

Brushless Motor and Driver Package DC Power Supply Input, High Power **BLV Series**

Standard Type/Electromagnetic Brake Type

Introducing the new high power, DC input **BLV** Series brushless motor and driver with output options of 200 W (1/4 HP) to 400 W (1/2 HP).

Communication control through I/O or RS-485 is available to support a wide variety of applications.



Features

DC Power Supply Input, High Power Output Options of 200 W (1/4 HP) to 400 W (1/2 HP), Compact Motor

The **BLV** Series are compact, DC input brushless motors and drivers with output options of 200 W (1/4 HP) to 400 W (1/2 HP). An extensive variety of motors lets you select the model that best suits your specific application.

| Output Power | 200 W (1/4 HP) | 400 W (1/2 HP) |
|----------------------------|------------------------|------------------------|
| Frame Size | □104 mm (□4.09 in.) | □104 mm (□4.09 in.) |
| Power Supply Voltage | 24 VDC | 48 VDC |
| Motor Type | | |
| Standard Type | ● | ● |
| Electromagnetic Brake Type | ● | ● |

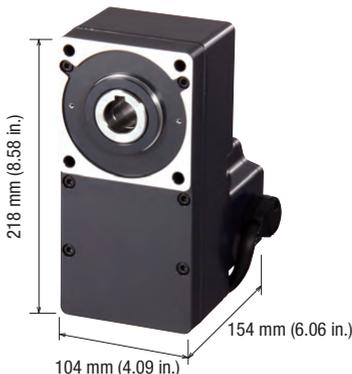
Three Types Available (Shown below are standard type models):



Combination Type - Parallel Shaft Gearhead



Round Shaft Type



Combination Type - Hollow Shaft Flat Gearhead

*For gear ratios 5 to 20.

Features of the Hollow Shaft Flat Gearhead

□104 mm (□4.09 in.), space-saving, hollow shaft flat gearhead has been added to the lineup.

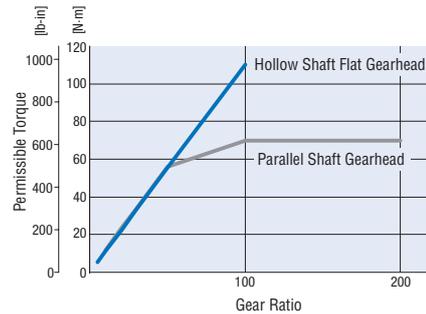
| Combination Motor Output | Gear Ratio | Rated Life |
|-----------------------------------|--|------------|
| 200 W (1/4 HP), 400 W (1/2 HP) | 5* , 10, 15, 20, 30, 50, 100 | 5000 hrs. |

*Only compatible with the 400 W (1/2 HP) type.



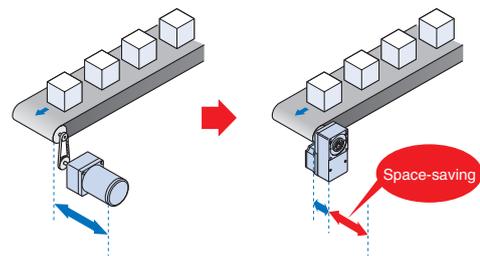
Permissible Torque without Saturation

The hollow shaft flat gearhead enables permissible torque without saturation so the motor torque can be fully utilized.



Space-saving

The output shaft can be coupled directly to a driven shaft without using a coupling, which allows you to reduce the size and installation space of your equipment.



[For Three-Phase Motor and Parallel Shaft Gearhead]

[For Brushless Motor and Hollow Shaft Flat Gearhead]

● Comes in an Electromagnetic Brake Type

The electromagnetic brake type is suitable for position holding during standstill or gravitational operation. Note that vertical drive (gravitational operation) requires motors of a specific power supply.

| Drive System | | Standard Type | Electromagnetic Brake Type |
|--|------------------------|---------------|----------------------------|
| Horizontal Drive | Switching Power Supply | ●* | ●* |
| | Battery | ● | ● |
| Vertical Drive (Gravitational Operation) | Switching Power Supply | — | — |
| | Battery | — | ● |

*Power supply limits depend on use. Please contact the nearest Oriental Motor sales office for details.

● Extended Functions

Functions can be extended and settings shown on a digital display by using a separately sold control module (OPX-2A). It can also be used in RS-485 communication mode.



● Equipped with Functions to Facilitate Battery Drive

- Capable of driving even if the battery voltage is low
- A warning output notifies when the battery voltage is low

| Item | Standard Model | Extended Function |
|----------------|--|--|
| Specifications | <ul style="list-style-type: none"> Speed Control Range: 100~4000 r/min (speed range 1:40) Speed Regulation: ±0.5% | <ul style="list-style-type: none"> Speed Control Range: 80~4000 r/min (speed range 1:50) Speed Regulation: ±0.2% |
| Function | <ul style="list-style-type: none"> Speed setting (internal speed potentiometer, external analog setting) Acceleration time, deceleration time Torque limiting | Various Display Functions: <ul style="list-style-type: none"> Operating speed (setting of gear ratio and speed increasing ratio), conveyor transportation speed, load factor, alarm code, warning code, I/O monitor Operating data digital settings (speed, torque limiting, acceleration time, deceleration time can be set up to 8 points) I/O signal allocation, test operation Data copy |

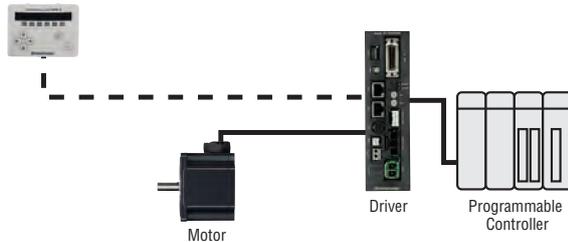
● Selectable Dual Control Method

Control from a programmable controller can be I/O control or RS-485 communication control.

◇ I/O Control System

Operation can be executed easily with I/O control.

Control Module OPX-2A (Sold separately) ● A control module (OPX-2A; accessory sold separately) is required for parameter settings.

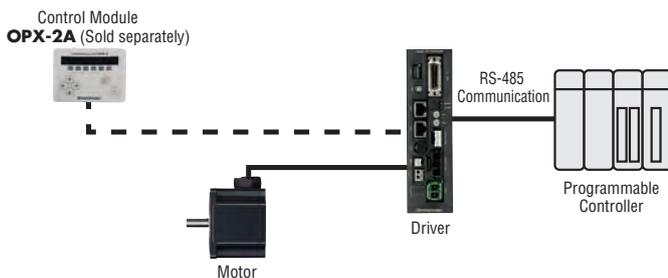


● Control Method for Data Settings and Operation Commands

| Operating Data and Parameter Settings | | Operation Commands (FWD, REV, etc.) |
|---------------------------------------|---|-------------------------------------|
| Operating Data | Driver potentiometer, control module (OPX-2A) | I/O |
| Parameters | Control module (OPX-2A) | |

◇ RS-485 Communication System

RS-485 communication lets you set operating data and parameters and enter operation commands. A single programmable controller connects up to 31 drivers and provides multi-axis synchronous starting. The protocol of the RS-485 communication system supports Modbus RTU, allowing it to easily connect with programmable controllers, touch panels and other devices.



