ORIENTAL MOTOR®

HM-9096-6

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.

© Copyright ORIENTAL MOTOR CO.,LTD. 2000

World K Series
Induction Motors
Reversible Motors
(Lead Wire Type)

OPERATING MANUAL

<Table of contents>

1. Precautions

1. 1 Precautions for Installation

●Do not use in a place where there is flammable 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.
●Motors for use only in equipment of protection class Ⅰ.
Motore zur Verwendung in Geräten der Schutzklasse Ⅰ.
●The motor housing must be mounted with a screw and spring washer to the ground point of the equipment.
Die Gehäuse der Motore sind mit einer Schraube und Zahnscheibe sicher mit dem geerdeten Gehäuse des Gerätes zu verbinden.
●Installation must be performed by a qualified installer.

1. 2 Precautions for Operation

●The Motor case temperature can exceed 70℃ (depending on operation conditions). In case motor is accessible during operation, please attach the following warning label so that it is clearly visible.


Warning label

●Always turn off the power to the motor before conducting checks or performing work on the motor.
Thermally protected motors will restart automatically when motor temperature falls bellow a certain level.

2. Checking the package contents

2. 1 Checking the contents

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)
-Capacitor cap·····1 (for only single-phase motors)
-This operating manual····· 1

Motors (except for **5IK90GU-SW** and **5IK90A-SW**) are recognized by UL and certified by VDE.
Recognized name and certified name are motor model name.
The certificate by VDE is valid only for the motor assembly itself. The capacitor is not included in the certificate.
However, both the motor assembly and capacitor combined have been tested against and have passed EN60950 Annex B.8.
5IK90GU-SW and **5IK90A-SW** are recognized by UL and certified by DEMKO.

• **Standards** UL519, UL547, UL1004, UL2111, CSA C22.2 №100, CSA C22.2 №77, EN60950
Standards File No. Motor : UL File No. E64199 (6W type), E64197(15W〜90W type)
VDE Licence No.114919ÜG (6W type)
6751ÜG, 6752ÜG or 6753ÜG (15W〜90W type)
DEMKO Certificate No.124234/DK 98-01504
Capacitor : UL FileNo. E83671 (CYWT2), VDE Licence No. 114747 (for only capacitor rated voltage 450VAC types)
Capacitor cap : UL FileNo. E56078 (YDTU2)

• **Applications for standard** EN60034-1, EN60034-5, IEC60034-11, IEC60664-1

A Running Heating Test and a Locked-Rotor Test has been conducted with a aluminum radiation plate of size indicated below. For the motor with a gear head, tests has been conducted with a gear head instead of the radiation plate.

First number in motor name	size	thickness	material
2	115×115 (4.53×4.53)	5 (0.20)	aluminium
3	125×125 (4.92×4.92)		
4	135×135 (5.31×5.31)		
5 (40W)	165×165 (6.50×6.50)		
5 (60W, 90W)	200×200 (7.87×7.87)		

※ Dimensions in millimeters(inches).

• **Installation Conditions** Overvoltage category Ⅱ, Pollution degree 2, Class Ⅰ equipment (For EN/IEC standards)
When the machinery to which the motor is mounted requires overvoltage category Ⅲ and pollution degree 3 specifications, install the motor in a cabinet that comply with IP54 and connect to power supply via an isolation transformer.

2. 2 Checking the product name and motor-capacitor combination

This product comes in a combined set consisting of a motor and a capacitor. When the product first arrives, check the name plates to confirm that you have received the correct motor and capacitor combination.

■Induction Motors

Model ※	Motor Model ※	Capacitor
2IK6GN-AWJ	2IK6GN-AW	CH35FAUL
2IK6GN-AWU	2IK6GN-AW	CH25FAUL
2IK6GN-CWJ	2IK6GN-CW	CH08BFAUL
2IK6GN-CWE	2IK6GN-CW	CH06BFAUL
3IK15GN-AWJ	3IK15GN-AW	CH55FAUL
3IK15GN-AWU	3IK15GN-AW	CH45FAUL
3IK15GN-CWJ	3IK15GN-CW	CH15BFAUL
3IK15GN-CWE	3IK15GN-CW	CH10BFAUL
4IK25GN-AWJ	4IK25GN-AW	CH80CFAUL
4IK25GN-AWU	4IK25GN-AW	CH65CFAUL
4IK25GN-CWJ	4IK25GN-CW	CH18BFAUL
4IK25GN-CWE	4IK25GN-CW	CH15BFAUL
5IK40GN-AWJ	5IK40GN-AW	CH110CFAUL
5IK40GN-AWU	5IK40GN-AW	CH90CFAUL
5IK40GN-CWJ	5IK40GN-CW	CH30BFAUL
5IK40GN-CWE	5IK40GN-CW	CH23BFAUL
5IK60GU-AWJ	5IK60GU-AW	CH200CFAUL
5IK60GU-AWU	5IK60GU-AW	CH180CFAUL
5IK60GU-CWJ	5IK60GU-CW	CH50BFAUL
5IK60GU-CWE	5IK60GU-CW	CH40BFAUL
5IK90GU-AWJ	5IK90GU-AW	CH280CFAUL
5IK90GU-AWU	5IK90GU-AW	CH200CFAUL
5IK90GU-CWJ	5IK90GU-CW	CH70BFAUL
5IK90GU-CWE	5IK90GU-CW	CH60BFAUL
2IK6GN-SW	2IK6GN-SW	——
4IK25GN-SW	4IK25GN-SW	——
5IK40GN-SW	5IK40GN-SW	——
5IK60GU-SW	5IK60GU-SW	——
5IK90GU-SW	5IK90GU-SW	——

