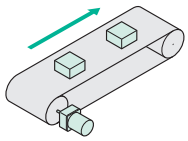
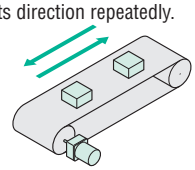
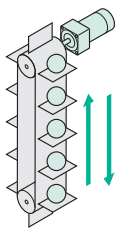
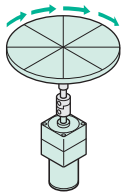
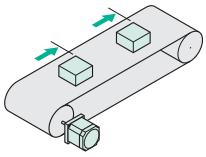
Standard AC Motors

Constant Speed Motors

Features and Types of Constant Speed Motors

Constant speed motors come in various types as shown below. Select from a wide range of products depending on the application, required functions, output, etc.

Types	Features	Series \ Frame Size mm (in.)/Output Power	□42 (□1.65) 1 W (1/750 HP)	□60 (□2.36) 6 W (1/125 HP)	□70 (□2.76) 15 W (1/50 HP)	□80 (□3.15) 25 W (1/30 HP)	□90 (□3.54) 40 W (1/19 HP)	□90 (□3.54) 60 W (1/12 HP)	□90 (□3.54) 90 W (1/8 HP)	□90 (□3.54) 100 W (1/8 HP)	□104 (□4.09) 200 W (1/4 HP)
Induction Motors Page C-21	Suitable for applications where the motor is operated continuously in one direction. 	**KⅡS** Series These new high-efficiency three-phase induction motors were created through optimized motor design. They are best suited for speed control in combination with an inverter. The right-angle geared type provides high strength through the use of hypoid gears and an integral structure of the motor and gears.  						●		●	
		Right-Angle Geared Type								●	
		KⅡ Series This series adopts a gearhead with high permissible torque, high strength, long life and low noise. The "Combination Type" comes with a motor and a pre-assembled gearhead. 		●	●	●	●	●	●		
		World **K** Series These motors conform to major standards and support global power supply voltages for use in major countries. 		●	●	●	●	●	●		
		2-Pole, High-Speed Type				● 40 W, 60 W (1/19 HP, 1/12 HP)		● 60 W, 90 W, 150 W (1/12 HP, 1/8 HP, 1/5 HP)			
		BH Series The **BH** Series provides high-output power of 200 W (1/4 HP) in a compact 104 mm (4.09 in.) square mounting configuration. They also conform to major standards and support global power supply voltages. 									●
Reversible Motors Page C-147	Suitable for applications where the motor reverses its direction repeatedly. 	World **K** Series These motors conform to major standards and support global power supply voltages for use in major countries. 	●	●	●	●	●	●	●		
Electromagnetic Brake Motors Page C-155	Suitable for applications where the load must always be held in place. 	**KⅡS** Series These new high-efficiency three-phase induction motors were created through optimized motor design. They are best suited for speed control in combination with an inverter. 						●		●	
		Right-Angle Geared Type								●	
		World **K** Series These motors conform to major standards and support global power supply voltages for use in major countries. 		●	●	●	●	●	●		
		BH Series The **BH** Series provides high-output power of 200 W (1/4 HP) in a compact 104 mm (4.09 in.) square mounting configuration. They also conform to major standards and support global power supply voltages. 									●

Types / Features	Frame Size mm (in.)/Output Power	□42 (□1.65)	□60 (□2.36)	□70 (□2.76)	□80 (□3.15)	□90 (□3.54)		
		1 W (1/750 HP)	6 W (1/125 HP)	15 W (1/50 HP)	25 W (1/30 HP)	40 W (1/19 HP)	60 W (1/12 HP)	90 W (1/8 HP)
Clutch & Brake Motors Page C-163	This motor combines a power on activated type clutch and brake with an induction motor. It is ideal for high-frequency starting and stopping.  					●	●	●
Low-Speed Synchronous Motors Page C-167	Suitable for applications where the motor is operated starting, stopping and reversing repeatedly and the motor is operated at synchronous speed regardless of load torque.  	●*	□56.4 (□2.22) ●*			□85 (□3.35) ●*		

*For low-speed synchronous motors, only the frame size is represented.

How to Read Specifications

When selecting a motor and gearhead, you should read the specifications to make sure that the motor you select meets the application requirements. Shown below is an explanation of how to read the specifications on some important items.

