

Speed Control Motors  
**Brushless Motors**  
**AC Input**

<b>BMU Series</b>
<b>BLE Series</b>
<b>BLF Series</b>
<b>BXII Series</b>

Overview,  
Product  
Series

Brushless  
Motors

AC Input  
**BMU**

AC Input  
**BLE**

AC Input  
**BLF**

AC Input  
**BXII**

DC Input  
**BLH**

AC Speed  
Control  
Motors

**DSC**

**BHF**

Accessories

Installation

	Page
<b>BMU Series</b> .....	D-18
<b>BLE Series</b> .....	D-42
<b>BLF Series</b> .....	D-82
<b>BXII Series</b> .....	D-86

## Brushless Motor and Driver Package

# BMU Series

<Additional Information>

- Technical reference → Page H-1
- Regulations & Standards → Page I-2



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



View Expanded Product Information, Specifications, CAD, Accessories & more online. Visit [www.orientalmotor.com/catalog](http://www.orientalmotor.com/catalog) or use the QR code and select "BMU Series".

- 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.

Featuring a new brushless motor from Oriental Motor. The entire motor structure has been redesigned in an effort to maximize the required performance. Unprecedented compact size, high power, and high efficiency.

## 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.



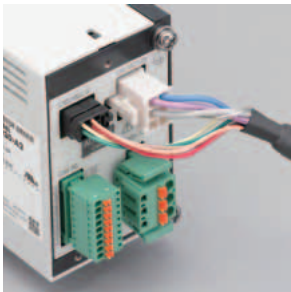
Pushing the dial sets the speed.



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.

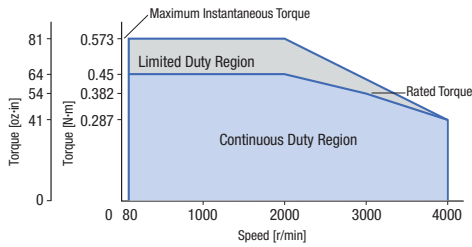


The motor's rotation direction can be switched with ease.

## Maximum Speed 4000 r/min, Speed Ratio 50:1 (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 50:1 (80~4000 r/min). Speed regulation has also been greatly improved from  $\pm 0.5\%$  to  $\pm 0.2\%$ .

- **BMU** Series 120 W (1/6 HP)



## 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.

**MODE Key**  
Changes the operating mode.

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



Acceleration/deceleration time potentiometer

### ◇ 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%

## User-friendly Features and Expanded Functions at an Affordable Price

The list price for the **BMU** Series, 60 mm (2.36 in.), 30 W (1/25 HP) motor with a 5:1 ratio offers more value and performance than ever before. The **BMU** Series motor, driver and gearhead come together as one part number saving ordering time and ensuring a complete solution, guaranteed.



### BMU Series

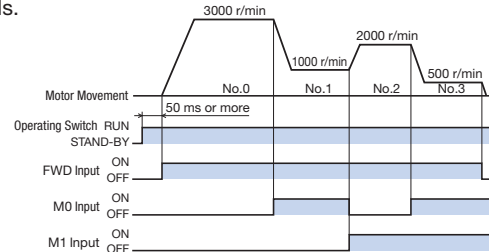
- Output power: 30 W (1/25 HP)
- Gearhead gear ratio: 5
- Permissible torque: 0.45 N·m (3.9 lb-in)
- Speed range: 16~800 r/min

**\$386.00**

● For price and lead time please contact the nearest Oriental Motor office, or visit our website.

### ◇ 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.

### ◇ Lock Dial Operations

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

- Setting the Lock Function

At the main screen for each operating mode, press the “MODE” key for 5 seconds or more. When “Lk” appears, the lock function is activated.



- Canceling the Lock Function

Return to the main screen, and press the “MODE” key for 5 seconds or more. When “UnLk” appears, the lock function is canceled.



### ◇ Setting the Upper and Lower Rotation Speed Limits

The upper and lower limits for the speed control range can be set. The speeds for both monitoring mode and data mode can be limited.

### ◇ 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.

Overview, Product Series

Brushless Motors

AC Input BMU

AC Input BLE

AC Input BLF

AC Input BXII

DC Input BLH

AC Speed Control Motors

DSC

BHF

Accessories

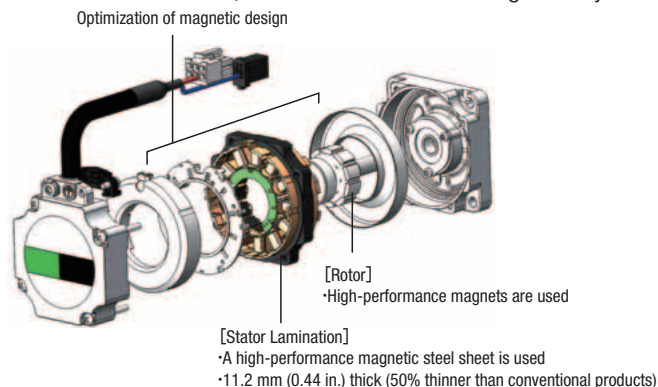
Installation

## 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 (0.44 in.). This thinness achieves highly efficient power.

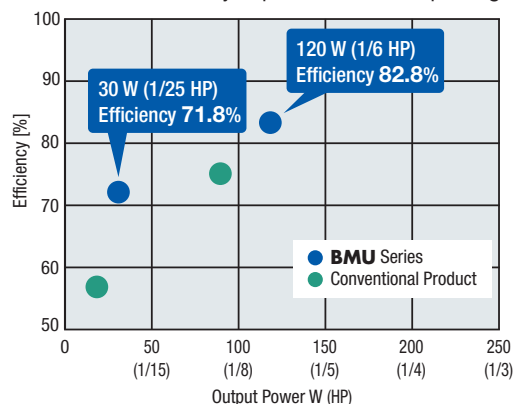
Compared with a conventional brushless motor of the same output power, the stator plate thickness is reduced by half [for motors with a frame size of 90 mm (3.54 in.)].

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

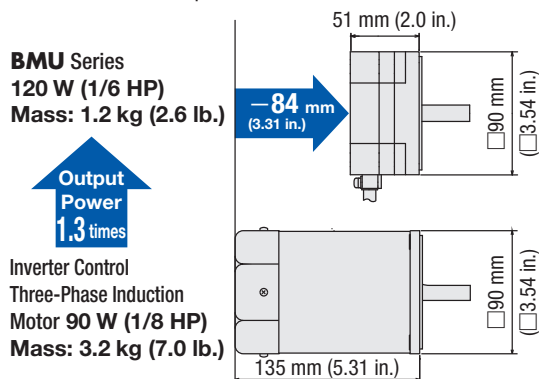


## Contributes to Downsizing and Energy Savings

The high-power new brushless motor is also lighter and slimmer motor. For example, compared with the three-phase induction motor of frame size 90 mm (3.54 in.):

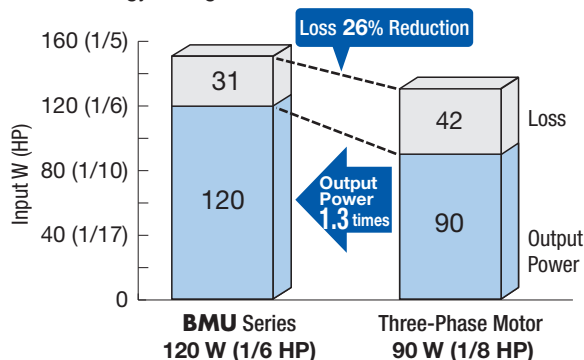
### ◇ Downsizing

With a motor mass of 2.0 kg (4.4 lb.) and an overall length of 84.6 mm (3.33 in.), the brushless motor represents approximately a 63% savings in both mass and length. On the other hand, the motor output power is about 1.3 times higher. A lightweight, slim, high-power motor saves space.







### ◇ Energy Savings

Motor output power is about 1.3 times higher, while motor loss is reduced by about 26%. The new brushless motors are even more effective for energy savings.



## Product Line

Package							
Motor	Output Power	Frame Size	Type	Driver	Power Supply Voltage	Connection Cable	Package Price Range
 Combination Type	30 W (1/25 HP)	60 mm (2.36 in.)	Standard (IP40) or IP65		Single-Phase 100-120 VAC* Single-Phase 200-240 VAC Three-Phase 200-240 VAC	 3 m (9.8 ft.) included	\$305.00~\$428.00
	60 W (1/12 HP)	Combination Type 80 mm (3.15 in.) Round Shaft Type 60 mm (2.36 in.)					\$325.00~\$462.00
120 W (1/6 HP)	90 mm (3.54 in.)	\$375.00~\$552.00					
200 W (1/4 HP)	Combination Type 110 mm (4.33 in.) Round Shaft Type 90 mm (3.54 in.)	\$441.00~\$669.00					
 Round Shaft Type							

\*Except for 200 W (1/4 HP)

Overview,  
Product  
Series

Brushless  
Motors

AC Input  
BMU

AC Input  
BLE

AC Input  
BLF

AC Input  
BXII

DC Input  
BLH

AC Speed  
Control  
Motors

DSC

BHF


Accessories

Installation


### System Configuration

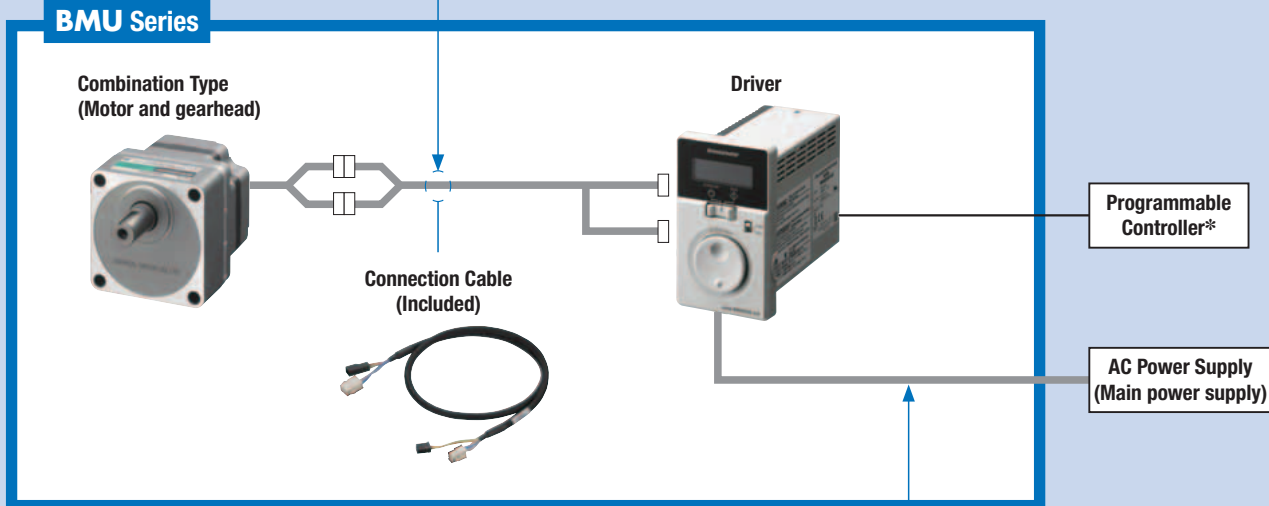
**Accessories (Sold separately)**

Flexible Couplings  
→ Page D-190



Connection Cables, Flexible Connection Cables  
→ Page D-181





**Accessories (Sold separately)**



Mounting Bracket for Motor and Gearhead  
→ Page D-190



Driver Mounting Brackets  
→ Page D-189



Power Supply Cable  
→ Page D-182

\*Not supplied.

