

Brushless Motors/AC Speed Control Motors

Brushless Motors



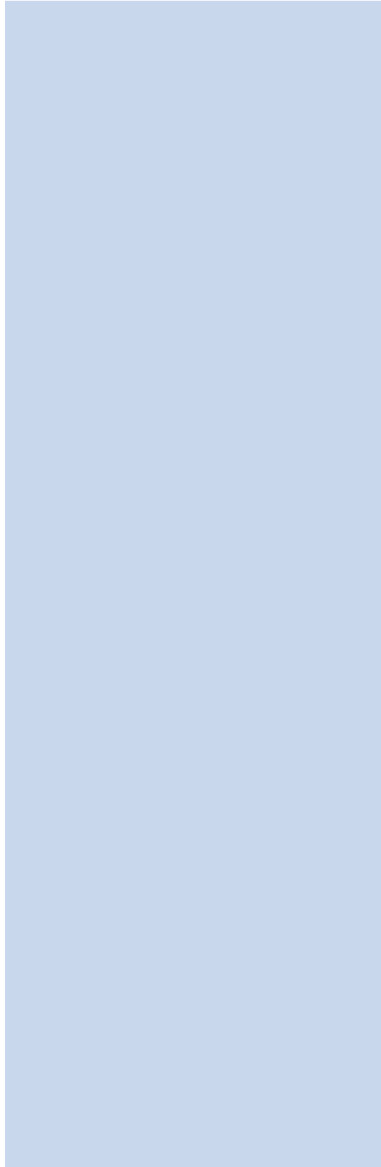
BMU Series

BLE Series

BLF Series

BXII Series

BLH Series



Overview,
Product
Series

Brushless
Motors

AC Input
BMU

AC Input
BLE

AC Input
BLF

AC Input
BXII

DC Input
BLH

AC Speed
Control
Motors

DSC

BHF





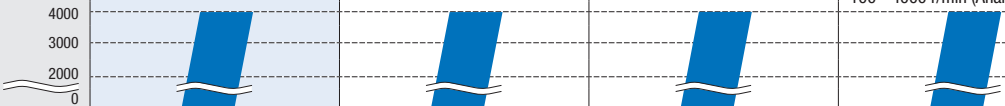





Accessories

Installation

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Product Line of Brushless Motors

The specifications and functions of each series are introduced in the lists below. Use these for your series selection.

Classification		AC Power Supply Input			
		Easy Control	Standard Products		
Series		BMU Series 	Standard Type 	BLE Series Standard Type + Control Module 	FLEX RS-485 Communication Type 
Page		▶ Page D-18	▶ Page D-42		
Features		<ul style="list-style-type: none"> • Easy Setup and Easy Operation • New Brushless Motor 	<ul style="list-style-type: none"> • The standard unit has a max. of 4000 r/min • Wide Variety • CC-Link Compatible Lineup 	<ul style="list-style-type: none"> • Extended functions improve the standard type with multistep speed-change operation and torque limiting possible 	<ul style="list-style-type: none"> • Extended functions improve the standard type with multistep speed-change operation and torque limiting possible • Compatible with Various Host Systems
Power Supply Input		Single-Phase 100-120 VAC [Except for 200 W (1/4 HP)] Single-Phase 200-240 VAC Three-Phase 200-240 VAC	Single-Phase 100-120 VAC Single-Phase 200-240 VAC Three-Phase 200-240 VAC	Single-Phase 100-120 VAC Single-Phase 200-240 VAC Three-Phase 200-240 VAC	Single-Phase 100-120 VAC Single-Phase 200-240 VAC Three-Phase 200-240 VAC
Output Power	Frame Size 42 mm (1.65 in.)	—	—	—	—
	Frame Size 60 mm (2.36 in.)	30 W (1/25 HP)	30 W (1/25 HP)	30 W (1/25 HP)	30 W (1/25 HP)
	Frame Size 80 mm (3.15 in.)	60 W (1/12 HP)	60 W (1/12 HP)	60 W (1/12 HP)	60 W (1/12 HP)
	Frame Size 90 mm (3.54 in.)	120 W (1/6 HP)	120 W (1/6 HP)	120 W (1/6 HP)	120 W (1/6 HP)
	Frame Size 104 mm (4.09 in.)	200 W (1/4 HP)	—	—	—
Speed Control Range	[r/min]	80~4000 r/min	100~4000 r/min	80~4000 r/min	80~4000 r/min (Digital setting) 100~4000 r/min (Analog setting)
					
