Standard AC Motors

Constant Speed Motors

Induction Motors

Reversible Motors

Electromagnetic Brake Motors

High-Strength, Long Life, Low Noise **V** Series

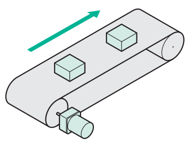
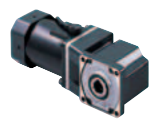
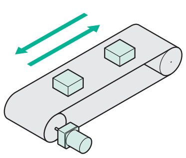
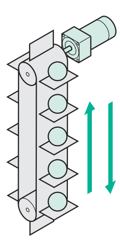
Clutch and Brake Motors

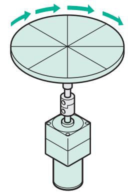
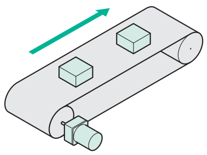
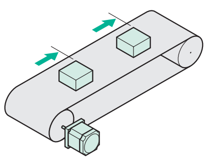
Synchronous Motors

Low-Speed Synchronous 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, 3 W (1/750 HP, 1/250 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)	□104 (□4.09) 200 W (1/4 HP)
Induction Motors Page C-19	Suitable for applications where the motor is operated continuously in one direction. 	**World K Series** These motors conform to major safety 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)		
		V Series Adopted High-Strength, Long Life, Low Noise gearheads. They also conform to major safety standards and support global power supply voltages. 		●	●	●	●	●	●	
		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 safety standards and support global power supply voltages. 								●
Reversible Motors Page C-75	Suitable for applications where the motor reverses its direction repeatedly. 	**World K Series** These motors conform to major safety standards and support global power supply voltages for use in major countries. 	● 1W (1/750 HP)	●	●	●	●	●	●	
		V Series Adopted High-Strength, Long Life, Low Noise gearheads. They also conform to major safety standards and support global power supply voltages. 		●	●	●	●	●	●	
Electromagnetic Brake Motors Page C-107	Suitable for applications where the load must always be held in place. 	**World K Series** These motors conform to major safety standards and support global power supply voltages for use in major countries. 		●	●	●	●	●	●	
		V Series Adopted High-Strength, Long Life, Low Noise gearheads. They also conform to major safety standards and support global power supply voltages. 		●	●	●	●	●	●	
		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 safety standards and support global power supply voltages. 								●

Types	Features / Frame Size mm (in.)/Output Power	□42 (□1.65) 1 W, 3 W (1/750 HP, 1/250 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)
Clutch and Brake Motors Page C-179	This motor combines a power on activated type clutch and brake with an induction motor. It is ideal for high-frequency starting and stopping.  		●		●	●	●	●
Synchronous Motors Page C-189	Suitable for applications where the motor is operated at synchronous speed continuously in one direction regardless of load torque.  		● 4 W (1/190 HP)	● 10 W (1/75 HP)	● 15 W (1/50 HP)	● 25 W (1/30 HP)		
Low-Speed Synchronous Motors Page C-191	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 Select a Brake Motor

◇Selecting Based on Stopping Accuracy

Overrun
- 1~1.5 Rotations → **Brake Pack**  Page C-253
- 1 Rotation → **C·B Motors**  C-179
- 2~3 Rotations → **Electromagnetic Brake Motors**  C-107

●The values for overrun applies to the motor only.

●For low-speed synchronous motors, the motor can be stopped instantly within ±10° of stopping accuracy by turning off the power supply. Refer to page C-191 for details.

◇Selecting Based on Frequency of Use

Holding Brake Force
- Not necessary — 60 cycles/minute or less → **Brake Pack**  Page C-253
- Necessary → **Operating Cycles**
  - 100 cycles/minute or less → **C·B Motors**  C-179
  - 50 cycles/minute or less → **Electromagnetic Brake Motors**  C-107

Notes
- ●The operating cycles are based merely on brake response. The value specified above is the maximum, so it may not be possible to repeat braking operation at this frequency.
  In an actual application, be certain the surface temperature of the motor case remains at 90˚C (194˚F) or less.
- ●For low-speed synchronous motors, if operated within the permissible load inertia, the motor can start and reverse within 1.5 cycles of power supply frequency. Refer to page C-191 for details.

