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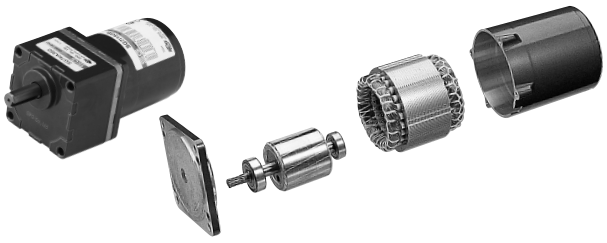
INDUCTION MOTOR

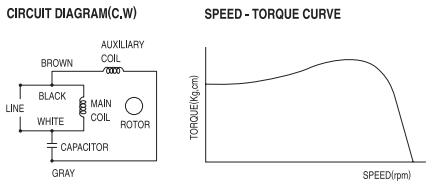
INDEX

Characteristics of INDUCTION MOTOR

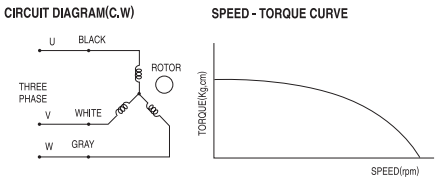


1. Characteristics of INDUCTION MOTOR

- A small induction motor usually means the condenser – run induction motor. This motor always uses both auxiliary winding and condenser not only when starting but also during operation. Generally, its starting torque isn't great, but its structure is simple reliable and efficient. Refer to 〈Fig. 1〉.
- The motor can be used in continuous rated operations.
- The number of rated rotation of the motor varies depending on the load imposed on it.
- It is suitable for operations that do not require the speed control.
- Its insulation class is E. SPG's UL conformance motor is class A.
- There are two types. One is a condenser-run single-phase induction motor and the other is a three-phase induction motor.
- Since the single-phase motor is a condenser-run induction motor, it provides high efficiency and low noise.
- There are A(100V type), B(200V type) of the power of Single-phase MOTOR.
- For a single-phase induction motor, make sure that the condenser complies with the capacity of the motor.
- For a single-phase induction motor, reversing the direction of the rotation within a short time during operation is not possible due to adverse exerting of the inertia torque against reversing. Thus, stop the motor first and change the rotational direction next.
- As an induction motor is driven by a three-phase power source, the three-phase motor provides high efficiency, relatively great starting torque, and high reliability. The three-phase motor is popular as a general-purpose motor.
- There areT(200V type), S(400V type)Power of three-phase MOTOR. (Refer to 〈Image2〉)



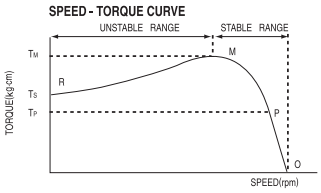
〈Fig. 1〉



〈Fig. 2〉

2. Characteristics of Rotation and TORQUE

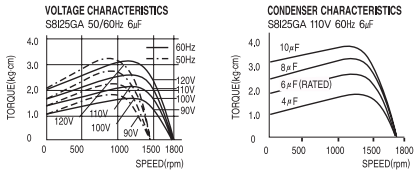
- Under a constant voltage, the relationship between the number of rotation and the torque is as shown in 〈Fig. 3〉. With no-load, the number of rotation roughly approximates the number of synchronous rotation, but as the load increases, the number of rotation decreases and approaches to the speed(rpm) indicated by the point P where the torque Tp horizontally meets the load curve.
- When the load is further increased and reaches the point M, the motor stops at the point R because the motor no longer generates further torque. Therefore, the leg R-M is referred to as an unstable zone and the leg M-O is a stable zone for operation.



〈Fig. 3〉

3. Characteristics of Voltage and CONDENSOR

- The Characteristics of voltage can be represented by the torque's Characteristics about the applied voltage. The torque of induction motor changes proportionate to twice the voltage.
- The characteristics of torque also change according the capacity of the condenser.
- As the capacity of the condenser boost, the starting torque and stalling torque increase. But if the capacity increases 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℃. Refer to (Fig. 4).



〈Fig. 4〉

GENERAL SPECIFICATION OF INDUCTION MOTORS

ITEM	SPECIFICATION
Insulation Resistance	100㏁ 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 1.5kVat 50/60Hz applied between the windings and the case after rated motor operation under normal ambient temperature and humidity.
Temperature Rise	80℃ or less increase measured by thermometer after rated operation.
Insulation Class	Class B(130℃)
Overheat Protection Device	Built-in THERMAL PROTECTOR (automatic return type) : Open 120℃±5℃ Close 76℃±15℃
Ambient Temperature	-10℃ ~ 40℃
Ambient Humidity	85% maximum(non condensing)

6W INDUCTION MOTOR

□60㎜ LEAD WIRE TYPE

■ MOTOR

Model	Poles	Voltage		Freq.	Duty	Rated Load				Starting Torque		Capacitor	Degree of Protection	Insulation Classification	Protected Type
						Current	Speed	Torque							
		Phase	(V)	(Hz)		(A)	(r/min)	(kgf · cm)	(mN · m)	(kgf · cm)	(mN · m)	(μF)			
SG6I06GA SG6I06DA SG6I06SA	4	1	100	50	Cont. S1	0.22	1300	0.44	44	0.58	58	3.5 (250V)	IP23	B(130)	Z.P.
				60		0.20	1600	0.36	36	0.58	58				
		1	110	60		0.19	1600	0.36	36	0.50	50	2.5 (250V)			
		1	115	60		0.19	1600	0.36	36	0.50	50				
SG6I06GB SG6I06DB SG6I06SB	4	1	200	50	Cont. S1	0.10	1250	0.46	46	0.52	52	0.8 (450V)	IP23	B(130)	Z.P.
				60		0.10	1550	0.37	37	0.52	52				
		1	220	50		0.12	1250	0.46	46	0.45	45	0.6 (450V)			
				60		0.09	1550	0.37	37	0.45	45				
		1	230	50		0.12	1250	0.46	46	0.52	52				
				60		0.09	1600	0.36	36	0.52	52				

❖ All the model of SG series received UL, TÜV, CCC certificate.
❖ output 6W product is Impedance Protected, 15~90W product is Thermally Protected type.
❖ Depend on the voltage, the capacitors are divided into two model. Please inquire separately when operational voltage is AC 100V or 200V.

