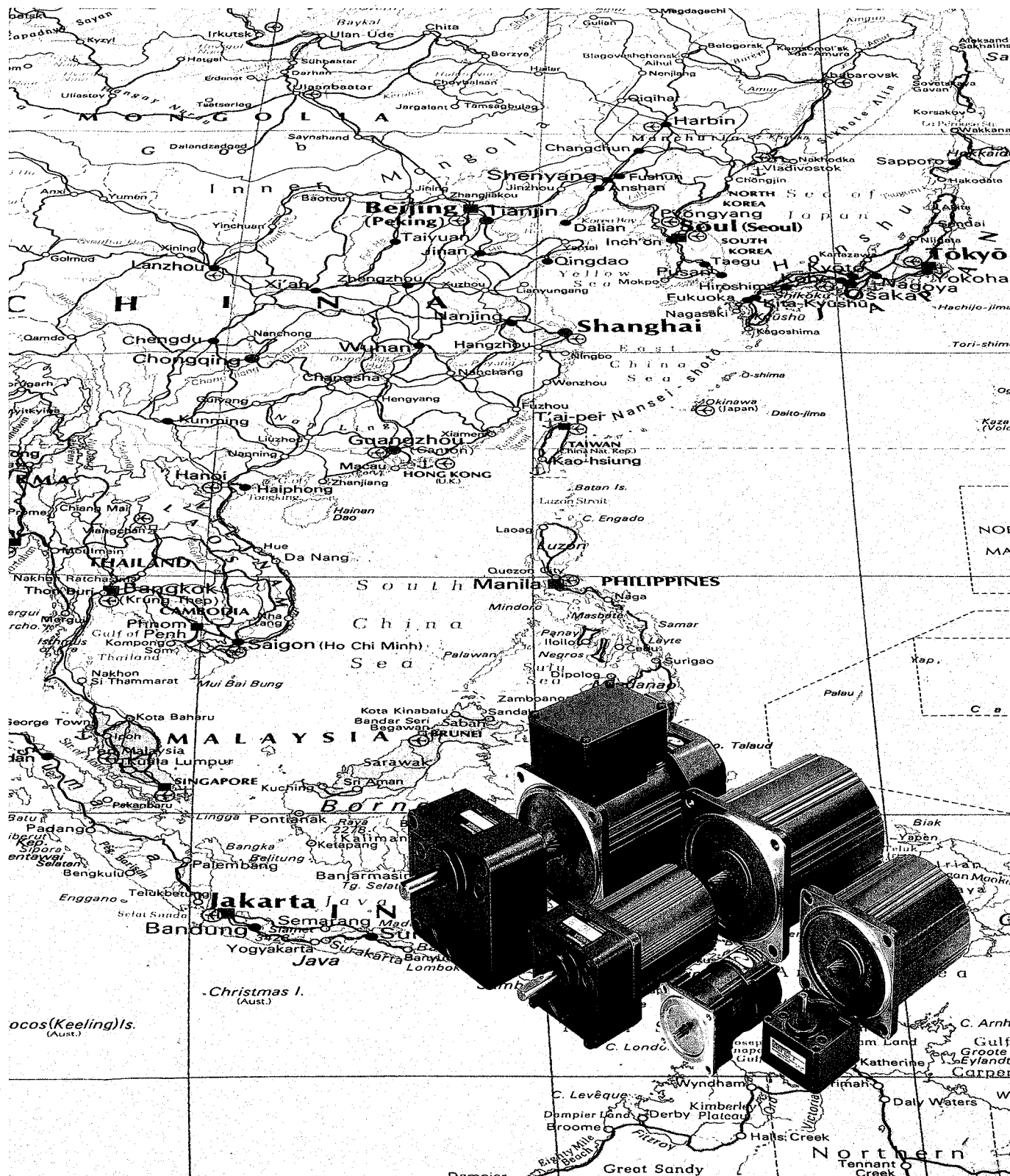


# Panasonic

## Compact AC geared motor

# G-Series/LOW NOISE TYPE

## 低噪音型馬達 저소음 타입



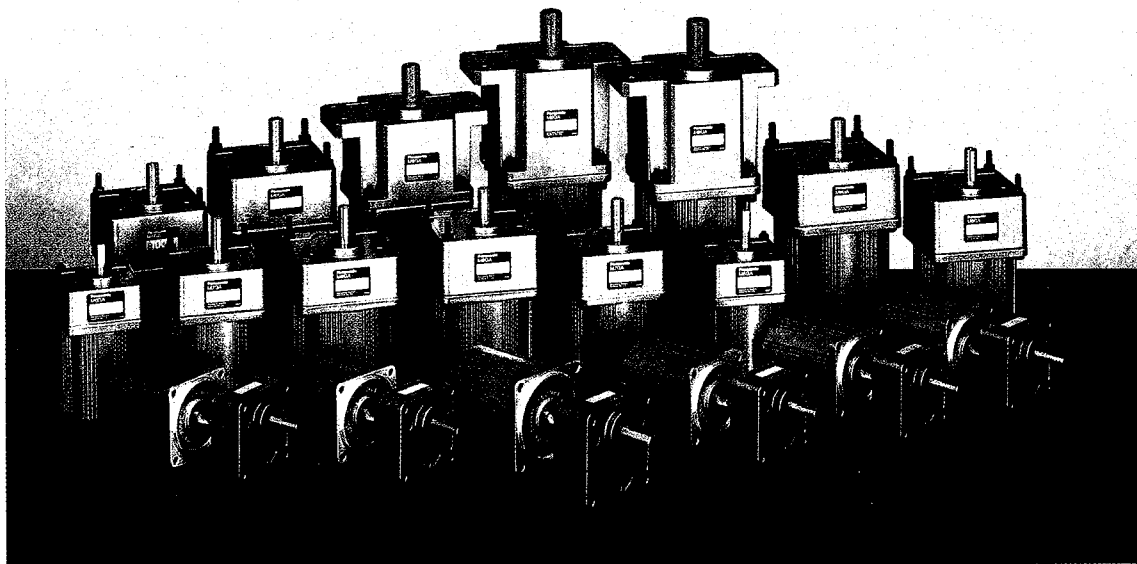
**Panasonic**

Compact AC geared motor

**G-Series/LOW NOISE TYPE**

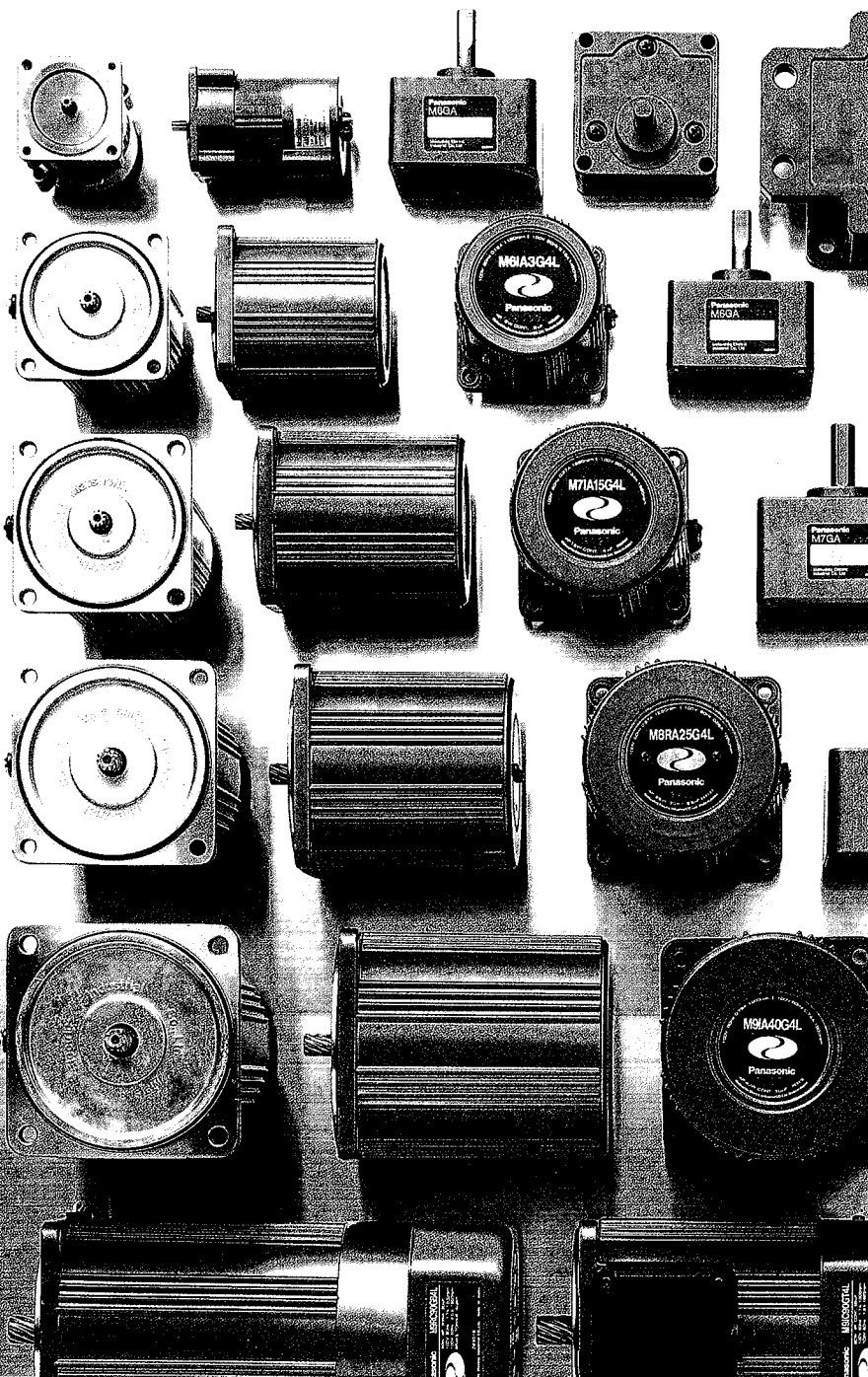
低噪音型馬達 저소음 타입

For Asia Market



# G-Series Compact AC geared motor LOW NOISE TYPE

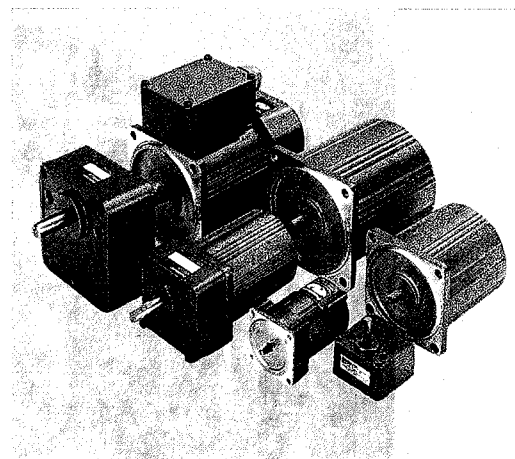
低噪音型馬達 저소음 타입



This catalogue covers all the standard models of our AC geared motor "G.series", manufactured and sold by Matsushita Electric Industrial Co., LTD.

Especially, wide range of models are available as our standard, that meets with the Asian voltage range. In addition, explanations are given in 3 major languages which is widely spoken in the Asian countries, English Chinese, and Korean.

We hope that our catalogue will serve your required specification and help your development and improvement in the designing of your product.



- MAIN FEATURES
- GLOBAL SALES NETWORK
- MOTOR SELECTION GUIDANCE
- APPLICATION EXAMPLE
- MODEL TABLE / CODING SYSTEM
- OUTLINE OF MOTOR
- MOTOR TERMINOLOGY
- $GD^2$  / VARIABLE SPEED

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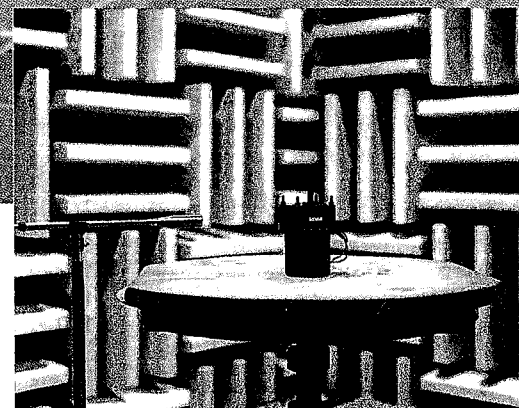
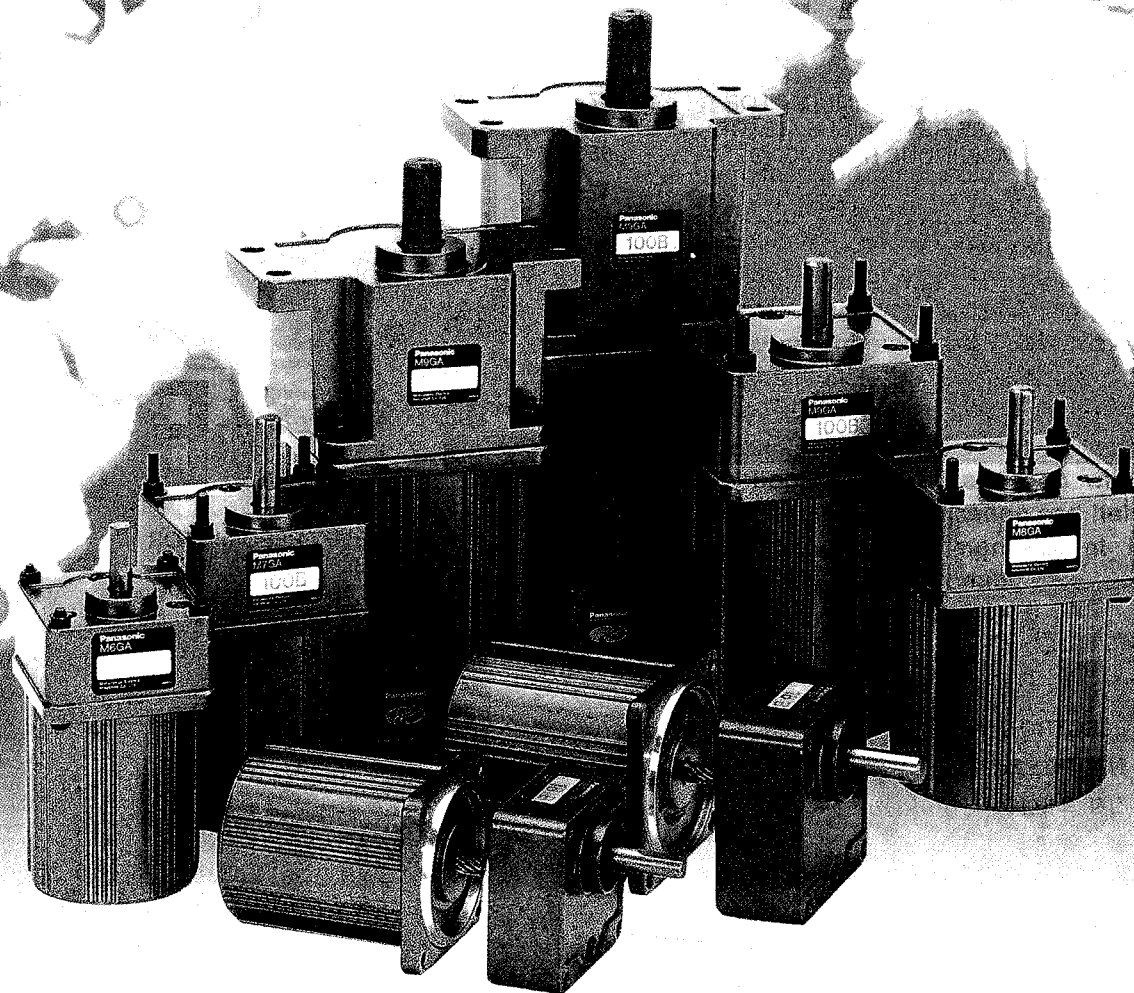
A  
B  
C  
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E  
F



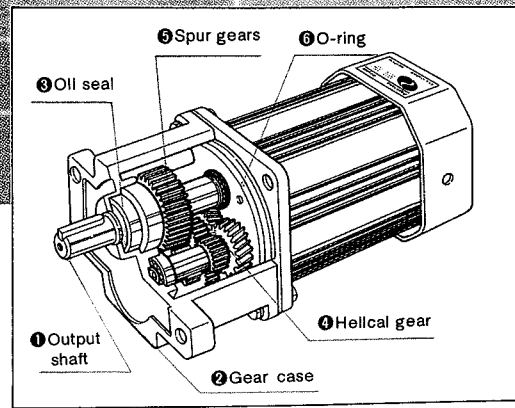
# Panasonic

The helical gear applied with the unique grease bath design enables approximately 15dB of noise reduction. Moreover, 5,000hours operation is reliable by using the ball bearing with the complete enclosed gearhead structure.

(See page 33 for ball bearing gearhead life)



●Research and development / anechoic room



●Motor Structure

- ① Output shaft
- ② Gear case
- ③ Oil seal
- ④ Helical gear
- ⑤ Spur gears
- ⑥ O-ring

## FEATURES

### 1. LOW NOISE GEAR DESIGN 低噪音設計 特殊螺旋齒輪箱

With the unique and sophisticated technology, the acoustic noise has reduced for more than 15dB (compared with current types), which owes to the application of special helical gear, oil sealed grease bath structure and oil ring.

使用高精度的螺旋齒輪，並配合油封、O型環的密封式齒輪箱。結果廠內測量證明比起以往的產品噪音降低10~15分貝。

高精度螺旋齒輪의 채용과 오일실, O링 등에 의한 기어 케이스의 密封구조화에 의하여 從來品과 비교하여 當社比10~15dB저소음으로 되었습니다.

### 2. COMPACT SIZE WITH POWERFUL OUTPUT 緊湊型 強力 출력

With the modification of the gears, bearing material and gear module, the shaft torque reached to 300kg·cm for 90mm square motor (S-type).

提高齒輪模件、材質、軸承的強度之同時，取消輸出方面的底板。本業界首次研製成功尺寸 90mm上的最大容許軸轉矩300kgcm (S型)。

기어모듈,材質,受軸의 強度 도모함과 동시에 출력축지판을 없게 했습니다. 사이즈는 □90mm에 있어 最大容許軸토크 300kgcm(S/TYPE)는 業界初の 상품입니다

### 3. WIDE VARIATION IN MODELS 多種의 機種 豐富한 種類

Wide selections of gear-ratios and motor output, ready to serve throughout all demands, from 42mm (1W) to 90mm (90W), covering induction, reversible, brakes, to variable speed motors.

尺寸範圍由 42mm 1W至 90mm 90W, 馬達的種類也有感應式、可逆式、三相、變速及付帶電磁制動器馬達等準備豐富的機種。

사이즈는 □42mm 1W부터 □90mm 90W까지 모터의 종류도 인덕션(INDUCTION), 리버시블(REVERSIBLE), 삼상, 가변속, 전자브레이크 등 풍부한機種을 구비하고 있습니다.

### 4. 5,000 HOURS TEST 5,000時間 壽命試驗

5,000hours operation is reliable by using ball bearing complete closed structure gearhead.

使用油封、O型環等成功製造密封結構的齒輪箱，此外，採用潤滑脂浴潤滑方式，防止無潤滑狀態，定能延長使用壽命。

기어박스를 오일실, O링 등에 의해 밀폐구조화하고 또 윤활방식에 구리스바스 윤활을 채용 구리스단절 발생이 없어 장수명입니다.

### 5. NEW PRODUCTS MORE TO COME 新製品 ますます 増える

Continuously launching new products into the market, such as 'Unit type' (variable speed motor with controller), which outstands of being award from the Ministry of International trade and Industry of Japan.

照舊地分別銷售電動部和齒輪頭部。從而多種馬達和齒輪頭也能任意配合使用。

종전과 같이 모터부와 헤드부를 별도로 판매합니다. 따라서 모터 종류와 기어헤드와의 조합이 수량이 많아도 조달이 용이합니다.

## GLOBAL SALES NETWORK

全球行銷網路

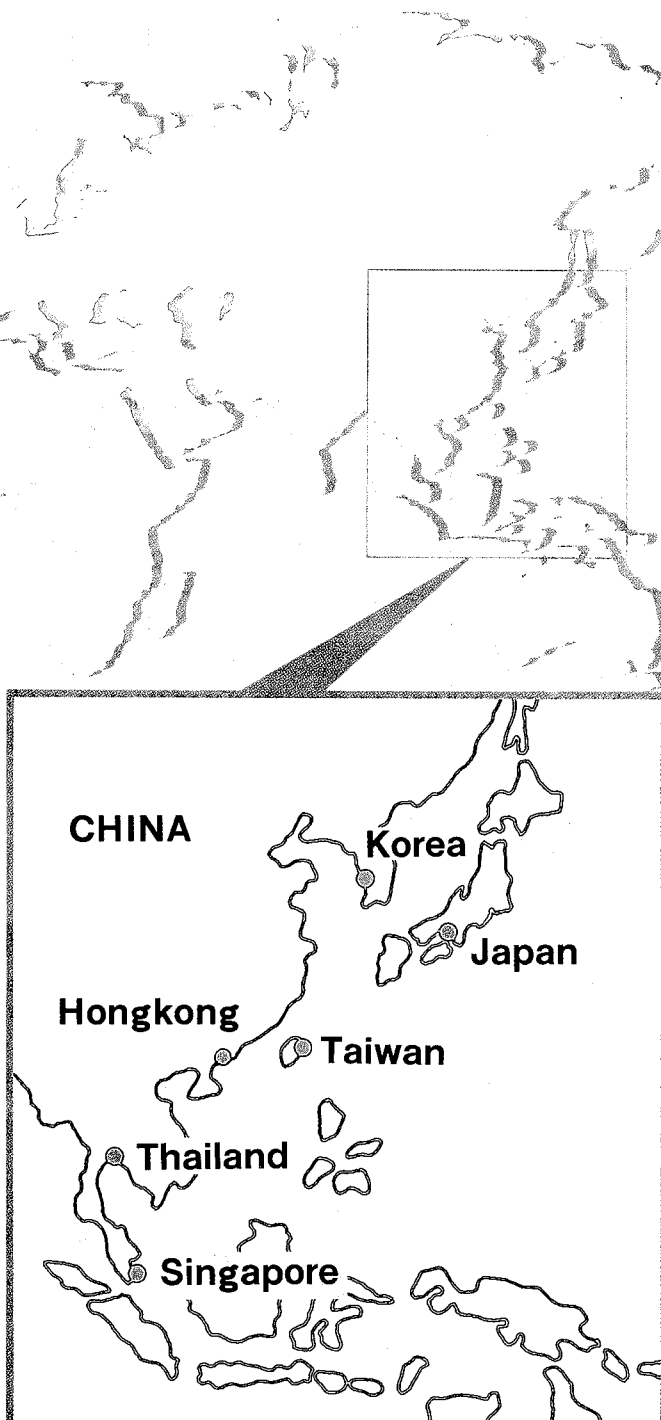
크로바 셀즈 네트워크

We have newly developed the compact AC geared motor (G-series) especially suitable for Asian countries. They are widely being introduced into the Asian market through our wide sales and service network.

專門發展出適合亞洲的規格，如韓國、台灣、及新加坡，並經過本身的銷售路線已經介紹進入各地市場。

東南아시아 전용 사양의 모터를 풍부하게 갖추어 한국, 대만, 싱가포르의 주요各國을 中心으로 폭넓은 판매, 서비스網을 구축하고 있습니다.

韓國에서는 G. 시리즈의 代理店으로서 榮一電業을 推獎합니다.



### ASIAN SALES OFFICES.

亞洲銷售據點。

東南아시아 판매거점

#### JAPAN

Matsushita Electric Industrial Co., Ltd.  
Industrial Motor Division  
TEL : (0720)70-3044  
FAX : (0720)70-3151  
Overseas Industry Support II Sales Office  
TEL : (06)282-5579  
FAX : (06)282-5742

#### SINGAPORE

AMS Asia Matsushita Electric (S) Pte Ltd.  
TEL : 2250444  
FAX : (65)3223997

#### TAIWAN

Sung Tien Mou Co., Ltd.  
TEL : 02-757-1836  
FAX : 02-757-1907

#### THAILAND

Siew-National Sales & Service Co., Ltd.  
TEL : 514-0501/514-1871  
FAX : (662)538-3728

#### HONGKONG

Shun Hing Electric Works and Engineering Co., Ltd.  
TEL : 861-2767  
FAX : 865-6707

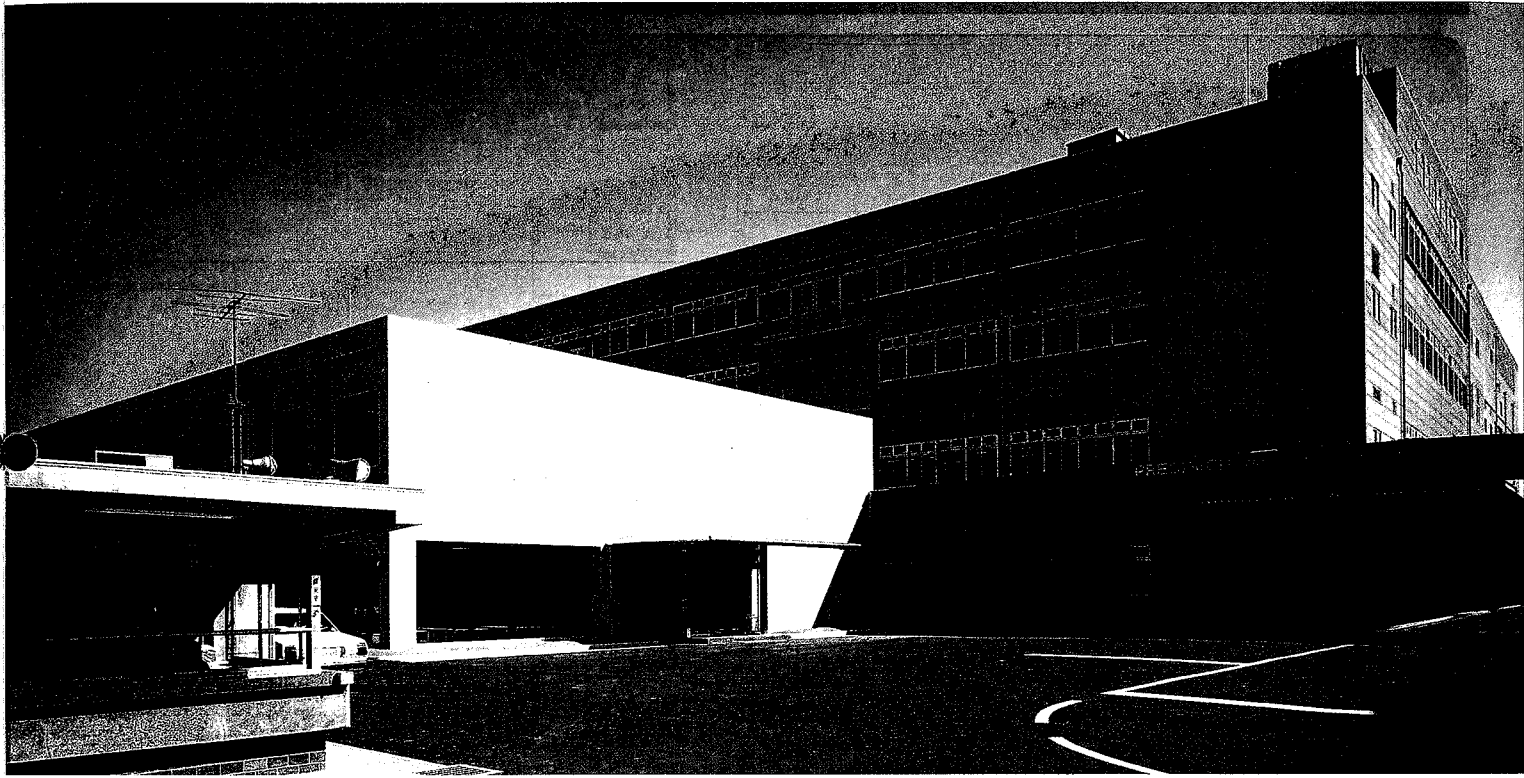
#### KOREA

榮一電業(株)  
HEAD OFFICE : (02)701-6943, 6944  
FAX : (02)701-6945  
SALES OFFICE : (02)265-4295, 278-2667  
FAX : (02)741-7076

Leading the new era and marching throughout the world with sophisticated technology and quality.

高水準科技及品質領導全世界進入另一新的紀元。

時代를 항상 앞질러 우수한 기술과 品質로 세계에 약진



Symbol of Our Technology



UL mark:  
This is issued by  
Underwriters  
Laboratory.



CSA mark:  
This Canadian  
safety standard  
mark of approval.

### ...Arrow Hits the target after some 60 years

The first production of small induction motors started in 1933 at Matsushita Electric. But many people were skeptical over Matsushita's entry into the electric motor industry, judging from the demand situation for motors those days.

However, the young, but decisive Konosuke Matsushita, founder of the company (Late the Executive Advisor) made a clear declaration at a press meeting, "After thoughtful consideration of Japan's future, I have decided to start motor production as I foresee an unlimited demand for motor in the future. I am very confident the day will come without doubt when a need for an average 10 motors in every household. We, National are prepared to carry out a thorough study of small and excellent motors to produce and meet this requirement."

After half a century after his dramatic declaration, many more motors than Mr. Matsushita's estimation are now used in most household appliances and electrical equipment as a power source, making the impossible dream of 60 years ago come true.

Now, new Intelligent Motors are being developed one after another, this episode is referred to as, Arrow Hits the target after some 60 years...

### 60年之後，一箭中鵰

小型感應馬達最初的生產源於松下電器1933年，但多數人依當時馬達需求的情形，對松下投入電動馬達工業多表存疑。

然而，年輕果斷的公司創始人，松下幸之助，（在一次記者會中明白地表示）“經詳細考慮過日本的未來，我預見未來對馬達無可限量的需求並決定展開馬達生產。我很有信心，每一家庭平均約需10個馬達的日子，毫無疑問的會來到。我們國際牌準備研究優良小型馬達並生產配合此一需求。”

在他引人注目的表白之後的半世紀，超過松下所預測的馬達，被應用在多數家電及電器用品，當作動力來源，使得60年前不可能的夢想實現成真。

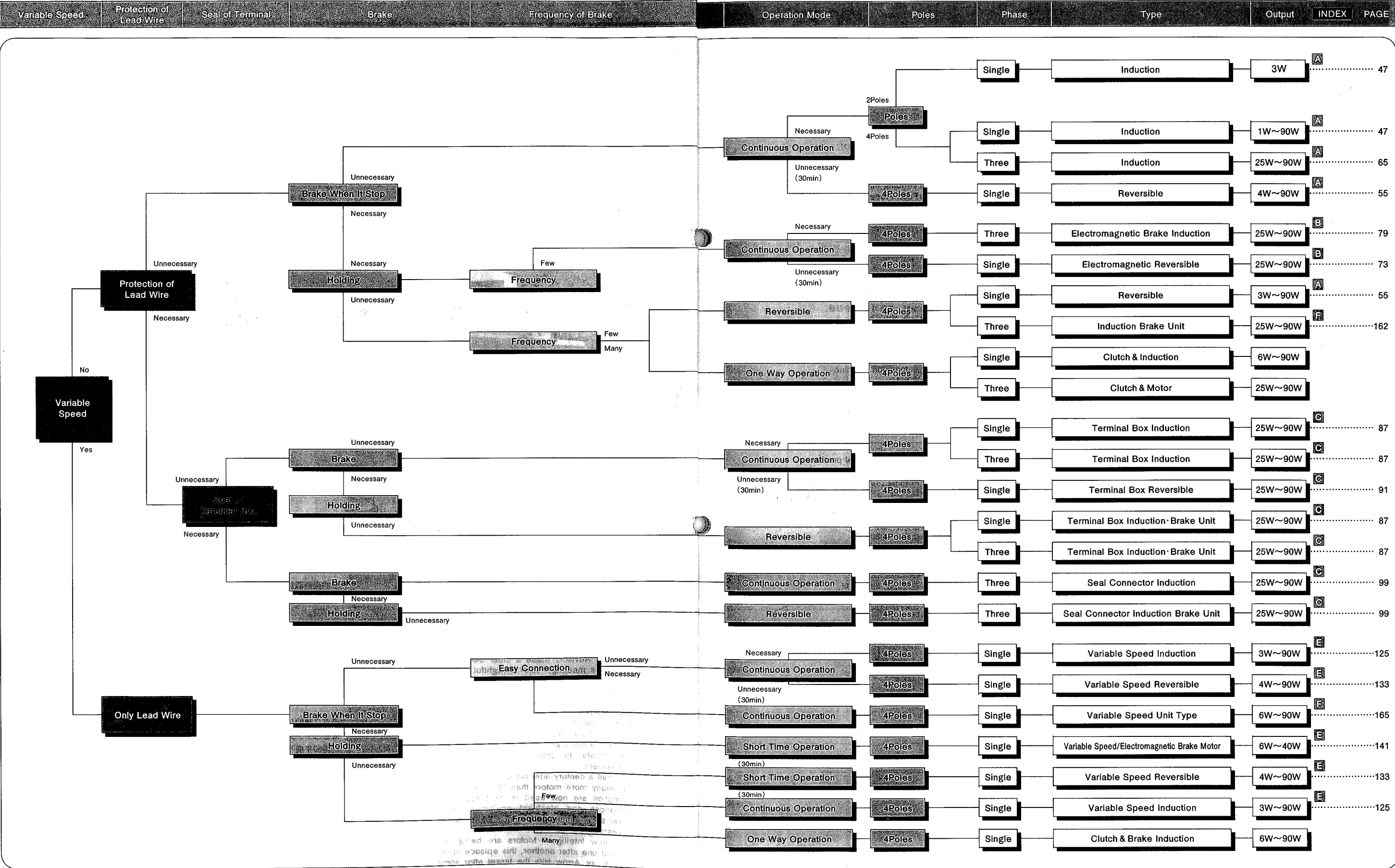
現在，新的智慧型馬達陸續發展，可再次應驗出這句話“60年之後，一箭中鵰”

### 60年前에 쏜 화살은命中하였습니다.

1933년에松下電器는小型을中心으로한모타의生産을開始하였습니다. 당시의모타의 수요로보아小型모타의大量生産을함에있어各方面으로부터其前途를위태롭게생각하는소리가높아졌습니다.

그러나當時의젊은松下幸之助(마쯔시다코노스케)社主(故相談役)는記者여러분들앞에서이렇게言明하였습니다.「나는日本の将来(장래)에있어서熟考(숙고)한끝에小型모타의需要는無限할것이라고생각해生産에발을디디었습니다. 장래여러분들의家庭에는1戶에平均10臺정도의모타를必要로하는날이꼭올것입니다. 그날에對備하여「나쇼날」은우수한小型모타를지금부터철저하게研究하여生産할覺悟입니다.

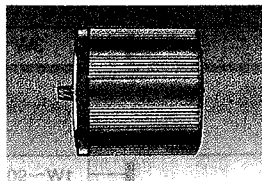
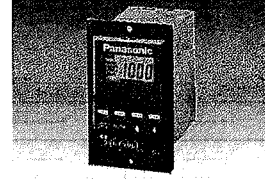
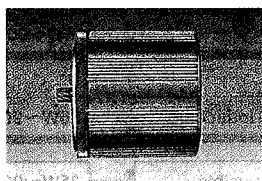
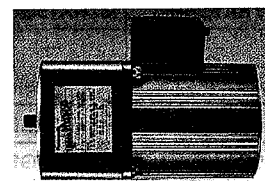
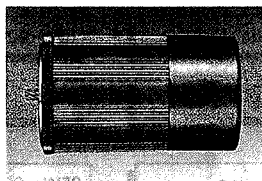
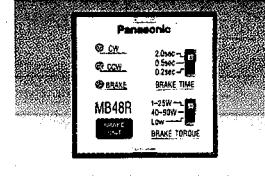

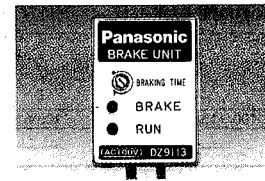
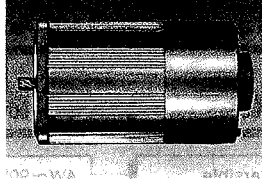
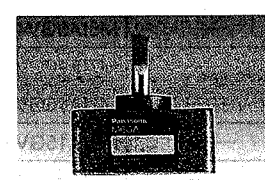

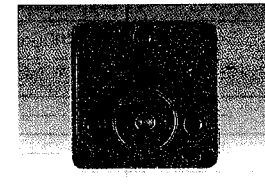
그리하여60년이지난오늘날各家庭에는여러電氣製品의驅動源(구동원)에小型모타가使用되어前에는「꿈」으로만생각했던生活이實現되었습니다. 새로운知恵(지혜)의모타가점차로開發되어오는오늘날다시금相談役의60年前的의말씀이的中하였다고할수있습니다.








馬達的主要特徵與功能比較一覽  
MOTOR의 주요 특징과 기능 비교 일람







## Main Features and Applications 主要特徵和用途 주요 특징과 용도

MOTOR TYPE 產品名稱 外觀照片 제품명 외관사진	FEATURES 主要特徵 외관사진	APPLICATIONS 用 途 용도	MOTOR TYPE 產品名稱 外觀照片 제품명 외관사진	FEATURES 主要特徵 주요특징	APPLICATIONS 用 途 용도		
Induction Motor 感應馬達 인덕션 모터		<ul style="list-style-type: none"><li>●Continuous ratings</li><li>●Wide variety in models</li><li>●Suitable for general use</li><li>●連續額定。</li><li>●種類豐富。</li><li>●最適合於一般動力用。</li><li>●연속 정격.</li><li>●종류가 풍부.</li><li>●일반 동력용으로 최적.</li></ul>	<ul style="list-style-type: none"><li>●Vending machines</li><li>●Conveyers, Displays</li><li>●Insertion machines</li><li>●打印機、複影機、打字機。</li><li>●兌換器、檢票機。</li><li>●機床、各種操作機。</li><li>●顯示器、搬運機。</li><li>●프린터, 복사기.</li><li>●금전교환기, 개찰기.</li><li>●공작기계, 각종삽입기.</li><li>●콘베이어.</li></ul>	Unit Type 付帶終端盒馬達 유니트 타입		<ul style="list-style-type: none"><li>●Digital speed setting / 8read-out</li><li>●Soft start, soft down function</li><li>●Set lock function</li><li>●一動作連接方式的速度控制器</li><li>●領先業界首次研製成的數字控制式</li><li>●控制面盤的標準化。</li><li>●可供豐富種類的另售配件。</li><li>●有軟式制動功能。</li><li>●완·맞치 接結의 스피드콘트롤</li><li>●業界初の 디지털型</li></ul>	<ul style="list-style-type: none"><li>●Convever automation machines</li><li>●搬運機</li><li>●콘베이어</li></ul>
Reversible Motor 可逆式馬達 리버시블 모터		<ul style="list-style-type: none"><li>●30 min. ratings</li><li>●Instant reversible rotation</li><li>●Built-in brake</li><li>●Smaller Overrun</li><li>●30分鐘額定。</li><li>●可能隨時正逆旋轉。</li><li>●內裝簡易制動機構。</li><li>●超位極少、具有少許保持力。</li><li>●30분 정격.</li><li>●순간 正逆轉이 가능.</li><li>●간이 브레이크 구조를 내장.</li><li>●OVER-RUN이 적고 약간의 保持力을 가짐.</li></ul>	<ul style="list-style-type: none"><li>●Vending machines, Hospital beds</li><li>●Food Process machines</li><li>●Shutter, Elevators, lifts</li><li>●Automation machines</li><li>●打印機、複影機、電動書架。</li><li>●自動販賣機、食品機械。</li><li>●醫療用床、包裝機械。</li><li>●卷簾門及照明燈具的昇降用。</li><li>●各種設備機械。</li><li>●프린트 복사기.</li><li>●자동판매기, 식품기계.</li><li>●의료베드, 포장기계.</li><li>●샷타, 조명기구의 승강용.</li><li>●각종 설비기계.</li></ul>	C&B Motor C & B 馬達 크러치 브레이크 모터 (C & B MOTOR)		<ul style="list-style-type: none"><li>●Electromagnetic clutch and brake motor</li><li>●High frequency operation and stop</li><li>●Excellent responsiveness</li><li>●G系列專用的電磁離合器制動馬達(激磁動作式)。</li><li>●可能連續多次啟動、停止。</li><li>●可實行間歇進給及微動。</li><li>●G시리즈 전용의 전자클러치 브레이크 모타.</li><li>●고정도의 기동, 停止가능.</li></ul>	<ul style="list-style-type: none"><li>●Packing machines</li><li>●Convever, Automation machines</li><li>●Carrying and lifting machines</li><li>●製袋機、包裝機。</li><li>●搬運機。</li><li>●各種移位裝置。</li><li>●設備機械。</li><li>●製袋機。</li><li>●콘베이어.</li><li>●각종移載장치.</li><li>●설비기계.</li></ul>
Electro-Magnetic Brake Motor 付帶電磁制動器馬達 전자브레이크모터		<ul style="list-style-type: none"><li>●Built-in non-excited E / B</li><li>●Suitable for repetitive reverse rotation</li><li>●High braking torque / holding torque</li><li>●內裝無激磁動作式電磁制動器。</li><li>●具有強大的制動力和負載的保持力。</li><li>●무여자 동작형의 전자 브레이크 내장.</li><li>●강한 제동력과 부하의 保持力을 가짐.</li></ul>	<ul style="list-style-type: none"><li>●Conveyers</li><li>●Hospital beds</li><li>●Automation machines</li><li>●搬運機。</li><li>●醫用床。</li><li>●設備機械。</li><li>●콘베이어.</li><li>●의료용 베드.</li><li>●설비기계.</li></ul>	DIN48 Brake Unit DIN48制動組件 DIN48 브레이크 유니트		<ul style="list-style-type: none"><li>●DIN48 size</li><li>●Directly adaptable to P/C</li><li>●Control unit for Induction, Reversible and Brake motors.</li><li>●無需維修保養</li><li>●控制面盤的標準化</li><li>●馬達容量的調整範圍較寬</li><li>●엔테난스후리</li><li>●모타容量이 폭넓게 選擇됩니다.</li><li>●盤設計가 標準化됩니다.</li></ul>	<ul style="list-style-type: none"><li>●Automation machines</li><li>●Equipment machines</li><li>●設備機械。</li><li>●各種自動機。</li><li>●설비기계</li><li>●각종자동기</li></ul>
Variable Speed Motor 變速馬達 가변속 모터		<ul style="list-style-type: none"><li>●Built-in tacho generator</li><li>●Non-step changing with Speed controller</li><li>●Variable speed, Reversible rotation, Slow-start and Slow-down(stop)</li><li>●內裝有轉速傳感器。</li><li>●併用速度控制器, 可做無級變速。</li><li>●可以進行變速、制動、正反轉、初速減緩、逐漸減速等多種運轉。</li><li>●타코 제네레이터 내장.</li><li>●스피드콘트롤과 병용하여 무단변속이 가능 변속제동, 정역전 SLOW-START, SLOW-DOWN 등의 다양한 운전가능.</li></ul>	<ul style="list-style-type: none"><li>●Conveyers, Label printers</li><li>●Physicochemistry pumps</li><li>●Printing pressers</li><li>●Dryers</li><li>●Tennis machines</li><li>●Labor saving machines</li><li>●搬運機、標籤打印機。</li><li>●化學泵、印刷機。</li><li>●乾燥機、紫帶製造機。</li><li>●網球練習設備。</li><li>●食品自動製造機。</li><li>●各種省力機械。</li><li>●콘베이어, 라벨프린터.</li><li>●이과학 펌프 인쇄기.</li><li>●건조기, 해태제조기.</li><li>●테니스머신.</li><li>●식품자동기계.</li><li>●각종동력기계.</li></ul>	Brake Unit 制動器組件 브레이크 유니트		<ul style="list-style-type: none"><li>●Electric brake unit for instant stop</li><li>●Intermittent action, Shot action</li><li>●High brake torque</li><li>●瞬時停止馬達的電氣制動組件。</li><li>●適合於間歇運轉和微動控制。</li><li>●無具有保持力, 但制動力良好。</li><li>●有接點型、無接點型兩種。</li><li>●모터를 순간 정지시키는 전기 브레이크 유니트 보지력은 없으나 제동력이 우수함.</li><li>●유점점타입과 무점점타입이 있음.</li></ul>	<ul style="list-style-type: none"><li>●Automation machines</li><li>●Equipment machines</li><li>●設備機械。</li><li>●各種自動機。</li><li>●설비기계.</li><li>●각종자동기.</li></ul>
Variable Speed with Electro-Magnetic Brake Motor 付帶電磁制動器變速馬達 전자 브레이크 가변속 모터		<ul style="list-style-type: none"><li>●Both functions of variable speed and electromagnetic brake</li><li>●具有變速馬達和電磁制動馬達的兩種功能。</li><li>●가변속 모터의 기능과 전자브레이크 모터의 기능을 조합.</li></ul>	<ul style="list-style-type: none"><li>●Conveyers, Label printers</li><li>●Physicochemistry pumps</li><li>●Printing pressers</li><li>●Dryers</li><li>●Tennis machines</li><li>●Labor saving machines</li><li>●搬運機、標籤打印機。</li><li>●化學泵、印刷機。</li><li>●乾燥機、紫帶製造機。</li><li>●網球練習設備。</li><li>●食品自動製造機。</li><li>●各種省力機械。</li><li>●콘베이어, 라벨프린터.</li><li>●이과학 펌프 인쇄기.</li><li>●건조기, 해태제조기.</li><li>●테니스머신.</li><li>●식품자동기계.</li><li>●각종동력기계.</li></ul>	Ball Bearing Type Gear head 滾珠軸承型 齒輪頭 玉軸受 타입 기어헤드		<ul style="list-style-type: none"><li>●5 hours / day or longer operation</li><li>●Continuous operation</li><li>●耐用 5 小時/天以上的運轉。</li><li>●耐用連續運轉。</li><li>●可耐中級以上的衝擊負載。</li><li>●5 시간/日이상의 운전 연속운전.</li><li>●中중격 以上の 負荷.</li></ul>	<ul style="list-style-type: none"><li>●Convever</li><li>●Automation machines</li><li>●搬運機。</li><li>●各種自動機。</li><li>●設備機械。</li><li>●콘베이어.</li><li>●각종자동기.</li><li>●설비기계.</li></ul>
Speed Controller 速度控制器 스피드 콘트롤		<ul style="list-style-type: none"><li>●Small type / 8P plug-in style</li><li>●Built-in speed set-up system (SD type)</li><li>●Variable speed, Reversible rotation, Slow-start and Slow-down(stop)</li><li>●Excellent stability and response</li><li>●採用8P插入方式的小形控制器。</li><li>●內裝速度設定器(SD型)。</li><li>●具有變速、制動、正反轉、初速減緩、緩慢減速(EX型)等功能。</li><li>●穩定性、應答性優異。</li><li>●8P플러그 IN방식을 채용한 소형 콘트롤 속도설정기 내장(SD타입).</li><li>●변속, 제동, 정역전, SLOW-START, SLOW-DOWN(EX-TYPE) 등의 기능이 가능.</li></ul>	<ul style="list-style-type: none"><li>●Conveyers, Label printers</li><li>●Physicochemistry pumps</li><li>●Printing pressers</li><li>●Dryers</li><li>●Tennis machines</li><li>●Labor saving machines</li><li>●搬運機、標籤打印機。</li><li>●化學泵、印刷機。</li><li>●乾燥機、紫帶製造機。</li><li>●網球練習設備。</li><li>●食品自動製造機。</li><li>●各種省力機械。</li><li>●콘베이어, 라벨프린터.</li><li>●이과학 펌프 인쇄기.</li><li>●건조기, 해태제조기.</li><li>●테니스머신.</li><li>●식품자동기계.</li><li>●각종동력기계.</li></ul>	Metal Bearing Type Gear Head 含油軸承型 齒輪頭 含油軸受 타입 기어헤드		<ul style="list-style-type: none"><li>●5 hours/day or shorter operation</li><li>●Light loading operation</li><li>●Short-time operation</li><li>●耐用 5 小時/天以下的運轉。</li><li>●輕度負載的運轉。</li><li>●耐用輕度以下的衝擊負載。</li><li>●可用於短時間運轉。</li><li>●5 시간/日이하의 운전.</li><li>●輕負荷운전.</li><li>●輕중격이하의 負荷.</li><li>●短시간운전.</li></ul>	<ul style="list-style-type: none"><li>●Agricultural machines</li><li>●Moisture meter</li><li>●農業機械。</li><li>●水分計.</li></ul>