● Example of System Configuration

BMU Series Combination Type with Parallel Shaft	Sold Separately			
	Connection Cable [7 m (23.0 ft.)]	Mounting Bracket for Motor and Gearhead	Flexible Coupling	Driver Mounting Brackets
<b>BMU5120A-10A-3</b> \$508.00	<b>CC07BL2</b> \$122.00	<b>SOL5UBF</b> \$29.00	<b>MCL5515F12</b> \$97.00	<b>MAFP04-15</b> \$35.00

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

### Product Number

**BMU 5 120 A P -10A - 3**

① ② ③ ⑤ ⑥ ⑦ ⑧

**BMU 4 60 S A P -10A - 3**

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①	Type	BMU: BMU Series
②	Frame Size	<b>2:</b> 60 mm (2.36 in.) <b>4:</b> 80 mm (3.15 in.) <b>5:</b> 90 mm (3.54 in.) <b>6:</b> 104 mm (4.09 in.) [Gearhead is 110 mm (4.33 in.)]
③	Output Power (W)	<b>30:</b> 30 W (1/25 HP) <b>60:</b> 60 W (1/12 HP) <b>120:</b> 120 W (1/6 HP) <b>200:</b> 200 W (1/4 HP)
④	Identification Number	<b>S</b>
⑤	Power Supply Voltage	<b>A:</b> Single-Phase 100-120 VAC <b>C:</b> Single-Phase, Three-Phase 200-240 VAC
⑥	Motor Degree of Protection	None: Standard Type (IP40 specifications) <b>P:</b> IP65 Specifications
⑦	Gear Ratio/Shaft Type	Number: Gear ratio for combination types <b>A:</b> Round shaft type
⑧	Length of Connection Cable (Included)	<b>3:</b> The length of the included connection cable is 3 m (9.8 ft.)

## Product Line

### 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.

### ● Combination Type – Parallel Shaft Gearhead

#### ◇ Standard Type (IP40 specifications)

Output Power	Power Supply Voltage	Product Name	Gear Ratio	List Price
30 W (1/25 HP)	Single-Phase 100-120 VAC	<b>BMU230A-□A-3</b>	<b>5, 10, 15, 20</b>	\$386.00
			<b>30, 50, 100</b>	\$394.00
			<b>200</b>	\$405.00
	Single-Phase, Three-Phase 200-240 VAC	<b>BMU230C-□A-3</b>	<b>5, 10, 15, 20</b>	\$386.00
			<b>30, 50, 100</b>	\$394.00
			<b>200</b>	\$405.00
60 W (1/12 HP)	Single-Phase 100-120 VAC	<b>BMU460SA-□A-3</b>	<b>5, 10, 15, 20</b>	\$419.00
			<b>30, 50, 100</b>	\$427.00
			<b>200</b>	\$439.00
	Single-Phase, Three-Phase 200-240 VAC	<b>BMU460SC-□A-3</b>	<b>5, 10, 15, 20</b>	\$419.00
			<b>30, 50, 100</b>	\$427.00
			<b>200</b>	\$439.00
120 W (1/6 HP)	Single-Phase 100-120 VAC	<b>BMU5120A-□A-3</b>	<b>5, 10, 15, 20</b>	\$508.00
			<b>30, 50, 100</b>	\$519.00
			<b>200</b>	\$529.00
	Single-Phase, Three-Phase 200-240 VAC	<b>BMU5120C-□A-3</b>	<b>5, 10, 15, 20</b>	\$508.00
			<b>30, 50, 100</b>	\$519.00
			<b>200</b>	\$529.00
200 W (1/4 HP)	Single-Phase, Three-Phase 200-240 VAC	<b>BMU6200SC-□A-3</b>	<b>5, 10, 15, 20</b>	\$614.00
			<b>30, 50</b>	\$628.00
			<b>100, 200</b>	\$646.00

#### ◇ IP65 Specifications

Output Power	Power Supply Voltage	Product Name	Gear Ratio	List Price
30 W (1/25 HP)	Single-Phase 100-120 VAC	<b>BMU230AP-□A-3</b>	<b>5, 10, 15, 20</b>	\$409.00
			<b>30, 50, 100</b>	\$417.00
			<b>200</b>	\$428.00
	Single-Phase, Three-Phase 200-240 VAC	<b>BMU230CP-□A-3</b>	<b>5, 10, 15, 20</b>	\$409.00
			<b>30, 50, 100</b>	\$417.00
			<b>200</b>	\$428.00
60 W (1/12 HP)	Single-Phase 100-120 VAC	<b>BMU460SAP-□A-3</b>	<b>5, 10, 15, 20</b>	\$442.00
			<b>30, 50, 100</b>	\$450.00
			<b>200</b>	\$462.00
	Single-Phase, Three-Phase 200-240 VAC	<b>BMU460SCP-□A-3</b>	<b>5, 10, 15, 20</b>	\$442.00
			<b>30, 50, 100</b>	\$450.00
			<b>200</b>	\$462.00
120 W (1/6 HP)	Single-Phase 100-120 VAC	<b>BMU5120AP-□A-3</b>	<b>5, 10, 15, 20</b>	\$531.00
			<b>30, 50, 100</b>	\$542.00
			<b>200</b>	\$552.00
	Single-Phase, Three-Phase 200-240 VAC	<b>BMU5120CP-□A-3</b>	<b>5, 10, 15, 20</b>	\$531.00
			<b>30, 50, 100</b>	\$542.00
			<b>200</b>	\$552.00
200 W (1/4 HP)	Single-Phase, Three-Phase 200-240 VAC	<b>BMU6200SCP-□A-3</b>	<b>5, 10, 15, 20</b>	\$637.00
			<b>30, 50</b>	\$651.00
			<b>100, 200</b>	\$669.00

The following items are included with each product.

Motor, Driver, Gearhead, Connection Cable, CN1 Connector, CN4 Connector, Installation Screws, Parallel Key, Operating Manual, Startup Guide

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

● Round Shaft Type

◇ Standard Type (IP40 specifications)

Output Power	Power Supply Voltage	Product Name	List Price
30 W (1/25 HP)	Single-Phase 100-120 VAC	<b>BMU230A-A-3</b>	\$305.00
	Single-Phase, Three-Phase 200-240 VAC	<b>BMU230C-A-3</b>	\$305.00
60 W (1/12 HP)	Single-Phase 100-120 VAC	<b>BMU260A-A-3</b>	\$325.00
	Single-Phase, Three-Phase 200-240 VAC	<b>BMU260C-A-3</b>	\$325.00
120 W (1/6 HP)	Single-Phase 100-120 VAC	<b>BMU5120A-A-3</b>	\$375.00
	Single-Phase, Three-Phase 200-240 VAC	<b>BMU5120C-A-3</b>	\$375.00
200 W (1/4 HP)	Single-Phase, Three-Phase 200-240 VAC	<b>BMU5200C-A-3</b>	\$441.00

◇ IP65 Specifications

Output Power	Power Supply Voltage	Product Name	List Price
30 W (1/25 HP)	Single-Phase 100-120 VAC	<b>BMU230AP-A-3</b>	\$328.00
	Single-Phase, Three-Phase 200-240 VAC	<b>BMU230CP-A-3</b>	\$328.00
60 W (1/12 HP)	Single-Phase 100-120 VAC	<b>BMU260AP-A-3</b>	\$348.00
	Single-Phase, Three-Phase 200-240 VAC	<b>BMU260CP-A-3</b>	\$348.00
120 W (1/6 HP)	Single-Phase 100-120 VAC	<b>BMU5120AP-A-3</b>	\$398.00
	Single-Phase, Three-Phase 200-240 VAC	<b>BMU5120CP-A-3</b>	\$398.00
200 W (1/4 HP)	Single-Phase, Three-Phase 200-240 VAC	<b>BMU5200CP-A-3</b>	\$464.00

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

## List of Motor and Driver Combinations

● Combination Type – Parallel Shaft Gearhead

Output Power	Power Supply Voltage	Product Name	Combination Motor Product Name*	Motor Product Name	Gearhead Product Name	Driver Product Name
30 W (1/25 HP)	Single-Phase 100-120 VAC	<b>BMU230A-□-□A-3</b>	BLM230□-□A2	BLM230□-GFV2	GFV2G□A	BMUD30-A2
	Single-Phase, Three-Phase 200-240 VAC	<b>BMU230C-□-□A-3</b>				BMUD30-C2
60 W (1/12 HP)	Single-Phase 100-120 VAC	<b>BMU460SA-□-□A-3</b>	BLM460S□-□A2	BLM460S□-GFV2	GFV4G□A	BMUD60-A2
	Single-Phase, Three-Phase 200-240 VAC	<b>BMU460SC-□-□A-3</b>				BMUD60-C2
120 W (1/6 HP)	Single-Phase 100-120 VAC	<b>BMU5120A-□-□A-3</b>	BLM5120□-□A2	BLM5120□-GFV2	GFV5G□A	BMUD120-A2
	Single-Phase, Three-Phase 200-240 VAC	<b>BMU5120C-□-□A-3</b>				BMUD120-C2
200 W (1/4 HP)	Single-Phase, Three-Phase 200-240 VAC	<b>BMU6200SC-□-□A-3</b>	BLM6200S□-□A	BLM6200S□-GFV	GFV6G□A	BMUD200-C

\*Combination motor parts product names are names of special order products in which motors and gearheads are pre-assembled.

● Round Shaft Type

Output Power	Power Supply Voltage	Product Name	Motor Product Name	Driver Product Name
30 W (1/25 HP)	Single-Phase 100-120 VAC	<b>BMU230A-□-□A-3</b>	BLM230□-A2	BMUD30-A2
	Single-Phase, Three-Phase 200-240 VAC	<b>BMU230C-□-□A-3</b>		BMUD30-C2
60 W (1/12 HP)	Single-Phase 100-120 VAC	<b>BMU260A-□-□A-3</b>	BLM260□-A2	BMUD60-A2
	Single-Phase, Three-Phase 200-240 VAC	<b>BMU260C-□-□A-3</b>		BMUD60-C2
120 W (1/6 HP)	Single-Phase 100-120 VAC	<b>BMU5120A-□-□A-3</b>	BLM5120□-A2	BMUD120-A2
	Single-Phase, Three-Phase 200-240 VAC	<b>BMU5120C-□-□A-3</b>		BMUD120-C2
200 W (1/4 HP)	Single-Phase, Three-Phase 200-240 VAC	<b>BMU5200C-□-□A-3</b>	BLM5200□-A	BMUD200-C

● A number indicating the gear ratio is entered where the box □ is located within the product name.  
 For motors with a degree of protection of IP65 specifications, P is entered where the box □ is located within the product name.