Speed Ratio		50 : 1	40 : 1	50 : 1	50 : 1 (Digital setting) 40 : 1 (Analog setting)
Speed Regulation (Load)		±0.2%	±0.5%	±0.2%	±0.2% (Digital setting) ±0.5% (Analog setting)
Speed Setting Method	Potentiometer	Dial Setting	Internal/External Speed Potentiometer	Internal/External Speed Potentiometer	External Speed Potentiometer
	Digital Setting	●	—	●	●
	External DC Voltage	—	●	●	●
Functions	Digital Speed Indicator	●	SDM496	●	●*1
	Instantaneous Stop	●	●	●	●
	Acceleration/Deceleration Operation	●	●	●	●
	Multi-Speed Operation	4 Speeds	2 Speeds	8 Speeds	16 Speeds
	Load Holding/Gravitational Operation	—	● Electromagnetic Brake Type	● Electromagnetic Brake Type	● Electromagnetic Brake Type
	Multi-Motor Control	—	●	●	●
	Protective Function	●	●	●	●
	Sink/Source Select Input	●	●	●	●
	Maximum Extension Distance	10.5 m (34.4 ft.)	20.5 m (67.2 ft.)	20.5 m (67.2 ft.)	20.5 m (67.2 ft.)
	Others	—	—	Torque Limiting	Torque Limiting
Gearheads	Parallel Shaft Gearhead	●	●	●	●
	Hollow Shaft Flat Gearhead	—	●	●	●
Safety Standards					Motor:  Driver: 
List Price		\$305.00~\$699.00	\$451.00~\$1,053.00	Standard Type + \$300.00*2	\$451.00~\$1,054.00

*1 Possible when connecting to the host system.

*2 This price is for the control module (OPX-2A).

SDM496 : Possible when a speed indicator (SDM496, accessory) is used.

Overview,
Product
Series

Brushless
Motors

AC Input
BMU

AC Input
BLE

AC Input
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AC Input
BXII

DC Input
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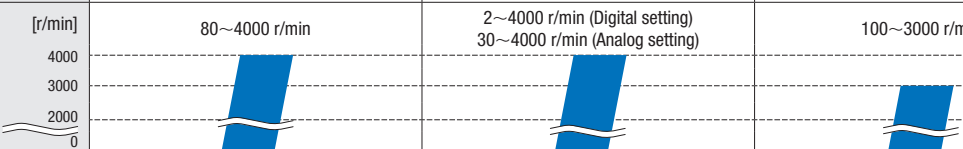

