Brushless Motor and Driver Package
BLE 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.


Standard Type


RS-485 Communication Type

View Expanded Product Information, Specifications, CAD, Accessories & more online. Visit **www.orientalmotor.com/catalog** or use the QR code and select "**BLE** Series".

- A brushless motor and driver package designed with all the necessary functions for effective speed control.
- Speed Control Range: 100~4000 r/min (speed ratio 40:1)
- By using the control module (sold separately), additional performance and functions are possible.
- An RS-485 communications type is also available for easy connection to a wide variety of industrial networks and host systems.

About FLEX ➜ Page F-4

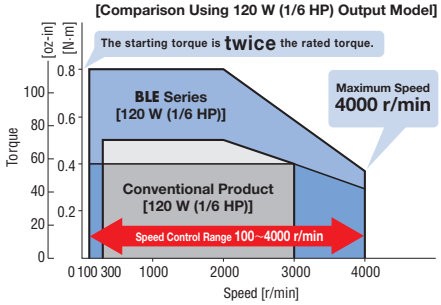
Features

Speed Control Range of 100~4000 r/min (Speed ratio 40:1)

Compared with conventional products, the speed control range is greatly expanded. Use in high-speed applications even at a maximum speed of 4000 r/min is possible.

Speed control range **BLE** Series: 100~4000 r/min (speed ratio 40:1)
Conventional Product: 300~3000 r/min (speed ratio 10:1)

[Comparison Using 120 W (1/6 HP) Output Model]



Excellent Speed Stability

The speed regulation (load) is ±0.5%.
For this reason, this mechanism ensures that the motor drives at a stable speed over its entire speed range from low to high, even when the load condition fluctuates.

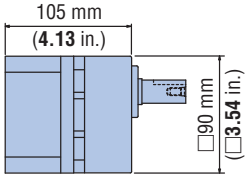
[Conventional Product]		[**BLE** Series*]	
Load	−1%	Load	±0.5%
Voltage	±1%	Voltage	±0.5%
Temperature	±1%	Temperature	±0.5%

*During Analog Setting

Compact yet Powerful

High power is achieved with a slim body, efficient gearhead and a compact design allowing for additional space savings.

[BLE Series 120 W (1/6 HP)]
Mass: 3.0 kg (6.6 lb.)

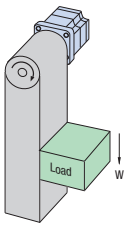


Energy Savings

Brushless motors use permanent magnets in the rotor. In comparison with inverter-controlled motors, they are high-efficiency with little loss, which means that energy savings is possible.

Speed Control during Vertical Operation is Possible

The electromagnetic brake type motor enables stable speed control even during vertical operation (gravitational operation).
The electromagnetic brake is automatically controlled via the driver in accordance with the operation command signal. When the power is turned OFF, such as during a blackout, the motor stops instantaneously to hold the load in place.



Note
● Since regenerated energy is produced during vertical operation, a regeneration unit, sold separately, is required. Regeneration units ➜ Page D-188

Additional Performance and Function

Functionality and performance can be improved by using in combination with the control module **OPX-2A** or the data setting software **MEXE02**.


● Control Module **OPX-2A**
(Sold separately)

or

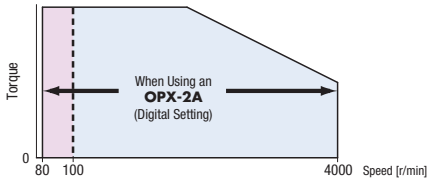

● Data Setting Software **MEXE02**
The software can be downloaded from the Oriental Motor website.

Various Settings	Speed, torque limit, acceleration time, deceleration time, I/O assignment, gear ratio, speed increasing ratio, conveyor gear ratio, conveyor speed increasing ratio, speed attainment range, overload warning level, overload warning function (enable/disable), JOG (test) run speed, JOG (test) run torque, digital/analog input signal selection ● Up to 16 points of operating data (speed, torque limit, acceleration time, and deceleration time) can be set*1
Monitoring Function (**OPX-2A**)	Speed, conveyor transportation speed, load factor, operating data No., alarm/warning (code indication), alarm/warning log (code indication), I/O monitor
Monitoring Function (**MEXE02**)	Status monitor: Speed, gear shaft speed, conveyor speed, load factor, operating selection number, alarm/warning, alarm/warning log I/O monitor: I/O signals, current internal/external potentiometer setting Waveform monitor: Setting speed, detected speed, I/O signals
Test Function	I/O test, JOG (test) operation
Data Copy	Download, upload, query*2, reset

*1 Specifications for the RS-485 communication type. Specifications of the standard type are up to 8 points.
*2 This function is only for the control module (**OPX-2A**).

◇Speed Control Range Expanded to 80~4000 r/min

The digital speed setting function expands the speed control range to cover 80~4000 r/min (speed ratio 50:1).

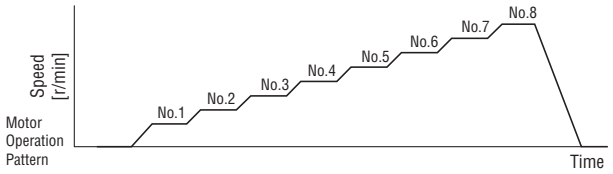


◇Improved Speed Regulation

[**BLE** Series]		[When using digital speed setting]
Load	±0.5%	Load ±0.2%
Voltage	±0.5%	Voltage ±0.2%
Temperature	±0.5%	Temperature ±0.2%

◇Multistep Speed-Change Operation up to 16 Speeds is Possible*

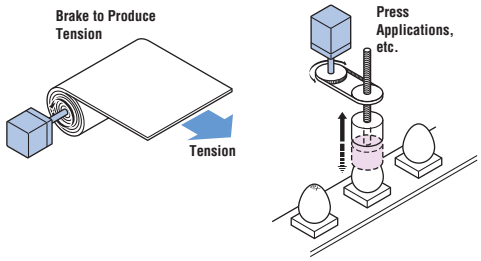
Multistep speed-change operation up to 16 speeds is possible using the **OPX-2A** or **MEXE02**. Speed setting in 1 r/min units as well as separate setting of the acceleration and deceleration time are possible.



*Specifications for the RS-485 Communication Type. Up to 8 types of operations are possible for the standard type.

◇Limiting the Motor Output Torque

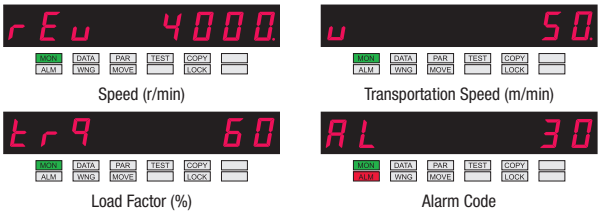
The motor output torque can be suppressed in accordance with the application and use condition.



◇Various Digital Indications are Possible (Control module **OPX-2A**)

Speed, load factor, alarm code, etc. can be displayed digitally.

- The speed can be displayed as the speed of the gearhead output shaft.



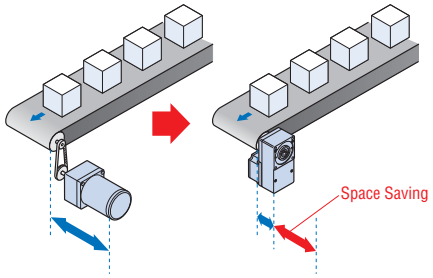
Gearhead Rated Life of 10000 Hours

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

- The parallel shaft gearheads for the 60 W (1/12 HP) and 120 W (1/6 HP) models have a tapped hole at the output shaft end.

Space Saving is Achieved with a Hollow Shaft Flat Gearhead

Direct connection to the drive shaft is possible without using a coupling, which will enable space saving.

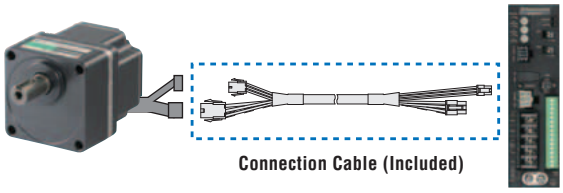


- Refer to page D-14 for further information on the features of parallel shaft gearheads and hollow shaft flat gearheads.

Cable Length and Flexible Extension Cable Can be Selected

◇The Included Cable is 3 m (9.8 ft.)

Comes with a cable that is 3 m (9.8 ft.) in length for connecting the motor to the driver.



◇Cables up to 20 m (65.6 ft.) are Available (Sold separately)

When the distance between the motor and the driver is 5 m (16.4 ft.) or longer, an accessory connection cable (sold separately) must be used. The distance between the motor and the driver can be extended up to 20 m (65.6 ft.).

- Connection Cables ➜ Page D-183

◇Flexible Extension Cables are Also Available (Sold separately)

Use the flexible connection cable in applications where the cable is bent and flexed.

- Flexible Connection Cables ➜ Page D-183

Product Line

2 different types are available based on the system requirements.

- Standard Type

- FLEX RS-485 Communication Type

- Motor Types

Combination Type with Parallel Shaft Gearhead
Standard or with electromagnetic brake

Combination Type with Hollow Shaft Flat Gearhead
Standard or with electromagnetic brake

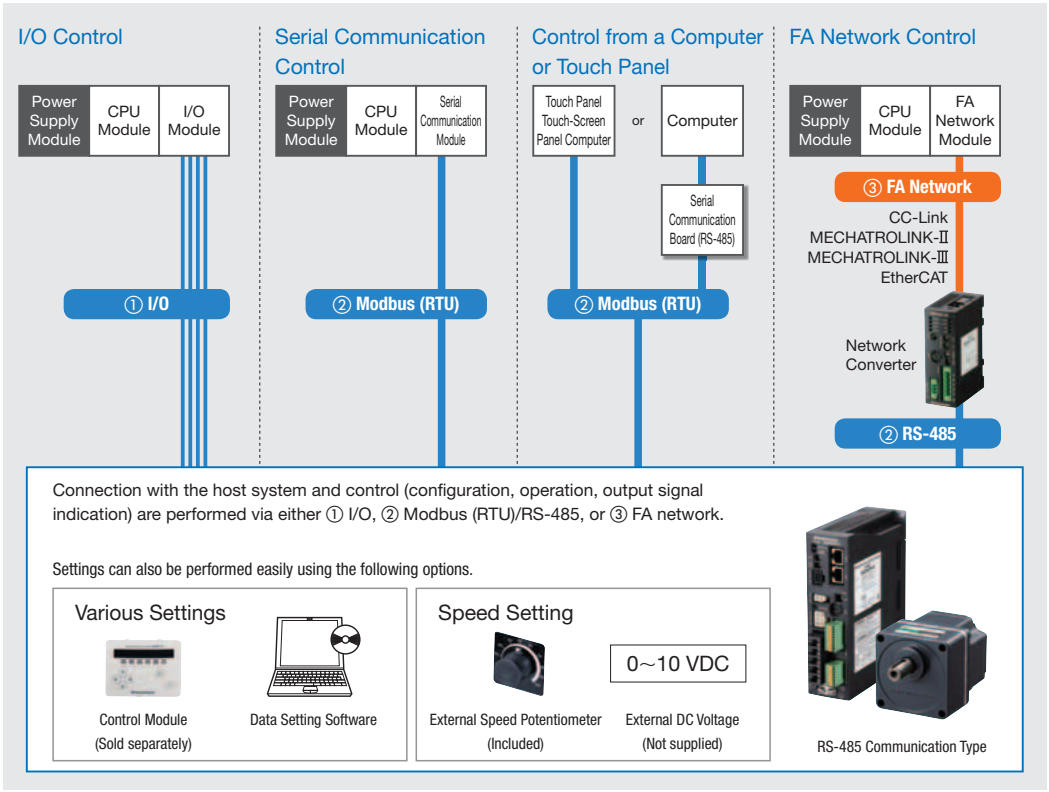
Round Shaft Type
Standard or with electromagnetic brake

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

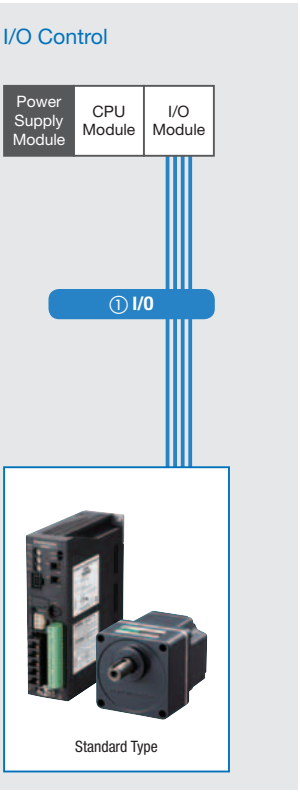
Connecting to a Wide Variety of Industrial Networks and Host Systems

In addition to the conventional I/O control, FA network control is now possible using Modbus (RTU) or network converters.

RS-485 Communication Type FLEX



Standard Type



① I/O

Connect directly to a switch box or PLC to construct an operation system controlled via I/O communication.

② Modbus (RTU)/RS-485

RS-485 communication can be used to set operating data and parameters, as well as input operation commands.
Up to 31 drivers can be connected to 1 serial communication driver. There is a function that enables multiple shafts to be started simultaneously. The Modbus (RTU) protocol is supported and can be used to connect to panel computers and PCs.

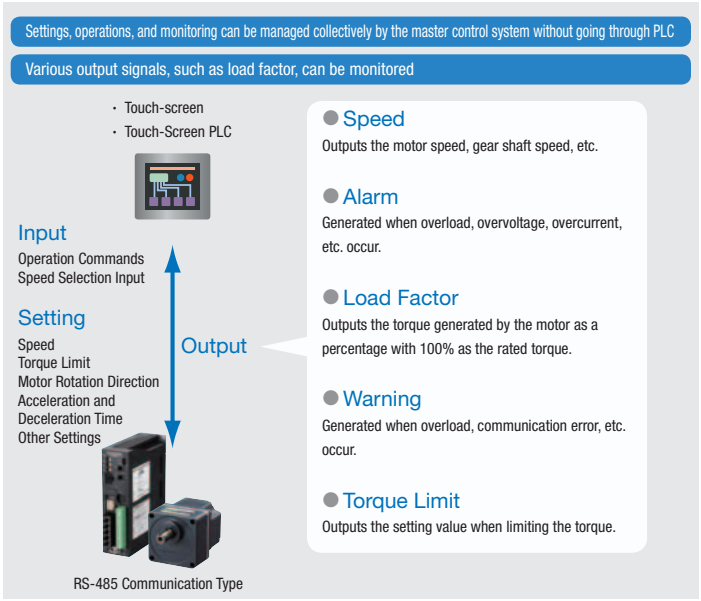
③ FA Network

By using a network converter (sold separately), CC-link communication, MECHATROLINK communication or EtherCAT communication is possible. All of these can be used to set operating data and parameters, as well as input operation commands.

◇Advantages of the RS-485 Communication Type

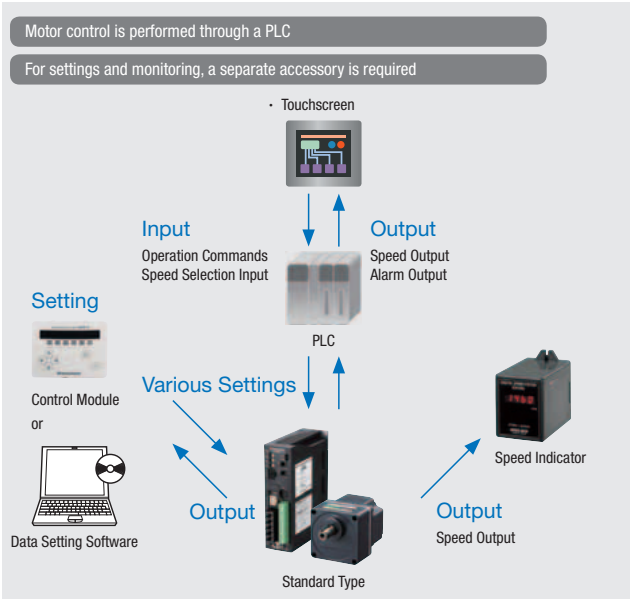
The **BLE** Series FLEX RS-485 Communication Type can be controlled entirely from a host system because operation, configuration, and monitoring are fed back to the host system. When controlling with a touch-screen or panel computer, load factor and other output signals can be monitored.

•RS-485 Communication Type



- The motor can be controlled directly from the host system such as a touch-screen or touch-screen PLC. The motor outputs its operating status such as motor speed and load factor to the host system to help improve equipment reliability.

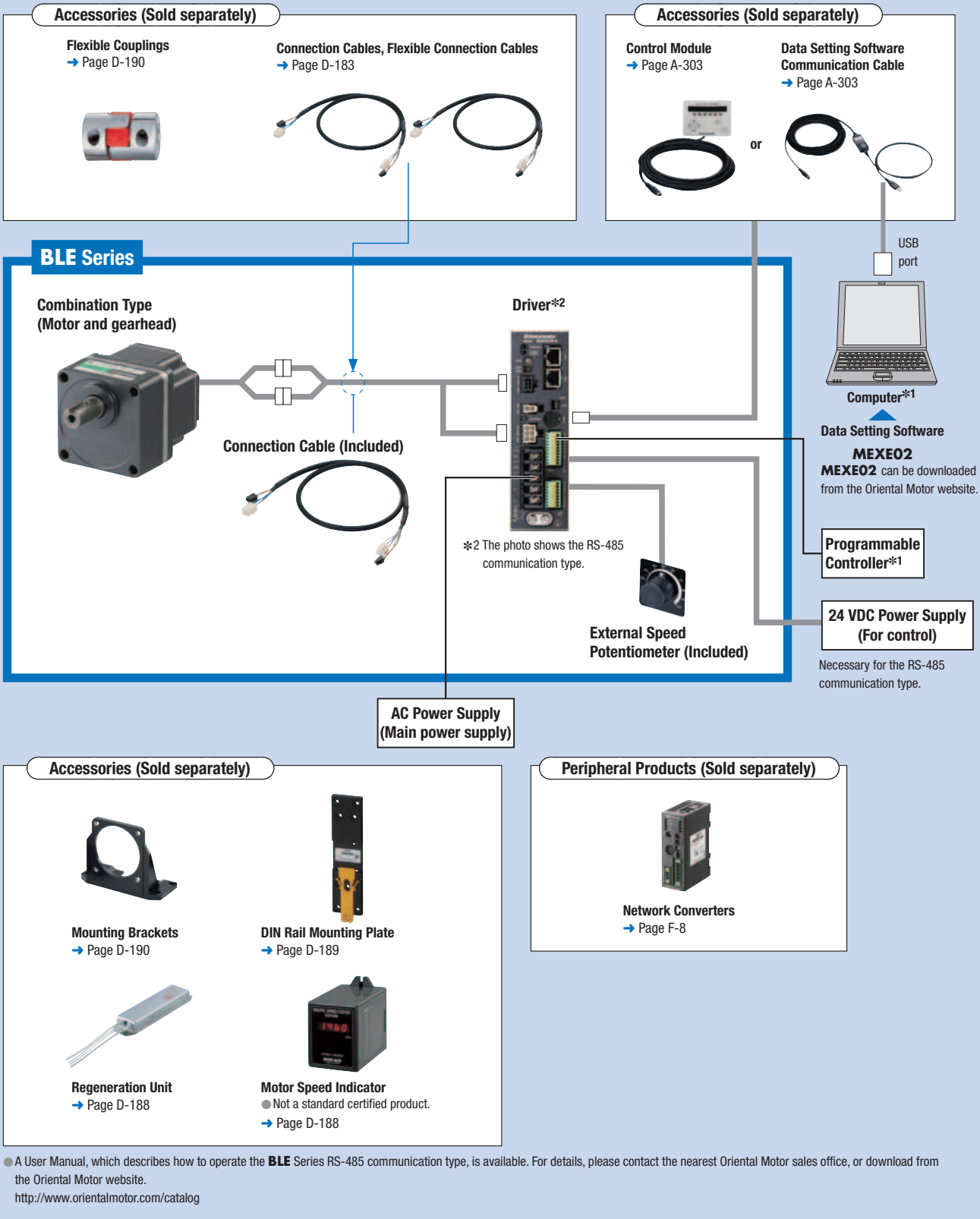
•Standard Type



- The motor is controlled through inputs received from a switch box, PLC, or the like. Motor speed, alarm, and other signals are output to the master control system.

System Configuration

*1 Not supplied



- A User Manual, which describes how to operate the **BLE** Series RS-485 communication type, is available. For details, please contact the nearest Oriental Motor sales office, or download from the Oriental Motor website.
  http://www.orientalmotor.com/catalog

Example of System Configuration

BLE Series Combination Type with Parallel Shaft	+	Sold Separately			
		Connection Cable [7 m (23.0 ft.)]	DIN Rail Installation Plates	Mounting Bracket	Flexible Coupling
BLE512AR5S-3		CC07BLE	PADP03	SOL5M8	MCL5518F12
$687.00		$127.00	$7.00	$34.00	$97.00

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

Product Number

BLE 5 12 A M R 200 F - 3

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

①	Series Name	**BLE**: **BLE** Series
②	Motor Frame Size	**2**: 60 mm (2.36 in.) **4**: 80 mm (3.15 in.) **5**: 90 mm (3.54 in.)
③	Output Power	**3**: 30 W (1/25 HP) **6**: 60 W (1/12 HP) **12**: 120 W (1/6 HP)
④	Power Supply Voltage	Standard Type **A**: Single-Phase 100-120 VAC **C**: Single-Phase 200-240 VAC **S**: Three-Phase 200-240 VAC RS-485 Communication Type **A**: Single-Phase 100-120 VAC **C**: Single-Phase, Three-Phase 200-240 VAC
⑤	**M**: With Electromagnetic Brake	Blank: Standard Type
⑥	**R**: RS-485 Communication Type	
⑦	Gear Ratio and Motor Shaft Type	Number: Gear ratio for combination types **A**: Round Shaft Type
⑧	Gearhead Type (Combination type only)	**S**: Parallel Shaft Gearhead **F**: Hollow Shaft Flat Gearhead
⑨	Connection Cable (Included)	**3**: Included Connection Cable Length 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.

●Standard Type

◇Combination Type, Parallel Shaft Gearhead

Output Power	Power Supply Voltage	Product Name	Gear Ratio	List Price
30 W (1/25 HP)	Single-Phase 100-120 VAC	**BLE23A□S-3**	**5, 10, 15, 20**	$577.00
			30, 50, 100	$586.00
			200	$595.00
	Single-Phase 200-240 VAC	**BLE23C□S-3**	**5, 10, 15, 20**	$577.00
			30, 50, 100	$586.00
			200	$595.00
	Three-Phase 200-240 VAC	**BLE23S□S-3**	**5, 10, 15, 20**	$577.00
			30, 50, 100	$586.00
			200	$595.00
60 W (1/12 HP)	Single-Phase 100-120 VAC	**BLE46A□S-3**	**5, 10, 15, 20**	$604.00
			30, 50, 100	$612.00
			200	$622.00
	Single-Phase 200-240 VAC	**BLE46C□S-3**	**5, 10, 15, 20**	$604.00
			30, 50, 100	$612.00
			200	$622.00
	Three-Phase 200-240 VAC	**BLE46S□S-3**	**5, 10, 15, 20**	$604.00
			30, 50, 100	$612.00
			200	$622.00
120 W (1/6 HP)	Single-Phase 100-120 VAC	**BLE512A□S-3**	**5, 10, 15, 20**	$686.00
			30, 50, 100	$697.00
			200	$708.00
	Single-Phase 200-240 VAC	**BLE512C□S-3**	**5, 10, 15, 20**	$686.00
			30, 50, 100	$697.00
			200	$708.00
	Three-Phase 200-240 VAC	**BLE512S□S-3**	**5, 10, 15, 20**	$686.00
			30, 50, 100	$697.00
			200	$708.00

The following items are included with each product.