How to Read Motor Specifications

Motor Specifications

Motor Specifications Table (Example)

Specifications – Continuous Rating ⑥

Product Name		① Output Power	Voltage	Frequency	② Current	③ Starting Torque	④ Rated Torque	⑤ Rated Speed	Capacitor	Overheat Protection Device
Terminal Box Type	Lead Wire Type	W (HP)	VAC	Hz	A	mN·m (oz-in.)	mN·m (oz-in.)	r/min	μF	
4IK25UAT2-□A	**4IK25UA-□A**	25 (1/30)	Single-Phase 110	60	0.44	120 (17.0)	170 (24)	1450	6.0	TP
			Single-Phase 115		0.43	120 (17.0)	170 (24)	1450		

①Output Power: The amount of work that can be performed in a given period of time. It can be used as a criteria for motor capability.
②Current: The current value used by a motor when the motor is producing rated torque.
③Starting Torque: This term refers to the torque generated the instant the motor starts. If the motor is subjected to a friction load smaller than this torque, it will operate.
④Rated Torque: This is the torque created when the motor is operating most efficiently. Though the maximum torque is far greater, rated torque should, from the standpoint of utility, be the highest torque.
⑤Rated Speed: This is the speed of the motor when the motor is producing rated torque.
⑥Rating: The time that a motor can operate continuously at rated output (torque). With a continuous rating, a motor can operate continuously.

Electromagnetic Brake (Power Off Activated Type)

Specifications Table (Example)

Motor Product Name	Voltage	Frequency	Current	Input	① Holding Brake Torque
	VAC	Hz	A	W	mN·m oz-in
4IK25GN-SW2M **4IK25A-SW2M**	Single-Phase 220	60	0.05	7	100 14.2
	Single-Phase 230				

①Holding Brake Torque: This refers to the holding brake torque of the electromagnetic brake and expresses the size of holding torque at the motor output shaft.

When a gearhead is connected, calculate the holding torque at the gearhead output shaft with the following formula.

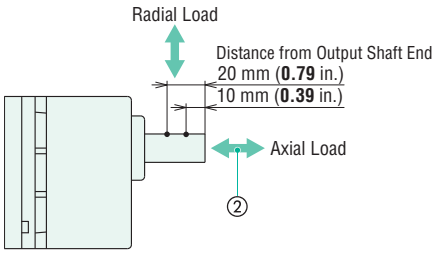
Holding torque at the gearhead output shaft $T_G = T_M \times i$

T_G : Holding torque at the gearhead output shaft
T_M : Holding torque at the motor output shaft
i : Gearhead gear ratio

●Permissible Radial Load and Permissible Axial Load of Motors

Specifications Table for Permissible Radial Load (Example)

Motor		Permissible Radial Load			
Frame Size	Output Shaft Diameter	10 mm (0.39 in.) from Output Shaft End		20 mm (0.79 in.) from Output Shaft End	
□ mm (in.)	ϕ mm (in.)	N	lb.	N	lb.
60 (2.36)	6 (0.2362)	50	11.2	110	24



①Permissible Radial Load: The value ① shown in the table above is the one for the permissible radial load. As shown in the figure to the left, this term refers to the permissible value of the load applied in a direction perpendicular to the motor output shaft.

②Permissible Axial Load: As shown in the figure to the left, this term refers to the permissible value of the load applied in the axial direction to the motor output shaft. Keep the axial load to half or less of motor mass.

The calculating method of radial load applied on the output shaft is the same as for a gear shaft. Refer to the permissible radial load and permissible axial load of gearheads for details. Permissible radial load and permissible axial load of gearheads ➜ Page C-16

How to Read Gearhead Specifications

Some gearheads other than those for constant speed motors are listed.

●Gearmotor – Torque Table

Gearmotor – Torque Table (Example)

◇60 Hz

Unit: Upper values: N·m/ Lower values: lb-in

Product Name	Speed r/min	360	300	240	200	144	120	100	72	60	50	36	30	24	20	18	15	12	10	7.2	6	5
	Gear Ratio	**5**	**6**	**7.5**	**9**	**12.5**	**15**	**18**	**25**	**30**	**36**	**50**	**60**	**75**	**90**	**100**	**120**	**150**	**180**	**250**	**300**	**360**
4IK25U□□-□A		0.77	0.92	1.1	1.4	1.9	2.3	2.8	3.8	4.4	5.3	7.3	8.8	11.0	13.2	14.6	16	16	16	16	16	16
		6.8	8.1	9.7	12.3	16.8	20	24	33	38	46	64	77	97	116	129	141	141	141	141	141	141

①Permissible Torque: It refers to the value of load torque driven by the gearhead's output shaft. Each value is shown for the corresponding gear ratio.

