BLU Series

●Connection Information●
Technical reference ➜ Page G-1
Safety standards ➜ Page H-2

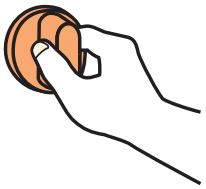
The **BLU** Series combines a brushless motor and a panel-installation type driver, enabling speed control via simple wiring and easy operation.
Choose a parallel gearhead or a hollow shaft flat gearhead that saves installation space in your equipment.

● For detailed product safety standard information including standards, file number and certification body, please visit www.orientalmotor.eu.

Features

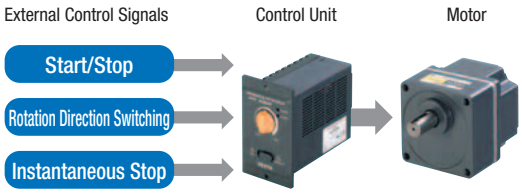
●Easy Connection, Easy Operation

The motor can be connected simply by plugging the connector into the driver. There is no need for troublesome wiring. The motor speed can be set using the potentiometer on the front panel.



●External Control Possible

Start/stop, rotation direction switching and instantaneous stop can be controlled using external signals. You can also switch between sink logic and source logic in accordance with the output type of your controller.



●Speed Control Range

100 to 2000 r/min (speed ratio 1:20)

●IP65 Motor Structure

The motor is protected against water intrusion should water come into contact with the motor.

● The motor must not be washed with water and is not suitable for use in an environment where it constantly comes into contact with water.

●Long Life Gearhead Rating of 10000 Hours*

The rated life of the parallel shaft gearhead and hollow shaft flat gearhead is 10000 hours. The parallel shaft gearhead achieves a rated life of twice as long as that of a conventional gearhead.

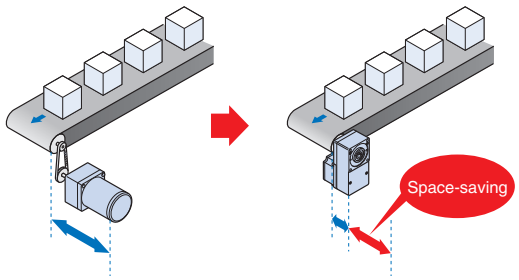
*For the rated life time definition, refer to "Service Life of Gearheads" on page G-35.

● The 40 W and 90 W parallel shaft gearhead has a tapped hole at the shaft end.

●Features of Hollow Shaft Flat Gearhead

◇Space-Saving and Low-Cost

The output shaft can be coupled directly to a driven shaft without using a coupling, which allows you to reduce the size and installation space of your equipment. Since no shaft-coupling parts are needed, the parts cost and labor will also decrease.

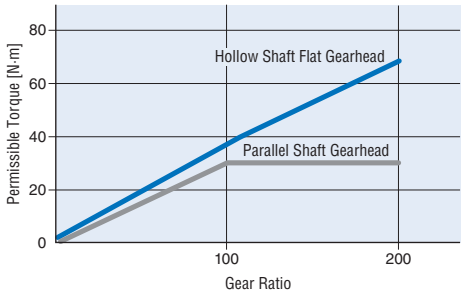


[For Three-Phase Motor and Parallel Shaft Gearhead]

[For Brushless Motor and Hollow Shaft Flat Gearhead]

◇High Permissible Torque

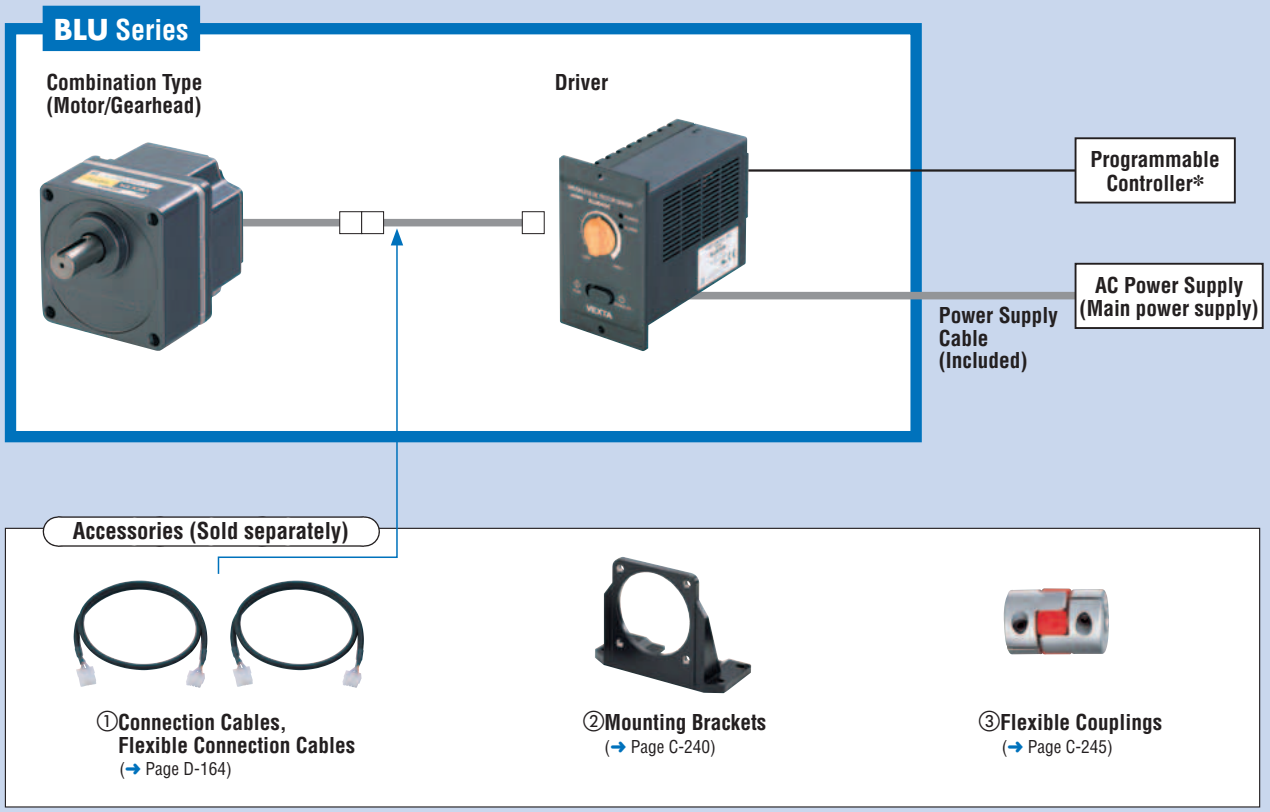
While the permissible torque of the parallel shaft gearhead saturates at high gear ratios, the hollow shaft flat gearhead enables the motor torque to be fully utilized.



[Frame Size 90 mm]

System Configuration

*Not supplied



Number	Name	Overview
①	Connection Cables	Cable for extending the wiring distance between the motor and driver (1～10 m).
	Flexible Connection Cables	Cable offering flexibility, used to extend the wiring distance between the motor and driver (1～10 m).
②	Mounting Brackets	Dedicated mounting bracket for the motor and gearhead.
③	Flexible Couplings	Clamp type coupling for connecting the motor/gearhead shaft with the driven shaft.