■ GEARED MOTOR – 50Hz

Model	Ratio	5	6	7.5	9	10	12.5	15	18	20	25	30	36	40	50	60	75	90	100	120	150	180	200	250	300	360
	r/min	300	250	200	167	150	120	100	83.3	75.0	60.0	50.0	41.6	37.5	30.0	25.0	20.0	16.6	15.0	12.5	10.0	8.3	7.5	6.0	5.0	4.1
SG6KA□ SG6DA□ SG6SA□	kgf·cm	2.10	2.50	3.11	3.73	4.14	5.20	6.21	7.50	8.30	10.4	11.9	14.2	15.8	19.8	23.7	29.7	35.6	39.6	47.5	55.9	60.0	60.0	60.0	60.0	60.0
	N·m	0.21	0.25	0.31	0.37	0.41	0.52	0.62	0.75	0.83	1.04	1.19	1.42	1.58	1.98	2.37	2.97	3.56	3.96	4.75	5.59	6.00	6.00	6.00	6.00	6.00

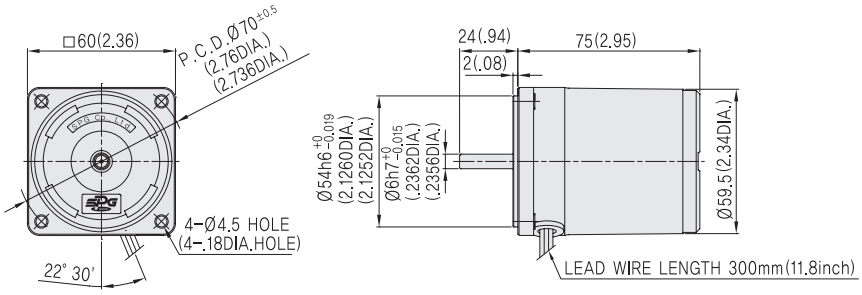
■ GEARED MOTOR – 60Hz

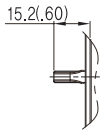
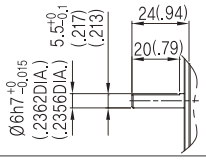
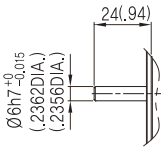
Model	Ratio	5	6	7.5	9	10	12.5	15	18	20	25	30	36	40	50	60	75	90	100	120	150	180	200	250	300	360
	r/min	360	300	240	200	180	144	120	100	90.0	72.0	60.0	50.0	45.0	36.0	30.0	24.0	20.0	18.0	15.0	12.0	10.0	9.0	7.2	6.0	5.0
SG6KA□ SG6DA□ SG6SA□	kgf·cm	1.71	2.10	2.60	3.10	3.42	4.30	5.13	6.20	6.84	8.60	9.80	11.8	13.1	16.3	19.6	24.5	29.4	32.7	39.2	46.2	55.4	60.0	60.0	60.0	60.0
	N·m	0.17	0.21	0.26	0.31	0.34	0.43	0.51	0.62	0.68	0.86	0.98	1.18	1.31	1.63	1.96	2.45	2.94	3.27	3.92	4.62	5.54	6.00	6.00	6.00	6.00

❖ Among GEAR HEAD model names, □is reduction gear ratio.
❖ Value of the chart is allowable torque of reduction gear of GEARED MOTOR.
❖ Regarding direction of rotation, in case of ■, its reduction gear ratio has same direction with MOTOR's and in case of □, its reduction gear ratio has the opposite direction of MOTOR's.
❖ rotation speed is calculated with synchronous rotation number of MOTOR(50Hz : 1500 r/min, 60Hz : 1800 r/min). Actual rotation speed can be less than (2~20%) depend on the size of the load 2~20%.

MOTOR

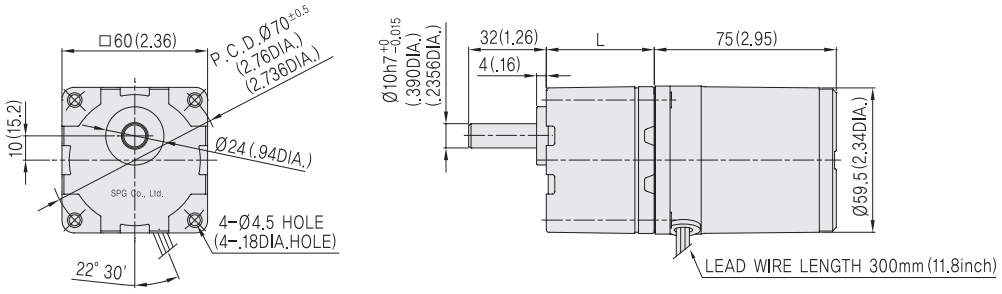
Unit : mm(inch)

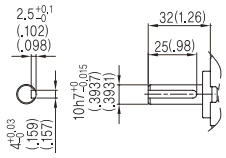
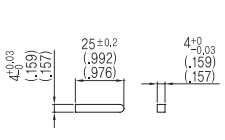
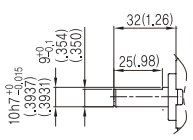
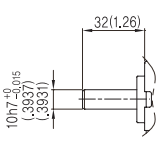


	GEAR TYPE	D-CUT TYPE	STRAIGHT TYPE
	SG6I06G□	SG6I06D□	SG6I06S□
MOTOR OUTPUT SHAFT			

GEARED MOTOR

Unit : mm(inch)



	KEY TYPE		D-CUT TYPE	STRAIGHT TYPE
	SG6KA□		SG6DA□	SG6SA□
GEAR HEAD OUTPUT SHAFT				

MODEL		GEAR RATIO	L	WEIGHT(kg)
GEAR HEAD	SG6□A□	5~25	34	0.28
		30~120	38	0.33
		150~360	43	0.37
MOTOR	SG6I06□□			0.7

15W INDUCTION MOTOR

□70㎜ LEAD WIRE TYPE

■ MOTOR

Model	Poles	Voltage		Freq.	Duty	Rated Load				Starting Torque		Capacitor	Degree of Protection	Insulation Classification	Protected Type
						Current	Speed	Torque							
		Phase	(V)	(Hz)		(A)	(r/min)	(kgf · cm)	(mN · m)	(kgf · cm)	(mN · m)	(μF)			
SG7I15GA SG7I15DA SG7I15SA	4	1	100	50	Cont. S1	0.37	1250	1.10	110	0.80	80	5.5 (250V)	IP23	B(130)	T.P.
				60		0.32	1550	0.90	90	0.80	80				
		1	110	60		0.32	1600	0.90	90	0.70	70	4.5 (250V)			
		1	115	60		0.32	1600	0.90	90	0.80	80				
SG7I15GB SG7I15DB SG7I15SB	4	1	200	50	Cont. S1	0.18	1200	1.20	120	1.00	100	1.5 (450V)	IP23	B(130)	T.P.
				60		0.19	1550	0.90	90	1.00	100				
		1	220	50		0.18	1250	1.10	110	0.70	70	1.0 (450V)			
				60		0.15	1550	0.90	90	0.70	70				
		1	230	50		0.18	1250	1.10	110	0.80	80				
				60		0.15	1550	0.90	90	0.80	80				

❖ All the model of SG series received UL, TÜV, CCC certificate.
❖ output 6W product is Impedance Protected, 15~90W product is Thermally Protected type.
❖ Depend on the voltage, the capacitors are divided into two model. Please inquire separately when operational voltage is AC 100V or 200V.

