1/LH010C1



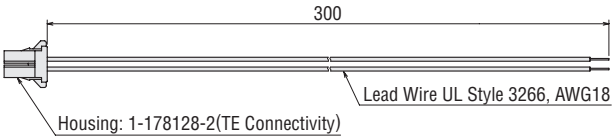
◇I/O Signal Cable

LH003C3/LH003C4/LH010C3/LH010C4



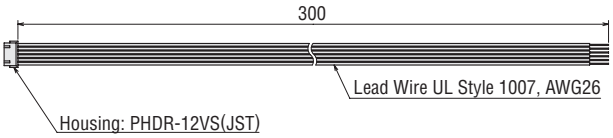
●Power Supply Cable (for 100 W/Included Items)

LH003C2



●I/O Signal Cable (for 100 W/Included Items)

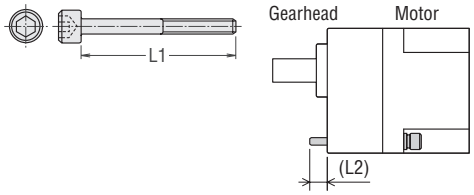
LH003C3



●Installation Screw Dimensions

L2 is the dimensions when a flat washer and spring washer are installed on the head side of the screw.

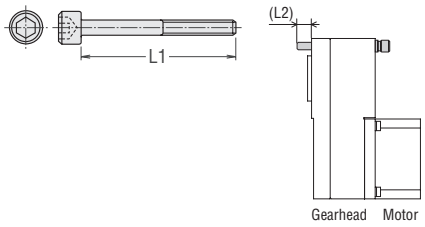
◇Parallel Shaft Gearhead



Product Name	Gear Ratio	Installation Screws		L2 [mm]
		Type of Screw	L1 [mm]	
GFS2G□	**5 - 20**	M4	50	6
	30 - 100		55	7
	200		60	7
GFS4G□	**5 - 20**	M6	65	13
	30 - 100		70	13
	200		75	13
GFS5G□	**5 - 20**	M8	75	16.5
	30 - 100		90	18.5
	200		95	17.5

- Installation screws: 4 flat washers, spring washers and hexagonal nuts are included.
- A number indicating the gear ratio is specified where the box □ is located in the product name.

◇Hollow Shaft Flat Gearhead



Product Name	Gear Ratio	Installation Screws		L2 [mm]
		Type of Screw	L1 [mm]	
GFS2G□FR	**5 - 200**	M5	65	15
GFS4G□FR	**5 - 200**	M6	70	14
GFS5G□FR	**5 - 200**	M8	90	21

- Installation screws: 4 flat washers, spring washers and hexagonal nuts are included.
- A number indicating the gear ratio is specified where the box □ is located in the product name.

Common Specifications

Driver Type			Analog Setting Type	Digital Setting Type	RS-485 Communication Type
Data Setting Number			2 Speeds	8 Speeds	8 Speeds
Speed		Control Range	100 - 3000 r/min	80 - 3000 r/min	80 - 3000 r/min
		Setting Method	・External Analog Control Module ・VR1	・Digital Setting (Support software **MEXE02**) ・External Analog Control Module ・PWM Input ・VR1 ・VR2	・Digital Setting (Support software **MEXE02**, communication) ・External Analog Control Module ・PWM Input
Acceleration/Deceleration Time		Setting Range	15 W, 30 W, 50 W: 0.1 - 12.0 s 100 W: 0.5 - 10 s Acceleration/deceleration time are common settings	0.1 - 15.0 s	0.1 - 15.0 s
		Setting Method	・VR2	・Digital Setting (Support software **MEXE02**) ・VR1 ・VR2	・Digital Setting (Support software **MEXE02**, communication)
Torque Limiting*1		Setting Range	–	0 - 200%	0 - 200%
		Setting Method		・Digital Setting (Support software **MEXE02**) ・External Analog Control Module ・PWM Input ・VR1 ・VR2	・Digital Setting (Support software **MEXE02**, communication) ・External Analog Control Module ・PWM Input
I/O Function	Direct Input	Mode	C-MOS Negative Logic Input	C-MOS Negative Logic Input	C-MOS Negative Logic Input
		Number of Points	5 Points	6 Points	5 Points
		Initial Assignment	15 W, 30 W, 50 W: START/STOP, RUN/BRAKE, FWD/REV, M0, ALM-RST 100 W: START/STOP, RUN /BRAKE, CW/CCW, INT.VR/EX, ALARM-RESET	START/STOP, RUN/BRAKE, FWD/REV, M0, M1, ALM-RST	START/STOP, RUN/BRAKE, FWD/REV, M0, ALM-RST
	Direct Output	Mode	Transistor and open-collector output	Transistor and open-collector output	Transistor and open-collector output
		Number of Points	2 Points	4 Points	2 Points
		Initial Assignment	15 W, 30 W, 50 W: SPEED-OUT, ALM-B 100 W: SPEED, ALARM	SPEED-OUT, ALM-B, TLC, DIR	SPEED-OUT, ALM-B
	RS-485 communication remote input		–	–	16 Points
	RS-485 communication remote output		–	–	16 Points
Setting Tool	Support Software **MEXE02**		–	○	○
Information			–	○	○
Alarm*2			○	○	○
Maximum Extension Length			15 W, 30 W, 50 W: Motor and Driver Distance: 5 m [when a connection cable is (sold separately) used] 100 W: Motor and Driver Distance: 2 m [when a connection cable is (sold separately) used]		
Time Rating			Continuous		

*1 For torque limiting, an error up to a max. of approximately ±20% (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 The **BLH** Series cannot control the motor speed in applications where the motor side is turned from the load side, such as in a gravitational load operation. When a load exceeding the permissible inertia value is driven, or in gravitational load operation, the protection function is activated and the motor stops spontaneously.

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.	100 MΩ or more when 500 VDC megger is applied between the power supply input and the heat sink after continuous operation under normal ambient temperature and humidity.
Dielectric Strength		Sufficient to withstand 0.5 kVAC at 50 Hz applied between the windings and the case for 1 minute after continuous operation under normal ambient temperature and humidity.	Sufficient to withstand 0.5 kVAC at 50 Hz applied between the power supply input and the heat sink for 1 minute after continuous operation under normal ambient temperature and humidity. (Excluding RS-485 communication type)
Temperature Rise		The temperature rise of the windings is 50˚C or less and that of the case surface is 40˚C or less*1, measured by the thermocouple method after continuous operation under normal ambient temperature and humidity.	The temperature rise of the heat sink is 50˚C or less, measured by the thermocouple method after continuous operation under normal ambient temperature and humidity.
Operating Environment	Ambient Temperature	0 to +50˚C (Non-freezing)	
	Ambient Humidity	85% or less (Non-condensing)	
	Altitude	Up to 1000 m above sea level	
	Atmosphere	No corrosive gases or dust. Not exposed to water and oil. Cannot be used in a radioactive area, magnetic field, vacuum, or other special environments.	
	Vibration	Must not be subjected to continuous vibration or excessive shock. Conforms to JIS C 60068-2-6, "Sine-Wave Vibration Test Method" Frequency Range: 10 - 55 Hz Half Amplitude: 0.15 mm Sweep Direction: 3 Directions (X, Y, and Z) Number of Sweeps: 20 Times	
Storage Conditions*2	Ambient Temperature	–25 to +70°C (Non-freezing) Electromagnetic brake motor: –20 to +70°C (Non-freezing)	–25 to +70˚C (Non-freezing)
	Ambient Humidity	85% or less (Non-condensing)	
	Altitude	Up to 3000 m above sea level	
	Atmosphere	No corrosive gases or dust. Not exposed to water and oil. Cannot be used in a radioactive area, magnetic field, vacuum, or other special environments.	
Insulation Class		UL/CSA Standards: 105 (A), EN Standards: 120 (E)	–
Degree of Protection		Connector type, Lead wire type: IP40 Cable type, Electromagnetic brake motor: IP65 (Excluding the installation surface of the connectors and round shaft type)	IP00

*1 For the round shaft type, install on a heat sink (material: aluminum) of the following size so that the surface temperature of the motor case does not exceed 90˚C. (Excluding **BLHM015**)

•Heat sink size

Product Name	Size [mm]	Thickness [mm]
BLM015, **BLM030**, **BLM230**, **BLHM230**	115×115	5
BLM250, **BLM450**, **BLHM450**	135×135	
BLHM5100	200×200	

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

Note

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

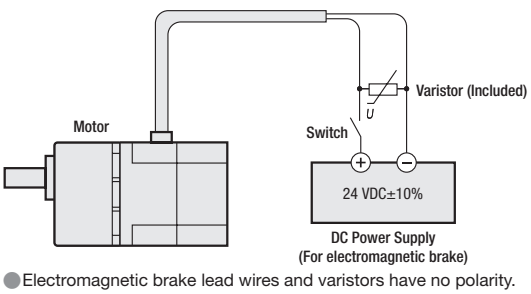
RS-485 Communication Specifications

Electrical Characteristics	Complies with EIA-485. The maximum total extension length of the communication cable is 10 m when using twisted-pair wires.
Communication Mode	Half duplex Start-stop synchronization (data: 8 bits, stop bit: 1 bit or 2 bits, parity: none, even, or odd)
Transmission Rate	Choose from 9,600 bps / 19,200 bps / 38,400 bps / 57,600 bps / 115,200 bps / 230,400 bps
Protocol	Modbus RTU Mode
Connection Type	Up to 15 units can be connected to a single programmable controller (master equipment).