Motor, Driver, Gearhead, Connection Cable, External Speed Potentiometer (with signal line), Installation Screws, Parallel Key, Operating Manual

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

Page
Features D-42 / System Configuration D-45 / Product Line D-46 / Specifications D-51 / Characteristics D-54
Dimensions D-59 / Connection and Operation D-70 / Motor and Driver Combinations D-79

◇Combination Type, Hollow Shaft Flat Gearhead

Output Power	Power Supply Voltage	Product Name	Gear Ratio	List Price
30 W (1/25 HP)	Single-Phase 100-120 VAC	**BLE23A□F-3**	**5, 10, 15, 20**	$635.00
			30, 50, 100	$647.00
			200	$659.00
	Single-Phase 200-240 VAC	**BLE23C□F-3**	**5, 10, 15, 20**	$635.00
			30, 50, 100	$647.00
			200	$659.00
	Three-Phase 200-240 VAC	**BLE23S□F-3**	**5, 10, 15, 20**	$635.00
			30, 50, 100	$647.00
			200	$659.00
60 W (1/12 HP)	Single-Phase 100-120 VAC	**BLE46A□F-3**	**5, 10, 15, 20**	$696.00
			30, 50, 100	$708.00
			200	$720.00
	Single-Phase 200-240 VAC	**BLE46C□F-3**	**5, 10, 15, 20**	$696.00
			30, 50, 100	$708.00
			200	$720.00
	Three-Phase 200-240 VAC	**BLE46S□F-3**	**5, 10, 15, 20**	$696.00
			30, 50, 100	$708.00
			200	$720.00
120 W (1/6 HP)	Single-Phase 100-120 VAC	**BLE512A□F-3**	**5, 10, 15, 20**	$789.00
			30, 50, 100	$801.00
			200	$813.00
	Single-Phase 200-240 VAC	**BLE512C□F-3**	**5, 10, 15, 20**	$789.00
			30, 50, 100	$801.00
			200	$813.00
	Three-Phase 200-240 VAC	**BLE512S□F-3**	**5, 10, 15, 20**	$789.00
			30, 50, 100	$801.00
			200	$813.00

The following items are included with each product.

Motor, Driver, Gearhead, Connection Cable, External Speed Potentiometer (with signal line), Installation Screws, Parallel Key, Safety Cover (Screws included), Operating Manual

◇Round Shaft Type

Output Power	Power Supply Voltage	Product Name	List Price
30 W (1/25 HP)	Single-Phase 100-120 VAC	**BLE23AA-3**	$451.00
	Single-Phase 200-240 VAC	**BLE23CA-3**	$451.00
	Three-Phase 200-240 VAC	**BLE23SA-3**	$451.00
60 W (1/12 HP)	Single-Phase 100-120 VAC	**BLE46AA-3**	$463.00
	Single-Phase 200-240 VAC	**BLE46CA-3**	$463.00
	Three-Phase 200-240 VAC	**BLE46SA-3**	$463.00
120 W (1/6 HP)	Single-Phase 100-120 VAC	**BLE512AA-3**	$507.00
	Single-Phase 200-240 VAC	**BLE512CA-3**	$507.00
	Three-Phase 200-240 VAC	**BLE512SA-3**	$507.00

The following items are included with each product.

Motor, Driver, Connection Cable, External Speed Potentiometer (with signal line), Operating Manual

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

●Standard Type with Electromagnetic Brake

◇Combination Type, Parallel Shaft Gearhead

Output Power	Power Supply Voltage	Product Name	Gear Ratio	List Price
30 W (1/25 HP)	Single-Phase 100-120 VAC	BLE23AM□S-3	5, 10, 15, 20	$757.00
			30, 50, 100	$766.00
			200	$775.00
	Single-Phase 200-240 VAC	BLE23CM□S-3	5, 10, 15, 20	$757.00
			30, 50, 100	$766.00
			200	$775.00
	Three-Phase 200-240 VAC	BLE23SM□S-3	5, 10, 15, 20	$757.00
			30, 50, 100	$766.00
			200	$775.00
60 W (1/12 HP)	Single-Phase 100-120 VAC	BLE46AM□S-3	5, 10, 15, 20	$784.00
			30, 50, 100	$792.00
			200	$802.00
	Single-Phase 200-240 VAC	BLE46CM□S-3	5, 10, 15, 20	$784.00
			30, 50, 100	$792.00
			200	$802.00
	Three-Phase 200-240 VAC	BLE46SM□S-3	5, 10, 15, 20	$784.00
			30, 50, 100	$792.00
			200	$802.00
120 W (1/6 HP)	Single-Phase 100-120 VAC	BLE512AM□S-3	5, 10, 15, 20	$926.00
			30, 50, 100	$937.00
			200	$948.00
	Single-Phase 200-240 VAC	BLE512CM□S-3	5, 10, 15, 20	$926.00
			30, 50, 100	$937.00
			200	$948.00
	Three-Phase 200-240 VAC	BLE512SM□S-3	5, 10, 15, 20	$926.00
			30, 50, 100	$937.00
			200	$948.00

The following items are included with each product.
Motor, Driver, Gearhead, Connection Cable, External Speed Potentiometer (with signal line), Installation Screws, Parallel Key, Operating Manual

◇Combination Type, Hollow Shaft Flat Gearhead

Output Power	Power Supply Voltage	Product Name	Gear Ratio	List Price
30 W (1/25 HP)	Single-Phase 100-120 VAC	BLE23AM□F-3	5, 10, 15, 20	$815.00
			30, 50, 100	$827.00
			200	$839.00
	Single-Phase 200-240 VAC	BLE23CM□F-3	5, 10, 15, 20	$815.00
			30, 50, 100	$827.00
			200	$839.00
	Three-Phase 200-240 VAC	BLE23SM□F-3	5, 10, 15, 20	$815.00
			30, 50, 100	$827.00
			200	$839.00
60 W (1/12 HP)	Single-Phase 100-120 VAC	BLE46AM□F-3	5, 10, 15, 20	$876.00
			30, 50, 100	$888.00
			200	$900.00
	Single-Phase 200-240 VAC	BLE46CM□F-3	5, 10, 15, 20	$876.00
			30, 50, 100	$888.00
			200	$900.00
	Three-Phase 200-240 VAC	BLE46SM□F-3	5, 10, 15, 20	$876.00
			30, 50, 100	$888.00
			200	$900.00
120 W (1/6 HP)	Single-Phase 100-120 VAC	BLE512AM□F-3	5, 10, 15, 20	$1,029.00
			30, 50, 100	$1,041.00
			200	$1,053.00
	Single-Phase 200-240 VAC	BLE512CM□F-3	5, 10, 15, 20	$1,029.00
			30, 50, 100	$1,041.00
			200	$1,053.00
	Three-Phase 200-240 VAC	BLE512SM□F-3	5, 10, 15, 20	$1,029.00
			30, 50, 100	$1,041.00
			200	$1,053.00

The following items are included with each product.
Motor, Driver, Gearhead, Connection Cable, External Speed Potentiometer (with signal line), Installation Screws, Parallel Key, Safety Cover (Screws included), Operating Manual

◇Round Shaft Type

Output Power	Power Supply Voltage	Product Name	List Price
30 W (1/25 HP)	Single-Phase 100-120 VAC	BLE23AMA-3	$631.00
	Single-Phase 200-240 VAC	BLE23CMA-3	$631.00
	Three-Phase 200-240 VAC	BLE23SMA-3	$631.00
60 W (1/12 HP)	Single-Phase 100-120 VAC	BLE46AMA-3	$643.00
	Single-Phase 200-240 VAC	BLE46CMA-3	$643.00
	Three-Phase 200-240 VAC	BLE46SMA-3	$643.00
120 W (1/6 HP)	Single-Phase 100-120 VAC	BLE512AMA-3	$747.00
	Single-Phase 200-240 VAC	BLE512CMA-3	$747.00
	Three-Phase 200-240 VAC	BLE512SMA-3	$747.00

The following items are included with each product.
Motor, Driver, Connection Cable, External Speed Potentiometer (with signal line), Operating Manual

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

●RS-485 Communication Type

◇Combination Type, Parallel Shaft Gearhead

Output Power	Power Supply Voltage	Product Name	Gear Ratio	List Price
30 W (1/25 HP)	Single-Phase 100-120 VAC	BLE23AR□S-3	5, 10, 15, 20	$577.00
			30, 50, 100	$586.00
			200	$595.00
	Single-Phase Three-Phase 200-240 VAC	BLE23CR□S-3	5, 10, 15, 20	$577.00
			30, 50, 100	$586.00
			200	$595.00
60 W (1/12 HP)	Single-Phase 100-120 VAC	BLE46AR□S-3	5, 10, 15, 20	$604.00
			30, 50, 100	$612.00
			200	$622.00
	Single-Phase Three-Phase 200-240 VAC	BLE46CR□S-3	5, 10, 15, 20	$604.00
			30, 50, 100	$612.00
			200	$622.00
120 W (1/6 HP)	Single-Phase 100-120 VAC	BLE512AR□S-3	5, 10, 15, 20	$687.00
			30, 50, 100	$698.00
			200	$709.00
	Single-Phase Three-Phase 200-240 VAC	BLE512CR□S-3	5, 10, 15, 20	$686.00
			30, 50, 100	$697.00
			200	$708.00

The following items are included with each product.

Motor, Driver, Gearhead, Connection Cable, CN5 Connector, CN6 Connector, External Speed Potentiometer (with signal line), Installation Screws, Parallel Key, Operating Manual

◇Combination Type, Hollow Shaft Flat Gearhead

Output Power	Power Supply Voltage	Product Name	Gear Ratio	List Price
30 W (1/25 HP)	Single-Phase 100-120 VAC	BLE23AR□F-3	5, 10, 15, 20	$635.00
			30, 50, 100	$647.00
			200	$659.00
	Single-Phase Three-Phase 200-240 VAC	BLE23CR□F-3	5, 10, 15, 20	$635.00
			30, 50, 100	$647.00
			200	$659.00
60 W (1/12 HP)	Single-Phase 100-120 VAC	BLE46AR□F-3	5, 10, 15, 20	$696.00
			30, 50, 100	$708.00
			200	$720.00
	Single-Phase Three-Phase 200-240 VAC	BLE46CR□F-3	5, 10, 15, 20	$696.00
			30, 50, 100	$708.00
			200	$720.00
120 W (1/6 HP)	Single-Phase 100-120 VAC	BLE512AR□F-3	5, 10, 15, 20	$790.00
			30, 50, 100	$802.00
			200	$814.00
	Single-Phase Three-Phase 200-240 VAC	BLE512CR□F-3	5, 10, 15, 20	$789.00
			30, 50, 100	$801.00
			200	$813.00

The following items are included with each product.

Motor, Driver, Gearhead, Connection Cable, CN5 Connector, CN6 Connector, External Speed Potentiometer (with signal line), Installation Screws, Parallel Key, Safety Cover (Screws included), Operating Manual

◇Round Shaft Type

Output Power	Power Supply Voltage	Product Name	List Price
30 W (1/25 HP)	Single-Phase 100-120 VAC	BLE23ARA-3	$451.00
	Single-Phase Three-Phase 200-240 VAC	BLE23CRA-3	$451.00
60 W (1/12 HP)	Single-Phase 100-120 VAC	BLE46ARA-3	$463.00
	Single-Phase Three-Phase 200-240 VAC	BLE46CRA-3	$463.00
120 W (1/6 HP)	Single-Phase 100-120 VAC	BLE512ARA-3	$508.00
	Single-Phase Three-Phase 200-240 VAC	BLE512CRA-3	$507.00

The following items are included with each product.

Motor, Driver, Connection Cable, CN5 Connector, CN6 Connector, External Speed Potentiometer (with signal line), Operating Manual

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

●RS-485 Communication Type with Electromagnetic Brake

◇Combination Type, Parallel Shaft Gearhead

Output Power	Power Supply Voltage	Product Name	Gear Ratio	List Price
30 W (1/25 HP)	Single-Phase 100-120 VAC	BLE23AMR□S-3	5, 10, 15, 20	$757.00
			30, 50, 100	$766.00
			200	$775.00
	Single-Phase Three-Phase 200-240 VAC	BLE23CMR□S-3	5, 10, 15, 20	$757.00
			30, 50, 100	$766.00
			200	$775.00
60 W (1/12 HP)	Single-Phase 100-120 VAC	BLE46AMR□S-3	5, 10, 15, 20	$784.00
			30, 50, 100	$792.00
			200	$802.00
	Single-Phase Three-Phase 200-240 VAC	BLE46CMR□S-3	5, 10, 15, 20	$784.00
			30, 50, 100	$792.00
			200	$802.00
120 W (1/6 HP)	Single-Phase 100-120 VAC	BLE512AMR□S-3	5, 10, 15, 20	$926.00
			30, 50, 100	$938.00
			200	$948.00
	Single-Phase Three-Phase 200-240 VAC	BLE512CMR□S-3	5, 10, 15, 20	$927.00
			30, 50, 100	$938.00
			200	$949.00

The following items are included with each product.
Motor, Driver, Gearhead, Connection Cable, CN5 Connector, CN6 Connector, External Speed Potentiometer (with signal line), Installation Screws, Parallel Key, Operating Manual

◇Combination Type, Hollow Shaft Flat Gearhead

Output Power	Power Supply Voltage	Product Name	Gear Ratio	List Price
30 W (1/25 HP)	Single-Phase 100-120 VAC	BLE23AMR□F-3	5, 10, 15, 20	$815.00
			30, 50, 100	$827.00
			200	$839.00
	Single-Phase Three-Phase 200-240 VAC	BLE23CMR□F-3	5, 10, 15, 20	$815.00
			30, 50, 100	$827.00
			200	$839.00
60 W (1/12 HP)	Single-Phase 100-120 VAC	BLE46AMR□F-3	5, 10, 15, 20	$876.00
			30, 50, 100	$888.00
			200	$900.00
	Single-Phase Three-Phase 200-240 VAC	BLE46CMR□F-3	5, 10, 15, 20	$876.00
			30, 50, 100	$888.00
			200	$900.00
120 W (1/6 HP)	Single-Phase 100-120 VAC	BLE512AMR□F-3	5, 10, 15, 20	$1,029.00
			30, 50, 100	$1,041.00
			200	$1,053.00
	Single-Phase Three-Phase 200-240 VAC	BLE512CMR□F-3	5, 10, 15, 20	$1,030.00
			30, 50, 100	$1,042.00
			200	$1,054.00

The following items are included with each product.
Motor, Driver, Gearhead, Connection Cable, CN5 Connector, CN6 Connector, External Speed Potentiometer (with signal line), Installation Screws, Parallel Key, Safety Cover (Screws included), Operating Manual

◇Round Shaft Type

Output Power	Power Supply Voltage	Product Name	List Price
30 W (1/25 HP)	Single-Phase 100-120 VAC	BLE23AMRA-3	$631.00
	Single-Phase Three-Phase 200-240 VAC	BLE23CMRA-3	$631.00
60 W (1/12 HP)	Single-Phase 100-120 VAC	BLE46AMRA-3	$643.00
	Single-Phase Three-Phase 200-240 VAC	BLE46CMRA-3	$643.00
120 W (1/6 HP)	Single-Phase 100-120 VAC	BLE512AMRA-3	$748.00
	Single-Phase Three-Phase 200-240 VAC	BLE512CMRA-3	$747.00

The following items are included with each product.
Motor, Driver, Connection Cable, CN5 Connector, CN6 Connector, External Speed Potentiometer (with signal line), Operating Manual

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

Page
Features D-42 / System Configuration D-45 / Product Line D-46 / Specifications D-51 / Characteristics D-54
Dimensions D-59 / Connection and Operation D-70 / Motor and Driver Combinations D-79

Specifications

Standard Type and RS-485 Communication Type

◇30 W (1/25 HP)

Standard Type: cULus CE / RS-485 Communication Type: UL CE

Product Name	Standard Type, Combination Type		**BLE23A□□-3**	**BLE23C□□-3**	**BLE23S□□-3**
	Standard Type, Round Shaft Type		**BLE23AA-3**	**BLE23CA-3**	**BLE23SA-3**
	RS-485 Communication Type, Combination Type		**BLE23AR□□-3**	**BLE23CR□□-3**	
	RS-485 Communication Type, Round Shaft Type		**BLE23ARA-3**	**BLE23CRA-3**	
Rated Output Power (Continuous)		W (HP)	30 (1/25)		
Power Supply Input	Rated Voltage	V	Single-Phase 100-120	Single-Phase 200-240	Three-Phase 200-240
	Permissible Voltage Range		−15～+10%		
	Rated Frequency	Hz	50/60		
	Permissible Frequency Range		±5%		
	Rated Input Current	A	1.3	0.8	0.45
	Maximum Input Current	A	3.5	2.1	1.2
Control Power Supply*1	Voltage		24 VDC		
	Permissible Voltage Range		−15～+20%		
Rated Torque		N·m (oz-in)	0.1 (14.2)		
Maximum Instantaneous Torque*2		N·m (oz-in)	0.2 (28)		
Rated Speed		r/min	3000		
Speed Control Range		r/min	100～4000 (Analog setting) 80～4000 (Setting in 1 r/min increments during digital setting)*3		
Round Shaft Type Permissible Inertia		J: $\times10^{-4}$ kg·m^2 (oz-in^2)	1.8 (9.8)		
Rotor Inertia		J: $\times10^{-4}$ kg·m^2 (oz-in^2)	0.087 (0.48)		
Speed Regulation	Load		±0.5% (±0.2%)*3 or less: Conditions 0～rated torque, rated speed, rated voltage, normal ambient temperature		
	Voltage		±0.5% (±0.2%)*3 or less: Conditions Rated voltage −15～+10%, rated speed, no load, normal ambient temperature		
	Temperature		±0.5% (±0.2%)*3 or less: Conditions Operating ambient temperature 0～+50°C (+32～+122°F), rated speed, no load, rated voltage		

◇60 W (1/12 HP)

Standard Type: cULus CE / RS-485 Communication Type: UL CE

Product Name	Standard Type, Combination Type		**BLE46A□□-3**	**BLE46C□□-3**	**BLE46S□□-3**
	Standard Type, Round Shaft Type		**BLE46AA-3**	**BLE46CA-3**	**BLE46SA-3**
	RS-485 Communication Type, Combination Type		**BLE46AR□□-3**	**BLE46CR□□-3**	
	RS-485 Communication Type, Round Shaft Type		**BLE46ARA-3**	**BLE46CRA-3**	
Rated Output Power (Continuous)		W (HP)	60 (1/12)		
Power Supply Input	Rated Voltage	V	Single-Phase 100-120	Single-Phase 200-240	Three-Phase 200-240
	Permissible Voltage Range		−15～+10%		
	Rated Frequency	Hz	50/60		
	Permissible Frequency Range		±5%		
	Rated Input Current	A	2.0	1.2	0.7
	Maximum Input Current	A	4.5	2.6	1.5
Control Power Supply*1	Voltage		24 VDC		
	Permissible Voltage Range		−15～+20%		
Rated Torque		N·m (oz-in)	0.2 (28)		
Maximum Instantaneous Torque*2		N·m (oz-in)	0.4 (56)		
Rated Speed		r/min	3000		
Speed Control Range		r/min	100～4000 (Analog setting) 80～4000 (Setting in 1 r/min increments during digital setting)*3		
Round Shaft Type Permissible Inertia		J: $\times10^{-4}$ kg·m^2 (oz-in^2)	3.75 (21)		
Rotor Inertia		J: $\times10^{-4}$ kg·m^2 (oz-in^2)	0.24 (1.31)		
Speed Regulation	Load		±0.5% (±0.2%)*3 or less: Conditions 0～rated torque, rated speed, rated voltage, normal ambient temperature		
	Voltage		±0.5% (±0.2%)*3 or less: Conditions Rated voltage −15～+10%, rated speed, no load, normal ambient temperature		
	Temperature		±0.5% (±0.2%)*3 or less: Conditions Operating ambient temperature 0～+50°C (+32～+122°F), rated speed, no load, rated voltage		

*1 Please provide for the RS-485 communication type.

*2 The maximum instantaneous torque can be used for up to approximately five seconds.

*3 These specifications apply when the RS-485 communication is used with either the **OPX-2A** or **MEXE02**.

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

● A number indicating the gear ratio is entered where the box □ is located within the product name.
Either **S** or **F** indicating the type of gearhead is entered where the box □ is located within the product name.

