ORIENTAL MOTOR

HM-9174-2

世界规格品K系列
无激磁动作型 电磁刹车马达

使用说明书



竭诚感谢您对东方马达的惠顾。使用前请熟读本产品说明书，并在对产品知识及安全注意事项熟悉后再开始使用。
阅读后请将本说明书保管在固定场所以便随时使用。

English version follows Chinese version

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1. 使用须知

1.1 使用注意事项

- 请勿在爆炸性环境、易燃性环境、腐蚀性环境及容易沾水的场所或可燃物周围使用。
- 请勿强行弯曲、拉扯或夹住电源电缆线和马达导线。
- 仅限于在等级 I 机器上使用。
- 将马达安装至机器上时，请装在手碰不到的地方或请接地。
- 安装、连接、检点等作业须由专业技术人员进行。

1.2 运转注意事项



警告标志

- 马达即使在正常运转状态时，表面温度亦会有超过70℃的现象。
  马达运转时，若有靠近马达的可能，请制作如右图之警告标志并贴在清晰可见之处。
- 在检查附过热保护装置(Thermal Protector)马达以及实施其他作业时，务必事先切断电源。
  当温度下降到所定标准以下时，过热保护装置会自动感知，马达则会再起动。
- 电磁刹车无法切实固定负载，且过热保护装置动作时亦无法保持负载。因此，欲作为安全刹车使用时，请采取其他安全措施。

2. 货品及品名的确认

2.1 验货

请确认下列物品是否齐全，若有不全或有破损时，请向东方马达株式会社询问。

- 马达…… 1 台
- 电容器套…… 1 个（仅单相马达附属）
- 电容器…… 1 个（仅单相马达附属）
- 本说明书…… 1 份

2.2 品名及搭配的确认

收到产品后，首先请参照马达铭板的记载，核对马达与刹车器的搭配是否正确，并请参照铭板上所记载的事项确认马达品名、电压、输出功率以及电容器之容量。

■100V/110V/115V产品

品名※	马达品名※	电容器品名
2RK6GN-AWMJG	2RK6GN-AWM	CH45FAUL
2RK6GN-AWMUG	2RK6GN-AWM	CH35FAUL
3RK15GN-AWMJG	3RK15GN-AWM	CH75CFAUL
3RK15GN-AWMUG	3RK15GN-AWM	CH60CFAUL
4RK25GN-AWMJG	4RK25GN-AWM	CH100CFAUL
4RK25GN-AWMUG	4RK25GN-AWM	CH80CFAUL
5RK40GN-AWMJG	5RK40GN-AWM	CH160CFAUL
5RK40GN-AWMUG	5RK40GN-AWM	CH120CFAUL
5RK60GU-AWMJG	5RK60GU-AWM	CH250CFAUL
5RK60GU-AWMUG	5RK60GU-AWM	CH200CFAUL
5RK90GU-AWMJG	5RK90GU-AWM	CH350CFAUL
5RK90GU-AWMUG	5RK90GU-AWM	CH300CFAUL

※ 品名及马达品名为齿轮轴型。
若为圆轴型时，品名及马达品名中的[**GN**] [**GU**]部分则为**A**。

■200V/220V/230V产品

品名※	马达品名※	电容器品名
2RK6GN-CWMJG	2RK6GN-CWM	CH10BFAUL
2RK6GN-CWMEG	2RK6GN-CWM	CH08BFAUL
3RK15GN-CWMJG	3RK15GN-CWM	CH18BFAUL
3RK15GN-CWMEG	3RK15GN-CWM	CH15BFAUL
4RK25GN-CWMJG	4RK25GN-CWM	CH25BFAUL
4RK25GN-CWMEG	4RK25GN-CWM	CH20BFAUL
5RK40GN-CWMJG	5RK40GN-CWM	CH40BFAUL
5RK40GN-CWMEG	5RK40GN-CWM	CH35BFAUL
5RK60GU-CWMJG	5RK60GU-CWM	CH60BFAUL
5RK60GU-CWMEG	5RK60GU-CWM	CH50BFAUL
5RK90GU-CWMJG	5RK90GU-CWM	CH80BFAUL
5RK90GU-CWMEG	5RK90GU-CWM	CH70BFAUL
2IK6GN-SWMG	2IK6GN-SWM	——
4IK25GN-SWMG	4IK25GN-SWM	——
5IK40GN-SWMG	5IK40GN-SWM	——
5IK60GU-SWMG	5IK60GU-SWM	——
5IK90GU-SWMG	5IK90GU-SWM	——