Electromagnetic Brake Specifications

Product Name		BLHM230	BLHM450	BLHM5100
Type		Power Off Activated Type (For holding)		
Power Supply Voltage	V	24 VDC±10%		
Power Supply Current	A	0.084	0.31	0.31
Brake Activation Time	ms	100		
Brake Release Time	ms	100		
Time Rating		Continuous		

Connecting the Electromagnetic Brake



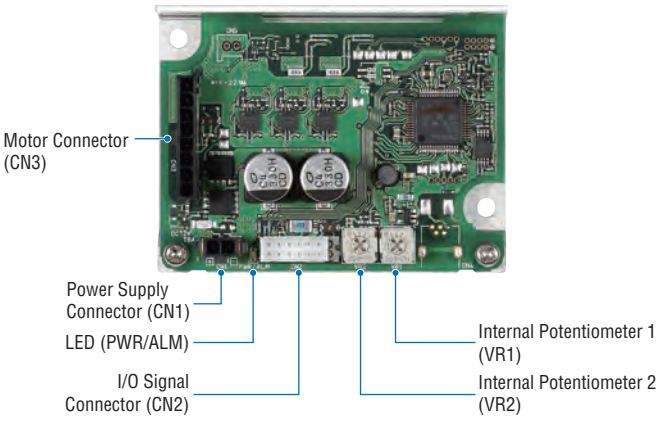
●Electromagnetic brake lead wires and varistors have no polarity.

Note

●When holding the load with the electromagnetic brake, make sure that the motor has stopped first. Operating the brake during rotation may cause damage to the product.

Connection and Operation Analog Setting Type (15 W, 30 W, 50 W)

Names and Functions of Driver Parts



Name	Indication	Description	
Power Supply Connector	CN1	Connects the power supply cable.	
I/O Signal Connector	CN2	Connects the I/O signal cable to connect with an external control device.	
Motor Connector	CN3	Connects the motor cable.	
LED	PWR/ALM	Green	Lit in green while the power is supplied.
		Red (LED Blinks)	If an alarm is generated, this LED will blink in red. The generated alarm content can be checked by counting the number of times the LED blinks.
Internal Potentiometer	VR1	Uses to set the speed (M0 input: ON)	
	VR2	Uses to set the acceleration time and deceleration time.	

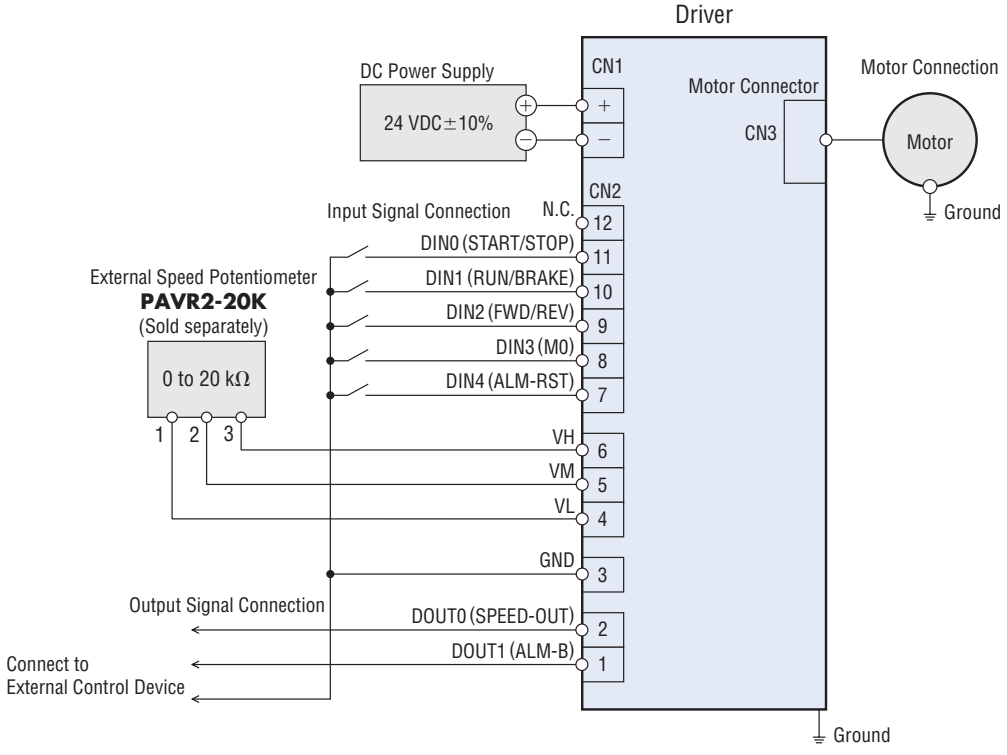
◇I/O Signal Connector (CN2)

Pin No.	Color of Lead Wire	Terminal Name	Signal Name	Description
12	–	–	–	N.C. (No Connection.)
11	Black	DIN0	START/STOP	These signals are used to operate the motor. The motor rotates according to the acceleration time when both the START/STOP input and the RUN/BRAKE input are turned ON. If the START/STOP input is turned OFF, the motor stops according to the deceleration time. If the RUN/BRAKE input is turned OFF, the motor stops instantaneously.
10	White	DIN1	RUN/BRAKE	
9	Gray	DIN2	FWD/REV	This signal is used to change the motor rotation direction. The motor rotates in the CW direction when this signal is turned ON, and in the CCW direction when it is turned OFF.*
8	Light Blue	DIN3	M0	When the M0 input is ON, the setting speed of the internal potentiometer (VR1) is enabled. When it is OFF, the setting speed of the external analog setting device (External speed potentiometer or external DC voltage) is enabled.
7	Purple	DIN4	ALM-RST	This signal is used to reset the alarm. (The alarm will be reset at the OFF edge of the input.)
6	Blue	VH	External Analog Setting Device	These signals are used when the rotation speed is externally set using an external analog setting device (External speed potentiometer or external DC voltage).
5	Green	VM		
4	Yellow	VL		
3	Orange	GND	GND	I/O signals common
2	Red	DOUT0	SPEED-OUT	30 pulses are output while the motor output shaft makes one revolution in synchronization with the motor rotation. The pulse width of output pulse signals is 0.3 ms. The motor rotation speed can be calculated using the SPEED-OUT output.
1	Brown	DOUT1	ALM-B	This is a signal to output an alarm status. It is turned OFF when an alarm is generated. (Normally closed) The generated alarm content can be checked by counting the number of times the LED blinks.

*The rotation direction depends on the gear ratio of the gearhead.

Connection Diagrams

The figure shows a connection example when connecting an external speed potentiometer.

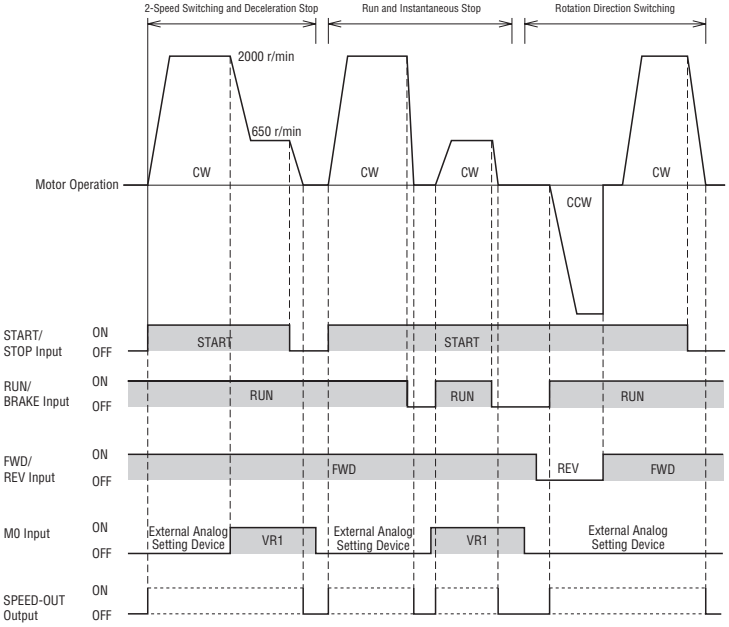


●Run/Stop

Operate the motor with the START/STOP and RUN/BRAKE inputs.
When the RUN/BRAKE Input is shut off during deceleration, the motor will stop instantaneously.
Decelerated Stop: Stopping in accordance with the set deceleration speed.
Instantaneous Stop: Stopping in a very short time window regardless of the deceleration speed.

