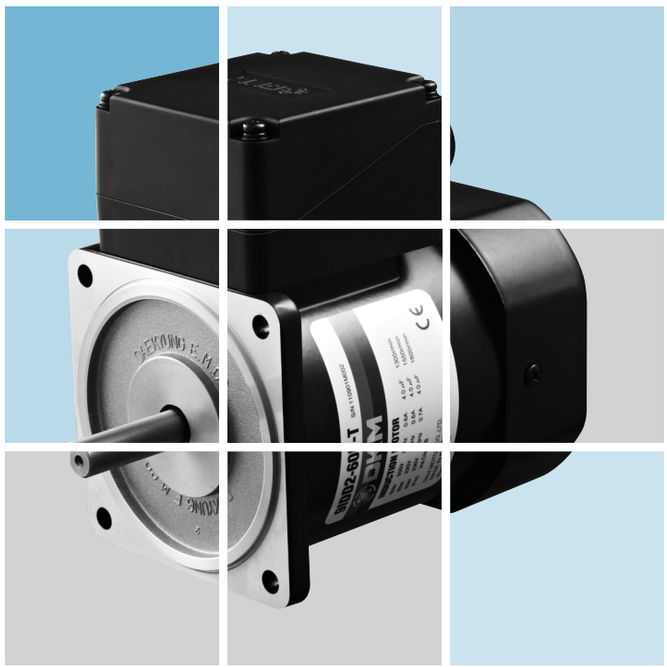


AC/DC Geared Motor and Gearhead

DKM Motor Co., Ltd.

DKM Products Overview

AC MOTORS

Induction Motor

- Constant speed with continuous operation
- Stop in 2 sec. when switched off (Overrun: 30-40 times)
- Possible for reverse rotation

Lead Wire Type

Terminal Box Type

2 Pole Motor

- High speed rotation
- 3,600r/min (60Hz) 3,000r/min (50Hz)
- Used without gearhead
- Possible for reverse rotation

Lead Wire Type

Terminal Box Type

Reversible Motor

- Suitable for frequent reverse operation
- Stop in 0.5 sec. when switched off (Overrun: 5-6 times)
- Possible for reverse rotation

Lead Wire Type

Terminal Box Type

E.M. Brake Motor

- Suitable for operation where load should be maintained
- Stop in 0.2 sec. when switched off (Overrun: 2-3 times)
- Possible for reverse rotation

Clutch & Brake Motor

- Suitable for high frequent start and stop operation
- Stop in 0.1 sec. when switched off (Overrun: 1 time)
- Used always with gearhead
- Possible for reverse rotation

Torque Motor

- Suitable for controlling tension and pushing in winding operations
- Easy control of motor torque by using torque controller
- Possible for reverse rotation

Speed Control System

- S.C. Induction Motor
- S.C. Reversible Motor
- S.C. E.M. Brake Motor
- S.C. Clutch & Brake Motor

- Speed control motor allows you to set and adjust the speed of the motor easily by using speed controller.

- Speed Controller:
  FX1000A
  DSK
  DSKS

Speed Controller FX1000A	Speed Controller DSK	Speed Controller DSKS
		
- Front panel potentiometer - Unit type (Connecting motor with easy-to-use connector)	- Front panel potentiometer - Socket type (Connecting motor with Socket)	- Separate potentiometer - Socket type (Connecting motorwith Socket)

DC MOTORS

DC Motor

- Big starting torque and high efficiency
- Easy to control the speed and change the normal/reverse rotation
- Superiority in the responsiveness of operation and stop
- Possible to attach parallel and worm gearheads

Speed Controller DSD-90

- Applicable to DC 90V motor
- Front panel potentiometer, Unit type

GEARHEADS

Parallel Gearhead

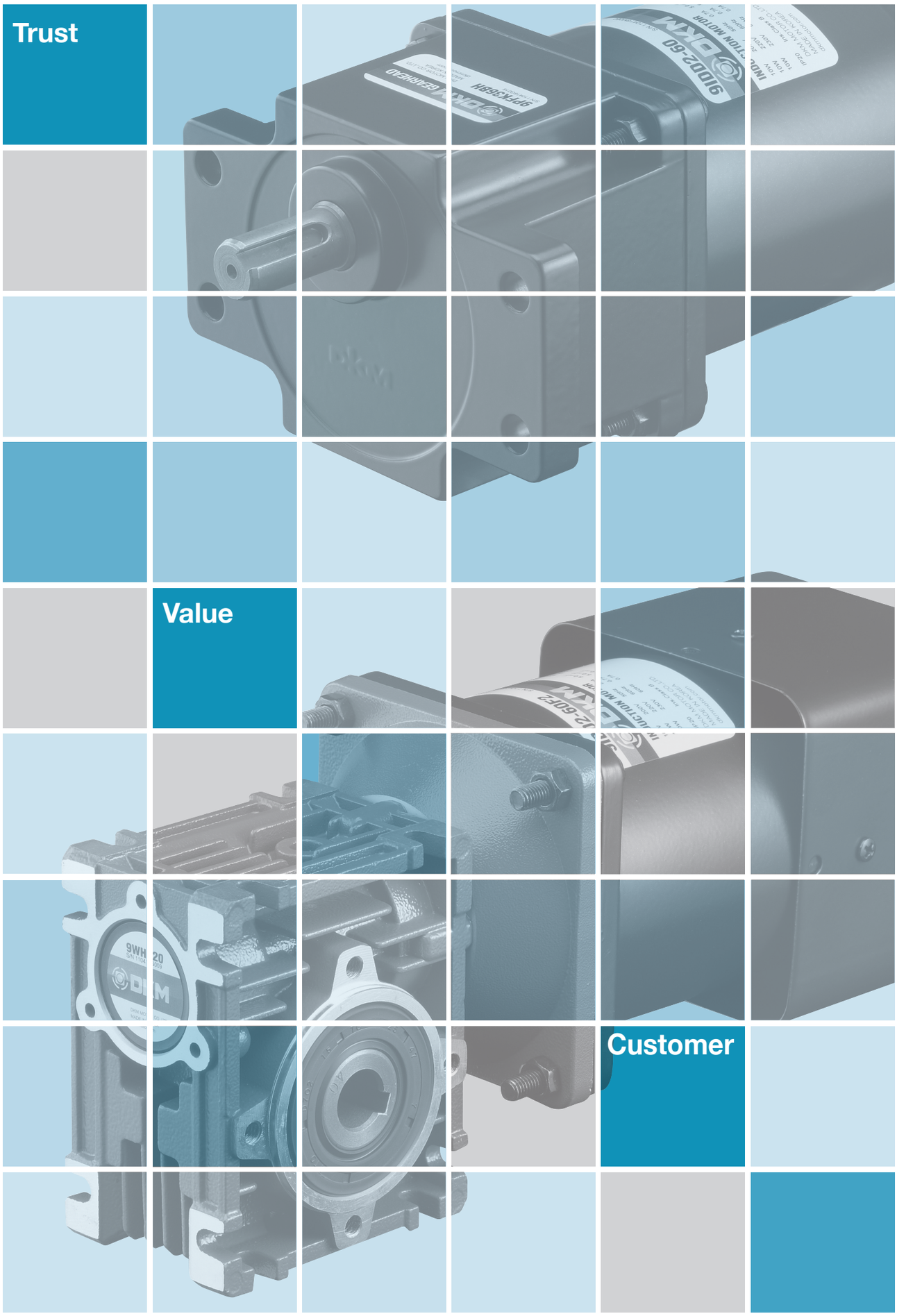
-General Box Type, Powerful Box / Flange Type, High Powerful Box / Flange Type
-Frame Size: 60/70/80/90mm
-Gear Ratio: 2 : 1~360 : 1

