Oriental motor

Superior

Simple, Compact, and Cost-effective

Speed Control Solution

Brushless Motor

BLS Series

Why not consider a product with a lower running cost than AC Motors that is easier to replace?
BLS Series is an “Economic Motor” that Makes “Better!” a Reality with Simple Operation.

24 VDC Input Brushless Motors

BLS Series

- 24 VDC, 25~120 W, 100~2000 (4000) r/min
- Constant speed operation

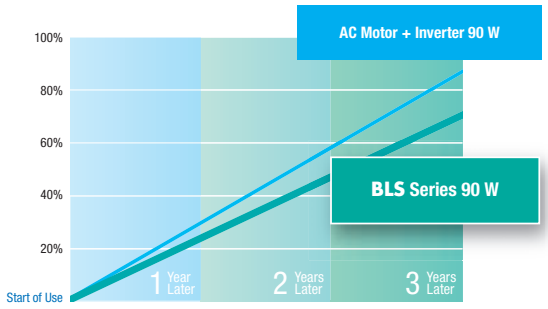
This product is recommended for use as a power source for belt conveyors, agitators, and similar equipment.

BLS Series Offers “Better!” Solutions

Cost Reduction

Reduce Electricity Charges by

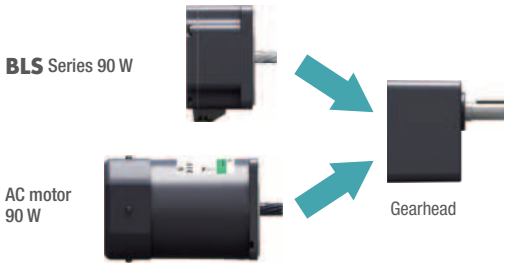
20%



Reduce Running Costs!

Simplicity

The Gearhead of an AC Motor Can be Used



Connection and Operation are Very Simple

Setting	Connection	Operation
Select with a switch	Connect easily with a connector	Turn on 24 VDC power supply

Smaller

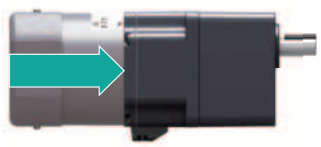
Compared to AC Motors:

Motor Length

78 mm Shorter

Mass

1.8 kg Lighter



Compared to Inverters:

Driver Volume

Reduced by 65%

Increased Reliability

Low heat generation with a high efficiency motor

40,000 Hours of Motor Service Life

Motor’s performance is not affected by the power supply frequency in each country.

The Same Design Can Be Used Globally

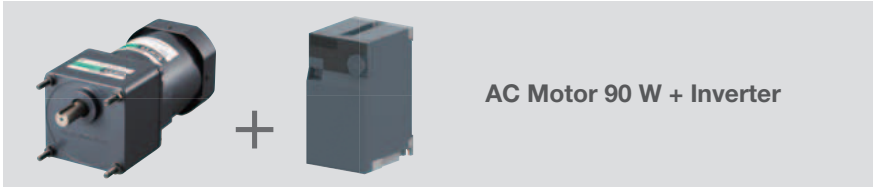
Low speed fluctuation when the load changes.

Speed Regulation ±0.2%

Greater Cost Reduction

Reduce Electricity Charges

Brushless motors are highly efficient, saving you energy.
Electricity costs can be reduced by 20% compared to the use of an AC motor and inverter.



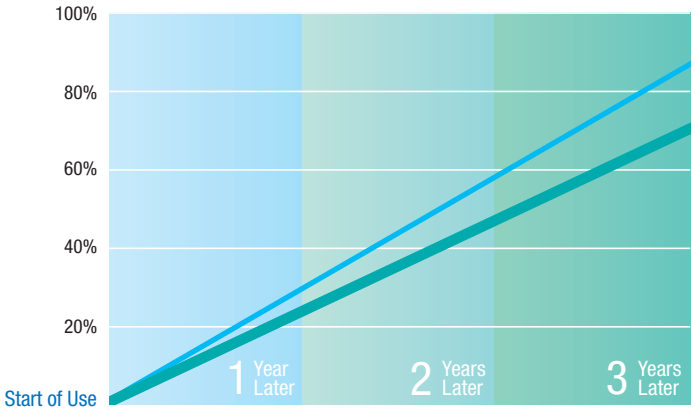
Reduce Electricity Charges by

20%

Operating Time : 24 hours

AC Motor + Inverter 60 Hz Setup
BLS Series at 2000 r/min

● Comparison of 3-Year Electricity Costs



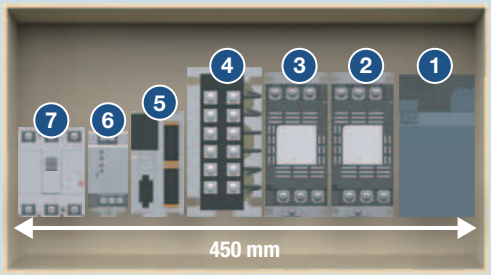
AC Motor 90 W + Inverter

BLS Series 90 W

Running Costs **Reduced!**

24 VDC-input brushless motors and compact drivers reduce the costs and space of components inside the control cabinet and the hassle of wiring

■ Components of AC Motor + Inverter

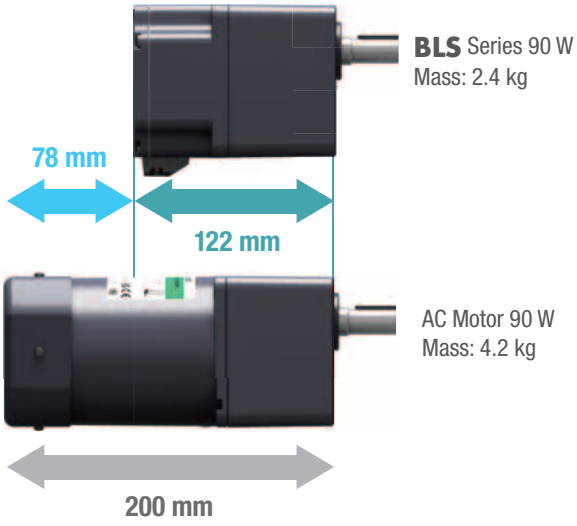


① Inverter
② AC noise filter on input side
③ AC noise filter on output side
④ AC reactor
⑤ PLC
⑥ DC power supply for signal (0.6 A)
⑦ Breaker (electromagnetic switch)
·Radio noise filter

Total number of components: 8

Smaller!

Smaller and Lighter Motor



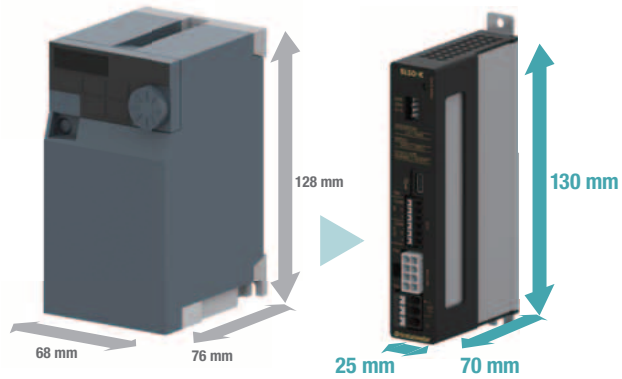
BLS Series 90 W
Mass: 2.4 kg

AC Motor 90 W
Mass: 4.2 kg

Motor Length:
78 mm Shorter

Motor Mass:
1.8 kg Lighter

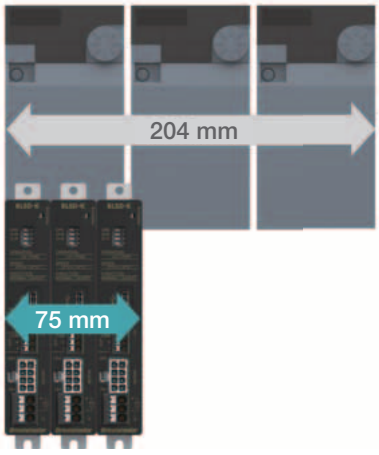
Slimmer Driver



General Inverter

BLS Series Driver

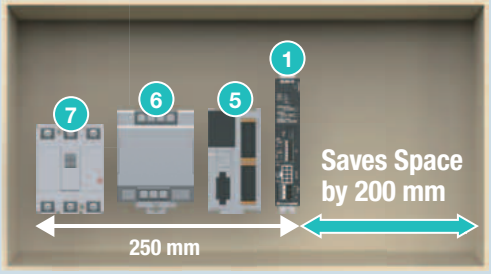
Driver Volume:
Reduced by 65%



Installation Width: Approx. 1/3

It can also be mounted in contact with another structure.
Even if the number of axes used increases, it still contributes to space saving of the equipment.

■ **BLS** Series Components



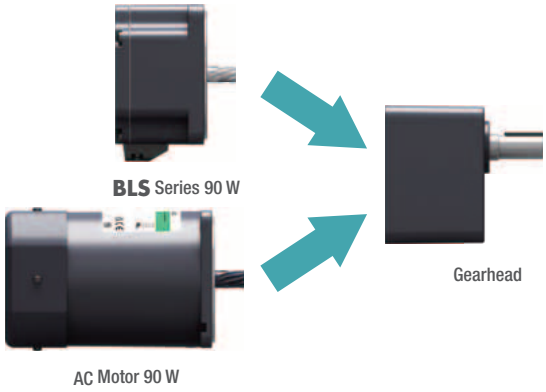
① Driver
⑤ PLC
⑥ DC power supply (10 A) for drive
⑦ Breaker (Electromagnetic switch)

Total number of components: 4

Offering the Same Simplicity as AC Motors

The Same Gearheads for AC Motors Can be Used*. Easily Replace the Motor without Having to Modify the System

For the same output power, the motor's frame size and pinion specifications are identical to an AC motor*.
The same gearheads (**GN** gearhead/**GE** gearhead) as an AC motor can be used* *For a standard (AC motor compatible) type.



Using the Same Gearhead Makes Replacement Easy!

- No need to modify the system; simply replace the motor
- Even if the motor and gearhead need to be replaced, the shaft diameter is the same, so couplings, etc. can be reused
- Using common parts simplifies stock management and maintenance

Simple Setup, Connection, and Operation

Setting

Set the operating method, operating speed, and rotation direction with a switch

Switch	Left side (Initial setting)	Right side
OPE (Operating method)	I/O operation	PWR Operation
SPD (Rotation speed)	1500 r/min*	1800 r/min*
DIR (Rotation direction)	FWD Direction	RVS Direction

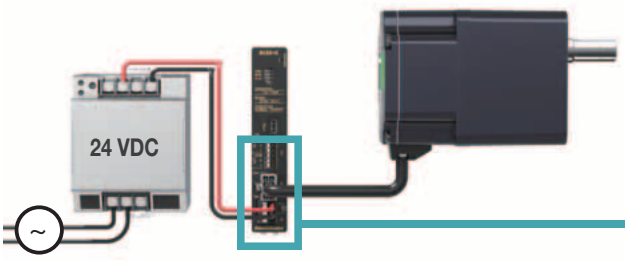
*Rotation speed can be changed using support software **MEXE02**.

