



MITSUBISHI GEARED MOTOR

MODEL

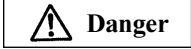
# GM-J2 Series

INSTRUCTION MANUAL

- Before you operate the geared motor, carefully read this manual, and correctly use the motor. Be sure to read the “Safety Precautions” described in this manual to ensure safety during operation.
- After reading, this manual should carefully be kept in a convenient place for the operator’s easy reference.

# Safety Precautions


If the geared motor is not used correctly, the motor may be damaged, and you may get an electric shock. This manual uses two safety levels to give you cautions. These two levels are “DANGER” and “CAUTION” levels.



Indicates that an operation error may cause an imminently hazardous situation, which, if not avoided, will result in death or serious injury.



Indicates that an operation error may cause a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury or physical damage only.

Note that even if the safety level is  **Caution**, the operator may be seriously injured or dead in some cases. All the cautions, therefore, are very important. Be sure to observe the cautions.



## General

- Before starting operation, be sure to read the instruction manual and the nameplate affixed to the motor, and fully understand the caution written in the instruction manual and the nameplate.

## Ambient conditions and operation conditions:

- Keep flammable substances away from the geared motor. Flammable substances may cause a fire or explosion.
- If a lift is designed for human beings, do not use the geared motor for such a lift. This is specified in the Building Standard Law.
- To use the geared motor for a lift, be sure to install a safety device on the machine side. Without a safety device, the lifted load may fall from the lift.

## Wiring:

- Be sure to ground the motor, and install a dedicated circuit breaker for each motor to prevent electric leakage. If you ignore this caution, you may get an electric shock.
- In accordance with the Technical Standard for Electric System and the Regulation for Internal Line specified by the corresponding electric power company, carefully carry out wiring so that safety can be ensured.
- Install an appropriate motor circuit protector for each geared motor. Without any protector, a problem of the motor circuit may result in a fire.
- Be sure to supply the power of the specified voltage. If a wrong power is supplied, a fire may start.
- Always follow the connection drawing in the instruction manual when connecting the power cable.

## Operation:

- If a load is lifted, do not manually release the brake. If the brake is released, the lifted load may fall.
- In the inverter operation mode, operate the motor in the specified frequency range. If the frequency is out of the specified range, the motor may be damaged.
- Never go near or touch the rotating parts (shaft, etc) during operation, Failure to observe this could lead to entanglement or injuries.
- Operate the motor while observing the speed range specified in the outline drawing, specification, catalog, etc. If the motor speed is out of the specified range, the motor may be damaged or explode.



## CAUTION

### **Ambient conditions and operation conditions:**

- When the motor malfunctions, the grease may leak from the motor and the leaked grease may damage the outside environment. For this reason, place an oil pan to prevent leakage of grease.
- Be sure to attach a safety cover to the belt, chain, gear, etc.
- Do not place any-object which may interface with ventilation around the geared motor. Failure to observe this warning may cool air which may cause burn injury and or fire.(In the case of 60 or 90W model.)

### **Operation:**

- Use the motor while observing the allowable loading torque range and the allowable starting frequency range.
- During operation, if the motor generates an abnormal noise, vibrates abnormally, or does not ensure the specified characteristics, be sure to stop operating the motor, and then inspect or overhaul the motor.
- During operation, do not touch the geared motor. If you touch the motor, you may be injured or burn your fingers.

### **Maintenance and modification:**

- Do not modify the product.
- Before starting maintenance, inspection, or repair, be sure to turn off the power.
- Geared motor will become quite hot during operation. Take care not to touch the geared motor with your hands or body. Failure to observe this could lead to burns etc.

### **Disposal:**

- Treat the motor as general industrial waste when disposing of it.

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## 1. Verification at Receiving Product

- (1) Verify that the model number, output value, speed value, etc. written on the nameplate do not differ from the customer specified values.
- (2) Check that no parts are damaged during transportation.
- (3) Check the screws and bolts for looseness.