Worm Gearhead

-Maximum use of install space
-Worm Solid Type Gearhead
Frame Size: 80/90mm
Gear Ratio: 10 : 1~60 : 1
- Worm Hollow Type Gearhead
Frame Size: 90mm
Gear Ratio: 7.5 : 1~80 : 1

Inter-decimal Gearhead

-In case of requiring high gear ratio that cannot be generated by single gearhead
-Frame Size: 80/90mm
-Gear Ratio: 10 : 1


Trust
Value
Customer

Contents

Infor-
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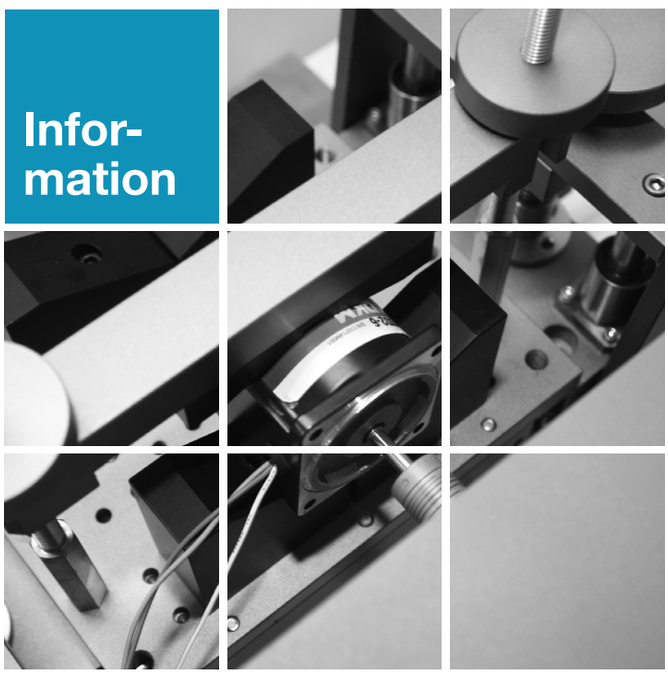

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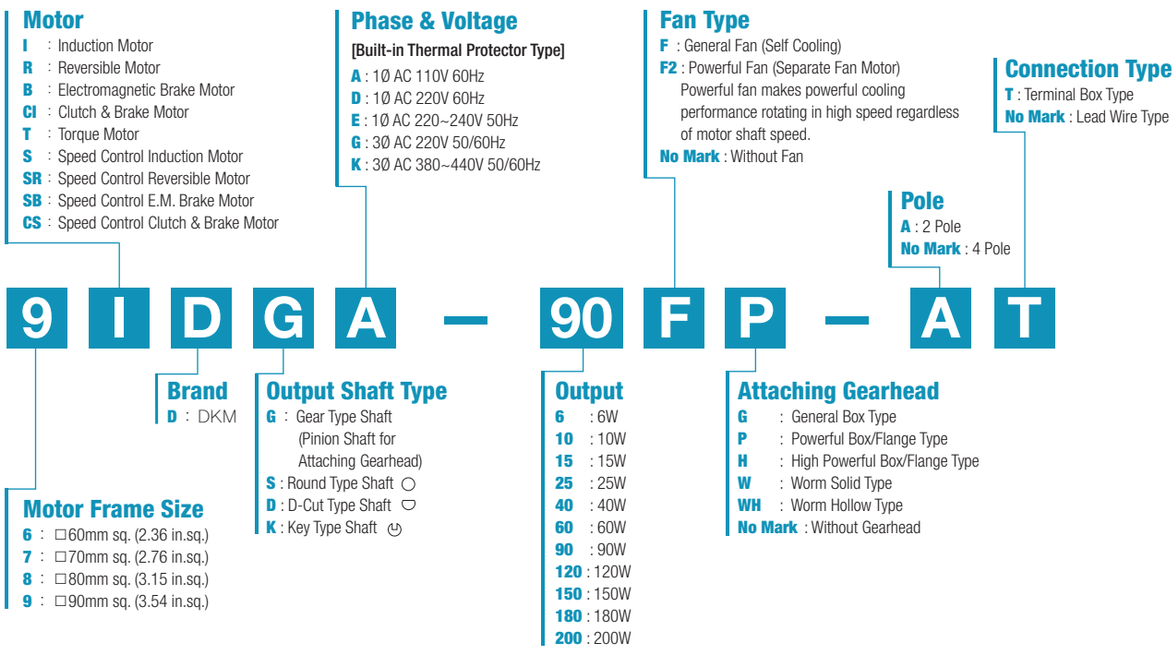
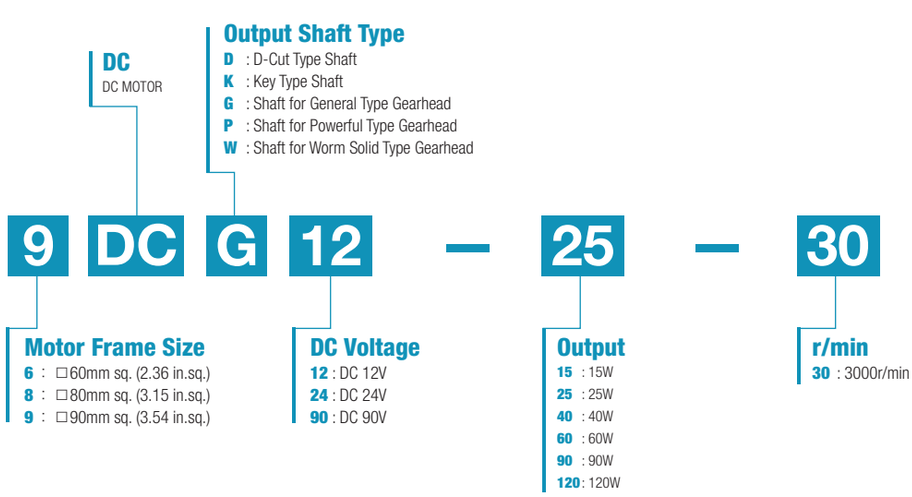
Product Coding System

AC Motors



DC Motors



Parallel Gearhead

Gearhead Frame Size
- **6** : □60mm sq. (2.36 in.sq.)
- **7** : □70mm sq. (2.76 in.sq.)
- **8** : □80mm sq. (3.15 in.sq.)
- **9** : □90mm sq. (3.54 in.sq.)

Frame Type
- **B** : Box Type □
- **F** : Flange Type (Only available for powerful and high powerful type gearheads)

Bearing Type
- **B** : Ball Bearing
- **BM** : Ball Bearing + Metal Bearing
- **M** : Metal Bearing

9 **P** **B** **K** **36** **B** **H**

Gear Type
- **G** : General Gear
- **P** : Powerful Gear
- **H** : High Powerful Gear

Output Shaft Type
- **K** : Key Type
- **D** : D-Cut Type
- **S** : Round Type

Gear Ratio
- **36** : 1/36

Input Gear Type
- **H** : Helical Gear

Worm Gearhead

Gearhead Type
- **W** : Worm Solid Type
- **WH** : Worm Hollow Type

Gear Ratio
- **30** : 1/30

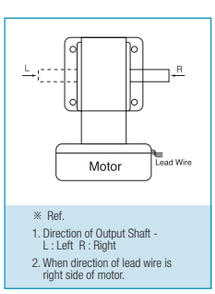
Direction of Output Shaft
- **L** : Left
- **R** : Right
- **RL** : Bi-directional
- ※ No mark in Worm Hollow Type Gearhead

9 **W** **D** **30** **B** **L**

Gearhead Frame Size
- **8** : □ 80mm sq. (3.15 in.sq.)
- **9** : □ 90mm sq. (3.54 in.sq.)

