

Brushless Motor and Driver Packages

BMU Series

200 W Output Type

A high power 200 W model of the well known **BMU** Series of "dial and press" brushless motor and driver packages. Thanks to the compact, high power, high efficiency brushless motor, the speed control range has expanded.



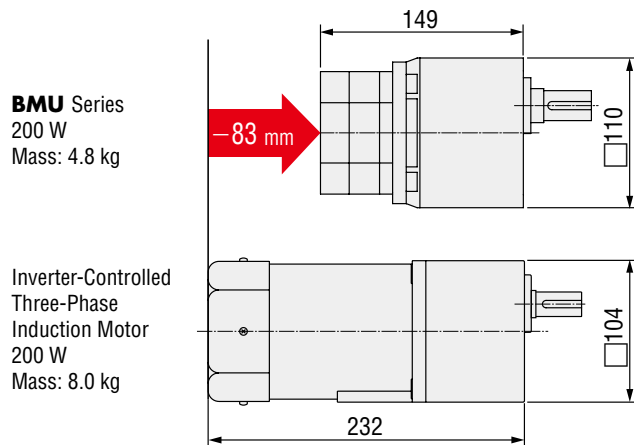
The **BMU** is the new brushless motor from Oriental Motor. All of the structures have been renewed, with a focus on maximizing the performance demanded of a motor. This series has achieved unprecedented compactness, high power and high efficiency.

Features

Designed to be Compact, High Power and High Efficiency

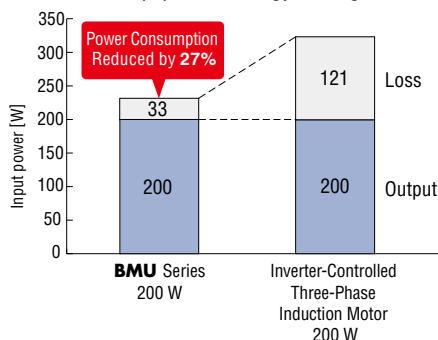
Contributes to Downsizing of Equipment.

When compared to a 200 W three-phase induction motor, the overall length is 83 mm (approximately 36%) shorter, and the motor mass is 3.2 kg (40%) lighter. The slimmer, reduced-weight high power motor contributes to the downsizing of the equipment.



Contributes to Equipment Energy Savings

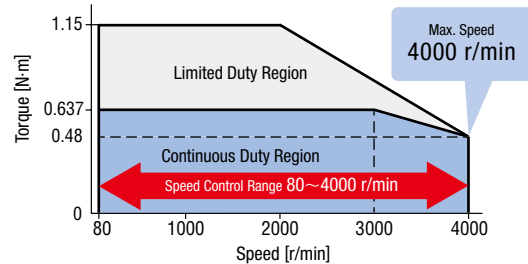
When compared to a 200 W three-phase induction motor, the power consumption is reduced by approximately 27%. These motors are effective in equipment energy savings.



● Rated output power at 50 Hz (Representative value)

Wide Speed Control Range (Speed ratio 1:50)

Max. Speed 4000 r/min
Speed Ratio 1:50



Additional Functions

- Front Panel Operation Can Be Disabled
When being operated by external signal, the front panel operation switches can be disabled.
- The Number of I/O Input Signals Increased From 3 to 5.
In response to our customers' requests, it is now possible to change rotation direction when operating at speed 4 and clear alarms without turning the main power supply off.

BMU Series Lineup

Output Power		30 W	60 W	120 W	200 W
Frame Size	Combination Type	□60 mm	□80 mm	□90 mm	□110 mm
	Round Shaft Type		□60 mm		□90 mm
Degree of Motor Protection		Standard Type (IP20 Spec.) IP65 Spec.			
Power Supply Voltage	Single-Phase 100-120 VAC	●	●	●	—
	Single-phase 200-240 V / Three-phase 200-240 V	●	●	●	NEW

Product Number Code

BMU 6 200 S C P - 10 - 1

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①	Series	BMU: BMU Series
②	Frame Size	5: 90 mm 6: 104 mm (Gearhead section is 110 mm)
③	Output Power (W)	200: 200 W
④	Identifying Product Number	S
⑤	Power Supply Voltage	C: Single-Phase, Three-Phase 200-240 VAC
⑥	Degree of Motor Protection	None: Standard type (IP40 Spec.) P: IP65 Spec.
⑦	Gear Ratio and Motor Shaft Configuration	Number: Gear ratio for combination types A: Round shaft type AC: Round shaft type (with shaft flat)
⑧	Connection Cable Length (Included)	Number: Length of the included connection cable -1: 1 m -2: 2 m -3: 3 m None: Connection cable not included

- Examples of product names that indicate connection cable availability and length
3 m connection cable included → **BMU6200SCP-10-3**
Connection cable not included → **BMU6200SCP-10**

Product Line

Combination Type	This type comes with the motor and its special gearhead pre-assembled. This simplifies the process of installing it onto a device. Motors and gearheads can also be purchased separately so that motor and gearhead combinations can be changed, or if spare gearheads are required.
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- Connection cable included: Price includes a motor, gearhead, driver, and connection cable (1 m, 2 m, or 3 m).
- Connection cable not included: Price includes a motor, gearhead, and a driver.

Combination Type with Parallel Shaft Gearhead

Specifications	Product Name	Gear Ratio
Standard Type (IP20 Spec.)	BMU6200SC -□◇	5, 10, 15, 20
		30, 50
		100, 200
IP65 Spec.	BMU6200SCP -□◇	5, 10, 15, 20
		30, 50
		100, 200

Round Shaft Type

Specifications	Product Name
Standard Type (IP20 Spec.)	BMU5200C -A◇
IP65 Spec.	BMU5200CP -A◇

The following items are included in each product.
 Motor, driver, gearhead*1, connection cable*2, CN1 connector, CN4 connector, installation screws*1, machine key*1, operating manual, startup guide
 *1 Combination type only.
 *2 Only for types that include a connection cable.

