

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

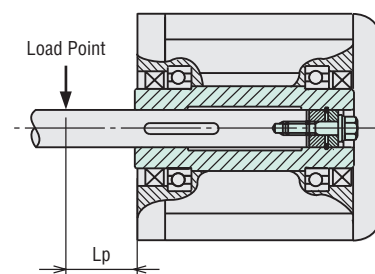
$$\text{Permissible overhung load } W \text{ [N (lb.)]} = \frac{87.5 \text{ mm (3.44 in.)}}{87.5 \text{ mm (3.44 in.)} + L_p} \times 1350 \text{ N (300 lb.)}$$

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

- Gear ratio 50:1~180:1

$$\text{Permissible overhung load } W \text{ [N (lb.)]} = \frac{87.5 \text{ mm (3.44 in.)}}{87.5 \text{ mm (3.44 in.)} + L_p} \times 2450 \text{ N (550 lb.)}$$

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

$$J_G = J_M \times i^2 \quad J_G : \text{Permissible load inertia at the gearhead output shaft } J \text{ [} \times 10^{-4} \text{ kg} \cdot \text{m}^2 \text{ (oz} \cdot \text{in}^2 \text{)]}$$

$$J_G = J_M \times 2500 \quad J_M : \text{Permissible load inertia at the motor shaft } J \text{ [} \times 10^{-4} \text{ kg} \cdot \text{m}^2 \text{ (oz} \cdot \text{in}^2 \text{)]}$$

$$i : \text{Gear ratio (Example: } i = 3 \text{ means the gear ratio of 3:1)}$$

● 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.