

Safety Precautions

The products in this catalog are designed to be used with general industrial devices. When using, pay sufficient attention to the following:

- Read the Instruction Manual carefully prior to installation, assembly, and/or operation for the correct usage of the product.
- Never attempt to disassemble or alter the product in any way.
- Contact us or your point of sale for installation or maintenance services of the product.
- Regarding the following uses of the product, consult us in advance because special considerations are required for operation, maintenance, and management such as dualization of systems, introduction of an emergency generator, and so forth.

- ① Use in medical equipment that may affect people's lives or cause bodily injury
- ② Use in transportation systems or transport-related equipment such as trains or elevators, that may affect people's lives or cause bodily injury
- ③ Use in computer systems that may have an impact on society or on the public
- ④ Use in other devices that have a major impact on human safety or on maintaining public operations

- In addition to the above, contact us or your point of sale for use in an environment where vibrations occur, such as in automobiles or transportation systems.
- For use in space, aviation, or nuclear power-related applications, contact us or your point of sale.
- The products shown in this catalog are subject to Japanese Export Control Law. Diversion contrary to the law of exporting country is prohibited.

Safety Information

Warning Labels on Products

Products bear the following Warning Labels to indicate precautions, depending on the model.



This label is attached to high voltage parts such as electrically charged or cover-protected parts, indicating the risk of electric shock.



必ずアース線を接続して下さい
Use proper grounding techniques.

This label is attached to the GND terminals of a driver, recommending that the terminals should be well grounded.



危険
WARNING
感電注意
May Cause electric shock

This label is attached to certain areas of a driver where voltages exceeding specified limits are used, drawing attention to the risk of electric shock.



Indicates that the motor may get hot, resulting in burns.



Indicates that the motor should be grounded.

Safety Alert Symbols


The following symbols are used in the manual to indicate potential hazardous situations and important actions.



DANGER Denotes immediate hazards that may cause severe bodily injury or death as a result of incorrect operation.



CAUTION Denotes hazards that could cause bodily injury and product or property damage as a result of incorrect operation.

Even those hazards denoted by the  CAUTION symbol could lead to a serious accident. Make sure to strictly follow these safety precautions.



PROHIBITED Indicates actions that must not be allowed to occur (prohibited actions).



MANDATORY Indicates actions that must be carried out (mandatory actions).

DANGER

General

1. Do not use the product in an explosive, flammable or corrosive atmosphere, watery place or near a combustible material. Doing so may cause injury or fire.
2. Have a person with expert knowledge on hand for performing the transportation, installation, wiring, operation, maintenance or inspection of the product. Without such knowledge, it may cause an electric shock, injury or fire.
3. Do not work on wiring, maintenance servicing or inspection with the electric power on. Perform either of those five minutes after turning the power off. Failure to do so may cause an electric shock.
4. When the protective functions of the product is activated, turn the power off immediately and eliminate the cause. If continuing the operation without eliminating the cause, the product may operate improperly and cause injury or a breakdown of the system devices.
5. The motor may have step-out during operation or when it stops depending on the magnitude of the load. Before using this product, perform adequate trial operations under the maximum load conditions to check that the product operates reliably. Failure to do so may cause a breakdown of the system. (When the product is used to drive upward/downward, the load may fall off due to step-out.)
6. Do not touch the internal parts of the driver. Doing so may cause an electric shock.

Wiring

7. Do not connect the motor directly to a commercial power outlet. Doing so may cause an electric shock, injury or fire. Power should be supplied to the motor through the driving circuit.
8. Use an electric power source within the rated input voltage. Using otherwise may cause fire or an electric shock.
9. Connect the driver and motor to the ground. Using without grounding may cause an electric shock.
10. Do not harm, forcibly put a stress, or load a heavy article on the cable or get it caught between the articles. Doing so may cause an electric shock.
11. Perform wiring with the power cable as instructed by the wiring diagram or the Instruction Manual. Doing otherwise may cause an electric shock or fire.
12. Do not move the motor cable, as it is not a movable cable. Doing so may result in electric shock, injury, or fire.

Operation

13. Do not touch the rotating part of the motor during its operation. Touching it may cause injury.
14. Do not reach or touch the electric terminals while electric power is on. Doing so may cause an electric shock.
15. Never disconnect any of the connectors while electric power is on. Doing so may cause an electric shock and corruption.
16. Do not operate this product with live parts exposed. Doing so may result in electric shock.
17. If smoke, fire, unusual smells, or unusual sounds are produced from the driver or motor, turn off the power and stop using this product immediately. Not doing so may result in electric shock, injury, or fire.

CAUTION

General

1. Prior to installation, operation, maintenance servicing or inspection, be sure to read the Instruction Manual and follow the instructions to perform. Failure to follow the instructions may cause an electric shock, injury or fire.
2. Do not use the driver or the motor under conditions that exceed the specification values. Doing so may cause an electric shock, injury or fire.
3. Do not insert a finger or an object into the opening of the product. Doing so may cause an electric shock, injury or fire.
4. Do not use a damaged driver or motor. Doing so may cause

injury, fire or the like.