◇120 W (1/6 HP)

Standard Type: cULus CE / RS-485 Communication Type: UL CE

Product Name	Standard Type, Combination Type		**BLE512A□□-3**	**BLE512C□□-3**	**BLE512S□□-3**
	Standard Type, Round Shaft Type		**BLE512AA-3**	**BLE512CA-3**	**BLE512SA-3**
	RS-485 Communication Type, Combination Type		**BLE512AR□□-3**	**BLE512CR□□-3**	
	RS-485 Communication Type, Round Shaft Type		**BLE512ARA-3**	**BLE512CRA-3**	
Rated Output Power (Continuous)		W (HP)	120 (1/6)		
Power Supply Input	Rated Voltage	V	Single-Phase 100-120	Single-Phase 200-240	Three-Phase 200-240
	Permissible Voltage Range		−15～+10%		
	Rated Frequency	Hz	50/60		
	Permissible Frequency Range		±5%		
	Rated Input Current	A	3.3	2.0	1.2
	Maximum Input Current	A	8.2	4.4	2.5
Control Power Supply*1	Voltage		24 VDC		
	Permissible Voltage Range		−15～+20%		
Rated Torque		N·m (oz-in)	0.4 (56)		
Maximum Instantaneous Torque*2		N·m (oz-in)	0.8 (113)		
Rated Speed		r/min	3000		
Speed Control Range		r/min	100～4000 (Analog setting) 80～4000 (Setting in 1 r/min increments during digital setting)*3		
Round Shaft Type Permissible Inertia		J: $\times10^{-4}$ kg·m^2 (oz-in^2)	5.6 (31)		
Rotor Inertia		J: $\times10^{-4}$ kg·m^2 (oz-in^2)	0.61 (3.3)		
Speed Regulation	Load		±0.5% (±0.2%)*3 or less: Conditions 0～rated torque, rated speed, rated voltage, normal ambient temperature		
	Voltage		±0.5% (±0.2%)*3 or less: Conditions Rated voltage −15～+10%, rated speed, no load, normal ambient temperature		
	Temperature		±0.5% (±0.2%)*3 or less: Conditions Operating ambient temperature 0～+50°C (+32～+122°F), rated speed, no load, rated voltage		

●Standard Type with Electromagnetic Brake and RS-485 Communication Type with Electromagnetic Brake

◇30 W (1/25 HP)

Standard Type: cULus CE / RS-485 Communication Type: UL CE

Product Name	Standard Type, Combination Type		**BLE23AM□□-3**	**BLE23CM□□-3**	**BLE23SM□□-3**
	Standard Type, Round Shaft Type		**BLE23AMA-3**	**BLE23CMA-3**	**BLE23SMA-3**
	RS-485 Communication Type, Combination Type		**BLE23AMR□□-3**	**BLE23CMR□□-3**	
	RS-485 Communication Type, Round Shaft Type		**BLE23AMRA-3**	**BLE23CMRA-3**	
Rated Output Power (Continuous)		W (HP)	30 (1/25)		
Power Supply Input	Rated Voltage	V	Single-Phase 100-120	Single-Phase 200-240	Three-Phase 200-240
	Permissible Voltage Range		−15～+10%		
	Rated Frequency	Hz	50/60		
	Permissible Frequency Range		±5%		
	Rated Input Current	A	1.3	0.8	0.45
	Maximum Input Current	A	3.5	2.1	1.2
Control Power Supply*1	Voltage		24 VDC		
	Permissible Voltage Range		−15～+20%		
Rated Torque		N·m (oz-in)	0.1 (14.2)		
Maximum Instantaneous Torque*2		N·m (oz-in)	0.2 (28)		
Rated Speed		r/min	3000		
Speed Control Range		r/min	100～4000 (Analog setting) 80～4000 (Setting in 1 r/min increments during digital setting)*3		
Round Shaft Type Permissible Inertia		J: $\times10^{-4}$ kg·m^2 (oz-in^2)	1.8 (9.8)		
Rotor Inertia		J: $\times10^{-4}$ kg·m^2 (oz-in^2)	0.087 (0.48)		
Speed Regulation	Load		±0.5% (±0.2%)*3 or less: Conditions 0～rated torque, rated speed, rated voltage, normal ambient temperature		
	Voltage		±0.5% (±0.2%)*3 or less: Conditions Rated voltage −15～+10%, rated speed, no load, normal ambient temperature		
	Temperature		±0.5% (±0.2%)*3 or less: Conditions Operating ambient temperature 0～+50°C (+32～+122°F), rated speed, no load, rated voltage		
Gravitational Operation Capability	Continuous Regenerative Power	W (HP)	100 (1/8)		
	Instantaneous Regenerative Power	W (HP)	240 (1/3)		
	Applicable Regeneration Unit*4		**EPRC-400P**		
Electromagnetic Brake*5	Brake Type		Power off activated type, automatically controlled by the driver		
	Static Friction Torque	N·m (oz-in)	0.1 (14.2)		

*1 Please provide for the RS-485 communication type.
*2 The maximum instantaneous torque can be used for up to approximately five seconds.
*3 These specifications apply when the RS-485 communication is used with either the **OPX-2A** or **MEXE02**.
*4 Install the regeneration unit in a place that has the same heat radiation capability as the heat sink [material: aluminum, 350×350 mm (13.8×13.8 in.), 3 mm (0.12 in.) thick].
*5 Do not start or stop the motor by turning the power supply ON/OFF, as this will cause the electromagnetic brake to wear abnormally.
● The values in the table are characteristics for the motor only.

● A number indicating the gear ratio is entered where the box □ is located within the product name.
Either **S** or **F** indicating the type of gearhead is entered where the box ■ is located within the product name.

◇60 W (1/12 HP)

Standard Type: cULus CE / RS-485 Communication Type: UL CE

Product Name	Standard Type, Combination Type		BLE46AM□□-3	BLE46CM□□-3	BLE46SM□□-3
	Standard Type, Round Shaft Type		BLE46AMA-3	BLE46CMA-3	BLE46SMA-3
	RS-485 Communication Type, Combination Type		BLE46AMR□□-3	BLE46CMR□□-3	
	RS-485 Communication Type, Round Shaft Type		BLE46AMRA-3	BLE46CMRA-3	
Rated Output Power (Continuous)		W (HP)	60 (1/12)		
Power Supply Input	Rated Voltage	V	Single-Phase 100-120	Single-Phase 200-240	Three-Phase 200-240
	Permissible Voltage Range		−15～+10%		
	Rated Frequency	Hz	50/60		
	Permissible Frequency Range		±5%		
	Rated Input Current	A	2.0	1.2	0.7
	Maximum Input Current	A	4.5	2.6	1.5
Control Power Supply*1	Voltage		24 VDC		
	Permissible Voltage Range		−15～+20%		
Rated Torque		N·m (oz-in)	0.2 (28)		
Maximum Instantaneous Torque*2		N·m (oz-in)	0.4 (56)		
Rated Speed		r/min	3000		
Speed Control Range		r/min	100～4000 (Analog setting) 80～4000 (Setting in 1 r/min increments during digital setting)*3		
Round Shaft Type Permissible Inertia		J: $\times10^{-4}$ kg·m^2 (oz-in^2)	3.75 (21)		
Rotor Inertia		J: $\times10^{-4}$ kg·m^2 (oz-in^2)	0.24 (1.31)		
Speed Regulation	Load		±0.5% (±0.2%)*3 or less: Conditions 0～rated torque, rated speed, rated voltage, normal ambient temperature		
	Voltage		±0.5% (±0.2%)*3 or less: Conditions Rated voltage −15～+10%, rated speed, no load, normal ambient temperature		
	Temperature		±0.5% (±0.2%)*3 or less: Conditions Operating ambient temperature 0～+50°C (+32～+122°F), rated speed, no load, rated voltage		
Gravitational Operation Capability	Continuous Regenerative Power	W (HP)	100 (1/8)		
	Instantaneous Regenerative Power	W (HP)	240 (1/3)		
	Applicable Regeneration Unit*4		EPRC-400P		
Electromagnetic Brake*5	Brake Type		Power off activated type, automatically controlled by the driver		
	Static Friction Torque	N·m (oz-in)	0.2 (28)		

◇120 W (1/6 HP)

Standard Type: cULus CE / RS-485 Communication Type: UL CE

Product Name	Standard Type, Combination Type		BLE512AM□□-3	BLE512CM□□-3	BLE512SM□□-3
	Standard Type, Round Shaft Type		BLE512AMA-3	BLE512CMA-3	BLE512SMA-3
	RS-485 Communication Type, Combination Type		BLE512AMR□□-3	BLE512CMR□□-3	
	RS-485 Communication Type, Round Shaft Type		BLE512AMRA-3	BLE512CMRA-3	
Rated Output Power (Continuous)		W (HP)	120 (1/6)		
Power Supply Input	Rated Voltage	V	Single-Phase 100-120	Single-Phase 200-240	Three-Phase 200-240
	Permissible Voltage Range		−15～+10%		
	Rated Frequency	Hz	50/60		
	Permissible Frequency Range		±5%		
	Rated Input Current	A	3.3	2.0	1.2
	Maximum Input Current	A	8.2	4.4	2.5
Control Power Supply*1	Voltage		24 VDC		
	Permissible Voltage Range		−15～+20%		
Rated Torque		N·m (oz-in)	0.4 (56)		
Maximum Instantaneous Torque*2		N·m (oz-in)	0.8 (113)		
Rated Speed		r/min	3000		
Speed Control Range		r/min	100～4000 (Analog setting) 80～4000 (Setting in 1 r/min increments during digital setting)*3		
Round Shaft Type Permissible Inertia		J: $\times10^{-4}$ kg·m^2 (oz-in^2)	5.6 (31)		
Rotor Inertia		J: $\times10^{-4}$ kg·m^2 (oz-in^2)	0.61 (3.3)		
Speed Regulation	Load		±0.5% (±0.2%)*3 or less: Conditions 0～rated torque, rated speed, rated voltage, normal ambient temperature		
	Voltage		±0.5% (±0.2%)*3 or less: Conditions Rated voltage −15～+10%, rated speed, no load, normal ambient temperature		
	Temperature		±0.5% (±0.2%)*3 or less: Conditions Operating ambient temperature 0～+50°C (+32～+122°F), rated speed, no load, rated voltage		
Gravitational Operation Capability	Continuous Regenerative Power	W (HP)	100 (1/8)		
	Instantaneous Regenerative Power	W (HP)	240 (1/3)		
	Applicable Regeneration Unit*4		EPRC-400P		
Electromagnetic Brake*5	Brake Type		Power off activated type, automatically controlled by the driver		
	Static Friction Torque	N·m (oz-in)	0.4 (56)		

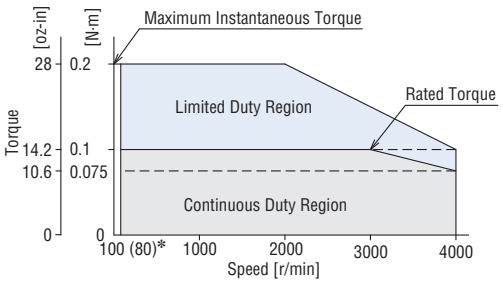
*1 Please provide for the RS-485 communication type.
*2 The maximum instantaneous torque can be used for up to approximately five seconds.
*3 These specifications apply when the RS-485 communication is used with either the **OPX-2A** or **MEXE02**.
*4 Install the regeneration unit in a place that has the same heat radiation capability as the heat sink [material: aluminum, 350×350 mm (13.8×13.8 in.), 3 mm (0.12 in.) thick].
*5 Do not start or stop the motor by turning the power supply ON/OFF, as this will cause the electromagnetic brake to wear abnormally.
● The values in the table are characteristics for the motor only.

● A number indicating the gear ratio is entered where the box □ is located within the product name.
Either **S** or **F** indicating the type of gearhead is entered where the box ■ is located within the product name.

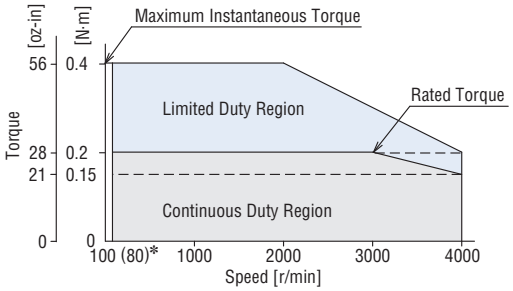
Speed - Torque Characteristics

Continuous Duty Region: Continuous operation is possible in this region.
Limited Duty Region : This region is used primarily when accelerating. When a load that exceeds the rated torque is applied continuously for approximately 5 seconds, overload protection is activated and the motor coasts to a stop.

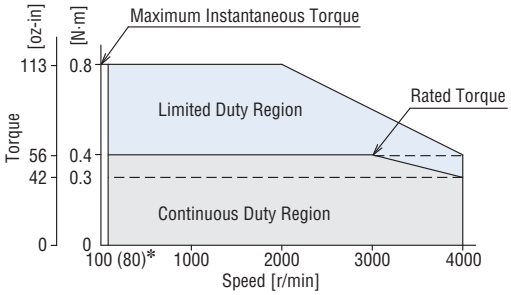
30 W (1/25 HP)



60 W (1/12 HP)



120 W (1/6 HP)



*Values in parentheses apply when RS-485 communication, **OPX-2A** or **MEXE02** is used.
● For combination types, the values are for the motor only.

Vertical Operation (Gravitational operation)

The **BLE** Series achieves stable speed control during gravitational operation.
During vertical operation, shown in the figure to the right, normally an external force causes the motor to rotate and function as a power generator. If this energy is applied to the driver, an error will occur. The accessory regeneration unit (sold separately) can convert regenerative energy into thermal energy for dissipation. Use the accessory regeneration unit when using the motor for vertical operation or when braking a big inertial load quickly.

Regeneration Unit Product Name : **EPRC-400P**
Continuous Regenerative Power : 100 W (1/8 HP)
Instantaneous Regenerative Power: 240 W (1/3 HP)

● Install the regeneration unit in a place that has the same heat radiation capability as the heat sink [material: aluminum, 350×350 mm (13.8×13.8 in.), 3 mm (0.12 in.) thick].

Note

● If the motor is used in a lift, the load may drop if the load exceeds the motor's rating or if the torque limit is set to a small value through RS-485 communication, **OPX-2A** or **MEXE02**. Even if the load is within the motor's rating, depending on the load conditions, reversing may occur momentarily during startup or shutdown.

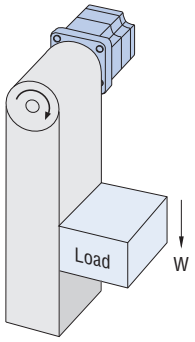
● Regenerative Power

The regenerative power can be estimated using the formula below. Use the calculated value as a reference.

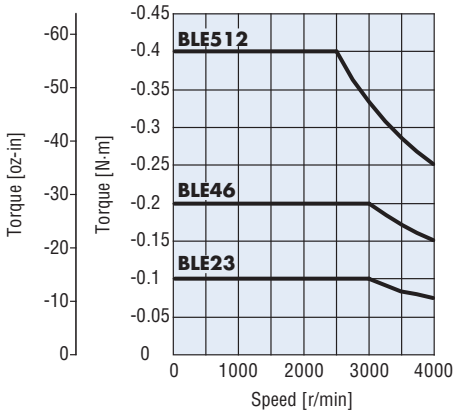
Regenerative Power (W) = $0.1047 \times T_L$ [N·m] $\times N$ [r/min]
T_L: Load torque N: Speed

● Use the electromagnetic brake type for gravitational operation.

Gravitational Operation Capability



Gravitational Operation Capability



● Gravitational operation exceeding the range of continuous regeneration capability will trigger the built-in thermal protector [150°C (302°F)].

Common Specifications (Standard type)

- Standard Product : These specifications apply when the basic motor and driver package is used.
- Extended Functions: These specifications apply when control module (**OPX-2A**) or data setting software (**MEXE02**) is used.

Item	Standard Product	Extended Functions
Speed Setting Methods	Select one of the following methods. ·Set using the internal speed potentiometer ·Set using an external speed potentiometer (included): **PAVR-20KZ** (20 kΩ, 1/4 W) ·Set using external DC voltage: 0～5 VDC, or 0～10 VDC, 1 mA min.	Select one of the following methods. ·Digital setting (**OPX-2A** or **MEXE02**) ·Set using the internal speed potentiometer ·Set using an external speed potentiometer (included): **PAVR-20KZ** (20 kΩ, 1/4 W) ·Set using external DC voltage: 0～5 VDC, or 0～10 VDC, 1 mA min.
Acceleration/ Deceleration Time	Set using acceleration and deceleration time potentiometer: 0.2～15 sec. (3000 r/min at no load)	Select one of the following methods. ·Digital setting (**OPX-2A** or **MEXE02**): 0.2～15 sec. (time until setting speed is achieved) ·Set using acceleration and deceleration time potentiometer: 0.2～15 sec. (3000 r/min at no load)
Multi-Speed Setting Methods	2 Speeds: 1 speed set by the internal speed potentiometer and 1 speed set by the external speed potentiometer (20 kΩ, 1/4 W) or external DC voltage (0～5 VDC or 0～10 VDC)	Select one of the following methods. ·8 Speeds: 8 speeds set by digital setting (**OPX-2A** or **MEXE02**) ·8 Speeds: 6 speeds set by digital setting (**OPX-2A** or **MEXE02**) and 2 speeds set by analog setting*
Input Signals	Photocoupler Input Input Resistance: 5.1 kΩ Operated by Internal Power Supply: 17 VDC±10% Connectable External DC Power Supply: 24 VDC −15～+20% Current 100 mA min.	
	Forward input (FWD), Reverse input (REV), Stop mode selection input (STOP-MODE), Speed setting selection input (M0), Alarm reset input (ALARM-RESET), Electromagnetic brake release input (MB-FREE), Regeneration unit thermal input (TH)	Arbitrary signal assignment to general purpose input X0～X6 (7 points) is possible Forward input (FWD), Reverse input (REV), Stop mode selection input (STOP-MODE), Speed setting selection input (M0, M1, M2), Alarm reset input (ALARM-RESET), Electromagnetic brake release input (MB-FREE), Regeneration unit thermal input (TH), External error signal (EXT-ERROR)
Output Signals	Open-collector output External Use Condition: Voltage control 4.5～30.0 VDC Current 40 mA max. Speed Output: 5 mA min.	
	Speed output (SPEED-OUT), Alarm output 1 (ALARM-OUT 1)	Arbitrary signal assignment to general purpose output Y0, Y1 (2 points) is possible Speed output (SPEED-OUT), Alarm output 1 (ALARM-OUT1), Motor running output (MOVE), Speed attainment output (VA), Alarm output 2 (ALARM-OUT2), Warning output (WNG), Torque limit output (TLC)
Protective Function	When the following protective functions are activated, the motor will coast to a stop, and the ALARM output will be turned off. Overload, Sensor error, Initial sensor error, Overvoltage, Undervoltage, Overspeed, Overcurrent, EEPROM error, Regeneration unit overheat, External stop, Initial operation inhibition, Main circuit output error	
Maximum Extension Distance	Motor and Driver Distance: 20.5 m (67.2 ft.) (when a connection cable is used)	
Time Rating	Continuous	

*One speed set by the internal speed potentiometer and one speed set by the external speed potentiometer (20 kΩ, 1/4 W) or external DC voltage (0～5 VDC or 0～10 VDC).

Common Specifications (RS-485 communication type)

- Analog Speed Setting: Speed setting by the external speed potentiometer or external DC voltage
- Digital Speed Setting : Speed setting through RS-485 communication with the **OPX-2A** or **MEXE02**

Item		Specifications
Speed Setting Methods	Digital Setting	・RS-485 Communication ・Control Module (**OPX-2A**) ・Data Setting Software (**MEXE02**)
	Analog Setting	・External speed potentiometer (included): **PAVR-20KZ** (20 kΩ, 1/4 W) ・External DC voltage: 0～10 VDC, 1 mA min.
Acceleration/Deceleration Time	Digital Setting	0.2～15 sec. Analog Speed Setting: Time to change from standstill to the rated speed Digital Speed Setting: Time to change from the current speed to the set speed
Multi-Speed Setting Methods	Digital Setting	Select one of the following methods. ・16 Speeds: 16 speeds set by digital setting (RS-485 communication, **OPX-2A** or **MEXE02**) ・16 Speeds: 15 speeds set by digital setting (RS-485 communication, **OPX-2A** or **MEXE02**) and 1 speed set by analog setting (external speed potentiometer or external DC voltage)
Input Signals	Photocoupler Input Input Resistance: 5.1 kΩ Operated by Internal Power Supply: 24 VDC −15～+20% Connectable External Power Supply: 24 VDC −15～+20% 100 mA min.	
	Input signals can be assigned to input terminals IN0～IN6. For the input signals that can be assigned, refer to page D-75.	
Output Signals	Open-collector output External power supply: 4.5～30 VDC Speed output: 5～40 mA Other outputs: 40 mA max.	
	Output signals can be assigned to output terminals OUT0 and OUT1. For the output signals that can be assigned, refer to page D-75.	
Protective Function	When the following protective functions are activated, the motor will coast to a stop, and the ALARM output will be turned off. Overload, Sensor error, Initial sensor error, Overvoltage, Undervoltage, Overspeed, Overcurrent, EEPROM error, Regeneration unit overheat, External stop, Initial operation inhibition, Network bus error, Communication switch setting error, RS-485 communication error, RS-485 communication timeout, Network converter error, Main power supply off, Main circuit output error	
Maximum Extension Distance	Motor and Driver Distance: 20.5 m (67.2 ft.) (when a connection cable is used)	
Time Rating	Continuous	

RS-485 Communication Specifications (RS-485 communication type)

Protocol	Modbus Protocol (Modbus RTU mode)
Electrical Characteristics	Complies with EIA-485. Use twisted-pair cables (TIA/EIA-568B CAT5e or better recommended). The maximum total extension length is 50 m (164 ft.).
Transmission/Reception Mode	Half duplex
Baud Rate	9600 bps, 19200 bps, 38400 bps, 57600 bps, 115200 bps
Physical Layer	Start-stop synchronization (data: 8 bits, stop bit: 1 bit or 2 bits, parity: none, even, or odd)
Connection Type	Up to 31 units can be connected to a single programmable controller (master unit).

Torque Limiting Function

A limit on the output torque of the motor can be set by using a control module (**OPX-2A**), data setting software (**MEXE02**), or RS-485 communication.

Item	Specifications
Torque Limiting Setting Methods	Select one of the following methods. ·Digital Independent Setting: Torque limiting values can be set separately for 8 data sets (standard type) and 16 data sets (RS-485 communication type). ·External Analog Common Setting: A torque limiting value can be set to all data sets at once with an external speed potentiometer **PAVR-20KZ** (20 kΩ, 1/4 W) or with external DC voltage (0～5 VDC or 0～10 VDC). The same torque limiting value applies to all operation data.
Torque Limiting Setting Range	Assuming that the rated torque of the motor is 100%, torque limiting values can be set in the following ranges (initial value 200%). ·Digital Setting: 0～200% (set in 1% increments) ·External Analog Common Setting: Set from 0～200% with an external speed potentiometer **PAVR-20KZ** (20 kΩ, 1/4 W) or with external DC voltage (0～5 VDC or 0～10 VDC)

Note

- An error up to a maximum of approximately ±20% (at rated torque and rated speed) may occur between the setting value and generated torque due to the setting speed, power supply voltage and motor cable extension length.

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 a 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 1834 VAC at 50 Hz applied between the power supply terminal and the protective earth terminal and with application of 3 kVAC at 50 Hz between the power supply terminal and the I/O terminal for 1 minute after continuous operation under normal ambient temperature and humidity.
Temperature Rise		Temperature rise of the windings and the case are 50°C (90°F) or less, and 40°C (72°F) or less*1 respectively measured by the thermocouple method after continuous operation under normal ambient temperature and humidity.	Temperature rise of the heat radiation plate is 50°C (90°F) or less measured by the thermocouple method after continuous operation under normal ambient temperature and humidity.
Operating Environment	Ambient Temperature	0～+50°C (+32～+122°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 environment	
	Vibration	Not subject to continuous vibration or excessive impact In conformance with JIS C 60068-2-6, "Sine-wave vibration test method" Frequency range: 10～55 Hz Pulsating amplitude: 0.15 mm (0.006 in.) Sweep direction: 3 directions (X, Y, Z) Number of sweeps: 20 times	
Storage Condition*2	Ambient Temperature	−25～+70°C (−13～+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		IP65 (Excluding the mounting surface of the round shaft type and connectors)	IP20

*1 For round shaft types, please attach to the heat radiation plate (material: aluminum) of the following sizes to maintain a maximum motor case temperature of 90°C (194°F).
30 W (1/25 HP) Standard Type: 115×115 mm (4.53×4.53 in.), 5 mm (0.20 in.) thick
30 W (1/25 HP) With Electromagnetic Brake Type: 135×135 mm (5.31×5.31 in.), 5 mm (0.20 in.) thick
60 W (1/12 HP) Type: 135×135 mm (5.31×5.31 in.), 5 mm (0.20 in.) thick
120 W (1/6 HP) Type: 165×165 mm (6.50×6.50 in.), 5 mm (0.20 in.) 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.