■Reversible Motors

Model ※	Motor Model ※	Capacitor
2RK6GN-AWJ	2RK6GN-AW	CH45FAUL
2RK6GN-AWU	2RK6GN-AW	CH35FAUL
2RK6GN-CWJ	2RK6GN-CW	CH10BFAUL
2RK6GN-CWE	2RK6GN-CW	CH08BFAUL
3RK15GN-AWJ	3RK15GN-AW	CH75CFAUL
3RK15GN-AWU	3RK15GN-AW	CH60CFAUL
3RK15GN-CWJ	3RK15GN-CW	CH18BFAUL
3RK15GN-CWE	3RK15GN-CW	CH15BFAUL
4RK25GN-AWJ	4RK25GN-AW	CH100CFAUL
4RK25GN-AWU	4RK25GN-AW	CH80CFAUL
4RK25GN-CWJ	4RK25GN-CW	CH25BFAUL
4RK25GN-CWE	4RK25GN-CW	CH20BFAUL
5RK40GN-AWJ	5RK40GN-AW	CH160CFAUL
5RK40GN-AWU	5RK40GN-AW	CH120CFAUL
5RK40GN-CWJ	5RK40GN-CW	CH40BFAUL
5RK40GN-CWE	5RK40GN-CW	CH35BFAUL
5RK60GU-AWJ	5RK60GU-AW	CH250CFAUL
5RK60GU-AWU	5RK60GU-AW	CH200CFAUL
5RK60GU-CWJ	5RK60GU-CW	CH60BFAUL
5RK60GU-CWE	5RK60GU-CW	CH50BFAUL
5RK90GU-AWJ	5RK90GU-AW	CH350CFAUL
5RK90GU-AWU	5RK90GU-AW	CH300CFAUL
5RK90GU-CWJ	5RK90GU-CW	CH80BFAUL
5RK90GU-CWE	5RK90GU-CW	CH70BFAUL

※ The list above shows the pinion shaft motor. Round shaft motors are indicated by **A** before the hyhen.
Recognized name and certified name are motor model name.

3. Installation

Installation conditions

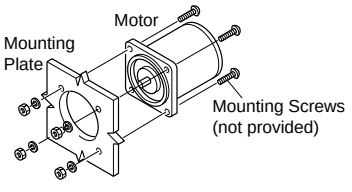
Install the motor and capacitor according to the following conditions:
Use under other than these conditions may damage the product.

- Indoor (the product is designed and manufactured to be mounted in a machine)
- Ambient temperature: -10˚C(**14**ºF) to +40˚C(**104**ºF) (no freezing)
  (-10℃(**14**ºF) 〜+50℃(**122**ºF) for 100V/200V)
- Ambient humidity: Less than 85% (no condensation)
- No explosive, flammable, and/or corrosive gas.
- Not exposed to direct sunlight.
- Not exposed to dirt.
- Not exposed to moisture or oil.
- Well ventilated and allows heat radiation.
- Does not receive continuous vibration or excessive shock.
- 1,000 meters or less above sea level.
- Overvoltage category **II**, Pollution degree 2, Class **I** equipment (For EN/IEC Standards)
  When the machinery to which the motor is mounted requires overvoltage category **III** and pollution degree 3 specifications, install the motor in a cabinet that comply with IP54 and connect to power supply via an isolation transformer.

3. 1 Installation of the motor

Installation method vary according to motor output shaft style.

1) Round shaft motor



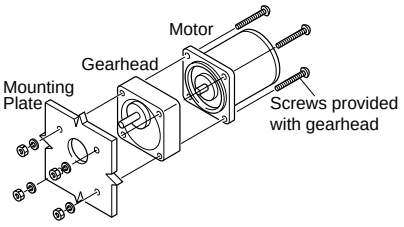
Note: Do not force the motor into the pilot hole of the mounting bracket.If the holes don't match correctly the motor may be damaged.