	START/STOP Input	RUN/BRAKE Input	Motor Operation
Signal Level	ON	ON	Operation
	ON	OFF	Instantaneous Stop
	OFF	ON	Deceleration Stop

◇Example of Operating Pattern

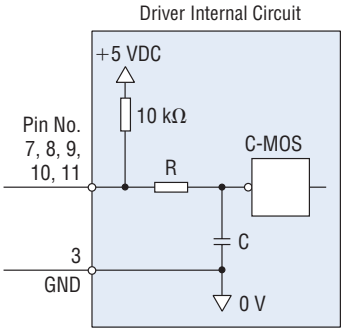


- START/STOP Input, RUN/BRAKE Input
  When the START/STOP and RUN/BRAKE inputs are both turned ON, the motor will run. When the START/STOP Input is shut OFF during operation, the motor will execute a decelerated stop in accordance with the settings on the internal potentiometer (VR2). When the RUN/BRAKE Input is shut OFF during operation, the motor will stop in the shortest window of time possible (Instantaneous stop).
- FWD/REV Input
  This signal is used to change the rotation direction of the motor. When ON, the motor will turn CW; when OFF, the motor will turn CCW. (The rotation direction varies according to the gear ratio of the gearhead.)
- M0 Input
  When the M0 input is turned ON, the motor will rotate in accordance with the internal potentiomenter (VR1). When it shut OFF, the motor will rotate in accordance with the external analog setting device.
- Please ensure that the ON and OFF durations for each output signal are 10 ms min.

I/O Signal Circuits

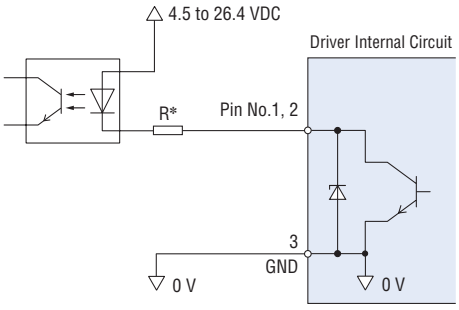
◇Input Signal Circuit

The driver's signal input uses the C-MOS input method.
The signal status indicates "ON: 0 to 0.5 V (L Level)" or "OFF: 4 to 5 V (H Level)."



◇Output Signal Circuit

The driver's signal output uses the transistor and open-collector output method.
The signal status indicates that the internal transistor is "ON: receiving power" or "OFF: not receiving power". It does not indicate the signal's voltage level.



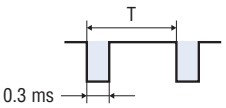
✻ Recommended resistance value when current limiting resistor R is connected
24 VDC: 2.7 kΩ to 4.7 kΩ (1 W)
5 VDC: 560 Ω to 820 Ω (0.25 W)

◇SPEED-OUT

30 pulses are output every rotation of the motor output shaft in synchronization with the rotation of the motor. The pulse width for output pulse signals is 0.3 ms. The SPEED-OUT output can be used to calculate the motor speed.

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

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



◇Alarm Deactivation

When the alarm sounds, the ALM-B output shuts OFF. At the same time, the motor stops, and the PWR/ALM LED flashes red.
After the alarm has been deactivated, the cause of the alarm must be dealt with before the device can be used again. The alarm cannot be deactivated while the operation input signal is ON.
The methods for deactivating the alarm are as follows.

- Turn the ALM-RST input from ON to OFF. (Active at OFF edge)
- Restart the power.

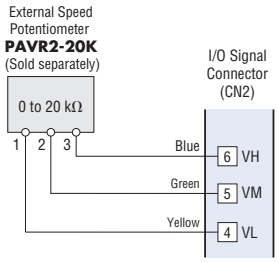
●Speed Setting Methods

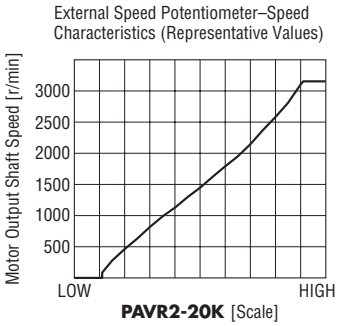
The motor speed can be set using the external analog setting device (The external speed potentiometer or external DC voltage) or VR1. The external analog setting and VR1 can be switched between depending on whether the M0 input is ON or OFF.

M0 Input	OFF	ON
Speed Setting	External Analog Setting Device	VR1

◇Setting by the External Speed Potentiometer

Connect to pin No. 4 to 6 of CN2.



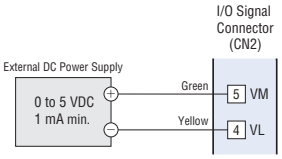


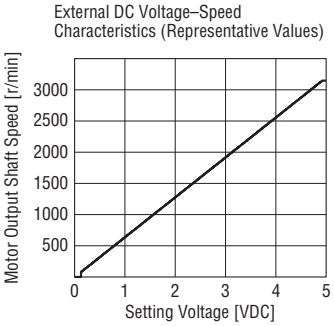
Note

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

◇Setting by External DC Voltage

Connect to pin No. 4 and 5 of CN2.



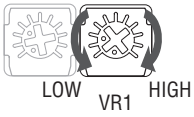


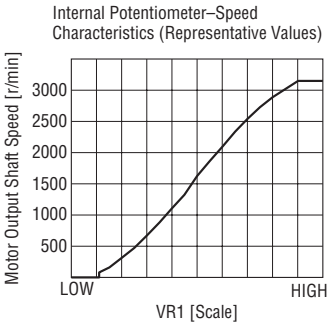
Note

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

◇Setting by VR1

Factory setting: 0 r/min





Note

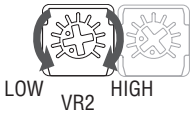
●The speed in the graph represents the speed of the motor alone. The gear output shaft speed is calculated by dividing the gear ratio.

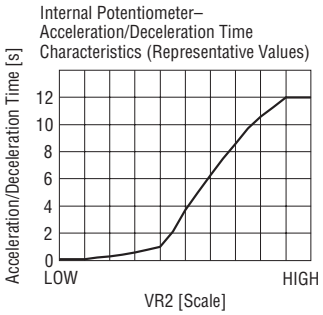
●Setting the Acceleration and Deceleration Times

For the acceleration time, set the time it takes the motor to move from a resting state to a rated speed. For the deceleration time, set the time it takes for the motor to move from a rated speed to rest. (Acceleration and deceleration have shared settings)

Factory setting: 0.1 s

◇VR2 settings





●Multi-Motor Control

Two or more motors can be operated at the same speed using 1 external speed potentiometer or external DC voltage.

◇When Using an External Speed Potentiometer

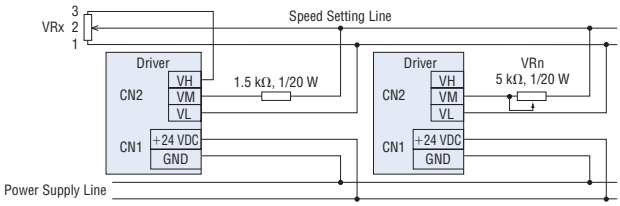
When using a external speed potentiometer (VRx), no more than ten motors should be operated simultaneously.

Resistance value when the number of drivers is n:

VRx (kΩ)=20 kΩ/n,

acceptable loss (W)=n/20

Example: When two drivers are used, the resistance is 10 kΩ,

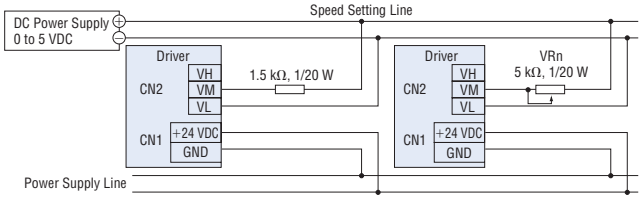


◇When Using an External DC Voltage

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

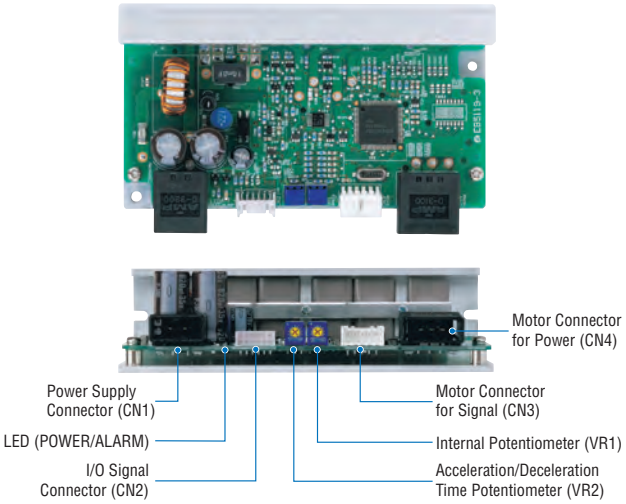
Current capacity (mA) when the number of drivers is n: 1 mA×n

Example: When two drivers are used, the current capacity should be 2 mA min.



