Gear-heads

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Technical Data of Gearhead

Definition and Function of Gearhead

It is a speed converter using gears and an instrumental device to reduce the rpm of motor into the required rpm and get a bigger torque.

The Kind of DKM Gearhead

According to Frame Size

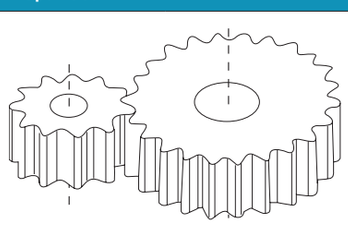
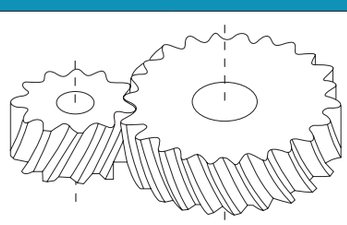
Frame Size □60mm GEARHEAD / Frame Size □70mm GEARHEAD / Frame Size □80mm GEARHEAD / Frame Size □90mm GEARHEAD

According to Direction of Output Shaft of Gearhead

- **Parallel Gearhead**

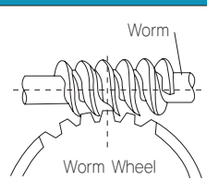
Parallel Gearhead is the most common type in small geared motor. DKM employs spur type and helical type. Especially the helical gear is employed for the low-noise and high-strength performance. Regarding noise the important part in gear is the contacting point with motor shaft which rotating rapidly. DKM employed helical gear which cut high precisely in that point and realized low-noise performance.

General Box Type (GB Type)	Powerful Box Type (PB Type)	Powerful Flange Type (PF Type)	High Powerful Box Type (HB Type)	High Powerful Flange Type (HF Type)	Inter-decimal Gearhead
					

Spur Gear		Helical Gear	
The spur gear is cylindrical gear on which the teeth are cut parallel to the shaft.		The helical gear has teeth cut in helical curve. Its high rate of contact has the advantages of low noise and higher strength comparing the spur gear.	

- **Worm Gearhead**

Worm Gearhead has the advantage of using the limited space with high efficiency and realizes the cost saving effect by the reduction of using power transmission part like coupling. DKM has worm solid type (for up to 120W) and worm hollow type (for 60W~200W).

Worm Solid Type (W Type, Left Output Shaft)	Worm Solid Type (W Type, Right Output Shaft)	Worm Solid Type (W Type, Bi-Directional Output Shaft)	Worm Hollow Type (WH Type)	Worm Wheel
				 Worm Gear transmits power to right-angle direction by threaded worm and worm wheel.

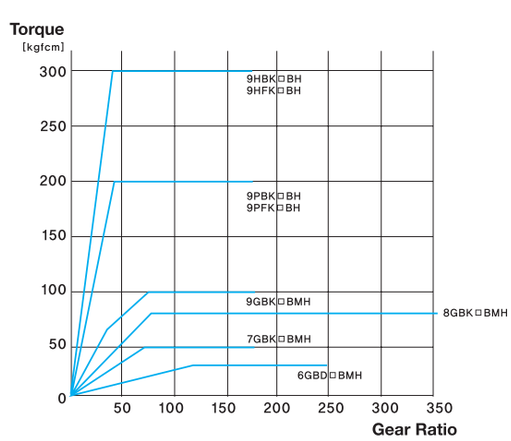
List of Gearhead Type

Type		Motor Output	Gearhead Model	Bearing Type	Frame Type
Parallel Gearhead	G Type (Gerneral)	6W	6GBD□MH	Metal Bearing	Box Type
		6W, 10W, 15W	7GBK□BMH	Ball Bearing + Metal Bearing	Box Type
		15W, 25W	8GBK□BMH	Ball Bearing + Metal Bearing	Box Type
		40W	9GBK□BMH	Ball Bearing + Metal Bearing	Box Type
	P Type (Powerful)	60W~120W	9PBK□BH	Ball Bearing	Box Type
			9PFK□BH	Ball Bearing	Flange Type
	H Type (High Powerful)	60W~200W	9HBK□BH	Ball Bearing	Box Type
			9HFK□BH	Ball Bearing	Flange Type
Worm Gearhead	W Type (Worm Solid)	15W, 25W	8WD□BL/□BR/□BRL	Ball Bearing	–
		40W~120W	9WD□BL/□BR/□BRL	Ball Bearing	–
	WH Type (Worm Hollow)	60W~200W	9WHD□	Ball Bearing	–
Inter-decimal Gearhead		15W, 25W	8XD10M□	Metal Bearing	Box Type
		40W~200W	9XD10M□	Metal Bearing	Box Type

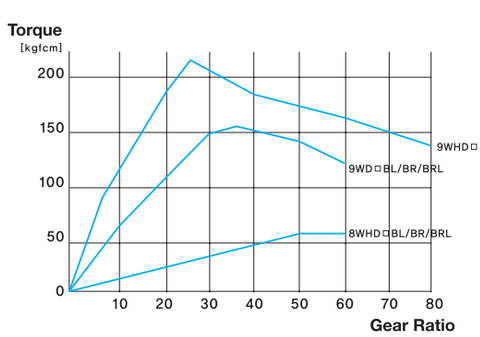
Maximum Permissible Torque and Efficiency of Gearhead

The output torque of gearhead is in proportion to the gear ratio. But there is limit in the size of load which can be applied to the gearhead in specific gear ratio depending on gear construction and materials etc. affecting the gearhead mechanical strength. This torque is called the maximum permissible torque. The maximum permissible torques of typical gearheads are shown in the figure.