■ GEARED MOTOR – 50Hz

Model	Ratio	5	6	7.5	9	10	12.5	15	18	20	25	30	36	40	50	60	75	90	100	120	150	180	200	250	300	360
	r/min	300	250	200	167	150	120	100	83.3	75.0	60.0	50.0	41.6	37.5	30.0	25.0	20.0	16.6	15.0	12.5	10.0	8.3	7.5	6.0	5.0	4.1
SG7KA□ SG7DA□ SG7SA□	kgf·cm	5.20	6.21	7.80	9.32	10.4	12.9	15.5	18.6	20.7	25.9	29.7	35.6	39.6	49.5	59.3	74.2	89.0	98.9	100	100	100	100	100	100	100
	N·m	0.52	0.62	0.78	0.93	1.04	1.29	1.55	1.86	2.07	2.59	2.97	3.56	3.96	4.95	5.93	7.42	8.90	9.89	10.0	10.0	10.0	10.0	10.0	10.0	10.0

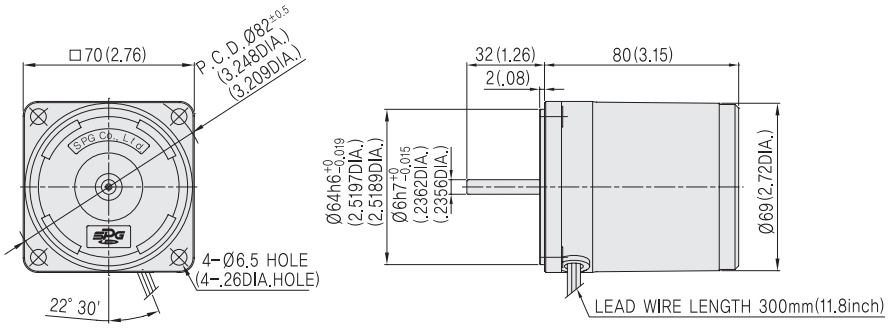
■ GEARED MOTOR – 60Hz

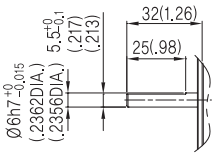
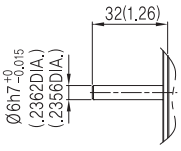
Model	Ratio	5	6	7.5	9	10	12.5	15	18	20	25	30	36	40	50	60	75	90	100	120	150	180	200	250	300	360
	r/min	360	300	240	200	180	144	120	100	90.0	72.0	60.0	50.0	45.0	36.0	30.0	24.0	20.0	18.0	15.0	12.0	10.0	9.0	7.2	6.0	5.0
SG7KA□ SG7DA□ SG7SA□	kgf·cm	4.20	5.02	6.30	7.53	8.40	10.5	12.6	15.1	16.7	20.9	24.0	28.8	32.0	40.0	48.0	60.0	72.0	80.0	96.0	100	100	100	100	100	100
	N·m	0.42	0.50	0.63	0.75	0.84	1.05	1.26	1.51	1.67	2.09	2.40	2.88	3.20	4.00	4.80	6.00	7.20	8.00	9.60	10.0	10.0	10.0	10.0	10.0	10.0

❖ Among GEAR HEAD model names, □is reduction gear ratio.
❖ Value of the chart is allowable torque of reduction gear of GEARED MOTOR.
❖ Regarding direction of rotation, in case of ■, its reduction gear ratio has same direction with MOTOR's and in case of □, its reduction gear ratio has the opposite direction of MOTOR's.
❖ rotation speed is calculated with synchronous rotation number of MOTOR(50Hz : 1500 r/min, 60Hz : 1800 r/min). Actual rotation speed can be less than (2~20%) depend on the size of the load 2~20%.

MOTOR

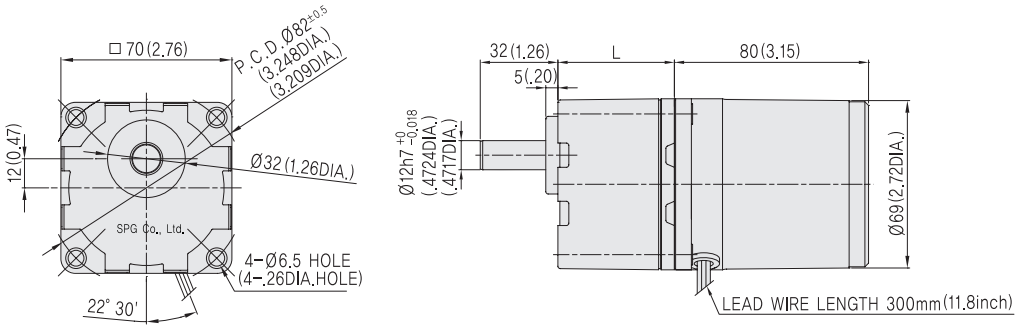
Unit : mm(inch)

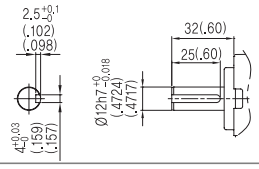
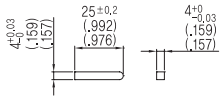
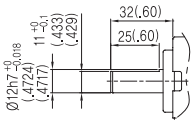
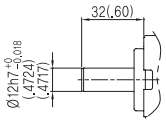


MOTOR OUTPUT SHAFT	GEAR TYPE	D-CUT TYPE	STRAIGHT TYPE
	SG7I15G□	SG7I15D□	SG7I15S□
			

GEARED MOTOR

Unit : mm(inch)



GEAR HEAD OUTPUT SHAFT	KEY TYPE		D-CUT TYPE	STRAIGHT TYPE
	SG7KA□		SG7DA□	SG7SA□
				

MODEL		GEAR RATIO	L	WEIGHT(kg)
GEAR HEAD	SG7□A□	5~120	43	0.42
		150~360	48	0.52
MOTOR	SG7I15□□			1.04

25W INDUCTION MOTOR

□80㎜ LEAD WIRE TYPE

■ MOTOR

Model	Poles	Voltage		Freq.	Duty	Rated Load				Starting Torque		Capacitor	Degree of Protection	Insulation Classification	Protected Type
						Current	Speed	Torque							
		Phase	(V)	(Hz)		(A)	(r/min)	(kgf · cm)	(mN · m)	(kgf · cm)	(mN · m)	(μF)			
SG8I25GA SG8I25KA SG8I25DA SG8I25SA	4	1	100	50	Cont. S1	0.49	1250	1.90	0.19	1.80	0.18	8.0 (250V)	IP23	B(130)	T.P.
				60		0.47	1550	1.50	0.15	1.70	0.17				
		1	110	60		0.45	1600	1.50	0.15	1.60	0.16	6.5 (250V)			
		1	115	60		0.45	1600	1.50	0.15	2.00	0.20				
SG8I25GB SG8I25KB SG8I25DB SG8I25SB	4	1	200	50	Cont. S1	0.24	1200	2.00	0.20	1.40	0.14	1.8 (450V)	IP23	B(130)	T.P.
				60		0.24	1500	1.60	0.16	1.40	0.14				
		1	220	50		0.23	1250	1.90	0.19	1.60	0.16	1.5 (450V)			
				60		0.21	1550	1.50	0.15	1.60	0.16				
		1	230	50		0.23	1300	1.90	0.19	1.70	0.17				
				60		0.21	1600	1.50	0.15	1.80	0.18				
SG8I25GT SG8I25KT SG8I25DT SG8I25ST	4	3	200	50	Cont. S1	0.23	1300	1.80	0.18	6.90	0.69	–	IP23	B(130)	T.P.
				60		0.20	1600	1.50	0.15	5.60	0.56				
		3	220	50		0.26	1350	1.80	0.18	8.50	0.85				
				60		0.21	1600	1.50	0.15	6.70	0.67				
		3	230	50		0.27	1350	1.80	0.18	9.20	0.92				
				60		0.22	1600	1.50	0.15	7.30	0.73				
SG8I25GS SG8I25KS SG8I25DS SG8I25SS	4	3	380	50	Cont. S1	0.12	1300	1.80	0.18	6.50	0.65	–	IP23	B(130)	T.P.
				60		0.11	1550	1.50	0.15	5.20	0.52				
		3	400	50		0.13	1300	1.80	0.18	7.20	0.72				
				60		0.11	1600	1.50	0.15	5.70	0.57				
		3	415	70		0.13	1350	1.80	0.18	7.70	0.77				
				80		0.11	1600	1.50	0.15	6.10	0.61				
		3	440	50		0.15	1350	1.80	0.18	8.60	0.86				
				60		0.12	1600	1.50	0.15	6.80	0.68				