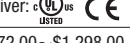


AC Speed
Control
Motors

DSC

BHF

Accessories


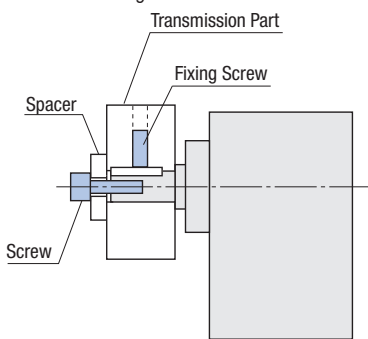

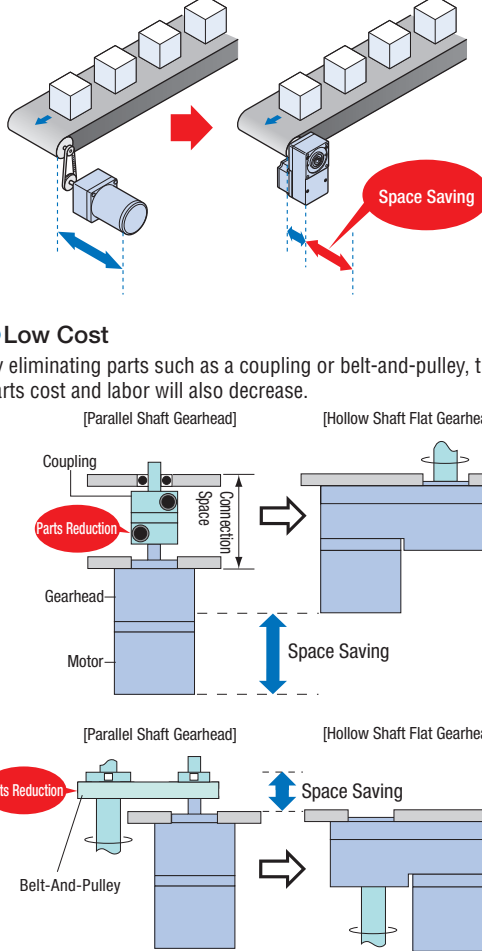
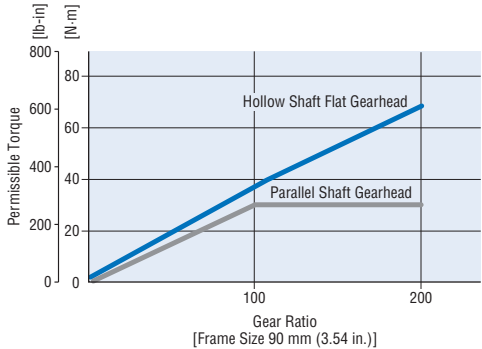
Installation

Classification		AC Power Supply Input		DC Power Supply Input
Series		Higher Functionality and Performance		24 VDC Input
		High Power and Digital Operator BLF Series 	High Power, Speed and Position Control BXII Series 	BLH Series 
Page		▶ Page D-82		▶ Page D-118
Features		<ul style="list-style-type: none"> The Mounted Digital Operator Enables Digital Setting and Display High-Power Motor Lineup with a Max. of 4000 r/min 	<ul style="list-style-type: none"> Speed Control, Position Control, Torque Limiting Excellent Speed Stability Digital Control Module Built-In 	<ul style="list-style-type: none"> Small Board Driver 24 VDC Input
Power Supply Input		Single-Phase 100-120 VAC Single-Phase 200-240 VAC Three-Phase 200-240 VAC	Single-Phase 100-120 VAC Single-Phase 200-240 VAC Three-Phase 200-240 VAC	24 VDC
Output Power	Frame Size 42 mm (1.65 in.)	—	—	15 W (1/50 HP)
	Frame Size 60 mm (2.36 in.)	30 W (1/25 HP)	30 W (1/25 HP)	30 W (1/25 HP)
	Frame Size 80 mm (3.15 in.)	60 W (1/12 HP)	60 W (1/12 HP)	50 W (1/15 HP)
	Frame Size 90 mm (3.54 in.)	120 W (1/6 HP)	120 W (1/6 HP)	100 W (1/8 HP)
	Frame Size 104 mm (4.09 in.)	200 W (1/4 HP)/400 W (1/2 HP)	200 W (1/4 HP)/400 W (1/2 HP)	—
Speed Control Range	[r/min]	80~4000 r/min	2~4000 r/min (Digital setting) 30~4000 r/min (Analog setting)	100~3000 r/min
				
Speed Ratio		50 : 1	2000 : 1 (Digital setting) 133 : 1 (Analog setting)	30 : 1
Speed Regulation (Load)		±0.2%	±0.05%	±0.5%
Speed Setting Method	Potentiometer	Internal/External Speed Potentiometer	Internal/External Speed Potentiometer	Internal/External Speed Potentiometer
	Digital Setting	●	●	—
	External DC Voltage	●	●	●
Functions	Digital Speed Indicator	●	●	SDM496
	Instantaneous Stop	●	●	●
	Acceleration/Deceleration Operation	●	●	●
	Multi-Speed Operation	8 Speeds	16 Speeds	2 Speeds (Internal/External switching)
	Load Holding/Gravitational Operation	—	● Electromagnetic Brake Type	—
	Multi-Motor Control	●	●	●
	Protective Function	●	●	●
	Sink/Source Select Input	●	●	—
	Maximum Extension Distance	23.4 m (76.7 ft.)	30.4 m (99.7 ft.)	2 m (6.6 ft.)
	Others	—	Position Control/Torque Limiting	—
Gearheads	Parallel Shaft Gearhead	●	●	●
	Hollow Shaft Flat Gearhead	●	●	● [Except for 15 W (1/50 HP)]
Safety Standards		Motor: c  Driver: c 	c 	c 
List Price		\$572.00~\$1,298.00	\$753.00~\$1,457.00	\$264.00~\$677.00

