Gear Head

Contents

Outline of gear head

Features

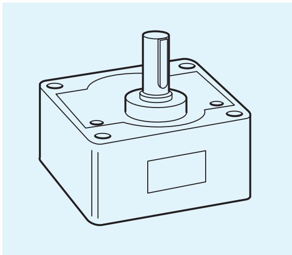
- Various types of gear heads are available.
- The X type is available in a metal bearing model and or a ball bearing type.
- The P type (90 mm sq. only) is high torque type: its maximum permissible shaft torque is 29.4 N·m (300 kgf·cm)
- 22 reduction ratios from 1/3 to 1/180 are available for the X type; 23 reduction ratios from 1/3 to 1/200 are available for the Y and Z types.
  When the decimal gear head (reduction ratio: 1/10) is used, a reduction ratio of up to 1/1800 (1/2000 for the Y and Z types) can be attained.
- The X type and Z type of 90 mm sq. are available in right-angle type.
- **Gear heads dedicated to C&B motors are available. The gear heads will withstand 2 million start and stop cycles.**

For allowable gear head permissible torque, see C&B motor (pp. B-342ff.).

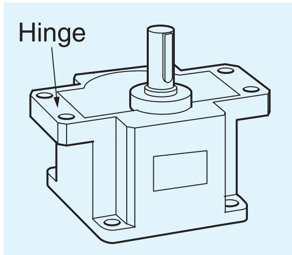
Gear type

A : 3 W or smaller / Hinge not attached (42 mm sq.)
X : 40 W or smaller / Hinge not attached
Z : 60 W or larger / Hinge not attached
Y : 60 W or larger / Hinge attached
R : 60 W or larger, High torque type / Hinge not attached
P : 60 W or larger, High torque type / Hinge attached

• Hinge not attached



• Hinge attached



• Gear type and reduction ratio list

Gear type		Motor capacity	Hinge	1/3	1/3.6	1/5	1/6	1/7.5	1/9	1/10	1/12.5	1/15	1/18	1/20	1/25	1/30	1/36	1/50	1/60	1/75	1/90	1/100	1/120	1/150	1/180	1/200
A		3 W or smaller	Not attached	○	○	○	○	○	○	–	○	○	○	–	○	○	○	○	○	○	○	○	○	○	○	–
X		40 W or smaller	Not attached	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–
Y		60W, 90W	attached	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Z		60W, 90W	Not attached	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
P		60W, 90W	attached	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○
R		60W, 90W	Not attached	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○
Right-angle	X	40 W or smaller	Not attached	○	○	○	○	○	○	–	○	○	○	–	○	○	○	○	○	○	○	○	○	○	○	–
Right-angle	Z	60W, 90W	Not attached	○	○	○	○	○	○	–	○	○	○	–	○	○	○	○	○	○	○	○	○	○	○	○
C&B	X	40 W or smaller	Not attached	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–
C&B	Y	60 W or larger	attached	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

(Reduction ratio columns: 1/3 to 1/200)

• Gear type and reduction ratio list (decimal gear head used)

Gear type		Motor capacity	Hinge	1/200	1/250	1/300	1/360	1/500	1/600	1/750	1/900	1/1000	1/1200	1/1500	1/1800	1/2000
X		40 W or smaller	Not attached	○	○	○	○	○	○	○	○	○	○	○	○	–
Y, P		60W, 90W	attached	○	○	○	○	○	○	○	○	○	○	○	○	○
Z, R		60W, 90W	Not attached	○	○	○	○	○	○	○	○	○	○	○	○	○
Right-angle	X	40 W or smaller	Not attached	–	○	○	○	○	○	○	○	○	○	○	○	–
Right-angle	Z	60W, 90W	Not attached	–	○	○	○	○	○	○	○	○	○	○	○	○

(Reduction ratio columns: 1/200 to 1/2000)

Coding system

M X 9 G 30 B A

- **X** – Output type
  - X : 40 W or smaller / Hinge not attached
  - Z : 60 W or larger / Hinge not attached
  - Y : 60 W or larger / Hinge attached
  - R : 60 W or larger, High torque type / Hinge not attached
  - P : 60 W or larger, High torque type / Hinge attached
- **9** – Size
  - 6 : 60 mm sq. (2.36 inch sq.)
  - 7 : 70 mm sq. (2.76 inch sq.)
  - 8 : 80 mm sq. (3.15 inch sq.)
  - 9 : 90 mm sq. (3.54 inch sq.)
- **G** – Gear head
- **30** – Reduction ratio
  - (Example) 30: Reduction ratio of 1/30
- **B** – Bearing
  - B : Ball bearing
  - M : Metal bearing
  - XB : Decimal gear head
  - R : Right-angle gear head (90 mm sq.: Applicable to MX and MZ only)
  - H : Gear head for C&B motor (Ball bearing)
- **A** – Thin gear head
  - A : Applicable to 60 mm sq. and 70 mm sq. gear heads with a reduction ratio of 1/25 or smaller, Blank for others
  - U : Gear head -inch (U.S.A.)

* The motor and gear are sold separately.

M 4 G A 30 F

- **4** – Size
  - 4 : 42 mm sq. (1.65 inch sq.)
- **G** – Gear head
- **A** – Type
  - For 42 mm sq. (1.65 inch sq.)
- **30** – Reduction ratio
  - (Example) 30 : Reduction ratio of 1/30
- **F** – Bearing
  - F : Ball bearing + Metal bearing

* The motor and gear are sold separately.

Calculation of torque at output shaft of gear head

• Standard gear head only

$$N_G = \frac{N_M}{i}$$

$$T_G = T_M \times i \times \eta$$

N_G : Speed of gear head (min^{-1})
N_M : Motor speed (min^{-1})
i : Reduction ratio of gear head
T_G : Output torque of gear head (N·m)
T_M : Motor torque (N·m)
η : Gear head efficiency

• With decimal gear head

$$N_G = \frac{N_M}{i \times i_D}$$

$$T_G = T_M \times i \times i_D \times \eta \times \eta_D$$

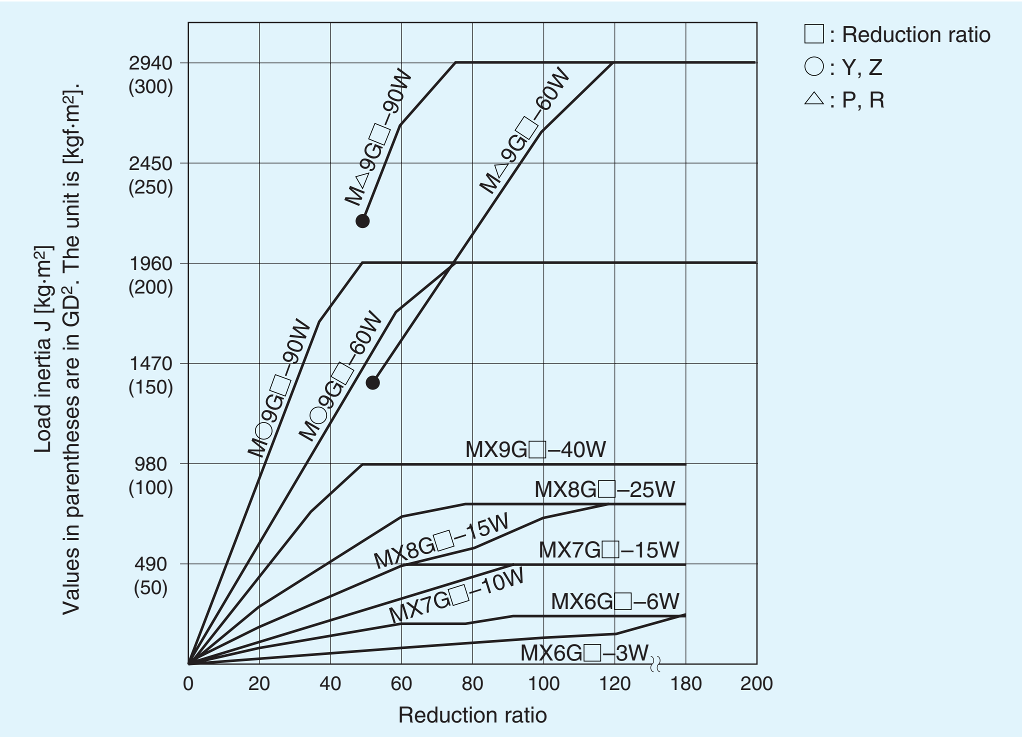
N_G : Speed of gear head (min^{-1})
N_M : Motor speed (min^{-1})
i : Reduction ratio of gear head
T_G : Output torque of gear head (N·m)
T_M : Motor torque (N·m)
η : Gear head efficiency
i_D : Reduction ratio of decimal gear head
η_D : Decimal gear head efficiency

* In the case of the variable speed motor, regard the serviceability limit torque as the motor torque.