马达按下述规格设计、检查，并已取得各认证机构的认证和中国强制产品认证制度(CCC制度)的认证。认证品名为马达之品名。本系列马达（除**5IK90GU-SWM**、**5IK90A-SWM**以外）已取得VDE规格认证。VDE认证仅为马达单体的认证，单相马达则在与电容器搭配使用的状态下通过EN60950 Annex B.8试验。**5IK90GU-SWM**、**5IK90A-SWM**已取得DEMKO认证。
*马达符合低电压指令。

●认证规格　UL1004、UL2111、CSA C22.2 No.100、CSA C22.2 No.77、EN60950、GB12350

●认证机构　UL File No.E64199(6W型)、E64197(15W～90W型)
VDE
DEMKO
CQC

●适合规格　EN60034-1、EN60034-5、IEC60034-11、IEC60664-1

上述规格所要求的超载运转试验及拘束时的升温实验是在下述状态实施的。
齿轮轴型：附减速机状态。　圆轴型：配装散热板状态。散热板的尺寸、材料如下表。

马达品名的第1个字母	尺寸(mm)	厚度(mm)	材 料
2	115×115	5	铝
3	125×125		
4	135×135		
5 (40W)	165×165		
5 (60W，90W)	200×200		

●设置条件　过电压范围Ⅱ、污染度２、等级Ⅰ机器（适用EN/IEC规格）
因机器而异，若要求值为过电压范围Ⅲ、污染度３时，请将马达收纳于符合IP54规格的保护箱内，并通过绝缘变压器向马达供给额定电压。

●附属品的规格认证
电容器：UL File No.E83671(CYWT2)
VDE Licence No.114747(仅限于电容器额定电压为450VAC之型号)
电容器套：UL File No.E56078(YDTU2)

3. 安装须知

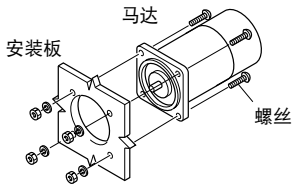
安装条件　马达须按下述条件安装，否则将有损坏产品之虞。

- 室内（产品是作为机器零件设计、制造的）
- 环境温度－10℃～＋40℃（不冻结）
（但是，100V/200V运转时则为－10℃～＋50℃）
- 环境湿度85%以下（不结露）
- 无爆炸性气体、引火性气体、腐蚀性气体
- 无阳光直射
- 无灰尘沾染
- 无水或油污沾染
- 易散热
- 无连续性振动及过度撞击
- 标高1000m以下
- 过电压范围Ⅱ、污染度２、等级Ⅰ机器（适用EN/IEC规格）
因机器而异，要求值过电压范围Ⅲ、污染度3时，请将马达收纳于符合IP54规格的保护箱中，并通过绝缘变压器向马达供给额定电压。

3.1 马达的安装

因出力轴形状之异，马达的安装方法有所不同。

1）圆轴型



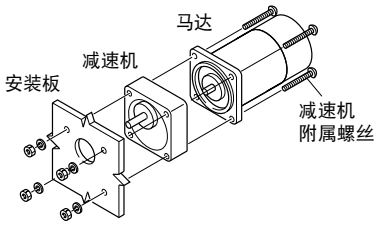
注意：请勿将马达斜插入安装孔或强行安装，否则有损伤内缘及损坏马达之虞。

在安装板上开孔后用螺丝、螺帽及底座将马达固定在安装板上。（不附属螺丝）。
请注意马达安装面与安装板之间不要留有缝隙。

螺丝规格

马达品名的第一个字母	螺丝尺寸	安装力矩
2	**M4**	**2.0N·m (20kgfcm)**
3	**M5**	**2.5N·m (25kgfcm)**
4	**M5**	**2.5N·m (25kgfcm)**
5	**M6**	**3.0N·m (30kgfcm)**

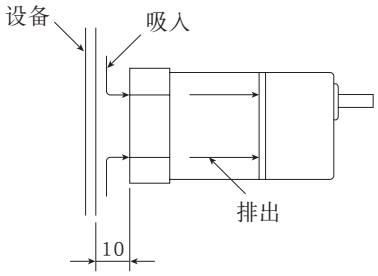
2）齿轮轴型



在安装板上开孔后，用另售减速机附属的４根螺丝将马达和减速机固定在安装板上。
请注意安装时不要使马达的凸缘与减速机的内缘之间留有缝隙。
详细安装方法请参照另售的减速机之说明书。