Brand
- **D** : DKM

Bearing Type
- **B** : Ball Bearing
- ※ No mark in Worm Hollow Type Gearhead



※ Ref.
1. Direction of Output Shaft - L : Left R : Right
2. When direction of lead wire is right side of motor.

Inter-decimal Gearhead

X10 Inter-decimal Gearhead

Metal Bearing

9 **X** **D** **10** **M** **H**

Gearhead Frame Size
- **8** : □ 80mm sq. (3.15 in.sq.)
- **9** : □ 90mm sq. (3.54 in.sq.)

Brand
- **D** : DKM

Gear Ratio
- **10** : 1/10

Attaching Gearhead
- **G** : General Type (Helical)
- **P** : Powerful Type
- **H** : High Powerful Type
- **W** : Worm Solid Type
- **WH** : Worm Hollow Type

In case of requiring high gear reduction ratio that cannot be generated by single gearhead, please use Inter-decimal gearhead with general gearhead. 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.

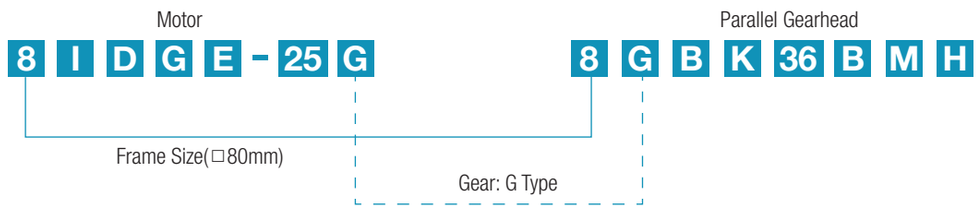
A Information

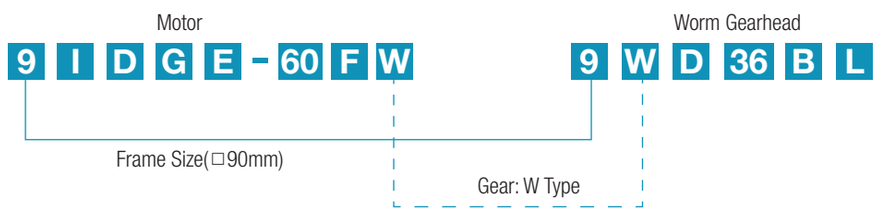
Product Coding System

Assembly of Motor and Gearhead

Motor + Gearhead

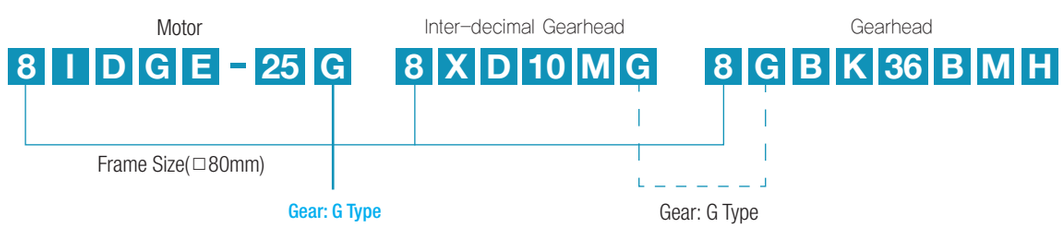
- As shown in the following scheme, motor and gearhead which have same frame size and gear type could be assembled.



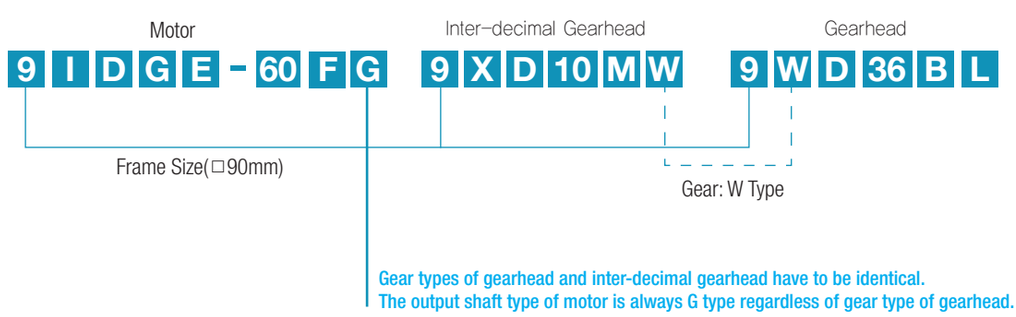


Motor + Inter-decimal Gearhead + Gearhead

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



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



AC Motors

Frame Size	Voltage / Output	Induction Motor A 1Ø 110V 60Hz	D 1Ø 220V 60Hz	G 3Ø 220V 50/60Hz	K 3Ø 380~440V 50/60Hz	E 1Ø 220~240V 50Hz	Page
60mm	6W	6ID*A-6□(-T)	6ID*D-6□(-T)	·	·	6ID*E-6□(-T)	B-09
70mm	6W	7ID*A-6□(-T)	7ID*D-6□(-T)	·	·	7ID*E-6□(-T)	B-11
	10W	7ID*A-10□(-T)	7ID*D-10□(-T)	·	·	7ID*E-10□(-T)	B-13
	15W	7ID*A-15□(-T)	7ID*D-15□(-T)	·	·	7ID*E-15□(-T)	B-15
80mm	15W	8ID*A-15□(-T)	8ID*D-15□(-T)	8ID*G-15□(-T)	8ID*K-15□(-T)	8ID*E-15□(-T)	B-17
	25W	8ID*A-25□(-T)	8ID*D-25□(-T)	8ID*G-25□(-T)	8ID*K-25□(-T)	8ID*E-25□(-T)	B-20
90mm	40W	9ID*A-40□(-T)	9ID*D-40□(-T)	9ID*G-40□(-T)	9ID*K-40□(-T)	9ID*E-40□(-T)	B-23
	60W	9ID*A-60F□(-T)	9ID*D-60F□(-T)	9ID*G-60F□(-T)	9ID*K-60F□(-T)	9ID*E-60F□(-T)	B-26
	90W	9ID*A-90F□(-T)	9ID*D-90F□(-T)	9ID*G-90F□(-T)	9ID*K-90F□(-T)	9ID*E-90F□(-T)	B-30
	120W	9ID*A-120F□(-T)	9ID*D-120F□(-T)	9ID*G-120F□(-T)	9ID*K-120F□(-T)	9ID*E-120F□(-T)	B-34
	150W	·	·	9ID*G-150F□(-T)	9ID*K-150F□(-T)	·	B-38
	180W	·	9ID*D-180F□(-T)	·	·	9ID*E-180F□(-T)	B-41
	200W	·	·	9ID*G-200F□(-T)	9ID*K-200F□(-T)	·	B-44

Frame Size	Voltage / Output	2 Pole Motor A 1Ø 110V 60Hz	D 1Ø 220V 60Hz	G 3Ø 220V 50/60Hz	K 3Ø 380~440V 50/60Hz	E 1Ø 220~240V 50Hz	Page
80mm	15W	8ID*A-15-A(T)	8ID*D-15-A(T)	8ID*G-15-A(T)	·	8ID*E-15-A(T)	B-49
	25W	8ID*A-25-A(T)	8ID*D-25-A(T)	8ID*G-25-A(T)	·	8ID*E-25-A(T)	B-51
90mm	40W	9ID*A-40-A(T)	9ID*D-40-A(T)	9ID*G-40-A(T)	9ID*K-40-A(T)	9ID*E-40-A(T)	B-53
	60W	9ID*A-60F-A(T)	9ID*D-60F-A(T)	9ID*G-60F-A(T)	9ID*K-60F-A(T)	9ID*E-60F-A(T)	B-55
	90W	9ID*A-90F-A(T)	9ID*D-90F-A(T)	9ID*G-90F-A(T)	9ID*K-90F-A(T)	9ID*E-90F-A(T)	B-57
	120W	9ID*A-120F-A(T)	9ID*D-120F-A(T)	9ID*G-120F-A(T)	9ID*K-120F-A(T)	9ID*E-120F-A(T)	B-59
	150W	·	·	9ID*G-150F-A(T)	9ID*K-150F-A(T)	·	B-61
	200W	·	·	9ID*G-200F-A(T)	9ID*K-200F-A(T)	·	B-63