Max. Permissible Torque of Parallel Gearhead



Max. Permissible Torque of Worm Gearhead



- The calculation of permissible torque at output shaft of gearhead is as below:

$$TG = TM \times i \times \eta$$

TG : Output torque of gearhead
TM : Motor torque
i : Gear reduction ratio
η : Gearhead efficiency

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Technical Data of Gearhead

Efficiency of Parallel Gearhead

Model \ Ratio	2	3	3.6	5	6	7.5	9	10	13	15	18	20	25	30	36	40	50	60	75	90	100	120	150	180	200	250	300	360
6GBD□MH	81%											73%					66%											
7GBK□BMH																												
8GBK□BMH																												
9GBK□BMH																												
9PBK□BH	81%									73%			66%				59%											
9PFK□BH																												
9HBK□BH																												
9HFK□BH																												

* The efficiency of Inter-decimal gearhead (8XD10M□, 9XD10M□) is 81%.

Efficiency of Worm Gearhead

Model \ Ratio	7.5	10	12	15	18	20	25	30	36	40	50	60	80
8WD □BL/□BR/□BRL	60%												
9WD □BL/□BR/□BRL													
9WHD□	60%							55%					

Speed and Direction of Rotations

Speed

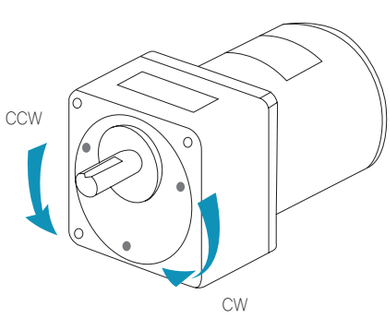
This refers to the speed of rotation in the gearhead output shaft. The speed is calculated by dividing the motor's synchronous speed by the gear ratio.
The actual speed, according to the load condition, is 2~20% less than the displayed value.
The speed is calculated with the following equation:

$$NG = \frac{NM}{i} \text{ [r/min]}$$

NG: Speed of gearhead [r/min]
NM: Speed of motor [r/min]
i: Gear reduction ratio

Direction of Rotation

This refers to the direction of rotation viewed from the output shaft. The direction of gearhead shaft rotation may differ from motor shaft rotation depending on the gear ratio of the gearhead.



Rotating Direction of Gearhead Output Shaft

Model \ Ratio	2	3	3.6	5	6	7.5	9	10	13	15	18	20	25	30	36	40	50	60	75	90	100	120	150	180	200	250	300	360
6GBD□MH	–																										–	–
7GBK□BMH	–			–				–				–				–									–	–	–	–
8GBK□BMH	–							–				–																
9GBK□BMH												–													–	–	–	–
9PB(F)K□BH								–																	–	–	–	–
9HB(F)K□BH	–			–		–		–								–									–	–	–	–

* In case of using inter-decimal gearhead, the rotating speed of output shaft will reduce by 10:1 but the rotating direction is the same as the gearhead's direction.

– not available
same direction as the motor
opposite direction as the motor

Gearhead Life Expectancy and Service Factor

- Life expectancy of gearhead varies depending on load fluctuation and is determined by the 'service factor' based on its load. Service factor 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 standard life can be expected when the product is operated at service factor 1.0. The life of a component during particular application is estimated by dividing the standard life expectancy by the service factor. For example, if the motor is operating with an ordinary load for 8 continuous hours a day, the service factor is 1.0. Thus, if the operation continues within the permissible torque for the gearhead and within the range of prescribed temperature (letting the gearhead case temperature stay below 50℃), the life expectancy of the gearhead is 10,000 hours for the ball bearing type and 2,000 hours for the metal type. However, if a ball bearing type of gearhead is operating for 24 hours a day, the service factor becomes 1.5 so that the life expectancy decreases to 1/1.5. Therefore the service factor should be taken into account to select such a motor and a gearhead which have biggest permissible torque.

- **Example of Load and Service Factor**

Type of Load	Service Factor			Operation Example
	5 hours/day	8 hours/day	24 hours/day	
Constant	0.8	1.0	1.5	Unidirectional, continuous run
Light impact/Changeable load	1.2	1.5	2.0	Frequent start/stop, reverse
Heavy impact	1.5	2.0	2.5	Very frequent start/stop, reverse

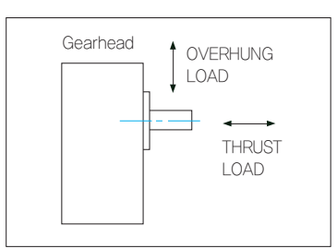
- **Standard Life Expectancy**

Ball Bearing Type*	10,000 hours
Metal Bearing Type	2,000 hours

* 5,000 hours when used on reversible motor

Overhung Load and Thrust Load

- The overhung load is defined as a load applied to the output shaft in the right-angle direction. This load is generated when the gearhead is coupled to the machine using a chain, belt, etc., but not when the gearhead is directly connected to the coupling. The thrust load is defined as a load applied to the output shaft in the axial direction.



- Since the overhung load exerts a load directly on the bearing, it affects the life span of the gearhead. The overhung load can be calculated from the following equation.

$$W = \frac{KxTxf}{r} \ [kg]$$

W: Overhung load [kg]
K: Weight coefficient by driving method (refer to the right table)
T: Delivery force of a gearhead output shaft [kgfcm]
F: Service factor
R: Effective radius of gear, pulley, etc. [cm]

Load Coefficient by Driving Method

Driving Method	K
Chain, Sprocket	1
Gear	1.25
V-Belt	1.5
Plat-Belt	2.5

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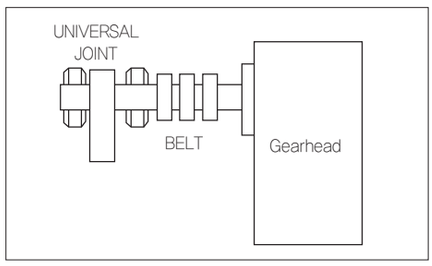
- If the motor operates with the calculated overhung load exceeds the maximum allowable value in below table, the output shaft may bend and the fatigue deformation may occur due to the repeated load. So consider it and take care in sizing.