Permissible torque when a gearhead is connected can be calculated with the formula below.
Permissible torque for some products are omitted. In that case, use the formula below to calculate the permissible torque.

Permissible torque $T_G = T_M \times i \times \eta$

T_G : Permissible torque of gearhead
T_M : Motor torque
i : Gearhead gear ratio
η : Gearhead efficiency

Gearhead Efficiency

Product Name \ 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	250	300	360
2GV□A, 3GV□A, 4GV□A			90%								86%								81%				
5GV□A, 5GVH□A			90%								86%								81%				
5GVR□A			90%						86%						81%								
2GN□SA, 3GN□SA, 4GN□SA, 5GN□SA			81%							73%				66%									
5GE□SA			81%				73%			66%				59%									
BH6G2-□			90%				86%							81%									

- For **BH6G2-□RH** and **BH6G2-□RA**, gearhead efficiency of all gear ratio is 73% at the rated speed and starting.
- Gearhead efficiency of all the decimal gearheads is 81%.

Product Name \ Gear Ratio	5	10	15	20	30	50	100	200
GFV2G□A, GFS2G□	90%				86%			81%
GFV4G□A, GFS4G□	90%				86%			81%
GFV5G□A, GFS5G□	90%				86%			81%
GFV6G□A, GFS6G□	90%				86%		81%	

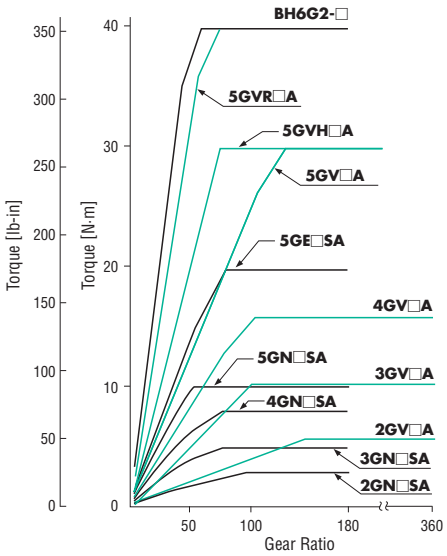
Product Name \ Gear Ratio	5	10	15	20	30	50	100	200
GFS2G□FR	80%	85%						
GFS4G□FR	85%							
GFS5G□FR	85%							
GFS6G□FR	85%							

Note

- The transmission efficiency in the table above is the value at room temperature. The transmission efficiency of the gear head varies according to the ambient temperature. Care should be taken when using in a low-temperature environment as the transmission efficiency will drop along with the output torque.

Maximum Permissible Torque

The gearhead output torque increases proportionally as the gear ratio increases. However, the load torque is saturated at a certain gear ratio because of the gear materials and other conditions. This torque is called the maximum permissible torque.
The maximum permissible torque of typical gearheads are shown in the figure to the right.



Maximum Permissible Torque of Gearhead

●Speed and Rotation Direction

Gearmotor – Torque Table (Example)

◇60 Hz

Unit: Upper values: N·m/ Lower values: lb-in

Product Name	Speed r/min ①	360	300	240	200	144	120	100	72	60	50	36	30	24	20	18	15	12	10	7.2	6	5
	Gear Ratio	**5**	**6**	**7.5**	**9**	**12.5**	**15**	**18**	**25**	**30**	**36**	**50**	**60**	**75**	**90**	**100**	**120**	**150**	**180**	**250**	**300**	**360**
4IK25U□□-□A		0.77	0.92	1.1	1.4	1.9	2.3	2.8	3.8	4.4	5.3	7.3	8.8	11.0	13.2	14.6	16	16	16	16	16	16
		6.8	8.1	9.7	12.3	16.8	20	24	33	38	46	64	77	97	116	129	141	141	141	141	141	141

①Speed: This refers to the speed at the gearhead output shaft. The speeds, depending on gear ratio, are shown in the "Gearmotor – Torque Table." The speed is calculated by dividing the motor's synchronous speed by the gear ratio. The actual speed is 2～20% less than the displayed value depending on the load.