■Product range/motors (100,200V,UL)

■Gearhead







	Type			 Standard	 Electro-magnetic breke				 Terminal box				Type	Applicable gear head							
PmOP (P)	P H A S E	S O C K E T (W)	Induction	Reversible		Reversible		Induction	Induction	Induction		Reversible		P H A S E	S O C K E T (W)	Metal bearing	Ball bearing	Decimal gearhead			
				100V	200V	100V	200V	100V		200V	200V	100V	200V						200V	100V	
2P		□42	3	M4IA3G2L	—	—	—	—	—	—	—	—	—	Single	□42	3	M4GA□F	—	—		
4P	Single	□42	1	M4IA1G4L	—	M4RA1G4L	—	—	—	—	—	—	—		□42	1	M4GA□F	—	—		
		□60	3	M6IA3G4L	—	—	—	—	—	—	—	—	—		□60	3	M6GA□M	M6GA□B	M6GA10XM		
			4	—	—	M6RA4G4L	—	—	—	—	—	—	—			4	M6GA□M	M6GA□B	M6GA10XM		
			6	M6IA6G4L	M6IA6G4Y	M6RA6G4L	M6RA6G4Y	M6RA6GB4L	M6RA6GB4Y	—	—	—	—			6	M6GA□M	M6GA□B	M6GA10XM		
		□70	10	M7IA10G4L	M7IA10G4Y	M7RA10G4L	—	—	—	—	—	—	—		□70	10	M7GA□M	M7GA□B	M7GA10XM		
			15	M7IA15G4L	M7IA15G4Y	M7RA15G4L	M7RA15G4Y	M7RA15GB4L	M7RA15GB4Y	—	—	—	—			15	M7GA□M	M7GA□B	M7GA10XM		
			15	M8IA15G4L	M8IA15G4Y	—	—	—	—	—	—	—	—			—	15	M8GA□M	M8GA□B	M8GA10XM	
		□80	20	—	—	M8RA20G4L	M8RA20G4Y	—	—	—	—	—	—		□80	20	M8GA□M	M8GA□B	M8GA10XM		
			25	M8IA25G4L	M8IA25G4Y	M8RA25G4L	M8RA25G4Y	M8RA25GB4L	M8RA25GB4Y	—	M8IA25GT4L	M8IA25GT4Y	M8RA25GT4L			M8RA25GT4Y	25	M8GA□M	M8GA□B	M8GA10XM	
			40	M9IA40G4L	M9IA40G4Y	M9RA40G4L	M9RA40G4Y	M9RA40GB4L	M9RA40GB4Y	—	M9IA40GT4L	M9IA40GT4Y	M9RA40GT4L			M9RA40GT4Y	40	M9GA□M	M9GA□B	M9GA10XM	
		□90	60	M9IC60G4L	M9IC60G4Y	M9RC60G4L	M9RC60G4Y	M9RC60GB4L	M9RC60GB4Y	—	M9IC60GT4L	M9IC60GT4Y	M9RC60GT4L		M9RC90GT4Y	□90	60	—	M9GC□B M9GS□B	—	M9GC10XB
			90	M9IC90G4L	M9IC90G4Y	M9RC90G4L	M9RC90G4Y	M9RC90GB4L	M9RC90GB4Y	—	M9IC90GT4L	M9IC90GT4Y	M9RC90GT4L		M9RC90GT4Y		90	—	M9GC□B M9GS□B	—	M9GC10XB
			Three	□80	25	—	M8MA25G4Y	—	—	—	M8MA25GB4Y	—	M8MA25GT4Y		—		—	Three	□90	25	M8GA□M
		40			—	M9MA40G4Y	—	—	—	M9MA40GB4Y	—	M9MA40GT4Y	—	—	40	M9GA□M	M9GA□B			M9GA10XM	
60	—	M9MC60G4Y			—	—	—	M8MC60GB4Y	—	M9MC60GT4Y	—	—	60	—	M9GC□B M9GS□B	—	M9GC10XB				
90	—	M9MC90G4Y			—	—	—	M8MC90GB4Y	—	M8MC90GT4Y	—	—	90	—	M9GC□B M9GS□B	—	M9GC10XB				

	Type			 Terminal box seal connector	 UL Standard motor			 UL With electro-magnetic brake	 Variable speed		 Variable speed		 Variable speed with electromagnetic brake		Type	Applicable gear head						
Poles (P)	Phase	Socket (V)	Cut-off (V)	Induction	Induction		Reversible	Reversible	Induction		Reversible		Reversible		Phase	Square (V)	Cut-off (V)	Metal bearing	Ball bearing	Decimal gearhead		
				200V	100/115/120V	220/240V	100/115/120V	100/115/120V	100V	200V	100V	200V	100V	200V								
2P		□42	3	—	—	—	—	—	—	—	—	—	—	—	Single	□42	3	M4GA□F	—	—		
4P	Single	□42	1	—	—	—	—	—	—	—	—	—	—	—		□42	1	M4GA□F	—	—		
		□60	3	—	M6IA3G4DU	—	—	—	M6IA3GV4L	—	—	—	—	—		□60	3	M6GA□M	M6GA□B	M6GA10XM		
			4	—	—	—	M6RA4G4DU	—	—	—	M6RA4GV4L	—	—	—		□60	4	M6GA□M	M6GA□B	M6GA10XM		
			6	—	M6IA6G4DU	—	M6RA6G4DU	—	—	M6IA6GV4L	M6IA6GV4Y	M6RA6GV4L	M6RA6GV4Y	M6RA6GBV4L		M6RA6GBV4Y	□60	6	M6GA□M	M6GA□B	M6GA10XM	
		□70	10	—	M7IA10G4DU	—	M7RA10G4DU	—	—	M7IA10GV4L	M7IA10GV4Y	M7RA10GV4L	M7RA10GV4Y	—		—	□70	10	M7GA□M	M7GA□B	M7GA10XM	
			15	—	M7IA15G4DU	—	M7RA15G4DU	—	—	M7IA15GV4L	M7IA15GV4Y	M7RA15GV4L	M7RA15GV4Y	M7RA15GBV4L		M7RA15GBV4Y	□70	15	M7GA□M	M7GA□B	M7GA10XM	
			15	—	M8IA15G4DU	—	—	—	M8IA15GV4L	M8IA15GV4Y	—	—	—	—		—	□80	15	M8GA□M	M8GA□B	M8GA10XM	
		□80	20	—	—	—	M8RA20G4DU	—	—	—	—	M8RA20GV4L	M8RA20GV4Y	—		—	□80	20	M8GA□M	M8GA□B	M8GA10XM	
			25	—	M8IA25G4DU	—	M8RA25G4DU	M8RA25GB4DU	M8IA25GV4L	M8IA25GV4Y	M8RA25GV4L	M8RA25GV4Y	M8RA25GBV4L	M8RA25GBV4Y		—	—	□80	25	M8GA□M	M8GA□B	M8GA10XM
			40	—	M9IA40G4DU	—	M9RA40G4DU	M9RA40GB4DU	M9IA40GV4L	M9IA40GV4Y	M9RA40GV4L	M9RA40GV4Y	M9RA40GBV4L	M9RA40GBV4Y	—	—	□90	40	M9GA□M	M9GA□B	M9GA10XM	
	□90	60	—	M9IC60G4DU	—	—	—	M9IC60GV4L	M9IC60GV4Y	M9RC60GV4L	M9RC60GV4Y	—	—	□90	60	—		M9GC□B M9GS□B	—	M9GC10XB		
		90	—	M9IC90G4DU	—	—	—	M9IC90GV4L	M9IC90GV4Y	M9RC90GV4L	M9RC90GV4Y	—	—	□90	90	—		M9GC□B M9GS□B	—	M9GC10XB		
		Three	□80	25	M8MA25GK4Y	—	M8MA25G4GU	—	—	—	—	—	—	—	—	Three		□80	25	M8GA□M	M8GA□B	M8GA10XM
	40			M9MA40GK4Y	—	M9MA40G4GU	—	—	—	—	—	—	—	—	□80		40	M9GA□M	M9GA□B	M9GA10XM		
	□90			60	M9MC60GK4Y	—	M9MC60G4GU	—	—	—	—	—	—	—	—		□90	60	—	M9GC□B M9GS□B	—	M9GC10XB
				90	M9MC90GK4Y	—	M9MC90G4GU	—	—	—	—	—	—	—	—		—	□90	90	—	M9GC□B M9GS□B	—

■ Product range/motors (100,200V,UL)

■ Gearhead

Type			Standard				Electro-magnetic breke				Terminal box				Type	Applicable gear head				
P HASE (P)	P HASE	S C A L E	O U T (W)	Induction		Reversible		Reversible		Induction	Induction		Reversible		P HASE	S C A L E	O U T (W)	Metal bearing	Ball bearing	Decimal gearhead
				100V	200V	100V	200V	100V	200V	200V	100V	200V	200V	100V						
2P		□42	3	M4IA3G2L	—	—	—	—	—	—	—	—	—	—	Single	□42	3	M4GA□F	—	—
4P	Single	□42	1	M4IA1G4L	—	M4RA1G4L	—	—	—	—	—	—	—	—		□42	1	M4GA□F	—	—
		□60	3	M6IA3G4L	—	—	—	—	—	—	—	—	—	—		□60	3	M6GA□M	M6GA□B	M6GA10XM
			4	—	—	M6RA4G4L	—	—	—	—	—	—	—	4			M6GA□M	M6GA□B	M6GA10XM	
			6	M6IA6G4L	M6IA6G4Y	M6RA6G4L	M6RA6G4Y	M6RA6GB4L	M6RA6GB4Y	—	—	—	—	6			M6GA□M	M6GA□B	M6GA10XM	
		□70	10	M7IA10G4L	M7IA10G4Y	M7RA10G4L	—	—	—	—	—	—	—	—		□70	10	M7GA□M	M7GA□B	M7GA10XM
			15	M7IA15G4L	M7IA15G4Y	M7RA15G4L	M7RA15G4Y	M7RA15GB4L	M7RA15GB4Y	—	—	—	—	15			M7GA□M	M7GA□B	M7GA10XM	
		□80	15	M8IA15G4L	M8IA15G4Y	—	—	—	—	—	—	—	—	—		□80	15	M8GA□M	M8GA□B	M8GA10XM
			20	—	—	M8RA20G4L	M8RA20G4Y	—	—	—	—	—	—	—			20	M8GA□M	M8GA□B	M8GA10XM
			25	M8IA25G4L	M8IA25G4Y	M8RA25G4L	M8RA25G4Y	M8RA25GB4L	M8RA25GB4Y	—	M8IA25GT4L	M8IA25GT4Y	M8RA25GT4L	M8RA25GT4Y			25	M8GA□M	M8GA□B	M8GA10XM
		□90	40	M9IA40G4L	M9IA40G4Y	M9RA40G4L	M9RA40G4Y	M9RA40GB4L	M9RA40GB4Y	—	M9IA40GT4L	M9IA40GT4Y	M9RA40GT4L	M9RA40GT4Y	□90	40	M9GA□M	M9GA□B	M9GA10XM	
60	M9IC60G4L		M9IC60G4Y	M9RC60G4L	M9RC60G4Y	M9RC60GB4L	M9RC60GB4Y	—	M9IC60GT4L	M9IC60GT4Y	M9RC60GT4L	M9RC90GT4Y	60	—		M9GC□B M9GS□B	M9GC10XB			
90	M9IC90G4L		M9IC90G4Y	M9RC90G4L	M9RC90G4Y	M9RC90GB4L	M9RC90GB4Y	—	M9IC90GT4L	M9IC90GT4Y	M9RC90GT4L	M9RC90GT4Y	90	—		M9GC□B M9GS□B	M9GC10XB			
Three	Three	□80	25	—	M8MA25G4Y	—	—	—	M8MA25GB4Y	—	M8MA25GT4Y	—	—	Three	□80	25	M8GA□M	M8GA□B	M8GA10XM	
		□90	40	—	M9MA40G4Y	—	—	—	M9MA40GB4Y	—	M9MA40GT4Y	—	—		□90	40	M9GA□M	M9GA□B	M9GA10XM	
			60	—	M9MC60G4Y	—	—	—	M8MC60GB4Y	—	M9MC60GT4Y	—	—			60	—	M9GC□B M9GS□B	M9GC10XB	
			90	—	M9MC90G4Y	—	—	—	M8MC90GB4Y	—	M8MC90GT4Y	—	—			90	—	M9GC□B M9GS□B	M9GC10XB	

Type			 Terminal box seal connector	 UL Standard motor			 UL With electro-magnetic brake	 Variable speed		 Variable speed		 Variable speed with electromagnetic brake		Type	Applicable gear head						
P HASE (P)	P HASE	S C A L E (W)	O U T (V)	Induction	Induction		Reversible	Reversible	Induction		Reversible		Reversible		P HASE	S C A L E (W)	O U T (V)	Metal bearing	Ball bearing	Decimal gearhead	
				200V	100/115/120V	220/240V	100/115/120V	100/115/120V	100V	200V	100V	200V	100V	200V							
2P		□42	<b>3</b>	—	—	—	—	—	—	—	—	—	—	Single	□42	<b>3</b>	M4GA□F	—	—		
4P	Single	□42	<b>1</b>	—	—	—	—	—	—	—	—	—	—		□42	<b>1</b>	M4GA□F	—	—		
		□60	<b>3</b>	—	M6IA3G4DU	—	—	—	M6IA3GV4L	—	—	—	—		—	□60	<b>3</b>	M6GA□M	M6GA□B	M6GA10XM	
			<b>4</b>	—	—	—	M6RA4G4DU	—	—	M6RA4GV4L	—	—	—		—	□60	<b>4</b>	M6GA□M	M6GA□B	M6GA10XM	
			<b>6</b>	—	M6IA6G4DU	—	M6RA6G4DU	—	—	M6IA6GV4L	M6IA6GV4Y	M6RA6GV4L	M6RA6GV4Y		M6RA6GBV4L	M6RA6GBV4Y	□60	<b>6</b>	M6GA□M	M6GA□B	M6GA10XM
		□70	<b>10</b>	—	M7IA10G4DU	—	M7RA10G4DU	—	—	M7IA10GV4L	M7IA10GV4Y	M7RA10GV4L	M7RA10GV4Y		—	—	□70	<b>10</b>	M7GA□M	M7GA□B	M7GA10XM
			<b>15</b>	—	M7IA15G4DU	—	M7RA15G4DU	—	—	M7IA15GV4L	M7IA15GV4Y	M7RA15GV4L	M7RA15GV4Y		M7RA15GBV4L	M7RA15GBV4Y	□70	<b>15</b>	M7GA□M	M7GA□B	M7GA10XM
		□80	<b>15</b>	—	M8IA15G4DU	—	—	—	M8IA15GV4L	M8IA15GV4Y	—	—	—		—	—	□80	<b>15</b>	M8GA□M	M8GA□B	M8GA10XM
			<b>20</b>	—	—	—	M8RA20G4DU	—	—	M8RA20GV4L	M8RA20GV4Y	—	—		—	—	□80	<b>20</b>	M8GA□M	M8GA□B	M8GA10XM
			<b>25</b>	—	M8IA25G4DU	—	M8RA25G4DU	M8RA25GB4DU	M8IA25GV4L	M8IA25GV4Y	M8RA25GV4L	M8RA25GV4Y	M8RA25GBV4L		M8RA25GBV4Y	—	□80	<b>25</b>	M8GA□M	M8GA□B	M8GA10XM
		□90	<b>40</b>	—	M9IA40G4DU	—	M9RA40G4DU	M9RA40GB4DU	M9IA40GV4L	M9IA40GV4Y	M9RA40GV4L	M9RA40GV4Y	M9RA40GBV4L	M9RA40GBV4Y	—	□90	<b>40</b>	—	M9GA□B M9GS□B	—	M9GA10XB
<b>60</b>	—		M9IC60G4DU	—	—	—	M9IC60GV4L	M9IC60GV4Y	M9RC60GV4L	M9RC60GV4Y	—	—	—	□90	<b>60</b>	—	M9GC□B M9GS□B	—	M9GC10XB		
<b>90</b>	—		M9IC90G4DU	—	—	—	M9IC90GV4L	M9IC90GV4Y	M9RC90GV4L	M9RC90GV4Y	—	—	—	□90	<b>90</b>	—	M9GC□B M9GS□B	—	M9GC10XB		
Three	Three	□80	<b>25</b>	M8MA25GK4Y	—	M8MA25G4GU	—	—	—	—	—	—	—	Three	□80	<b>25</b>	M8GA□M	M8GA□B	M8GA10XM		
		<b>40</b>	M9MA40GK4Y	—	M9MA40G4GU	—	—	—	—	—	—	—	—		□90	<b>40</b>	M9GA□M	M9GA□B	M9GA10XM		
		<b>60</b>	M9MC60GK4Y	—	M9MC60G4GU	—	—	—	—	—	—	—	—		□90	<b>60</b>	—	M9GC□B M9GS□B	—	M9GC10XB	
		<b>90</b>	M9MC90GK4Y	—	M9MC90G4GU	—	—	—	—	—	—	—	—			<b>90</b>	—	M9GC□B M9GS□B	—	M9GC10XB	



■ Product range/motors (110,220,230V)

Type				Standard			Electromagnetic brake		Terminal box		Terminal box seal connector	
P (mHP)	PHASE	SQUARE	C.O.T. (W)	Induction			Reversible		Induction	Induction		Induction
				110V	220V	230V	110V	220V		110V	220V	
4P	1PH	□60	3	—	—	—	—	—	—	—	—	—
			4	—	—	—	—	—	—	—	—	—
			6	M6IA6G4Q	M6IA6G4W	M6IA6G4G	M6RA6G4Q	M6RA6G4W	M6RA6GB4Q	—	—	—
		□70	10	—	—	—	—	—	—	—	—	—
			15	M7IA15G4Q	M7IA15G4W	M7IA15G4G	M7RA15G4Q	M7RA15G4W	M7RA15GB4Q	—	—	—
			15	—	—	—	—	—	—	—	—	—
		□80	20	—	—	—	—	—	—	—	—	—
			25	M8IA25G4Q	M8IA25G4W	M8IA25G4G	M8RA25G4Q	M8RA25G4W	M8RA25GB4Q	M8RA25GB4W	—	—
			40	M9IA40G4Q	M9IA40G4W	M9IA40G4G	M9RA40G4Q	M9RA40G4W	M9RA40GB4Q	M9RA40GB4W	—	—
		□90	60	M9IC60G4Q	M9IC60G4W	M9IC60G4G	M9RC60G4Q	M9RC60G4W	M9RC60GB4Q	M9RC60GB4W	—	—
			90	M9IC90G4Q	M9IC90G4W	M9IC90G4G	M9RC90G4Q	M9RC90G4W	M9RC90GB4Q	M9RC90GB4W	—	—
	3PH	□80	25	—	M8MA25G4Y	—	—	—	—	M8MA25GB4Y	—	M8MA25GK4Y
			40	—	M9MA40G4Y	—	—	—	—	M9MA40GB4Y	—	M9MA40GK4Y
		□90	60	—	M9MC60G4Y	—	—	—	—	M9MC60GB4Y	—	M9MC60GK4Y
			90	—	M9MC90G4Y	—	—	—	—	M9MC90GB4Y	—	M9MC90GK4Y

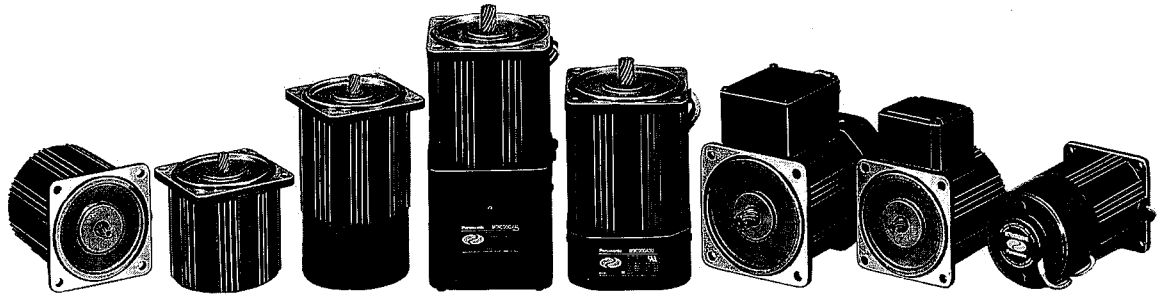
■ Gearhead

Type				Variable speed		
P (mHP)	PHASE	SQUARE	C.O.T. (W)	Induction		
				110V	220V	230V
4P	1PH	□60	3	—	—	—
			4	—	—	—
			6	M6IA6GV4Q	M6IA6GV4W	M6RA6GV4Q
		□70	10	—	—	—
			15	M7IA15GV4Q	M7IA15GV4W	M7RA15GV4Q
			15	—	—	—
		□80	20	—	—	—
			25	M8IA25GV4Q	M8IA25GV4W	M8RA25GV4Q
			40	M9IA40GV4Q	M9IA40GV4W	M9RA40GV4Q
		□90	60	M9IC60GV4Q	M9IC60GV4W	M9RC60GV4Q
			90	M9IC90GV4Q	M9IC90GV4W	M9RC90GV4Q
	3PH	□80	25	—	—	—
			40	—	—	—
		□90	60	—	—	—
			90	—	—	—

Type		Applicable gear head		
PHASE	SQUARE	C.O.T. (W)	Metal bearing	Ball bearing
Single	□42	3	M4GA□F	—
		1	M4GA□F	—
		3	M6GA□M	M6GA□B
	□60	4	M6GA□M	M6GA□B
		6	M6GA□M	M6GA□B
		10	M7GA□M	M7GA□B
	□70	15	M7GA□M	M7GA□B
		15	M8GA□M	M8GA□B
		20	M8GA□M	M8GA□B
	□80	25	M8GA□M	M8GA□B
		40	M9GA□M	M9GA□B
		60	—	M9GC□B
	□90	90	—	M9GS□B
		90	—	M9GC□B
		90	—	M9GS□B
Three	□80	25	M8GA□M	M8GA□B
		40	M9GA□M	M9GA□B
	□90	60	—	M9GC□B
		90	—	M9GS□B

Voltage coding  
Q=110V  
W=220V  
G=230V

## Motor



**M9**

Represents size  
M4 : 42mm Square  
M6 : 60mm Square  
M7 : 70mm Square  
M8 : 80mm Square  
M9 : 90mm Square

**I**

Represents type  
I : Induction  
R : Reversible  
M : 3-phase

**A**

Represents type  
A : A-type  
1W up to 40W  
C : C-type  
60W, 90W

**40 G**

Represents output shaft type  
G : Gear screw type  
S : Straight type

Represents output  
1 : 1W  
3 : 3W  
4 : 4W  
6 : 6W  
10 : 10W  
15 : 15W  
20 : 20W  
25 : 25W  
40 : 40W  
60 : 60W  
90 : 90W

**B**

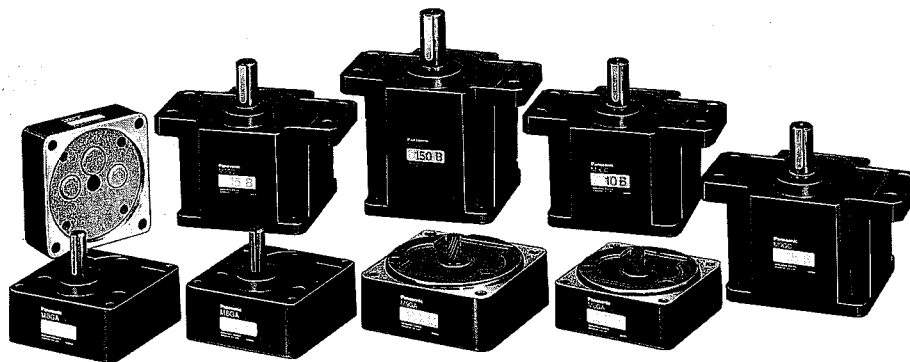
Represents motor function  
T : Terminal box  
K : Seal connector  
B : Electromagnetic brake  
V : Variable speed

**4 L**

Represents poles  
4 : 4poles  
2 : 2poles

Represents voltage  
L : 100V  
Y : 200V  
Q : 110V  
W : 220V  
G : 230V

## Gear head



**M9**

■ Gear head  
Represents size  
M4.42mm Square  
M6.60mm Square  
M7.70mm Square  
M8.80mm Square  
M9.90mm Square

**G**

G : Gear head

**A 100**

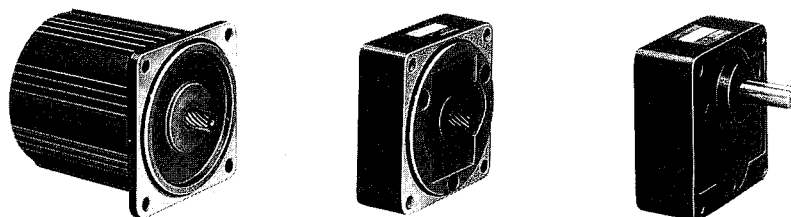
Represents types  
A : A-type 1W up to 40W  
C : C-type 60W, 90W Gear  
Head 90square Torque 200kg·cm  
S : S-type 60W, 90W Gear head 90Square  
Torque 300kg·cm

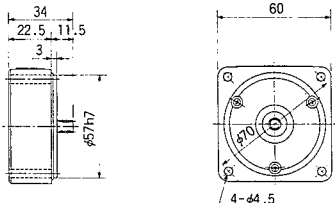
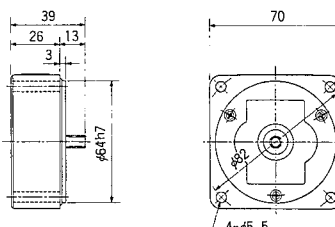
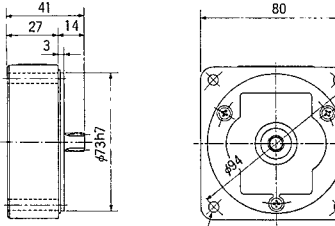
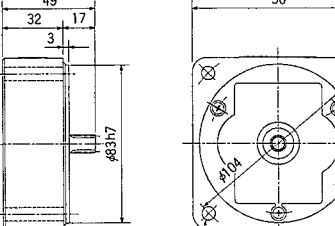
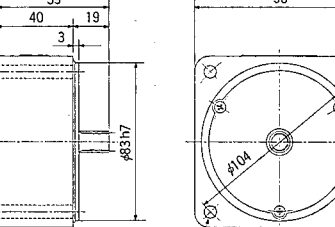
Represents reduction ratio  
100:1/100

**B**

Represents bearing types  
B : Ball bearing types  
M : Metal (Oil impregnated sintered) bearing  
F : Balls only for output shaft, Rest are metal.

Decimal Gearheads

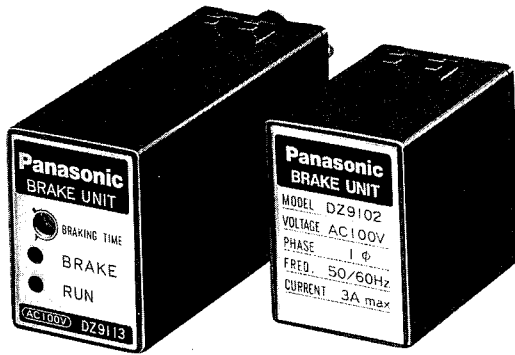


Types / Models	Dimension	unit : mm	Applicable gearhead	Screws (option) 1set 4pcs
M6GA10XM		0.21kg	M6GA □ M M6GA □ M	M4×85 (MOPM4001)
M7GA10XM		0.33kg	M7GA □ M M7GA □ B	M5×95 (MOPM5001)
M8GA10XM		0.43kg	M8GA □ M M8GA □ M	M5×95 (MOPM5001)
M9GA10XM		0.70kg	M9GA □ M M9GA □ B	M6×115 (MOPM6001)
M9GC10XB		0.64kg	M9GC □ B M9GS □ B	M6×65 (MOPM6002)
			M9GD □ B	M6×95

## Model Table

感應馬達  
모타의 概要 인덱스 모타

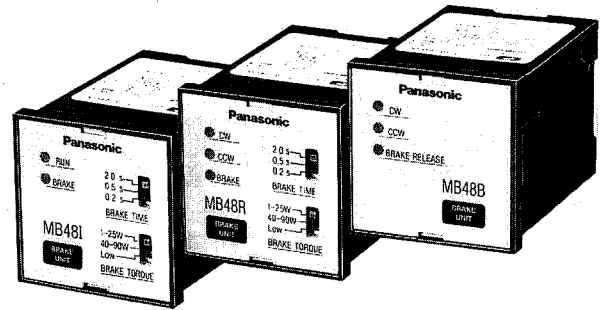
### ■ Brake unit



EX type

SD type

### ■ Din 48 brake unit



### ■ Brake unit model table

Contact			single phase 100V	single phase 200V	3 phase 200V	applicable motor
8P Plug-in type	contact	SD	DZ9102	DZ9202	DZ9302	Less than 90W
	non- contact	EX	DZ9103	DZ9213	—	
48·11P Plug-in type	non- contact		DVMB48IL DVMB48RL DVMB48BL	DVMB48IY DVMB48RY DVMB48BY	—	Less than 90W

Not applicable to 3 phase motors

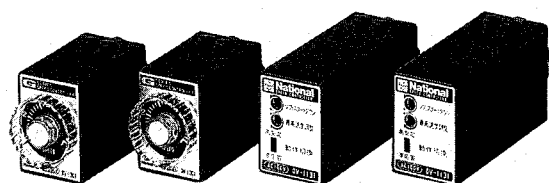
Electromagnetic brake does not operate for DVMB48B

### ■ Gearhead / Reduction ratio table

type	1/3	1/3.6	1/5	1/6	1/7.5	1/9	1/10	1/12.5	1/15	1/18	1/20	1/25	1/30	1/36	1/50	1/60	1/75	1/90	1/100	1/120	1/150	1/180	1/200
M4GA□F	○	○	○	○	○	○		○	○	○		○	○	○	○	○	○	○	○	○	○	○	—
M6GA□B(M)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	—
M7GA□B(M)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	—
M8GA□B(M)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	—
M9GA□B(M)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	—
M9GC□B	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
M9GS□B															○	○	○	○	○	○	○	○	○

○ stands for reduction ratios.

Speed controller



Unit type



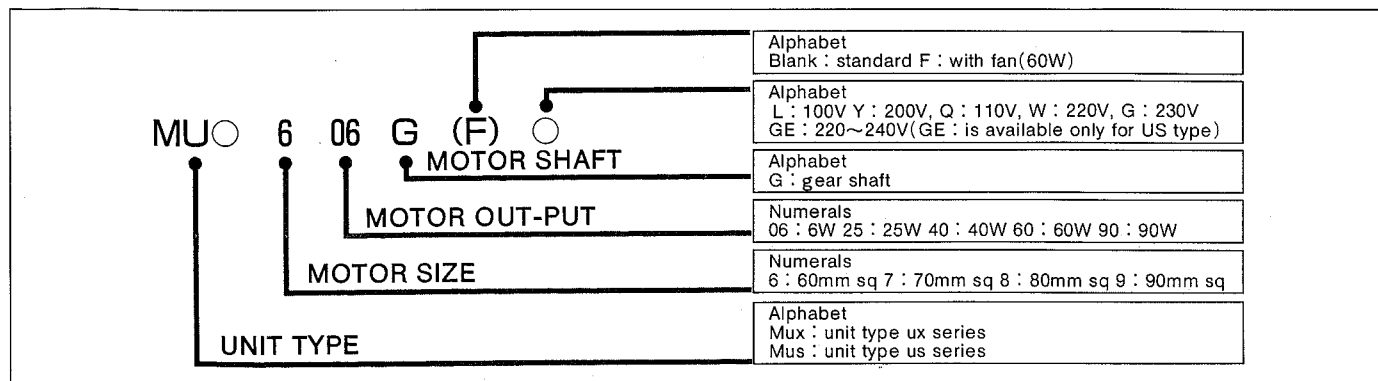
Speed controller model table (Q : 110V/115V, W : 220/230V is available for SD type)

Motor square			60			70		80			90		
Output (W)			3W	4W	6W	10W	15W	15W	20W	25W	40W	60W	90W
Single phase	SD	100V	DV1101	DV1101	DV1101	DV1101	DV1102	DV1102	DV1102	DV1102	DV1102	DV1104	DV1104
		200V	—	—	DV1201	DV1201	DV1201	DV1201	DV1201	DV1202	DV1202	DV1204	DV1204
	EX	100V	DV1131	DV1131	DV1131	DV1131	DV1132	DV1132	DV1132	DV1132	DV1132	DV1134	DV1134
		200V	—	—	DV1231	DV1231	DV1231	DV1231	DV1231	DV1234	DV1234	DV1234	DV1234

Unit type

Motor out-put	Unit model	Motor model	Controller model	Applicable gearhead model		
				Ball bearing	Metal bearing	Decimal gearhead
6W	MU○606G○	M61A6GD4○	DVU○606○	M6GA□B	M6GA□M	M6GA10XM
15W	MU○715G○	M71A15GD4○	DVU○715○	M7GA□B	M7GA□M	M7GA10XM
25W	MU○825G○	M81A25GD4○	DVU○825○	M8GA□B	M8GA□M	M8GA10XM
40W	MU○940G○	M91A40GD4○	DVU○940○	M9GA□B	M9GA□M	M9GA10XM
60W	MU○960G○	M91C60GD4○	DVU○960○	M9GC□B M9GS□B	—	M9GC10XB
60W (with fan)	MU○960GF○	M91C60GFD4○	DVU○960○	M9GC□B M9GS□B	—	M9GC10XB
90W	MU○990G○	M91C90GD4○	DVU○990○	M9GC□B M9GS□B	—	M9GC10XB

Coding



# Application Example Variable Speed / Electromagnetic Brake / Control Device

變速馬達付帶電磁制動器馬達  
전자 브레이크 가변속 모터

## Applications 比較變速馬達的功能 加變 모타의 機能比較

Motor 馬達 모타	Types of Speed Controllers 速度控制器的種類 스피드콘트롤러의 種類	Applications 功能範圍 用途
Variable Speed / Signal Phase, Induction 가변속 단상 인덕션 모터 變速單相感應馬達	Speed Controller : SD Type 速度控制器 SD型 스피드콘트롤 SD타입	<ul style="list-style-type: none"> <li>Continuous variable speed operation</li> <li>Instant stop (Brake time 0.5 sec, No holding torque)</li> <li>連續變速運轉。</li> <li>瞬時停止 (制動時間0.5秒) (無保持力)。</li> <li>連續變速 연속 변속운전</li> <li>임시정지 (브레이크시간 0.5초) (保持力없음)。</li> </ul>
	Speed Controller : EX Type 速度控制器 E X型 스피드콘트롤 EX타입	<ul style="list-style-type: none"> <li>High response, High stability functions,</li> <li>Continuous variable speed operation</li> <li>Instant stop, (Brake time 0.5 sec, No holding torque)</li> <li>Parallel operation by single volume is available.</li> <li>付帶靈敏應答/穩定轉換功能、連續變速運轉。</li> <li>瞬時停止 (無保持力) (制動時間最大 5 秒)。</li> <li>慢速啟動、慢速減速 (最大 5 秒爲止)。</li> <li>只用一個電位器可以併聯運轉。</li> <li>可以連接其他控制系統。</li> <li>高應答/高安定切換 운전。</li> <li>임시정지 (保持力없음) (브레이크시간 최대 5 초)。</li> <li>소프트스타트, 소프트다운 (최대 5 초까지) 가능。</li> <li>병렬 운전 가능 (한개의 Volume으로)。</li> <li>다른 (他) 제어기와 연결가능。</li> </ul>
	Unit Type 組件型 유니트 타입	<ul style="list-style-type: none"> <li>Quick and easy connection</li> <li>Digital display (UX)</li> <li>Digital speed setting / read-out</li> <li>Soft start, soft down function</li> <li>Set lock function</li> <li>一動作連接方式的速度控制器。</li> <li>領先業界首次研製成功的數字控制式。</li> <li>數字調整、數字表示方式。</li> <li>齒輪頭速度、輸送機速度均可瞬時換算。</li> <li>具有緩慢啟動、慢速停機功能。</li> <li>門鎖設定功能。</li> <li>완 · 탕치 接續의 스피드콘트롤</li> <li>業界初の 디지털型</li> <li>디지털調整 · 디지털表示</li> <li>기어헤드速度 · 콤베아速度의 瞬間換算</li> <li>소프트 스타트, 다운 기능</li> <li>셋트록 機能</li> </ul>
	Brake Unit SD Type 制動組件 SD型 브레이크 유니트 SD타입	<ul style="list-style-type: none"> <li>Instant stop (Brake time 0.5 sec, No holding torque)</li> <li>瞬時停止 (無保持力)、制動動作時間0.5秒爲止。</li> <li>임시정지 (保持力없음) 가능, 브레이크 작동시간 0.5초까지 가능。</li> </ul>
	Brake Unit : EX Type 制動組件 E X型 브레이크 유니트 EX타입	<ul style="list-style-type: none"> <li>Instant stop (Brake time 0.5 sec, NO holding torque)</li> <li>Brake by electric signal</li> <li>瞬時停止 (無保持力)、制動動作의調整, 時間爲0.1 ~ 2 秒。</li> <li>電信號控制。</li> <li>임시정지 (保持力없음) 가능, 브레이크작동시간의 調整이 0.1초 ~ 2 초까지 가능。</li> <li>전기 신호에 의한 제어가 가능。</li> </ul>
	DIN 48 series Brake Unit (Induction) DIN48制動組件 (感應馬達) DIN48 브레이크 유니트 (인덕션 모터)	<ul style="list-style-type: none"> <li>For induction motor</li> <li>Uni-directional operation, Electrical braking</li> <li>無觸點制動機組48毫米方型系列</li> <li>因採用無觸點方式</li> <li>實現無需進行維修保養。</li> <li>멘테넌스후리</li> <li>모타容量이 폭넓게 選擇됩니다。</li> <li>盤設計가 標準化됩니다。</li> </ul>
	Clutch and Brake Type C & B型 C & B타입	<ul style="list-style-type: none"> <li>Instant stop for one way high frequency (100 times/min)</li> <li>High holding torque by excitation brake</li> <li>Intermittent action and short action</li> <li>單方向多次瞬時停止 (100次/分鐘)。</li> <li>激磁制動方式, 保持力大。</li> <li>單方向間歇微動運轉。</li> <li>一方向高精度 (100回/分) 임시정지가 가능。</li> <li>브레이크는 려자제동형이므로 保持力이 크다。</li> <li>일방향운전。</li> </ul>

Motor 馬達 모터	Types of Speed Controllers 速度控制器的種類 스피드콘트롤의 種類	Applications 功能範圍 用途
Variable Speed / Signal Phase, Reversible 變速單相可逆式馬達 가변속 단상 리버시블 모터	Speed Controller : SD Type 速度控制器 SD型 스피드콘트롤 SD타입	<ul style="list-style-type: none"> <li>● 30 min ratings variable speed motor</li> <li>● Reversible variable speed operation</li> <li>● Instant stop (Brake time 0.5 sec)</li> <li>● 30分鐘額定變速運轉。</li> <li>● 正逆兩向變速運轉。</li> <li>● 瞬時停止(制動時間0.5秒)(無保持力)。</li> <li>● 30분 정격변속 운전.</li> <li>● 正逆변속운전.</li> <li>● 임시정지(브레이크시간 0.5초) (保持力없음).</li> </ul>
	Speed Controller : EX Type 速度控制器 E × 型 스피드콘트롤 EX타입	<ul style="list-style-type: none"> <li>● High response, High stability, Change-over switch</li> <li>● 30 min ratings variable speed operation</li> <li>● Instant stop (Brake time 0.5 sec)</li> <li>● Reversible variable speed operation</li> <li>● Soft start, Soft down (MAX 5 sec)</li> <li>● Parallel operation by one volume is available</li> <li>● 付帶靈敏應答/穩定轉換功能、30分鐘額定變速運轉。</li> <li>● 瞬時停止(制動時間最大 5 秒)。</li> <li>● 正逆兩向變速運轉。</li> <li>● 慢速啟動、慢速減速(最大 5 秒爲止)。</li> <li>● 只用一個電位器可以併聯運轉。</li> <li>● 可以連接其他控制系統。</li> <li>● 高應答/高安定切換기능, 30分定格變速운전.</li> <li>● 임시정지(브레이크시간 최대 5 초까지)가능.</li> <li>● 正逆변속운전.</li> <li>● 소프트스타트 소프트다운(최대 5 초까지)가능.</li> <li>● 병렬운전가능(한개의 Volume 으로).</li> <li>● 다른(他)제어기와 연결가능.</li> </ul>
	Brake Unit SD type 制動組件SD型 브레이크 유 니트 SD타입	<ul style="list-style-type: none"> <li>● Instant reversible stop (Brake time 0.5 sec)</li> <li>● 瞬時停止(無保持力)、制動動作時間0.5秒。</li> <li>● 임시정지(保持力없음)가능, 브레이크 작동시간 0.5초까지 가능.</li> </ul>
	Brake Unit : EX Type 制動組件 EX型 브레이크 유 니트 EX타입	<ul style="list-style-type: none"> <li>● Instant reversible stop (Brake time 0.5 sec)</li> <li>● Brake by electric signal</li> <li>● 瞬時停止(無保持力)、制動動作時間0.5秒。</li> <li>● 電信號制動。</li> <li>● 임시정지(保持力없음)가능, 브레이크 작동시간 0.5초까지 가능.</li> <li>● 전기신호에 의한 제어 가능.</li> </ul>
	DIN 48 Series Brake Unit (Reversible) DIN48制動組件(可逆式馬達) DIN48 브레이크 유닛(리버시블 모터)	<ul style="list-style-type: none"> <li>● For Reversible motor</li> <li>● Bi-directional operation, Electrical braking</li> <li>● 無觸點制動機組48毫米方型系列</li> <li>● 因採用無觸點方式</li> <li>● 實現無需進行維修保養。</li> <li>● 멘테넌스후리</li> <li>● 모터容量이 폭넓게 選択됩니다.</li> <li>● 盤設計가 標準化됩니다.</li> </ul>
	Speed Controller: SD Type and with Elec- tromagnetic Brake 付帶電磁制動器變速馬達及 速度控制器 SD型 전자 브레이크 가변속 모 타와 스피드 콘트롤 SD타입	<ul style="list-style-type: none"> <li>● Instant stop, variable operation for stop/down</li> <li>● 在時需要保持力的瞬時停止功能和變速運轉(因使用彈簧制動方式, 停電時也有保持力)。</li> <li>● 정지시의 保持力을 필요로 할 때 임시정지, 변속운전, 스프링제동형이므로 정전시에도 保持力이 있음.</li> </ul>
ELECTRO-MAGNETIC BRAKE MOTOR 付帶電磁制動器馬達 전자 브레이크 모 타	Speed Controller : EX Type with Electro- magnetic Brake 付帶電磁制動器變速馬達及 速度控制器 EX型 전자 브레이크 가변속 모터와 스피드 콘트롤 EX타입.	<ul style="list-style-type: none"> <li>● High response, high stability, Change-over switch</li> <li>● 30 min ratings variable speed operation</li> <li>● Variable speed operation which needs Soft start/Soft down and holding torque at stop</li> <li>● 靈敏應答/穩定轉換功能的30分鐘, 額定變速運轉。</li> <li>● 停止時需要保持力的變速運轉。</li> <li>● 要求慢速啟動/慢速減速, 並停止時需要保持力的變速運轉。</li> <li>● 高應答/高安定切換기능 30분 正格變速운전.</li> <li>● 停止時的 保持力을 필요로 하는 변속운전.</li> <li>● 소프트스타트, 소프트다운을 필요로 하고 더욱 정지시의 保持力을 필요로 하는 변속운전.</li> </ul>
	DIN 48 Series Brake Unit (Brake) DIN48制動組件 (變速馬達付帶電磁制動器馬達) DIN48 브레이크 유닛 (가변속 모터 전자 브레이크 모터)	<ul style="list-style-type: none"> <li>● For Brake motor</li> <li>● Bi-directional operation, Electrical brake drive</li> <li>● 無觸點制動機組48毫米方型系列</li> <li>● 因採用無觸點方式</li> <li>● 實現無需進行維修保養。</li> <li>● 멘테넌스후리</li> <li>● 모터容量이 폭넓게 選択됩니다.</li> <li>● 盤設計가 標準化됩니다.</li> </ul>



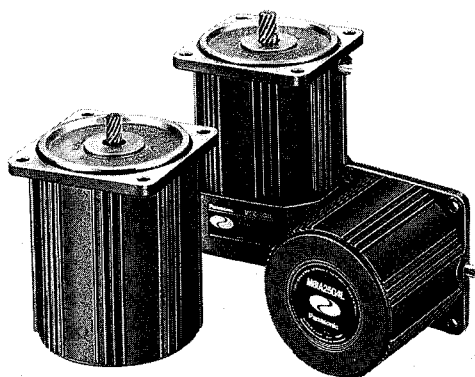
# Model Table

## ■Straight Shaft Motor

		TYPE		STANDARD			UL STANDRD MOTOR	VARIABLE SPEED			
POLE (P)	PHASE	SQUARE	OUTPUT (W)	INDUCTION		REVERSIBLE	INDUCTION	INDUCTION		REVERSIBLE	
				100V	200V	100V	100/115/120V	100V	200V	100V	
2P	SINGLE	□42	3	M4IA3S2L	—	—	—	—	—	—	
			1	M4IA1S4L	—	M4RA1S4L	—	—	—	—	
		□60	3	M6IA3S4L	—	—	—	—	—	—	—
			4	—	—	M6RA4S4L	—	—	—	—	—
			6	M6IA6S4L	M6IA6S4Y	M6RA6S4L	M6IA6S4DU	M6IA6SV4L	M6IA6SV4Y	M6RA6SV4L	
			10	M7IA10S4L	M7IA10S4Y	M7RA10S4L	—	—	—	—	—
			15	M7IA15S4L	M7IA15S4Y	M7RA15S4L	M7IA15SDU	M7IA15SV4L	M7IA15SV4Y	M7RA15SV4L	
		□80	15	M8IA15S4L	M8IA15S4Y	—	—	—	—	—	—
			20	—	—	M8RA20S4L	—	—	—	—	—
			25	M8IA25S4L	M8IA25S4Y	M8RA25S4L	M8IA25SDU	M8IA25SV4L	M8IA25SV4Y	M8RA25SV4L	
		□90	40	M9IA40S4L	M9IA40S4Y	M9RA40S4L	M9IA40S4DU	M9IA40SV4L	M9IA40SV4Y	M9RA40SV4L	
			60	M9IC60S4L	M9IC60S4Y	M9RC60S4L	M9IC60S4DU	M9IC60SV4L	M9IC60SV4Y	M9RC60SV4L	
			90	M9IC90S4L	M9IC90S4Y	M9RC90S4L	M9IC90S4DU	M9IC90SV4L	M9IC90SV4Y	M9RC90SV4L	
		THREE	□80	25	—	M8MA25S4Y	—	—	—	—	—
□90	40		—	M9MA40S4Y	—	—	—	—	—	—	
	60		—	M9MC60S4Y	—	—	—	—	—	—	
	90		—	M9MC90S4Y	—	—	—	—	—	—	

單相感應馬達

단상 인덕션 모터



## ■FEATURES

- Continuous ratings
- E class insulation
- Single phase motor is a capacitor motor type with high efficiency and low noise performance.
- 3 phase motor is 200v induction motor, and construction is same as single phase motor.