Easy Rotation Direction Change

- Unlike AC motors, there is no need to change wiring; all you have to do is flip a switch!

Connection

- Motor and Driver: One-touch connection with a connector
- Power Supply : Connect by simply inserting the wires. No special tools or screw tightening required, so there is no need to manage tightening torque.



Operation

24 VDC power supply ON

Increased Reliability

Extending the Service Life of Your System

BLS Series has a longer service life than AC motors because of its highly efficient motor and low heat generation.

- One of the factors that affects a motor's service life is the service life of grease on the bearing. Since the service life of grease is affected by heat, **BLS** Series with low heat generation extends the service life of its motor.

Brushless Motor BLS Series: 40,000 hours

AC Motor (Induction Motor): 30,000 hours

Conditions: Continuous and one-way operation, rated torque and constant load, rated speed, ambient temperature of 30°C

24 VDC Input Makes it Easy to Deploy Equipment Globally and Design Safely

Easy to Expand Globally

- The same **BLS** Series products can be used worldwide.
- Unlike AC motors, there is no need to select and design according to the voltage/ frequency of each country.
- Not subject to the Low Voltage Directive

Safe Design, Low Noise

- 24 VDC input is below dangerous voltage (60 VDC)
- Significant reduction in safety measure designs

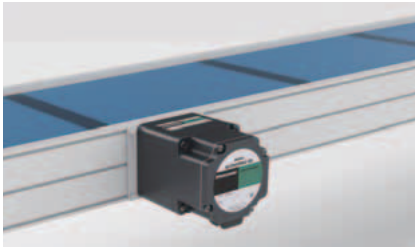
Compact System

- DC power supply is easy to control. The overall structure of the system is simple
- The control panel has also been simplified, making the entire system more compact

Reducing Speed Fluctuation

The motor is equipped with a small sensor that performs feedback control.
This reduces the fluctuation in motor speed when the load changes.

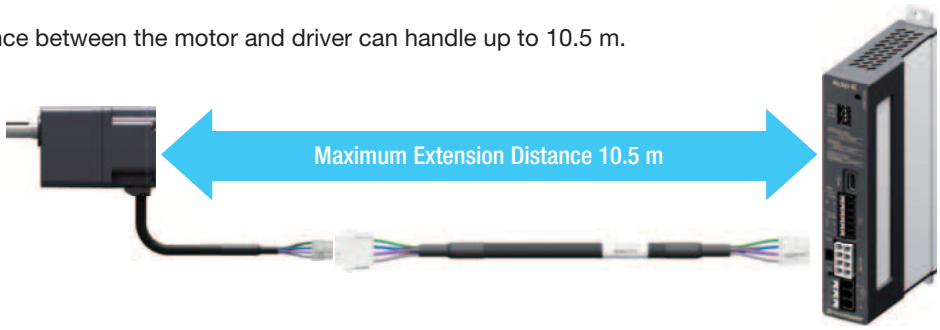
Speed Regulation
(With Respect to Load)
±0.2%



Multiple Choices for Multiple Needs

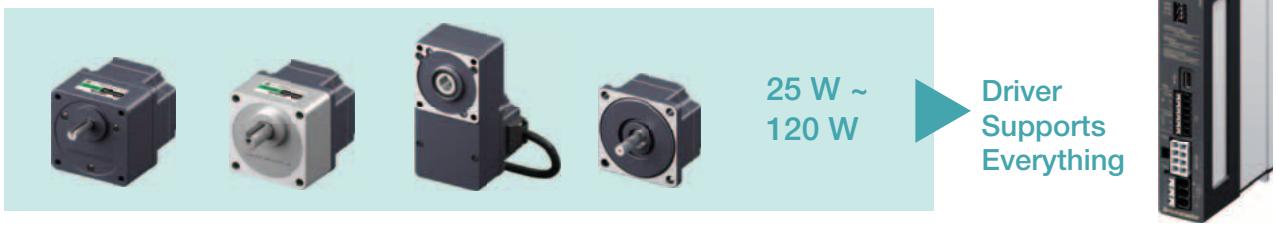
Cable Extension Distance 10.5 m

The maximum extension distance between the motor and driver can handle up to 10.5 m.



One Driver Can Handle All Motor Outputs

All motors can be operated by a single driver model.
Because parts can be standardized, inventory and maintenance can be reduced.



Gearhead Selection Based on Intended Use

Type	Standard (AC Motor Compatible) Type	High Strength, Long Life Type
Appearance	 Parallel Shaft Gearhead	 Parallel Shaft Gearhead  Hollow Shaft Flat Gearhead
Overview	The same gearhead as Oriental Motor's AC motor Example) **4GN□K**	Gearheads for brushless motors High permissible torque, long service life Example) **GFV4G□**, **GFS4G□FR**
Assembled Motor Output Power	25 W, 40 W, 90 W	30 W, 60 W, 120 W
Max. Permissible Torque (When frame size is 90 mm)	20 N·m	30 N·m (Parallel shaft gearhead) 60 N·m (Hallow shaft flat gearhead)
Rated Life of a Gearhead	5000 hours	10000 hours

●A number indicating the gear ratio is inserted where the box □ is located in the product name.

Support Software **MEXE02**

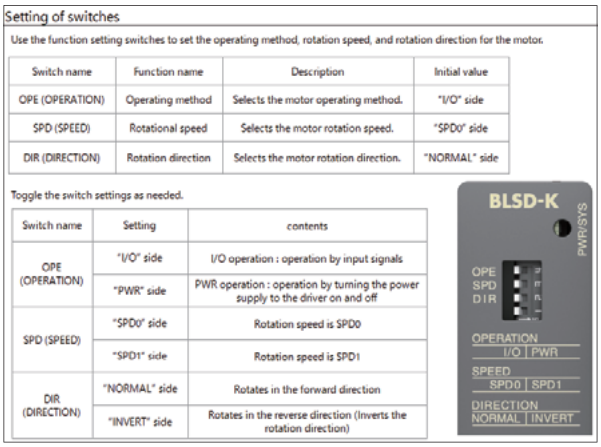
The Free Support Software **MEXE02** Allows for More Advanced Setting and Monitoring

Using support software **MEXE02** makes data setting and monitoring easier.

【Set Up】Operation Setting Support Wizard

● **Switch Setting**

Set the operating method, rotation speed and rotation direction.



Setting of switches

Use the function setting switches to set the operating method, rotation speed, and rotation direction for the motor.

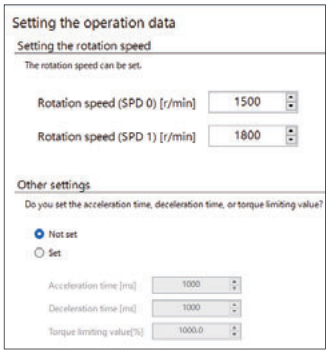
Switch name	Function name	Description	Initial value
OPE (OPERATION)	Operating method	Selects the motor operating method.	"I/O" side
SPD (SPEED)	Rotational speed	Selects the motor rotation speed.	"SPD0" side
DIR (DIRECTION)	Rotation direction	Selects the motor rotation direction.	"NORMAL" side

Toggle the switch settings as needed.

Switch name	Setting	contents
OPE (OPERATION)	"I/O" side	I/O operation : operation by input signals
	"PWR" side	PWR operation : operation by turning the power supply to the driver on and off
SPD (SPEED)	"SPD0" side	Rotation speed is SPD0
	"SPD1" side	Rotation speed is SPD1
DIR (DIRECTION)	"NORMAL" side	Rotates in the forward direction
	"INVERT" side	Rotates in the reverse direction (Inverts the rotation direction)

● **Operation Data Setting**

Modify the settings for rotation speed, acceleration/deceleration time, etc.



Setting the operation data

Setting the rotation speed

The rotation speed can be set.

Rotation speed (SPD 0) [r/min] 1500

Rotation speed (SPD 1) [r/min] 1800

Other settings

Do you set the acceleration time, deceleration time, or torque limiting value?

Not set

Set

Acceleration time [ms] 1000

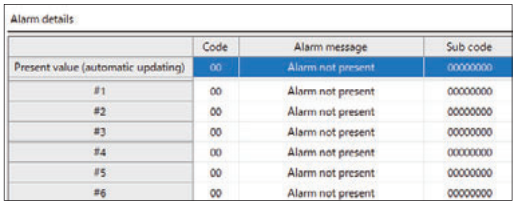
Deceleration time [ms] 1000

Torque limiting value[%] 1000.0

【Maintenance】Helpful Features for Diagnosis and Maintenance

● **Alarm Monitoring**

Check the alarm details.

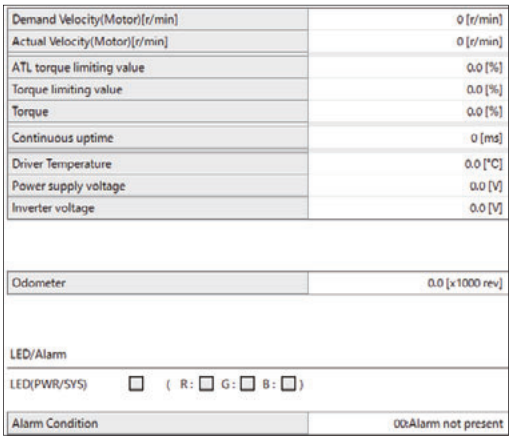


Alarm details

	Code	Alarm message	Sub code
Present value (automatic updating)	00	Alarm not present	00000000
#1	00	Alarm not present	00000000
#2	00	Alarm not present	00000000
#3	00	Alarm not present	00000000
#4	00	Alarm not present	00000000
#5	00	Alarm not present	00000000
#6	00	Alarm not present	00000000

● **Status Check**

Check the motor load, driver temperature, odometer, etc.