## Specifications

### ● 30 W (1/25 HP)



Product Name	Combination Type – Parallel Shaft Gearhead Round Shaft Type	BMU230A□-□A-3		BMU230C□-□A-3	
		BMU230A□-A-3		BMU230C□-A-3	
Rated Output Power (Continuous)	W (HP)			30 (1/25)	
Rated Speed	r/min			3000	
Rated Torque	N·m (oz·in)			0.096 (13.6)	
Maximum Instantaneous Torque	N·m (oz·in)			0.144 (20)	
Rotor Inertia	J: $\times 10^{-4}$ kg·m <sup>2</sup> (oz·in <sup>2</sup> )			0.042 (0.23)	
Round Shaft Type Permissible Inertia	J: $\times 10^{-4}$ kg·m <sup>2</sup> (oz·in <sup>2</sup> )			1.8 (9.8)	
Speed Control Range				80~4000 r/min (Speed ratio 50:1)	
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 (+32~+104°F), rated speed, no load, rated voltage			
Power Supply Input	Rated Voltage	VAC	Single-Phase 100-120		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	1.2	Single-Phase: 0.7/ Three-Phase: 0.38	
	Maximum Input Current	A	2.0	Single-Phase: 1.2/ Three-Phase: 0.75	

Overview, Product Series

Brushless Motors

AC Input BMU

AC Input BLE

AC Input BLF

AC Input BXII

DC Input BLH

AC Speed Control Motors

DSC

BHF

Accessories

Installation

### ● 60 W (1/12 HP)



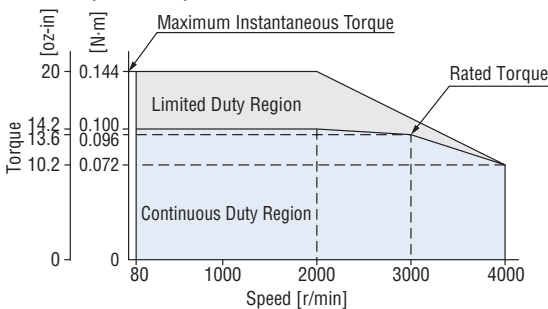
Product Name	Combination Type – Parallel Shaft Gearhead Round Shaft Type	BMU460SA□-□A-3		BMU460SC□-□A-3	
		BMU260A□-A-3		BMU260C□-A-3	
Rated Output Power (Continuous)	W (HP)			60 (1/12)	
Rated Speed	r/min			3000	
Rated Torque	N·m (oz·in)			0.191 (27)	
Maximum Instantaneous Torque	N·m (oz·in)			0.287 (41)	
Rotor Inertia	J: $\times 10^{-4}$ kg·m <sup>2</sup> (oz·in <sup>2</sup> )			0.082 (0.45)	
Round Shaft Type Permissible Inertia	J: $\times 10^{-4}$ kg·m <sup>2</sup> (oz·in <sup>2</sup> )			3.75 (21)	
Speed Control Range				80~4000 r/min (Speed ratio 50:1)	
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 (+32~+104°F), rated speed, no load, rated voltage			
Power Supply Input	Rated Voltage	VAC	Single-Phase 100-120		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	1.7	Single-Phase: 1.0/ Three-Phase: 0.52	
	Maximum Input Current	A	3.3	Single-Phase: 1.9/ Three-Phase: 1.1	

## Speed – Torque Characteristics

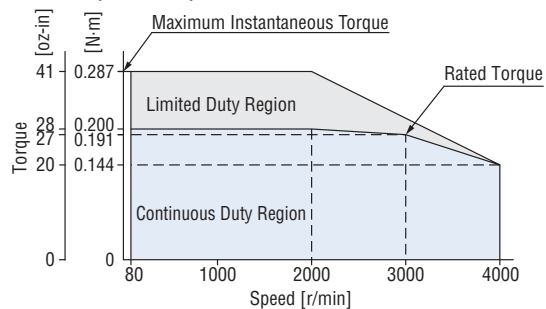
Continuous Duty Region: Continuous operation is possible in this region.

Limited Duty Region: This region is used primarily when accelerating.

### ● 30 W (1/25 HP)



### ● 60 W (1/12 HP)



● 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.

For motors with a degree of protection of IP65 specifications, P is entered where the box □ is located within the product name.



● 120 W (1/6 HP)

Product Name	Combination Type – Parallel Shaft Gearhead		BMU5120A□-□A-3		BMU5120C□-□A-3	
	Round Shaft Type		BMU5120A□-A-3		BMU5120C□-A-3	
Rated Output Power (Continuous)	W (HP)		120 (1/6)			
Rated Speed	r/min		3000			
Rated Torque	N·m (oz·in)		0.382 (54)			
Maximum Instantaneous Torque	N·m (oz·in)		0.573 (81)			
Rotor Inertia	J: × 10 <sup>-4</sup> kg·m <sup>2</sup> (oz·in <sup>2</sup> )		0.23 (1.26)			
Round Shaft Type Permissible Inertia	J: × 10 <sup>-4</sup> kg·m <sup>2</sup> (oz·in <sup>2</sup> )		5.6 (31)			
Speed Control Range			80~4000 r/min (Speed ratio 50:1)			
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 (+32~+104°F), rated speed, no load, rated voltage				
Power Supply Input	Rated Voltage	VAC	Single-Phase 100-120		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	3.3	Single-Phase: 2.0/ Three-Phase: 1.1		
Maximum Input Current	A	6.8	Single-Phase: 4.1/ Three-Phase: 2.0			

● 200 W (1/4 HP)

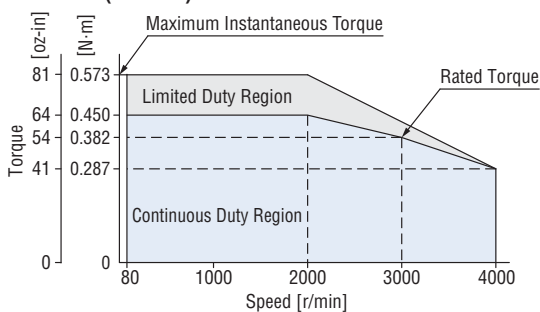


Product Name	Combination Type – Parallel Shaft Gearhead		BMU6200SC□-□A-3		BMU5200C□-A-3	
	Round Shaft Type		BMU6200SC□-A-3		BMU5200C□-A-3	
Rated Output Power (Continuous)	W (HP)		200 (1/4)			
Rated Speed	r/min		3000			
Rated Torque	N·m (oz·in)		0.637 (90)			
Maximum Instantaneous Torque	N·m (oz·in)		1.15 (163)			
Rotor Inertia	J: × 10 <sup>-4</sup> kg·m <sup>2</sup> (oz·in <sup>2</sup> )		0.454 (2.5)			
Round Shaft Type Permissible Inertia	J: × 10 <sup>-4</sup> kg·m <sup>2</sup> (oz·in <sup>2</sup> )		8.75 (48)			
Speed Control Range			80~4000 r/min (Speed ratio 50:1)			
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 (+32~+104°F), rated speed, no load, rated voltage				
Power Supply Input	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				

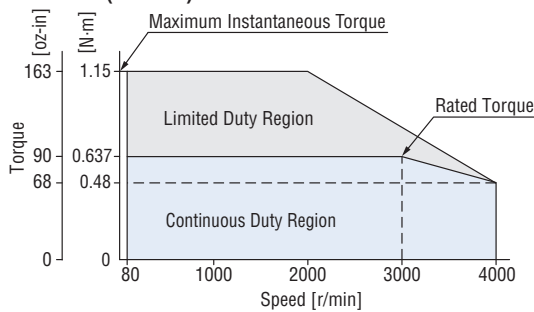
■ Speed – Torque Characteristics

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

● 120 W (1/6 HP)



● 200 W (1/4 HP)



- 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.  
 For motors with a degree of protection of IP65 specifications, P is entered where the box ■ is located within the product name.

## Common Specifications

Item	Specifications
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	30 W (1/25 HP) 60 W (1/12 HP) 120 W (1/6 HP) 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. Sink input/source input Supplied through external wiring Arbitrary signal assignment to X0~X2 input (3 points) is possible [ ]: Initial setting [FWD], [REV], [MO], M1, ALARM-RESET, EXT-ERROR, H-FREE
	200 W (1/4 HP) 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. Sink input/source input Supplied through external wiring Arbitrary signal assignment to IN0~IN4 input (5 points) is possible [ ]: Initial setting [FWD], [REV], [MO], [M1], [ALARM-RESET], EXT-ERROR, H-FREE
Output Signals	30 W (1/25 HP) 60 W (1/12 HP) 120 W (1/6 HP) Photocoupler and Open-Collector Output External power supply: 4.5~30 VDC 100 mA max. Sink output/source 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
	200 W (1/4 HP) Photocoupler and Open-Collector Output External power supply: 4.5~30 VDC 100 mA max. Sink output/source output Supplied through external wiring 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
Max. Extension Distance	Motor and driver distance: 10.5 m (34.4 ft.) (when an accessory 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

Overview,  
Product  
Series

Brushless  
Motors

AC Input  
BMU

AC Input  
BLE

AC Input  
BLF

AC Input  
BXII

DC Input  
BLH

AC Speed  
Control  
Motors

DSC

BHF

Accessories

Installation

### 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 (90°F) max. and that of the case surface is 40°C (72°F) max.*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 (90°F) max., measured by the thermocouple method after rated continuous operation under normal ambient temperature and humidity.
Operating Environment	Ambient Temperature	0~+40°C (+32~+104°F) (Non-freezing)
	Ambient Humidity	85% or less (Non-condensing)
	Altitude	Up to 1000 m (3300 ft.) 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 (0.006 in.) Sweep Direction: 3 directions (X, Y, Z) Number of Sweeps: 20 times
Storage Condition*2	Ambient Temperature	-20~+70°C (-4~+158°F) (Non-freezing)
	Ambient Humidity	85% or less (Non-condensing)
	Altitude	Up to 3000 m (10000 ft.) above sea level
Thermal Class	UL/CSA Standards: 105 (A), EN Standards: 120 (E)	
Degree of Protection	Standard Type: IP40 IP65 Specifications: IP65 (Excluding the installation surface of the round shaft type and connectors)	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 (194°F).

- 30 W (1/25 HP) Type: 115×115 mm (4.53×4.53 in.) Thickness 5 mm (0.20 in.),
- 60 W (1/12 HP) Type: 135×135 mm (5.31×5.31 in.) Thickness 5 mm (0.20 in.),
- 120 W (1/12 HP) Type: 165×165 mm (5.31×5.31 in.) Thickness: 5 mm (0.20 in.),
- 200 W (1/4 HP) Type: 200×200 mm (7.87×7.87 in.) Thickness: 5 mm (0.20 in.)