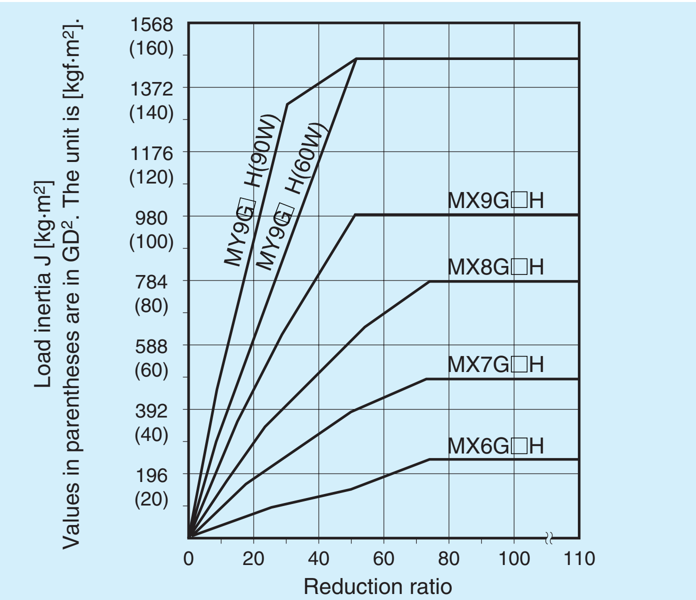
Maximum permissible torque

There is a limit to the strength of a gear due to its material and construction. The usable load torque determined based on this limit is called permissible torque. As can be seen from the above-mentioned formula, the load becomes larger when the reduction ratio is increased. If the gear head is used with the load exceeding the permissible torque, its life expectancy will be shortened significantly. Refer to the following graph and the permissible torque for each model and use the gear head at an appropriate load.

• Maximum permissible torque



• Maximum permissible torque (Gear head for C&B motor)



Nominal reduction ratio and actual reduction ratio

Note that there is a difference between the nominal reduction ratio and actual reduction ratio of each gear head. Refer to the table below. When using the gear head, calculate the speed based on the actual reduction ratio.

* Gear heads dedicated to C&B motors have the same nominal reduction ratio and actual reduction ratio. Example: nominal reduction ratio 1/3; actual reduction ratio 1/3

For practical use, calculate the speed based on the actual reduction ratio.

• Gear head

Nominal reduction ratio	Actual reduction ratio									
	M4GA□	MX6G□	MX7G□	MX8G□	MX9G□	MZ9G□ MY9G□	MR9G□ MP9G□	Right-angle type MX9G□R	Right-angle type MZ9G□R	for C&B motor
1/3	1/3	1/2.96	1/2.99	1/3.01	1/2.98	1/3.02	–	1/3.05	1/3.00	**1/3**
1/3.6	1/3.6	1/3.59	1/3.64	1/3.60	1/3.59	1/3.61	–	1/3.65	1/3.62	**1/3.6**
1/5	1/5	1/5.04	1/4.95	1/4.98	1/5.00	1/5.03	–	1/5.06	1/4.97	**1/5**
1/6	1/6	1/6.01	1/6.08	1/5.96	1/6.00	1/6.02	–	1/5.93	1/6.00	**1/6**
1/7.5	1/7.5	1/7.49	1/7.48	1/7.48	1/7.54	1/7.58	–	1/7.50	1/7.57	**1/7.5**
1/9	1/9	1/9.07	1/8.98	1/9.00	1/9.07	1/9.06	–	1/9.09	1/9.14	**1/9**
1/10	–	1/9.91	1/10.1	1/9.99	1/9.90	1/10.2	–	–	–	**1/10**
1/12.5	1/12.5	1/12.7	1/12.6	1/12.5	1/12.5	1/12.3	–	1/12.5	1/12.6	**1/12.5**
1/15	1/15	1/15.1	1/14.9	1/14.9	1/14.9	1/14.8	–	1/15.2	1/15.2	**1/15**
1/18	1/18	1/18.0	1/18.0	1/18.1	1/18.0	1/18.0	–	1/17.8	1/17.8	**1/18**
1/20	–	1/19.8	1/19.8	1/20.1	1/20.0	1/19.9	–	–	–	**1/20**
1/25	1/25	1/25.0	1/25.3	1/25.1	1/25.3	1/25.5	–	1/25.0	1/25.3	**1/25**
1/30	1/30	1/29.7	1/30.2	1/30.3	1/30.4	1/30.1	–	1/30.2	1/30.4	**1/30**
1/36	1/36	1/36.4	1/36.4	1/36.4	1/36.5	1/36.1	–	1/36.3	1/36.2	**1/36**
1/50	1/50	1/50.4	1/49.8	1/49.8	1/50.2	1/50.9	1/50.9	1/49.4	1/49.6	**1/50**
1/60	1/60	1/59.6	1/59.9	1/61.2	1/61.3	1/60.5	1/60.5	1/60.5	1/59.8	**1/60**
1/75	1/75	1/75.8	1/75.4	1/76.2	1/74.6	1/76.0	1/76.0	1/74.1	1/75.6	**1/75**
1/90	1/90	1/90.1	1/90.8	1/90.5	1/88.3	1/89.8	1/89.8	1/90.7	1/90.0	**1/90**
1/100	1/100	1/98.9	1/100.7	1/98.0	1/97.8	1/98.6	1/98.6	1/100.0	1/101.2	**1/100**
1/120	1/120	1/119.3	1/119.2	1/122.5	1/120.0	1/121.2	1/121.2	1/121.2	1/121.9	**1/120**
1/150	1/150	1/148.9	1/147.6	1/148.9	1/146.5	1/150.4	1/150.4	1/154.6	1/151.1	**1/150**
1/180	1/180	1/179.3	1/180.0	1/183.5	1/177.0	1/182.1	1/182.1	1/182.2	1/182.2	**1/180**
1/200	–	–	–	–	–	1/202.1	1/202.1	–	1/202.4	**1/200**

• Decimal gear head

Nominal reduction ratio	Actual reduction ratio				
	MX6G10XB	MX7G10XB	MX8G10XB	MX9G10XB	MZ9G10XB
1/10	1/10.04	1/9.93	1/9.94	1/10.0	1/9.97