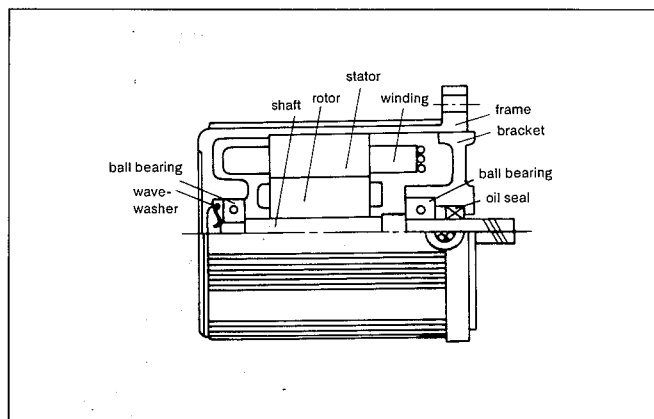
## ■特長

- 額定運轉爲連續運轉。
- 採用E級絕緣。
- 單相馬達使用電容器式感應馬達，故高功率、低噪音。
- 三相馬達使用三相電源200V的感應馬達。

## ■특징

- 운전정격은 연속정격임.
- 절연은 E종절연을 채용했음.
- 단상모타는 콘덴서형 인덕션모타이므로 고력률, 저소음으로 되어 있음.
- 구성도.

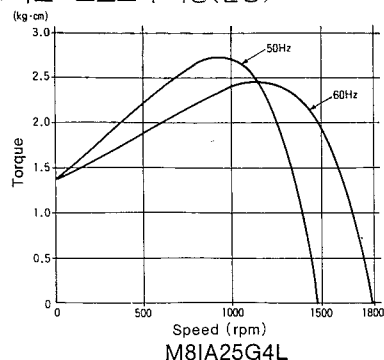
## ■Structure



## ■Characteristics of Induction Motor 인덕션 모터의 특성

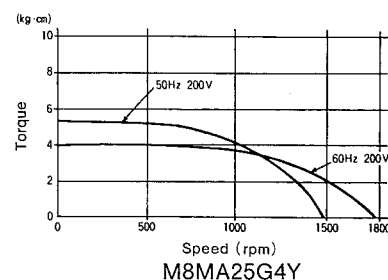
## ● Speed-torque performance (single phase)

## ● 속도-토크의 특성(단상)

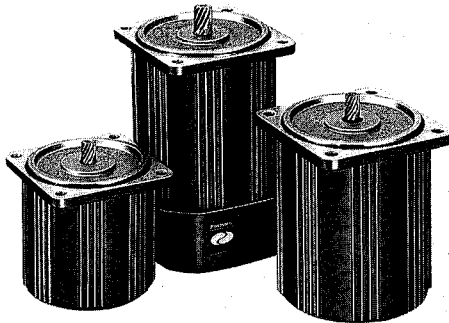


## ● Speed-torque performance (3 phase)

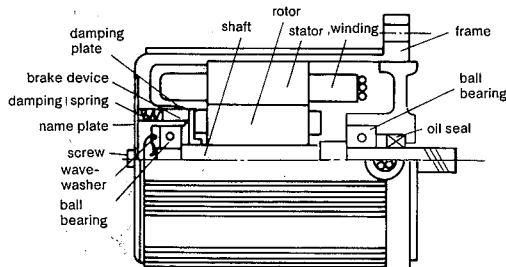
## ● 속도-토크의 특성(삼상)



可逆式馬達  
리버시블 모터

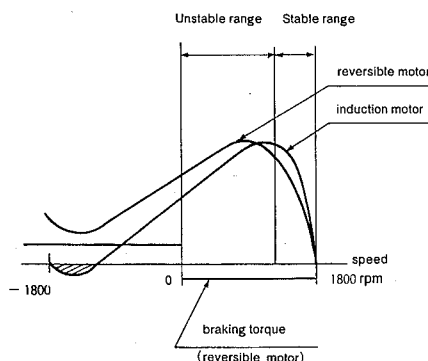


## Structure



## Characteristic of Reversible Motor REVERSIBLE MOTOR의 特性

- Speed-Torque Curve
- 速度토크 特性.



## FEATURES

- Instant reverse rotation  
Motor has balanced winding structure and plain braking system built-in, which enables instant reverse rotation keeping the same performance at either rotation.
- Smaller Overrun  
Motor has holding torque with about 10% of starting torque. This torque and plain braking system enables to make smaller over run.
- 30 min. Rated Operation  
The difference between INDUCTION MOTOR and REVERSIBLE MOTOR: The reversible motor enables to reverse rotation direction instantly, while, the induction motor is not suitable to make sudden reverses.  
(It is proper to change the wiring connection after stopping the motor to change directions)

## 特長

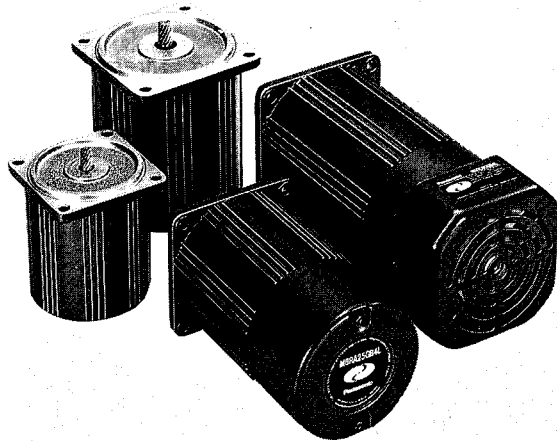
- 具有瞬時轉換正轉、反轉功能。  
因採用平衡繞線方式，並內裝簡易制動機構，能夠順時地轉換正轉、反轉，其正反旋轉特性同樣均勻且穩定。
- 幾乎不會發生超程現象，加上簡易制動器的作用稍有保持力，停止時的超位極少，而自保轉矩是有起動轉矩的10%左右。
- 運轉額定是30分鐘額定。  
感應馬達和可逆式馬達的不同點：  
可逆式是能瞬時轉換正、反轉，但感應馬達將接線轉換到反轉，會發生旋轉磁場和逆方向的轉矩(下圖斜線部)，故不能使旋轉負載瞬時轉換逆方向。

## 특징

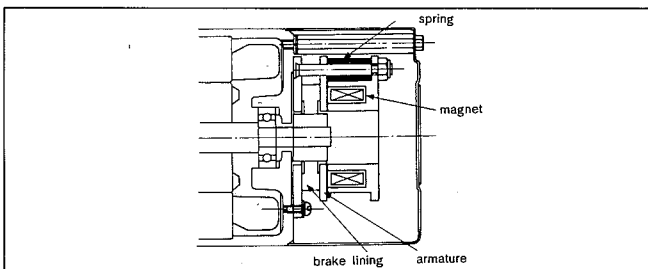
- 순간 정역전이 가능.  
균형 권선방식과 간이 브레이크 기구를 내장해 있고 순간 정역전이 가능하며 정전, 역전 등 동시 특성을 가지고 있음.
- 오버라이트가 적고 간이 브레이크 내장에 의해 약간의保持力を 가짐.  
정지시에 OVER-RUN이 적고 시동 토크의 약 10% 정도의 保持토크가 있음.
- 운전정격은 30분 정격입니다.  
인덕션 모터와 리버시블 모터의 상이점 리버시블 모터는 순간 정역전이 가능하나 인덕션 모터에서는 결선을 역전으로 절환해도 회전자계와 역방향의 토크(아래그림의 사선부)를 발생하고 있으므로 부하를 순간에 역전시킬 수는 없습니다.  
일단 정지한 다음 결선을 바꾸어 역전시켜 주세요.

## 電磁制動器馬達

전자 브레이크 모터



## Structure



## FEATURES

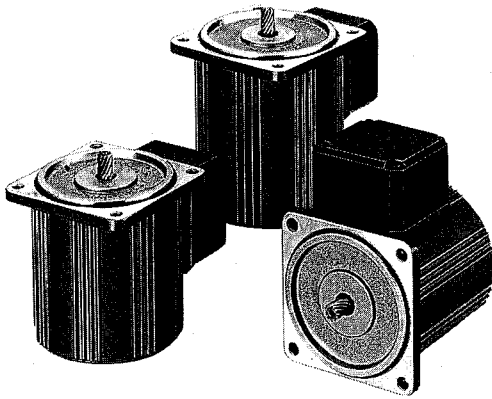
- Electro-magnetic brake motor has a built-in fail-safe electromagnetic brake which instantly stops the motor when the power supply is turned off and provides a high holding torque.
- Stops instantly  
The overrun is 2-4 rotations for the motor alone.
- Frequent instant reverse rotation is possible. 6 stops per minute is possible by easy switching. (Keep the switch off for more than 3 seconds) If 7 to 100 stops is necessary CLUTCH AND BRAKE MOTOR is suitable
- The motor and brake can be operated by the same power supply.

## 特長

- 確實地保持負載。  
既爲無激磁動作式電磁制動器，剛關掉電源時，立即產生制動力而確實地保持負載。
- 性能優越的安全制動器。  
停電時的緊急制動，保持長時間的停動狀態，防止機械的慣性滑動等，將能發揮安全制動的性能。
- 短時間內制動。  
電動機單機時，超程是 2 ~ 4 旋轉。
- 可能控制較複雜的瞬時正・反轉動作。  
每分鐘可以停止 6 次(停止時間必須保持 3 秒以上)。如需 1 分鐘停止 7 次~100 次時，應採用 C & B 馬達。
- 電動部、制動部可以使用同一電源。  
因爲在電磁制動部配合整流電路，均可使用同一的交流電源。

## 특징

- 確실한 負荷의 保止가 이루어 집니다.  
무려자 작동형의 전자 브레이크이므로 전원이 OFF되었을 때 제동력이 움직여 확실히 負荷를 保持함.
- 우수한 안전 브레이크임.  
정전시의 긴급제동, 장시간의 停止保持 기계의 방지 등안전 브레이크로서 우수한 성능을 가지고 있음.
- 短시간에 제동합니다.  
오버라이트는 모터單體일때 2 ~ 4 회전입니다.
- 빈번한 순간정격전이 가능합니다.  
간단한 절환으로 1 분간에 6 회의 정지를 할 수 있음(정지시간은 3 초이상 확보바랍니다) 1 분간 7 회부터 100 회의 정지가 필요한 경우에는 C & B모터를 사용해주세요.
- 모터 브레이크부와도 동일전원으로 사용함. 전자브레이크에 정류회로가 내장되어 있으므로 모터와 동일한 교류전원이 사용됨.



## FEATURES

- Dust/Water proof design is applied to the output and of leadwires.
- Compact design
- Ground terminal box
- Seal connector convenient for piping (Three phase motor)

## 特長

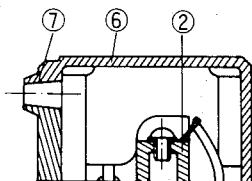
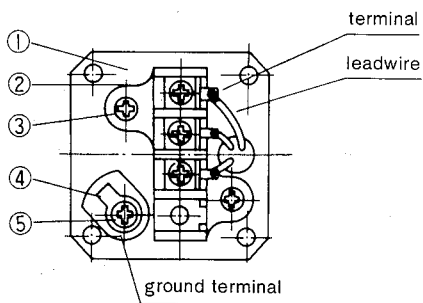
- 引導線部完全保護、防塵、防滴。以終端盒封閉電動充電部，形成防塵、防滴的保護結構。
- 小型緊湊設計。
- 付帶接地端子。
- 管路上付有密封式連接器(三相馬達)異常方便。

## 특징

- 口출선부의 방塵, 방滴, 보호.  
단자함으로 부터 충전부가 밀폐되어 있어 방塵, 방滴, 구조로 되어있습.
- 콤팩트 설계.
- 아-스 단자부.
- 배관에 편리한 실콘넥타부(삼상모타).

## Structure

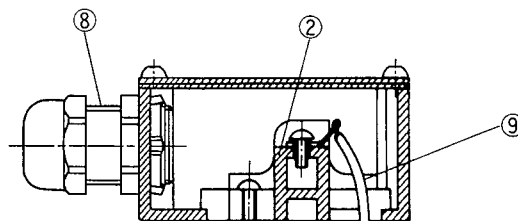
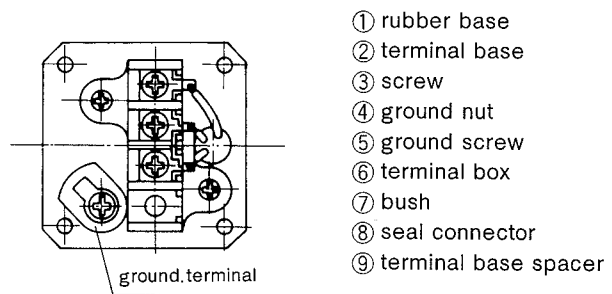
### Small terminal box



Applied size of cabtire sheating cord  $\phi 6.8 \sim \phi 8.6$

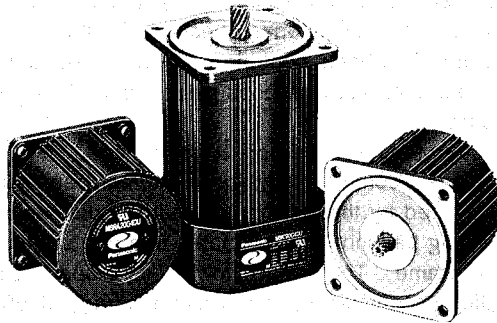
(Note) Please ground from ground terminal

### Large terminal box (with seal connector)

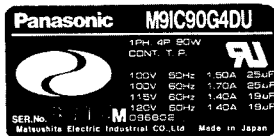


Applied size of cabtire sheating cord  $\phi 8 \sim \phi 12$

UL規格批准馬達  
UL규격 인정 모터



● UL name label



## FEATURES

- These products are UL standard (USA) recognized, which in purpose of maintaining the reliability of equipments, especially for the safety from fires. The equipments; which is exported to USA, is required to have UL standard. Moreover, the UL standard products are suitable for safety equipments for other countries, as well.
- The motor with a thermal protection E51187, E57251 is applied for 70mm, 80mm, 90mm square type. The impedance protected motor E48524 is applied for 60mm square type.

## UL規格批准馬達

- 電源規格是60Hz 115V/120V、50/60Hz 100V 共用，有內裝防止過熱裝置的馬達和保護阻抗的馬達之兩種。  
這些馬達均獲得美國UL規格的批准。本規格是以測試機器的可靠性，尤其考慮防止火災而制定的，向美國出口機器時，應獲得UL規格的許可。因此，這些馬達適合於安全要求嚴格的設備。成套設備上如使用已獲得UL規格的馬達，當將機器申請UL時，可以省略文件，手續簡單，更有縮短申請期間等利點。  
護取UL規格的产品，銘板上明示下記UL標記。
- 付帶防止過熱裝置馬達E51187、E57251，是等於70角、80角、90角者。  
保護阻抗型馬達是等於60角者。
- 正在運轉的馬達上發生過負載，或周圍溫度突然上昇，或有何原因增加輸入，便會劇激地上昇溫度。在過熱狀態放置，不免降低馬達內部的絕緣效果，影響到耐用壽命，甚至燒損繞線組，會招致火災之原因。  
本廠供應的UL規格批准馬達即具有下述特長，以防止熱所致的異常現象。

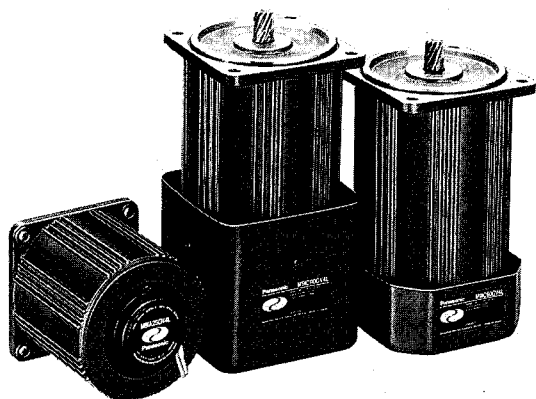
(例：UL標記銘板)

## UL규격 인정 모터

- 전원 사양은 60HZ 115V/120V 50/60HZ 100V 공용으로 싸마르 프로젝트를 내장한 모터와 임피던스 프로젝트된 모터가 있습니다. 이러한 모터는 기기의 신뢰성 특히 화재에 대한 안전을 목적으로 제정된 미국 UL 규격에 합격한 제품입니다. 기기가 미국으로 수출될 때에는 꼭 UL 규격의 합격품이 요구되나 국내에 있어서 보다 안정성이 요구되는 제품을 이용해 주세요.

UL 규격 인정 모터 사용의 이점은 기기를 UL에 신청할 경우 신청수속, 신청서류가 간단하고 또한 납기도 단축됩니다.

- 싸마르 프로젝트 모터는 E51187, E57251 70각 80각 90각에 해당됩니다.  
임피던스 프로젝트모터는 E48524 60각에 해당됩니다.
- 운전상태에 있는 모터가 과부하에 의해 구속되던가 주변 온도가 급격히 상승되던가 또는 무엇인가의 원인으로 입력이 증가하면 온도가 급격히 상승합니다.  
이 상태로 방치 해 두면 모터 내부의 절연이 열화되어 수명이 단축되던가 심한 경우 내선이 타서 화재의 원인이 될 수도 있습니다.



## FEATURES

- A tacho generator built into the most widely used type of induction motors and reversible motors, in combination with various pack, allows speed control of the range of 90-1400 rpm at 50 Hz, 90-1700 rpm at 60 Hz.
- Variable speed, brake, reverse rotation, soft start, soft down and other more various operations are possible.
- Since the feedback control is operated by the built-in tacho generator, the rotation is not influenced by the power frequency.
- The motor output ranges from 3 watt up to 90 watt. In the speed control motor, the maximum permissible torque is limited by the stall torque, but the danger of motor-overheating beyond the acceptable temperature limit (90°C at motor frame). The graph show a "safe-operation" area indicating the maximum permissible torque at 60Hz and 50Hz.

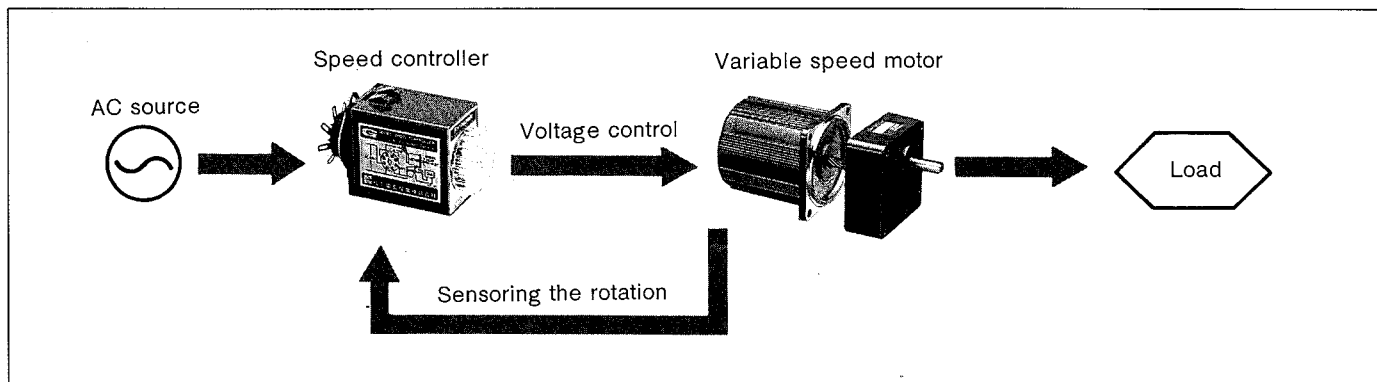
## 特長

- 因配用速度控制器，可以調整廣範圍的變速(50Hz……90~1400轉/分；60Hz……90~1700轉/分)。
- 可按需選擇變速、制動、轉換正・反轉、慢速啟動、慢速減速等多種複雜的運轉程序。
- 內部備有轉速傳感器，實行反饋控制，因此電源頻率有變化，其規定轉數決無變化。
- 馬達準備感應馬達和可逆式馬達的兩種。可按需採購。

## 특징

- 스피드 컨트롤을 병용하여 광범위(50HZ...90~1400rpm, 60Hz...9~1700RPM)의 변속이 가능합니다.
- 변속, 제동, 정역전, 소프트 스타트, 소프트 다운 등의 다용도의 운전이 가능함.
- 타코 제네레이터를 내장하고 피드 백 제어를 하고 있으므로 전원 주파수가 변화해도 회전수는 변하지 않습니다.
- 모터는 인덕션 모터와 리버시블 모터가 있습니다. 용도에 따라 선정해 주세요.

## System chart 控制流程

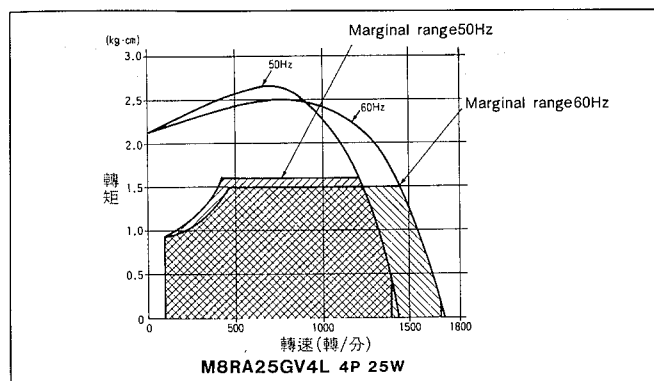




# Working range

使用範圍

사용 범위



- As for the speed control motor, the maximum permissible torque is limited by the stall torque, which is dangerous becoming motor-overheated if used beyond the acceptable temperature limit (90°C at motor frame). The graph shows the "safe operation" area indicating the maximum permissible torque at 60Hz and 50Hz.

## ● 使用臨界線

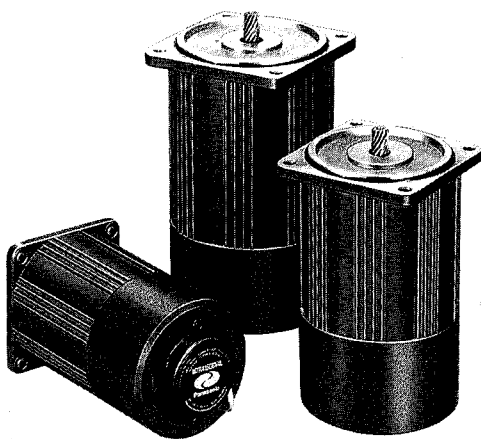
是表示變速馬達的使用範圍臨界線。容許轉矩應限於圖中斜線所示的範圍內使用，否則(超過斜線範圍)馬達溫度容易升高，會招致燒損、齒輪打斷等障礙，應多加注意。

## ● 사용 한계선에 있어서

가변속 모터의 사용 한계를 표시합니다. 허용 토크는 사용 범위의 사선 내부에서 사용해 주세요. 사용 한계선 (사선이 없는 부분) 사용하면 모터의 온도상승이 높아져 소손의 염려가 있습니다. 더욱 기어의 톱니바퀴가 부러질 경우도 생기니 사용을 피하세요.

## Variable Speed Motor With Electro-Magnetic Brake E

付帶電磁制動器變速馬達  
전자 브레이크 가변속 모터



### FEATURES

- Combining the instantaneous stop of speed controller and the electro magnetic brake, powerful brake operation is possible.
- The non-excitation electro-magnetic brake type stops the motor instantly when the power supply is turned off providing a high holding torque.

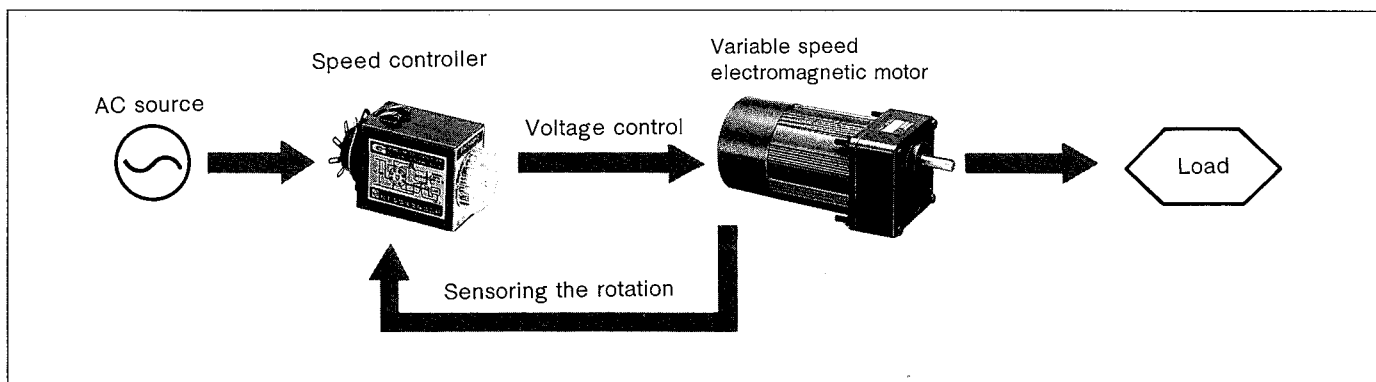
### 特長

- 因配用速度控制器，可以調整廣範圍的變速(50Hz……90~1400轉/分；60Hz……90~1700轉/分)。
- 可按需選擇變速、制動、轉換正・反轉、慢速啟動、慢速減速等多種複雜的運轉程序。
- 內部備有轉速傳感器，實行反饋控制，因此電源頻率有變化，其規定轉速決無變化。
- 馬達準備感應馬達和可逆式馬達的兩種，可按需採購。

### 특징

- 스피드콘트롤을 사용하여 광범위(50HZ...90~1400rpm)의 변속이 가능합니다.
- 변속, 제동, 정역전, 소프트스타트, 소프트다운 등의 다양한 운전이 가능합니다.
- 타코 제너레이터를 내장하여 피드백 제어를 하므로 전원 주파수가 변화해도 회전수는 변화하지 않습니다.
- 스피드 콘트롤의 순간정지와 전자브레이크를 병용하므로 해서 더욱 강력한 제동력을 얻을 수 있습니다.
- 확실히 부하의保持在 가능합니다.  
무려자 작동형의 전자 브레이크이므로 전원이 OFF되었을 때 제동력이 작동 확실히 부하를 保持함.
- 모터 출력은 6W~40W까지임.

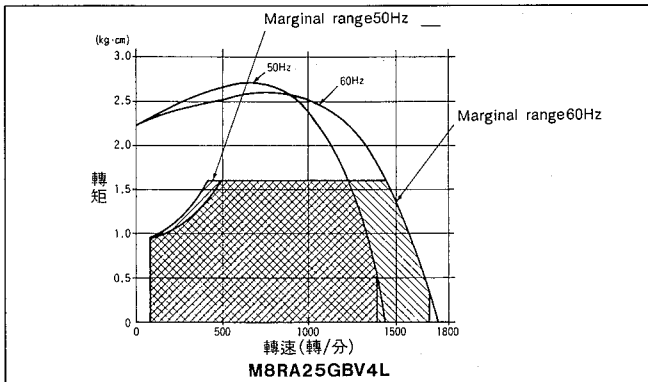
### System chart 控制流程



## Working range

使用範圍

사용범위



- As for the speed control motor, the maximum permissible torque is limited by the stall torque, which is dangerous becoming motor-overheated if used beyond the acceptable temperature limit (90°C at motor frame). The graph shows the "safe operation" area indicating the maximum permissible torque at 60Hz and 50Hz.

### ● 使用臨界線:

是表示變速馬達的使用範圍臨界線。容許轉矩應限於圖中斜線所示的範圍內使用。否則(超過斜線範圍)馬達溫度容易昇高,會招致燒損、齒輪折斷等障礙,應多加注意。

### ● 사용 한계선에 대하여

가변속 모터의 사용한계를 표시함. 허용토크는 이 사용범위의 사선내부에서 사용해 주세요.

사용한계선을 넘어 사용하면 모터의 온도상승으로 소손의 우려가 있고 기어의 톱니바퀴가 부러질 경우가 있으니 사용을 피해주시기 바랍니다.

## ■ Principle of Closed-Loop Speed Control

In the closed-loop system, speed is converted to the voltage in proportion to the speed at 'Speed sensing' and compared with the voltage set by 'Speed setting'. The difference of this voltage is called 'Error voltage'. This error voltage drives the motor through 'Amplifier' and 'Driver'.

As Error voltage can be controlled to almost 0, speed can be equal to the preset speed. Therefore speed does not change because of the load change and follow the change of preset speed.

Closed-Loop Control System controls the driving voltage by sensing the motor speed to maintain the speed.

## ■ Primary Voltage Control with Closed-Loop

Relation between torque and speed of the induction motor when changing apply voltage (primary) to the motor is described in Fig. 2. Taking point 'A', where voltage =  $V_1$ , and speed =  $N_1$  load torque =  $T_1$  and when 'A' is accelerating and reach to 'B' and change the voltage from  $V_1$  to  $V_2$ , 'B' shifts to point 'C'. At point 'C', load torque/ $T_1$  is greater than motor torque and motor speed drops from  $N_2$ .

when speed reaches to  $N_3$  and reduce voltage to  $V_3$ , motor shifts to point 'E' and motor torque becomes greater than load torque and starts accelerating to point 'F'.

By controlling primary voltage so that the loop of  $C \rightarrow D \rightarrow E \rightarrow F$  becomes smaller and continuously, stable speed can be obtained. Primary voltage control at closed loop control is to sense motor speed and control primary voltage to meet change of speed.

## ■ Operation of Speed Controller

Fig. 3 shows Panasonic's speed controller. Motor speed is sensed by tachogenerator, TG and feed-back voltage is gained through rectifying circuit. Difference of voltage between feed-back voltage and preset voltage which is adjustable with VR of speed setting is then amplified by error amplifier. Then trigger signal from thyristor is generated by saw-tooth wave (though saw-tooth wave generator) and error signal through comparator/trigger circuit. Voltage to the motor is then controlled by controlling conductive angle of thyristor by trigger signal.

Through above process, motor speed is controlled at constant speed. (refer Fig. 4)

We show some of the examples and calculation formula to choose proper motor. These formulas are based on normal operation and actual operating condition vary. Please take safety factor, instant large load, power fluctuation and others into consideration when you choose the motor.

Fig.1

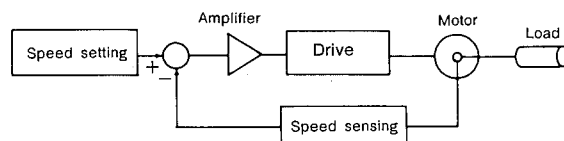


Fig.2

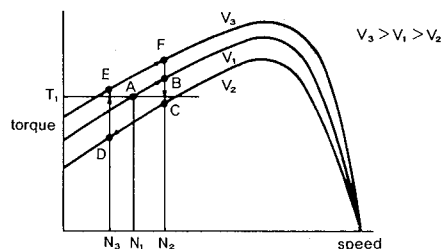


Fig.3

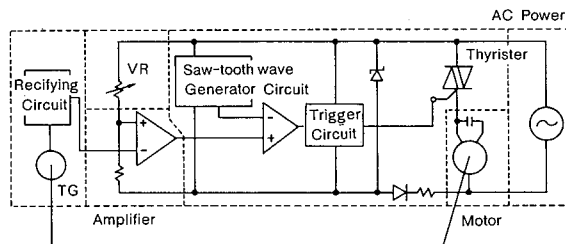
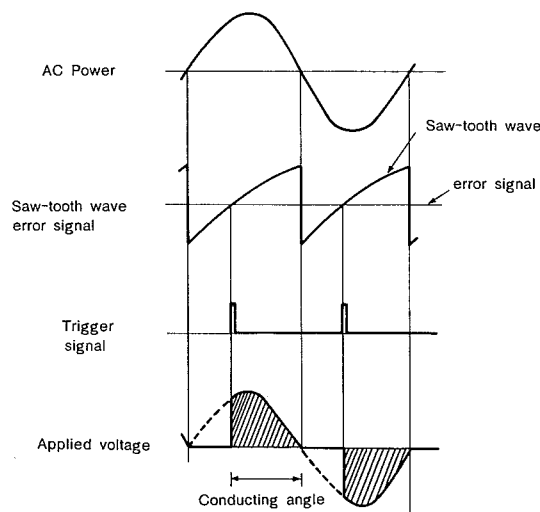
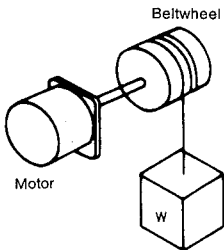


Fig.4



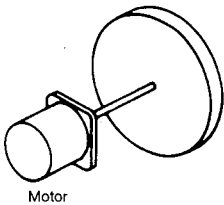
### 1. Winding up/Lifting up the load



$$P_g = \frac{wv}{6.12} \cdot \frac{100}{\eta} \text{ (W)}$$

W : Load (kgf)  
V : Speed (m/min)  
 $\eta$  : Efficiency (%)

### 2. Driving Flywheel Load

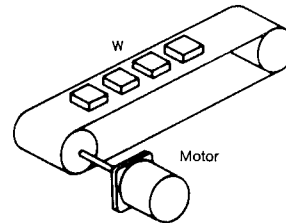


$$P_g = 1.027NT \text{ (W)}$$

$$T = \frac{GD^2}{375} \cdot \frac{N}{t} \text{ (kgf} \cdot \text{m)}$$

N : Speed (r/min)  
T : Torque (kgf·m)  
GD<sup>2</sup> : Flywheel Effect (kgf·m<sup>2</sup>)  
t : Time (sec.)

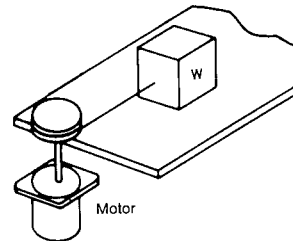
### 3. Belt Conveyor



$$P_g = (P_1) + (P_2) + (P_3) \cdot \frac{100}{\eta} \text{ (W)}$$

where; No load Power  $P_1 = 9.8\mu wv \ell$  (W)  
Horizontal Power  $P_2 = \frac{\mu Q \ell}{367} \text{ (W)}$   
Vertical Power  $P_3 = \pm \frac{QH}{367} \text{ (W)}$   
 $\ell$  : Length of conveyor (m)  
w : Weight of belt (unit) (kgf/m)  
 $\mu$  : Friction coefficient  
v : Belt Speed (m/sec)  
Q : Weight Capacity (kgf/h)  
 $\eta$  : Efficiency (%)  
H : Height between both conveyor end

### 4. Traveling on Flat Surface



$$P_g = \frac{\mu wv}{6.12} \text{ (W)}$$

w : Load (kgf)  
v : Speed (m/min)  
 $\mu$  : Friction coefficient

### 5. Driving Ball Screw

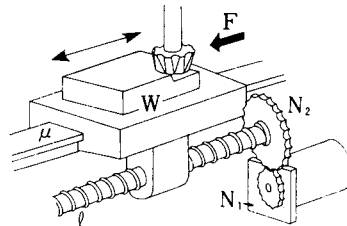
#### a) Horizontal movement

$$P_g = P_1 + P_2 \text{ (W)}$$

where;

$$\text{Outer Load } P_1 = 1.027N_2 \cdot \frac{(F + \mu W) \ell}{2\pi \eta}$$

$$\text{Pre Load } P_2 = 1.027N_2 \cdot k \cdot \frac{Fa_0 \ell}{2\pi}$$



F : Cutting Force (kgf)  
W : Work Weight+Table Weight (kgf)  
 $\mu$  : Friction coefficient at rubbing surface (0.01)  
 $\ell$  : Ball Screw Lead (m)  
 $\eta$  : Ball Screw Efficiency (0.9)  
Fa<sub>0</sub> : Pre load (kgf)  
k : Friction coefficient of pre-load nut (0.1~1.3)  
N<sub>2</sub> : Speed of Ball Screw (r/min)

#### b) Vertical movement

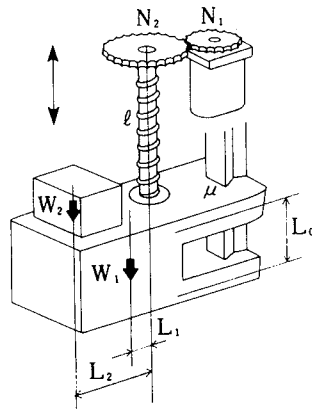
$$P_g = P_1 + P_2 \text{ (W)}$$

where;

$$\text{Outer Load } P_1 = 1.027N_2 \cdot \frac{(W_1 + W_2 + \mu W) \ell}{2\pi \eta} \text{ (W)}$$

$$W = \frac{W_1 L_1 + W_2 L_2}{L_0} \text{ (kgf)}$$

$$\text{Pre Load } P_2 = 1.027N_2 \cdot k \cdot \frac{Fa_0 \ell}{2\pi} \text{ (W)}$$

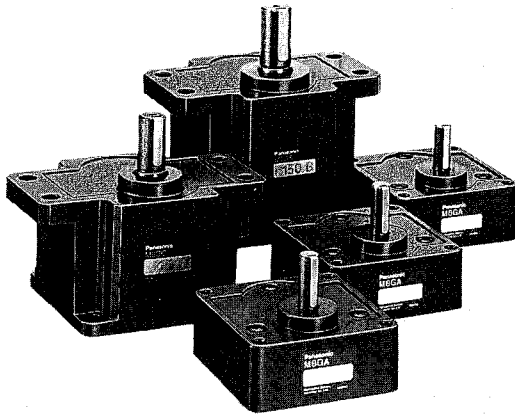


W<sub>1</sub> : Work Weight (kgf)  
W<sub>2</sub> : Table Weight (kgf)  
L<sub>1</sub> : Distance between Ball Screw center and center of gravity of the Work (m)  
 $\ell$  : Distance between Ball Screw center and center of gravity of the Table (m)  
 $L_0$  : Distance between center of the Tables' leg (m)  
 $\mu$  : Friction coefficient at rubbing surface (0.01)  
 $\ell$  : Ball Screw Lead (m)  
 $\eta$  : Ball Screw Efficiency (0.9)  
Fa<sub>0</sub> : Pre load (kgf)  
k : Friction coefficient of pre load nut (0.1~1.3)  
N<sub>2</sub> : Speed of Ball Screw (r/min)

# Outline of Gearhead

## 齒輪頭概要

## 기어헤드의 개요



### Features

- Depending on the motor output power, low noise type gearheads of A, C, D, S, B, type are available.  
plication.  
A type : 3W~40W  
B type : 3W~40W(grease applied type)  
C type : 60W,90W(200kg·cm) torque on gear shaft  
D type : 60W,90W(200kg·cm) torque on gear shaft  
same as C type but without mounting ear  
S type : 60W,90W(300kg·cm) torque on gear shaft  
·Low noise gearhead
- Applying the helical gears along with the totally enclosed system for the gearbox, with the unique grease structure reduces sound noise by 10 to 15dBA.
- When gear ratios over than 200 : 1 are required, a decimal gearhead which the gear ratio is 10 : 1, should be used. The decimal gearhead is placed between the motor and the gearhead.

### 特長

- 齒輪有豐富的型號，可供多種系列。  
A型/C型/S型。
- A型使用的軸承有兩種，是燒結含油軸承，或是滾珠軸承，可任意選用。
- S型(限於90角)是最大容許扭矩有300kg·cm，極其堅韌耐用。
- 減速比在1/3~1/180範圍內可以調整20階段(C型是1/200為止有21階段)，如使用減速比1/10的中間齒輪頭，便能減速到1/1800。

### 특징

- 풍부한 기어헤드 시리즈가 있습니다.  
A타입/C타입/S타입
- A타입에는 軸受가 燒結含油軸受의 기종과 玉軸受의 기종류가 있습니다.
- S타입(90角)은 최대허용축 토크가 300kgcm이고 견고합니다.
- 감속비는 1/3~1/180까지 20종류(C타입은 1/200까지 21종류) 있고 중간기어헤드(감속비 1/10)를 사용하면 1/1800까지 감속됩니다.

### Service Factor

Please use "Service Factor" (Coefficient) when you estimate or calculate the life. This factor will vary depending on the load to motor which is also variable in application. From the table you can multiply those multiply those factor to actual load so that you can decide necessary motor and gearhead.

For example, if you operate your machine 8 hour a day with constant load, service factor will be 1.0. Then if you use oil impregnated sintered bearing, you can expect about 2000 hours of life and 5000 hours with ball bearing type. (Suppose load is lower than permissible torque of gearhead)

If you operate same machine for 24 hours a day, you need to use 1.5 as service factor. This means that the life of the motor will be reduced to 1/1.5 of the original or if you need 2000 hours of life, you have to reduce the load to 1/1.5 or use a gearhead withstand larger permissible torque.

### Service Factor

Type of Load	Service Factor		
	5h/day	8h/day	24h/day
Constant	0.8	1.0	1.5
Light Impact	1.2	1.5	2.0
Medium Impact	1.5	2.0	2.5
Heavy Impact	2.0~2.5	2.0~3.0	3.0~3.5

### (Ex. of Load)

Type of Load	Application
Constant	Belt Conveyor, Film Winding. One-way operation
Light impact	Start/Stop/Cam operation
Medium Impact	Instant Reverse operation with Reversible Motor Instant Stall operation with Brake Pack
Heavy Impact	Repetition of Medium Impact Instant Stall of the motor at vibrating material

### ■減速比

齒輪頭的減速比，是在1/3~1/180範圍內有20階段。

按照電動機的輸出旋轉數和對象機械的旋轉數，應選擇最合適的減速比。如要求1/180以上的減速比，該配合使用中速齒輪(減速比1/10)。

### ■감속비에 대하여

기어헤드의 감속비에 있어서는 1/3~1/180까지 20종류가 있습니다.

모타의 출력 회전수와 상대기계의 회전수에 대응한 감속비를 선정해 주세요.

또한 1/180이상의 감속이 필요한 경우는 중간기어(감속비 1/10)를 사용해 주세요.

### ■滾珠軸承・燒結含油軸承

軸承也有兩種，是使用燒結浸油合金的含油軸承和滾珠軸承，它對負載的變動、衝擊荷載以及連續使用發揮優異的耐久性，宜按工作的負載狀態選擇。

### ■玉軸・燒結含油受에 대하여

燒結合金을 사용한 함유축수와 변동부하, 충격부하, 또는 연속 사용에 대하여 내구성이 있고 베어링이 있습니다.

부하에 따라 선정해 주시기 바랍니다.

### ■服務因數

負載是既然容易發生變動，在負載變化嚴重的條件下考慮壽命、動力等，由於負載的種類，選擇一種係數，它叫稱服務因數。在第一表選定最適的服務因數，與所需動力乘算而決定設計動力。在同一負載下每天開動8小時時，其服務因數為10。在上述條件的前提下，使用本廠的齒輪頭，容許軸轉矩範圍運轉時的壽命是：含油軸承型齒輪頭約2,000小時；

滾珠軸承型齒輪頭約5,000小時。

該數字以一天24小時運轉的條件來計算，由第1表可知服務因數必要1.5，運轉狀態之下耐用壽命將會呈出對數刻度性的減少。為此，使用含油軸承型齒輪，而要求2,000小時的壽命時，必需安排額定轉矩的1/1.5倍條件。

### ■서비스 요인에 대하여

부하는 일반적으로 변동할 때가 많고 그러한 경우의 수명동력 등을 생각할 때 부하의 종류에 따라 서비스 요인이라고 불리는 계수를 사용합니다.

表부터 서비스 요인을 정하여 필요로 하는 동력에 대하여 설계 동력을 결정해 주세요.

일단부하로 1일 8시간운전의 경우의 서비스 요인은 1.0이고 이때의 당사의 기어헤드는 허용축 토크로 운전했을 때, 함유 축수타입 기어헤드로 약 2,000시간 옥축수 타입 기어헤드로 5,000시간의 수명이 있습니다.

그러나 이것을 1일 24시간운전하면 表부터 서비스 요인은 1.5 필요합니다. 운전상태에서의 수명은 對數目盛의(눈짐작)으로 감소됩니다. 따라서 함유축수타입 기어헤드로 2,000시간의 수명을 필요로 할 때는 정격토크의 1/1.5배로 사용할 필요가 있습니다.

### ■How to Calculate torque Direct assembly of gearhead

$$Ng = \frac{Nm}{i}$$

$$Tg = Tm \times i \times \eta$$

Ng : Gearhead Speed (rpm)

Nm : Motor Speed (rpm)

i : Gear Ratio

Tg : Gearhead Output Torque (kg·cm)

Tm : Motor Output Torque (kg·cm)

η : Gear Efficiency

### ■直接連結齒輪頭時的轉矩計算公式：

$$Ng = \frac{Nm}{i}$$

$$Tg = Tm \times i \times \eta$$

Ng : 齒輪頭的轉數(rpm)(轉/分)

Nm : 電動機的轉數(rpm)

i : 齒輪頭的減速比

Tg : 齒輪頭的輸出軸轉矩(kg·cm)

Tm : 電動機的轉矩(kg·cm)

η : 齒輪效率。

### ■기어헤드를 직결 했을 때의 토크 산정

$$Ng = \frac{Nm}{i}$$

$$Tg = Tm \times i \times \eta$$

Ng : 기어헤드의 회전수(rpm)

Nm : 모타의 회전수(rpm)

i : 기어헤드의 감속비

Tg : 기어헤드 출력축토크(kg·cm)

Tm : 모타의 토크(kg·cm)

η : 기어의 효율



# Outline Of Gear Head

## 齒輪頭的概要 기어헤드의 개요

### Max. permissible Torque

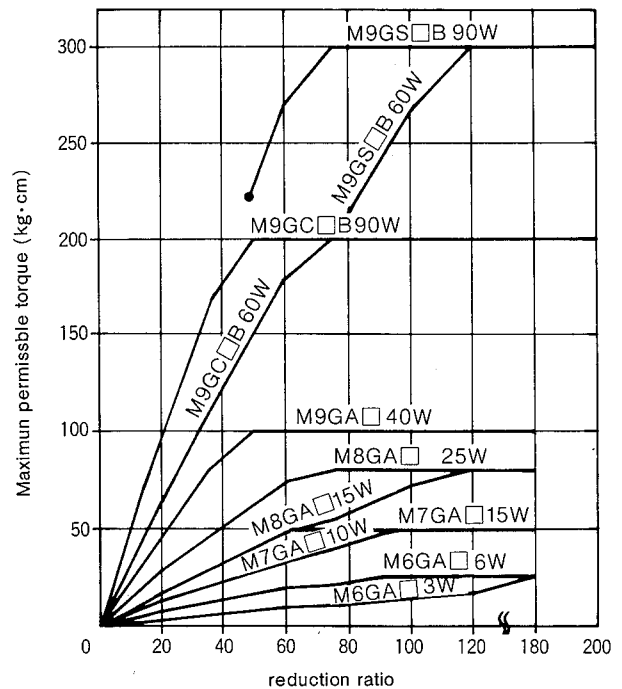
Gearhead output torque can be calculated with mentioned formula, but there is certain limit of torque that gearhead can receive based on the material and other condition if the gear ratio becomes larger. Max. permissible torque is listed in the right graph.