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

**Note**

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

### Permissible Torque of Combination Types

#### Combination Type – Parallel Shaft Gearhead

Unit: N·m (lb·in)

Product Name	Gear Ratio Motor Speed	5	10	15	20	30	50	100	200
		<b>BMU230</b>	At 80~2000 r/min	0.45 (3.9)	0.9 (7.9)	1.4 (12.3)	1.8 (15.9)	2.6 (23)	4.3 (38)
	At 3000 r/min	0.43 (3.8)	0.86 (7.6)	1.3 (11.5)	1.7 (15.0)	2.5 (22)	4.1 (36)	6 (53)	6 (53)
	At 4000 r/min	0.32 (2.8)	0.65 (5.7)	0.97 (8.5)	1.3 (11.5)	1.9 (16.8)	3.1 (27)	5.4 (47)	5.4 (47)
<b>BMU460S</b>	At 80~2000 r/min	0.9 (7.9)	1.8 (15.9)	2.7 (23)	3.6 (31)	5.2 (46)	8.6 (76)	16 (141)	16 (141)
	At 3000 r/min	0.86 (7.6)	1.7 (15.0)	2.6 (23)	3.4 (30)	4.9 (43)	8.2 (72)	16 (141)	16 (141)
	At 4000 r/min	0.65 (5.7)	1.3 (11.5)	1.9 (16.8)	2.6 (23)	3.7 (32)	6.2 (54)	12.4 (109)	14 (123)
<b>BMU5120</b>	At 80~2000 r/min	2 (17.7)	4.1 (36)	6.1 (53)	8.1 (71)	11.6 (102)	19.4 (171)	30 (260)	30 (260)
	At 3000 r/min	1.7 (15.0)	3.4 (30)	5.2 (46)	6.9 (61)	9.9 (87)	16.4 (145)	30 (260)	30 (260)
	At 4000 r/min	1.3 (11.5)	2.6 (23)	3.9 (34)	5.2 (46)	7.4 (65)	12.3 (108)	24.7 (210)	27 (230)
<b>BMU6200S</b>	At 80~3000 r/min	2.9 (25)	5.7 (50)	8.6 (76)	11.5 (101)	16.4 (145)	27.4 (240)	51.6 (450)	70 (610)
	At 4000 r/min	2.2 (19.4)	4.3 (38)	6.5 (57)	8.6 (76)	12.4 (109)	20.6 (182)	38.9 (340)	63 (550)

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

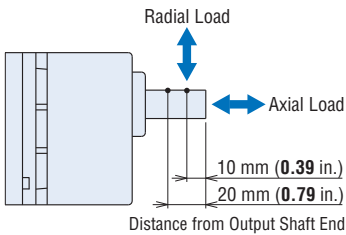
Unit: r/min

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
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

Product Name	Gear Ratio		Permissible Radial Load				Permissible Axial Load	
			10 mm (0.39 in.) from shaft end		20 mm (0.79 in.) from shaft end			
			N	lb.	N	lb.	N	lb.
<b>BMU230</b>	<b>5</b>	At 80~3000 r/min	100	22	150	33	40	9
		At 4000 r/min	90	20	110	24		
	<b>10, 15, 20</b>	At 80~3000 r/min	150	33	200	45		
		At 4000 r/min	130	29	170	38		
	<b>30, 50, 100, 200</b>	At 80~3000 r/min	200	45	300	67		
		At 4000 r/min	180	40	230	51		
<b>BMU460S</b>	<b>5</b>	At 80~3000 r/min	200	45	250	56	100	22
		At 4000 r/min	180	40	220	49		
	<b>10, 15, 20</b>	At 80~3000 r/min	300	67	350	78		
		At 4000 r/min	270	60	330	74		
	<b>30, 50, 100, 200</b>	At 80~3000 r/min	450	101	550	123		
		At 4000 r/min	420	94	500	112		
<b>BMU5120</b>	<b>5</b>	At 80~3000 r/min	300	67	400	90	150	33
		At 4000 r/min	230	51	300	67		
	<b>10, 15, 20</b>	At 80~3000 r/min	400	90	500	112		
		At 4000 r/min	370	83	430	96		
	<b>30, 50, 100, 200</b>	At 80~3000 r/min	500	112	650	146		
		At 4000 r/min	450	101	550	123		
<b>BMU6200S</b>	<b>5, 10, 15, 20</b>	At 80~3000 r/min	550	123	800	180	200	45
		At 4000 r/min	500	112	700	157		
	<b>30, 50</b>	At 80~3000 r/min	1000	220	1250	280		
		At 4000 r/min	900	200	1100	240		
	<b>100, 200</b>	At 80~3000 r/min	1400	310	1700	380		
		At 4000 r/min	1200	270	1400	310		



### Round Shaft Type

Product Name	Permissible Radial Load				Permissible Axial Load
	10 mm (0.39 in.) from shaft end		20 mm (0.79 in.) from shaft end		
	N	lb.	N	lb.	
<b>BMU230</b>	80	18	100	22	Half of motor mass or less
<b>BMU260</b>	80	18	100	22	
<b>BMU5120</b>	150	33	170	38	
<b>BMU5200</b>	150	33	170	38	

## Permissible Load Inertia J of Combination Types

### Combination Type – Parallel Shaft Gearhead

Unit:  $\times 10^{-4}$  kg-m<sup>2</sup> (oz-in<sup>2</sup>)

Product Name	Gear Ratio	<b>5</b>	<b>10</b>	<b>15</b>	<b>20</b>	<b>30</b>	<b>50</b>	<b>100</b>	<b>200</b>
		<b>BMU230</b>		12 (66)	50 (270)	110 (600)	200 (1090)	370 (2000)	920 (5000)
	When instantaneous stop or instantaneous bi-directional operation is performed*	1.55 (8.5)	6.2 (34)	14 (77)	24.8 (136)	55.8 (310)	155 (850)	155 (850)	155 (850)
<b>BMU460S</b>		22 (120)	95 (520)	220 (1200)	350 (1910)	800 (4400)	2200 (12000)	6200 (34000)	12000 (66000)
	When instantaneous stop or instantaneous bi-directional operation is performed*	5.5 (30)	22 (120)	49.5 (270)	88 (480)	198 (1080)	550 (3000)	550 (3000)	550 (3000)
<b>BMU5120</b>		45 (250)	190 (1040)	420 (2300)	700 (3800)	1600 (8800)	4500 (25000)	12000 (66000)	25000 (137000)
	When instantaneous stop or instantaneous bi-directional operation is performed*	25 (137)	100 (550)	225 (1230)	400 (2200)	900 (4900)	2500 (13700)	2500 (13700)	2500 (13700)
<b>BMU6200S</b>		100 (550)	460 (2500)	1000 (5500)	1700 (9300)	3900 (21000)	9300 (51000)	18000 (98000)	37000 (200000)
	When instantaneous stop or instantaneous bi-directional operation is performed*	50 (270)	200 (1090)	450 (2500)	800 (4400)	1800 (9800)	5000 (27000)	5000 (27000)	5000 (27000)

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

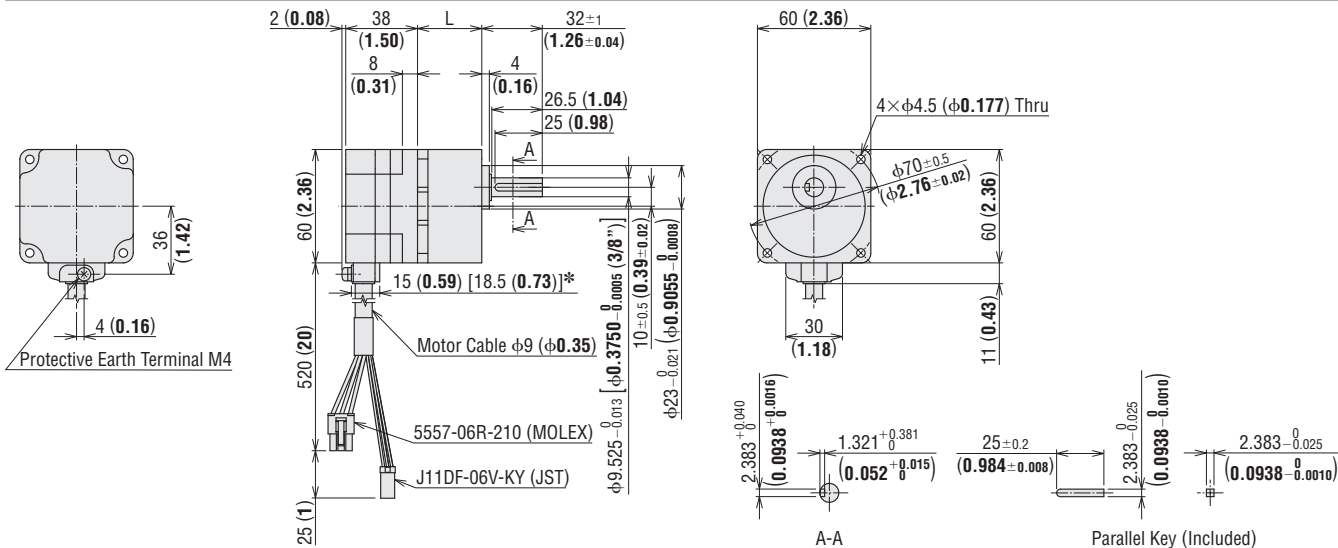
**Dimensions** Unit = mm (in.)

- "Installation screws" are included with the combination type. Installation screws → Page D-194
- A number indicating the gear ratio is entered where the box □ is located within the product name.  
For motors with a degree of protection of IP65 specifications, P is entered where the box ■ is located within the product name.

● 30 W (1/25 HP)  
◇ Motor/Parallel Shaft Gearhead

2D & 3D CAD

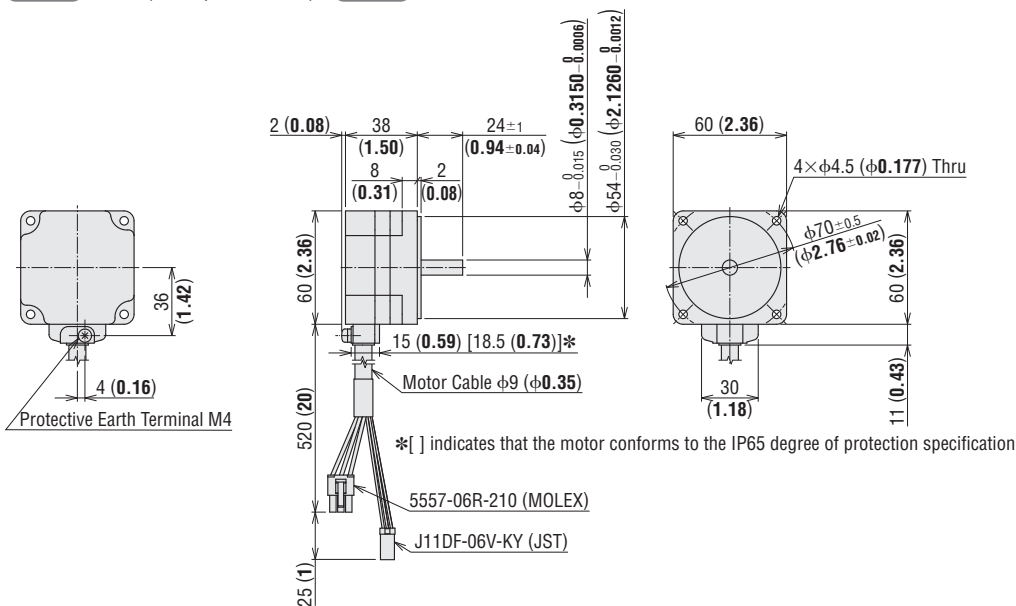
Product Name	Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass kg (lb.)	2D CAD	
						Standard Type	IP65 Specification
<b>BMU230A</b> ■□ <b>A-3</b> <b>BMU230C</b> ■□ <b>A-3</b>	BLM230■-GFV2	GFV2G□A	<b>5~20</b>	34 (1.34)	0.92 (2.0)	A1381A	A1382A
			<b>30~100</b>	38 (1.50)		A1381B	A1382B
			<b>200</b>	43 (1.69)		A1381C	A1382C



◇ Round Shaft Type  
**BMU230A**■**A-3**, **BMU230C**■**A-3**

Motor: BLM230■-A2  
Mass: 0.42 kg (0.92 lb.)

