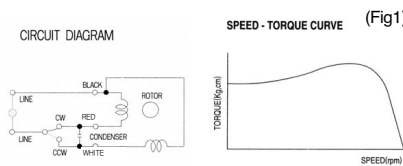




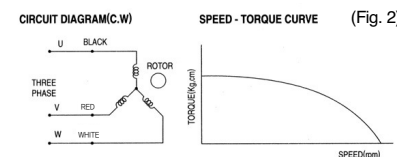
[Characteristic of Induction Motor]

1. Characteristic of Induction Motor

- The induction motor is classified into a single-phase motor and a three-phase motor according to the using power source. This motor always uses both auxiliary winding and condenser not only when starting but also during operation. Generally speaking, its starting torque is not so great, but its structure is simple and reliable. In addition, its connection is simple. It is suitable to use in houses and on factories. For a single-phase induction motor, be sure that the condenser indicated in the name plate should comply with the capacity of the motor.
- For a single-phase induction motor, it is not possible to reverse the direction of rotation within a short time during operation because of the inertia torque exerting adversely against the direction the motor is supposed to change to. Thus, stop the motor first and change the rotational direction next. In case you do not, the motor can be damaged.
- The power source of a single-phase motor includes U (100V 60.60Hz), C (200V 50/60Hz, 220V 50/60Hz, 230V 50Hz). Refer to (Fig. 1).



- The three-phase induction motor has simpler connection, and higher efficiency and reliability than the single-phase motor, because it can be driven by a three-phase power source directly. The three-phase motor is popular as a general-purpose motor. The power source for a three-phase motor includes H (220V 50/60Hz), M (380V 50/60Hz), Z (440V 50/60Hz). Refer to (Fig. 2).



- It is possible to use the motor for continuous rated operation.
- It is designed to be used in a single direction.
- The number of rated revolution of the motor varies depending on the load imposed on it.
- It is suitable for such operation that does not need the speed control.
- Its insulation class is E. Our UL conformance motor is class A.

2. Characteristic of Rotation and Torque

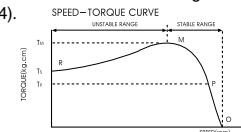
- Under a constant voltage, the relationship between

the number of rotation and the torque is as shown in (Fig. 3). With no-load, the number of rotation roughly approximates the number of synchronous rotation, but as the load increases, the number of rotation decreases and reaches the torque TL. The stable zone is to this point.

- When the load is further increased and over the point TM, that is, the torque of the motor reaches the unstable zone, the motor stops and restriction electricity runs. As a result, the motor generates high heat, and then it can be damaged. Therefore, a safe operation is possible if only the motor is used within the stable zone of the load.

3. Characteristic of Voltage and Condenser

- The characteristic of voltage can be represented by the torque's characteristic about the applied voltage. The torque of induction motor changes in proportion to two times the voltage.
- The characteristic of torque also change according to the capacity of the condenser.
- As the capacity of the condenser boost, the starting torque and stalling torque increase. But if the capacity is increased by 2.5~3.0 folds, the operating torque decreases and the starting torque do not increase.
- As a simple method to increase the torque when the induction motor is short on torque, either the voltage or the condenser capacity can be increased to continue the operation. In this case, the loss input of the motor increases and the temperature rises rapidly.
- However, if the motor must be run with insufficient torque, take measures to let the motor release heat as much as possible and operate the motor while keeping the temperature of the motor's housing below 90°C. Refer to (Fig. 4).



GENERAL SPECIFICATION OF INDUCTION MOTORS

Item	Specification
Insulation Resistance	100MΩ or more when 500V megger is applied between the windings and the housing after rated motor operation under normal ambient temperature and humidity
Dielectric Strength	Sufficient to withstand 1500V at 50/60Hz applied between the windings and the case after rated motor operation under normal ambient temperature and humidity
Temperature Rise	80°C or less increase measured by thermometer after rated operation (less than 45°C for motors with fan)
Insulation Class	Class B (130°C), UL approval motor class A (105°C)
Overheat Protection Device	Built-in thermal protector (automatic return type) Open : 120°C ± 5°C Close 77°C ± 5°C
Ambient Temperature	-10°C ~ +40°C
Ambient Humidity	85% maximum (non condensing)

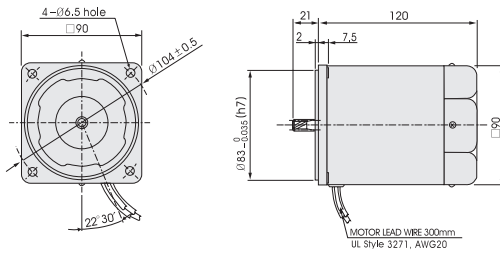
INDUCTION MOTORS

60W □90mm

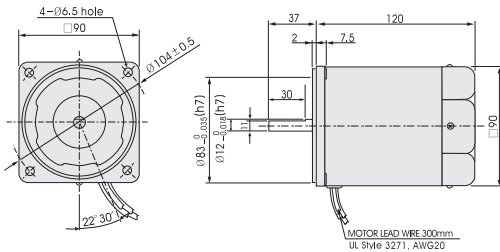
LEAD WIRE TYPE

DIMENSIONS

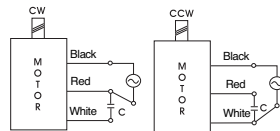
K9IP60FD



K9IS60FD



CONNECTION DIAGRAMS



SPECIFICATIONS

continuous rating, four poles class E or A

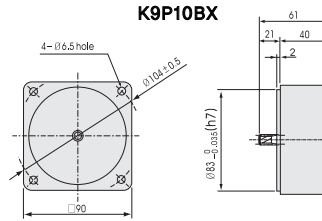
The direction of motor rotation is as viewed from the front shaft end of the motor