Connection and Operation Analog Setting Type (100 W)

Names and Functions of Driver Parts



Name	Indication	Description	
Power Supply Connector	CN1	Connects the power supply cable.	
I/O Signal Connector	CN2	Connects the I/O signal cable to connect with an external control device.	
Motor Connector for Signal	CN3	Connects the power supply cable.	
Motor Connector for Power	CN4		
LED	POWER/ ALARM	Green	Lit in green while the power is supplied.
		Green (Blinks)	If an alarm is generated, this LED will blink in green. The generated alarm content can be checked by counting the number of times the LED blinks.
Internal Speed Potentiometer	VR1	Uses to set the speed (M0 input: ON)	
Acceleration/ Deceleration Time Potentiometer	VR2	Uses to set the acceleration time and deceleration time.	

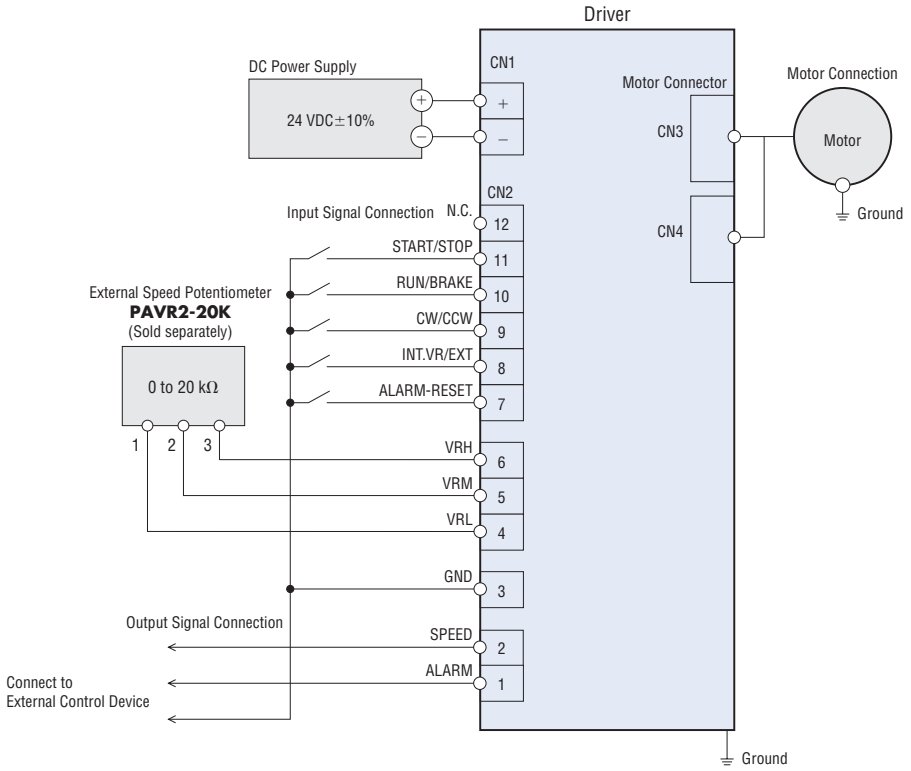
◇I/O Signal Connector (CN2)

Pin No.	Color of Lead Wire	Terminal Name	Description
12	—	—	N.C. (No Connection.)
11	Black	START/STOP	These signals are used to operate the motor. The motor rotates according to the acceleration time when both the START/STOP input and the RUN/BRAKE input are turned ON. If the START/STOP input is turned OFF, the motor stops according to the deceleration time. If the RUN/BRAKE input is turned OFF, the motor stops instantaneously.
10	White	RUN/BRAKE	
9	Gray	CW/CCW	This signal is used to change the motor rotation direction. When this signal is turned ON, the motor rotates in the CW direction, and when turned OFF, it rotates in the CCW direction.*
8	Light Blue	INT.VR/EXT	When the INT. VR/EXT input is ON, the setting speed of the internal speed potentiometer (VR1) is enabled. When OFF, the setting speed of the external speed potentiometer and the external DC voltage is enabled.
7	Purple	ALARM-RESET	This signal is used to reset the alarm. (The alarm will be reset at the OFF edge of the input.)
6	Blue	VRH	These signals are used to set the speed externally using the external speed potentiometer or external DC voltage.
5	Green	VRM	
4	Yellow	VRL	
3	Orange	GND	I/O signals common
2	Red	SPEED	30 pulses are output while the motor output shaft makes one revolution in synchronization with the motor rotation.
1	Brown	ALARM	This is a signal to output an alarm status. It is turned OFF when an alarm is generated, and the motor stops. The generated alarm content can be checked by counting the number of times the LED blinks.

*The rotation direction depends on the gear ratio of the gearhead.

Connection Diagrams

The figure shows a connection example when connecting an external speed potentiometer.



Run/Stop

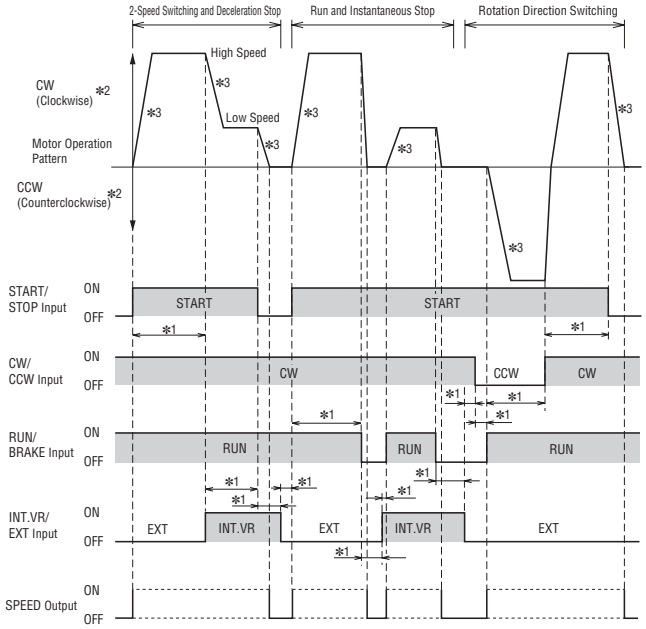
Operate the motor with the START/STOP and RUN/BRAKE inputs.

	START/STOP Input	RUN/BRAKE Input	Motor Operation
Signal Level	ON	ON	Operation*1
	ON	OFF	Instantaneous Stop
	OFF	ON	Stop*2

*1 The operating speed of the motor is set by either one of the internal speed potentiometer, external speed potentiometer, or external DC voltage. Acceleration is performed at the time set in the acceleration/deceleration time potentiometer.

*2 Deceleration is performed at the time set in the acceleration/deceleration time potentiometer.

◇Example of Operating Pattern



*1 10 ms min.

*2 The direction of rotation applies to the motor only. It will vary depending on the gear ratio.

*3 The motor will start and stop at the time set by the acceleration and deceleration time potentiometer.

● START/STOP Input, RUN/BRAKE Input

When the START/STOP and RUN/BRAKE inputs are both turned ON, the motor will run.

When the START/STOP Input is shut OFF during operation, the motor will execute a decelerated stop in accordance with the settings on the acceleration and deceleration potentiometer (VR2).

When the RUN/BRAKE Input is shut OFF during operation, the motor will stop in the shortest window of time possible (Instantaneous stop).

● CW/CCW Input

This signal is used to change the rotation direction of the motor. When ON, the motor will turn CW; when OFF, the motor will turn CCW. (The rotation direction varies according to the gear ratio of the gearhead.)

● INT. VR/EXT Input

When the INT.VR/EXT Input is turned ON, the set speed for the internal potentiomenter (VR1) is enabled. When it shut OFF, the set speed for the external speed potentiometer or the external DC voltage is enabled.

● Please ensure that the ON and OFF durations for each output signal are 10 ms min.

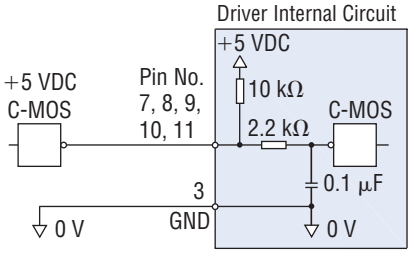
I/O Signal Circuit

◇Input Signal Circuit

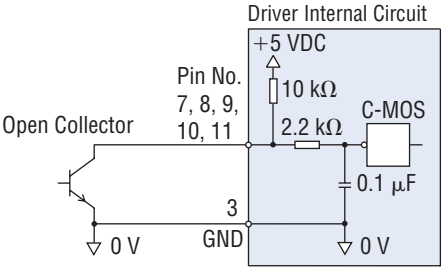
The driver's signal input uses the C-MOS input method.