Permissible Torque on Combination Types

Combination Type, Parallel Shaft Gearhead

Unit: N·m (lb-in)

Product Name	Motor Shaft Speed \ Gear Ratio	5	10	15	20	30	50	100	200
BLE23	At 100~3000 r/min	0.45 (3.9)	0.90 (7.9)	1.4 (12.3)	1.8 (15.9)	2.6 (23)	4.3 (38)	6 (53)	6 (53)
	At 4000 r/min	0.34 (3.0)	0.68 (6.0)	1.0 (8.8)	1.4 (12.3)	1.9 (16.8)	3.2 (28)	5.4 (47)	5.4 (47)
BLE46	At 100~3000 r/min	0.90 (7.9)	1.8 (15.9)	2.7 (23)	3.6 (31)	5.2 (46)	8.6 (76)	16 (141)	16 (141)
	At 4000 r/min	0.68 (6.0)	1.4 (12.3)	2.0 (17.7)	2.7 (23)	3.9 (34)	6.5 (57)	12.9 (114)	14 (123)
BLE512	At 100~3000 r/min	1.8 (15.9)	3.6 (31)	5.4 (47)	7.2 (63)	10.3 (91)	17.2 (152)	30 (260)	30 (260)
	At 4000 r/min	1.4 (12.3)	2.7 (23)	4.1 (36)	5.4 (47)	7.7 (68)	12.9 (114)	25.8 (220)	27 (230)

● 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 (lb-in)

Product Name	Motor Shaft Speed \ Gear Ratio	5	10	15	20	30	50	100	200
BLE23	At 100~3000 r/min	0.4 (3.5)	0.85 (7.5)	1.3 (11.5)	1.7 (15.0)	2.6 (23)	4.3 (38)	8.5 (75)	17 (150)
	At 4000 r/min	0.3 (2.6)	0.64 (5.6)	0.96 (8.4)	1.3 (11.5)	1.9 (16.8)	3.2 (28)	6.4 (56)	12.8 (113)
BLE46	At 100~3000 r/min	0.85 (7.5)	1.7 (15.0)	2.6 (23)	3.4 (30)	5.1 (45)	8.5 (75)	17 (150)	34 (300)
	At 4000 r/min	0.64 (5.6)	1.3 (11.5)	1.9 (16.8)	2.6 (23)	3.8 (33)	6.4 (56)	12.8 (113)	25.5 (220)
BLE512	At 100~3000 r/min	1.7 (15.0)	3.4 (30)	5.1 (45)	6.8 (60)	10.2 (90)	17 (150)	34 (300)	68 (600)
	At 4000 r/min	1.3 (11.5)	2.6 (23)	3.8 (33)	5.1 (45)	7.7 (68)	12.8 (113)	25.5 (220)	51 (450)

● The flat gearhead rotates in the opposite direction to the motor when viewed from the front face of the gearhead. It rotates in the same direction as the motor when viewed from the rear (motor mounting surface) of the gearhead.

Rotation direction of hollow shaft flat gearhead ➜ Page D-195

Output Shaft Speed of Combination Types

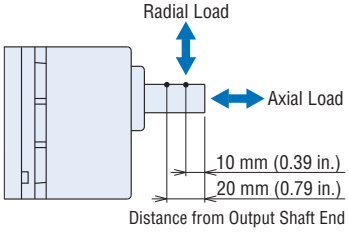
Unit: r/min

Motor Shaft Speed \ Gear Ratio	5	10	15	20	30	50	100	200
100 r/min	20	10	6.7	5	3.3	2	1	0.5
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, Parallel Shaft Gearhead

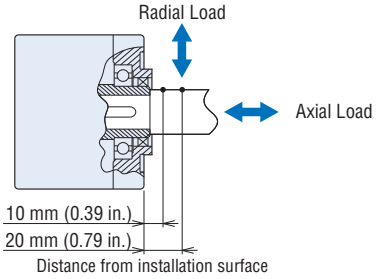
Product Name	Gear Ratio		Permissible Radial Load: 10 mm (0.39 in.) from shaft end N	lb.	Permissible Radial Load: 20 mm (0.79 in.) from shaft end N	lb.	Permissible Axial Load N	lb.
BLE23	**5**	At 100~3000 r/min	100	22	150	33	40	9
		At 4000 r/min	90	20	110	24		
	10, 15, 20	At 100~3000 r/min	150	33	200	45		
		At 4000 r/min	130	29	170	38		
	30, 50, 100, 200	At 100~3000 r/min	200	45	300	67		
		At 4000 r/min	180	40	230	51		
BLE46	**5**	At 100~3000 r/min	200	45	250	56	100	22
		At 4000 r/min	180	40	220	49		
	10, 15, 20	At 100~3000 r/min	300	67	350	78		
		At 4000 r/min	270	60	330	74		
	30, 50, 100, 200	At 100~3000 r/min	450	101	550	123		
		At 4000 r/min	420	94	500	112		
BLE512	**5**	At 100~3000 r/min	300	67	400	90	150	33
		At 4000 r/min	230	51	300	67		
	10, 15, 20	At 100~3000 r/min	400	90	500	112		
		At 4000 r/min	370	83	430	96		
	30, 50, 100, 200	At 100~3000 r/min	500	112	650	146		
		At 4000 r/min	450	101	550	123		



●Combination Type, Hollow Shaft Flat Gearhead

Product Name	Gear Ratio		Permissible Radial Load: 10 mm (0.39 in.) from mounting surface of gearhead N	lb.	Permissible Radial Load: 20 mm (0.79 in.) from mounting surface of gearhead N	lb.	Permissible Axial Load N	lb.
BLE23	5, 10	At 100～3000 r/min	450	101	370	83	200	45
		At 4000 r/min	410	92	330	74		
	15, 20, 30, 50, 100, 200	At 100～3000 r/min	500	112	400	90		
		At 4000 r/min	460	103	370	83		
BLE46	5, 10	At 100～3000 r/min	800	180	660	148	400	90
		At 4000 r/min	730	164	600	135		
	15, 20, 30, 50, 100, 200	At 100～3000 r/min	1200	270	1000	220		
		At 4000 r/min	1100	240	910	200		
BLE512	5, 10	At 100～3000 r/min	900	200	770	173	500	112
		At 4000 r/min	820	184	700	157		
	15, 20	At 100～3000 r/min	1300	290	1110	240		
		At 4000 r/min	1200	270	1020	220		
	30, 50, 100, 200	At 100～3000 r/min	1500	330	1280	280		
		At 4000 r/min	1400	310	1200	270		

● The permissible radial load can also be calculated with a formula. Calculation of permissible radial load ➜ Page D-194



●Round Shaft Type

Product Name	Permissible Radial Load: 10 mm (0.39 in.) from shaft end N	lb.	20 mm (0.79 in.) from shaft end N	lb.	Permissible Axial Load
BLE23	80	18	100	22	The permissible axial load should not be greater than half the motor mass.
BLE46	110	24	130	29	
BLE512	150	33	170	38	

■Permissible Inertia J of Combination Types

●Combination Type, Parallel Shaft Gearhead

Unit: $\times 10^{-4}$kg·m^2 (oz-in^2)

Product Name	Gear Ratio	5	10	15	20	30	50	100	200
BLE23		12 (66)	50 (270)	110 (600)	200 (1090)	370 (2000)	920 (5000)	2500 (13700)	5000 (27000)
	When instantaneous stop or instantaneous bi-directional operation is performed	1.55 (8.5)	6.2 (34)	14.0 (77)	24.8 (136)	55.8 (310)	155 (850)	155 (850)	155 (850)
BLE46		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)
BLE512		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)

●Combination Type, Hollow Shaft Flat Gearhead

Unit: $\times 10^{-4}$kg·m^2 (oz-in^2)

Product Name	Gear Ratio	5	10	15	20	30	50	100	200
BLE23		12 (66)	50 (270)	110 (600)	200 (1090)	370 (2000)	920 (5000)	2500 (13700)	5000 (27000)
	When instantaneous stop or instantaneous bi-directional operation is performed	1.55 (8.5)	6.2 (34)	14.0 (77)	24.8 (136)	55.8 (310)	155 (850)	155 (850)	155 (850)
BLE46		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)
BLE512		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)

Dimensions Unit = mm (in.)

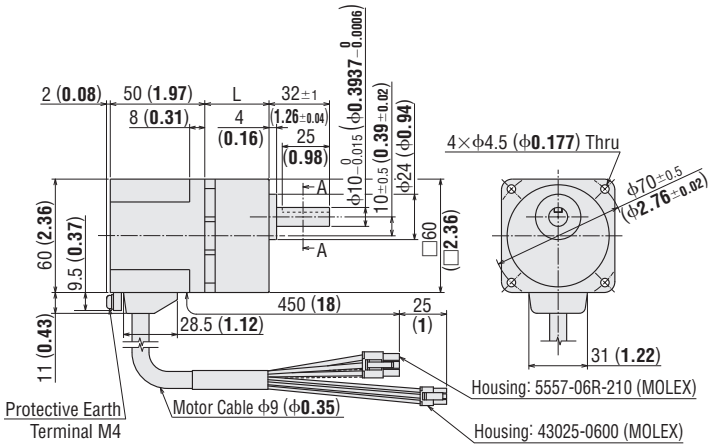
- Installation screws are included with the combination type. Dimensions for installation screws → Page D-194
- For the RS-485 communication type, **R** is entered where the box ■ is located within the product name.
- A number indicating the gear ratio is entered where the box □ is located within the product name.

Standard Type, RS-485 Communication Type, 30 W (1/25 HP)

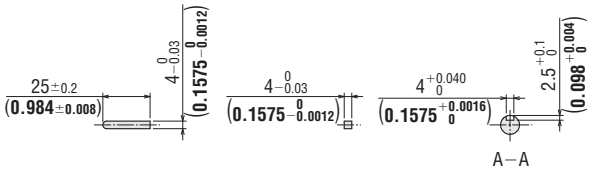
◇Motor/Parallel Shaft Gearhead

2D & 3D CAD

Product Name	Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass kg (lb.)	2D CAD
BLE23A■□S-3 **BLE23C■□S-3** **BLE23S□S-3**	BLEM23-GFS	GFS2G□	**5~20**	34 (1.34)	1.1 (2.4)	A694A
			30~100	38 (1.50)		A694B
			200	43 (1.69)		A694C



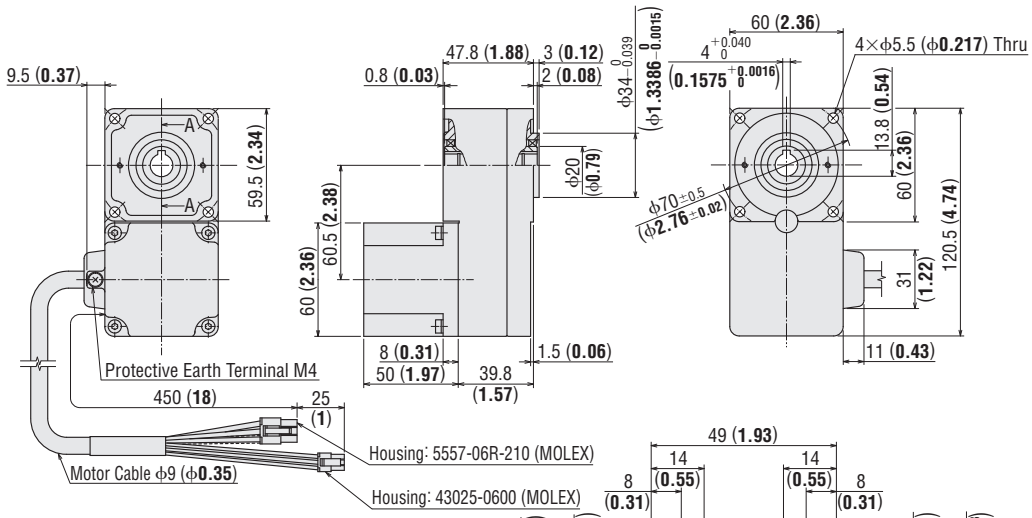
◇Key and Key Slot (Included)



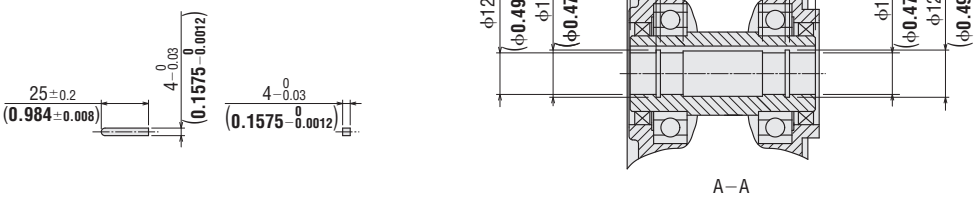
◇Motor/Hollow Shaft Flat Gearhead

BLE23A■□F-3, **BLE23C■□F-3**, **BLE23S□F-3**

Motor: BLEM23-GFS
Gearhead: GFS2G□FR
Mass: 1.4 kg (3.1 lb.)
2D CAD A695
3D CAD



◇Key (Included)



◇Round Shaft Type

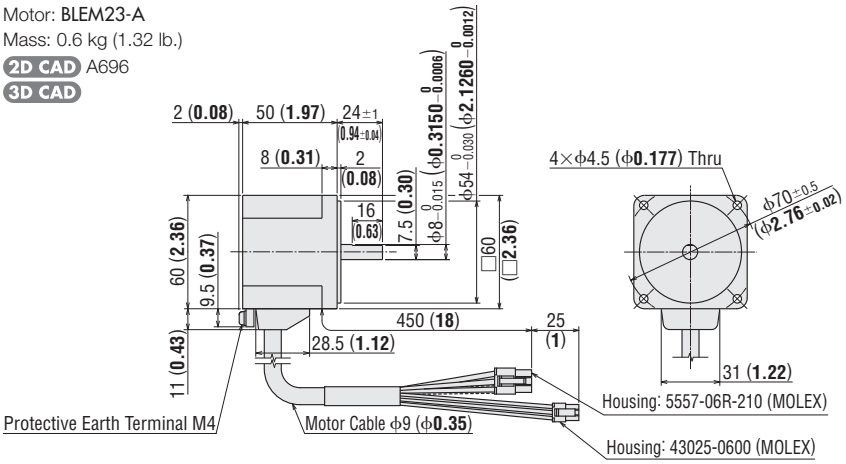
BLE23A■A-3, BLE23C■A-3, BLE23SA-3

Motor: BLEM23-A

Mass: 0.6 kg (1.32 lb.)

2D CAD A696

3D CAD

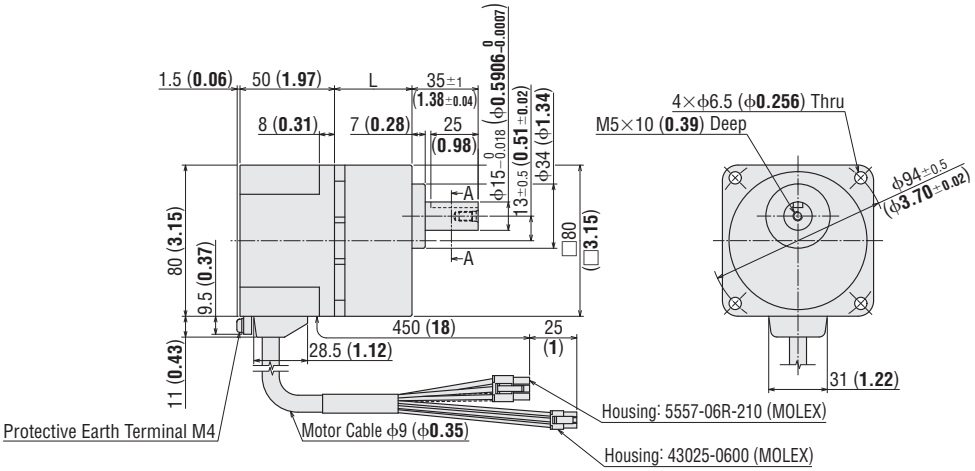


●Standard Type, RS-485 Communication Type, 60 W (1/12 HP)

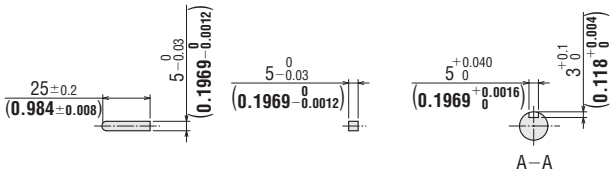
◇Motor/Parallel Shaft Gearhead

2D & 3D CAD

Product Name	Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass kg (lb.)	2D CAD
BLE46A■□S-3 **BLE46C■□S-3** **BLE46S□S-3**	BLEM46-GFS	GFS4G□	**5～20**	41 (1.61)	1.9 (4.2)	A697A
			30～100	46 (1.81)		A697B
			200	51 (2.01)		A697C



◇Key and Key Slot (Included)



◇Motor/Hollow Shaft Flat Gearhead

BLE46A■□F-3, **BLE46C■□F-3**, **BLE46S□F-3**

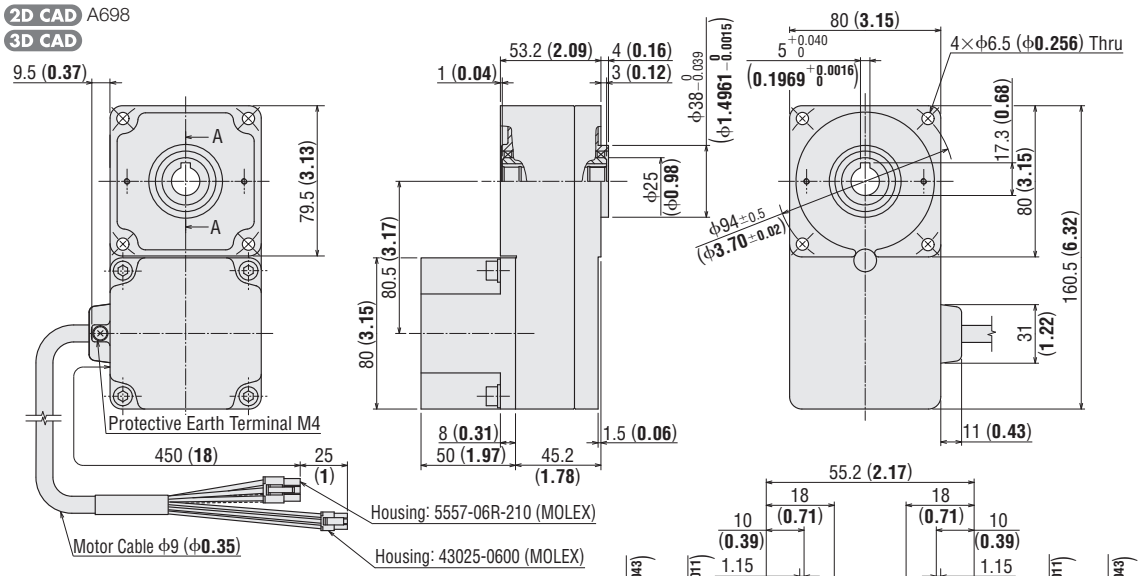
Motor: BLEM46-GFS

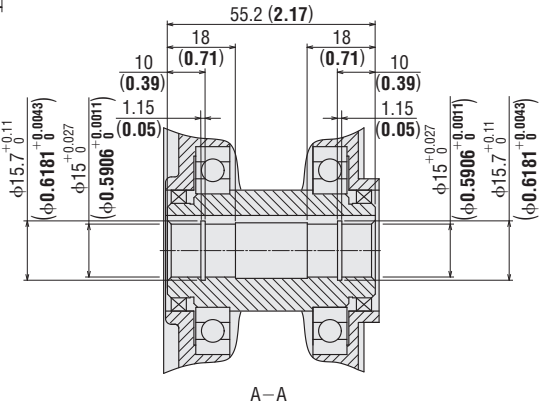
Gearhead: GFS4G□FR

Mass: 2.5 kg (5.5 lb.)

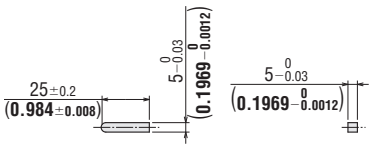
2D CAD A698

3D CAD





◇Key (Included)



◇Round Shaft Type

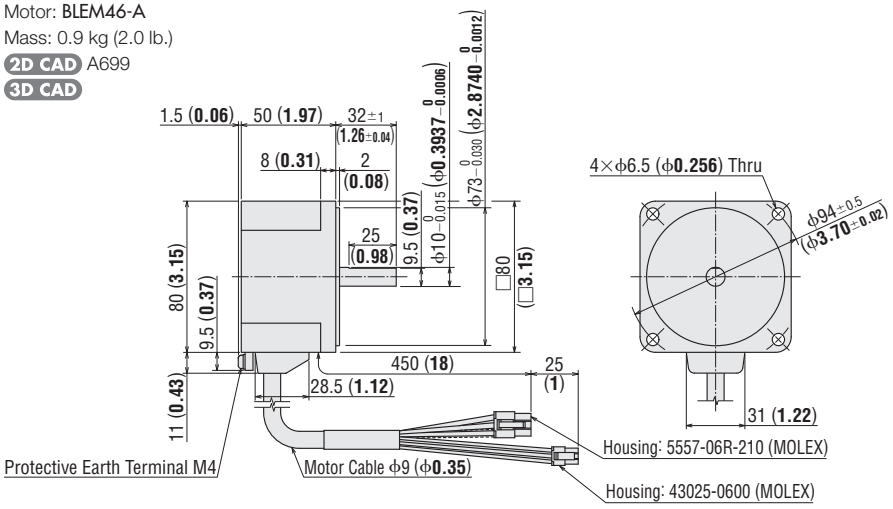
BLE46A■A-3, **BLE46C■A-3**, **BLE46SA-3**

Motor: BLEM46-A

Mass: 0.9 kg (2.0 lb.)