Other Product Lineup

Round Shaft Type Shaft Flat on Output Shaft
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- For details about products with a shaft flat on the output shaft, check the Oriental Motor website or contact an Oriental Motor sales office.
<http://www.orientalmotor.eu>

Specifications



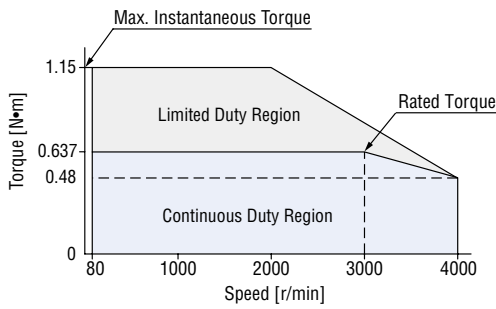
Product Name	Combination Type with Parallel Shaft Gearhead	
	Round Shaft Type	BMU6200SC -□◇ BMU5200C -A◇
Rated Output Power (Continuous)	W	200
Rated Speed	r/min	3000
Rated Torque	N·m	0.637
Max. Instantaneous Torque	N·m	1.15
Rotor Inertia	J: x10 ⁻⁴ kg·m ²	0.454
Round Shaft Type's Permissible Inertia	J: x10 ⁻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 temperature
	Voltage	±0.2% or less: Conditions Rated voltage -15~+10%, rated speed, no load, normal temperature
	Temperature	±0.2% or less: Conditions Operating ambient temperature from 0~+40°C, rated speed, no load, rated voltage
Power-Supply Input	Rated Voltage	V Single-Phase 200-240 VAC/Three-Phase 200-240 VAC
	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	

- These specifications and characteristics are values for the motor only. The speed – torque characteristic values are when operating at the rated voltage.
- A number indicating the gear ratio is specified in the box □ in the product name.
If the product has the IP65 specification degree of motor protection, **P** is entered in the □ in the product name.
For products that include a connection cables a number indicating the length of the cable, **-1** (1 m), **-2** (2 m), **-3** (3 m), is specified in the box ◇ in 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.



● These characteristics are values for the motor only. The speed – torque characteristic values are when operating at the rated voltage.

Permissible Torque on Combination Types

Combination Type with a Parallel Shaft Gearhead

Unit: N·m

Product Name	Motor Shaft Speed \ Gear Ratio	5	10	15	20	30	50	100	200
		BMU6200S	80~3000 r/min	2.9	5.7	8.6	11.5	16.4	27.4
	At 4000 r/min	2.2	4.3	6.5	8.6	12.4	20.6	38.9	63

● A colored indicates gear shaft rotation in the same direction as the motor shaft. Other models rotate in the opposite direction.

Combination Type Output Shaft Speed

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
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 and Permissible Axial Load

Combination Type with Parallel Shaft Gearhead

Product Name	Gear Ratio	Permissible Radial Load		Permissible Axial Load N	
		10 mm from the end of the output shaft N	20 mm from the end of the output shaft N		
BMU6200S	5, 10, 15, 20	At 80~3000 r/min	550	800	200
		At 4000 r/min	500	700	
	30, 50	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	

Round Shaft Type

Product Name	Permissible Radial Load		Permissible Axial Load
	10 mm from the end of the output shaft N	20 mm from the end of the output shaft N	
BMU5200	150	170	Half of motor mass max.

Permissible Inertia J of Combination Types

Combination Type with Parallel Shaft Gearhead

Unit: $\times 10^{-4}$ kg·m²

Product Name	Gear Ratio	5	10	15	20	30	50	100	200
		BMU6200S		100	460	1000	1700	3900	9300
	When instantaneous stop or instantaneous bi-directional operation is performed*	37.5	150	338	600	1350	3750	3750	3750

*Applicable even when the deceleration time is set to less than 0.1 second in the digital setting.

Common Specifications

Item	Specifications
Speed Setting Methods	Digital setting by dial 4 speed settings are possible
Acceleration and Deceleration Time	Analog Setting: 0.1~15.0 seconds (The setting time is from a stopped state to the rated speed) The acceleration and deceleration time are set to the same value using the acceleration and deceleration time potentiometer.* Digital setting: 0.0~15.0 seconds (The setting time is from the current speed to the rated speed) The acceleration time and deceleration time can be set separately for each operating data.* *The motor acceleration time and deceleration time will vary according to the load conditions.
Input Signals	Photocoupler Input Input Resistance 6.6 kΩ Operated by Internal Power Supply: 5 VDC Connectable External DC Power Supply: 24 VDC -15~+20% Current 100 mA or more. Sink Input/Source Input Supports External Wiring Arbitrary signal assignment to IN0~IN4 input (5 points) is possible []: Initial Setting [FWD], [REV], [MO], [M1], [ALARM-RESET], EXT-ERROR, H-FREE
Output Signal	Photocoupler and Open-Collector Output External Power Supply: 4.5~30 VDC 100 mA or less Sink Output/Source Output supports external wiring Arbitrary signal assignment to OUT0, OUT1 (2 points) is possible []: Initial setting [ALARM-OUT1], [SPEED-OUT], ALARM-OUT2, MOVE, VA, WNG
Protective Function	When the following protective functions are activated, the output from ALARM-OUT1 will turn off and the motor will perform a coasting stop. An alarm code will be displayed at the same time. (Instantaneous stop will only occur when an external stop is applied) Overcurrent, main circuit overcurrent, overvoltage, undervoltage, sensor error, overload, overspeed, EEPROM error, sensor error during initialization, operation stop during initialization, external stop
Max. Extension Distance	Motor and Driver Distance: 10.5 m (when an accessory connection cable is used)
Time Rating	Continuous