Frame Size	Voltage / Output	Reversible Motor A 1Ø 110V 60Hz	D 1Ø 220V 60Hz	G 3Ø 220V 50/60Hz	K 3Ø 380~440V 50/60Hz	E 1Ø 220~240V 50Hz	Page
60mm	6W	6RD*A-6□(-T)	6RD*D-6□(-T)	·	·	6RD*E-6□(-T)	B-69
70mm	6W	7RD*A-6□(-T)	7RD*D-6□(-T)	·	·	7RD*E-6□(-T)	B-71
	10W	7RD*A-10□(-T)	7RD*D-10□(-T)	·	·	7RD*E-10□(-T)	B-73
	15W	7RD*A-15□(-T)	7RD*D-15□(-T)	·	·	7RD*E-15□(-T)	B-75
80mm	15W	8RD*A-15□(-T)	8RD*D-15□(-T)	·	·	8RD*E-15□(-T)	B-77
	25W	8RD*A-25□(-T)	8RD*D-25□(-T)	·	·	8RD*E-25□(-T)	B-80
90mm	40W	9RD*A-40□(-T)	9RD*D-40□(-T)	·	·	9RD*E-40□(-T)	B-83
	60W	9RD*A-60F□(-T)	9RD*D-60F□(-T)	·	·	9RD*E-60F□(-T)	B-86
	90W	9RD*A-90F□(-T)	9RD*D-90F□(-T)	·	·	9RD*E-90F□(-T)	B-90
	120W	9RD*A-120F□(-T)	9RD*D-120F□(-T)	·	·	9RD*E-120F□(-T)	B-94

1. Enter the output shaft type of motor (G: Gear Type/S: Round Type/D: D-Cut Type/K: Key Type) in the place * within the motor model name.
2. Enter the model type of attaching gearhead (G Type/P Type/H Type/W Type/WH Type) in the box (□) within the motor model name.
3. When using terminal box type motor, '-T' is added to the end of the motor model name.
4. All models contain a built-in thermal protector.

A Information

Products Lineup

AC Motors

Frame Size	Voltage / Output	Electromagnetic Brake Motor					Page
		A 1Ø 110V 60Hz	D 1Ø 220V 60Hz	G 3Ø 220V 50/60Hz	K 3Ø 380~440V 50/60Hz	E 1Ø 220~240V 50Hz	
70mm	6W	7BD*A-6□	7BD*D-6□	·	·	7BD*E-6□	B-101
	10W	7BD*A-10□	7BD*D-10□	·	·	7BD*E-10□	B-103
	15W	7BD*A-15□	7BD*D-15□	·	·	7BD*E-15□	B-105
80mm	15W	8BD*A-15□	8BD*D-15□	8BD*G-15□	8BD*K-15□	8BD*E-15□	B-107
	25W	8BD*A-25□	8BD*D-25□	8BD*G-25□	8BD*K-25□	8BD*E-25□	B-110
90mm	40W	9BD*A-40□	9BD*D-40□	9BD*G-40□	9BD*K-40□	9BD*E-40□	B-113
	60W	9BD*A-60F□	9BD*D-60F□	9BD*G-60F□	9BD*K-60F□	9BD*E-60F□	B-116
	90W	9BD*A-90F□	9BD*D-90F□	9BD*G-90F□	9BD*K-90F□	9BD*E-90F□	B-120
	120W	9BD*A-120F□	9BD*D-120F□	9BD*G-120F□	9BD*K-120F□	9BD*E-120F□	B-124
	150W	·	·	9BD*G-150F□	9BD*K-150F□	·	B-128
	180W	·	9BD*D-180F□	·	·	9BD*E-180F□	B-131
	200W	·	·	9BD*G-200F□	9BD*K-200F□	·	B-134

Frame Size	Voltage / Output	Clutch & Brake Motor					Page
		A 1Ø 110V 60Hz	D 1Ø 220V 60Hz	G 3Ø 220V 50/60Hz	K 3Ø 380~440V 50/60Hz	E 1Ø 220~240V 50Hz	
80mm	15W	8CID*A-15□	8CID*D-15□	8CID*G-15□	8CID*K-15□	8CID*E-15□	B-141
	25W	8CID*A-25□	8CID*D-25□	8CID*G-25□	8CID*K-25□	8CID*E-25□	B-143
90mm	40W	9CID*A-40□	9CID*D-40□	9CID*G-40□	9CID*K-40□	9CID*E-40□	B-145
	60W	9CID*A-60F2□	9CID*D-60F2□	9CID*G-60F2□	9CID*K-60F2□	9CID*E-60F2□	B-147
	90W	9CID*A-90F2□	9CID*D-90F2□	9CID*G-90F2□	9CID*K-90F2□	9CID*E-90F2□	B-149
	120W	9CID*A-120F2□	9CID*D-120F2□	9CID*G-120F2□	9CID*K-120F2□	9CID*E-120F2□	B-151

Frame Size	Voltage / Output	Torque Motor					Page
		A 1Ø 110V 60Hz	D 1Ø 220V 60Hz	G 3Ø 220V 50/60Hz	K 3Ø 380~440V 50/60Hz	E 1Ø 220~240V 50Hz	
70mm	6W	7TD*A-6□	7TD*D-6□	·	·	7TD*E-6□	B-157
80mm	10W	8TD*A-10□	8TD*D-10□	·	·	8TD*E-10□	B-159
90mm	20W	9TD*A-20F2□	9TD*D-20F2□	·	·	9TD*E-20F2□	B-161
	30W	9TD*A-30F2□	9TD*D-30F2□	·	·	9TD*E-60F2□	B-163
	40W	9TD*A-40F2□	9TD*D-40F2□	·	·	9TD*E-90F2□	B-165

1. Enter the output shaft type of motor (G: Gear Type/S: Round Type/D: D-Cut Type/K: Key Type) in the place * within the motor model name.
2. Enter the model type of attaching gearhead (G Type/P Type/H Type/W Type/WH Type) in the box (□) within the motor model name.
3. All models contain a built-in thermal protector.

Frame Size	Voltage / Output	Speed Control Induction Motor					Page
		A 1Ø 110V 60Hz	D 1Ø 220V 60Hz	G 3Ø 220V 50/60Hz	K 3Ø 380~440V 50/60Hz	E 1Ø 220~240V 50Hz	
70mm	6W	7SD*A-6□	7SD*D-6□	·	·	7SD*E-6□	B-179
	10W	7SD*A-10□	7SD*D-10□	·	·	7SD*E-10□	B-182
	15W	7SD*A-15□	7SD*D-15□	·	·	7SD*E-15□	B-185
80mm	15W	8SD*A-15□	8SD*D-15□	·	·	8SD*E-15□	B-188
	25W	8SD*A-25□	8SD*D-25□	·	·	8SD*E-25□	B-191
90mm	40W	9SD*A-40□	9SD*D-40□	·	·	9SD*E-40□	B-194
	60W	9SD*A-60F2□	9SD*D-60F2□	·	·	9SD*E-60F2□	B-197
	90W	9SD*A-90F2□	9SD*D-90F2□	·	·	9SD*E-90F2□	B-201
	120W	9SD*A-120F2□	9SD*D-120F2□	·	·	9SD*E-120F2□	B-205
	180W	·	9SD*D-180F2□	·	·	9SD*E-180F2□	B-209