Introduction
Induction Motors
Reversible Motors
Electromagnetic Brake Motors
V Series
Clutch & Brake Motors
Synchronous Motors
Low-Speed Synchronous Motors
Watertight, Dust-Resistant Motors
Torque Motors
Right-Angle Gearheads
Linear Heads
Brake Pack
Accessories
Installation

How to Read Specifications

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

How to Read Motor Specifications

Motor Specifications

Motor Specifications Table (Example)

Specifications – Continuous Rating ⑥

Model Upper Model Name: Pinion Shaft Type Lower Model Name ( ): Round Shaft Type		① Output Power	Voltage	Frequency	② Current	③ Starting Torque	④ Rated Torque	⑤ Rated Speed	Capacitor
Lead Wire Type Dimension ①	Terminal Box Type Dimension ②	W HP	VAC	Hz	A	mN·m oz-in	mN·m oz-in	r/min	μF
TP **4IK25GN-AW2U** **(4IK25A-AW2U)**	**4IK25GN-AW2TU** **(4IK25A-AW2TU)**	25 1/30	Single-Phase 110 Single-Phase 115	60	0.46	120 17.0	170 24	1450	6.5

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 Model	Voltage VAC	Frequency Hz	Current A	Input W	① Holding Brake Torque mN·m oz-in
4RK25GN-AW2MU **4RK25A-AW2MU**	Single-Phase 110 Single-Phase 115	60	0.09	6	100 14.2

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.

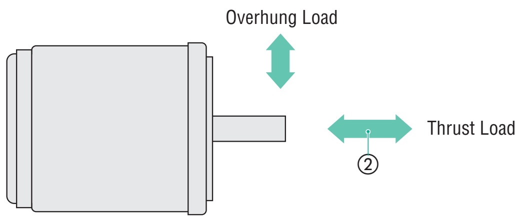
When a gearhead is connected, calculate the holding torque at the gearhead output shaft with the following formula.
Holding torque at the gearhead output shaft $T_G = T_M \times i$

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

● Permissible Overhung Load and Permissible Thrust Load of Motors

Specifications Table for Permissible Overhung Load (Example)

Motor			Permissible Overhung Load ①			
Frame Size □ mm (in.)	Output Shaft Diameter ϕ mm (in.)	Series	10 mm (0.39 in.) from shaft end		20 mm (0.79 in.) from shaft end	
			N	lb.	N	lb.
60 (2.36)	6 (0.2362)	World **K**	50	11.2	110	24



① Permissible Overhung Load: The value ① shown in the table above is the one for the permissible overhung 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 shaft.

② Permissible Thrust 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 shaft. Keep the thrust load to half or less of motor mass.

The calculating method of overhung load applied on the output shaft is the same as for a gear shaft. Refer to the permissible overhung load and permissible thrust load of gearheads for details.

Permissible overhung load and permissible thrust 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

Model	Speed r/min	600 ①	500	360	300	240	200	144	120	100	72	60	50	36	30	24	20	18	15	12	10
Motor/ Gearhead	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**
4IK25GN-AW2□U **4IK25GN-CW2□E**	**4GN□SA**	0.41 3.6	0.50 4.4	0.69 6.1	0.83 7.3	1.0 8.8	1.2 10.6	1.7 15.0	2.1 18.5	2.5 22	3.1 27	3.7 32	4.5 39	5.6 49	6.7 59	8 70	8 70	8 70	8 70	8 70	8 70