● About the Overload Alarm Detection Timing

If motor use exceeds the continuous duty region, an overload alarm will occur.
The detection time for the overload alarm can be set arbitrarily between 0.1~60.0 seconds.
(Factory setting: 30.0 seconds)
However, an alarm will be generated within 5 seconds in the following cases:
· When a load exceeding the limited duty region is applied
· When 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.	The measured value is 100 MΩ or more when a 500 VDC megger is applied between the power supply terminal and the protective earth terminal and between the power supply terminal and the signal I/O terminal after continuous operation under normal ambient temperature and humidity.
Dielectric Voltage	Sufficient to withstand 1.5 kVAC at 50 Hz applied between the windings and the case for 1 minute after continuous operation under normal ambient temperature and humidity.	Sufficient to withstand the application of 1.5 kVAC at 50 Hz between the power supply terminal and the protective earth terminal for 1 minute, and with application of 1.5 kVAC at 50 Hz between the power supply terminal and the signal I/O terminal for 1 minute after continuous operation under normal ambient temperature and humidity.
Temperature Rise	Temperature rise of the windings is 50°C max. and that of the case is 40°C max. *1 when measured by the thermocouple method after rated continuous operation under normal ambient temperature and humidity.	Temperature rise of the heat sink is 50°C or less when measured by the thermocouple method after rated continuous operation under normal ambient temperature and humidity.
Operating Environment	Ambient Temperature	0~40°C (Non-freezing)
	Ambient Humidity	85% max. (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	Must not be subjected to continuous vibration or excessive shock. Conforms to JIS C 60068-2-6, "Sine-wave vibration test method" Frequency range: 10~55 Hz Half amplitude: 0.15 mm Sweep direction: 3 directions (X, Y, Z) Number of sweeps: 20 times	
Storage Conditions*2	Ambient Temperature	-20~70°C (Non-freezing)
	Ambient Humidity	85% max. (Non-condensing)
	Altitude	Up to 3000 m above sea level
Heat-Resistant Class	EN Standard: 120 (E)	—
Degree of Protection	Standard type: IP20 IP65 Specification: IP65 (Excluding the installation surface of the round shaft type and connectors)	IP20

*1 For round shaft types, install on a heat sink (material: aluminum) of one of the following sizes to maintain a motor case surface temperature of 90°C or less.
200 W Type: 200×200 mm, 5 mm thick

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

Note

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

■ Dimensions (Unit = mm)

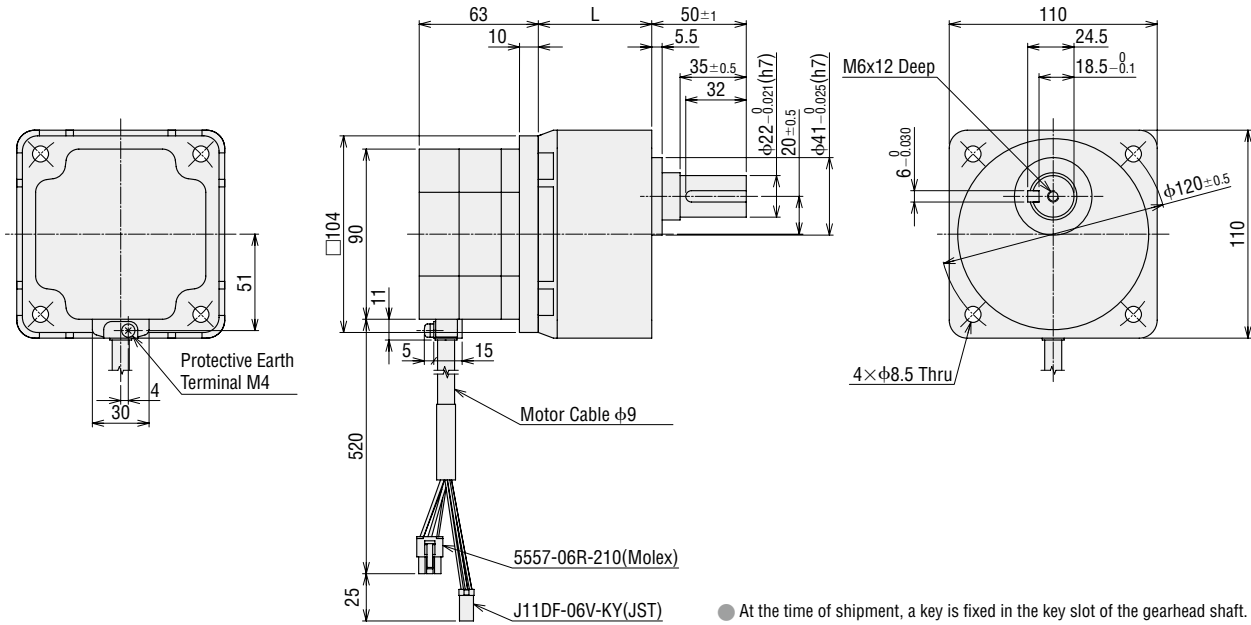
● A number indicating the gear ratio is specified in the box □ in the product name.

A **P** is entered in the ■ in the product name for those products with the IP65 specification degree of motor protection.