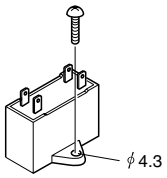
注意：减速机须使用与马达同样形状的齿轮轴型。

■附散热风扇的马达



安装附散热风扇的马达时，为了避免堵塞马达后部的散热孔，请在风扇罩后部空出10mm以上或开换气孔．

3.2 电容器安装须知（仅单相马达附属）



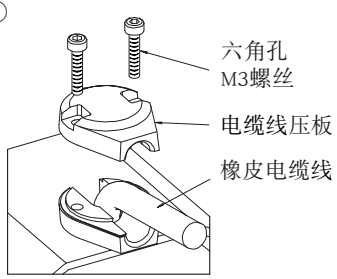
请在确认附属的电容器容量是否符合马达铭板上所记载的容量后再进行安装．安装电容器时，请使用M４螺丝。（本电容器不附属螺丝．）

注意　・为了防止损坏安装脚座，请将螺丝的安装力矩控制在 1N･m(10kgfcm)以下。
・电容器的安装位置须离开马达10cm以上，否则会引电容器发热而缩短使用寿命。

3.3 变更橡皮电缆线方向的方法（60W，90W）

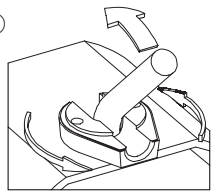
60W、90W马达的橡皮电缆线的引线方向出厂时设定为马达出力轴方向。
引线方向可转动180°。
请按下图所表示里变更引线方向。

①



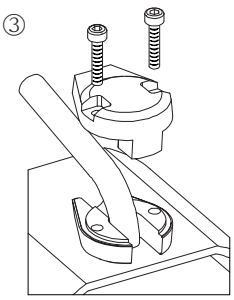
①拆除电缆线压板的螺丝和电缆线压板上部，将橡皮电缆线扳到相反侧

②



②将电缆线压板旋转180°。

③



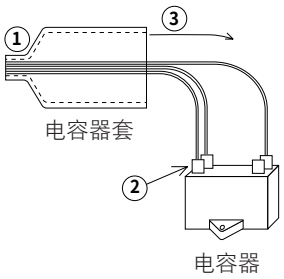
③安装电缆线压板上部并用螺丝固定。

注意　为了防止橡皮电缆线的松弛与破损，请按照以下的螺丝安装力矩来进行安装。
安装力矩：0.5N･m(5kgfcm)～0.7N･m(7kgfcm)

4. 连接及运转

4.1 连接

- 请按接线图所示进行连接。
- 马达导线与电源连接部、电容器端子连接部等所有连接部分须作绝缘处理。
  进行电容器端子连接部的绝缘处理时，请使用附属的电容器套。

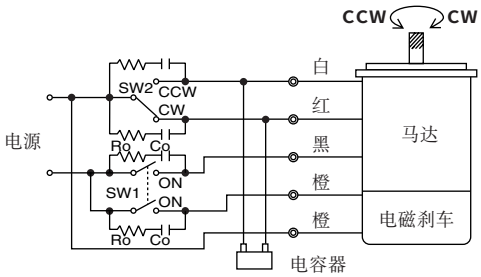


电容器套的安装顺序
①首先将导线穿过电容器套
②将导线连接端子
③套上电容器套

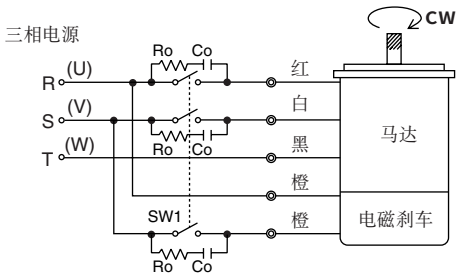
■接线图

马达方向为从马达出力轴上目测到的方向。顺时针方向为ＣＷ，逆时针方向为ＣＣＷ。

单相马达



三相马达



［6～40W型］

开关号码	开关的接点容量			备考
	单相100V/110V/115V输入	单相200V/220V/230V输入	三相200V/220V/230V输入	
SW1	AC125V 3A以上	AC250V 1.5A以上	AC250V 1.5A以上	连动
SW2			—	—

请按照接线图(⊣⊢)连接吸收突波电压用的CR电路。

Ro=5～200Ω
Co=0.1～0.2μF 200WV

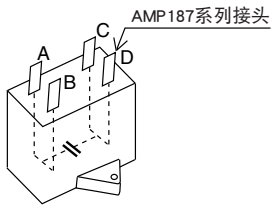
［60W，90W型］

开关号码	开关的接点容量			备考
	单相100V/110V/115V输入	单相200V/220V/230V输入	三相200V/220V/230V输入	
SW1	AC125V 5A以上	AC250V 5A以上	AC250V 5A以上	连动
SW2			—	—

本公司备有选购配件。
选购配件品名
EPCR1201-2(另售)