## 2. Ambient Conditions and Operation Conditions

- (1) Keep flammable substances away from the geared motor. Flammable substances may cause a fire or explosion.
- (2) If a lift is designed for human beings, do not use the geared motor for such a lift. This is specified in the Building Standard Law.
- (3) To use the geared motor for a lift, be sure to install a safety device on the machine side. Without a safety device, the lifted load may fall from the lift.
- (4) If the loading side applies an extremely large load, the motor speed may exceed the rated speed. In this case, install a safety device on the machine side so that the motor speed cannot exceed the rated speed. If the motor speed is too high, the geared motor may be damaged.

## 3. Installation and Adjustment

- (1) The grease lubrication system is adopted for all the types. So the geared motor can be installed in any direction. (The motor is greased before delivery from our factory.)
- (2) When the motor malfunctions, the grease may leak from the motor and the leaked grease may damage the outside environment. For this reason, place an oil pan to prevent leakage of grease.
- (3) Be sure to attach a safety cover to the belt, chain, gear, etc.
- (4) Keep the motor away from the humidity and dust. Adjust the ambient temperature in the range of  $-15^{\circ}\text{C}$  to  $+40^{\circ}\text{C}$ , and the relative humidity to 90% or less. Do not freeze the motor. In addition, check that the motor can be cooled quickly.
- (5) Select a rigid frame that can ensure effective thermal conductivity, and then firmly install the motor so that the bolts cannot be loose. Install the motor so that the flatness can be 0.2 mm or less.

## 4. Connection

- (1) When connecting the geared motor to the machine, center the motor so that decentering from the machine can be 0.05 mm or less.  
Use the flexible coupling for easy centering.
- (2) Adjust the sag of the chain to approximately 4% of the span length (refer to Fig. 1). If the sag is too large, starting the motor may cause a large shock, and the geared motor may be damaged.
- (3) To protect the motor from damage caused by an overhung load, adjust the sprocket, gear, and pulley positions so that the load position can be on the output shaft joggling side.
- (4) The tolerance for the sprocket and coupling holes should be approximately H7. When inserting a part into a hole, do not hit the part using a hammer. If a part is hit with a strong force, bearings and gears cannot be engaged properly.

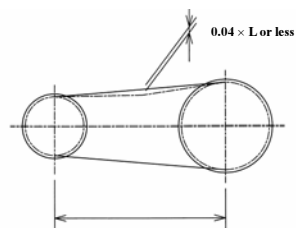


Fig. 1 Sag of chain

## **5. Wiring**

- (1) Be sure to ground the motor, and install a dedicated circuit breaker for each motor to prevent electric leakage. If you ignore this caution, you may get an electric shock.
- (2) When wiring the motor, use good wiring parts, and observe the Technical Standard for Electric System and the Regulation specified by the corresponding electric power company. If the power supply line is long, adjust the voltage drop to 2% or less.
- (3) Install an appropriate motor circuit protector for each geared motor. Without any protector, a problem of the motor circuit may result in a fire.
- (4) Be sure to supply the power of the specified voltage. If a wrong power is supplied, a fire may start.

## 6. Motor Line Connection and Output Shaft Rotational Direction

■ Connection of constant-speed series

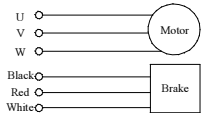
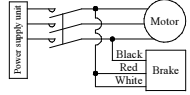
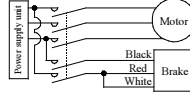
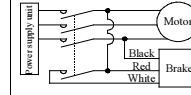
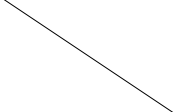
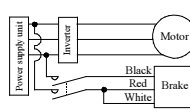
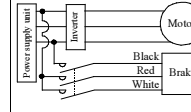
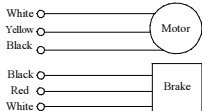
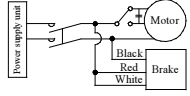
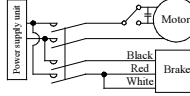
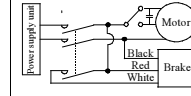
● Motor