The signal status indicates "ON: 0 to 0.5 V (L Level)" or "OFF: 4 to 5 V (H Level)."

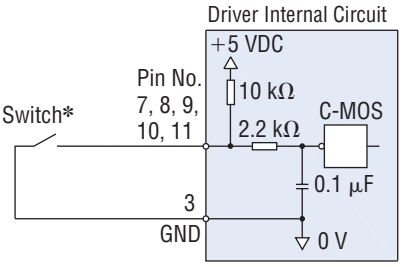
● External control device output: 5 VDC C-MOS



● External control device output: Open-collector output



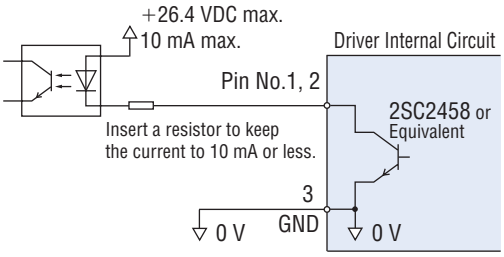
● Switch Connection



*Please use a switch capable of opening/closing the current flow at 5 VDC, 1 mA max.

◇Output Signal Circuit

The driver's signal output uses the transistor and open-collector output method. The signal status indicates that the internal transistor is "ON: receiving power" or "OFF: not receiving power". It does not indicate the signal's voltage level.



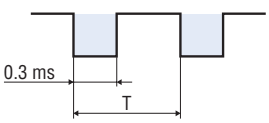
◇SPEED Output

Pulse signals of 30 pulses (Pulse width: 0.3 ms) are output every 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.

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

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



◇ALARM-RESET Input

When the alarm sounds, the ALARM output shuts OFF. At the same time, the motor stops, and the POWER/ALARM LED flashes green.

After the alarm has been deactivated, the cause of the alarm must be dealt with before the device can be used again. The alarm cannot be deactivated while the operation input signal is ON.

The methods for deactivating the alarm are as follows.

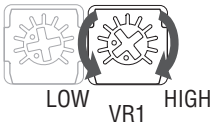
- Turn the ALARM-RESET input from ON to OFF. (Active at OFF edge)
- Restart the power.

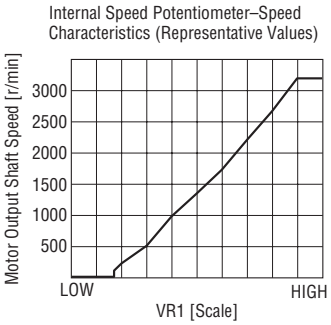
●Speed Setting Method

The motor speed can be set using any of the following: the internal speed potentiometer, the external speed potentiometer or the external DC voltage. The speed potentiometer can be switched by turning the INT.VR/EXT input ON or OFF.

◇Setting by the Internal Speed Potentiometer

Factory setting: 0 r/min



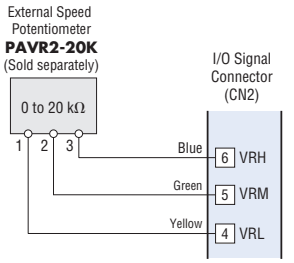


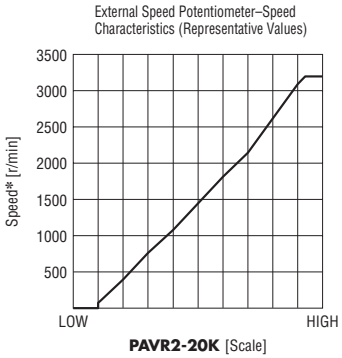
Note

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

◇Setting by the External Speed Potentiometer

Connect to pin No. 4 to 6 of CN2.



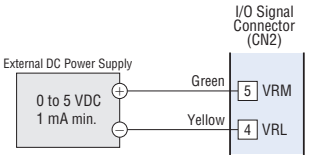


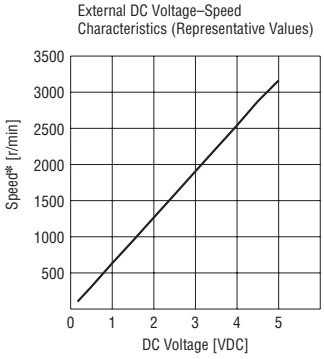
Note

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

◇Setting by External DC Voltage

Connect to pin No. 4 and 5 of CN2.





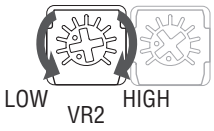
Note

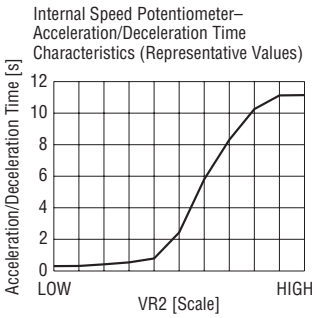
●The speed in the graph represents the speed of the motor alone. The gear output shaft speed is calculated by dividing the gear ratio.

●Setting the Acceleration and Deceleration Times

For the acceleration time, set the time it takes the motor to move from a resting state to a rated speed. For the deceleration time, set the time it takes for the motor to move from a rated speed to rest. (Acceleration and deceleration times have shared settings)

Factory setting: 0.5 s





●Multi-Motor Control

Two or more motors can be operated at the same speed using 1 external speed potentiometer or external DC voltage.

◇When Using an External Speed Potentiometer

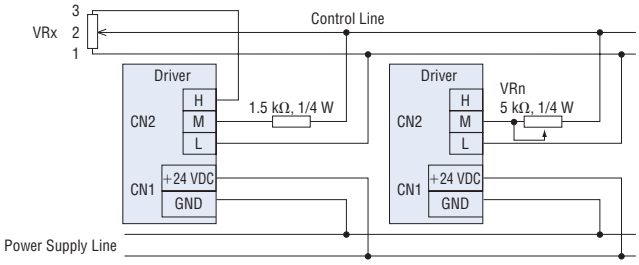
When using a external speed potentiometer (VRx), no more than five motors should be operated simultaneously.

Resistance value when the number of drivers is n:

VRx (kΩ)=20 kΩ/n,

acceptable loss (W)=n/20

Example: 10 kΩ , 1/2 W for 2 drivers.

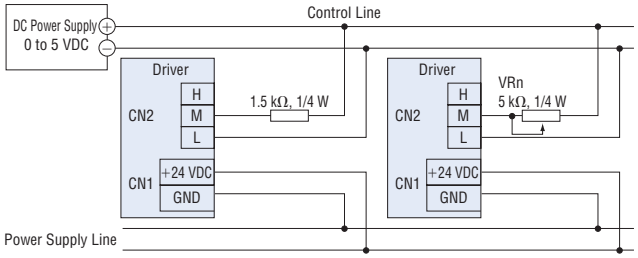


◇When Using an External DC Voltage

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

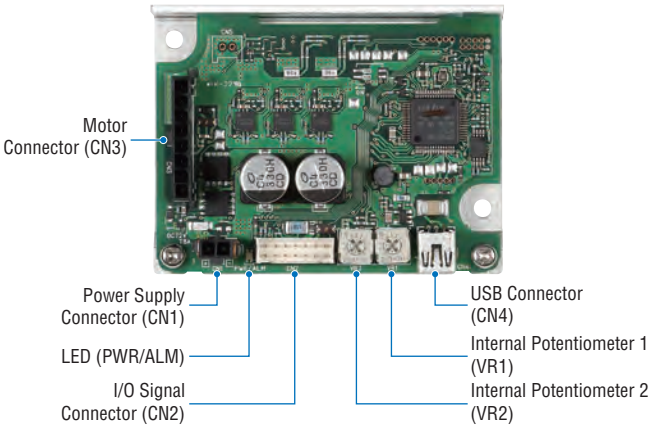
Current capacity (mA) when the number of drivers is n: 1 mA×n

Example: When two drivers are used, the current capacity should be 2 mA min.



Connection and Operation　Digital Setting Type (15 W, 30 W, 50 W)

Names and Functions of Driver Parts



Name	Indication	Description	
Power Supply Connector	CN1	Connects the power supply cable.	
I/O Signal Connector	CN2	Connects the I/O signal cable to connect with an external control device.	
Motor Connector	CN3	Connects the motor cable.	
USB Connector	CN4	Connects a PC in which the **MEXE02** has been installed.	
LED	PWR/ALM	Green	Lit in green while the power is supplied.
		Red (Blinks)	If an alarm is generated, this LED will blink in red.
		Orange (Blinks)	If information is generated, it will blink in orange.
Internal Potentiometer*	VR1	Uses to set the operation data. Factory setting: The rotation speed in the operation data No.1 can be set.	
	VR2	Uses to set the operation data. Factory setting: The acceleration time and deceleration time in the operation data No.0 and No.1 can be set.	