For products that include a connection cable, a number indicating the length of the cable, **-1** (1 m), **-2** (2 m), **-3** (3 m), is specified in the box ◇ in the product name.

● Motor/Parallel Shaft Gearhead

Product Name	Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass kg
BMU6200SC ■-□◇	BLM6200S■-GFV	GFV6G□	5~20	60	4.8
			30, 50	72	
			100, 200	86	

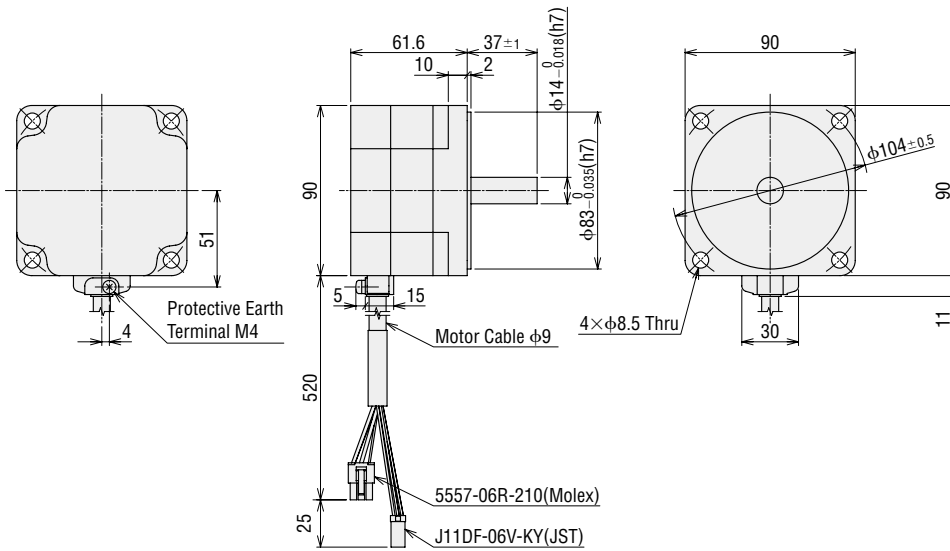


● Round Shaft Type

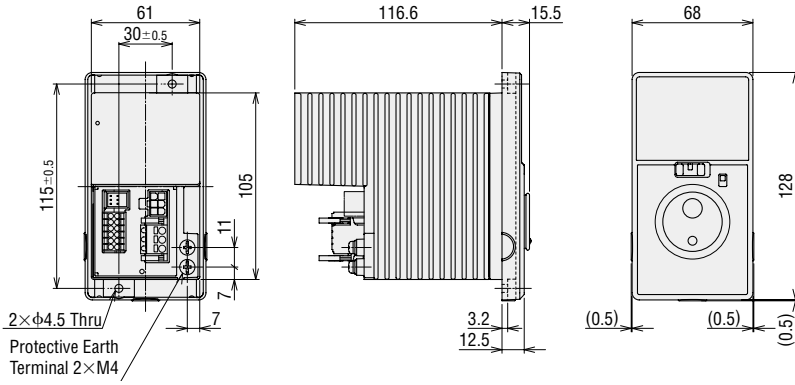
BMU5200C■-A◇

Motor: BLM5200■-A

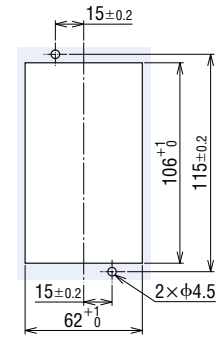
Mass: 1.7 kg



● **Driver**
 BMUD200-C
 Mass: 0.8 kg

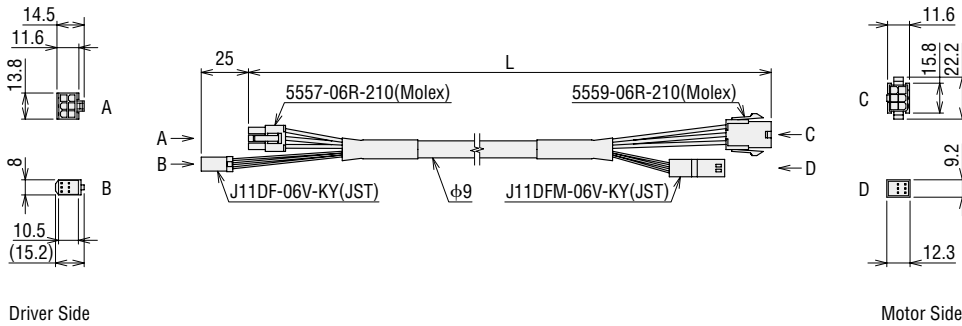


◇ **Driver Panel Cut-Out Dimensions**



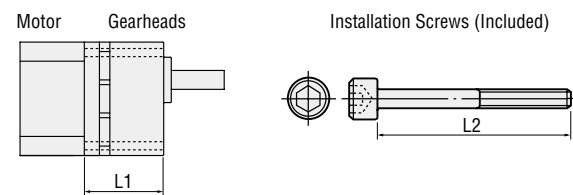
● **Connection Cable (Included)**
 Only for types that include a connection cable