● Control Method for Data Settings and Operation Commands

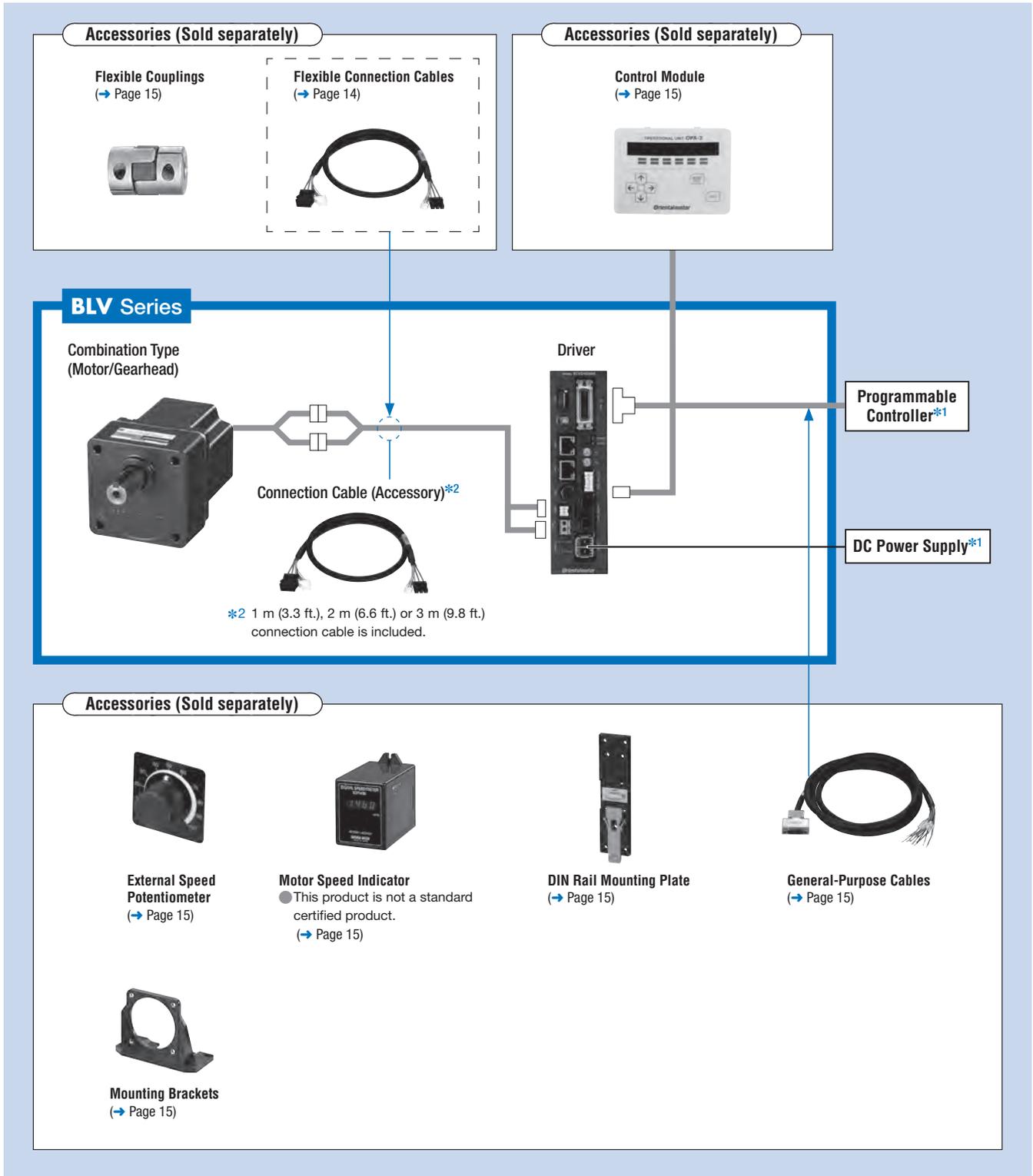
| Operation Data and Parameter Setting | Operation Commands (FWD, REV, etc.) |
|---|-------------------------------------|
| RS-485 communication, control module (OPX-2A) | RS-485 communication, I/O |

- FWD input, REV input and other operation commands can also be controlled from I/O.
- The test operation function is available with the control module (OPX-2A).
- The internal potentiometers for Speed, Acceleration/Deceleration and Torque Limiting are still active even when using either the control module (OPX-2A) or RS-485 communication.

System Configuration

An example of a single-axis system configuration using I/O control is shown below.

*1 Parts sold separately.



● Examples of System Configuration

| | | | | | |
|---|---|------------------------------|-------------------------|-------------------|-------------------|
| BLV Series Combination Type - Parallel Shaft BLV620K30S-3 | + | Sold Separately | | | |
| | | External Speed Potentiometer | DIN Rail Mounting Plate | Mounting Brackets | Flexible Coupling |
| | | PAVR-20KZ | PADPO3 | SOL6M8 | MCL652022 |

● The system configuration shown above is an example of the standard type. Other combinations are available.

Product Number Code

BLV 6 20 K M 200 S - 1

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

| | | |
|---|--|---|
| ① | Series | BLV : BLV Series |
| ② | Motor Frame Size | 6 : 104 mm (4.09 in.) [Gearhead Frame Size: 110 mm (4.33 in.)] |
| ③ | Output Power (W) | 20 : 200 W (1/4 HP) 40 : 400 W (1/2 HP) |
| ④ | Power Supply Voltage | K : 24 VDC N : 48 VDC |
| ⑤ | M: Electromagnetic Brake Type | Blank: Standard Type |
| ⑥ | Gear Ratio/Shaft Type | Number: Parallel shaft gearhead type Gear ratio 5~200 Hollow shaft flat gearhead Gear ratio 5~100 A : Round Shaft Type |
| ⑦ | Gearhead Type (Combination type only) | S : Parallel Shaft Gearhead F : Hollow Shaft Flat Gearhead |
| ⑧ | Cable Length (Included) | 1 : 1 m (3.3 ft.) 2 : 2 m (6.6 ft.) 3 : 3 m (9.8 ft.) |

Product Line

Combination Type

The combination type comes with the motor and its dedicated gearhead pre-assembled simplifying installation in equipment. Motors and gearheads are also available separately to facilitate changes or repairs.

Standard Type

◇ Combination Type – Parallel Shaft Gearhead

| Output Power | Power Supply Voltage | Model | Gear Ratio |
|----------------|----------------------|------------------------------|--|
| 200 W (1/4 HP) | 24 VDC | BLV620K □ S -◇ | 5, 10, 15, 20, 30, 50, 100, 200 |
| 400 W (1/2 HP) | 48 VDC | BLV640N □ S -◇ | 5, 10, 15, 20, 30, 50, 100, 200 |

The following items are included in each product.

Motor, Driver, Gearhead, Connection Cable*, Power Connector, Mounting Screws, Parallel Key, Operating Manual
*A cable of 1 m (3.3 ft.), 2 m (6.6 ft.) or 3 m (9.8 ft.) long is included.

◇ Combination Type – Hollow Shaft Flat Gearhead

| Output Power | Power Supply Voltage | Model | Gear Ratio |
|----------------|----------------------|------------------------------|-----------------------------------|
| 200 W (1/4 HP) | 24 VDC | BLV620K □ F -◇ | 10, 15, 20, 30, 50, 100 |
| 400 W (1/2 HP) | 48 VDC | BLV640N □ F -◇ | 5, 10, 15, 20, 30, 50, 100 |

The following items are included in each product.

Motor, Driver, Gearhead, Connection Cable*, Power Connector, Mounting Screws, Parallel Key, Safety Cover (with screws), Operating Manual
*A cable of 1 m (3.3 ft.), 2 m (6.6 ft.) or 3 m (9.8 ft.) long is included.

◇ Round Shaft Type

| Output Power | Power Supply Voltage | Model |
|----------------|----------------------|--------------------|
| 200 W (1/4 HP) | 24 VDC | BLV620KA -◇ |
| 400 W (1/2 HP) | 48 VDC | BLV640NA -◇ |

The following items are included in each product.

Motor, Driver, Connection Cable*, Power Connector, Operating Manual
*A cable of 1 m (3.3 ft.), 2 m (6.6 ft.) or 3 m (9.8 ft.) long is included.

Electromagnetic Brake Type

◇ Combination Type – Parallel Shaft Gearhead

| Output Power | Power Supply Voltage | Model | Gear Ratio |
|----------------|----------------------|-------------------------------|--|
| 200 W (1/4 HP) | 24 VDC | BLV620KM □ S -◇ | 5, 10, 15, 20, 30, 50, 100, 200 |
| 400 W (1/2 HP) | 48 VDC | BLV640NM □ S -◇ | 5, 10, 15, 20, 30, 50, 100, 200 |

The following items are included in each product.

Motor, Driver, Gearhead, Connection Cable*, Power Connector, Mounting Screws, Parallel Key, Operating Manual
*A cable of 1 m (3.3 ft.), 2 m (6.6 ft.) or 3 m (9.8 ft.) long is included.

◇ Combination Type – Hollow Shaft Flat Gearhead

| Output Power | Power Supply Voltage | Model | Gear Ratio |
|----------------|----------------------|-------------------------------|-----------------------------------|
| 200 W (1/4 HP) | 24 VDC | BLV620KM □ F -◇ | 10, 15, 20, 30, 50, 100 |
| 400 W (1/2 HP) | 48 VDC | BLV640NM □ F -◇ | 5, 10, 15, 20, 30, 50, 100 |

The following items are included in each product.

Motor, Driver, Gearhead, Connection Cable*, Power Connector, Mounting Screws, Parallel Key, Safety Cover (with screws), Operating Manual
*A cable of 1 m (3.3 ft.), 2 m (6.6 ft.) or 3 m (9.8 ft.) long is included.

◇ Round Shaft Type

| Output Power | Power Supply Voltage | Model |
|----------------|----------------------|---------------------|
| 200 W (1/4 HP) | 24 VDC | BLV620KMA -◇ |
| 400 W (1/2 HP) | 48 VDC | BLV640NMA -◇ |

The following items are included in each product.

Motor, Driver, Connection Cable*, Power Connector, Operating Manual
*A cable of 1 m (3.3 ft.), 2 m (6.6 ft.) or 3 m (9.8 ft.) long is included.

● Enter the gear ratio in the box (□) within the model name.

Enter the length of the connection cable (included) as **1** [1 m (3.3 ft.)], **2** [2 m (6.6 ft.)] or **3** [3 m (9.8 ft.)] in the diamond (◇) within the model name.