2D CAD A699

3D CAD

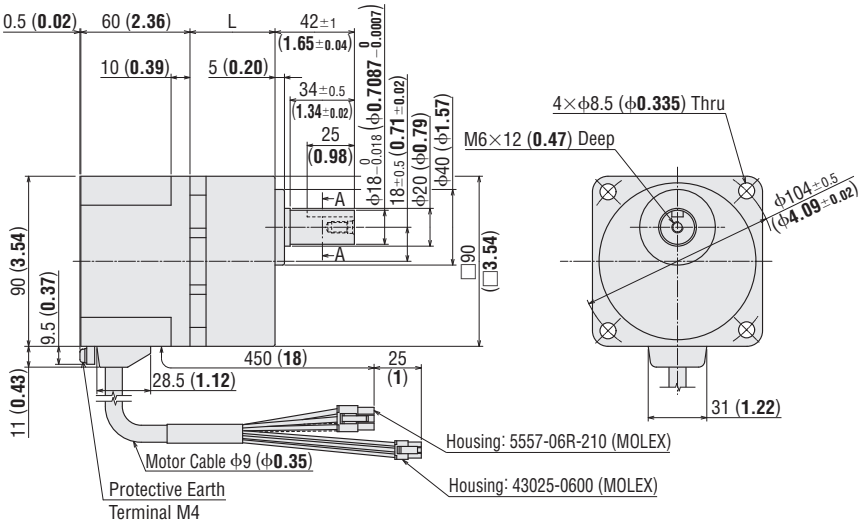


●Standard Type, RS-485 Communication Type, 120 W (1/6 HP)

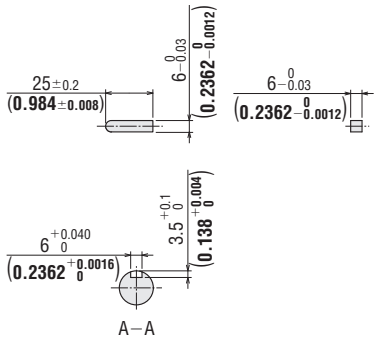
◇Motor/Parallel Shaft Gearhead

2D & 3D CAD

Product Name	Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass kg (lb.)	2D CAD
BLE512A■□S-3 **BLE512C■□S-3** **BLE512S□S-3**	BLEM512-GFS	GFS5G□	**5～20**	45 (1.77)	3.0 (6.6)	A700A
			30～100	58 (2.28)		A700B
			200	64 (2.52)		A700C



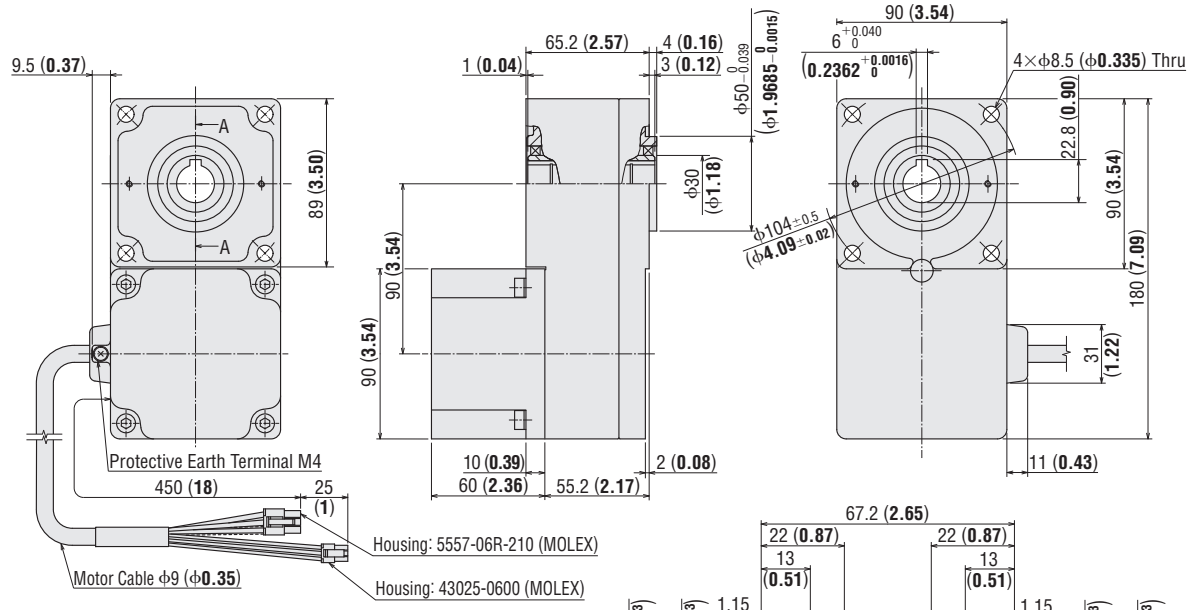
◇Key and Key Slot (Included)



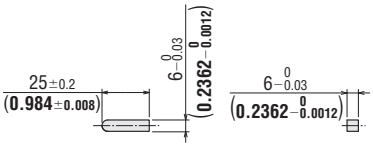
◇Motor/Hollow Shaft Flat Gearhead

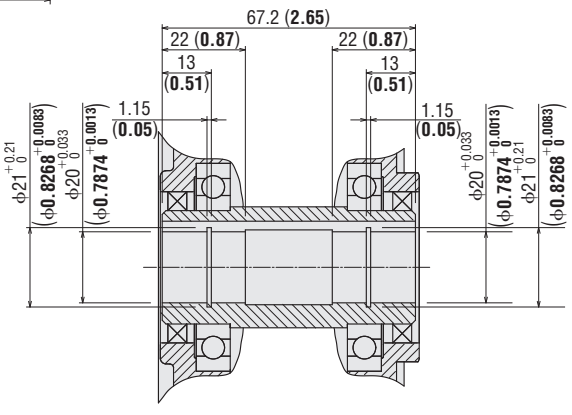
BLE512A■□F-3, **BLE512C■□F-3**, **BLE512S□F-3**

Motor: BLEM512-GFS
Gearhead: GFS5G□FR
Mass: 3.7 kg (8.1 lb.)
2D CAD A701
3D CAD



◇Key (Included)





◇Round Shaft Type

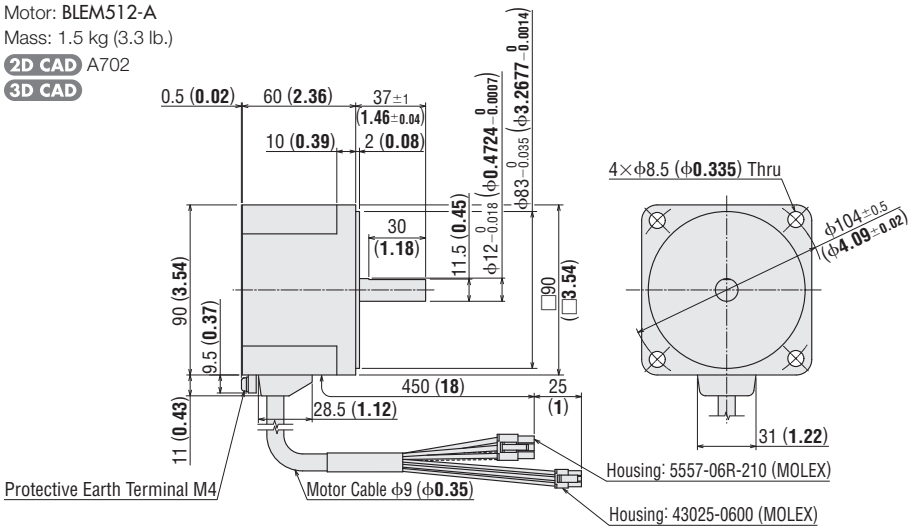
BLE512A■A-3, **BLE512C■A-3**, **BLE512SA-3**

Motor: BLEM512-A

Mass: 1.5 kg (3.3 lb.)

2D CAD A702

3D CAD

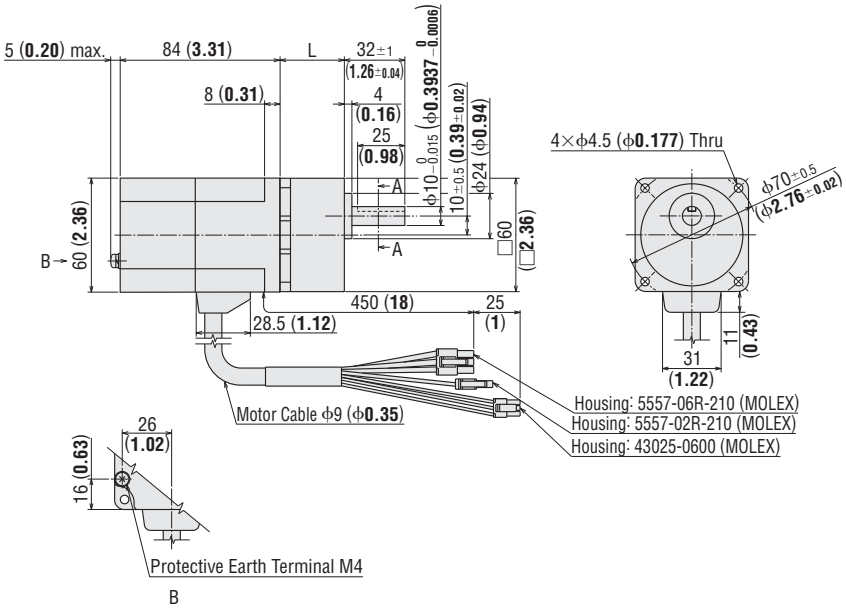


●Standard Type with Electromagnetic Brake, RS-485 Communication Type with Electromagnetic Brake, 30 W (1/25 HP)

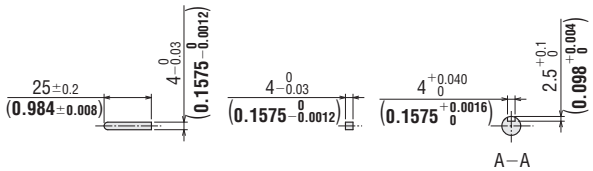
◇Motor/Parallel Shaft Gearhead

2D & 3D CAD

Product Name	Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass kg (lb.)	2D CAD
BLE23AM■□S-3 **BLE23CM■□S-3** **BLE23SM□S-3**	BLEM23M2-GFS	GFS2G□	**5**~**20**	34 (1.34)	1.4 (3.1)	A1132A
			30~**100**	38 (1.50)		A1132B
			200	43 (1.69)		A1132C



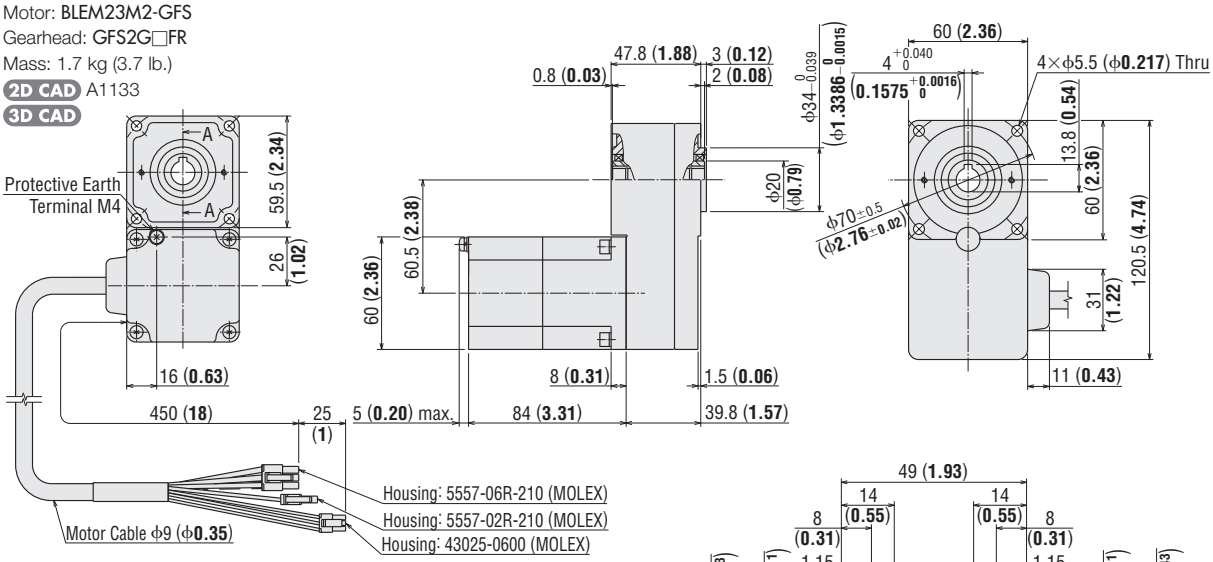
◇Key and Key Slot (Included)



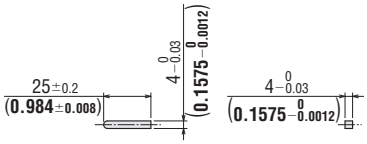
◇Motor/Hollow Shaft Flat Gearhead

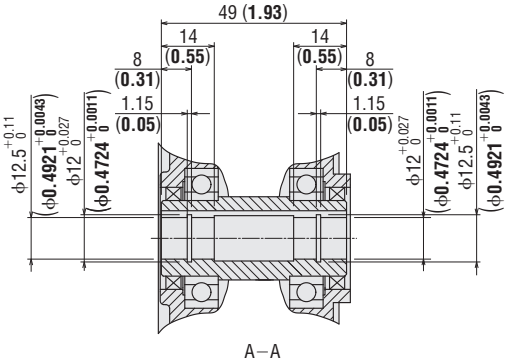
BLE23AM■□F-3, BLE23CM■□F-3, BLE23SM□F-3

Motor: BLEM23M2-GFS
Gearhead: GFS2G□FR
Mass: 1.7 kg (3.7 lb.)
2D CAD A1133
3D CAD



◇Key (Included)

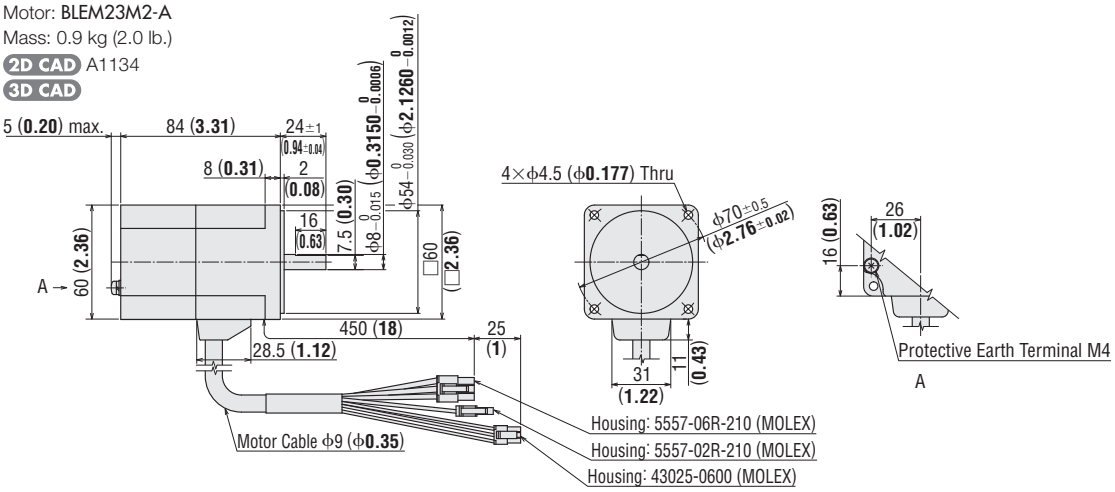




◇Round Shaft Type

BLE23AM■A-3, BLE23CM■A-3, BLE23SMA-3

Motor: BLEM23M2-A
Mass: 0.9 kg (2.0 lb.)
2D CAD A1134
3D CAD

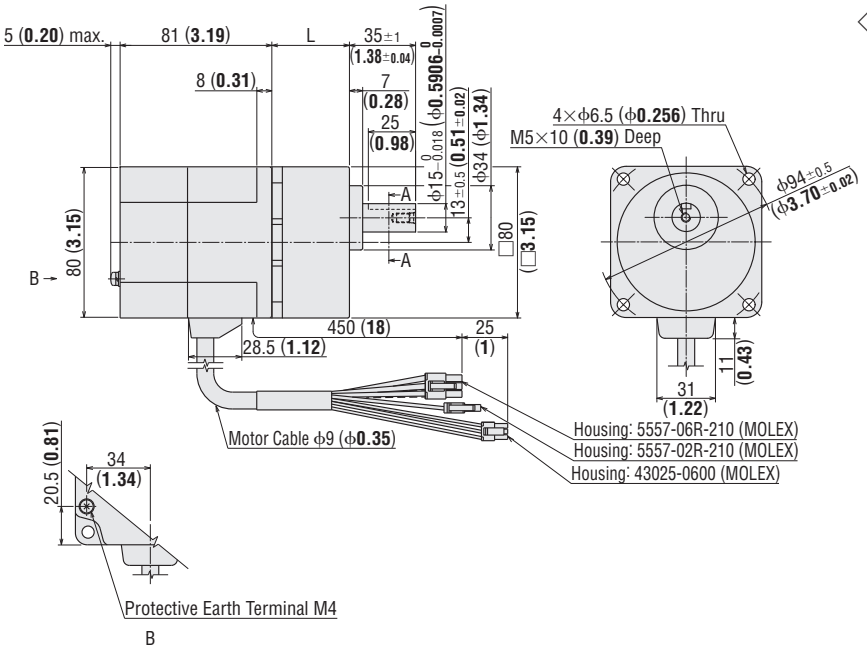


●Standard Type with Electromagnetic Brake, RS-485 Communication Type with Electromagnetic Brake, 60 W (1/12 HP)

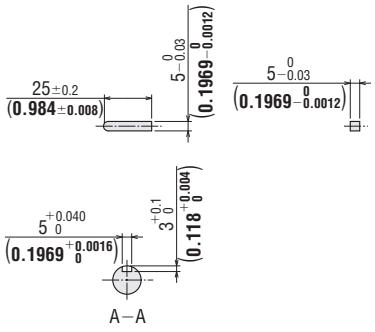
◇Motor/Parallel Shaft Gearhead

2D & 3D CAD

Product Name	Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass kg (lb.)	2D CAD
BLE46AM■□S-3 **BLE46CM■□S-3** **BLE46SM□S-3**	BLEM46M2-GFS	GFS4G□	**5~20**	41 (1.61)	2.5 (5.5)	A1135A
			30~100	46 (1.81)		A1135B
			200	51 (2.01)		A1135C



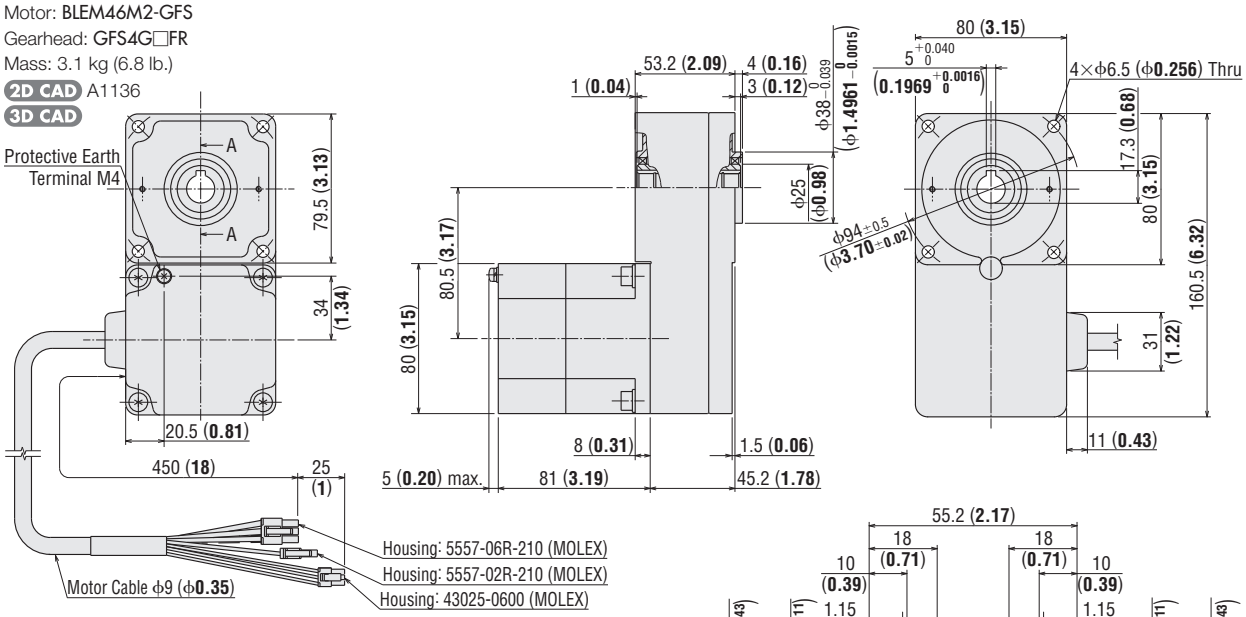
◇Key and Key Slot (Included)



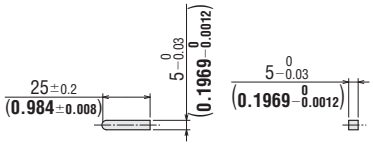
◇Motor/Hollow Shaft Flat Gearhead

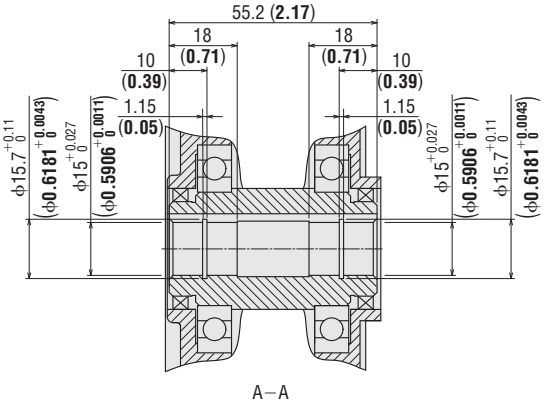
BLE46AM■□F-3, **BLE46CM■□F-3**, **BLE46SM□F-3**

Motor: BLEM46M2-GFS
Gearhead: GFS4G□FR
Mass: 3.1 kg (6.8 lb.)
2D CAD A1136
3D CAD



◇Key (Included)





◇Round Shaft Type

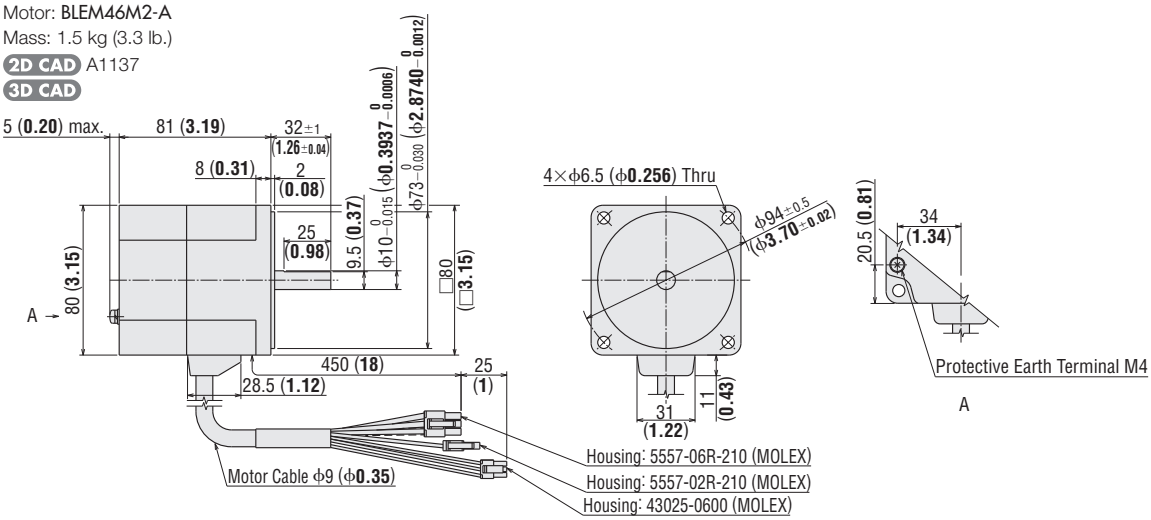
BLE46AM■A-3, BLE46CM■A-3, BLE46SMA-3

Motor: BLEM46M2-A

Mass: 1.5 kg (3.3 lb.)