*The function can be changed using the **MEXE02**.

◇I/O Signal Connector (CN2)

Pin No.	Color of Lead Wire	Terminal Name	Initial Assignment Signal*1	Description
14	Yellow/Black	DIN0	[START/STOP]	These signals are used to operate the motor. The motor rotates according to the acceleration time when both the START/STOP input and the RUN/BRAKE input are turned ON. If the START/STOP input is turned OFF, the motor stops according to the deceleration time. If the RUN/BRAKE input is turned OFF, the motor stops instantaneously.
13	Orange/White	DIN1	[RUN/BRAKE]	
12	Red/White	DIN2	[FWD/REV]	This signal is used to change the motor rotation direction. The motor rotates in the forward direction when the signal is turned ON.*2
11	Brown/White	DIN3	[M0]	The operation data number can be selected based on a combination of ON/OFF status of the M0 and M1 inputs.
10	Black	DIN4	[M1]	
9	White	DIN5	[ALM-RST]	This signal is used to reset the alarm. (The alarm will be reset at the ON edge of the input.)
8	Gray	VH	External Analog Setting Device*3	These terminals are used when the rotation speed or torque limiting value is externally set using an external analog setting device (External speed potentiometer or external DC voltage).
7	Purple	VM		
6	Blue	VL		
5	Green	GND	GND	I/O signals common
4	Yellow	DOUT0	[SPEED-OUT]	30 pulses are output while the motor output shaft makes one revolution.
3	Orange	DOUT1	[ALM-B]	This is a signal to output an alarm status. It is turned OFF when an alarm is generated. (Normally closed)
2	Red	DOUT2	[TLC]	This is a signal to output when the motor output torque is limited.*4
1	Brown	DOUT3	[DIR]	This is a signal to output information of the motor rotation direction. (It is turned ON when the motor rotates in the forward direction.)

*1 Described in brackets [ ] are signal assigned at the time of shipment. Functions for the pin No.1 to No.4 and No.9 to No.14 can be changed using the **MEXE02**.
*2 The rotation direction of the output shaft varies depending on the gear ratio of the gearhead.
*3 If the "External setting method" parameter is changed, the speed and torque limiting value can be set with the PWM signal input.
*4 The torque limiting value is set to 200% at the time of shipment and can be changed using the **MEXE02**.

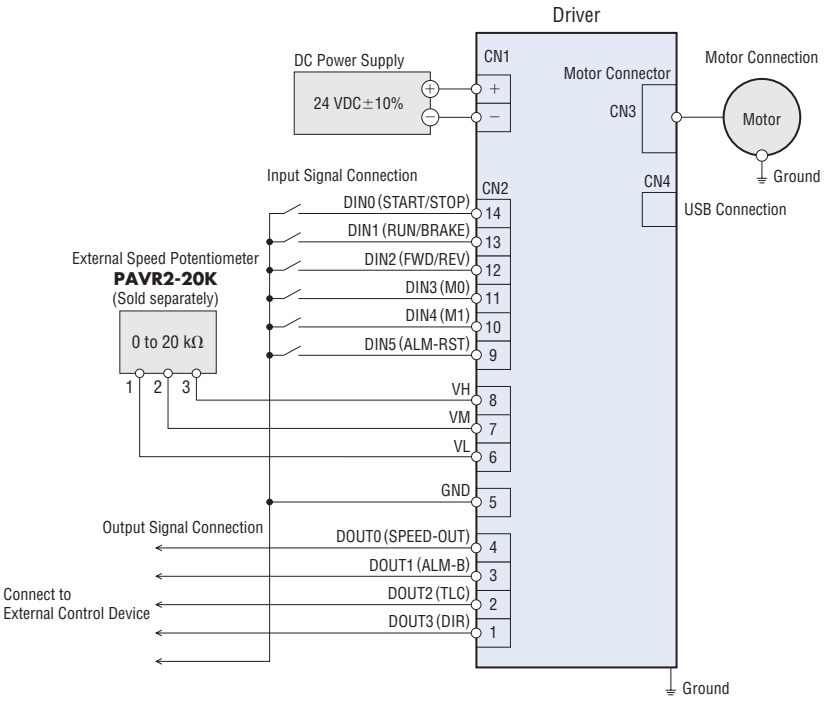
◇USB Cable (CN4)

•USB Cable Specifications

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

Connection Diagrams

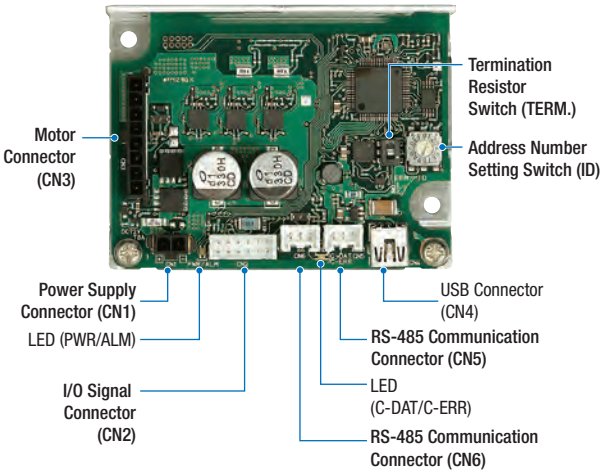
The figure shows a connection example when connecting an external speed potentiomenter.



For detailed information and handling precautions of this product, see the Operating Manual. The operating manual is available for download from the Oriental Motor website.

Connection and Operation RS-485 Communication Type (15 W, 30 W, 50 W)

Names and Functions of Driver Parts



Name	Indication	Description	
Power Supply Connector	CN1	Connects the power supply cable	
I/O Signal Connector	CN2	Connects the I/O signal cable to connect an external controller	
Motor Connector	CN3	Connects the motor cable	
USB Connector	CN4	Connects to the computer on which **MEXE02** is installed	
RS-485 Communication Connector	CN5	Connects the communication cable to connect an external controller Or, connects another driver through a daisy chain	
	CN6		
LED	PWR/ALM	Green	Lit up when power is on
		Red (blinking)	Blinks when an alarm is generated.
		Orange (blinking)	Blinks when information is generated
	C-DAT C-ERR	Green (lit up)	When communication with the master station via RS-485 communication is normal
		Red (lit up)	When communication with the master station via RS-485 communication is abnormal
Address Number Setting Switch	ID	Sets the address number when RS-485 communication is used Factory setting: 1 (0~F)	
Termination Resistor Switch	TERM.	Sets the RS-485 communication termination resistor (120 Ω) Factory setting: OFF (OFF: disabled, ON: enabled)	

◇I/O Signal (CN2)

Pin No.	Wire Color	Terminal Name	Initial Assignment Signal*1	Description
12	–	–	–	N.C. (No connection)
11	Black	D-IN0	START/STOP	This signal operates the motor. If both the START/STOP input and RUN/BRAKE input are turned ON, the motor rotates according to the acceleration time. If the START/STOP input is turned OFF, the motor will stop according to the deceleration time. If the RUN/BRAKE input is turned OFF simultaneously, the motor will stop instantaneously.
10	White	D-IN1	RUN/BRAKE	
9	Gray	D-IN2	FWD/REV	Changes the rotation direction of the motor. If turned ON, the motor rotates in the FWD direction. *2
8	Aqua	D-IN3	M0	This signal allows you to select the operating data No.
7	Purple	D-IN4	ALM-RST	Alarms are reset. (ON edge enabled)
6	Blue	VH	External Analog Control Module*3	Use an external analog control module (external speed potentiometer or external DC voltage) to connect when speed and torque limiting values are set.
5	Green	VM		
4	Yellow	VL		
3	Orange	GND	GND	This is the I/O signal common terminal.
2	Red	D-OUT0	SPEED-OUT	30 pulses are output while the motor output shaft makes one rotation.
1	Brown	D-OUT1	ALM-B	This signal outputs the alarm status. Turns OFF when an alarm is activated. (B contact)

*1 Pin Nos. 1, 2, and 7~11 can change functions through **MEXE02** or RS-485 communication.
*2 The rotation direction of the output shaft differs depending on the gear ratio of the gearhead.
*3 By switching the "External potentiometer function selection" parameter, the speed and torque limiting value can be set via PWM input.