Demand Velocity(Motor)[r/min]	0 [r/min]
Actual Velocity(Motor)[r/min]	0 [r/min]
ATL torque limiting value	0.0 [%]
Torque limiting value	0.0 [%]
Torque	0.0 [%]
Continuous uptime	0 [ms]
Driver Temperature	0.0 [°C]
Power supply voltage	0.0 [V]
Inverter voltage	0.0 [V]
Odometer	0.0 [x1000 rev]

LED/Alarm

LED(PWR/SYS) ☐ (R: ☐ G: ☐ B: ☐)

Alarm Condition	00:Alarm not present

Product Line

Motor

Standard (AC Motor Compatible) Type

GN/GE Gearhead

Frame Size (mm)	Output (W)	Gear Ratio	Gearhead Permissible Torque (N·m)	Speed Control Range (r/min)
80	25	3~180	8	100~2000
90	40		10	
	90		20	

High Strength, Long Life Type

GFV Gearhead

Hollow Shaft Flat Gearhead

Frame Size (mm)	Output (W)	Gear Ratio	Gearhead Permissible Torque (N·m)	Speed Control Range (r/min)
60	30	5~200	6	100~4000
80	60		16	
90	120		30	
60	30		16	
80	60		32	
90	120		65	

Round Shaft Type

Frame Size (mm)	Output (W)	Speed Control Range (r/min)
60	30	100~4000
80	60	
90	120	

Driver (Common to All Outputs)

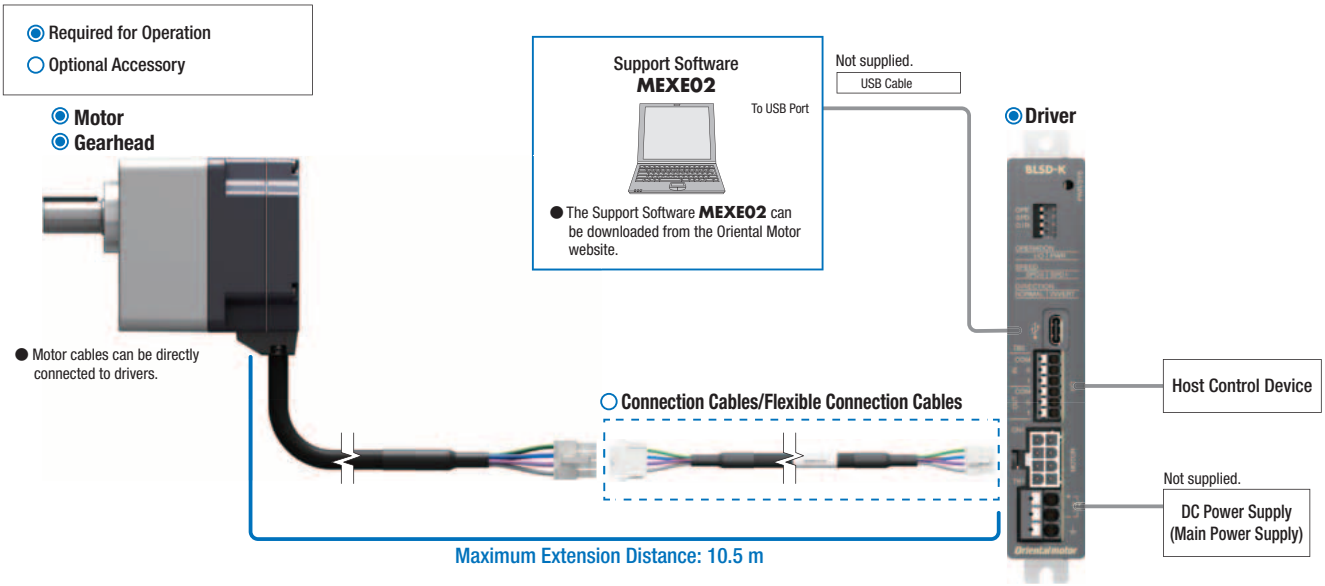
Output (W)	Power Supply Voltage (VDC)
25~120	DC24

Connection Cables/Flexible Connection Cables

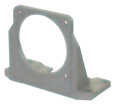
Length (m)
1/2/3/5/7/10

System Configuration

Motors, gearheads, drivers, and connection cables must be ordered individually.



○ Accessory for Motors



Mounting Brackets for Motor and Gearhead
➜ Website

Flexible Couplings
➜ Website

○ Accessory for Driver

DIN Rail Mounting Bracket
➜ Page 30

● Example of System Configuration

Motor		Gearhead		Driver		Cables		Accessory
						Connection Cable (1 m)		DIN Rail Mounting Bracket
BL2M460KCP-GF	+	GFV4G10	+	BLSD-K	+	CC010B2F	+	PADP04
◉		◉		◉		○		○

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

Product Code

Motor

BL2M 5 120 K C P - GF

① ② ③ ④ ⑤ ⑥ ⑦

①	Motor Type	**BL2M**: **BLS** Series Motor
②	Frame Size	**2**: 60 mm **4**: 80 mm **5**: 90 mm
③	Output	(Example) **120**: 120 W
④	Power Supply Voltage	**K**: DC Input
⑤	Motor Connection Method	**C**: Cable Type
⑥	Motor Degree of Protection	**P**: IP65 Rating Blank: IP40 Rating
⑦	Shaft Type	**GF**: **GF** Pinion **GN**: **GN** Pinion **GE**: **GE** Pinion **A**: Round Shaft

Gearhead

GFS 5 G 50 FR

① ② ③ ④

5 GN 50 K

② ① ③ ④

①	Shaft Type	**GFV**: **GFV** Pinion **GFS**: **GFS** Pinion **GN**: **GN** Pinion **GE**: **GE** Pinion
②	Combinable Motors Frame Size	**2**: 60 mm **4**: 80 mm **5**: 90 mm
③	Gear Ratio	
④	Gearhead Type	Blank, **K**, **S**: Parallel Shaft Gearhead **FR**: Hollow Shaft Flat Gearhead

Driver

BLSD - K

① ②

①	Driver Type	**BLSD**: **BLS** Series Driver
②	Power Supply Voltage	**K**: 24 VDC

Standard (AC Motor Compatible) Type

25 W, 40 W, 90 W

Product Line

Motors, gearheads, drivers, and connection cables must be ordered individually. Refer to page 30 for details on connection cables.

Motor

Output	Product Name
25 W	**BL2M425KC-GN**
40 W	**BL2M540KC-GN**
90 W	**BL2M590KC-GE**

Gearhead

◇Parallel Shaft Gearhead

Applicable Motor Output Power	Product Name	Gear Ratio
25 W	**4GN□K**	**3~18**
		25~36
		50~180
40 W	**5GN□K**	**3~18**
		25~36
		50~180
90 W	**5GE□S**	**3~9**
		12.5~18
		25~60
		75~180

Driver

Product Name
BLSD-K

List of Combinations

Motor	Gearhead	Driver	Connection Cable Flexible Connection Cable
Product Name	Product Name	Product Name	Product Name
BL2M425KC-GN	**4GN□K**	**BLSD-K**	**CC010B2◇** **CC020B2◇** **CC030B2◇** **CC050B2◇** **CC070B2◇** **CC100B2◇**
BL2M540KC-GN	**5GN□K**		
BL2M590KC-GE	**5GE□S**		

● A number indicating the gear ratio is inserted where the box □ is located in the product name.
The letter **F** (connection cable) or **R** (flexible connection cable) is specified where the symbol ◇ is located in the product name.

Specifications

Product Name			BL2M425KC-GN	BL2M540KC-GN	BL2M590KC-GE
	Motor		BL2M425KC-GN	BL2M540KC-GN	BL2M590KC-GE
	Gearhead		4GN□K	5GN□K	5GE□S
	Driver		BLSD-K		
Rated Output Power (Continuous)		W	25	40	90
Power Supply Input	Rated Voltage	V	DC24		
	Permissible Voltage Range		±10%		
	Rated Input Current	A	1.6	2.4	5.3
	Maximum Input Current*1	A	1.8 (2.2)	3.2 (4.0)	6.1 (7.1)
Rated Speed		r/min	1200		
Speed Control Range		r/min	100~2000*2		
Rated Torque		N·m	0.199	0.319	0.717
Rotor Inertia J		$\times10^{-4}$kg·m^2	0.25	0.62	0.62
Speed Regulation	Load		±0.2% or less: Conditions 0~rated torque, rated speed, rated voltage, normal ambient temperature		
	Voltage		±0.2% or less: Conditions ±10% rated voltage, rated speed, no load, normal ambient temperature		
	Temperature		±0.2% or less: Conditions Operating ambient temperature 0~+50℃, rated speed, no load, rated voltage		

*1 The value inside parenthesis represents the value when a 10 m connection cable is used.

*2 The rotation speed at the time of shipping is 1500 r/min or 1800 r/min (switch toggle). The rotation speed setting can be changed using support software **MEXE02**.

- The values correspond to each specification and characteristics of a stand-alone motor.
- A number indicating the gear ratio is specified where the box □ is located in the product name.

Gearhead Output Shaft's Rotation Direction and Speed

	Gear Ratio	3	3.6	5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180
Rotation Direction	25 W, 40 W	Same direction as motor									Opposite direction from motor			Same direction as motor							
	90 W	Same direction as motor						Opposite direction from motor			Same direction as motor			Opposite direction from motor							
Output Shaft Speed [r/min]*	At 100 r/min	33	28	20	17	13	11	8	6.7	5.6	4	3.3	2.8	2	1.7	1.3	1.1	1	0.8	0.7	0.6
	At 2000 r/min	667	556	400	333	267	222	160	133	111	80	67	56	40	33	27	22	20	17	13	11

*The output shaft's rotation speed is determined by dividing the speed with the gear ratio.

