Speed Control Motors

Brushless Motors

AC Input

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BMU Series
BLE2 Series
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Brushless Motor and Driver Package

BMU Series

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● For detailed information about regulations and standards, please see the Oriental Motor website.

- Watertight and dust-resistant performance IP66.
- A motor and driver package designed for simplicity, performance and affordability. Simply turn the dial and press to set the speed.
- Easy wiring – just connect the motor and driver and flip the switch.
- Features a new, smaller, high power, high efficiency brushless motor.
- The highest standard in speed control at an affordable price.

Features

Easy Speed Control

Using the dial and digital speed indicator, controlling the **BMU** Series brushless motor speed is simple and user-friendly.

Turn the dial and set to the desired speed.

Turning the dial slowly changes the speed by 1 r/min.

Pushing the dial sets the speed.

The dial operation can be locked.

Easy Wiring, Easy Set-Up

Get started quickly and easily. Connecting the motor is simple using the included cables with connectors.

The motor and driver can be easily connected.

The power and I/O connectors feature a screwless connector.

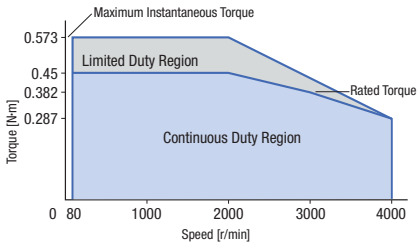
The motor can be started immediately with only one switch.

The motor's rotation direction can be switched with ease.

Maximum Speed 4000 r/min, Speed Ratio 1:50 (2.5 times higher than conventional products)

The **BMU** Series offers the highest standard in speed control with a maximum speed of 4000 r/min and a speed ratio of 1:50 (80~4000 r/min). Speed regulation has also been greatly improved from ±0.5% to ±0.2%.

• **BMU** Series 120 W



User-friendly Features and Expanded Functions at an Affordable Price

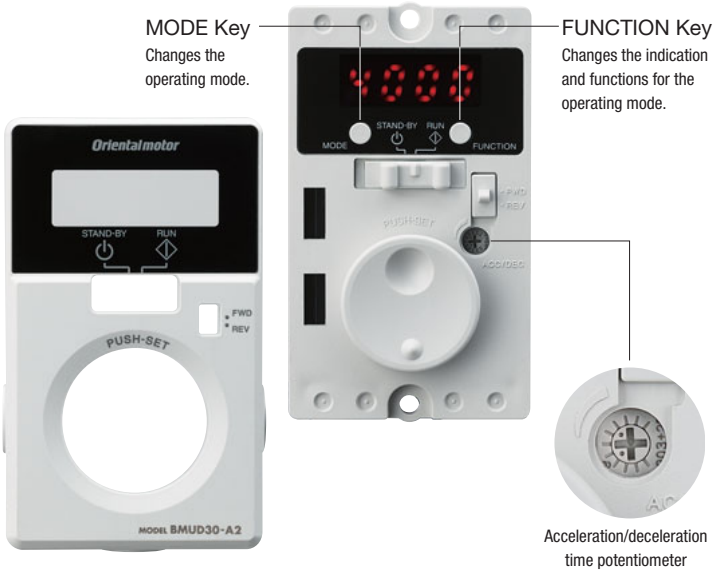
The list price for the **BMU** Series, 60 mm, 30 W motor with a 1:5 ratio offers more value and performance than ever before.

BMU Series
- Output power: 30 W
- Gearhead gear ratio: 5
- Permissible torque: 0.45 N·m
- Speed range: 16~800 r/min

€329.00*

*Total price of motor, driver and connection cable (1 m).

Expanded Functions can be Set on the Driver



◇**Typical Functions that can be Set while the Front Panel is Opened:**

- Motor start/stop*
- Adjusting the operating speed*
- Setting the operating speed*
- Switching the rotation direction*
- Changing the indication
- Indicating the operating speed when the speed reduction/speed increasing ratio is set
- Setting the acceleration/deceleration time
- Dial operation lock
- Speed setting for the 4-speed operation
- Speed limits setting
- Validating the external operating signals
- External input/output signal allocation
- Setting the overload alarm detection time (except during axial lock)
- Load holding function for output shaft

*Setting is possible even if the front panel is attached.

Speed Display

Displays the motor speed in increments of 1 r/min. To display the conveyor transportation speed in m/s, calculate the conveyor gear ratio and set the "Gear Ratio" parameter. The conveyor transportation speed can be checked directly.

Load Factor can be Indicated

With the rated torque of the motor at 100%, the load factor can be expressed as a percentage (40~200%). The load condition during start-up, as well as the load condition due to the aging deterioration of the equipment, can be confirmed.

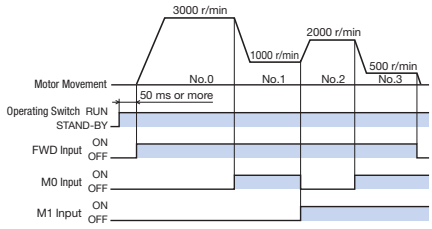
Indication at a load factor of 50%

Protective Functions

Equipped with various protective functions such as the overload protective function and the overvoltage protective function. When any protective function is activated, alarm code is displayed on the display and also the alarm signal is output.

4-Speed Operation

4-speed operation is possible by setting the data to operating data No.0, No.1, No.2, or No.3, and switching the input of the M0 and M1 terminals.



- When operating in 4-speed settings, the rotation direction of the motor cannot be changed by external input signals. (Only for 30 W, 60 W and 120 W)

Acceleration/Deceleration Time Setting

The setting of the acceleration time and deceleration time can be adjusted with the acceleration/deceleration time potentiometer and also can be done for the digital setting.

●Setting Range
0.0~15.0 seconds
(Initial value: 0.5 seconds)

When the digital setting is performed, the acceleration and deceleration time can be set independently, which enables to finely adjust the shock absorption for the load at start/stop or set the time freely according to the takt time.

Output Shaft Holding when Stopped

The load can be electrically held when the motor is at standstill.
(Holding force up to 50% of rated torque)

Note

- If the power supply to the driver is turned OFF, the holding force dissipates. This cannot be used to prevent a fall during a power outage.

Other Functions

●Lock Dial Operations

This prevents the undesired changes in the speed and the changes or deletion of data with the operation of the dial.

●"Disable the Front Panel Operation" is Possible

When operating by an external signal, the switching operation on the front panel can be set to "Disable".

Connector Type Features

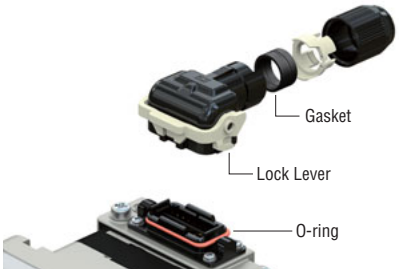
The connector is newly developed only for the small motor. It enabled the direct connection between motors and drivers. Also the IP66 degree of protection* is achieved by the motor structure and improved watertight and dust-resistant performance.

*Motor only

New Type Connector

The internal gasket and O-ring improved the watertight performance. The connection is easy due to the lock lever that does not need to tighten screws.

●Connector Structure

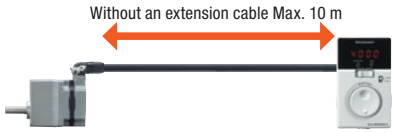


●Installation Method

Insert the connector | Turn down the lock lever | Connection complete

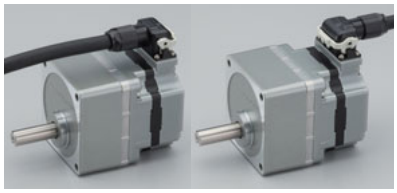
Direct Connection with Motors and Drivers

Up to 10 m connection without an extension cable is possible. No extension cable is required. Wiring process can be reduced by using one cable, instead of power lines, signal lines, and ground wires.



Cable Outlet Direction Can be Selected

Two direction types of the motor cable outlet can be selected based on the equipment.
(For the round shaft type, the opposite side of the output shaft only.)



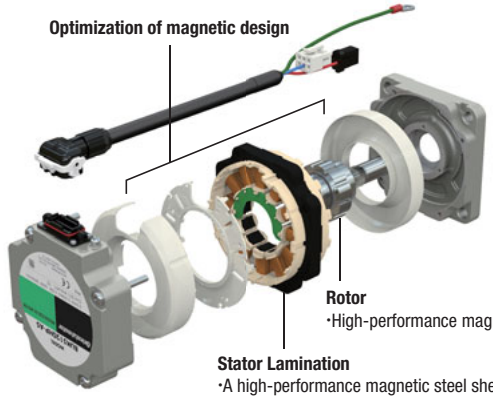
Cable drawn by the outlet shaft side | Cable drawn in the opposite side of the output shaft

Stainless Steel Shaft Is Included as Standard

Uses a shaft made of SUS303 type, which especially excels in rust prevention and corrosion resistance. Also, uses a parallel key and installation screws made of stainless steel.

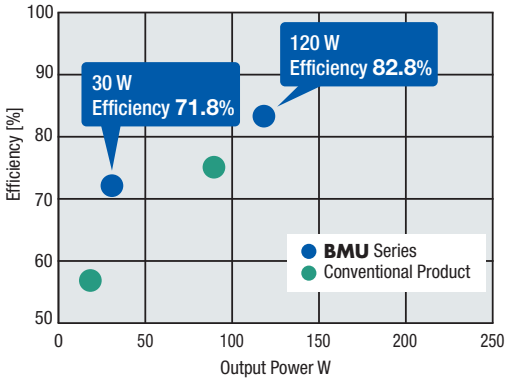
Compact, High Power, and High Efficiency with a New Brushless Motor

Optimal magnetic design and high-performance materials allow for a stator lamination thickness of only 11.2 mm. This thinness achieves highly efficient power.
Compared with a conventional brushless motor of the same output power, the stator plate thickness is reduced by half (for motors with a frame size of 90 mm).
Moreover, by using high-performance materials while reducing the amount of material used, costs have been reduced significantly.



Substantial Improvement in the Efficiency of the Motor and Driver Package

●A maximum of 15% efficiency improvement of the package

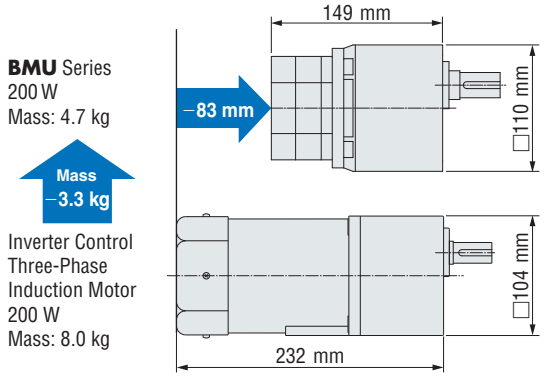


Contributes to Downsizing and Energy Savings

The high-power new brushless motor is also lighter and slimmer. For example, compared with the three-phase induction motor of output power 200 W:

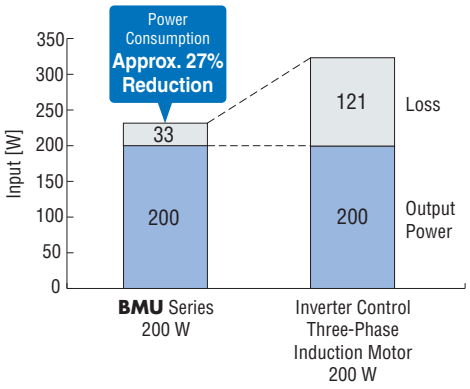
◇Downsizing

Brushless motors have slim and lightweight body but provide high power due to permanent magnets being used in the rotor. Using brushless motors can contribute to downsizing of equipment.



◇Energy Savings

Brushless motors, which incorporate permanent magnets in the rotor, generate little secondary loss from the rotor. This allows for power consumption to be reduced greatly. This contributes to energy savings with the equipment.