Specifications

Standard Type

◇ 200 W (1/4 HP), 400 W (1/2 HP) (RoHS)



| Model | Combination Type – Parallel Shaft Gearhead | | BLV620K□S-◇ | BLV640N□S-◇ |
|---|---|-----|--|-------------|
| | Combination Type – Hollow Shaft Flat Gearhead | | BLV620K□F-◇ | BLV640N□F-◇ |
| | Round Shaft Type | | BLV620KA-◇ | BLV640NA-◇ |
| Rated Output Power (Continuous) | W (HP) | | 200 (1/4) | 400 (1/2) |
| Power Source | Rated Voltage | VDC | 24 | 48 |
| | Permissible Voltage Range | | ±10% | |
| | Rated Input Current | A | 13 | 11 |
| | Maximum Input Current | A | 25 | 18 |
| Rated Torque | N·m (oz·in) | | 0.65 (92) | 1.3 (184) |
| Starting Torque*1 | N·m (oz·in) | | 1.15 (163) | 1.8 (250) |
| Rated Speed | r/min | | 3000 | |
| Speed Control Range | r/min | | 100~4000 (Analog setting) 80~4000 (Digital setting: can be set in 1 r/min increments)*2 | |
| Round Shaft Type Permissible Load Inertia J | ×10 ⁻⁴ kg·m ² (oz·in ²) | | 8.75 (48) | 15 (82) |
| Rotor Inertia J | ×10 ⁻⁴ kg·m ² (oz·in ²) | | 0.61 (3.3) | 0.66 (3.6) |
| Speed Regulation | Load | | ±0.5% (±0.2%)*2 max. (0~Rated torque, at rated speed, at rated voltage, at normal ambient temperature) | |
| | Voltage | | ±0.5% (±0.2%)*2 max. (Rated voltage ±10%, at rated speed, with no load, at normal ambient temperature) | |
| | Temperature | | ±0.5% (±0.2%)*2 max. [0~+40°C (+32~+104°F), at rated speed, with no load, at rated voltage] | |

Electromagnetic Brake Type

◇ 200 W (1/4 HP), 400 W (1/2 HP) (RoHS)



| Model | Combination Type – Parallel Shaft Gearhead | | BLV620KM□S-◇ | BLV640NM□S-◇ |
|---|---|-------------|--|--------------|
| | Combination Type – Hollow Shaft Flat Gearhead | | BLV620KM□F-◇ | BLV640NM□F-◇ |
| | Round Shaft Type | | BLV620KMA-◇ | BLV640NMA-◇ |
| Rated Output Power (Continuous) | W (HP) | | 200 (1/4) | 400 (1/2) |
| Power Source | Rated Voltage | VDC | 24 | 48 |
| | Permissible Voltage Range | | ±10% | |
| | Rated Input Current | A | 13 | 11 |
| | Maximum Input Current | A | 25 | 18 |
| Rated Torque | N·m (oz·in) | | 0.65 (92) | 1.3 (184) |
| Starting Torque*1 | N·m (oz·in) | | 1.15 (163) | 1.8 (250) |
| Rated Speed | r/min | | 3000 | |
| Speed Control Range | r/min | | 100~4000 (Analog setting) 80~4000 (Digital setting: can be set in 1 r/min increments)*2 | |
| Round Shaft Type Permissible Load Inertia J | ×10 ⁻⁴ kg·m ² (oz·in ²) | | 8.75 (48) | 15 (82) |
| Rotor Inertia J | ×10 ⁻⁴ kg·m ² (oz·in ²) | | 0.61 (3.3) | 0.66 (3.6) |
| Speed Regulation | Load | | ±0.5% (±0.2%)*2 max. (0~Rated torque, at rated speed, at rated voltage, at normal ambient temperature) | |
| | Voltage | | ±0.5% (±0.2%)*2 max. (Rated voltage ±10%, at rated speed, with no load, at normal ambient temperature) | |
| | Temperature | | ±0.5% (±0.2%)*2 max. [0~+40°C (+32~+104°F), at rated speed, with no load, at rated voltage] | |
| Electromagnetic Brake*3 | Brake Type | | Power off activated type, automatically controlled by the driver | |
| | Static Friction Torque | N·m (oz·in) | 0.65 (92) | 1.3 (184) |

*1 The time during which the starting torque is effective is no more than five seconds.

*2 These specifications apply when a separately sold control module (OPX-2A) or communication is used.

*3 Do not start or stop the motor by turning on/off the power supply, as it will cause the electromagnetic brake to wear abnormally.

● The values for each specification apply to the motor only.

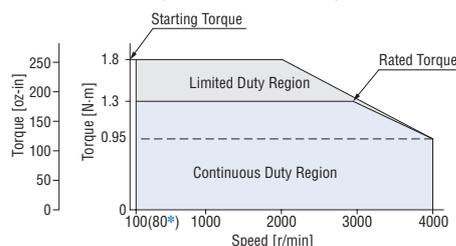
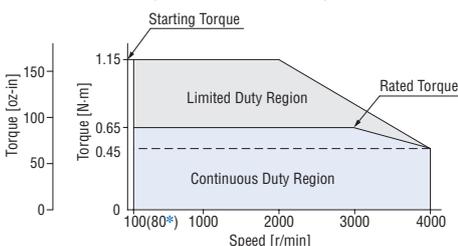
Speed – Torque Characteristics

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

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

BLV620K□S-◇/BLV620K□F-◇/BLV620KA-◇
BLV620KM□S-◇/BLV620KM□F-◇/BLV620KMA-◇

BLV640N□S-◇/BLV640N□F-◇/BLV640NA-◇
BLV640NM□S-◇/BLV640NM□F-◇/BLV640NMA-◇



*Values in parentheses indicate specifications that apply when a separately sold control module (OPX-2A) or communication is used.

● For the combination types, the values apply to the motor only.

● Enter the gear ratio in the box (□) within the model name.

Enter the length of the connection cable (included) as **1** [1 m (3.3 ft.)], **2** [2 m (6.6 ft.)] or **3** [3 m (9.8 ft.)] in the diamond (◇) within the model name.

Common Specifications

● Standard Model: These specifications apply when the basic motor/driver package is used.

● Extended Function: These specifications apply when a separately sold control module (**OPX-2A**) or communication is used.

| Item | Standard Model | Extended Function*1 |
|----------------------------------|---|--|
| Speed Setting Method | Select one of the following methods: · Internal speed potentiometer (VR1) · External analog setting (External speed potentiometer or external DC voltage) | Select one of the following methods: · Control module (OPX-2A) · Communication setting · Internal speed potentiometer (VR1) · External analog setting (External speed potentiometer or external DC voltage) |
| Acceleration/Deceleration Time | Acceleration and Deceleration time potentiometer (VR2): 0.2~15 seconds (3000 r/min with no load) | Select one of the following methods: · Control module (with OPX-2A) or communication setting: 0.2~15 seconds (time until setting speed is achieved) · Acceleration and Deceleration time potentiometer (VR2): 0.2~15 seconds (3000 r/min with no load) |
| Multi-Speed Setting Method | 2 Speeds: 1 speed set by the internal speed potentiometer and 1 speed set by the external analog setting | Select one of the following methods: · 8 Speeds: Control module (with OPX-2A) or communication setting · 8 Speeds: 6 speeds set by control module (with OPX-2A) and 2 speeds set by analog setting*2 *2 1 speed set by the internal speed potentiometer (VR1), and 1 speed set by the external analog setting |
| Torque Limiting Function | Setting Method | Torque limiting potentiometer (VR3) |
| | Setting Range | 0~200% (Assuming that the rated torque of the motor is 100%) Factory Setting: 200% |
| Input Signals | Photocoupler input method Input resistance 3.3 kΩ Operated by internal power supply: 15 VDC±10% Connectable external DC power supply: 24 VDC-15~+20% Current 100 mA min. Sink logic/source logic: Switchable using a switch (factory setting: sink logic) | |
| | FWD, REV, STOP-MODE, M0, ALARM-RESET, MB-FREE | Arbitrary signal allocation to general-purpose input X0~X5 (6 points) is possible FWD [START/STOP], REV [RUN/BRAKE], STOP-MODE [FWD/REV], MB-FREE, EXT-ERROR, ALARM-RESET, HMI, M0, M1, M2 Names in [] apply in the 3-wire input mode. |
| Output Signals | Open-collector output External use condition Voltage control 200 W (1/4 HP): 30 VDC max., 400 W (1/2 HP): 53 VDC max. General-purpose output Y0, Y1: 100 mA max., SPEED-OUT: 10 mA max. | |
| | SPEED-OUT, ALARM-OUT1 (Y0), WNG (Y1) | SPEED-OUT Arbitrary signal allocation to general-purpose output Y0, Y1 (2 points) is possible ALARM-OUT1, WNG, MOVE, TLC, VA, ALARM-OUT2 |
| Protective Functions | Overload, sensor abnormality, initial sensor abnormality, overvoltage, undervoltage, overcurrent, EEPROM error, main circuit overheat, external stop, initial operation stop, communication switch setting error, main circuit output abnormality | |
| Warning | Main circuit overheat, undervoltage, overload, operation stop | |
| Maximum Cable Extension Distance | Motor/Driver Distance: 3.5 m (11.5 ft.) | |
| Time Rating | Continuous | |

*1 The contents able to be set by the driver potentiometers (VR1, VR2, VR3) or external analog settings can be changed using parameters.