●System Configuration Example

BLU Series Combination Type – Parallel Shaft	+	Sold Separately		
		Connection Cable (1 m)	Mounting Bracket	Flexible Coupling
BLU440C-30		CC01AXU	SOL4M6	MCL551515

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

Product Number Code

BLU 4 40 C - 5 FR

① ② ③ ④ ⑤ ⑥

①	Series Name	**BLU**: **BLU** Series
②	Motor Frame Size	**2**: 60 mm **4**: 80 mm **5**: 90 mm
③	Output Power (W)	(Example) **40**: 40 W
④	Power Supply Voltage	**A**: Single-Phase 100-115 VAC **C**: Single-Phase 200-230 VAC **S**: Three-Phase 200-230 VAC
⑤	Gear Ratio, Motor Shaft Type	Number: Gear ratio for combination types: 8 types from **5** to **200** **A**: Round Shaft Type
⑥	Blank: Combination Type – Parallel Shaft Gearhead **FR**: Combination Type – Hollow Shaft Flat Gearhead	

Product Line

Combination Type

This type comes with the motor and its dedicated gearhead pre-assembled. This simplifies installing in equipment. Motors and gearheads are also available separately to facilitate changes in motor and gearhead combinations and if spare gearheads are required.

For the single-phase 100-115 VAC models and three-phase 200-230 VAC models, please contact the nearest Oriental Motor sales office.

●Combination Type – Parallel Shaft Gearhead

Output Power	Power Supply Voltage	Product Name	Gear Ratio
20 W	Single-Phase 100-115 VAC	**BLU220A-□**	**5**, **10**, **15**, **20**, **30**, **50**, **100**, **200**
	Single-Phase 200-230 VAC	**BLU220C-□**	**5**, **10**, **15**, **20**, **30**, **50**, **100**, **200**
	Three-Phase 200-230 VAC	**BLU220S-□**	**5**, **10**, **15**, **20**, **30**, **50**, **100**, **200**
40 W	Single-Phase 100-115 VAC	**BLU440A-□**	**5**, **10**, **15**, **20**, **30**, **50**, **100**, **200**
	Single-Phase 200-230 VAC	**BLU440C-□**	**5**, **10**, **15**, **20**, **30**, **50**, **100**, **200**
	Three-Phase 200-230 VAC	**BLU440S-□**	**5**, **10**, **15**, **20**, **30**, **50**, **100**, **200**
90 W	Single-Phase 100-115 VAC	**BLU590A-□**	**5**, **10**, **15**, **20**, **30**, **50**, **100**, **200**
	Single-Phase 200-230 VAC	**BLU590C-□**	**5**, **10**, **15**, **20**, **30**, **50**, **100**, **200**
	Three-Phase 200-230 VAC	**BLU590S-□**	**5**, **10**, **15**, **20**, **30**, **50**, **100**, **200**

The following items are included in each product.
Motor, Driver, Gearhead, Power Supply Cable, Mounting Screws for Driver, Short Circuit Bar, Mounting Screws, Parallel Key, Operating Manual

●Combination Type – Hollow Shaft Flat Gearhead

Output Power	Power Supply Voltage	Product Name	Gear Ratio
20 W	Single-Phase 100-115 VAC	**BLU220A-□FR**	**5**, **10**, **15**, **20**, **30**, **50**, **100**, **200**
	Single-Phase 200-230 VAC	**BLU220C-□FR**	**5**, **10**, **15**, **20**, **30**, **50**, **100**, **200**
	Three-Phase 200-230 VAC	**BLU220S-□FR**	**5**, **10**, **15**, **20**, **30**, **50**, **100**, **200**
40 W	Single-Phase 100-115 VAC	**BLU440A-□FR**	**5**, **10**, **15**, **20**, **30**, **50**, **100**, **200**
	Single-Phase 200-230 VAC	**BLU440C-□FR**	**5**, **10**, **15**, **20**, **30**, **50**, **100**, **200**
	Three-Phase 200-230 VAC	**BLU440S-□FR**	**5**, **10**, **15**, **20**, **30**, **50**, **100**, **200**
90 W	Single-Phase 100-115 VAC	**BLU590A-□FR**	**5**, **10**, **15**, **20**, **30**, **50**, **100**, **200**
	Single-Phase 200-230 VAC	**BLU590C-□FR**	**5**, **10**, **15**, **20**, **30**, **50**, **100**, **200**
	Three-Phase 200-230 VAC	**BLU590S-□FR**	**5**, **10**, **15**, **20**, **30**, **50**, **100**, **200**

The following items are included in each product.
Motor, Driver, Gearhead, Power Supply Cable, Mounting Screws for Driver, Short Circuit Bar, Mounting Screws, Parallel Key, Safety Cover (with screws), Operating Manual

●Round Shaft Type

Output Power	Power Supply Voltage	Product Name
20 W	Single-Phase 100-115 VAC	**BLU220A-A**
	Single-Phase 200-230 VAC	**BLU220C-A**
	Three-Phase 200-230 VAC	**BLU220S-A**
40 W	Single-Phase 100-115 VAC	**BLU440A-A**
	Single-Phase 200-230 VAC	**BLU440C-A**
	Three-Phase 200-230 VAC	**BLU440S-A**
90 W	Single-Phase 100-115 VAC	**BLU590A-A**
	Single-Phase 200-230 VAC	**BLU590C-A**
	Three-Phase 200-230 VAC	**BLU590S-A**

The following items are included in each product.
Motor, Driver, Power Supply Cable, Mounting Screws for Driver, Short Circuit Bar, Operating Manual

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

Specifications

●20 W, 40 W, 90 W RoHS

Product Name			BLU220C-□	BLU440C-□	BLU590C-□
	Combination Type – Parallel Shaft Gearhead		BLU220C-□	BLU440C-□	BLU590C-□
	Combination Type – Hollow Shaft Flat Gearhead		BLU220C-□FR	BLU440C-□FR	BLU590C-□FR
	Round Shaft Type		BLU220C-A	BLU440C-A	BLU590C-A
Rated Output Power (Continuous)		W	20	40	90
Power Supply Input	Rated Voltage	VAC	Single-Phase 200-230		
	Permissible Voltage Range		±10%		
	Rated Frequency	Hz	50/60		
	Permissible Frequency Range		±5%		
	Rated Input Current	A	0.55	0.85	1.45
	Maximum Input Current	A	0.9	1.4	2.4
Rated Torque		N·m	0.1	0.2	0.45
Starting Torque*		N·m	0.12	0.24	0.54
Rated Speed		r/min	2000		
Speed Control Range		r/min	100～2000		
Round Shaft Type Permissible Load Inertia		$J\times10^{-4}$ kg·m^2	1.25	2.5	5.6
Rotor Inertia		$J\times10^{-4}$ kg·m^2	0.087	0.23	0.61
Speed Regulation	Load		±0.5% max.: Conditions 0～rated torque, rated speed, rated voltage, normal temperature		
	Voltage		±0.5% max.: Conditions Rated voltage ±10%, rated speed, no load, normal temperature		
	Temperature		±0.5% max.: Conditions Operating ambient temperature 0～+40˚C, rated speed, no load, rated voltage		

*The starting torque can be used for a maximum duration of approximately five seconds.