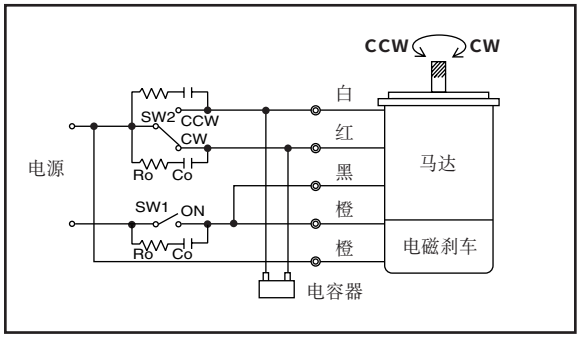
注意：60W，90W型进行橡皮电缆线表皮剥离处理时，请勿损伤里面的导线。

■电容器的接线方法（仅单相马达附属）



电容器内部的接线如左图所示。
容器的端子在电气上为2个端子。
A和B、C和D已在内部连接。
使用简易的压着端子连接时，请使用以下的压着端子。
Tyco Electronics AMP 公司制品
AMP FASTON Terminal187 系列
请在１个端子上连接１根导线。

■接线的简化



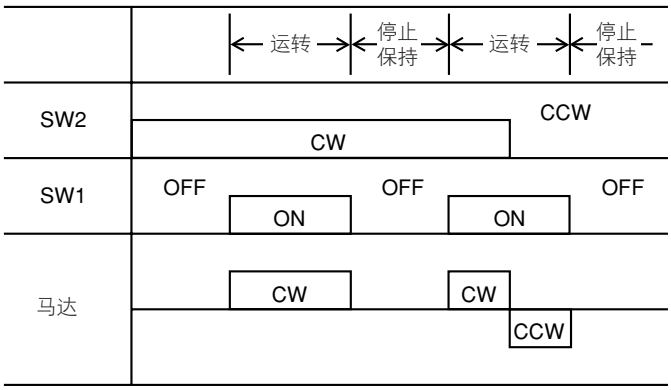
注意：采用上下驱动运转方式及三相马达的场合接线不能简化。

欲以一个开关进行马达的运转/停止和电磁刹车的运转/停止时，可按左图所示简化接线。但此时与基本接线方式相比，刹车时间约长50msec，过转量亦随之增加。这是由于即使将SW1断开，马达的磁能仍作用于电磁刹车的激磁线圈上，在约50msec的时间内电磁石继续作用，因此刹车动作延迟。

4.2 运转

注意　・此产品为Ｂ种绝缘马达。
请注意运转中的马达外壳温度不能超过90℃，否则会缩短线圈及滚珠轴承的使用寿命。
马达外壳温度可通过在马达表面固定温度表的方法来测定，亦可使用热敏纸或热电藕来测量。
・请使用单相马达附属的电容器，马达起动后亦必须使电容器保持连接状态。

[SW1与SW2的时序例]
此序例为基本接线图



■运转/停止

SW1用来进行马达运转/停止及电磁刹车的操作（连动）。
SW1 ON时，电磁刹车被解除、马达运转；SW1 OFF时，则电磁刹车动作、马达停止。

注意：电磁刹车动作时，由于刹车为摩擦式因此会发出摩擦音，并非异常。

■运转方向的切换

[单相马达] 将SW2扳到CW时按顺时针方向运转，扳到CCW时则为逆时针方向运转。
[三相马达] 按照接线图连接时为顺时针方向运转，只要交换U、V、W中任何两根线的连接则为逆时针方向运转。

■其他的操作方法

注意：用于上下驱动时，负载有滑落下之情形，请在确认负载状况后再进行操作。

・加快马达启动时间的方法
提前开放电磁刹车可使马达更快启动。
请在马达启动10msec之前开放电磁刹车。
・马达停止时电磁刹车的开放方法
在2根电磁刹车闭导线（橙色）之间通电则电磁刹车被解除，马达可手动启动。

5. 运转额定时间

感应马达可作连续运转（连续额定）
可逆马达的可续运转时间为30分钟（30分钟额定：铭板上的记载为[30min]）。

6. 过热保护功能

本产品具备当马达因某种原因异常发热时能防止马达烧毁的过热保护功能。
保护方式有以下两种

■过热保护装置（马达铭板上记载为ＴＰ及ＴＰ２１１）

当温度上升到规定温度时，内藏的过热保护装置会自动动作，马达则会自然停止。
这时，由于电磁刹车仍保持开放状态，所以负载无法保持。请另外采取安全措施。
因是自动恢复型，所以当马达温度下降后马达会自动重新运转。检点作业等须在切断电源后实行。