●At rated output 50 Hz (Representative value)

Product Line

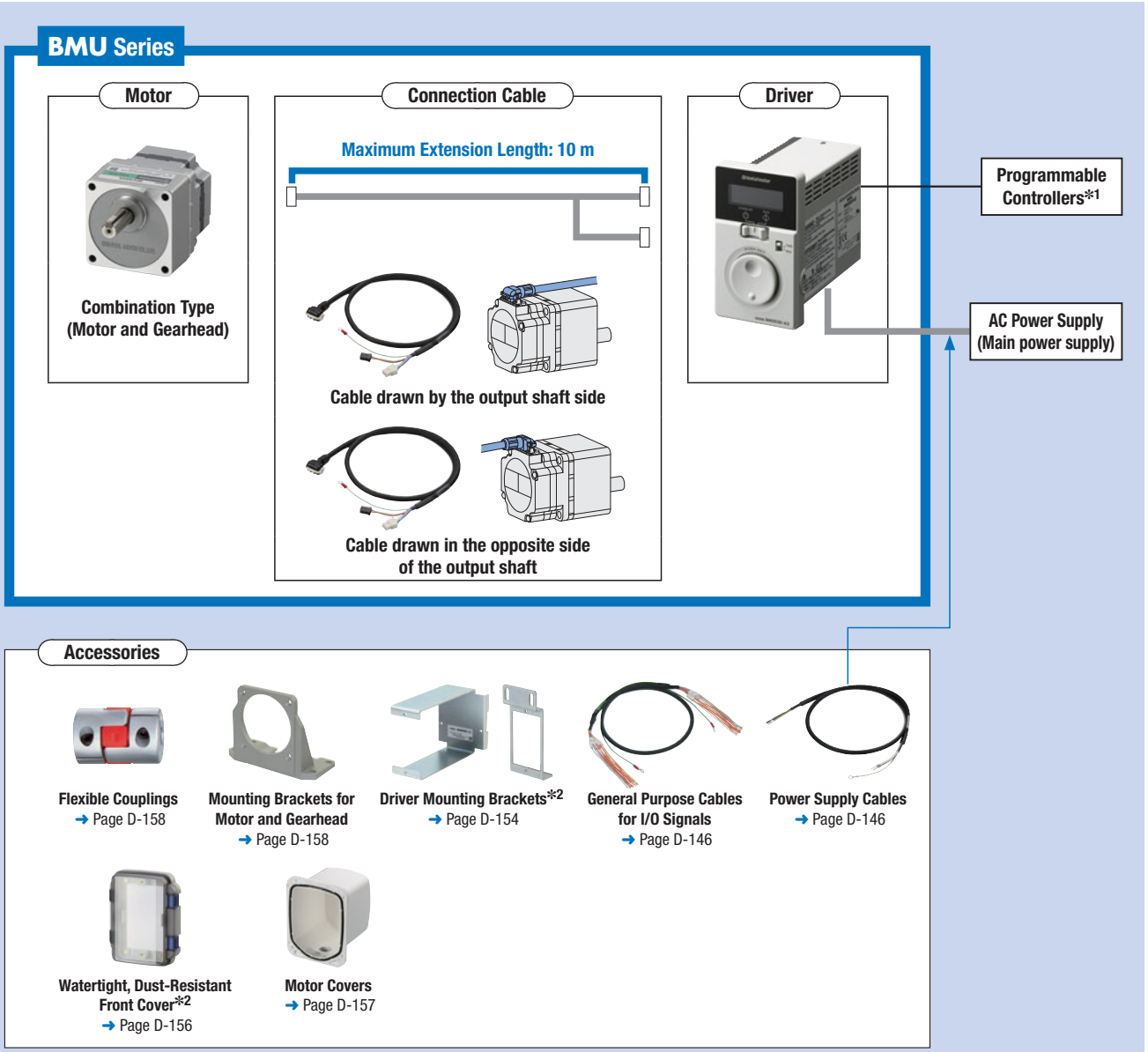
For **BMU** Series, motors, drivers, and connection cables need to be ordered separately.
Select suitable products according to the specifications or installation conditions.

Motor	Output Power	Frame Size	Gear Ratio (Combination Type)	Driver	Power Supply Voltage	Connection Cable
 Combination Type  Round Shaft Type*	30 W	Combination Type 60 mm Round Shaft Type 60 mm	5, 10, 15, 20, 30, 50, 100, 200		Single-Phase 200 - 240 VAC Three-Phase 200 - 240 VAC	Cable drawn by the output shaft side  0.5, 1, 1.5, 2, 2.5, 3, 4, 5, 7, 10 m Cable drawn in the opposite side of the output shaft  0.5, 1, 1.5, 2, 2.5, 3, 4, 5, 7, 10 m
	60 W	Combination Type 80 mm Round Shaft Type 60 mm	5, 10, 15, 20, 30, 50, 100, 200			
	120 W	Combination Type 90 mm Round Shaft Type	5, 10, 15, 20, 30, 50, 100, 200			
	200 W	Combination Type 110 mm Round Shaft Type 90 mm	5, 10, 15, 20, 30, 50, 100, 200			
	300 W	Combination Type 110 mm Round Shaft Type 90 mm	5, 10, 15, 20, 30, 50, 100			

*The connection cable for combining with the round shaft type is the cable drawn in the opposite side of the output shaft only.

System Configuration

The motor, the driver and the connection cables are purchased individually.



*1 Not supplied.

*2 Driver mounting bracket and watertight, dust-resistant front cover cannot be attached to the driver together.

●Example of System Configuration

BMU Series			+	Sold Separately		
Combination Type with Parallel Shaft	Driver	Connection Cable (3 m)		Mounting Bracket for Motor and Gearhead	Flexible Coupling	Driver Mounting Bracket
BLM230HP-10S	BMUD30-C2	CC030HBLF		SOL2M4F	MCL301010	MAFP05V
€183.00	€120.00	€46.00		€20.00	€36.00	€10.00

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

Product Number

Motor (Combination Type/Round Shaft Type)

BLM 4 60 S H P - 50 S

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①	Motor Type	**BLM**: Brushless motor
②	Frame Size	**2**: 60 mm **4**: 80 mm **5**: 90 mm **6**: 104 mm (Gearhead is 110 mm)
③	Output Power	**30**: 30 W **60**: 60 W **120**: 120 W **200**: 200 W **300**: 300 W
④	Identification Number	**S**
⑤	Motor Connection Method	**H**: Connector
⑥	Motor Degree of Protection	**P**: IP66 Specifications
⑦	Gear Ratio/Shaft Type	Number: Gear ratio for combination type **A**: Round shaft type
⑧	Output Shaft Material	**S**: Stainless steel

Driver

BMUD 60 - C 2

① ② ③ ④

①	Driver Type	**BMUD**: Driver for **BMU** Series
②	Output Power	**30**: 30 W **60**: 60 W **120**: 120 W **200**: 200 W **300**: 300 W
③	Power Supply Voltage	**C**: Single-Phase, Three-Phase 200-240 VAC
④	Reference Number	

Connection Cable

CC 010 H BL F

① ② ③ ④ ⑤

①	Cable Type	**CC**: Connection cable
②	Length	**005**: 0.5 m **010**: 1 m **015**: 1.5 m **020**: 2 m **025**: 2.5 m **030**: 3 m **040**: 4 m **050**: 5 m **070**: 7 m **100**: 10 m
③	Motor Connection Method	**H**: Connector
④	Applicable Motor	**BL**: Brushless motor
⑤	Direction of Cable Outlet	**F**: Output shaft side **B**: Counter-output shaft side

Product Line

The motor, the driver and the connection cables are purchased individually.
For the single-phase 100-120 VAC models, please contact the nearest Oriental Motor sales office.

Combination Type – Parallel Shaft Gearhead

Combination Type: Delivered with the motor and gearhead pre-assembled.
The combination of motor and gearhead can be changed, or purchased separately. In addition, the gearhead can be removed and the assembly position can be changed in 90° increments.

◇Motors

Output Power	Product Name	Gear Ratio	List Price
30 W	**BLM230HP-□S**	**5, 10, 15, 20**	€183.00
		30, 50, 100	€189.00
		200	€197.00
60 W	**BLM460SHP-□S**	**5, 10, 15, 20**	€202.00
		30, 50, 100	€208.00
		200	€217.00
120 W	**BLM5120HP-□S**	**5, 10, 15, 20**	€255.00
		30, 50, 100	€263.00
		200	€271.00
200 W	**BLM6200SHP-□S**	**5, 10, 15, 20**	€308.00
		30, 50	€320.00
		100, 200	€333.00
300 W	**BLM6300SHP-□S**	**5, 10, 15, 20**	€345.00
		30, 50	€357.00
		100	€370.00

The following items are included with each product.
Motor, Gearhead, Installation Screws, Parallel Key, Operating Manual

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

◇Drivers

Output Power	Power Supply Voltage	Product Name	List Price
30 W	Single-Phase, Three-Phase 200-240 VAC	**BMUD30-C2**	€120.00
60 W	Single-Phase, Three-Phase 200-240 VAC	**BMUD60-C2**	€126.00
120 W	Single-Phase, Three-Phase 200-240 VAC	**BMUD120-C2**	€140.00
200 W	Single-Phase, Three-Phase 200-240 VAC	**BMUD200-C**	€157.00
300 W	Single-Phase, Three-Phase 200-240 VAC	**BMUD300-C**	€165.00

The following items are included with each product.
Driver, CN1 Connector, CN4 Connector, Operating Manual, Startup Guide

◇Connection Cables

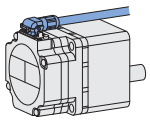
Length	Product Name	List Price
0.5 m	**CC005HBL■**	€26.00
1 m	**CC010HBL■**	€26.00
1.5 m	**CC015HBL■**	€30.00
2 m	**CC020HBL■**	€33.00
2.5 m	**CC025HBL■**	€39.00

Length	Product Name	List Price
3 m	**CC030HBL■**	€46.00
4 m	**CC040HBL■**	€54.00
5 m	**CC050HBL■**	€62.00
7 m	**CC070HBL■**	€77.00
10 m	**CC100HBL■**	€97.00

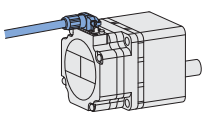
● **F** or **B** indicating the direction of cable outlet is entered where the box ■ is located within the product name.

Two types of the connection cables with different drawing directions are available.

F: Cable drawn by the output shaft side



B: Cable drawn in the opposite side of the output shaft



●Round Shaft Type

◇Motors

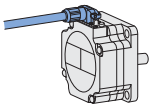
Output Power	Product Name	List Price
30 W	**BLM230HP-AS**	€105.00
60 W	**BLM260HP-AS**	€114.00
120 W	**BLM5120HP-AS**	€137.00
200 W	**BLM5200HP-AS**	€163.00
300 W	**BLM5300HP-AS**	€200.00

The following items are included with each product.
Motor, Operating Manual

◇Connection Cables

Length	Product Name	List Price
0.5 m	**CC005HBLB**	€26.00
1 m	**CC010HBLB**	€26.00
1.5 m	**CC015HBLB**	€30.00
2 m	**CC020HBLB**	€33.00
2.5 m	**CC025HBLB**	€39.00
3 m	**CC030HBLB**	€46.00
4 m	**CC040HBLB**	€54.00
5 m	**CC050HBLB**	€62.00
7 m	**CC070HBLB**	€77.00
10 m	**CC100HBLB**	€97.00

B: Cable drawn in the opposite side of the output shaft



◇Drivers

Output Power	Power Supply Voltage	Product Name	List Price
30 W	Single-Phase, Three-Phase 200-240 VAC	**BMUD30-C2**	€120.00
60 W	Single-Phase, Three-Phase 200-240 VAC	**BMUD60-C2**	€126.00
120 W	Single-Phase, Three-Phase 200-240 VAC	**BMUD120-C2**	€140.00
200 W	Single-Phase, Three-Phase 200-240 VAC	**BMUD200-C**	€157.00
300 W	Single-Phase, Three-Phase 200-240 VAC	**BMUD300-C**	€165.00

The following items are included with each product.
Driver, CN1 Connector, CN4 Connector, Operating Manual, Startup Guide

Note

● The cable drawing direction of the round shaft type is the opposite side of the output shaft only.