SDM496 : Possible when a speed indicator (**SDM496**, accessory) is used.

Types and Features of Gearheads

These are high-strength gearheads that are compatible with the high speed and high power of brushless motors. The two types include parallel shaft gearheads and hollow shaft flat gearheads. Both types are available as a combination type pre-assembled with a motor.

Types	Features													
<p>Parallel Shaft Gearhead</p> 	<ul style="list-style-type: none"> High-Strength Gearhead High strength is achieved through improving the strength of gears through heat treatment and through larger bearing diameters. The high permissible torque is 2 to 3 times that of a gearhead for an AC motor with the same frame size, and this contributes to reducing the size of equipment. Long-Life The GFV and GFS gearheads are a long life gearhead that uses a special bearing as well as grease for high-speed rotation. The rated life is twice that of a conventional product at 10000 hours. Improved Installation Accuracy On the GFV gearhead, the output shaft boss and installation surface have been machined. This improves the installation accuracy for the equipment. 	<ul style="list-style-type: none"> Tapped Hole at the Output Shaft End The 80 mm (3.15 in.), 90 mm (3.54 in.), and 104 mm (4.09 in.) gearheads come with a tapped hole at the output shaft end. This can be used as an aid for preventing transmission parts from coming off.  <p>Example of Using the Output Shaft End Tapped Hole</p>												
<p>Hollow Shaft Flat Gearhead</p> 	<ul style="list-style-type: none"> Space Saving Direct connection to the drive shaft is possible without using a connecting part which enables equipment space saving. Low Cost By eliminating parts such as a coupling or belt-and-pulley, the parts cost and labor will also decrease. 	<ul style="list-style-type: none"> High Permissible Torque, Long Life High permissible torque and long life are achieved through improved gear case rigidity and larger diameters for gears and bearings. A rated life of 10000 hrs* is achieved. *5000 hours for 200 W (1/4 HP) and 400 W (1/2 HP) Permissible Torque without Saturation The hollow shaft flat gearhead enables permissible torque without saturation even at high gear ratios. The motor torque can be fully utilized.  <table border="1"> <caption>Permissible Torque vs Gear Ratio (Frame Size 90 mm)</caption> <thead> <tr> <th>Gear Ratio</th> <th>Parallel Shaft Gearhead (lb-in)</th> <th>Hollow Shaft Flat Gearhead (lb-in)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>100</td> <td>~30</td> <td>~30</td> </tr> <tr> <td>200</td> <td>~30</td> <td>~65</td> </tr> </tbody> </table>	Gear Ratio	Parallel Shaft Gearhead (lb-in)	Hollow Shaft Flat Gearhead (lb-in)	0	0	0	100	~30	~30	200	~30	~65
Gear Ratio	Parallel Shaft Gearhead (lb-in)	Hollow Shaft Flat Gearhead (lb-in)												
0	0	0												
100	~30	~30												
200	~30	~65												