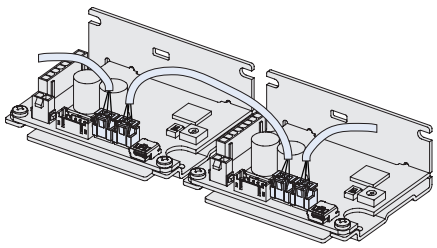
◇USB Cable (CN4)

•USB Cable Specifications

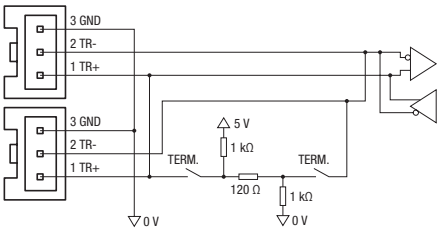
Specifications	USB2.0 (Full speed)
Cables	Length: 3 m or less
	Configuration: A to mini-B

◇RS-485 Communication Connector (CN5, CN6)

Connect when controlling with RS-485 communication. Connect the RS-485 communication cable (sold separately) to either the CN5 or CN6 connector.
Another driver can be connected to the open connectors.



•Internal Input Circuit



Pin No.	Signal Name	Description
1	TR+	RS-485 Communication Signal (+)
2	TR−	RS-485 Communication Signal (−)
3	GND	GND

◇Axis Setting Switch (ID)

Sets the address number (slave address) with the address number setting switch. Please set such that address numbers (slave addresses) are not duplicated.

Address number 0 is reserved for broadcasting, so do not use it.

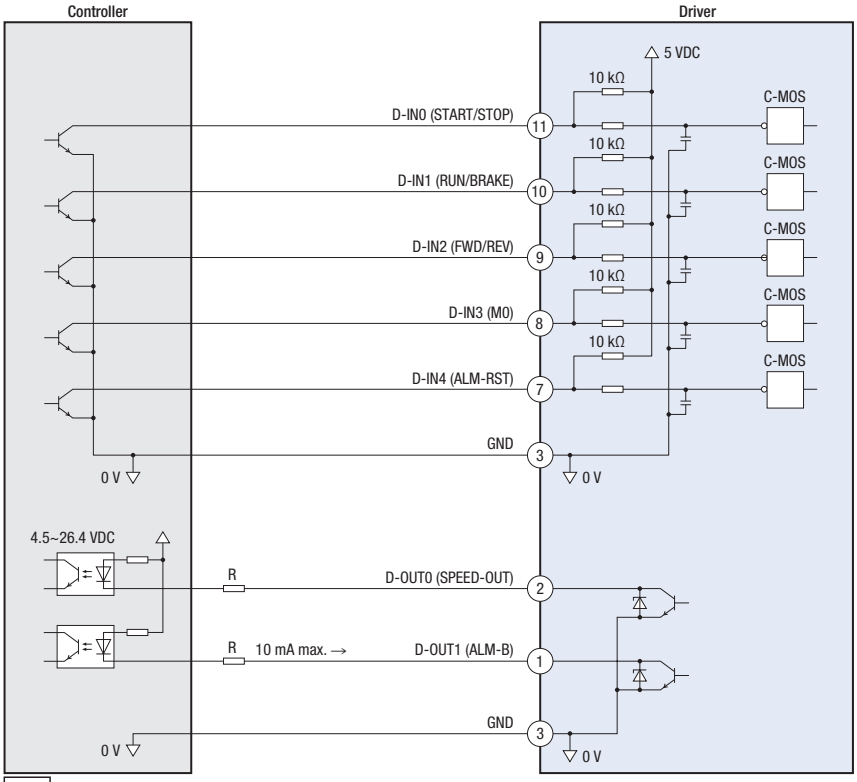
ID Switch	Address Number	ID Switch	Address Number
0	Not used	8	8
1	1 (Factory setting)	9	9
2	2	A	10
3	3	B	11
4	4	C	12
5	5	D	13
6	6	E	14
7	7	F	15

Connection Diagrams

An example of I/O signal connection with a host controller is shown below.

The I/O signal connection method between the **BLH** Series RS-485 communication type and the host controller should be a sink connection.

(Not compatible with source connection.)



Note

Be sure to maintain the current value of the output signal at 10 mA or less. If this current value is exceeded, connect the current limiting resistor R externally.

Please refer to the operating manual for detailed information and precautions for the use of this product. The operating manual is available for download from the Oriental Motor website.

Installing a Load to the Hollow Shaft

How to Install a Load Shaft

- Install the load shaft to the hollow output shaft by aligning the center of the hollow shaft with that of the load shaft.
- The hollow output shaft has a key slot. Machine a matching key slot on the load shaft and use the supplied key to affix the two shafts across the slots.
- The recommended tolerance of the load shaft is h7.
- If the motor is intended to receive large impacts due to frequent instantaneous stops or carry a large radial load, use a stepped load shaft.
- The load shaft can be installed from both the front and rear faces of the hollow shaft flat gearheads.

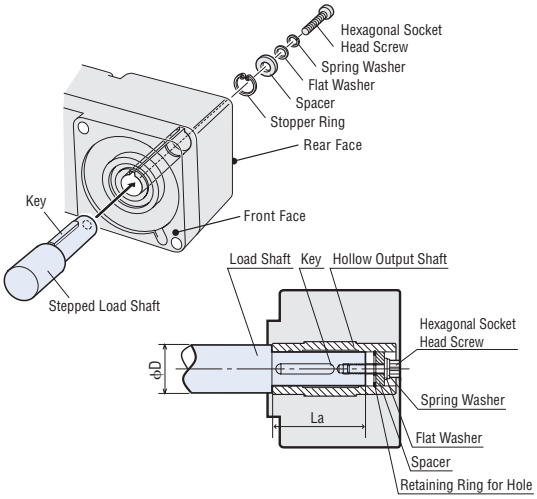
Note

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

◇Stepped Load Shaft

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

Example of Front Face Installation

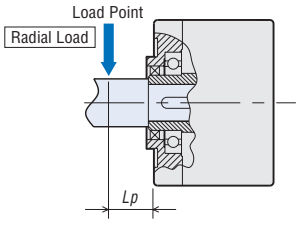


Permissible Radial Load Calculation of the Hollow Shaft Type

The formula for permissible radial load varies depending on the mechanism.

◇When End of Shaft being Driven is Not Supported by a Bearing

This mechanism experiences the highest amount of radial load. The stepped type is recommended for the load shaft.



F_0 [N] : Permissible Radial Load at 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

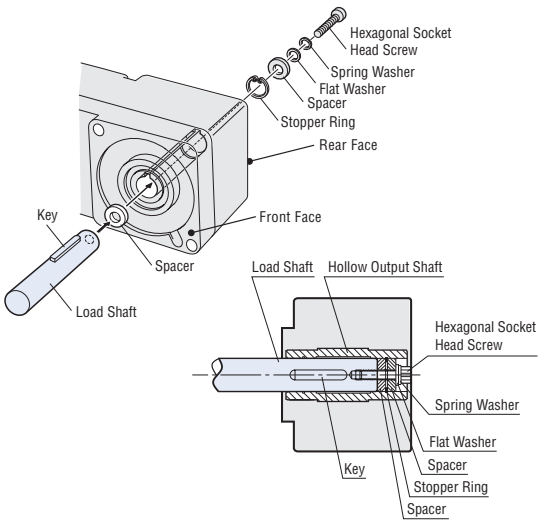
Product Name	Permissible Radial Load W [N]
GFS2G□FR	$W\,[\mathrm{N}]=\dfrac{36}{36+Lp}\times F_0\,[\mathrm{N}]$
GFS4G□FR	$W\,[\mathrm{N}]=\dfrac{40}{40+Lp}\times F_0\,[\mathrm{N}]$
GFS5G□FR	$W\,[\mathrm{N}]=\dfrac{50}{50+Lp}\times F_0\,[\mathrm{N}]$

- A number indicating the gear ratio is specified where the box □ is located within the product name..

◇Straight Load Shaft

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

Example of Front Face Installation



◇Recommended Load Shaft Installation Dimensions

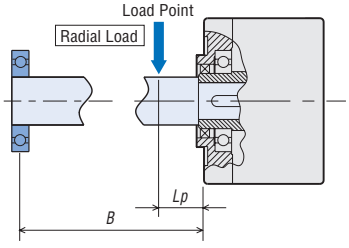
Unit: mm

Product Name	GFS2G□FR	GFS4G□FR	GFS5G□FR
Inner Diameter of Hollow Shaft (H8)	$\phi12^{+0.027}_{0}$	$\phi15^{+0.027}_{0}$	$\phi20^{+0.033}_{0}$
Shaft Diameter of Load Shaft (h7)	$\phi12^{0}_{-0.018}$	$\phi15^{0}_{-0.018}$	$\phi20^{0}_{-0.021}$
Screw Size	M4	M5	M6
Spacer Thickness*	3	4	5
Nominal Hole Diameter of Retaining Ring	ϕ12 (C-Shaped)	ϕ15 (C-Shaped)	ϕ20 (C-Shaped)
Outer Diameter of Stepped Shaft ϕD	20	25	30
Stepped Shaft La Length	39	43	52

*Determine the spacer thickness in conformance with the table. If the spacer is thicker than the specified dimension, the screw head may project outside of the gear case and the safety cover may not be installed.