❖ All the model of SG series received UL, TÜV, CCC certificate.
❖ output 6W product is Impedance Protected, 15~90W product is Thermally Protected type.
❖ Depend on the voltage, the capacitors are divided into two model. Please inquire separately when operational voltage is AC 100V or 200V.

■ GEARED MOTOR – 50Hz

Model	Ratio	5	6	7.5	9	10	12.5	15	18	20	25	30	36	40	50	60	75	90	100	120	150	180	200	250	300	360
	r/min	300	250	200	167	150	120	100	83.3	75.0	60.0	50.0	41.6	37.5	30.0	25.0	20.0	16.6	15.0	12.5	10.0	8.3	7.5	6.0	5.0	4.1
SG8KA□ SG8DA□ SG8SA□	kgf·cm	8.90	10.7	13.4	16.0	17.8	22.3	26.7	32.1	35.6	44.6	51.1	61.3	68.1	85.1	102	128	153	160	160	160	160	160	160	160	160
	N·m	0.89	1.07	1.34	1.60	1.78	2.23	2.67	3.21	3.56	4.46	5.11	6.13	6.81	8.51	10.2	12.8	15.3	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0

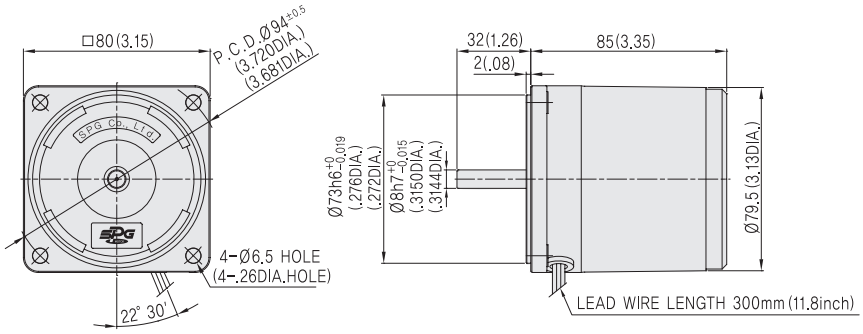
■ GEARED MOTOR – 60Hz

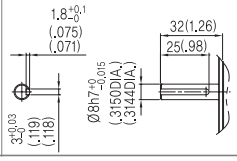
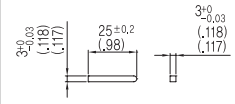
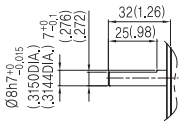
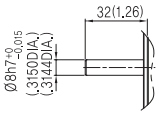
Model	Ratio	5	6	7.5	9	10	12.5	15	18	20	25	30	36	40	50	60	75	90	100	120	150	180	200	250	300	360
	r/min	360	300	240	200	180	144	120	100	90.0	72.0	60.0	50.0	45.0	36.0	30.0	24.0	20.0	18.0	15.0	12.0	10.0	9.0	7.2	6.0	5.0
SG8KA□ SG8DA□ SG8SA□	kgf·cm	7.30	8.80	10.9	13.1	14.6	18.2	21.9	26.2	29.2	36.5	41.8	50.2	55.7	69.7	83.6	105	125	139	160	160	160	160	160	160	160
	N·m	0.73	0.88	1.09	1.31	1.46	1.82	2.19	2.62	2.92	3.65	4.18	5.02	5.57	6.97	8.36	10.5	12.5	13.9	16.0	16.0	16.0	16.0	16.0	16.0	16.0

❖ Among GEAR HEAD model names, □is reduction gear ratio.
❖ Value of the chart is allowable torque of reduction gear of GEARED MOTOR.
❖ Regarding direction of rotation, in case of ■, its reduction gear ratio has same direction with MOTOR's and in case of □, its reduction gear ratio has the opposite direction of MOTOR's.
❖ rotation speed is calculated with synchronous rotation number of MOTOR(50Hz : 1500 r/min, 60Hz : 1800 r/min). Actual rotation speed can be less than (2~20%) depend on the size of the load 2~20%.

MOTOR

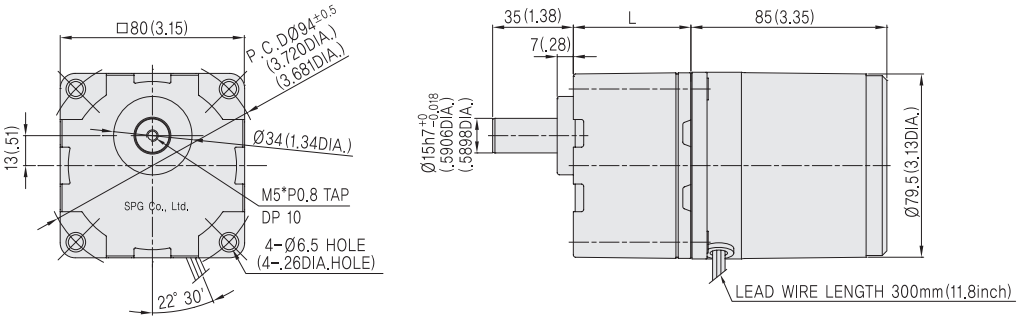
Unit : mm(inch)

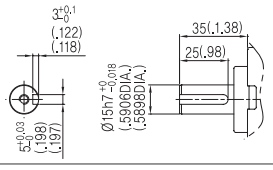
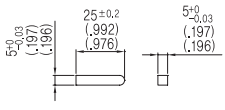
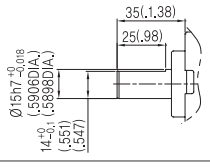
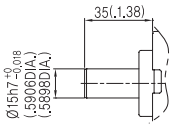


	GEAR TYPE	KEY TYPE		D-CUT TYPE	STRAIGHT TYPE
	SG8I25G□	SG8I25K□		SG8I25D□	SG8I25S□
MOTOR OUTPUT SHAFT					

GEARED MOTOR

Unit : mm(inch)