Frame Size	Voltage / Output	Speed Control Reversible Motor					Page
		A 1Ø 110V 60Hz	D 1Ø 220V 60Hz	G 3Ø 220V 50/60Hz	K 3Ø 380~440V 50/60Hz	E 1Ø 220~240V 50Hz	
70mm	6W	7SRD*A-6□	7SRD*D-6□	·	·	7SRD*E-6□	B-213
	10W	7SRD*A-10□	7SRD*D-10□	·	·	7SRD*E-10□	B-215
	15W	7SRD*A-15□	7SRD*D-15□	·	·	7SRD*E-15□	B-217
80mm	15W	8SRD*A-15□	8SRD*D-15□	·	·	8SRD*E-15□	B-219
	25W	8SRD*A-25□	8SRD*D-25□	·	·	8SRD*E-25□	B-222
90mm	40W	9SRD*A-40□	9SRD*D-40□	·	·	9SRD*E-40□	B-225
	60W	9SRD*A-60F2□	9SRD*D-60F2□	·	·	9SRD*E-60F2□	B-228
	90W	9SRD*A-90F2□	9SRD*D-90F2□	·	·	9SRD*E-90F2□	B-232
	120W	9SRD*A-120F2□	9SRD*D-120F2□	·	·	9SRD*E-120F2□	B-236

Frame Size	Voltage / Output	Speed Control E.M. Brake Motor					Page
		A 1Ø 110V 60Hz	D 1Ø 220V 60Hz	G 3Ø 220V 50/60Hz	K 3Ø 380~440V 50/60Hz	E 1Ø 220~240V 50Hz	
80mm	15W	8SBD*A-15□	8SBD*D-15□	·	·	8SBD*E-15□	B-241
	25W	8SBD*A-25□	8SBD*D-25□	·	·	8SBD*E-25□	B-244
90mm	40W	9SBD*A-40□	9SBD*D-40□	·	·	9SBD*E-40□	B-247
	60W	9SBD*A-60F2□	9SBD*D-60F2□	·	·	9SBD*E-60F2□	B-250
	90W	9SBD*A-90F2□	9SBD*D-90F2□	·	·	9SBD*E-90F2□	B-254
	120W	9SBD*A-120F2□	9SBD*D-120F2□	·	·	9SBD*E-120F2□	B-258
	180W	·	9SBD*D-180F2□	·	·	9SBD*E-180F2□	B-262

1. Enter the output shaft type of motor (G: Gear Type/S: Round Type/D: D-Cut Type/K: Key Type) in the place * within the motor model name.
2. Enter the model type of attaching gearhead (G Type/P Type/H Type/W Type/WH Type) in the box (□) within the motor model name.
3. All models contain a built-in thermal protector.

A Information

Products Lineup

AC Motors

Frame Size	Voltage / Output	Speed Control Clutch & Brake Motor					Page
		A 1Ø 110V 60Hz	D 1Ø 220V 60Hz	G 3Ø 220V 50/60Hz	K 3Ø 380~440V 50/60Hz	E 1Ø 220~240V 50Hz	
80mm	15W	8CSD*A–15□	8CSD*D–15□	·	·	8CSD*E–15□	B-267
	25W	8CSD*A–25□	8CSD*D–25□	·	·	8CSD*E–25□	B-267
90mm	40W	9CSD*A–40□	9CSD*D–40□	·	·	9CSD*E–40□	B-271
	60W	9CSD*A–60F2□	9CSD*D–60F2□	·	·	9CSD*E–60F2□	B-273
	90W	9CSD*A–90F2□	9CSD*D–90F2□	·	·	9CSD*E–90F2□	B-275
	120W	9CSD*A–120F2□	9CSD*D–120F2□	·	·	9CSD*E–120F2□	B-277

1. Enter the output shaft type of motor (G: Gear Type/S: Round Type/D: D-Cut Type/K: Key Type) in the place * within the motor model name.
2. Enter the model type of attaching gearhead (G Type/P Type/H Type/W Type/WH Type) in the box (□) within the motor model name.
3. All models contain a built-in thermal protector.

DC Motors

Frame Size	Voltage / Output	DC Motor			Page
		DC 12V	DC 24V	DC 90V	
60mm	15W	6DC*12–15–30	6DC*24–15–30	6DC*90–15–30	C-05
80mm	25W	8DC*12–25–30	8DC*24–25–30	8DC*90–25–30	C-07
	40W	8DC*12–40–30	8DC*24–40–30	8DC*90–40–30	C-09
90mm	60W	9DC*12–60–30	9DC*24–60–30	9DC*90–60–30	C-11
	90W	9DC*12–90–30	9DC*24–90–30	9DC*90–90–30	C-13
	120W	9DC*12–120–30	9DC*24–120–30	9DC*90–120–30	C-15

1. Enter the output shaft type of motor in the place * within the motor model name.
(D: D-Cut Type/K: Key Type/G: Shaft for G Type Gearhead/P: Shaft for P Type Gearhead/W: Shaft for W Type Gearhead)

Gearheads

Type		Frame Size	Gearhead Model	Gear Reduction Ratio	Page
Parallel Gearhead	G Type	60mm	6GBD□MH	3/3.6/5/6/7.5/9/10/12.5/15/18/20/25/30/36/40/50/60/75/90/100/120/150/180/200/250	D-07
		70mm	7GBK□BMH	3/3.6/6/7.5/9/12.5/15/18/25/30/36/50/60/75/90/100/120/150/180	D-07
		80mm	8GBK□BMH	3/3.6/5/6/7.5/9/12.5/15/18/25/30/36/40/50/60/75/90/100/120/150/180/200/250/300/360	D-08
		90mm	9GBK□BMH	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	D-09
	P Type	90mm	9PBK□BH/9PFK□BH	2/3/3.6/5/6/7.5/9/12.5/15/18/20/25/30/36/40/50/60/75/90/100/120/150/180	D-10
	H Type	90mm	9HBK□BH/9HFK□BH	3/3.6/6/9/12.5/15/18/20/25/30/36/50/60/75/90/100/120/150/180	D-11
Worm Gearhead	W Type	80mm	8WD□BL/□BR/□BRL	10/12/15/18/25/30/36/50/60	D-12
		90mm	9WD□BL/□BR/□BRL	10/12/15/18/25/30/36/50/60	D-12
	WH Type	90mm	9WHD□	7.5/10/15/20/25/30/40/50/60/80	D-13
Inter-decimal Gearhead		80mm	8XD10M*	10	D-14
		90mm	9XD10M*	10	D-14

1. Enter the gear ratio in the box (□) within the gearhead model name.
2. Enter the model type of attaching gearhead (G/P/H/W/WH) in the place *.

How to Read Motor Specifications

Model (9IDG*-60F□(-T): Gear Type Shaft, 9IDD*-60F(-T): D-Cut Type Shaft, 9IDK*-60F(-T): Key Type Shaft)		Output	Voltage	Frequency	Poles	Duty	Starting Torque ②		Rated Load				Capacitor
									③ Speed	④ Current	⑤ Torque		
Lead Wire Type	Terminal Box Type	❶ W	V	Hz			kgfcm	N.m	r/min	A	kgfcm	N.m	μF / VAC
9IDGA-60F□	9IDGA-60F□-T	60	1ø 110	60	4	Cont.	3.40	0.340	1600	1.40	4.60	0.460	16.0 / 250
9IDGD-60F□	9IDGD-60F□-T	60	1ø 220	60	4	Cont.	4.20	0.420	1600	0.63	4.60	0.460	4.0 /450
9IDGE-60F□	9IDGE-60F□-T	60	1ø 220	50	4	Cont.	3.40	0.340	1300	0.48	4.80	0.480	3.5 / 450
			1ø 240				4.00	0.400		0.54	5.40	0.540	
9IDGG-60F□	9IDGG-60F□-T	60	3ø 220	50	4	Cont.	15.00	1.500	1350	0.59	4.60	0.460	–
				60			12.80	1.280	1600	0.49	4.20	0.420	
9IDGK-60F□	9IDGK-60F□-T	60	3ø 380	50	4	Cont.	17.00	1.700	1350	0.33	4.80	0.480	–
				60			13.80	1.380	1600	0.29	4.60	0.460	
			3ø 400	50	4	Cont.	18.60	1.860	1350	0.36	5.20	0.520	
				60			15.20	1.520	1600	0.30	5.00	0.500	
			3ø 415	50	4	Cont.	20.00	2.000	1350	0.40	5.60	0.560	
				60			16.20	1.620	1600	0.33	5.20	0.520	
			3ø 440	50	4	Cont.	22.00	2.200	1350	0.44	6.00	0.600	
				60			18.20	1.820	1600	0.36	5.80	0.580	

① Output: The amount of work that can be performed in a given period of time. It can be used as a criterion for motor capability.