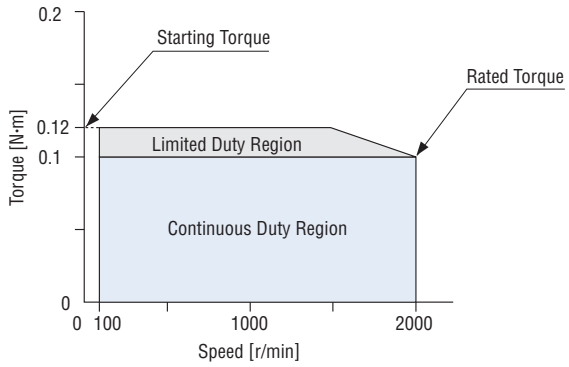
●The values in the table are characteristics for the motor only.

Speed – Torque Characteristics

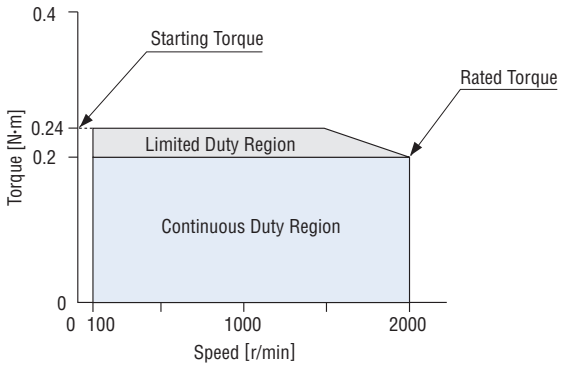
Continuous Duty Region: Continuous operation is possible in this region.

Limited Duty Region: This region is used primarily when accelerating. When a load that exceeds the rated torque is applied continuously for approximately five seconds, overload protection is activated and the motor coasts to a stop.

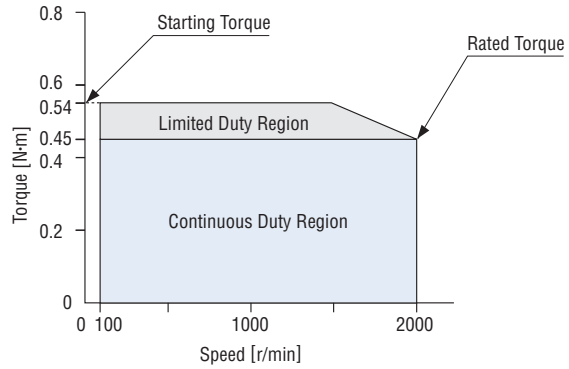
●20W



●40W



●90W



●For combination types, the values are for the motor only.

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

Common Specifications

Item	Specifications
Speed Setting Method	Speed potentiometer on front panel
Acceleration/Deceleration Time	0.5～10 seconds. (at 2000 r/min with no load) (The actual speed may change by load condition.) A common value is set using the acceleration/deceleration time potentiometer provided at the back of the front panel.
Input Signal	Photocoupler input (Reinforced insulation photocoupler) Input resistance 2.4 kΩ Internal power supply voltage 14 VDC ±10% Operated by internal power supply Common to CW input and CCW input Source logic or sink logic ... Switchable using a select switch Factory setting: source logic
Output Signal	Open-collector output (Reinforced insulation photocoupler) Operated by external power supply Use condition 4.5～26.4 VDC, 0.5～10 mA Common to Alarm output and Speed output
Protective Function*	When the following are activated, the motor will coast to a stop and the ALARM output will be OFF. When the overload protective function is activated, the alarm LED on the driver will blink. The alarm LED will illuminate steadily in the event of actuation of any other protective function. ・Overload protection: Activated when the motor load exceeds rated torque for a minimum of 5 seconds. ・Overvoltage protection: Activated when the voltage applied to the driver exceeds 115 VAC or 230 VAC by a minimum of approximately 20%, a gravitational operation is performed or a load exceeding the permissible load inertia is driven. ・Motor sensor error: Activated when the sensor wire inside the motor cable is disconnected during motor operation. ・Undervoltage protection: Activated when the voltage applied to the driver falls below 100 VAC or 200 VAC by a minimum of approximately 30%. ・Overspeed protection: Activated when the motor speed exceeds 2500 r/min.
Maximum Extension Distance	Motor/Driver Distance: 10.5 m (when an accessory connection cable is used)
Timing Rating	Continuous

*With the **BLU** Series, motor speed control cannot be performed in a gravitational operation or other applications where the motor shaft is turned by the load.
When a load exceeding the permissible load inertia is driven or a gravitational operation is performed, the overvoltage protective function will be activated and the motor will coast to a stop.

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 signal I/O 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 1.8 kVAC at 50 Hz applied between the power supply terminal and the protective earth terminal for 1 minute, and 3 kVAC at 50 Hz applied 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		60°C or less in the windings, and 50°C or less in the case*1 as measured by the thermocouple method after continuous operation at normal temperature and humidity.	–
Operating Environment	Ambient Temperature	UL/CSA standards: 0～+40°C (non-freezing) EN standards: 0～+50°C (non-freezing)	0～+40°C (non-freezing)
	Ambient Humidity	85% or less (non-condensing)	
	Altitude	Up to 1000 m above sea level	
	Atmosphere	Use in an area without corrosive gases or dust. Use in special environments with radioactive materials, magnetic fields, or in a vacuum is not possible.	
	Vibration	Use in an area not subject to continuous vibration or excessive shock. Environment should conform with JIS C 60068-2-6 “Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal)” 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	−25～+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		IP65 (Excluding the installation surface of the round shaft type and connectors)	IP10

*1 For round shaft types, attach to a heat sink (Material: aluminum) of one of the following sizes to maintain a motor case surface temperature of 90°C max.
20 W Type: 135×135 mm, 5 mm thick 40 W Type: 165×165 mm, 5 mm thick 90 W Type: 200×200 mm, 5 mm thick
*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.