Drill holes on the installation bracket and mount the motor on the bracket using screws, nuts, and washers (screws for attaching are not supplied). Be careful no to leave a gap between the motor installation face and the bracket.

mounting screws

First letter of motor model name	Screw size	Tightening torque
2	M4	2.0N•m (20kgfcm)
3	M5	2.5N•m (25kgfcm)
4	M5	2.5N•m (25kgfcm)
5	M6	3.0N•m (30kgfcm)

2) Pinion shaft motor



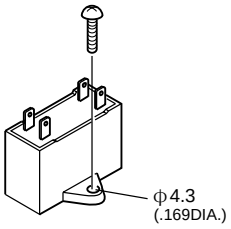
Drill holes on the installation bracket and fix the motor and gear head on the bracket using screws delivered with the gear head. Be careful there is no gap between the motor flange surface and the gear head. For details of installation, see the instruction manual of the separately sold gear head.

Note : Use the gear head with pinion shaft which is identical with one of the motor.

3) Motor with cooling fan

To install a motor with an integrated cooling fan , provide 10 mm or more space at back of the fan cover to prevent blockage of cooling fan air inlet at the end of the motor, or provide a ventilation hole.

3. 2 Mounting the capacitor (For only single-phase motors)



※Dimensions in millimeters(inches).

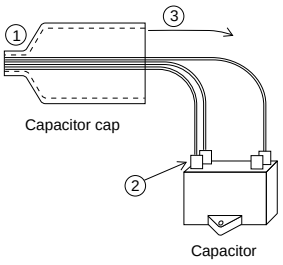
Before mounting the provided capacitor,check that the capacitor's capacitance matches that stated on the motor's name plate .

Use M4 screws to mount the capacitor (screws not provided).

Note -Do not let the screw fastening torque exceed 1 N･m (10kgfcm) to prevent damage to the mounting feet.
-Mount capacitor at least 10cm(3.94inches) 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 cap are available to insulate capacitor connection.

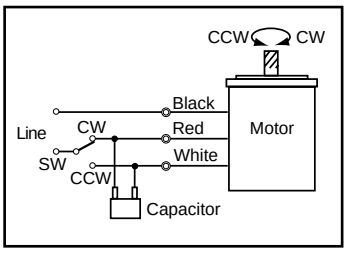


Capacitor cap
①Pass the lead wires through the capacitor cover as shown in the figure.
②Connect the lead wires to the terminals or use terminal ends.
③Cap the capacitor with the capacitor cover.

■Wiring diagram

The directions of motor rotation is as viewed from motor output shaft side.

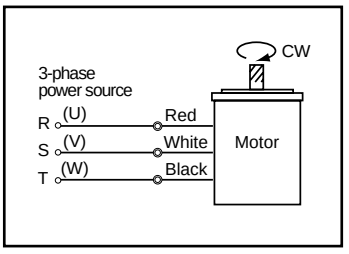
【Single-phase motors】



To rotate the motor in a clockwise (CW) direction, flip switch SW to CW.

To rotate it in a counterclockwise (CCW) direction, flip this switch to CCW.

【Three-phase motors】



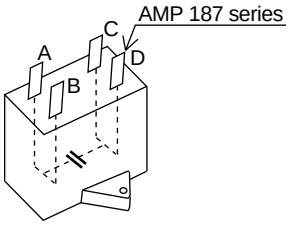
To change the direction of rotation,change any two connections between U,V and W.

Note 1 : Insulation class of this motor is B.
Make sure that the motor case temperature does not exceed 90˚C(**194**ºF) during operation of the motor. Operation exceeding case temperature 90˚C(**194**ºF) may significantly deteriorate the coils and ball bearings of the motor and shorten motor's life span. Motor case temperature can be measured by fixing a thermometer on the motor surface. It can also be measured using thermo tape or a thermocouple.

Note 2 : To change rotation direction of the induction motor, wait until the motor completely stops. Otherwise its direction may not change or may take much time to change.

Note 3 : Single-phase motors use a capacitor and keep it connected even after rotation of the motor has started.

■Capacitor Connection (For only single-phase motors)



The capacitor internal wiring is as follows:

Capacitor terminals are internally electrically connected in twos;A—B and C—D for easy connection.

For easy to install terminals use 187 series AMP FASTON Terminals.

For lead wire connection, use one lead wire for each individual terminal.

5. Time Rating

Induction motors have a continuus rating.
Reversible motors have a 30 minutes rating. " 30min" is indicated on the nameplate.

6. Locked rotor burnout protection

This motor is equipped with one of two methods to prevent burning the motor as a result of abnormal heating .