Cable Type	Length L (m)
1 m	1
2 m	2
3 m	3



■ **Dimension of Mounting Screws**

● **Combination Type with Parallel Shaft Gearhead**

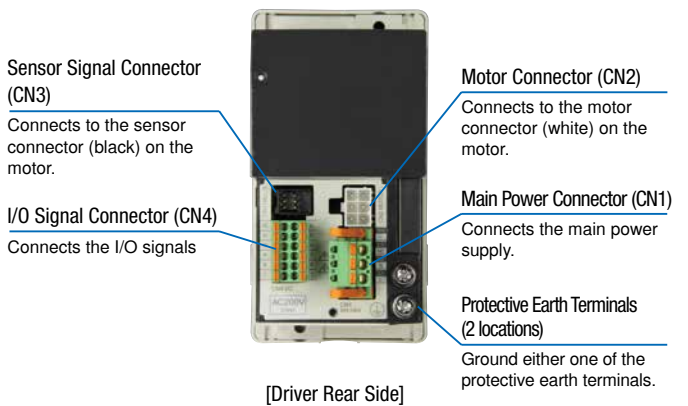
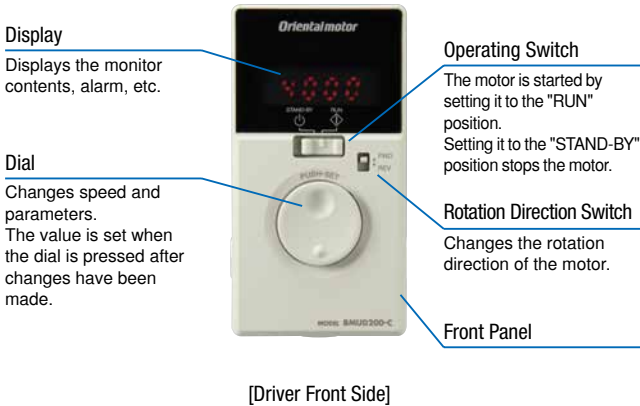


Gearhead Product Name	L1		L2	
	Length (mm)	Length (mm)	Length (mm)	Screw Size
GFV6G5~20	70	85	M8 P1.25	
GFV6G30~50	82	100		
GFV6G100~200	96	110		

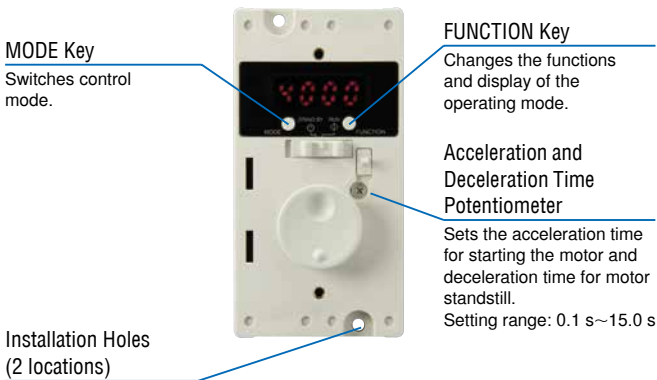
- Installation Screws: Plain washer, spring washer included (4 each)
- The installation screw material is stainless steel.

Connection and Operation

Names and Functions of Driver Parts



When Front Panel is Removed



Extended Functions

Various settings can be made by operating the keys after removing the front panel.

Operation Mode	Details
Monitoring	Speed, load factor, operating data number, alarm, warnings, I/O monitor
Data	4 points of data Speed, acceleration time, deceleration time, reset
Parameters	Gear ratio, speed increasing ratio, initial panel display, initial operation inhibition alarm, analog acceleration/deceleration, upper limit and lower limit setting function for speed, simplified holding selection, external operating signal input, input function selection, output function selection, overload alarm detection time except during axial lock, overload warning level, speed attainment width, parameter mode reset

Main Power Connector (CN1)

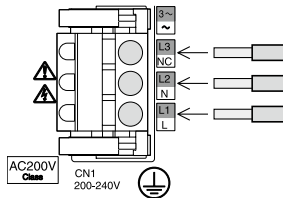
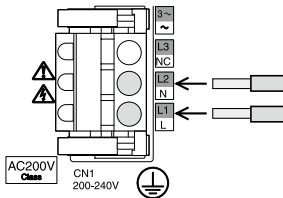
Connects the main power supply. Connect a power supply that matches the power supply voltage to be used.

Single-Phase 200-240 VAC

Three-Phase 200-240 VAC

Applicable Lead Wire Size

AWG18~14 (0.75~2.0 mm²)



Operating with Driver Only

Running and Stopping

When the operating switch is set to the "RUN" position, the motor will start.

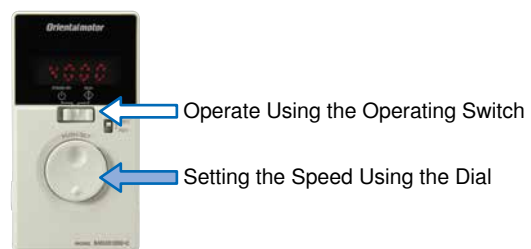
When it is returned to "STAND-BY," the motor will decelerate to a stop.

Speed Setting Method

Set the motor speed by using the dial.

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 decelerates by 1 r/min increments. Turning the dial quickly produces a larger speed variation. Pressing the dial sets the speed.



Operation Switch



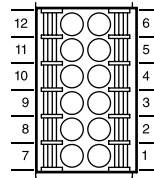
● Operation by External Signals

◇ 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 chart below.
- When operating using external signals, change the "external operation input signal" parameter. For more details, refer to the operating manual.
- Multistep speed change operations involving up to 4 steps are possible.

● I/O Signal Connector (CN4)

Pin No.	Signal Name	Function*	Description
1	IN4	[ALARM-RESET]	Alarms are reset.
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 (for external power supply)
7	IN-COM1	IN-COM1	Input signal common (for external power supply: 0 V)
8	N.C.	N.C.	No connection.
9	OUT1-	[ALARM-OUT1]	Turns OFF when an alarm activates. (Normally closed)
10	OUT1+		
11	OUT0-	[SPEED-OUT]	30 pulses are output with each rotation of the motor output shaft.
12	OUT0+		



CN4

- Applicable Lead Wire Size
AWG24~18 (0.2~0.75 mm²)

*Text inside the [] represents the factory default function assignment.