Permissible Torque

Unit: N·m

Output \ Gear Ratio		3	3.6	5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180
25 W	At 100~1200 r/min	0.48	0.58	0.8	0.96	1.2	1.4	2	2.4	2.9	3.6	4.3	5.2	6.5	7.8	8	8	8	8	8	8
	At 2000 r/min	0.29	0.34	0.48	0.58	0.72	0.87	1.2	1.4	1.7	2.1	2.6	3.1	3.9	4.7	5.9	7.1	7.9	8	8	8
40 W	At 100~1200 r/min	0.8	0.9	1.2	1.5	1.9	2.3	3.2	3.8	4.6	5.8	6.9	8.3	10	10	10	10	10	10	10	10
	At 2000 r/min	0.46	0.55	0.77	0.92	1.1	1.3	1.9	2.3	2.7	3.4	4.1	5	6.3	7.5	9.4	10	10	10	10	10
90 W	At 100~1200 r/min	1.7	2	2.9	3.4	4.3	5.2	6.5	7.8	9.4	11.8	14.1	17	20	20	20	20	20	20	20	20
	At 2000 r/min	1	1.2	1.7	2	2.6	3.1	3.9	4.7	5.6	7	8.5	10.2	14.1	17	19	20	20	20	20	20

Permissible Inertia J

Unit: $\times10^{-4}$ kg·m^2

Output \ Gear Ratio	3	3.6	5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180
25 W	2.8	4.1	7.8	11.2	25.2	48.5	69.8	101	194	279	402	775	775	775	775	775	775	775	775	775
40 W	6.8	9.8	18.8	27	42.2	60.8	117	169	243	469	675	972	1880	1880	1880	1880	1880	1880	1880	1880
90 W	9.9	14.3	27.5	39.6	61.9	89.1	172	248	356	688	990	1430	2750	2750	2750	2750	2750	2750	2750	2750

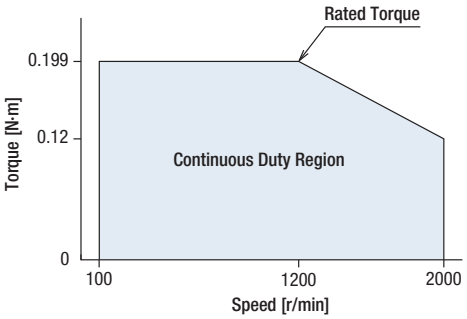
Permissible Radial Load and Permissible Axial Load

Output	Gear Ratio	Permissible Radial Load		Permissible Axial Load
		From the end of the output shaft 10 mm	From the end of the output shaft 20 mm	
		N	N	N
25 W	3~18	100	150	50
	25~180	200	300	
40 W	3~18	250	350	100
	25~180	300	450	
90 W	3~9	400	500	150
	12.5~18	450	600	
	25~180	500	700	

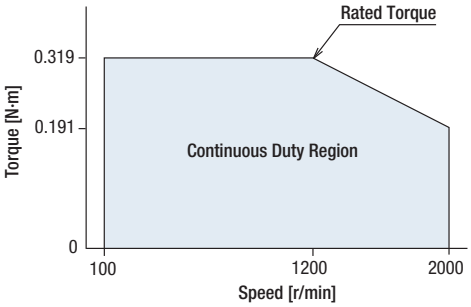
Speed – Torque Characteristics

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

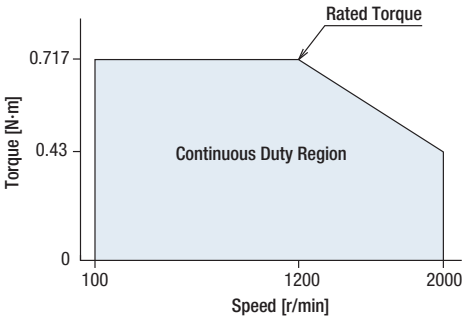
25 W



40 W



90 W



The values correspond to each specification and characteristics of a stand-alone motor. The speed - torque characteristics show the values when rated voltage is applied.

Common Specifications

Item		Specifications
Speed	Control Range	25 W, 40 W, 90 W: 100~2000 r/min 30 W, 60 W, 120 W: 100~4000 r/min The factory setting of rotational speed is as follows: 1500 r/min (when “Function setting switch: SPD (SPEED)” is “SPD0”) 1800 r/min (when “Function setting switch: SPD (SPEED)” is “SPD1”)
	Setting Method	Support Software **MEXE02**
Acceleration/Deceleration Time	Control Range	100~30000 ms (Factory setting: 1000 ms)
	Setting Method	Support Software **MEXE02**
Input Signals		2-points input Photocoupler input mode 24 VDC (−15~+20%)
Output Signals		2-points output Photocoupler and open-collector output 4.5~30 VDC, 10 mA current max.
Information		When information is generated, INFO output will turn ON and PWR/SYS LED will flash blue. The motor will continue to run.
Alarm		When an alarm is activated, ALM-B output will turn OFF and the motor will stop. At the same time, PWR/SYS LED will flash red.
Maximum Extension Distance		Motor and driver distance: 10.5 m (when a connection cable sold separately is used)
Time Rating		Continuous

General Specifications

Item		Motor	Driver
Insulation Resistance		100 MΩ or more when a 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 heat sink and the power supply input terminal after continuous operation under normal ambient temperature and humidity.
Dielectric Strength		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 heat sink and the power supply input terminal for 1 minute after continuous operation under normal ambient temperature and humidity.
Temperature Rise		Temperature rise of the case surface is 30°C or less (50°C or less for 90 W type) when it has been mounted on a heat sink✻1 and measured using thermocouple method after rated continuous operation under normal ambient temperature and humidity.	The temperature rise of the heat sink is 50°C or less, measured by the thermocouple method after rated continuous operation under normal ambient temperature and humidity.
Operating Environment	Ambient Temperature	0~+40°C (Non-freezing)	0~+50°C (Non-freezing)✻2
	Ambient Humidity	85% or less (Non-condensing)	
	Altitude	Up to 1000 m above sea level	
	Atmosphere	No corrosive gases or dust. Do not expose to water or oil. Cannot be used in a radioactive area, magnetic field, vacuum, or other special environments.	
	Vibration	Not subject to continuous vibration or excessive shock In conformance with JIS C 60068-2-6, "Sine-wave vibration test method" Frequency Range: 10~55 Hz, Half Amplitude: 0.15 mm Sweep Direction: 3 directions (X, Y, Z) Number of Sweeps: 20 times	
Storage Condition✻3	Ambient Temperature	−25~+70°C (Non-freezing)	
	Ambient Humidity	85% or less (Non-condensing)	
	Altitude	Up to 3000 m above sea level	
	Atmosphere	No corrosive gases or dust. Do not expose to water or oil. Cannot be used in a radioactive area, magnetic field, vacuum, or other special environments.	
Thermal Class		EN Standards: 120 (E)	–
Degree of Protection		25 W, 40 W, 90 W: IP40 (excluding mounting surfaces and connector units) 30 W, 60 W, 120 W: IP65 (excluding mounting surfaces and connector units)	IP20

✻1 The size of heat sink (material: aluminum) is shown below.

Output	Size (mm)	Thickness (mm)
30 W	115×115	5
25 W, 60 W	135×135	
40 W, 90 W, 120 W	200×200	

For the round shaft type, install on a heat sink so that the surface temperature of the motor case does not exceed 90°C.

✻2 When installing a driver in contact with another surface, use the driver under ambient temperature of 0~+40°C.

✻3 The storage condition applies to short periods such as the period during transport.

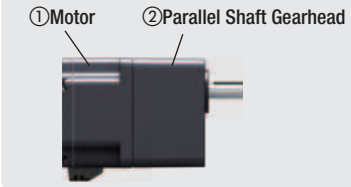
Note

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

Dimensions (Unit = mm)

The dimensions are for standalone motor and standalone gearhead.
The figure to the right shows what it looks like when a motor and a gearhead have been assembled.

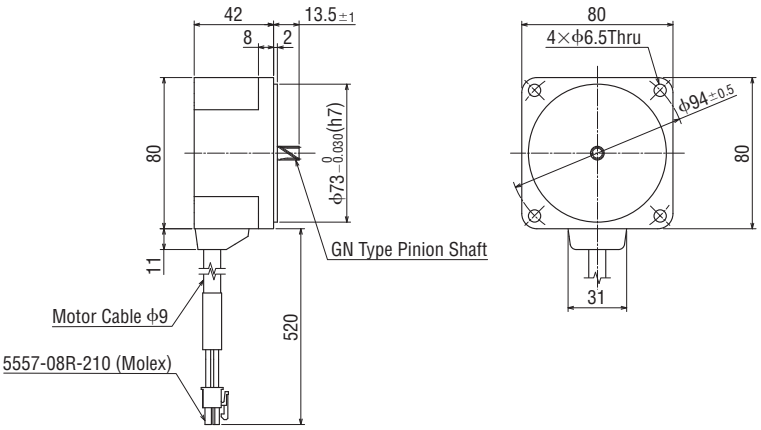
<Assembled Look>



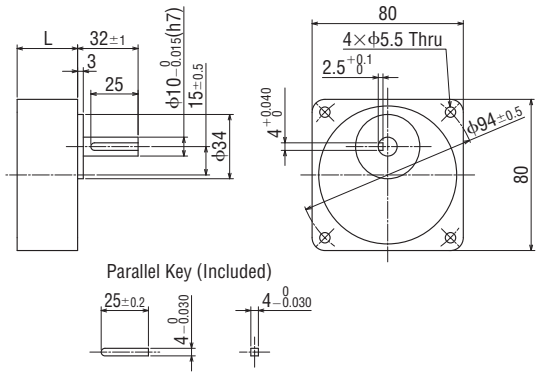
25 W

①Motor			②Parallel Shaft Gearhead				
Product Name	Mass kg	CAD	Product Name	Gear Ratio	L	Mass kg	CAD
BL2M425KC-GN	0.8	A1887-GN	**4GN□K**	**3~18**	32	0.45	A1895A
				25~36	42.5	0.58	A1895B
				50~180		0.63	

①Motor



②Parallel Shaft Gearhead

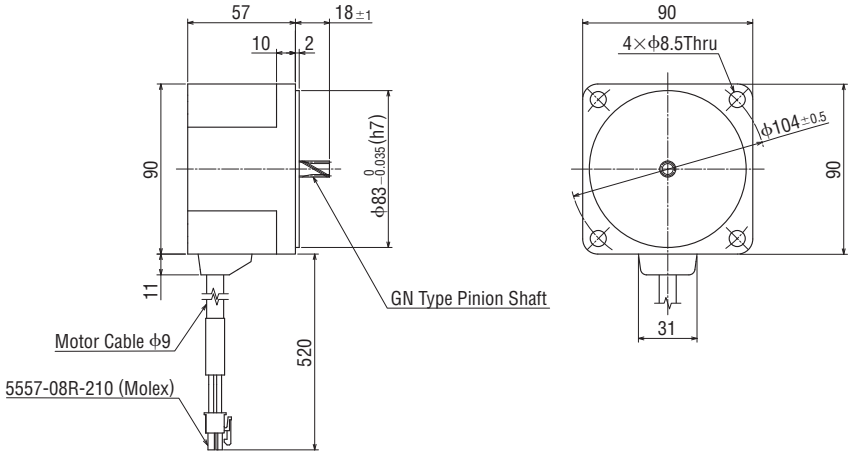


● A number indicating the gear ratio is inserted where the box □ is located in the product name.