① Permissible 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

<table>
<tr><th>Model \ Gear Ratio</th><th>3</th><th>3.6</th><th>5</th><th>6</th><th>7.5</th><th>9</th><th>12.5</th><th>15</th><th>18</th><th>25</th><th>30</th><th>36</th><th>50</th><th>60</th><th>75</th><th>90</th><th>100</th><th>120</th><th>150</th><th>180</th><th>250</th><th>300</th><th>360</th></tr>
<tr><td>2GN□SA, 3GN□SA, 4GN□SA
5GN□SA, 5GC□KA</td><td colspan="9">81%</td><td colspan="3">73%</td><td colspan="8">66%</td><td colspan="3"></td></tr>
<tr><td>0GN□KA,5GE□SA, 5GU□KA, 5GCH□KA</td><td colspan="6">81%</td><td colspan="3">73%</td><td colspan="5">66%</td><td colspan="6">59%</td><td colspan="3"></td></tr>
<tr><td>BH6G2-□</td><td colspan="6">90%</td><td colspan="6">86%</td><td colspan="8">81%</td><td colspan="3"></td></tr>
<tr><td>GV2G□, GV3G□, GV4G□</td><td colspan="2"></td><td colspan="8">90%</td><td colspan="8">86%</td><td colspan="5">81%</td></tr>
<tr><td>GVH5G□</td><td colspan="2"></td><td colspan="7">90%</td><td colspan="8">86%</td><td colspan="5">81%</td><td></td></tr>
<tr><td>GVR5G□</td><td colspan="2"></td><td colspan="6">90%</td><td colspan="6">86%</td><td colspan="6">81%</td><td colspan="3"></td></tr>
</table>

● 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%.
● For the efficiency of right-angle gearheads, refer to the page for right-angle gearheads. The gearhead efficiency of right-angle gearheads ➜ Page C-230

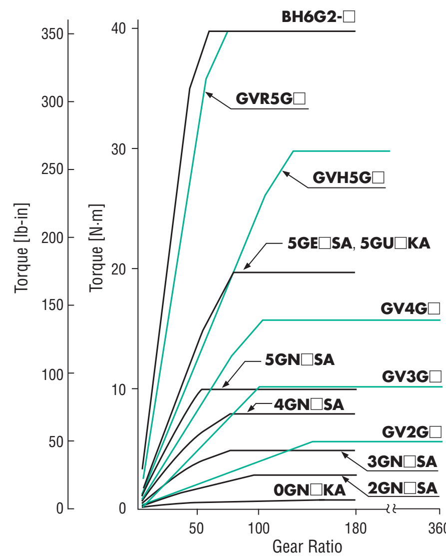
<table>
<tr><th>Model \ Gear Ratio</th><th>5</th><th>10</th><th>15</th><th>20</th><th>30</th><th>50</th><th>100</th><th>200</th></tr>
<tr><td>GFS2G□</td><td colspan="4">90%</td><td colspan="3">86%</td><td>81%</td></tr>
<tr><td>GFS4G□</td><td colspan="4">90%</td><td colspan="3">86%</td><td>81%</td></tr>
<tr><td>GFS5G□</td><td colspan="4">90%</td><td colspan="3">86%</td><td>81%</td></tr>
<tr><td>GFS6G□</td><td colspan="4">90%</td><td colspan="2">86%</td><td colspan="2">81%</td></tr>
</table>

<table>
<tr><th>Model \ Gear Ratio</th><th>5</th><th>10</th><th>15</th><th>20</th><th>30</th><th>50</th><th>100</th><th>200</th></tr>
<tr><td>GFS2G□FR</td><td>80%</td><td colspan="7">85%</td></tr>
<tr><td>GFS4G□FR</td><td colspan="8">85%</td></tr>
<tr><td>GFS5G□FR</td><td colspan="8">85%</td></tr>
<tr><td>GFS6G□FR</td><td colspan="8">85%</td></tr>
</table>

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

Model	Speed r/min ①	600	500	360	300	240	200	144	120	100	72	60	50	36	30	24	20	18	15	12	10
Motor/ Gearhead	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**
4IK25GN-AW2□U **4IK25GN-CW2□E**	**4GN□SA**	0.41 3.6	0.50 4.4	0.69 6.1	0.83 7.3	1.0 8.8	1.2 10.6	1.7 15.0	2.1 18.5	2.5 22	3.1 27	3.7 32	4.5 39	5.6 49	6.7 59	8 70	8 70	8 70	8 70	8 70	8 70