Motor type		Counterclockwise rotation	Clockwise rotation
Without terminal box	3-phase type		Exchange the connected terminals of 2 wires with each other to rotate the motor clockwise.
	Single-phase type 25W		Turn the switch to B to rotate the motor clockwise.
With small-/large-sized terminal box	Single-phase type 40W 60W 90W		
	Single-phase reversible type		Turn the switch to B to rotate the motor clockwise.
	3-phase type		Exchange the connected terminals of 2 wires with each other to rotate the motor clockwise.
	Single-phase type 25W		Turn the switch to B to rotate the motor clockwise.
	Single-phase type 40W 60W 90W		
Single-phase reversible type		Turn the switch to B to rotate the motor clockwise.	

Note: "C" represents a capacitor.

## 7. Brake Connection Method and Coasting Time

The brake coasting time (time required for starting the braking operation after power-off) depends on the brake connection method and the load specifications. Select the optimum connection method depending on the purpose of use.

Model	Before delivery		Simultaneous power-off	Respective power-off	DC power-off (quick power-off)
GM-J2B series (3-phase type)		Connection method	Commercial 		
		Coasting time	0.2 to 0.4 sec	0.1 to 0.2 sec	0.01 to 0.03 sec
		Connection method	Inverter 		
		Coasting time		0.1 to 0.2 sec	0.01 to 0.03 sec
GM-J2RB series (Single-phase reversible type)		Connection method			
		Coasting time	0.2 to 0.4 sec	0.1 to 0.2 sec	0.01 to 0.03 sec

Note 1: For DC power-off (quick power-off) method, the brake contact for DC power-off (quick power-off) should be suitable for the rated current of 200 VDC and DC class 13 (L/R = 100 ms).



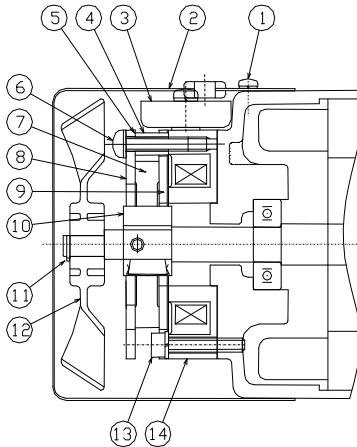
■ Instructions for use

1. If the motor is used for a lift and high accuracy is needed in braking operation, adopt the DC power-off (quick power-off) circuit.
2. The coasting time may slightly vary depending on the load specifications and braking torque.
3. Due to the brake structure, the lining may generate a sliding noise. This noise, however, will not affect the performance of the motor, and will be reduced as the time elapses.
4. If the capacitor for power factor improvement is connected to the motor circuit, be sure to select the respective power-off circuit.  
For the inverter drive system, the capacitor for power factor improvement cannot be connected to the motor circuit.
5. To adopt the inverter drive system or to control the input power, be sure to connect the brake to the power supply unit side of the inverter.  
(If the brake is connected to the output side of the inverter, the power supply unit may be damaged.)  
For this type, the brake can be applied after turning off the inverter main circuit.
6. In the inverter drive mode, the noise may be rather loud even in the low-frequency area. This noise, however, will not affect the functions of the motor.
7. To operate the motor at the frequency of 25 Hz or less in the inverter drive mode, the rated value should be 1 hour or 25% ED.
8. In the inverter drive mode, the frequency for braking operation should be 60 Hz or less. (The braking capacity is limited.)
9. In the inverter drive mode, if the wiring distance is too long between geared motor and the inverter, the torque of the geared motor may be reduced due to cable voltage drop. In this case, select a cable size so that the voltage drop can be 2% or less of the rated voltage.