Specifications

30 W

Product Name	Motor	Combination Type - Parallel Shaft Gearhead	BLM230HP-□S
		Round Shaft Type	BLM230HP-AS
	Driver		BMUD30-C2
Rated Output Power (Continuous)		W	30
Power Supply Voltage	Rated Voltage	VAC	Single-Phase 200-240 / Three-Phase 200-240
	Permissible Voltage Range		−15～+10%
	Frequency	Hz	50 / 60
	Permissible Frequency Range		±5%
	Rated Input Current	A	Single-Phase: 0.7 / Three-Phase: 0.38
	Maximum Input Current	A	Single-Phase: 1.2 / Three-Phase: 0.75
Rated Speed		r/min	3000
Rated Torque		N·m	0.096
Maximum Instantaneous Torque		N·m	0.144
Rotor Inertia		J: $\times 10^{-4}$kg·m^2	0.042
Round Shaft Type Permissible Inertia		J: $\times 10^{-4}$kg·m^2	1.8
Speed Control Range			80～4000 r/min (Speed ratio 1:50)
Speed Regulation	Load		±0.2% or less: Conditions 0～rated torque, rated speed, rated voltage, normal ambient temperature
	Voltage		±0.2% or less: Conditions Rated voltage −15～+10%, rated speed, no load, normal ambient temperature
	Temperature		±0.2% or less: Conditions Operating ambient temperature 0～+40°C, rated speed, no load, rated voltage

60 W

Product Name	Motor	Combination Type - Parallel Shaft Gearhead	BLM460SHP-□S
		Round Shaft Type	BLM260HP-AS
	Driver		BMUD60-C2
Rated Output Power (Continuous)		W	60
Power Supply Voltage	Rated Voltage	VAC	Single-Phase 200-240 / Three-Phase 200-240
	Permissible Voltage Range		−15～+10%
	Frequency	Hz	50 / 60
	Permissible Frequency Range		±5%
	Rated Input Current	A	Single-Phase: 1.0 / Three-Phase: 0.52
	Maximum Input Current	A	Single-Phase: 1.9 / Three-Phase: 1.1
Rated Speed		r/min	3000
Rated Torque		N·m	0.191
Maximum Instantaneous Torque		N·m	0.287
Rotor Inertia		J: $\times 10^{-4}$kg·m^2	0.082
Round Shaft Type Permissible Inertia		J: $\times 10^{-4}$kg·m^2	3.75
Speed Control Range			80～4000 r/min (Speed ratio 1:50)
Speed Regulation	Load		±0.2% or less: Conditions 0～rated torque, rated speed, rated voltage, normal ambient temperature
	Voltage		±0.2% or less: Conditions Rated voltage −15～+10%, rated speed, no load, normal ambient temperature
	Temperature		±0.2% or less: Conditions Operating ambient temperature 0～+40°C, rated speed, no load, rated voltage

120 W

Product Name	Motor	Combination Type - Parallel Shaft Gearhead	BLM5120HP-□S
		Round Shaft Type	BLM5120HP-AS
	Driver		BMUD120-C2
Rated Output Power (Continuous)		W	120
Power Supply Voltage	Rated Voltage	VAC	Single-Phase 200-240 / Three-Phase 200-240
	Permissible Voltage Range		−15～+10%
	Frequency	Hz	50 / 60
	Permissible Frequency Range		±5%
	Rated Input Current	A	Single-Phase: 2.0 / Three-Phase: 1.1
	Maximum Input Current	A	Single-Phase: 4.1 / Three-Phase: 2.0
Rated Speed		r/min	3000
Rated Torque		N·m	0.382
Maximum Instantaneous Torque		N·m	0.573
Rotor Inertia		J: $\times 10^{-4}$kg·m^2	0.23
Round Shaft Type Permissible Inertia		J: $\times 10^{-4}$kg·m^2	5.6
Speed Control Range			80～4000 r/min (Speed ratio 1:50)
Speed Regulation	Load		±0.2% or less: Conditions 0～rated torque, rated speed, rated voltage, normal ambient temperature
	Voltage		±0.2% or less: Conditions Rated voltage −15～+10%, rated speed, no load, normal ambient temperature
	Temperature		±0.2% or less: Conditions Operating ambient temperature 0～+40°C, rated speed, no load, rated voltage

- The values correspond to each specification and characteristic of a stand-alone motor. The speed-torque characteristics show the values when rated voltage is applied.
- A number indicating the gear ratio is entered where the box □ is located within the product name.

●200 W

Product Name		Combination Type - Parallel Shaft Gearhead	BLM6200SHP-□S
	Motor	Round Shaft Type	BLM5200HP-AS
	Driver		BMUD200-C
Rated Output Power (Continuous)		W	200
Power Supply Voltage	Rated Voltage	VAC	Single-Phase 200-240 / Three-Phase 200-240
	Permissible Voltage Range		−15～+10%
	Frequency	Hz	50 / 60
	Permissible Frequency Range		±5%
	Rated Input Current	A	Single-Phase: 2.7 / Three-Phase: 1.5
	Maximum Input Current	A	Single-Phase: 4.9 / Three-Phase: 3.4
Rated Speed		r/min	3000
Rated Torque		N·m	0.637
Maximum Instantaneous Torque		N·m	1.15
Rotor Inertia		J: $\times 10^{-4}$kg·m^2	0.454
Round Shaft Type Permissible Inertia		J: $\times 10^{-4}$kg·m^2	8.75
Speed Control Range			80～4000 r/min (Speed ratio 1:50)
Speed Regulation	Load		±0.2% or less: Conditions 0～rated torque, rated speed, rated voltage, normal ambient temperature
	Voltage		±0.2% or less: Conditions Rated voltage −15～+10%, rated speed, no load, normal ambient temperature
	Temperature		±0.2% or less: Conditions Operating ambient temperature 0～+40°C, rated speed, no load, rated voltage

●300 W

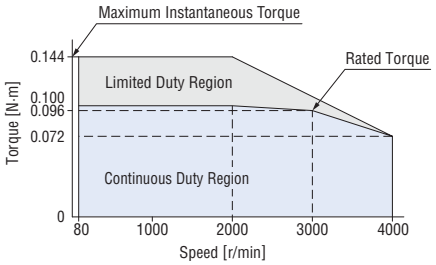
Product Name		Combination Type - Parallel Shaft Gearhead	BLM6300SHP-□S
	Motor	Round Shaft Type	BLM5300HP-AS
	Driver		BMUD300-C
Rated Output Power (Continuous)		W	300
Power Supply Voltage	Rated Voltage	VAC	Single-Phase 200-240 / Three-Phase 200-240
	Permissible Voltage Range		−15～+10%
	Frequency	Hz	50 / 60
	Permissible Frequency Range		±5%
	Rated Input Current	A	Single-Phase: 3.4 / Three-Phase: 2.1
	Maximum Input Current	A	Single-Phase: 7.8 / Three-Phase: 4.7
Rated Speed		r/min	3000
Rated Torque		N·m	0.955
Maximum Instantaneous Torque		N·m	1.43
Rotor Inertia		J: $\times 10^{-4}$kg·m^2	0.67
Round Shaft Type Permissible Inertia		J: $\times 10^{-4}$kg·m^2	12
Speed Control Range			80～4000 r/min (Speed ratio 1:50)
Speed Regulation	Load		±0.2% or less: Conditions 0～rated torque, rated speed, rated voltage, normal ambient temperature
	Voltage		±0.2% or less: Conditions Rated voltage −15～+10%, rated speed, no load, normal ambient temperature
	Temperature		±0.2% or less: Conditions Operating ambient temperature 0～+40°C, rated speed, no load, rated voltage

● The values correspond to each specification and characteristic of a stand-alone motor. The speed-torque characteristics show the values when rated voltage is applied.
● A number indicating the gear ratio is entered where the box □ is located within the product name.

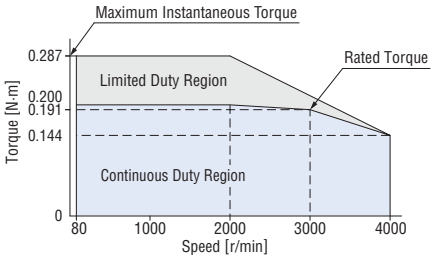
Speed – Torque Characteristics

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

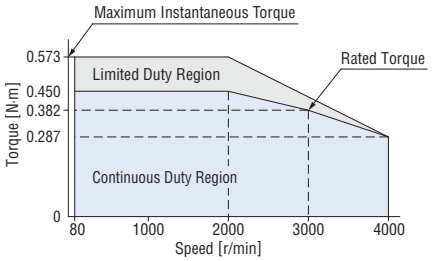
30 W



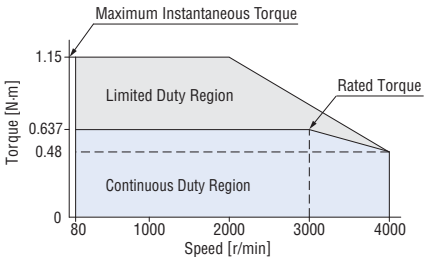
60 W



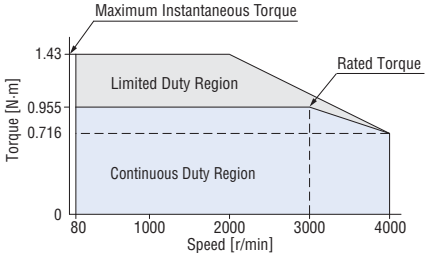
120 W



200 W



300 W



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

Common Specifications

Item	Specifications	
	30 W, 60 W, 120 W	200 W, 300 W
Speed Setting Methods	Digital setting with dial 4 speed settings	
Acceleration/Deceleration Time	Analog Setting: 0.1～15.0 s (set time from stopped state to rated speed) Common setting for acceleration/deceleration time with acceleration/deceleration time potentiometer* Digital Setting: 0.0～15.0 s (set time from current speed to setting speed) Individual acceleration times and deceleration times can be set for each operating data* *Acceleration time/deceleration time varies with the load condition of the motor.	
Input Signals	Photocoupler input Input resistance: 5.7 kΩ Operated by internal power supply: 5 VDC Connectable external DC power supply: 24 VDC −15～+20% 100 mA min. Source input/sink input Supplied through external wiring	Photocoupler input Input resistance: 6.6 kΩ Operated by internal power supply: 5 VDC Connectable external DC power supply: 24 VDC −15～+20% 100 mA min. Source input/sink input Supplied through external wiring
	Arbitrary signal assignment to X0～X2 input (3 points) is possible [ ]: Initial setting [FWD], [REV], [M0], M1, ALARM-RESET, EXT-ERROR, H-FREE	Arbitrary signal assignment to IN0～IN4 input (5 points) is possible [ ]: Initial setting [FWD], [REV], [M0], [M1], [ALARM-RESET], EXT-ERROR, H-FREE
Output Signals	Photocoupler and Open-Collector Output External power supply: 4.5～30 VDC 100 mA max. Source output/sink output Supplied through external wiring	Photocoupler and Open-Collector Output External power supply: 4.5～30 VDC 100 mA max. Source output/sink output Supplied through external wiring
	Arbitrary signal assignment to Y0, Y1 (2 points) is possible [ ]: Initial setting [ALARM-OUT1], [SPEED-OUT], ALARM-OUT2, MOVE, VA, WNG	Arbitrary signal assignment to OUT0, OUT1 (2 points) is possible [ ]: Initial setting [ALARM-OUT1], [SPEED-OUT], ALARM-OUT2, MOVE, VA, WNG
Protective Functions	When the following protective functions are activated, ALARM-OUT1 output turns OFF and the motor will coast to a stop. The alarm code will be displayed at the same time. (Instantaneous stop for external stop only) Overcurrent, main circuit overheat, overvoltage, undervoltage, sensor error, overload, over-speed, EEPROM error, initial sensor error, initial operation prohibited, external stop	
Maximum Extension Length	Motor and driver distance: 10.5 m (when a connection cable is used)	
Time Rating	Continuous	

● Overload alarm detection time

The overload alarm is generated if the operation goes beyond the continuous duty region.
The detection time for this overload alarm can be set from 0.1～60.0 seconds. (Initial value: 30.0 Seconds)
However, an alarm is generated for a maximum length of 5 seconds in the following cases.
- If an applied load goes beyond the limited duty region
- If the output shaft is locked

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 terminal and the protective earth terminal, and between the power supply terminal and the I/O signal terminal after continuous operation under normal ambient temperature and humidity.
Dielectric Strength		Sufficient to withstand 1.5 kVAC at 50 Hz applied between the windings and the case for 1 minute after continuous operation under normal ambient temperature and humidity.	Sufficient to withstand 1.5 kVAC at 50 Hz applied between the power supply terminal and the protective earth terminal for 1 minute, and 1.5 kVAC at 50 Hz applied between the power supply terminal and the I/O signal terminal for 1 minute after continuous operation under normal ambient temperature and humidity.
Temperature Rise		The temperature rise of the windings is 50°C max. (60°C max. for 300 W types) and that of the case surface is 40°C max. (50°C max. for 300 W types)*1, measured by the thermocouple method after rated continuous operation under normal ambient temperature and humidity.	The temperature rise of the heat sink is 50°C max., measured by the thermocouple method after rated continuous operation under normal ambient temperature and humidity.
Operating Environment	Ambient Temperature	0～+40°C (Non-freezing)	0～+40°C (Non-freezing) [When the 300 W type driver is installed with the front panel side facing upward: 0～+35°C (Non-freezing).]
	Ambient Humidity	85% or less (Non-condensing)	
	Altitude	Up to 1000 m above sea level	
	Atmosphere	No corrosive gases or dust. Cannot be used in a radioactive area, magnetic field, vacuum, or other special environments.	
	Vibration	Not subject to continuous vibration or excessive shock. In conformance with 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, Z), Number of Sweeps: 20 times	
Storage Condition*2	Ambient Temperature	−20～+70°C (Non-freezing)	−20～+70°C (Non-freezing)
	Ambient Humidity	85% or less (Non-condensing)	
	Altitude	Up to 3000 m above sea level	
Thermal Class		UL/CSA Standards: 105 (A), EN Standards: 120 (E)	–
Degree of Protection*3		When using the connection cable: IP66 (Excluding the installation surface of the round shaft type)	IP20

*1 For round shaft types, attach to a heat sink (material: aluminum) of one of the following sizes to keep the motor case surface temperature from exceeding 90°C.
30 W Type: 115×115 mm Thickness 5 mm, 60 W Type: 135×135 mm Thickness 5 mm, 120 W Type: 165×165 mm Thickness: 5 mm,
200 W Type: 200×200 mm Thickness: 5 mm, 300 W Type: 250×250 mm Thickness: 6 mm

*2 The storage condition applies to a short period such as a period during transportation.