过热保护装置的动作温度
开（断电）……130℃±5℃
关（通电）…… 82℃±15℃

■阻抗型保护器（铭板上记载为ＺＰ）

当马达发生异常呈拘束状态时，此保护器能增大线圈的阻抗值，抑制电流输入马达以避免烧坏马达线圈。

7. 运转异常时的检查事项

马达动作异常时，请按下表进行检点。
若检点结果为全部符合要求但马达无法正常动作时，请向东方马达株式会社咨询。另外，事故发生时请勿自行分解检修，一旦破坏产品事故原状则会妨害检查判定，也可能难以查出确实的事故原因。

现象	确认内容
马达不转或作低速运转	①马达电压是否符合规格要求? ②电源接线是否正确? ③负载是否过大? ④使用端子台或压接端子时，是否有接触不良的现象? ⑤单相马达附属的电容器或与铭板记载要求相符的电容器是否按P.4的「接线图」连接? ⑥电磁刹车导线（橙色）是否施加规定电压?
马达时转时停	①电源接线是否正确? ②使用端子台或压接端子时，是否有接触不良的现象? ③单相马达附属的电容器或与铭板记载要求相符的电容器是否按P.4的「接线图」连接?
马达反转	①是否按接线图正确接线? 请再次参照P.4的接线图。 ②减速机出力轴的运转方向因减速比的不同而异。请参照减速机的产品说明书 ③单相马达附属的电容器或与铭板记载要求相符的电容器是否按P.4的「接线图」连接? ④目测方向是否有误? 马达运转方向是以目测出力轴运转方向来判断是顺时针方向还是逆时针方向。
马达异常发热 （马达外壳温度超过90℃）	①马达电压是否符合规格要求? ②环境温度是否超过规定极限? ③单相马达附属的电容器或与铭板记载要求相符的电容器是否按P.4的「接线图」连接?
马达发出异音	①马达与减速机的搭配是否正确? 请参照减速机的产品说明书。 ②是否使用与马达同样的齿轮型减速机?

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本使用说明书使用环保再生纸制成。

ORIENTAL MOTOR

World K Series

Electromagnetic Brake Motors

OPERATING MANUAL

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.

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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˚C (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.
●The electromagnetic brake is designed to activate when power is removed. However, it may not arrest all loads completely. If this motor is designed to hold in emergency situations then a second method of stopping the load must be used to ensure to load stops. If this is not used injury or machine damage may result.

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

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.

■100V/110V/115V type

Model ※	Motor Model ※	Capacitor Model
2RK6GN-AWMJG	2RK6GN-AWM	CH45FAUL
2RK6GN-AWMUG	2RK6GN-AWM	CH35FAUL
3RK15GN-AWMJG	3RK15GN-AWM	CH75CFAUL
3RK15GN-AWMUG	3RK15GN-AWM	CH60CFAUL
4RK25GN-AWMJG	4RK25GN-AWM	CH100CFAUL
4RK25GN-AWMUG	4RK25GN-AWM	CH80CFAUL
5RK40GN-AWMJG	5RK40GN-AWM	CH160CFAUL
5RK40GN-AWMUG	5RK40GN-AWM	CH120CFAUL
5RK60GU-AWMJG	5RK60GU-AWM	CH250CFAUL
5RK60GU-AWMUG	5RK60GU-AWM	CH200CFAUL
5RK90GU-AWMJG	5RK90GU-AWM	CH350CFAUL
5RK90GU-AWMUG	5RK90GU-AWM	CH300CFAUL

■200V/220V/230V type

Model ※	Motor Model ※	Capacitor Model
2RK6GN-CWMJG	2RK6GN-CWM	CH10BFAUL
2RK6GN-CWMEG	2RK6GN-CWM	CH08BFAUL
3RK15GN-CWMJG	3RK15GN-CWM	CH18BFAUL
3RK15GN-CWMEG	3RK15GN-CWM	CH15BFAUL
4RK25GN-CWMJG	4RK25GN-CWM	CH25BFAUL
4RK25GN-CWMEG	4RK25GN-CWM	CH20BFAUL
5RK40GN-CWMJG	5RK40GN-CWM	CH40BFAUL
5RK40GN-CWMEG	5RK40GN-CWM	CH35BFAUL
5RK60GU-CWMJG	5RK60GU-CWM	CH60BFAUL
5RK60GU-CWMEG	5RK60GU-CWM	CH50BFAUL
5RK90GU-CWMJG	5RK90GU-CWM	CH80BFAUL
5RK90GU-CWMEG	5RK90GU-CWM	CH70BFAUL
2IK6GN-SWMG	2IK6GN-SWM	——
4IK25GN-SWMG	4IK25GN-SWM	——
5IK40GN-SWMG	5IK40GN-SWM	——
5IK60GU-SWMG	5IK60GU-SWM	——
5IK90GU-SWMG	5IK90GU-SWM	——

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

Motors have been designed and inspected according to the following standards, and they are certified/recognized by the certification bodies listed below and under the China Compulsory product Certification system (CCC system). Recognized name and certified name are motor model name.
Motors (except for the **5IK90GU-SWM** and **5IK90A-SWM**) are recognized by UL and certified by VDE.
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-SWM and **5IK90A-SWM** are recognized by UL and certified by DEMKO.
*Voluntary display of the CE mark conforming to the Low Voltage Directives.