### 最大容許軸轉矩

齒輪頭的輸出軸轉矩是以上述的計算公式算出，如減速比大些，由於受到齒輪材質及其他條件的限制，能承受的負載轉矩有限。它叫做最大容許軸轉矩，按各齒輪頭和減速比來決定。最大容許軸轉矩在右圖表示。

### 최대 허용 토크

기어헤드의 출력축 토크는 前述한 계산식에 의해 구해지지만 감속비가 커지면 치차재료, 기타조건에 의하여 걸리는 부하 토크가 한정됩니다. 이것을 최대 허용축 토크라고 하며 기어헤드의 감속비에 의해 결정되어 있습니다. 최대 허용축 토크는 우측 그래프에 표시한 것과 같습니다.



### Overhanging Load and Thrust Load

Overhanging Load shows how much bending load will be applied to the output shaft of gearhead at  $\ell/2$  position. This applies to the application when motor and machine is connected with chain belt, but not to apply when coupling is used. Since the Overhanging Load or Thrust Load affects the life and strength of the motor, avoid to use under the excess load.

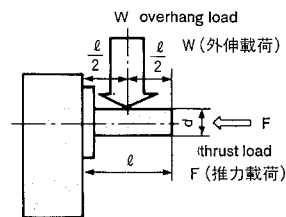
### 外伸載荷和推力載荷

「外伸載荷」是在下圖所示，輸出軸部位所承受的彎曲載荷。將馬達和其他機械用鏈帶等連結時產生這種載荷，能用聯軸節來直接連接時倒不會產生外伸載荷。軸承的使用壽命及主軸的強度直接受到外伸載荷和推力載荷的影響，因此，運轉中不可超過右表所示的容許外伸載荷及容許推力載荷，以期保護軸承。

### 오버하그 荷重과 스라스트 荷重에 대하여

오버하그 하중이란 아래 그림과 같은 출력축을  $\frac{\ell}{2}$  치수에 어느 정도 곡질하중이 걸리는 가를 표시합니다. 이것은 상대기계와체인, 벨트등으로 연결했을 때에 생기지만 커플링과 연결했을때에는 생기지 않습니다.

오버하그하중, 스라스트하중은 축의 수명이나 축의 강도에 크게 영향을 주므로 운전시의 부하가 오른쪽표의 허용 오버하그하중, 허용스라스트하중을 초과하지 않도록 주의해 주시기 바랍니다.



Gearhead	Overhung load (kg)	Thrust load (kg)
M4GA□F	20	1.5
M6GA□M M6GB□M M6GA□B M6GB□B	5 10	3
M7GA□M M7GB□M M7GA□B M7GB□B	10 20	4
M8GA□M M8GB□M M8GA□B M8GB□B	20 30	5
M9GA□M M9GB□M M9GA□B M9GB□B	30 40	10
M9GC□M M9GD□M M9GS□B	60 80	15

# ■ Gearhead Option (Screws)

OPTIONS	MODEL	SCREW	MODEL	SCREW
pan head scerew plain washer hexagon out	M4GA3F~M4GA180F	M3×38		
	M6GA3B~M6GA15B	M4×40	M6GA20B~M6GA180B	M4×50
	M7GA3B~M7GA15B	M5×55	M7GA20B~M7GA180B	M5×65
	M8GA3B~M8GA15B	M5×55	M8GA20B~M8GA180B	M5×65
	M9GA3B~M9GA15B	M6×70	M9GA20B~M9GA180B	M6×85
hexagon socket head cap screw	M9GC3B~M9GC200B M9GS50B~M9GS200B	M6×25		

# ■ Calibration of Gear Ratio with temperature

Please use and multiply the Torque-Reduction Ratio per the right table if you use at different temperature.

Please note the above table shows the Gearhead Efficiency at room temperature (20 deg. C).

For example, if you use at -10 deg. C, you can expect 20% lower torque.

# ■ 周圍溫度和齒輪頭的傳動效率計算公式：

對上述常溫下齒輪頭傳動效率乘右表所示的降低率而算出。

上述齒輪效率是馬達在常溫時的數值。周圍溫度降低到-10℃，轉矩再降低20%左右，故使用前必須確認溫度狀態。

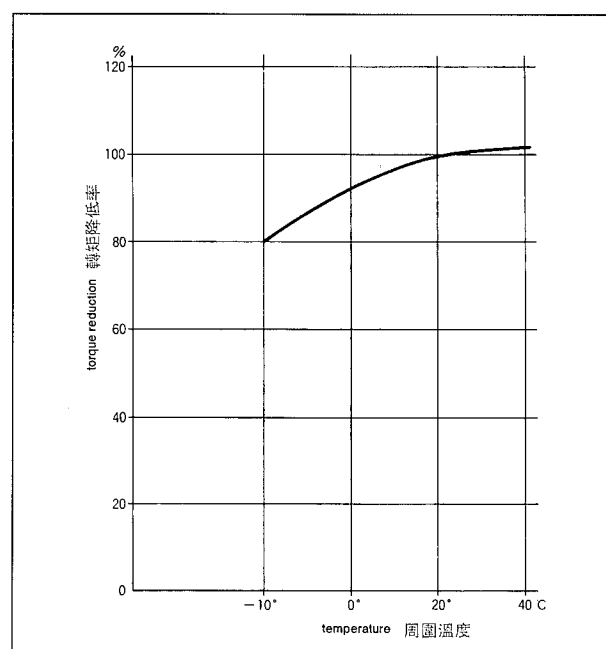
# ■ 기어헤드의 전달효율

주변 온도에 의한 기어헤드의 전달 효율을 구하는 법 아래 표에서 상온의 기어헤드 전달효율에 오른쪽 표의 토크 저감율을 아래하여 산출해 주세요.

승표의 기어헤드 전달효율은 모터 상온일때의 값입니다.

주변온도가 -10C로 되면 토크가 곧바로 약 20%저하 하므로 모터 사용시 확인하시기 바랍니다.

조립상의 주의사항



# ■ GEARHEAD EFFICIENCY 齒輪頭的傳動效率

Bearing 軸承	Gearhead/Ratio 型號/減速比	3~9	10~18	20~60	75~180	200	Decimal 中速齒輪
Ball 滾珠 軸承 玉軸受 타입 기어헤드	M6GA□B, M6GB□B M7GA□B, M7GB□B M8GA□B, M8GB□B M9GA□B, M9GB□B	81%		75%	70%	—	56%
	M9GC□B	81%	75%	70%	65%	—	58%
	M9GS□B	—			70%	65%	58%
Metal 含油軸承 含油軸受 타입 기어헤드	M6GA□M, M6GB□M M7GA□M, M7GB□M M8GA□M, M8GB□M M9GA□M, M9GB□M	68%		63%	58%	—	46%

## Caution at Assembly

### 裝配時的注意事項

#### ■Prior to assembly

- (1) After opening package, please take off seal-cap of gear head
- (2) Please make sure that O-ring is inserted to the far-end of rotor-faucet.  
If you assemble the gear With O-ring floated, it may cause damage to O-ring or may result in leakage of grease.
- (3) We insert felt to metal-type gear head for protection.  
Please assemble without taking off this felt.

#### ■裝配前的準備

- (1) 先拆下密封帽。  
注) 齒輪頭不該橫倒狀態長時間放置，否則將會漏油。
- (2) 檢驗 O 型環是否準確裝配在接合部裏面。  
注) O 型環應緊緊嵌上，如果稍浮起狀態裝配，會招致漏脂之原因。
- (3) 齒輪箱端面粘附油分時，應充分擦掉。  
注) 粘附油分的狀態裝配，將會滲出油分。

#### ■조립전의 준비

- (1) 실캡을 열어 주세요  
注) 기어헤드를 옆으로 누어서 그대로 방치하면 기름이 흘러 내릴 수 있습니다.
- (2) O링이 인로부의 깊이 장착되어 있음을 확인하시기 바랍니다.  
注) O링이 뜬상태로 조립하면 구리스가 흘러 내리는 원인이 됩니다.
- (3) 기어 케이스의 단면에 기름이 부착되어 있는 경우 이를 잘 닦아주시기 바랍니다.  
注) 기름이 부착된채 조립하면 기름이 스며셀 원인이 됩니다.

#### ■Assembling the motor and gearhead

- (1) Please make proper alignment of motor and gearhead before assembly. If you make alignment after assembly, it may cause damage to O-ring.
- (2) Place the motor with toothed output shaft upward. Then assemble the gearhead from the top after making proper alignment. If you find the alignment is not proper, please repeat (1) and (2).
- (3) Fasten 4 screws diagonally.  
Fastening torque to be as follows;

注) 馬達和齒輪頭不該勉強裝配，如果損傷馬達小齒輪的齒頂或齒輪部，會產生異常噪音，也會縮短耐用壽命。

注) 모터와 기어헤드를 무리하게 조립하면 모터 피니언의 치선이나 기어헤드의 기어에 손상이 생기며 이상을 발생 또는 수명 저하의 원인됩니다.

#### ■裝配

- (1) 使馬達小齒輪朝上，對合馬達引出線的引導方向和齒輪頭輸出軸的相對位置。
- (2) 馬達小齒輪的齒輪尖頭慎重地左右旋轉，對合齒輪頭的位置而裝配。此時不應使它勉強接觸到齒輪的齒頂。
- (3) 將馬達齒輪頭連接到機器時，心須使用所附屬的專用「固定螺絲釘」來充分緊締，馬達凸緣面和齒輪頭接合端面間無空隙狀態為宜。此時注意不該使 O 型環咬入。
- (4) 「固定螺絲釘」的標準緊締力矩參照下表。

#### ■조립

- (1) 모터 피니언을 위로 하고 모터의 리드선 출구방향과 기어헤드의 출력축의 관계에 위치를 맞추어 주십시오.
- (2) 모터 피니언의 齒先을 기어헤드의 기어에 세게 닿지 않 도록 좌우로 약간 돌리면서 조립 해 주세요.
- (3) 모터 기어헤드의 상대기계체의 부착은 부속의 부착나사를 사용하고 O링의 물림에 주의하면서 모터 플랜지 면과 기어헤드 내부 단면에 틈이 없게 꼭 죄여 주시기 바랍니다.
- (4) 부착 나사 체결 토크는 아래표에 의함.  
기어 나사못 체결 토크

	screw	torque
42mmsq	M3	10kg·cm
60mmsq.	M4	20kg·cm
70mmsq.	M5	25kg·cm
80mmsq.	M5	25kg·cm
90mmsq.	M6	30kg·cm

## ■Storage of gearhead

Keep the output shaft direction downwards, when storing the gearhead.

## ■齒輪部的保管

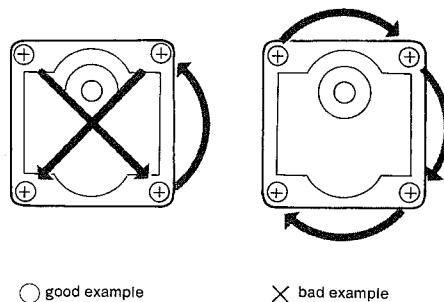
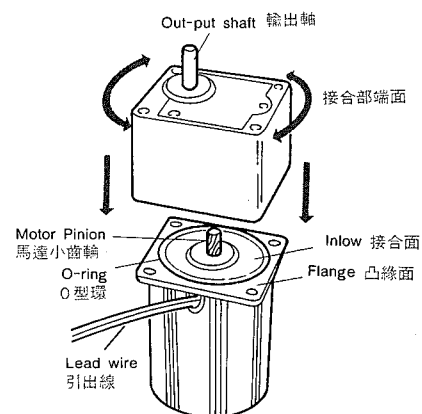
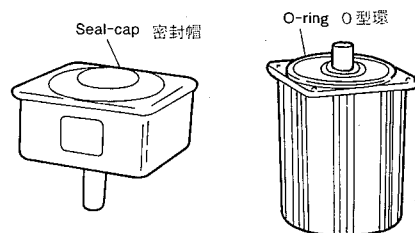
暫時保藏齒輪頭部時，應使輸出軸朝下為要。

注) 輸出軸不該橫倒、朝上狀態保管，以免漏出潤滑脂。

## ■기어 헤드의 보관

기어 헤드를 보관 할 때에는 출력 축을 아래로 해 주세요.

注) 출력 축을 옆으로 또는 위로 보관하면 구리스가 새어 나오는 원인이 되므로 주의 바랍니다.



# Motor Terminology

馬達用詞匯解釋  
용어설명

## ■ Ratings

Motor ratings calls for the permissible working limitations based on temperature rise and clasified into 2 ratings, continuous and short-run. The applies to motor output, voltage, frequency and speed (rpm) and are known as rated output, rated voltage, rated frequency and rated speed (rpm) respectively.

## ■ Continuous and Short-Time Ratings

The period while the motor can operate at rated output without any problem is also rated as Time Ratings. Continuous Ratings means that you can operate the motor continuously and Short-Time Ratings means that you can operate the motor only for the specified time period.

## ■ Output

The amount of work which the motor can produce during the given time period, and is determined by speed and torque of the motor. Rated output is marked on the motor

$$\text{Output (Watts)} = 1.027 \times 10^{-5} \times T \times N$$

$$1\text{HP} = 746\text{Watts}$$

where

$$1.027 \times 10^{-5} : \text{Constant}$$

$$T(\text{g} \cdot \text{cm}) : \text{Torque}$$

$$N(\text{rpm}) : \text{Speed}$$

## ■ Rated Output

You can get optimum characteristics of the motor at rated voltage and frequency in continuous operation. We call this output as Rated Output and the speed and torque which produce Rated Output as Rated Speed and Torque. Generally "Output" refers to Rated Output.

## ■ Starting Torque (refer ① of diagram)

Torque which the motor generate at starting is called Starting Torque. If you apply greater load than this torque, you can not start the motor.

## ■ Pull-out Torque (refer ② of diagram)

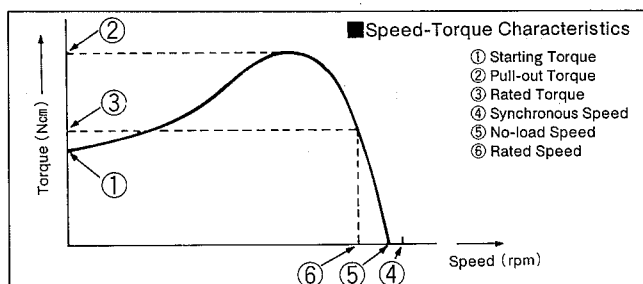
Maximum torque you can get from the motor at a given voltage and frequency. If you apply greater load than this torque, the motor will stall.

## ■ Rated Torque (refer ③ of diagram)

We call the torque which the motor produce continuously rated output at rated voltage and frequency as Rated Torque. This is also the torque at rated speed.

## ■ Overrun

We call the extra revolution which the motor will make when the power is turned off as Overrun and is indicated in angle or revolution.



## ■ Synchronous Speed (refer ④ of diagram)

Inherent speed of the motor whose number of poles and the line frequency are decisive factors. This is usually indicated in rpm. and calculated as per the following formula,

$$N_s = \frac{120f}{p}$$

Where  $N_s$ : Synchronous Speed (rpm)

$f$ : Line frequency (Hz)

$p$ : Number of poles

120: Constant

For example, for a 4-pole motor with the line frequency of 50 Hz, would be;

$$N_s = \frac{120 \times 50}{4} = 1500\text{rpm}$$

## ■ No-load Speed (refer ⑤ of diagram)

The motor speed at no load condition. This speed of induction and Reversible Motor is few percent (20 to 60 rpm) lower than Synchronous Speed because of rotor slippage.

## ■ Rated Speed (refer ⑥ of diagram)

The most appropriate and desired speed at rated output.

## ■ Slippage

One of the expression of the speed and will be indicated in the following formula;

$$S = \frac{N_s - N}{N_s} \text{ or } N = N_s(1 - S)$$

Where  $N_s$ : Synchronous Speed (rpm)

$N$ : Speed at given load (rpm)

If you operate a 4-pole, 50 Hz induction motor with a slipage of 0.1 ( $S=0.1$ )

$$N = \frac{120 \times 50}{4} (1 - 0.1) = 1500(1 - 0.1) = 1350\text{rpm}$$

## ■ 額定

是指對馬達保證的使用限度，而由於溫度上升情況，分為連續額定和短時間額定之兩種。其條件來說，規定對輸出的使用限度，同時，指定電壓、頻率、轉數(旋轉速度)等。這些項目分別叫稱額定輸出、額定電壓、額定頻率、額定轉數等。

## ■ 連續額定、短時間額定

時間額定是指保持額定輸出正常運轉的時間。在額定輸出下連續運轉者叫連續額定；按規定的時間進行額定輸出運轉者，是叫短時間額定。

## ■ 輸出

顯示馬達的一個單位時間內能做的工作量，它是以馬達的轉速和轉矩來決定。馬達上一定顯示着額定輸出的數值。在日本一般用瓦特數，歐美以馬力(HP)來表示。

$$\text{輸出 [watts]} = 1.027 \times 10^{-5} \times T \times N$$

$$1 \text{ HP} = 746 \text{ watts}$$

$$1.027 \times 10^{-5} = \text{常數}$$

$$T [\text{gcm}] = \text{轉矩}$$

$$N [\text{rpm}] = \text{轉數}$$

## ■ 額定輸出

指着馬達在額定電壓、額定頻率條件下，連續發揮最佳特性的輸出效率。發出額定輸出的旋轉數、轉矩叫額定轉數、額定轉矩。通常簡稱輸出就指着額定輸出。

## ■ 起動轉矩 (圖中①)

是指馬達剛啟動的瞬間發出的轉矩。馬達所受的負載大於這項轉矩，馬達無法啟動。

## ■ 逆轉轉矩 (圖中②)

是指馬達在規定電壓、規定頻率條件下能發出的最大轉矩，馬達的負載大於該項轉矩，馬達立即停止。

## ■ 額定轉矩 (圖中③)

馬達在額定電壓、額定功率下連續發出額定輸出時的轉矩，是額定轉數時的轉矩。

## ■ 超程 (超過)

斷開電源的瞬間至完全停穩為止的馬達旋轉狀態，以角度(轉數)來顯示。

## ■ 同步轉數 (圖④)

由於馬達的極數和電源頻率決定的固有數值。

通常以每分鐘的轉速來顯示。

Ns : 同步轉數(rpm)

f : 頻率(Hz)

P : 極數

120: 常數

比如有 4 極的馬達，並電源頻率 50Hz 時如下：

$$Ns = \frac{120 \times 50}{4} = 1500 \text{ rpm}$$

## ■ 無負載轉數 (圖中⑤)

馬達未承受負載時的轉數，感應馬達、可變式馬達均小於同步轉數(低幾個巴仙約 20~60 轉/分)的數值。

## ■ 額定轉數 (圖中⑥)

馬達能發出額定輸出效率時的旋轉數，是使用馬達上最理想的旋轉數。

## ■ 滑差(轉差率)

屬於轉數表現之一，用下述公式來表示。

$$S = \frac{Ns - N}{Ns}$$

$$\text{或 } N = Ns(1 - S)$$

Ns : 同步轉數(rpm)

N : 在任意負載下的轉數(rpm)

比方說 4 極 50Hz 感應馬達以滑差 S=0.1 條件運轉，其結果如下：

$$N = \frac{120 \times 50}{4} (1 - 0.1) = 1500 (1 - 0.1) = 1350 \text{ rpm}$$

### ■정격

온도상승면에서 某모타에 保證된 사용한도를 말하고 연속 정격과 단시간 정격으로 구별합니다.

某條件으로서 출력에 대한 사용한도를 정함과 동시에 전압, 주파수, 회전수(회전속도)등을 정합니다.

이러한 것들은 정격출력, 정격전압, 정격주파수, 정격회전수등을 말합니다.

### ■연속정격, 단시간 정격

정격출력으로 이상없이 운전을 계속하는 시간을 시간정격으로 표시합니다. 정격출력으로 연소사용할 수 있는 것은 연속정격이라고 지정된 일정시간 정격출력에 의한 운전이될 수 있는 것을 단시간 정격이라 합니다.

### ■출력

모타의 單位時間에 行해지는 작업을 표시한 것으로 모타의 회전수와 토크에 의해 결정됩니다.

모타에는 정격출력의 直를 표시하고 있으며 일본국에서는 W로 표시되지만 구미에서는 HP가 사용됩니다.

출력  $Watts = 1.027 \times 10^{-5} \times T \times N$

HP=746Watts

여기서  $1.027 \times 10^{-5}$  : 定數

T[gcm] : 토크

N[rpm] : 회전수

### ■정격출력

모타가 정격전압, 정격주파수로 가장 양호한 특성을 발휘하면서 연속발생하는 출력을 말합니다.

정격출력을 내는 회전수, 토크를 정격회전수, 정격토크라 하며 일반적으로 출력이란 정격출력을 의미함.

### ■始動토크(圖中①)

모타를 사용할때에 내는 토크를 말합니다. 이 토크보다 큰 부하로 모타가 돌리우면 모타는 작동하지 않습니다. (起動 토크라고도 함)

### ■停動토크(圖中②)

모타가 일정전압, 일정주파수로 낼 수 있는 최대 토크로 이 토크 이상의 부하가 걸리면 모타는 정지합니다.

### ■定格토크(圖中③)

모타가 정격전압, 정격주파수로 정격출력을 연속적으로 내는 때의 토크를 말합니다. 정격회전수때의 토크입니다.

### ■오버라이트

전원을 내린 순간부터 정지할때 까지의 모타 회전을 각도(회전수)로 표시 한것입니다.

### ■同期회전수(圖中④)

모타의 극수와 전원주파수로 정하는 고유의 것으로 다음식으로 표시함.

通常 1 分間の 회전수로 표시함

$$N_s : \text{同期회전수}[\text{rpm}] \quad N_s = \frac{120}{P} f[\text{rpm}]$$

f : 주파수[Hz]

P : 극수

120 : 定數

$$N_s = 120/P f[\text{rpm}]$$

가령 4 극의 모타로는 전원주파수가 50Hz이면

$$N_s = \frac{120 \times 50}{4} = 1500[\text{rpm}]$$

으로 됩니다.

### ■無負荷회전수(圖中⑤)

부하가 걸려 있지 않을 때의 회전수로 인덕션모타, 리버시블 모타로서는 同期회전수보다 數%(약 20~60RPM) 낮게 됩니다.

### ■정격회전수(圖中⑥)

모타가 정격출력을 낼때의 회전수로 사용상 가장 바람직한 회전수입니다.

### ■미끄럼

회전수 표현 방법중 다음 식으로 포함.

$$S = \frac{N_s - N}{N_s} \text{ 또는}$$

$$N = N_s(1 - s)$$

Ns : 동기회전수[rpm]

N : 임의부하시회전수[rpm]

여기서 4 극 50HZ 인덕션모타는 미끄럼 S=0.1로 되며

$$N = \frac{120 \times 50}{4} (1 - 0.1) = 1500(1 - 0.1) = 1250(\text{rpm})$$

으로 됩니다.

### Motor and Load Inertia

Equation of motion when you rotate inertia load is as follows;

$$T = J\alpha = J \cdot \frac{d\omega}{dt} \cdot \frac{GD^2}{4g} \cdot \frac{d\omega}{dt} = \frac{2\pi}{60} \cdot \frac{GD^2}{4g} \cdot \frac{dn}{dt}$$

where T : Torque  
 J : Moment of inertia  
 $\omega$  : Angular velocity  
 t : Time  
 n : Speed  
 $GD^2$  : Flywheel effect [ $GD^2 = 4gJ$ ]  
 g : Gravity acceleration  $g = 9.8 \text{ (m/sec}^2\text{)}$   
 $\alpha$  : Angular acceleration

In case of Induction motor, torque at starting varies depend upon motor speed.

Average acceleration torque is conventionally used by averaging starting to constant speed.

Necessary average acceleration torque,  $T_A$  when you want to accelerate inertia load of  $GD^2$  to  $n$  (r/min) in  $t$  (sec) can be calculated with

$$T_A = \frac{GD^2}{37500} \times \frac{n}{t} \text{ [kg-cm]}$$

Please refer page for average acceleration torque of each model.

### How to calculate $GD^2$

Please convert inertia of the load into motor shaft. Table of the left shows how to calculate depend on the load.

### Permissible $GD^2$ of Load

When brake is used,  $GD^2$  of the load affects the life of gear and electromagnetic brake. Please use within permissible range of  $GD^2$ .

### $GD^2$ Examples


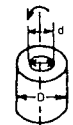


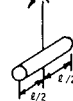
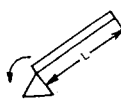
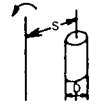
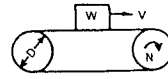

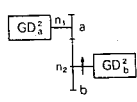
Type	$GD^2$ Calculation
Disc 	$GD^2 = \frac{1}{2} WD^2 \text{ [kg} \cdot \text{m}^2\text{]}$ W : Weight (kg·f) D : Dia. (m)
Hollow Cylinder 	$GD^2 = \frac{1}{2} W (D^2 + d^2) \text{ [kg} \cdot \text{m}^2\text{]}$ W : Weight (kg·f) D : Dia. (m) d : Inner Dia. (m)
Ball 	$GD^2 = \frac{2}{5} WD^2 \text{ [kg} \cdot \text{m}^2\text{]}$ W : Weight (kg·f) D : Dia. (m)
Cubic 	$GD^2 = \frac{1}{3} W (a^2 + b^2) \text{ [kg} \cdot \text{m}^2\text{]}$ W : Weight (kg·f) a, b : Side length (m)
Club 	$GD^2 = W \left( \frac{D^2}{4} + \frac{l^2}{3} \right) \text{ [kg} \cdot \text{m}^2\text{]}$ W : Weight (kg·f) l : length (m)
Pole 	$GD^2 = \frac{4}{3} WL^2 \text{ [kg} \cdot \text{m}^2\text{]}$ L : length (m) W : Weight (kg·f)
$GD^2_o$ 	$GD^2_o = GD^2 + 4WS^2$ $= W \left( \frac{D^2}{2} + 4S^2 \right) \text{ [kg} \cdot \text{m}^2\text{]}$ W : Weight (kg·f) D : Dia. (m) S : Radius of gyration (m)
Linear movement (horizontal) 	$GD^2 = WD^2 \text{ [kg} \cdot \text{m}^2\text{]} = \frac{WV^2}{\pi^2 N^2}$ V : Conveyor speed (m/min) N : Drum speed (rpm) W : Weight on conveyor (kg·f) D : Drum Dia. (m) ※ does not include $GD^2$ of belt/drum
Vertical movement 	$GD^2 = WD^2 \text{ [kg} \cdot \text{m}^2\text{]}$ W : Weight (kg·f) D : Dia. (m)
Gear reducer 	Total $GD^2$ converted to axis 'a' $GD^2_a = GD^2_1 + \left( \frac{n_2}{n_1} \right)^2 GD^2_2 \text{ [kg} \cdot \text{m}^2\text{]}$ n <sub>1</sub> : Speed of axis 'a' n <sub>2</sub> : Speed of axis 'b' gear reduction = $\frac{n_1}{n_2}$ ( $i > 1$ )



Table below represents permissible GD<sup>2</sup> of the load at motor shaft. Please calculate with the following formula to convert to gearhead shaft.

$$GD_G^2 = GD_M^2 \times i^2$$

GD<sub>G</sub><sup>2</sup> : Permissible GD<sup>2</sup> at gearhead shaft (kg·cm<sup>2</sup>)

GD<sub>M</sub><sup>2</sup> : Permissible GD<sup>2</sup> at motorshaft (kg·cm<sup>2</sup>)

i : Gear reduction (ex.i=5 in case of 1/5 gear)

### Life Expectancy

When inertia load is used, GD<sup>2</sup> of the load influence the life of gearhead.

- In case of Brake Unit+Variable Speed Motor, Life is 2 Million times.
- In case of Electromagnetic Brake Motor, Life is 2 Million times.

### Induction Motor + Brake Unit Variable Speed Motor + Speed Controller/Brake 3-phase Motor + Brake Unit

Phase	Size	Output (W)	Motor	GD <sup>2</sup> of Rotor Inertia (kg·cm <sup>2</sup> )	Average Acceleration Torque (kg·cm)		Permissible GD <sup>2</sup> of the load (kg·cm)
Single	60mm	3	M6IA3G4L	0.412	50Hz 60Hz	0.36 0.34	0.50
		6	M6IA6G4L M6IA6G4Y	0.650	50Hz 60Hz	0.56 0.54	0.50
	70mm	10	M7IA10G4L M7IA10G4Y	0.883	50Hz 60Hz	0.77 0.76	0.50
		15	M7IA15G4L M7IA15G4Y	1.286	50Hz 60Hz	1.94 0.97	0.50
	80mm	15	M8IA15G4L M8IA15G4Y	1.751	50Hz 60Hz	1.29 1.20	0.55
		25	M8IA25G4L M8IA25G4Y	2.311	50Hz 60Hz	2.03 2.05	0.55
	90mm	40	M9IA40G4L M9IA40G4Y	5.146	50Hz 60Hz	3.25 3.25	1.60
		60	M9IC60G4L M9IC60G4Y	7.147	50Hz 60Hz	5.35 5.33	2.60
		90	M9IC90G4L M9IC90G4Y	8.843	50Hz 60Hz	7.06 7.05	2.60
Three	80mm	25	M8MA25G4Y	2.311	50Hz 60Hz	3.16 3.22	0.55
	90mm	40	M9MA40G4Y	5.146	50Hz 60Hz	6.81 5.23	1.60
		60	M9MC60G4Y	7.147	50Hz 60Hz	10.52 7.83	2.60
		90	M9MC90G4Y	8.843	50Hz 60Hz	14.88 10.87	2.60

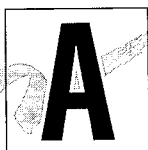
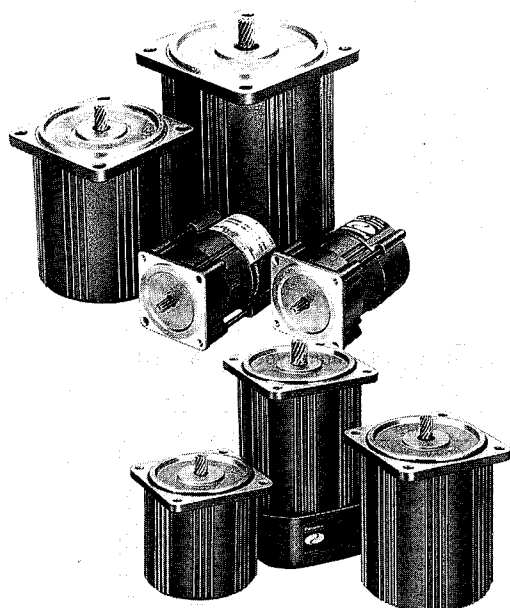
Reversible motor+Brake unit  
Variable speed motor+speed controller/brake

Phase	Size	Output (W)	Motor	GD <sup>2</sup> of Rotor Inertia (kg·cm <sup>2</sup> )	Average Acceleration Torque (kg·cm)		Permissible GD <sup>2</sup> of the load (kg·cm)
Single	60mm	4	M6RAG4L	0.452	50Hz 60Hz	0.41 0.40	0.50
		6	M6RA6G4L M6RA6G4Y	0.691	50Hz 60Hz	0.55 0.56	0.50
	70mm	10	M7RA10G4L M7RA10G4Y	0.940	50Hz 60Hz	0.69 0.67	0.50
		15	M7RA15G4L M7RA15G4Y	1.343	50Hz 60Hz	1.07 1.03	0.50
	80mm	20	M8RA20G4L M8RA20G4Y	1.839	50Hz 60Hz	1.49 1.44	0.55
		25	M8RA25G4L M8RA25G4Y	2.399	50Hz 60Hz	2.22 2.09	0.55
	90mm	40	M9RA40G4L M9RA40G4Y	5.363	50Hz 60Hz	4.08 3.89	1.60
		60	M9RC60G4L M9RC60G4Y	7.364	50Hz 60Hz	6.34 6.12	2.60
		90	M9RC90G4L M9RC60G4Y	9.060	50Hz 60Hz	8.12 7.51	2.60

Single phase Electromagnetic brake motor  
3 phase Electromagnetic brake motor

Phase	Size	Output (W)	Motor	GD <sup>2</sup> of Rotor Inertia (kg·cm <sup>2</sup> )	Average Acceleration Torque (kg·cm)		Permissible GD <sup>2</sup> of the load (kg·cm)
Single	60mm	6	M6RA6GB4L M6RA6GB4L	0.805	50Hz 60Hz	0.65 0.66	0.32
	70mm	15	M7RA15GB4L M7RA15GB4Y	1.316	50Hz 60Hz	1.22 1.16	0.63
	80mm	25	M8RA25GB4L M8RA25GB4Y	2.411	50Hz 60Hz	2.40 2.27	0.71
	90mm	40	M9RA40GB4L M9RA40GB4Y	5.446	50Hz 60Hz	4.48 4.29	2.94
		60	M9RC60GB4L M9RC60GB4Y	7.447	50Hz 60Hz	6.52 6.28	3.50
		90	M9RC90GB4L M9RC90GB4Y	9.143	50Hz 60Hz	8.77 8.20	4.00
Three	80mm	25	M8MA25GB4Y	2.411	50Hz 60Hz	3.96 3.12	0.71
	90mm	40	M9MA40GB4Y	5.446	50Hz 60Hz	6.81 5.23	2.94
		60	M9MC60GB4Y	7.447	50Hz 60Hz	10.52 7.83	3.50
		90	M9MC90GB4Y	9.143	50Hz 60Hz	14.58 10.87	4.0





**Single Phase Induction Motor**

**Single Phase Reversible Motor**

**Three Phase Induction Motor**

## INDEX

● SINGLE PHASE INDUCTION MOTOR .....	47
● SINGLE PHASE REVERSIBLE MOTOR .....	55
● THREE PHASE INDUCTION MOTOR .....	65
● STRAIGHT SHAFT .....	69

A

單相感應馬達  
단상 인дук션 모타

M4IA3G2L 2P 3W 100V  
M4IA1G4L 4P 3W 100V

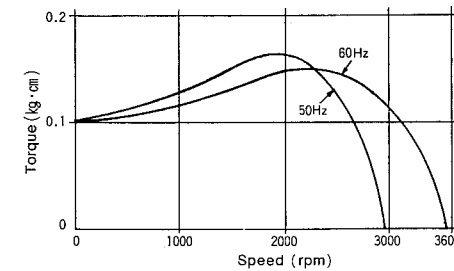
**42**  
mmSQ,  
*3W/1W*

Technical drawing of the AWG24 motor. The left view is a side profile showing dimensions: total length 69, mounting flange diameter 60, mounting flange thickness 9, and a 1.5mm gap. The motor body has a diameter of 37.6h7. The right view is a top-down view of the mounting flange, showing a square hole with a width of 42, concentric circles for CW and CCW rotation, and two sets of mounting holes: 2-φ3.5 and 2-M3. A note indicates "Motor lead wire 300mm".

M4GA□F (metal bearing type) weight 0.2kg

Technical drawing of a mechanical part with dimensions. The drawing shows a side view and a top view. The side view dimensions are: 46 (total length), 26 (distance from left face to start of hole), 20 (distance from end of hole to right face), 3 (height of the part), 12 (height of the hole), 4.5 (height of the hole),  $\phi 5$  (diameter of the hole), and 1.8 (height of the hole). The top view dimensions are: 42 (width), 4 (distance from left face to center of hole), and 4- $\phi 3.5$  (four holes with diameter 3.5).

## M4IA3G2L



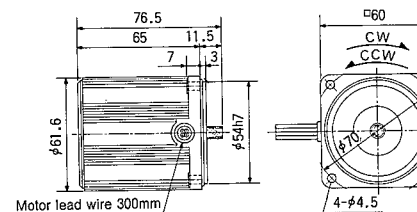
The graph shows the torque-speed characteristics for a 4-pole induction motor. The y-axis represents Torque in kg-cm, ranging from 0 to 0.2. The x-axis represents Speed in rpm, ranging from 0 to 1800. Two curves are plotted: one for 50 Hz and one for 60 Hz. The 50 Hz curve starts at approximately 0.14 kg-cm at 0 rpm, reaches a peak of about 0.15 kg-cm at 750 rpm, and drops to 0 at 1500 rpm. The 60 Hz curve starts at approximately 0.15 kg-cm at 0 rpm, reaches a peak of about 0.18 kg-cm at 1000 rpm, and drops to 0 at 1800 rpm.

Technical drawing of the Faston tab 187, showing top and side views with dimensions:

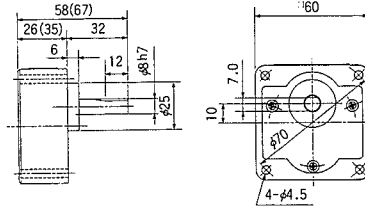
- Top View Dimensions:**
  - Overall length:  $L$
  - Overall width:  $W$
  - Overall depth:  $D$
  - Inner width:  $1.5$
  - Inner depth:  $6.2$
  - Fastener hole diameter:  $\phi 4.3$
- Side View Dimensions:**
  - Fastener height:  $10\text{max.}$
  - Overall height:  $H$
  - Base thickness:  $T$
- Labels:**
  - Faston tab 187
  - 2- $\phi 2.5$

**60**  
mmSQ,  
**3W**

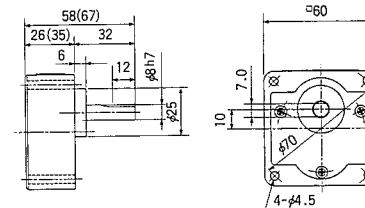
M6IA3G4L 4P 3W 100V



M6GA□M (metal bearing type) weight 0.34kg  
M6GA□B (ball bearing type)

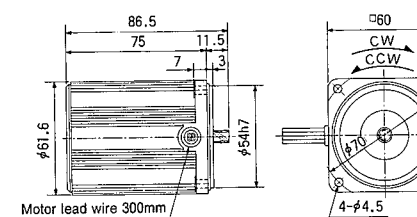


M6GA□M (metal bearing type) weight 0.34kg  
M6GA□B (ball bearing type)



**60**  
mmSQ  
**6W**

**M6IA6G4L** 4P 6W 100V      **M6IA6G4Q** 4P 6W 110V  
**M6IA6G4Y** 4P 6W 200V      **M6IA6G4W** 4P 6W 220V



White

Brown

Grey

Black

Condenser CR

Main

Auxiliary

Clock wise

White

Grey

Brown

Black

Condenser CR

Main

Auxiliary

Counter clock wise

Specifications																											
Size mmsq.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Rated load				Starting Current (A)	Starting Torque (kg·cm)	Condensor Capacitor μF(V)		Speed (rpm)		1000	600	400	240	200	120	100	60	40	30	20
							Input (W)	Current (A)	Speed (rpm)	Torque (kg·cm)					Gear redution ratio	50Hz 60Hz	3	5	7.5	12.5	15	18	25	30	36	50	60
42	M4IA3G2L	4	3	100	50	CONT.	9	0.09	2625	0.111	0.14	0.10	1.5(200V)		Maximum permissible torque (kg·cm)	0.29	0.48	0.72	1.0	1.3	1.9	2.3	3.9	5.0	5.0	5.0	
					60		9	0.09	3250	0.090	0.14	0.10															

[illegible]

■ Geared motor maximum permissible torque table [kg·cm]

Note : rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 2~20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.

### ■齒輪馬達最大承受扭力對照表

rpm表列數字乃根據馬達同步運轉之轉速，但在額定扭力負載情況下實際輸出轉速為同步運轉轉速的80~98%。灰色欄乃輸出軸運轉方向與馬達相同時的數據資料。白色欄乃輸出軸運轉方向與馬達相反時的數據資料。

■GEAR HEAD를 直結했을 때의 許容軸토크

★回轉數는 同期速度의 中面기어헤드에 値(값)을 表示하고 있습니다. 一般 回轉數는負荷의 크기에 따라 表示值보다 2%~20% 작은(值)을 표시합니다.

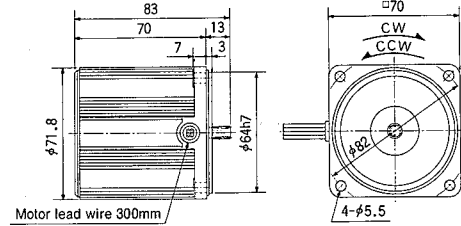
Motor

Scale 1/4 Unit mm

**70**  
**mmSQ,**  
**10W**

Weight 0.84kg  
helical gear  
module 0.5  
number of teeth 10

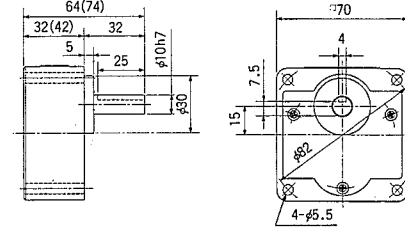
M7IA10G4L 4P 10W 100V  
M7IA10G4Y 4P 10W 200V



## Gear Head

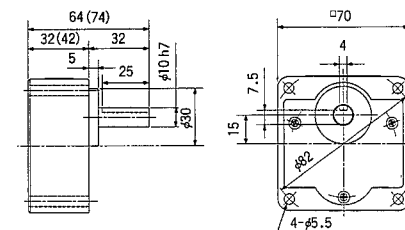
Scale 1/4 Unit mm

M7GA□M (metal bearing type) weight 0.34kg  
M7GA□B (ball bearing type)



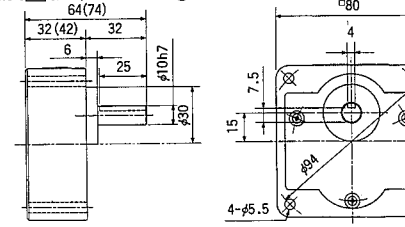
Note : The value in "( )" is for gear ratio of 1/20 or larger.

M7GA□M (metal bearing type) weight 0.54kg  
M7GA□B (ball bearing type)



Note : The value in "( )" is for gear ratio of 1/20 or larger.

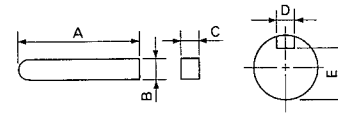
M8GA□M (metal bearing type) weight 0.54kg  
M8GA□B (ball bearing type)



Note : The value in "( )" is for gear ratio of 1/20 or larger.

### Key and Key Slot

M7GA□M(B)  
M8GA□M(B)



Type	A	B	C	D	E
M7GA□M(B)	2	$4 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$4 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$4 \begin{smallmatrix} +0.060 \\ +0.010 \end{smallmatrix}$	$7.5 \begin{smallmatrix} 0 \\ -0.15 \end{smallmatrix}$
M8GA□M(B)	25	$4 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$4 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$4 \begin{smallmatrix} +0.060 \\ +0.010 \end{smallmatrix}$	$7.5 \begin{smallmatrix} 0 \\ -0.15 \end{smallmatrix}$

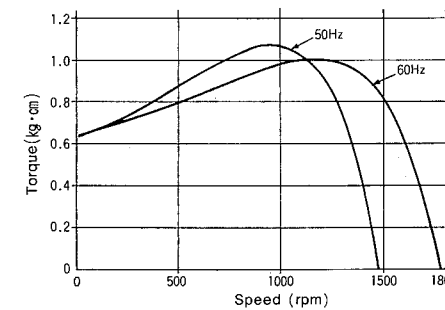
## ■ Specifications

[illegible]

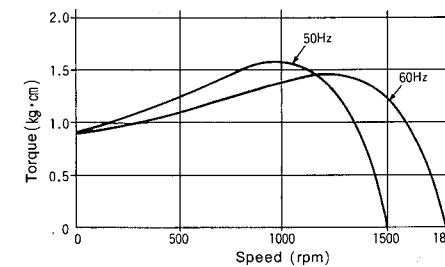
Note : The box (☐) represents the desired gear reduction ratio, which thereby becomes part of the code for geared motor.

### Speed-Torque Curve

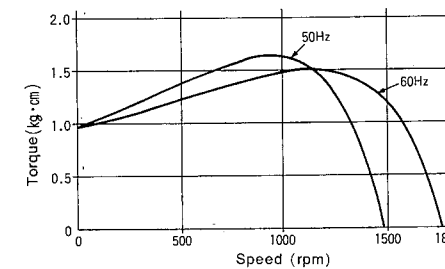
M7IA10G4L



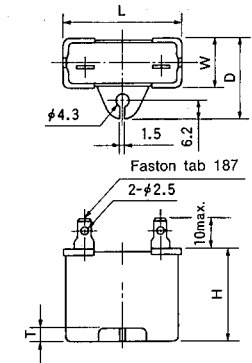
M7IA15G4L



M81A15G4L



## Capacitor



### ■ Dimensions of Capacitor (mm)

Motor Type	Capacitor Type	L	W	D	H	T
M7IA10G4L 100V	MZAX040	39.5	16	26.5	30.5	4
M7IA10G4Y 200V	MZAX060	39.5	16.2	27	27	4
M7IA15G4L 100V	MZAX042	39.5	16	26.5	30.5	4
M7IA15G4Y 200V	MZAX060	39.5	16.2	27	27	4
M8IA15G4L 100V	MZAX042	39.5	16	26.5	30.5	4
M8IA15G4Y 200V	MZAX060	39.5	16.2	27	27	4

■ Geared motor maximum permissible torque table [kg·cm]

Note : rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 2~20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.

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rpm表列數字乃根據馬達同步運轉之轉速，但在額定扭力負載情況下實際輸出轉速為同步運轉轉速的80~98%。灰色欄乃輸出軸運轉方向與馬達相同時的數據資料。白色欄乃輸出軸運轉方向與馬達相反時的數據資料。

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# Single Phase Induction Motor / Lead Wire Type

單相感應馬達  
단상 인덕션 모터

Panasonic



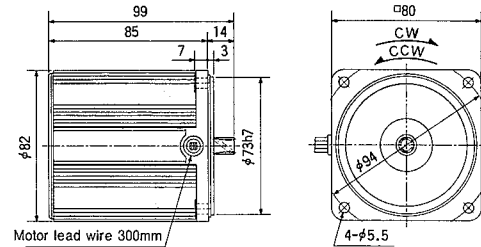
## Motor

80  
mmSQ,  
25W

Weight 1.5kg  
helical gear  
module 0.6  
number of teeth 11

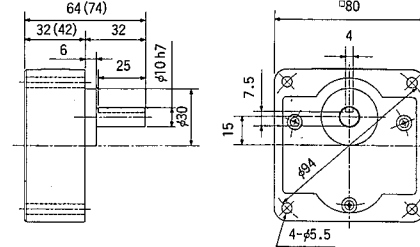
M8IA25G4L 4P 25W 100V  
M8IA25G4Y 4P 25W 200V

Scale 1/4 Unit mm  
M8IA25G4Q 4P 25W 110V  
M8IA25G4W 4P 25W 220V  
M8IA25G4G 4P 25W 230V



## Gear Head

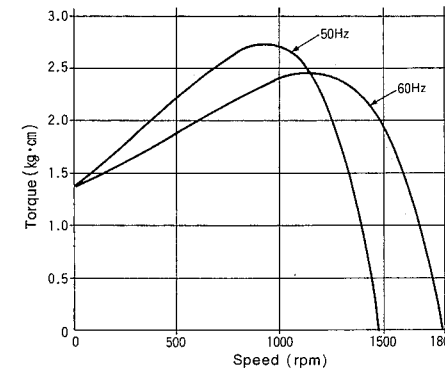
Scale 1/4 Unit mm  
M8GA□M (metal bearing type) weight 0.68kg  
M8GA□B (ball bearing type)



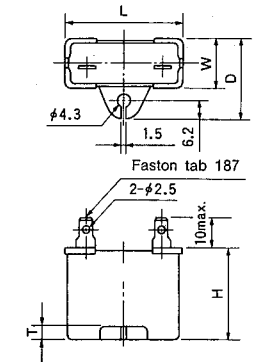
Note : The value in "( )" is for gear ratio of 1/20 or larger.