5. Use the driver and motor in the designated combination. Using otherwise may cause fire or failure.
6. The operating driver, motor, and peripheral devices become very hot. Be careful so as not to get burned.
7. Never disassemble, repair, modify, or remanufacture this product. Doing so may result in electric shock, injury, or fire.
8. Do not remove the nameplate. Using this product with an incorrect rating may result in fire.
9. Be careful that this product does not fall or tip over when handling, as this can be dangerous.

Unpacking

10. Confirm that the bottom and top of the box are facing correctly while unpacking. Failure to do so may cause injury.
11. Confirm that the product is the one that you have ordered. Installing an incorrect product may cause a breakdown.

Wiring

12. Do not measure the insulation resistance or dielectric voltage of the product. Doing so may cause a breakdown. Contact us or your point of sale instead, if such a measurement is required.
13. Perform wiring conforming to the technical standards of electric facility or the wiring rule. Doing otherwise may cause burning or fire.
14. Ensure that wiring are done correctly. Incorrect wiring may cause the motor to run out of control, resulting in injury.
15. Make sure to insulate the included capacitor and terminals for external resistor connection. Failure to do so may cause an electric shock.

Installation

16. Do not step on, or stack heavy items on the product. Doing so may cause injury.
17. Make sure that the intake and exhaust ports are not blocked or stuffed by foreign substances. Failure to do so may cause fire.
18. Make sure to follow the specified driver mounting orientation. Failure to do so may cause failure.
19. Keep a distance as instructed by the Instruction Manual for the driver from the inner surface of the control console or other devices. Failure to do so may cause failure.
20. Place the product with great care so as to prevent from danger such as a tumble or a turnover.
21. Mount the product on an incombustible material such as metal. Failure to do so may cause fire, injury, or damage to product.
22. Do not place combustible material around this product. Failure to do so may result in fire or burns.
23. Be sure to provide an adequate ventilation path when installing this product, and do not block the intake and exhaust ports. Failure to do so may result in electric shock, fire, or device breakdown.
24. Confirm the rotating direction before connecting with the mechanical device. Failure to do so may cause injury or a breakdown.
25. Do not touch the motor output shaft (including the key slot and gears) with your bare hand. Doing so may cause injury.
26. Make sure not to apply excessive force to the output shaft.

Operation

27. The motor is not equipped with any protective device. Take protective measures using an over-current protective relay, a ground fault interrupter, a protective device from excess temperature, and an emergency stopping device. Failure to do so may cause injury or fire.
28. Do not touch the product while the power is on or for a while after the power is turned off since the driver and motor remain very hot. Doing so may cause burns. In particular, the temperature of the motor may rise considerably depending on the operating conditions. Do not allow the motor surface to exceed the following temperatures:
 - Thermal class F (+155°C) stepping motors: 125°C
 - Thermal class B (+130°C) stepping motors: 100°C
 - Regardless of thermal class, encoder equipped stepping motors: 85°C, stepping motors with built in drivers: 70°C, stepping motors for vacuum environments: 150°C
29. Stop operations immediately when an emergency occurs. Failure

- to do so may cause an electric shock, injury, or fire.
30. Do not change adjustment to an extreme, for such a change results in unstable operation and may cause injury.
 31. When performing a trial operation, fasten the motor and disconnect it from the mechanical system. Check the operation, then connect it to the machine. Failure to do so may cause injury.
 32. When the alarm has been activated, eliminate the cause and ensure safety before resuming operations. Failure to do so may cause injury.
 33. When the electric power recovers after a momentary interruption, do not approach the devices because the system may restart operation by itself. (Set the system so as to secure the safety even when it restarts on such occasions.) Failure to do so may cause injury.
 34. Confirm that the electric power supply properly conforms to the product specifications. Failure to do so may cause failure.
 35. The brake mechanism of the motor with the electromagnetic brake is used to hold the movable section and the motor position. Do not use it as a safety measure. Doing so may cause the breakdown of the system.
 36. Firmly stabilize the key when operating the motor with the key individually. Failure to do so may cause injury.

Maintenance

37. Driver and motor frames become very hot. Be careful when performing maintenance or inspection. Failure to do so may cause burns.
38. It is recommended to replace the electrolytic condenser of the driver with a new one for securing the preventive measure after using for 5 years (the expected life in an average operating environment of 40°C). The expected life of the fuse is 10 years in an average operating environment of 40°C. Thus, periodical replacement is recommended.
39. Contact us or your point of sale for repair. If the product is disassembled by the user, it may become inoperable.

Transportation

40. Handle the product with care during transportation so as to prevent from dangers such as tumbling or overturning.
41. Do not hold with the cable or the motor spindle. Doing so may cause trouble or injury.

Disposal

42. When scrapping the driver or stepping motor, handle it as general industrial waste.



Storage

1. Avoid storing this product in places exposed to rain or water drops, or in an environment with hazardous gas or liquid. Failure to do so may cause trouble.

Maintenance

2. Do not disassemble or repair the product. Doing so may cause fire or an electric shock.

General

3. Do not remove the nameplate. Using this product with an incorrect rating may result in fire.



Storage

1. Store the product in a location that is not exposed to sunlight, at a temperature and humidity within the product specifications.
2. If the driver has been stored for a long period (3 years or longer as a general guide), contact us. The capacitance may have decreased with the electrolytic condenser due to the long period storage, which may cause failure.

Operation

3. Install an external emergency stop circuit to turn the power off in the event that operation must be instantly halted.
4. Operate products within the specified ambient temperature