- **Standards** UL1004, UL2111, CSA C22.2 No.100, CSA C22.2 No.77, EN60950, GB12350
- **Certification Body** UL File No.E64199 (6W type), File No.E64197 (15W ～90W type)
  VDE, DEMKO, CQC
- **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 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.
- **Certification for Accessories** Capacitor: UL File No.E83671 (CYWT2)
  VDE Licence No.114747 (for only capacitor rated voltage 450VAC types)
  Capacitor cap: UL File No.E56078 (YDTU2)

3. Installation

Installation conditions

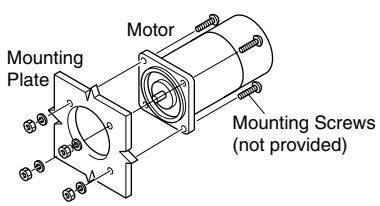
Install the motor and capacitor in a location that meets the following conditions. Using the motor and capacitor in a location that does not satisfy these conditions could damage it.

- Indoors (this product is designed and manufactured to be installed within another device)
- Ambient temperature:-10˚C(14˚F) ～ +40˚C(104˚F) (avoid freezing)
  (-10˚C(14˚F) ～+50˚C(122˚F) for 100V/200V)
- Ambient humidity: 85% max. (avoid condensation)
- Not exposed to explosive, flammable, or corrosive gas
- Not exposed to direct sunlight
- Not exposed to dust
- Not exposed to water or oil
- A place where heat can escape easily
- Not exposed to continuous vibration or excessive impact
- 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 Mounting the motor

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

1) Round shaft motors



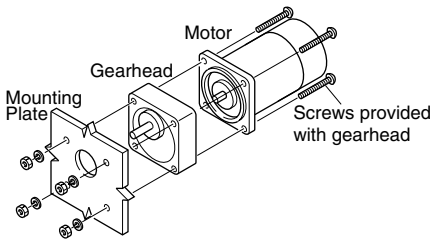
Note: Do not insert the motor into the mounting hole at an angle or force it in, as this could scratch the flange and damage the motor.

Drill holes in the mounting plate that match the screws and the motor's dimensions. Use screws, washers, and nuts listed below to fasten the motor to the mounting plate. Make sure that no gaps are left between the motor and the surface of the mounting plate.
Use screws of an appropriate length.

Mounting screws

First number in motor 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 in the mounting plate that match the screws and the motor's dimensions.
Attach the motor and gearhead using the screws supplied with the gearhead (gearhead sold separately).
Fasten the screws supplied with the gearhead to the mounting plate. Attach so that no gaps are left between the motor flange surface and the gearhead pilot section end surface.

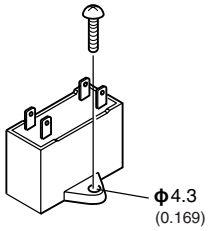
Refer to the gearhead operation manual for further details concerning mounting (gearhead sold separately).

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

3) Motor with cooling fan

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

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



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).

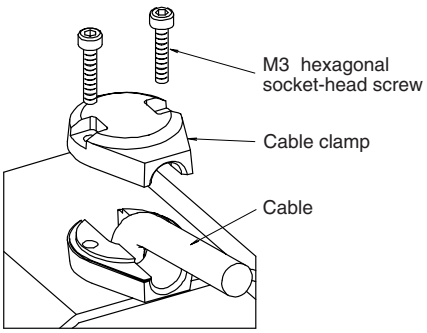
Note -Do not let the screw fastening torque exceed 1 N·m (10 kgfcm) to prevent damage to the mounting feet.
-Mount capacitor at least 10 cm (3.94inches) away from the motor. If it is located closer, the life of the capacitor will be shortened.

※Dimensions in millimeters (inches).

3. 3 Changing Direction of the Cable Outlet

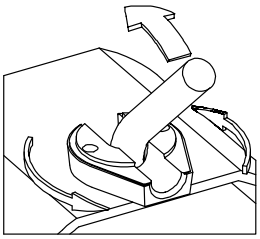
In case of 60W and 90W type, the direction of the cable outlet is the output shaft side of the motor when shipping.
The direction of outlet can be changed by 180° if desired.
Change the direction of the cable outlet according to following steps.