## Speed-Torque Curve

M8IA25G4L



## Capacitor



## Dimensions of Capacitor (mm)

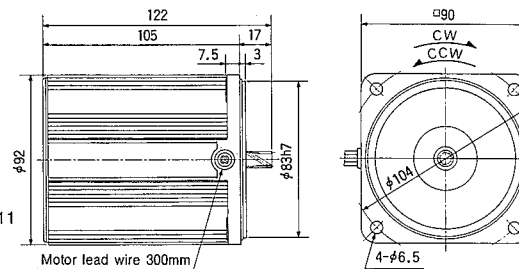
Motor Type	Capacitor Type	L	W	D	H	T
M8IA25G4L 100V	MZAX045	39.5	17.5	28	30.5	4
M8IA25G4Y 200V	MZAX063	39.5	22	32.5	32.5	4
M9IA40G4L 100V	MZAX049	39.5	26.7	37	32	4
M9IA40G4Y 200V	MZAX067	49.7	24	34.5	34.5	4

90  
mmSQ,  
40W

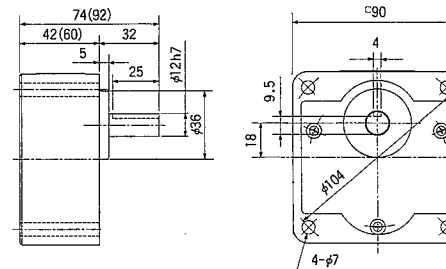
Weight 2.4kg  
helical gear  
module 0.6  
number of teeth 11

M9IA40G4L 4P 40W 100V  
M9IA40G4Y 4P 40W 200V

M9IA40G4Q 4P 40W 110V  
M9IA40G4W 4P 40W 220V  
M9IA40G4G 4P 40W 230V

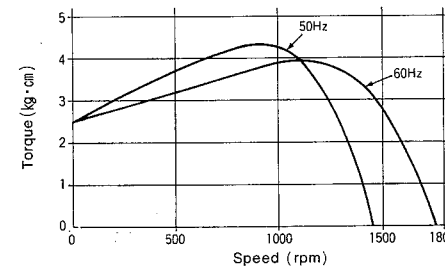


M9GA□M (metal bearing type) weight 1.2kg  
M9GA□B (ball bearing type)

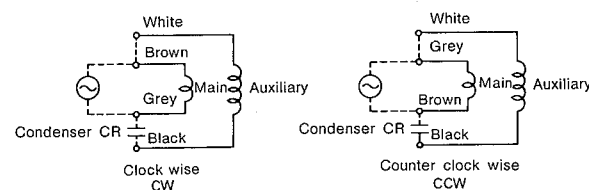


Note : The value in "( )" is for gear ratio of 1/20 or larger.

M9IA40G4L

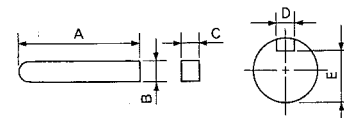


## Connecting Diagram



## Key and Key Slot

M8GA□M(B)  
M9GA□M(B)



Type	A	B	C	D	E
M8GA□M(B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.010</sub>	7.5 <sup>0</sup> <sub>-0.15</sub>
M9GA□M(B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.010</sub>	9.5 <sup>0</sup> <sub>-0.15</sub>

## Geared motor maximum permissible torque table [kg·cm]

Note : rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 2~20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.

## 齒輪馬達最大承受扭力對照表

rpm表列數字乃根據馬達同步運轉之轉速，但在額定扭力負載情況下實際輸出轉速為同步運轉轉速的80~98%。灰色欄乃輸出軸運轉方向與馬達相同時的數據資料。白色欄乃輸出軸運轉方向與馬達相反時的數據資料。

## GEAR HEAD를 직결했을 때의 허용토크

★回轉數는 同期速度의 中間기어헤드에 値(값)을 表示하고 있습니다. 一般 回轉數는 負荷의 크기에 따라 表示値보다 2%~20% 적은(値)을 표시합니다.  
★回轉方向은 □ 이 모락와 同方向 他는 逆方向입니다.

## Specifications

Size mmsq.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Rated load				Starting Current (A)	Starting Torque (kg·cm)	Capacitor μF(V)	Applied gearhead type				Speed (rpm)		500	300	200	180	150	120	100	90	75	60	50	30	20	15	10	9	7.5	6	5	3	2	1.5	1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
							Input (W)	Current (A)	Speed (rpm)	Torque (kg·cm)				Metal	Ball	Decimal		Gear reduction 50Hz	60Hz	3	5	7.5	—	10	12.5	15	—	20	25	30	30	50	75	100	150	—	200	—	250	300	360	500	600	750	1000	1500																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
80	M8IA25G4L	4	25	100	50	CONT.	52	0.57	1325	1.8	1.2	1.4	6(200V)	M8GA□M	M8GA□B	M8GA10XM			Maximum permissible torque (kg·cm)	4.0	6.7	10	11	13	16	20	21	26	32	39	65	80	80	80	80	80	80	80	80	80	80	80	80																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
				60			48	0.48	1625	1.5	1.1	1.4																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
80	M8IA25G4Y	4	25	200	50	CONT.	52	0.28	1325	1.8	0.6	1.4	1.5(400V)	M8GA□M	M8GA□B	M8GA10XM				6.7	11	16	18	23	28	33	36	45	54	65	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	

## Motor

**90**  
mmSQ,  
**60W**

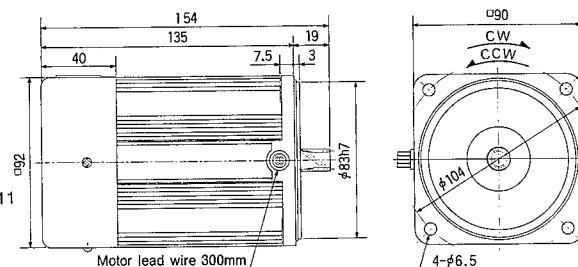
Weight 2.7kg  
helical gear  
module 0.8  
number of teeth 11

A

**90**  
mmSQ,  
*90W*

Weight 2.9kg  
helical gear  
module 0.8  
number of teeth 11

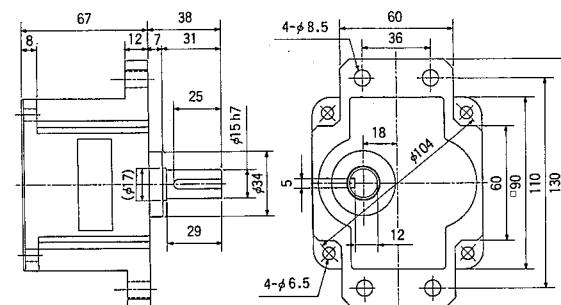
M9IC90G4L 4P 90W 100V  
M9IC90G4Y 4P 90W 200V



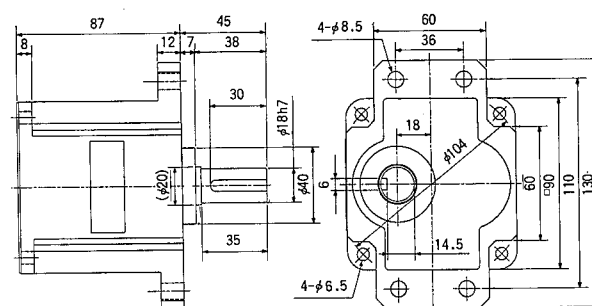
## Gear Head

M9GC□B (ball bearing type) 1.5kg

Scale 1/4 Unit mm

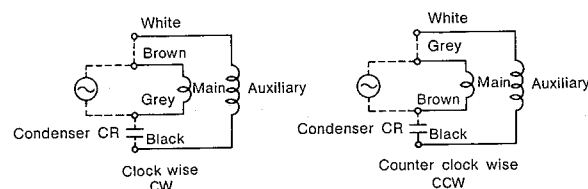


M9GS□B (ball bearing type) 1.9kg



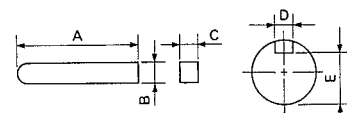
C type 200kg·cm / max. permissible torque  
S type 300kg·cm / max. permissible torque

### Connecting Diagram



### Key and Key Slot

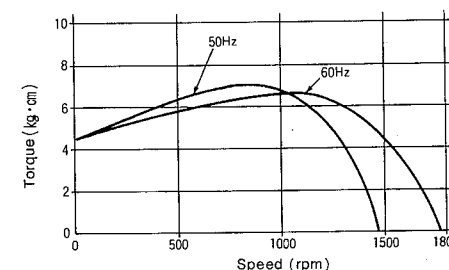
M9GC ☐ B  
M9GS ☐ B



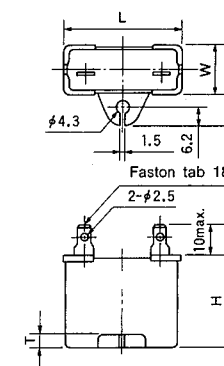
Type	A	B	C	D	E
M9GC□B	25	$5 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$5 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$5 \begin{smallmatrix} +0.050 \\ 0 \end{smallmatrix}$	$12 \begin{smallmatrix} 0 \\ -0.15 \end{smallmatrix}$
M9GS□B	30	$6 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$6 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$6 \begin{smallmatrix} +0.050 \\ 0 \end{smallmatrix}$	$14.5 \begin{smallmatrix} 0 \\ -0.15 \end{smallmatrix}$

### Speed-Torque Curve

M9IC60G4L



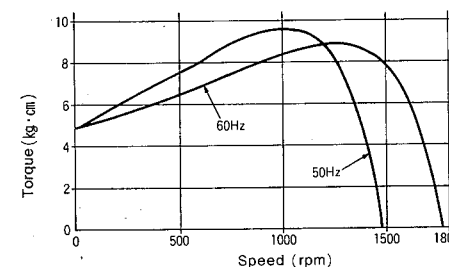
## Capacitor



## ■ Dimensions of Capacitor (mm)

Motor Type	Capacitor Type	L	W	D	H	T
M9IC60G4L 100V	MZAX051	39.5	26.7	37	41	4
M9IC60G4Y 200V	MZAX069	50	26.7	37.5	38	4
M9IC90G4L 100V	MZAX053	50.2	31	41	42	5
M9IC90G4Y 200V	MZAX071	50	30.5	41	41.5	4

M91C90G4L



■ Geared motor maximum permissible torque table [kg·cm]

Note : rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 2~20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.

### ■齒輪馬達最大承受扭力對照表

rpm表列數字乃根據馬達同步運轉之轉速，但在額定扭力負載情況下實際輸出轉速為同步運轉轉速的80~98%。灰色欄乃輸出軸運轉方向與馬達相同時的數據資料。白色欄乃輸出軸運轉方向與馬達相反時的數據資料。

■GEAR HEAD를 直結했을 때의 許容軸토크

★回転数は同期速度の中間ギアヘッドに値(값)를 表示하고 있습니다. 一般 回転数は負荷の 크기에 따라 表示值보다 2%~20% 적은(値)를 표시합니다.

## ■ Specifications

[illegible]

Note : The box (☐) represents the desired gear reduction ratio, which thereby becomes part of the code for geared motor.



# Single Phase Reversible Motor

單相可逆式馬達  
단상 리버시블 모터

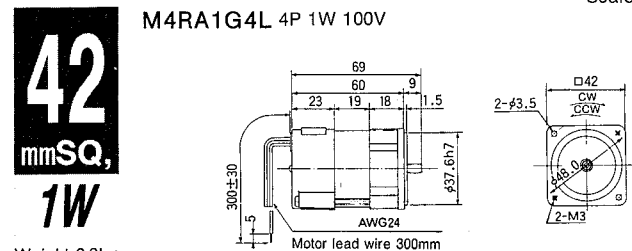
Panasonic



## Motor

Scale 1/4 Unit mm

M4RA1G4L 4P 1W 100V

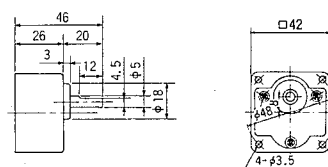


Weight 0.3kg  
helical gear  
module 0.4  
number of teeth 10

## Gear Head

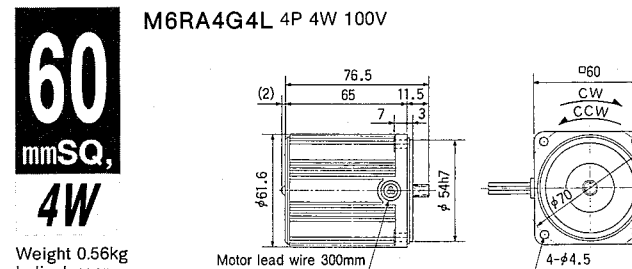
Scale 1/4 Unit mm

M4GA□F (metal bearing type) weight 0.2kg



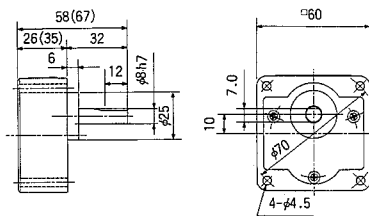
Note : The value in "( )" is for gear ratio of 1/20 or larger.

M6RA4G4L 4P 4W 100V



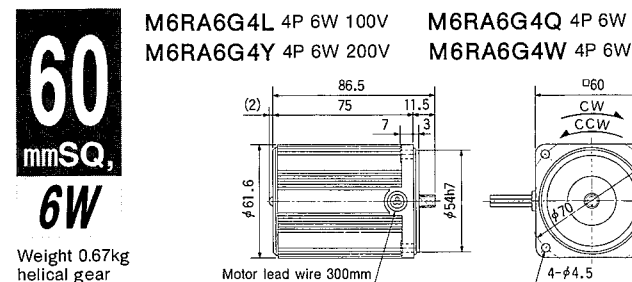
Weight 0.56kg  
helical gear  
module 0.5  
number of teeth 10

M6GA□M (metal bearing type) weight 0.34kg  
M6GA□B (ball bearing type)



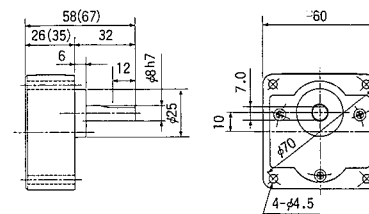
Note : The value in "( )" is for gear ratio of 1/20 or larger.

M6RA6G4L 4P 6W 100V M6RA6G4Q 4P 6W 110V  
M6RA6G4Y 4P 6W 200V M6RA6G4W 4P 6W 220V



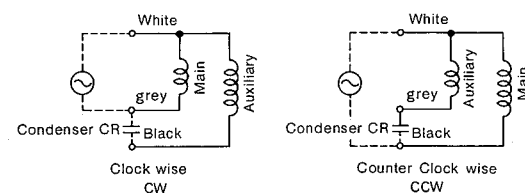
Weight 0.67kg  
helical gear  
module 0.5  
number of teeth 10

M6GA□M (metal bearing type) weight 0.34kg  
M6GA□B (ball bearing type)



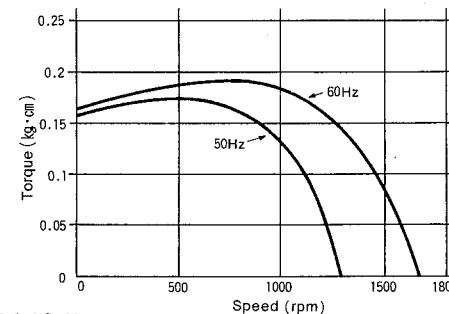
Note : The value in "( )" is for gear ratio of 1/20 or larger.

## Connecting Diagram

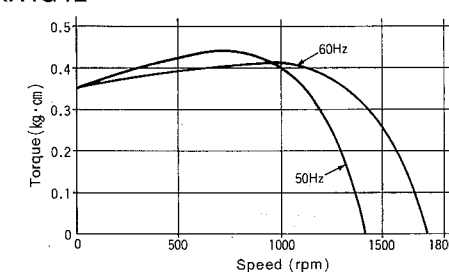


## Speed-Torque Curve

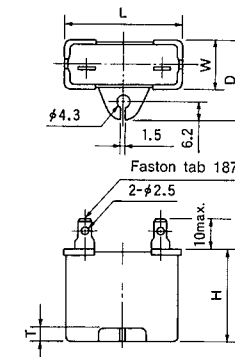
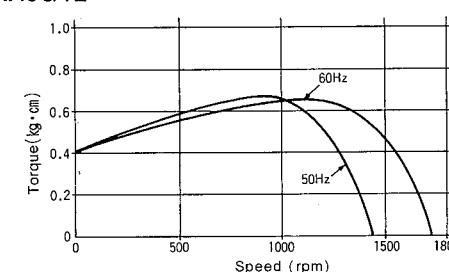
M4RA1G4L



M6RA4G4L



M6RA6G4L



## Dimensions of Capacitor (mm)

Motor Type	Capacitor Type	L	W	D	H	T
M4RA1G4L 100V	MZAX037	39.5	16	26.5	30.5	4
M6RA4G4L 100V	MZAX040	39.5	16	26.5	30.5	4
M6RA6G4L 100V	MZAX041	39.5	16	26.5	30.5	4
M6RA6G4Y 200V	MZAX059	39.5	16.2	27	27	4

## Geared motor maximum permissible torque table [kg·cm]

Note : rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 2~20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.

### 齒輪馬達最大承受扭力對照表

rpm表列數字乃根據馬達同步運轉之轉速，但在額定扭力負載情況下實際輸出轉速為同步運轉轉速的80~98%。灰色欄乃輸出軸運轉方向與馬達相同時的數據資料。白色欄乃輸出軸運轉方向與馬達相反時的數據資料。

### GEAR HEAD를 직결했을 때의 許容軸토크

★回転数は同期速度の中間ギヤレド値(값)를 表示하고 있습니다. 一般 回転数は負荷의 크기에 따라 表示値보다 2%~20% 적은(值)를 표시합니다.  
★回転方向은 □ 이 모터와 同方向 他는 逆方向입니다.

## Specifications

Size mmsq.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Rated load				Starting Current (A)	Starting Torque (kg·cm)	Capacitor μF (V)	Applied gearhead type					Speed (rpm)		500	300	200	180	150	120	100	90	75	60	50	30	20	15	10	9	7.5	6	5	3	2	1.5	1
							Input (W)	Current (A)	Speed (rpm)	Torque (kg·cm)				Metal	Ball	Decimal			Gear redution ratio	50Hz	60Hz	3	5	7.5	—	10	12.5	15	—	20	25	30	50	75	100	150	—	200	250	300	500	750	1000
42	M4RA1G4L	4	1	100	50	30min	11	0.11	1140	0.085	0.11	0.15	1.5(200V)	M4GA□F	—	—			Maximum permissible torque (kg·cm)	0.23	0.38	0.57	—	—	0.86	1.0	—	—	1.5	1.8	3.1	4.2	5.0	5.0	—	—	—	—	—	—	—	—	
					60		11	0.11	1550	0.065	0.12	0.16								3.6	6	9	10	—	15	18	20	—	30	36	60	90	120	180	200	—	300	360	600	900	1200	1800	
60	M6RA4G4L	4	4	100	50	30min	19	0.19	1125	0.33	0.22	0.34	3(200V)	M6GA□M	M6GA□B	M6GA10XM			Maximum permissible torque (kg·cm)	0.6	1.1	1.6	1.8	2.3	2.8	3.3	3.6	4.5	5.4	6.5	10	15	21	25	25	25	25	25	25	25	25	25	25
					60		21	0.21	1475	0.26	0.24	0.34								0.6	1.1	1.6	1.8	2.3	2.8	3.3	3.6	4.5	5.4	6.5	10	15	21	25	25	25	25	25	25	25	25	25	25
60	M6RA6G4L	4	6	100	50	30min	23	0.23	1225	0.46	0.31	0.40	3.5(200V)	M6GA□M	M6GA□B	M6GA10XM			Maximum permissible torque (kg·cm)	1.0	1.6	2.5	2.7	3.4	4.1	5.0	5.4	6.7	8.1	9.7	16	23	25	25	25	25	25	25	25	25	25	25	25
					60		23	0.23	1550	0.37	0.31	0.40								1.0	1.6	2.5	2.7	3.4	4.1	5.0	5.4	6.7	8.1	9.7	16	23	25	25	25	25	25	25	25	25	25	25	25
60	M6RA6G4Y	4	6	200	50	30min	23	0.12	1225	0.46	0.16	0.40	0.9(400V)	M6GA□M	M6GA□B	M6GA10XM			Maximum permissible torque (kg·cm)	1.0	1.6	2.5	2.7	3.4	4.1	5.0	5.4	6.7	8.1	9.7	16	23	25	25	25	25	25	25	25	25	25	25	25
					60		23	0.12	1550	0.37	0.16	0.40								1.0	1.6	2.5	2.7	3.4	4.1	5.0	5.4	6.7	8.1	9.7	16	23	25	25	25	25	25	25	25	25	25	25	25

Note : The box (□) represents the desired gear reduction ratio, which thereby becomes part of the code for geared motor.

# Single Phase Reversible Motor

單相可逆式馬達  
단상 리버시블 모터

Panasonic



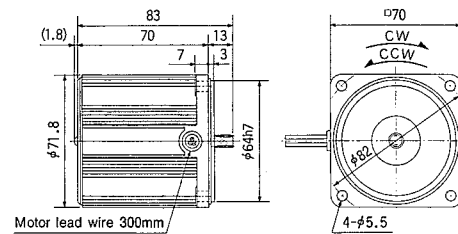
## Motor

M7RA10G4L 4P 10W 100V M7RA10G4Y 4P 10W 200V

Scale 1/4 Unit mm

70  
mmSQ,  
10W

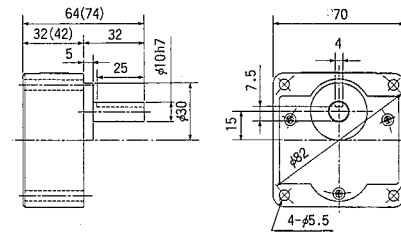
Weight 0.84kg  
helical gear  
module 0.5  
number of teeth 10



## Gear Head

M7GA□M (metal bearing type) weight 0.54kg  
M7GA□B (ball bearing type)

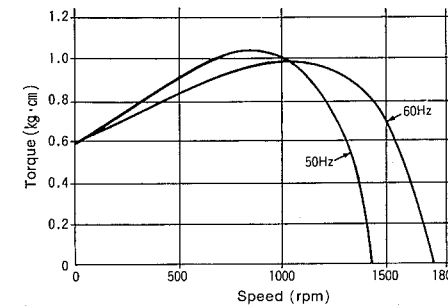
Scale 1/4 Unit mm



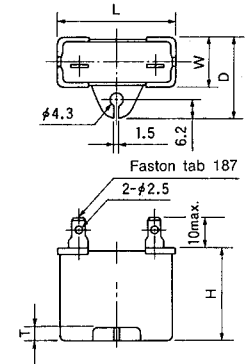
Note : The value in "( )" is for gear ratio of 1/20 or larger.

## Speed-Torque Curve

M7RA10G4L



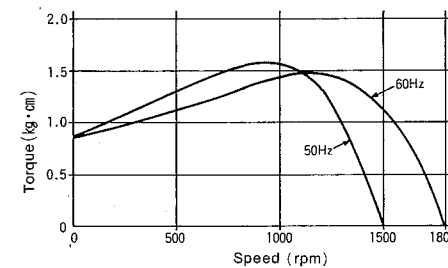
## Capacitor



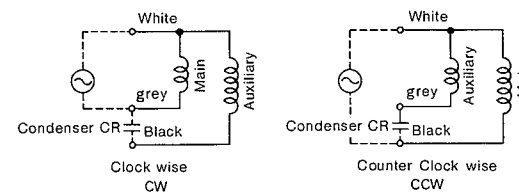
## Dimensions of Capacitor (mm)

Motor Type	Capacitor Type	L	W	D	H	T
M7RA10G4L 100V	MZAX043	39.5	16	26.5	30.5	4
M7RA10G4Y 200V	MZAX061	39.5	18.3	29	29	4
M7RA15G4L 100V	MZAX045	39.5	17.5	32.5	30.5	4
M7RA15G4Y 200V	MZAX063	39.5	22	32.5	32.5	4

M7RA15G4L

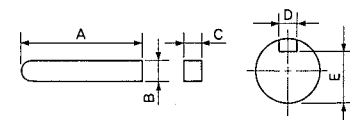


## Connecting Diagram



## Key and Key Slot

M7GA□M(B)



Type	A	B	C	D	E
M7GA□M(B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.010</sub>	7.5 <sup>0</sup> <sub>-0.15</sub>

## Geared motor maximum permissible torque table [kg·cm]

Note : rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 2~20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.

## 齒輪馬達最大承受扭力對照表

rpm表列數字乃根據馬達同步運轉之轉速，但在額定扭力負載情況下實際輸出轉速為同步運轉轉速的80~98%。灰色欄乃輸出軸運轉方向與馬達相同時的數據資料。白色欄乃輸出軸運轉方向與馬達相反時的數據資料。

## GEAR HEAD를 직접했을 때의 許容軸토크

★回転数は 同期速度の中間ギアヘッド値(값)를 表示하고 있습니다. 一般 回転数は負荷의 크기에 따라 表示値보다 2%~20% 적은(値)를 표시합니다.

★回転方向은 □ 이 모터와 同方向 他는 逆方向입니다.

## Specifications

Size mmsq.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Rated load				Starting Current (A)	Starting Torque (kg·cm)	Capacitor μF(V)	Applied gearhead type			Speed (rpm)	500	300	200	180	150	120	100	90	75	60	50	30	20	15	10	9	7.5	6	5	3	2	1.5	1	
							Input (W)	Current (A)	Speed (rpm)	Torque (kg·cm)				Metal	Ball	Decimal		Gear reduction ratio	50Hz	60Hz	3	5	7.5	—	10	12.5	15	—	20	25	30	50	75	100	150	—	200	250	300	500	750
70	M7RA10G4L	4	10	100	50	30min	30	0.30	1150	0.85	0.41	0.58	4.5(200V)	M7GA□M	M7GA□B	M7GA10XM	Maximum permissible torque (kg·cm)	1.6	2.6	3.9	4.5	5.2	6.5	7.9	8.7	10	13	15	26	37	49	50	50	50	50	50	50	50	50	50	50
	60	30	0.30	1525	0.64	0.41	0.58	3.6	6	9	10	15																													
70	M7RA10G4Y	4	10	200	50	30min	30	0.15	1150	0.85	0.21	0.58	1.2(400V)	M7GA□M	M7GA□B	M7GA10XM	Maximum permissible torque (kg·cm)	2.4	2.7	6.0	6.7	8.2	10	12	13	16	19	23	39	50	50	50	50	50	50	50	50	50	50	50	50
	60	30	0.15	1525	0.64	0.21	0.58	3.6	6	9	10	15																													
70	M7RA15G4L	4	15	100	50	30min	36	0.36	1250	1.1	0.59	0.84	6(200V)	M7GA□M	M7GA□B	M7GA10XM	Maximum permissible torque (kg·cm)	2.4	2.7	6.0	6.7	8.2	10	12	13	16	19	23	39	50	50	50	50	50	50	50	50	50	50	50	50
	60	38	0.38	1575	0.9	0.57	0.84	3.6	6	9	10	15																													
70	M7RA15G4Y	4	15	200	50	30min	36	0.18	1250	1.1	0.30	0.84	1.5(400V)	M7GA□M	M7GA□B	M7GA10XM	Maximum permissible torque (kg·cm)	2.4	2.7	6.0	6.7	8.2	10	12	13	16	19	23	39	50	50	50	50	50	50	50	50	50	50	50	50
	60	38	0.19	1575	0.9	0.29	0.84	3.6	6	9	10	15																													

Note : The box (□) represents the desired gear reduction ratio, which thereby becomes part of the code for geared motor.

單相可逆式馬達  
단상 리버시블 모타

# Panasonic

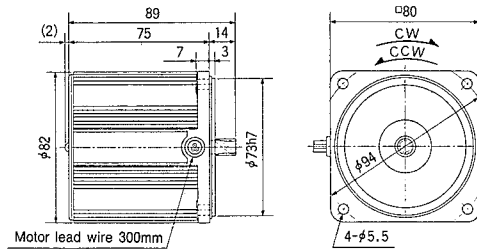


**Motor**

**80**  
**mmSQ,**  
**20W**

Weight 1.2kg  
helical gear  
module 0.6  
number of teeth 11

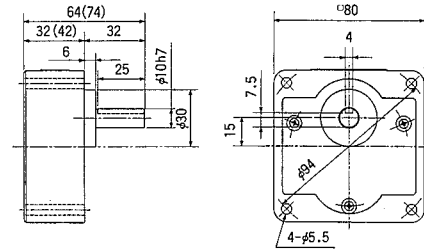
M8RA20G4L 4P 20W 100V  
M8RA20G4Y 4P 20W 200V



Scale 1/4 Unit mm

## Gear Head

Scale 1/4 Unit mm  
M8GA□M (metal bearing type) weight 0.68kg  
M8GA□B (ball bearing type)

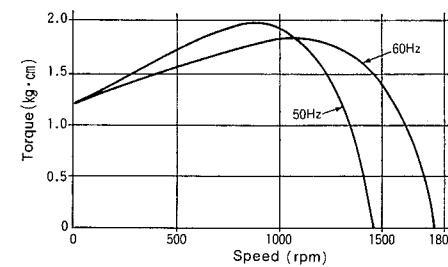


Scale 1/4 Unit mm

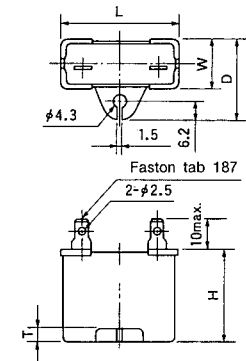
Note : The value in "( )" is for gear ratio of 1/20 or larger.

### Speed-Torque Curve

M8RA20G4L



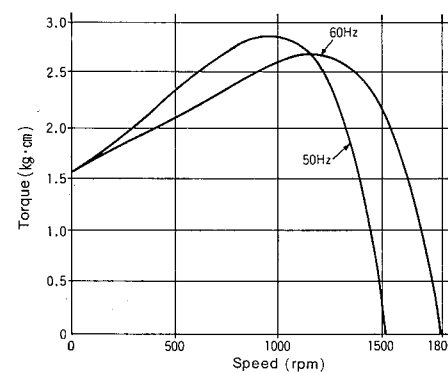
## Capacitor



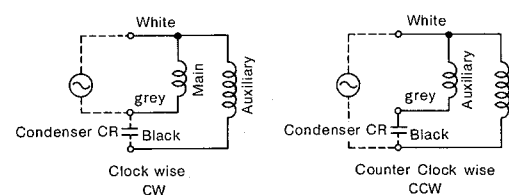
■ Dimensions of Capacitor (mm)

Motor Type	Capacitor Type	L	W	D	H	T
M8RA20G4L 100V	MZAX046	39.5	22	32.5	30.5	4
M8RA20G4Y 200V	MZAX064	39.5	22	32.5	32.5	4
M8RA25G4L 100V	MZAX048	39.5	26.7	32.5	30.5	4
M8RA25G4Y 200V	MZAX066	49.7	26.7	34.5	32.5	4

M8RA25G4L

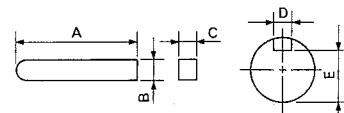


### Connecting Diagram



### Key and Key Slot

M8GA ☐ M(B)  
M8GA ☐ M(B)



Type	A	B	C	D	E
M8GA□M(B)	25	$4 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$4 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$4 \begin{smallmatrix} +0.060 \\ +0.010 \end{smallmatrix}$	$7.5 \begin{smallmatrix} 0 \\ -0.15 \end{smallmatrix}$
M8GA□M(B)	25	$4 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$4 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$4 \begin{smallmatrix} +0.060 \\ +0.010 \end{smallmatrix}$	$7.5 \begin{smallmatrix} 0 \\ -0.15 \end{smallmatrix}$

■ Geared motor maximum permissible torque table [kg·cm]

Note : rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 2~20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.

### ■齒輪馬達最大承受扭力對照表

rpm表列數字乃根據馬達同步運轉之轉速，但在額定扭力負載情況下實際輸出轉速為同步運轉轉速的80~98%。灰色欄乃輸出軸運轉方向與馬達相同時的數據資料。白色欄乃輸出軸運轉方向與馬達相反時的數據資料。

■GEAR HEAD를 直結했을 때의 許容軸토크

★回転数は 同期速度の 中間値(ハズレ) を表示하고 있습니다. 一般 回転数は負荷の 크기에 따라 表示値보다 2%~20% 적은(値)을 표시합니다.  
★回転方向은 ☐ 이 모터와 同方向 他는 逆方向입니다.

## ■ Specifications

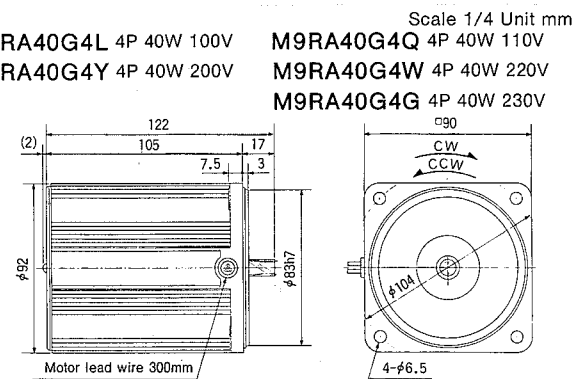
Specifications																																										
Size mm sq.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Rated load				Starting Current (A)	Starting Torque (kg·cm)	Capacitor µF (V)	Applied gearhead type				Speed (rpm)																	With decimal gearhead							
							Input (W)	Current (A)	Speed (rpm)	Torque (kg·cm)				Metal	Ball	Decimal			Gear reduction ratio	500	300	200	180	150	120	100	90	75	60	50	30	20	15	10	9	7.5	6	5	3	2	1.5	1
80	M8RA20G4L	4	20	100	50	30min	48	0.48	1150	1.7	0.67	1.2	7(200V)	M8GA□M	M7GA□B	M8GA10XM	Maximum permissible torque (kg·cm)	3	5	7.5	—	10	12.5	15	—	20	25	30	50	30	20	15	10	—	200	6	5	3	2	1.5	1	
					60		48	0.48	1500	1.3	0.67	1.2																														3.6
80	M8RA20G4Y	4	20	200	50	30min	48	0.24	1150	1.7	0.34	1.2	1.8(400V)	M8GA□M	M7GA□B	M8GA10XM	Maximum permissible torque (kg·cm)	2.7	5.8	8.7	9.7	12	14	17	19	23	28	34	56	80	80	80	80	80	80	80	80	80	80			
					60		48	0.24	1500	1.3	0.34	1.2																														
80	M8RA25G4L	4	25	100	50	30min	55	0.55	1300	1.9	1.0	1.4	9.5(200V)	M8GA□M	M8GA□B	M8GA10XM	Maximum permissible torque (kg·cm)	4.0	6.7	10	11	13	16	20	21	26	32	39	65	80	80	80	80	80	80	80	80	80				
					60		57	0.58	1625	1.5	1.0	1.5																														
80	M8RA25G4Y	4	25	200	50	30min	55	0.28	1300	1.9	0.50	1.4	2.4(400V)	M8GA□M	M8GA□B	M8GA10XM	Maximum permissible torque (kg·cm)																									
					60		57	0.29	1625	1.5	0.50	1.5																														

Note : The box (☐) represents the desired gear reduction ratio, which thereby becomes part of the code for geared motor.

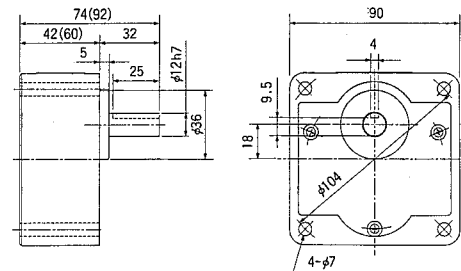
單相可逆式馬達  
단상 리버시블 모타

**90**  
**mmSQ,**  
**40W**

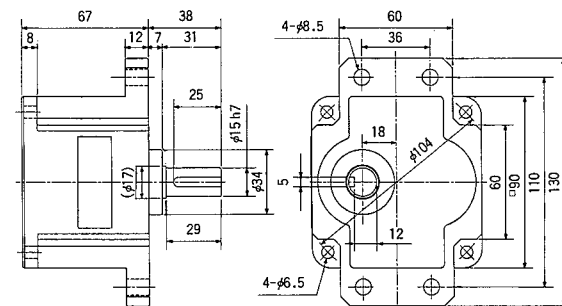
Weight 2.4kg  
helical gear  
module 0.6  
number of teeth 11



Scale 1/4 Unit mm  
M9GA□M (metal bearing type) weight 1.2kg  
M9GA□B (ball bearing type)

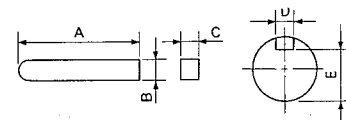


M9GC□B (ball bearing type) 1.5kg



C type 200kg·cm / max. permissible torque  
S type 200kg·cm / max. permissible torque

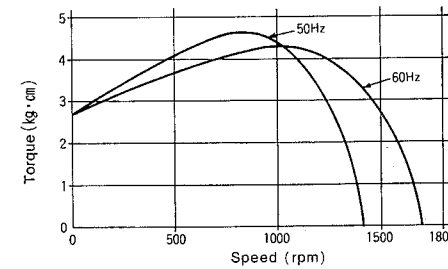
M9GA ☐ M(B)  
M9GC ☐ B



Type	A	B	C	D	E
M9GA□M(B)	25	$4 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$4 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$4 \begin{smallmatrix} +0.060 \\ +0.010 \end{smallmatrix}$	$9.5 \begin{smallmatrix} 0 \\ -0.15 \end{smallmatrix}$
M9GC□B	25	$5 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$5 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$5 \begin{smallmatrix} +0.050 \\ 0 \end{smallmatrix}$	$12 \begin{smallmatrix} 0 \\ -0.15 \end{smallmatrix}$

Size mmsq.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Rated load				Starting Current (A)	Starting Torque (kg·cm)	Capacitor µF (V)	Applied gearhead type			
							Input (W)	Current (A)	Speed (rpm)	Torque (kg·cm)				Metal	Ball	Decimal	
90	M9RA40G4L	4	40	100	50	30min	92	0.95	1150	3.3	1.6	2.6	15(200V)	M9GA□M	M9GA□B	M9GA10XM	
					60		92	0.93	1475	2.6	1.6	2.6					
90	M9RA40G4Y	4	40	200	50	30min	92	0.48	1150	3.3	0.80	2.6	3.8(400V)				
				60	92		0.47	1475	2.6	0.80	2.6						
90	M9RC60G4L	4	60	100	50	30min	139	1.5	1250	4.7	2.4	5.5	25(200V)	—	M9GC□B	M9GC10XB	
				60	148		1.6	1550	3.8	2.4	5.4						
90	M9RC60G4Y	4	60	200	50	30min	139	0.75	1250	4.7	1.2	5.5	6.2(375V)		M9GS□B		
				60	148		0.80	1550	3.8	1.2	5.5						

M9RA40G4L



Technical drawing of a fastener assembly. The top view shows a rectangular fastener with dimensions L (length), W (width), and D (thickness). It has two mounting holes with a diameter of 4.3 and a central hole with a diameter of 1.5. The distance from the center of the mounting holes to the bottom edge is 6.2. The side view shows the fastener mounted on a base with a height H. The fastener has a thickness of 10max. The base has a thickness T. The fastener is labeled "Faston tab 187" and "2-φ2.5".

Motor Type	Capacitor Type	L	W	D	H	T
M9RA40G4L 100V	MZAX051	39.5	26.7	37	41	4
M9RA40G4Y 200V	MZAX069	50	26.7	37.5	38	4
M9RC60G4L 100V	MZAX053	50.2	31	41	42	5
M9RC60G4Y 200V	MZAX072	50	30.5	41	41.5	4

The graph shows the torque-speed characteristics for a 1/2 hp motor. The y-axis represents Torque in kg · cm, ranging from 0 to 10. The x-axis represents Speed in rpm, ranging from 0 to 1800. Two curves are plotted: one for 50 Hz and one for 60 Hz. Both curves start at approximately 5.8 kg · cm at 0 rpm. The 50 Hz curve reaches a peak torque of 8 kg · cm at approximately 800 rpm. The 60 Hz curve reaches a peak torque of 7.5 kg · cm at approximately 1000 rpm. Both curves show a decrease in torque as speed increases beyond their respective peak values.

Speed (rpm)	Torque (kg · cm) at 50 Hz	Torque (kg · cm) at 60 Hz
0	5.8	5.8
500	7.2	6.8
800	8.0	7.2
1000	7.5	7.5
1200	6.0	6.5
1400	3.5	4.5
1600	0	2.5
1800	0	0

Note : rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 2~20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.

rpm 表示數字乃根據馬達同步運轉之轉速，但在設定扭力負載情況下實際輸出轉速為同步運轉轉速的 80~98%。灰色欄乃輸出軸運轉方向與馬達相同時的數據資料。白色欄乃輸出軸運轉方向與馬達相反時的數據資料。

★回転数は 同期速度の 中間기어해드에 값(값)을 表示하고 있습니다. 一般 回転数は負荷의 크기에 따라 表示値보다 2%~20% 적은(値)을 표시합니다.

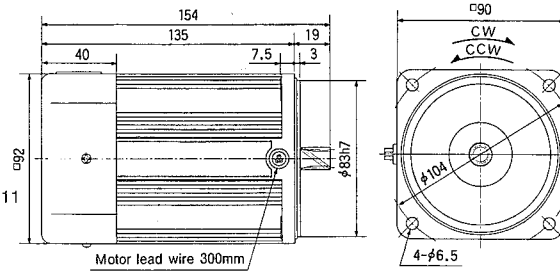
																With decimal gearhead											
	Speed (rpm)	500	300	200	180	150	120	100	90	75	60	50	30	20	15	10	9	7.5	6	5	3	2	1.5	1	0.9	0.75	
	Gear reduction	3	5	7.5	—	10	12.5	15	—	20	25	30	50	75	100	150	—	200	250	300	500	750	1000	1500	—	2000	
	50Hz ratio	60Hz	6	9	10	—	15	18	20	—	30	36	60	90	120	180	200	—	300	360	600	900	1200	1800	2000	—	
	Maximum permissible torque (kg·cm)	6.7	11	16	18	23	28	33	36	45	54	65	100	100	100	100	100	100	100	100	100	100	100	100	—	—	
	Maximum permissible torque (kg·cm)	10	16	24	27	32	40	48	54	64	—	93	155	200	200	200	200	200	200	200	200	200	200	200	200	200	
		—	—	—	—	—	—	—	—	—	—	93	155	226	300	300	300	300	—	—	300	300	300	300	300	300	

Note : The box (□) represents the desired gear reduction ratio, which thereby becomes part of the code for geared motor.

單相可逆式馬達  
단상 리버시블 모타

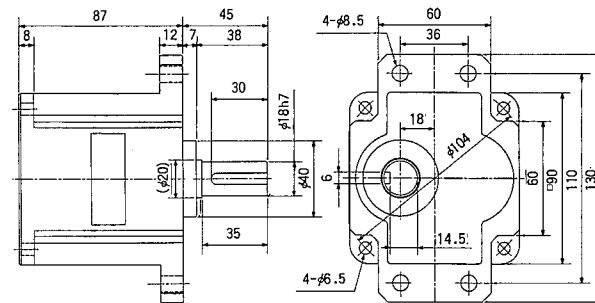
**90**  
**mmSQ,**  
**90W**

Weight 2.9kg  
helical gear  
module 0.8  
number of teeth 11



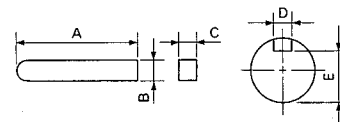
M9GS□B (ball bearing type) 1.9kg

Scale 1/4 Unit mm



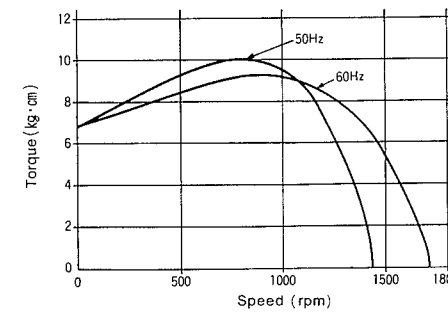
C type 200kg·cm / max. permissible torque  
S type 300kg·cm / max. permissible torque

The image contains two circuit diagrams for a three-phase motor. The left diagram is labeled 'Clock wise CW' and shows a condenser connected between the 'grey' and 'Black' lines. The right diagram is labeled 'Counter Clock wise CCW' and shows a condenser connected between the 'grey' and 'White' lines. Both diagrams include a 'Main' winding and an 'Auxiliary' winding.

M9GS ☐ B

Type	A	B	C	D	E
M9GS□B	30	$6 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$6 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$6 \begin{smallmatrix} +0.050 \\ 0 \end{smallmatrix}$	$14.5 \begin{smallmatrix} 0 \\ -0.15 \end{smallmatrix}$

M9RC90G4L



Motor Type	Capacitor Type	L	W	D	H	T
M9RC90G4L 100V	MZAX054	50.2	31	41	42	5
M9RC90G4Y 200V	MZAX073	50	34	45	45	6

Note : rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 2~20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.

rpm表列數字乃根據馬達同步運轉之轉速，但在額定扭力負載情況下實際輸出轉速為同步運轉轉速的80~98%。灰色欄乃輸出軸運轉方向與馬達相同時的數據資料。白色欄乃輸出軸運轉方向與馬達相反時的數據資料。

★回転数は 同期速度の 中間ギアヘッド値 (값) を 表示하고 있습니다. 一般 回転数は負荷の 크기에 따라 表示値보다 2%~20% 작은(値) 을 표시합니다.

Size mm sq.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Rated load				Starting Current (A)	Starting Torque (kg·cm)	Capacitor µF (V)	Applied gearhead type		
							Input (W)	Current (A)	Speed (rpm)	Torque (kg·cm)				Metal	Ball	Decimal
90	M9RC90G4L	4	90	100	50	30min	184	1.9	1200	7.3	3.0	6.8	30(200V)	—	M9GC□B	M9GC10XB
					60		190	1.9	1500	5.8	3.0	6.8				
90	M9RC90G4Y	4	90	50	30min	184	0.95	1200	7.3	1.5	6.8	7.5(370V)	M9GS□B			
				60		190	0.95	1500	5.8	1.5	6.8					

																		With decimal gearhead									
Speed (rpm)	500	300	200	180	150	120	100	90	75	60	50	30	20	15	10	9	7.5	6	5	3	2	1.5	1	0.9	0.75		
Gear reduction ratio	50Hz	3	5	7.5	—	10	12.5	15	—	20	25	30	50	75	100	150	—	200	250	300	500	750	1000	1500	—	2000	
	60Hz	3.6	6	9	10	—	15	18	20	—	30	36	60	90	120	180	200	—	300	360	600	900	1200	1800	2000	—	
Maximum permissible torque (kg·cm)		14	23	35	38	46	58	69	77	92	111	133	200	200	200	200	200	200	200	200	200	200	200	200	200	200	
		—	—	—	—	—	—	—	—	—	—	—	216	300	300	300	300	300	300	300	300	300	300	300	300	300	

Note : The box (☐) represents the desired gear reduction ratio, which thereby becomes part of the code for geared motor.