Gearmotor – Torque Table of Combination Type

Combination Type – Parallel Shaft Gearhead

Unit = N·m

Product Name	Gear Ratio	5	10	15	20	30	50	100	200
	Speed Range [r/min]	20～400	10～200	6.7～133.3	5～100	3.3～66.7	2～40	1～20	0.5～10
BLU220C-□		0.45	0.90	1.4	1.8	2.6	4.3	6	6
BLU440C-□		0.90	1.8	2.7	3.6	5.2	8.6	16	16
BLU590C-□		2.0	4.1	6.1	8.1	11.6	19.4	30	30

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

Combination Type – Hollow Shaft Flat Gearhead

Unit = N·m

Product Name	Gear Ratio	5	10	15	20	30	50	100	200
	Speed Range [r/min]	20～400	10～200	6.7～133.3	5～100	3.3～66.7	2～40	1～20	0.5～10
BLU220C-□FR		0.40	0.85	1.3	1.7	2.6	4.3	8.5	17
BLU440C-□FR		0.85	1.7	2.6	3.4	5.1	8.5	17	34
BLU590C-□FR		1.9	3.8	5.7	7.7	11.5	19.1	38.3	68

● The flat gearhead rotates in the opposite direction to the motor when viewed from the front of the gearhead. It rotates in the same direction as the motor when viewed from the rear (motor installation surface) of the gearhead. Rotation direction of the hollow shaft flat gearhead ➜ Page D-174

Permissible Overhung Load and Permissible Thrust Load

Combination Type – Parallel Shaft Gearhead

Product Name	Gear Ratio	Permissible Overhung Load		Permissible Thrust Load
		10 mm from Shaft End N	20 mm from Shaft End N	N
BLU220C-□	**5**	100	150	40
	10, 15, 20	150	200	
	30, 50, 100, 200	200	300	
BLU440C-□	**5**	200	250	100
	10, 15, 20	300	350	
	30, 50, 100, 200	450	550	
BLU590C-□	**5**	300	400	150
	10, 15, 20	400	500	
	30, 50, 100, 200	500	650	

Combination Type – Hollow Shaft Flat Gearhead

Product Name	Gear Ratio	Permissible Overhung Load		Permissible Thrust Load
		10 mm from Installation Surface of Gearhead N	20 mm from Installation Surface of Gearhead N	N
BLU220C-□FR	**5, 10**	450	370	200
	15, 20, 30, 50, 100, 200	500	400	
BLU440C-□FR	**5, 10**	800	660	400
	15, 20, 30, 50, 100, 200	1200	1000	
BLU590C-□FR	**5, 10**	900	770	500
	15, 20	1300	1110	
	30, 50, 100, 200	1500	1280	

● The permissible overhung load can also be calculated with a formula. Permissible overhung load calculation ➜ Page D-173

Round Shaft Type

Product Name	Permissible Overhung Load		Permissible Thrust Load
	10 mm from Shaft End N	20 mm from Shaft End N	
BLU220C-A	70	100	Half of motor mass max.
BLU440C-A	120	140	
BLU590C-A	160	170	

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

Permissible Load Inertia: J of Combination Type

Combination Type – Parallel Shaft Gearhead

Unit = $\times 10^{-4}$ kg·m^2

Product Name	Gear Ratio	5	10	15	20	30	50	100	200
BLU220C-□		12	50	110	200	370	920	2500	5000
	When instantaneous stop operation is performed	1.55	6.2	14.0	24.8	55.8	155	155	155
BLU440C-□		22	95	220	350	800	2200	6200	12000
	When instantaneous stop operation is performed	5.5	22	49.5	88	198	550	550	550
BLU590C-□		45	190	420	700	1600	4500	12000	25000
	When instantaneous stop operation is performed	25	100	225	400	900	2500	2500	2500

Combination Type – Hollow Shaft Flat Gearhead

Unit = $\times 10^{-4}$ kg·m^2

Product Name	Gear Ratio	5	10	15	20	30	50	100	200
BLU220C-□FR		12	50	110	200	370	920	2500	5000
	When instantaneous stop operation is performed	1.55	6.2	14.0	24.8	55.8	155	155	155
BLU440C-□FR		22	95	220	350	800	2200	6200	12000
	When instantaneous stop operation is performed	5.5	22	49.5	88	198	550	550	550
BLU590C-□FR		45	190	420	700	1600	4500	12000	25000
	When instantaneous stop operation is performed	25	100	225	400	900	2500	2500	2500

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

Dimensions (Unit = mm)

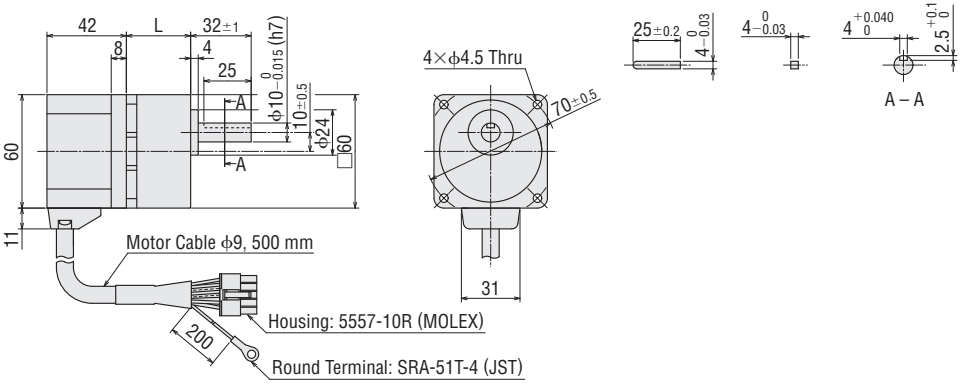
● Mounting screws are included with the combination type. Dimensions for mounting screws ➜ Page D-174
● A number indicating the gear ratio is entered where the box □ is located within the product name.

20 W

◇Motor/Parallel Shaft Gearhead

Product Name	Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass kg
BLU220C-□	BLUM220-GFS	GFS2G□	5~20	34	1.0
			30~100	38	
			200	43	

◇Key and Key Slot (Included)



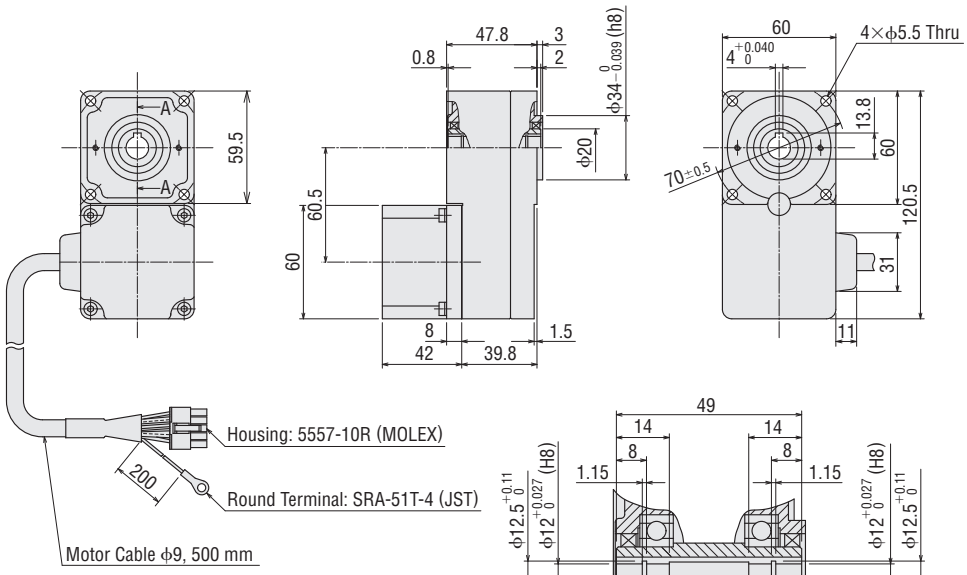
◇Motor/Hollow Shaft Flat Gearhead

BLU220C-□FR

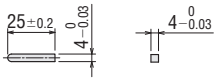
Motor: BLUM220-GFS

Gearhead: GFS2G□FR

Mass: 1.3 kg



◇Key (Included)