How to Read Specifications

How to Read Specifications

Product Name	Combination Type – Parallel Shaft Gearhead		BMU460SA-□-□A-3		BMU460SC-□-□A-3	
	Round Shaft Type		BMU260A-□-□A-3		BMU260C-□-□A-3	
① Rated Output Power (Continuous)	W (HP)		60 (1/12)			
② Rated Speed	r/min		3000			
③ Rated Torque	N·m (oz-in)		0.191 (27)			
④ Maximum Instantaneous Torque	N·m (oz-in)		0.287 (41)			
⑤ Rotor Inertia	J: $\times 10^{-4}\text{kg}\cdot\text{m}^2$ (oz-in ²)		0.082 (0.45)			
⑥ Round Shaft Type Permissible Inertia	J: $\times 10^{-4}\text{kg}\cdot\text{m}^2$ (oz-in ²)		3.75 (21)			
⑦ Speed Control Range			80~4000 r/min (Speed ratio 50:1)			
⑦ Speed Regulation	Load		$\pm 0.2\%$ or less: Conditions 0~rated torque, rated speed, rated voltage, normal temperature			
	Voltage		$\pm 0.2\%$ or less: Conditions Rated voltage $-15\sim+10\%$, rated speed, no load, normal temperature			
	Temperature		$\pm 0.2\%$ or less: Conditions Operating ambient temperature from $0\sim+40^\circ\text{C}$ ($+32\sim+104^\circ\text{F}$), rated speed, no load, rated voltage			
Power Supply Input	Rated Voltage	VAC	Single-Phase 100-120		Single-Phase 200-240/Three-Phase 200-240	
	Permissible Voltage Range		$-15\sim+10\%$			
	Frequency	Hz	50/60			
	Permissible Frequency Range		$\pm 5\%$			
	Rated Input Current	A	1.7	Single-Phase: 1.0/ Three-Phase: 0.52		
⑧ Maximum Input Current	A	3.3	Single-Phase: 1.9/ Three-Phase: 1.1			

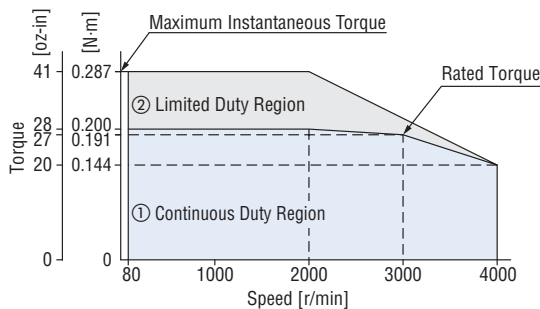
- ① Rated Output Power: This refers to, with the combination of motor and driver, the amount of work that can be performed by a motor in a given period of time. It also expresses the maximum output that can be generated continuously.
- ② Rated Speed: This refers to, with the combination of motor and driver, the speed at rated output.
- ③ Rated Torque: This refers to, with the combination of motor and driver, the maximum torque created when they are in continuous operation.
- ④ Maximum Instantaneous Torque: This refers to, with the combination of motor and driver, the limit of torque that can be generated instantaneously.
- ⑤ Round Shaft Type Permissible Inertia J: This refers to, with the combination of motor and driver, the maximum inertia that can be driven. The permissible load specified here is applicable only to round shaft type.
- ⑥ Speed Control Range: This refers to, with the combination of motor and driver, the range of variable speed.
- ⑦ Speed Regulation: This shows how much the speed is affected by the change in load, voltage and temperature.
- ⑧ Maximum Input Current: This refers to, with the combination of motor and driver, the maximum current sent into the driver.

● Permissible Radial Load and Permissible Axial Load of Motors

Similar to standard AC motors. Refer to "How to Read Motor Specifications" of constant speed motors.

- How to read motor specifications of constant speed motors → Page C-12

How to Read Speed – Torque Characteristics



- ① Continuous Duty Region: This refers to the region where a motor can be operated continuously. The area is also used for the frictional load torque at the sliding portion of equipment.
- ② Limited Duty Region: This refers to the region which can be used for a short period of time. If operated for more than about five seconds in the limited duty region, the driver's overload protective function engages and the motor is automatically stopped. This area is also used as the acceleration torque which accelerates an inertial load up to the set speed at motor start-up.

How to Read Gearhead Specifications

Similar to standard AC motors. Refer to "How to Read Gearhead Specifications" of constant speed motors.

- How to read gearhead specifications of constant speed motors → Page C-13

Overview, Product Series

Brushless Motors

AC Input BMU

AC Input BLE

AC Input BLF

AC Input BXII

DC Input BLH

AC Speed Control Motors

DSC

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