■ Thermal protection (“ TP ” “ TP211 ” is stamped on the motor name plate)

When the motor reaches a predetermined temperature, the internal thermal protector is activated and the motor is stopped.
In this stage,the electromagnetic brake is left released so that the motor does not keep hold of the load.Adopt another safety measure.
With the automatic resume feature, the motor automatically begins operating again as soon as the motor temperature falls to a temp.
Always turn the power off before performing inspections.

Thermal protector activation range:

Power is turned off at 130℃(266ºF) ±5℃(9ºF)
Power is turned back on at 82℃(180ºF)±15℃(27ºF)

■ Impedance protection (“ ZP ” is stamped on the motor name plate)

When the motor goes into locked rotor condition due to a malfunction, coil impedance rises, suppressing input to the motor and protecting the motor coil from burnout.

7. Troubleshooting

When the motor does not operate normally, check by referring to the table below.
If the motor does not operate normally even after checking, contact your nearest ORIENTAL MOTOR office for further information.

Phenomena	Check items
Motor does not rotate or rotates slowly.	1) Is supplied voltage appropriate? 2) Is the power source securely connected? 3) Is the load on the motor too much? 4) Is there a faulty contact on terminal blocks or crimped terminals if the cable is extended these methods? 5) For a single-phase motor is the capacitor properly connected as per the “wiring diagram” shown in page 3.
Motor sometimes rotates and stops.	1) Is the power source securely connected? 2) Is there a faulty contact on terminal blocks or crimping terminals? 3) For a single-phase motor is the capacitor properly connected as per the “wiring diagram” shown in page 3.
Motor rotates in reverse direction.	1) Is the motor connected differently than the “wiring diagram” shown in this manual. Check wiring by referring to the “wiring diagram” in page 3. 2) In some gear heads, rotation direction of the gear head output shaft may differ from rotation direction of the motor. See the instruction manual of the gear head. 3) For a single-phase motor is the capacitor properly connected as per the “wiring diagram” shown in page 3. 4) Is your understanding of rotation direction different than the manual description? In this manual rotation direction of the motor is defined as viewed at the motor from shaft side.
Motor temperature abnormally high (Motor case temperature exceeds 90˚C(**194**ºF))	1) Is appropriate voltage applied to the motor? 2) Does ambient temperature exceed the specified range? 3) For a single-phase motor is the capacitor properly connected as per the “wiring diagram” shown in page 3.
Noisy operation	1) Are the motor and gear head appropriately coupled? See the instruction manual for the gear head. 2) Is the coupled gear head the same pinion type as the motor shaft?

ORIENTAL MOTOR®

• Characteristics, specifications and dimensions are subject to change without notice.
• Please contact your nearest ORIENTAL MOTOR office for further information.

ORIENTAL MOTOR U.S.A CORP.
Los Angeles Office Tel:(310)784-8200 Fax:(310)325-1076
San Jose Office Tel:(408)358-6900 Fax:(408)358-8200
Chicago Office Tel:(847)240-2649 Fax:(847)240-2753
Cincinnati Office Tel:(513)563-2722 Fax:(513)956-3183
Austin Office Tel:(512)918-9438 Fax:(512)335-5983
New York Office Tel:(973)359-1100 Fax:(973)359-1090
Boston Office Tel:(781)848-2426 Fax:(781)848-2617
Atlanta Office Tel:(770)716-2800 Fax:(770)719-8515
Canada Office Tel:(905)502-5333 Fax:(905)502-5444
Technical Support Line Tel:(800)468-3982
Available from 8:30 AM to 8:00 PM , Eastern Time

ORIENTAL MOTOR (EUROPA) GmbH
Headquarters and Düsseldorf Office
Tel:02131-95280 Fax:02131-952899
Munich Office Tel:08131-59880 Fax:08131-598888
Hamburg Office Tel:04076-910443 Fax:04076-910445
ORIENTAL MOTOR (UK) LTD.
Tel:01252-519809 Fax:01252-547086
ORIENTAL MOTOR (FRANCE) SARL
Tel:01 47 86 97 50 Fax:01 47 82 45 16
ORIENTAL MOTOR ITALIA s. r. l
Tel:02-3390541 Fax:02-33910033

TAIWAN ORIENTAL MOTOR CO.,LTD.
Tel:(02)2299-9360 Fax:(02)2299-4173
SINGAPORE ORIENTAL MOTOR PTE LTD.
Tel:(745)7344 Fax:(745)9405
ORIENTAL MOTOR · KOREA CO.,LTD.
Tel:(02)632-9122 Fax:(02)679-4588
ORIENTAL MOTOR CO.,LTD.
Headquarters
Tel:(03)3835-0684 Fax:(03)3835-1890

Printed on Recycled Paper