Standard Type

RS-485 Communication Type

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.
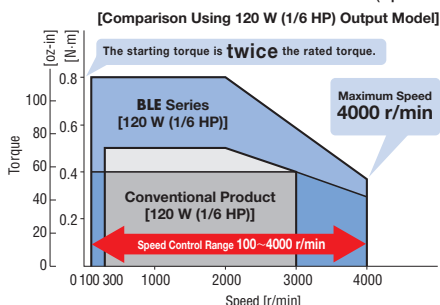
FLEX About FLEX ➜ Page F-4

■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]

The starting torque is **twice** the rated torque.

BLE Series [120 W (1/6 HP)]

Maximum Speed **4000 r/min**

Conventional Product [120 W (1/6 HP)]

Speed Control Range 100~4000 r/min

Torque [oz-in] [N·m]
0.8 / 100
0.6 / 80
0.4 / 60
0.2 / 40 / 20
0

0 100 300 1000   2000   3000   4000
Speed [r/min]

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]
Load −1%
Voltage ±1%
Temperature ±1%

[**BLE** Series*]
Load ±0.5%
Voltage ±0.5%
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.

105 mm
(**4.13** in.)

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

□90 mm
(□**3.54** in.)
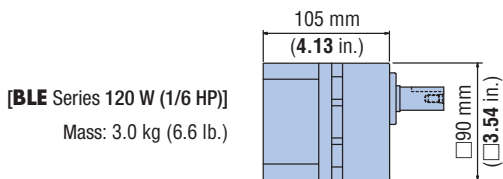
Energy Savings

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.

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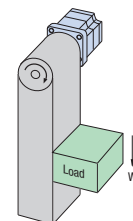
Note
● Since regenerated energy is produced during vertical operation, a regeneration unit, sold separately, is required. Regeneration units ➜ Page D-188

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**.

or

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

● 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**).

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◇**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).


When Using an **OPX-2A** (Digital Setting)
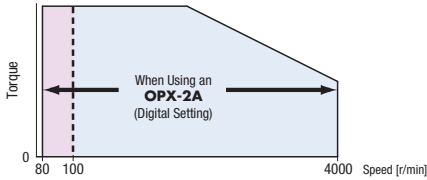
◇**Improved Speed Regulation**

[**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.

Motor Operation Pattern
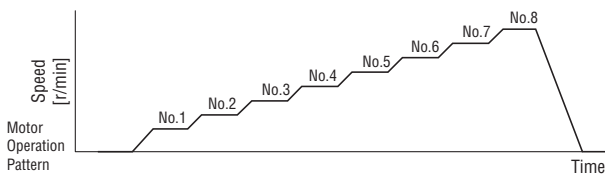
∗Specifications for the RS-485 Communication Type. Up to 8 types of operations are possible for the standard type.
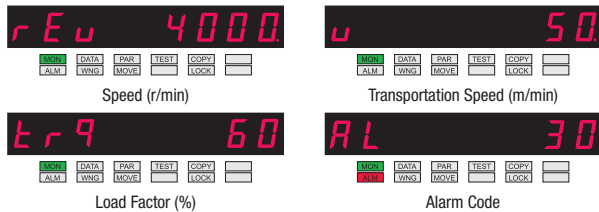
◇**Limiting the Motor Output Torque**

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

Brake to Produce Tension

Tension

Press Applications, etc.
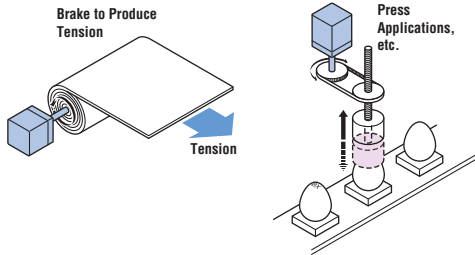
◇**Various Digital Indications are Possible (Control module OPX-2A)**

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

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

Speed (r/min)

Transportation Speed (m/min)

Load Factor (%)

Alarm Code

■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)

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.
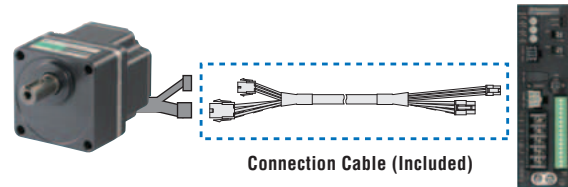

Space Saving
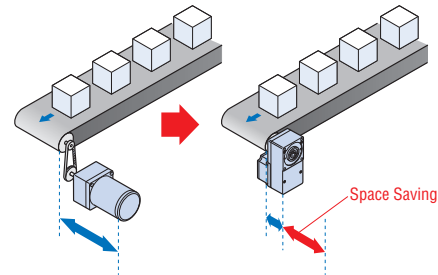
● Refer to page D-14 for further information on the features of parallel shaft gearheads and hollow shaft flat gearheads.

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.

