



Low Voltage Brushless DC Gearmotors
Gearmotor Instruction Manual
(abridged edition)
<Read this Manual before using the product.>

Introduction

Thank you for purchasing the Brother Brushless DC series.

Related instruction manuals and software

Name	Description	Availability
Gearmotor Instruction Manual	Instruction manual that describes the gearmotor wiring method, precautions, etc.	Our web site
Driver Instruction Manual	Unabridged instruction manual that provides information such as details of user-defined constants for the driver designed specifically for this gearmotor.	Our web site
Driver Instruction Manual (abridged edition)	Abridged edition of the Driver Instruction Manual.	Included in driver packaging
Parameter setting software ACD-PSTool	This is the software for setting the parameters for the driver.	Our web site
ACD-PSTool Instruction Manual	This instruction manual describes the wiring of the parameter setting tools for the driver.	Our web site

Safety precautions

- Be sure to carefully read the contents described in this Instruction Manual and to master how to use the product correctly before using it.
- Extents of hazard/damage expected to occur in the case of inept handling are basically classified and indicated into ranks of "Danger", "Warning" and "Caution" in this Instruction Manual. The definitions and indications are as follows:

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

Even the items described in "Caution" may lead to a serious accident depending on situation. Be sure to observe every instruction which deals with important contents.

Installation

- Installation environment**
Ambient temperature: 0 to 40°C
Ambient humidity: 85% or less
Altitude: 1,000 m or lower
Atmosphere: Well-ventilated place free from dust.
Installation location: Indoor
- Installation direction**
There are no limitations on its orientation. (Since it uses a grease lubrication system)
- Installation method**
[1] Foot and flange mount:
Secure it to a vibration-free, machined flat surface (flatness 0.3 mm or less) using four bolts.
[2] Shaft Mount:
 - Allow the driven shaft to support the weight of the reducer. (Make sure that the torque arm isn't subjected to any force other than rotation reaction forces.)
 - If the motor operation involves frequent starts/stops and/or forward/reverse, make sure the torque arm is fastened firmly in place to eliminate loosening.

Tightening torque

Mounting (mm)	Bolt diameter	Tightening torque (N·m)	Tightening torque ((kgf·m))
5.5	M5	2.9	{0.3}
6.5	M6	4.9	{0.5}
8.5	M8	13	{1.3}
9	M8	13	{1.3}
11	M10	25	{2.6}
13	M12	44	{4.5}
15	M14	69	{7.0}
18	M16	108	{11.0}
22	M20	294	{30.0}

Specifications and Performance

Motor power	50W	100W
Item	Brushless Motor	
Voltage (V)	12 24	12 24 48
Rated Current (A)	5.9 2.7	12.4 5.8 2.7
Wire Size (mm2)	0.9(AWG18)	2(AWG14)
Maximum Extended Length (m)	5	
Ambient Temperature (°C)	0 ~ 40°C	
Ambient Humidity (%RH)	85%RH or less (no condensation)	
Ambient Storage Temperature (°C)	-10 ~ 60°C (no freezing)	
Ambient Storage Humidity (%RH)	85%RH or less (no condensation)	
Vibration	0.5 G or less	
Altitude	1,000 m or lower	
Atmosphere	Well-ventilated place free from corrosive/explosive gasses and dust	
Installation place	Indoor	

	The symbol indicates "what you should pay attention to." (The example on the left shows "Electric Shock Hazard.")
	The symbol indicates "what you must not do." Specific "don't" item is depicted in the circle. (The example on the left shows "Don't Disassemble.")
	The symbol indicates "what you must do." Specific "do" item is depicted in the circle. (The example on the left shows "Ground Connection.")

Danger

	If the product is used in a device such as a personnel transport device, make sure to install a protective device for safety purposes. Failure to observe this precaution may result in personal injury or death or damage to the device.
	If the product is used in an elevator, install a safety device on the device side to prevent it from falling. Failure to observe this precaution may result in personal injury or death or damage to the device due to falling down of the elevator.
	Do not use the product in an explosive environment. Failure to observe this precaution may result in explosion, ignition of fire, fire, electric shock, injury, or damage to the device.
	Do not change the wiring while the product is energized. Failure to observe this precaution may result in fire, electric shock, or damage to the device.