	KEY TYPE		D-CUT TYPE	STRAIGHT TYPE
	SG8KA□		SG8DA□	SG8SA□
GEAR HEAD OUTPUT SHAFT				

MODEL		GEAR RATIO	L	WEIGHT(kg)
GEAR HEAD	SG8□A□	5~25	41	0.61
		30~120	46	0.72
		150~360	51	0.80
MOTOR	SG8I25□□			1.46

40W INDUCTION MOTOR

□90㎜ LEAD WIRE TYPE

■ MOTOR

Model	Poles	Voltage		Freq.	Duty	Rated Load				Starting Torque		Capacitor	Degree of Protection	Insulation Classification	Protected Type
						Current	Speed	Torque							
		Phase	(V)	(Hz)		(A)	(r/min)	(kgf · cm)	(mN · m)	(kgf · cm)	(mN · m)	(μF)			
SG9I40GA SG9I40KA SG9I40DA SG9I40SA	4	1	100	50	Cont. S1	0.70	1250	3.00	0.30	2.20	0.22	11.0 (250V)	IP23	B(130)	T.P.
				60		0.71	1550	2.40	0.24	2.30	0.23				
		1	110	60		0.63	1600	2.40	0.24	2.10	0.21	9.0 (250V)			
		1	115	60		0.61	1600	2.30	0.23	2.60	0.26				
SG9I40GB SG9I40KB SG9I40DB SG9I40SB	4	1	200	50	Cont. S1	0.34	1300	2.90	0.29	2.70	0.27	3.0 (450V)	IP23	B(130)	T.P.
				60		0.38	1600	2.40	0.24	2.90	0.29				
		1	220	50		0.35	1300	2.90	0.29	2.40	0.24	2.3 (450V)			
				60		0.3	1600	2.40	0.24	2.40	0.24				
		1	230	50		0.35	1300	2.90	0.29	2.40	0.24				
				60		0.3	1600	2.40	0.24	2.80	0.28				
SG9I40GT SG9I40KT SG9I40DT SG9I40ST	4	3	200	50	Cont. S1	0.27	1300	2.90	0.29	10.2	1.02	–	IP23	B(130)	T.P.
				60		0.24	1550	2.40	0.24	7.70	0.77				
		3	220	50		0.27	1350	2.80	0.28	11.9	1.19				
				60		0.24	1600	2.40	0.24	9.40	0.94				
		3	230	50		0.28	1350	2.80	0.28	13.1	1.31				
				60		0.24	1600	2.30	0.23	10.5	1.05				
SG9I40GS SG9I40KS SG9I40DS SG9I40SS	4	3	380	50	Cont. S1	0.17	1350	2.80	0.28	12.3	1.23	–	IP23	B(130)	T.P.
				60		0.15	1600	2.40	0.24	9.30	0.93				
		3	400	50		0.18	1350	2.80	0.28	13.4	1.34				
				60		0.16	1600	2.40	0.24	10.3	1.03				
		3	415	70		0.18	1350	2.80	0.28	14.5	1.45				
				80		0.16	1600	2.30	0.23	11.0	1.10				
		3	440	50		0.2	1350	2.80	0.28	16.2	1.62				
				60		0.16	1650	2.30	0.23	12.3	1.23				

❖ All the model of SG series received UL, TÜV, CCC certificate.
❖ output 6W product is Impedance Protected, 15~90W product is Thermally Protected type.
❖ Depend on the voltage, the capacitors are divided into two model. Please inquire separately when operational voltage is AC 100V or 200V.

■ GEARED MOTOR – 50Hz

Model	Ratio	5	6	7.5	9	10	12.5	15	18	20	25	30	36	40	50	60	75	90	100	120	150	180	200	250	300
	r/min	300	250	200	167	150	120	100	83.3	75.0	60.0	50.0	41.6	37.5	30.0	25.0	20.0	16.6	15.0	12.5	10.0	8.3	7.5	6.0	5.0
SG9KB□ SG9DB□ SG9SB□	kgf·cm	13.4	16.1	20.1	24.1	26.8	33.5	40.2	48.3	51.3	64.1	76.9	92.3	103	128	154	192	231	256	290	300	300	300	300	300
	N·m	1.34	1.61	2.01	2.41	2.68	3.35	4.02	4.83	5.13	6.41	7.69	9.23	10.3	12.8	15.4	19.2	23.1	25.6	29.0	30.0	30.0	30.0	30.0	30.0

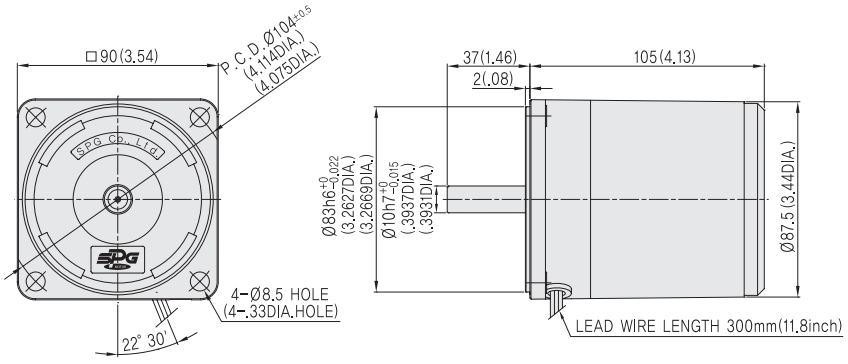
■ GEARED MOTOR – 60Hz

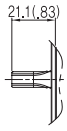
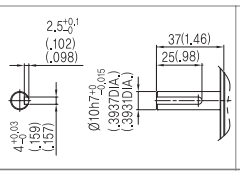
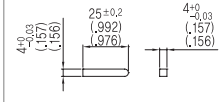
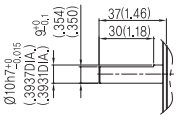
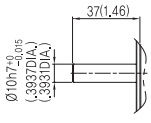
Model	Ratio	5	6	7.5	9	10	12.5	15	18	20	25	30	36	40	50	60	75	90	100	120	150	180	200	250	300
	r/min	360	300	240	200	180	144	120	100	90.0	72.0	60.0	50.0	45.0	36.0	30.0	24.0	20.0	18.0	15.0	12.0	10.0	9.0	7.2	6.0
SG9KB□ SG9DB□ SG9SB□	kgf·cm	10.9	13.1	16.3	19.6	21.8	27.2	32.7	39.2	41.6	52.0	62.4	74.9	83.2	104	125	156	187	208	235	294	300	300	300	300
	N·m	1.09	1.31	1.63	1.96	2.18	2.72	3.27	3.92	4.16	5.20	6.24	7.49	8.32	10.4	12.5	15.6	18.7	20.8	23.5	29.4	30.0	30.0	30.0	30.0

❖ Among GEAR HEAD model names, □is reduction gear ratio.
❖ Value of the chart is allowable torque of reduction gear of GEARED MOTOR.
❖ Regarding direction of rotation, in case of ■, its reduction gear ratio has same direction with MOTOR's and in case of □, its reduction gear ratio has the opposite direction of MOTOR's.
❖ rotation speed is calculated with synchronous rotation number of MOTOR(50Hz : 1500 r/min, 60Hz : 1800 r/min). Actual rotation speed can be less than (2~20%) depend on the size of the load 2~20%.