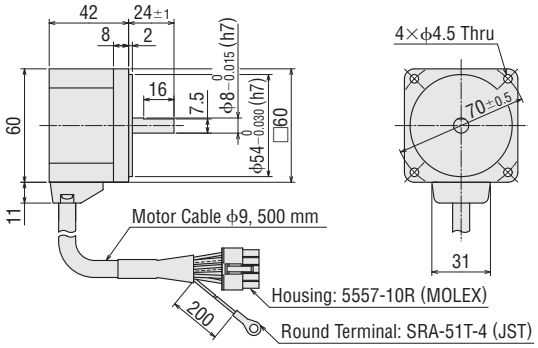


◇Round Shaft Type

BLU220C-A

Motor: BLUM220-A

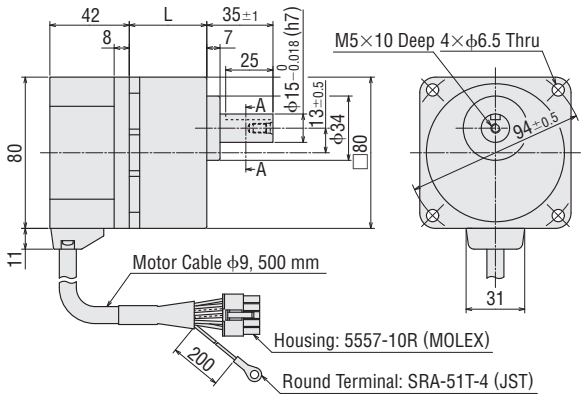
Mass: 0.5 kg



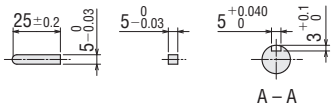
●40 W

◇Motor/Parallel Shaft Gearhead

Product Name	Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass kg
BLU440C-□	BLUM440-GFS	GFS4G□	**5~20**	41	1.8
			30~100	46	
			200	51	



◇Key and Key Slot (Included)



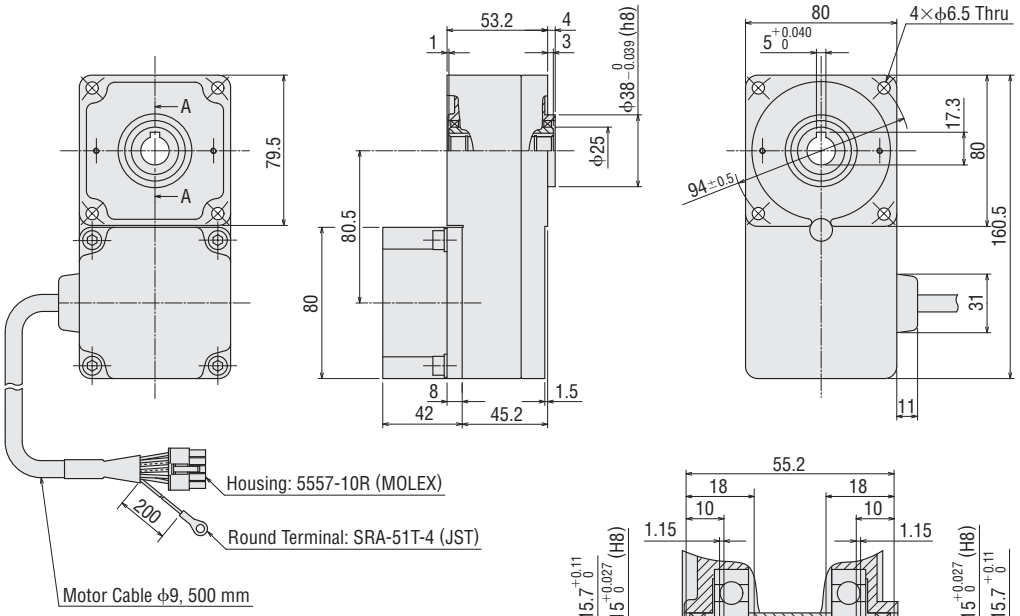
◇Motor/Hollow Shaft Flat Gearhead

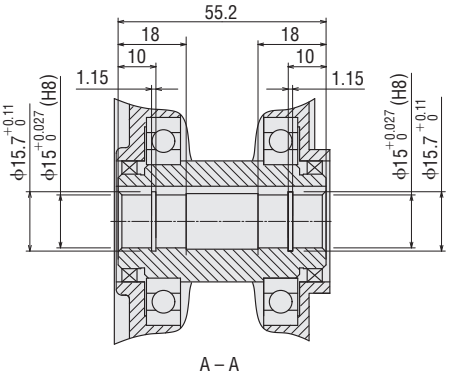
BLU440C-□FR

Motor: BLUM440-GFS

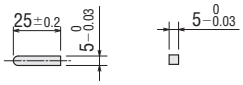
Gearhead: GFS4G□FR

Mass: 2.4 kg





◇Key (Included)

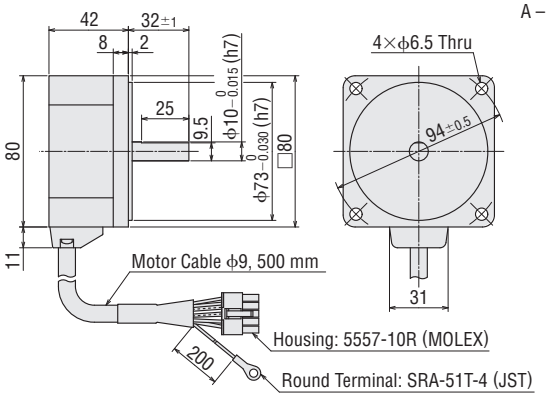


◇Round Shaft Type

BLU440C-A

Motor: BLUM440-A

Mass: 0.8 kg

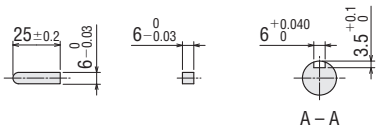


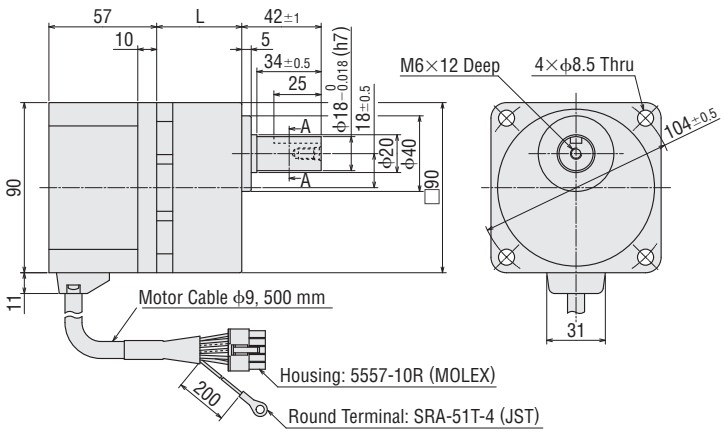
●90 W

◇Motor/Parallel Shaft Gearhead

Product Name	Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass kg
BLU590C-□	BLUM590-GFS	GFS5G□	**5~20**	45	2.9
			30~100	58	
			200	64	

