

# High Precision Gearbox for Servo Motor


## Instruction Manual (abridged edition)

<Read this manual before using the product.>

### Introduction

Thank you for purchasing our product. A Simple Instruction Manual (this document) and a Detailed Instruction Manual are available for this product. For more information, please see the Detailed Instruction Manual.




#### ■ Related instruction manual

Name	
High Precision Gearbox for Servo Motor Detailed Instruction Manual	
How to Obtain	
From our website	QR code
<a href="https://www.brother-usa.com/servo-gearbox-manual">https://www.brother-usa.com/servo-gearbox-manual</a>	

### Safety Precautions

- Be sure to carefully read the contents described in this instruction manual and to understand how to use product correctly before using it.
- The extent of hazard/damage expected to occur in the case of improper handling are classified and indicated in ranks of "DANGER", "WARNING", and "CAUTION." The definitions and indications are as follows.

#### ■ Description of the symbol

 <b>Danger</b>	Cases where it is expected that a degree of danger is extremely high such that improper handling possibly causes a dangerous situation to occur, which may lead to death or serious injury.
 <b>Warning</b>	Cases where improper handling possibly causes a dangerous situation to occur, which may lead to death or serious injury.
 <b>Caution</b>	Cases where improper handling possibly causes a dangerous situation to occur, from which a minor or medium degree of injury may be incurred.

Even items described in "CAUTION" may lead to a serious results depending on the situation.



Be sure to observe every instruction which deals with important contents.



■ The icons used in this document stand for the following:



	Nonspecific hazard warning		Nonspecific prohibition
	Burn injury hazard		Do not dismount or disassemble
	Electric shock hazard		Nonspecific obligations
	Fire hazard		Grounding required

### ⚠ DANGER



#### ■ General

 	When using the product for an application that may directly cause harm to human bodies, such as personnel transportation equipment, provide the equipment with a protective device to ensure safety. Otherwise, there is a risk of accident with casualties or damage to the equipment due to a loss of control or dropping.
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 	If the product is used in an elevator, install a safety device on the device side to prevent it from falling. Failure to implement safety measures may result in personal injury, death, and/or damage to the device due to the falling of the elevator.
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 	Do not use the product in an explosive environment. Failure to follow this precaution may result in explosions, ignition of fire, electric shocks, injuries, and/or damage to the device.
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#### ■ Transport



 	Do not enter underneath the product when it is lifted for transportation. Failure to follow this precaution may result in an accident with casualties due to dropping.
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#### ■ Operation

 	Never approach or touch the product while it is rotating. Failure to follow this precaution may result in injury due to entanglement.
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### ⚠ WARNING



#### ■ General

 	Transportation, installation, piping, wiring, operation, handling, maintenance, and inspections must be performed by personnel having expertise and skills. Failure to follow this precaution may result in an explosion, ignition of fire, fire, electric shock, injury, or damage to the equipment.
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 	Do not repair, disassemble, or remodel the product. Failure to follow this precaution may result in fire, electric shock, burns, injury, and/or damage to the product.
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#### ■ Operation



 	When the operation has stopped due to the occurrence of error or activated safeguards, do not restart the operation until the causes of error are identified and countermeasures are taken. Failure to follow this precaution may result in fire, electric shock, burns, injury, and/or damage to the product.
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 	When performing trial operation, fix the product in place and disconnect it from the application. Failure to follow this precaution may result in injury.
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### ⚠ CAUTION



#### ■ General



 	Operate the product under the conditions specified in this instruction manual. Failure to follow this precaution may result in damage to the application and/or injury.
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 	Do not expose the product to strong impacts/shocks. Failure to observe this precaution may result in failure of the product and/or injury.
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### ⚠ CAUTION