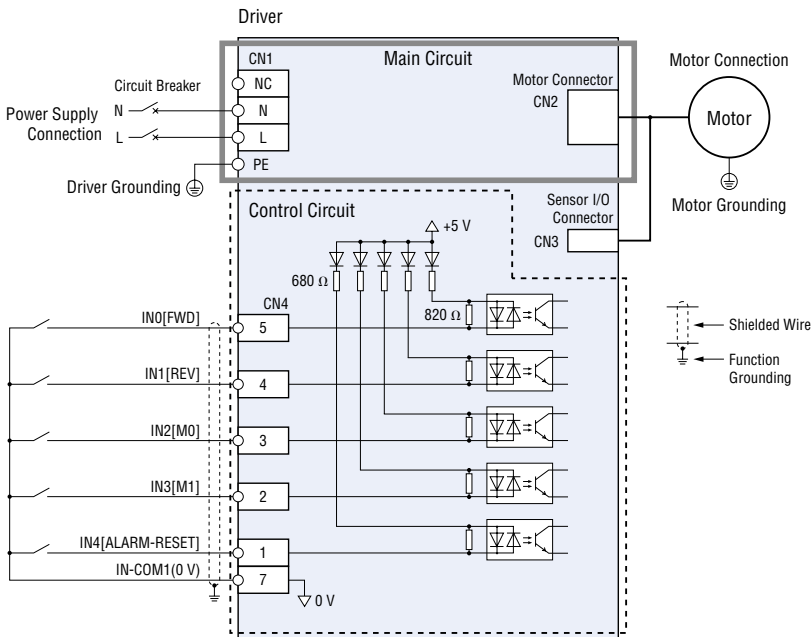
The following signals can be assigned as necessary to 5 input signal terminals (IN0~IN4) and 2 output signal terminals (OUT0, OUT1).

5 out of the 7 possible input signals (FWD, REV, M0, M1, ALARM-RESET, EXT-ERROR, H-FREE)

2 out of the 6 possible output signals (ALARM-OUT1, SPEED-OUT, ALARM-OUT2, MOVE, VA, WNG)

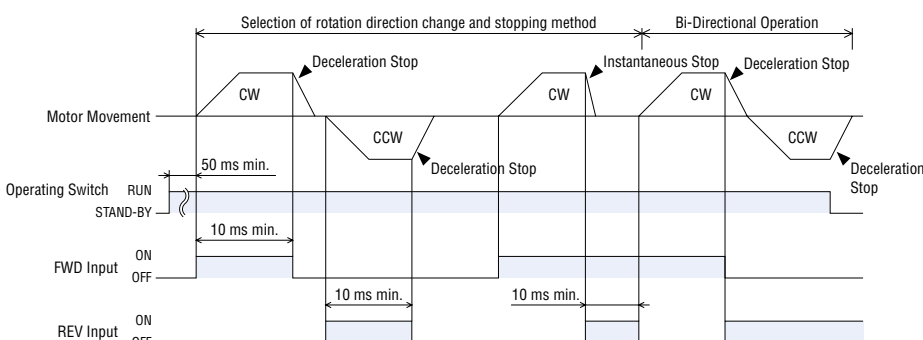
◇ Connection Example using Switches and Relays

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

In this case, the "External Operation Signal Input" parameter is "ON" and the rotation direction switch is "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. The motor will perform a deceleration stop when it is switched to OFF.

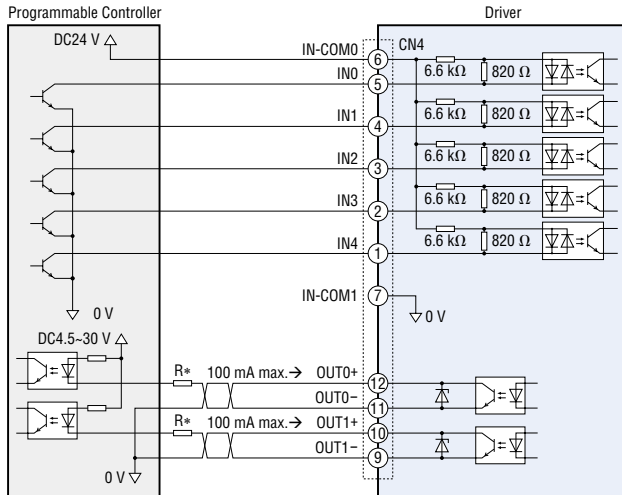
- If the FWD input and REV input are turned ON simultaneously, the motor will stop instantaneously.

