



Induction Motor



Induction Motor

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DKM AC/DC Geared Motor and Gearbox **B-06**

Änderungen und Irrtümer auch technischer Art vorbehalten!

B AC Motors

Outline of Induction Motor

☐ Suitable for Unidirectional Continuous Operation

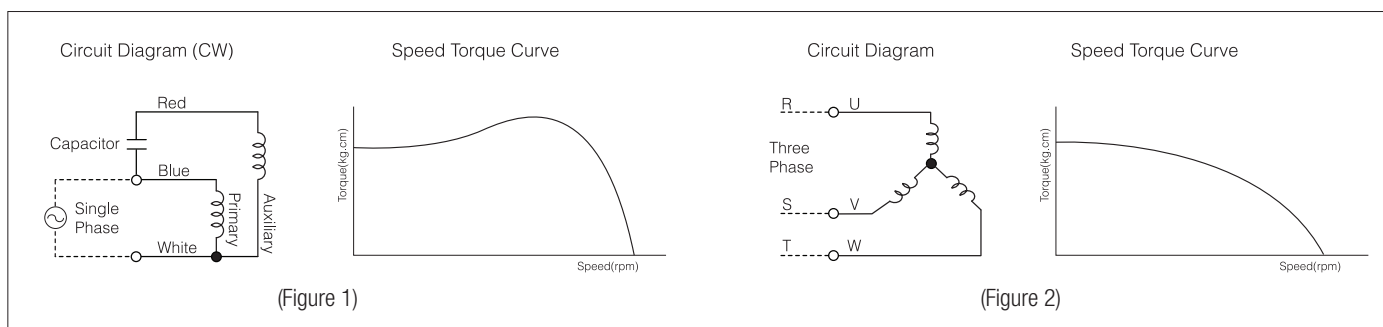
- Induction motors are suitable for unidirectional continuous operation such as conveyor belt system.

☐ Single Phase Run

- For the running of a single phase motor, please use the capacitor complying with the capacity of the motor. For a single phase induction motor, it is not possible to reverse the direction within a short time during operation. So stop the motor first and change the direction next. (Figure 1)

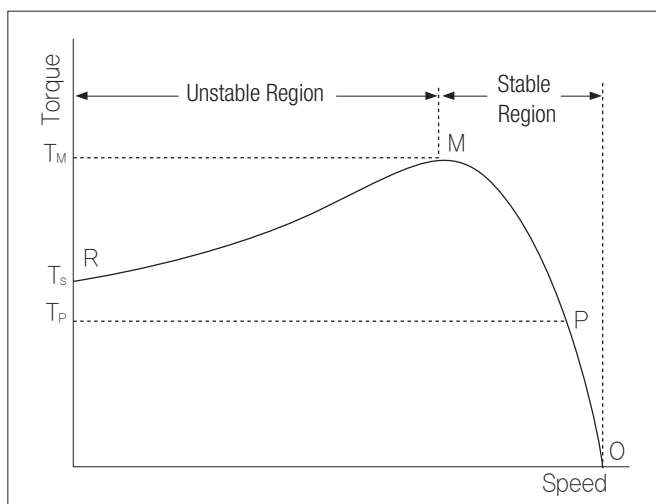
☐ Three Phase Run

- Three phase induction motor has relatively high starting torque comparing single phase motor and has high reliability because it can be directly operated by a three phase power source. (Figure 2)