◇Key and Key Slot (Included)

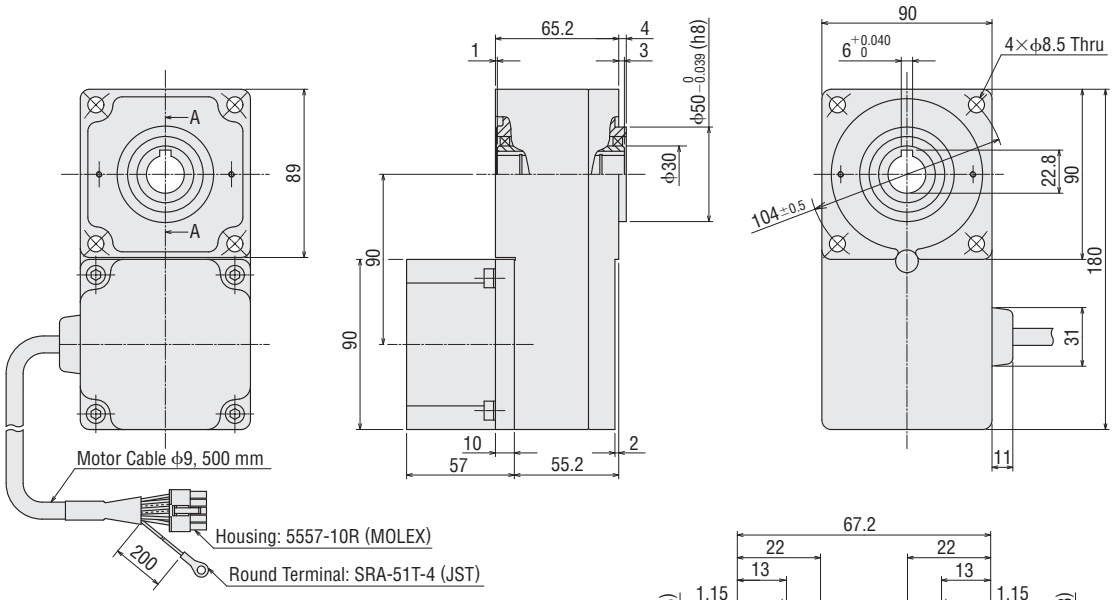




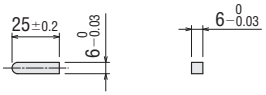
◇Motor/Hollow Shaft Flat Gearhead

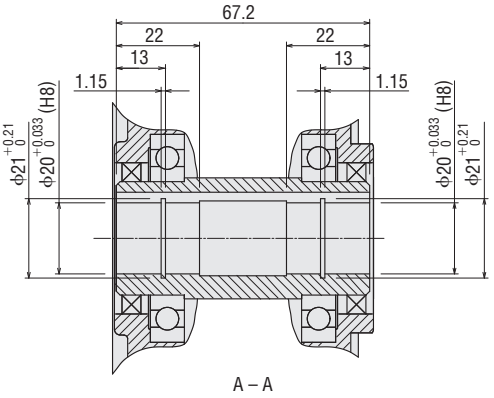
BLU590C-□FR

Motor: BLUM590-GFS
Gearhead: GFS5G□FR
Mass: 3.6 kg



◇Key (Included)



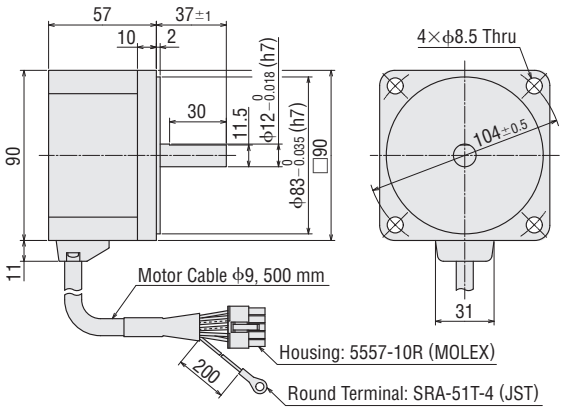


A – A

◇Round Shaft Type

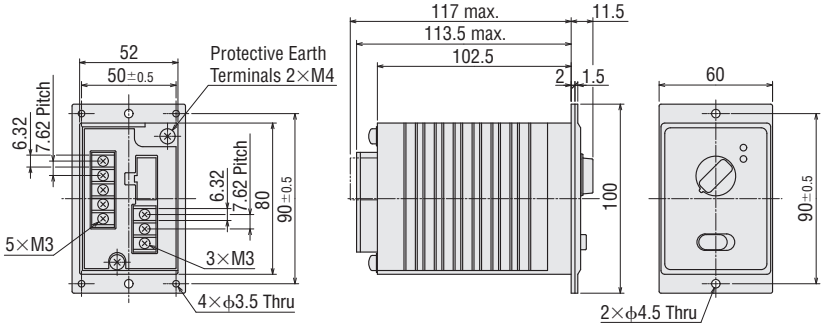
BLU590C-A

Motor: BLUM590-A
Mass: 1.4 kg

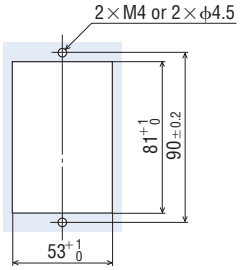


◇Driver (Common to all models)

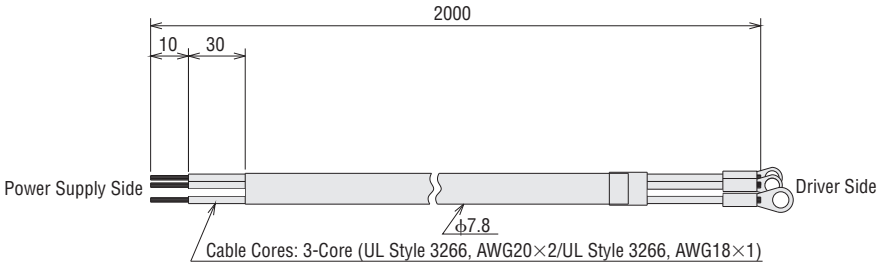
BLUD20C
BLUD40C
BLUD90C
Mass: 0.4 kg



◇Driver Panel Cut-Out

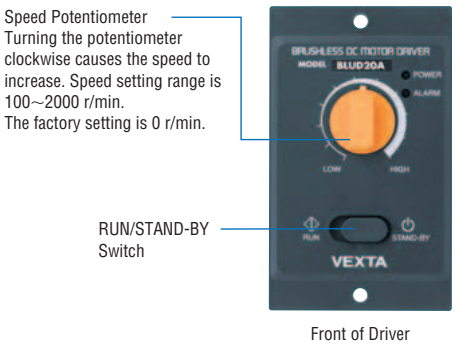


◇Driver Power Supply Cable (Included, common to all models)

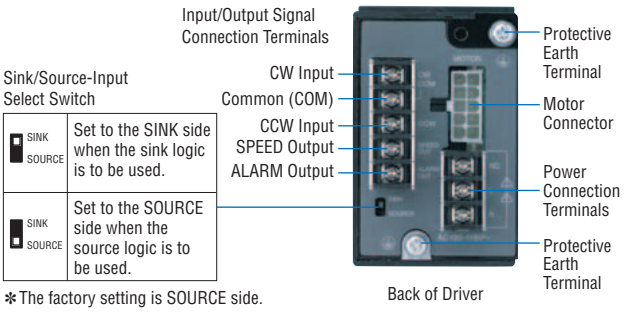


Connection and Operation

Names and Functions of Driver Parts



Front of Driver



✻The factory setting is SOURCE side.