Model	Gear Ratio	Permissible Overhung Load N		Permissible Thrust Load N
		10mm Distance from Shaft End	20mm Distance from Shaft End	
6GBD□MH	3 ~ 18	50	80	30
	20 ~ 250	120	180	
7GBK□BMH	3 ~ 18	80	120	40
	25 ~ 180	150	250	
8GBK□BMH	3 ~ 18	100	150	50
	25 ~ 360	200	300	
9GBK□BMH	3 ~ 18	250	350	100
	25 ~ 180	300	450	
9PBK□BH 9PFK□BH	3 ~ 9	400	500	150
	12.5 ~ 20	450	600	
	25 ~ 180	500	700	
9HBK□BH 9HFK□BH	50 ~ 180	400	600	150
8WD□BL 8WD□BR 8WD□BRL	10 ~ 60	300	450	100
9WD□BL 9WD□BR 9WD□BRL	10 ~ 60	500	700	150

- In the case of that calculated overhung load value exceeds above allowable value, please set up the structure of the motor as below to withstand the overhung load.
- Also, if a load should be directly imposed on the output shaft, please place the load as near to the gearhead as possible to avoid the one-sided load.
- In the case of that a helical gear or a worm gear is employed as an output delivery mechanism, make sure not to exceed both the overhung load and the thrust load simultaneously.



Backlash Noise of Gearhead

Operating Noise of Gearhead

The backlash noise can be indicated by operating noise value. DKM Gearhead's operating noise is like below.

Frame Size	Limit of Operating Noise
70mm	40dB
80mm	42dB
90mm	49dB

Reference i) Operating noise value is the value measured beside gearhead with 1m distance.
ii) dB (decibel) is a unit of measurement which is used to indicate how loud a sound is.
iii) Level of operating noise (Ref. value)

20dB —— The sound of a leaf is shaking
30dB —— The sound in suburb of city in night time
40dB —— The sound in a silent park
50dB —— The sound in a silent office

The Check Point of Gearhead Noise

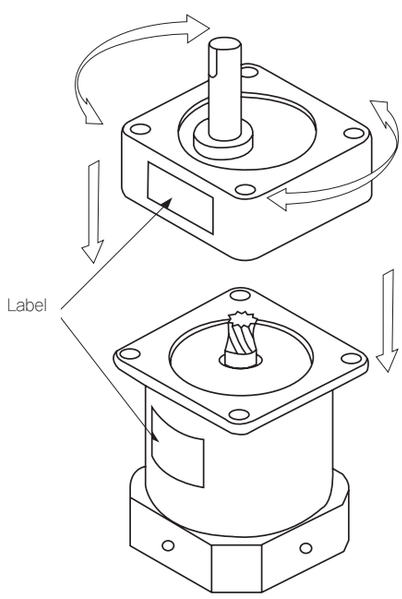
- **Noise in No Load**
  The backlash noise depends on the situation of load. For example, in case of no load rotation, gear could pop and crash between them therefore there could be little vibration and it could cause noise. This noise can be restrained and controlled by carrying some friction load.

- **Noise in Mounting with Load**
  When mounting is not good in mounting plate, there could be some noise by vibration caused from eccentric force. In this case, please check the mounting situation.

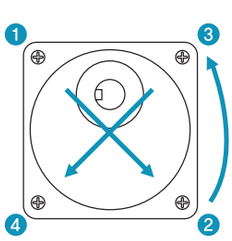
- **Noise of Damaged Gear**
  In assembly gearhead and motor, users have to turn the gearhead slowly according to the shape of pinion. Otherwise gear could get damaged. And by over load gear could get damaged. As a result there may some abnormal noise in gearhead. So please handle gearhead with special care in assembly.

Assembly Method of Motor and Gearhead

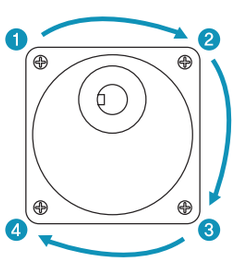
- To assemble the motor and the gearhead, adjust the assembling faces together in such a way as shown in below figure and turn slowly to complete the assembly. When doing the assembly, special care should be taken neither to exert excessive force on the motor shaft nor to hit inside of the gearhead. Otherwise, the gear will get damaged, resulting in an abnormal noise and a shortened lifetime of the motor.



- Use the provided mounting screws for set mounting of gearhead and motor, and tighten the screws correctly. Be sure there is no-gab between motor flange, gearhead surface and the mounting surface.



Correct



Wrong

D Gearheads

Parallel Gearhead

G Type General Box Type Gearhead

Frame Size 60mm Model: 6GBD□MH – Max. Permissible Torque

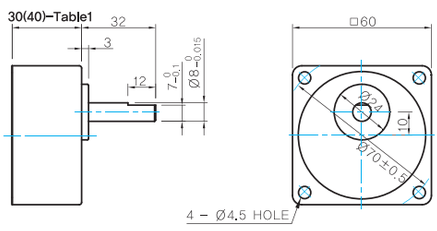
* These are reference figures when the gearhead is attached to the induction motor.