## 8. Brake Structure

### 1. Structure and operation

The brake structure is shown in the following figure. For all the models, the non-excitation braking system (spring braking system) is adopted for the brake operation.



Item	Description
1	Tightening screw
2	Brake cover
3	Power supply unit
4	Spacer
5	Shim
6	Cross-recessed round head machine screw
7	Brake lining
8	Support plate
9	Movable iron core
10	Hub
11	Snap ring
12	Fan
13	Hexagon socket head bolt
14	Fixed iron core

### 2. Brake specifications

The standard specifications for the brake are shown in the following table. (Standard specifications for 100-V and 200-V type)

Brake model	Output (W)	Number of poles (P)	Braking power supply voltage (V)	Braking voltage (VDC)	Braking current (A)	Braking torque (N-m) * Notes 1 and 2	Void (mm)	
							Initial	Limit
BXM-04-10-A-76	25	4	100	45	0.156	0.29	0.15 (through)	0.57
BXM-04-10-A-77			200	90	0.078			
BXM-05-10-A-18	40 - 90		100	45	0.2	0.5	0.3 (stop)	0.55
BXM-05-10-A-19			200	90	0.1			

\* Notes 1 : The static friction torque is used for indication of the braking torque. The dynamic friction torque is approximately 80% of the static friction torque.

2 : At the initial stage of motor operation, the specified braking torque may not be obtained. In this case, turn on and off the brake with a light load as far as possible to adjust the friction surface.

### 3. Manual releasing method

Step 1 : Loosen the brake cover tightening screws (Item 1) (at 4 points), and then remove the brake cover (Item 2). After that, remove the fan (Item 12).

Note that the snap ring (Item 11) is adopted to fix the fan.

Step 2 : Prepare the cross-recessed round head machine screws (M4 screws, 16 mm or more in length), and then equally insert these screws in to the screw holes (at 2 points) of the support plate (Item 8) to release the brake.

At the completion of work, be sure to remove the screws to reset the manually released brake.

Note: When manually releasing the brake, be sure to observe the following points:

- Be sure to check that the brake is properly released.  
Basically, if the void is eliminated, you can judge that the brake is released. In addition, if you can easily turn the motor shaft with your hand, you can judge that the brake is released.
- If the tightening force of the brake releasing screws is too large, the movable iron core or the support plate may be distorted or flawed, and the brake may not operate properly.
- If the brake is manually released, do not operate the motor. Before starting normal operation, be sure to check that the brake is not released and ready for operation.

## 9. Operation

- If a load is lifted, do not manually release the brake. If the brake is released, the lifted load may fall.
- In the inverter operation mode, operate the geared motor while observing the frequency range specified in the catalog. If the frequency is out of the specified range, the motor may be damaged.

### Before turning on the switch

- (1) Check of each tightening bolt  
Check that all the foundation bolts, sprocket bolts, coupling bolts, etc. are tightened enough.
- (2) Check of electric system  
Check that the motor is properly connected to the power supply unit. Check that the terminal box is equipped with a cover. Check that the breaker capacity and the overcurrent protective relay are properly set.

### Regular operation

- (1) Use the motor while observing the allowable loading torque range and the allowable starting frequency range.
- (2) During operation, if the motor generates an abnormal noise, vibrates abnormally, or does not ensure the specified characteristics, be sure to stop operating the motor, and then inspect or overhaul the motor.
- (3) During operation, do not touch the geared motor. If you touch the motor, you may be injured or burn your fingers.

### Others

- (1) At starting, apply a light load as far as possible. When the motor speed rises to the full speed, apply the specified load.
- (2) When the motor is stopped, be sure to turn off the switch.

## 10. Maintenance

- Do not modify the product.
- Before starting maintenance, inspection, or repair, be sure to turn off the power.

