



HM-7423-2

Orientalmotor

OPERATING MANUAL

2-Phase Stepping Motor PK Series PL 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., 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.



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.



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.
- 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.
- To prevent bodily injury, do not touch the rotating parts (output shaft) of the motor during operation.

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.

- Immediately when trouble has occurred, stop running and turn off the driver power. Failure to do so may result in fire or 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 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

- 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.

- 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

The gear output shaft is subject to backlash of 20 to 35'. To reduce the effect of backlash, perform positioning operations from one direction only-either from the CW direction or the CCW direction.

- Rotating direction of the gear output shaft

Rotating direction of the gear output shaft and the motor shaft are same direction.

Checking the product

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

- Motor 1 unit
- Motor cable [0.6 m (2 ft.)] 1 pc. (PK2□-L only)
- * □ represents an alpha numeric indicating the motor type.
- OPERATING MANUAL (this document) 1 copy

Installation

■ Location for installation

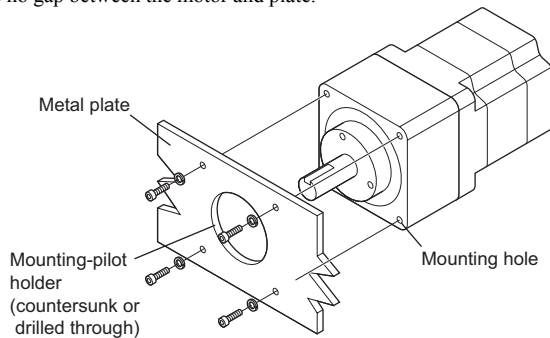
The motor is designed and manufactured for installation in equipment. Install it in a well-ventilated location that provides easy access for inspection. The location must also satisfy the following conditions:

- Inside an enclosure that is installed indoors (provide vent holes)
- Ambient temperature: -10 to +50 °C (+14 to +122 °F) (non-freezing)
- Ambient humidity: 85% or less (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

Installation method

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.



Motor type	Bolt size	Tightening torque [N·m (oz-in)]	Effective depth [mm (in.)]
PK244P	M4	2 (280)	8 (0.315)
PK26□P	M5	2.5 (350)	10 (0.394)

* Enter the motor length in the box (□) within the model number.

Permissible overhung load and permissible thrust load

The overhung load and thrust load on the motor's output shaft or gear output shaft must be kept within the permissible values listed below.

Motor type	Permissible overhung load [N (lb.)]					Permissible thrust load [N (lb.)]
	Distance from the tip of motor's output shaft [mm (in.)]					
	0 (0)	5 (0.20)	10 (0.39)	15 (0.59)	20 (0.79)	
PK244PD□-P5 PK244PD□-P10	73 (16.4)	84 (18.9)	100 (22)	123 (27)	-	50 (11.2)
PK244PD□-P36	109 (24)	127 (28)	150 (33)	184 (41)	-	50 (11.2)
PK266PD□-P5	200 (45)	220 (49)	250 (56)	280 (63)	320 (72)	100 (22)
PK266PD□-P10	250 (56)	270 (60)	300 (67)	340 (76)	390 (87)	100 (22)
PK264PD□-P36	330 (74)	360 (81)	400 (90)	450 (101)	520 (117)	100 (22)

* Enter A (single shaft) or B (double shaft) in the box (□) within the model name.

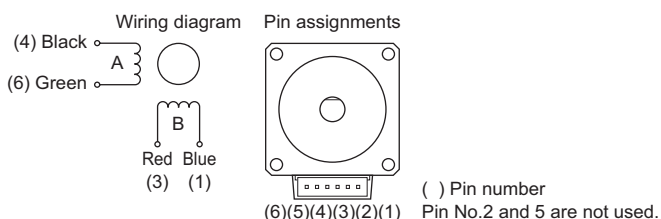
Installing a load

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.

Connecting with a key

With a geared motor, to connect a load to the gear output shaft having a key groove, first provide a key groove on the load and fix the load with the gear output shaft using the supplied key.