2D CAD A1137

3D CAD

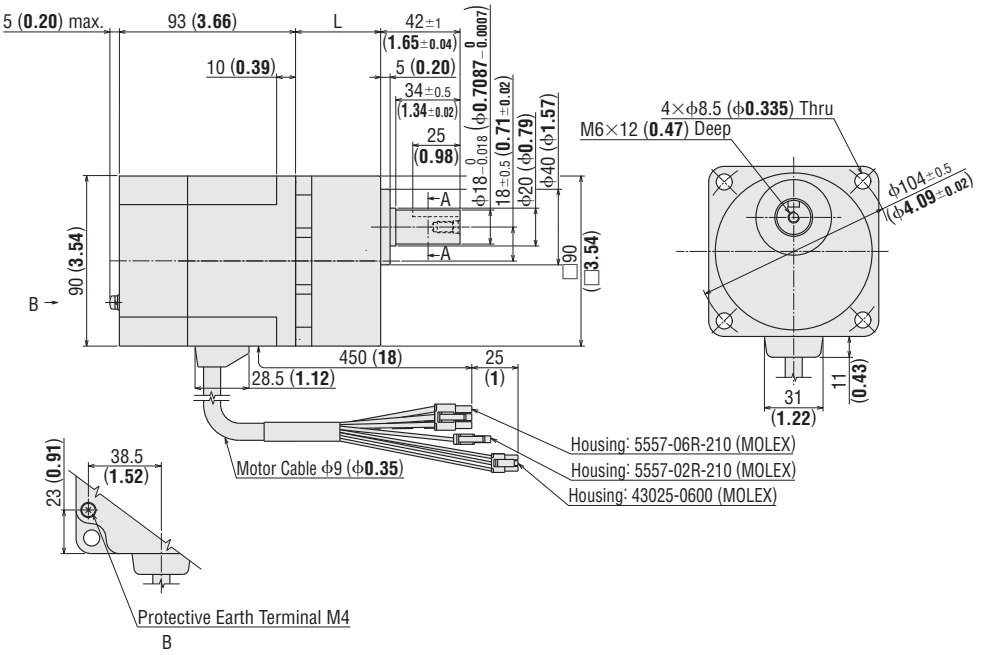


●Standard Type with Electromagnetic Brake, RS-485 Communication Type with Electromagnetic Brake, 120 W (1/6 HP)

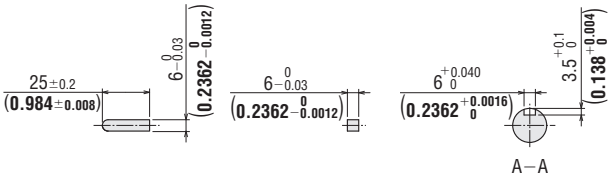
◇Motor/Parallel Shaft Gearhead

2D & 3D CAD

Product Name	Motor Product Name	Gearhead Product Name	Gear Ratio	L	Mass kg (lb.)	2D CAD
BLE512AM■□S-3 **BLE512CM■□S-3** **BLE512SM□S-3**	BLEM512M2-GFS	GFS5G□	**5~20**	45 (1.77)	3.6 (7.9)	A1093A
			30~100	58 (2.28)		A1093B
			200	64 (2.52)		A1093C



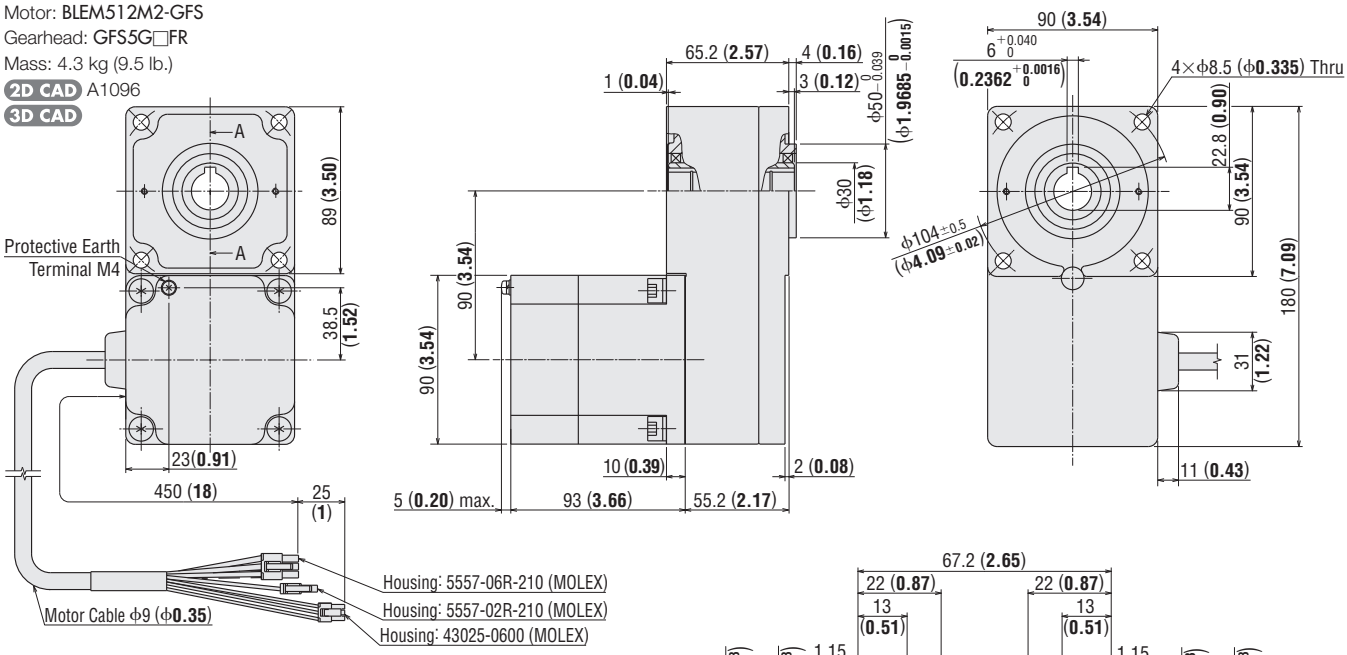
◇Key and Key Slot (Included)

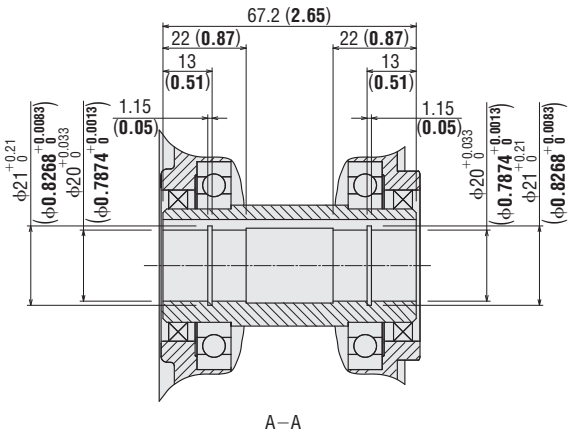


◇Motor/Hollow Shaft Flat Gearhead

BLE512AM■□F-3, BLE512CM■□F-3, BLE512SM□F-3

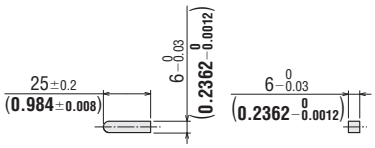
Motor: BLEM512M2-GFS
Gearhead: GFS5G□FR
Mass: 4.3 kg (9.5 lb.)
2D CAD A1096
3D CAD





A–A

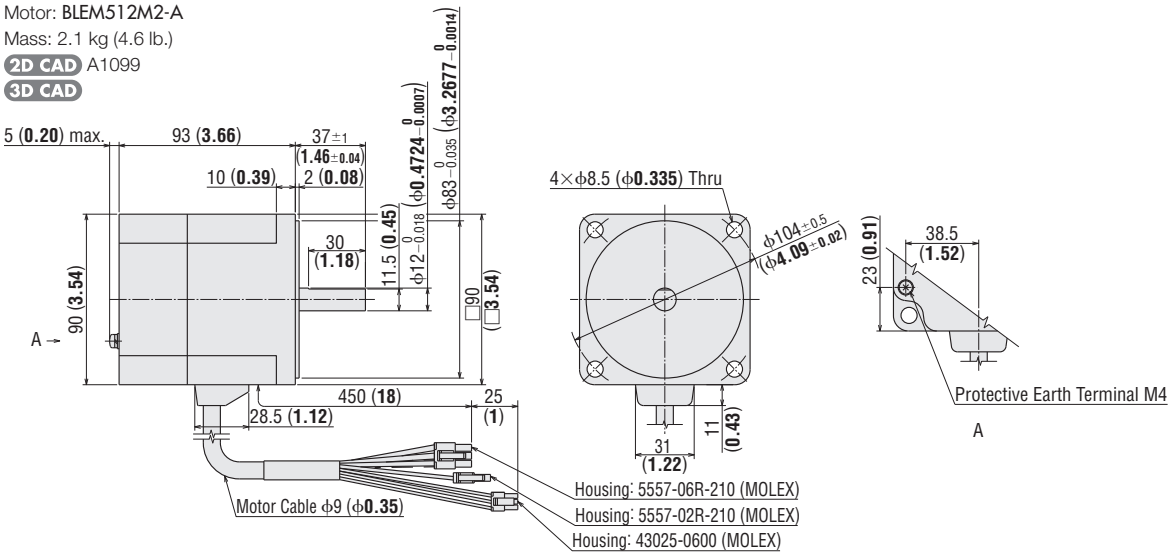
◇Key (Included)



◇Round Shaft Type

BLE512AM■A-3, BLE512CM■A-3, BLE512SMA-3

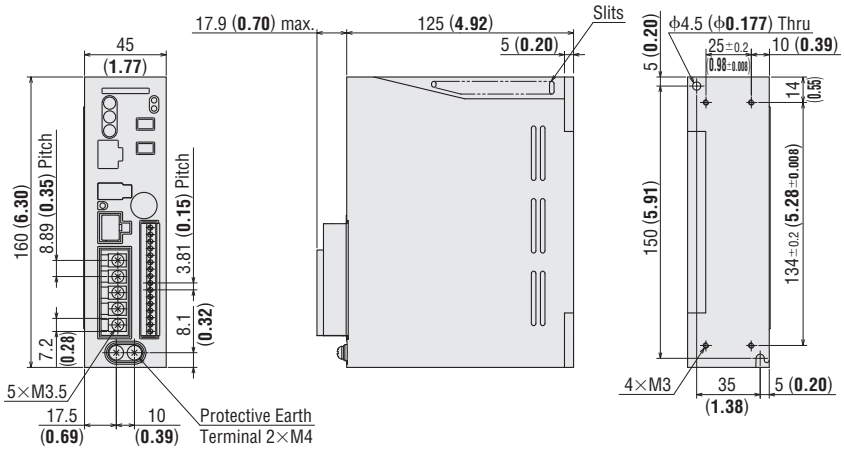
Motor: BLEM512M2-A
Mass: 2.1 kg (4.6 lb.)
2D CAD A1099
3D CAD



●Driver

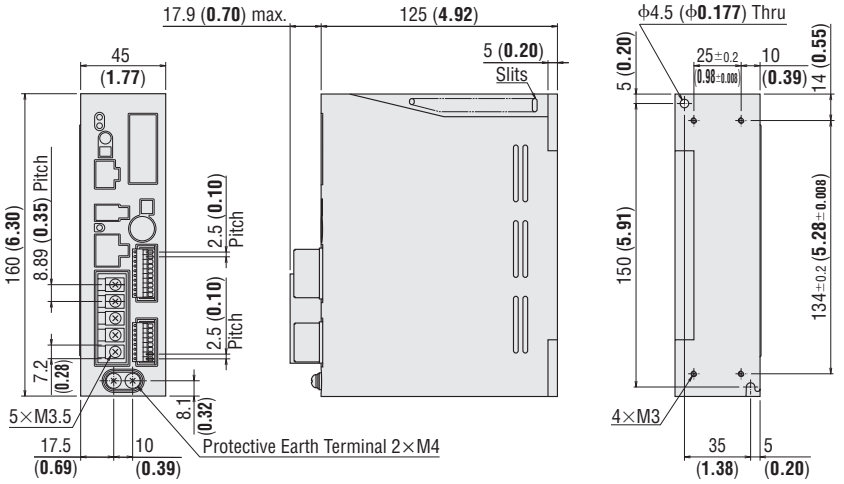
◇Standard Type

BLED3A, BLED3C, BLED3S, BLED6A, BLED6C, BLED6S, BLED12A, BLED12C, BLED12S
BLED3AM, BLED3CM, BLED3SM, BLED6AM, BLED6CM, BLED6SM, BLED12AM, BLED12CM, BLED12SM
Mass: 0.7 kg (1.54 lb.)
2D CAD A916
3D CAD



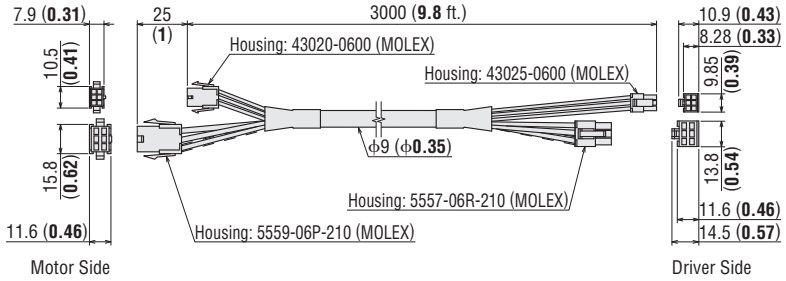
◇RS-485 Communication Type

BLED3AM-R, BLED3CM-R, BLED6AM-R, BLED6CM-R, BLED12AM-R, BLED12CM-R
Mass: 0.7 kg (1.54 lb.)
2D CAD A1183
3D CAD

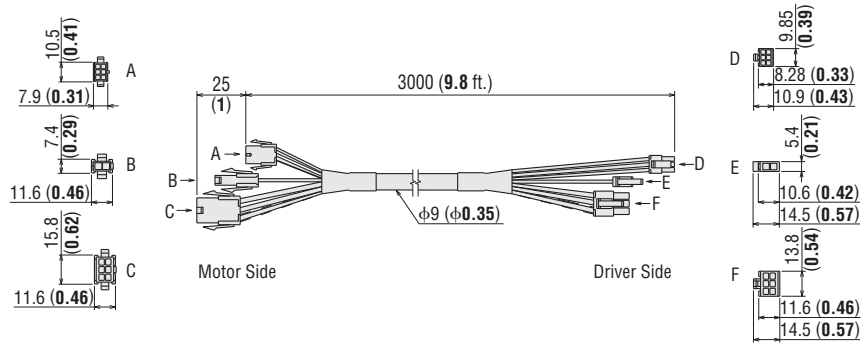


●Connection Cable (Included)

◇Cable for the Standard Type Motor

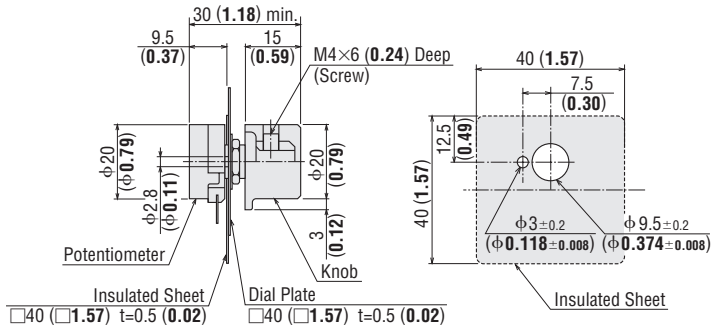


◇Cable for the Motor with the Electromagnetic Brake



Code	Housing Part Number	Manufacturer
A	43020-0600	MOLEX
B	5559-02P-210	
C	5559-06P-210	
D	43025-0600	
E	5557-02R-210	
F	5557-06R-210	

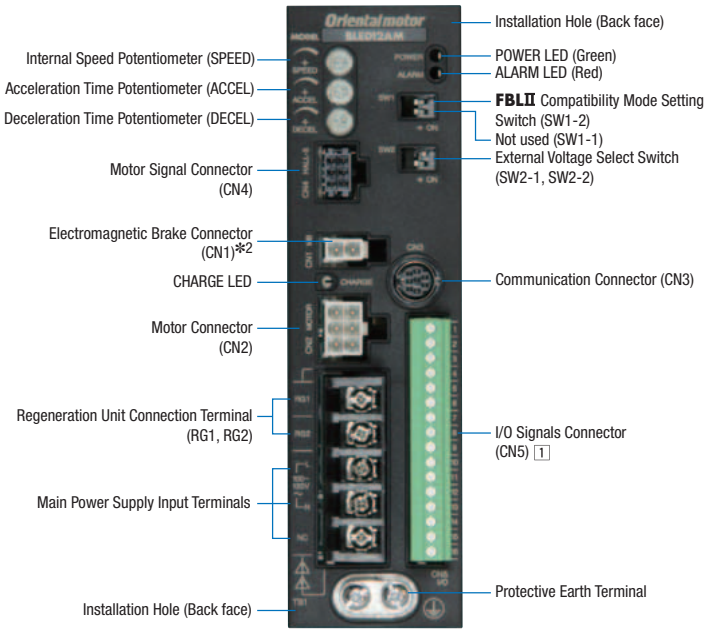
●External Speed Potentiometer (Included)



Recommended thickness of a mounting plate is a maximum of 4.5 mm (**0.18** in.).

Connection and Operation (Standard type)

Names and Functions of Driver Parts



Name	Description
Internal Speed Potentiometer [SPEED]	Sets the motor speed
Acceleration Time Potentiometer [ACCEL]	Sets the acceleration time at starting of motor
Deceleration Time Potentiometer [DECEL]	Sets the deceleration time when the motor is stopped
POWER LED (Green)	Lights when main power supply is ON
ALARM LED (Red)	Blinks when protective functions are activated
Motor Signal Connector (CN4)	Connects the signal cable connector
FBLII Compatibility Mode Setting Switch (SW1)*1	SW1-1: Not used. SW1-2: Sets the **FBLII** compatibility mode
External Voltage Select Switch (SW2)	SW2-1: Selects the power supply for input signal and selects either external power supply or driver built-in power supply
	SW2-2: Switches according to external DC voltage and selects either 5 VDC or 10 VDC
Electromagnetic Brake Connector (CN1)*2	Connects the connector for the electromagnetic brake either of the motor cable or the connection cable
CHARGE LED (Red)	Lights when main power supply is ON Turns off after main power supply is turned OFF and internal residual voltage is reduced to a stable level
Motor Connector (CN2)	Connects the cable motor connector
Regeneration Unit Connection Terminal (TB1) [RG1, RG2]	Connects the accessory regeneration unit **EPRC-400P** (sold separately)
Main Power Input Terminal (TB1) [L, N] (Single-phase input) [L1, L2, L3] (Three-phase input)	Connects the main power supply ● Single-Phase 100-120 VAC: Connects single-phase 100-120 VAC to L, N ● Single-Phase 200-240 VAC: Connects single-phase 200-240 VAC to L, N ● Three-Phase 200-240 VAC: Connects three-phase 200-240 VAC to L1, L2, L3
Communication Connector (CN3)	Connects to control module **OPX-2A** or data setting software **MEXE02**
I/O Signals Connector (CN5)	Connects when external I/O signals are used
Protective Earth Terminal	Grounds with AWG18～14 grounding conductor

*1 Settings can be changed to the same as those of the **FBLII** series using the **FBLII** compatibility mode.
*2 Only the electromagnetic brake type is connected.