*3 The IP indication that shows the watertight and dust-resistant performance are specified under IEC 60529 and IEC 60034-5.

Note

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

● Materials and Finish of the Motor

Materials Case: Aluminum
Output Shaft: Stainless Steel
Screws: Stainless Steel (except protective earth terminal)
Finish Case: Paint (except installing surface)

Permissible Torque of Combination Types

● Combination Type – Parallel Shaft Gearhead

Unit: N·m

Product Name	Motor Speed \ Gear Ratio	5	10	15	20	30	50	100	200
30 W	At 80～2000 r/min	0.45	0.9	1.4	1.8	2.6	4.3	6	6
	At 3000 r/min	0.43	0.86	1.3	1.7	2.5	4.1	6	6
	At 4000 r/min	0.32	0.65	0.97	1.3	1.9	3.1	5.4	5.4
60 W	At 80～2000 r/min	0.9	1.8	2.7	3.6	5.2	8.6	16	16
	At 3000 r/min	0.86	1.7	2.6	3.4	4.9	8.2	16	16
	At 4000 r/min	0.65	1.3	1.9	2.6	3.7	6.2	12.4	14
120 W	At 80～2000 r/min	2	4.1	6.1	8.1	11.6	19.4	30	30
	At 3000 r/min	1.7	3.4	5.2	6.9	9.9	16.4	30	30
	At 4000 r/min	1.3	2.6	3.9	5.2	7.4	12.3	24.7	27
200 W	At 80～3000 r/min	2.9	5.7	8.6	11.5	16.4	27.4	51.6	70
	At 4000 r/min	2.2	4.3	6.5	8.6	12.4	20.6	38.9	63
300 W	At 80～3000 r/min	4.3	8.6	12.9	17.2	24.6	41.1	70	–
	At 4000 r/min	3.2	6.4	9.7	12.9	18.5	30.8	58	–

● A colored background ( ) indicates gear shaft rotation in the same direction as the motor shaft. The others rotate in the opposite direction.

Output Shaft Speed of Combination Types

Unit: r/min

Motor Shaft Speed \ Gear Ratio	5	10	15	20	30	50	100	200
80 r/min	16	8	5.3	4	2.7	1.6	0.8	0.4
2000 r/min	400	200	133	100	66.7	40	20	10
3000 r/min	600	300	200	150	100	60	30	15
4000 r/min	800	400	267	200	133	80	40	20

Permissible Radial Load/Permissible Axial Load

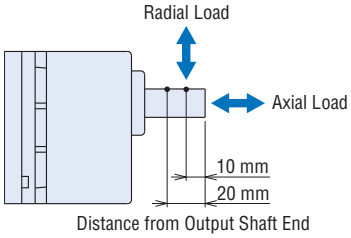
Combination Type – Parallel Shaft Gearhead

Output Power	Gear Ratio		Permissible Radial Load 10 mm from shaft end N	Permissible Radial Load 20 mm from shaft end N	Permissible Axial Load N
30 W	5	At 80~3000 r/min	100	150	40
		At 4000 r/min	90	110	
	10, 15, 20	At 80~3000 r/min	150	200	
		At 4000 r/min	130	170	
	30, 50, 100, 200	At 80~3000 r/min	200	300	
		At 4000 r/min	180	230	
60 W	5	At 80~3000 r/min	200	250	100
		At 4000 r/min	180	220	
	10, 15, 20	At 80~3000 r/min	300	350	
		At 4000 r/min	270	330	
	30, 50, 100, 200	At 80~3000 r/min	450	550	
		At 4000 r/min	420	500	
120 W	5	At 80~3000 r/min	300	400	150
		At 4000 r/min	230	300	
	10, 15, 20	At 80~3000 r/min	400	500	
		At 4000 r/min	370	430	
	30, 50, 100, 200	At 80~3000 r/min	500	650	
		At 4000 r/min	450	550	
200 W 300 W	5, 10, 15, 20	At 80~3000 r/min	550	800	200
		At 4000 r/min	500	700	
	30, 50	At 80~3000 r/min	1000	1250	300
		At 4000 r/min	900	1100	
	100, 200*	At 80~3000 r/min	1400	1700	400
		At 4000 r/min	1200	1400	

*Only for 200 W type.

Round Shaft Type

Output Power	Permissible Radial Load 10 mm from shaft end N	Permissible Radial Load 20 mm from shaft end N	Permissible Axial Load
30 W 60 W	80	100	Half of motor mass or less
120 W 200 W 300 W	150	170	



Permissible Load Inertia J of Combination Types

Combination Type – Parallel Shaft Gearhead

Unit: $\times 10^{-4}$kg·m^2

Motor Shaft Speed \ Gear Ratio		5	10	15	20	30	50	100	200
30 W		12	50	110	200	370	920	2500	5000
	When instantaneous stop or instantaneous bi-directional operation is performed*	1.55	6.2	14	24.8	55.8	155	155	155
60 W		22	95	220	350	800	2200	6200	12000
	When instantaneous stop or instantaneous bi-directional operation is performed*	5.5	22	49.5	88	198	550	550	550
120 W		45	190	420	700	1600	4500	12000	25000
	When instantaneous stop or instantaneous bi-directional operation is performed*	25	100	225	400	900	2500	2500	2500
200 W		100	460	1000	1700	3900	9300	18000	37000
	When instantaneous stop or instantaneous bi-directional operation is performed*	50	200	450	800	1800	5000	5000	5000
300 W		100	460	1000	1700	3900	9300	18000	–
	When instantaneous stop or instantaneous bi-directional operation is performed*	50	200	450	800	1800	5000	5000	–

*It is also applicable when digitally setting the deceleration time to below 0.1 seconds.

Dimensions Unit: mm

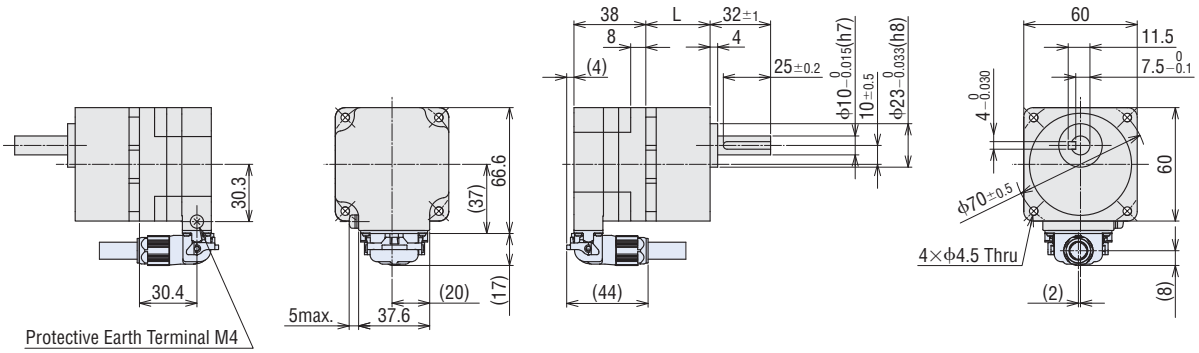
- The motor dimensions in this catalogue are illustrated with the separately-sold connection cable (▭ parts in the figure). The described masses do not include the connection cable mass.
- For the dimensions and the mass of connection cable, please refer to Page D-35
- Installation screws are included with the combination type. Installation screws → Page D-162
- A number indicating the gear ratio is entered where the box □ is located within the product name.

Motor · 30 W

◇Combination Type – Parallel Shaft Gearhead

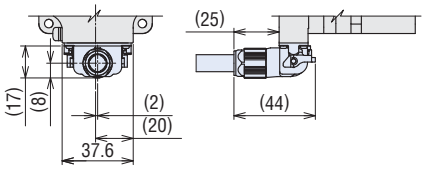
Product Name	Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass kg
BLM230HP-□S	BLM230HP-GFV	GFV2G□S	**5～20**	34	0.85
			30～100	38	
			200	43	

•When attaching a connection cable drawn by the output shaft side



- At the time of shipment, a parallel key is fixed in the key slot of the gearhead shaft.

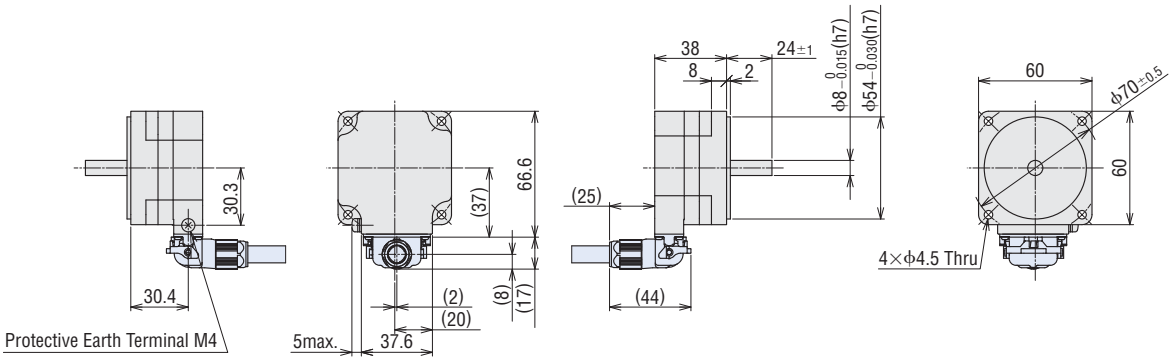
•When attaching a connection cable drawn in the opposite side of the output shaft



◇Round Shaft Type

BLM230HP-AS

Mass: 0.35 kg

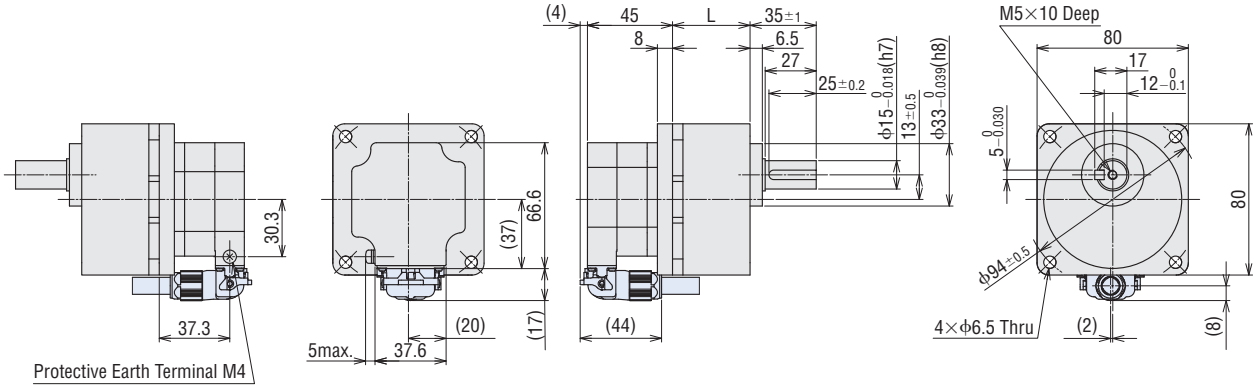


●Motor · 60 W

◇Combination Type – Parallel Shaft Gearhead

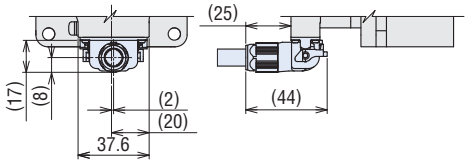
Product Name	Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass kg
BLM460SHP-□S	BLM460SHP-GFV	GFV4G□S	**5~20**	41	1.6
			30~100	46	
			200	51	

•When attaching a connection cable drawn by the output shaft side



● At the time of shipment, a parallel key is fixed in the key slot of the gearhead shaft.