2D CAD A1362 (Standard type) 3D CAD  
2D CAD A1363 (IP65 specifications) 3D CAD

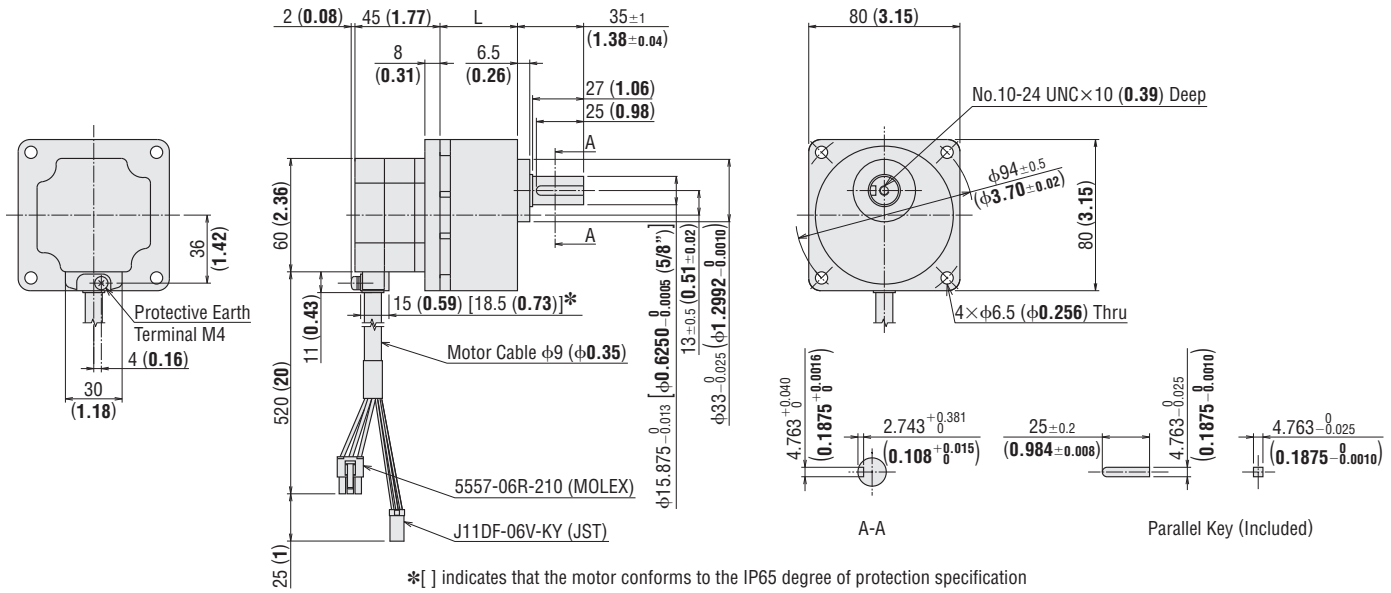


● 60 W (1/12 HP)

◇ Motor/Parallel Shaft Gearhead

2D & 3D CAD

Product Name	Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass kg (lb.)	2D CAD	
						Standard Type	IP65 Specification
<b>BMU460SA</b> □-□ <b>A-3</b> <b>BMU460SC</b> □-□ <b>A-3</b>	BLM460S □-GFV2	GFV4G □A	5~20	41 (1.61)	1.6 (3.5)	A1383A	A1384A
			30~100	46 (1.81)		A1383B	A1384B
			200	51 (2.01)		A1383C	A1384C



◇ Round Shaft Type

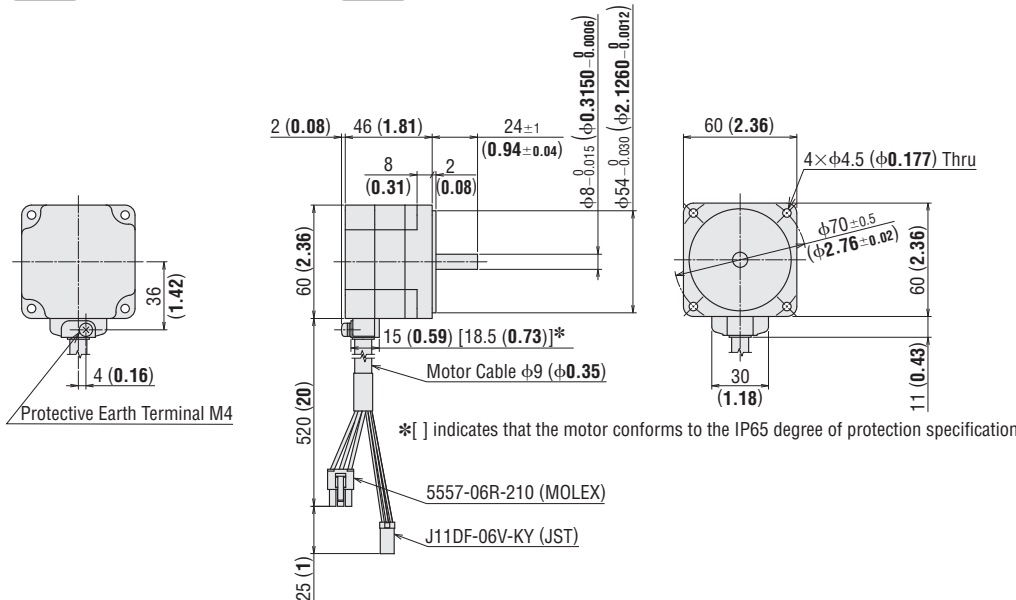
**BMU260A** □-**A-3**, **BMU260C** □-**A-3**

Motor: BLM260 □-A2

Mass: 0.55 kg (1.21 lb.)

2D CAD A1368 (Standard type) 3D CAD

2D CAD A1369 (IP65 specifications) 3D CAD



Overview, Product Series

Brushless Motors

AC Input BMU

AC Input BLE

AC Input BLF

AC Input BXII

DC Input BLH

AC Speed Control Motors

DSC

BHF

Accessories

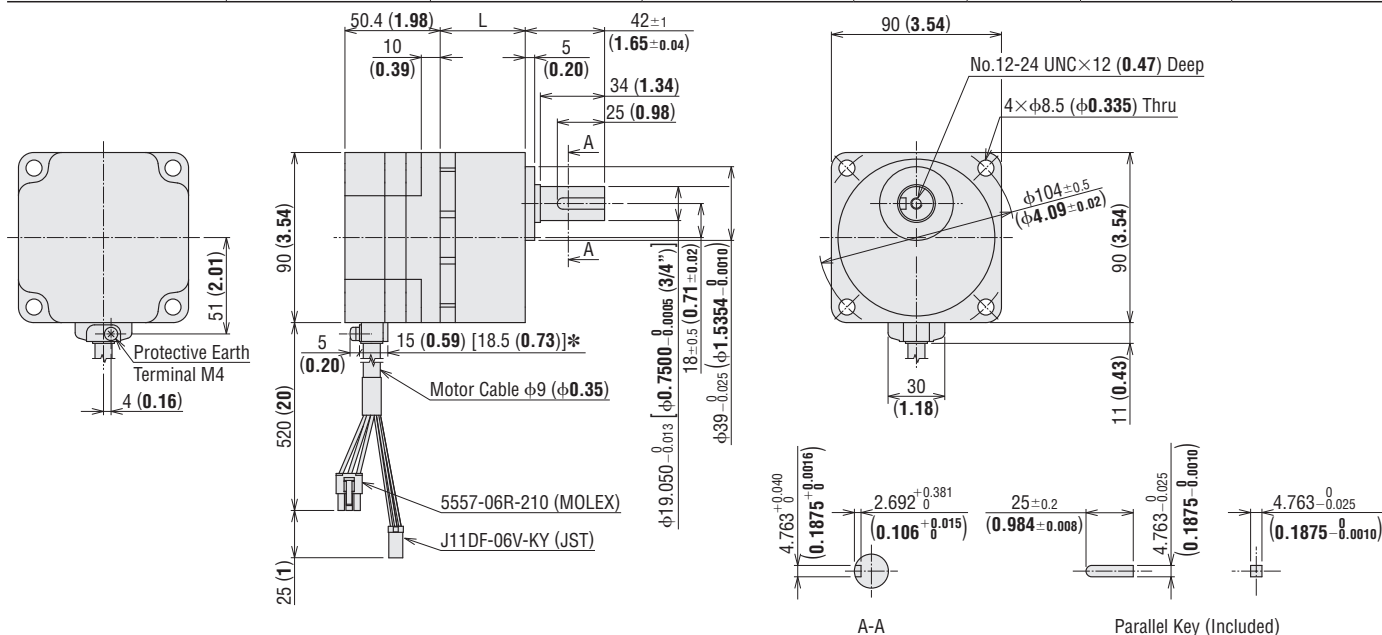
Installation

● 120 W (1/6 HP)

◇ Motor/Parallel Shaft Gearhead

2D & 3D CAD

Product Name	Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass kg (lb.)	2D CAD	
						Standard Type	IP65 Specification
<b>BMU5120A</b> □-□- <b>A-3</b> <b>BMU5120C</b> □-□- <b>A-3</b>	BLM5120 □-GFV2	GFV5G □-A	5~20	45 (1.77)	2.7 (5.9)	A1385A	A1386A
			30~100	58 (2.28)		A1385B	A1386B
			200	64 (2.52)		A1385C	A1386C



\*[ ] indicates that the motor conforms to the IP65 degree of protection specification

◇ Round Shaft Type

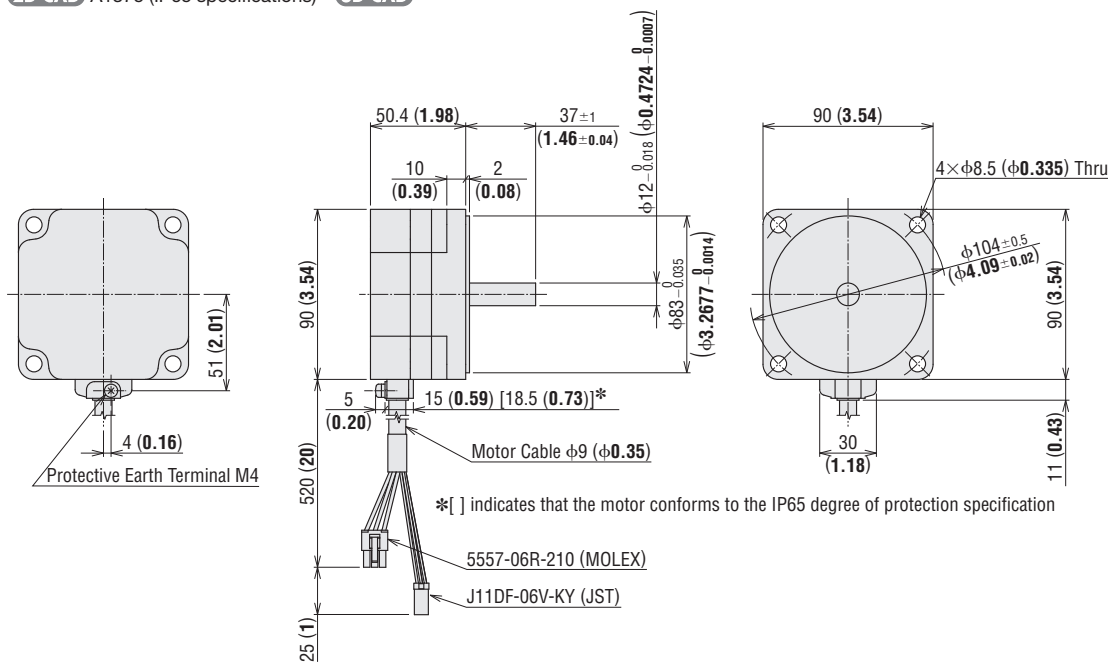
**BMU5120A** □-**A-3**, **BMU5120C** □-**A-3**

Motor: BLM5120 □-A2

Mass: 1.2 kg (2.6 lb.)