- (1) Daily inspection

Inspection item	Inspection method	Description of inspection
Current value	Ammeter	Check that the current value is equal to or less than the rated current value written on the nameplate.
Noise	Listening	Use the listening rod or directly listen to the noise, and confirm that the noise is not abnormal compared with the usual noise.
Surface temperature	Thermometer	Check that the rise in the motor frame surface temperature (subtract the ambient temperature value from the motor frame surface temperature value) is in the range of 55°C to 65°C.
Vibration	Vibration meter	Check that the vibration of the gear case and the motor frame is 4.9 m/s <sup>2</sup> or less.
Lubricant	Visual check	Check that grease is not leaking from the geared motor to the outside.
Chain	Visual check	Check that the chain is not too loose or too tight. Also check that the chain rotates smoothly.

(2) Periodical inspection

Carry out periodical inspection while referring to the following table. (For the following table, the schedule is determined assuming that the motor will be operated for 8 hours a day.)

Inspection item	Inspection schedule (reference)	Description of inspection
Tension applied to chain	Every 6 months	If the chain is loose, apply tension to the chain.
Loose foundation bolts	Every 6 months	If the foundation bolts are loose, tighten the bolts.
Insulation resistance of motor coil	Every 6 months	Using a 500-V insulation resistance tester, check that the resistance is 1 MΩ or more. If the resistance is less than 1 MΩ, dry the coil at 90°C or less using a drying oven.

## 11. Please Contact Us

When you order a part, please let us know the following items:

- (1) Production number (serial number)
  - (2) Model
  - (3) Output
  - (4) Speed reduction ratio (or speed)
  - (5) Part name
  - (6) Quantity
  - (7) Desired date of delivery
- } (Written on the nameplate)

## 【Warranty】

### 1. Warranty term and scope of warranty

When failure by the responsibility by the side of our company occurs for a product during the term of a warranty, our company will deliver a substitute free of charge through the store or the service company of our company which purchased.

#### 【Warranty term】

The warranty term for the product shall be 18 months after the date of delivery or 12 month from the product starting operation, whether be shorter.

#### 【Scope of warranty】

##### (1) Inspection

Please inspect your product by yourself. Our service personal, however, can inspect your product at your request with change to you. If a problem is detected by the inspection ,we will discuss with you to determine whether we are responsible for the problem. If we are responsible for the problem, we will deliver a substitute free of charge.

##### (2) Repair

In the following cases ( i , ii , iii ,iv , v ,vi ,vii ,viii and ix ) , we will charge the repair expense, parts replacement expense, and traveling expense to you. In the other cases, we will repair your product free of charge.

i )The problem is caused due to inappropriate storage or handling of your product, carelessness, negligence , or operation in inappropriate facility or with inappropriate machine, etc.

ii )The problem is caused because you have modified our product without our approval.

iii )The problem is caused because you have used lubricating oil other than recommendation of our products.

iv )The problem is caused because periodical inspection is not performed.

v )The problem is caused because you have used our product while ignoring the product specifications.

vi )The problem is caused because you have used accepted that the consumable parts (Bearing, oil seal, etc.) specified as the instructions manual etc. Even if it was a normal operating condition were able to protect when performed maintenance and inspection normally.

vii )The problem is caused because natural disasters, such as an external factor by inevitability, such as a fire an unusual voltage, and an earthquake, thunder, and storm and flood damages.

viii )The problem is caused because the reason which was not able to be foreseen with the level of the technology at the time of our company shipment.

ix )Other cases where you are responsible for the problem.

These services are applied only in Japan. The foreign country is unavailable. We appreciate your understanding.

### 2. Exclusion

Even if a problem of our product causes damage of other manufacturers' machine, etc., we will not compensate any loss caused by the problem of our product or damaged other manufacturers' machines (loss of your company or your customer), even in the warranty period

Since it may change without a notice, please give beforehand the specification indicated to a catalog, an instructions manual, or technical data every knowledge.

