

OPERATING MANUAL

2-Phase Stepping Motor

PK Series High Torque Type

Thank you for purchasing an Oriental Motor product. This Operating Manual describes product handling procedures and safety precautions.

- Please read it thoroughly to ensure safe operation.
- Always keep the manual where it is readily available.

Introduction

■ Before using the motor

Only qualified personnel should work with the product. Use the product correctly after thoroughly reading the section "Safety precautions." The product described in this manual has been designed and manufactured for use in general industrial machinery, and must not be used for any other purpose. For the power supply use a DC power supply with reinforced insulation on its primary and secondary sides. Oriental Motor Co., Ltd. is not responsible for any damage caused through failure to observe this warning.

■ Hazardous substances

RoHS (Directive 2002/95/EC 27Jan.2003) compliant

Safety precautions

The precautions described below are intended to prevent danger or injury to the user and other personnel through safe, correct use of the product. Use the product only after carefully reading and fully understanding these instructions.

⚠ Warning

Handling the product without observing the instructions that accompany a "Warning" symbol may result in serious injury or death.

⚠ Caution

Handling the product without observing the instructions that accompany a "Caution" symbol may result in injury or property damage.

⚠ Warning

- Do not use the product in explosive or corrosive environments, in the presence of flammable gases, locations subjected to splashing water, or near combustibles. Doing so may result in fire or injury.
- Assign qualified personnel the task of installing, wiring, operating/controlling and/or inspecting the product. Failure to do so may result in fire or injury.
- If this product is used in a vertical application, be sure to provide a measure for the position retention of moving parts. The motor loses its holding capability when the power is turned off. Failure to provide such a measure may cause the moving parts to descend, resulting in injury or damage to the equipment.
- Install the motor in an enclosure in order to prevent injury.
- Keep the input-power voltage within the specified range to avoid fire.
- Connect the cables securely according to the wiring diagram in order to prevent fire.
- Do not forcibly bend, pull or pinch the cable. Doing so may result in fire.
- For the power supply use a DC power supply with reinforced insulation on its primary and secondary sides. Failure to do so may result in electric shock.
- Turn off the power in the event of a power failure, or the motor will suddenly start when the power is restored and may cause injury or damage to equipment.
- Do not disassemble or modify the motor. This may cause electric shock or injury. Refer all such internal inspections and repairs to the branch or sales office from which you purchased the product.

⚠ Caution

- Do not use the motor beyond its specification, or injury or damage to equipment may result.
- Do not touch the motor during operation or immediately after stopping. The surface is hot and may cause a skin burn(s).
- Do not hold the motor output shaft (output shaft) or motor cable. This may cause injury.

- Provide an emergency-stop device or emergency-stop circuit external to the equipment so that the entire equipment will operate safely in the event of a system failure or malfunction. Failure to do so may result in injury.
- Conduct the insulation resistance measurement or withstand voltage test separately on the motor and the driver. Conducting the insulation resistance measurement or withstand voltage test with the motor and driver connected may result in injury or damage to equipment.
- To prevent bodily injury, do not touch the rotating parts (output shaft) of the motor during operation.
- Immediately when trouble has occurred, stop running and turn off the controller power. Failure to do so may result in fire, electric shock or injury.
- To dispose of the motor, disassemble it into parts and components as much as possible and dispose of individual parts/components as industrial waste.

Checking the product

To verify that the unit you've purchased is the correct one, check the model number shown on the identification plate. Report any incorrect or damaged item to the branch or sales office from which you purchased the product.

Installation

■ Location for installation

The motor is designed and manufactured for installation in equipment. Install it in a well-ventilated location that provides easy access for inspection. The location must also satisfy the following conditions:

- Inside an enclosure that is installed indoors (provide vent holes)
- Operating ambient temperature -10 to +50 °C (+14 to +122 °F) (non-freezing)
- Operating ambient humidity 85%, maximum (non-condensing)
- Area that is free of explosive atmosphere or toxic gas (such as sulfuric gas) or liquid
- Area not exposed to direct sun
- Area free of excessive amount of dust, iron particles or the like
- Area not subject to splashing water (rain, water droplets), oil (oil droplets) or other liquids
- Area free of excessive salt
- Area not subject to continuous vibration or excessive shocks
- Area free of excessive electromagnetic noise (from welders, power machinery, etc.)
- Area free of radioactive materials, magnetic fields or vacuum

■ How to install the motor

Install the motor onto an appropriate flat metal plate having excellent vibration resistance and heat conductivity.

When installing the motor, secure it with four bolts (not supplied) through the four mounting holes provided. Leave no gap between the motor and plate.

Bolt size: M4 Tightening torque: 2 N·m (284 oz-in)

Insert the pilot located on the motor's installation surface into the mounting plate's countersunk or through hole.

■ Installing a load

When connecting a load to the motor, align the centers of the motor's output shaft and load shaft. Be careful not to damage the output shaft or bearings when installing a coupling or pulley to the motor's output shaft.

■ Permissible overhung load and permissible thrust load

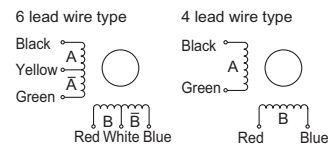
The overhung load on the motor's output shaft or gear output shaft must be kept within the permissible values listed below. The thrust load must not exceed the motor's mass.

Distance from the end of the motor output shaft and permissible overhung load

0 mm (0 in.)	5 mm (0.2 in.)	10 mm (0.4 in.)	15 mm (0.6 in.)	20 mm (0.8 in.)
50 N (11.2 lb.)	60 N (13.5 lb.)	75 N (16.8 lb.)	100 N (22 lb.)	150 N (33 lb.)

Failure due to fatigue may occur if the motor's bearings and output shaft are subject to repeated loading by an overhung or thrust load that is in excess of the permissible limit.

Wiring diagram



Inspection

It is recommended that periodic inspections be conducted for the items listed below after each operation of the motor. If an abnormal condition is noted, discontinue any use and contact your nearest office.

- Check for any unusual noises in the motor's bearings (ball bearings) or other moving parts.
- Check for damage or stress in the motor's lead wires or loose connections to the driver.
- Are the motor's output shaft and load shaft out of alignment?

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- Please contact your nearest Oriental Motor office for further information.

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