



Thank you for purchasing ORIENTAL MOTOR products.  
Please read this operating manual thoroughly before  
installing and operating the motor, and always keep  
the manual where it is readily accessible.

## AC Standard Motors

### K Series

### J Series

# OPERATING MANUAL

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## 1. Precautions

### 1.1 Precautions for Installation

- Do not use in a place where there is inflammable gas and/or corrosive gas.
- When installing the motor into your equipment, ensure that the motor lead wires are fixed and do not move.  
In addition, do not apply any pressure to these lead wires.
- The motor housing (Lead wire type) must be mounted with a screw and spring washer to the ground point of the equipment.
- Installation must be performed by a qualified installer.

### 1.2 Precautions for Operation

- Do not touch the motor that has been constricted for a long period of time. It will be hot and can burn you.
- Always turn off the power to the motor before conducting checks or performing work on the motor.

## 2. Checking the package contents

### 2.1 Checking the products

Make sure that you have received all of the items listed below. If an accessory is missing or damaged, contact the nearest Oriental Motor office.

- Motor: 1
- Capacitor: 1 (for only single-phase motors)
- This operation manual: 1

### 2.2 Checking the product name

This operation manual covers the following products.

Make sure that the product is the one you ordered.

Make sure the motor's model name, voltage, output and capacitor capacitance, which are listed on the nameplate.

#### • Induction motors

0IK1GN-A	0IK1A-A	0IK3GN-B	0IK3A-B	0IK1GN-C	0IK1A-C	0IK3GN-D	0IK3A-D	2IJ3GB-A
2IK6GN-A	2IK6A-A	2IK6GN-C	2IK6A-C	3IJ10GB-A	3IK15GN-A	3IK15A-A	3IK15GN-C	3IK15A-C
4IJ15GB-A	4IJ15GB-C	4IK25GN-A	4IK25A-A	4IK25GN-C	4IK25A-C	4IK25GN-S	4IK25A-S	4IK40A-B
4IK60A-BF	5IK40GN-A	5IK40A-A	5IK40GN-C	5IK40A-C	5IK40GN-S	5IK40A-S	5IK60GU-AF	5IK60A-AF
5IK60A-B	5IK60GU-CF	5IK60A-CF	5IK60A-D	5IK60GU-SF	5IK60A-SF	5IK90GU-AF	5IK90A-AF	5IK90A-BF
5IK90GU-CF	5IK90A-CF	5IK90A-DF	5IK90GU-SF	5IK90A-SF	5IK90A-TF	5IK150A-BF	5IK150A-DF	5IK150A-TF

#### • Reversible motors

0RK1GN-A	0RK1A-A	0RK1GN-C	0RK1A-C	2RJ4GB-A	2RJ4A-A	2RJ4GB-C	2RK6GN-A	2RK6A-A
2RK6GN-C	2RK6A-C	3RJ10GB-A	3RJ10GB-C	3RK15GN-A	3RK15A-A	3RK15GN-C	3RK15A-C	4RJ20GB-A
4RJ20A-A	4RJ20GB-C	4RK25GN-A	4RK25A-A	4RK25GN-C	4RK25A-C	5RK40GN-A	5RK40A-A	5RK40GN-C
5RK40A-C	5RK60GU-AF	5RK60A-AF	5RK60GU-CF	5RK60A-CF	5RK90GU-AF	5RK90A-AF	5RK90GU-CF	5RK90A-CF

#### • Reaction synchronous motors

2SJ2GB-A	2SK4GN-A	2SK4A-A	3SK10GN-A	3SK10A-A	4SK15GN-A	4SK15A-A	5SK25GN-A	5SK25A-A
5SK40GN-AF	5SK40A-AF	5SK60GU-AF	5SK60A-AF					

### 3. Installation

#### Installation conditions

Install the motor and capacitor in a location that meets the following conditions.

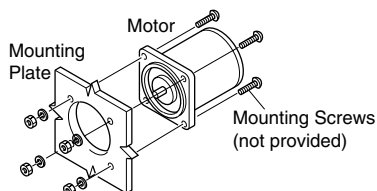
Using the motor and capacitor in a location that does not satisfy these conditions could damage it.