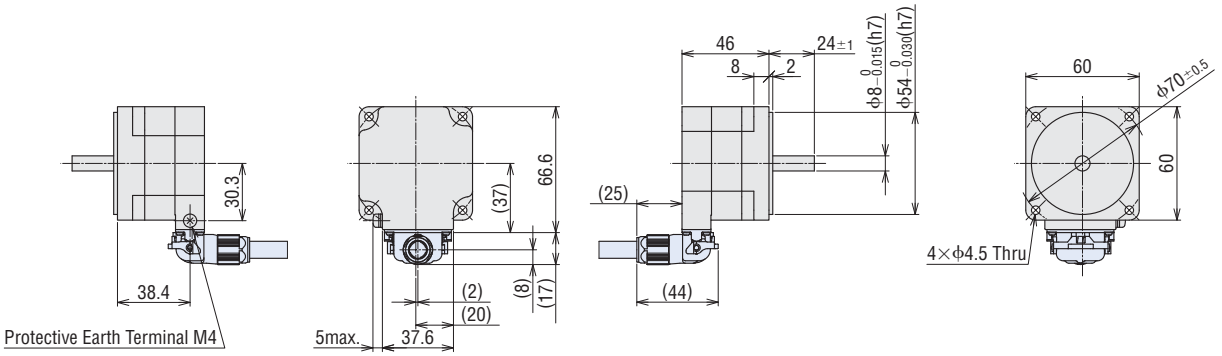
•When attaching a connection cable drawn in the opposite side of the output shaft



◇Round Shaft Type

BLM260HP-AS

Mass: 0.52 kg

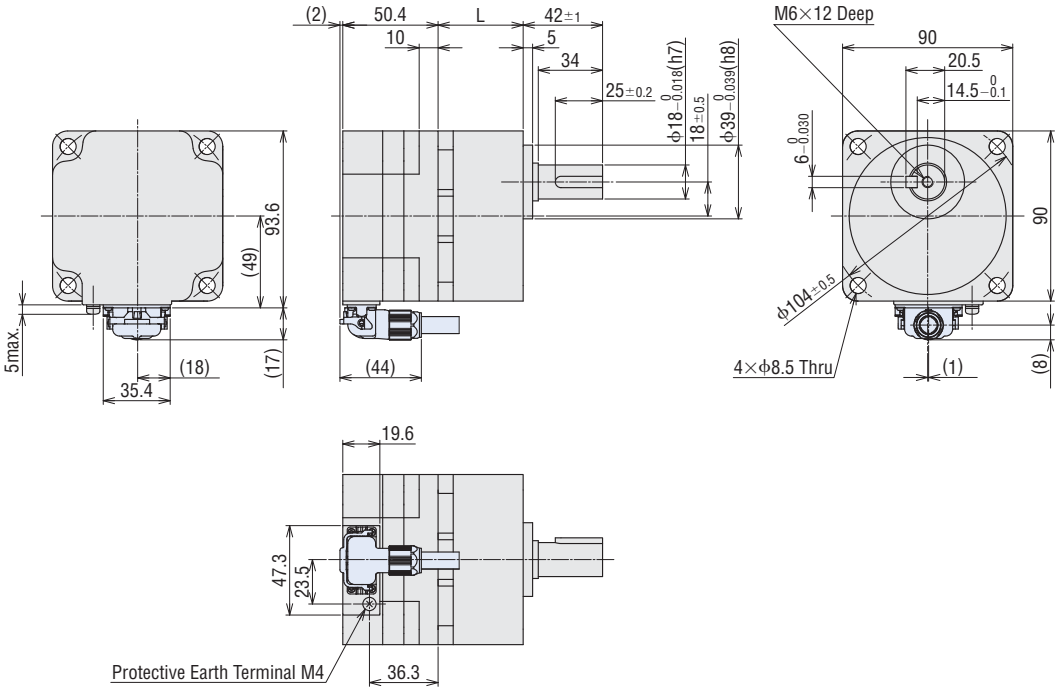


●Motor · 120 W

◇Combination Type – Parallel Shaft Gearhead

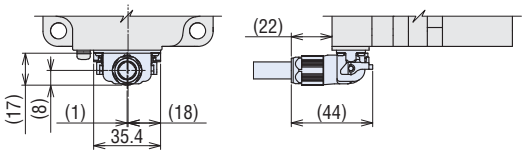
Product Name	Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass kg
BLM5120HP-□S	BLM5120HP-GFV	GFV5G□S	**5～20**	45	2.6
			30～100	58	
			200	64	

●When attaching a connection cable drawn by the output shaft side



●At the time of shipment, a parallel key is fixed in the key slot of the gearhead shaft.

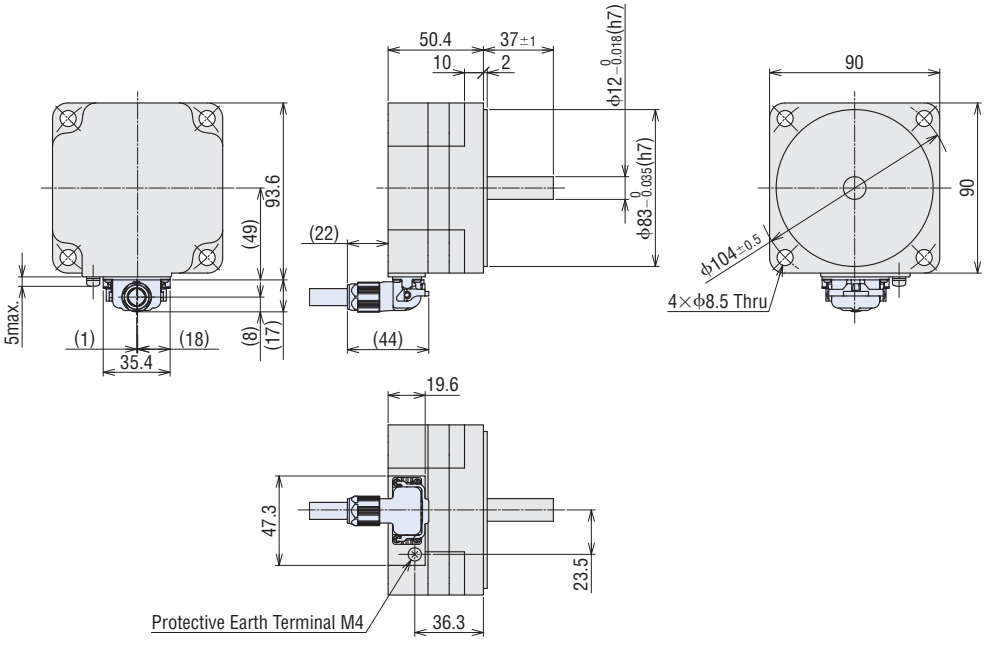
●When attaching a connection cable drawn in the opposite side of the output shaft



◇Round Shaft Type

BLM5120HP-AS

Mass: 1.1 kg

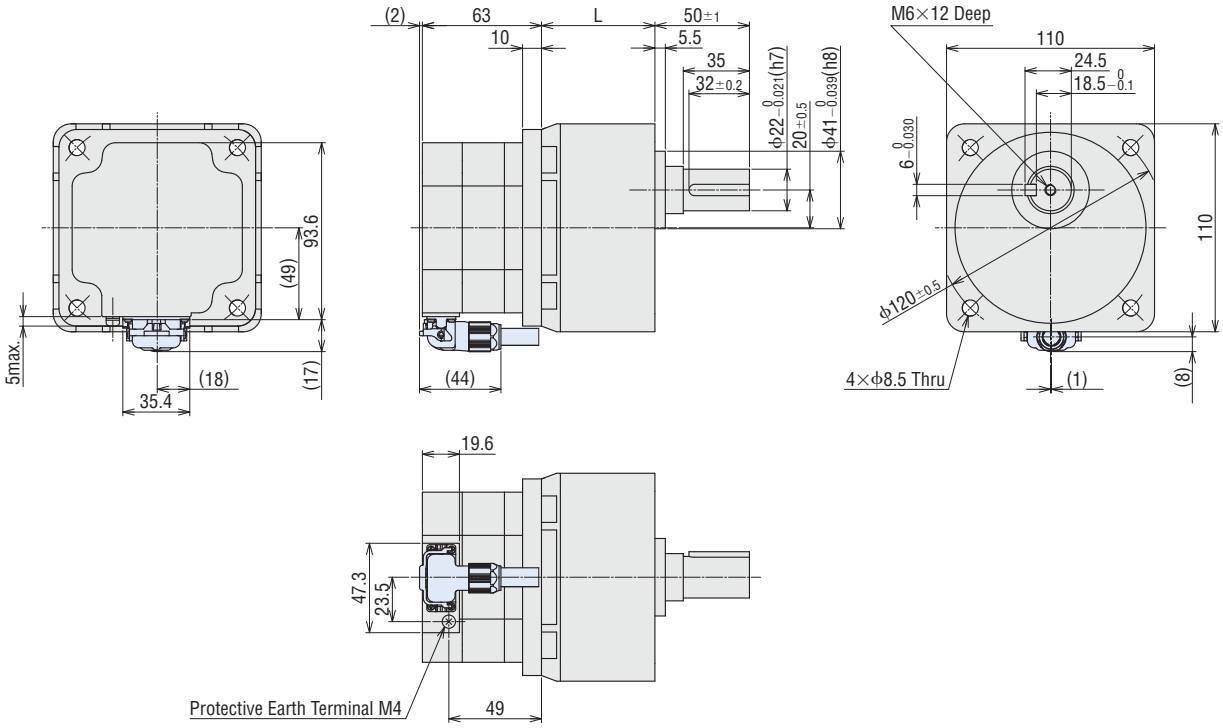


●Motor · 200 W

◇Combination Type – Parallel Shaft Gearhead

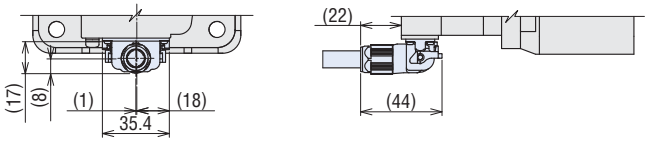
Product Name	Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass kg
BLM6200SHP-□S	BLM6200SHP-GFV	GFV6G□S	**5**~**20**	60	4.7
			30, **50**	72	
			100, **200**	86	

•When attaching a connection cable drawn by the output shaft side



●At the time of shipment, a parallel key is fixed in the key slot of the gearhead shaft.