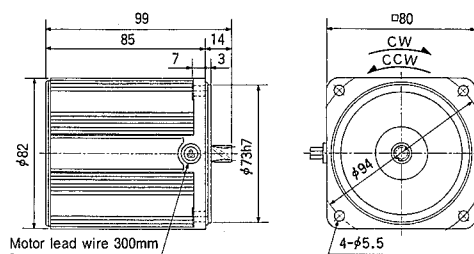
## Motor

M8MA25G4Y 4P 25W 200-220V

Scale 1/4 Unit mm

**80**  
**mmSQ,**  
**25W**

Weight 1.5kg  
helical gear  
module 0.6  
number of teeth 11

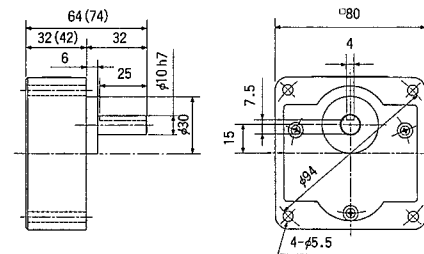


## Gear Head

Scale 1/4 Unit mm

M8GA□M (metal bearing type) weight 0.68kg

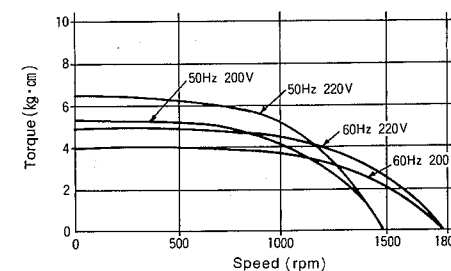
M8GA□B (ball bearing type)



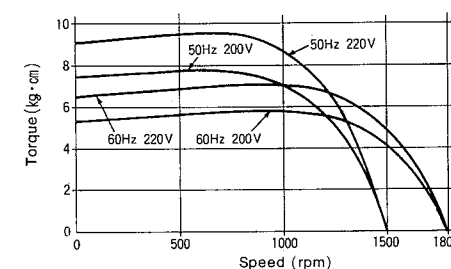
Note : The value in “( )” is for gear ratio of 1/20 or larger.

### Speed-Torque Curve

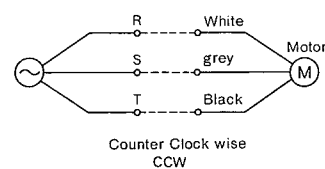
M8MA25G4Y



## M9MA40G4Y



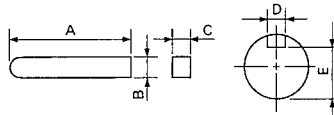
### Connecting Diagram



As for CW rotation, change the 2 leads among R. S. T. shown above.

### Key and Key Slot

M8GA ☐ M(B)  
M9GA ☐ M(B)



Type	A	B	C	D	E
M8GA□M(B)	25	$4 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$4 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$4 \begin{smallmatrix} +0.060 \\ +0.010 \end{smallmatrix}$	$7.5 \begin{smallmatrix} 0 \\ -0.15 \end{smallmatrix}$
M9GA□M(B)	25	$4 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$4 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$4 \begin{smallmatrix} +0.060 \\ +0.010 \end{smallmatrix}$	$9.5 \begin{smallmatrix} 0 \\ -0.15 \end{smallmatrix}$

## ■ Specifications

Specifications																	mm decimal gearhead																										
Size mmsq.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Rated load				Starting Current (A)	Starting Torque (kg·cm)	Capacitor μF(V)	Applied gearhead type			Speed(rpm)																Gear reduction ratio										
							Input (W)	Current (A)	Speed (rpm)	Torque (kg·cm)				Metal	Ball	Decimal	Gear reduction ratio	50Hz	3	5	7.5	—	10	12.5	15	—	20	25	30	50	75	100	150	9	7.5	6	5	3	2	1.5	1		
80	M8MA25G4Y	4	25	200	50	CONT.	46	0.20	1325	1.8	0.53	5.3	—	M8GA□M	M8GA□B	M8GA10XM	Maximum permissible torque (kg·cm)	3	5	7.5	—	10	12.5	15	—	20	25	30	50	75	100	150	—	200	250	300	500	750	1000	1500			
					60		43	0.18	1600	1.5	0.52	4.1						3.6	6	9	10	—	15	18	20	—	30	36	60	90	120	180	200	—	300	360	600	900	1200	1800			
		4	25	220	50	CONT.	46	0.22	1375	1.8	0.58	6.6						—	M9GA□M	M9GA□B	M9GA10XM	Maximum permissible torque (kg·cm)	4.0	6.7	10	11	13	16	20	21	26	32	39	65	80	80	80	80	80	80	80	80	80
					60		45	0.19	1650	1.5	0.54	5.0											200	250	300	500	750	1000	1500	200	—	300	360	600	900	1200	1800	200	—	300	360	600	900
90	M9MA40G4Y	4	40	200	50	CONT.	66	0.30	1375	2.9	1.0	7.4	—	M9GA□M	M9GA□B	M9GA10XM	Maximum permissible torque (kg·cm)	6.7	11	16	18	23	28	33	36	45	54	65	100	100	100	100	100	100	100	100	100	100					
					60		62	0.27	1650	2.4	0.90	5.4						200	250	300	500	750	1000	1500	200	—	300	360	600	900	1200	1800	200	—	300	360	600	900	1200	1800			
		4	40	220	50	CONT.	66	0.31	1400	2.8	1.1	9.0						—	M9GA□M	M9GA□B	M9GA10XM	Maximum permissible torque (kg·cm)	6.7	11	16	18	23	28	33	36	45	54	65	100	100	100	100	100	100	100	100	100	100
					60		62	0.27	1675	2.31	0.98	6.5											200	250	300	500	750	1000	1500	200	—	300	360	600	900	1200	1800	200	—	300	360	600	900

Note : The box (☐) represents the desired gear reduction ratio, which thereby becomes part of the code for geared motor.

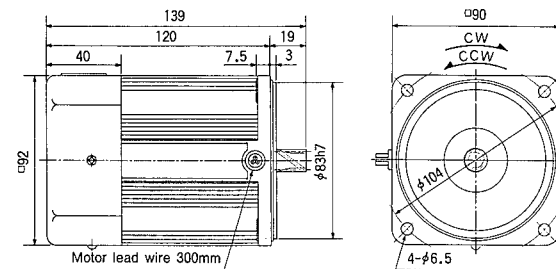
三相感應馬達  
삼상 인덕션 모터

M9MC60G4Y 4P 60W 200-220V

Scale 1/4 Unit mm

**90**  
**mmSQ,**  
**60W**

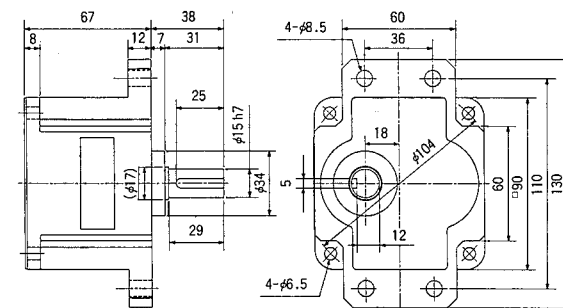
Weight 2.7kg  
helical gear  
module 0.8  
number of teeth 11



## Gear Head

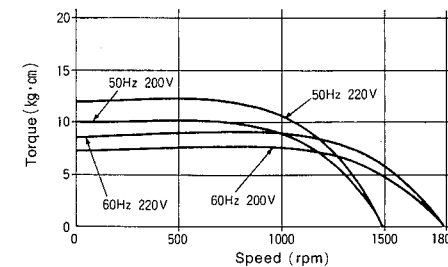
M9GC□B (ball bearing type) 1.5kg

Scale 1/4 Unit mm

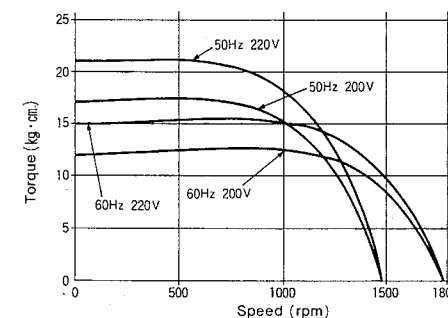


### Speed-Torque Curve

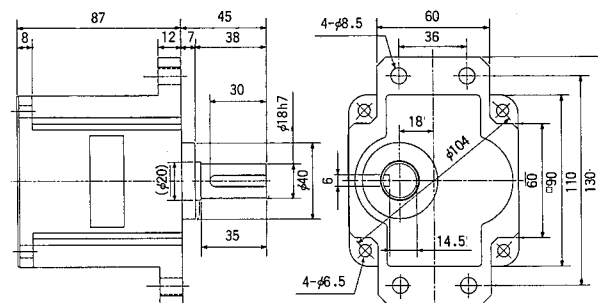
M9MC60G4Y



M9MC90G4Y

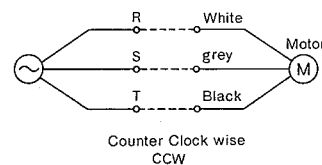


M9GS□B (ball bearing type) 1.9kg



C type 200kg·cm / max. permissible torque  
S type 300kg·cm / max. permissible torque

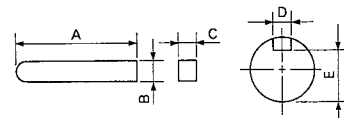
### Connecting Diagram



As for CW rotation, change the 2 leads among R. S. T. shown above.

## Key and Key Slot

M9GC ☐ B  
M9GS ☐ B



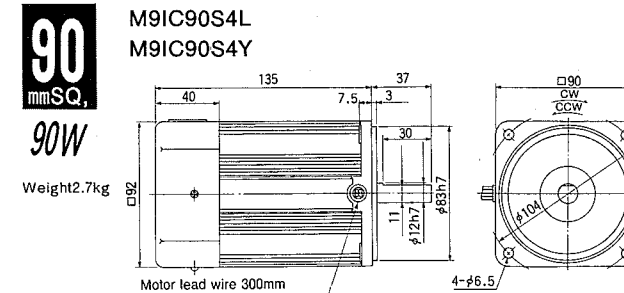
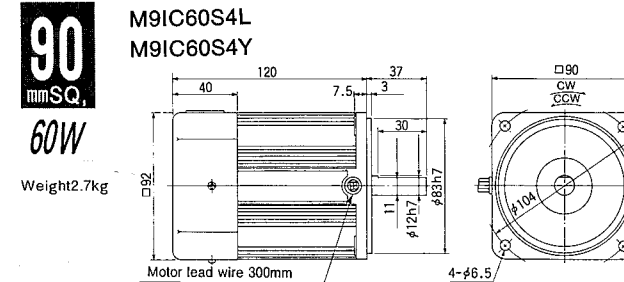
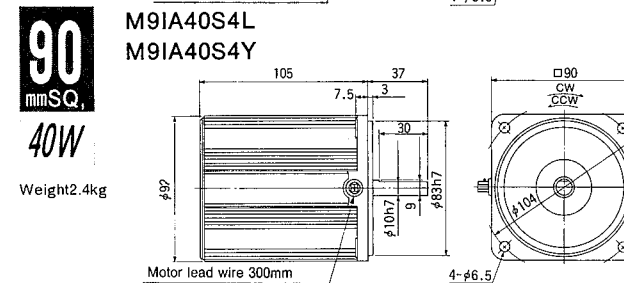
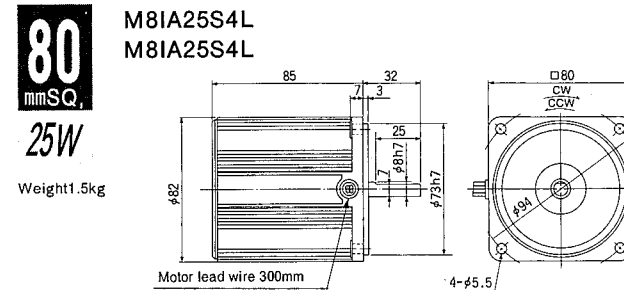
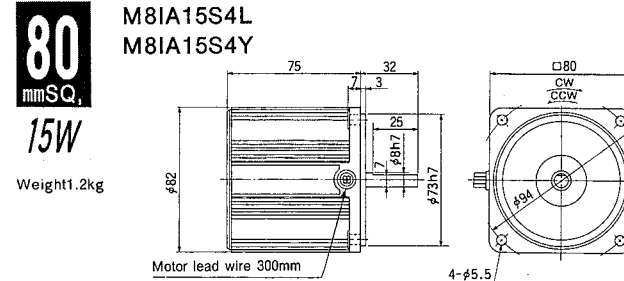
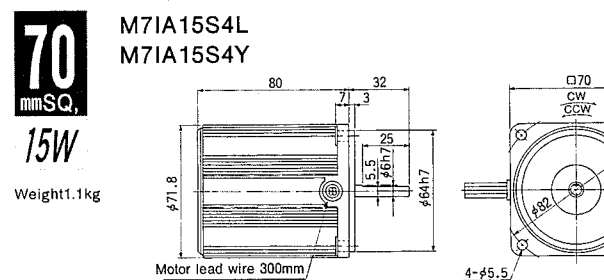
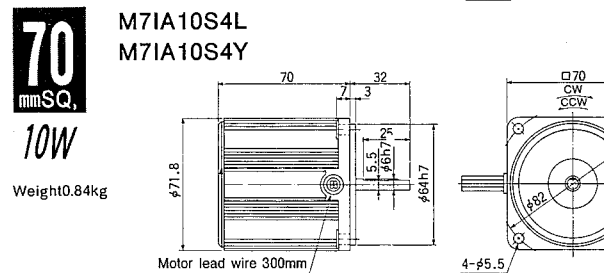
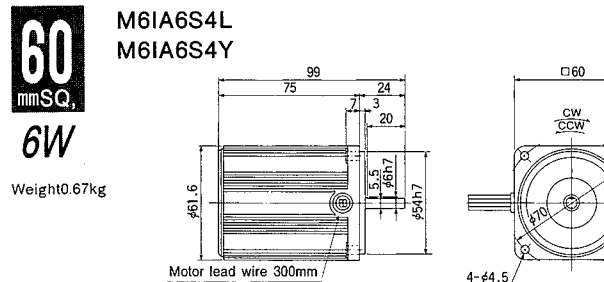
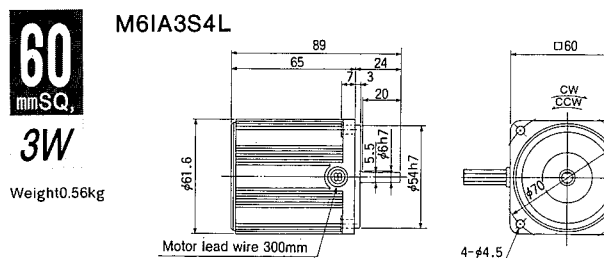
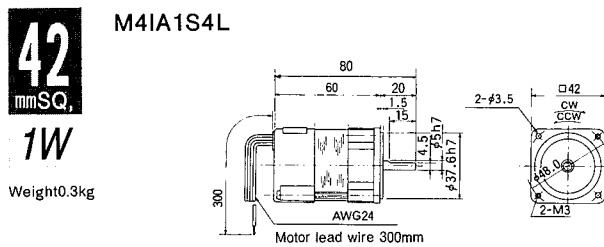
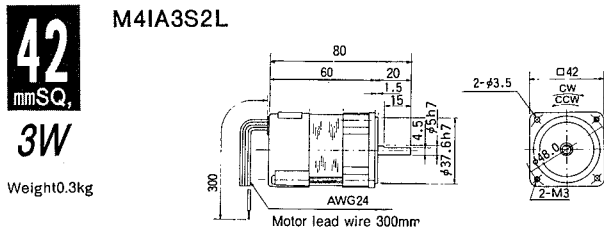
Type	A	B	C	D	E
M9G□B	25	$5 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$5 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$5 \begin{smallmatrix} +0.050 \\ 0 \end{smallmatrix}$	$12 \begin{smallmatrix} 0 \\ -0.15 \end{smallmatrix}$
M9GS□B	30	$6 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$6 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$6 \begin{smallmatrix} +0.050 \\ 0 \end{smallmatrix}$	$14.5 \begin{smallmatrix} 0 \\ -0.15 \end{smallmatrix}$

## ■ Specifications

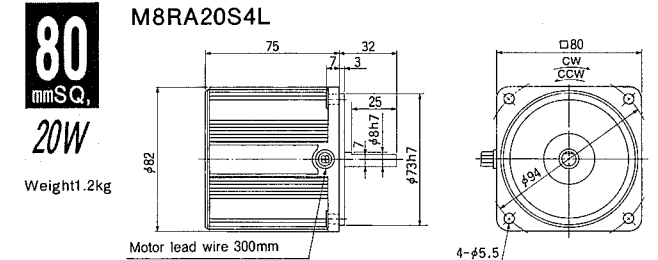
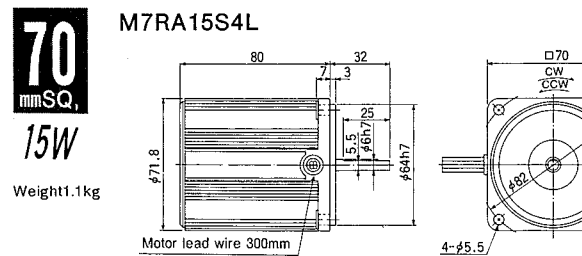
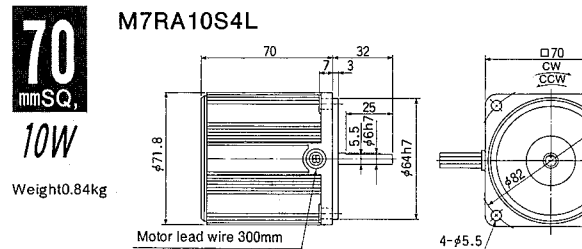
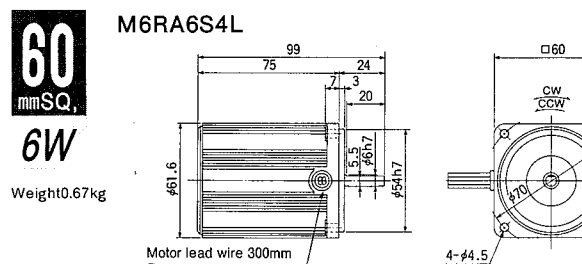
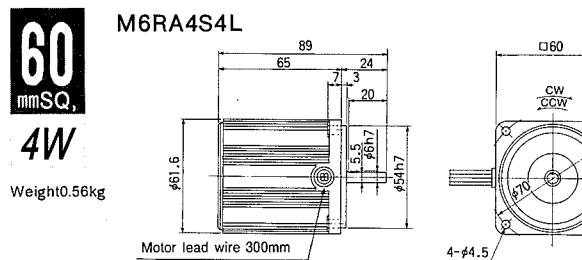
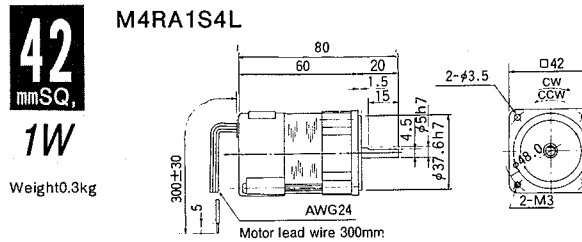
[illegible]

Note : The box (□) represents the desired gear reduction ratio, which thereby becomes part of the code for geared motor.

## Single Phase Induction Motor



## Single Phase Reversible Motor



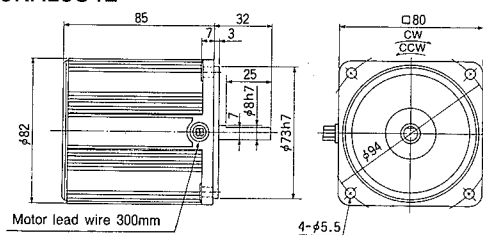


## Single Phase Reversible Motor

**80**  
mmSQ,  
25W

Weight 1.5kg

M8RA25S4L



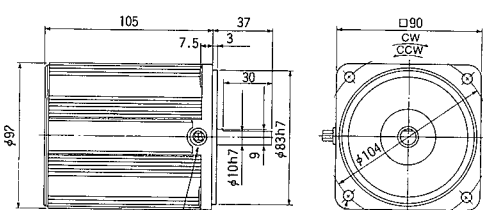
Motor lead wire 300mm

4- $\phi 5.5$

**90**  
mmSQ,  
40W

Weight 2.4kg

M9RA40S4L



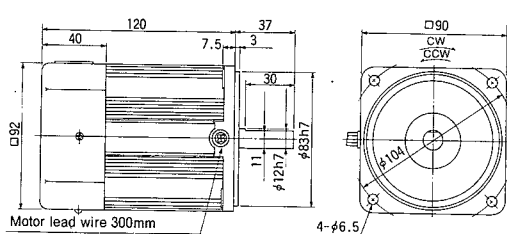
Motor lead wire 300mm

4- $\phi 6.5$

**90**  
mmSQ,  
60W

Weight 2.7kg

M9RC60S4L



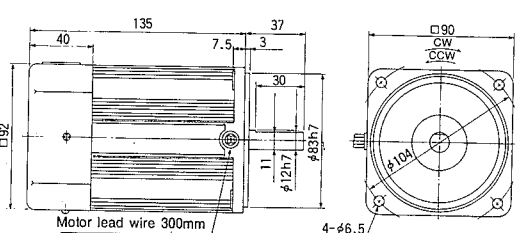
Motor lead wire 300mm

4- $\phi 6.5$

**90**  
mmSQ,  
90W

Weight 2.9kg

M9RC90S4L



Motor lead wire 300mm

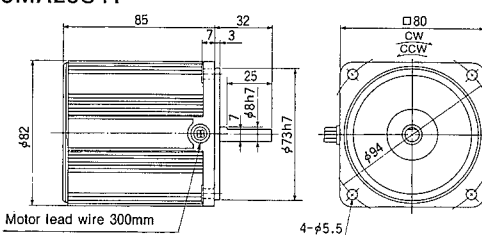
4- $\phi 6.5$

## Three Phase Induction Motor

**80**  
mmSQ,  
25W

Weight 1.5kg

M8MA25S4Y



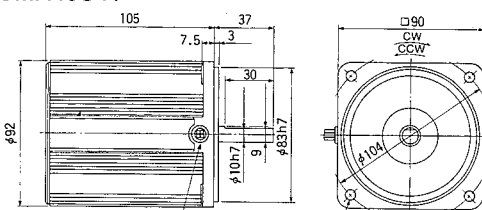
Motor lead wire 300mm

4- $\phi 5.5$

**90**  
mmSQ,  
40W

Weight 2.4kg

M9MA40S4Y



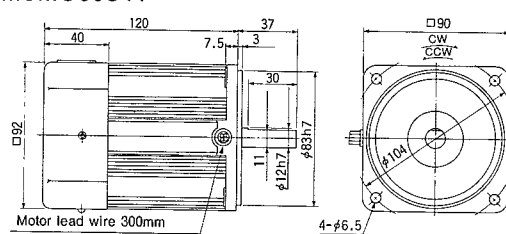
Motor lead wire 300mm

4- $\phi 6.5$

**90**  
mmSQ,  
60W

Weight 2.7kg

M9MC60S4Y



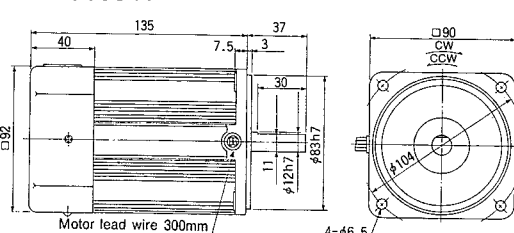
Motor lead wire 300mm

4- $\phi 6.5$

**90**  
mmSQ,  
90W

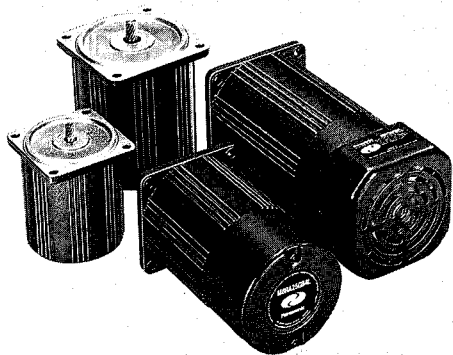
Weight 2.9kg

M9MC90S4Y



Motor lead wire 300mm

4- $\phi 6.5$



## Electro-Magnetic Brake Motor

### INDEX

- ELECTRO-MAGNETIC BRAKE  
/SINGLE PHASE REVERSIBLE MOTOR .... 73
- ELECTRO-MAGNETIC BRAKE  
/THREE PHASE INDUCTION MOTOR ..... 79
- STRAIGHT SHAFT ..... 83

**60**  
mmSQ,  
**6W**

Weight 0.85kg  
helical gear  
module 0.5  
number of teeth 10

Technical drawing of the motor assembly showing side and front views with dimensions.

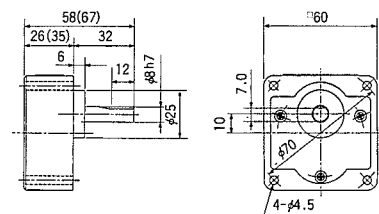
**Side View Dimensions:**

- Total length: 126.5
- Section 1: 3
- Section 2: 42.5
- Section 3: 72.5
- Section 4: 11.5
- Section 5: 7
- Section 6: 3
- Motor lead wire length: 300mm
- Brake lead wire length: 300mm
- Shaft diameter:  $\phi 54H7$

**Front View Dimensions:**

- Outer diameter:  $\phi 60$
- Inner diameter:  $\phi 70$
- Number of mounting holes: 4- $\phi 4.5$
- Rotation direction: CW (Clockwise) and CCW (Counter-clockwise)

Scale 1/4 Unit mm  
M6GA□M (metal bearing type) weight 0.34kg  
M6GA□B (ball bearing type)



Note : The value in "( )" is for gear ratio of 1/20 or larger.

# B

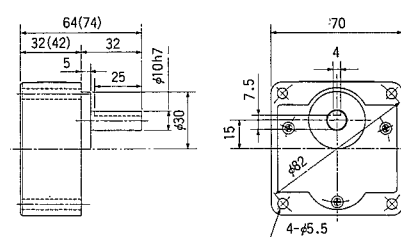
**70**  
mmSQ,  
**15W**

Weight 1.1kg  
helical gear  
module 0.5  
number of teeth 10

Technical drawing of the motor assembly showing side and front views with dimensions:

- Side View Dimensions:**
  - Total length: 133
  - Distance from mounting flange to center: 42.5
  - Distance from center to end flange: 77.5
  - End flange thickness: 13
  - Mounting flange thickness: 3
  - Shaft diameter:  $\phi 71.8$
  - End flange outer diameter:  $\phi 64.7$
  - End flange hole diameter:  $\phi 52$
  - Motor lead wire length: 300mm
  - Brake lead wire length: 300mm
- Front View Dimensions:**
  - Outer diameter:  $\phi 70$
  - Inner diameter:  $\phi 62$
  - Mounting holes: 4- $\phi 5.5$
  - Rotation direction: CW (Clockwise) and CCW (Counter-clockwise)

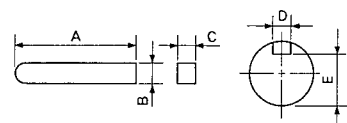
M7GA□M (metal bearing type) weight 0.54kg  
M7GA□B (ball bearing type)



Note : The value in "( )" is for gear ratio of 1/20 or larger.

- (Caution 1) The brake operates to a holding condition when the electromagnetic brake is 'off'.
- (Caution 2) Use R<sup>1</sup>+C<sup>1</sup> inbetween the contacts.  
Also DV-OPO08 is available as an option.

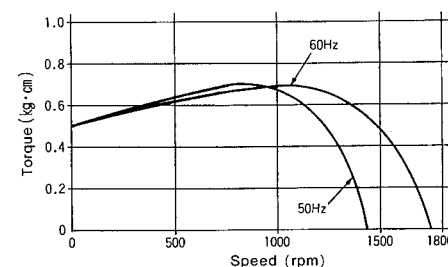
## M7GA□M(B)



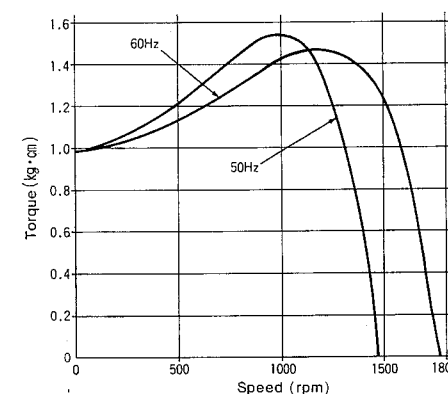
Type	A	B	C	D	E
M7GA□M(B)	25	$4 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$4 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$4 \begin{smallmatrix} +0.060 \\ +0.010 \end{smallmatrix}$	$7.5 \begin{smallmatrix} 0 \\ -0.15 \end{smallmatrix}$

Size mmsq.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Rated load				Starting Current (A)	Starting Torque (kg·cm)	Brake input (W)	Brake current (A)	Brake torque (kg·cm)	Capacitor µF (V)	Applied gearhead type			
							Input (W)	Current (A)	Speed (rpm)	Torque (kg·cm)							Metal	Ball	Decimal	
60	M6RA6GB4L	4	6	100	50	30min	22	0.22	1275	0.45	0.30	0.50	4	0.05	0.5	3.5	M6GA□M	M6GA□B	M6GA10XM	
					60		23	0.23	1600	0.36	0.30	0.50	4	0.05	0.5	(200V)				
60	M6RA6GB4Y	4	6	200	50	30min	22	0.11	1275	0.45	0.15	0.50	4	0.03	0.5	0.9	M6GA□M	M6GA□B	M6GA10XM	
					60		23	0.12	1600	0.36	0.15	0.50	4	0.03	0.5	(400V)				
70	M7RA15GB4L	4	15	100	50	30min	37	0.37	1250	1.20	0.56	0.99	5	0.06	0.8	6(200V)	M7GA□M	M7GA□B	M7GA10XM	
					60		38	0.39	1575	0.92	0.56	0.99	5	0.06	0.8					
70	M7RA15GB4Y	4	15	200	50	30min	37	0.19	1250	1.20	0.28	0.99	5	0.03	0.8	1.5	M7GA□M	M7GA□B	M7GA10XM	
					60		38	0.20	1575	0.93	0.28	0.99	5	0.03	0.8	(400V)				

## M6RA6GB4L



M7RA15GB4L



Technical drawing of the fastener assembly. The top view shows a rectangular fastener with a central hole of diameter  $\phi 4.3$ . The overall length is  $L$  and the width is  $W$ . The distance from the center of the hole to the nearest edge is  $1.5$ . The side view shows the fastener with a height of  $6.2$  and a fastener tab of height  $10\text{max.}$ . The fastener is secured with two screws of diameter  $2-\phi 2.5$ . The overall height of the assembly is  $H$ .

■ Dimensions of Capacitor (mm)

Motor Type	Capacitor Type	L	W	D	H	T
M6RA6GB4L 100V	MZAX041	39.5	17.5	28	30.5	4
M6RA6GB4Y 200V	MZAX059	39.5	22	32.5	32.5	4
M7RA15GB4L 100V	MZAX042	39.5	26.7	37	32	4
M7RA15GB4Y 200V	MZAX060	49.7	24	34.5	34.5	4

■ Geared motor maximum permissible torque table [kg·cm]

Note : rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 2~20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.

### ■齒輪馬達最大承受扭力對照表

rpm表列數字乃根據馬達同步運轉之轉速，但在額定扭力負載情況下實際輸出轉速為同步轉速的80~98%。灰色欄乃輸出軸運轉方向與馬達相同時的數據資料，白色欄乃輸出軸運轉方向與馬達相反時的數據資料。

■GEAR HEAD를 直結했을 때의 許容軸토크

★回転数は 同期速度の中間回転数(値)を表示하고 있습니다. 一般 回転数は負荷の 크기에 따라 表示値보다 2%~20% 적은(値)을 표시합니다.

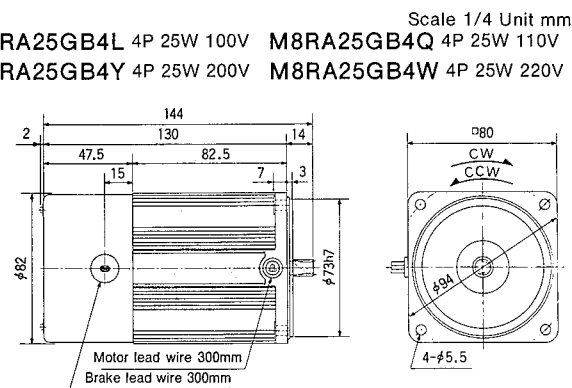
																	With decimal gearhead									
Speed (rpm)		500	300	200	180	150	120	100	90	75	60	50	30	20	15	10	9	7.5	6	5	3	2	1.5	1		
Gear reduction ratio	50Hz	3	5	7.5	—	10	12.5	15	—	20	25	30	50	75	100	150	—	200	250	300	500	750	1000	1500		
	60Hz	3.6	6	9	10	—	15	18	20	—	30	36	60	90	120	180	200	—	300	360	600	900	1200	1800		
Maximum permissible torque (kg·cm)		1.0	1.6	2.5	2.7	3.4	4.1	5.0	5.4	6.7	8.1	9.7	16	23	25	25	25	25	25	25	25	25	25	25		
Maximum permissible torque (kg·cm)		2.4	2.7	6.0	6.7	8.2	10	12	13	16	19	23	39	50	50	50	50	50	50	50	50	50	50	50		

Note : The box (□) represents the desired gear reduction ratio, which thereby becomes part of the code for geared motor.

付帶電磁制動器馬達 單相可逆式馬達  
전자 브레이크 모타 단상 리버시블 모타

**80**  
mmSQ,  
**25W**

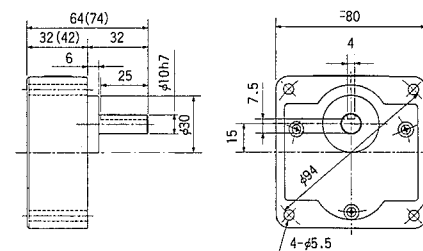
Weight 1.75kg  
helical gear  
module 0.6  
number of teeth 11



Scale 1/4 Unit mm

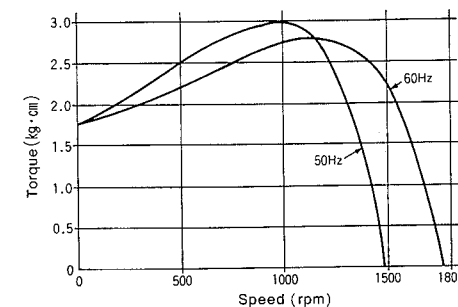
M8GA□M (metal bearing type) weight 0.68kg

M8GA□B (ball bearing type)



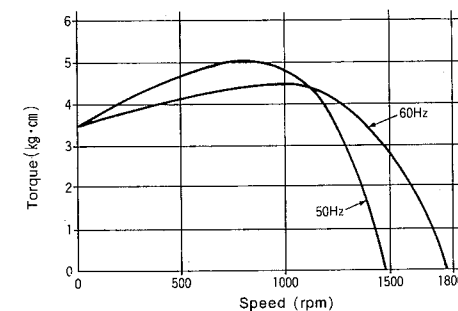
Note : The value in "( )" is for gear ratio of 1/20 or larger.

M8RA25GB4L



Technical drawing of a fastener assembly. The top view shows a rectangular fastener with dimensions L (length), W (width), and D (thickness). It has two mounting holes with a diameter of  $\phi 4.3$ . The bottom view shows the fastener mounted on a base with a height H. The mounting holes are spaced 10max. apart. The fastener has a central tab with a width of 1.5 and a height of 6.2. The fastener is labeled "Faston tab 187" and "2- $\phi 2.5$ ".

M9RA40GB4L



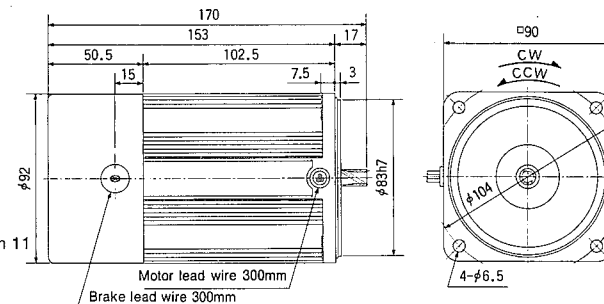
■ Dimensions of Capacitor (mm)

Motor Type	Capacitor Type	L	W	D	H	T
M8RA25GB4L 100V	MZAX048	39.5	22	32.5	30.5	4
M8RA25GB4Y 200V	MZAX066	49.7	24	34.5	34	4
M9RA40GB4L 100V	MZAX051	39.5	26.7	37	41	4
M9RA40GB4Y 200V	MZAX069	50	26.7	37.5	38	4

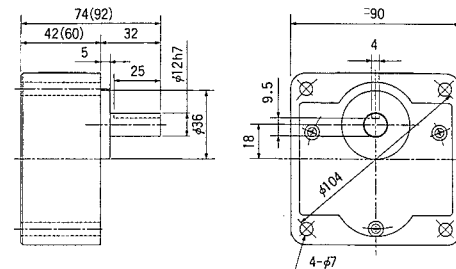
# B

**90**  
mmSQ,  
**40W**

Weight 3.3kg  
helical gear  
module 0.6  
number of teeth 11



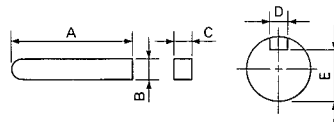
M9GA□M (metal bearing type) weight 1.2kg  
M9GA□B (ball bearing type)



Note : The value in "( )" is for gear ratio of 1/20 or larger.

- (Caution 1) The brake operates to a holding condition when the electromagnetic brake is 'off'.
- (Caution 2) Use R<sup>1</sup>+C<sup>1</sup> in between the contacts.  
Also DV-QPO08 is available as an option.

M8GA ☐ M(B)  
M9GA ☐ M(B)



Type	A	B	C	D	E
M8GA□M(B)	25	$4 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$4 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$4 \begin{smallmatrix} +0.060 \\ +0.010 \end{smallmatrix}$	$7.5 \begin{smallmatrix} 0 \\ -0.15 \end{smallmatrix}$
M9GA□M(B)	25	$4 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$4 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$4 \begin{smallmatrix} +0.060 \\ +0.010 \end{smallmatrix}$	$9.5 \begin{smallmatrix} 0 \\ -0.15 \end{smallmatrix}$

■ Geared motor maximum permissible torque table [kg·cm]

Note : rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 2~20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.

### ■齒輪馬達最大承受扭力對照表

rpm表列數字乃根據馬達同步運轉之轉速，但在額定扭力負載情況下實際輸出轉速為同步運轉轉速的80~98%。灰色標乃輸出軸運轉方向與馬達相同時的數據資料。白色標乃輸出軸運轉方向與馬達相反時的數據資料。

■ GEAR HEAD를 直結했을 때의 許容軸토크

★回転数は 同期速度の中間ギアヘッド値(値)を表示하고 있습니다. 一般 回転数は負荷の 크기에 따라 表示値보다 2%~20% 적은(値)를 표시합니다.

## ■ Specifications

Size mm.sq.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Rated load				Starting Current (A)	Starting Torque (kg·cm)	Brake input (W)	Brake current (A)	Brake torque (kg·cm)	Capacitor μF(V)	Applied gearhead type				Speed (rpm)		500	300	200	180	150	120	100	90	75	60	50	30	20	15	10	9	7.5	6	5	3	2	1.5	1	
							Input (W)	Current (A)	Speed (rpm)	Torque (kg·cm)							Metal	Ball	Decimal		Gear reduction ratio	50Hz 60Hz	3 3.6	5 6	7.5 9	— 10	10 —	12.5 15	15 18	— 20	20 —	25 30	30 36	50 60	75 90	100 120	150 180	— 200	200 —	250 300	300 360	500 600	750 900	1000 1200	1500 1800	
80	M8RA25GB4L	4	25	100	50	30min	53	0.53	1325	1.8	1.0	1.7	6	0.12	1.0	9.5	M8GA□M	M8GA□B	M8GA10XM		Maximum permissible torque (kg·cm)	4.0	6.7	10	11	13	16	20	21	26	32	39	65	90	80	80	80	80	80	80	80	80	80	80		
					56		0.57	1625	1.5	1.0	1.7	6	0.12	1.0	(200V)																															
80	M8RA25GB4Y	4	25	200	50	30min	53	0.27	1325	1.8	0.5	1.7	6	0.06	1.0	2.4	M8GA□M	M8GA□B	M8GA10XM		Maximum permissible torque (kg·cm)	4.0	6.7	10	11	13	16	20	21	26	32	39	65	90	80	80	80	80	80	80	80	80	80	80	80	
					56		0.29	1625	1.5	0.5	1.7	6	0.06	1.0	(400V)																															
90	M9RA40GB4L	4	40	100	50	30min	77	0.80	1300	3.0	1.6	3.5	7	0.14	2	15	M9GA□M	M9GA□B	M9GA10XM		Maximum permissible torque (kg·cm)	6.7	11	16	18	23	28	33	36	45	54	65	100	100	100	100	100	100	100	100	100	100	100	100	100	
					81		0.83	1600	2.4	1.6	3.5	7	0.14	2	(200V)																															
90	M9RA40GB4Y	4	40	200	50	30min	77	0.40	1300	3.0	0.8	3.5	7	0.07	2	3.8	M9GA□M	M9GA□B	M9GA10XM		Maximum permissible torque (kg·cm)	6.7	11	16	18	23	28	33	36	45	54	65	100	100	100	100	100	100	100	100	100	100	100	100	100	100
					81		0.42	1600	2.4	0.8	3.5	7	0.07	2	(400V)																															

Note : The box (□) represents the desired gear reduction ratio, which thereby becomes part of the code for geared motor.

# Electro-Magnetic Brake Motor / Single Phase Reversible

付帶電磁制動器馬達  
전자 브레이크 모터 단상 리버시블 모터

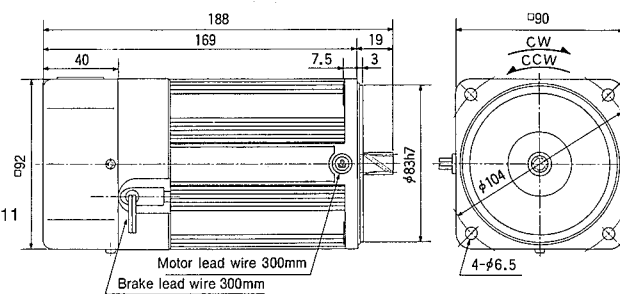
Panasonic



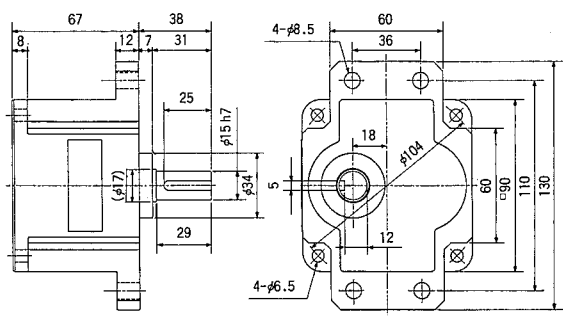
**Motor**  
Scale 1/4 Unit mm  
M9RC60GB4L 4P 60W 100V M9RC60GB4Q 4P 60W 110V  
M9RC60GB4Y 4P 60W 200V M9RC60GB4W 4P 60W 220V

**90**  
mmSQ,  
**60W**

Weight 3.1kg  
helical gear  
module 0.8  
number of teeth 11



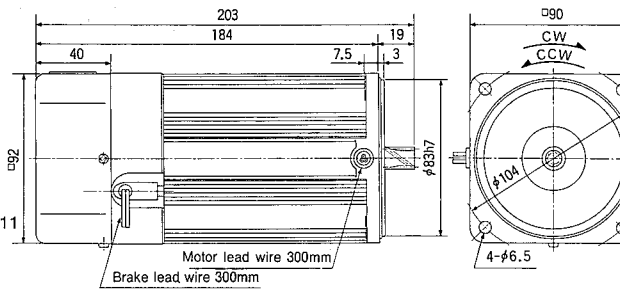
**Gear Head**  
Scale 1/4 Unit mm  
M9GC□B (ball bearing type) 1.5kg



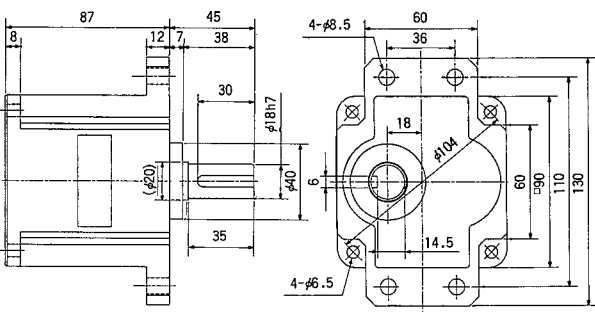
**Motor**  
Scale 1/4 Unit mm  
M9RC90GB4L 4P 90W 100V M9RC90GB4Q 4P 90W 110V  
M9RC90GB4Y 4P 90W 200V M9RC90GB4W 4P 90W 220V

**90**  
mmSQ,  
**90W**

Weight 3.4kg  
helical gear  
module 0.8  
number of teeth 11

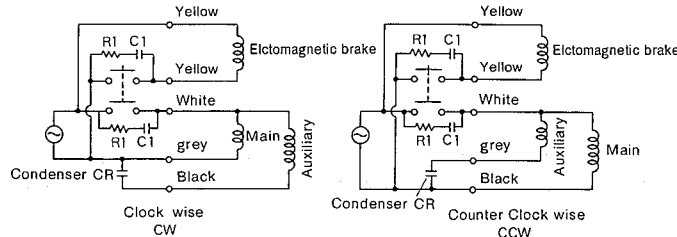


M9GS□B (ball bearing type) 1.9kg



C type 200kg·cm/max. permissible torque  
S type 300kg·cm/max. permissible torque

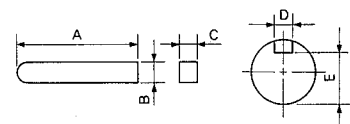
## Connecting Diagram



- (Caution 1) The brake operates to a holding condition when the electromagnetic brake is 'off'.  
(Caution 2) Use R<sup>1</sup>+C<sup>1</sup> in between the contacts. Also DV-OPO08 is available as an option.

## Key and Key Slot

M9GC□B  
M9GS□B



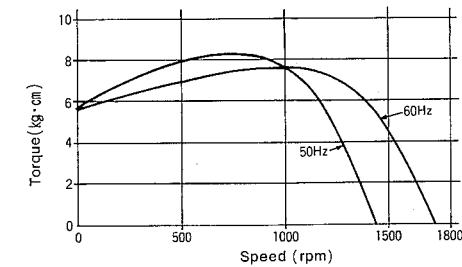
Type	A	B	C	D	E
M9GC□B	25	5 <sup>0</sup> <sub>-0.030</sub>	5 <sup>0</sup> <sub>-0.030</sub>	5 <sup>+0.050</sup> <sub>0</sub>	12 <sup>0</sup> <sub>-0.15</sub>
M9GS□B	30	6 <sup>0</sup> <sub>-0.030</sub>	6 <sup>0</sup> <sub>-0.030</sub>	6 <sup>+0.050</sup> <sub>0</sub>	14.5 <sup>0</sup> <sub>-0.15</sub>

## Specifications

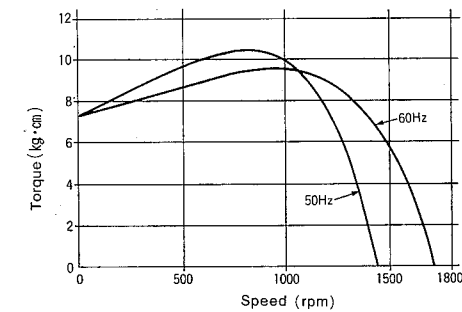
Size mmSQ	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Rated load				Starting Current (A)	Starting Torque (kg·cm)	Brake input (W)	Brake current (A)	Brake torque (kg·cm)	Capacitor μF(V)	Applied gearhead type		
							Input (W)	Current (A)	Speed (rpm)	Torque (kg·cm)							Metal	Ball	Decimal
90	M9RC60GB4L	4	60	100	50	30min	126	1.3	1300	4.5	2.4	5.8	7	0.14	4	25	—	M9GC□B	M9GC10XB
							135	1.4	1600	3.6	2.4	5.8	7	0.14	4	(200V)			
90	M9RC60GB4Y	4	60	200	50	30min	126	0.65	1300	4.5	1.2	5.8	7	0.07	4	6.2	—	M9GC□B	M9GC10XB
							135	0.70	1600	3.6	1.2	5.8	7	0.07	4	(375V)			
90	M9RC90GB4L	4	90	100	50	30min	177	1.9	1225	7.1	3.0	7.2	7	0.14	4	30	—	M9GC□B	M9GC10XB
							197	2.1	1525	5.7	2.0	7.2	7	0.14	4	(200V)			
90	M9RC90GB4Y	4	90	200	50	30min	177	1.0	1225	7.1	1.5	7.2	7	0.07	4	7.5	—	M9GS□B	M9GS10XB
							197	1.1	1525	5.7	1.5	7.2	7	0.07	4	(370V)			

## Speed-Torque Curve

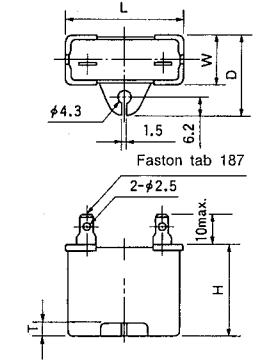
M9RC60GB4L



M9RC90GB4L



## Capacitor



## Dimensions of Capacitor (mm)

Motor Type	Capacitor Type	L	W	D	H	T
M9RC60GB4L 100V	MZAX053	50.2	31	41	42	5
M9RC60GB4Y 200V	MZAX072	50	30.2	41	41.5	4
M9RC90GB4L 100V	MZAX054	50.2	31	41	42	5
M9RC90GB4Y 200V	MZAX073	50	34	45	45	6

## Geared motor maximum permissible torque table [kg·cm]

Note : rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 2~20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.