Note:

● The torque limiting value may cause an error up to a maximum of approximately ±20% (during rated torque and rated speed) 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 500 VDC megger is applied between the power supply terminal and heat sink after continuous operation under normal ambient temperature and humidity. |
| Dielectric Voltage | Sufficient to withstand 0.5 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 0.5 kVAC at 50 Hz applied between the power supply terminal and heat sink for 1 minute after continuous operation under normal ambient temperature and humidity. |
| Temperature Rise | 60°C (108°F) or less in the windings, and 50°C (90°F) or less in the case*1, as measured by the thermocouple method after continuous operation under normal ambient temperature and humidity. | 50°C (90°F) or less in the heat sink, as measured by the thermocouple method after continuous operation under normal ambient temperature and humidity. |
| Operating Environment | Ambient Temperature | 0~+40°C (+32~+104°F) |
| | 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 compliance 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 (10 000 ft.) above sea level |
| Thermal Class | EN standards: 120 (E) | |
| Degree of Protection | IP40 | IP20 |

*1 For round shaft types, please attach a heat radiation plate (material: aluminum) of the appropriate size listed below to maintain a maximum motor case temperature of 90°C (194°F):

200 W (1/4 HP): 200×200 mm (7.87×7.87 in.), 5 mm (0.20 in.) thick

400 W (1/2 HP): 250×250 mm (9.84×9.84 in.), 6 mm (0.24 in.) thick

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

Note:

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

Communication Specifications

Modbus Communication Specifications

| Item | Specifications |
|----------------------------|--|
| Communication Protocol | Modbus protocol (Modbus RTU mode) |
| Electrical Characteristics | EIA-485-compliant For use of twisted-pair wire (TIA/EIA-568B CAT5e min. recommended), set the total extension length of the communication cable at max. 50 m (163.9 ft.). |
| Transmit/Receive Method | Half-duplex communication |
| Baud Rate | 9600 bps, 19200 bps, 38400 bps, 57600 bps, 115200 bps |
| Physical Layer | Asynchronous method (Data: 8-bit, Stop-Bit: 1-bit/2-bit, Parity: Blank/Even No./Odd No.) |
| Number of Connection Units | 31 units max. |

Gearmotor – Torque Table of Combination Type

Combination Type – Parallel Shaft Gearhead

Unit = N·m (lb·in)

| Model | Gear Ratio | Motor Speed [r/min] | 5 | 10 | 15 | 20 | 30 | 50 | 100 | 200 |
|-------------------------------------|----------------|---------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|-------------|
| | | | 100 r/min | 20 | 10 | 6.7 | 5 | 3.3 | 2 | 1 |
| BLV620 <input type="checkbox"/> S-◇ | 100~3000 r/min | 3000 r/min | 600 | 300 | 200 | 150 | 100 | 60 | 30 | 15 |
| | | 4000 r/min | 800 | 400 | 267 | 200 | 133 | 80 | 40 | 20 |
| | | 100~3000 r/min | 2.9 (25) | 5.9 (52) | 8.8 (77) | 11.7 (103) | 16.8 (148) | 28.0 (240) | 52.7 (460) | 70 (610) |
| BLV640 <input type="checkbox"/> S-◇ | 100~3000 r/min | 4000 r/min | 2.0 (17.7) | 4.1 (36) | 6.1 (53) | 8.1 (71) | 11.6 (102) | 19.4 (171) | 36.5 (320) | 63 (550) |
| | | 100~3000 r/min | 5.9 (52) | 11.7 (103) | 17.6 (155) | 23.4 (200) | 33.5 (290) | 55.9 (490) | 70 (610) | 70 (610) |
| | | 4000 r/min | 4.3 (38) | 8.6 (76) | 12.8 (113) | 17.1 (151) | 24.5 (210) | 40.9 (360) | 63 (550) | 63 (550) |

● A colored background indicates gear shaft rotation in the same direction as the motor shaft, while the others rotate in the opposite direction.

Combination Type – Hollow Shaft Flat Gearhead

Unit = N·m (lb·in)

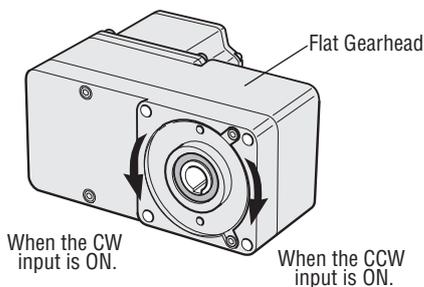
| Model | Gear Ratio | Motor Speed [r/min] | 5 | 10 | 15 | 20 | 30 | 50 | 100 |
|-------------------------------------|----------------|---------------------|-------------|--------------|---------------|---------------|---------------|---------------|---------------|
| | | | 100 r/min | 20 | 10 | 6.7 | 5 | 3.3 | 2 |
| BLV620 <input type="checkbox"/> F-◇ | 100~3000 r/min | 3000 r/min | 600 | 300 | 200 | 150 | 100 | 60 | 30 |
| | | 4000 r/min | 800 | 400 | 267 | 200 | 133 | 80 | 40 |
| | | 100~3000 r/min | — | 5.5 (48) | 8.3 (73) | 11.1 (98) | 16.6 (146) | 27.6 (240) | 55.3 (480) |
| BLV640 <input type="checkbox"/> F-◇ | 100~3000 r/min | 4000 r/min | — | 3.8 (33) | 5.7 (50) | 7.7 (68) | 11.5 (101) | 19.1 (169) | 38.3 (330) |
| | | 100~3000 r/min | 5.5 (48) | 11.1 (98) | 16.6 (146) | 22.1 (195) | 33.2 (290) | 55.3 (480) | 110 (970) |
| | | 4000 r/min | 4.0 (35) | 8.1 (71) | 12.1 (107) | 16.2 (143) | 24.2 (210) | 40.4 (350) | 80.8 (710) |

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

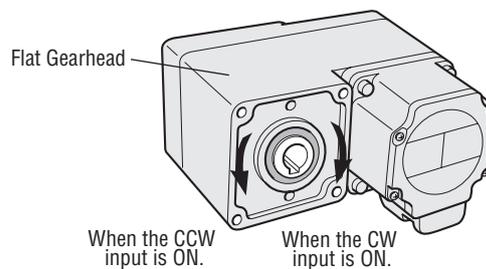
Rotation Direction of the Hollow Shaft Flat Gearhead

The hollow shaft flat gearhead of the combination type rotates in the direction as shown below, with respect to the direction input from the driver.

Front View



Rear View



- Enter the power supply voltage **K** or **N** (**KM** and **NM** for electromagnetic brake type) in the box within the model name.
- Enter the gear ratio in the box within the model name.
- Enter the length of the connection cable (included) as **1** [1 m (3.3 ft.)], **2** [2 m (6.6 ft.)] or **3** [3 m (9.8 ft.)] in the diamond within the model name.

Permissible Overhung Load and Permissible Thrust Load

Combination Type – Parallel Shaft Gearhead

| Model | Gear Ratio | | Permissible Overhung Load | | | | Permissible Thrust Load | |
|------------------------------|---------------|----------------|---------------------------------|-----|---------------------------------|-----|-------------------------|-----|
| | | | 10 mm (0.39 in.) from shaft end | | 20 mm (0.79 in.) from shaft end | | N | lb. |
| | | | N | lb. | N | lb. | | |
| BLV620-□-S-◇ BLV640-□-S-◇ | 5, 10, 15, 20 | 100~3000 r/min | 550 | 123 | 800 | 180 | 200 | 45 |
| | | 4000 r/min | 500 | 112 | 700 | 157 | | |
| | 30, 50 | 100~3000 r/min | 1000 | 220 | 1250 | 280 | 300 | 67 |
| | | 4000 r/min | 900 | 200 | 1100 | 240 | | |
| | 100, 200 | 100~3000 r/min | 1400 | 310 | 1700 | 380 | 400 | 90 |
| | | 4000 r/min | 1200 | 270 | 1400 | 310 | | |

Combination Type – Hollow Shaft Flat Gearhead

| Model | Gear Ratio | | Permissible Overhung Load | | | | Permissible Thrust Load | |
|------------------------------|-------------|----------------|--|-----|--|-----|-------------------------|-----|
| | | | 10 mm (0.39 in.) from mounting surface of gearhead | | 20 mm (0.79 in.) from mounting surface of gearhead | | N | lb. |
| | | | N | lb. | N | lb. | | |
| BLV620-□-F-◇ BLV640-□-F-◇ | 5*, 10 | 100~3000 r/min | 1230 | 270 | 1070 | 240 | 800 | 180 |
| | | 4000 r/min | 1130 | 250 | 990 | 220 | | |
| | 15, 20 | 100~3000 r/min | 1680 | 370 | 1470 | 330 | | |
| | | 4000 r/min | 1550 | 340 | 1360 | 300 | | |
| | 30, 50, 100 | 100~3000 r/min | 2040 | 450 | 1780 | 400 | | |
| | | 4000 r/min | 1900 | 420 | 1660 | 370 | | |

*BLV640-□-F-◇ only.