② Starting 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.

③ Speed: This is the speed of the motor when the motor is producing rated torque.

④ Current: The current value used by a motor when the motor is producing rated torque.

⑤ 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.

How to Read Gearhead Specifications

60Hz

Motor Model	Gearhead Model	감속비	2	3	3.6	5	6	7.5	9	12.5	15	18	20
		② r/min	900	600	500	360	300	240	200	144	120	100	90
9IDG□-60FP	9PBK□BH 9PFK□BH	❶ kgfcm	7.0	10.5	12.5	17.4	20.9	26.1	31.4	39.4	47.3	56.7	57.1
		N.m	0.68	1.02	1.23	1.71	2.05	2.56	3.07	3.86	4.63	5.56	5.60
9IDG□-60FH	9HBK□BH 9HFK□BH	kgfcm	❸ –	10.5	12.5	–	20.9	–	31.4	39.4	47.3	56.7	57.1
		N.m		1.02	1.23		2.05		3.07	3.86	4.63	5.56	5.60

Motor Model	Gearhead Model	감속비	25	30	36	40	50	60	75	90	100	120	150	180
		r/min	72	60	50	45	36	30	24	20	18	15	12	10
9IDG□-60FP	9PBK□BH 9PFK□BH	kgfcm	71.4	85.7	102.8	114.2	142.8	171.4	192.2	200.0	200.0	200.0	200.0	200.0
		N.m	7.00	8.40	10.08	11.20	13.99	16.79	18.83	19.60	19.60	19.60	19.60	19.60
9IDG□-60FH	9HBK□BH 9HFK□BH	kgfcm	71.4	85.7	102.8	–	142.8	171.4	192.2	230.6	256.2	300.0	300.0	300.0
		N.m	7.00	8.40	10.08		13.99	16.79	18.83	22.60	25.11	29.40	29.40	29.40

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.

② r/min: This refers to the speed of rotation in the gearhead output shaft. The speeds, depending on gear ratio, are shown in the permissible torque table when the gearhead is attached. The 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, according to the load condition, is 2~20% less than the displayed value.

③ Direction of Rotation: This refers to the direction of rotation viewed from the output shaft. The colored background areas indicate 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.

A Information

General Information

Permissible Load Inertia

'J' and 'GD²' is used to describe the moment of inertia. J is generally called inertia and has the same value of physical moment of inertia in SI units. Unit is in kg·m². GD² is called 'flywheel effect' and generally used in industrial application with gravitational systems of units. Unit is in kgf·m² or kgf·cm². A relation between J and GD² is described as: **J** = GD² /4

Calculation of Permissible Load Inertia

When the load inertia J connected to the gearhead is large, frequent starting of the motor or electromagnetic brake generates a large torque. If this impact is excessive, it may damage the gearhead and the motor. Inertia varies with types of the load and the inertia of the load significantly affects life expectancy of gear and electromagnetic brake. When applying the braking force by using the electromagnetic brake, do not exceed a permissible load inertia set for a specific model.

● Permissible Inertia at Motor Shaft

$$J_M = J_G \times \frac{1}{i^2}$$

J_G : Inertia of gearhead output shaft (kg·cm²)
J_M : Permissible inertia at motor shaft (kg·cm²)
i : Gear reduction ratio (e.g. 5 if the ratio is 1/5)

● Permissible Load Inertia Moment at Gearhead Output Shaft

$J_G = J_M \times i^2$ (when reduction ratio is 1/3 to 1/50)
$J_G = J_M \times 2500$ (when reduction ratio is 1/60 or larger)

J_G : Permissible load inertia moment at gearhead output shaft (kg·cm²)
J_M : Permissible inertia at motor shaft (kg·cm²)
i : Gear reduction ratio (e.g. 5 if the ratio is 1/5)

Motor and Load Inertia

The equation of motion is described as below when the inertia load is driven by the motor.

$$T = J\alpha = J \cdot \frac{d\omega}{dt} = \frac{GD^2}{4} \cdot \frac{d\omega}{dt} = \frac{2\pi}{60} \cdot \frac{GD^2}{4} \cdot \frac{dn}{dt}$$

T : Torque (N·m)
J : Moment of inertia (kg·m²)
ω : Angular speed (rad/s)
t : Time (s)
n : Rotational speed (r/s)
GD^2 : Flywheel Effect ($GD^2 = 4J$)
g : Flywheel Effect ($GD^2 = 4J$)
α : Angular acceleration (rad/s²)

- In the case of induction motor, torque generated at the starting varies depending on the speed. Therefore, an average acceleration torque is generally used, which is the averaged torque from the starting and the constant speed.
- A necessary average acceleration torque TA to accelerate the load inertia of J(kg·cm²)/ GD²(kgf·cm²) up to a speed n(min^-1) in time t(s) can be obtained by the following formula.

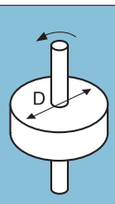
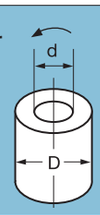
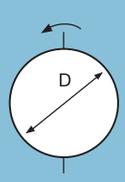
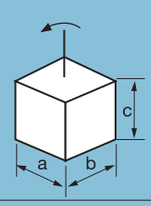
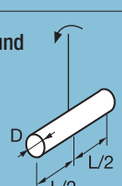
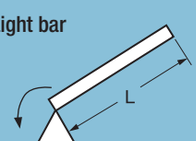
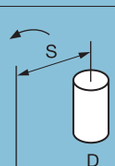
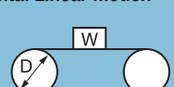
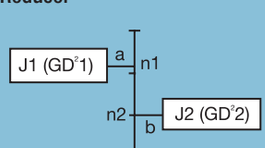
● SI Units

$$T_A = \frac{J}{9.55 \times 10^4} \times \frac{N}{t} \quad (N \cdot m)$$

● Gravitational System of Units

$$T_A = \frac{GD^2}{3750000} \times \frac{N}{t} \quad (kgf \cdot cm)$$

Calculation of Flywheel Effect (GD²)