Warning

	Never use the product in a location where water may spatter, in an atmosphere with corrosive substance or inflammable gas, or near flammable objects. Failure to observe this precaution may result in fire or accidents.
	The operators in charge of transportation, installation, wiring, operation, handling, maintenance, and inspection should have enough knowledge and technical skill related to the product. Failure to observe this precaution may result in explosion, ignition of fire, fire, electric shock, injury, or damage to the device.
	When the operation has stopped due to error occurrence or safeguards, do not start the operation until the causes of error are determined, and countermeasures are taken. Failure to observe this precaution may result in damage to the equipment, injury, fire, electric shock or burns.
	The equipment might suddenly start operating after recovering from the power failure. Make sure not to go near the equipment. Failure to observe this precaution may result in injury.
	Do not repair, disassemble or remodel the product. Failure to observe this precaution may result in injury, fire, electric shock or burns.
	When performing trial operation, fix the product in place and disconnect it from the machine. Failure to observe this precaution may result in injury.
	When replacing the product equipped with holding brake, secure the machine side part of the product. Failure to observe this precaution may result in injury or damage to the device due to falling down of the device.

Caution

	The product must be transported correctly in accordance with its weight.
	Do not hold the cable or output shaft when transporting the product.
	Failure to observe this precaution may result in damage to the equipment or injury.

	Do not overload with products. Failure to observe this precaution may result in injury or equipment failure.
	When handling the gearmotor, be careful with the sharp portions of the device, such as its corners. Failure to observe this precaution may result in injury.
	Fix the gearmotor firmly in place. Failure to observe this precaution may result in damage to the equipment or injury.
	If there is possible risk of dangerous movement due to external forces (such as gravity) during a power outage and/or error, the brake on the gear motor alone cannot ensure safety. For such situations, please be sure to add external brakes to ensure safety.
	Never perform operations with wet hands. Failure to observe this precaution may result in electric shock.
	When operating the gearmotor with a Nissei driver, use the specified combination.
	Failure to observe this precaution may result in fire or damage to the equipment.
	Do not touch the gearmotor or driver when the power is on or immediately after turning off the power, as their surfaces may be hot. Failure to observe this precaution may cause burns.
	Immediately stop the operation if there is any abnormality. Failure to observe this precaution may result in fire or injury.
	Do not put any combustible material near the product. Failure to observe this precaution may result in fire.
	Operate the product under the conditions specified in this instruction manual. Failure to observe this precaution may result in damage to the equipment or injury.
	Do not put any object that may prevent air from being circulated around the product. Failure to observe this precaution can cause abnormal overheating of the product. It may result in fire or burns.
	Do not step on or place any heavy object on the product. Failure to observe this precaution may result in injury.
	Be careful not to cause damage to the cable nor pull it strongly. Failure to observe this precaution may result in injury, fire or electric shock.
	Do not expose the product to high impact. Failure to observe this precaution may result in failure of the product or injury.
	Make sure that the gearmotor is correctly wired. Failure to observe this precaution may result in injury due to damaged equipment.
	Do not touch the rotating part of the gearmotor. Failure to observe this precaution may result in injury.
	In equipments like food machines, which must avoid oil or grease, furnish with protective devices like oil pan, in order to protect from the oil leakage caused by failure or life of the manufactured products. Leaking oil may cause defective products.

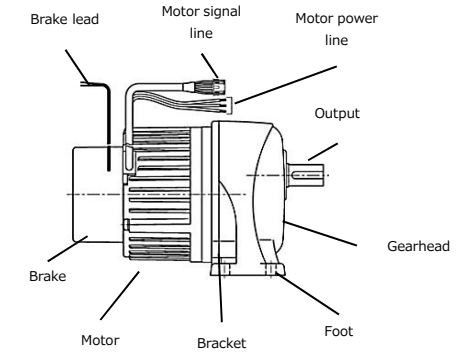
Important

When disposing of the product, dispose of it as a general industrial waste. However, follow local laws and regulations if any applies and take appropriate treatment.

Notice

We shall assume no responsibility or liability for any troubles caused by use in violation of the cautions above.
The contents of this Manual are subject to change without notice.
We have made every possible effort to make the contents of this Manual precise. If there is any point not understandable, error or finding, however, your comment will be appreciated.