### 3. Repair after stopping production

Even if production of the same model is stopped, we will repair your product for 7 years from the date of production stoppage.

However, the parts manufactured by casting and mold have a case where allowed to consider it as the alternative parts which have the same function.

The product supply after production stoppage cannot respond including spare parts.

### 4. Change of Product specifications

Specifications listed in our catalogs, manuals or technical documents may be changed without notice.

### 5. Application and use of the Product

(1) For the use of the product, its applications should be those that may not result in a serious damage even if any failure or malfunction occurs in the product, and a backup or fail-safe function should operate on an external system to the product when any failure or malfunction occurs.

(2) The product is designed and manufactured as a general purpose product for use at general industries. Therefore, applications substantially influential on the public interest for such as atomic power plants and other power plants of electric power companies, and also which require a special quality assurance system, including applications for railway companies and government or public offices are not recommended, and we assume no responsibility for any failure caused by these applications when used. In addition, applications which may be substantially influential to human lives or properties for such as airlines, medical treatments, railway service, incineration and fuel systems, man-operated material handling equipment, entertainment machines, safety machines, etc. are not recommended, and we assume no responsibility for any failure caused by these applications when used. We will review the acceptability of the abovementioned applications, if you agree not to require a specific quality for a specific application. Please contact us for consultation.

## 12. Labeling (product name) based on the Marking for the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment: Geared Motor

### (1) Marking for the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment



This mark indicates the environmental protection use period based on the Administrative Measure on the Restricted Use of Hazardous Substances in Electrical and Electronic Equipment applied to electrical and electronic equipment sold in China. To the extent that this product is used under the instructions on safety and usage, it will not cause any serious impact on the environment, human health, and properties for the indicated number of years from the manufacturing date.

Note:

When disposing of the product after proper use, follow local laws and regulations stipulating how to collect and recycle electrical and electronic devices.

Note: This symbol mark is for China only.

### (2) Six hazardous substances, names of parts containing the substances, and the contents

The table below lists the six hazardous substances contained in this equipment, names of parts containing these substances, and the contents.

Names of hazardous substances contained in the equipment and the contents

Part Name	Hazardous Substances					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent chromium (Cr (VI) )	Polybrominated biphenyls (PBB)	Polybrominated diphenyl ethers (PBDE)
Structural parts	×	○	○	○	○	○
Stator	○	○	○	○	○	○
Rotor	○	○	○	○	○	○
Brake	×	○	○	○	○	○
Detector	×	○	○	○	○	○

This table is prepared in accordance with the provisions of SJ/T 11364.

○: Indicates that said hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.

×: Indicates that said hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572.

## (1) 电器电子产品有害物质限制使用标识



根据《电器电子产品有害物质限制使用管理办法》，该标记适用于在中国销售的电器电子产品，其中的数字为产品的环保使用期限。只要遵守本产品在安全和使用方面的注意事项，在自生产日期算起的该年限内，将不会污染环境，也不会给人身和财产带来严重的影响。

(注) 产品正常使用终结废弃时，有关电子电气产品的回收、再利用等要遵守各自自治体的法律法规的要求。

Note: This symbol mark is for China only.

## (2) 所含有的6种有害物质的名称, 含有量, 含有部品

本产品中所含有的6种有害物质的名称, 含有量, 含有部品如下表所示。

产品中有害物质的名称及含量

部件名称	有害物质					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
构造部件	×	○	○	○	○	○
转子	○	○	○	○	○	○
定子	○	○	○	○	○	○
制动器	×	○	○	○	○	○
检测器	×	○	○	○	○	○

本表格依据SJ/T11364的规定编制。

○:表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。

×:表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T26572规定的限量要求。

## **Inspection Certificate**

Thank you for selecting a Mitsubishi geared motor.  
This is to certify that your geared motor has been accepted  
by the specified inspection in our factory.

This document was issued in October 2017.  
Note that product specifications may be subject to change without prior notice.

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