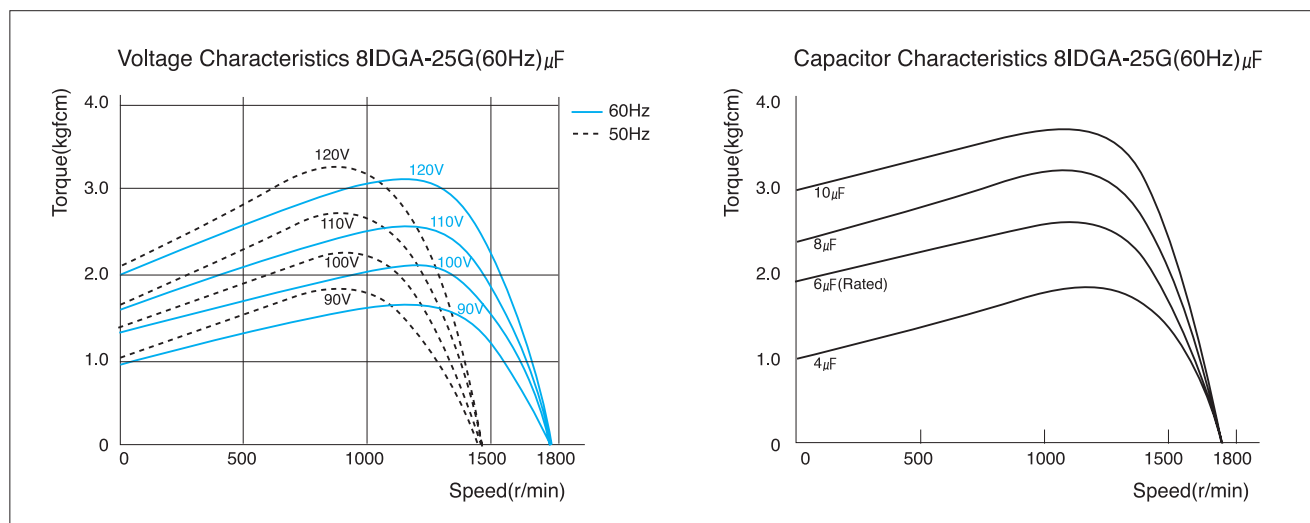
☐ The Relation between Speed and Torque

- In a condition of constant power voltage, the relation between speed and torque is like next figure.
Under the condition of no-load, the number of rotation is roughly same as the number of synchronous rotation.
But if the load increases, the number of rotation decreases and approaches to the speed (r/min) indicated by the point P where the torque T_p horizontally meets the load curve.
When the load further increases 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 O-M is a stable zone for operation.



☐ Features of Voltage and Capacitor

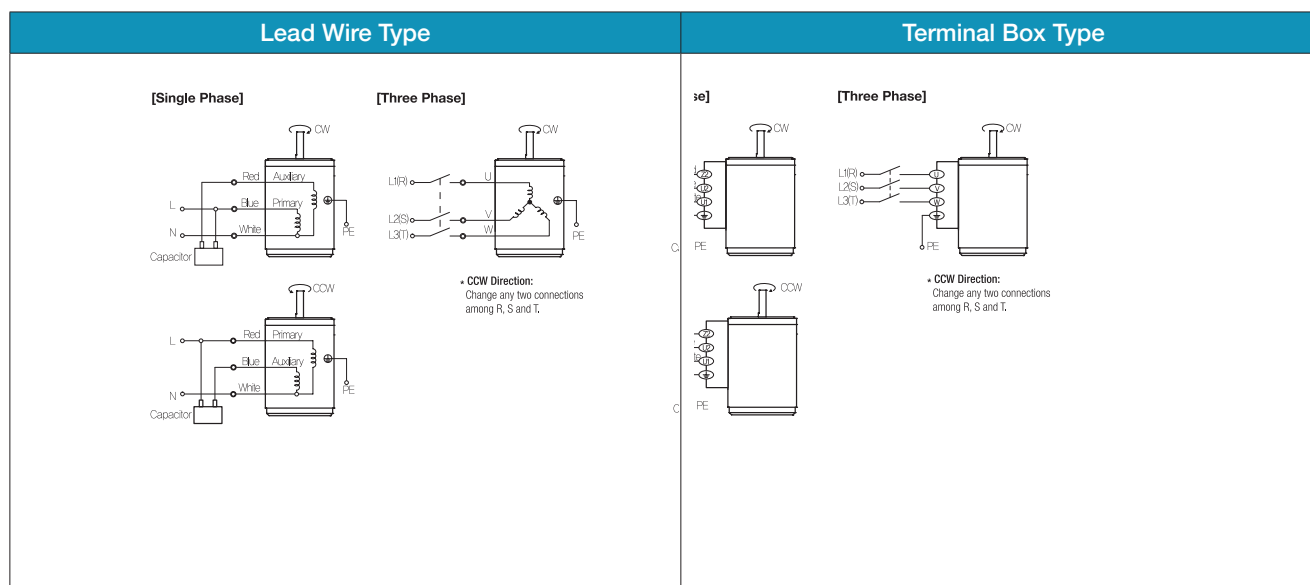
- Generally the torque of induction motor changes proportionate to twice the voltage and it also changes according the capacity of the capacitor.
If the capacity of the capacitor increases, the starting torque and rated torque will increase. But if the capacity increases by over 2 times, the rated torque decreases and starting torque do not increase.
When the induction motor is short on torque, it is possible to increase the torque by increasing the voltage or the capacity of the capacitor to continue the operation. But please be informed that 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 by installing separate fan as an example and operate the motor while keeping the temperature of the motor's housing below 90°C.