Motor Output	Gear Ratio		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
	60Hz	r/min	600	500	360	300	240	200	180	144	120	100	90	72	60	50	45	36	30	24	20	18	15	12	10	9	7.2
	50Hz		500	417	300	250	200	166	150	120	100	83	75	60	50	41	37	30	25	20	16	15	12	10	8	7.5	6
6W	60Hz	kgfcm	1.0	1.3	1.7	2.1	2.6	3.1	3.5	4.4	5.2	6.3	6.3	7.9	9.5	11.3	12.6	14.3	17.1	21.4	25.7	28.6	30.0	30.0	30.0	30.0	30.0
	50Hz		1.2	1.4	2.0	2.3	2.9	3.5	3.9	4.9	5.9	7.0	7.1	8.8	10.6	12.7	14.1	16.0	19.2	24.0	28.8	30.0	30.0	30.0	30.0	30.0	30.0

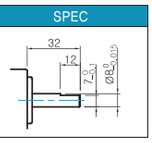
1) Enter the gear ratio in the box (□) within the gearhead model name.
2) A colored background indicates gear shaft rotation in the same direction as the motor shaft; a white background indicates rotation in the opposite direction.
3) The rotating speed is calculated by dividing the motor's synchronous 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.
4) Caculation of N.m ≒ kgfcm X 0.98

Dimensions

● Model: 6GBD□MH



● GEARHEAD OUTPUT SHAFT

MODEL	SPEC
D-CUT TYPE	

● 30(40)-Table1

SIZE(mm)	GEAR RATIO
30	6GBD3MH – 6GBD18MH
40	6GBD20MH – 6GBD250MH

● WEIGHT

Model	WEIGHT(Kg)
6GBD3MH ~ 6GBD18MH	0.3
6GBD20MH ~ 6GBD40MH	0.32
6GBD50MH ~ 6GBD250MH	0.34

Frame Size 70mm Model: 7GBK□BMH – Max. Permissible Torque

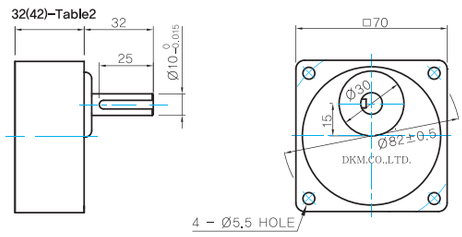
* These are reference figures when the gearhead is attached to the induction motor.

Motor Output	Gear Ratio		3	3.6	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180
	60Hz	r/min	600	500	300	240	200	144	120	100	72	60	50	36	30	24	20	18	15	12	10
	50Hz		500	416	250	200	166	120	100	83	60	50	41	30	25	20	16	15	12.5	10	8.3
6W	60Hz	kgfcm	1.4	1.6	2.7	3.4	4.1	5.7	6.8	8.2	10.3	12.4	13.5	18.7	22.4	28.1	33.7	37.4	44.9	50.0	50.0
	50Hz		1.7	2.1	3.5	4.4	5.2	7.3	8.7	10.5	13.1	15.8	17.1	23.8	28.6	35.7	42.8	47.6	50.0	50.0	50.0
10W	60Hz		1.7	2.1	3.4	4.3	5.2	7.2	8.6	10.3	12.9	15.5	16.9	23.5	28.2	35.2	42.2	46.9	50.0	50.0	50.0
	50Hz		2.1	2.5	4.2	5.2	6.3	8.7	10.5	12.5	15.8	18.9	20.6	28.6	34.3	42.8	50.0	50.0	50.0	50.0	50.0
15W	60Hz		2.5	3.0	5.0	6.2	7.5	10.4	12.5	14.9	18.8	22.5	24.5	34.0	40.8	50.0	50.0	50.0	50.0	50.0	50.0
	50Hz		3.5	4.2	7.0	8.7	10.5	14.5	17.4	20.9	26.3	31.5	34.3	47.6	50.0	50.0	50.0	50.0	50.0	50.0	50.0

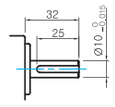
1) Enter the gear ratio in the box (□) within the gearhead model name.
2) A colored background indicates gear shaft rotation in the same direction as the motor shaft; a white background indicates rotation in the opposite direction.
3) The rotating speed is calculated by dividing the motor's synchronous 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.
4) Caculation of N.m ≒ kgfcm X 0.98

Dimensions

● Model: 7GBK□BMH



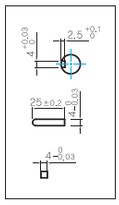
● GEARHEAD OUTPUT SHAFT

MODEL	SPEC
KEY TYPE	

● 32(42)–Table2

SIZE(mm)	GEAR RATIO
32	7GBK3BMH – 7GBK18BMH
42	7GBK25BMH – 7GBK180BMH

● KEY SPEC



● WEIGHT

Model	WEIGHT(Kg)
7GBK3BMH ~ 7GBK18BMH	0.36
7GBK25BMH ~ 7GBK30BMH	0.44
7GBK36MH ~ 7GBK180MH	0.5

Frame Size 80mm Model: 8GBK□BMH Max. Permissible Torque

* These are reference figures when the gearhead is attached to the induction motor.