①



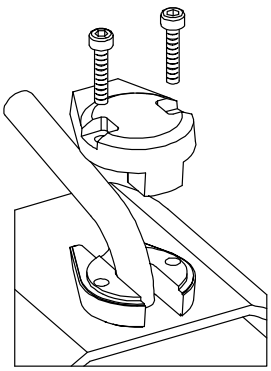
①Remove screws and upper unit of cable clamp.
Put the cable toward the opposite direction.

②



②Turn the cable clamp to change the direction of cable outlet.

③



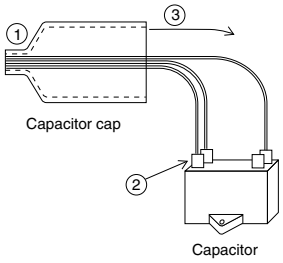
③Refasten upper unit of cable clamp with screws.

Note: Keep the tightening torque within the limits shown below to prevent the cable from coming loose or to damage caused by excessive tightening torque.
Screw tightening torque 0.5N·m (5kgfcm) ～ 0.7N·m (7kgfcm)

4. Connection and Operation

4. 1 Connection

- 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 caps

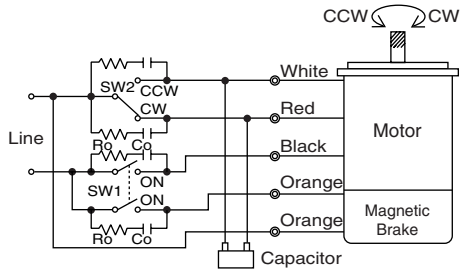
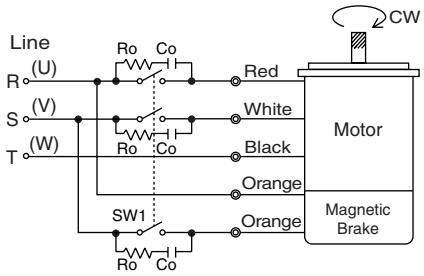
①Pass the lead wires through the capacitor cover as shown in the figure.

②Connect the lead wires to the terminals or use terminal ends.

③Cap the capacitor with the capacitor cover.

■ Wiring diagram

The motor rotates in a clockwise (CW) and counterclockwise (CCW) direction (viewing the motor from the side with the output shaft).

Single- phase Motor	Three- phase Motor
	

[6W～40W type]

No. of Switch	Specification			Note
	Single-phase 100V/110V/115V	Single-phase 200V/220V/230V	Three-phase 200V/220V/230V	
SW1	AC125V 3A or more	AC250V 1.5A or more	AC250V 5A or more	Switched Simultaneously
SW2			—	—

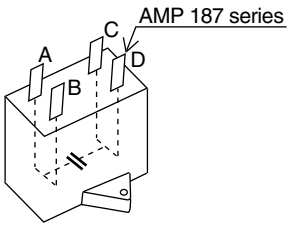
[60W , 90w type]

No. of Switch	Specification			Note
	Single-phase 100V/110V/115V	Single-phase 200V/220V/230V	Three-phase 200V/220V/230V	
SW1	AC125V 5A or more	AC250V 5A or more	AC250V 5A or more	Switched Simultaneously
SW2			—	—

SW1 emits sparks when turned on and off.
In order to protect the relay contacts,
CR circuit ( ) must be connected.
Ro=5～200Ω
Co=0.1～0.2μF 200WV

Option of the ORIENTAL MOTOR’s surge absorber is available.
Optional product name **EPCR1201-2**
(sold separately)

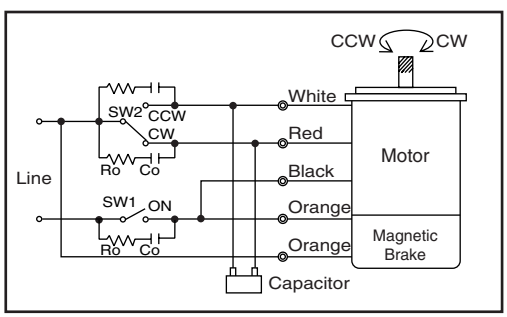
Note: In case of 60W and 90W type, When removing the sheath of the cable, be careful not to damage the inside lead wire.



■ 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.