General Specifications

Item	Specification
Insulation Resistance	100M Ω or more when DC500V MEGA is applied between the windings and the frame after rated motor operation under normal ambient temperature and humidity.
Dielectric Strength	Sufficient to withstand 1.5KV at 50Hz and 60Hz applied between the windings and the frame for 1 minute after rated motor operation under normal ambient temperature and humidity.
Temperature Rise	Temperature rise of windings are 80°C or less measured by the resistance change method after rated motor operation with connecting a Gearbox or equivalent heat radiation plate.
Insulation Class	Class B [130°C]
Overheat Protection	Operating temperature (Built-in thermal protector type motor): Open 120°C $\pm$ 5°C, Close 90°C $\pm$ 5°C
Ambient Temperature	-10°C $\sim$ +40°C (Three phase 220VAC: -10°C $\sim$ +50°C)
Ambient Humidity	85% maximum

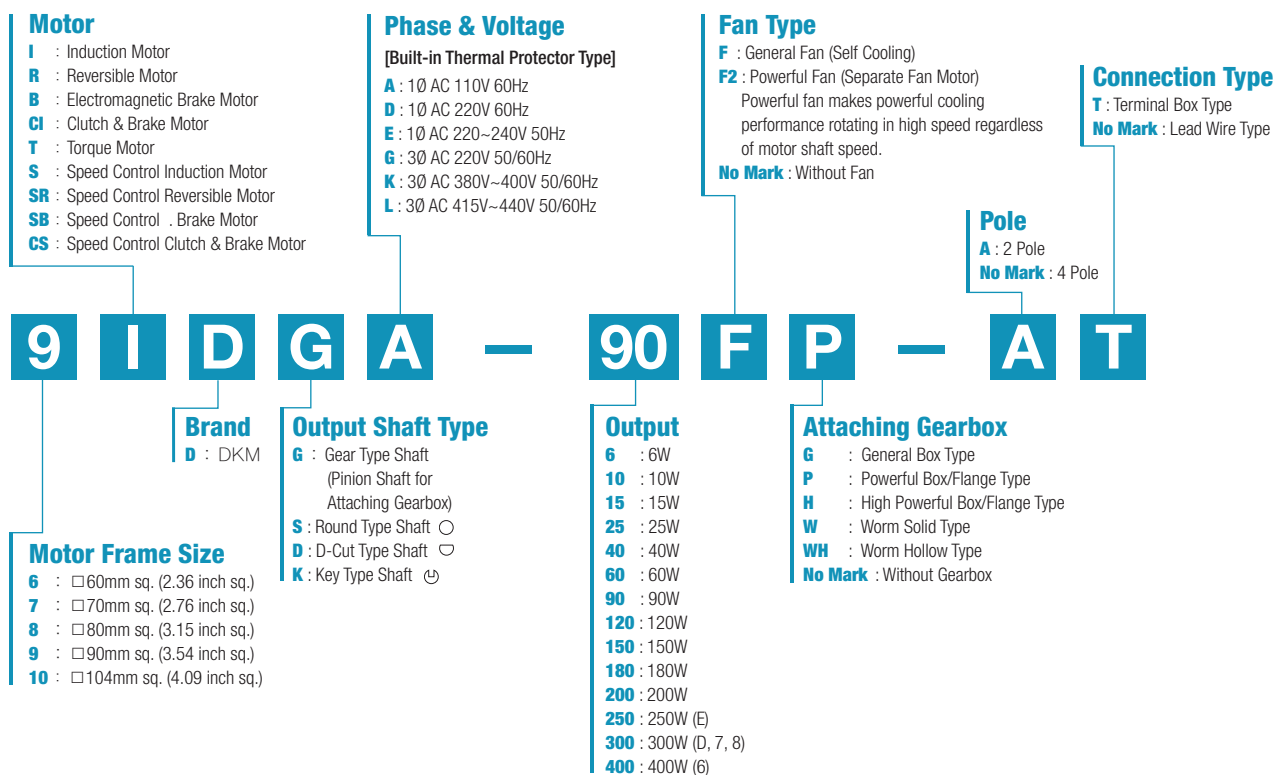
Connection Diagrams



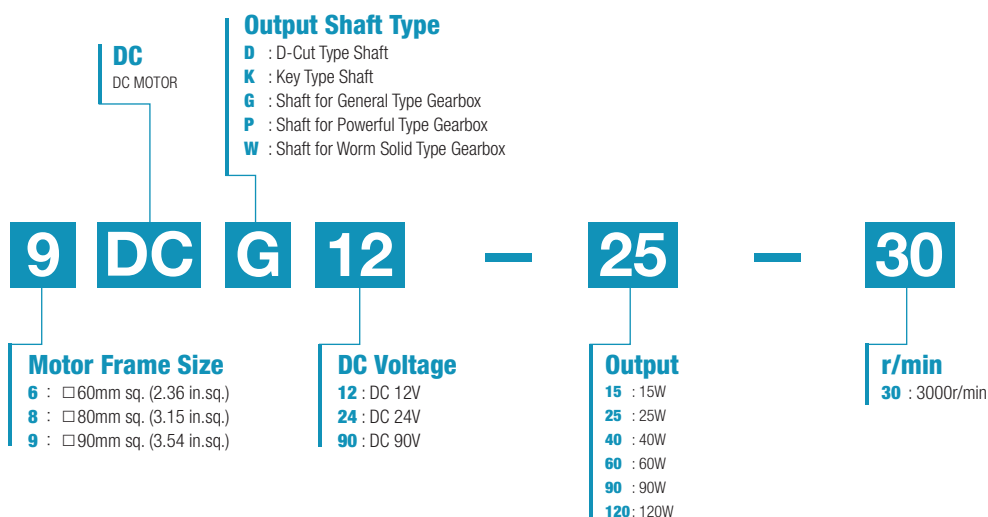
A Information

Product Coding System

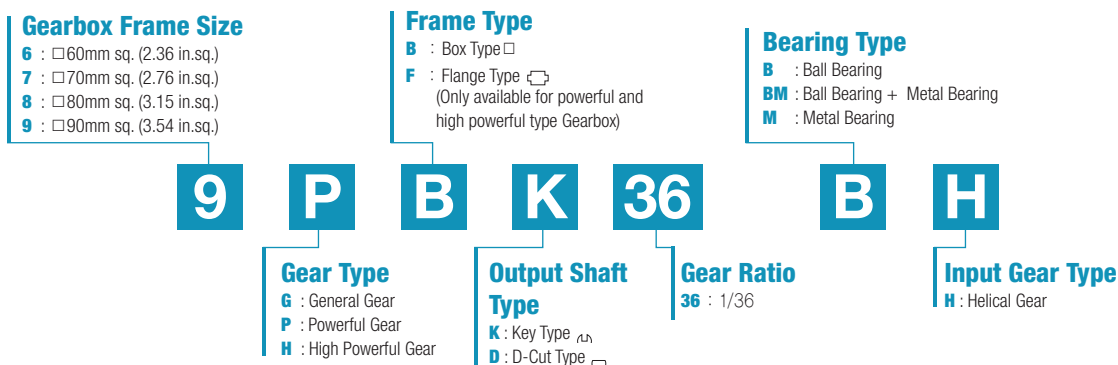