- Indoors (this product is designed and manufactured to be installed within another device)
- Ambient temperature: -10°C (+14°F) to +50°C (+122°F) (avoid freezing)
- Not exposed to explosive, flammable, or corrosive gases
- Ambient humidity: 85% max. (avoid condensation)
- Not exposed to direct sunlight
- Not exposed to dust
- Not exposed to water or oil
- In a location with good heat ventilation
- Not exposed to continuous vibration or excessive impact

#### 3.1 Installing the motor

Installation varies with the shape of the motor's output shaft.

##### 1) Round shaft motor

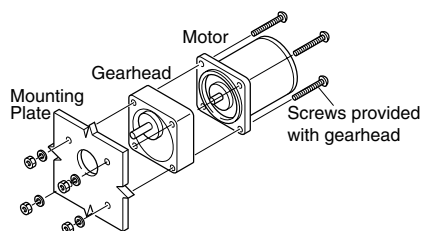


Note : Do not insert the motor into the mounting hole at an angle or force it in, as this may scratch the flange pilot section and damage the motor.

Drill holes in the mounting plate and fasten the motor to the mounting plate with screws, nuts, and washers. (The mounting screws are not provided.) Be sure that no gaps are left between the motor and the surface of the mounting plate.

Mounting Screws	First number in motor name	Screw size	Tightening torque
	0	M3	1.0 N·m (8.6 lb-in)
	2	M4	2.0 N·m (18 lb-in)
	3	M5	2.5 N·m (22 lb-in)
	4	M5	2.5 N·m (22 lb-in)
	5	M6	3.0 N·m (27 lb-in)

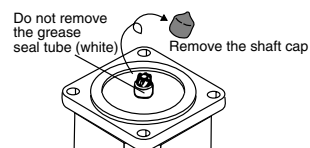
##### 2) Pinion shaft motor



Drill holes in the mounting plate and fasten the gearhead (sold separately) and the motor to the mounting plate using the four screws provided with the gearhead. Install the equipment so that no gaps are left between the motor flange surface and the gearhead pilot section end surface. Refer to the gearhead operation manual for further details concerning mounting.

(gearhead sold separately)

Note: Use the gearhead of the same type of pinion shaft as the motor.



Note : Every 42 mm (1.65 inch) frame motor has a white tube and a black cap on the motor shaft. To install these models, remove only the black cap but leave the white tube in place.

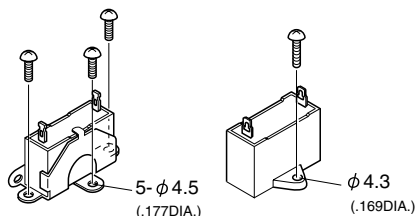
If it is removed, gearhead grease will get into the motor, possibly causing damage.

##### 3) Motor with a cooling fan

When installing a motor with a cooling fan onto a device, leave 10 mm (0.4 inch) or more behind the fan cover or open a ventilation hole so that the cooling inlet on the back of the motor cover is not blocked.

#### 3.2 Installing capacitors

Before installing the provided capacitor, check that the capacitor's capacitance matches that stated on the motor's name plate. Use the screws specified below to install capacitor. (Screws not provided.)



Mounting feet equipped.  
Use screws of 4 mm in diameter to install the capacitor.

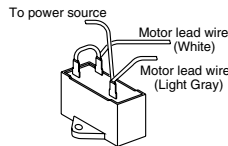
\* Dimensions in millimeters (inches).

- Notes: 1 When installing the rectangular capacitor with the plastic foot, tighten the screw to a torque of 1 N·m (8.6 lb-in) or less to prevent damage to the mounting foot.  
2 Install capacitor at least 10 cm (3.94 inch) away from the motor. If it is located closer, the life of the capacitor will be shortened.

## 4. Connection and Operation

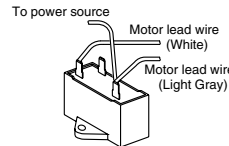
- Connect the motor according to the "wiring diagram" shown below.
- Insulate all the wire connections, such as the connection between the motor and the capacitor connection.  
Capacitor caps are available as an option to insulate capacitor connection.
- The capacitors for reaction synchronous motors have three terminals. Connection method varies with power frequency.  
Connect the capacitors as shown below: (Example : The connection of capacitor **CH4030A** / CW rotation)

[50 Hz: 4.0  $\mu$ F connection]



Short-circuit terminals 3.0  $\mu$ F and 1.0  $\mu$ F.