Outline of gear head

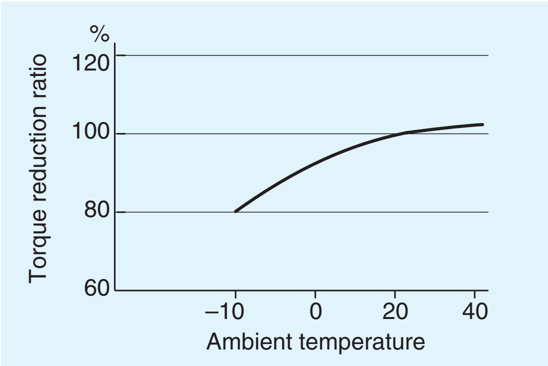
Gear head efficiency

<table>
<tr><th rowspan="2" colspan="2">Model No.</th><th colspan="23">Reduction ratio</th><th>Decimal gear head</th></tr>
<tr><th>3</th><th>3.6</th><th>5</th><th>6</th><th>7.5</th><th>9</th><th>10</th><th>12.5</th><th>15</th><th>18</th><th>20</th><th>25</th><th>30</th><th>36</th><th>50</th><th>60</th><th>75</th><th>90</th><th>100</th><th>120</th><th>150</th><th>180</th><th>200</th><th>10</th></tr>
<tr><td colspan="2">M4GA□F</td><td colspan="6">72%</td><td>—</td><td colspan="3">61%</td><td>—</td><td colspan="5">52%</td><td colspan="7">41%</td><td>—</td></tr>
<tr><td colspan="2">MX6G□B
MX7G□B
MX8G□B
MX9G□B</td><td colspan="11">81%</td><td colspan="11">75%</td><td>—</td><td>81%</td></tr>
<tr><td colspan="2">MZ9G□B
MY9G□B</td><td colspan="7">81%</td><td colspan="6">75%</td><td colspan="10">70%</td><td>81%</td></tr>
<tr><td colspan="2">MR9G□B
MP9G□B</td><td colspan="14">—</td><td colspan="9">70%</td><td>81%</td></tr>
<tr><td colspan="2">MX6G□M
MX7G□M
MX8G□M
MX9G□M</td><td colspan="11">72%</td><td colspan="11">61%</td><td>—</td><td>81%</td></tr>
<tr><td colspan="2">MX9G□R</td><td colspan="6">60%</td><td>—</td><td colspan="3">60%</td><td>—</td><td colspan="7">60%</td><td colspan="4">45%</td><td>—</td><td>81%</td></tr>
<tr><td colspan="2">MZ9G□R</td><td colspan="6">60%</td><td>—</td><td colspan="3">60%</td><td>—</td><td colspan="5">60%</td><td colspan="3">54%</td><td colspan="4">45%</td><td>81%</td></tr>
<tr><td rowspan="2">for C&B motor</td><td>MX6G□H
MX7G□H
MX8G□H
MX9G□H</td><td colspan="10">81%</td><td colspan="6">75%</td><td colspan="6">70%</td><td>—</td><td rowspan="2">—</td></tr>
<tr><td>MY9G□H</td><td colspan="5">81%</td><td colspan="5">75%</td><td colspan="6">70%</td><td colspan="7">65%</td></tr>
</table>

* When the decimal gear head is used, the total efficiency is the product of gear head efficiency and decimal gear head efficiency.

Gear head efficiency and ambient temperature

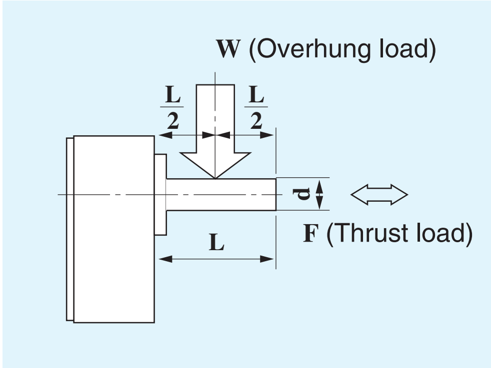
Calculate the actual gear head efficiency by multiplying the above-shown gear head efficiency at room temperature by the torque reduction ratio shown below.



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 gear head is coupled to the machine using a chain, belt, etc., but not when the gear head is directly connected to the coupling. As shown in the figure below, the permissible value is determined based on the load applied to the L/2 position of the output shaft.
The thrust load is defined as a load applied to the output shaft in the axial direction.
Because the overhung load and thrust load significantly affect the life of the bearing, take care not to allow the load during operation to exceed the permissible overhung load and thrust load shown in the table below.

• Overhung load and thrust load



• Permissible load list

<table>
<tr><th rowspan="2">Size</th><th rowspan="2">Model</th><th colspan="3">Permissible overhung load</th><th colspan="3">Permissible thrust load</th></tr>
<tr><th>N</th><th>kgf</th><th>lb</th><th>N</th><th>kgf</th><th>lb</th></tr>
<tr><td>42 mm sq. (1.65 inch sq.)</td><td>M4GA□F</td><td>20</td><td>2</td><td>4.4</td><td>15</td><td>2</td><td>4.4</td></tr>
<tr><td rowspan="2">60 mm sq. (2.36 inch sq.)</td><td>MX6G□B(A)</td><td>98</td><td>10</td><td>22</td><td rowspan="2">29</td><td rowspan="2">3</td><td rowspan="2">6.6</td></tr>
<tr><td>MX6G□M(A)</td><td>49</td><td>5</td><td>11</td></tr>
<tr><td rowspan="2">70 mm sq. (2.76 inch sq.)</td><td>MX7G□B(A)</td><td>196</td><td>20</td><td>44</td><td rowspan="2">39</td><td rowspan="2">4</td><td rowspan="2">8.8</td></tr>
<tr><td>MX7G□M(A)</td><td>98</td><td>10</td><td>22</td></tr>
<tr><td rowspan="2">80 mm sq. (3.15 inch sq.)</td><td>MX8G□B</td><td>294</td><td>30</td><td>66</td><td rowspan="2">49</td><td rowspan="2">5</td><td rowspan="2">11</td></tr>
<tr><td>MX8G□M</td><td>196</td><td>20</td><td>44</td></tr>
<tr><td rowspan="4">90 mm sq. (3.54 inch sq.)</td><td>MX9G□B</td><td>392</td><td>40</td><td>88</td><td rowspan="2">98</td><td rowspan="2">10</td><td rowspan="2">22</td></tr>
<tr><td>MX9G□M</td><td>294</td><td>30</td><td>66</td></tr>
<tr><td>MZ9G□B</td><td rowspan="2">588</td><td rowspan="2">60</td><td rowspan="2">132</td><td rowspan="2">147</td><td rowspan="2">15</td><td rowspan="2">33</td></tr>
<tr><td>MY9G□B</td></tr>
<tr><td rowspan="2">90 mm sq. (3.54 inch sq.) High torque type</td><td>MR9G□B</td><td rowspan="2">784</td><td rowspan="2">80</td><td rowspan="2">176</td><td rowspan="2">147</td><td rowspan="2">15</td><td rowspan="2">33</td></tr>
<tr><td>MP9G□B</td></tr>
<tr><td rowspan="2">90 mm sq. (3.54 inch sq.) Right-angle type</td><td>MX9G□R</td><td>392</td><td>40</td><td>88</td><td>98</td><td>10</td><td>22</td></tr>
<tr><td>MZ9G□R</td><td>588</td><td>60</td><td>132</td><td>147</td><td>15</td><td>33</td></tr>
</table>

Service factor

Life expectancy of motor varies depending on load fluctuation. To determine the life expectancy, a factor called service factor, as shown in the table below is used.First choose the appropriate service factor according to the type of load and multiply the result by the required power to determine the design power.

• Service factor

Type of load	Typical load	Service factor		
		5 hours/day	8 hours/day	24 hours/day
Constant	Belt conveyor, One-directional rotation	0.8	1.0	1.5
Light-impact	Start/Stop, Cam-drive	1.2	1.5	2.0
Medium-impact	Instant FWD/REV, Instant stop	1.5	2.0	2.5
Heavy-impact	Frequent medium-impact	2.5	3.0	3.5

The required allowable shaft torque T_A of the gear head can be determined based on the service factor and actual load torque T_1:

$T_A = T_1 \times S_f$

T_A : Allowable torque of gear head (N·m)
T_1 : Actual load torque (N·m)
S_f : Service factor

Use the motor so that the allowable torque T_A calculated from the formula above falls within the allowable torque range.
* Though it seems that the motor can be operated even in overload when the service factor is 0.8, note that the service factor is defined for the allowable torque of the gear head. If the motor is operated in overload, the life of insulator may be shortened or the motor may be burned out due to an abnormal temperature rise.