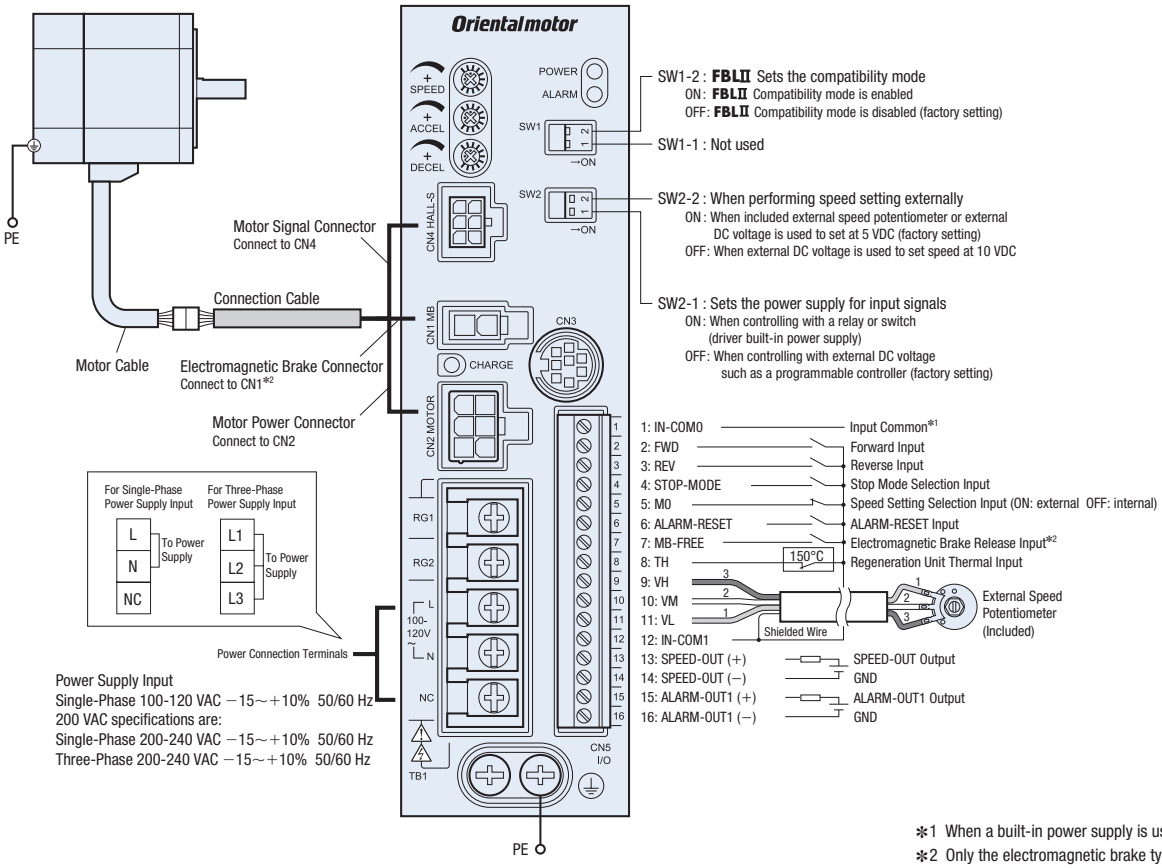
1 I/O Signals

CN5 Terminal Number	Signal Type	Terminal Name	Signal Name*2	Name	Description
1	Input	C0	IN-COM0	Input Signal Common	–
2		X0	FWD	Forward Input	The motor rotates in the clockwise direction.
3		X1	REV	Reverse Input	The motor rotates in the counterclockwise direction.
4		X2	STOP-MODE	Stop Mode Selection Input	Selects instantaneous stop or deceleration stop.
5		X3	M0	Speed Setting Selection Input	The internal speed potentiometer or external speed potentiometer (external DC voltage) is selected.
6		X4	ALARM-RESET	Alarm Reset Input	Alarms are reset.
7		X5	MB-FREE	Electromagnetic Brake Release Input	The electromagnetic brake operation is selected when the motor stops. Not used for the standard type.
8		X6	TH	Regeneration Unit Thermal Input	The thermostat output of a regeneration unit is connected when using the regeneration unit (normally closed).
9		VH	VH	External Speed Setting Input	Speed is set with an external speed potentiometer (external DC voltage).
10		VM	VM		
11		VL	VL		
12		C1	IN-COM1	Input Common (0 V)	–
–		–	M1*1	Speed Setting Selection Input	For multistep speed-change operation, the M0, M1, and M2 signals are used in combination.
–		–	M2*1		
–		–	EXT-ERROR*1	External Error Input	When an external error signal is input, the motor stops.
13	Output	Y0+	SPEED-OUT (+)	Speed Output	30 pulses are output per each rotation of the motor output shaft. (12 pulses are output if the **FBLII** compatibility mode is used.)
14		Y0–	SPEED-OUT (–)		
15		Y1+	ALARM-OUT1 (+)	Alarm Output 1	This signal is output when an alarm is generated (normally closed). (Normally open if the **FBLII** compatibility mode is used.)
16		Y1–	ALARM-OUT1 (–)		
–		–	MOVE*1	Motor Running Output	This signal is output during motor rotation.
–		–	VA*1	Speed Attainment Output	This signal is output if the motor speed reaches a speed within the speed attainment range that has been set.
–		–	ALARM-OUT2*1	Alarm Output 2	This signal is output if the overload warning level is exceeded when the overload warning function is set to enable. In addition, it outputs if an overload alarm is generated even when the overload warning function is set to disable (normally closed).
–		–	WNG*1	Warning Output	This signal turns ON if a warning is generated (overload warning function is activated). It turns OFF if the warning is cancelled.
–		–	TLC*1	Torque Limit Output	This signal is output when the motor output torque reaches the torque limiting value.

*1 Functions can be extended using the **OPX-2A** or the **MEXE02**.
*2 The **OPX-2A** or the **MEXE02**) may be used to assign the required signals out of the seven input terminals (X0～X6) and the two output signal terminals (Y0～Y1).
7 types for the 10 types of input signals (FWD/REV/STOP-MODE/M0/ALARM-RESET/MB-FREE/TH/M1/M2/EXT-ERROR)
2 types for the 7 types of output signals (SPEED-OUT/ALARM-OUT1/MOVE/VA/ALARM-OUT2/WNG/TLC)

●Connection Diagram

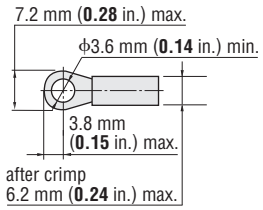
The figure shows a connection example for when a single-phase 100-120 VAC internal power supply and an external speed potentiometer are used to set speed.



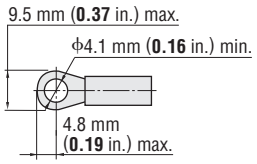
*1 When a built-in power supply is used, connection is not necessary.
*2 Only the electromagnetic brake type is connected.

◇Applicable Crimp Terminals

●Power Supply Connection Terminal (M3.5) Insulated Round Terminal



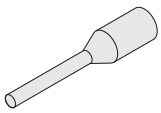
●Protective Earth Terminal (M4) Insulated Round Terminal



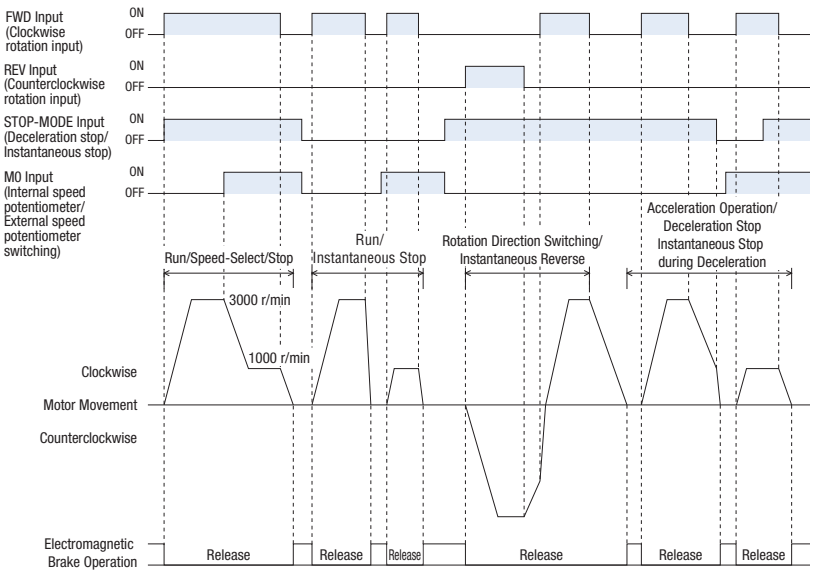
●I/O Terminals

Use the terminals specified below for connection using crimp terminals. Please note that the applicable crimp terminal will vary depending on the size of the wire. The following terminals can be used with wires of AWG24～20 in size.

[Manufacturer: PHOENIX CONTACT Inc.]
AI 0.25-6 Applicable Cable Size: AWG24
AI 0.34-6 Applicable Cable Size: AWG22
AI 0.5-6 Applicable Cable Size: AWG20



●Timing Chart



- FWD input, REV input and STOP-MODE input can be used to control all operations, such as run, stop, rotation direction switching, deceleration stop and instantaneous stop.
- 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. Switching it OFF will stop the motor. If both the FWD input and REV input are turned ON simultaneously, the motor will stop instantaneously. The starting time is the time set by the acceleration time potentiometer (ACCEL).
- If STOP-MODE input is turned ON, the motor comes to deceleration stop at the time set by the deceleration time potentiometer (DECEL). Switching the STOP-MODE input to OFF will cause the motor to stop instantaneously.
- For electromagnetic brake types, the motor stops and the brake is activated.

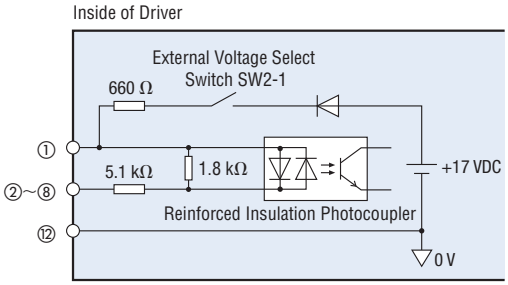
●I/O Signal Circuits

Select sink logic or source logic according to the external control device that will be used.

◇Input Circuit

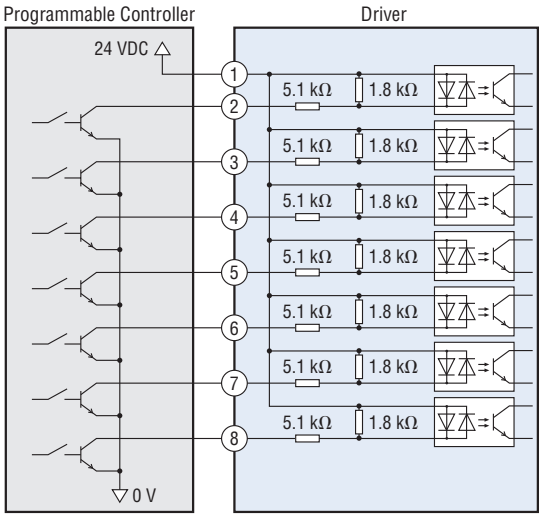
FWD/REV/STOP-MODE/M0/ALARM-RESET/MB-FREE/TH (M1*/M2*/EXT-ERROR*)

*When using **OPX-2A** or **MEXE02**

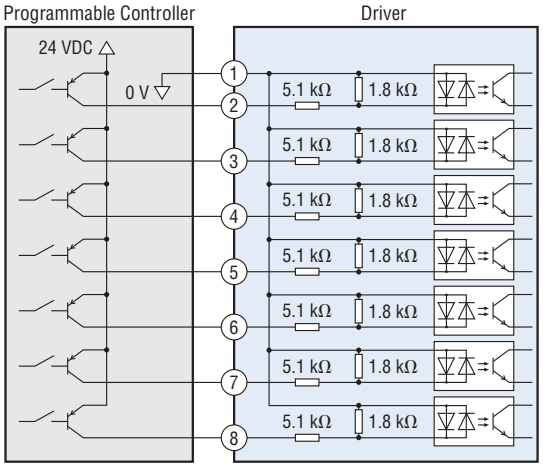


◇Connection to Programmable Controller

●Sink Logic



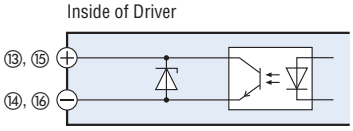
●Source Logic



◇Output Circuit

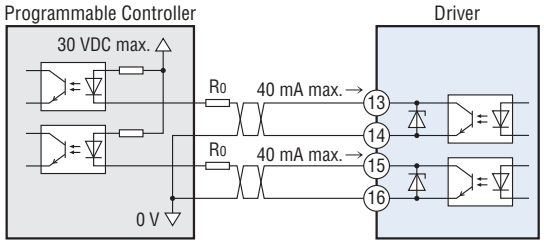
SPEED-OUT/ALARM-OUT1/ (MOVE*/VA*/ALARM-OUT2*/WNG*/TLC*)

*When using **OPX-2A** or **MEXE02**

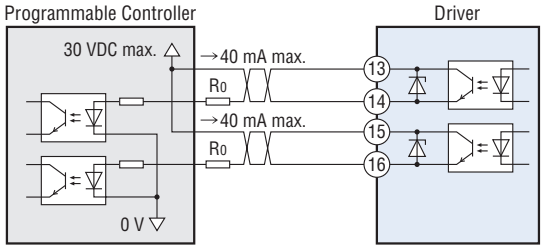


◇Programmable Controller Connection Examples

●Sink Logic



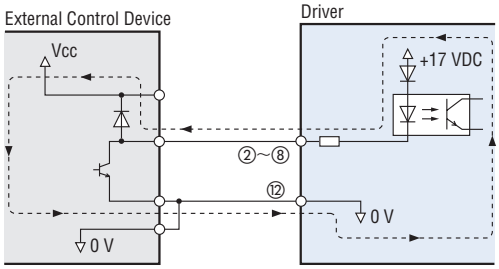
●Source Logic



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

When an external control device with a built-in clamp diode is used, if the power is being supplied to the driver, current may flow and cause the motor to run, even if the power supply of the external control device is off. When the power supply is turned ON or OFF simultaneously, the motor may run temporarily due to differences in power supply capacity. The external control device power supply must be turned ON first, and driver power supply must be turned OFF first.

●Example of Sink Logic



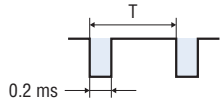
◇Speed Output (SPEED-OUT)

Pulse signals of 30 pulses (Pulse Width: 0.2 ms) are output per each rotation of the motor output shaft in synchronization with the motor operation.

The speed output frequency can be measured and the approximate motor speed calculated.

$$\text{Speed Output Frequency [Hz]} = \frac{1}{T[s]}$$

$$\text{Motor Shaft Speed [r/min]} = \frac{\text{Speed Output Frequency [Hz]}}{30} \times 60$$



- The calculated SPEED output frequency will be slightly off from the actual frequency.
- To display and monitor the speed of the output shaft of the motor and gearhead, use the accessory **SDM496** motor speed indicator (sold separately).

Motor speed indicator ➜ Page D-188

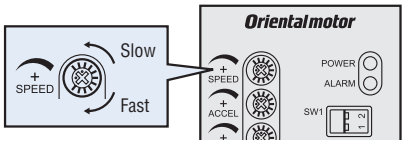
◇Alarm Output 1 (ALARM-OUT 1)

When any of the driver's protective functions is activated, the alarm output turns OFF and the alarm LED blinks. The motor will coast to a stop.

●Speed Setting Method

◇Set Using the Internal Speed Potentiometer

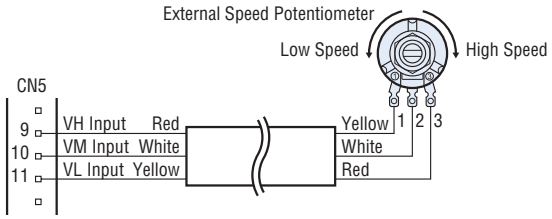
When setting is performed with the internal speed potentiometer, set the M0 input to OFF.

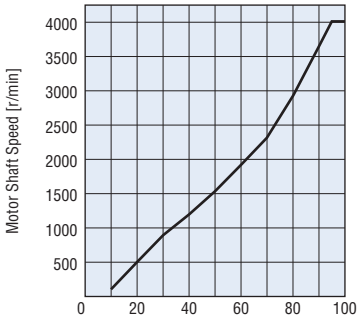


◇Using the External Speed Potentiometer

Connect the included external speed potentiometer to the I/O signal connector (CN5). For the connection, use the included signal line [1 m (3.3 ft.)].

When setting is performed with the external speed potentiometer, set the M0 input to ON.





External Speed Potentiometer Scale – Speed Characteristics (Representative values)

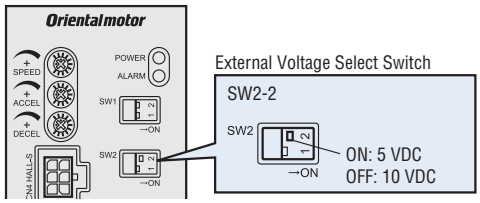
●SW2-2: ON (5 VDC: Factory setting)

Note

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

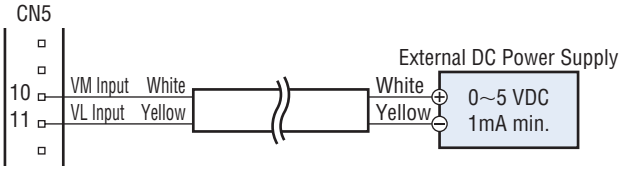
◇Using External DC Voltage

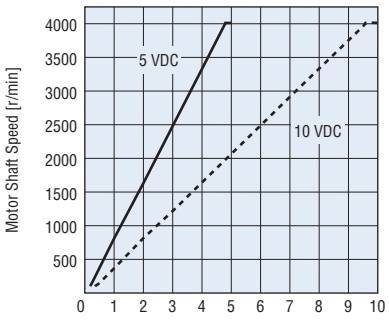
Set the external voltage select switch on the driver in accordance with the voltage value of the external DC voltage. Switch it to 5 VDC or 10 VDC.



Use external DC voltage and connect to the I/O signal connector (CN5) using the included signal line [1 m (3.3 ft.)].

When setting is performed with the external DC voltage, set the M0 input to ON.





External DC Voltage – Speed Characteristics (Representative values)

Note

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

●Multi-Motor Control

When operating two or more sets of motor and driver at the same speed using a single speed potentiometer, an external speed potentiometer or external DC voltage must be used.

The figure below shows an example of the single-phase power supply specification. For a three-phase power supply specification, change the power supply line to a three-phase power supply. The motor and operation control unit are not illustrated in the figure.

◇When Using an External Speed Potentiometer

Connect all drivers using a common power supply line and common speed control line, as shown in the figure, and set a speed using the external speed potentiometer VRx.

The resistance value of the external speed potentiometer is determined using the formula below.

Resistance value when the number of drivers is n: VRx=20/n (kΩ), n/4 (W)

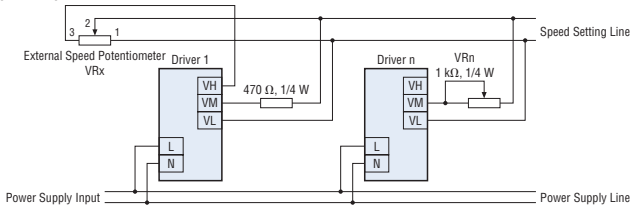
Example: When two drivers are connected

VRx=20/2=10 (kΩ), 2/4=1/2 (W)

Resistance is 10 kΩ, 1/2 W.

To adjust the speed difference among the motors, connect a 470 Ω, 1/4 W resistor to the VM terminal on the first driver, and connect a 1 kΩ, 1/4 W (VRn) potentiometer to the VM terminal on each of the remaining drivers.

Up to twenty motors can be operated in parallel using an external speed potentiometer.



◇Using External DC Voltage

Connect all drivers using a common power supply line and common speed control line, as shown in the figure, and connect a 5 VDC or 10 VDC power supply.

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

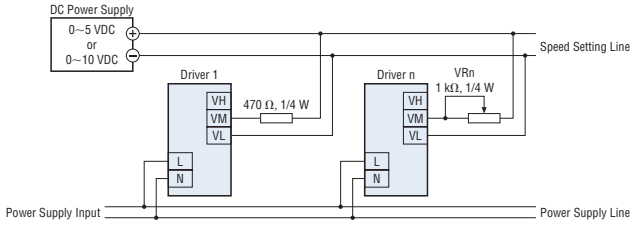
Power supply capacity when the number of drivers is n: I=1×n (mA)

Example: When two drivers are connected

I=1×2=2 (mA)

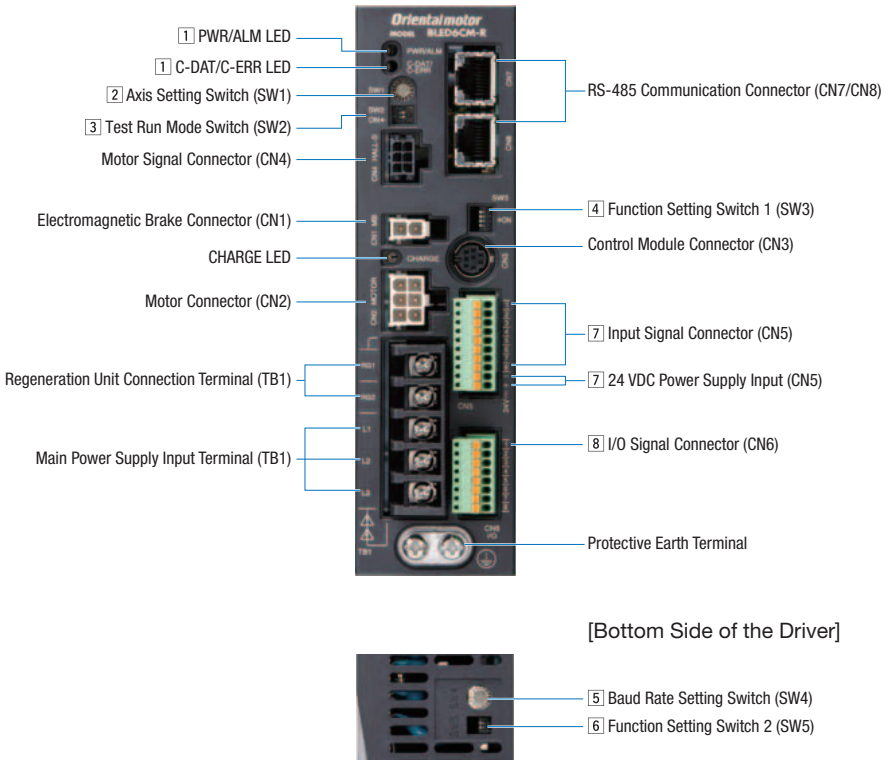
Power supply capacity is 2 mA or more.

To adjust the speed difference among the motors, connect a 470 Ω, 1/4 W resistor to the VM terminal on the first driver, and connect a 1 kΩ, 1/4 W (VRn) potentiometer to the VM terminal on each of the remaining drivers.



Connection and Operation (RS-485 communication type)

Names and Functions of Driver Parts



[Bottom Side of the Driver]

1 Signal Monitor Displays

◇LED Indicators

Indication	Color	Function	Lighting Condition
PWR	Green	Power supply indication	When a 24 VDC power supply is being received
ALM	Red	Alarm indication	When a protective function is activated (blinking)
C-DAT	Green	Communication indication	When communication data is being sent or received
C-ERR	Red	Communication error indication	When communication data is in error

2 Axis Setting Switch (SW1)

Indication	Switch Name	Function
SW1	Axis Setting Switch	Set this when RS-485 communication is used. Set the axis number (factory setting: 0).

3 Test Run Mode Switch (SW2)

Indication	Switch Name	Function
SW2	Test Run Mode Switch	・ SW2-No.1: The connection between the motor and driver can be checked before establishing a connection (factory setting: OFF). ・ SW2-No.2: Not used (keep this in the OFF position).

4 Function Setting Switch 1 (SW3)

Indication	No.	Function
SW3	3	Set the power supply for input signals (factory setting: OFF). OFF: To control with external DC voltage ON: To control with a relay or switch (driver built-in power supply)
	4	Set the RS-485 communication termination resistance (120 Ω) (factory setting: OFF). OFF: Disable termination resistance ON: Enable termination resistance

5 Baud Rate Setting Switch (SW4)

Indication	Switch Name	Function
SW4	Baud Rate Setting Switch	Set this when RS-485 communication is used. Set the baud rate (factory setting: 7).

◇RS-485 Baud Rate Setting

No.	Baud Rate (bps)
0	9600
1	19200
2	38400
3	57600
4	115200
5～6	Not used
7	625000 (connection with a network converter)
8～F	Not used

6 Function Setting Switch 2 (SW5)

Indication	No.	Function
SW5	1	Set the axis number (factory setting: OFF) in combination with Axis Setting Switch SW1.
	2	Set the RS-485 communication protocol (factory setting: OFF).

◇RS-485 Communication Protocol Setting

No. \ Connection	Connection with a Network Converter	Modbus RTU Mode
2	OFF	ON

7 Input Signal Connector (CN5), 24 VDC Power Supply Input (CN5)

Indication	Pin No.	Signal Name	Initial Value	
CN5	1	IN0	FWD	The motor rotates in the FWD direction.
	2	IN1	REV	The motor rotates in the REV direction.
	3	IN2	STOP-MODE	Selects instantaneous stop or deceleration stop.
	4	IN3	M0	Speed selection input
	5	IN4	ALARM-RESET	Resets alarms.
	6	IN5	MB-FREE	Releases the electromagnetic brake.
	7	IN6	TH	Stop the motor. (Normally closed)
	8	IN-COM0	—	Input signal common
	—	—	—	Power supply GND and input signal common (0 V)
	+	—	—	24 VDC Power Supply

● Functions to assign can be set by specifying parameters. Initial values are shown above. For details, see the user manual.