Names of parts and their functions

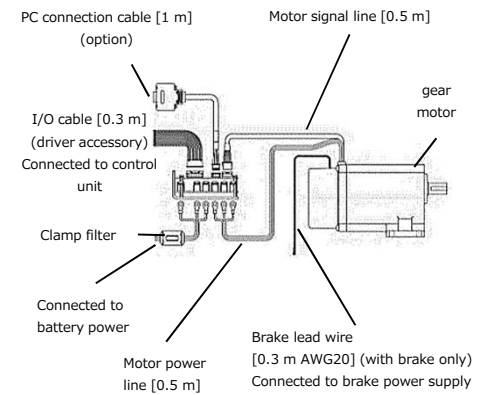


Checks that should be made before use

- Checking the contents of the package
Check the following items after unpacking the package. If there are any defects, or if you have any questions, please contact us immediately.

- Is the information on the nameplate consistent with your order?
Model, reduction ratio, motor capacity, voltage
- Are there any damaged parts due to an unexpected accident, etc. during transportation?
- Are there any loose nuts or screws?
- Contents of the package
 - Gearmotor..... 1 unit
 - Gearmotor Instruction Manual (abridged edition) 1 copy
 - Surge protector (with brake only)..... 1 piece
 - Optional parts

Example of connecting to Brother driver



Note: The maximum extension length for the motor signal line, motor power line, and brake lead wire is 5 m. If the motor signal line is extended by connecting optional extension cords, its overall length must be 4.5 m or less (i.e., up to four extension cords can be used).

Note: The motor power line is not equipped with a round terminal. It must be prepared by the user.

Standard Terms and Conditions of Sale

- General**
These standard Terms and Conditions of Sale shall be incorporated into any contract between Purchaser and Brother International Corporation (hereafter Brother) and shall apply to all purchase orders issued by Purchaser. Unless specifically provided herein or in a separate written agreement duly executed by Brother, the quotation and this form constitute the entire agreement between Brother and Purchaser and no other terms or conditions oral or written shall be of any effect. All orders, whether placed pursuant to a quotation or not, are accepted only upon express condition that purchaser agrees to the Terms and Conditions as specified herein.
- Price and Delivery Terms**
Price and delivery terms are F.O.B. Brothers nearest U.S. facility and do not include sales, use, excise, or any other taxes. Our responsibility ceases when delivery is made to the transportation company and any claims for loss or damage in transit must be handled by the Purchaser with the carrier.
- Packing**
No charge is made for standard boxing for domestic shipments. Purchaser will be quoted and charged separately for export or special packing requirements.
- Payment Terms**
To Purchasers with credit standing satisfactory to Brother, terms of payment are cash in full, net 30 days. If at any time Brother deems that by reason of financial condition of the Purchaser or otherwise, the continuance of production or shipments is not justified, Brother may revoke its extension of credit, enforce any security interest(s) created hereby on all goods furnished by Brother to the Purchaser and otherwise secure itself as to Purchaser's performance of its obligation.
- Cancellation**
Changes, suspension or cancellation of any order by Purchaser may be made only upon written approval of an authorized officer of Brother.
- Warranty**
All Brother gearmotor product are warranted against defects in materials and workmanship for a period of 2 years from the date of manufacture. This constitutes Brother's only warranty in connection with this sale, and is in lieu of all other warranties expressed or implied, written or oral. There are no implied warranties of merchantability or fitness for a particular purpose that apply to this sale. If performance guarantees are requested, they should be requested in writing. Full consideration will be given to such requests when complete details of the proposed application are included.
- Limitation of Remedy**
Brother will repair or replace, at brother's option, F.O.B. Brother's factory, freight prepaid, any Brother gearmotor proved defective in materials or workmanship if immediate written notice of claim is made to Brother by Purchaser within 2 years from the date of manufacture. It is agreed that such repair or replacement is the exclusive remedy available from Brother. Under no circumstances shall Brother be liable to anyone for any special, incidental or consequential damages, whether the result of negligence or otherwise.
- Warranty Exclusions**
The Warranty of Brother gearmotor products does not cover and Brother makes no warranty with respect to:
1. Failures not reported in writing to Brother within the warranty period of 2 years after the date of manufacture.
2. Failures or damages due to miss-application, abuse, improper installation or abnormal conditions (overtemperature, humidity, dirt or corrosive matter).
3. Failures due to operation, either intentional or otherwise, above rated capacities or in an otherwise improper manner.
4. Product which has in any way been tampered with or altered by anyone other than an authorized representative of Brother.
5. Expenses incurred by the Purchaser in an attempt to repair or rework an allegedly defective product.
6. Product damaged in shipment or otherwise without the fault of Brother.