Connection



The colors of lead wires shown apply to the supplied cable or optional motor cable. If you are using the connector set or when you are providing your own connector or cable, connect based on the pin numbers shown.

The applicable connector and the cable are as follows.

Applicable connector and cable

Motor type	Housing Contact (Molex)	Cable	Crimping tool (Molex)
PK244P	51103-0600 50351-8XXX	AWG28 to 22 (0.08 to 0.3 mm ²) Cable outer diameter Ø1.15 to 1.8 mm (0.045 to 0.071 in.) Stripping the cable 2.3 to 2.8 mm (0.091 to 0.11 in.)	57295-5000
PK26□P	51067-0600 50217-9XXX	AWG24 to 18 (0.2 to 0.75 mm ²) Cable outer diameter Ø1.4 to 3 mm (0.055 to 0.118) Stripping the cable 3 to 3.5 mm (0.118 to 0.138 in.)	57189-5000 57190-5000

* Optional motor cables and connector set (sold separately) are available from Oriental Motor.

Note

- Secure the motor connector cable in place so that the connection won't be subjected to stress induced by a bent cable or the cable's own mass. The cable's radius of curvature should be as large as possible.
- When removing the motor cable, pull it out horizontally toward the output shaft. The motor may be damaged if force is applied in any other direction. The motor cable for the PK244P and PK26□P (both supplied and sold separately) employs a connector with a lock. When removing this type of cable, release the connector lock first. Forcibly pulling out the cable without releasing the connector lock may damage the motor.

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 and load shaft out of alignment?

- Unauthorized reproduction or copying of all or part of this manual is prohibited.
- Oriental Motor shall not be liable whatsoever for any problems relating to industrial property rights arising from use of any information, circuit, equipment or device provided or referenced in this manual.
- Characteristics, specifications and dimensions are subject to change without notice.
- While we make every effort to offer accurate information in the manual, we welcome your input. Should you find unclear descriptions, errors or omissions, please contact the nearest office.
- **Oriental motor** is a registered trademark or trademark of Oriental Motor Co., Ltd., in Japan and other countries.

© Copyright ORIENTAL MOTOR CO., LTD. 2009

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

ORIENTAL MOTOR U.S.A. CORP.
Technical Support Tel:(800)468-3982
8:30 A.M. to 5:00 P.M., P.S.T. (M-F)
7:30 A.M. to 5:00 P.M., C.S.T. (M-F)
E-mail: techsupport@orientalmotor.com
www.orientalmotor.com

ORIENTAL MOTOR (EUROPA) GmbH
Headquarters and Düsseldorf Office Tel:0211-52067-00 Fax:0211-52067-099
Munich Office Tel:089-3181225-00 Fax:089-3181225-25
Hamburg Office Tel:040-76910443 Fax:040-76910445

ORIENTAL MOTOR (UK) LTD.
Tel:01256-347090 Fax:01256-347099

ORIENTAL MOTOR (FRANCE) SARL
Tel:01 47 86 97 50 Fax:01 47 82 45 16

ORIENTAL MOTOR ITALIA s.r.l.
Tel:02-93906346 Fax:02-93906348

TAIWAN ORIENTAL MOTOR CO.,LTD.
Tel:(02)8228-0707 Fax:(02)8228-0708

SINGAPORE ORIENTAL MOTOR PTE LTD
Tel:(6745)7344 Fax:(6745)9405

ORIENTAL MOTOR (MALAYSIA) SDN. BHD.
Tel:(03)22875778 Fax:(03)22875528

ORIENTAL MOTOR (THAILAND) CO.,LTD.
Tel:66-2-254-6113 Fax:66-2-254-6114

INA ORIENTAL MOTOR CO.,LTD.
KOREA
Tel:(032)822-2042-3 Fax:(032)819-8745

ORIENTAL MOTOR CO.,LTD.
Headquarters Tokyo, Japan
Tel:(03)3835-0684 Fax:(03)3835-1890