2D CAD A1374 (Standard type) 3D CAD

2D CAD A1375 (IP65 specifications) 3D CAD



\*[ ] indicates that the motor conforms to the IP65 degree of protection specification

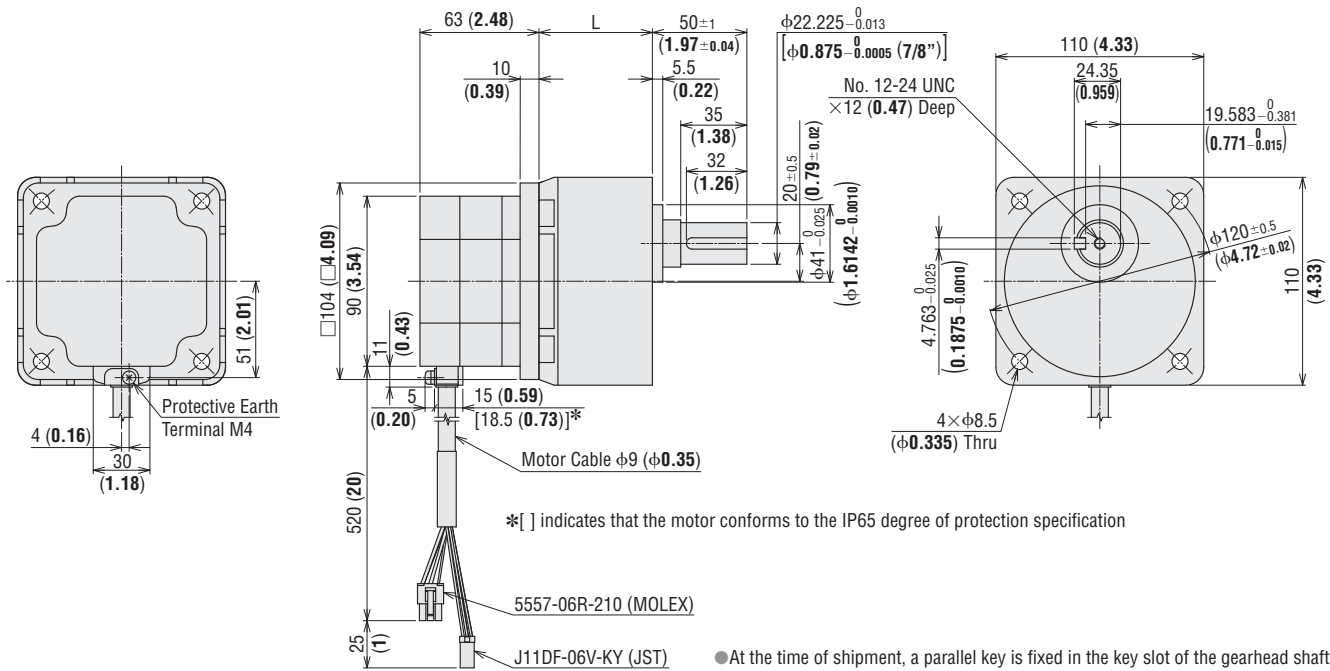


● 200 W (1/4 HP)

◇ Motor/Parallel Shaft Gearhead

2D & 3D CAD

Product Name	Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass kg (lb.)	2D CAD	
						Standard Type	IP65 Specification
<b>BMU6200SC</b> □-□ <b>A-3</b>	BLM6200S□-GFV	GFV6G□A	<b>5~20</b>	60 (2.36)	4.8 (10.6)	A1387A	A1388A
			<b>30, 50</b>	72 (2.83)		A1387B	A1388B
			<b>100, 200</b>	86 (3.39)		A1387C	A1388C



◇ Round Shaft Type

**BMU5200C**□-□**A-3**

Motor: BLM5200□-A

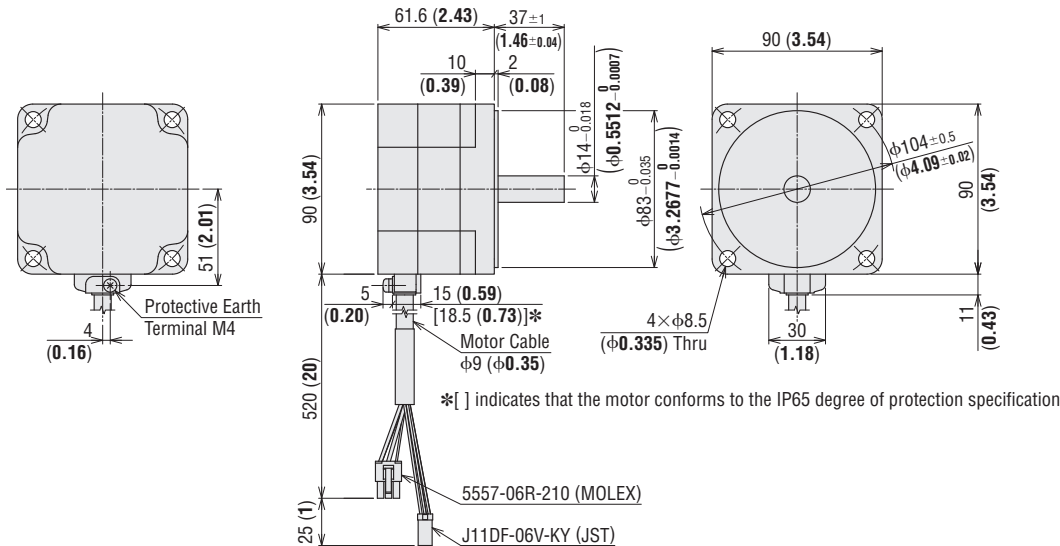
Mass: 1.7 kg (3.7 lb.)

2D CAD A1341 (Standard type)

3D CAD

2D CAD A1379 (IP65 specifications)

3D CAD



Overview,  
Product  
Series

Brushless  
Motors

AC Input  
BMU

AC Input  
BLE

AC Input  
BLF

AC Input  
BXII

DC Input  
BLH

AC Speed  
Control  
Motors

DSC

BHF

Accessories

Installation

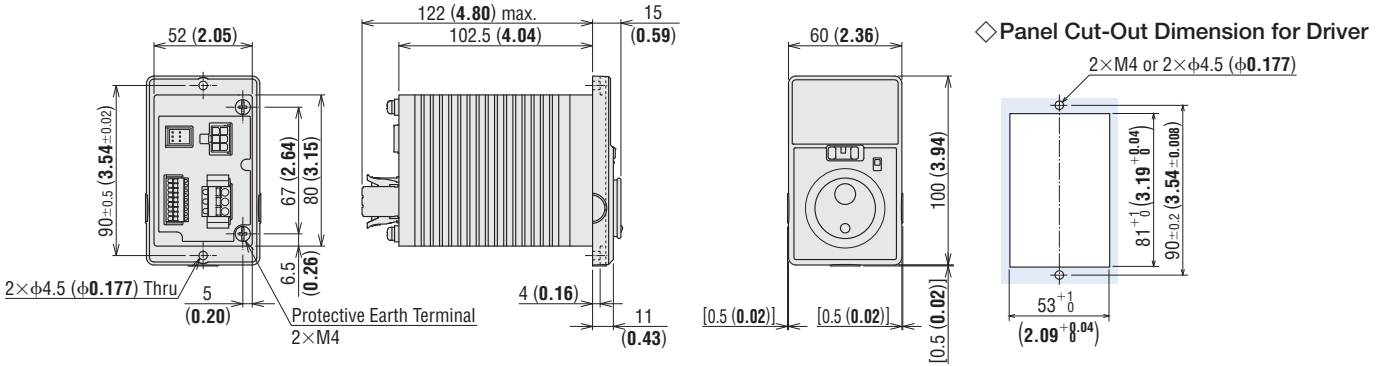
● Driver

◇ 30 W (1/25 HP), 60 W (1/12 HP), 120 W (1/6 HP)

BMUD30-A2, BMUD30-C2, BMUD60-A2, BMUD60-C2, BMUD120-A2, BMUD120-C2

Mass: 0.4 kg (0.88 lb.)

2D CAD A1359 3D CAD

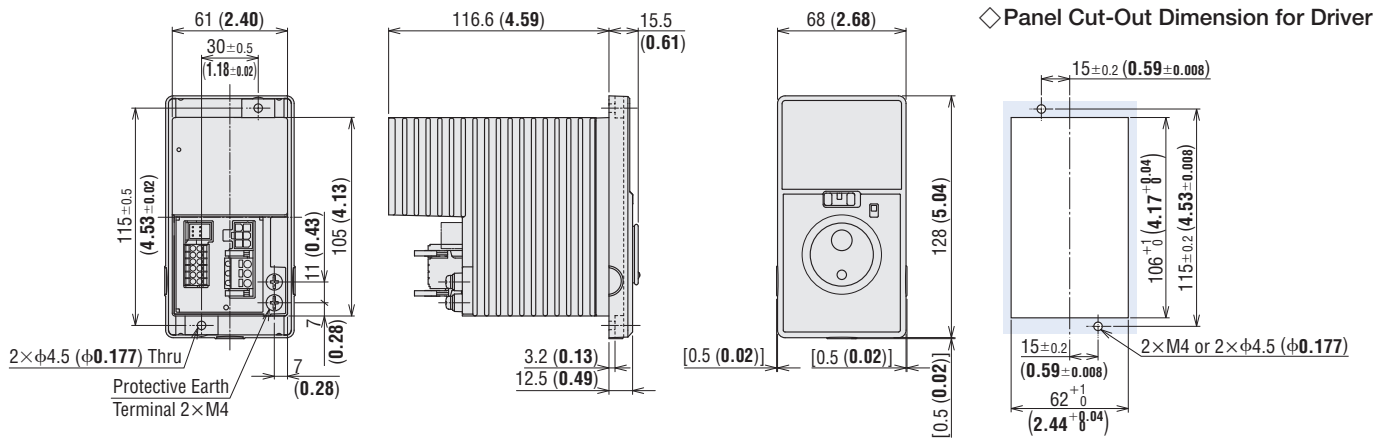


◇ 200 W (1/4 HP)

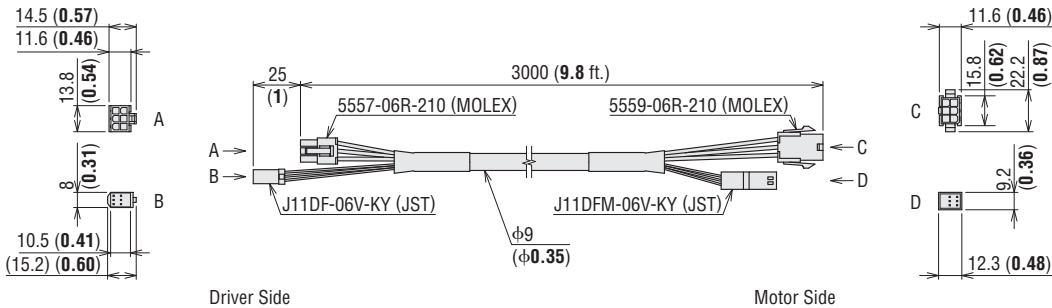
BMUD200-C

Mass: 0.8 kg (1.76 lb.)