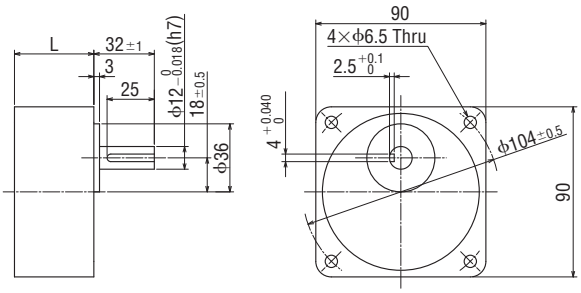
●40 W

①Motor			②Parallel Shaft Gearhead				
Product Name	Mass kg	CAD	Product Name	Gear Ratio	L	Mass kg	CAD
BL2M540KC-GN	1.4	A1888-GN	**5GN□K**	**3~18**	42	0.77	A1896A
				25~36	60	1.1	A1896B
				50~180		1.2	

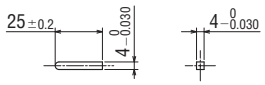
①Motor



②Parallel Shaft Gearhead



Parallel Key (Included)

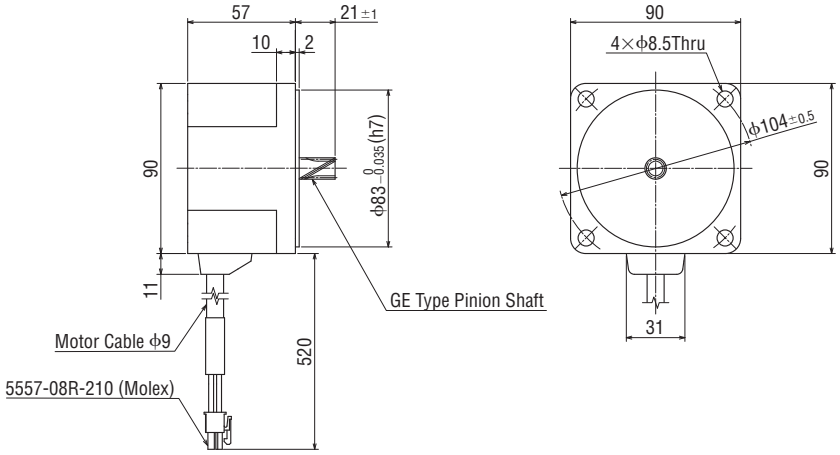


●A number indicating the gear ratio is inserted where the box □ is located in the product name.

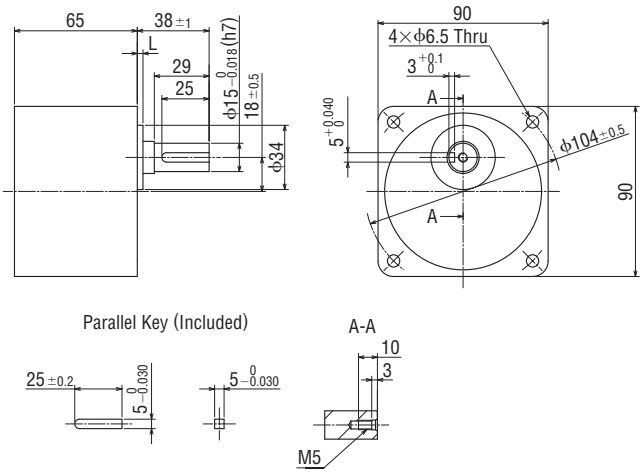
90 W

①Motor			②Parallel Shaft Gearhead				
Product Name	Mass kg	CAD	Product Name	Gear Ratio	L	Mass kg	CAD
BL2M590KC-GE	1.4	A1888-GE	**5GE□S**	**3~9**	3	1.0	A1897
				12.5~18		1.3	
				25~60		1.4	
				75~180	7	1.5	A1898

①Motor



②Parallel Shaft Gearhead

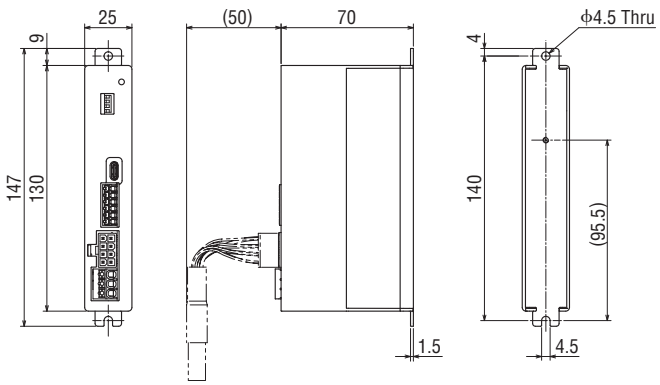


●Driver

BLSD-K

Mass: 0.13 kg

CAD: A1899



●A number indicating the gear ratio is inserted where the box □ is located in the product name.

High Strength and Long Life Type, Round Shaft Type

30 W, 60 W, 120 W

Product Line

Motors, gearheads, drivers, and connection cables must be ordered individually. Refer to page 30 for details on connection cables.

Motor

◇Pinion Shaft Type

Output	Product Name
30 W	**BL2M230KCP-GF**
60 W	**BL2M460KCP-GF**
120 W	**BL2M5120KCP-GF**

◇Round Shaft Type

Output	Product Name
30 W	**BL2M230KCP-A**
60 W	**BL2M460KCP-A**
120 W	**BL2M5120KCP-A**

Gearhead

◇Parallel Shaft Gearhead

Applicable Motor Output Power	Product Name	Gear Ratio
30 W	**GFV2G□**	**5**, **10**, **15**, **20**
		30, **50**, **100**
		200
60 W	**GFV4G□**	**5**, **10**, **15**, **20**
		30, **50**, **100**
		200
120 W	**GFV5G□**	**5**, **10**, **15**, **20**
		30, **50**, **100**
		200

◇Hollow Shaft Flat Gearhead

Applicable Motor Output Power	Product Name	Gear Ratio
30 W	**GFS2G□FR**	**5**, **10**, **15**, **20**
		30, **50**, **100**
		200
60 W	**GFS4G□FR**	**5**, **10**, **15**, **20**
		30, **50**, **100**
		200
120 W	**GFS5G□FR**	**5**, **10**, **15**, **20**
		30, **50**, **100**
		200

Driver

Product Name
BLSD-K

List of Combinations

Motor	Gearhead	Driver	Connection Cable Flexible Connection Cable
Product Name	Product Name	Product Name	Product Name
BL2M230KCP-GF	**GFV2G□**	**BLSD-K**	**CC010B2◇** **CC020B2◇** **CC030B2◇** **CC050B2◇** **CC070B2◇** **CC100B2◇**
	GFS2G□FR		
BL2M230KCP-A	–		
BL2M460KCP-GF	**GFV4G□**		
	GFS4G□FR		
BL2M460KCP-A	–		
BL2M5120KCP-GF	**GFV5G□**		
	GFS5G□FR		
BL2M5120KCP-A	–		

● A number indicating the gear ratio is inserted where the box □ is located in the product name.
The letter **F** (connection cable) or **R** (flexible connection cable) is specified where the symbol ◇ is located in the product name.

Parallel Shaft Gearhead Combination

Specifications

Product Name	Motor		BL2M230KCP-GF	BL2M460KCP-GF	BL2M5120KCP-GF
	Gearhead		GFV2G□	GFV4G□	GFV5G□
	Driver		BLSD-K		
Rated Output Power (Continuous)		W	30	60	120
Power Supply Input	Rated Voltage	V	DC24		
	Permissible Voltage Range		±10%		
	Rated Input Current	A	1.9	3.3	6.3
	Maximum Input Current*1	A	2.8 (3.1)	5.0 (6.2)	9.8 (13)
Rated Speed		r/min	3000		
Speed Control Range		r/min	100~4000*2		
Rotor Inertia J		$\times10^{-4}$kg·m^2	0.092	0.25	0.62
Speed Regulation	Load		±0.2% or less: Conditions 0~rated torque, rated speed, rated voltage, normal ambient temperature		
	Voltage		±0.2% or less: Conditions ±10% rated voltage, rated speed, no load, normal ambient temperature		
	Temperature		±0.2% or less: Conditions Operating ambient temperature 0~+50˚C, rated speed, no load, rated voltage		

*1 The value inside parenthesis represents the value when a 10 m connection cable is used.

*2 The rotation speed at the time of shipping is 1500 r/min or 1800 r/min (switch toggle). The rotation speed setting can be changed using support software **MEXE02**.

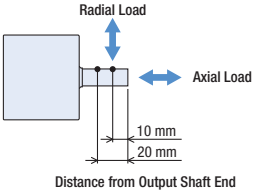
● The values correspond to each specification and characteristics of a stand-alone motor.

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

Gear Ratio				5	10	15	20	30	50	100	200
Rotation Direction				Same direction as motor				Opposite direction from motor			Same direction as motor
Output Shaft Speed [r/min]*			100 r/min	20	10	6.7	5	3.3	2	1	0.5
			4000 r/min	800	400	267	200	133	80	40	20
Permissible Torque [N·m]		30 W	At 100~3000 r/min	0.4	0.86	1	2	2.5	4.1	6	6
			At 4000 r/min	0.32	0.65	0.97	1.3	1.9	3.1	5.4	5.4
		60 W	At 100~3000 r/min	0.9	1.7	2.6	3.4	4.9	8.2	16	16
			At 4000 r/min	0.65	1.3	1.9	2.6	3.7	6.2	12.4	14
		120 W	At 100~3000 r/min	1.7	3.4	5.2	6.9	9.9	16.4	30	30
			At 4000 r/min	1.3	2.6	3.9	5.2	7.4	12.3	24.7	27
Permissible Radial Load [N]	From the End of the Output Shaft 10 mm	30 W	At 100~3000 r/min	100	150	150	150	200	200	200	200
			At 4000 r/min	90	130	130	130	180	180	180	180
		60 W	At 100~3000 r/min	200	300	300	300	450	450	450	450
			At 4000 r/min	180	270	270	270	420	420	420	420
		120 W	At 100~3000 r/min	300	400	400	400	500	500	500	500
			At 4000 r/min	230	370	370	370	450	450	450	450
	From the End of the Output Shaft 20 mm	30 W	At 100~3000 r/min	150	200	200	200	300	300	300	300
			At 4000 r/min	110	170	170	170	230	230	230	230
		60 W	At 100~3000 r/min	250	350	350	350	550	550	550	550
			At 4000 r/min	220	330	330	330	500	500	500	500
		120 W	At 100~3000 r/min	400	500	500	500	650	650	650	650
			At 4000 r/min	300	430	430	430	550	550	550	550
Permissible Axial Load [N]		30 W		40							
		60 W		100							
		120 W		150							
Permissible Inertia J [$\times10^{-4}$kg·m^2]		30 W		12	50	110	200	370	920	2500	5000
		60 W		22	95	220	350	800	2200	6200	12000
		120 W		45	190	420	700	1600	4500	12000	25000

*The output shaft's rotation speed is determined by dividing the speed with the gear ratio.