Connection Cable (Included)

◇**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

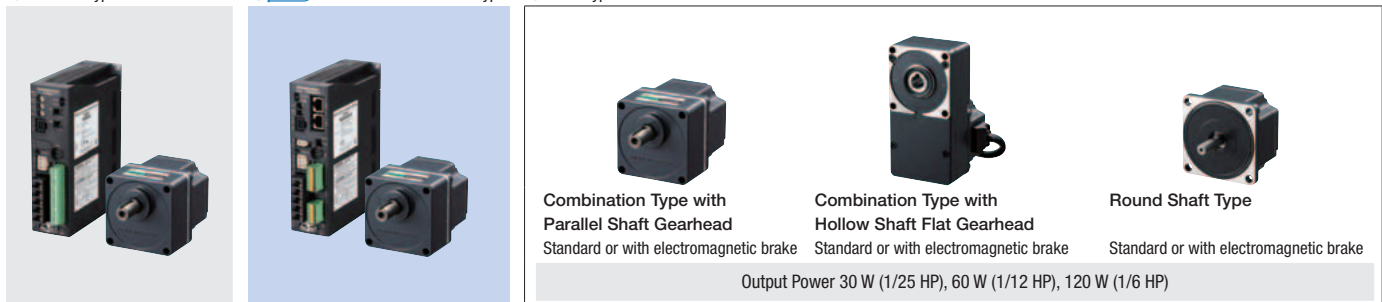◇**Flexible Extension Cables are Also Available (Sold separately)**

Use the flexible connection cable in applications where the cable is bent and flexed.
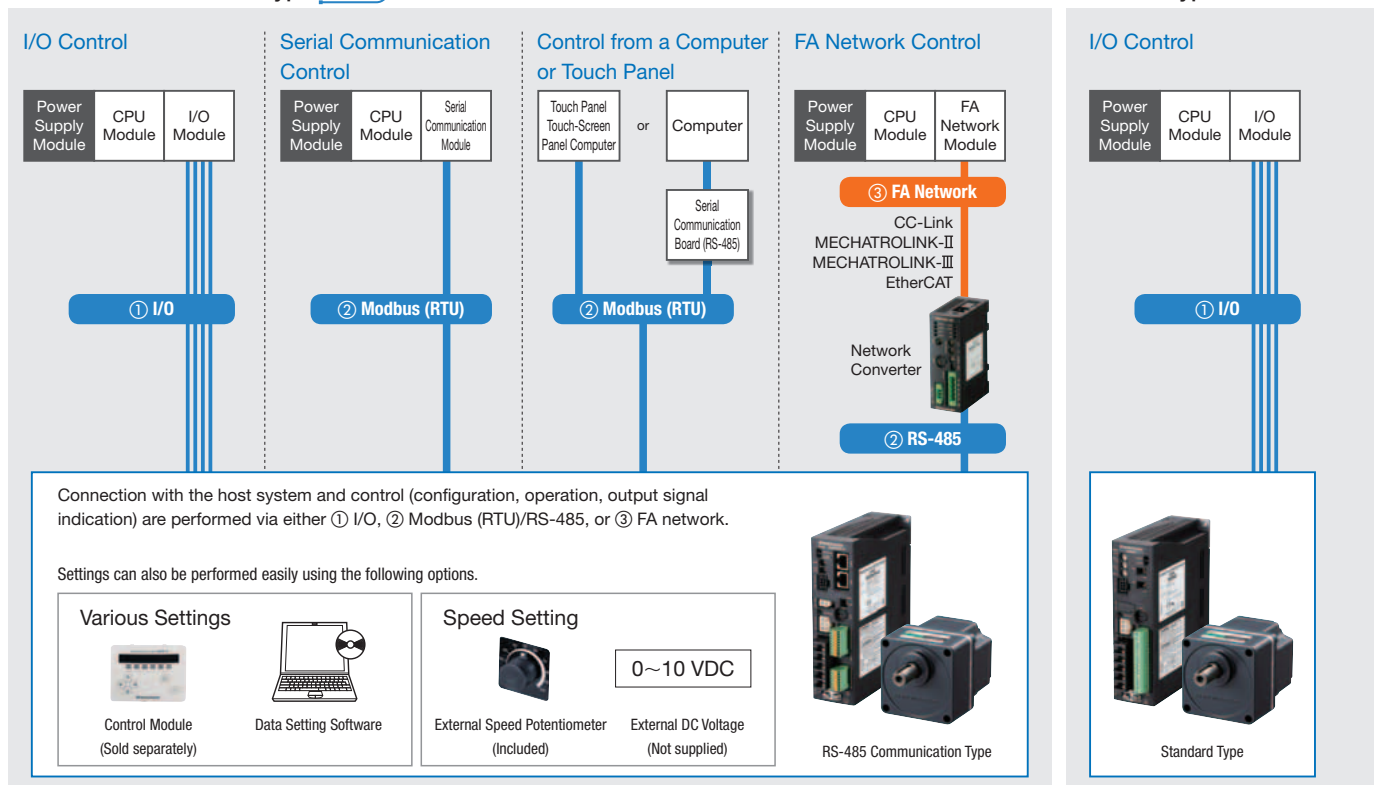
● Flexible Connection Cables ➜ Page D-183