Standard life expectancy

Standard life expectancy: Standard life expectancy when operated for 8 hours/day at the standard load (Service factor=1.0)
＊ The oil seal is excluded because it is a consumable.

• Calculation of life expectancy
Calculate the life expectancy while referring to the service factor table shown last pege.
When the service factor is 2.0, for example, the life expectancy is calculated as follows:
Life expectancy = 10,000 (h) / 2.0 = 5,000 (h)

• Standard life expectancy

	Life (hours)
Ball bearing Decimal gear head	10,000 hours＊
Metal bearing	2,000 hours
Right-angle	5,000 hours
42 mm sq.	2,000 hours
for C&B motor	5,000 hours

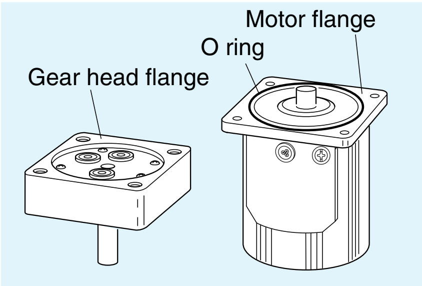
＊ 5,000 hours when used on reversible motor

Preparation

(1) Prepare a gear head that matches a motor described in this manual.
Use of incompatible gear head will cause malfunction.

(2) Check O-ring being correctly placed in a right place. If it is not, this may result in grease in the gear head coming out.

(3) Wipe off any grease on the gear head flange surface.

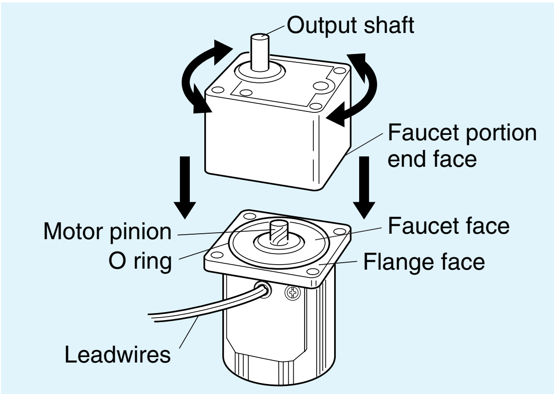


Assembling

(1) Place the unit so that the motor shaft faces up.
Direction of the motor lead and output shaft of gear head must match an application.

(2) Do not contact a tooth tip of pinion shaft to a tooth tip of gear head.
Set each toothes of motor and gear head correctly and gently press and turn the gear head in counter and counter-clockwise.

(3) To attach the gear head to an application, use the "attaching screws" supplied with the gear head and tighten the screws with appropriate torque and with care not to pinch the O ring, so that the there is no gap between motor flange and gear flange.

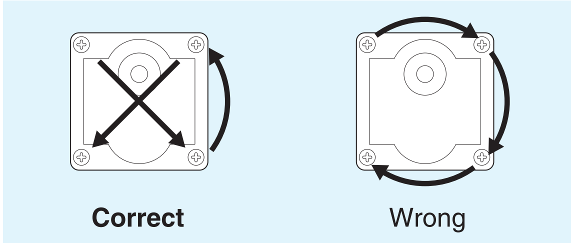


Assemble the motor shaft facing up.

(4) The recommended torque is shown below.

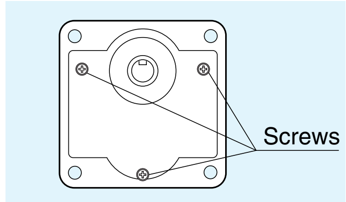
Size	Screw size	Tightening torque	
		N·m	lb-in
42 mm sq. (1.65 inch sq.)	M3	0.6 to 1	5.31 to 8.85
60 mm sq. (2.36 inch sq.)	M4	2 to 2.5	17.7 to 22.1
70 mm sq. (2.76 inch sq.)	M5	2.5 to 3	22.1 to 26.6
80 mm sq. (3.15 inch sq.)	M5	2.5 to 3	22.1 to 26.6
90 mm sq. (3.54 inch sq.)	M6	3.5 to 4.5	31.0 to 39.8

(5) Tighten the screws correctly.



<Note>
Do not forcedly assemble the motor and gear head. Do not damage the tooth of the motor pinion and gear head. Incorrect assembly results in abnormal noise generation or shortened unit life.

DON'T	Don't touch screws on the output shaft of gear head.	Will cause malfunction.



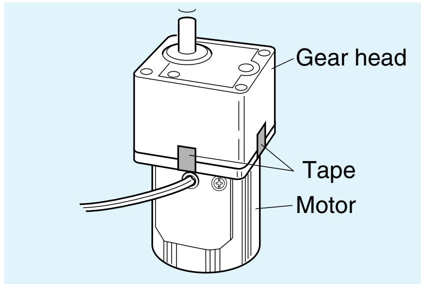
Considerations for installation of gear head

You may experience a sliping gear contact due to broken pinion tooth, locked gear or leaked grease as the gear head life comes closer.
Place a safety device to keep safe operation at any time even if such problems take place.

• Place a drop-proof device in an verticlly motioned application like a lifter.
• Place a device to open the door in a door application just in case the gear head is locked.
• Place an oil pan to prevent oil from coming out in an application like food/textile etc.
• Do not place an encoder, sensor, contact, etc near a gear head where the grease may leaking out. If not, please have a protection from grease.
• Have a routain check of the gear head to avoid unexpected accident.

<Precautions>
Keep the gear head attached to the motor. Otherwise, the O ring may become distorted or damaged, causing grease leakage.

• When reassembling, first replace the O ring with a new one.
• When installing a motor associated with the gear head to the application device, temporarily secure the motor and gear head with a tape until assembly completes.



Considerations for storage of gear head

When storing the gear head as a single unit, place it with the output shaft facing down.
(To prevent grease leakage)

Model list of gear head

Gear head

• Ball bearing

Size		Reduction ratio	Model No.	Hinge
60 mm sq. (2.36 inch sq.)		1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/10, 1/12.5, 1/15, 1/18	MX6G3BA – MX6G18BA	
		1/20, 1/25, 1/30, 1/36	MX6G20BA – MX6G36B	
		1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX6G50B – MX6G180B	
70 mm sq. (2.76 inch sq.)		1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/10, 1/12.5, 1/15, 1/18	MX7G3BA – MX7G18BA	
		1/20, 1/25, 1/30, 1/36	MX7G20BA – MX7G36B	
		1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX7G50B – MX7G180B	
80 mm sq. (3.15 inch sq.)		1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/10, 1/12.5, 1/15, 1/18	MX8G3B – MX8G18B	
		1/20, 1/25, 1/30, 1/36	MX8G20B – MX8G36B	
		1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX8G50B – MX8G180B	
90 mm sq. (3.54 inch sq.)	40W	1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/10, 1/12.5, 1/15, 1/18	MX9G3B – MX9G18B	
		1/20, 1/25, 1/30, 1/36	MX9G20B – MX9G36B	
		1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX9G50B – MX9G180B	
	Common to 60 W, 90 W	1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9	MZ9G3B – MZ9G9B	
		1/10, 1/12.5, 1/15, 1/18	MZ9G10B – MZ9G18B	
		1/20, 1/25, 1/30, 1/36, 1/50, 1/60	MZ9G20B – MZ9G60B	
		1/75, 1/90, 1/100, 1/120, 1/150, 1/180, 1/200	MZ9G75B – MZ9G200B	
		1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9	MY9G3B – MY9G9B	○
		1/10, 1/12.5, 1/15, 1/18	MY9G10B – MY9G18B	○
		1/20, 1/25, 1/30, 1/36, 1/50, 1/60	MY9G20B – MY9G60B	○
		1/75, 1/90, 1/100, 1/120, 1/150, 1/180, 1/200	MY9G75B – MY9G200B	○

* For the specifications for each item, refer to the page of the motor to which it can be applied.