AC Motors



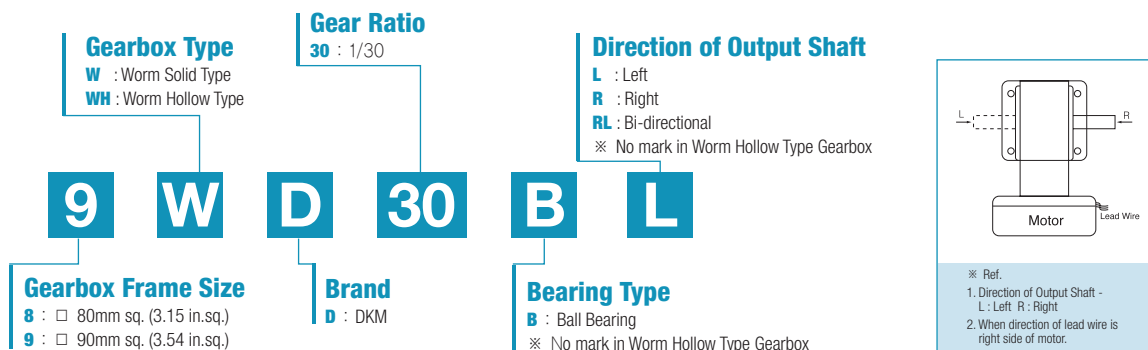
DC Motors



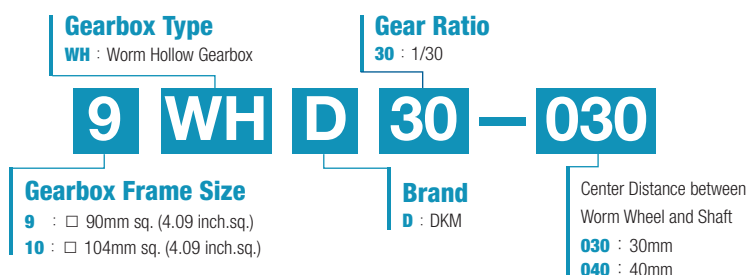
Parallel Gearbox



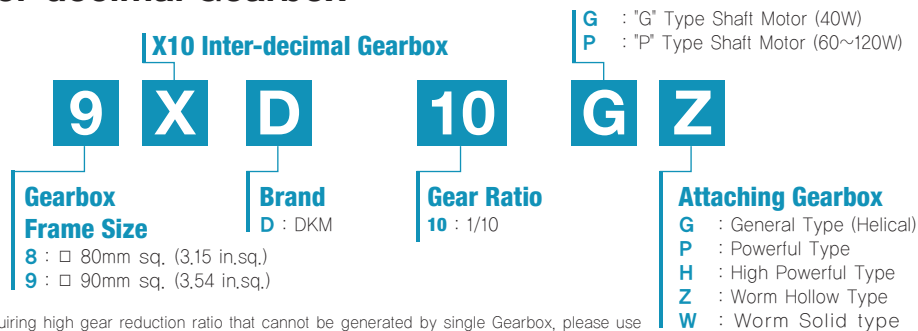
Worm Solid Gearbox



Worm Hollow Gearbox



Inter-decimal Gearbox



In case of requiring high gear reduction ratio that cannot be generated by single Gearbox, please use Inter-decimal Gearbox with general Gearbox. And please be advised that in this case only revolution speed of output shaft will reduce by 10:1 without increasing of maximum permissible torque.