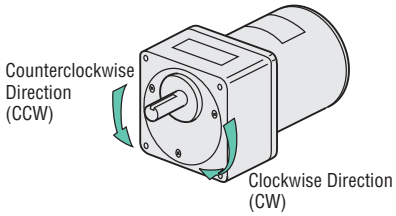
The speed is calculated with the following formula.

Speed $N_G = \frac{N_M}{i}$ N_G : Gearhead speed [r/min]

N_M : Motor speed [r/min]

i : Gearhead gear ratio

②Rotation Direction: This refers to the rotation direction viewed from the output shaft. A colored background (□) indicates gear shaft rotation in the same direction as the motor shaft, while the others rotate in the opposite direction. The direction of gearhead shaft rotation may differ from motor shaft rotation depending on the gear ratio of the gearhead. The gear ratio and rotation direction of each gearhead is shown in the table below.



◇Gear Ratio and Rotation Direction of Gearhead

■.....Same direction as the motor shaft
□.....Opposite direction as the motor shaft

Product Name \ 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	250	300	360
2GV□A, 3GV□A, 4GV□A			■	■	■	■	■	■	■	■	□	□	□	□	□	□	□	□	■	■	■	■	■
5GV□A, 5GVH□A			■	■	■	■	■	■	■	□	□	□	□	□	□	□	□	■	■	■	■	■	□
5GVR□A			■	■	■	■	■	□	□	□	□	□	□	□	■	■	■	■	■	■	■	□	□
2GN□SA, 3GN□SA, 4GN□SA, 5GN□SA	■	■	■	■	■	■	■	■	■	□	□	□	■	■	■	■	■	■	■	■	■	□	□
5GE□SA	■	■	■	■	■	■	□	□	□	□	■	■	■	■	■	■	■	■	■	■	■	□	□
BH6G2-□	■	■	■	■	■	■	□	□	□	□	□	□	■	■	■	■	■	■	■	■	■	□	□

Connection of a decimal gearhead reduces the speed by 10:1, but does not affect the rotation direction.

Product Name \ Gear Ratio	5	10	15	20	30	50	100	200
GFV2G□A, GFS2G□	■	■	■	■	□	□	□	■
GFV4G□A, GFS4G□	■	■	■	■	□	□	□	■
GFV5G□A, GFS5G□	■	■	■	■	□	□	□	■
GFV6G□A, GFS6G□	■	■	■	■	□	■	■	■

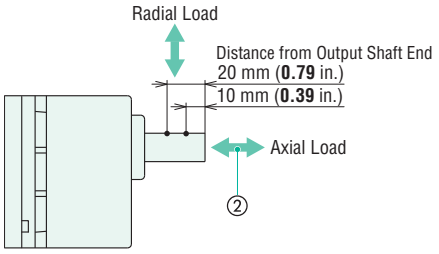
●Permissible Radial Load and Permissible Axial Load of Gearheads

Specifications Table for Permissible Radial Load and Permissible Axial Load (Example)

Product Name	Gear Ratio	Max. Permissible Torque		Permissible Radial Load ①				Permissible Axial Load ②	
				10 mm (0.39 in.) from Output Shaft End		20 mm (0.79 in.) from Output Shaft End			
		N·m	lb-in	N	lb.	N	lb.	N	lb.
4GN□SA	**3~18**	8.0	70	100	22	150	33	50	11.2
	25~180			200	45	300	67		

①Permissible Radial Load: The value ① shown in the table above is the one for the permissible radial load. This term refers to the permissible value of the load applied in a direction perpendicular to the gearhead output shaft as shown in the figure to the right.

②Permissible Axial Load: The value ② shown in the table above is the one for permissible axial load. This term refers to the permissible value of the load applied in the axial direction to the gearhead output shaft as shown in the figure to the right.



When a chain, gear, belt, etc. is used as the transmission mechanism, the radial load is always applied on the gearhead output shaft. The radial load is calculated with the following formula.

Radial load $W = \dfrac{K \times T \times f}{\gamma}$

W : Radial load [N]
K : Load coefficient for driving method (on the right)
T : Torque at gearhead output shaft [N·m]
f : Service factor (on the right)
γ : Effective radius of gear or pulleys [m]

◇Load Coefficient for Driving Method (K)

Drive System	K
Chain or synchronous belt	1
Gear	1.25
V-belt	1.5
Flat belt	2.5

◇Service Factor (f)

Load Type	Example	Factor f
Uniform Load	· Uni-directional continuous operation · For driving belt conveyors and film rollers that are subject to minimal load fluctuation	1.0
Light Impact	· Frequent starting and stopping · Cam drive and inertial body positioning	1.5
Medium Impact	· Frequent instantaneous bi-directional operation, starting and stopping of reversible motors · Frequent instantaneous stopping by brake pack of AC motors · Frequent instantaneous starting and stopping by brushless motors	2.0

●Permissible Inertia J of Gearhead

This refers to the permissible value for inertia (J) at the gearhead output shaft. Convert the permissible value at the motor output shaft into the permissible value at the gearhead output shaft with the following formula.