• Metal bearing

Size		Reduction ratio	Model No.	Hinge
60 mm sq. (2.36 inch sq.)		1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/10, 1/12.5, 1/15, 1/18	MX6G3MA – MX6G18MA	
		1/20, 1/25, 1/30, 1/36	MX6G20MA – MX6G36M	
		1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX6G50M – MX6G180M	
70 mm sq. (2.76 inch sq.)		1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/10, 1/12.5, 1/15, 1/18	MX7G3MA – MX7G18MA	
		1/20, 1/25, 1/30, 1/36	MX7G20MA – MX7G36M	
		1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX7G50M – MX7G180M	
80 mm sq. (3.15 inch sq.)		1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/10, 1/12.5, 1/15, 1/18	MX8G3M – MX8G18M	
		1/20, 1/25, 1/30, 1/36	MX8G20M – MX8G36M	
		1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX8G50M – MX8G180M	
90 mm sq. (3.54 inch sq.)	40W	1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/10, 1/12.5, 1/15, 1/18	MX9G3M – MX9G18M	
		1/20, 1/25, 1/30, 1/36	MX9G20M – MX9G36M	
		1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX9G50M – MX9G180M	

* For the specifications for each item, refer to the page of the motor to which it can be applied.

• Ball bearing and metal bearing

Size	Reduction ratio	Model No.	Hinge
42 mm sq. (1.65 inch sq.)	1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/12.5, 1/15, 1/18	M4GA3F – M4GA18F	
	1/25, 1/30, 1/36, 1/50, 1/60	M4GA25F – M4GA60F	
	1/75, 1/90, 1/100, 1/120, 1/150, 1/180	M4GA75F – M4GA180F	

* For the specifications for each item, refer to the page of the motor to which it can be applied.

• High torque gear head

Size	Reduction ratio	Model No.	Hinge
90 mm sq. (3.54 inch sq.)	1/50, 1/60	MR9G50B – MR9G60B	
	1/75, 1/90, 1/100, 1/120, 1/150, 1/180, 1/200	MR9G75B – MR9G200B	
	1/50, 1/60	MP9G50B – MP9G60B	○
	1/75, 1/90, 1/100, 1/120, 1/150, 1/180, 1/200	MP9G75B – MP9G200B	○

• Right-angle gear head

Size		Reduction ratio	Model No.	Hinge
90 mm sq. (3.54 inch sq.)	40W	1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/12.5, 1/15, 1/18	MX9G3R – MX9G18R	
		1/25, 1/30, 1/36,	MX9G25R – MX9G36R	
		1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX9G50R – MX9G180R	
	Common to 60 W, 90 W	1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/12.5, 1/15, 1/18, 1/25	MZ9G3R – MZ9G25R	
		1/30, 1/36, 1/50, 1/60,	MZ9G30R – MZ9G60R	
		1/75, 1/90, 1/100, 1/120, 1/150, 1/180, 1/200	MZ9G75R – MZ9G200R	

• Gear head for C&B motor (Ball bearing)

* The details refer to B-342.

Size		Reduction ratio	Model No.	Hinge
60 mm sq. (2.36 inch sq.)		1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/10, 1/12.5, 1/15, 1/18	MX6G3H – MX6G18H	
		1/20, 1/25, 1/30, 1/36	MX6G20H – MX6G36H	
		1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX6G50H – MX6G180H	
70 mm sq. (2.76 inch sq.)		1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/10, 1/12.5, 1/15, 1/18	MX7G3H – MX7G18H	
		1/20, 1/25, 1/30, 1/36	MX7G20H – MX7G36H	
		1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX7G50H – MX7G180H	
80 mm sq. (3.15 inch sq.)		1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/10, 1/12.5, 1/15, 1/18	MX8G3H – MX8G18H	
		1/20, 1/25, 1/30, 1/36	MX8G20H – MX8G36H	
		1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180,	MX8G50H – MX8G180H	
90 mm sq. (3.54 inch sq.)	40W	1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/10, 1/12.5, 1/15, 1/18	MX9G3H – MX9G18H	
		1/20, 1/25, 1/30, 1/36	MX9G20H – MX9G36H	
		1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX9G50H – MX9G180H	
	Common to 60 W, 90 W	1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9	MY9G3H – MY9G9H	○
		1/10, 1/12.5, 1/15, 1/18, 1/20, 1/25, 1/30, 1/36, 1/50, 1/60	MY9G10H – MY9G60H	○
		1/75, 1/90, 1/100, 1/120, 1/150, 1/180, 1/200	MY9G70H – MY9G200H	○

* For the specifications for each item, refer to the page of the motor to which it can be applied.

Model list of gear head

Gear head accessory

• Ball bearing / Metal bearing / Ball bearing and metal bearing

Accessory — Unit: mm (inch)

Size	Reduction ratio	Model No.	Screw	Flat washer	Hexagon nut	Key
42 mm sq. (1.65 inch sq.)	1/3 to 1/180	M4GA3F – M4GA180F	M3P0.5 x 38 (1.50) pan head screw: 2	For M3P0.5: 2	M3P0.5: 2	–
60 mm sq. (2.36 inch sq.)	1/3 to 1/25	MX6G3BA – MX6G25BA	M4P0.7 x 40 (1.57) pan head screw: 4	For M4P0.7: 4	M4P0.7: 4	–
	1/30 to 1/180	MX6G30B – MX6G180B	M4P0.7 x 50 (1.97) pan head screw: 4	For M4P0.7: 4	M4P0.7: 4	–
70 mm sq. (2.76 inch sq.)	1/3 to 1/25	MX7G3BA – MX7G25BA	M5P0.8 x 50 (1.97) pan head screw: 4	For M5P0.8: 4	M5P0.8: 4	4 x 4 x 25 (0.16 x 0.16 x 0.98) one-end round: 1
	1/30 to 1/180	MX7G30B – MX7G180B	M5P0.8 x 55 (2.17) pan head screw: 4	For M5P0.8: 4	M5P0.8: 4	4 x 4 x 25 (0.16 x 0.16 x 0.98) one-end round: 1
80 mm sq. (3.15 inch sq.)	1/3 to 1/180	MX8G3B – MX8G180B	M5P0.8 x 55 (2.17) pan head screw: 4	For M5P0.8: 4	M5P0.8: 4	4 x 4 x 25 (0.16 x 0.16 x 0.98) one-end round: 1
90 mm sq. (3.54 inch sq.) 40W	1/3 to 1/180	MX9G3B – MX9G180B	M6P1.0 x 65 (2.56) pan head screw: 4	For M6P1.0: 4	M6P1.0: 4	4 x 4 x 25 (0.16 x 0.16 x 0.98) one-end round: 1
90 mm sq. (3.54 inch sq.) Common to 60 W, 90 W	1/3 to 1/200	MZ9G3B – MZ9G200B	M6P1.0 x 85 (3.35) hexagon socket head bolt: 4	For M6P1.0: 4	M6P1.0: 4	5 x 5 x 25 (0.20 x 0.20 x 0.98) one-end round: 1
	1/3 to 1/200	MY9G3B – MY9G200B	M6P1.0 x 25 (0.98) hexagon socket head bolt: 4	For M6P1.0: 4	M6P1.0: 4	5 x 5 x 25 (0.20 x 0.20 x 0.98) one-end round: 1

• Ball bearing / Metal bearing / Ball bearing and metal bearing

Accessory — Unit: mm (inch)