Disk 	$GD^2 = \frac{1}{2} WD^2$ (kgf·cm²) W: Weight [kgf] D: Outer diameter [cm]	**Hollow Circular Cylinder** 	$GD^2 = \frac{1}{2} W(D^2 + d^2)$ (kgf·cm²) W: Weight [kgf] D: Outer diameter [cm] d: Inner diameter [cm]
Sphere 	$GD^2 = \frac{2}{5} WD^2$ (kgf·cm²) W: Weight [kgf] D: Diameter [cm]	**Cube** 	$GD^2 = \frac{1}{3} W(a^2 + b^2)$ (kgf·cm²) W: Weight [kgf] a,b: Length of side [cm]
Slender Round Bar 	$GD^2 = \frac{3D^2 + 4L^2}{12}$ (kgf·cm²) W: Weight [kgf] D: Outer diameter [cm] L: Length [cm]	**Straight bar** 	$GD^2 = \frac{4}{3} WL^2$ (kgf·cm²) W: Weight [kgf] L: Length [cm]
Discrete Shaft 	$GD^2 = \frac{1}{2} WD^2 + 4WS^2$ (kgf·cm²) W: Weight [kgf] D: Diameter [cm] S: Turning radius [cm]	**Horizontal Linear Motion** 	$GD^2 = WD^2$ (kgf·cm²) W: Weight on the conveyor [kgf] D: Drum diameter [cm] * GD² of drum not included
Ball Screw 	$GD^2 = GD^2_A + \frac{W \cdot P^2}{\pi^2}$ (kgf·cm²) W: Weight [kgf] P: Lead of feed screw [cm] GD²A: GD² of feed screw [kgf·cm²]	**Reducer** 	Equivalent all GD² on axis 'a' $GD^2 = GD^2_1 + (\frac{n2}{n1})^2 GD^2_2$ (kgf·cm²) n1: Speed of axis 'a' [min^-1] n2: Speed of axis 'b' [min^-1] GD²1: GD² of axis 'a' [kgf·cm²] GD²2: GD² of axis 'b' [kgf·cm²]

Permissible Load Inertia at Motor Shaft

Frame Size	Output	Permissible Load Inertia GD² (kgfcm²)
□60mm	6W	0.25
□70mm	15W	0.56
□80mm	15W, 25W	1.24
□90mm	40W	3.00
	60W	4.40
	90W, 120W, 150W	4.40
	180W, 200W	6.00

A Information

General Information

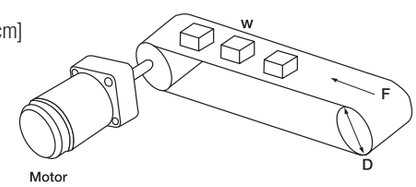
Calculation Method of Motor Capacity

For the calculation way of load torque, refer to below for the reference. According to this, needed motor sizing is decided. Be advised that basic calculation way is referred below. So in real sizing consider the acceleration time in start, needed power, safety index in design and manufacturing and the influence by voltage fluctuation and select motor considering.

Belt Conveyor Application

$$T = \frac{1}{2} D(F+\mu W) \ [kgf \cdot cm]$$

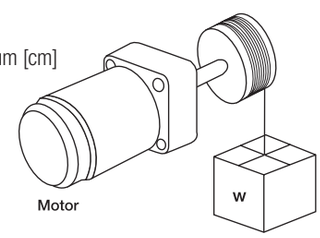
D : Diameter of drum [cm]
W : Weight [kgf]
μ : Friction coefficient
F : External force [kgf]



Hoisting Application

$$T = \frac{1}{2} D \cdot W \ [kgf \cdot cm]$$

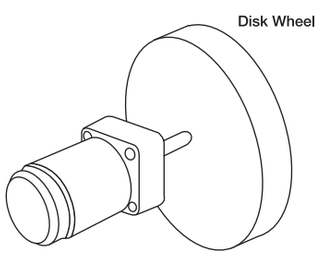
D : Diameter of drum [cm]
W : Weight [kgf]



Flywheel Application

$$T = \frac{GD^2}{37500} \times \frac{N}{t} \ [kgf \cdot cm]$$

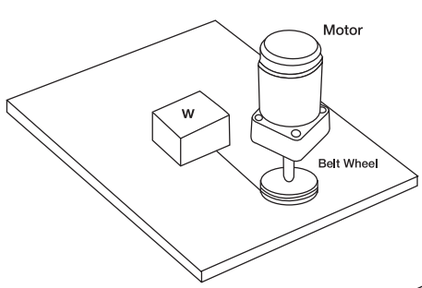
N : Revolutions per minute [r/min]
GD^2 : Flywheel effect [kgfcm²]
t : Time [sec]



Horizontal Travel on Contact Face

$$T = \frac{1}{2} D \cdot \mu W \ [kgf \cdot cm]$$

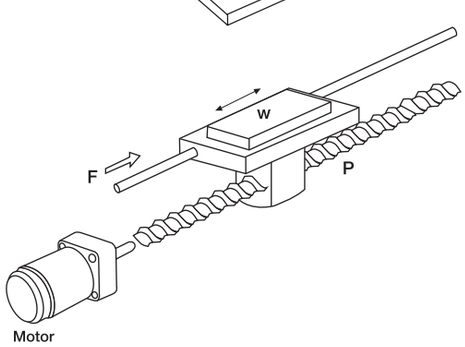
W : Weight [kgf]
μ : Friction coefficient
D : Diameter of wheel



Ball Screw Drive

$$T = \frac{1}{2\pi} P \cdot (F+\mu W) \ [kgf \cdot cm]$$

F : External force [kgf]
W : Weight [kgf]
μ : Friction coefficient of sliding surfaces (approx. 0.05 to 0.2)
P : Lead of ball screw [cm]



Terminology

Motor

Alternating Current (AC)

- AC, which is different than DC, is the current coming from the power supply so that positive (+) pole and negative (-) pole can cross with regular time interval, and becomes current sine wave which the direction of current and voltage has regular period and is changed. In other words, this appears as if the pendulum swings from left to right with the constant rhythm.

Direct Current (DC)

- DC is the current coming from the power supply that positive (+) pole and negative (-) pole is constant all the times, and the direction is invariable and the size is also constant.
- The direction of voltage is constant.
- DC generation device includes various rectifiers such as battery, storage battery, and DC generator.

Frequency (F)

- Frequency is the times of vibration that AC repeats for 1 second.
- The unit is Hertz (Hz).
- In Korea, 60Hz frequency is employed as a standard which means that the direction of current changes from (+) to (–) 60 times for 1 minute.

Rating

- This means what is designed to be suitable for the requirements specified in the motor and when satisfied with the use conditions, the use limit is called 'rating'.
- This designates voltage, current, r/min, frequency which determine the use limit for output. We call it rated output, rated voltage, rated current, rated r/min, and rated frequency.
- Rating includes continuous rating, short-time rating and intermittent periodic rating.

● Continuous Rating

- When using continuously under the designated condition, if it is available to use continuously without exceeding the prescribed temperature rising and general condition, it is called 'continuous rating'. (e.g. Induction motor)

● Short-time Rating

- When operating during the prescribed time under the designated condition, if it is available to use without exceeding the prescribed temperature rising and general condition, it is called 'short-time rating'. (e.g. Reversible motor)

● Intermittent Periodic Rating

- When repeating run and stop periodically with constant load under the prescribed condition, if it is available not exceed general condition such as the prescribed temperature rising etc., it is called 'intermittent periodic rating'.

Output

- Output is the thing which can be done by motor during the unit time and it is determined by r/min x torque. The value of rated output is indicated as follows:

Output = 1.027xTxN [WATTS]
T: TORQUE [kgf·m]
N: Number of rotation [r/min]

- Rated output: It indicates the output which is generated continuously under the condition of designated voltage and frequency. This designated voltage and frequency is called the rated voltage and rated frequency. At this time, the rated output is called generally the output of motor.

A Information

Terminology

Torque and r/min

- Torque of motor is the revolution force to turn the body of revolution. The unit is [gf·cm] or [kgf·cm] and SI unit is N.m.
- The torque of 1kgf·cm is the revolution force when 1kg of force is applied to the right angle from the point of outer circle which radius of the body of revolution is 1cm.

● Starting Torque (① in figure 1)
- This is the revolving force generated when motor starts and is called 'locked rotor torque' or 'starting torque'.
- If the bigger force than this torque is applied to the motor, the motor does not revolve.