Returns
No product will be accepted for return unless authorized in writing with a returned merchandise authorization (RMA) number assigned. Any returned goods must be returned with transportation charges prepaid.

Regulatory Laws and/or Standards
It is the Purchaser's obligation to install and operate all Brother gearmotor products in conformance with all applicable national or local laws and safety codes.

Patents
Brother represents that its gearmotors are designed and manufactured such that they do not infringe on any United States Patent(s), and that Brother will, at its expense, defend any claim charging such infringement and will save Purchaser harmless from any adverse judgements resulting therefrom. Purchaser agrees to give Brother, prompt written notice of any claim of infringement and to turn over to Brother the complete control of any litigation involving such claims including the right to settle such claims. This indemnity does not apply to Products which are incorporated by the Purchaser into Products which are changed to infringe a Patent or to Product which is used by Purchaser in performance of a method or process which is charged to infringe a Patent.

Law
These Standard terms and Conditions of Sale shall be interpreted in accordance with the Laws of the State of New Jersey.

Severability
If any of the terms and Conditions shown here are determined to be invalid, illegal, or unenforceable the remainder of these Terms and Conditions shall remain in full force and effect.



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Motor power	200W	400W
Item	Brushless Motor	
Voltage (V)	24 48	24 48
Rated current (A)	9.8 5.1	20.1 9.9
Motor lead wire (mm2)	2(AWG14)	
Maximum Extended Length (m)	5	
Ambient Temperature (°C)	0 ~ 40°C	
Ambient Humidity (%RH)	85%RH or less (no condensation)	
Ambient Storage Temperature (°C)	-10 ~ 60°C (no freezing)	
Ambient Storage Humidity (%RH)	85%RH or less (no condensation)	
Vibration	0.5 G or less	
Altitude	1,000 m or lower	
Atmosphere	Well-ventilated place free from corrosive/explosive gasses and dust	
Installation place	Indoor	

* Rated current values are reference values for use without gearhead(motor only).

Electromagnetic brake specifications

Motor power	50W	100W
Item	Power-Off (spring close)	
Brake type	Power-Off (spring close)	
Static torque(N·m) (motor shaft)	0.2	0.57
Excitation voltage(V) (±10%)	12 24	12 24 48
Current Draw(A) (20°C)	0.44 0.25	0.65 0.36 0.17
Power Draw (W) (20°C)	5.3 6	7.8 8.6 8.3
Wire Size (mm2)	0.5 (AWG20)	

Motor power	200W	400W
Item	Power-Off (spring close)	
Brake type	Power-Off (spring close)	
Static torque(N·m) (motor shaft)	0.95	1.76
Excitation voltage(V) (±10%)	24 48	24 48
Current Draw(A) (20°C)	0.58 0.28	0.58 0.31
Power Draw (W) (20°C)	13.9 13.2	13.9 15.1
Wire Size (mm2)	0.5 (AWG20)	

	Be sure to insert a surge protector to protect the driver from surge generated by turning on/off the electromagnetic brake.
	Use the varistor (82 V, 1J or higher) included in the package or a diode (100 V, 1A, or higher).

Maintenance, Service Life

- All the models that we offer use a grease lubrication system; they do not need grease replacement/replenishment.
The gearmotor is designed for 10,000 hours of operation.
- The service life of the oil seal differs according to use conditions.
It may need to be replaced before it has reached 10,000 hours.

Periodic inspection

Gearmotor inspection items are described in the table below. Please determine the best inspection timing based on the inspection frequency described below while taking into account usage conditions/environment.

Inspection items	Inspection frequency	Inspection and maintenance procedure	Remarks
Checking of connection between gearmotor and machine	Before the start of operations	<ul style="list-style-type: none"> Make sure that the gearmotor-machine mounting screws are tight enough. Make sure that the gearmotor-is firmly connected to the load. Check for misalignment. 	-
Vibrational and acoustic check	Every day	<ul style="list-style-type: none"> Make tactual and aural checks. 	No increase from the normal level
Appearance check	Whenever required	<ul style="list-style-type: none"> Perform clearing with a cloth, compressed air, etc. 	-
Checking for grease leakage	Every 2 or 3 days	<ul style="list-style-type: none"> Make sure that the connections of the gearmotor case, oil seal, bracket, etc. are free from leakage. 	-