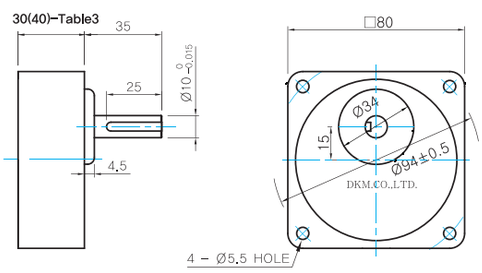
Motor Output	Gear Ratio		3	3.6	5	6	7.5	9	12.5	15	18	25	30	36
	60Hz	r/min	600	500	360	300	240	200	144	120	100	72	60	50
	50Hz		500	417	300	250	200	167	120	100	83	60	50	42
15W	60Hz	kgfcm	3.0	3.6	5.0	6.0	7.5	9.0	12.5	14.9	17.9	22.5	27.0	29.4
	50Hz		3.5	4.2	5.8	7.0	8.7	10.5	14.5	17.4	20.9	26.3	31.5	34.3
25W	60Hz		4.5	5.4	7.5	9.0	11.2	13.4	18.7	22.4	26.9	33.8	40.5	44.1
	50Hz		5.5	6.6	9.1	11.0	13.7	16.4	22.8	27.4	32.9	41.3	49.5	53.9

Motor Output	Gear Ratio		40	50	60	75	90	100	120	150	180	200	250	300	360
	60Hz	r/min	45	36	30	24	20	18	15	12	10	9	7	6	5
	50Hz		38	30	25	20	17	15	13	10	8	7	6	5	5
15W	60Hz	kgfcm	32.6	40.8	49.0	61.2	73.4	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0
	50Hz		38.1	47.6	57.1	71.4	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0
25W	60Hz		49.0	61.2	73.4	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0
	50Hz		59.8	74.8	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0

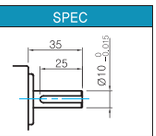
1) Enter the gear ratio in the box (□) within the gearhead model name.
2) A colored background indicates gear shaft rotation in the same direction as the motor shaft; a white background indicates rotation in the opposite direction.
3) The rotating speed is calculated by dividing the motor's synchronous 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.
4) Caculation of N.m ≒ kgfcm X 0.98

Dimensions

● Model: 8GBK□BMH



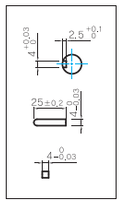
● GEARHEAD OUTPUT SHAFT

MODEL	SPEC
KEY TYPE	

● 30(40)–Table3

SIZE(mm)	GEAR RATIO
30	8GBK3BMH – 8GBK18BMH
40	8GBK25BMH – 8GBK360BMH

● KEY SPEC



● WEIGHT

Model	WEIGHT(Kg)
8GBK3BMH ~ 8GBK18BMH	0.48
8GBK25BMH ~ 8GBK30BMH	0.61
8GBK36BMH ~ 8GBK180BMH	0.67
8GBK200BMH ~ 8GBK360BMH	0.63

D Gearheads

Parallel Gearhead

Frame Size 90mm Model: 9GBK□BMH – Max. Permissible Torque

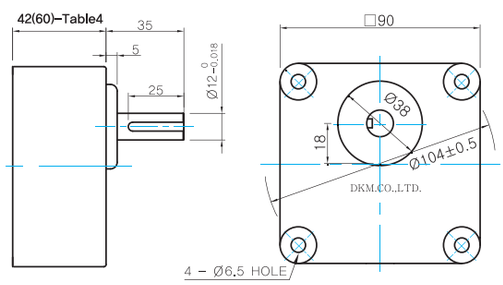
* These are reference figures when the gearhead is attached to the induction motor.

Motor Output	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
	60Hz	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
	50Hz		750	500	417	300	250	200	167	150	120	100	83	60	50	42	38	30	25	20	17	15	13	10	8
40W	60Hz	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
	50Hz		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

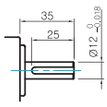
1) Enter the gear ratio in the box (□) within the gearhead model name.
2) A colored background indicates gear shaft rotation in the same direction as the motor shaft; a white background indicates rotation in the opposite direction.
3) The rotating speed is calculated by dividing the motor's synchronous 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.
4) Caculation of N.m ≒ kgfcm X 0.98