MOTOR

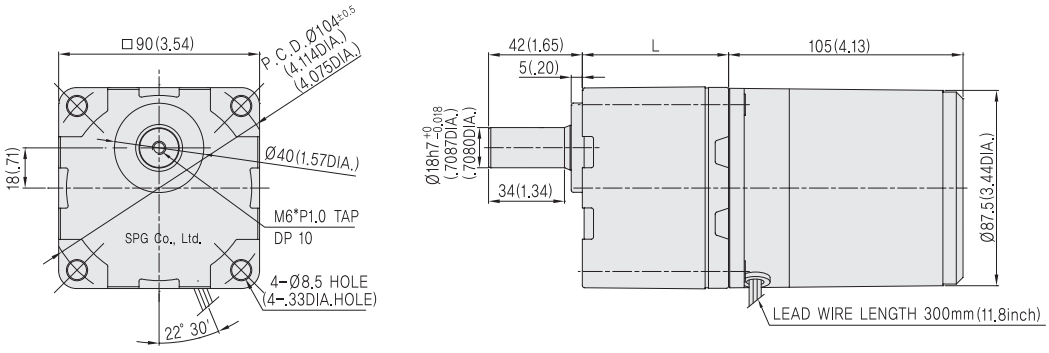
Unit : mm(inch)

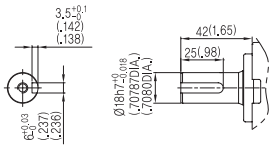
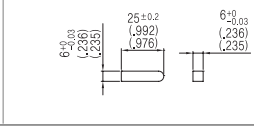
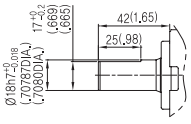
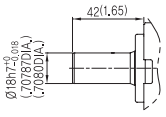


	GEAR TYPE	KEY TYPE		D-CUT TYPE	STRAIGHT TYPE
	SG9I40G□	SG9I40K□		SG9I40D□	SG9I40S□
MOTOR OUTPUT SHAFT					

GEARED MOTOR

Unit : mm(inch)



	KEY TYPE		D-CUT TYPE	STRAIGHT TYPE
	SG9KB□		SG9DB□	SG9SB□
GEAR HEAD OUTPUT SHAFT				

MODEL		GEAR RATIO	L	WEIGHT(kg)
GEAR HEAD	SG9□B□	5~20	45	0.85
		25~100	58	1.15
		120~300	64	1.30
MOTOR	SG9I40□□			2.30

60W INDUCTION MOTOR

□90㎜ LEAD WIRE TYPE

■ MOTOR

Model	Poles	Voltage		Freq.	Duty	Rated Load				Starting Torque		Capacitor	Degree of Protection	Insulation Classification	Protected Type
						Current	Speed	Torque							
		Phase	(V)	(Hz)		(A)	(r/min)	(kgf · cm)	(mN · m)	(kgf · cm)	(mN · m)	(μF)			
SG9I60GA SG9I60KA SG9I60DA SG9I60SA	4	1	100	50	Cont. S1	1.03	1300	4.40	0.44	4.10	0.41	20.0 (250V)	IP23	B(130)	T.P.
				60		1.17	1600	3.60	0.36	4.30	0.43				
		1	110	60		1.08	1600	3.50	0.35	4.60	0.46	18.0 (250V)			
		1	115	60		1.08	1650	3.50	0.35	5.30	0.53				
SG9I60GB SG9I60KB SG9I60DB SG9I60SB	4	1	200	50	Cont. S1	0.52	1300	4.30	0.43	4.50	0.45	5.0 (450V)	IP23	B(130)	T.P.
				60		0.6	1600	3.60	0.36	4.80	0.48				
		1	220	50		0.54	1300	4.30	0.43	4.50	0.45	4.0 (450V)			
				60		0.48	1600	3.50	0.35	4.50	0.45				
		1	230	50		0.58	1350	4.30	0.43	4.90	0.49				
				60		0.48	1650	3.50	0.35	4.80	0.48				
SG9I60GT SG9I60KT SG9I60DT SG9I60ST	4	3	200	50	Cont. S1	0.42	1300	4.40	0.44	14.8	1.48	–	IP23	B(130)	T.P.
				60		0.37	1550	3.70	0.37	11.5	1.15				
		3	220	50		0.45	1350	4.30	0.43	18.1	1.81				
				60		0.38	1600	3.60	0.36	13.9	1.39				
		3	230	50		0.48	1350	4.20	0.42	19.6	1.96				
				60		0.38	1600	3.50	0.35	15.1	1.51				
SG9I60GS SG9I60KS SG9I60DS SG9I60SS	4	3	380	50	Cont. S1	0.25	1300	4.30	0.43	16.1	1.61	–	IP23	B(130)	T.P.
				60		0.21	1600	3.60	0.36	12.8	1.28				
		3	400	50		0.26	1350	4.20	0.42	18.5	1.85				
				60		0.21	1600	3.60	0.36	14.2	1.42				
		3	415	70		0.28	1350	4.20	0.42	19.7	1.97				
				80		0.22	1600	3.50	0.35	15.3	1.53				
		3	440	50		0.32	1350	4.20	0.42	22.1	2.21				
				60		0.23	1650	3.50	0.35	17.0	1.70				

❖ All the model of SG series received UL, TÜV, CCC certificate.
❖ output 6W product is Impedance Protected, 15~90W product is Thermally Protected type.
❖ Depend on the voltage, the capacitors are divided into two model. Please inquire separately when operational voltage is AC 100V or 200V.

■ GEARED MOTOR – 50Hz

Model	Ratio	5	6	7.5	9	10	12.5	15	18	20	25	30	36	40	50	60	75	90	100	120	150	180	200	250	300
	r/min	300	250	200	167	150	120	100	83.3	75.0	60.0	50.0	41.6	37.5	30.0	25.0	20.0	16.6	15.0	12.5	10.0	8.3	7.5	6.0	5.0
SG9KB□ SG9DB□ SG9SB□	kgf·cm	19.7	23.7	29.6	35.5	39.4	49.3	59.1	71.0	75.3	94.2	113	136	151	188	226	283	300	300	300	300	300	300	300	300
	N·m	1.97	2.37	2.96	3.55	3.94	4.93	5.91	7.10	7.53	9.42	11.3	13.6	15.1	18.8	22.6	28.3	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0