● Stalling Torque (② in figure 1)
- The maximum torque of motor is breakdown torque.
- If there is a load more than maximum torque during operation, motor will stop.

● Rated Torque (③ in figure 1)
- It is the torque when the motor is the rated r/min.
- The torque when the rated output is generated continuously by applying the rated voltage to the motor.

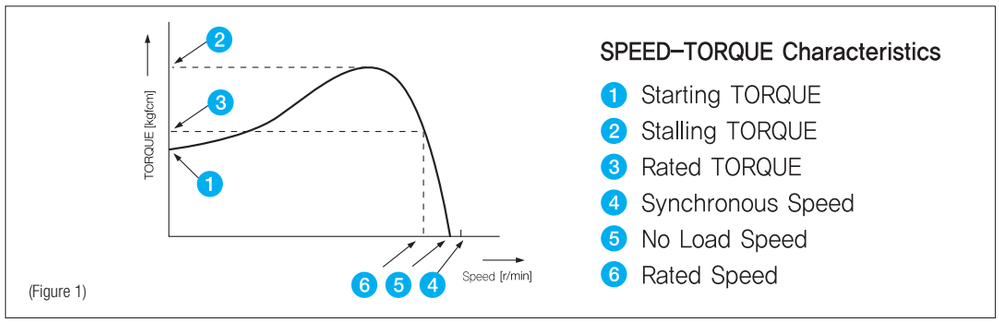
● Synchronous Speed (④ in figure 1)
- It is r/min which is determined by the power frequency and the number of pole of motor.

$NS = 120f/P$ [r/min]

NS : Synchronous r/min [r/min]
P : The number of pole of motor
f : Power frequency [Hz]
120 : Constant number
r/min : Revolution per minute

● No Load Speed (⑤ in figure 1)
- It is r/min when motor revolves without applying any load to motor output shaft. In this case, motor revolves low about 20~80[r/min] than synchronous r/min in Induction Motor or Reversible Motor.

● Rated Speed (⑥ in figure 1)
- It is r/min when rate r/min is generated by applying the rated load to the motor, and the most ideal r/min in use.



(Figure 1)

SPEED–TORQUE Characteristics
1 Starting TORQUE
2 Stalling TORQUE
3 Rated TORQUE
4 Synchronous Speed
5 No Load Speed
6 Rated Speed

Slippage

- Slippage can be described in the following formula as one of the rotational speed.

$$S = \frac{NS-N}{NS} \text{ or } N = NS \times (1-S)$$

NS : Synchronous r/min [r/min]
N : r/min at Temporary load [r/min]
S : SLIP

For example, if induction motor with 4 pole and 60Hz operates at SLIP S=0.1,

$$N = \frac{120 \times 60}{4} \times (1-0.1) = 1620 \text{ [r/min]}$$

Permissible Torque

- It is the maximum torque available when operating the motor. This is limited by rated torque of motor, temperature rising, and the strength of gearhead to combine.

Overrun

- This is the angle (r/min) that indicates the excessive revolution of motor from the moment of power shutdown to the stop.

Gearhead

Gear Reduction Ratio

- Gearhead is a speed converter using a gear and an instrumental device to reduce the r/min of motor into the required r/min and get bigger torque. Gear reduction ratio is a rate in which the gearhead decelerates the motor's r/min.
- There are two groups of gear reduction ratio; one is for 3, 5, 7.5, 12.5, 15… and the other is 3.6, 6, 9, 15, 18… which are 1.2 times the previous group so that you can obtain approx. the same output speed for both 50Hz and 60Hz.

Maximum Permissible Torque

- It is maximum load torque which can be applied to the output shaft of the gearhead.
- It is determined by the mechanical strength such as material of gearhead, gear teeth and bearing and the size of gearhead as well as the gear reduction ratio.

Transmission efficiency

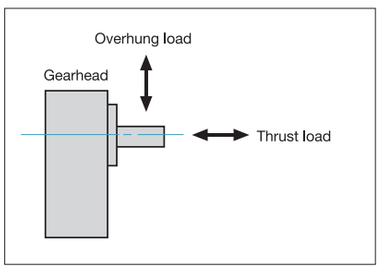
- It is an efficiency with which motor torque is increased by the gearhead and described in %.
- It is determined by the bearing, friction of the gear tooth and resistance of lubricating oil.
- In general, this efficiency is approx. 90% per stage of the gear. If gear ratio is higher, the number of gear will increase and the efficiency rate will decrease.

Service Factor

- It is a coefficient which is used to estimate the service life of the gearhead.
- This value is generally derived from experience and based on type of the load and operating conditions.
- The life of a gearhead during particular application is estimated by dividing the standard life expectancy by the service factor.

Overhung Load

- Overhung load is defined as a load applied to the output shaft in the right-angle direction.
- Maximum value of the overhung load which is applicable to the shaft is called as 'permissible overhung load'. This value varies depending on the type of gearhead and the distance from the edge of the shaft.



Thrust Load

- The thrust load is defined as a load applied to the output shaft in the axial direction.
- Maximum value of the thrust load which is applicable to the shaft is called as 'permissible thrust load'. This value varies depending on the type of the gearhead.

A Information

Caution for Using

Before using, read safety precautions carefully and use products properly. For the suggestions on using, they are classified as caution and warning.

⚠ Caution

- Make sure to check whether the things are what you ordered. If you install the other thing, there may occur the injury and/or the fire.
- The motor and the controlling unit should be used only by the designated compounding. If not, the fire may occur.
- The motor should be used after it is fixed tightly. If not, the injury and/or the damage of the unit may occur.
- Make sure to check the rotating direction before connecting the machine. If not, the injury and/or the damage of the unit may occur.
- In case of connecting with the machine and beginning to operate, do in the state of emergency stop anytime. If not, the damage will occur.
- Use products only according to the specification of motor and controlling unit. If not, there will be dangerous fire, electric shock, injury and/or damage of the unit.
- Do not place any obstacle around motor which can disturb circulation of air. It could be cause of overheating or breakdown.
- Do not put the fingers or things into the outlet of the unit. There may be electric shock, injury or danger of fire.
- Do not operate with the wet hands. The electric shock may occur.
- In case of moving, do not catch the output shaft, connecting part or the lead wire. There may be the injury by the drop.
- Do not touch the rotating part (output shaft, cooling fan) in running. It could be cause of injury.
- Do not touch the side of the motor output shaft (key way, cutting part) with the naked hands. It could be cause of injury.
- Make sure to install the overload device because the protection device is not attached to the motor. It is desirable to install other protection devices other than overload protection device to prevent fire.
- Electromagnetic brake is not for holding the load certainly and it doesn't hold the load if thermal protector (TP) works. So if the safety brake is needed, install another braking system.
- If there are abnormal cases, turn off the power at once. If not, there will be the electric shock, injury and the damage.
- In operating and right after the operation, do not touch the controlling device by your hands or body. The fire will occur.
- In scrap of motor, disassemble and treat it as industrial waste as possible.

⚠ Warning

- Never put around the explosive atmosphere, gas to be burnt, corrosive air, the location to be wet and combustibles. If not, there will be the electric shock and the fire.
- In case of movement, connection and checking of motor please turn off the electric power.
- Make sure to connect motor and speed controller based on the connection diagram. If not, there will be the electric shock and the fire.
- The power cable and the lead wire should not be bent, pulled and inserted by force. If not, the electric shock and the fire may occur.
- In case of the motor and controlling unit are attached to the machine, never touch with hand or connect with the earth. If not, the electric shock may take place.
- Never operate in the state of exposing the flowing current. If not, the electric shock may take place.
- In case of interruption of electric power and wiring the protection of overheat, please turn off the power. When motors are working continuously, there may be injury and damage of the unit.
- Within the 30 seconds after the power off, do not touch the output terminal of the controlling unit. If not, the electric shock may occur because of the residual volts.