Dimensions

● Model: 9GBK□BMH



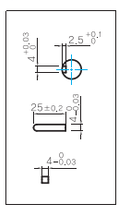
● GEARHEAD OUTPUT SHAFT

MODEL	SPEC
KEY TYPE	

● 42(60)–Table4

SIZE(mm)	GEAR RATIO
42	9GBK2BMH – 9GBK15BMH
60	9GBK18BMH – 9GBK180BMH

● KEY SPEC

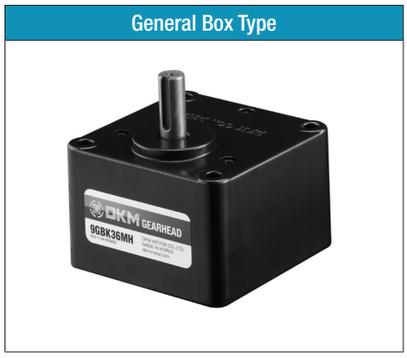


● WEIGHT

Model	WEIGHT(Kg)
9GBK2BMH ~ 9GBK15BMH	0.67
9GBK18BMH ~ 9GBK30BMH	0.96
9GBK36BMH ~ 9GBK180BMH	1.07

Gearhead Image

General Box Type

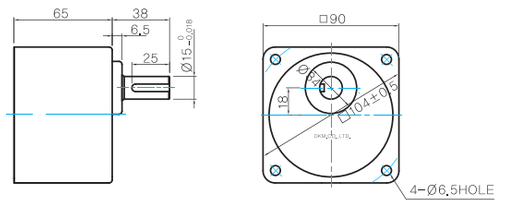


P Type

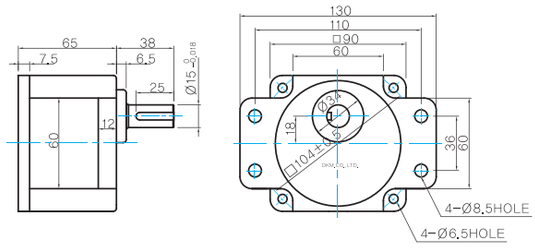
Powerful Box / Flange Type Gearhead

Dimensions

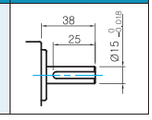
● Model: 9PBK□BH



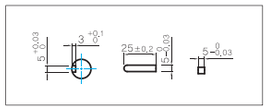
● Model: 9PFK□BH



● MOTOR OUTPUT SHAFT

MODEL	SPEC
KEY TYPE	

● KEY SPEC



WEIGHT

Model	WEIGHT(Kg)
9PB(F)K2BH ~ 9PB(F)K18BH	1.3
9PB(F)K20BH ~ 9PB(F)K180BH	1.4

Gearhead Images

9PBK□BH

9PFK□BH

9PBK□BH/9PFK□BH – Max. Permissible Torque

* These are reference figures when the gearhead is attached to the induction motor.

Motor Output	Gear Ratio		2	3	3.6	5	6	7.5	9	12.5	15	18	20
	60Hz	r/min	900	600	500	360	300	240	200	144	120	100	90
	50Hz		750	500	417	300	250	200	167	120	100	83	75
60W	60Hz	kgfcm	7.0	10.5	12.5	17.4	20.9	26.1	31.4	39.4	47.3	56.7	57.1
	50Hz		8.6	12.9	15.5	21.6	25.9	32.4	38.8	48.8	58.5	70.2	70.7
90W	60Hz		11.3	16.9	20.3	28.2	33.9	42.3	50.8	63.8	76.5	91.8	92.5
	50Hz		12.3	18.4	22.1	30.7	36.9	46.1	55.3	69.4	83.3	99.9	100.6
120W	60Hz		12.6	18.9	22.7	31.5	37.8	47.3	56.8	71.3	85.5	102.6	103.4
	50Hz		16.3	24.4	29.3	40.7	48.8	61.0	73.2	101.7	122.0	146.4	162.7

Motor Output	Gear Ratio		25	30	36	40	50	60	75	90	100	120	150	180
	60Hz	r/min	72	60	50	45	36	30	24	20	18	15	12	10
	50Hz		60	50	42	38	30	25	20	17	15	13	10	8
60W	60Hz	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
	50Hz		88.4	106.1	127.3	141.4	176.8	200.0	200.0	200.0	200.0	200.0	200.0	200.0
90W	60Hz		115.6	138.7	166.5	185.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0
	50Hz		125.8	151.0	181.2	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0
120W	60Hz		129.2	155.0	186.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0
	50Hz		200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0

1) Enter the gear ratio in the box (□) within the gearhead model name.
2) A colored background indicates gear shaft rotation in the same direction as the motor shaft; a white background indicates rotation in the opposite direction.
3) 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.
4) Caculation of N.m ≒ kgfcm X 0.98

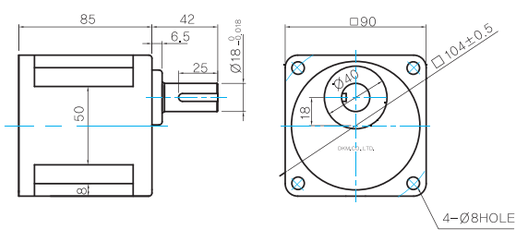
D Gearheads

Parallel Gearhead

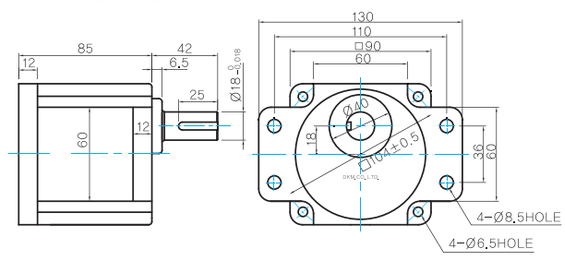
H Type High Powerful Box / Flange Type Gearhead

Dimensions

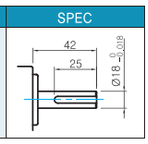
● Model: 9HBK□BH



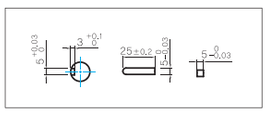
● Model: 9HFK□BH



● MOTOR OUTPUT SHAFT

MODEL	SPEC
KEY TYPE	

● KEY SPEC



WEIGHT

Model	WEIGHT(Kg)
9HB(F)K3BH ~ 9HB(F)K9BH	1.45
9HB(F)K12.5BH ~ 9HB(F)K18BH	1.5
9HB(F)K20BH ~ 9HB(F)K60BH	1.7
9HB(F)K75BH ~ 9HB(F)K180BH	1.8

Gearhead Images

9HBK□BH

9HFK□BH

9HBK□BH/9HFK□BH – Max. Permissible Torque

* These are reference figures when the gearhead is attached to the induction motor.