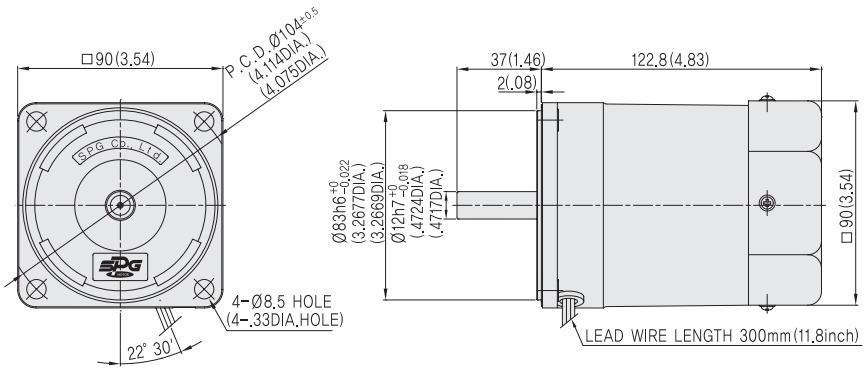
■ GEARED MOTOR – 60Hz

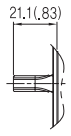
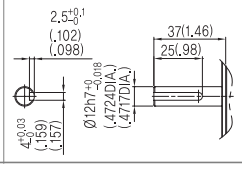
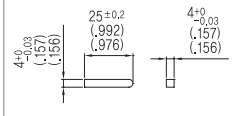
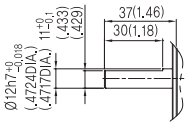
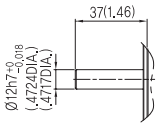
Model	Ratio	5	6	7.5	9	10	12.5	15	18	20	25	30	36	40	50	60	75	90	100	120	150	180	200	250	300
	r/min	360	300	240	200	180	144	120	100	90.0	72.0	60.0	50.0	45.0	36.0	30.0	24.0	20.0	18.0	15.0	12.0	10.0	9.0	7.2	6.0
SG9KB□ SG9DB□ SG9SB□	kgf·cm	16.5	19.8	24.8	29.7	33.0	41.3	49.6	59.5	63.1	78.9	94.7	114	126	158	189	237	284	300	300	300	300	300	300	300
	N·m	1.65	1.98	2.48	2.97	3.30	4.13	4.96	5.95	6.31	7.89	9.47	11.4	12.6	15.8	18.9	23.7	28.4	30.0	30.0	30.0	30.0	30.0	30.0	30.0

❖ Among GEAR HEAD model names, □is reduction gear ratio.
❖ Value of the chart is allowable torque of reduction gear of GEARED MOTOR.
❖ Regarding direction of rotation, in case of ■, its reduction gear ratio has same direction with MOTOR's and in case of □, its reduction gear ratio has the opposite direction of MOTOR's.
❖ rotation speed is calculated with synchronous rotation number of MOTOR(50Hz : 1500 r/min, 60Hz : 1800 r/min). Actual rotation speed can be less than (2~20%) depend on the size of the load 2~20%.

MOTOR

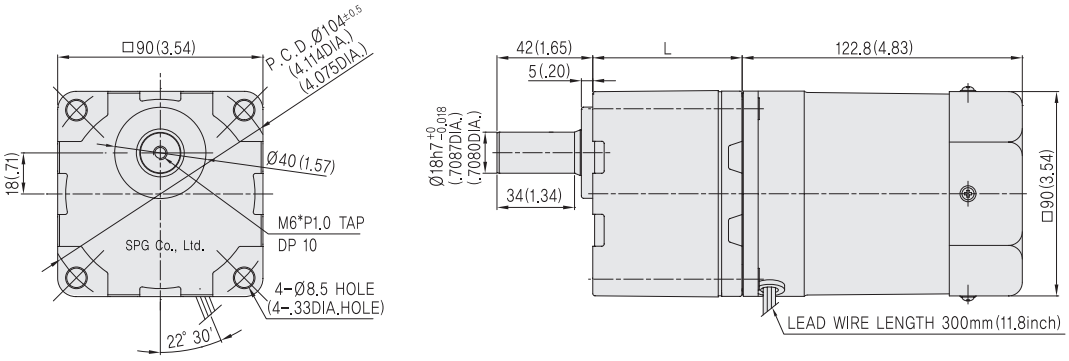
Unit : mm(inch)

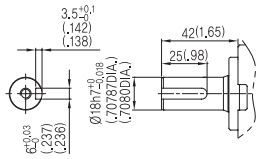
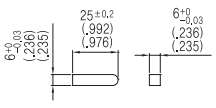
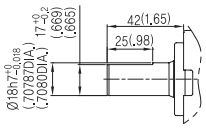
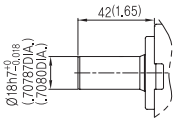


	GEAR TYPE	KEY TYPE		D-CUT TYPE	STRAIGHT TYPE
	SG9I60G□	SG9I60K□		SG9I60D□	SG9I60S□
MOTOR OUTPUT SHAFT					

GEARED MOTOR

Unit : mm(inch)



	KEY TYPE		D-CUT TYPE	STRAIGHT TYPE
	SG9KB□		SG9DB□	SG9SB□
GEAR HEAD OUTPUT SHAFT				

MODEL		GEAR RATIO	L	WEIGHT(kg)
GEAR HEAD	SG9□B□	5~20	45	0.85
		25~100	58	1.15
		120~300	64	1.30
MOTOR	SG9I60□□			2.44

90W INDUCTION MOTOR

□90㎜ LEAD WIRE TYPE

■ MOTOR

Model	Poles	Voltage		Freq.	Duty	Rated Load				Starting Torque		Capacitor	Degree of Protection	Insulation Classification	Protected Type
						Current	Speed	Torque							
		Phase	(V)	(Hz)		(A)	(r/min)	(kgf · cm)	(mN · m)	(kgf · cm)	(mN · m)	(㎌)			
SG9I90GA SG9I90KA SG9I90DA SG9I90SA	4	1	100	50	Cont. S1	1.46	1300	6.50	0.65	4.70	0.47	28.0 (250V)	IP23	B(130)	T.P.
				60		1.78	1600	5.30	0.53	5.10	0.51				
		1	110	60		1.29	1600	5.30	0.53	4.60	0.46	20.0 (250V)			
		1	115	60		1.26	1650	5.20	0.52	5.20	0.52				
SG9I90GB SG9I90KB SG9I90DB SG9I90SB	4	1	200	50	Cont. S1	0.74	1300	6.50	0.65	5.70	0.57	7.0 (450V)	IP23	B(130)	T.P.
				60		0.92	1600	5.30	0.53	5.90	0.59				
		1	220	50		0.67	1350	6.40	0.64	5.90	0.59	6.0 (450V)			
				60		0.79	1650	5.20	0.52	6.10	0.61				
		1	230	50		0.68	1350	6.30	0.63	7.00	0.7				
				60		0.78	1650	5.20	0.52	6.40	0.64				
SG9I90GT SG9I90KT SG9I90DT SG9I90ST	4	3	200	50	Cont. S1	0.59	1300	6.50	0.65	22.1	2.21	–	IP23	B(130)	T.P.
				60		0.53	1550	5.50	0.55	17.7	1.77				
		3	220	50		0.63	1350	6.40	0.64	26.3	2.63				
				60		0.53	1600	5.30	0.53	21.6	2.16				
		3	230	50		0.67	1350	6.30	0.63	29.0	2.9				
				60		0.54	1600	5.30	0.53	23.3	2.33				
SG9I90GS SG9I90KS SG9I90DS SG9I90SS	4	3	380	50	Cont. S1	0.3	1300	6.60	0.66	20.6	2.06	–	IP23	B(130)	T.P.
				60		0.27	1550	5.50	0.55	15.6	1.56				
		3	400	50		0.3	1300	6.50	0.65	22.5	2.25				
				60		0.36	1600	5.40	0.54	17.3	1.73				
		3	415	70		0.31	1300	6.40	0.64	23.9	2.39				
				80		0.26	1600	5.40	0.54	18.6	1.86				
		3	440	50		0.33	1350	6.30	0.63	26.6	2.66				
				60		0.27	1600	5.30	0.53	20.6	2.06				

❖ All the model of SG series received UL, TÜV, CCC certificate.
❖ output 6W product is Impedance Protected, 15~90W product is Thermally Protected type.
❖ Depend on the voltage, the capacitors are divided into two model. Please inquire separately when operational voltage is AC 100V or 200V.