2D CAD A1343 3D CAD



● Connection Cable (Included)



## Connection and Operation [30 W (1/25 HP), 60 W (1/12 HP), 120 W (1/6 HP)]

### 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.



[Front of Driver]

#### 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.

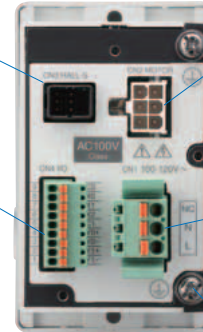
#### Front Panel

#### Sensor Connector (CN3)

Connects the motor sensor connector (black).

#### I/O Signal Connector (CN4)

Connects the I/O signals.



[Back of Driver]

#### 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.

### 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

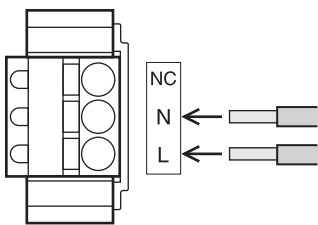
These settings can be made with key operations after removing the front panel.

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

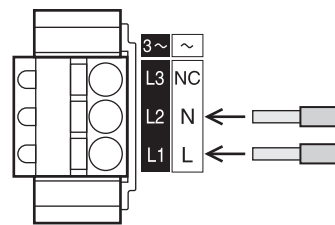
### Main Power Connector (CN1)

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

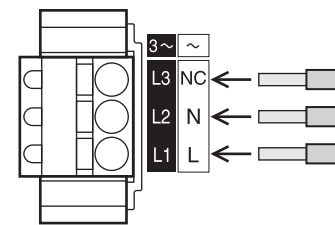
#### Single-Phase 100-120 VAC



#### Single-Phase 200-240 VAC



#### Three-Phase 200-240 VAC



• Applicable Lead Wire Size  
AWG18~14

### 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.

Speed Setting Range: 50~4000 r/min

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



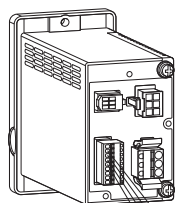
"RUN" Position



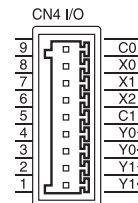
● Operation by External Signals

◇ 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.



Pin No. 8 (X0): FWD  
 Pin No. 7 (X1): REV  
 Pin No. 6 (X2): MO  
 Pin No. 5 (C1): IN-COM1 (0 V)



● 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	[MO]	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-		

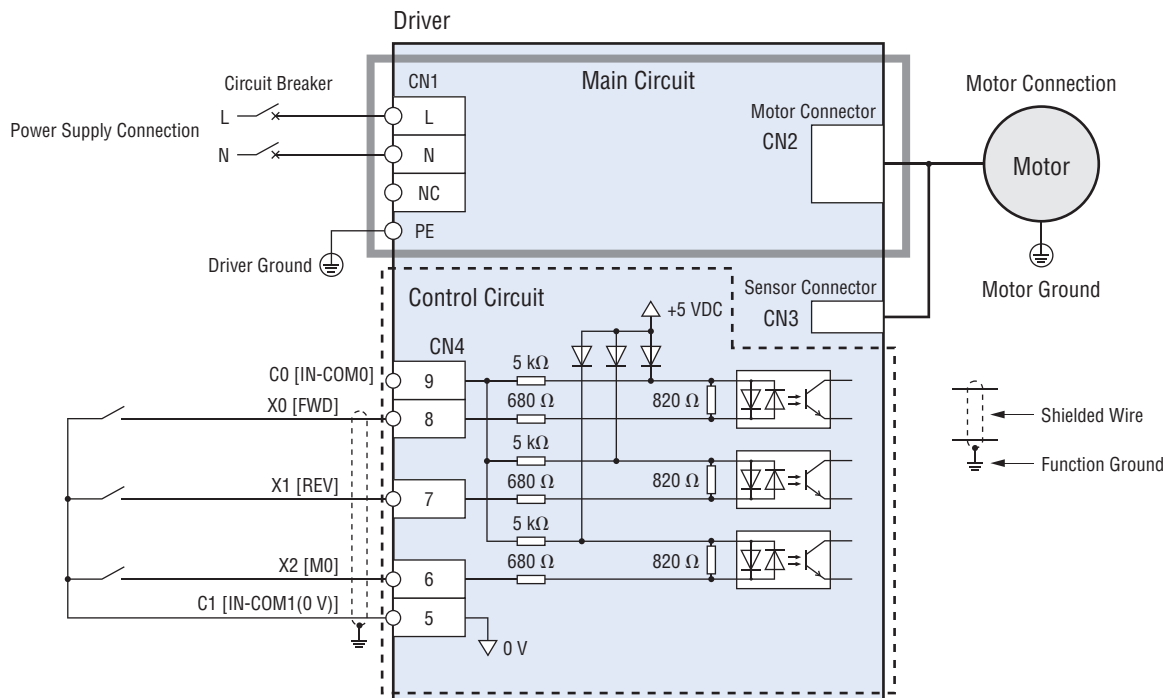
● Applicable Lead Wire Size

AWG26~20

\*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, MO, M1, ALARM-RESET, EXT-ERROR, H-FREE)  
 2 of the 6 output signals (ALARM-OUT1, SPEED-OUT, ALARM-OUT2, MOVE, VA, WNG)

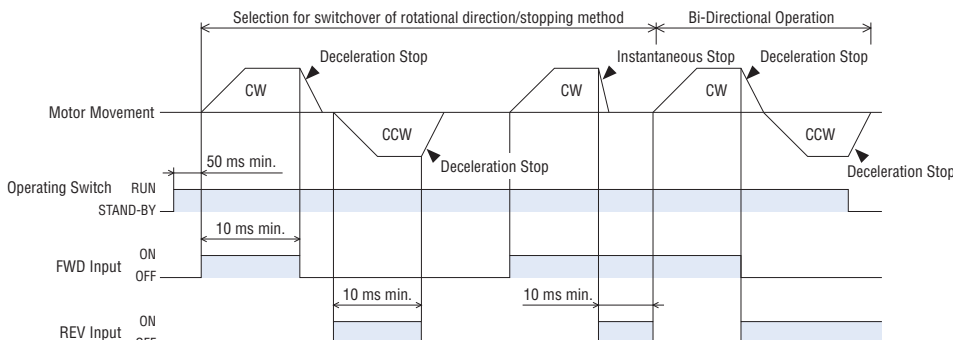
◇ Connection Example Using Switches and Relays

The figure shows a connection example when operating a motor with a contact switch such as switches and relays. (Single-phase 100-120 VAC)



◇ Timing Chart

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

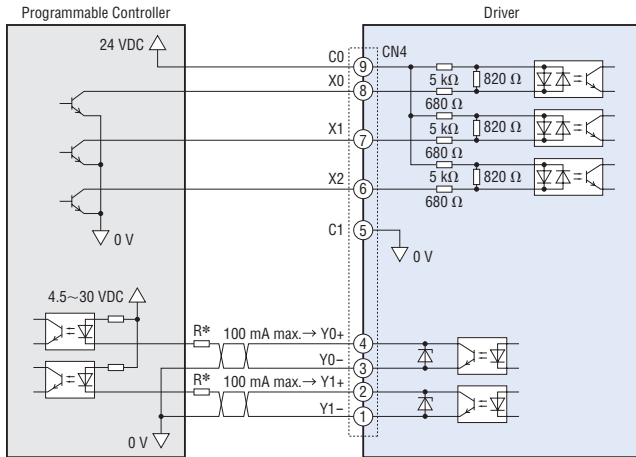


- Switching the FWD input to ON will cause the motor to turn clockwise as viewed from the motor shaft side, while switching the REV input to ON will cause the motor to turn counterclockwise. Turning it OFF decelerates the motor to a stop.
- If the FWD input and REV input are turned ON simultaneously, the motor will stop instantaneously.
- With the combination type, the rotation direction varies according to the gear ratio of the gearhead.

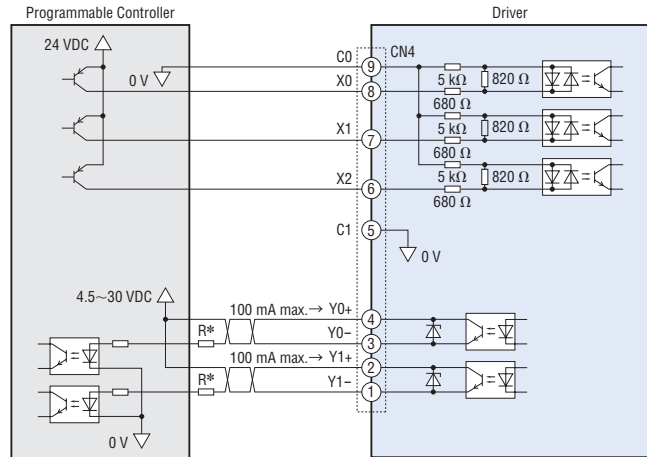
## ◇ I/O Signal and Programmable Controller Connection Examples

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

### ● Sink Logic



### ● Source Logic



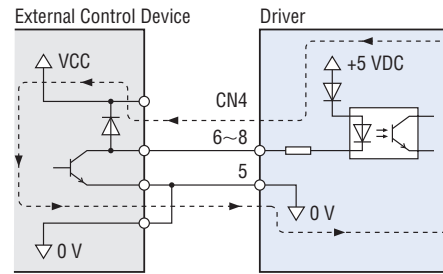
\*Recommended Resistance Value  
 24 VDC: 680 Ω~2.7 kΩ (2 W)  
 5 VDC: 150 Ω~560 Ω (0.5 W)

