

## OPERATING MANUAL

### Stepping motor

### PK Series, PX Series Geared Type

## 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., td. is not responsible for any damage caused through failure to observe this warning.

### ■ Hazardous substances (PK series only)

The products do not contain the substances exceeding the restriction values of RoHS Directive (2011/65/EU).

## 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.

- 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, inspecting and troubleshooting the product. Failure to do so may result in fire or injury.
- Provide a means to hold moving parts in place for applications involving vertical travel. The motor loses holding torque when the power is shut off, allowing the moving parts to fall and possibly causing injury or damage to 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 or push the connector. Doing so may fire.
- Do not forcibly bend, pull or pinch the cable. Doing so may 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 injury. Refer all such internal inspections and repairs to the branch or sales office from which you purchased the product.

### Caution

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

- Do not use the motor beyond its specifications, or injury or damage to equipment may result.

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.

- Do not touch the motor during operation or immediately after stopping. The surface is hot and may cause a burn.
- Do not hold the motor 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.
- To prevent bodily injury, do not touch the rotating parts (output shaft) of the motor during operation.
- Immediately when trouble has occurred, stop unning and turn off the driver power. Failure to do so may result in fire or injury.
- Conduct the insulation resistance measurement or withstand voltage test separately on the motor and the driver. Failure to do so may result in injury or damage to equipment.
- To dispose of the motor, disassemble it into parts and components as much as possible and dispose of individual parts/components as industrial waste.

## Precautions for use

### • About grease of geared motor

On rare occasions, a small amount of grease may ooze out from the gearhead. If there is concern over possible environmental damage resulting from the leakage of grease, check for grease stains during regular inspections. Alternatively, install an oil pan or other device to prevent leakage from causing further damage. Oil leakage may lead to problems in the customer's equipment or products.

### • Allowable torque

Operate the motor by making sure the sum of the acceleration/deceleration torque at the starting/stopping of the motor and the load (friction) torque doesn't exceed the allowable torque. Operating the motor in excess of the allowable torque may result in a damaged gear.

### • Allowable speed range

Operate the motor at speeds within the allowable range. Operating the motor at a speed outside the allowable range may result in a shorter gear life.

### • Backlash

Backlash is the angle of free rotation (i. e. play) of the output shaft when the reduction gear's input section is fixed. If backlash can become a problem when positioning uses bidirectional rotation, control sequences should be designed so that the output shaft is stopped from only unidirectional, forward or reverse.

### • Rotating direction of the gear output shaft

The direction of rotation of the motor and gearhead shaft relative to each other is determined by the reduction gear ratio as follows:

S: Same direction

O: Opposite direction

Geared motor model	Reduction ratio			
	1:3.6 to 1:10	1:18	1:36	1:50 to 1:100
PX243G01-0□□	–	O	–	–
PK243□□□-SG□	S	O	O	S
PK264□□□-SG□	S	O	O	S
PK296□□□-SG□	S	S	O	–

## Checking the product

Upon opening the package, verify that the items listed below are included. Report any missing or damaged items to the branch or sales office from which you purchased the product.

- Motor .....1 unit
- Screws.....4 pcs.

Check the model number of the motor against the number shown on the nameplate.

## Installation

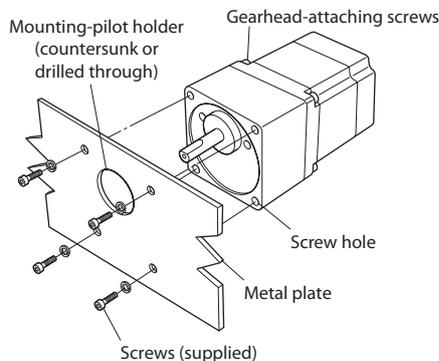
### Location for installation

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 (rains, 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 screws (supplied) through the four screw holes provided. Leave no gap between the motor and plate.



#### • PX243G01-0□□, PK243□□□-SG□

Nominal size	Tightening torque	Effective depth	Screw hole
M3 (No.4-40UNC *)	1 N·m (142 oz-in)	7 mm (0.278 in.)	M3 P0.5

#### • PK264□□□-SG□

Nominal size	Tightening torque	Effective depth	Screw hole
M4 (No.8-32UNC *)	2 N·m (280 oz-in)	8 mm (0.315 in.)	M4 P0.7

#### • PK296□□□-SG□

Nominal size	Tightening torque	Effective depth	Screw hole
M6 (No.1/4-20UNC *)	3 N·m (420 oz-in)	15 mm (0.591 in.)	M6 P1.0

\* USA Model type.

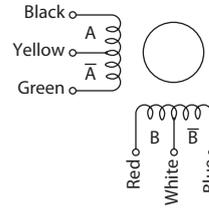
**Note** Do not loosen the gearhead-attaching screws (four pcs.).

## Installing a load

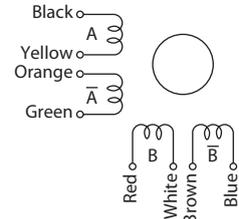
When connecting a load to the motor, align the centers of the motor's output shaft and load shaft. Be careful not to damage the output shaft or the bearings when installing a coupling or pulley to the motor's output shaft.

## Wiring diagram

### 6-lead wire type



### 8-lead wire type



## 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.
- Are there any loose connector connections, or any scratches or signs of stress in the motor cable?
- Are the motor's output shaft (or gear 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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