■ GEARED MOTOR – 50Hz

Model	Ratio	5	6	7.5	9	10	12.5	15	18	20	25	30	36	40	50	60	75	90	100	120	150	180	200
	r/min	300	250	200	167	150	120	100	83.3	75.0	60.0	50.0	41.6	37.5	30.0	25.0	20.0	16.6	15.0	12.5	10.0	8.3	7.5
SG9KC□ SG9DC□ SG9SC□	kgf·cm	31.1	37.3	46.6	56.0	62.2	77.7	93.3	107	119	149	178	214	238	297	357	400	400	400	400	400	400	400
	N·m	3.11	3.73	4.66	5.60	6.22	7.77	9.33	10.7	11.9	14.9	17.8	21.4	23.8	29.7	35.7	40.0	40.0	40.0	40.0	40.0	40.0	40.0

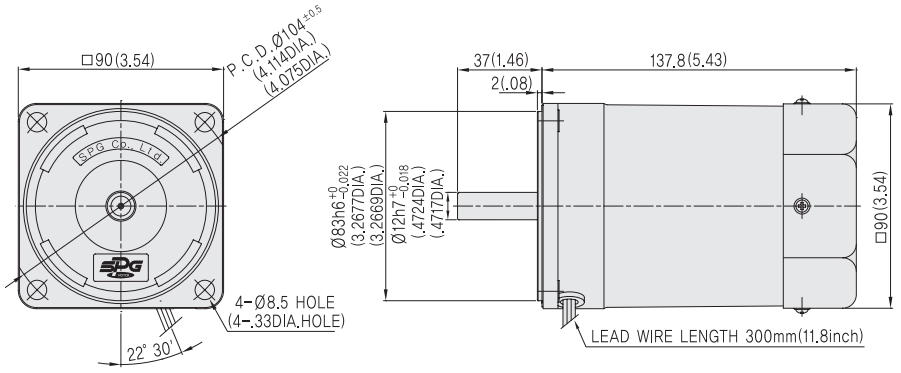
■ GEARED MOTOR – 60Hz

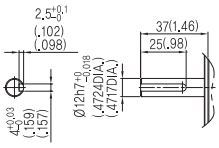
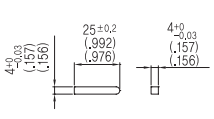
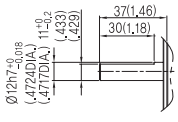
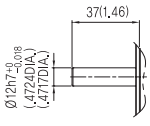
Model	Ratio	5	6	7.5	9	10	12.5	15	18	20	25	30	36	40	50	60	75	90	100	120	150	180	200
	r/min	360	300	240	200	180	144	120	100	90.0	72.0	60.0	50.0	45.0	36.0	30.0	24.0	20.0	18.0	15.0	12.0	10.0	9.0
SG9KC□ SG9DC□ SG9SC□	kgf·cm	25.7	30.8	38.5	46.2	51.3	64.1	77.0	88.2	98.0	123	147	177	196	245	294	346	400	400	400	400	400	400
	N·m	2.57	3.08	3.85	4.62	5.13	6.41	7.70	8.82	9.80	12.3	14.7	17.7	19.6	24.5	29.4	34.6	40.0	40.0	40.0	40.0	40.0	40.0

❖ Among GEAR HEAD model names, □is reduction gear ratio.
❖ Value of the chart is allowable torque of reduction gear of GEARED MOTOR.
❖ Regarding direction of rotation, in case of ■, its reduction gear ratio has same direction with MOTOR's and in case of □, its reduction gear ratio has the opposite direction of MOTOR's.
❖ rotation speed is calculated with synchronous rotation number of MOTOR(50Hz : 1500 r/min, 60Hz : 1800 r/min). Actual rotation speed can be less than (2~20%) depend on the size of the load 2~20%.

MOTOR

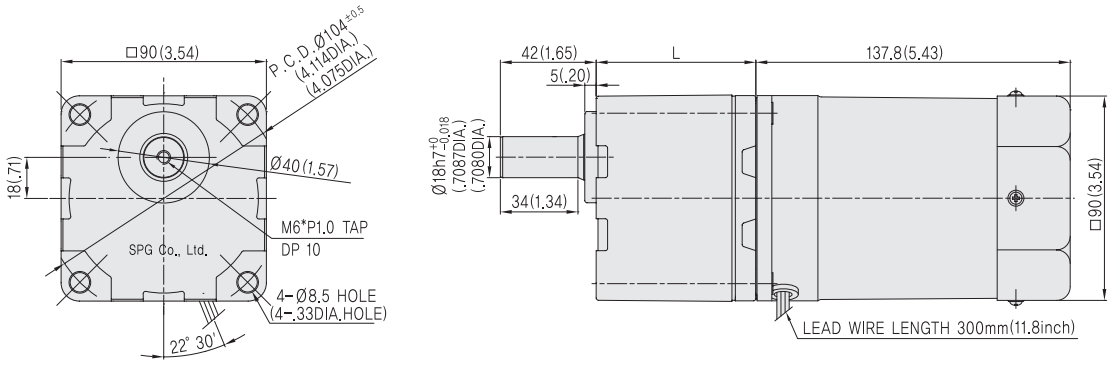
Unit : mm(inch)

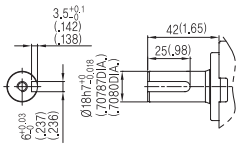
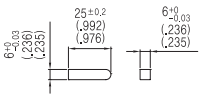
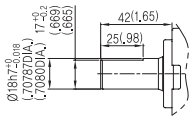
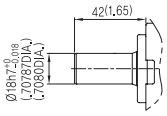


	GEAR TYPE	KEY TYPE		D-CUT TYPE	STRAIGHT TYPE
	SG9I90G□	SG9I90K□		SG9I90D□	SG9I90S□
MOTOR OUTPUT SHAFT					

GEARED MOTOR

Unit : mm(inch)



	KEY TYPE		D-CUT TYPE	STRAIGHT TYPE
	SG9KC□		SG9DC□	SG9SC□
GEAR HEAD OUTPUT SHAFT				

MODEL		GEAR RATIO	L	WEIGHT(kg)
GEAR HEAD	SG9□C□	5~15	45	0.85
		18~40	58	1.15
		50~200	70	1.42
MOTOR	SG9I90□□			2.93