Size	Reduction ratio	Model No.	Screw	Flat washer	Hexagon nut	Key
90 mm sq. (3.54 inch sq.)	1/50 to 1/200	MR9G50B – MR9G200B	M6P1.0 x 20 (0.79) hexagon socket head bolt: 4	For M6P1.0: 4	–	6 x 6 x 30 (0.24 x 0.24 x 1.18) one-end round: 1
	1/50 to 1/200	MP9G50B – MP9G200B	M6P1.0 x 25 (0.98) hexagon socket head bolt: 4	For M6P1.0: 4	M6P1.0: 4	6 x 6 x 30 (0.24 x 0.24 x 1.18) one-end round: 1

• Right-angle gear head

Accessory — Unit: mm (inch)

Size	Reduction ratio	Model No.	Screw	Flat washer	Hexagon nut	Key
90 mm sq. (3.54 inch sq.) 40W	1/3 to 1/180	MX9G3R – MX9G180R	M6P1.0 x 20 (0.79) hexagon socket head bolt: 4	For M6P1.0: 4	–	4 x 4 x 25 (0.16 x 0.16 x 0.98) one-end round: 1
90 mm sq. (3.54 inch sq.) Common to 60 W, 90 W	1/3 to 1/200	MZ9G3R – MZ9G200R	M6P1.0 x 20 (0.79) hexagon socket head bolt: 4	For M6P1.0: 4	–	5 x 5 x 25 (0.20 x 0.20 x 0.98) one-end round: 1

• Gear head for C&B motor

Accessory — Unit: mm (inch)

Size	Reduction ratio	Model No.	Screw	Flat washer	Key
60 mm sq. (2.36 inch sq.)	1/3 to 1/18	MX6G3H – MX6G18H	M4P0.7 x 40 (1.57) pan head screw: 4	For M4P0.7: 4	–
	1/25 to 1/180	MX6G20H – MX6G180H	M4P0.7 x 50 (1.97) pan head screw: 4	For M4P0.7: 4	–
70 mm sq. (2.76 inch sq.)	1/3 to 1/18	MX7G3H – MX7G18H	M5P0.8 x 55 (2.17) pan head screw: 4	For M5P0.8: 4	4 x 4 x 25 (0.16 x 0.16 x 0.98) one-end round: 1
	1/25 to 1/180	MX7G20H – MX7G180H	M5P0.8 x 65 (2.56) pan head screw: 4	For M5P0.8: 4	4 x 4 x 25 (0.16 x 0.16 x 0.98) one-end round: 1
80 mm sq. (3.15 inch sq.)	1/3 to 1/18	MX8G3H – MX8G18H	M5P0.8 x 55 (2.17) pan head screw: 4	For M5P0.8: 4	4 x 4 x 25 (0.16 x 0.16 x 0.98) one-end round: 1
	1/25 to 1/180	MX8G20H – MX8G180H	M5P0.8 x 65 (2.56) pan head screw: 4	For M5P0.8: 4	4 x 4 x 25 (0.16 x 0.16 x 0.98) one-end round: 1
90 mm sq. (3.54 inch sq.)	1/3 to 1/18	MX9G3H – MX9G18H	M6P1.0 x 70 (2.76) pan head screw: 4	For M6P1.0: 4	5 x 5 x 25 (0.20 x 0.20 x 0.98) one-end round: 1
	1/25 to 1/180	MX9G20H – MX9G180H	M6P1.0 x 85 (3.35) pan head screw: 4	For M6P1.0: 4	5 x 5 x 25 (0.20 x 0.20 x 0.98) one-end round: 1
	1/3 to 1/200	MY9G3H – MY9G200H	M6P1.0 x 25 (0.98) hexagon socket head bolt: 4	For M6P1.0: 4	5 x 5 x 25 (0.20 x 0.20 x 0.98) one-end round: 1

* Though a hexagon nut is supplied with the accessories, it is not necessary in mounting the gear head.

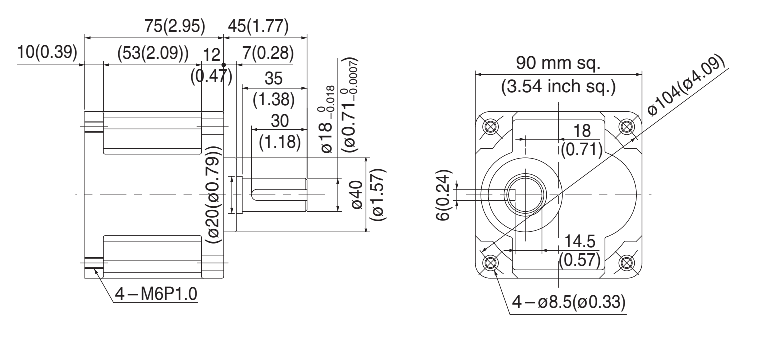
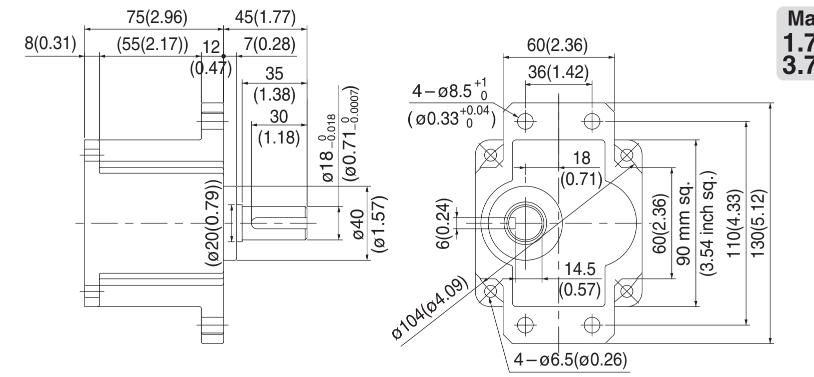
Decimal gear head (Cannot be used for C&B motor)

Size	Reduction ratio	Model No.	Applicable gear head	Page
60 mm sq. (2.36 inch sq.)	1/10	MX6G10XB	MX6G□BA MX6G□B	B-448
70 mm sq. (2.76 inch sq.)	1/10	MX7G10XB	MX7G□BA MX7G□B	B-448
80 mm sq. (3.15 inch sq.)	1/10	MX8G10XB	MX8G□B	B-448
90 mm sq. (3.54 inch sq.) 40W	1/10	MX9G10XB	MX9G□B	B-448
90 mm sq. (3.54 inch sq.) Common to 60 W, 90 W	1/10	MZ9G10XB	MZ9G□B MY9G□B MR9G□B MP9G□B	B-448

• Decimal gear head fixing screw (option: page D-2)

Size	Reduction ratio	Applicable gear head	Gear fixing screw Model No.
60 mm sq. (2.36 inch sq.)	MX6G10XB	MX6G□BA MX6G□B MX6G□MA MX6G□M	M0PM4001
70 mm sq. (2.76 inch sq.)	MX7G10XB	MX7G□BA MX7G□B MX7G□MA MX7G□M	M0PM5001
80 mm sq. (3.15 inch sq.)	MX8G10XB	MX8G□B MX8G□M	M0PM5002
90 mm sq. (3.54 inch sq.) 40W	MX9G10XB	MX9G□B MX9G□M	M0PM6003
90 mm sq. (3.54 inch sq.) Common to 60 W, 90 W	MZ9G10XB	MZ9G□B	M0PM6004
		MY9G□B MR9G□B MP9G□B	M0PM6002

• Type of high torque gear head

Model No.	Dimensions (Scale: 1/4, Unit: mm (inch))	Gear fixing screw
MR9G□B (Ball bearing, Hinge not attached)		M6P1.0 x 20(0.79)
MR9G□B (Ball bearing, Hinge attached)		M6P1.0 x 25(0.98)

* Cannot be attached to the C&B motor.

Allowable shaft torque with high torque gear head directly connected

* The number of revolutions is calculated based on the synchronous rotating speed (1500 min^{-1}, 1800 min^{-1}).
Usually, actual speed is slow by 2 to 20% the value shown in the table, depending on load condition.