■ Simplified Connection

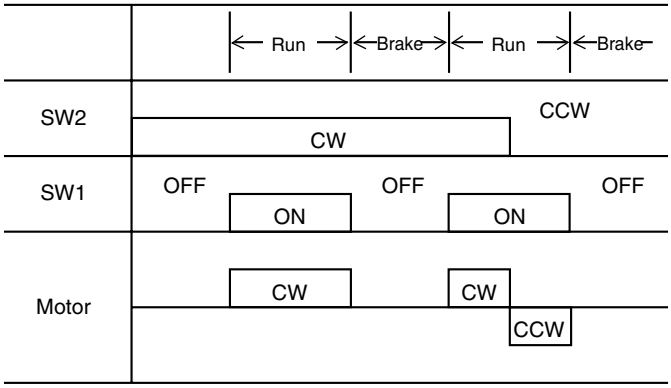
Note: Wiring cannot be simplified for vertical drive applications or three-phase motors.

Connection can be simplified by using the connecting diagrams shown below when changing the swich RUN/STOP of the motor and the electromagnetic brake by one swich. Using the connection shown below, however, results in a 50msec. increase in braking time over that of the basic connection with a corresponding increase in overrun. The reason for this is that an electromagnetic energy of motor electromagnetic brake, so that the electromagnetic continues to operate for about 50msec. even though the swich SW1 has been turned off. The brake thus takes

4. 2 Operation

Note : -This motor is B type insulation motor.
Make sure that the motor case temperature does not exceed 90˚C (194˚F) during motor operation.
Operating the motor above 90˚C (194˚F) will shorten the life of the coil and the ball bearings.
Motor case temperature can be measured by fastening a thermometer to the motor's surface, or with thermo-tape.
-Be sure to use the capacitor that comes standard with your motor.
Keep the capacitor connected all the time even after the motor has been started.

[Timing Chart] This Timing Chart is case of the basic connection



■ Starting and Stopping

SW1 operates motor and electromagnetic brake action.
Motor will rotate when SW1 is switched simultaneously to ON (short circuit). When SW1 is swiched simultaneously to OFF (open), the motor stops immediately by electromagnetic brake and holds the load.

Note : When operating the electromagnetic brake, this may make a friction noise because this is the braking system by friction, but this is not a problem.

■ Direction of Rotation

[Single-phase motor] To rotate the motor in a clockwise (CW) direction, swich SW2 to CW.
To rotate it in a counter-clockwise (CCW) direction, swich SW2 to CCW.

[Three-phase motor] To change the direction of rotation,change any two connections between U, V and W.

■Other ways of operating

Note : When driving a vertical load, this method cannot be applied because this may cause the load to fall.

- Hastening the motor's starting time
  If the electromagnetic brake is left release, the motor can be started much faster.
  Optimum timing for release of the brake is at least 10msec. before starting up the motor.
- Releasing Electromagnetic brake
  If you wish to release the brake while the motor is stopped, apply voltage between only two orange lead wires.
  The electromagnetic brake is released and the motor shaft can be rotated easily by hand.

5. Time Rating

Induction motors have a continuous 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˚C(266˚F) ±5˚C(9˚F)
Power is turned back on at 82˚C(180˚F)±15˚C(27˚F)

■ 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 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.

Problem	Things to check
The motor does not rotate or motor rotates at low speed	①Is the correct voltage being supplied to the Motor? ②Are lead wires properly and firmly connected? ③Is the load too large? ④If lead wires have been extended by using a terminal strip or terminal block, are the lead wires properly and firmly connected at all points? ⑤For a single-phase motor is the provided capacitor connected as shown in the wiring diagram of page 4? ⑥Is voltage applied to the brake lead wires?
The motor rotate correctly or properly	①Are lead wires properly and firmly connected? ②If lead wires have been extended by using a terminal strip or terminal block, are the lead wires properly and firmly connected at all points? ③For a single-phase motor is the provided capacitor connected as shown in the wiring diagram of page 4 ?
The motor rotates in the wrong direction	①Is the connection as shown in the wiring diagram? Check the wiring diagram of page 4 again. ②The gearhead output shaft's rotation direction differs depending on the gearhead's deceleration ratio. Refer to the gearhead operation manual. ③For a single-phase motor is the provided capacitor connected as shown in the wiring diagram of page 4 ? ④Are you looking at the motor from the wrong side? Rotation is defined as viewed from the output shaftside.
The motor becomes extraordinarily hot (motor case temperature exceeds 90˚C (194˚F))	①Is the correct voltage being supplied to the motor? ②Does the ambient temperature exceed the permissible range ? ③For a single-phase motor is the provided capacitor connected as shown in the wiring diagram of page 4 ?
The motor makes a strange noise	①Are the motor and gearhead correctly fastened? Refer to the gearhead operation manual. ②Is the coupled gearhead the same pinion type as the motor shaft?

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

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