## 齒輪馬達最大承受扭力對照表

rpm表列數字乃根據馬達同步運轉之轉速，但在額定扭力負載情況下實際輸出轉速為同步運轉轉速的80~98%。灰色欄乃輸出軸運轉方向與馬達相同時的數據資料，白色欄乃輸出軸運轉方向與馬達相反時的數據資料。

## GEAR HEAD를 직결했을 때의 許容軸トルク

★回転数は同期速度の中間にギヤード値(値)を表示하고 있습니다。一般 回転数は負荷の 크기에 따라 表示値보다 2%~20% 적은(値)을 표시합니다。  
★回転方向은 □이 모터와 同方向 他는 逆方向입니다。

																		With decimal gearhead									
Speed (rpm)		500	300	200	180	150	120	100	90	75	60	50	30	20	15	10	9	7.5	6	5	3	2	1.5	1	0.9	0.75	
	Gear redution ratio	50Hz	3	5	7.5	—	10	12.5	15	—	20	25	30	50	75	100	150	—	200	250	300	500	750	1000	1500	—	2000
		60Hz	3.6	6	9	10	—	15	18	20	—	30	36	60	90	120	180	200	—	300	360	600	900	1200	1800	2000	—
	Maximum permissible torque (kg·cm)		10	16	24	27	32	40	48	54	64	77	93	155	200	300	200	200	200	200	200	200	200	200	200	200	200
			—	—	—	—	—	—	—	—	—	—	—	155	226	300	300	300	300	—	—	300	300	300	300	300	300
	Maximum permissible torque (kg·cm)		14	23	35	38	46	58	69	77	92	111	133	200	200	200	200	200	200	200	200	200	200	200	200	200	200
			—	—	—	—	—	—	—	—	—	—	—	216	300	300	300	300	300	—	—	300	300	300	300	300	300

Note : The box (□) represents the desired gear reduction ratio, which thereby becomes part of the code for geared motor.

# Electro-Magnetic Brake Motor / Three Phase Induction

付帶電磁制動器馬達 三相感應馬達  
전자 브레이크 모터 삼상 인덕션 모터

Panasonic



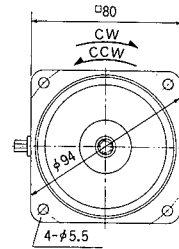
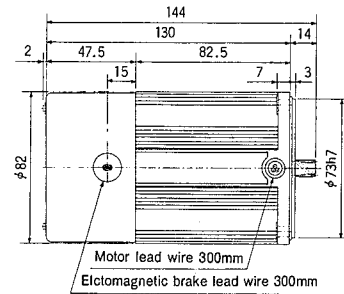
## Motor

M8MA25GB4Y 4P 25W 25-200-220V

Scale 1/4 Unit mm

**80**  
mmSQ,  
**25W**

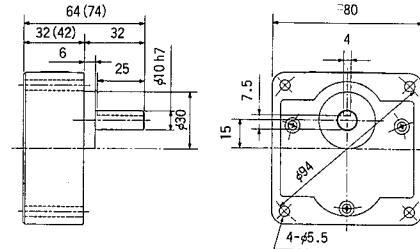
Weight 1.75kg  
helical gear  
module 0.6  
number of teeth 11



## Gear Head

M8GA□M (metal bearing type) weight 0.68kg  
M8GA□B (ball bearing type)

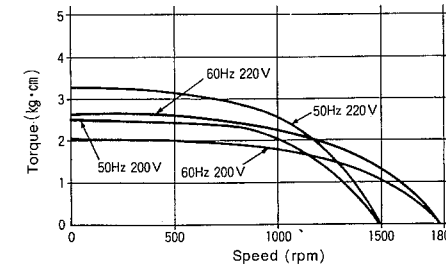
Scale 1/4 Unit mm



Note : The value in "( )" is for gear ratio of 1/20 or larger.

## Speed-Torque Curve

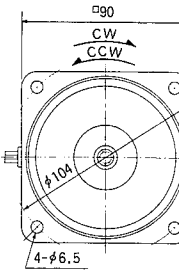
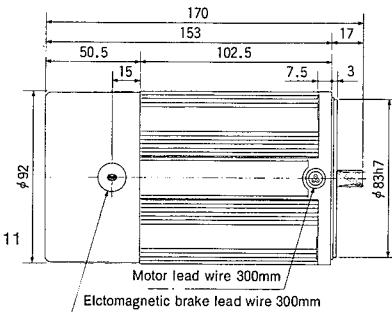
M8MA25GB4Y



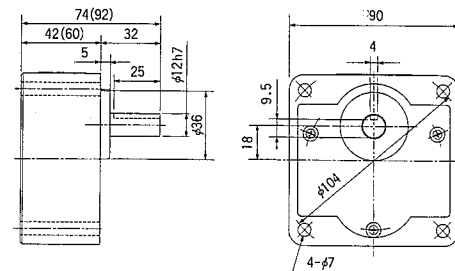
M9MA40GB4Y 4P 40W 200-220V

**90**  
mmSQ,  
**40W**

Weight 2.95kg  
helical gear  
module 0.6  
number of teeth 11

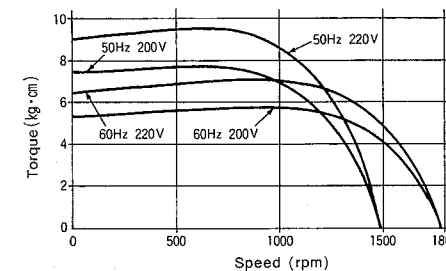


M9GA□M (metal bearing type) weight 1.2kg  
M9GA□B (ball bearing type)

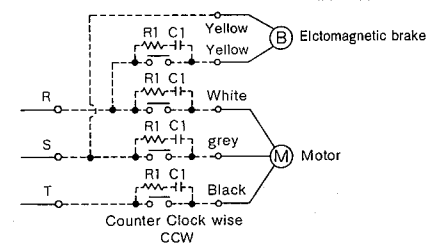


Note : The value in "( )" is for gear ratio of 1/20 or larger.

M9MA40GB4Y



## Connecting Diagram

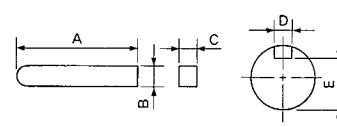


As for CW rotation, change the 2 leads among R, S, T, shown above.

- (Caution 1) The brake operates to a holding condition when the electromagnetic brake is 'off'.  
(Caution 2) Use R<sup>1</sup>+C<sup>1</sup> inbetween the contacts.  
Also DV-OPO08 is available as an option.

## Key and Key Slot

M8GA□M(B)  
M9GA□M(B)



Type	A	B	C	D	E
M8GA□M(B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.010</sub>	7.5 <sup>0</sup> <sub>-0.15</sub>
M9GA□M(B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.010</sub>	9.5 <sup>0</sup> <sub>-0.15</sub>

## Geared motor maximum permissible torque table [kg·cm]

Note : rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 2~20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.

### 齒輪馬達最大承受扭力對照表

rpm表列數字乃根據馬達同步運轉之轉速，但在額定扭力負載情況下實際輸出轉速為同步運轉轉速之80~98%。灰色欄乃輸出軸運轉方向與馬達相同時的數據資料。白色欄乃輸出軸運轉方向與馬達相反時的數據資料。

### GEAR HEAD를 직결했을 때의 허용축토크

- ★回転数は同期速度の中間ギアヘッドに値(값)를表示하고 있습니다. 一般回転数は負荷の大きさに 따라表示値보다2%~20% 적은(値)를 표시합니다.  
★回転方向은 □ 이 모터와 同方向 他는 逆方向입니다.

## Specifications

Size mmSQ.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Rated load				Starting Current (A)	Starting Torque (kg·cm)	Brake input (W)	Brake current (A)	Brake torque (kg·cm)	Capacitor μF(V)	Applied gearhead type		
							Input (W)	Current (A)	Speed (rpm)	Torque (kg·cm)							Metal	Ball	Decimal
80	M8MA25GB4Y	4	25	200	50	CONT.	46	0.20	1325	1.8	0.56	5.2	6	0.06	1	—	M8GA□M	M8GA□B	M8GA10XM
					60	CONT.	43	0.18	1600	1.5	0.52	3.9	6	0.06	1				
				220	50	CONT.	46	0.22	1375	1.8	0.56	5.2	6	0.06	1				
					60	CONT.	45	0.19	1650	1.5	0.52	3.9	6	0.06	1				
90	M9MA40GB4Y	4	40	200	50	CONT.	66	0.30	1375	2.9	1.10	3.8	7	0.07	2	—	M9GA□M	M9GA□B	M9GA10XM
					60	CONT.	62	0.27	1650	2.4	1.00	6.6	7	0.07	2				
				220	50	CONT.	66	0.31	1400	2.8	1.10	8.8	7	0.07	2				
					60	CONT.	62	0.27	1675	2.3	1.00	6.6	7	0.07	2				

Speed (rpm)	With decimal gearhead																							
	500	300	200	180	150	120	100	90	75	60	50	30	20	15	10	9	7.5	6	5	3	2	1.5	1	
Gear reduction ratio	50Hz 3	5	7.5	—	10	12.5	15	—	20	25	30	50	75	100	150	200	250	300	500	750	1000	1500		
	60Hz 3.6	6	9	10	—	15	18	20	—	30	36	60	90	120	180	200	—	300	360	600	900	1200	1800	
Maximum permissible torque (kg·cm)	4.0	6.7	10	11	13	16	20	21	26	32	39	65	80	80	80	80	80	80	80	80	80	80	80	80
Maximum permissible torque (kg·cm)	6.7	11	16	18	23	28	33	36	45	54	65	100	100	100	100	100	100	100	100	100	100	100	100	100

Note : The box (□) represents the desired gear reduction ratio, which thereby becomes part of the code for geared motor.



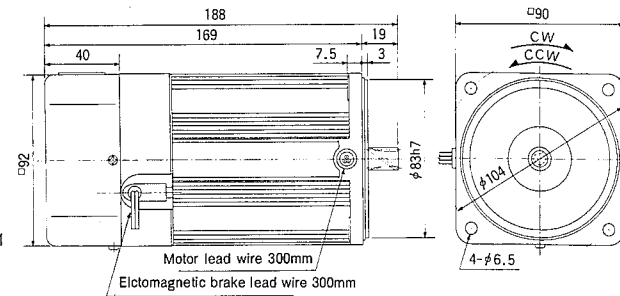
## Motor

Scale 1/4 Unit mm

M9MC60GB4Y 4P 60W 200-220V

**90**  
mmSQ,  
**60W**

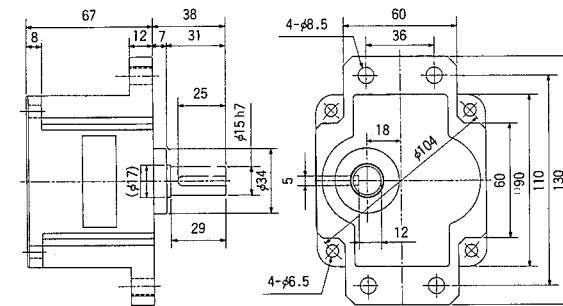
Weight 3.2kg  
helical gear  
module 0.8  
number of teeth 11



## Gear Head

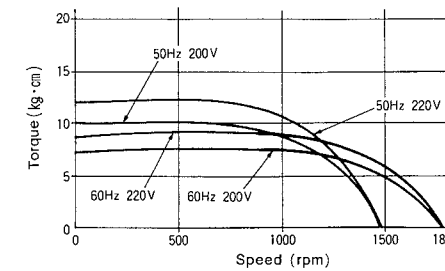
Scale 1/4 Unit mm

M9GC□B (ball bearing type) 1.5kg

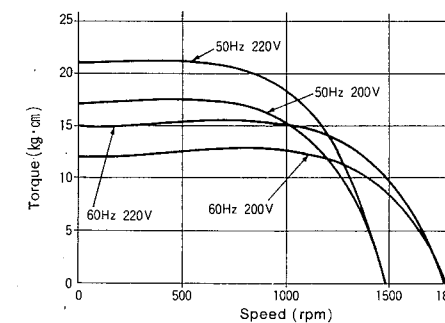


### Speed-Torque Curve

M9MC60GB4Y



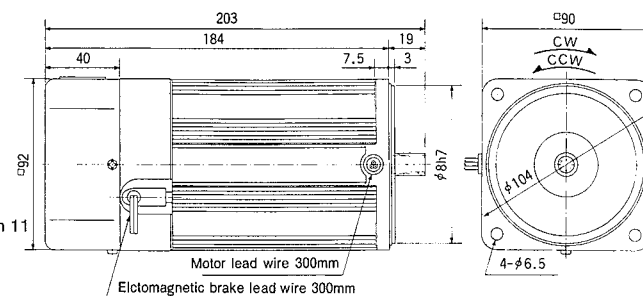
M9MC90GB4Y



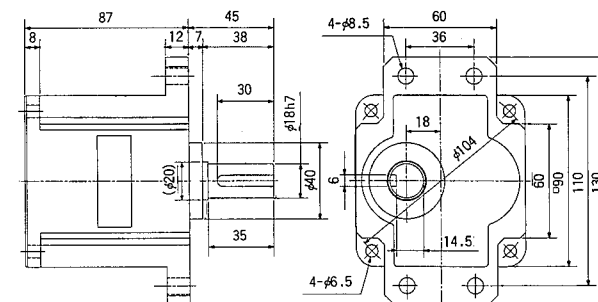
M9MC90GB4Y 4P 90W 200-220V

**90**  
mmSQ,  
**90W**

Weight 3.5kg  
helical gear  
module 0.8  
number of teeth 11

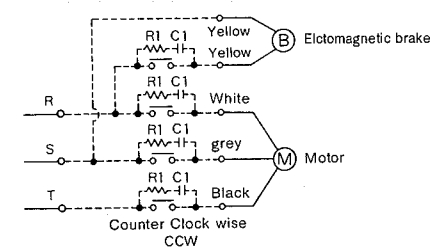


M9GS□B (ball bearing type)



C type 200kg·cm/max. permissible torque  
S type 300kg·cm/max. permissible torque

### Connecting Diagram



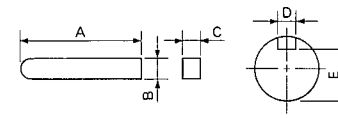
As for CW rotation, change the 2 leads among R. S. T. shown above.

(Caution 1) The brake operates to a holding condition when the electromagnetic brake is 'off'.

(Caution 2) Use R<sup>1</sup>+C<sup>1</sup> in between the contacts.  
Also DV-OPOO 8 is available as an option.

## Key and Key Slot

M9GC ☐ B  
M9GS ☐ B



Type	A	B	C	D	E
M9GC□B	25	$5 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$5 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$5 \begin{smallmatrix} +0.050 \\ 0 \end{smallmatrix}$	$12 \begin{smallmatrix} 0 \\ -0.15 \end{smallmatrix}$
M9GS□B	30	$6 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$6 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$6 \begin{smallmatrix} +0.050 \\ 0 \end{smallmatrix}$	$14.5 \begin{smallmatrix} 0 \\ -0.15 \end{smallmatrix}$

■ Geared motor maximum permissible torque table [kg·cm]

Note : rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 2~20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.

### ■齒輪馬達最大承受扭力對照表

rpm表列數字乃根據馬達同步運轉之轉速，但在額定扭力負載情況下實際輸出轉速為同步運轉轉速的80~98%。灰色欄乃輸出軸運轉方向與馬達相同時的數據資料。白色欄乃輸出軸運轉方向與馬達相反時的數據資料。

■GEAR HEAD를 直結했을 때의 許容軸토크

★ 回転数は、同期速度の中間ギアヘッドで値(값)を表示하고 있습니다. 一般 回転数は負荷の 크기에 따라 表示値보다 2%~20% 작은(值)을 표시합니다.  
★ 回転方向은 ☐ 이 모터와 同方向 他는 逆方向입니다.

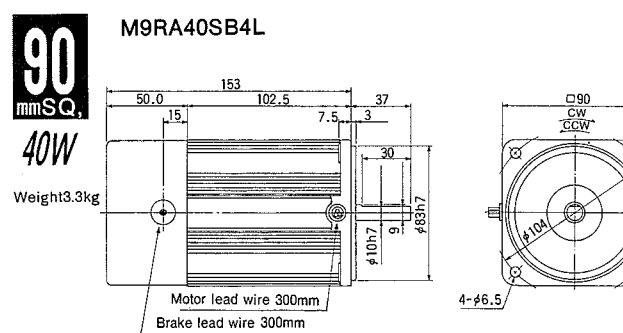
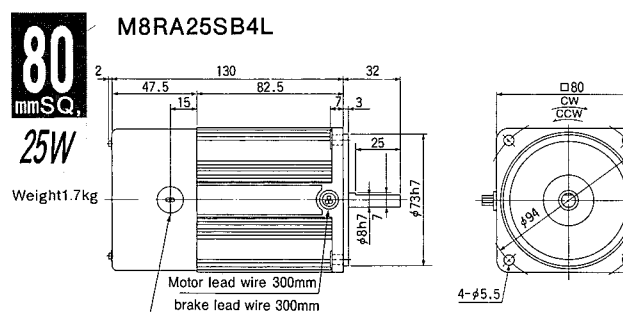
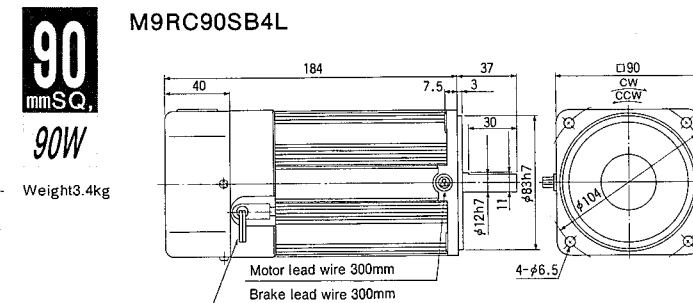
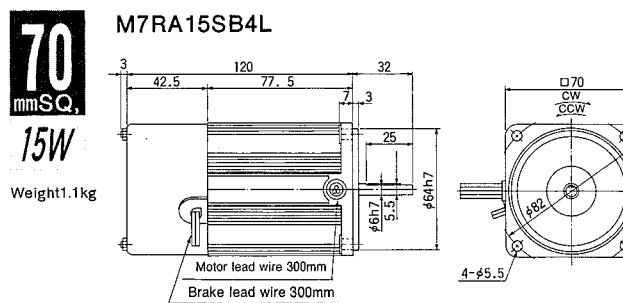
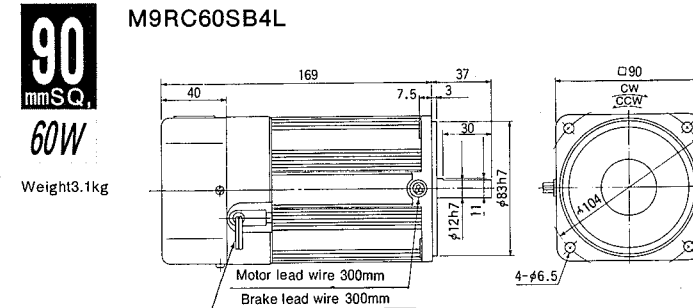
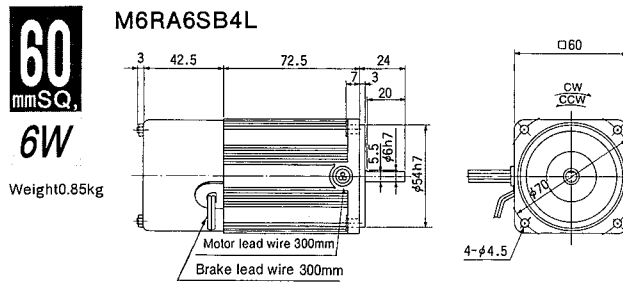
## ■ Specifications

[illegible]

Note : The box (□) represents the desired gear reduction ratio, which thereby becomes part of the code for geared motor.

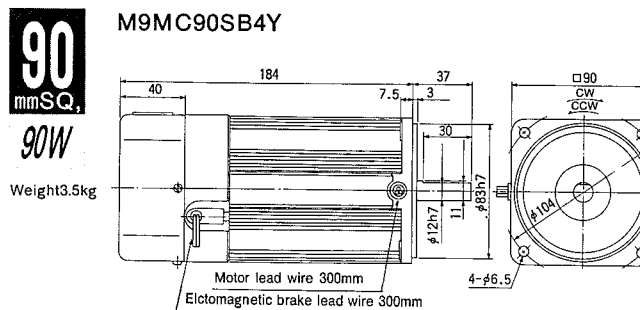
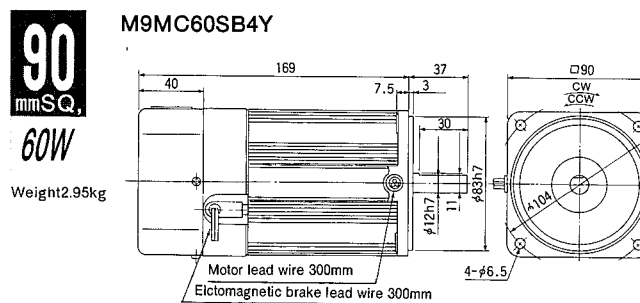
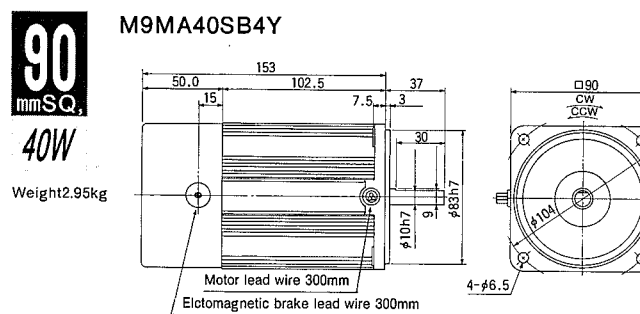
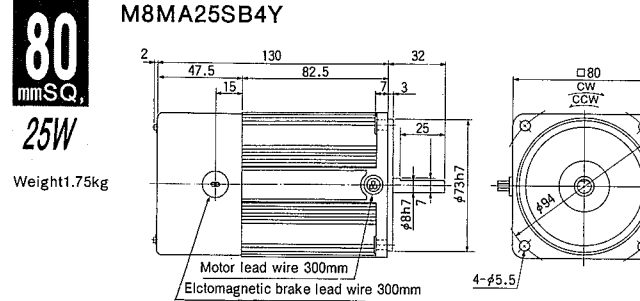
## Electro-Magnetic Brake Motor

Reversible/Lead Wire Type

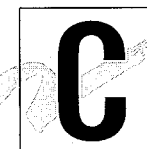
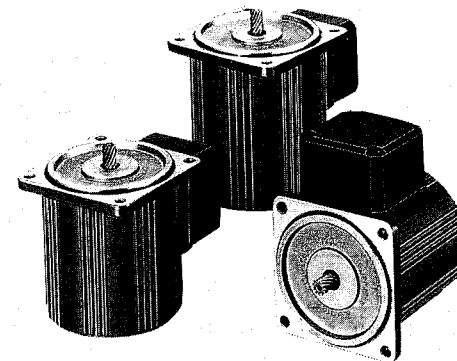


## Electro-Magnetic Brake Motor

Three Phase/Lead Wire Type







## Terminal Box Motor

### Terminal Box With Seal Connector

#### INDEX

- TERMINAL BOX  
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- TERMINAL BOX WITH SEALED CONNECTOR  
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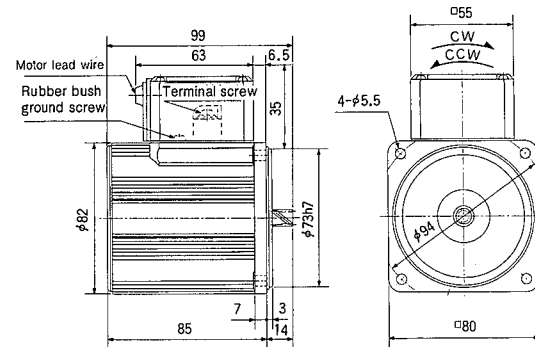
**Motor**

Scale 1/4 Unit mm

M8IA25GT4L 4P 25W 100V  
M8IA25GT4Y4P 25W 200V

**80**  
**mmSQ,**  
**25W**

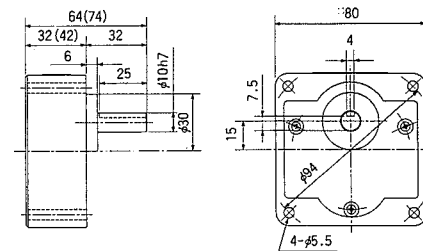
Weight 1.8kg  
helical gear  
module 1.6  
number of teeth 11



## Gear Head

Scale 1/4 Unit mm

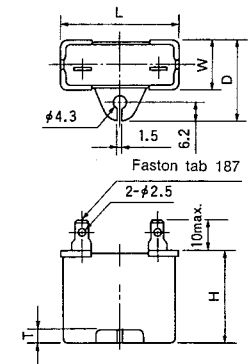
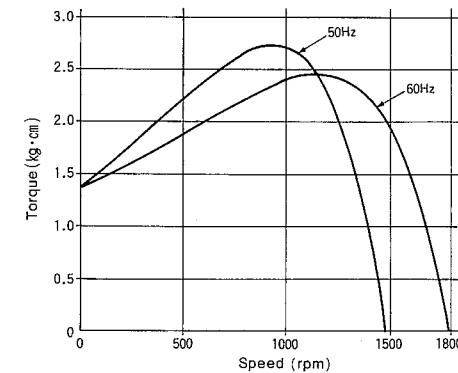
M8GA□M (metal bearing type) weight 0.68kg  
M8GA□B (ball bearing type)



Note : The value in "( )" is for gear ratio of 1/20 or larger.

### Speed-Torque Curve

M8IA25GT4L



## Capacitor

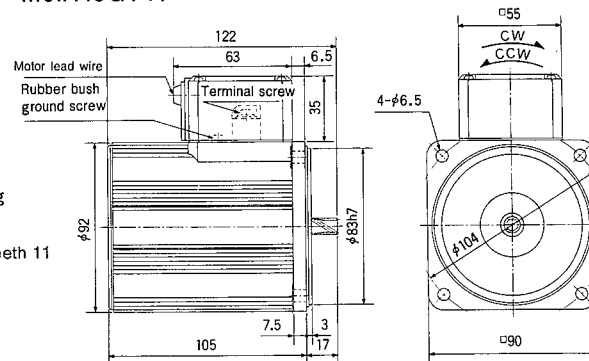
### ■ Dimensions of Capacitor (mm)

Motor Type	Capacitor Type	L	W	D	H	T
M8IA25GT4L 100V	MZAX045	39.5	17.5	28	30.5	4
M8IA25GT4Y 200V	MZAX063	39.5	22	32.5	32.5	4
M9IA40GT4L 100V	MZAX049	39.5	26.7	37	32	4
M9IA40GT4Y 200V	MZAX067	49.5	24	34.5	34.5	4

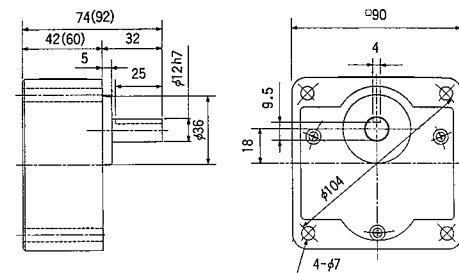
M9IA40GT4L 4P 40W 100V  
M9IA40GT4Y 4P 40W 200V

**90**  
**mmSQ,**  
**40W**

Weight 2.5kg  
helical gear  
module 0.6  
number of teeth 11

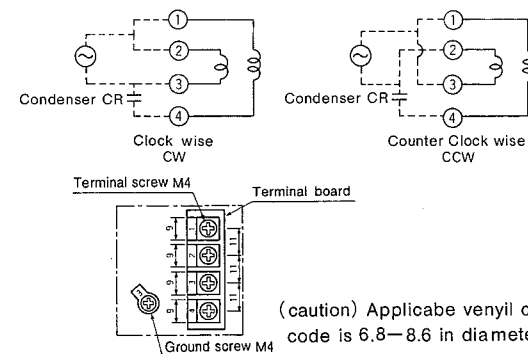


M9GA□M (metal bearing type) weight 1.2kg  
M9GA□B (ball bearing type)



Note : The value in "( )" is for gear ratio of 1/20 or larger.

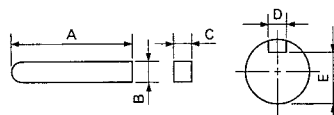
## Connecting Diagram



(caution) Applicabe venyil cap tire  
code is 6.8—8.6 in diameter.

### Key and Key Slot

M8GA ☐ M(B)  
M9GA ☐ M(B)



Type	A	B	C	D	E
M8GA□M(B)	25	$4 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$4 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$4 \begin{smallmatrix} +0.060 \\ +0.010 \end{smallmatrix}$	$7.5 \begin{smallmatrix} 0 \\ -0.15 \end{smallmatrix}$
M9GA□M(B)	25	$4 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$4 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$4 \begin{smallmatrix} +0.060 \\ +0.010 \end{smallmatrix}$	$9.5 \begin{smallmatrix} 0 \\ -0.15 \end{smallmatrix}$

■ Geared motor maximum permissible torque table (kg·cm)

Note : rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 3 ~ 20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.

### ■齒輪馬達最大承受扭力對照表

rpm 代表數字乃根據馬達同步運轉之轉速，但在額定扭力負載情況下實際輸出轉速為同步運轉轉速的 80~98%。灰色欄乃輸出軸運轉方向與馬達相同時的數據資料。白色欄乃輸出軸運轉方向與馬達相反時的數據資料。

■ GEAR HEAD를 直結했을 때의 許容軸토크

★回転数は 同期速度の 中間ギアレードに 値(값)을 表示하고 있습니다. 一般 回転数は負荷의 크기에 따라 表示値보다 2%~20% 적은(적은) 値을 표시합니다.

## ■ Specifications

Size mmsq.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Rated load				Starting Current (A)	Starting Torque (kg·cm)	Capacitor µF (V)	Applied gearhead type		
							Input (W)	Current (A)	Speed (rpm)	Torque (kg·cm)				Metal	Ball	Decima
80	M8IA25GT4L	4	25	100	50	CONT.	52	0.57	1325	1.8	1.2	1.4	6(200V)	M8GA□M	M8GA□B	M8GA10XM
					60		48	0.48	1625	1.5	1.1	1.4				
80	M8IA25GT4Y	4	25	200	50	CONT.	52	0.28	1325	1.8	0.6	1.4	1.5(400V)	M8GA□M	M8GA□B	M8GA10XM
					60		48	0.24	1625	1.5	0.55	1.4				
90	M9IA40GT4L	4	40	100	50	CONT.	79	0.87	1250	3.1	1.6	2.4	10(200V)	M9GA□M	M9GA□B	M9GA10XM
					60		74	0.74	1575	2.5	1.5	2.4				
90	M9IA40GT4Y	4	40	200	50	CONT.	79	0.44	1250	3.1	0.80	2.4	2.5(400V)	M9GA□M	M9GA□B	M9GA10XM
					60		74	0.37	1575	2.5	0.75	2.4				

																	With decimal gearhead									
Speed (rpm)		500	300	200	180	150	120	100	90	75	60	50	30	20	15	10	9	7.5	6	5	3	2	1.5	1.2	1	
Gear reduction ratio	50Hz	3	5	7.5	—	10	12.5	15	—	20	25	30	50	75	100	150	—	200	250	300	500	750	1000	1250	1500	
	60Hz	3.6	6	9	10	—	15	18	20	—	30	36	60	90	120	180	200	—	300	360	600	900	1200	1500	1800	
Maximum permissible torque (kg·cm)		4.0	6.7	10	11	13	16	20	21	26	32	39	65	80	80	80	—	—	80	80	80	80	80	80	80	
Maximum permissible torque (kg·cm)		6.7	11	16	18	23	28	33	36	45	54	65	100	100	100	100	—	—	100	100	100	100	100	100	100	

Note : The box (□) represents the desired gear reduction ratio, which thereby becomes part of the code for geared motor.

# Terminal Box Motor / Single Phase Induction

付帶終端盒馬達 單相感應馬達  
단자함 모터 단상 인덕션 모터

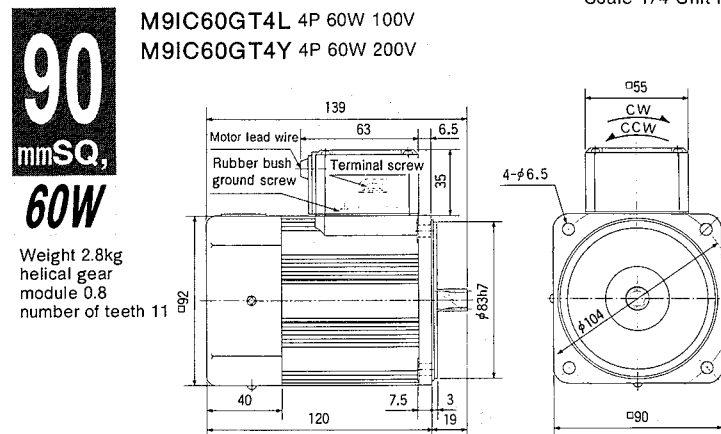
Panasonic



## Motor

M9IC60GT4L 4P 60W 100V  
M9IC60GT4Y 4P 60W 200V

Scale 1/4 Unit mm

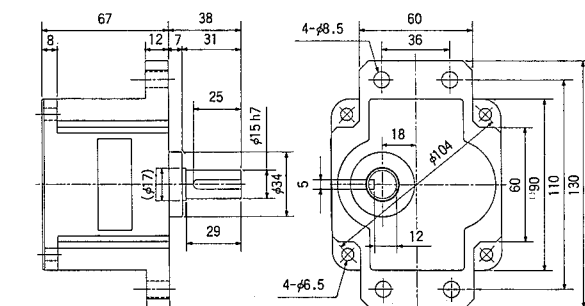


90 mmSQ, 60W  
Weight 2.8kg  
helical gear  
module 0.8  
number of teeth 11

## Gear Head

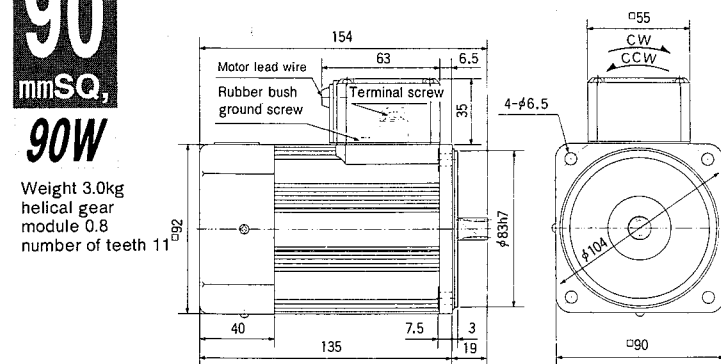
M9GC□B (ball bearing type) 1.5kg

Scale 1/4 Unit mm



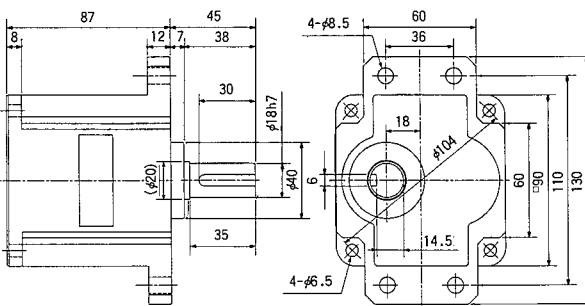
M9IC90GT4L 4P 90W 100V  
M9IC90GT4Y 4P 90W 200V

Scale 1/4 Unit mm



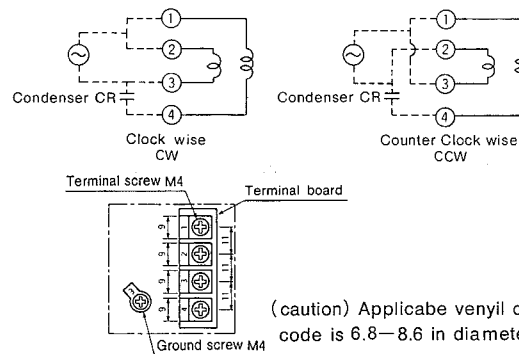
90 mmSQ, 90W  
Weight 3.0kg  
helical gear  
module 0.8  
number of teeth 11

M9GS□B (ball bearing type) 1.9kg



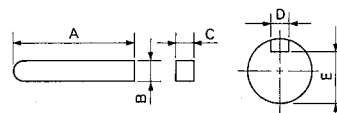
C type 200kg·cm/max. permissible torque  
S type 300kg·cm/max. permissible torque

## Connecting Diagram



## Key and Key Slot

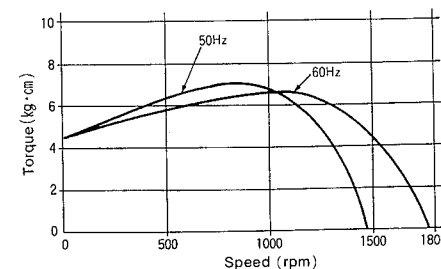
M9GC□B  
M9GS□B



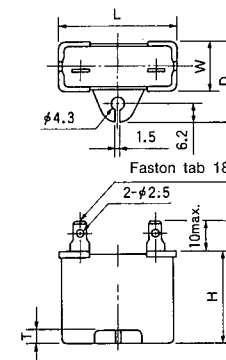
Type	A	B	C	D	E
M9GC□B	25	5 <sup>0</sup> <sub>-0.030</sub>	5 <sup>0</sup> <sub>-0.030</sub>	5 <sup>+0.050</sup> <sub>0</sub>	12 <sup>0</sup> <sub>-0.15</sub>
M9GS□B	30	6 <sup>0</sup> <sub>-0.030</sub>	6 <sup>0</sup> <sub>-0.030</sub>	6 <sup>+0.050</sup> <sub>0</sub>	14.5 <sup>0</sup> <sub>-0.15</sub>

## Speed-Torque Curve

M9IC60GT4L



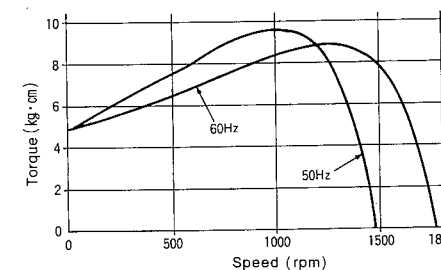
## Capacitor



## Dimensions of Capacitor (mm)

Motor Type	Capacitor Type	L	W	D	H	T
M9IC60GT4L 100V	MZAX051	39.5	26.7	37	41	4
M9IC60GT4Y 200V	MZAX069	50	26.7	37.5	38	4
M9IC90GT4L 100V	MZAX053	50.2	31	41	42	5
M9IC90GT4Y 200V	MZAX071	50	30.5	41	41.5	4

M9IC90GT4L



## Geared motor maximum permissible torque table (kg·cm)

Note : rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 3 ~ 20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.

## 齒輪馬達最大承受扭力對照表

rpm表列數字乃根據馬達同步運轉之轉速，但在額定扭力負載情況下實際輸出轉速為同步運轉轉速的80~98%。灰色欄乃輸出軸運轉方向與馬達相同時的數據資料。白色欄乃輸出軸運轉方向與馬達相反時的數據資料。

## GEAR HEAD를 직접했을 때의 許容軸토크

★回轉數는 同期速度의 中面기어헤드에 值(값)를 表示하고 있습니다. 一般 回轉數는 負荷의 크기에 따라 表示值보다 2%~20% 적은(值)을 표시합니다.  
★回轉方向은 □ 이 모터와 同方向 他는 逆方向입니다.

## Specifications

Size mmsq.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Rated load				Starting	Starting	Capacitor	Applied gearhead type		
							Input (W)	Current (A)	Speed (rpm)	Torque (kg·cm)	Current (A)	Torque (kg·cm)	Capacitor μF(V)	Metal	Ball	Decimal
90	M9IC60GT4L	4	60	100	50	CONT.	114	1.3	1275	4.6	2.2	4.5	15(200V)	—	M9GC□B	M9GC10XB
							114	1.20	1575	3.7	2.2	4.5				
90	M9IC60GT4Y	4	60	200	50	CONT.	114	0.65	1275	4.6	1.1	4.5	3.8(400V)		M9GS□B	
							114	0.60	1575	3.7	1.1	4.5				
90	M9IC90GT4L	4	90	100	50	CONT.	154	1.6	1325	6.5	3.4	4.8	25(200V)	—	M9GC□B	M9GC10XB
							161	1.7	1625	5.3	3.1	4.8				
90	M9IC90GT4Y	4	90	200	50	CONT.	154	0.80	1325	6.5	1.7	4.8	5.8(400V)		M9GS□B	
							161	0.85	1625	5.3	1.6	4.8				

																			With decimal gearhead							
Speed (rpm)	500	300	200	180	150	120	100	90	75	60	50	30	20	15	10	9	7.5	6	5	3	2	1.5	1	0.9	0.75	
Gear reduction ratio	50Hz	3	5	7.5	—	10	12.5	15	—	20	25	30	50	75	100	150	—	200	250	300	500	750	1000	1500	—	2000
	60Hz	3.6	6	9	10	—	15	18	20	—	30	36	60	90	120	180	200	—	300	360	600	900	1200	1800	2000	—
Maximum permissible torque (kg·cm)		10	16	24	27	32	40	48	54	64	77	93	155	200	200	200	200	200	200	200	200	200	200	200	200	200
Maximum permissible torque (kg·cm)		—	—	—	—	—	—	—	—	—	—	—	155	226	300	300	300	300	—	—	300	300	300	300	300	300
Maximum permissible torque (kg·cm)		14	23	35	38	46	58	69	77	92	111	133	206	200	200	200	200	200	200	200	200	200	200	200	200	200
Maximum permissible torque (kg·cm)		—	—	—	—	—	—	—	—	—	—	—	216	300	300	300	300	300	—	—	300	300	300	300	300	300

Note : The box (□) represents the desired gear reduction ratio, which thereby becomes part of the code for geared motor.

付帶終端盒馬達 單相可逆式馬達  
단자함 모터 단상 리버시블 모터

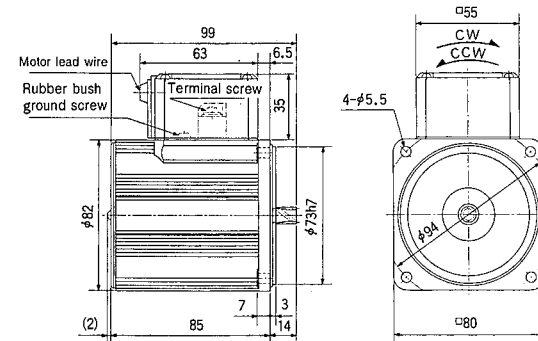
## Motor

Scale 1/4 Unit mm

**90**  
mmSQ,  
**80W**

Weight 1.6kg  
helical gear  
module 0.6  
number of teeth 11

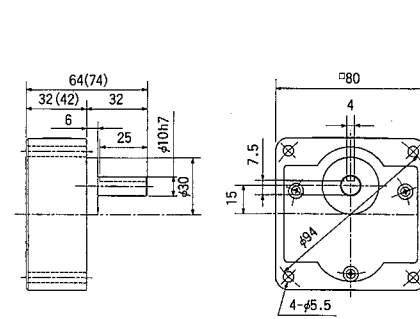
M8RA25GT4L 4P 25W 100V  
M8RA25GT4Y 4P 25W 200V



## Gear Head

Scale 1/4 Unit mm

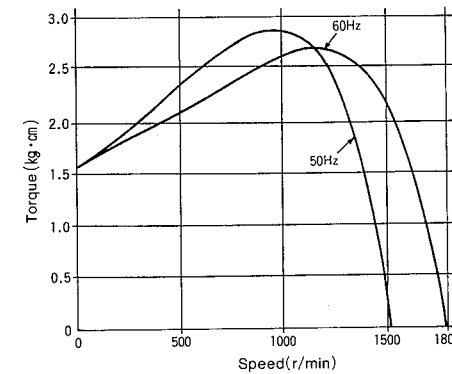
M8GA□M (metal bearing type) weight 0.68kg  
M8GA□B (ball bearing type)



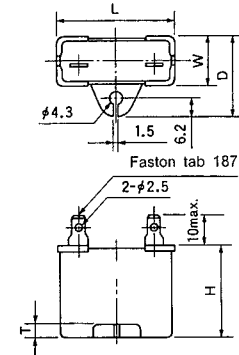
Note : The value in "( )" is for gear ratio of 1/20 or larger.

## Speed-Torque Curve

M8RA25GT4L



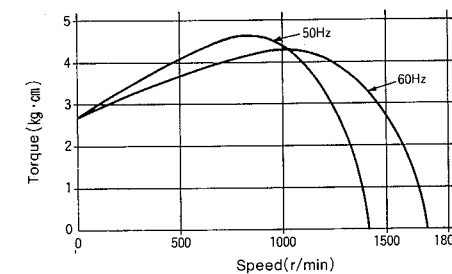
## Capacitor



## ■ Dimensions of Capacitor (mm)

Motor Type	Capacitor Type	L	W	D	H	T
M8RA25GT4L 100V	MZAX048	39.5	22	32.5	32.5	4
M8RA25GT4Y 200V	MZAX066	49.7	24	34.5	34.5	4
M9RA40GT4L 100V	MZAX051	39.5	26.7	37	41	4
M9RA40GT4Y 200V	MZAX069	50	26.7	37.5	38	4

M9RA40GT4L



## ■ Geared motor maximum permissible torque table (kg·cm)

Note : rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 3~20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.