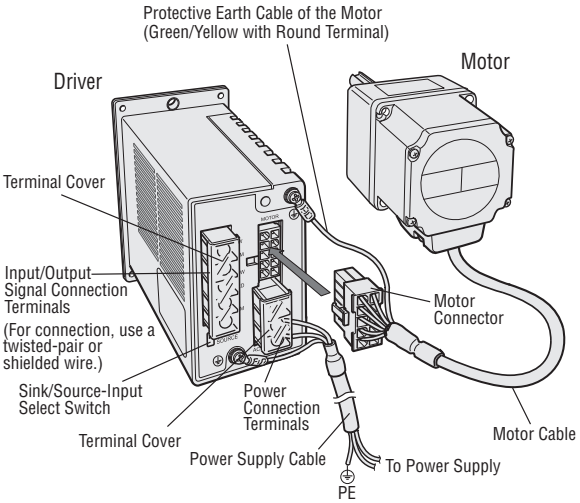
Back of Driver

Note

- The RUN/STAND-BY switch is not a power ON/OFF switch.
- When you want to stop the motor for an extended period, turn OFF the driver power.

Connection Diagrams

Motor and Driver Connection



• Motor Connection

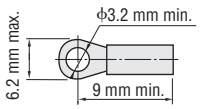
Insert the motor cable connector into the motor connector (MOTOR) on the driver. To extend the distance between the motor and driver, use an accessory dedidcated connection cable. The connection can be extended to a maximum of 10.5 m.

Connect the motor's protective earth cable (green/yellow) to the driver, as shown in the figure. If you are using an connection cable or the motor can be accessed directly by hands, connect the protective earth cable from the motor directly to ground. If the protective earth cable is not long enough, connect a lead wire of AWG18 (0.75 mm^2) or thicker to the protective earth cable of the motor cable and connect it to ground over the shortest distance. The lead wire must be provided by the user. The accessory dedicated connection cable does not come with a protective earth cable. If you are using the accessory dedicated connection cable, provide grounding at a relay point or extend the cable to an appropriate grounding point.

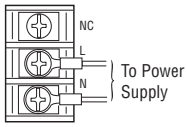
• Power Connection

Connect the included power supply cable to the power connection terminals of the driver. Connect the red and black lead wires to the power connection terminals, and green/yellow lead wire to the protective earth terminal. When the included power supply cable is not used, use a cable of AWG22 (0.3 mm^2) or thicker. For the protective earth cable, use a cable of AWG18 (0.75 mm^2) or thicker.

Recommended Crimp Terminals
Round Terminal with Insulation (M3)



Single-Phase 200-230 VAC

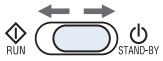


Operation

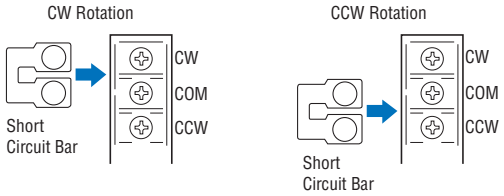
The direction of motor rotation is as viewed from the output shaft end of the motor. "CW" indicates clockwise direction, while "CCW" indicates counterclockwise direction.

• Stand Alone Operation

When the RUN/STAND-BY switch is set to the "RUN" position, the motor will run. When it is set to the "STAND-BY" position, the motor will stop.



The direction of rotation depends on how the short circuit bar at the back of driver is connected. Connect the short circuit bar between the CW and COM or CCW and COM. Do not use the short circuit bar for any other purpose.



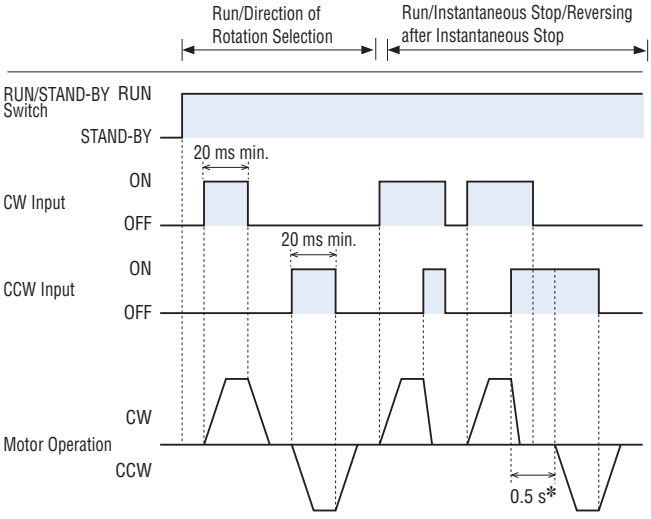
• Operation Using External Signals

Set the RUN/STAND-BY switch to the "RUN" position.

- Refer to "Input circuit connection example" shown on the page D-74 for connection.

Timing Chart

Operation Using External Signals



✻Motor does not run for 0.5 s after instantaneous stop, if a reversing run signal is input.

Note

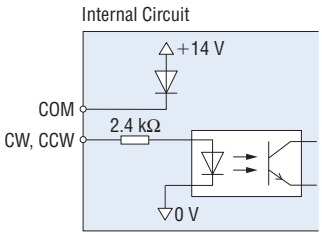
- The CW and CCW input signals must be ON for at least 20 ms.
- When both the CW and CCW inputs are turned ON, the motor stops instantaneously.

●I/O Signal Circuits

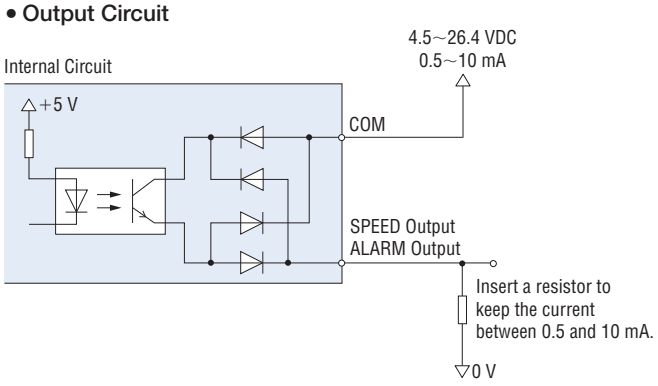
The factory setting is the source logic. Select the sink logic or source logic according to the external control device you will be using.