Gear ratio 3:1~50:1 $J_G = J_M \times i^2$
Gear ratio 60:1 or higher $J_G = J_M \times 2500$

J_G : Permissible inertia at the gearhead output shaft J [$\times 10^{-4}$ kg·m^2 (oz-in^2)]
J_M : Permissible inertia at the motor shaft J [$\times 10^{-4}$ kg·m^2 (oz-in^2)]
i : Gear ratio (Example: $i = 3$ means the gear ratio of 3:1)

●Permissible Inertia at the Motor Shaft (Example)

Number of Phase	Frame Size	Output Power	Permissible Inertia at the Motor Shaft J [$\times 10^{-4}$ kg·m^2 (oz-in^2)]
Single-Phase	□80 mm (□3.15 in.)	25 W (1/30 HP)	0.31 (1.70)

For some products that are combination types, the permissible inertia at the gearhead output shaft is shown as the specifications values, divided with each gear ratio.

Common Specifications

Some specifications other than those for constant speed motors are listed.

Permissible Radial Load and Permissible Axial Load of Motors

Permissible Radial Load

Motor		Permissible Radial Load			
Frame Size □ mm (in.)	Output Shaft Diameter ϕ mm (in.)	10 mm (0.39 in.) from Output Shaft End		20 mm (0.79 in.) from Output Shaft End	
		N	lb.	N	lb.
60 (2.36)	6 (0.2362)	50	11.2	110	24
70 (2.76)	6 (0.2362)	40	9.0	60	13.5
80 (3.15)	8 (0.3150)	90	20	140	31
	10 (0.3937)	110	24	120	27
90 (3.54)	10 (0.3937)	140	31	200	45
	12 (0.4724)	240	54	270	60
104 (4.09)	14 (0.5512)	320	72	350	78

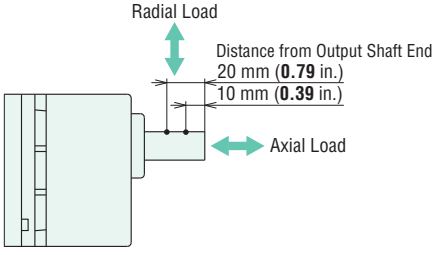
Permissible Axial Load

Avoid axial load as much as possible. If axial load is unavoidable, keep it to half or less of the motor mass.

Permissible Radial Load and Permissible Axial Load of Gearheads

Product Name	Gear Ratio	Max. Permissible Torque		Permissible Radial Load				Permissible Axial Load	
				10 mm (0.39 in.) from Output Shaft End		20 mm (0.79 in.) from Output Shaft End			
		N·m	lb-in	N	lb.	N	lb.	N	lb.
2GV□A	**5~25**	6.0	53	150	33	200	45	40	9
	30~360			200	45	300	67		
3GV□A	**5~25**	10	88	200	45	300	67	80	18
	30~360			300	67	400	90		
4GV□A	**5~25**	16	141	300	67	350	78	100	22
	30~360			450	101	550	123		
5GV□A 5GVH□A	**5~9**	30	260	400	90	500	112	150	33
	12.5~18			450	101	600	135		
	25~300			500	112	700	157		
5GVR□A	**5~9**	40	350	400	90	500	112	150	33
	12.5~18			450	101	600	135		
	25~180			500	112	700	157		
2GN□SA	**3~18**	3.0	26	50	11.2	80	18	30	6.7
	25~180			120	27	180	40		
3GN□SA	**3~18**	5.0	44	80	18	120	27	40	9
	25~180			150	33	250	56		
4GN□SA	**3~18**	8.0	70	100	22	150	33	50	11.2
	25~180			200	45	300	67		
5GN□SA	**3~18**	10	88	250	56	350	78	100	22
	25~180			300	67	450	101		
5GE□SA	**3~9**	20	177	400	90	500	112	150	33
	12.5~18			450	101	600	135		
	25~180			500	112	700	157		
BH6G2-□	**3~36**	40	350	550	123	800	180	200	45
	50~180			650	146	1000	220		
BH6G2-□RH	**5~36**	60	530	1200*	270	1100*	240	300	67
	50~180			2200*	490	2000*	450		
BH6G2-□RA	**5~36**	60	530	900	200	1000	220	300	67
	50~180			1700	380	1850	410		

*For **BH6G2-□RH** (Gearhead for **BH** Series right-angle, hollow shaft combination type), the permissible radial load is the value at the distance from the flange mounting surface. The permissible radial load at each distance is calculated with the formula below.