#### ■ General

 	Do not use the product under the conditions not specified on the nameplate or in the product specifications. Failure to follow this precaution may result in fire, electric shock, injury, and/or damage to the equipment.
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 	Do not use damaged products. Failure to follow this precaution may result in fire, injury, and/or damage to the equipment.
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 	Do not insert fingers or objects in the opening of the product. Failure to follow this precaution may result in fire, electric shock, injury, and/or damage to the equipment.
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 	Do not remove the nameplate.
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 	Products modified by a customer will not be covered by the warranty.
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#### ■ Transport



 	The product must be transported correctly in accordance with its weight. Otherwise, it may result in injury and/or failure.
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 	Do not overload/over stack the products. Failure to follow this precaution may result in injury and/or malfunction.
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#### ■ Installation



 	When handling the product, be careful with the angles and sharp edges of the product. Failure to follow this precaution may result in injury.
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 	Ensure that the product is securely fixed onto the machine. Failure to follow this precaution may result in injury and/or damage to the product.
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 	Do not stand or hang on the product. Failure to follow this precaution may result in injury and/or damage to the product.
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 	Do not place heavy items on the product. Failure to follow this precaution may result in damage to the product.
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 	Do not put any object that may prevent air from being circulated around the product. Failure to follow this precaution may cause burns due to abnormal overheating, and/or fire.
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 	Do not put any combustible material near the product. Failure to follow this precaution may result in fire.
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 	Install an oil pan for a food machinery and other applications in which leakage cannot be present and may occur in the event of a failure, service life, etc. Otherwise, products may be defective due to oil leakage.
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 	Do not touch the keyways at the end of shaft, internal diameter, etc. with a bare hand. Failure to follow this precaution may result in injury.
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 	Confirm the rotational direction before connecting to the application. Incorrect rotational direction may result in injury or damage to the equipment.
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#### ■ Operation



 	Immediately stop the operation if there is any abnormality. Failure to follow this precaution may result in a fire, electric shock, and/or injury.
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 	Do not touch the product during operation or for a while after the operation is stopped as its surfaces may become very hot. Failure to follow this precaution may result in burns.
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 	Do not touch the rotating parts of the product. Failure to follow this precaution may result in injury.
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 	Make sure that the surface temperature of the reducer does not exceed 90°C. If the surface temperature exceeds 90°C, cool it down using the external fan or heat sink to keep it 90°C or below.
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 	Ensure that the product is securely fixed to the application before operating it. Sudden acceleration or deceleration without fixing the product may cause unexpected move, that could result in injury, product failure, and/or damage to the application.
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 	Ensure that the inertial load does not cause vibration to the output shaft during acceleration or deceleration. Vibration may cause product failure and/or damage to the application.
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### Important

When disposing of the product, dispose of it as a general industrial waste. Please follow local laws and regulations if any apply and take care of the waste accordingly.

### Notice

We shall assume no responsibility or liability for any troubles caused by use that violates the cautions in this manual.

The contents of this manual are subject to change without notice.

We have made every possible effort to make the contents of this manual easy to understand. If there is anything that is unclear or hard to understand, please feel free to contact us.

### Inspection upon Unpacking

#### Checking Package Contents

Check for the following items when unpacking the package. Contact the dealer from where you purchased the product or your nearest service office if you have any questions or if there are any defects.

- Does the information on the nameplate completely match your order?
- Is there any damage caused during transportation?
- Is (Are) there any loose screw(s), bolt(s), or other fastening part(s)?
- Where an accessories list is included in the package, do the accessories match the descriptions of the accessories list?

### Installation

#### Installation place

Ambient temperature	0°C~40°C
Ambient humidity	85% RH max. (no dew condensation)
Altitude	1,000 m max.
Vibration resistance	0.5 G max.
Atmosphere	Well-ventilated place free from corrosive gas, explosive gas, vapor, chemicals, etc. Well-ventilated place with no dust No direct exposure to rain or water No direct exposure to sunlight

#### Installation orientation

No restriction on installation orientation.  
(Since it uses a grease lubrication system)

#### Installation method

Foot mount, Flange mount  
Secure the gearmotor with four bolts on a vibration-free and machine-processed flat surface (0.1mm or less of flatness).