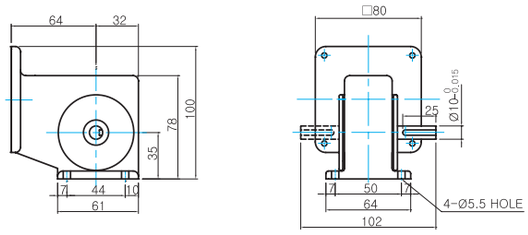
Motor Output	Gear Ratio		3	3.6	6	9	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
	60Hz	r/min	600	500	300	200	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
	50Hz		500	417	250	167	120	100	83	75	60	50	42	30	25	20	17	15	13	10	8
60W	60Hz	kgfcm	10.5	12.5	20.9	31.4	39.4	47.3	56.7	57.1	71.4	85.7	102.8	142.8	171.4	192.2	230.6	256.2	300.0	300.0	300.0
	50Hz		12.9	15.5	25.9	38.8	48.8	58.5	70.2	70.7	88.4	106.1	127.3	176.8	212.2	237.9	285.5	300.0	300.0	300.0	300.0
90W	60Hz		16.9	20.3	33.9	50.8	63.8	76.5	91.8	92.5	115.6	138.7	166.5	231.2	277.4	300.0	300.0	300.0	300.0	300.0	300.0
	50Hz		18.4	22.1	36.9	55.3	69.4	83.3	99.9	100.6	125.8	151.0	181.2	251.6	300.0	300.0	300.0	300.0	300.0	300.0	300.0
120W	60Hz		18.9	22.7	37.8	56.8	71.3	85.5	102.6	103.4	129.2	155.0	186.0	258.4	300.0	300.0	300.0	300.0	300.0	300.0	300.0
	50Hz		24.4	29.3	48.8	73.2	91.9	110.3	132.3	133.3	166.6	199.9	239.9	300.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0
150W	60Hz		24.2	29.0	48.3	72.5	90.9	109.1	131.0	131.9	164.9	197.9	237.5	300.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0
	50Hz		28.1	33.8	56.3	84.4	105.9	127.1	152.6	153.7	192.1	230.5	276.6	300.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0
180W	60Hz		27.4	32.9	54.8	82.2	103.1	123.8	148.5	149.6	187.0	224.4	269.3	300.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0
	50Hz		34.9	41.8	69.7	104.6	131.3	157.5	189.0	190.4	238.0	285.6	300.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0
200W	60Hz		32.4	38.8	64.7	97.1	121.9	146.3	175.5	176.8	221.0	265.2	300.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0
	50Hz		37.4	44.8	74.7	112.1	140.6	168.8	202.5	204.0	255.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0

1) Enter the gear ratio in the box (□) within the gearhead model name.
2) A colored background indicates gear shaft rotation in the same direction as the motor shaft; a white background indicates rotation in the opposite direction.
3) 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.
4) Caculation of N.m ≒ kgfcm X 0.98

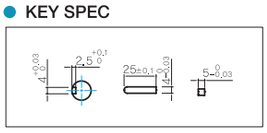
W Type Worm Solid Type Gearhead

Dimensions

● Model: 8WD□BL/BR/BRL



● KEY SPEC



● WEIGHT

Model	WEIGHT(Kg)
8WD□BL/BR/BRL	0.67

8WD□BL/□BR/□BRL Max. Permissible Torque

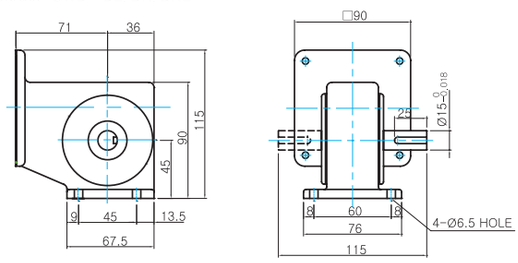
* These are reference figures when the gearhead is attached to the induction motor.

Motor Output	Gear Ratio		10	12	15	18	25	30	36	50	60
	60Hz	r/min	180	150	120	100	72	60	50	36	30
	50Hz		150	125	100	83	60	50	42	30	25
15W	60Hz	kgfcm	9.8	11.5	13.9	16.0	21.0	23.8	27.6	36.0	39.6
	50Hz		11.5	13.4	16.2	18.6	24.5	27.7	32.3	42.0	46.2
25W	60Hz		14.8	17.3	20.8	24.0	31.5	35.6	41.5	54.0	59.4
	50Hz		18.0	21.1	25.4	29.3	38.5	43.6	50.7	66.0	72.6

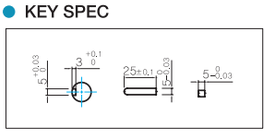
1) Enter the gear ratio in the box (□) within the gearhead model name.
2) The rotating speed is calculated by dividing the motor's synchronous speed (50Hz: 1,500r/min, 60Hz: 1,800r/min) by the gear ratio. The actual speed is 2~20% less than the displayed value, depending on the size of the load.
3) Caculation of N.m ≒ kgfcm X 0.98

Dimensions

● Model: 9WD□BL/BR/BRL



● KEY SPEC



● WEIGHT

Model	WEIGHT(Kg)
9WD□BL/BR/BRL	1.0

9WD□BL/□BR/□BRL Max. Permissible Torque

* These are reference figures when the gearhead is attached to the induction motor.