Round Shaft Type

| Model | Permissible Overhung Load | | | | Permissible Thrust Load |
|------------------------------|---------------------------------|-----|---------------------------------|-----|---|
| | 10 mm (0.39 in.) from shaft end | | 20 mm (0.79 in.) from shaft end | | |
| | N | lb. | N | lb. | |
| BLV620-□-A-◇ BLV640-□-A-◇ | 197 | 44 | 221 | 49 | The permissible thrust load should not be greater than half the motor mass. |

Permissible Load Inertia J of Combination Type

Combination Type – Parallel Shaft Gearhead

Unit = $\times 10^{-4} \text{kg}\cdot\text{m}^2$ (oz-in²)

| Model | Gear Ratio | 5 | 10 | 15 | 20 | 30 | 50 | 100 | 200 |
|-------|--|------------------------------|---------------|---------------|----------------|-----------------|-----------------|-----------------|------------------|
| | | BLV620-□-S-◇ BLV640-□-S-◇ | 100 (550) | 460 (2500) | 1000 (5500) | 1700 (9300) | 3900 (21000) | 9300 (51000) | 18000 (98000) |
| | When instantaneous stop or instantaneous bi-directional operation is performed | 50 (270) | 200 (1100) | 450 (2500) | 800 (4400) | 1800 (10000) | 5000 (27000) | 5000 (27000) | 5000 (27000) |

Combination Type – Hollow Shaft Flat Gearhead

Unit = $\times 10^{-4} \text{kg}\cdot\text{m}^2$ (oz-in²)

| Model | Gear Ratio | 5* | 10 | 15 | 20 | 30 | 50 | 100 |
|-------|--|------------------------------|---------------|---------------|----------------|-----------------|-----------------|-----------------|
| | | BLV620-□-F-◇ BLV640-□-F-◇ | 100 (550) | 460 (2500) | 1000 (5500) | 1700 (9300) | 3900 (21000) | 9300 (51000) |
| | When instantaneous stop or instantaneous bi-directional operation is performed | 50 (270) | 200 (1100) | 450 (2500) | 800 (4400) | 1800 (10000) | 5000 (27000) | 5000 (27000) |

*BLV640-□-F-◇ only.

Enter the power supply voltage **K** or **N** (**KM** and **NM** for electromagnetic brake type) in the box (■) within the model name.

Enter the gear ratio in the box (□) within the model name.

Enter the length of the connection cable (included) as **1** [1 m (3.3 ft.)], **2** [2 m (6.6 ft.)] or **3** [3 m (9.8 ft.)] in the diamond (◇) within the model name.

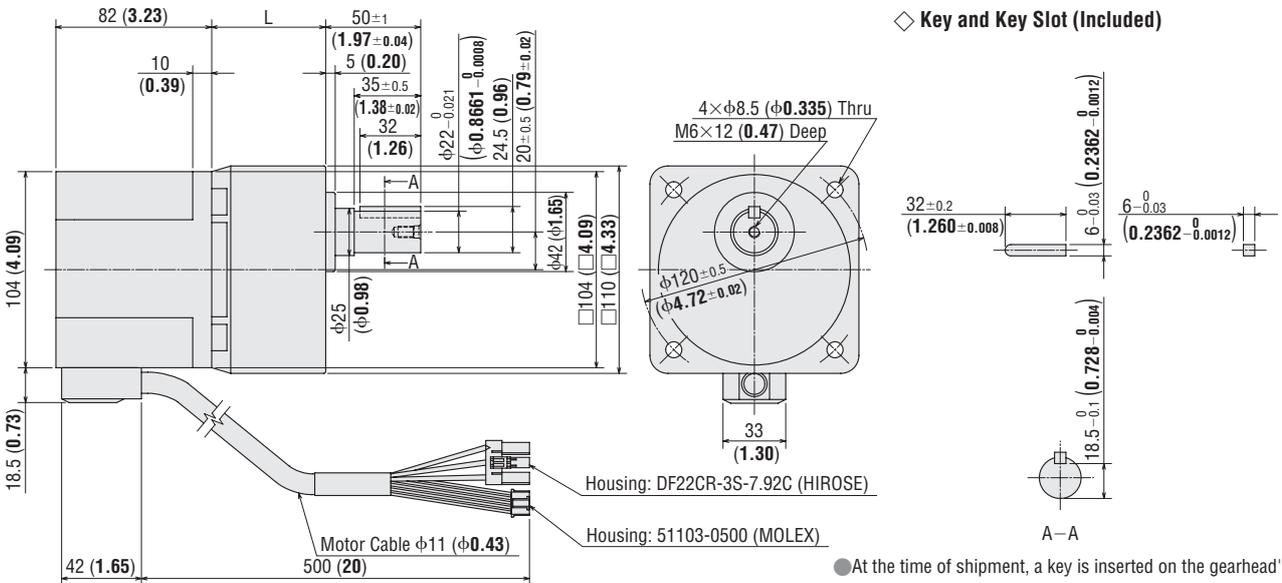
Dimensions Unit = mm (in.)

● Mounting screws are included with the combination type.

● Standard Type 200 W (1/4 HP), 400 W (1/2 HP)

◇ Motor/Parallel Shaft Gearhead

| Model | Motor Model | Gearhead Model | Gear Ratio | L | Mass kg (lb.) | DXF |
|---------------------|--------------|----------------|-----------------|-----------|---------------|--------|
| BLV620K □S-◇ | BLVM620K-GFS | GFS6G□ | 5~20 | 60 (2.36) | 5.4 (11.9) | A1139A |
| BLV640N □S-◇ | BLVM640N-GFS | | 30, 50 | 72 (2.83) | | A1139B |
| | | | 100, 200 | 86 (3.39) | | A1139C |



◇ Motor/Hollow Shaft Flat Gearhead

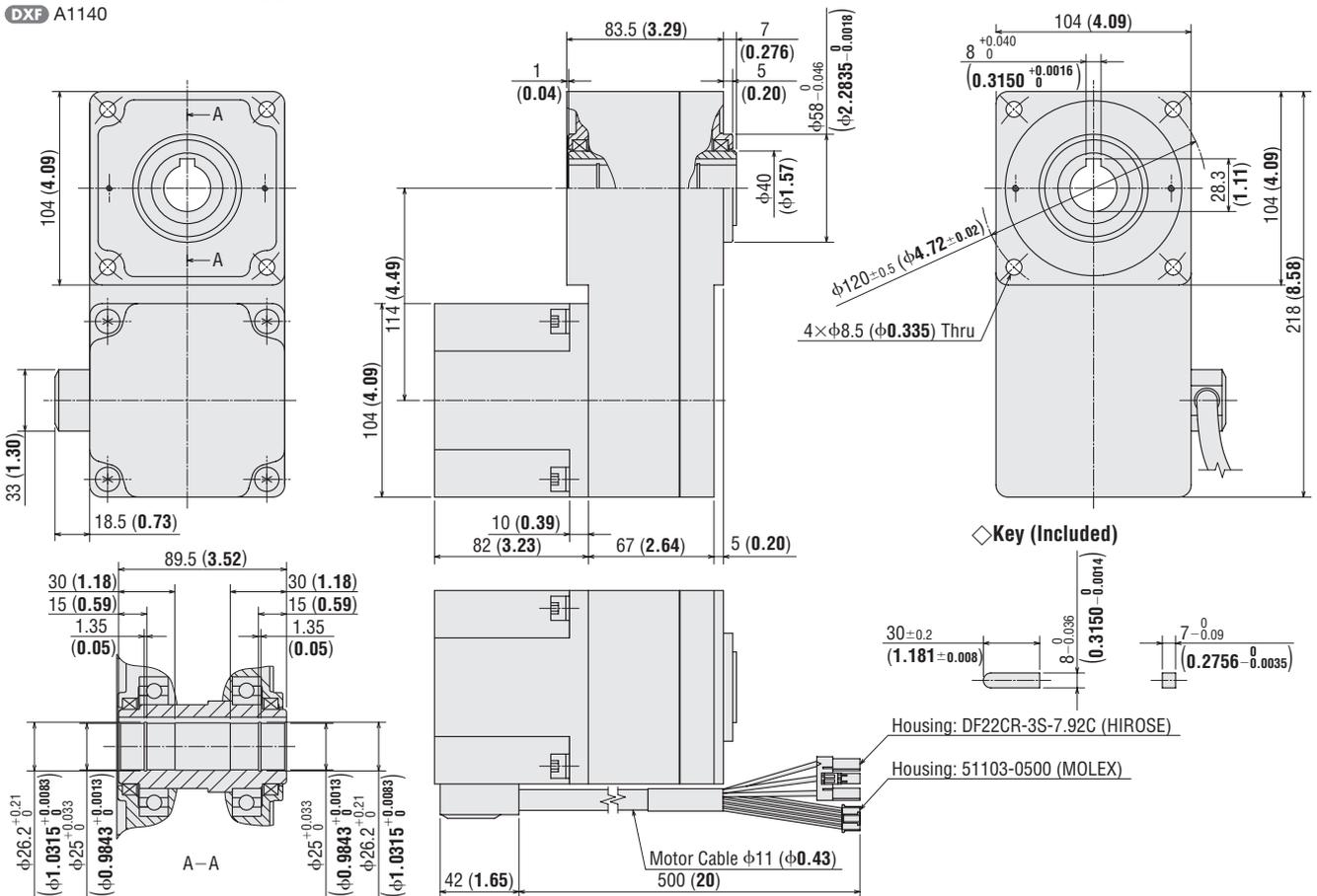
BLV620K□F-◇, **BLV640N**□F-◇

Motor: BLVM620K-GFS, BLVM640N-GFS

Gearhead: GFS6G□FR

Mass: 7.2 kg (15.8 lb.) (Including gearhead)

DXF A1140



● Enter the gear ratio in the box (□) within the model name.