• Hinge not attached 90 mm sq. (3.54 inch sq.) / 60W Unit of permissible torque: upper **(N·m)** / lower **(lb-in)**

Reduction ratio		50	60	75	90	100	120	150	180	200
Speed (min^{-1})	50Hz	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	36	30	24	20	18	15	12	10	9
Applicable gear head: MR9G50B–MR9G200B (ball bearing hinge not attached)	50Hz	15.2 (135)	18.2 (161)	22.1 (196)	26.5 (235)	29.4 (260)				
	60Hz	12.7 (112)	15.2 (135)	18.6 (165)	22.1 (196)	24.6 (218)	29.4 (260)			
Rotational direction		Same as motor rotational direction								

• Hinge not attached 90 mm sq. (3.54 inch sq.) / 90W Unit of permissible torque: upper **(N·m)** / lower **(lb-in)**

Reduction ratio		50	60	75	90	100	120	150	180	200
Speed (min^{-1})	50Hz	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	36	30	24	20	18	15	12	10	9
Applicable gear head: MR9G50B–MR9G200B (ball bearing hinge not attached)	50Hz	21.2 (188)	25.5 (226)	29.4 (260)						
	60Hz	17.6 (156)	21.2 (188)	26.7 (236)	29.4 (260)					
Rotational direction		Same as motor rotational direction								

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		500	600	750	900	1000	1200	1500	1800	2000
Bearing	Decimal gear head	Speed (min^{-1})	50Hz	3	2.5	2	1.7	1.5	1.3	1	0.83	0.75
			60Hz	3.6	3	2.4	2	1.8	1.5	1.2	1	0.9
MR9G□B (ball bearing hinge not attached)	MZ9G10XB	Permissible torque	N·m (lb-in)	29.4 (260)	29.4 (260)	29.4 (260)	29.4 (260)	29.4 (260)	29.4 (260)	29.4 (260)	29.4 (260)	29.4 (260)
		Rotational direction		Same as motor rotational direction								

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Allowable shaft torque with high torque gear head directly connected

* The number of revolutions is calculated based on the synchronous rotating speed (1500 min^{-1}, 1800 min^{-1}).
Usually, actual speed is slow by 2 to 20% the value shown in the table, depending on load condition.

• With hinge Sq.90mm (3.54 inch sq.) / 60W Unit of permissible torque: upper **(N·m)** / lower **(lb-in)**

Speed reduction ratio		50	60	75	90	100	120	150	180	200
Rotating speed (min^{-1})	50Hz	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	36	30	24	20	18	15	12	10	9
Applicable gear head: MP9G50B–MP9G200B (Ball bearing, with hinge)	50Hz	15.2 (135)	18.2 (161)	22.1 (196)	26.5 (235)	29.4 (260)				
	60Hz	12.7 (112)	15.2 (135)	18.6 (165)	22.1 (196)	24.6 (218)	29.4 (260)			
Rotation direction		Same as on the motor								

• With hinge Sq.90mm (3.54 inch sq.) / 90W Unit of permissible torque: upper **(N·m)** / lower **(lb-in)**

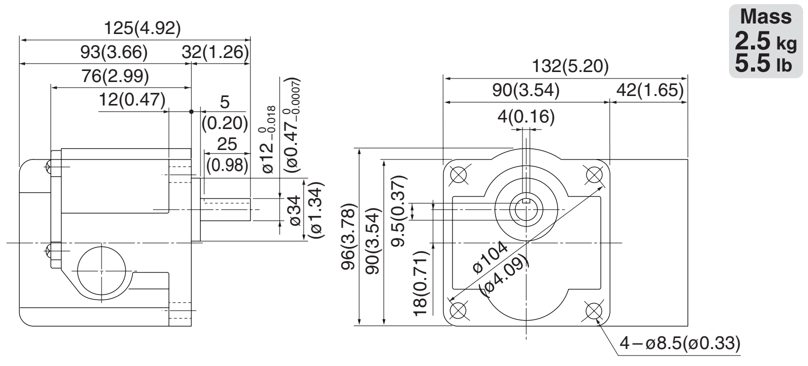
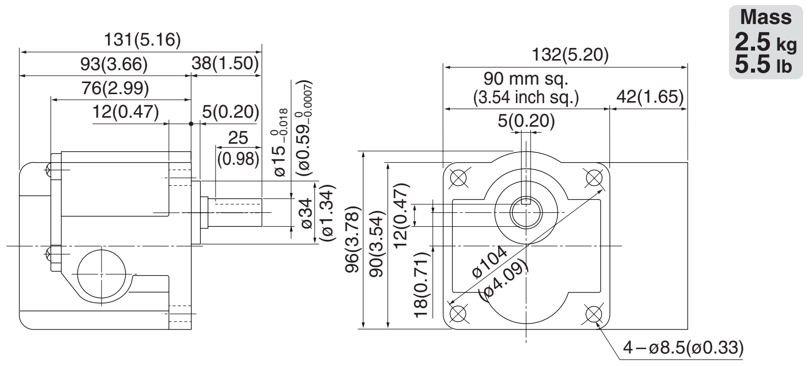
Speed reduction ratio		50	60	75	90	100	120	150	180	200
Rotating speed (min^{-1})	50Hz	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	36	30	24	20	18	15	12	10	9
Applicable gear head: MP9G50B–MP9G200B (Ball bearing, with hinge)	50Hz	21.2 (118)	25.5 (226)	29.4 (260)						
	60Hz	17.6 (156)	21.2 (188)	26.7 (236)	29.4 (260)					
Rotation direction		Same as on the motor								

• When intermediate gear head is used

Applicable gear head		Speed reduction ratio		500	600	750	900	1000	1200	1500	1800	2000
Bearing	Intermediate gear head	Rotating speed (min^{-1})	50Hz	3	2.5	2	1.7	1.5	1.3	1	0.83	0.75
			60Hz	3.6	3	2.4	2	1.8	1.5	1.2	1	0.9
MP9G*B (Ball bearing, with hinge)	MZ9G10XB	Allowable shaft torque	N·m (lb-in)	29.4 (260)	29.4 (260)	29.4 (260)	29.4 (260)	29.4 (260)	29.4 (260)	29.4 (260)	29.4 (260)	29.4 (260)
		Rotation direction		Same as on the motor								

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

• Type of right-angle gear head

Model No.	Dimensions (Scale: 1/4, Unit: mm (inch))	Gear fixing screw
MX9G□R (Ball bearing)		M6P1.0 x 20(0.79)
MZ9G□R (Ball bearing)		M6P1.0 x 20(0.79)

*** Cannot be attached to the C&B motor.**

Allowable shaft torque with right-angle type gear head directly connected

* The number of revolutions is calculated based on the synchronous rotating speed (1500 min^{-1}, 1800 min^{-1}).
Usually, actual speed is slow by 2 to 20% the value shown in the table, depending on load condition.