◇Load Position



Speed – Torque Characteristics

→ Page 24

Hollow Shaft Flat Gearhead Combination

Specifications

Product Name	Motor		BL2M230KCP-GF	BL2M460KCP-GF	BL2M5120KCP-GF
	Gearhead		GFS2G□FR	GFS4G□FR	GFS5G□FR
	Driver		BLSD-K		
Rated Output Power (Continuous)		W	30	60	120
Power Supply Input	Rated Voltage	V	DC24		
	Permissible Voltage Range		±10%		
	Rated Input Current	A	1.9	3.3	6.3
	Maximum Input Current*1	A	2.8 (3.1)	5.0 (6.2)	9.8 (13)
Rated Speed		r/min	3000		
Speed Control Range		r/min	100~4000*2		
Rotor Inertia J		$\times10^{-4}$kg·m^2	0.092	0.25	0.62
Speed Regulation	Load		±0.2% or less: Conditions 0~rated torque, rated speed, rated voltage, normal ambient temperature		
	Voltage		±0.2% or less: Conditions ±10% rated voltage, rated speed, no load, normal ambient temperature		
	Temperature		±0.2% or less: Conditions Operating ambient temperature 0~+50˚C, rated speed, no load, rated voltage		

*1 The value inside parenthesis represents the value when a 10 m connection cable is used.

*2 The rotation speed at the time of shipping is 1500 r/min or 1800 r/min (switch toggle). The rotation speed setting can be changed using support software **MEXE02**.

● The values correspond to each specification and characteristics of a stand-alone motor.

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

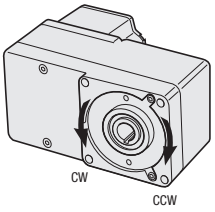
Gear Ratio				5	10	15	20	30	50	100	200
Output Shaft Speed [r/min]*1			100 r/min	20	10	6.7	5	3.3	2	1	0.5
			4000 r/min	800	400	267	200	133	80	40	20
Permissible Torque [N·m]		30 W	At 100~3000 r/min	0.4	0.82	1	2	2.4	4.1	8.2	16
			At 4000 r/min	0.29	0.61	0.92	1.2	1.8	3.1	6.1	12
		60 W	At 100~3000 r/min	0.81	1.6	2.4	3.2	4.9	8.1	16	32
			At 4000 r/min	0.61	1.2	1.8	2.4	3.7	6.1	12	24
		120 W	At 100~3000 r/min	1.6	3.2	4.9	6.5	9.7	16	32	65
			At 4000 r/min	1.2	2.4	3.7	4.9	7.3	12	24	49
Permissible Radial Load [N]*2	From Installation Surface 10 mm	30 W	At 100~3000 r/min	450	450	500	500	500	500	500	500
			At 4000 r/min	410	410	460	460	460	460	460	460
		60 W	At 100~3000 r/min	800	800	1200	1200	1200	1200	1200	1200
			At 4000 r/min	730	730	1100	1100	1100	1100	1100	1100
		120 W	At 100~3000 r/min	900	900	1300	1300	1500	1500	1500	1500
			At 4000 r/min	820	820	1200	1200	1400	1400	1400	1400
	From Installation Surface 20 mm	30 W	At 100~3000 r/min	370	370	400	400	400	400	400	400
			At 4000 r/min	330	330	370	370	370	370	370	370
		60 W	At 100~3000 r/min	660	660	1000	1000	1000	1000	1000	1000
			At 4000 r/min	600	600	910	910	910	910	910	910
		120 W	At 100~3000 r/min	770	770	1110	1110	1280	1280	1280	1280
			At 4000 r/min	700	700	1020	1020	1200	1200	1200	1200
Permissible Axial Load [N]		30 W		200							
		60 W		400							
		120 W		500							
Permissible Inertia J [$\times10^{-4}$kg·m^2]		30 W		12	50	110	200	370	920	2500	5000
		60 W		22	95	220	350	800	2200	6200	12000
		120 W		45	190	420	700	1600	4500	12000	25000

*1 The output shaft speed is the speed divided by the gear ratio.

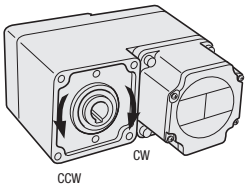
*2 The radial load at each distance can also be calculated with a formula. ➜ Page 29

◇Rotation Direction

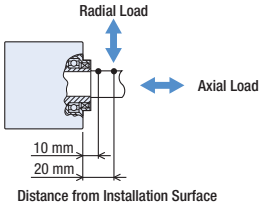
•Viewed from front face



•Viewed from back face



◇Load Position



Speed – Torque Characteristics

➜ Page 24

Round Shaft Type

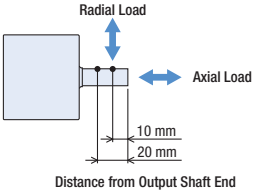
Specifications

Product Name	Motor		BL2M230KCP-A	BL2M460KCP-A	BL2M5120KCP-A
	Driver		BLSD-K		
Rated Output Power (Continuous)		W	30	60	120
Power Supply Input	Rated Voltage	V	DC24		
	Permissible Voltage Range		±10%		
	Rated Input Current	A	1.9	3.3	6.3
	Maximum Input Current*1	A	2.8 (3.1)	5.0 (6.2)	9.8 (13)
Rated Speed		r/min	3000		
Speed Control Range		r/min	100~4000*2		
Rated Torque		N·m	0.096	0.191	0.382
Maximum Instantaneous Torque		N·m	0.191	0.382	0.764
Permissible Radial Load	From the End of the Output Shaft 10 mm	N	70	120	160
	From the End of the Output Shaft 20 mm	N	100	140	170
Permissible Axial Load		N	15	20	25
Rotor Inertia J		$\times 10^{-4}$kg·m^2	0.092	0.25	0.62
Permissible Inertia J		$\times 10^{-4}$kg·m^2	1.8	3.3	5.6
Speed Regulation	Load		±0.2% or less: Conditions 0~rated torque, rated speed, rated voltage, normal ambient temperature		
	Voltage		±0.2% or less: Conditions 10% rated voltage, rated speed, no load, normal ambient temperature		
	Temperature		±0.2% or less: Conditions Operating ambient temperature 0~+50℃, rated speed, no load, rated voltage		

*1 The value inside parenthesis represents the value when a 10 m connection cable is used.

*2 The rotation speed at the time of shipping is 1500 r/min or 1800 r/min (switch toggle). The rotation speed setting can be changed using support software **MEXE02**.

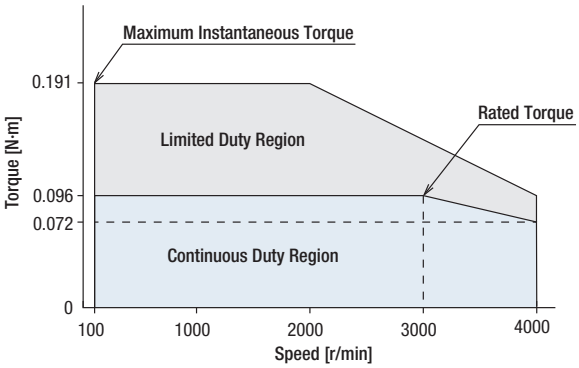
◇Load Position



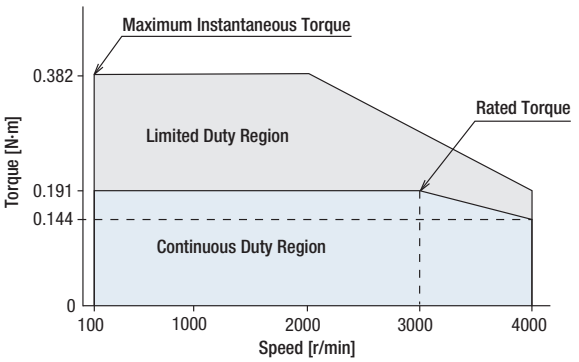
Speed – Torque Characteristics

Continuous Duty Region: Continuous operation is possible in this region.
Limited Duty Region: This region is used primarily when accelerating.

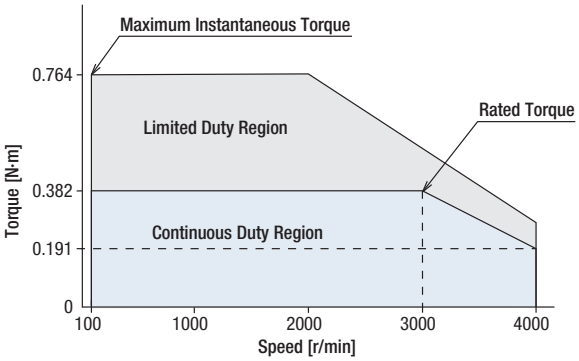
30 W



60 W



120 W



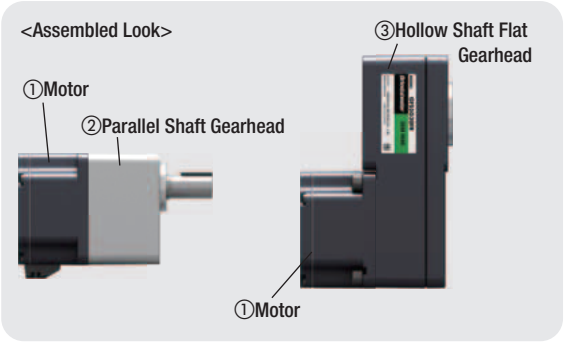
● The values correspond to each specification and characteristics of a stand-alone motor. The speed - torque characteristics show the values when rated voltage is applied.

Common Specifications, General Specifications

→ Page 16

Dimensions (Unit = mm)

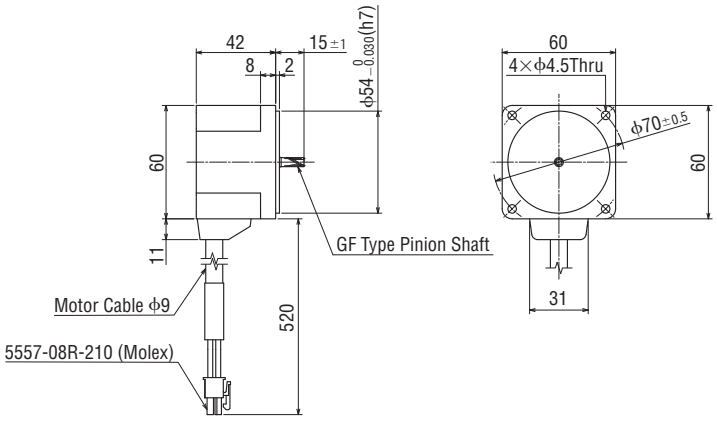
The dimensions are for standalone motor and standalone gearhead. The figure to the right shows what it looks like when a motor and a gearhead have been assembled.