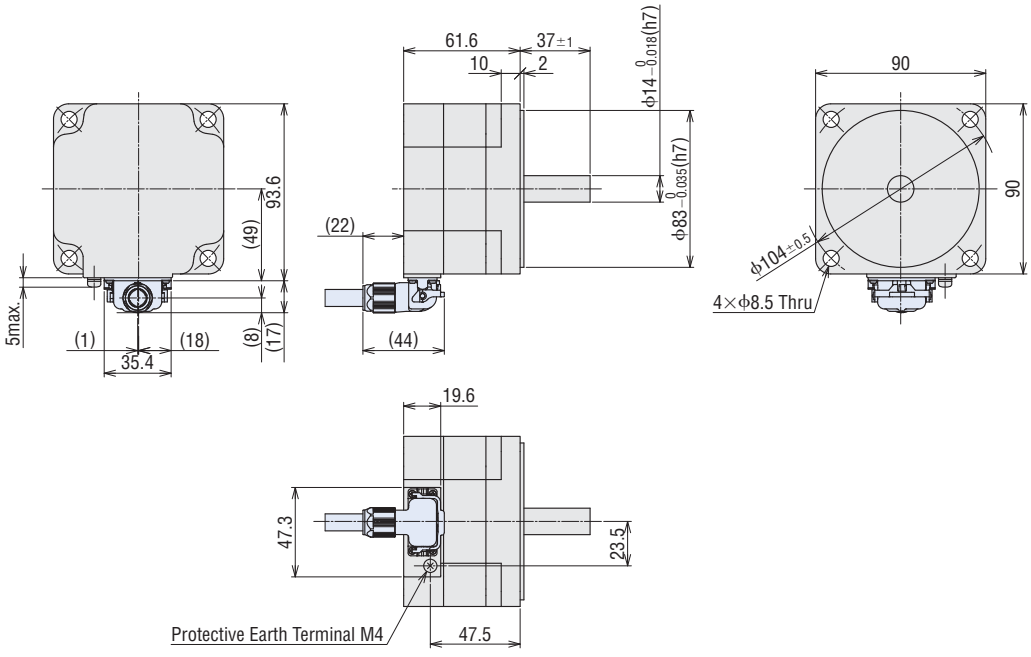
•When attaching a connection cable drawn in the opposite side of the output shaft



◇Round Shaft Type

BLM5200HP-AS

Mass: 1.6 kg

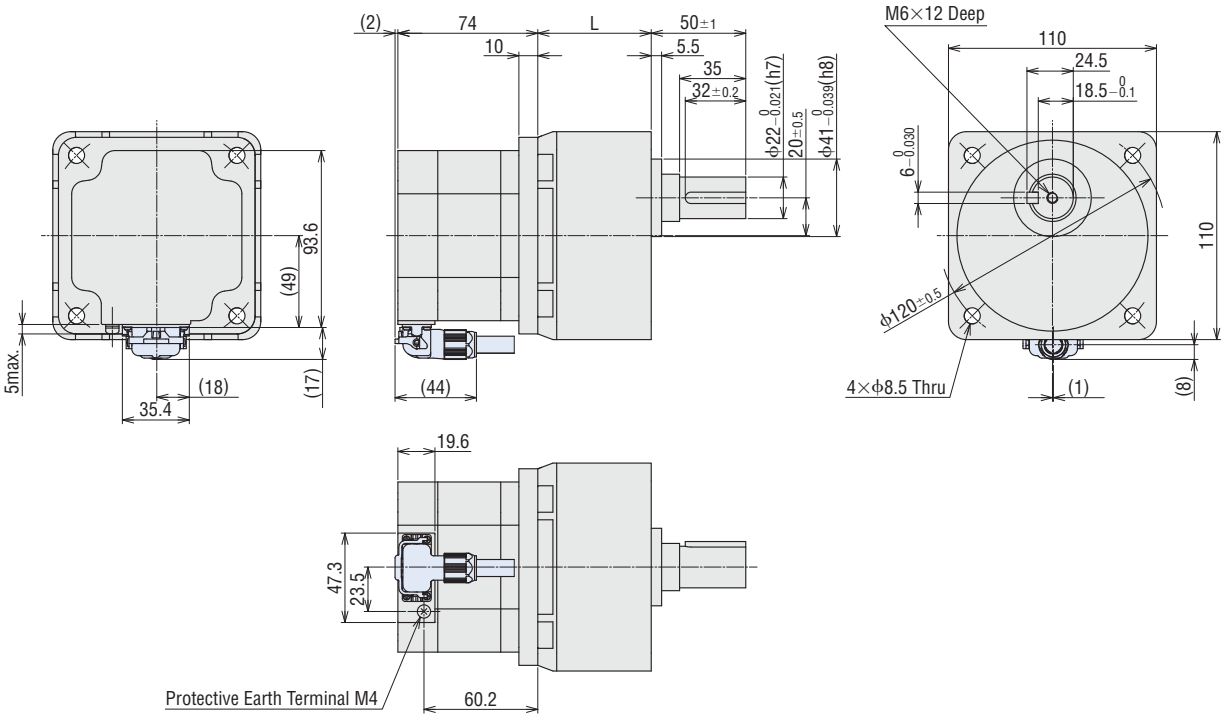


●Motor · 300 W

◇Combination Type – Parallel Shaft Gearhead

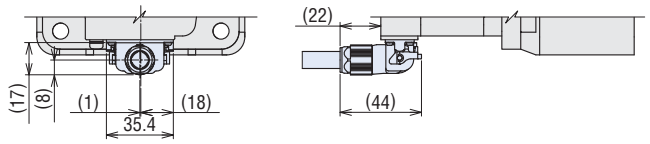
Product Name	Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass kg
BLM6300SHP-□S	BLM6300HP-GFV	GFV6G□S	**5~20**	60	5.2
			30, 50	72	
			100	86	

•When attaching a connection cable drawn by the output shaft side



●At the time of shipment, a parallel key is fixed in the key slot of the gearhead shaft.

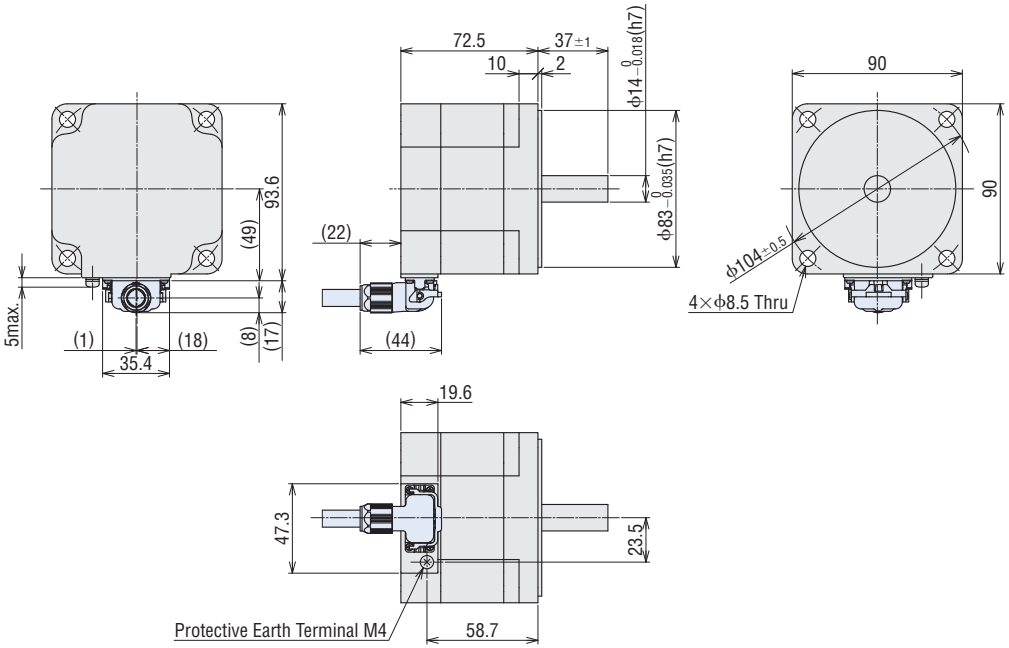
•When attaching a connection cable drawn in the opposite side of the output shaft



◇Round Shaft Type

BLM5300HP-AS

Mass: 2.1 kg

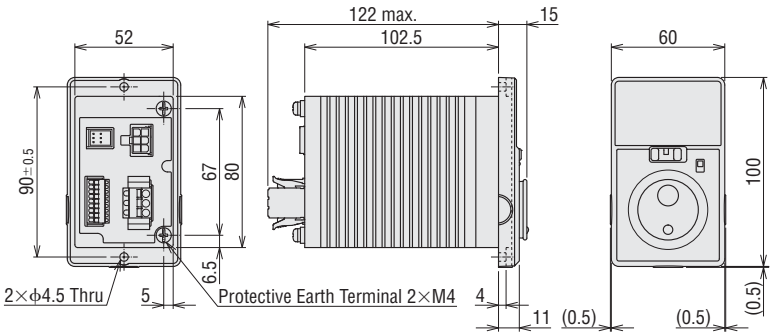


●Driver

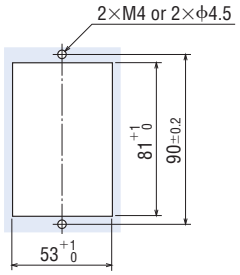
◇30 W, 60 W, 120 W

BMUD30-C2, **BMUD60-C2**, **BMUD120-C2**

Mass: 0.4 kg



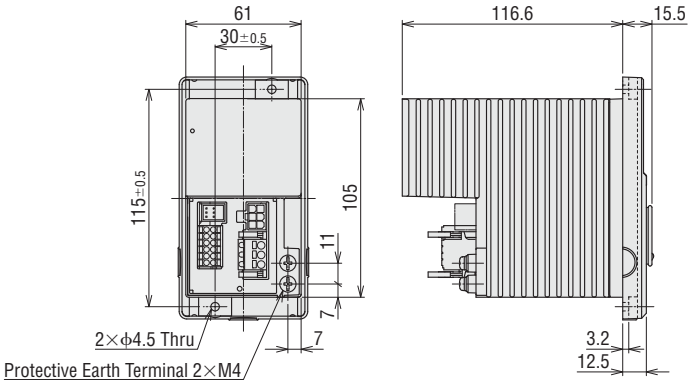
●Driver Panel Cut-Out



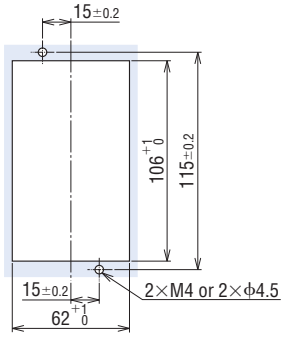
◇200 W, 300 W

BMUD200-C, **BMUD300-C**

Mass: 0.8 kg

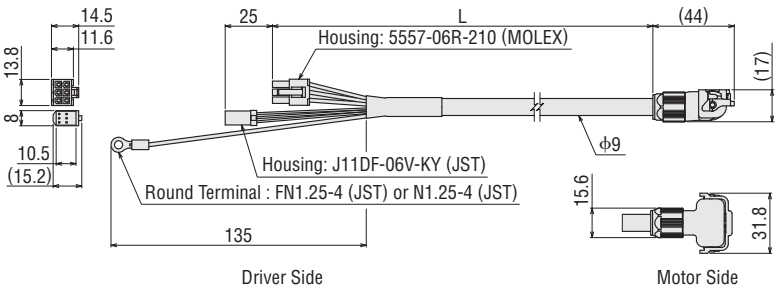


●Driver Panel Cut-Out



●Connection Cable

Length L (m)	Product Name		Mass (kg)
	Cable drawn by the output shaft side	Cable drawn in the opposite side of the output shaft	
0.5	**CC005HBLF**	**CC005HBLB**	0.08
1	**CC010HBLF**	**CC010HBLB**	0.12
1.5	**CC015HBLF**	**CC015HBLB**	0.2
2	**CC020HBLF**	**CC020HBLB**	0.25
2.5	**CC025HBLF**	**CC025HBLB**	0.32
3	**CC030HBLF**	**CC030HBLB**	0.38
4	**CC040HBLF**	**CC040HBLB**	0.49
5	**CC050HBLF**	**CC050HBLB**	0.62
7	**CC070HBLF**	**CC070HBLB**	0.86
10	**CC100HBLF**	**CC100HBLB**	1.2



■Connection and Operation (30 W, 60 W, 120 W)

●Names and Functions of Driver Parts

Display
Displays the monitor contents, alarm, etc.

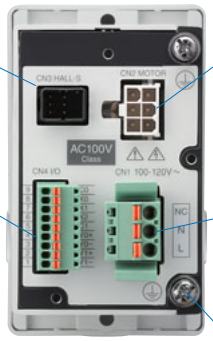
Dial
Changes the speed and parameters.
The value is set when the dial is pressed after changes are made.

Operating Switch
The motor is started by setting it to the "RUN" position.
Setting it to the "STAND-BY" position stops the motor.

Rotation Direction Switch
Changes the rotation direction of the motor.

Front Panel

Front of Driver



Sensor Connector (CN3)
Connects the motor sensor connector (black).

I/O Signal Connector (CN4)
Connects the I/O signals.

Motor Connector (CN2)
Connects the motor connector (white).