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

◇Calculating the Permissible Radial Load for Hollow Shaft Type

When the end of the shaft being driven is not supported by a bearing as shown in the figure below, calculate the permissible radial load using the following formula. (This mechanism is the most demanding state in terms of radial load.)

● **KⅡS** Series Right-Angle Geared Type

• Gear ratio **5**:**1**～**40**:**1**

Permissible radial load W [N (lb.)] $= \dfrac{83.5\ mm\ (3.29\ in.)}{83.5\ mm\ (3.29\ in.)+L_P} \times 1340$ N (300 lb.)

1340 N (300 lb.) : Permissible radial load at the flange mounting surface

• Gear ratio **50**:**1**～**240**:**1**

Permissible radial load W [N (lb.)] $= \dfrac{83.5\ mm\ (3.29\ in.)}{83.5\ mm\ (3.29\ in.)+L_P} \times 2460$ N (550 lb.)

2460 N (550 lb.) : Permissible radial load at the flange mounting surface

● **BH6G2-□RH**

• Gear ratio **5**:**1**～**36**:**1**

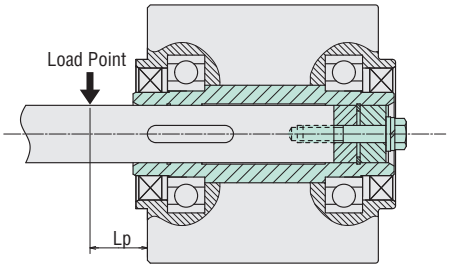
Permissible radial load W [N (lb.)] $= \dfrac{87.5\ mm\ (3.44\ in.)}{87.5\ mm\ (3.44\ in.)+L_P} \times 1350$ N (300 lb.)

1350 N (300 lb.) : Permissible radial load at the flange mounting surface

• Gear ratio **50**:**1**～**180**:**1**

Permissible radial load W [N (lb.)] $= \dfrac{87.5\ mm\ (3.44\ in.)}{87.5\ mm\ (3.44\ in.)+L_P} \times 2450$ N (550 lb.)

2450 N (550 lb.) : Permissible radial load at the flange mounting surface



Lp [mm (in.)]: Distance from Flange Mounting Surface to Radial Load Point

■Permissible Inertia J of Gearhead

When a high inertia (J) is connected to a gearhead, high torque is exerted instantaneously on the gearhead when starting in frequent, intermittent operations (or when stopped by an electromagnetic brake, or when stopped instantaneously by a brake pack).
The table below gives values for permissible inertia at the motor shaft. Use the motor and gearhead within these parameters. The permissible inertia for three-phase motors is the value when reversing after a stop.
The permissible inertia (J) at the gearhead output shaft is calculated with the following formula.
The life of the gearhead when operating at the permissible inertia with instantaneous stop of motors with electromagnetic brakes, brake pack or speed control motors is approximately two million cycles.

●Permissible Inertia at the Gearhead Output Shaft

Gear ratio 3:1～50:1	$J_G = J_M \times i^2$	J_G : Permissible inertia at the gearhead output shaft J [$\times 10^{-4}$ kg·m^2 (oz-in^2)]
Gear ratio 60:1 or higher	$J_G = J_M \times 2500$	J_M : Permissible inertia at the motor shaft J [$\times 10^{-4}$ kg·m^2 (oz-in^2)]
		i : Gear ratio (Example: $i = 3$ means the gear ratio of 3:1)