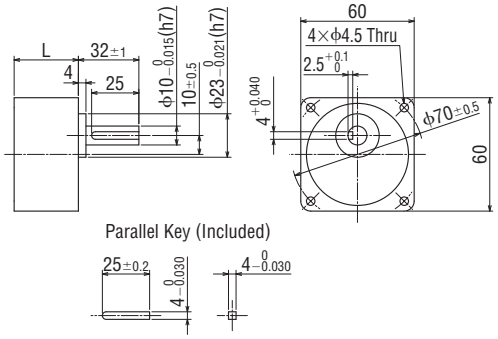
30 W

①Motor			②Parallel Shaft Gearhead					③Hollow Shaft Flat Gearhead		
Product Name	Mass kg	CAD	Product Name	Gear Ratio	L	Mass kg	CAD	Product Name	Mass kg	CAD
BL2M230KCP-GF	0.5	A1886-GF	**GFV2G□**	**5, 10, 15, 20**	34	0.28	A1889A	**GFS2G□FR**	0.8	A1890
				30, 50, 100	38	0.33	A1889B			
				200	43	0.38	A1889C			

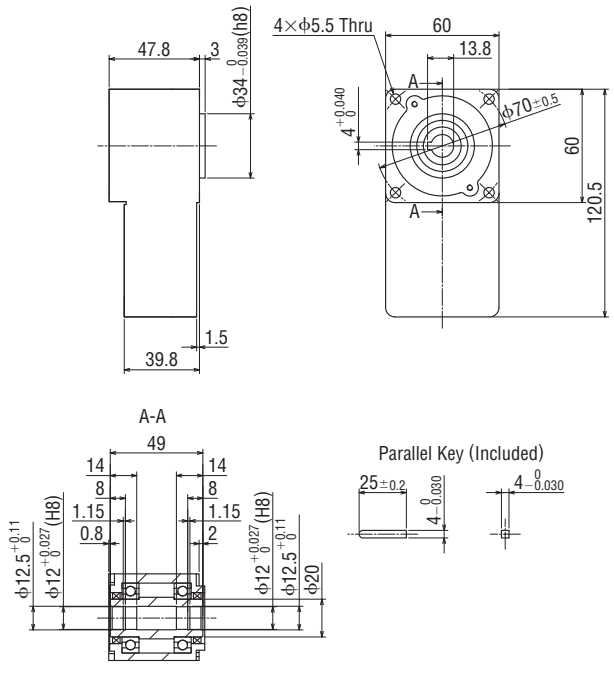
①Motor



②Parallel Shaft Gearhead



③Hollow Shaft Flat Gearhead

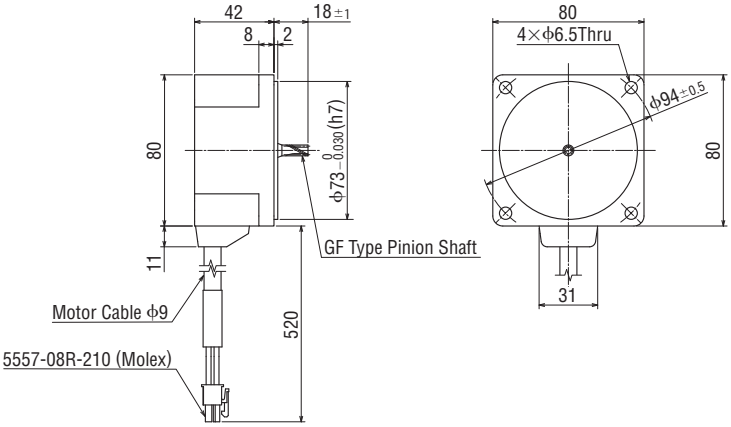


● A number indicating the gear ratio is inserted where the box □ is located in the product name.

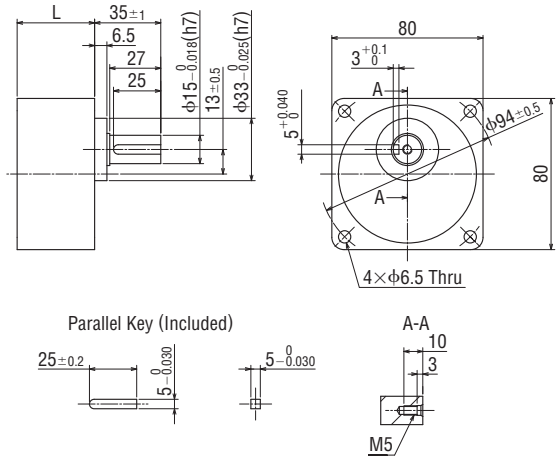
60 W

①Motor			②Parallel Shaft Gearhead					③Hollow Shaft Flat Gearhead		
Product Name	Mass kg	CAD	Product Name	Gear Ratio	L	Mass kg	CAD	Product Name	Mass kg	CAD
BL2M460KCP-GF	0.8	A1887-GF	**GFV4G□**	**5**, **10**, **15**, **20**	41	0.67	A1891A	**GFS4G□FR**	1.6	A1892
				30, **50**, **100**	46	0.79	A1891B			
				200	51	0.89	A1891C			

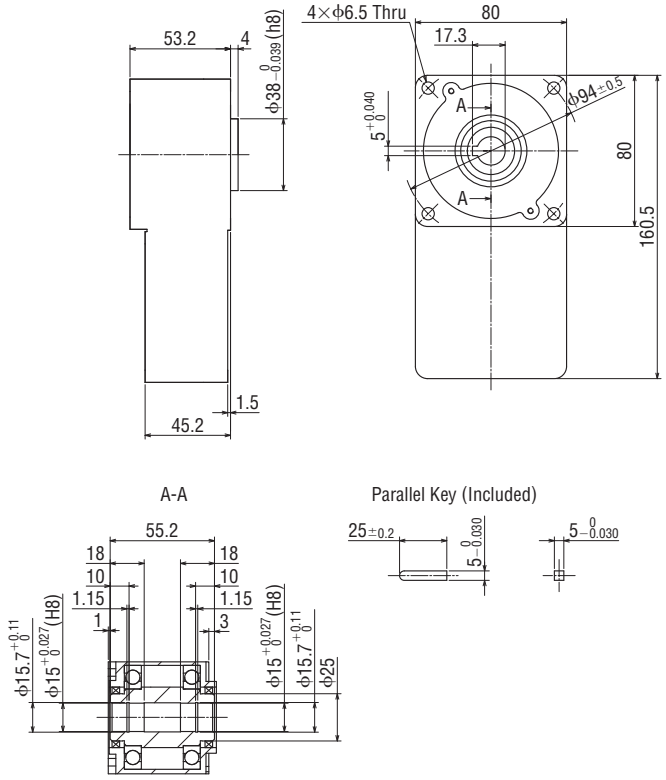
①Motor



②Parallel Shaft Gearhead



③Hollow Shaft Flat Gearhead

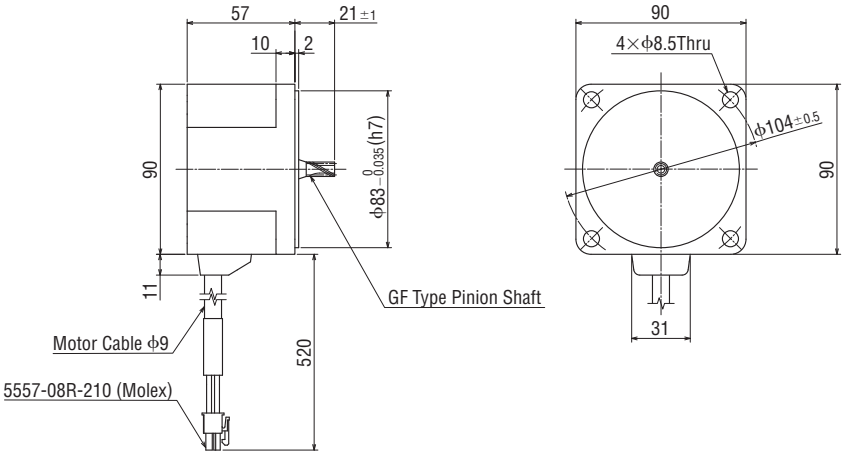


● A number indicating the gear ratio is inserted where the box □ is located in the product name.

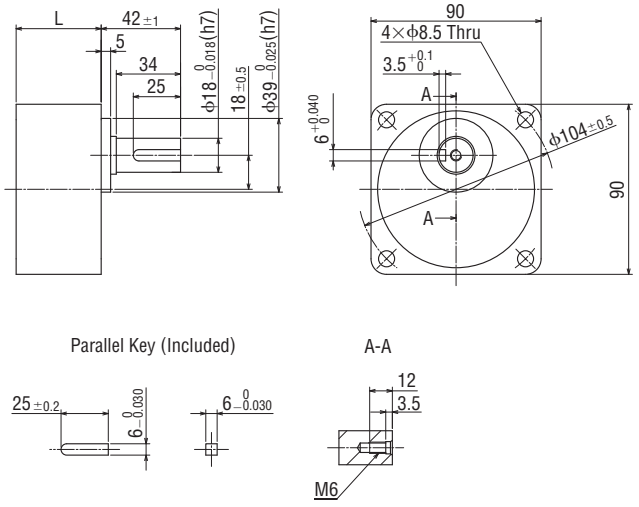
●120 W

①Motor			②Parallel Shaft Gearhead					③Hollow Shaft Flat Gearhead		
Product Name	Mass kg	CAD	Product Name	Gear Ratio	L	Mass kg	CAD	Product Name	Mass kg	CAD
BL2M5120KCP-GF	1.4	A1888-GF	**GFV5G□**	**5**, **10**, **15**, **20**	45	0.95	A1893A	**GFS5G□FR**	2.2	A1894
				30, **50**, **100**	58	1.3	A1893B			
				200	64	1.4	A1893C			

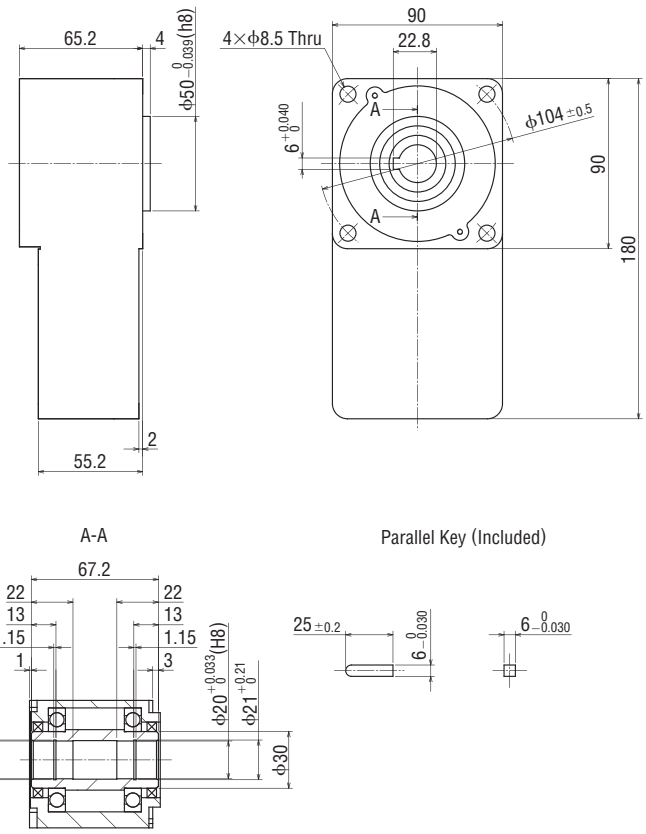
①Motor



②Parallel Shaft Gearhead



③Hollow Shaft Flat Gearhead



●A number indicating the gear ratio is inserted where the box □ is located in the product name.