- Retaining rings for holes, spacers, screws and other parts used to install the load shaft are not included. The customer must supply these.

◇When End of Shaft being Driven is Supported by a Bearing



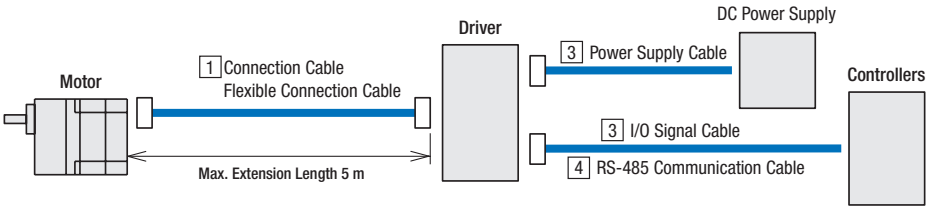
Product Name	Permissible Radial Load W [N]
GFS2G□FR **GFS4G□FR** **GFS5G□FR**	$W\,[\mathrm{N}]=\dfrac{B}{B-Lp}\times F_0\,[\mathrm{N}]$

Product Name	Gear Ratio	F0 [N]
GFS2G□FR	**5**, **10**	570
	15 to **200**	630
GFS4G□FR	**5**, **10**	1000
	15 to **200**	1500
GFS5G□FR	**5**, **10**	1080
	15, **20**	1550
	30 to **200**	1800

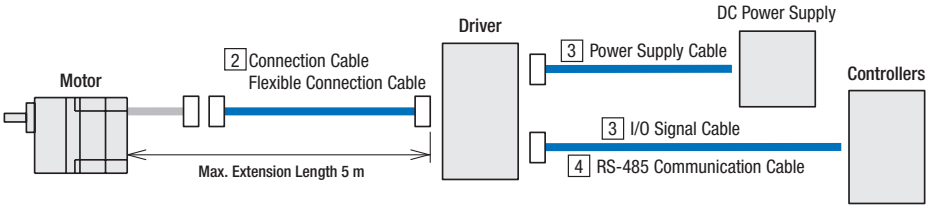
Cables and Accessories (Sold Separately)

●Cable System Configuration

◇Connector Type



◇ Cable Type



1 Connection Cables/Flexible Connection Cables (Connector type)

These cables are used to connect the motor and the driver. Keep the overall cable within 5 m.
Use the flexible connection cable in applications where the cable is bent and flexed repeatedly.

●Product Line → Page 15

●Dimensions → Page 24

2 Connection Cables/Flexible Connection Cables (Cable type)

These cables are used to connect the motor and the driver. When using an extension on the product's cable, keep the overall cable length within 5 m.
Use the flexible connection cable in applications where the cable is bent and flexed repeatedly.

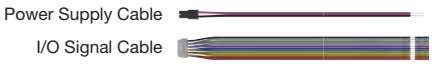
●Product Line → Page 29

●Dimensions → Page 43

3 Power Supply Cable and I/O Signal Cable Set (For 15 W, 30 W, 50 W)

Power supply cable is used to connect the driver and the power supply. I/O signal cable is used to connect the driver and programmable controller. Cables come as a set of power supply cable and I/O signal cable.

●Product Line

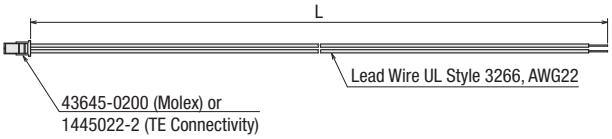


Length L [m]	Product Line	Product Name	Component Name	
			Power Supply Cable	I/O Signal Cable
0.3	For Analog Setting Type For RS-485 Communication Type	**LHS003CC**	**LH003C1**	**LH003C3**
	For Digital Setting Type	**LHS003CD**	**LH003C1**	**LH003C4**
1	For Analog Setting Type For RS-485 Communication Type	**LHS010CC**	**LH010C1**	**LH010C3**
	For Digital Setting Type	**LHS010CD**	**LH010C1**	**LH010C4**

●Dimensions (Unit = mm)

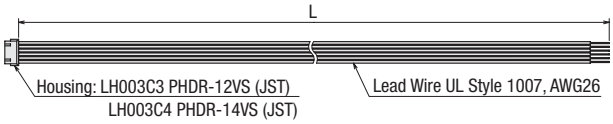
◇Power Supply Cable

LH003C1/LH010C1



◇I/O Signal Cable

LH003C3/LH003C4/LH010C3/LH010C4

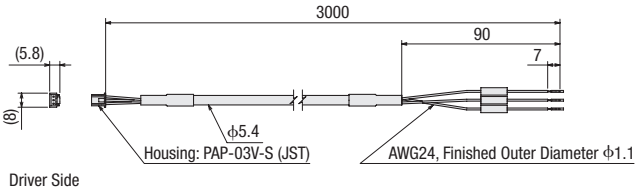


4 RS-485 Communication Cables

These cables are used to connect the driver and the host master.

Length [m]	Product Line	Product Name
3	For RS-485 Communication Type	**CC030-RS**

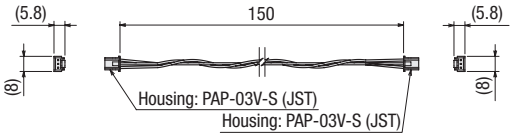
Dimensions (Unit = mm)



These cables are used to connect between drivers.

Length [m]	Product Line	Product Name
0.15	For RS-485 Communication Type	**LH0015-RWN**

Dimensions (Unit = mm)



Flexible Couplings

These products are clamp type couplings to connect a motor or gearhead shaft to the shaft of the equipment.
Once the motor or gearhead is determined, the proper coupling can be selected.

- Couplings can also be used with round shaft types. Select a coupling with the same inner diameter size as the motor shaft diameter.

MCL Couplings (Parallel Shaft Gearhead)

Applicable Product	Load Type	Coupling Type
BLM015HK **BLHM015**	Uniform Load	**MCL20** Type
	Impact Load	
BLM230HK **BLHM230**	Uniform Load	**MCL30** Type
	Impact Load	
BLM450HK **BLHM450**	Uniform Load	**MCL40** Type
	Impact Load	**MCL55** Type
BLHM5100	Uniform Load	**MCL55** Type
	Impact Load	

DIN Rail Mounting Plates

Use these mounting plates to mount the driver to a DIN rail.

Product Line

Product Name	Applicable Product
MADP01	15 W, 30 W, 50 W Driver
MADP02	100 W Driver

Driver Cover

This is a protection cover to prevent contact with the circuit board.

Product Line

Product Name
PADC-BLH2D

<Application Example>

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 **GFS** with an output power of 100 W.

Product Line

Product Name
AGD580B

Motor/Gearhead Mounting Brackets

Dedicated mounting brackets for attaching and securing a motor and gearhead.

Product Name	Applicable Product
SOL0B	**BLM015HK-□, BLM015HK-□CS, BLM030DHK-□CS, BLHM015K-□**
SOL0M3	**BLM015HK-A, BLM030DHK-A, BLHM015K-A**
SOL2M4	**BLM230HK-A, BLM250DHK-A, BLM230HK-□CS, BLM250DHK-□CS, BLHM230K□-A, GFS2G□**
SOL4M6	**BLM450HK-A, BLHM450K□-A, GFS4G□**
SOL5M8	**BLHM5100K□-A, GFS5G□**

- A number indicating the gear ratio is specified where the box □ is located in the applicable product.
  Either **C** for cable type or **CM** for electromagnetic brake motor is specified where the box □ is located in the applicable product.

External Speed Potentiometer

Features

- Potentiometer which allows the adjustment of rotation speed and torque.
- Easy installation
  Simply insert the potentiometer into the mounting hole. No tools are required. It can be removed.
- Easy wiring
  A terminal block is employed. Lead wire connection or soldering is not required. The efficiency of wiring is improved.

Front Face

Rear Face

Product Line

Product Name
PAVR2-20K

Note

- When connecting the potentiometer with an I/O signal cable, attach crimp terminals to the I/O signal cable.

Specifications

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

•Applicable Lead Wire Size
AWG22 - 16 (0.3 - 1.25 mm²)

For details, check the Oriental Motor website or contact the Oriental Motor sales office.

http://www.orientalmotor.eu

Related Products

Brushless Motor　DC Power Supply
BLV Series R Type

DC input brushless motors that can be driven by battery and controlled by communication

- Output power 60 W, 100 W, 200 W, 400 W
- Compact and lightweight drivers
  (W 65 mm×D 75 mm×H 29 mm　Mass 0.12 kg)
- Power Supply Input: 24 - 48 VDC
- Electromagnetic brake motors available
- Compatible with Modbus (RTU) and CANopen communications

For details, refer to the product catalog or web catalog.

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.

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UK/102024/VERS01

Printed in Germany.