Enter the length of the connection cable (included) as **1** [1 m (3.3 ft.)], **2** [2 m (6.6 ft.)] or **3** [3 m (9.8 ft.)] in the diamond (◇) within the model name.

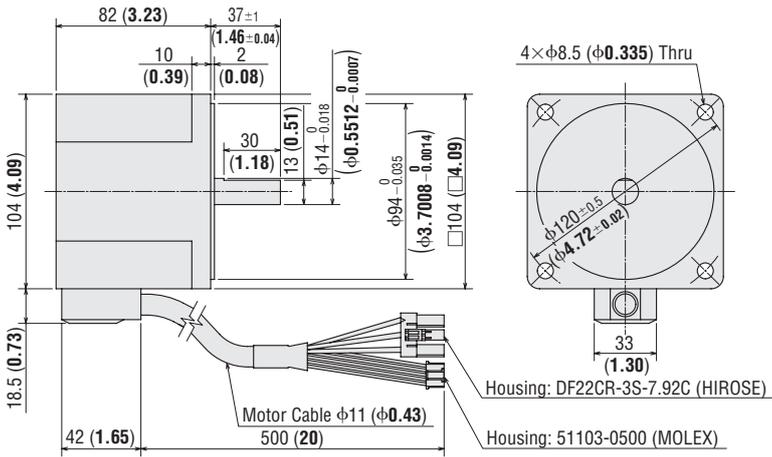
◇ Round Shaft Type

BLV620KA-◇, **BLV640NA**-◇

Motor: BLVM620K-A, BLVM640N-A

Mass: 2.4 kg (5.3 lb.)

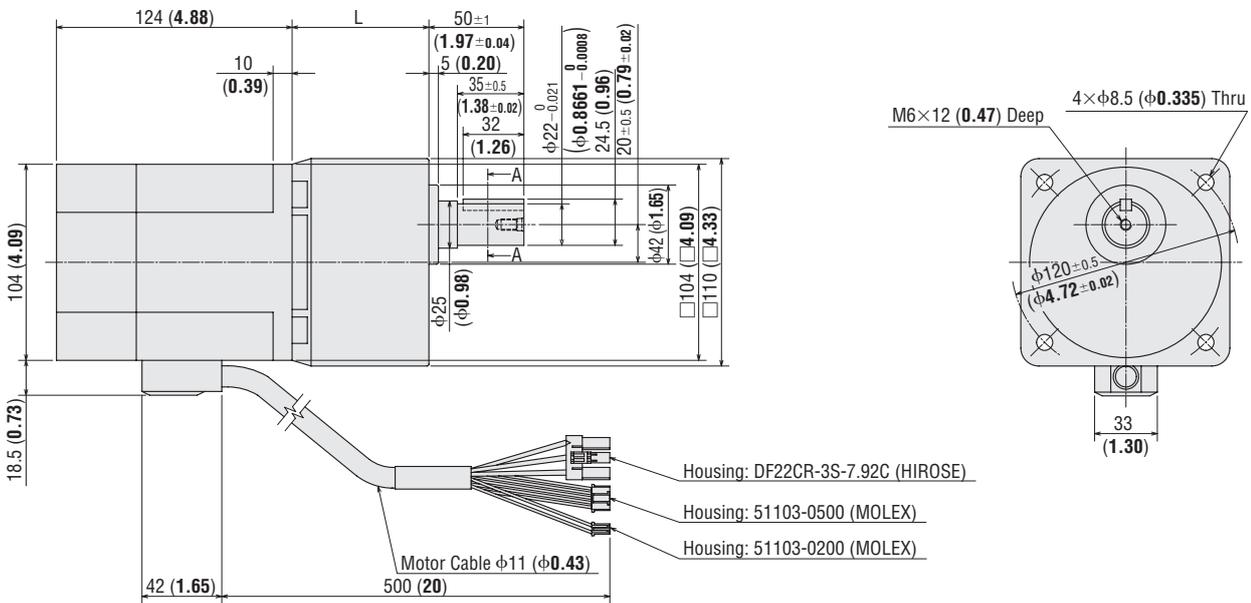
DXF A1141



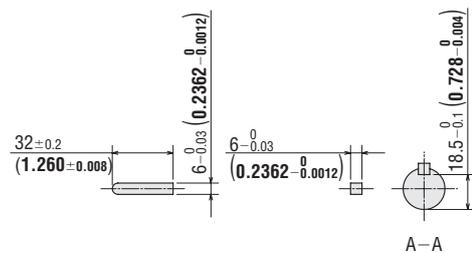
● Electromagnetic Brake Type 200 W (1/4 HP), 400 W (1/2 HP)

◇ Motor/Parallel Shaft Gearhead

| Model | Motor Model | Gearhead Model | Gear Ratio | L | Mass kg (lb.) | DXF |
|--|--------------------------------|----------------|----------------|-----------|---------------|--------|
| BLV620KM □S-◇ BLV640NM □S-◇ | BLVM620KM-GFS BLVM640NM-GFS | GFS6G□ | 5~20 | 60 (2.36) | 6.4 (14.1) | A1142A |
| | | | 30.50 | 72 (2.83) | | A1142B |
| | | | 100.200 | 86 (3.39) | | A1142C |



◇ Key and Key Slot (Included)



● At the time of shipment, the key is inserted on the gearhead's shaft.

● Enter the gear ratio in the box (□) within the model name.

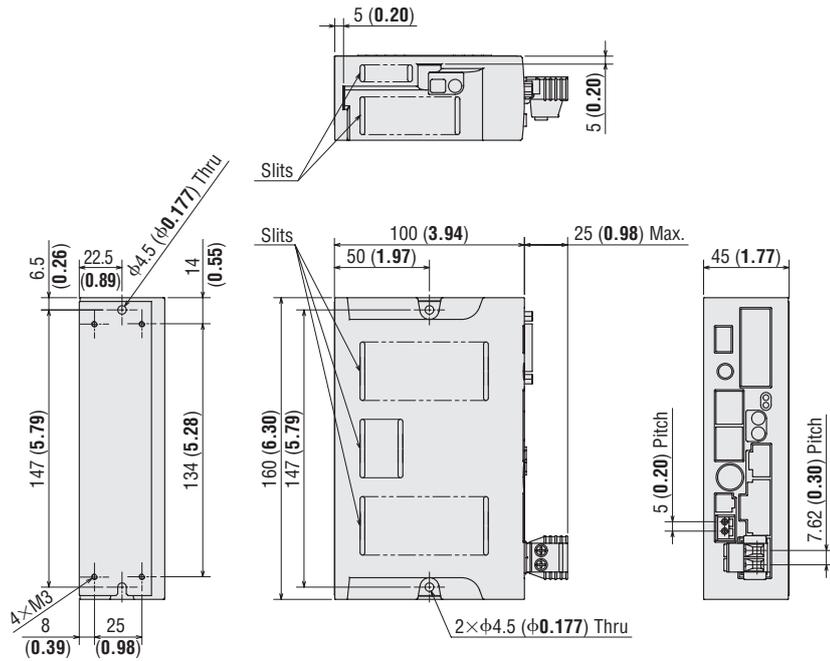
Enter the length of the connection cable (included) as **1** [1 m (3.3 ft.)], **2** [2 m (6.6 ft.)] or **3** [3 m (9.8 ft.)] in the diamond (◇) within the model name.

Driver

BLVD20KM, BLVD40NM

Mass: 0.6 kg (1.32 lb.)

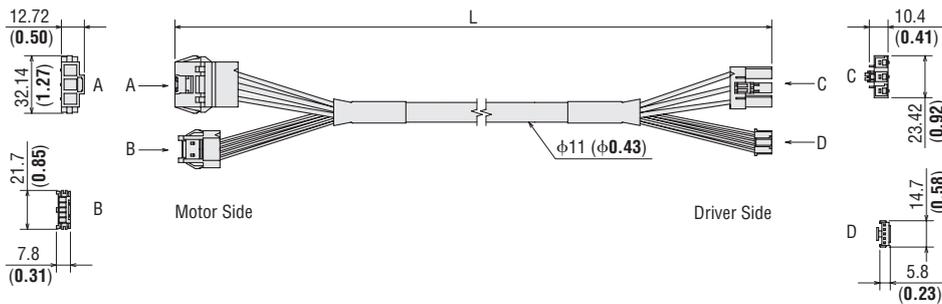
DXF A1138



Connection Cable (Included)