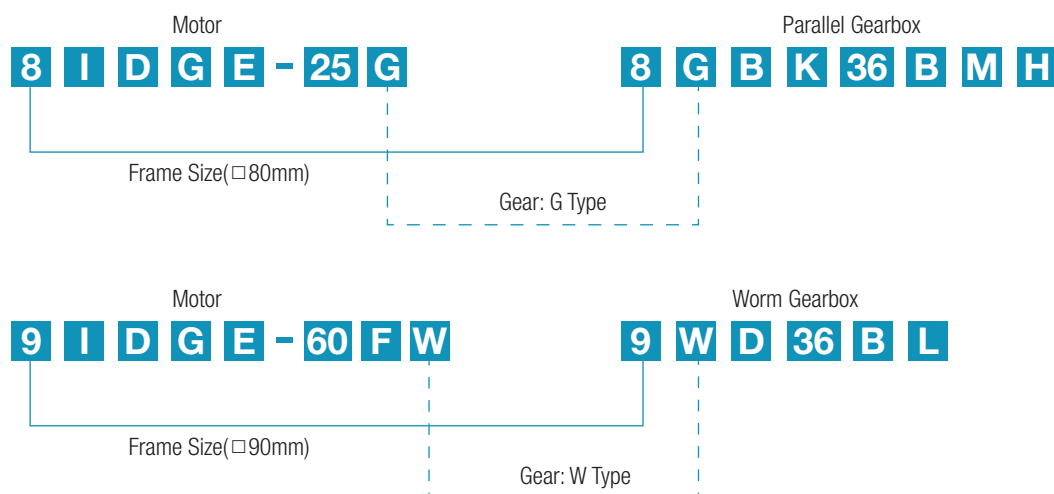
A Information

Product Coding System

Assembly of Motor and Gearbox

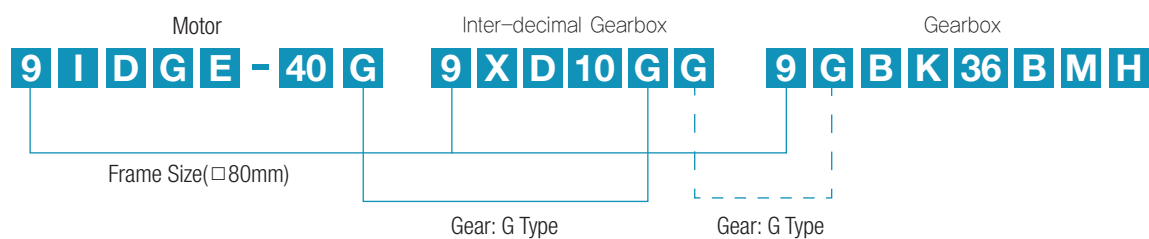
Motor + Gearbox

- As shown in the following scheme, motor and Gearbox which have same frame size and gear type could be assembled.



Motor + Inter-decimal Gearbox + Gearbox

- When using an inter-decimal Gearbox together, give attention to the gear types of motor, Gearbox and inter-decimal Gearbox.



- When attaching inter-decimal Gearbox, the output shaft type of the motor is always G Type.
For example, when using P/H/W/WH type Gearbox, only the gear type of inter-decimal Gearbox is identical with attached Gearbox and the output shaft type of the motor is G type. (Refer to the scheme below.)

B AC Motors

Induction Motor 40W(□ 90mm)

40W Induction Motor 40W(□ 90mm)

Motor Specification

Model		Output	Voltage	Frequency	Poles	Duty	Starting Torque		Rated Load				Capacitor	
9IDG*~40□(-T): Gear Type Shaft 9IDD*~40(-T): D-Cut Type Shaft 9IDK*~40(-T): Key Type Shaft							kgfcm	N.m	Speed r/min	Current A	Torque			μF / VAC
Lead Wire Type	Terminal Box Type										kgfcm	N.m		
9IDGA~40□	9IDGA~40□~T	40	1ø110	60	4	Cont.	2.60	0.260	1600	0.80	2.80	0.280	10.0 / 250	
9IDGD~40□	9IDGD~40□~T	40	1ø220	60	4	Cont.	2.60	0.260	1600	0.39	2.80	0.280	2.5 / 450	
9IDGE~40□	9IDGE~40□~T	40	1ø220	50	4	Cont.	1.80	0.180	1300	0.33	3.00	0.300	2.0 / 450	
			1ø240				2.20	0.220		0.36	3.60	0.360		
9IDGG~40□	9IDGG~40□~T	40	3ø220	50	4	Cont.	9.00	0.900	1300	0.31	3.20	0.320	—	
				60			7.40	0.740	1600	0.27	2.45	0.245		
9IDGK~40□	9IDGK~40□~T	40	3ø380	50	4	Cont.	9.00	0.900	1300	0.20	3.20	0.320	—	
				60			7.20	0.720	1550	0.18	2.80	0.280		
			3ø400	50	4	Cont.	10.00	1.000	1300	0.20	3.40	0.340		
				60			7.80	0.780	1550	0.18	3.00	0.300		
			3ø415	50	4	Cont.	11.00	1.100	1350	0.20	3.00	0.300		
				60			8.60	0.860	1600	0.18	2.80	0.280		
			3ø440	50	4	Cont.	12.00	1.200	1350	0.21	3.40	0.340		
				60			9.80	0.980	1600	0.19	3.00	0.300		

1) Enter the phase & voltage code in the place * and enter the model type of attaching Gearbox in the box (□) within the motor model name.

2) All models contain a built-in thermal protector.

3) Gear Type Shaft is for attaching Gearbox and D-Cut & Key Type Shafts are for using motor only.

※ It is not possible to use inverter for three phase 380~440V motor. When inverter is used, the insulation of winding coil becomes hot and may cause damage to the motor.