Motor Output	Gear Ratio		10	12	15	18	25	30	36	50	60
	60Hz	r/min	180	150	120	100	72	60	50	36	30
	50Hz		150	125	100	83	60	50	42	30	25
40W	60Hz	kgfcm	23.0	26.9	32.3	37.3	49.0	55.4	64.5	84.0	92.4
	50Hz		27.9	32.6	39.3	45.3	59.5	67.3	78.3	102.0	112.2
60W	60Hz		34.4	40.3	48.5	55.9	73.5	83.2	96.8	126.0	122.4
	50Hz		42.6	49.9	60.1	69.3	91.0	103.0	119.8	142.9	122.4
90W	60Hz		55.8	65.3	78.5	90.6	119.0	134.6	153.1	142.9	122.4
	50Hz		60.7	71.0	85.5	98.6	129.5	146.5	153.1	142.9	122.4
120W	60Hz		62.3	73.0	87.8	101.2	133.0	150.5	153.1	142.9	122.4
	50Hz		80.4	94.1	113.2	130.5	142.9	163.3	153.1	142.9	122.4

1) Enter the gear ratio in the box (□) within the gearhead model name.
2) 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.
3) Caculation of N.m ≒ kgfcm X 0.98

Gearhead Images

8(9)WD□BL	8(9)WD□BR	8(9)WD□BRL
		

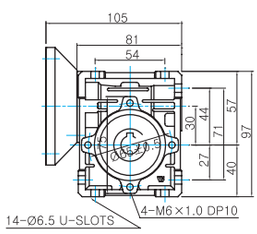
D Gearheads

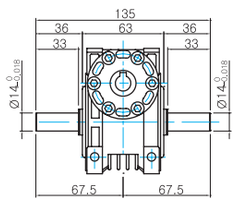
Worm Gearhead

WH Type Worm Hollow Type Gearhead

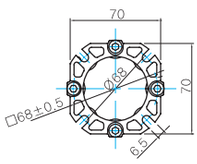
Dimensions

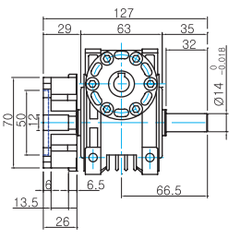
● Model: 9WHD□



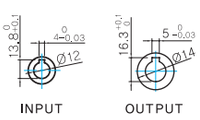


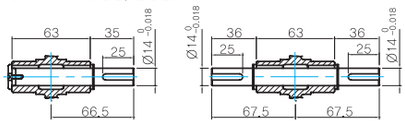
● FLANGE



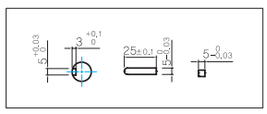


● SHAFT(한방향, 양방향)





● KEY SPEC



● WEIGHT

Model	WEIGHT(Kg)
9WHD□	1.13

* 출력 Flange와 Shaft는 별매입니다.

9WHD□ – Max. Permissible Torque

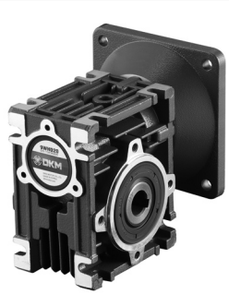
* These are reference figures when the gearhead is attached to the induction motor.

Motor Output	Gear Ratio		7.5	10	15	20	25	30	40	50	60	80
	60Hz	r/min	240	180	120	90	72	60	45	36	30	22
	50Hz		200	150	100	75	60	50	38	30	25	18
60W	60Hz	kgfcm	26.5	34.0	47.9	60.5	69.3	80.6	99.1	113.4	126.0	132.7
	50Hz		32.8	42.1	59.3	74.9	85.8	99.8	122.7	140.4	156.0	132.7
90W	60Hz		42.8	55.1	77.5	97.9	112.2	130.6	160.5	173.5	163.3	132.7
	50Hz		46.6	59.9	84.4	106.6	122.1	142.1	174.6	173.5	163.3	132.7
120W	60Hz		47.9	61.6	86.6	109.4	125.4	145.9	179.4	173.5	163.3	132.7
	50Hz		61.7	79.4	111.7	141.1	161.7	188.2	183.7	173.5	163.3	132.7
150W	60Hz		61.1	78.6	110.6	139.7	160.1	186.2	183.7	173.5	163.3	132.7
	50Hz		71.2	91.5	128.8	162.7	186.5	204.1	183.7	173.5	163.3	132.7
180W	60Hz		69.3	89.1	125.4	158.4	181.5	204.1	183.7	173.5	163.3	132.7
	50Hz		88.2	113.4	159.6	183.7	214.3	204.1	183.7	173.5	163.3	132.7
200W	60Hz		81.9	105.3	148.2	183.7	214.3	204.1	183.7	173.5	163.3	132.7
	50Hz		94.5	121.5	171.0	183.7	214.3	204.1	183.7	173.5	163.3	132.7

1) Enter the gear ratio in the box (□) within the gearhead model name.
2) 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.
3) Caculation of N.m ≒ kgfcm X 0.98

Gearhead Image

9WHD□



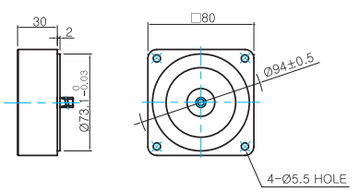
Inter-decimal Gearhead

Frame Size 80mm Model : 8XD10M□
Frame Size 90mm Model : 9XD10M□

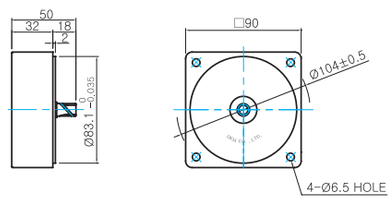
- In case of requiring high gear reduction ratio that cannot be generated by single gearhead, please use Inter-decimal Gearhead with general gearhead. And please be advised that in this case only revolution speed of output shaft will reduce by 10:1 without increasing of maximum permissible torque.
- Enter the model type of attaching gearhead (G/P/H/W/WH) in the box □ within the model name.

Dimensions

- Model: 8XD10M□



- Model: 9XD10H□



- WEIGHT

Model	WEIGHT(Kg)
8XD10M□	0.44
9XD10M□	0.5

Gearhead Image

Inter-decimal Gearhead