◇Source Logic

• Input Circuit

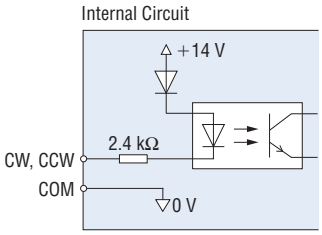


• Output Circuit

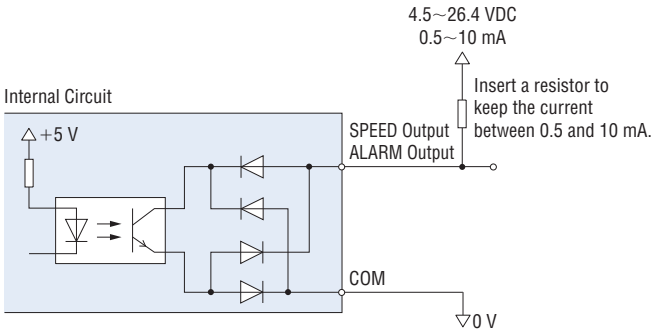


◇Sink Logic

• Input Circuit



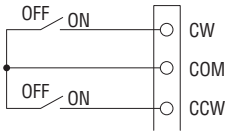
• Output Circuit



◇Input Circuit Connection Example

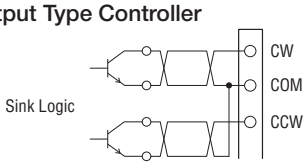
Set the RUN/STAND-BY switch to the "RUN" position.

• Small-Capacity Switch and Relay



● Use a small-capacity contact type relay capable of opening and closing 14 VDC, 10 mA.

• Transistor Output Type Controller



Rotation Direction of Motor

● CW (clockwise) directional operation

When CW input is turned ON, the motor runs in a clockwise direction. When CW input is turned OFF, the motor stops.

● CCW (counterclockwise) directional operation

When CCW input is turned on, the motor runs in a counterclockwise direction. When CCW input is turned OFF, the motor stops.

When both the CW and CCW inputs are turned ON simultaneously, the motor stops instantly. Instantaneous reversing operation is not possible.

Note

● When in the source logic, do not connect the CW input and CCW input to transistor output type controller.

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

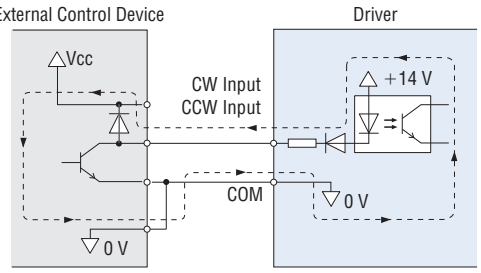
When you want to use the external control device with a built-in clamp diode, pay attention to the sequence of turning ON or OFF the power.

Power ON: External control device ON ➜ Driver ON

Power OFF: Driver OFF ➜ External control device OFF

If the driver power is turned ON first when connected as shown below, or the external control device power is turned OFF with the driver power turned ON, current will be applied, as indicated by the arrows in the diagram. This may cause the motor to run. When the power is turned ON or OFF simultaneously, the motor may run temporarily due to differences in power capacity. The external control device power must be turned ON first, and driver power must be turned OFF first.

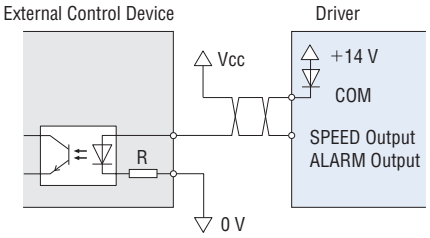
• Example of Sink Logic



◇Output Circuit Connection Example

The signal output is open-collector output. Use the power supply of 4.5 to 26.4 VDC to connect the limit resistor (R) to keep output current between 0.5 mA and 10 mA.

• **Signal Output (Source Logic) Connection Example**



Note

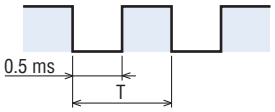
- The ON voltage of the output circuit is approximately 1.5 VDC. Remember this specification when driving other element using the output circuit.

◇SPEED Output

The speed output signal is synchronized with the motor speed. The system outputs pulses (with a width of approximately 0.5 ms) at a rate of 30 pulses per rotation of the motor output shaft. You can measure the speed output frequency and calculate motor speed.

$$\text{Motor speed (r/min)} = \frac{\text{SPEED output frequency [Hz]}}{30} \times 60$$

$$\text{SPEED output frequency (Hz)} = \frac{1}{T}$$



Note

- When you want to extend the input/output signal cable, the length must not exceed 2 m. The cable should be as short as possible in order to minimize noise.
- The input/output signal cable should be kept away from power supply cables or motor cables.

◇ALARM Output

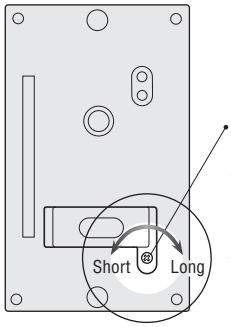
In the following conditions, the driver's protective function will actuate. The ALARM output will turn OFF and the motor will stop. In this case, the protective function that actuated can be checked based on whether the LED is blinking or illuminating steadily.

- The LED will blink upon actuation of the following protective function:
  Overload protective function
- The LED will illuminate steadily upon actuation of the following protective functions:
  Overvoltage protective function, motor sensor error, undervoltage protective function, overspeed protective function

●Setting the Acceleration/Deceleration Time

The motor starts over the specified acceleration time and stops over the specified deceleration time. This acceleration/deceleration time can be set within the range from 0.5 to 10 seconds (2000 r/min without load). The time can be set using the acceleration/deceleration potentiometer. Remove the front panel of the driver to access the potentiometer.

- The figure shows the driver with the front panel removed.



Acceleration/Deceleration Time Potentiometer
Time is increased by turning the switch clockwise. Use an insulated Phillips Screwdriver for this operation. The shortest time is set at the time of shipment.

■List of Motor and Driver Combinations

●Combination Type – Parallel Shaft Gearhead

The combination type comes with the motor and parallel shaft gearhead pre-assembled.

Output Power	Product Name	Motor Product Name	Gearhead Product Name	Driver Product Name
20 W	**BLU220C-□**	BLUM220-GFS	GFS2G□	BLUD20C
40 W	**BLU440C-□**	BLUM440-GFS	GFS4G□	BLUD40C
90 W	**BLU590C-□**	BLUM590-GFS	GFS5G□	BLUD90C

●Combination Type – Hollow Shaft Flat Gearhead

The combination type comes with the motor and hollow shaft flat gearhead pre-assembled.

Output Power	Product Name	Motor Product Name	Gearhead Product Name	Driver Product Name
20 W	**BLU220C-□FR**	BLUM220-GFS	GFS2G□FR	BLUD20C
40 W	**BLU440C-□FR**	BLUM440-GFS	GFS4G□FR	BLUD40C
90 W	**BLU590C-□FR**	BLUM590-GFS	GFS5G□FR	BLUD90C

●Round Shaft Type

Output Power	Product Name	Motor Product Name	Driver Product Name
20 W	**BLU220C-A**	BLUM220-A	BLUD20C
40 W	**BLU440C-A**	BLUM440-A	BLUD40C
90 W	**BLU590C-A**	BLUM590-A	BLUD90C

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