Max. Permissible Torque at Output Shaft of Gearbox

60Hz

Motor Model	Gearbox Model	Gear Ratio	2	3	3.6	5	6	7.5	9	10	12.5	15	18	25	30	36	40	50	60	75	90	100	120	150	180	200
		r/min	900	600	500	360	300	240	200	180	144	120	100	72	60	50	45	36	30	24	20	18	15	12	10	10
9IDG□-40G	9GBK□ BMH	kgfcm	4.6	7.0	8.4	11.6	13.9	17.4	20.9	23.2	29.1	34.9	37.8	52.5	63.0	68.5	76.2	95.2	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
		N.m	0.46	0.68	0.82	1.14	1.37	1.71	2.05	2.28	2.85	3.42	3.70	5.15	6.17	6.72	7.46	9.33	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80

Motor Model	Gearbox Model	Gear Ratio	10	12	15	18	25	30	36	50	60
			r/min	180	150	120	100	72	60	50	30
9IDG□-40W	9WD□BL/□BR/ □BRL	kgfcm	23.0	26.9	32.3	37.3	49.0	55.4	64.5	84.0	92.4
		N.m	2.25	2.63	3.17	3.66	4.80	5.43	6.32	8.23	9.06

50Hz

Motor Model	Gearbox Model	Gear Ratio	2	3	3.6	5	6	7.5	9	10	12.5	15	18	25	30	36	40	50	60	75	90	100	120	150	180	200
		r/min	750	500	417	300	250	200	167	150	120	100	83	60	50	42	38	30	25	20	17	15	13	10	8	8
91DG□-40G	9GBK□ BMH	kgfcm	5.6	8.5	10.2	14.1	16.9	21.2	25.4	28.2	35.3	42.3	45.9	63.8	76.5	83.2	92.5	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
		N.m	0.55	0.83	1.00	1.38	1.66	2.07	2.49	2.77	3.46	4.15	4.50	6.25	7.50	8.16	9.06	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80

Motor Model	Gearbox Model	Gear Ratio	10	12	15	18	25	30	36	50	60
		r/min	150	125	100	83	60	50	42	30	25
9IDG□-40W	9WD□BL/□BR/ □BRL	kgfcm	27.9	32.6	39.3	45.3	59.5	67.3	78.3	102.0	112.2
		N.m	2.73	3.20	3.85	4.44	5.83	6.60	7.68	10.00	11.00

1) Enter the phase & voltage code in the box (□) within the motor model name.

2) Enter the gear ratio in the box (□) within the Gearbox model name.

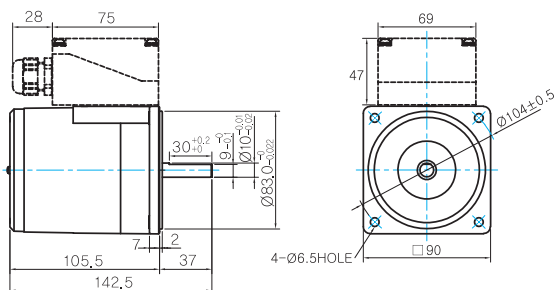
3) A colored background indicates gear shaft rotation in the same direction as the motor shaft; a white background indicates rotation in the opposite direction.

4) The rotating speed is calculated by dividing the motor's synchronous speed (50Hz: 1,500r/min, 60Hz: 1,800r/min) by the gear ratio. The actual speed is 2~20% less than the displayed value, depending on the size of the load.

Dimensions

MOTOR ONLY

- MOTOR MODEL: 9IDD□-40(-T) (NO FAN)

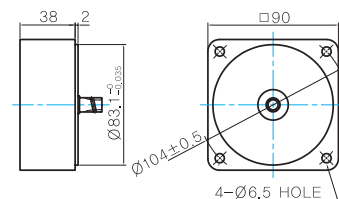


MOTOR OUTPUT SHAFT

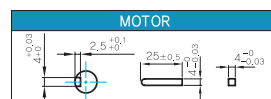
MODEL	SPEC
D-CUT TYPE	37 30 ^{+0.2} ₋₀ 9 ⁺⁰ _{-0.02} Ø10 ^{+0.02} ₋₀
KEY TYPE	37 25 ^{+0.2} ₋₀ Ø10 ^{+0.02} ₋₀
9IDD□-40	
9IDK□-40	

INTER-DECIMAL GEARBOX

- MODEL: 9XD10□□



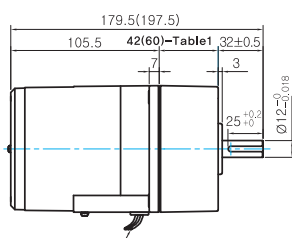
KEY SPEC



GEARED MOTOR

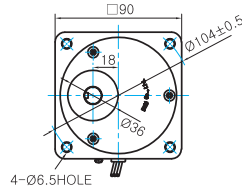
G TYPE GEARBOX

- MOTOR MODEL: 9IDG□-40G (NO FAN)