Main Power Connector (CN1)
Connects the main power supply.

Protective Earth Terminals (2 locations)
Ground either one of the protective earth terminals by all means.

Back of Driver

◇When Front Panel is Removed

MODE Key
Changes the operating mode.

FUNCTION Key
Changes the indication and functions for the operating mode.

Acceleration/Deceleration Time Potentiometer
Sets the acceleration time for starting the motor and deceleration time for motor standstill.
Setting Range: 0.1 s~15.0 s

Mounting Holes (2 locations)

●Extended Functions

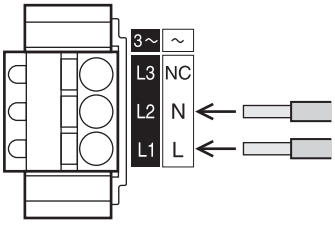
These settings can be made with key operations after removing the front panel.

Operating Mode	Details
Monitoring	Speed, load factor, operating data number, alarm code, warning, I/O monitor
Data	4 data points Speed, acceleration time, deceleration time, reset
Parameters	Gear ratio, speed increasing ratio, initial panel display, initial operation prohibition alarm, initial operation prohibition alarm cancellation method selection, analog acceleration/deceleration, speed upper limit/lower limit setting function, simple holding selection, external operating signal input, input function selection, output function selection, overload alarm detection time except when shaft is locked, overload warning level, speed attainment band, parameter mode reset

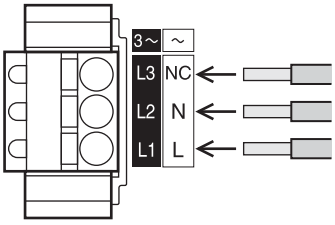
◇Main Power Connector (CN1)

Connects to the main power supply. Please connect to the power supply according to the power supply voltage being used.

•Single-Phase 200-240 VAC



•Three-Phase 200-240 VAC



•Applicable Lead Wire Size
AWG18~14
(0.75~2.0 mm^2)

●Operation with the Driver Only

◇Run/Stop

When the operating switch is set to the "RUN" position, the motor will start.
When it is returned to the "STAND-BY" position, the motor decelerates to a stop.

◇Speed Setting Method

Set the motor speed by using the dial.

Turning the dial slowly to the right increases the speed by 1 r/min increments, while turning it to the left reduces the speed by 1 r/min increments.
Turning the dial quickly increases the speed variation.
Pressing the dial sets the speed.

Operate with the operating switch

Set the speed with the dial

•Operating Switch

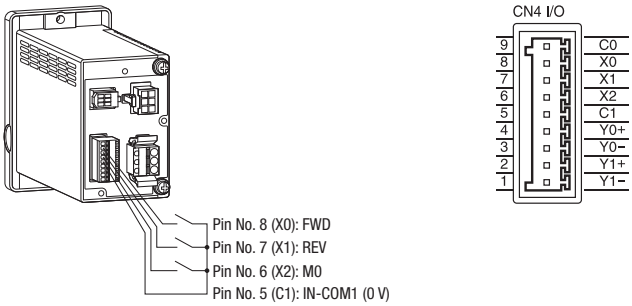
"STAND-BY" Position

"RUN" Position

●Operation by External Signals

◇Operating Method

- Using the built-in power supply in the driver, the motor is operated through signals from external sources (switches, relays, etc.).
  Connect Pins No. 5~8 of the I/O signal connector (CN4) as shown in the figure to the right.
- When operating using external signals, change the parameter setting in the "External Operating Signal Input." Refer to the operating manual for details.
- Multistep speed-change operation up to 4 steps can be performed.



●I/O Signal Connector (CN4)

Pin No.	Terminal Name	Function*	Description
9	C0	IN-COM0	Input Signal Common (External power supply)
8	X0	[FWD]	The motor rotates in the forward direction when "ON."
7	X1	[REV]	The motor rotates in the reverse direction when "ON."
6	X2	[M0]	Selects the operating data.
5	C1	IN-COM1	Input Signal Common (Internal power supply: 0 V)
4	Y0+	[SPEED-OUT]	30 pulses are output when the motor output shaft makes one rotation.
3	Y0−		
2	Y1+	[ALARM-OUT1]	Turns OFF when an alarm is activated. (Normally closed)
1	Y1−		

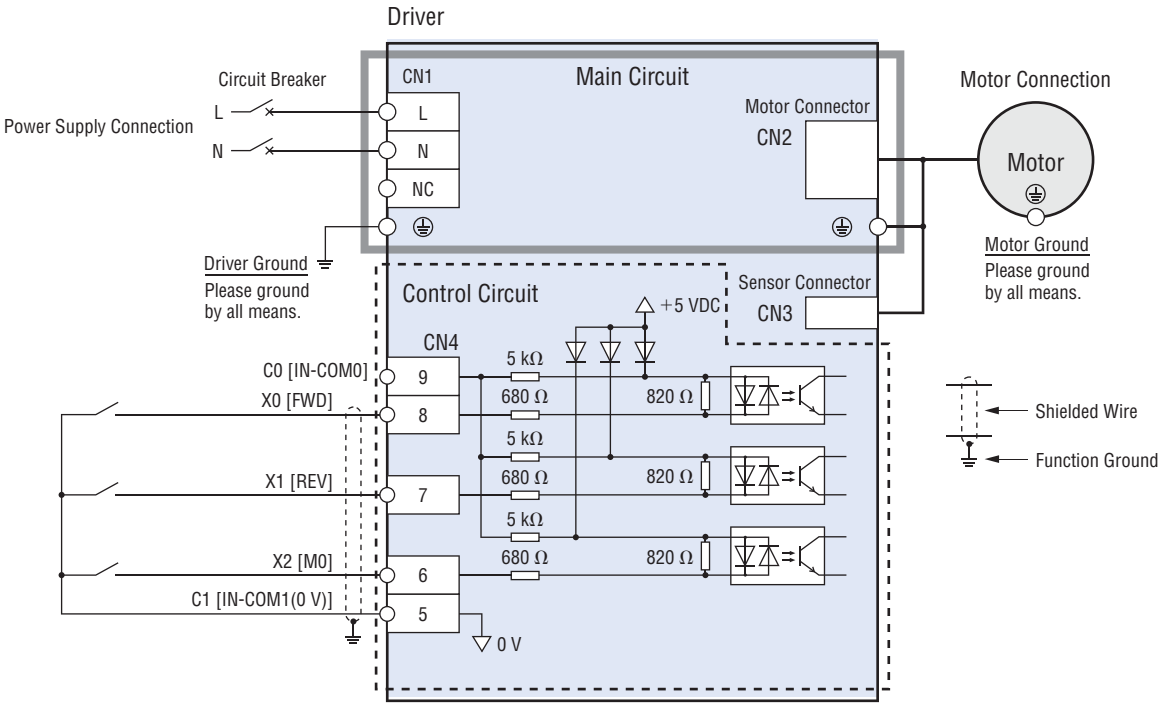
●Applicable Lead Wire Size

AWG26~20 (0.14~0.5 mm²)

*The text inside the [ ] represents the factory default function assignment.
The following signals can be assigned as necessary to 3 input signal terminals (X0~X2) and 2 output signal terminals (Y0, Y1).
3 of the 7 input signals (FWD, REV, M0, M1, ALARM-RESET, EXT-ERROR, H-FREE)
2 of the 6 output signals (ALARM-OUT1, SPEED-OUT, ALARM-OUT2, MOVE, VA, WNG)

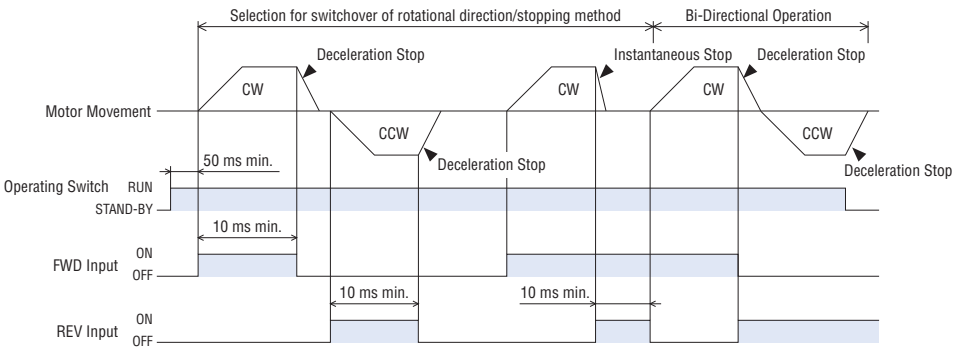
◇Connection Example Using Switches and Relays

The figure shows a connection example when operating a motor with a contact switch such as switches and relays.



◇Timing Chart

This is when the "External Operating Signal Input" parameter setting is"ON" and the rotation direction switch is set to "FWD."



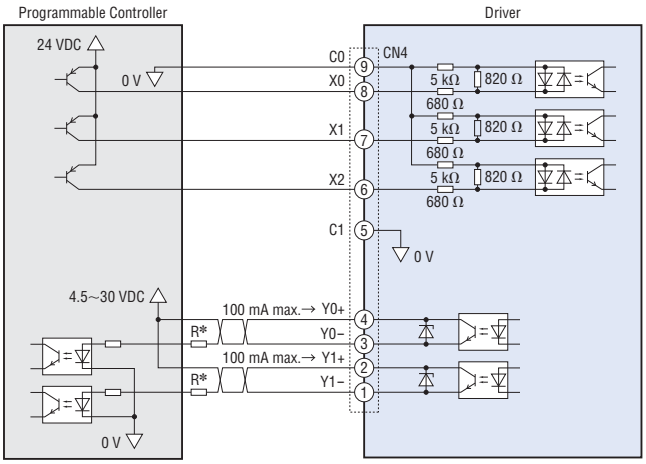
- Switching the FWD input to ON will cause the motor to turn clockwise as viewed from the motor shaft side, while switching the REV input to ON will cause the motor to turn counterclockwise. Turning it OFF decelerates the motor to a stop.
- If the FWD input and REV input are turned ON simultaneously, the motor will stop instantaneously.

- With the combination type, the rotation direction varies according to the gear ratio of the gearhead.

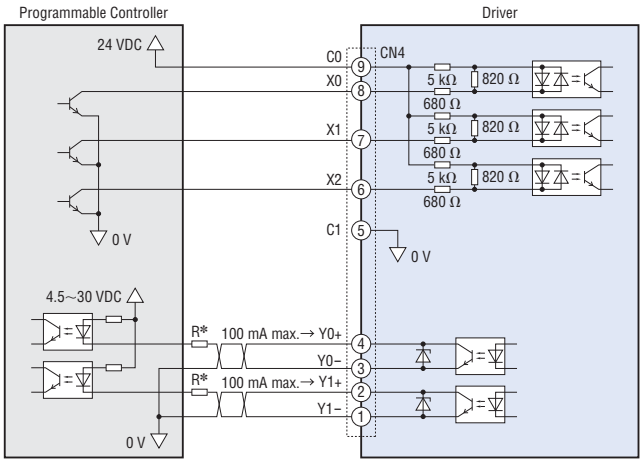
◇I/O Signal and Programmable Controller Connection Examples

This is a connection example for operating a motor using a transistor output type programmable controller.

•Source Logic



•Sink Logic



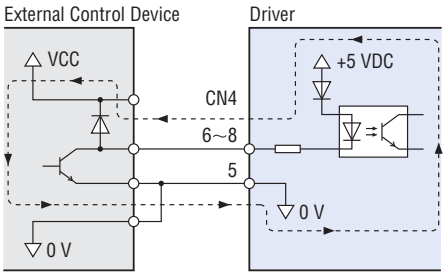
✻Recommended Resistance Value
24 VDC: 680 Ω~2.7 kΩ (2 W)
5 VDC: 150 Ω~560 Ω (0.5 W)

Note

Maintain the current value of Y0 and Y1 at 100 mA or less. If this current value is exceeded, connect the limiting resistor R.