#### 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.

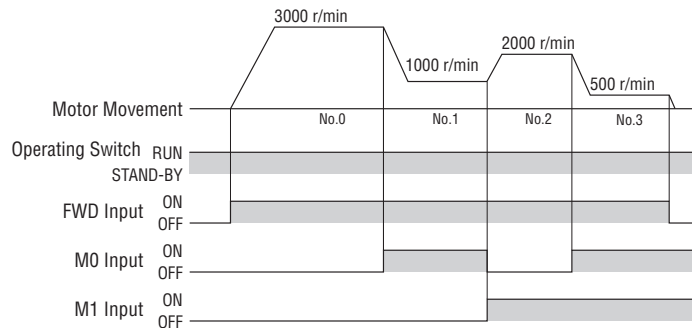


## ◇ When Multistep Speed-Change Operation is Used

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



Overview, Product Series

Brushless Motors

AC Input BMU

AC Input BLE

AC Input BLF

AC Input BXII

DC Input BLH

AC Speed Control Motors

DSC

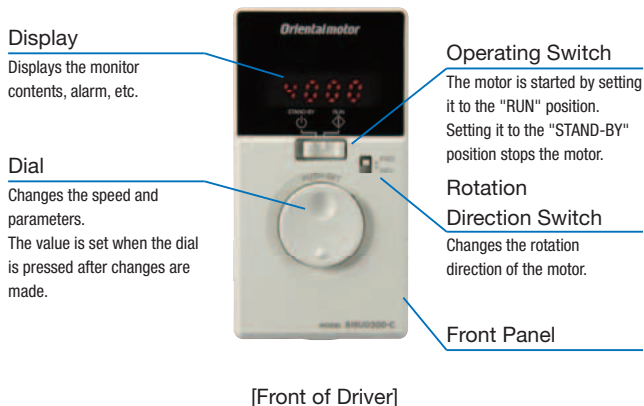
BHF

Accessories

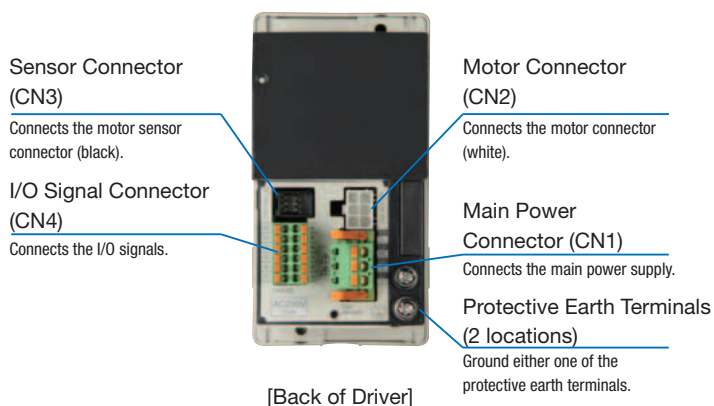
Installation

## Connection and Operation [200 W (1/4 HP)]

### Names and Functions of Driver Parts

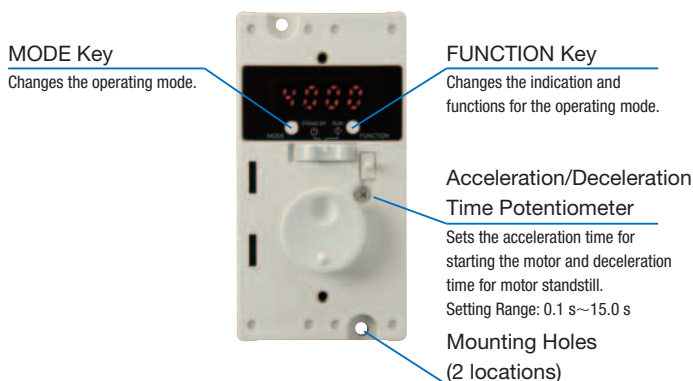


[Front of Driver]



[Back of Driver]

### When Front Panel is Removed



### Extended Functions

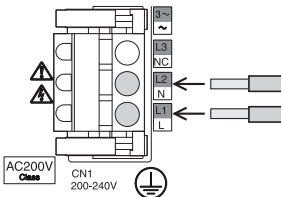
These settings can be made with key operations after removing the front panel.

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

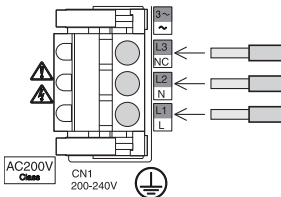
### Main Power Connector (CN1)

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

### 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

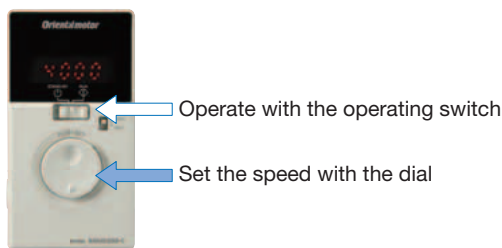
Set the motor speed by using the dial.

Speed Setting Range: 50~4000 r/min

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.



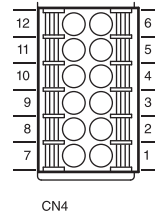
#### Operating Switch



## ● 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.



### ● I/O Signal Connector (CN4)

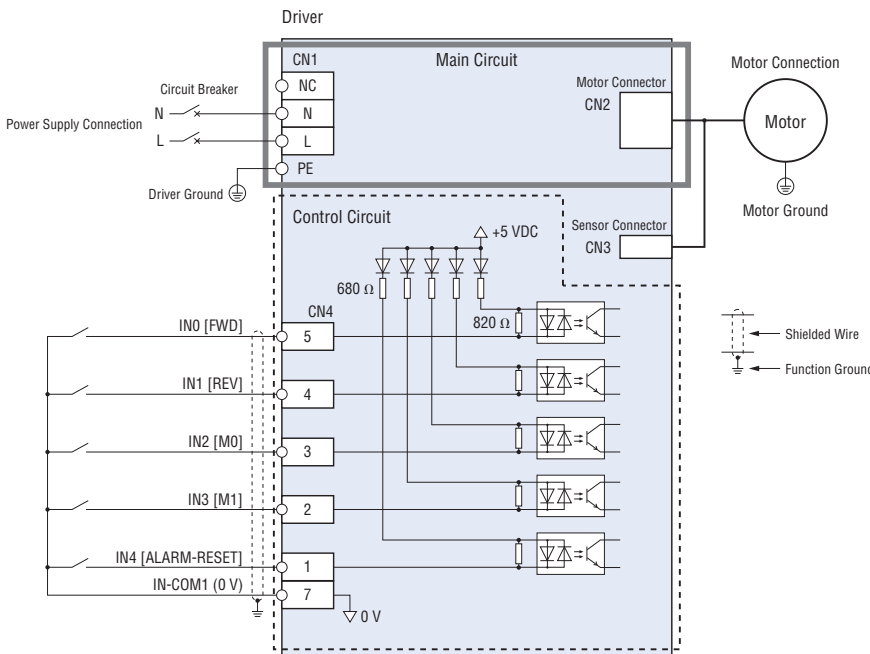
Pin No.	Signal Name	Function*	Description
1	IN4	[ALARM-RESET]	Alarms are canceled.
2	IN3	[M1]	Selects the operating data.
3	IN2	[M0]	
4	IN1	[REV]	The motor rotates in the reverse direction when "ON."
5	IN0	[FWD]	The motor rotates in the forward direction when "ON."
6	IN-COM0	IN-COM0	Input Signal Common (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

\*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)

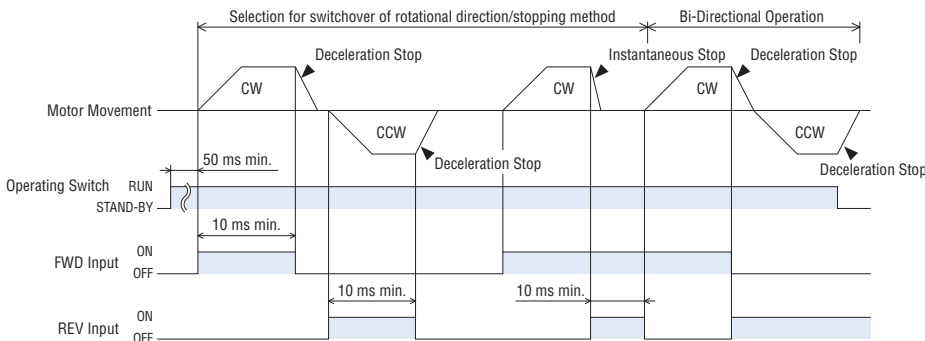
### ◇ Connection Example Using Switches and Relays

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.

Overview, Product Series

Brushless Motors

AC Input BMU

AC Input BLE

AC Input BLF

AC Input BXII

DC Input BLH

AC Speed Control Motors

DSC

BHF

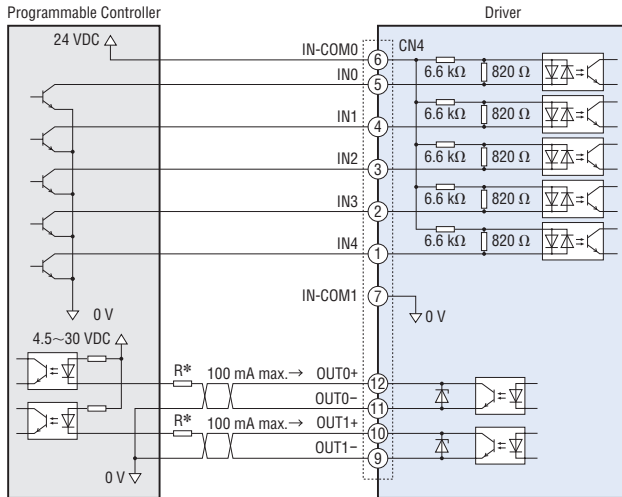
Accessories

Installation

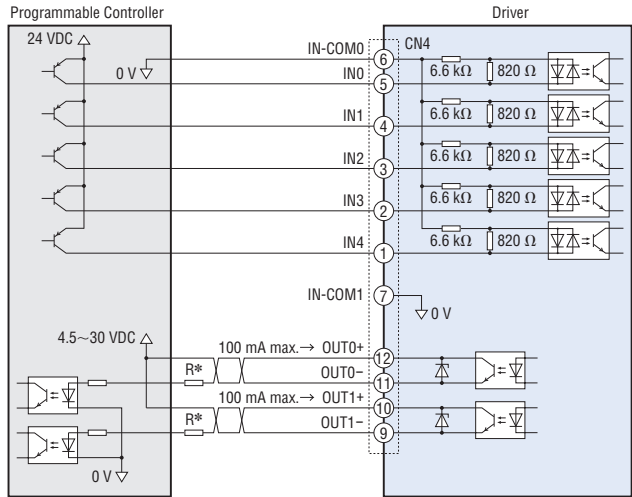
◇ I/O Signal and Programmable Controller Connection Examples

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

● Sink Logic



● Source Logic



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

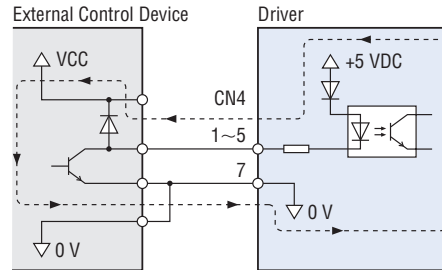
**Note**

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.

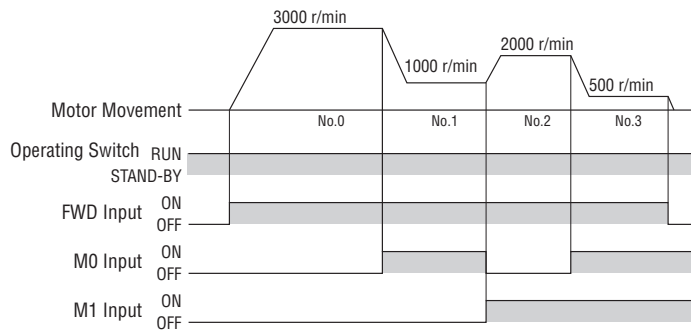


◇ When Multistep Speed-Change Operation is Used

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





Overview,  
Product  
Series

Brushless  
Motors

**AC Input  
BMU**

**AC Input  
BLE**

**AC Input  
BLF**

**AC Input  
BXII**

**DC Input  
BLH**

AC Speed  
Control  
Motors

**DSC**

**BHF**

Accessories

Installation