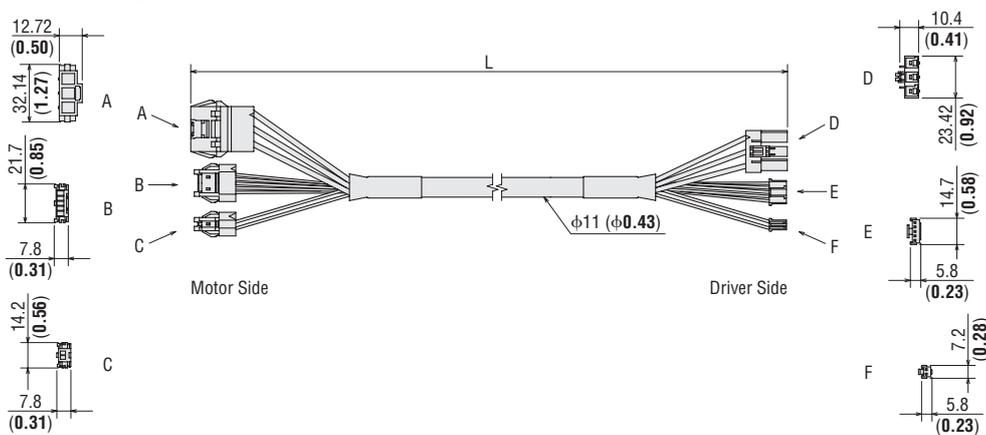
| Product Name | Length L [m (ft.)] |
|-----------------|--------------------|
| CC01BLV2 | 1 (3.3) |
| CC02BLV2 | 2 (6.6) |
| CC03BLV2 | 3 (9.8) |

Standard Type



| Code | Housing Product Name | Manufacturer |
|------|----------------------|--------------|
| A | DF22R-3EP-7.92C | HIROSE |
| B | 51198-0500 | MOLEX |
| C | DF22CR-3S-7.92C | HIROSE |
| D | 51103-0500 | MOLEX |

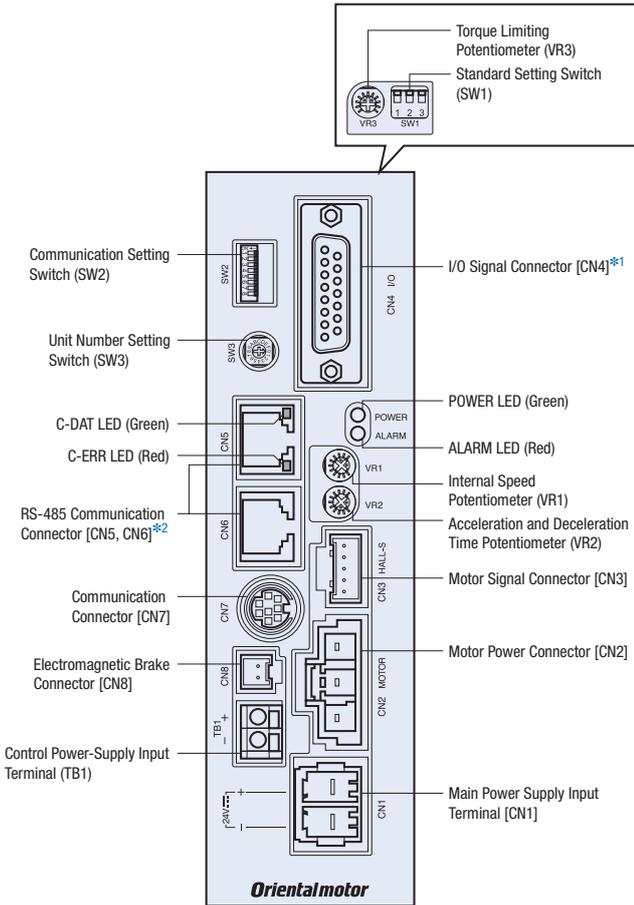
Electromagnetic Brake Type



| Code | Housing Product Name | Manufacturer |
|------|----------------------|--------------|
| A | DF22R-3EP-7.92C | HIROSE |
| B | 51198-0500 | MOLEX |
| C | 51198-0200 | MOLEX |
| D | DF22CR-3S-7.92C | HIROSE |
| E | 51103-0500 | MOLEX |
| F | 51103-0200 | MOLEX |

Connection and Operation

Names and Functions of Driver Parts



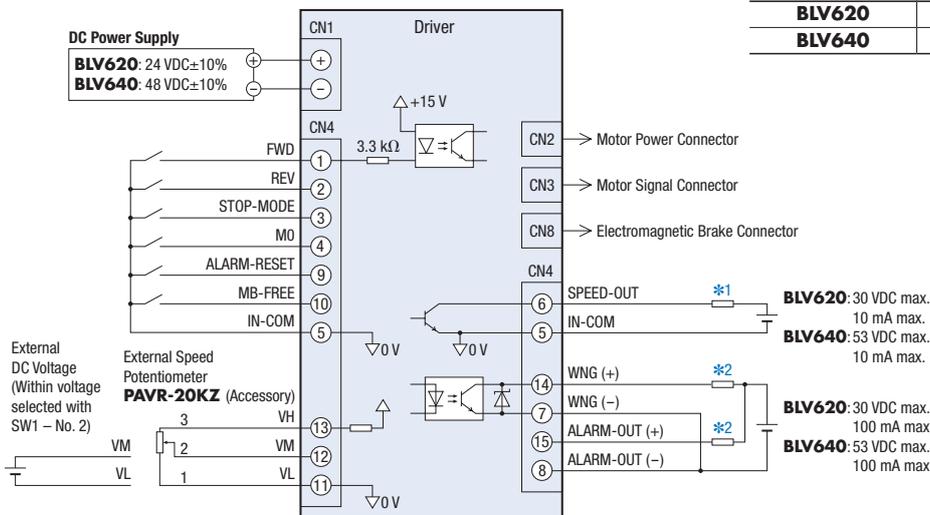
| Name | Description |
|--|--|
| POWER LED (Green) | Lights when main or logic power supply is on. |
| ALARM LED (Red) | Blinks while an alarm (protective function) occurs. The type of alarm can be confirmed by the blink count. |
| Internal Speed Potentiometer (VR1) | Sets the motor's speed. |
| Acceleration and Deceleration Time Potentiometer (VR2) | Sets the motor's starting and stopping times. |
| Torque Limiting Potentiometer (VR3) | Sets the motor's torque limiting value. |
| Main Power Supply Input Terminal [CN1] | Connects the main power supply. BLV620 : +24V, BLV640 : +48V |
| Motor Power Connector [CN2] | Connects the motor power connector. |
| Motor Signal Connector [CN3] | Connects the motor signal connector. |
| Electromagnetic Brake Connector [CN8] | Connects the motor electromagnetic brake connector. |
| I/O Signal Connector [CN4] | Used when an external control device is used or an operation command is entered. |
| Standard Setting Switch (SW1) | Switches the speed response, sink logic/ source logic, and the external DC voltage. |
| Communication Connector [CN7] | Connects to control module OPX-2A . |
| Control Power-Supply Input Terminal (TB1)*2 | Connects the driver's power supply for signal control. |
| RS-485 Communication Connector [CN5, CN6]*2 | Connects the RS-485 communication cable. |
| C-DAT LED (Green)*2 | Lights when communications are normal with the master station via RS-485 communication. |
| C-ERR LED (Red)*2 | Lights when a communication abnormality occurs with the master station via RS-485 communication. |
| Communication Setting Switch (SW2)*2 | Sets the baud rate, communication protocol and terminating resistor of the RS-485 communication. |
| Unit Number Setting Switch (SW3)*2 | Sets the unit number of the RS-485 communication. |

*1 The following items are needed for the connector that connects the I/O signals:
 - D-sub connector (15-pin), hood (screw: No. 4-40UNC)
 - General-purpose cable is available as an accessory. → Page 15

*2 Used with RS-485 communications.
 An RS-485 communication cable is available as an accessory.
 → Page 15

Connection Diagrams

A connection example for sink logic.



*1 To prevent the current value from exceeding 10 mA, connect a limiting resistor appropriate for the power supply voltage that will be used.
 *2 To prevent the current value from exceeding 100 mA, connect a limiting resistor appropriate for the power supply voltage that will be used.

Recommended Power Supply Capacity

| Package Name | Input Power Supply Voltage | Power Supply Capacity |
|---------------|----------------------------|-----------------------|
| BLV620 | 24 VDC±10% | 800 W min. |
| BLV640 | 48 VDC±10% | 1 kW min. |

Refer to the operating manual for detailed information and notes about this product. Please download the operating manual from our website or contact your nearest Oriental Motor sales office.
<http://www.orientalmotor.com/>

List of Motor and Driver Combinations

Standard Type

Combination Type – Parallel Shaft Gearhead

| Output Power | Model | Motor Model | Gearhead Model | Driver Model |
|----------------|---------------------|--------------|----------------|--------------|
| 200 W (1/4 HP) | BLV620K □S-◇ | BLVM620K-GFS | GFS6G□ | BLVD20KM |
| 400 W (1/2 HP) | BLV640N □S-◇ | BLVM640N-GFS | | BLVD40NM |

Combination Type – Hollow Shaft Flat Gearhead

| Output Power | Model | Motor Model | Gearhead Model | Driver Model |
|----------------|---------------------|--------------|----------------|--------------|
| 200 W (1/4 HP) | BLV620K □F-◇ | BLVM620K-GFS | GFS6G□FR | BLVD20KM |
| 400 W (1/2 HP) | BLV640N □F-◇ | BLVM640N-GFS | | BLVD40NM |

Round Shaft Type

| Output Power | Model | Motor Model | Driver Model |
|----------------|--------------------|-------------|--------------|
| 200 W (1/4 HP) | BLV620KA -◇ | BLVM620K-A | BLVD20KM |
| 400 W (1/2 HP) | BLV640NA -◇ | BLVM640N-A | BLVD40NM |

Electromagnetic Brake Type

Combination Type – Parallel Shaft Gearhead

| Output Power | Model | Motor Model | Gearhead Model | Driver Model |
|----------------|----------------------|---------------|----------------|--------------|
| 200 W (1/4 HP) | BLV620KM □S-◇ | BLVM620KM-GFS | GFS6G□ | BLVD20KM |
| 400 W (1/2 HP) | BLV640NM □S-◇ | BLVM640NM-GFS | | BLVD40NM |

Combination Type – Hollow Shaft Flat Gearhead

| Output Power | Model | Motor Model | Gearhead Model | Driver Model |
|----------------|----------------------|---------------|----------------|--------------|
| 200 W (1/4 HP) | BLV620KM □F-◇ | BLVM620KM-GFS | GFS6G□FR | BLVD20KM |
| 400 W (1/2 HP) | BLV640NM □F-◇ | BLVM640NM-GFS | | BLVD40NM |

Round Shaft Type

| Output Power | Model | Motor Model | Driver Model |
|----------------|---------------------|-------------|--------------|
| 200 W (1/4 HP) | BLV620KMA -◇ | BLVM620KM-A | BLVD20KM |
| 400 W (1/2 HP) | BLV640NMA -◇ | BLVM640NM-A | BLVD40NM |

● Enter the gear ratio in the box (□) within the model name.