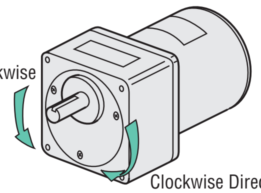
①Speed: This refers to the speed at the gearhead output shaft. The speeds, depending on gear ratio, are shown in the "Gearmotor – Torque Table." The speed is calculated by dividing the motor's synchronous speed by the gear ratio. The actual speed is 2~20% less than the displayed value depending on the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

Model \ 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
2GN□SA, **3GN□SA**, **4GN□SA**, **5GN□SA**, **5GC□KA**																							
0GN□KA, **5GE□SA**, **5GU□KA**, **5GCH□KA**																							
BH6G2-□																							
GV2G□, **GV3G□**, **GV4G□**																							
GVH5G□																							
GVR5G□																							

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

Model \ Gear Ratio	5	10	15	20	30	50	100	200
GFS2G□								
GFS4G□								
GFS5G□								
GFS6G□								

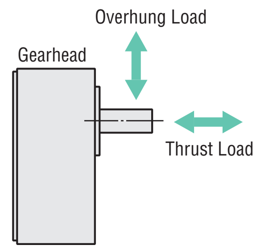
●Permissible Overhung Load and Permissible Thrust Load of Gearheads

Specifications Table for Permissible Overhung Load and Permissible Thrust Load (Example)

Model	Gear Ratio	Max. Permissible Torque		Permissible Overhung Load ①				Permissible Thrust Load ②	
				10 mm (0.39 in.) from shaft end		20 mm (0.79 in.) from 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 Overhung Load: The value ① shown in the table above is the one for the permissible overhung 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 Thrust Load: The value ② shown in the table above is the one for permissible thrust 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 overhung load is always applied on the gearhead output shaft. The overhung load is calculated with the following formula.

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

W : Overhung 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 Load Inertia J of Gearhead

This refers to the permissible value for load 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 load inertia at the gearhead output shaft J ($\times 10^{-4}$ kg·m^2)
J_M : Permissible load inertia at the motor shaft J ($\times 10^{-4}$ kg·m^2)
i : Gear ratio (Example: $i = 3$ means the gear ratio of 3:1)

●Permissible Load Inertia at the Motor Shaft (Example)

Number of Phase	Frame Size	Output Power	Permissible Load 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 load 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 Overhung Load and Permissible Thrust Load of Motors

● Permissible Overhung Load

Motor			Permissible Overhung Load			
Frame Size □ mm (in.)	Output Shaft Diameter ϕ mm (in.)	Series	10 mm (0.39 in.) from shaft end		20 mm (0.79 in.) from shaft end	
			N	lb.	N	lb.
42 (1.65)	5 (0.1969)	World **K**	40	9.0	–	–
60 (2.36)	6 (0.2362)	World **K**	50	11.2	110	24
70 (2.76)	6 (0.2362)	World **K**	40	9.0	60	13.5
80 (3.15)	8 (0.3150)	World **K**	90	20	140	31
	10 (0.3937)	World **K**	110	24	120	27
90 (3.54)	10 (0.3937)	World **K**	140	31	200	45
	12 (0.4724)	World **K**	240	54	270	60
104 (4.09)	14 (0.5512)	**BH**, **BHF**	320	72	350	78