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

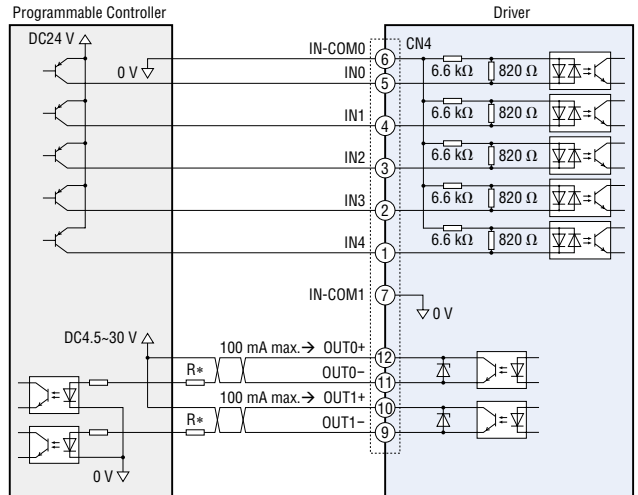
◇ I/O Signal and Programmable Controller Connection Examples

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

● Sink Logic



● Source Logic



*Recommended Resistance Value

24 VDC: 680 Ω~2.7 kΩ (2 W)

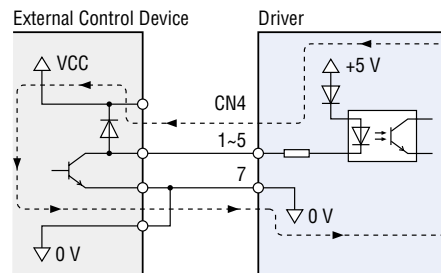
5 VDC: 150 Ω~560 Ω (0.5 W)

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, and the motor may turn. Because the current capacity between the driver and external control device is different, the motor may also rotate when their power supplies are turned ON/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.

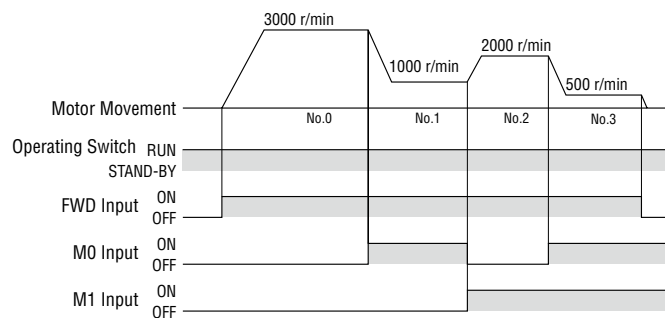


◇ When a Multistep Speed-Change Operation is Used

By turning the M0 and M1 inputs ON or OFF, multistep speed-change operations are possible.

● Examples of Operating Conditions

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



Motor and Driver Combinations

● Combination Type with Parallel Shaft Gearhead

Output	Power Supply Voltage	Product Name	Combination Type Motor Product Name*	Motor Product Name	Gearhead Product Name	Driver Product Name
200 W	Single-Phase, Three-Phase 200-240 VAC	BMU6200SC ■-□◇	BLM6200S■-□	BLM6200S■-GFV	GFV6G□	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 Supply Voltage	Product Name	Motor Product Name	Driver Product Name
200 W	Single-Phase, Three-Phase 200-240 VAC	BMU5200C ■-A◇	BLM5200■-A	BMUD200-C

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

If the product has the IP65 specification degree of motor protection, **P** is entered in the ■ in the product name.

For products in which a connection cable is included, a number indicating the length of the cable, **-1** (1 m), **-2** (2 m), **-3** (3 m), is specified in the box ◇ in the product name.

Accessories (Sold separately)

Power Supply Cables, Connection Cables, Flexible Connection Cables

These cables are used to connect the motor and the driver and power supply.
 When extending the connection cable or flexible connection cable, ensure that the overall length of the cable is 10.5 m or less (Use a maximum of 2 connection cables).
 Use the flexible connection cable in applications where the cable is bent and flexed repeatedly.

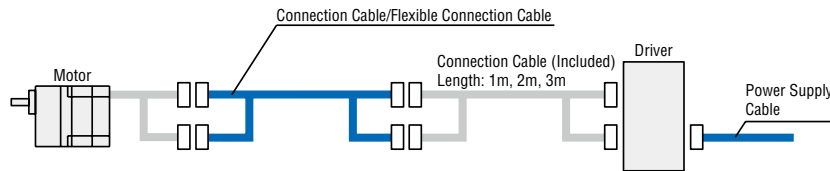


Power Supply Cable



Connection Cable Flexible Connection Cables

Cable System Configuration



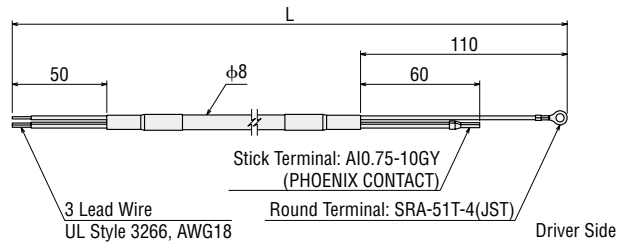
Product Line

Power Supply Cable

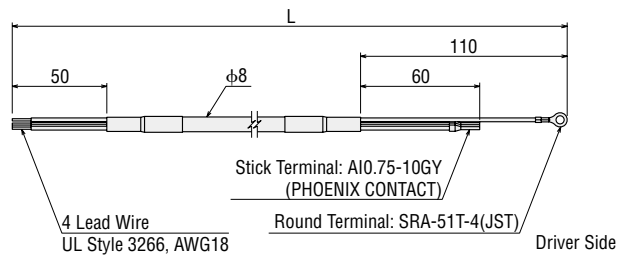
Product Name	Product Line	Power Supply Voltage	Length L (m)
CC01AC03N	No plug	Single-Phase 200-240 VAC	1
CC02AC03N			2
CC03AC03N			3
CC01AC04N		Three-Phase 200-240 VAC	1
CC02AC04N			2
CC03AC04N			3

Dimensions (Unit = mm)