Enter the length of the connection cable (included) as **1** [1 m (3.3 ft.)], **2** [2 m (6.6 ft.)] or **3** [3 m (9.8 ft.)] in the diamond (◇) within the model name.

Accessories (Sold separately)

Flexible Connection Cables (RoHS)

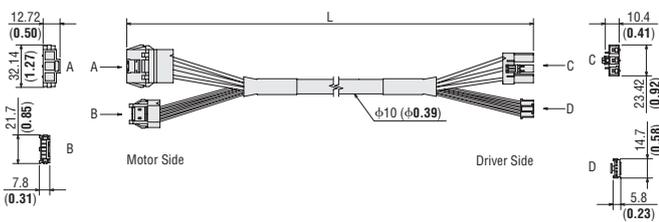
Use of flexible connection cables is recommended in applications where the cable will be bent and stretched repeatedly. The maximum extension length is 3.5 m (11.5 ft.).



Standard Type

| Model | Length L [m (ft.)] |
|------------------|--------------------|
| CC01BLV2R | 1 (3.3) |
| CC02BLV2R | 2 (6.6) |
| CC03BLV2R | 3 (9.8) |

Dimensions Unit = mm (in.)

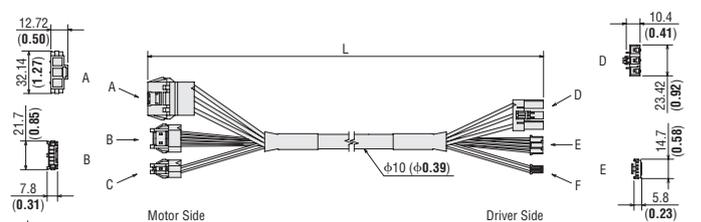


| Code | Housing Product Name | Manufacturer |
|------|----------------------|--------------|
| A | DF22R-3EP-7.92C | HIROSE |
| B | 51198-0500 | MOLEX |
| C | DF22CR-3S-7.92C | HIROSE |
| D | 51103-0500 | MOLEX |

Electromagnetic Brake Type

| Model | Length L [m (ft.)] |
|-------------------|--------------------|
| CC01BLV2MR | 1 (3.3) |
| CC02BLV2MR | 2 (6.6) |
| CC03BLV2MR | 3 (9.8) |

Dimensions Unit = mm (in.)



| Code | Housing Product Name | Manufacturer |
|------|----------------------|--------------|
| A | DF22R-3EP-7.92C | HIROSE |
| B | 51198-0500 | MOLEX |
| C | 51198-0200 | MOLEX |
| D | DF22CR-3S-7.92C | HIROSE |
| E | 51103-0500 | MOLEX |
| F | 51103-0200 | MOLEX |

Control Module (RoHS)

Allows for setting of various parameters and confirmation of the setting data. It is used by connecting to the driver communication connector (CN7).

| |
|---------------|
| Model |
| OPX-2A |



External Speed Potentiometer (RoHS)

Used to set and adjust the speed of motor.

| |
|------------------|
| Model |
| PAVR-20KZ |



Motor Speed Indicator (RoHS)

Indicates speed of the motor.

| |
|---------------|
| Model |
| SDM496 |



Motor and Gearhead Mounting Brackets (RoHS)

Dedicated mounting brackets for mounting a motor and gearhead.

| Applicable Product | Model |
|--------------------------|---------------|
| BLV620□S-◇ BLV640□S-◇ | SOL6M8 |
| BLV620□A-◇ BLV640□A-◇ | |



Note:

- This mounting bracket cannot be used with the hollow shaft flat gearhead.

Flexible Couplings (RoHS)

A clamp type coupling for connecting the motor/gearhead shaft with the driven shaft. Once the motor or gearhead are chosen, the coupling can be selected.



| Applicable Product | Shaft Diameter [mm (in.)] | Coupling Type |
|--------------------------|---------------------------|-------------------|
| BLV620□S-◇ BLV640□S-◇ | φ22 (φ0.8661) | MCL65 Type |
| BLV620□A-◇ BLV640□A-◇ | φ14 (φ0.5512) | MCL40 Type |

DIN Rail Mounting Plate (RoHS)

Use this plate when installing the driver to a DIN rail.

| |
|---------------|
| Model |
| PADP03 |



Driver Cable

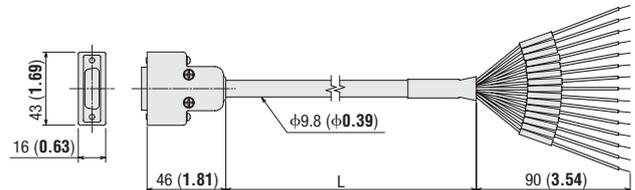
General-Purpose Cables (RoHS)

Dedicated 15-conductor cables for connecting the I/O signal connector and programmable controller. They are high-quality, noise-blocking, double-shielded cables.



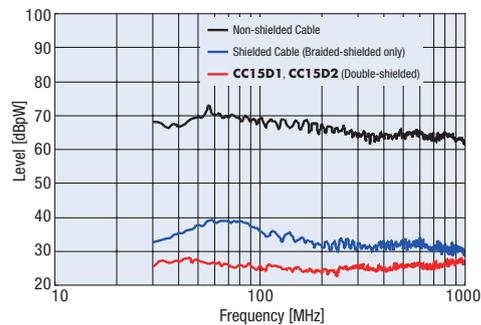
| Model | Length L [m (ft.)] |
|---------------|--------------------|
| CC15D1 | 1 (3.3) |
| CC15D2 | 2 (6.6) |

◇ Dimensions Unit = mm (in.)



Noise-Blocking Property

The figure below shows the noise effects on a signal line. As you can see, the noise-blocking effect is high with signal lines that have a low level value. Oriental Motor driver cables come with double-shielding that includes aluminum foil-shielding and braided-shielding, which provides excellent noise-blocking characteristics.



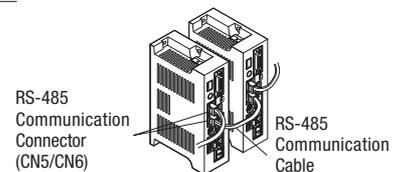
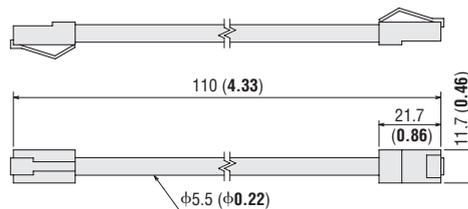
RS-485 Communication Cable (RoHS)

This cable with connector assemblies are available to connected drivers for multi axis operation.

| |
|------------------|
| Model |
| CC001-RS4 |



◇ Dimensions Unit = mm (in.)



- Enter the power supply voltage **K** or **N** (**KM** and **NM** for electromagnetic brake type) in the box (■) within the model name.
- Enter the gear ratio in the box (□) within the model name.
- Enter the length of the connection cable (included) as **1** [1 m (3.3 ft.)], **2** [2 m (6.6 ft.)] or **3** [3 m (9.8 ft.)] in the diamond (◇) within the model name.



Safety Precautions

- To ensure correct operation, carefully read the Operating Manual before using it.
- The products listed in this catalogue are for industrial use and for built-in component. Do not use for any other applications.

- The factories which manufacture the products listed in this catalogue have obtained Quality Management Systems ISO9001 and Environment Management Systems ISO14001.
- The content listed in this catalogue such as performance and specifications of the products are subject to change without notice for improvements.
- The price of all products listed in this catalogue does not include the consumption tax etc.
- For details of the products, please contact the nearest dealer, sales office or the following "Order Support Center" or "Customer Support Center".
- **Orientalmotor** is registered trademark or trademark of Oriental Motor in Japan and other countries.

Orientalmotor

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For Malaysia: 1800-806161 (Toll Free)
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For India: 1800-1201995 (Toll Free)
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