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**

Standard Type

RS-485 Communication Type

I/O Control

| Power Supply Module | CPU Module | I/O Module |

① I/O

Serial Communication Control

| Power Supply Module | CPU Module | Serial Communication Module |

② Modbus (RTU)

Control from a Computer or Touch Panel

Touch Panel Touch-Screen Panel Computer   or   Computer

Serial Communication Board (RS-485)

② Modbus (RTU)

FA Network Control

| Power Supply Module | CPU Module | FA Network Module |

③ **FA Network**

CC-Link
MECHATROLINK-Ⅱ
MECHATROLINK-Ⅲ
EtherCAT

Network Converter

② **RS-485**

I/O Control

| Power Supply Module | CPU Module | I/O Module |

① I/O

Connection with the host system and control (configuration, operation, output signal indication) are performed via either ① I/O, ② Modbus (RTU)/RS-485, or ③ FA network.

Settings can also be performed easily using the following options.

Various Settings

Control Module (Sold separately)   Data Setting Software

Speed Setting

0～10 VDC

External Speed Potentiometer (Included)   External DC Voltage (Not supplied)

RS-485 Communication Type

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.
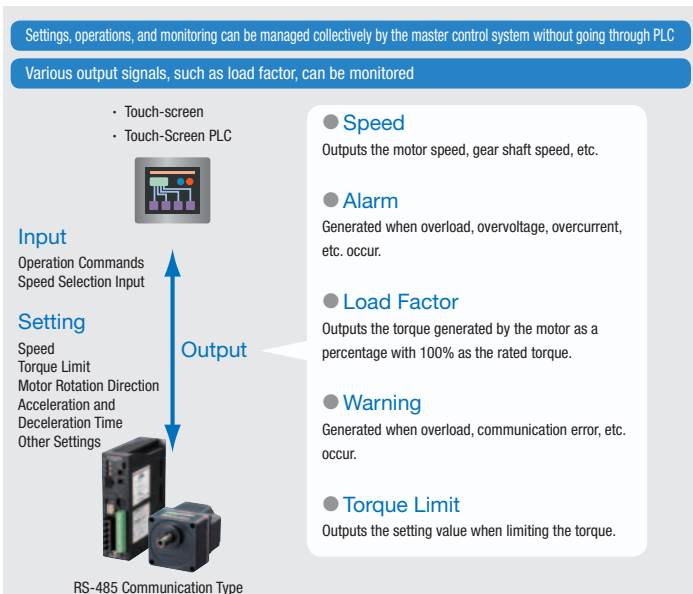
③ FA Network

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

Settings, operations, and monitoring can be managed collectively by the master control system without going through PLC

Various output signals, such as load factor, can be monitored

・Touch-screen
・Touch-Screen PLC

Input
Operation Commands
Speed Selection Input

Setting
Speed
Torque Limit
Motor Rotation Direction
Acceleration and Deceleration Time
Other Settings

Output

● **Speed**
Outputs the motor speed, gear shaft speed, etc.

● **Alarm**
Generated when overload, overvoltage, overcurrent, etc. occur.

● **Load Factor**
Outputs the torque generated by the motor as a percentage with 100% as the rated torque.

● **Warning**
Generated when overload, communication error, etc. occur.

● **Torque Limit**
Outputs the setting value when limiting the torque.

RS-485 Communication Type

● Standard Type

Motor control is performed through a PLC

For settings and monitoring, a separate accessory is required

・Touchscreen

Input
Operation Commands
Speed Selection Input

Output
Speed Output
Alarm Output

Setting
Control Module
or
Data Setting Software

PLC

Various Settings

Output

Output
Speed Output

Speed Indicator

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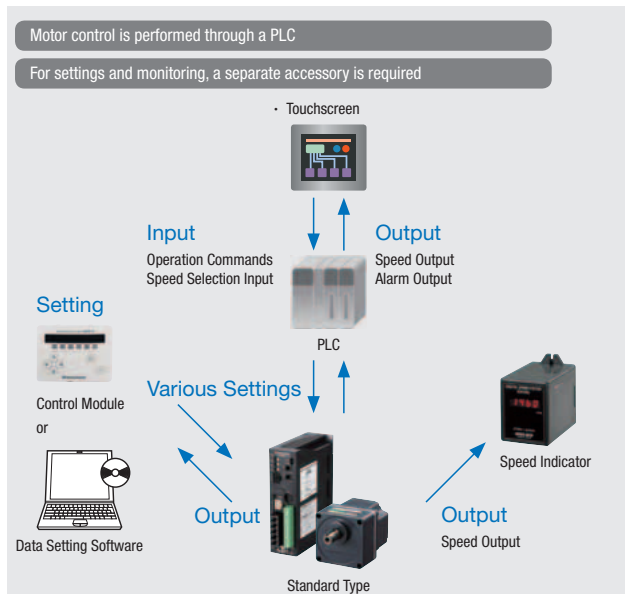
● The motor is controlled through inputs received from a switch box, PLC, or the like.
Motor speed, alarm, and other signals are output to the master control system.