LEAD WIRE 300mm
UL STYLE NO.3271 AWG NO.22

- GEARBOX MODEL: 9GBK□BMH



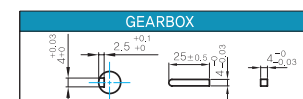
GEARBOX OUTPUT SHAFT

MODEL	SPEC
KEY TYPE	32 25 ^{+0.2} ₋₀ Ø12 ^{+0.02} ₋₀

- 42(60)-Table1

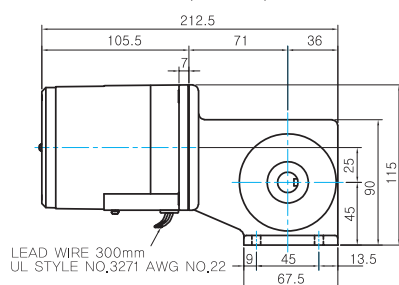
SIZE(mm)	GEAR RATIO
42	9GBK2BMH ~ 9GBK18BMH
60	9GBK25BMH ~ 9GBK200BMH

- Key Spec



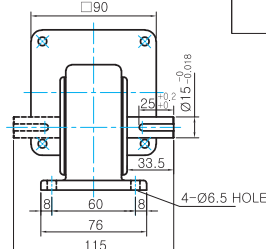
W TYPE GEARBOX

- MOTOR MODEL: 9IDG□-40W (NO FAN)

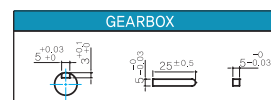


LEAD WIRE 300mm
UL STYLE NO.3271 AWG NO.22

- GEARBOX MODEL: 9WD□BL/BR/BRL



KEY SPEC



WEIGHT

PART	WEIGHT(Kg)
MOTOR	2.4
GEAR BOX	
9GBK2BMH ~ 9GBK15BMH	0.67
9GBK18BMH ~ 9GBK30BMH	0.96
9GBK36BMH ~ 9GBK200BMH	1.07
9WD□BL/BR/BRL	1.0
9XD10□□	0.5

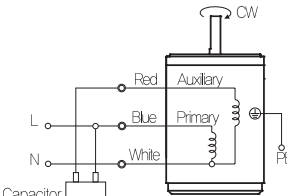
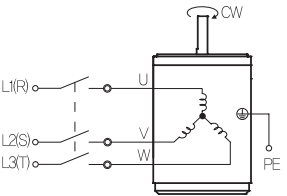
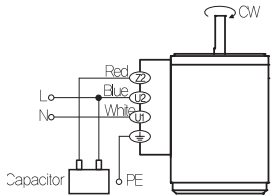
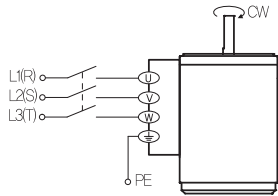
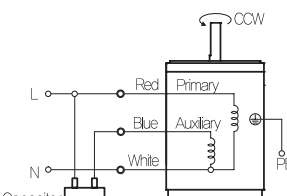
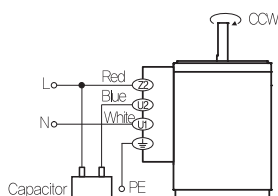
B AC Motors

Induction Motor 40W(□ 90mm)

Motor Images

9IDD□-40	9IDD□-40-T	9IDG□-40G+9GBK□BMH	9IDG□-40W+9WD□BL
			

Connection Diagrams

Lead Wire Type		Terminal Box Type	
[Single Phase]	[Three Phase]	[Single Phase]	[Three Phase]
 Red: Auxiliary Blue: Primary White: PE Capacitor	 L1(R) U L2(S) V L3(T) W PE • CCW Direction: Change any two connections among R, S and T.	 Red: Auxiliary Blue: Primary White: PE Capacitor	 L1(R) U L2(S) V L3(T) W PE • CCW Direction: Change any two connections among R, S and T.
 Red: Primary Blue: Auxiliary White: PE Capacitor		 Red: Primary Blue: Auxiliary White: PE Capacitor	

- 1) The direction of motor rotation is as viewed from the shaft end of the motor.
- 2) CW represents the clockwise direction, while CCW represents the counterclockwise direction.
- 3) Change the direction of single phase motor rotation only after bringing the motor to a stop. If an attempt is made to change the direction of rotation while the motor is rotating, the motor may ignore the reversing command or change its direction after some delay.