The following input signals can be assigned to input terminals IN0~IN6.

Input Signals					
0: Not used	21: EXT-ERROR	33: R1	38: R6	43: R11	48: M0
1: FWD	22: TH	34: R2	39: R7	44: R12	49: M1
2: REV	24: ALARM-RESET	35: R3	40: R8	45: R13	50: M2
19: STOP-MODE	27: HMI	36: R4	41: R9	46: R14	51: M3
20: MB-FREE	32: R0	37: R5	42: R10	47: R15	54: TL

8 I/O Signal Connector (CN6)

Indication	Pin No.	Signal Name	Initial Value	
CN6	1	VH	VH	External analog speed setting input
	2	VM	VM	
	3	VL	VL	
	4	IN-COM1	—	Input signal common (0 V)
	5	OUT0+	SPEED-OUT	30 pulses are output per motor rotation of the motor shaft.
	6	OUT0−		
	7	OUT1+	ALARM-OUT1	This signal is output when an alarm is generated. (Normally closed)
	8	OUT1−		

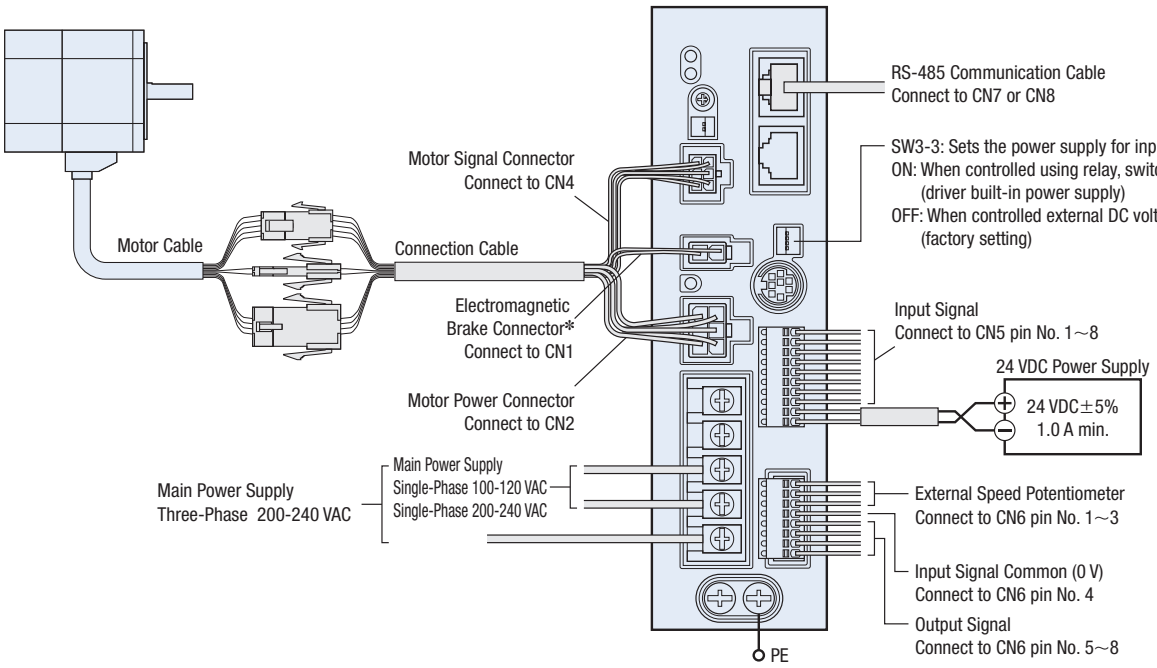
● Functions to assign can be set by specifying parameters. Initial values are shown above. For details, see the user manual.

The following output signals can be assigned to output terminals OUT0~OUT1.

Output Signals					
0: Not used	33: R1	40: R8	47: R15	66: WNG	84: DIR
1: FWD_R	34: R2	41: R9	48: M0_R	68: MOVE	85: SPEED-OUT
2: REV_R	35: R3	42: R10	49: M1_R	71: TLC	
19: STOP-MODE_R	36: R4	43: R11	50: M2_R	77: VA	
20: MB-FREE_R	37: R5	44: R12	51: M3_R	80: S-BSY	
27: HMI_R	38: R6	45: R13	54: TL_R	81: ALARM_OUT2	
32: R0	39: R7	46: R14	65: ALARM_OUT1	82: MPS	

●Connection Diagram

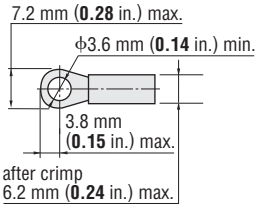
The figure shows a connection example for the electromagnetic brake type motor. In addition to the AC power supply, be sure to connect the DC power supply for control when operating the motor.



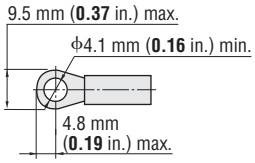
*Only for an electromagnetic brake type.

◇Applicable Crimp Terminals

•Power Supply Connection Terminal (M3.5)
Insulated Round Terminal



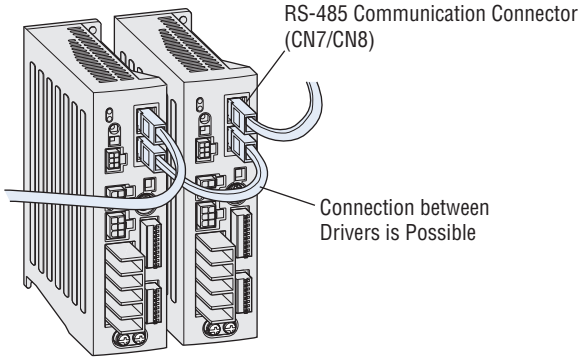
•Protective Earth Terminal (M4)
Insulated Round Terminal

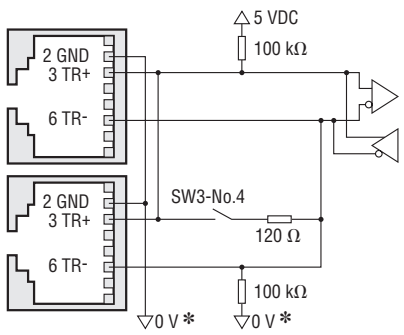


●RS-485 Communication Cable Connection

Connect when controlling the **BLE** Series with RS-485 communication. Connect the RS-485 communication cable to CN7 or CN8. Another driver can be connected to the open connectors.

- Accessory cables (sold separately) to connect drivers are available. RS-485 Communication Cable ➜ Page A-285
- Drivers can be connected to each other using commercially available LAN cables (straight through).

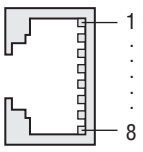




*Shared with the ground for the 24 VDC power input terminal (CN5).

◇RS-485 Communication Connector (CN7/CN8)

Indication	Pin No.	Signal Name	Description
CN7 CN8	1	N.C.	Not used
	2	GND	GND
	3	TR+	RS-485 communication signal (+)
	4	N.C.	Not used
	5	N.C.	
	6	TR−	RS-485 communication signal (−)
	7	N.C.	Not used
	8	N.C.	



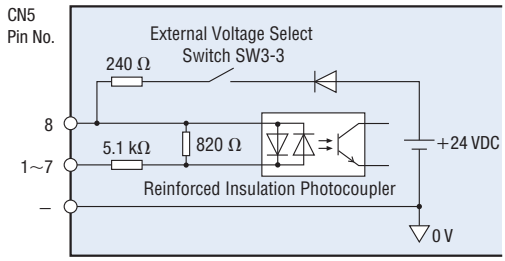
●I/O Signal Circuits

Select sink logic or source logic according to the external control device that will be used.

◇Input Circuit

FWD, REV, STOP-MODE, M0, ALARM-RESET, MB-FREE, and TH are initial settings.*

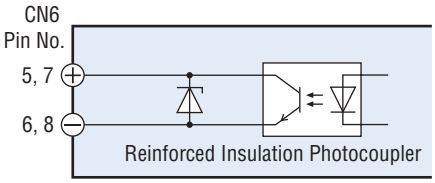
*Input signals can be changed with parameters.



◇Output Circuit

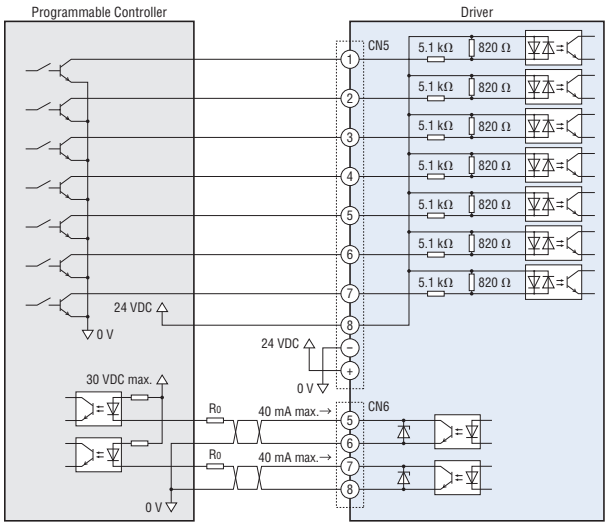
SPEED-OUT and ALARM-OUT1 are initial settings.*

*Output signals can be changed with parameters.

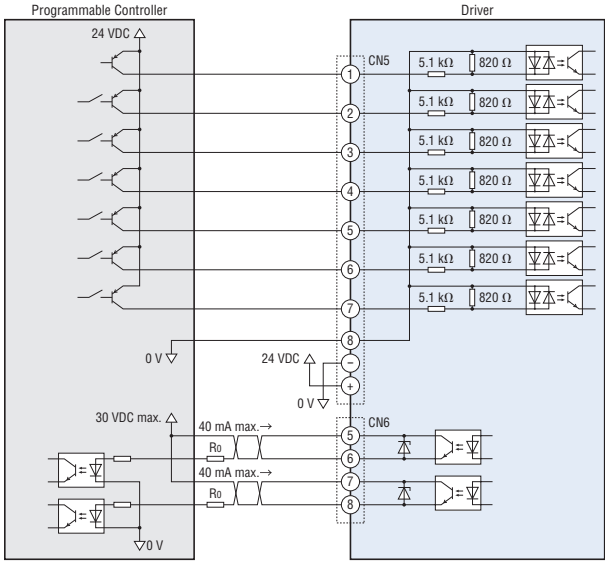


◇Connection to Programmable Controller

•Sink Logic



•Source Logic



●Output Signals

The output signal is assigned to output terminal CN6. (Initial setting)

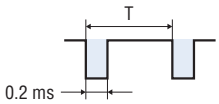
◇Speed Output (SPEED-OUT)

Pulse signals of 30 pulses (pulse width: 0.2 ms) are output per each rotation of the motor output shaft in synchronization with the motor operation.

The speed output frequency can be measured and the approximate motor speed calculated.

$$\text{Speed Output Frequency [Hz]} = \frac{1}{T[s]}$$

$$\text{Motor Shaft Speed [r/min]} = \frac{\text{Speed Output Frequency [Hz]}}{30} \times 60$$



●The calculated SPEED output frequency will be slightly off from the actual frequency.

◇Alarm Output 1 (ALARM-OUT 1)

When any of the driver's protective functions is activated, the alarm output turns OFF and the alarm LED blinks. The motor will stop.

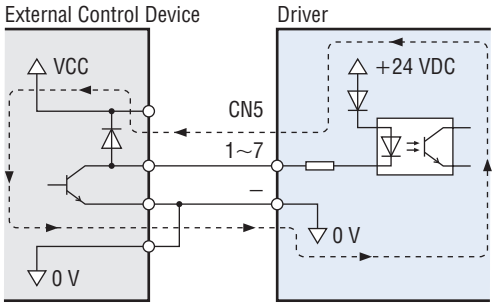
In the case of an electromagnetic brake type, the electromagnetic brake is activated, and the motor shaft is held in position.

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

If a controller with a built-in clamp diode is connected and the controller 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 controller 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 controller. To turn the power ON, turn ON the controller and then the driver.

•Example of Sink Logic



●How to Set Operating Data

The table below shows the pieces of data that are needed to operate a motor. Operating data for up to 16 speeds can be set (No.0～No.15). There are 2 ways to set the data.

- Analog Speed Setting: Speed setting by the external speed potentiometer or external DC voltage
- Digital Speed Setting: Speed setting through RS-485 communication with the **OPX-2A** or **MEXE02**

Data Name	Description	Setting Method	Set Range	Initial Value
Speed	Set the motor speed.	Analog Setting	100～4000 r/min	0 r/min
		Digital Setting	80～4000 r/min	
Acceleration Time*1	Set the time until the appropriate speed is reached.	Digital Setting	0.2～15 sec.	0.5 sec.
Deceleration Time*2	Set the time to change from given speed to until the motor stops.			
Torque Limiting	Limits the motor output torque. Set the maximum torque as percentage by assuming the rated torque to be 100%.	Digital Setting Analog Setting	0～200%	200%

*1 The acceleration time for digital speed setting is the time until the specified speed is reached.
The acceleration time for analog speed setting is the time until the rated speed (3000 r/min) is reached.

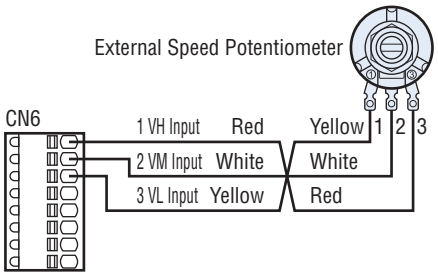
*2 The deceleration time for digital speed setting is the time to change from the specified speed to until the motor stops.
The deceleration time for analog speed setting is the time to change from the rated speed (3000 r/min) to until the motor stops.

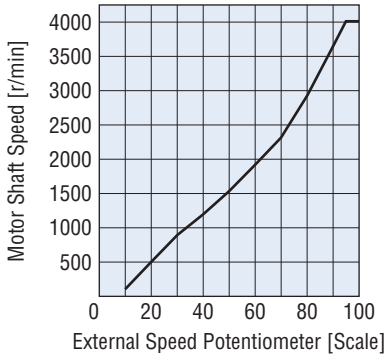
●Speed Setting

Connect the external speed potentiometer (included) or and external DC voltage to set the motor speed using analog signals.

◇Using the External Speed Potentiometer

Connect the external speed potentiometer (included) to pin numbers 1～3 of CN6.



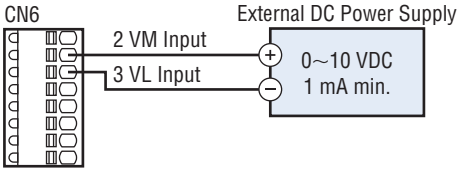


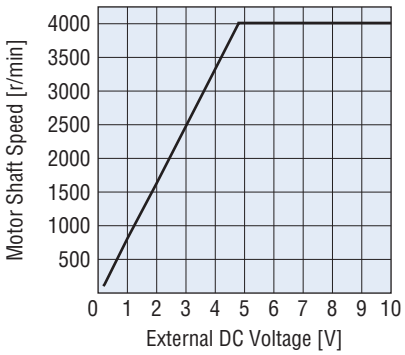
Note

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

◇Using External DC Voltage

Connect external DC voltage to pin numbers 2 and 3 of CN6.





Note

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

For details (specifications, characteristics, dimensions and others) on these products please refer to either to our website, contact technical support or your nearest Oriental Motor sales office.

www.orientalmotor.com/catalog

Motor and Driver Combinations

●Standard Type

◇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
30 W (1/25 HP)	**BLE23A□S-3**	BLEM23-GFS	GFS2G□	BLED3A
	BLE23C□S-3			BLED3C
	BLE23S□S-3			BLED3S
60 W (1/12 HP)	**BLE46A□S-3**	BLEM46-GFS	GFS4G□	BLED6A
	BLE46C□S-3			BLED6C
	BLE46S□S-3			BLED6S
120 W (1/6 HP)	**BLE512A□S-3**	BLEM512-GFS	GFS5G□	BLED12A
	BLE512C□S-3			BLED12C
	BLE512S□S-3			BLED12S

◇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
30 W (1/25 HP)	**BLE23A□F-3**	BLEM23-GFS	GFS2G□FR	BLED3A
	BLE23C□F-3			BLED3C
	BLE23S□F-3			BLED3S
60 W (1/12 HP)	**BLE46A□F-3**	BLEM46-GFS	GFS4G□FR	BLED6A
	BLE46C□F-3			BLED6C
	BLE46S□F-3			BLED6S
120 W (1/6 HP)	**BLE512A□F-3**	BLEM512-GFS	GFS5G□FR	BLED12A
	BLE512C□F-3			BLED12C
	BLE512S□F-3			BLED12S

◇Round Shaft Type

Output Power	Product Name	Motor Product Name	Driver Product Name
30 W (1/25 HP)	**BLE23AA-3**	BLEM23-A	BLED3A
	BLE23CA-3		BLED3C
	BLE23SA-3		BLED3S
60 W (1/12 HP)	**BLE46AA-3**	BLEM46-A	BLED6A
	BLE46CA-3		BLED6C
	BLE46SA-3		BLED6S
120 W (1/6 HP)	**BLE512AA-3**	BLEM512-A	BLED12A
	BLE512CA-3		BLED12C
	BLE512SA-3		BLED12S

●Standard Type with Electromagnetic Brake

◇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
30 W (1/25 HP)	**BLE23AM□S-3**	BLEM23M2-GFS	GFS2G□	BLED3AM
	BLE23CM□S-3			BLED3CM
	BLE23SM□S-3			BLED3SM
60 W (1/12 HP)	**BLE46AM□S-3**	BLEM46M2-GFS	GFS4G□	BLED6AM
	BLE46CM□S-3			BLED6CM
	BLE46SM□S-3			BLED6SM
120 W (1/6 HP)	**BLE512AM□S-3**	BLEM512M2-GFS	GFS5G□	BLED12AM
	BLE512CM□S-3			BLED12CM
	BLE512SM□S-3			BLED12SM

◇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
30 W (1/25 HP)	**BLE23AM□F-3**	BLEM23M2-GFS	GFS2G□FR	BLED3AM
	BLE23CM□F-3			BLED3CM
	BLE23SM□F-3			BLED3SM
60 W (1/12 HP)	**BLE46AM□F-3**	BLEM46M2-GFS	GFS4G□FR	BLED6AM
	BLE46CM□F-3			BLED6CM
	BLE46SM□F-3			BLED6SM
120 W (1/6 HP)	**BLE512AM□F-3**	BLEM512M2-GFS	GFS5G□FR	BLED12AM
	BLE512CM□F-3			BLED12CM
	BLE512SM□F-3			BLED12SM

◇Round Shaft Type

Output Power	Product Name	Motor Product Name	Driver Product Name
30 W (1/25 HP)	**BLE23AMA-3**	BLEM23M2-A	BLED3AM
	BLE23CMA-3		BLED3CM
	BLE23SMA-3		BLED3SM
60 W (1/12 HP)	**BLE46AMA-3**	BLEM46M2-A	BLED6AM
	BLE46CMA-3		BLED6CM
	BLE46SMA-3		BLED6SM
120 W (1/6 HP)	**BLE512AMA-3**	BLEM512M2-A	BLED12AM
	BLE512CMA-3		BLED12CM
	BLE512SMA-3		BLED12SM

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

●RS-485 Communication Type

◇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
30 W (1/25 HP)	**BLE23AR□S-3**	BLEM23-GFS	GFS2G□	BLED3AM-R
	BLE23CR□S-3			BLED3CM-R
60 W (1/12 HP)	**BLE46AR□S-3**	BLEM46-GFS	GFS4G□	BLED6AM-R
	BLE46CR□S-3			BLED6CM-R
120 W (1/6 HP)	**BLE512AR□S-3**	BLEM512-GFS	GFS5G□	BLED12AM-R
	BLE512CR□S-3			BLED12CM-R

◇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
30 W (1/25 HP)	**BLE23AR□F-3**	BLEM23-GFS	GFS2G□FR	BLED3AM-R
	BLE23CR□F-3			BLED3CM-R
60 W (1/12 HP)	**BLE46AR□F-3**	BLEM46-GFS	GFS4G□FR	BLED6AM-R
	BLE46CR□F-3			BLED6CM-R
120 W (1/6 HP)	**BLE512AR□F-3**	BLEM512-GFS	GFS5G□FR	BLED12AM-R
	BLE512CR□F-3			BLED12CM-R

◇Round Shaft Type

Output Power	Product Name	Motor Product Name	Driver Product Name
30 W (1/25 HP)	**BLE23ARA-3**	BLEM23-A	BLED3AM-R
	BLE23CRA-3		BLED3CM-R
60 W (1/12 HP)	**BLE46ARA-3**	BLEM46-A	BLED6AM-R
	BLE46CRA-3		BLED6CM-R
120 W (1/6 HP)	**BLE512ARA-3**	BLEM512-A	BLED12AM-R
	BLE512CRA-3		BLED12CM-R

●RS-485 Communication Type with Electromagnetic Brake

◇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
30 W (1/25 HP)	**BLE23AMR□S-3**	BLEM23M2-GFS	GFS2G□	BLED3AM-R
	BLE23CMR□S-3			BLED3CM-R
60 W (1/12 HP)	**BLE46AMR□S-3**	BLEM46M2-GFS	GFS4G□	BLED6AM-R
	BLE46CMR□S-3			BLED6CM-R
120 W (1/6 HP)	**BLE512AMR□S-3**	BLEM512M2-GFS	GFS5G□	BLED12AM-R
	BLE512CMR□S-3			BLED12CM-R

◇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
30 W (1/25 HP)	**BLE23AMR□F-3**	BLEM23M2-GFS	GFS2G□FR	BLED3AM-R
	BLE23CMR□F-3			BLED3CM-R
60 W (1/12 HP)	**BLE46AMR□F-3**	BLEM46M2-GFS	GFS4G□FR	BLED6AM-R
	BLE46CMR□F-3			BLED6CM-R
120 W (1/6 HP)	**BLE512AMR□F-3**	BLEM512M2-GFS	GFS5G□FR	BLED12AM-R
	BLE512CMR□F-3			BLED12CM-R

◇Round Shaft Type

Output Power	Product Name	Motor Product Name	Driver Product Name
30 W (1/25 HP)	**BLE23AMRA-3**	BLEM23M2-A	BLED3AM-R
	BLE23CMRA-3		BLED3CM-R
60 W (1/12 HP)	**BLE46AMRA-3**	BLEM46M2-A	BLED6AM-R
	BLE46CMRA-3		BLED6CM-R
120 W (1/6 HP)	**BLE512AMRA-3**	BLEM512M2-A	BLED12AM-R
	BLE512CMRA-3		BLED12CM-R

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