CC01AC03N, CC02AC03N, CC03AC03N



CC01AC04N, CC02AC04N, CC03AC04N



Product Line

Connection Cable

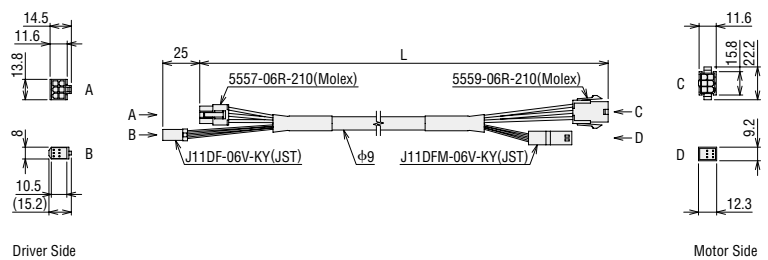
Product Name	Length L (m)
CC01BL2	1
CC02BL2	2
CC03BL2	3
CC05BL2	5
CC07BL2	7
CC10BL2	10

Flexible Connection Cable

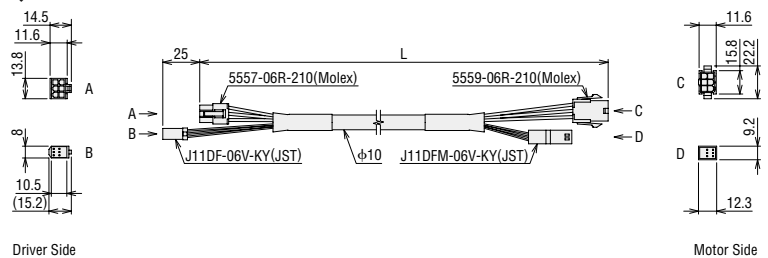
Product Name	Length L (m)
CC01BL2R	1
CC02BL2R	2
CC03BL2R	3
CC05BL2R	5
CC07BL2R	7
CC10BL2R	10

Dimensions (Unit = mm)

Connection Cable



Flexible Connection Cable



Note

The connection cables and flexible connection cables shown here are only for use with 200 W types. Cannot be used on 30 W, 60 W, or 120 W products.

Motor and Gearhead Installation Bracket

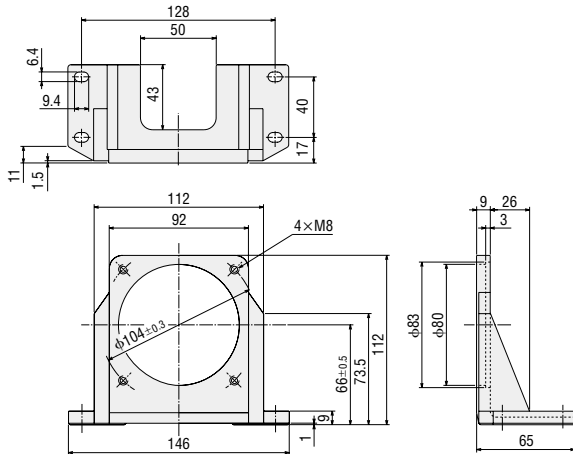
These dedicated installation brackets are for installing motors and gearheads.



Dimensions (Unit = mm)

SOL5M8F

Mass: 280 g

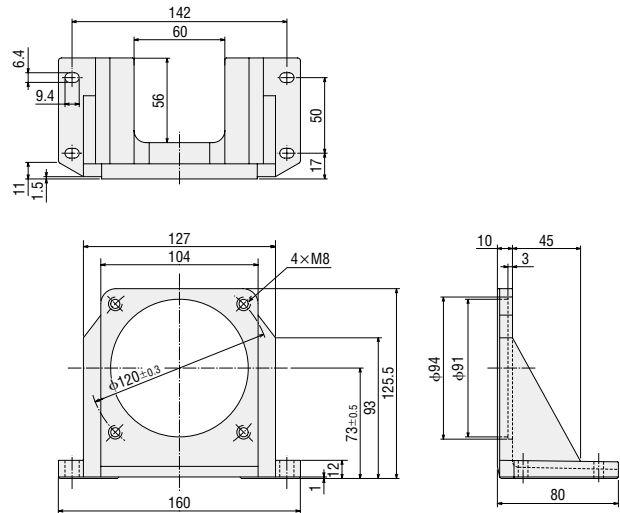


Product Line

Product Name	Applicable Product
SOL5M8F	BMU5200 (Round shaft type)
SOL6M8F	BMU6200 (Combination type)

SOL6M8F

Mass: 430 g



Installation Brackets for Circuit Products

Handy installation brackets are available for installation of drivers. A variety of application-specific installation brackets are available, including DIN rail installation brackets and surface mount installation brackets.

Product Line

Material: SPCC Surface Treatment: Trivalent chromate

Product Name	Application
MADP05-12B	DIN rail installation model
MAFP04-12B	Surface mount model



MADP05-12B



MAFP04-12B



<<Application Example>>

Flexible Coupling

A clamp type coupling for connecting the motor and gearhead shaft with a driven shaft. Couplings that can be used with combination type and round shaft type models are available.



Product Line

Motor		Flexible Coupling	
Type	Shaft Diameter mm	Type	Product Name
BMU6200 (Combination Type)	φ22	MCL65	MCL652022
			MCL652222
			MCL652225
BMU5200 (Round Shaft Type)	φ14	MCL40	MCL401014
			MCL401214
			MCL401414
			MCL401415
			MCL401416



For detailed information about these products, please see the Oriental Motor website.

<http://www.orientalmotor.eu>

● A catalogue is available featuring other products in the **BMU** Series that were not introduced here. For details, check the **Oriental Motor** website or contact the Oriental Motor sales office.
<http://www.orientalmotor.eu>



Brushless Motor and Driver Packages
BMU Series

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

Specifications are subject to change without notice.
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