●Permissible Inertia at the Motor Shaft

Number of Phase	Frame Size	Output Power	Permissible Inertia at the Motor Shaft J [$\times 10^{-4}$ kg·m^2 (oz-in^2)]
Three-Phase	□60 mm (□2.36 in.)	6 W (1/125 HP)	0.062 (0.34)
	□70 mm (□2.76 in.)	15 W (1/50 HP)	0.14 (0.77)
	□80 mm (□3.15 in.)	25 W (1/30 HP)	0.31 (1.70)
	□90 mm (□3.54 in.)	40 W (1/19 HP)	0.75 (4.1) [1.1 (6.0)]*
		60 W (1/12 HP)	1.1 (6.0)
		90 W (1/8 HP)	1.1 (6.0)
	□104 mm (□4.09 in.)	200 W (1/4 HP)	2.0 (10.9)
Single-Phase	□60 mm (□2.36 in.)	6 W (1/125 HP)	0.062 (0.34)
	□70 mm (□2.76 in.)	15 W (1/50 HP)	0.14 (0.77)
	□80 mm (□3.15 in.)	25 W (1/30 HP)	0.31 (1.70)
	□90 mm (□3.54 in.)	40 W (1/19 HP)	0.75 (4.1) [1.1 (6.0)]*
		60 W (1/12 HP)	1.1 (6.0)
		90 W (1/8 HP)	1.1 (6.0)
	□104 mm (□4.09 in.)	200 W (1/4 HP)	2.0 (10.9)

*Values in the brackets are for the **KⅡ** Series.

Permissible Inertia J of Combination Types

Unit: Upper values: $\times 10^{-4}$ kg·m^2/Lower values: oz-in^2

Product Name \ Gear Ratio		5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180	250	300	360
2GV□A		12	18	28	40	78	110	160	260	370	540	920	1300	1700	2000	2500	3600	5000	5000	5000	5000	5000
		66	98	153	220	430	600	880	1420	2000	3000	5000	7100	9300	10900	13700	19700	27000	27000	27000	27000	27000
	When performing instantaneous stop	1.55	2.23	3.49	5.02	9.69	14	20.1	38.8	55.8	80.4	155	155	155	155	155	155	155	155	155	155	155
		8.5	12.2	19.1	27	53	77	110	210	310	440	850	850	850	850	850	850	850	850	850	850	850
3GV□A		20	28	45	65	120	180	260	440	630	900	1500	2100	2800	3200	4000	5700	8000	8000	8000	8000	8000
		109	153	250	360	660	980	1420	2400	3400	4900	8200	11500	15300	17500	22000	31000	44000	44000	44000	44000	44000
	When performing instantaneous stop	3.5	5.04	7.88	11.3	21.9	31.5	45.4	87.5	126	181	350	350	350	350	350	350	350	350	350	350	350
		19.1	28	43	62	120	172	250	480	690	990	1910	1910	1910	1910	1910	1910	1910	1910	1910	1910	1910
4GV□A		22	32	50	72	150	220	310	550	800	1100	2200	3200	4000	5000	6200	8900	12000	12000	12000	12000	12000
		120	175	270	390	820	1200	1700	3000	4400	6000	12000	17500	22000	27000	34000	49000	66000	66000	66000	66000	66000
	When performing instantaneous stop	7.75	11.2	17.4	25.1	48.4	69.8	100	194	279	402	775	775	775	775	775	775	775	775	775	775	775
		42	61	95	137	260	380	550	1060	1530	2200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200
5GV□A 5GVH□A		45	65	100	150	300	420	620	1100	1600	2300	4500	6000	8000	10000	12000	17000	25000	25000	25000	25000	–
		250	360	550	820	1640	2300	3400	6000	8800	12600	25000	33000	44000	55000	66000	93000	137000	137000	137000	137000	–
	When performing instantaneous stop	27.5	39.6	61.9	89.1	172	248	356	688	990	1426	2750	2750	2750	2750	2750	2750	2750	2750	2750	2750	–
		150	220	340	490	940	1360	1950	3800	5400	7800	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	–
5GVR□A		45	65	100	150	300	420	620	1100	1600	2300	4500	6000	8000	10000	12000	17000	25000	25000	–	–	–
		250	360	550	820	1640	2300	3400	6000	8800	12600	25000	33000	44000	55000	66000	93000	137000	137000	–	–	–
	When performing instantaneous stop	27.5	39.6	61.9	89.1	172	248	356	688	990	1426	2750	2750	2750	2750	2750	2750	2750	2750	–	–	–
		150	220	340	490	940	1360	1950	3800	5400	7800	15000	15000	15000	15000	15000	15000	15000	15000	–	–	–

Note

- Do not perform instantaneous bi-directional operations on three-phase motors.