●90 mm sq. (3.54 inch sq.) / 40W

Unit of permissible torque: upper **(N·m)** / lower **(lb-in)**

Reduction ratio		3	3.6	5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180
Speed (min^{-1})	50Hz	500	416.7	300	250	200	166.7	120	100	83.3	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
	60Hz	600	500	360	300	240	200	144	120	100	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head: MX9G3R– MX9G180R (ball bearing)	50Hz	0.60 (5.31)	0.72 (6.37)	0.98 (8.67)	1.18 (10.4)	1.47 (13.0)	1.76 (15.6)	2.45 (21.7)	2.94 (26.0)	3.53 (31.2)	5.00 (44.3)	6.00 (53.1)	7.18 (63.6)	9.80 (86.7)							
	60Hz	0.50 (4.43)	0.60 (5.31)	0.82 (7.26)	0.98 (8.67)	1.23 (10.9)	1.47 (13.0)	2.04 (18.1)	2.45 (21.7)	2.94 (26.0)	4.17 (36.9)	5.00 (44.3)	5.98 (52.9)	8.17 (72.3)	9.80 (86.7)						
Rotational direction		Same as motor rotational direction																			

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min^{-1})	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.83
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX9G25R– MX9G180R	MX9G10XB	Permissible torque	N·m (lb-in)	9.80 (86.7)	9.80 (86.7)	9.80 (86.7)	9.80 (86.7)	9.80 (86.7)	9.80 (86.7)	9.80 (86.7)	9.80 (86.7)	9.80 (86.7)	9.80 (86.7)	9.80 (86.7)
		Rotational direction		Same as motor rotational direction										

Allowable shaft torque with right-angle type gear head directly connected

* The number of revolutions is calculated based on the synchronous rotating speed (1500 min^{-1}, 1800 min^{-1}).
Usually, actual speed is slow by 2 to 20% the value shown in the table, depending on load condition.

●90 mm sq. (3.54 inch sq.) / 60W

Unit of permissible torque: upper **(N·m)** / lower **(lb-in)**

Reduction ratio		3	3.6	5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min^{-1})	50Hz	500	416.7	300	250	200	166.7	120	100	83.3	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	600	500	360	300	240	200	144	120	100	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head: MZ9G3R– MZ9G200R (ball bearing)	50Hz	0.90 (7.97)	1.15 (10.2)	1.50 (13.3)	1.92 (17.0)	2.20 (19.5)	2.81 (24.9)	3.70 (32.7)	4.40 (38.9)	5.62 (49.7)	7.40 (65.5)	8.80 (77.9)	11.2 (99.1)	14.8 (131)	18.9 (167)	19.6 (173)						
	60Hz	0.70 (6.20)	0.90 (7.97)	1.17 (10.4)	1.50 (13.3)	1.72 (15.2)	2.20 (19.5)	2.90 (25.7)	3.44 (30.4)	4.40 (38.9)	5.79 (51.2)	7.40 (65.5)	8.80 (77.9)	11.6 (103)	14.8 (131)	15.3 (135)	19.6 (173)					
Rotational direction		Same as motor rotational direction																				

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800	2000
Bearing	MX9G10XB	Speed (min^{-1})	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.83	0.75
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1	0.9
MZ9G25R– MZ9G200R	MZ9G10XB	Permissible torque	N·m (lb-in)	19.6 (173)	19.6 (173)	19.6 (173)	19.6 (173)	19.6 (173)	19.6 (173)	19.6 (173)	19.6 (173)	19.6 (173)	19.6 (173)	19.6 (173)	19.6 (173)
		Rotational direction		Same as motor rotational direction											

●90 mm sq. (3.54 inch sq.) / 90W

Unit of permissible torque: upper **(N·m)** / lower **(lb-in)**

Reduction ratio		3	3.6	5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min^{-1})	50Hz	500	416.7	300	250	200	166.7	120	100	83.3	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	600	500	360	300	240	200	144	120	100	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head: MZ9G3R– MZ9G200R (ball bearing)	50Hz	1.30 (11.5)	1.59 (14.1)	2.30 (20.4)	2.82 (25.0)	3.30 (29.2)	4.05 (35.8)	5.60 (49.6)	6.80 (60.2)	8.34 (73.8)	10.6 (93.8)	12.7 (112)	15.6 (138)	19.6 (173)								
	60Hz	1.06 (9.38)	1.30 (11.5)	1.88 (16.6)	2.30 (20.4)	2.69 (23.8)	3.30 (29.2)	4.56 (40.4)	5.54 (49.0)	6.80 (60.2)	8.15 (72.1)	10.6 (93.8)	12.7 (112)	16.0 (142)	19.6 (173)							
Rotational direction		Same as motor rotational direction																				

• Permissible torque at output shaft of gear head using decimal gear head

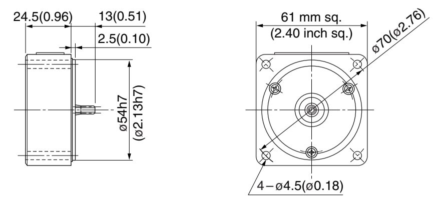
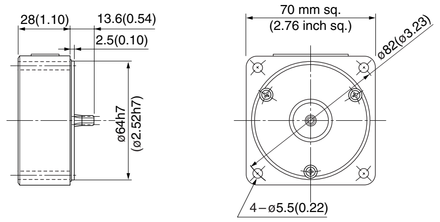
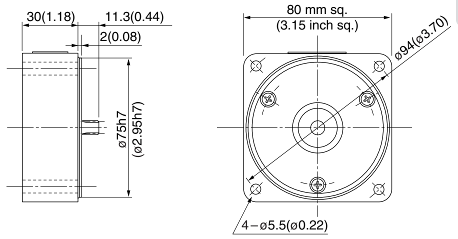
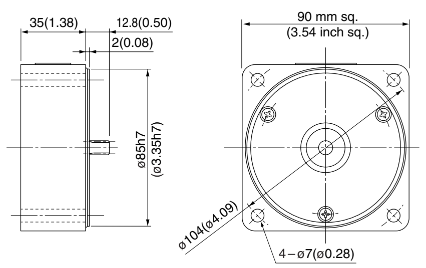
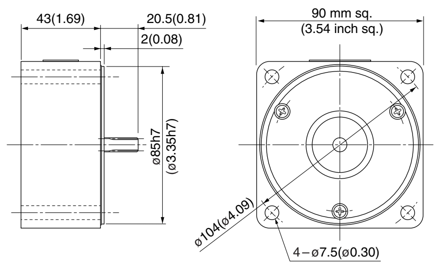
Applicable gear head		Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800	2000
Bearing	MX9G10XB	Speed (min^{-1})	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.83	0.75
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1	0.9
MZ9G25R– MZ9G200R	MZ9G10XB	Permissible torque	N·m (lb-in)	19.6 (173)	19.6 (173)	19.6 (173)	19.6 (173)	19.6 (173)	19.6 (173)	19.6 (173)	19.6 (173)	19.6 (173)	19.6 (173)	19.6 (173)	19.6 (173)
		Rotational direction		Same as motor rotational direction											

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

• Type of decimal gear head

＊The decimal gear head fixing screw is sold separately. ＊Shown in □ is a gear ratio.

Model No.	Dimensions　Scale: 1/4, Unit: mm (inch)	Applicable gear head	Gear fixing screw (option)
MX6G10XB	Mass 0.23 kg 0.51 lb  	**MX6G□BA** **MX6G□B** **MX6G□MA** **MX6G□M**	**M0PM4001** • M4P0.7 x 85(3.35) • Cross recessed pan head screw
MX7G10XB	Mass 0.35 kg 0.77 lb  	**MX7G□BA** **MX7G□B** **MX7G□MA** **MX7G□M**	**M0PM5001** • M5P0.8 x 95(3.74) • Cross recessed pan head screw
MX8G10XB	Mass 0.39 kg 0.86 lb  	**MX8G□B** **MX8G□M**	**M0PM5002** • M5P0.8 x 85(3.35) • Cross recessed pan head screw
MX9G10XB	Mass 0.53 kg 1.17 lb  	**MX9G□B** **MX9G□M**	**M0PM6003** • M6P1.0 x 100(3.94) • Cross recessed pan head screw
MZ9G10XB	Mass 0.65 kg 1.43 lb  	**MZ9G□B**	**M0PM6004** • M6P1.0 x 125(4.92) • Hexagon socket head bolt
		MY9G□B **MP9G□B** **MR9G□B**	**M0PM6002** • M6P1.0 x 65(2.56) • Hexagon socket head bolt

＊Fit tolerance symbol is used in the outside dimension diagram of motor and gear head.
For further information, see “Fit tolerance” on page A-35.

＊Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.