Tightening torque of installation fixing bolt

APG type/AFC type (Reference values)			
Installation Hole (mm)	Bolt Size	Strength Type (JIS B 1051)	Tightening Torque (N·m)
5.5	M5	10.9	8.3
6.5	M6	10.9	14.2
9	M8	10.9	29.4
11	M10	10.9	65.8

AG3 type/AH2 type/AF3 type (Reference values)			
Installation Hole (mm)	Bolt Size	Strength Type (JIS B 1051)	Tightening Torque (N·m)
9	M8	4.8	13
11	M10	4.8	25
13	M12	4.8	44
15	M14	4.8	69
18	M16	4.8	108
22	M20	6.8	294

Operation

Checking before operation

- The product is correctly connected to the application.
- The product is correctly installed.

Checking under trial operation

- Switch on for 1 to 2 seconds under no load to check the rotational direction before installing to the connecting machine.
- Execute running-in operation without load.  
If there is no abnormality, gradually increase the load up to full load.

Checking under operation

- Refer to the inspection details and check the operational conditions.  
Immediately stop the operation if there is any abnormality.  
Failure to follow this precaution may result in fire, electric shock, burns, injury, and/or damage to the product.
- Refer to detailed instruction manual for the diagnosis when abnormality occurred and do not operate the motor until the causes of error are found and measures/treatments are applied.

Inspection

Based on 8 hours/day operation.  
Perform periodic inspections according to your inspection interval guideline.  
Failure to follow this precaution may result in fire, electric shock, burns, injury, and/or damage to the product.

Inspection Item	Inspection interval guideline	Inspection Details
Noise	Every 2 to 3 days	No abnormal sound (rattling, periodic sound) No increase from the normal level Reference: Apply a listening rod to the bearing part to check for abnormal sounds
Vibration	Every 2 to 3 days	No abnormal vibrations No increase from the normal level
Surface temperature	Every 2 to 3 days	Below 90°C No rapid increase or decrease from the normal temperatures
Grease leakage	Every 2 to 3 days	No leakage from the oil seals and joint parts of cases
Installation	Every 6 months	No loose screws to mount the product onto the application
Connected to the application	Every 6 months	The connection between the product and its load not loosened Tension of the chains and belts No core displacements

Maintenance

- All the models that we offer use a grease lubrication system; they do not need grease replacement/replenishment.
- The product is designed for 10,000 hours of operation.
- Though the oil seals etc. should prevent grease and oil leakage, we highly recommend that you apply protection such as oil pans in case of unexpected events.  
Oil leakage may cause your product failure. (There are risks of grease and oil leakage during a product failure or at the product's life-end.)
- The service life of oil seals may vary depending on the conditions of use, and replacements may be required even before the 10,000 hours of usage.  
Please note that the replacement must be performed at our factory.
- The life time of precision (backlash) varies depending on the conditions of use.

Storage

- Storage location
  - When the product is stored, it shall be stored in a dry place indoors, with good ventilation, without direct sunlight, extreme temperature change, humidity, dust, and/or corrosive gas.
  - Do not directly place the product on the ground when it is stored.
  - If there is a micro vibration the bearing may be damaged by fretting corrosion even when the product is stored. Please store the product in a place without vibration.
- Operation during storage
  - To prevent the bearings from getting rusty, operate the motor every six months to check if the motor rotates smoothly and there is no abnormal sound.
  - Apply rust prevention to the rotating shafts, flange surface, and any other uncoated, processed surfaces every six months.
- Usage after storage
  - Check that there is no abnormal sound, vibration, heat generation and other abnormalities during the initial operation.

Terms and Conditions

Full Terms and Conditions can be found at the link below.

[www.brother-usa.com/GM-terms-conditions](http://www.brother-usa.com/GM-terms-conditions)



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