[60 Hz: 3.0  $\mu$ F connection]



Connect only to terminal 3.0  $\mu$ F.  
Insulate unused terminals.

### ■ Wiring diagram

The direction of rotation is as viewed from the side of the motor's output shaft.

Motor model and type		Clockwise	Counterclockwise
Induction motor	Single-phase 100 V/200 V		
	Three-phase 200 V/220 V		
Reversible motor	Single-phase 100 V/200 V		<p>Clockwise: Flip the switch to CW for clockwise rotation. Counterclockwise: Flip the switch to CCW for counterclockwise rotation.</p>
Reaction synchronous motor	Single-phase 100 V/110 V		

- Notes: 1 Check that the temperature of the motor case does not exceed 90°C (194°F) during operation. Operating the motor in excess of 90°C (194°F) will rapidly deteriorate the coil and ball bearings and shorten service life. The temperature of the motor case can be measured by fixing a thermometer to the motor surface. Alternatively, thermotape or a thermocouple can be used to measure temperature.
- 2 Bring induction motors to a complete stop before switching the direction of rotation. If you try to switch the direction of rotation before the motor has stopped, it may not change or may require time.
- 3 Use the provided capacitor for single-phase motors and always keep the capacitor connected after the motor is started.

## 5. Time Rating

Induction and reaction synchronous motors can be operated continuously (continuous rating).

Reversible motors can operate continuously for up to 30 minutes. (The 30 minute rating is indicated by "30 min" on the nameplate.)

## 6. Troubleshooting

When the motor is not functioning normally, perform an inspection covering the points listed in the table below.  
If the inspection shows that everything is normal but the motor and control unit still are not functioning correctly, contact the nearest Oriental Motor office. Do not repair, disassemble or remodel it yourself.

Problem	Things to check
The motor does not rotate or rotates at low speed	<ol style="list-style-type: none"> <li>1. Is the correct voltage being supplied to the motor?</li> <li>2. Are lead wires properly and firmly connected?</li> <li>3. Is the load too large?</li> <li>4. If lead wires have been extended using a terminal block or crimp-style terminals, are the lead wires properly and firmly connected at all points?</li> <li>5. For a single-phase motor, is the provided capacitor connected as shown in the wiring diagram of page 3?</li> <li>6. For a reaction synchronous motor, is the capacitor connected correctly for frequency?</li> </ol>
The motor rotates intermittently	<ol style="list-style-type: none"> <li>1. Are lead wires properly and firmly connected?</li> <li>2. If lead wires have been extended using a terminal block or crimp-style terminals, are the lead wires properly and firmly connected at all points?</li> <li>3. For a single-phase motor, is the provided capacitor connected as shown in the wiring diagram of page 3?</li> </ol>
The motor rotates in the opposite direction	<ol style="list-style-type: none"> <li>1. Is it connected as shown in the wiring diagram? Check the wiring diagram of page 3 again.</li> <li>2. The rotation direction of the gearhead's output shaft differs depending on the gearhead's reduction ratio. Refer to the gearhead's operating manual.</li> <li>3. For a single-phase motor, is the provided capacitor connected as shown in the wiring diagram of page 3?</li> <li>4. Are you viewing the motor from the same direction as the diagram? The direction of rotation is defined as clockwise or counterclockwise when viewed from the side of the motor output shaft.</li> </ol>
The motor becomes extraordinarily hot (motor case temperature exceeds 90°C (194°F))	<ol style="list-style-type: none"> <li>1. Is the correct voltage being supplied to the motor?</li> <li>2. Does the ambient temperature exceed the permissible range (+50°C (+122°F))?</li> <li>3. For a single-phase motor, is the provided capacitor connected as shown in the wiring diagram of page 3?</li> <li>4. For a reaction synchronous motor, is the capacitor connected correctly for frequency?</li> </ol>
The motor makes a strange noise	<ol style="list-style-type: none"> <li>1. Are motor and gearhead properly installed? Refer to the gearhead's operating manual.</li> <li>2. If the motor has a pinion shaft, is the coupled gearhead the same pinion type as the motor shaft?</li> </ol>