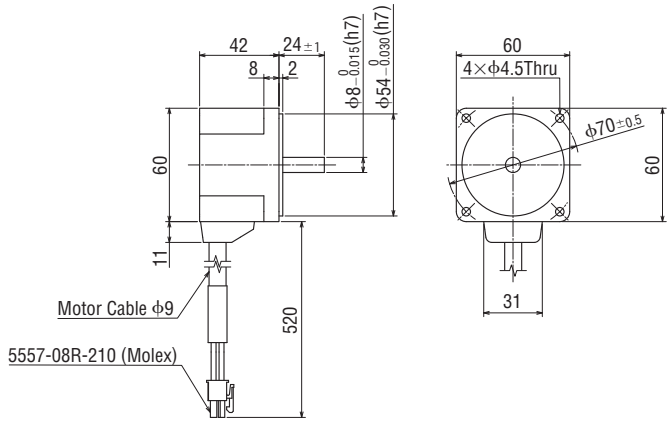
●30 W

◇Round Shaft Type

BL2M230KCP-A

Mass: 0.5 kg

CAD: A1886-A



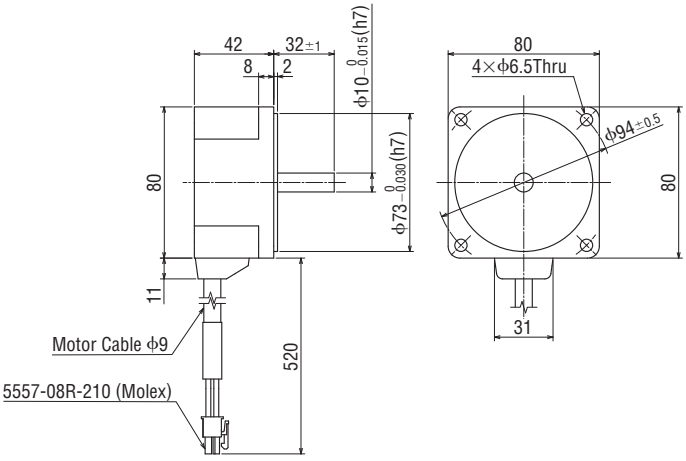
●60 W

◇Round Shaft Type

BL2M460KCP-A

Mass: 0.8 kg

CAD: A1887-A



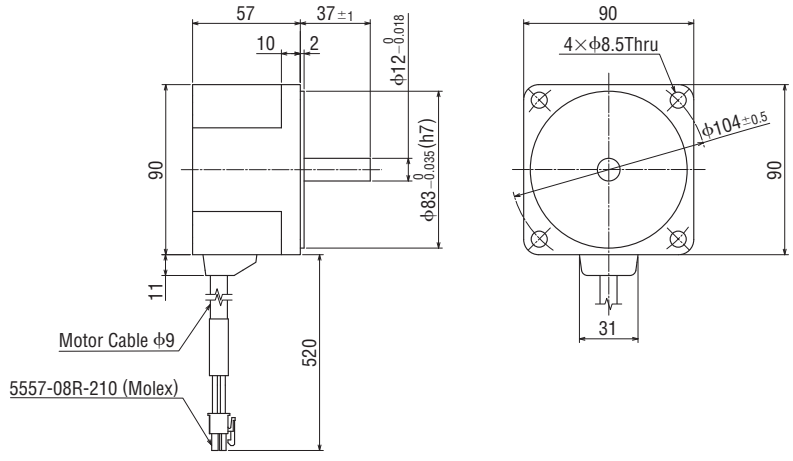
●120 W

◇Round Shaft Type

BL2M5120KCP-A

Mass: 1.4 kg

CAD: A1888-A

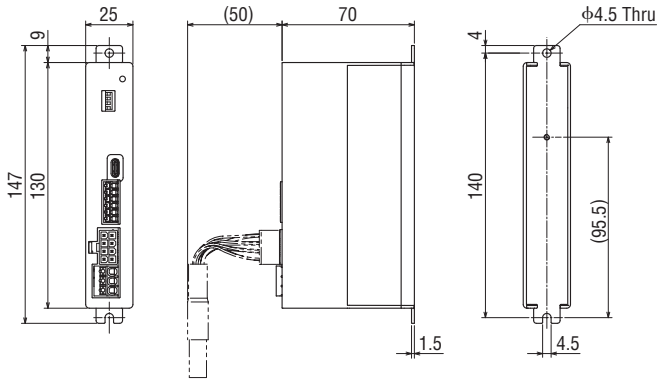


●Driver

BLSD-K

Mass: 0.13 kg

CAD: A1899

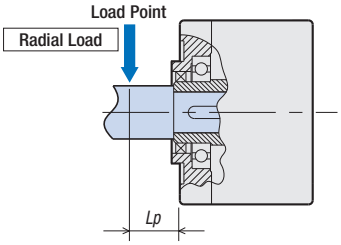


■Calculation of Permissible Radial Load of Hollow Shaft Type

The permissible radial load calculation formula differs depending on the mechanism.

◇If one side of the load shaft is not supported by the bearing unit

Radial load is the most severe mechanism. The recommended load shaft is the stepped type.



F_0 [N] : Permissible radial load on flange-installation surface

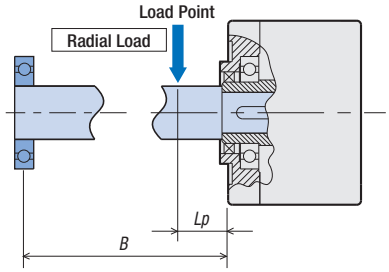
Lp [mm]: Distance from flange-installation surface to radial load point

B [mm] : Distance from flange-installation surface to bearing unit

Product Name	Permissible Radial Load W [N]
GFS2G□FR	$W\,[N]=\frac{36}{36+Lp}\times F_0\,[N]$
GFS4G□FR	$W\,[N]=\frac{40}{40+Lp}\times F_0\,[N]$
GFS5G□FR	$W\,[N]=\frac{50}{50+Lp}\times F_0\,[N]$

●A number indicating the gear ratio is inserted where the box □ is located in the product name.

◇If one side of the load shaft is supported by the bearing unit



Product Name	Permissible Radial Load W [N]
GFS2G□FR **GFS4G□FR** **GFS5G□FR**	$W\,[N]=\frac{B}{B-Lp}\times F_0\,[N]$

Product Name	Gear Ratio	F_0 [N]
GFS2G□FR	**5, 10**	570
	15~200	630
GFS4G□FR	**5, 10**	1000
	15~200	1500
GFS5G□FR	**5, 10**	1080
	15, 20	1550
	30~200	1800

Cables and Accessories

Connection Cable/Flexible Connection Cable

These cables are used to connect the motor and the driver. When using an extension for the product cable, keep the overall cable length to 10.5 m or less.
Use the flexible connection cable in applications where the cable is bent and flexed repeatedly.

Product Line

◇Connection Cable

Length (m)	Product Name
1	**CC010B2F**
2	**CC020B2F**
3	**CC030B2F**
5	**CC050B2F**
7	**CC070B2F**
10	**CC100B2F**

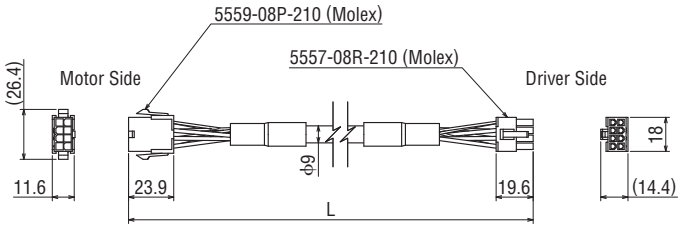
◇Flexible Connection Cable

Length (m)	Product Name
1	**CC010B2R**
2	**CC020B2R**
3	**CC030B2R**
5	**CC050B2R**
7	**CC070B2R**
10	**CC100B2R**

Dimensions (Unit = mm)

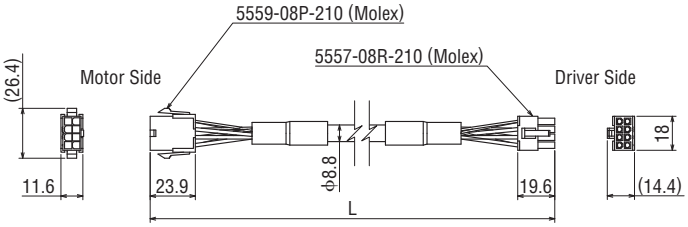
◇Connection Cable

Length L (m)	Product Name	Mass (kg)
1	**CC010B2F**	0.12
2	**CC020B2F**	0.24
3	**CC030B2F**	0.36
5	**CC050B2F**	0.59
7	**CC070B2F**	0.82
10	**CC100B2F**	1.2



◇Flexible Connection Cable

Length L (m)	Product Name	Mass (kg)
1	**CC010B2R**	0.13
2	**CC020B2R**	0.25
3	**CC030B2R**	0.37
5	**CC050B2R**	0.61
7	**CC070B2R**	0.85
10	**CC100B2R**	1.2



DIN Rail Mounting Bracket

Use this bracket when mounting a driver on a DIN rail.

Product Line

Product Name
PADP04

Dimensions (Unit = mm)

Mass: 11 g