Model	Output (W)	Voltage (V)	Frequency (Hz)	Current (A)	Starting Torque (mN·m) (gfcM)	Rated Torque (mN·m) (gfcM)	Speed (rpm)	Condenser (μF)
K9IP60FU K9IS60FU	single-phase	60	110	1.30	350	400	1550	16
			115		350	4000		
K9IP60FC K9IS60FC	single-phase	60	220	0.60	350	400	1550	4
			230		50	390		
				230	60	390	4700	
			60		0.72	350	400	
K9IP60FH K9IS60FH	single-phase	60	220	0.48	1450	370	1600	-
			230		50	1150		
				230	60	1450	370	
			60		0.49	1450	3700	

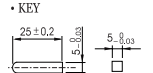
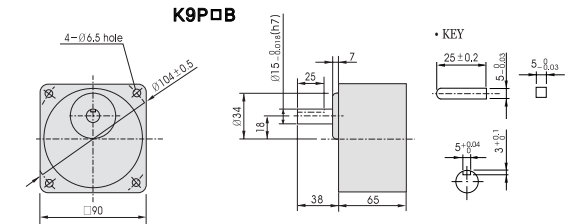
GEARHEADS

DIMENSIONS

DECIMAL GEARHEAD



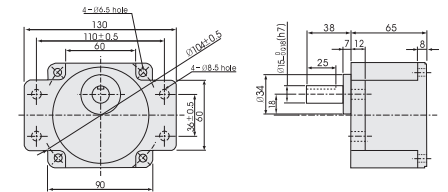
GEARHEAD



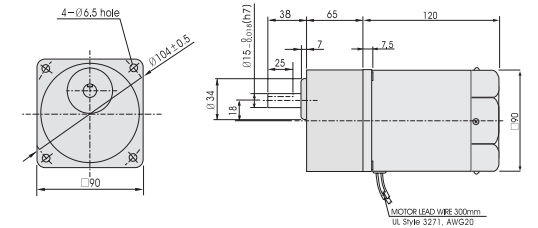
DIMENSION TABLE

PART No.	L	APPLICATION MODEL	MOUNTING BOLT
01	65	K9P3~180B	M6 P1.0×95
02	65	K9P3~180BF	M6 P1.0×25
03	40	K9P10BX	M6 P1.0×140

K9P□BF



K9IP60FD + K9P□B



RATED TORQUE OF GEARHEAD

● 50Hz

Model Motor/ Gearhead	Speed (rpm)		500		300		250		200		166		120		100		83		60		50		41		30		25		20		16		15		12		10		8.3	
	Ratio	3	3.6	5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180	200	250	300	360	500	600	750	900	1000	1200	1500	1800	2000	2500	3000	3600			
K9IP60FD	1.14	1.37	1.90	2.28	2.86	3.43	4.28	5.14	6.17	7.71	9.25	11.10	15.42	18.50	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	
K9P□B, K9P□BF	11.4	13.7	19.0	22.8	28.6	34.3	42.8	51.4	61.7	77.1	92.5	111.0	154.2	185.0	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
K9IP60FH	1.12	1.34	1.86	2.24	2.79	3.35	4.19	5.03	6.04	7.55	9.05	10.87	15.09	18.11	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
K9P□B, K9P□BF	11.2	13.4	18.6	22.4	27.9	33.5	41.9	50.3	60.4	75.5	90.5	108.7	150.9	181.1	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200

● 60Hz

Model Motor/ Gearhead	Speed (rpm)		600		500		360		300		240		200		144		120		100		72		60		50		36		30		24		20		18		15		12		10	
	Ratio	3	3.6	5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180	200	250	300	360	500	600	750	900	1000	1200	1500	1800	2000	2500	3000	3600					
K9IP60FD	0.97	1.17	1.62	1.94	2.43	2.92	3.65	4.37	5.25	6.56	7.87	9.45	13.12	15.75	17.71	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	
K9P□B, K9P□BF	9.7	11.7	16.2	19.4	24.3	29.2	36.5	43.7	52.5	65.6	78.7	94.5	131.2	157.5	177.1	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
K9IP60FH	0.90	1.08	1.50	1.80	2.25	2.70	3.37	4.05	4.86	6.07	7.28	8.74	12.14	14.57	16.39	19.66	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	
K9P□B, K9P□BF	9.0	10.8	15.0	18.0	22.5	27.0	33.7	40.5	48.6	60.7	72.8	87.4	121.4	145.7	163.9	196.6	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200

* Gearhead and decimal gearhead are sold separately.

* The code in □ of gearhead model is for gear ratio.

* color indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. Others indicate rotation in the opposite direction.

* If you are to have less ratio than the ratio in the table, you can install the decimal gearhead, which has one tenth of the ratio, between the gearhead and the motor. In this case, the permissible torque is 20N·m/200kgfcm.