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

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

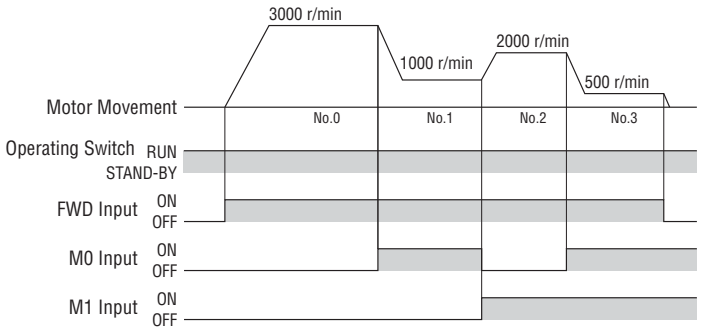


◇When Multistep Speed-Change Operation is Used

Multistep speed-change operation is possible by switching the M0 and M1 inputs ON / OFF.

•Operating Condition Example

Operating Data No.	M0	M1	Speed [r/min]
0	OFF	OFF	3000
1	ON	OFF	1000
2	OFF	ON	2000
3	ON	ON	500



Connection and Operation (200 W, 300 W)

Names and Functions of Driver Parts

Display
Displays the monitor contents, alarm, etc.

Dial
Changes the speed and parameters.
The value is set when the dial is pressed after changes are made.

Operating Switch
The motor is started by setting it to the "RUN" position.
Setting it to the "STAND-BY" position stops the motor.

Rotation Direction Switch
Changes the rotation direction of the motor.

Front Panel

Front of Driver

Sensor Connector (CN3)
Connects the motor sensor connector (black).

I/O Signal Connector (CN4)
Connects the I/O signals.

Motor Connector (CN2)
Connects the motor connector (white).

Main Power Connector (CN1)
Connects the main power supply.

Protective Earth Terminals (2 locations)
Ground either one of the protective earth terminals by all means.

Back of Driver

◇When Front Panel is Removed

MODE Key
Changes the operating mode.

FUNCTION Key
Changes the indication and functions for the operating mode.

Acceleration/Deceleration Time Potentiometer
Sets the acceleration time for starting the motor and deceleration time for motor standstill.
Setting Range: 0.1 s～15.0 s

Mounting Holes (2 locations)

Extended Functions

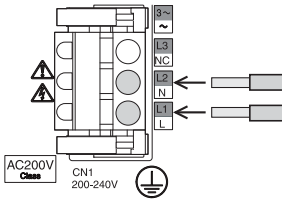
These settings can be made with key operations after removing the front panel.

Operating Mode	Details
Monitoring	Speed, load factor, operating data number, alarm, warning, I/O monitor
Data	4 data points Speed, acceleration time, deceleration time, reset
Parameters	Gear ratio, speed increasing ratio, initial panel display, initial operation prohibition alarm, initial operation prohibition alarm cancellation method selection, analog acceleration/deceleration, speed upper limit/lower limit setting function, simple holding selection, external operating signal input, input function selection, output function selection, overload alarm detection time except when shaft is locked, overload warning level, speed attainment band, parameter mode reset

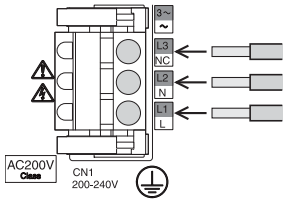
◇Main Power Connector (CN1)

Connects to the main power supply. Please connect to the power supply according to the power supply voltage being used.

•Single-Phase 200-240 VAC



•Three-phase 200-240 VAC



•Applicable Lead Wire Size
AWG18～14 (0.75～2.0 mm²)

Operation with the Driver Only

◇Run/Stop

When the operating switch is set to the "RUN" position, the motor will start.
When it is returned to the "STAND-BY" position, the motor decelerates to a stop.

◇Speed Setting Method

Set the motor speed by using the dial.

Turning the dial slowly to the right increases the speed by 1 r/min increments, while turning it to the left reduces the speed by 1 r/min increments.
Turning the dial quickly increases the speed variation.
Pressing the dial sets the speed.

Operate with the operating switch

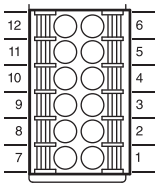
Set the speed with the dial

•Operating Switch

●Operation by External Signals

◇Operating Method

- Using the built-in power supply in the driver, the motor is operated through signals from external sources (switches, relays, etc.).
  Connect pins No. 1～5 and No. 7 of the I/O signal connector (CN4) as shown in the table below.
- When operating using external signals, change the parameter setting in the "External Operating Signal Input." Refer to the operating manual for details.
- Multistep speed-change operation up to 4 steps can be performed.



CN4

●I/O Signal Connector (CN4)

Pin No.	Signal Name	Function*	Description
1	IN4	[ALARM-RESET]	Alarms are canceled.
2	IN3	[M1]	Selects the operating data.
3	IN2	[M0]	
4	IN1	[REV]	The motor rotates in the reverse direction when "ON."
5	IN0	[FWD]	The motor rotates in the forward direction when "ON."
6	IN-COM0	IN-COM0	Input Signal Common (External power supply)
7	IN-COM1	IN-COM1	Input Signal Common (Internal power supply: 0 V)
8	N.C.	N.C.	No connection.
9	OUT1−	[ALARM-OUT1]	Turns OFF when an alarm is activated. (Normally closed)
10	OUT1+		
11	OUT0−	[SPEED-OUT]	30 pulses are output when the motor output shaft makes one rotation.
12	OUT0+		

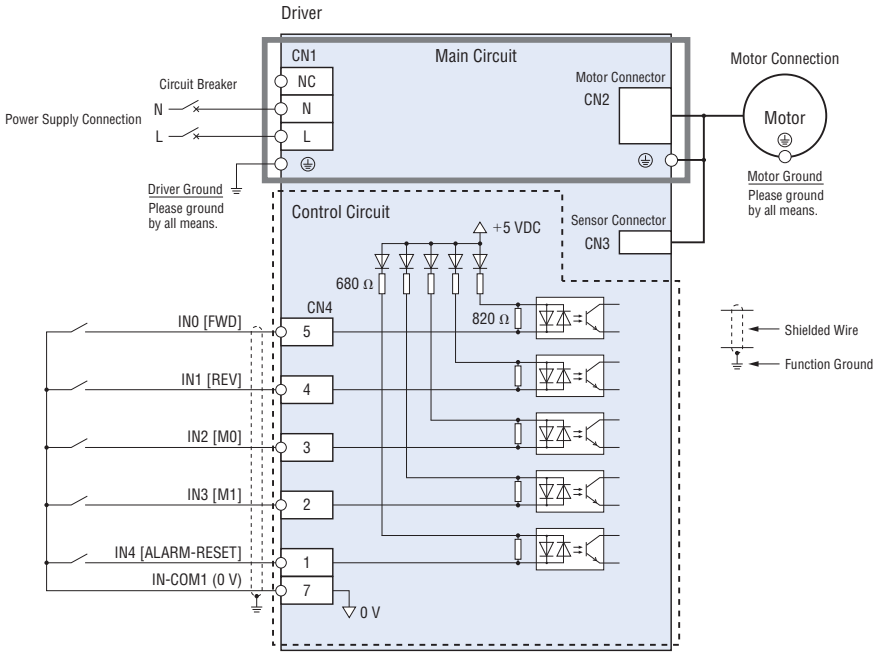
●Applicable Lead Wire Size

AWG24～18 (0.2～0.75 mm²)

*The text inside the [ ] represents the factory default function assignment. The following signals can be assigned as necessary to 5 input signal terminals (IN0～IN4) and 2 output signal terminals (OUT0, OUT1).
5 of the 7 input signals (FWD, REV, M0, M1, ALARM-RESET, EXT-ERROR, H-FREE)
2 of the 6 output signals (ALARM-OUT1, SPEED-OUT, ALARM-OUT2, MOVE, VA, WNG)

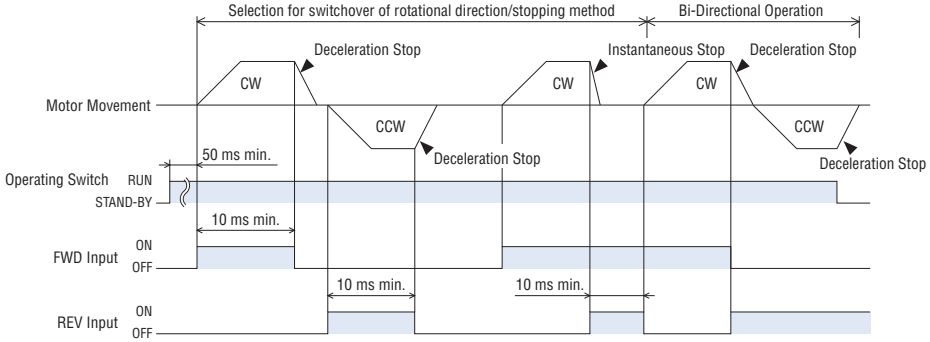
◇Connection Example Using Switches and Relays

The figure shows a connection example when operating a motor with a contact switch, such as switches and relays. (Single-phase 200-240 VAC)



◇Timing Chart

This is when the "External Operating Signal Input" parameter setting is "ON" and the rotation direction switch is set to "FWD."



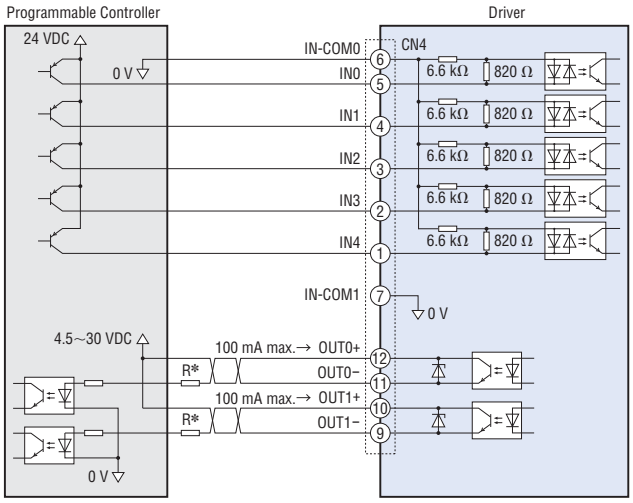
- Switching the FWD input to ON will cause the motor to turn clockwise as viewed from the motor shaft side, while switching the REV input to ON will cause the motor to turn counterclockwise. Turning it OFF decelerates the motor to a stop.
- If the FWD input and REV input are turned ON simultaneously, the motor will stop instantaneously.

- With the combination type, the rotation direction varies according to the gear ratio of the gearhead.

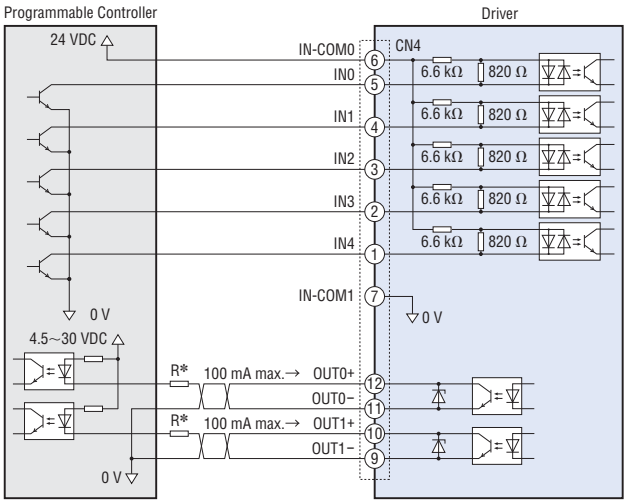
◇I/O Signal and Programmable Controller Connection Examples

This is a connection example for operating a motor using a transistor output type programmable controller.

•Source Logic



•Sink Logic



*Recommended Resistance Value
24 VDC: 680 Ω~2.7 kΩ (2 W)
5 VDC: 150 Ω~560 Ω (0.5 W)

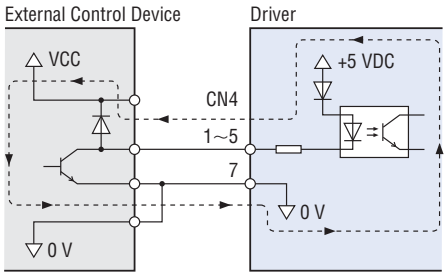
Note

Maintain the current value of OUT0 and OUT1 at 100 mA or less. If this current value is exceeded, connect the limiting resistor R.

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

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

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



◇When Multistep Speed-Change Operation is Used

Multistep speed-change operation is possible by switching the M0 and M1 inputs ON / OFF.

•Operating Condition Example

Operating Data No.	M0	M1	Speed [r/min]
0	OFF	OFF	3000
1	ON	OFF	1000
2	OFF	ON	2000
3	ON	ON	500