● Permissible Thrust Load

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

Permissible Overhung Load and Permissible Thrust Load of Gearheads

Model	Gear Ratio	Max. Permissible Torque		Permissible Overhung Load				Permissible Thrust Load	
				10 mm (0.39 in.) from shaft end		20 mm (0.79 in.) from shaft end			
		N·m	lb-in	N	lb.	N	lb.	N	lb.
0GN□KA	**3~180**	1.0	8.8	20	4.5	–	–	15	3.3
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 **5GC□KA**	**3~18**	10	88	250	56	350	78	100	22
	25~180			300	67	450	101		
5GE□SA **5GU□KA** **5GCH□KA**	**3~9**	20	177	400	90	500	112	150	33
	12.5~18			450	101	600	135		
	25~180			500	112	700	157		
GV2G□	**5~9**	6.0	53	100	22	150	33	40	9
	12.5~25			150	33	200	45		
	30~360			200	45	300	67		
GV3G□	**5~9**	10	88	150	33	200	45	80	18
	12.5~25			200	45	300	67		
	30~360			300	67	400	90		
GV4G□	**5~9**	16	141	200	45	250	56	100	22
	12.5~25			300	67	350	78		
	30~360			450	101	550	123		
GVH5G□	**5~9**	30	260	400	90	500	112	150	33
	12.5~18			450	101	600	135		
	25~300			500	112	700	157		
GVR5G□	**5~9**	40	350	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		

Model	Gear Ratio	Max. Permissible Torque		Permissible Overhung Load				Permissible Thrust Load	
				10 mm (0.39 in.) from shaft end		20 mm (0.79 in.) from shaft end			
		N·m	lb-in	N	lb.	N	lb.	N	lb.
FPW425□	**3~18**	8.0	70	100	22	150	33	50	11.2
	25~180			200	45	300	67		
FPW540□	**3~18**	10	88	250	56	350	78	100	22
	25~180			300	67	450	101		
FPW560□	**3~9**	15	132	400	90	500	112	150	33
	12.5~18			450	101	600	135		
	25~180			500	112	700	157		
FPW690□	**3~9**	30	260	550	123	800	180	200	45
	12.5~180			650	146	1000	220		

●For permissible overhung load and permissible thrust load of right-angle gearheads, refer to the page where the products are listed. ➜ Page C-229

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

◇Calculating the Permissible Overhung Load for **BH6G2-□RH**

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

● Gear ratio 5:1~36:1

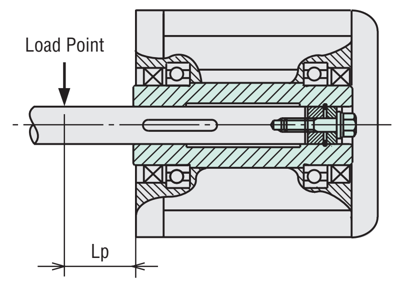
Permissible overhung load $W\,[\mathrm{N\,(lb.)}] = \dfrac{87.5\ \mathrm{mm}\ (3.44\ \mathrm{in.})}{87.5\ \mathrm{mm}\ (3.44\ \mathrm{in.}) + L_P} \times 1350\ \mathrm{N}\ (300\ \mathrm{lb.})$

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

● Gear ratio 50:1~180:1

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

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



■Permissible Load Inertia J of Gearhead

When a high load 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 load inertia at the motor shaft. Use the motor and gearhead within these parameters. The permissible load inertia for three-phase motors is the value when reversing after a stop.
The permissible load inertia (J) at the gearhead output shaft is calculated with the following formula.
The life of the gearhead when operating at the permissible load inertia with instantaneous stop of motors with electromagnetic brakes, brake pack or speed control motors is approximately two million cycles.

●Permissible Load Inertia at the Gearhead Output Shaft

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 load inertia at the gearhead output shaft J [$\times 10^{-4}$ kg·m^2 (oz-in^2)]

J_M : Permissible load 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 Load Inertia at the Motor Shaft

Number of Phase	Frame Size	Output Power	Permissible Load Inertia at the Motor Shaft J [$\times 10^{-4}$ kg·m^2 (oz-in^2)]
Single-Phase	□42 mm (□1.65 in.)	1 W, 3 W (1/750 HP, 1/250 HP)	0.016 (0.088)
	□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)
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)

✻Values in the brackets are for the **V** Series.