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## ■ GEAR HEAD를 直結했을 때의 許容軸토크

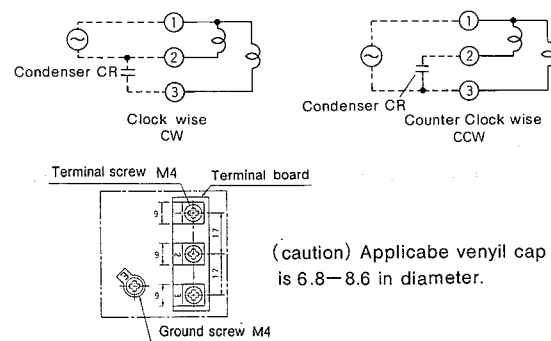
★ 回転数は 同期速度の 中間ギアヘッドに 値(값)를 表示하고 있습니다. 一般 回転数は 負荷의 크기에 따라 表示値보다 2%~20% 적은(值)를 표시합니다.

★ 回転方向은 □ 이 모터의 同方向 他는 逆方向입니다.

Speed (rpm)	With decimal gearhead															
	500	300	200	180	150	120	100	90	75	60	50	30	20	15	10	9
Gear reduction ratio	3	5	7.5	10	12.5	15	20	25	30	36	45	60	75	100	150	200
Maximum permissible torque (kg·cm)	4.0	6.7	10	11	13	16	20	21	26	32	39	65	80	80	80	80

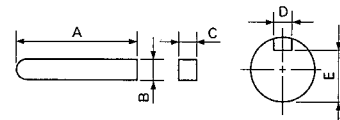
Note : The box (□) represents the desired gear reduction ratio, which thereby becomes part of the code for geared motor.

## Connecting Diagram



## Key and Key Slot

M8GA□M(B)  
M9GA□M(B)



Type	A	B	C	D	E
M8GA□M(B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.010</sub>	7.5 <sup>0</sup> <sub>-0.15</sub>
M9GA□M(B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.010</sub>	9.5 <sup>0</sup> <sub>-0.15</sub>

## ■ Specifications

Size mmSQ	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Rated load				Starting Current (A)	Starting Torque (kg·cm)	Capacitor μF(V)	Applied gearhead type		
							Input (W)	Current (A)	Speed (rpm)	Torque (kg·cm)				Metal	Ball	Decimal
80	M8RA25GT4L	4	25	100	50	30min	55	0.55	1300	1.9	1.0	1.4	9.5(200V)	M8GA□M	M8GA□B	M8GA10XM
					60	30min	57	0.58	1625	1.5	1.0	1.5				
80	M8RA25GT4Y	4	25	200	50	30min	55	0.28	1300	1.9	0.50	1.4	2.4(400V)	M8GA□M	M8GA□B	M8GA10XM
					60	30min	57	0.29	1625	1.5	0.50	1.5				
90	M9RA40GT4L	4	40	100	50	30min	92	0.95	1150	3.3	1.6	2.6	15(200V)	M9GA□M	M9GA□B	M9GA10XM
					60	30min	92	0.93	1475	2.6	1.6	2.6				
90	M9RA40GT4Y	4	40	200	50	30min	92	0.48	1150	3.3	0.80	2.6	3.8(400V)	M9GA□M	M9GA□B	M9GA10XM
					60	30min	92	0.47	1475	2.6	0.80	2.6				

# Terminal Box Motor / Single Phase Reversible

付帶終端盒馬達單相可逆式馬達  
단자함 모터 단상 리버시블 모터

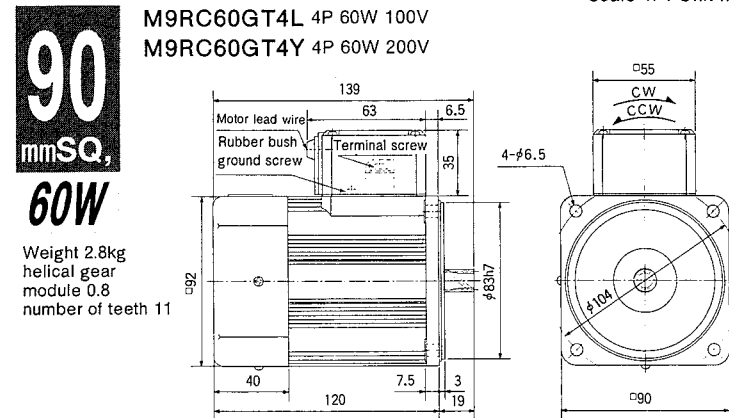
Panasonic



## Motor

M9RC60GT4L 4P 60W 100V  
M9RC60GT4Y 4P 60W 200V

Scale 1/4 Unit mm

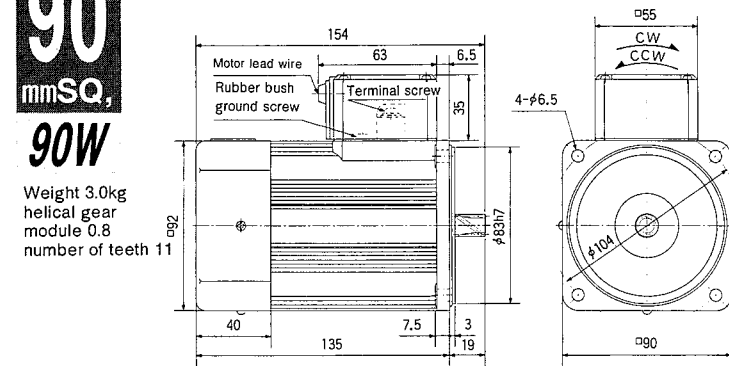


90  
mmSQ,  
60W

Weight 2.8kg  
helical gear  
module 0.8  
number of teeth 11

M9RC90GT4L 4P 90W 100V  
M9RC90GT4Y 4P 90W 200V

Scale 1/4 Unit mm



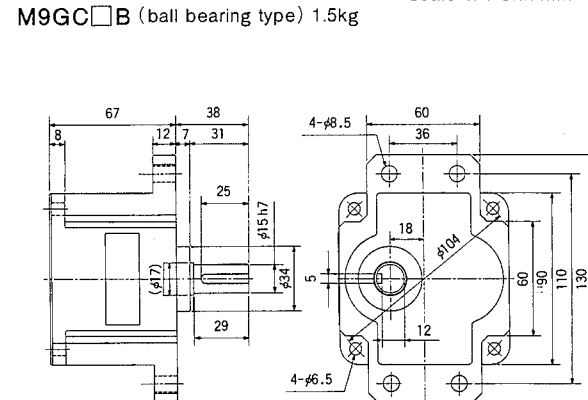
90  
mmSQ,  
90W

Weight 3.0kg  
helical gear  
module 0.8  
number of teeth 11

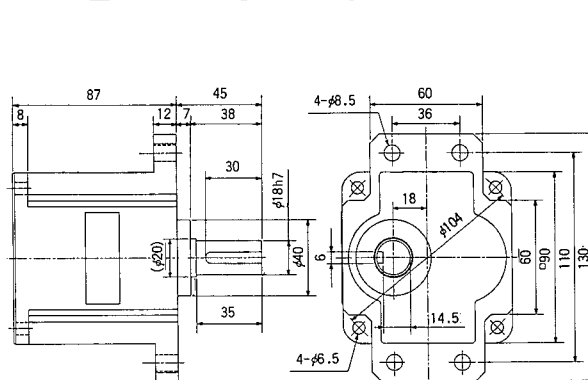
## Gear Head

M9GC□B (ball bearing type) 1.5kg

Scale 1/4 Unit mm

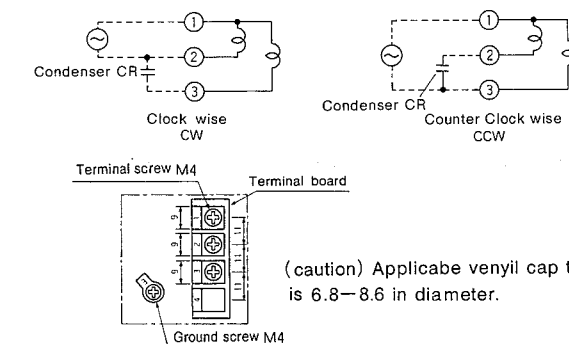


M9GS□B (ball bearing type) 1.9kg



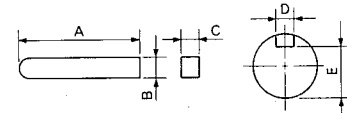
C type 200kg·cm/max. permissible torque  
S type 300kg·cm/max. permissible torque

## Connecting Diagram



## Key and Key Slot

M9GC□B  
M9GS□B



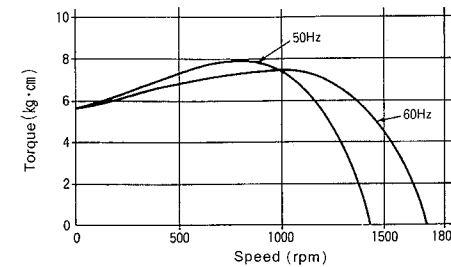
Type	A	B	C	D	E
M9GC□B	25	5 <sup>0</sup> <sub>-0.030</sub>	5 <sup>0</sup> <sub>-0.030</sub>	5 <sup>+0.050</sup> <sub>0</sub>	12 <sup>0</sup> <sub>-0.15</sub>
M9GS□B	30	6 <sup>0</sup> <sub>-0.030</sub>	6 <sup>0</sup> <sub>-0.030</sub>	6 <sup>+0.050</sup> <sub>0</sub>	14.5 <sup>0</sup> <sub>-0.15</sub>

## Specifications

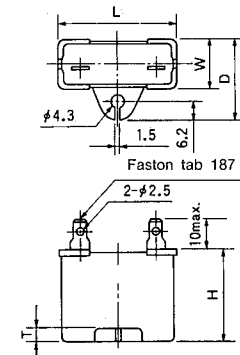
Size mmsq.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Rated load				Starting Current (A)	Starting Torque (kg·cm)	Capacitor μF (V)	Applied gearhead type		
							Input (W)	Current (A)	Speed (rpm)	Torque (kg·cm)				Metal	Ball	Decimal
90	M9RC60GT4L	4	60	100	50	30min	139	1.5	1250	4.7	2.4	5.5	25(200V)	—	M9GC□B	M9GC10XB
							148	1.6	1550	3.8	2.4	5.5				
90	M9RC60GT4Y	4	60	200	50	30min	139	0.75	1250	4.7	1.2	5.5	6.2(375V)	—	M9GS□B	M9GC10XB
							148	0.80	1550	3.8	1.2	5.5				
90	M9RC90GT4L	4	90	100	50	30min	184	1.9	1200	7.3	3.0	6.8	30(200V)	—	M9GC□B	M9GC10XB
							190	1.9	1500	5.8	3.0	6.8				
90	M9RC90GT4Y	4	90	200	50	30min	184	0.95	1200	7.3	1.5	6.8	7.5(370V)	—	M9GS□B	M9GC10XB
							190	0.95	1500	5.8	1.5	6.8				

## Speed-Torque Curve

M9RC60GT4L



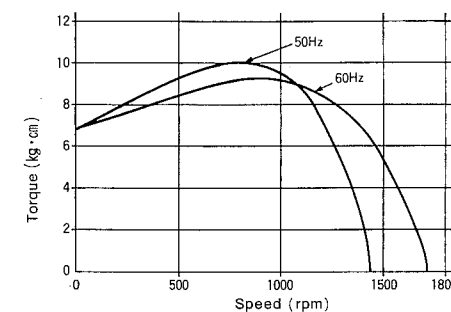
## Capacitor



## Dimensions of Capacitor (mm)

Motor Type	Capacitor Type	L	W	D	H	T
M9RC60GT4L 100V	MZAX053	50.2	31	41	42	5
M9RC60GT4Y 200V	MZAX072	50	30.5	41	41.5	4
M9RC90GT4L 100V	MZAX054	50.2	31	41	42	5
M9RC90GT4Y 200V	MZAX073	50	34	45	45	6

M9RC90GT4L



## Geared motor maximum permissible torque table (kg·cm)

Note : rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 3~20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.

## 齒輪馬達最大承受扭力對照表

rpm表列數字乃根據馬達同步運轉之轉速，但在額定扭力負載情況下實際輸出轉速為同步運轉轉速的80~98%。灰色欄乃輸出軸運轉方向與馬達相同時的數據資料。白色欄乃輸出軸運轉方向與馬達相反時的數據資料。

## GEAR HEAD를 직접했을 때의 許容軸토크

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★回転方向은 □ 이 모터와 同方向 他는 逆方向입니다.

																		With decimal gearhead								
	Speed (rpm)	500	300	200	180	150	120	100	90	75	60	50	30	20	15	10	9	7.5	6	5	3	2	1.5	1	0.9	0.75
Gear reduction ratio	50Hz	3	5	7.5	—	10	12.5	15	—	20	25	30	50	75	100	150	—	200	250	300	500	750	1000	1500	—	2000
	60Hz	3.6	6	9	10	—	15	18	20	—	30	36	60	90	120	180	200	—	300	360	600	900	1200	1800	2000	—
Maximum permissible torque (kg·cm)		10	16	24	27	32	40	48	54	64	77	93	155	200	200	200	200	200	200	200	200	200	200	200	200	200
Maximum permissible torque (kg·cm)		—	—	—	—	—	—	—	—	—	—	—	155	226	300	300	300	300	—	—	300	300	300	300	300	300
Maximum permissible torque (kg·cm)		14	23	35	38	46	58	69	77	92	111	133	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Maximum permissible torque (kg·cm)		—	—	—	—	—	—	—	—	—	—	—	216	300	300	300	300	300	—	—	300	300	300	300	300	300

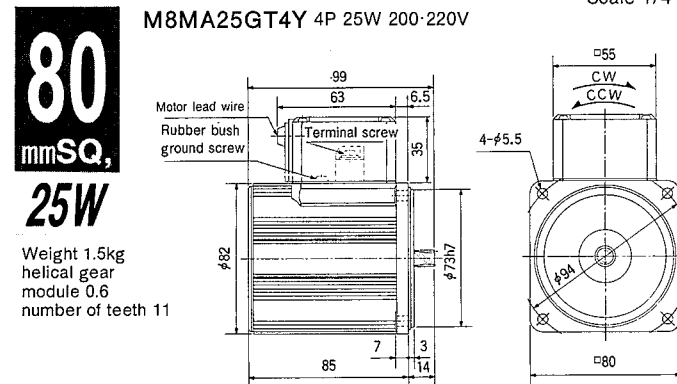
Note : The box (□) represents the desired gear reduction ratio, which thereby becomes part of the code for geared motor.



## Motor

M8MA25GT4Y 4P 25W 200-220V

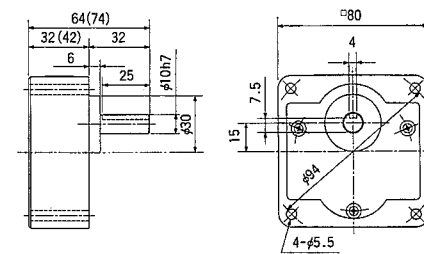
Scale 1/4 Unit mm



## Gear Head

M8GA□M (metal bearing type) weight 0.68kg  
M8GA□B (ball bearing type)

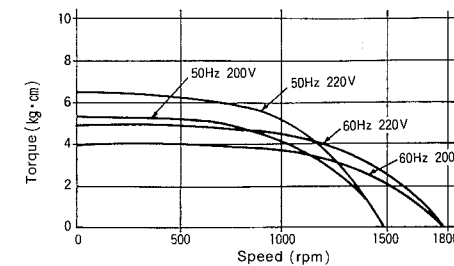
Scale 1/4 Unit mm



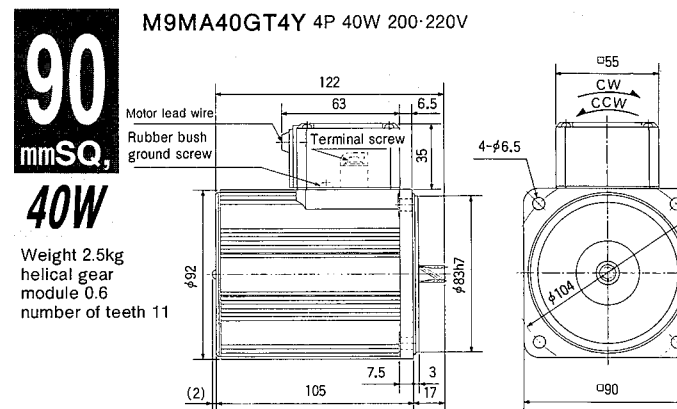
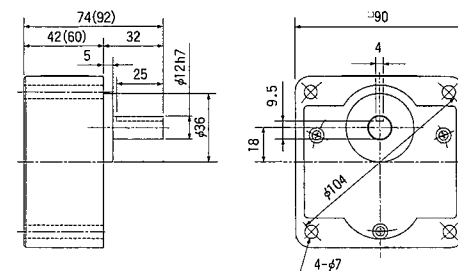
Note: The value in "( )" is for gear ratio of 1/20 or larger.

## Speed-Torque Curve

M8MA25GT4Y

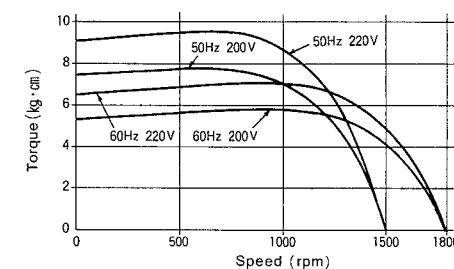


M9MA40GT4Y 4P 40W 200-220V

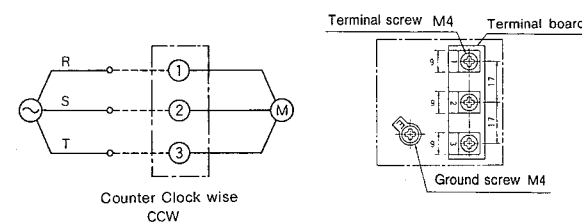
M9GA□M (metal bearing type) weight 1.2kg  
M9GA□B (ball bearing type)

Note: The value in "( )" is for gear ratio of 1/20 or larger.

M9MA40GT4Y

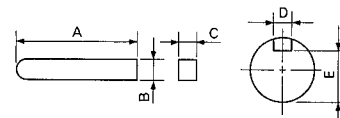


## Connecting Diagram



As for CW rotation, change the 2 leads among R, S, T shown above.  
(caution) Applicable vinyl cap tire code is 6.8—8.6 in diameter.

## Key and Key Slot

M8GA□M(B)  
M9GA□M(B)

Type	A	B	C	D	E
M8GA□M(B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.010</sub>	7.5 <sup>0</sup> <sub>-0.15</sub>
M9GA□M(B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.010</sub>	9.5 <sup>0</sup> <sub>-0.15</sub>

## Geared motor maximum permissible torque table (kg·cm)

Note: rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 2~20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.

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★回轉方向은 □ 이 모터와 同方向 他는 逆方向입니다.

## Specifications

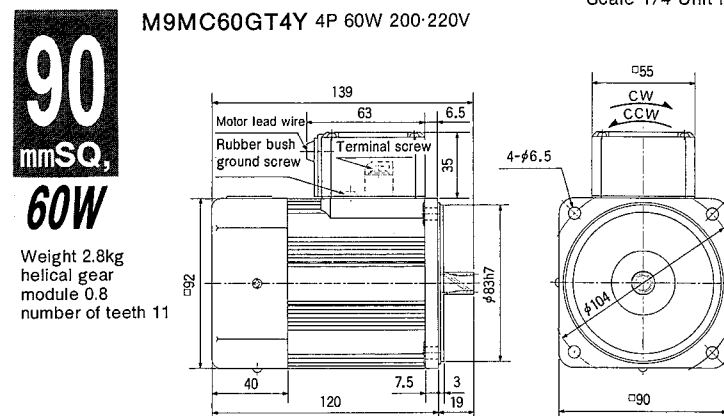
Size mmsq.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Rated load				Starting Current (A)	Starting Torque (kg·cm)	Capacitor μF(V)	Applied gearhead type				Speed (rpm)		500	300	200	180	150	120	100	90	75	60	50	30	20	15	10	9	7.5	6	5	3	2	1.5	1																													
							Input (W)	Current (A)	Speed (rpm)	Torque (kg·cm)				Metal	Ball	Decimal		Gear reduction ratio	50Hz	60Hz	3	5	7.5	—	10	12.5	15	—	20	25	30	50	75	100	150	—	200	250	300	500	750	1000	1500																												
80	M8MA25GT4Y	4	25	200	50	CONT.	46	0.20	1325	1.8	0.53	5.3	—	M8GA□M	M8GA□B	M8GA10XM		Maximum permissible torque (kg·cm)	4.0	6.7	10	11	13	16	20	21	26	32	39	65	80	80	80	80	80	80	80	80	80	80	80																														
					60		43	0.18	1600	1.5	0.52	4.1	—																																																										
		4	25	220	50	CONT.	46	0.22	1375	1.8	0.58	6.6	—																													Maximum permissible torque (kg·cm)	4.0	6.7	10	11	13	16	20	21	26	32	39	65	80	80	80	80	80	80	80	80	80	80	80	80	80	80			
					60		45	0.19	1650	1.5	0.54	5.0	—																																																										
90	M9MA40GT4Y	4	40	200	50	CONT.	66	0.30	1375	2.9	1.0	7.4	—	M9GA□M	M9GA□B	M9GA10XM		Maximum permissible torque (kg·cm)	6.7	11	16	18	23	30	36	36	44	55	66	100	100	100	100	100	100	100	100	100	100	100	100	100																													
					60		62	0.27	1650	2.4	0.90	5.4	—																																																										
		4	40	220	50	CONT.	66	0.31	1400	2.8	1.1	9.0	—																														Maximum permissible torque (kg·cm)	6.7	11	16	18	23	30	36	36	44	55	66	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
					60		62	0.27	1675	2.31	0.98	6.5	—																																																										

Note: The box (□) represents the desired gear reduction ratio, which thereby becomes part of the code for geared motor.

**Motor**

M9MC60GT4Y 4P 60W 200-220V

Scale 1/4 Unit mm

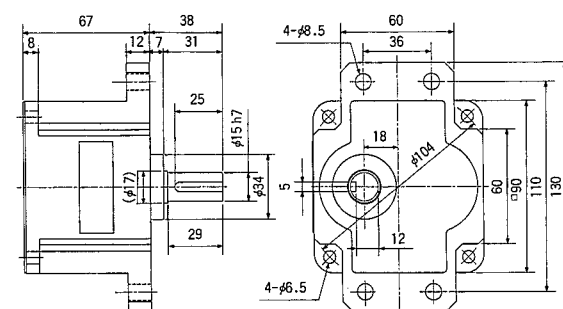


Weight 2.8kg  
helical gear  
module 0.8  
number of teeth 11

## Gear Head

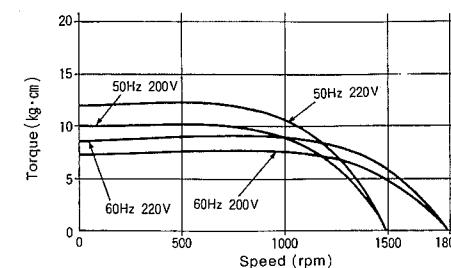
M9GC□B (ball bearing type) 1.5kg

Scale 1/4 Unit mm



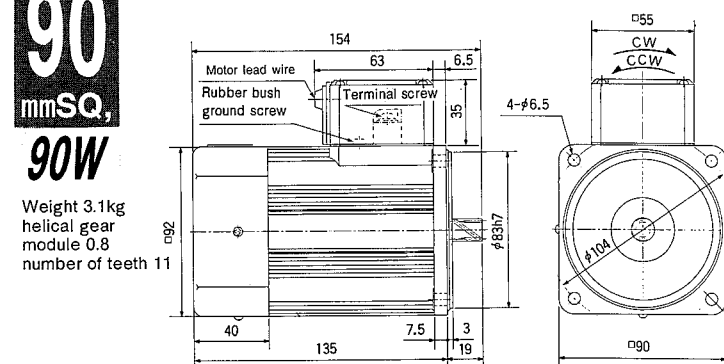
### Speed-Torque Curve

M9MC60GT4Y



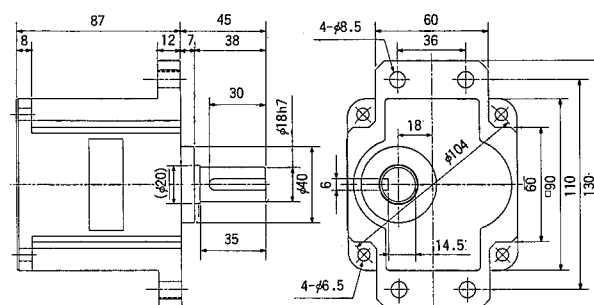
**M9MC90GT4Y 4P 90W 200-220V**

□55



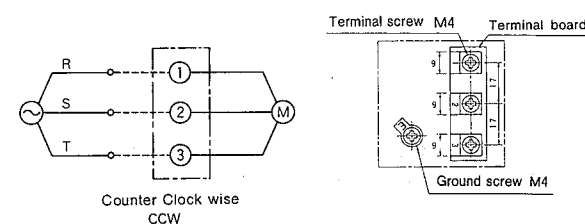
Weight 3.1kg  
helical gear  
module 0.8  
number of tee

M9GS□B (ball bearing type) 1.9kg



C type 200kg·cm/max. permissible torque  
S type 300kg·cm/max. permissible torque

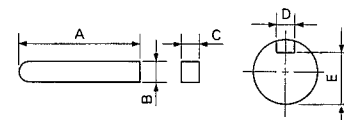
### Connecting Diagram



As for CW rotation, change the 2 leads among R. S. T. shown above.  
(caution) Applicabe-venyil cap tire code is 6.8—8.6 in diameter.

### Key and Key Slot

M9GC ☐ B  
M9GS ☐ B



Type	A	B	C	D	E
M9GC□B	25	$5 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$5 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$5 \begin{smallmatrix} +0.050 \\ 0 \end{smallmatrix}$	$12 \begin{smallmatrix} 0 \\ -0.15 \end{smallmatrix}$
M9GS□B	30	$6 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$6 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$6 \begin{smallmatrix} +0.050 \\ 0 \end{smallmatrix}$	$14.5 \begin{smallmatrix} 0 \\ -0.15 \end{smallmatrix}$

■ Geared motor maximum permissible torque table (kg·cm)

Note : rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 2~20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.

### ■齒輪馬達最大承受扭力對照表

rpm表數字乃根據馬達同步運轉之轉速，但在額定扭力負載情況下實際輸出轉速為同步運轉轉速的80~98%。灰色欄乃輸出軸運轉方向與馬達相同時的數據資料。白色欄乃輸出軸運轉方向與馬達相反時的數據資料。

## ■GEAR HEAD를 直結했을 때의 許容軸토크

★回転数は同期速度の中間に於いて値(값)を表示하고 있습니다. 一般 回転数は負荷の 크기에 따라 表示値보다 2%~20% 적은(値)을 표시합니다.

## ■ Specifications

Size mmsq.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Rated load				Starting	Starting	Capacitor µF (V)	Applied gearhead type		
							Input (W)	Current (A)	Speed (rpm)	Torque (kg·cm)	Current (A)	Torque (kg·cm)		Metal	Ball	Decimal
90	M9MC60GT4Y	4	60	200	50	CONT.	101	0.44	1350	4.3	1.4	10	—	—	M9GC□B	M9GC10XB
					97		0.40	1625	3.6	1.2	7.3	M9GS□B				
		4	60	220	50	CONT.	101	0.46	1400	4.2	1.5		12		—	
					97		0.40	1675	3.5	1.4	8.6					
90	M9MC90GT4Y	4	90	200	50	CONT.	141	0.62	1375	6.4	2.0	17	—	—	M9GC□B	M9GC10XB
					139		0.57	1625	5.4	1.9	12	M9GS□B				
		4	90	220	50	CONT.	144	0.65	1400	6.3	2.3		21		—	
					138		0.56	1675	5.3	2.1	15					

																		With decimal gearhead								
Speed (rpm)	500	300	200	180	150	120	100	90	75	60	50	30	20	15	10	9	7.5	6	5	3	2	1.5	1	0.9	0.7	
Gear reduction ratio	50Hz	3	5	7.5	—	10	12.5	15	—	20	25	30	50	75	100	150	—	200	250	300	500	750	1000	1500	—	2000
	60Hz	3.6	6	9	10	—	15	18	20	—	30	36	60	90	120	180	200	—	300	360	600	900	1200	1800	2000	—
Maximum permissible torque (kg·cm)		10	16	24	27	32	40	48	54	64	77	93	155	200	200	200	200	200	200	200	200	200	200	200	200	200
Maximum permissible torque (kg·cm)		—	—	—	—	—	—	—	—	—	—	155	226	300	300	300	300	—	—	300	300	300	300	300	300	300
Maximum permissible torque (kg·cm)		14	23	35	38	46	58	69	77	92	111	133	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Maximum permissible torque (kg·cm)		—	—	—	—	—	—	—	—	—	—	216	300	300	300	300	300	—	—	300	300	300	300	300	300	300

Note : The box (□) represents the desired gear reduction ratio, which thereby becomes part of the code for geared motor.



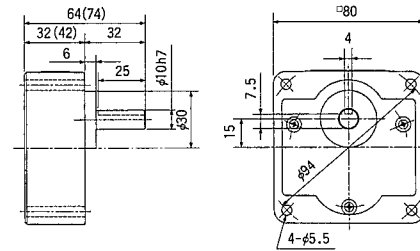
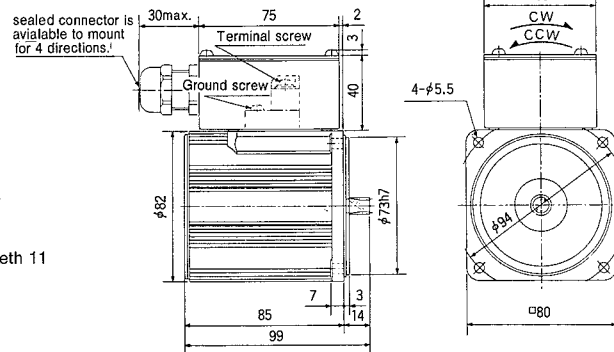


## Gear Head

Scale 1/4 Unit mm

Scale 1/4 Unit mm

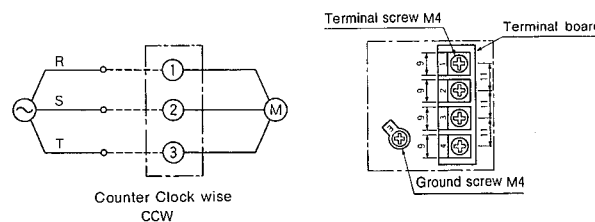
Weight 1.8kg  
helical gear  
module 0.6  
number of teeth 11



Note : The value in "( )" is for gear ratio of 1/20 or larger.

Note : The value in "( )" is for gear ratio of 1/20 or larger.

### Key and Key Slot



As for CW rotation, change the 2 leads among R. S. T. shown above.  
(caution) Applicabe venyil cap tire code is 6.8—8.6 in diameter.

The technical drawing shows a mechanical part with two views. The front view (left) is a horizontal cylinder with a rounded end, labeled with dimension A for its length and B for its diameter. The top view (right) shows a circle with a square feature on top, labeled with dimension D for the square's width and E for the circle's diameter. A dimension C indicates the distance from the right end of the cylinder to the center of the square feature.

Type	A	B	C	D	E
M8GA□M(B)	25	$4 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$4 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$4 \begin{smallmatrix} +0.060 \\ +0.010 \end{smallmatrix}$	$7.5 \begin{smallmatrix} 0 \\ -0.15 \end{smallmatrix}$
M9GA□M(B)	25	$4 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$4 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$4 \begin{smallmatrix} +0.060 \\ +0.010 \end{smallmatrix}$	$9.5 \begin{smallmatrix} 0 \\ -0.15 \end{smallmatrix}$

■ Geared motor maximum permissible torque table (kg·cm)

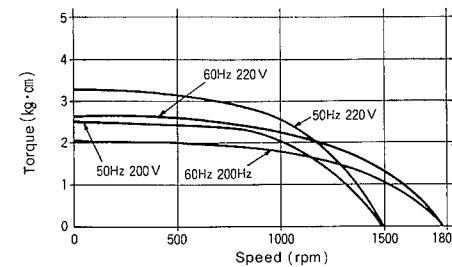
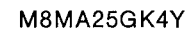
Note : rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 2~20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.

### ■齒輪馬達最大承受扭力對照表

rpm表列數字乃根據馬達同步運轉之轉速，但在額定推力負載情況下實際輸出轉速為同步轉速的80~98%。灰色欄乃輸出軸運轉方向與馬達相同時的數據資料。白色欄乃輸出軸運轉方向與馬達相反時的數據資料。

### ■ GEAR HEAD를 直結했을 때의 許容軸토크

★回轉數는 同期速度의 中間기어하드에 值(값)을 表示하고 있습니다. 一般 回轉數는 負荷의 크기에 따라 表示値보다 2%~20% 작을(値)을 表示합니다.



																	With decimal gearhead							
Speed (rpm)		500	300	200	180	150	120	100	90	75	60	50	30	20	15	10	9	7.5	6	5	3	2	1.5	1
Gear reduction ratio	50Hz	3	5	7.5	—	10	12.5	15	—	20	25	30	50	75	100	150	—	200	250	300	500	750	1000	1500
	60Hz	3.6	6	9	10	—	15	18	20	—	30	36	60	90	120	180	200	—	300	360	600	900	1200	1800
Maximum permissible torque (kg·cm)		4.0	6.7	10	11	13	16	20	21	26	32	39	65	80	80	80	80	80	80	80	80	80	80	80
Maximum permissible torque (kg·cm)		6.7	11	16	18	23	28	33	36	45	54	65	100	100	100	100	100	100	100	100	100	100	100	100

Note : The box (□) represents the desired gear reduction ratio, which thereby becomes part of the code for geared motor.



# Terminal Box With Seal Connector / Three Phase Induction Motor

終端盒(付帶封閉式連接器) 三相感應馬達  
단자함(실-콘넥터) 삼상 인덕션 모터

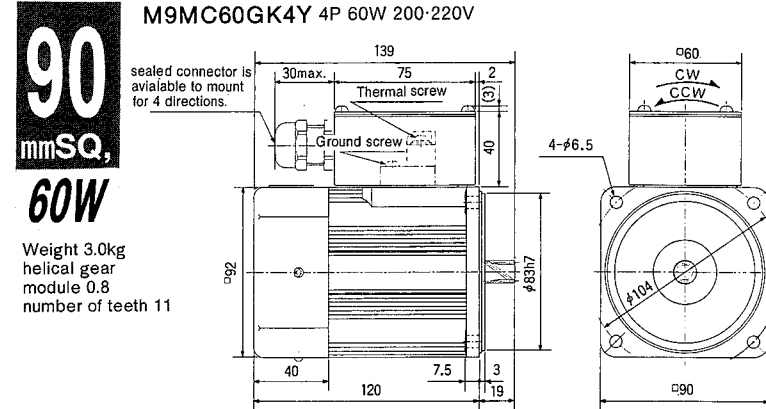
Panasonic



## Motor

M9MC60GK4Y 4P 60W 200-220V

Scale 1/4 Unit mm



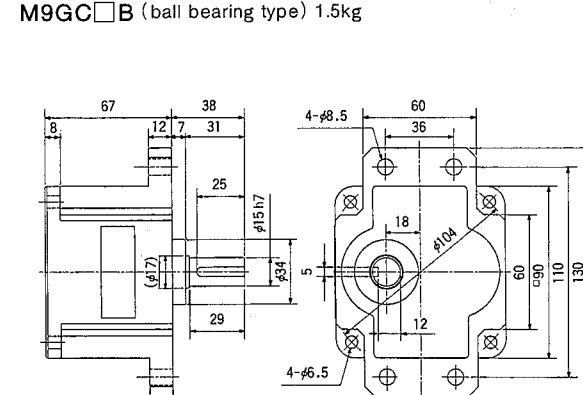
90  
mmSQ,  
60W

Weight 3.0kg  
helical gear  
module 0.8  
number of teeth 11

## Gear Head

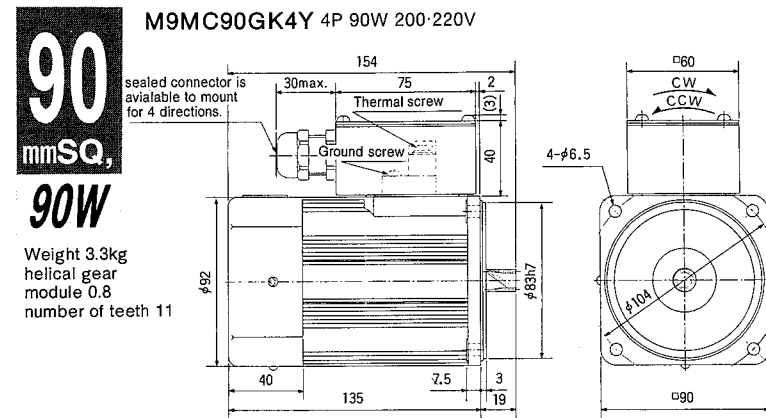
M9GC□B (ball bearing type) 1.5kg

Scale 1/4 Unit mm



M9MC90GK4Y 4P 90W 200-220V

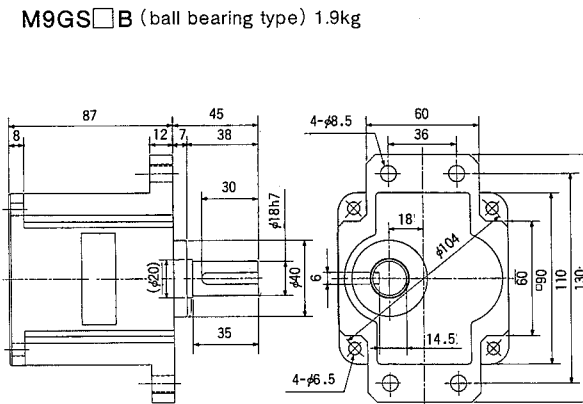
Scale 1/4 Unit mm



90  
mmSQ,  
90W

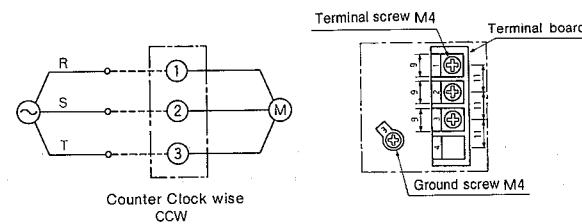
Weight 3.3kg  
helical gear  
module 0.8  
number of teeth 11

M9GS□B (ball bearing type) 1.9kg



C type 200kg·cm/max. permissible torque  
S type 300kg·cm/max. permissible torque

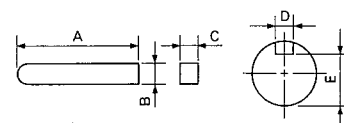
## Connecting Diagram



As for CW rotation, change the 2 leads among R, S, T.  
shown above.  
(caution) Applicable vinyl cap tire code is 6.8—8.6 in dia-  
meter.

## Key and Key Slot

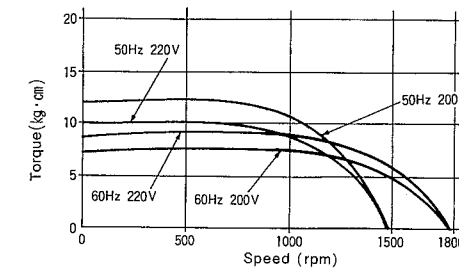
M9GC□B  
M9GS□B



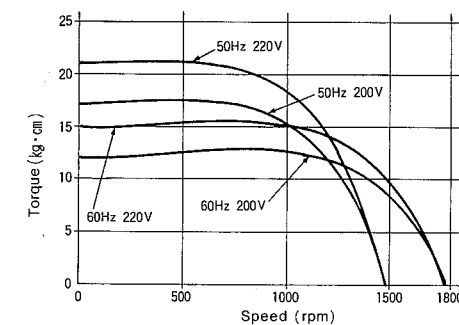
Type	A	B	C	D	E
M9GC□B	25	5 <sup>0</sup> <sub>-0.030</sub>	5 <sup>0</sup> <sub>-0.030</sub>	5 <sup>+0.050</sup> <sub>0</sub>	12 <sup>0</sup> <sub>-0.15</sub>
M9GS□B	30	6 <sup>0</sup> <sub>-0.030</sub>	6 <sup>0</sup> <sub>-0.030</sub>	6 <sup>+0.050</sup> <sub>0</sub>	14.5 <sup>0</sup> <sub>-0.15</sub>

## Speed-Torque Curve

M9MC60GK4Y



M9MC90GK4Y



## Geared motor maximum permissible torque table (kg·cm)

Note : rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 2~20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.

### 齒輪馬達最大承受扭力對照表

rpm表列數字乃根據馬達同步運轉之轉速，但在額定扭力負載情況下實際輸出轉速為同步運轉轉速的80~98%。灰色欄乃輸出軸運轉方向與馬達相同時的數據資料。白色欄乃輸出軸運轉方向與馬達相反時的數據資料。

### GEAR HEAD를 직결했을 때의 許容軸토크

★回轉數는 同期速度의 中間기어에 值(값)를 表示하고 있습니다. 一般 回轉數는 負荷의 크기 에 따라 表示值보다 2%~20% 작은(值)를 표시합니다.

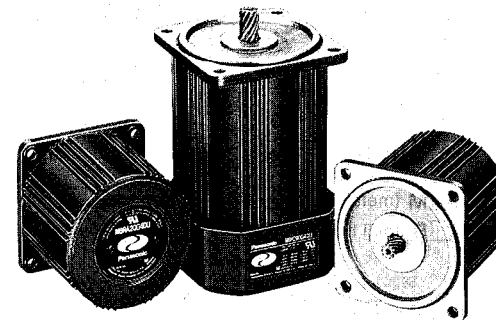
★回轉方向은 □ 이 모터와 同方向 他는 逆方向입니다.

## Specifications

Size mmsq.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Rated load				Starting	Starting	Capacitor	Applied gearhead type		
							Input (W)	Current (A)	Speed (rpm)	Torque (kg·cm)	Current (A)	Torque (kg·cm)	Capacitor μF (V)	Metal	Ball	Decimal
90	M9MC60GK4Y	4	60	200	50	CONT.	101	0.44	1350	4.3	1.4	10.0	—	—	M9GC□B	M9GC10XB
					60		97	0.40	1625	3.6	1.2	7.2				
		4	60	200	50	CONT.	101	0.46	1400	4.2	1.5	12.0	—		M9GS□B	
					60		97	0.40	1675	3.5	1.4	8.6				
90	M9MC90GK4Y	4	90	200	50	CONT.	141	0.62	1375	6.4	2.0	17.0	—	—	M9GC□B	M9GC10XB
					60		139	0.57	1625	5.4	1.9	12.0				
		4	90	220	50	CONT.	144	0.65	1400	6.3	2.3	21.0	—		M9GS□B	
					60		138	0.56	1675	5.3	2.1	15.0				

Speed (rpm)	With decimal gearhead																							
	500	300	200	180	150	120	100	90	75	60	50	30	20	15	10	9	7.5	6	5	3	2	1.5	1	0.9
Gear reduction 50Hz ratio	3	5	7.5	—	10	12.5	15	—	20	25	30	50	75	100	150	—	200	250	300	500	750	1000	1500	—
Gear reduction 60Hz ratio	3.6	6	9	10	—	15	18	20	—	30	36	60	90	120	180	200	—	300	360	600	900	1200	1800	2000
Maximum permissible torque (kg·cm)	10	16	24	27	32	40	48	54	64	77	93	155	200	200	200	200	200	200	200	200	200	200	200	200
Maximum permissible torque (kg·cm)	—	—	—	—	—	—	—	—	—	—	—	155	226	300	300	300	300	—	—	300	300	300	300	300
Maximum permissible torque (kg·cm)	14	23	35	38	46	58	69	77	92	111	133	200	200	200	200	200	200	200	200	200	200	200	200	200
Maximum permissible torque (kg·cm)	—	—	—	—	—	—	—	—	—	—	—	216	300	300	300	300	300	—	—	300	300	300	300	300

Note : The box (□) represents the desired gear reduction ratio, which thereby becomes part of the code for geared motor.



## UL Standard Motor

## UL Standard with Electromagnetic Brake Motor

### INDEX

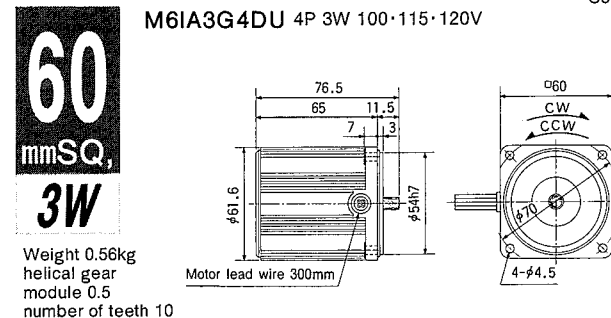
- UL STANDARD /SINGLE PHASE INDUCTION MOTOR ... 105
- UL STANDARD /SINGLE PHASE REVERSIBLE MOTOR ... 111
- UL STANDARD /THREE PHASE INDUCTION MOTOR ..... 117
- UL STANDARD ELECTRO-MAGNETIC /SINGLE PHASE REVERSIBLE ..... 121
- STRAIGHT SHAFT ..... 123



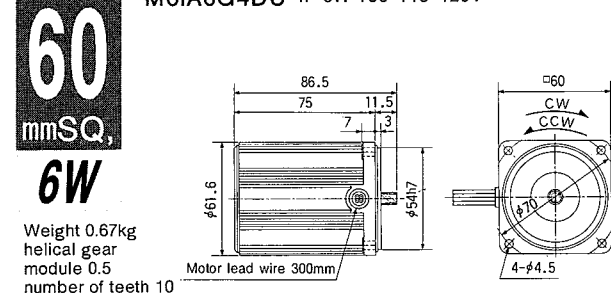
Motor

M6IA3G4DU 4P 3W 100·115·120V

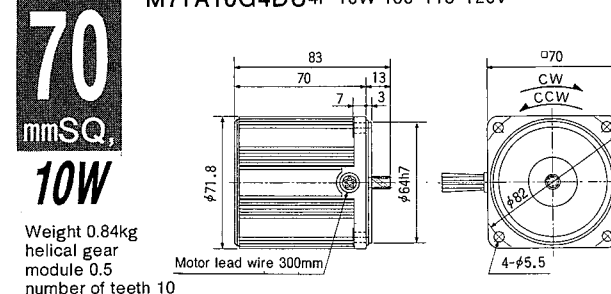
Scale 1/4 Unit mm



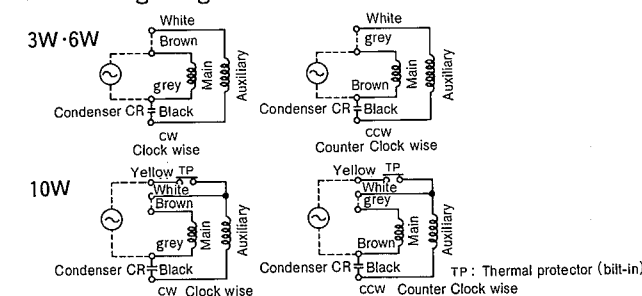
M6IA6G4DU 4P 6W 100·115·120V



M7IA10G4DU 4P 10W 100·115·120V



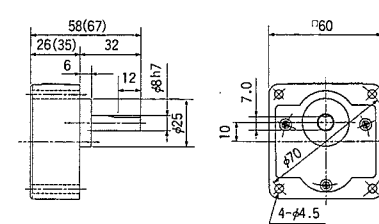
Connecting Diagram



Gear Head

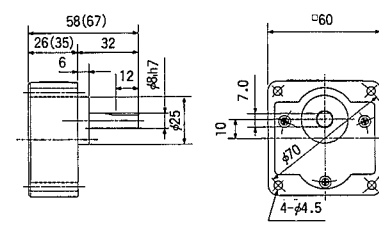
M6GA□M (metal bearing type) weight 0.2kg  
M6GA□B (ball bearing type)

Scale 1/4 Unit mm



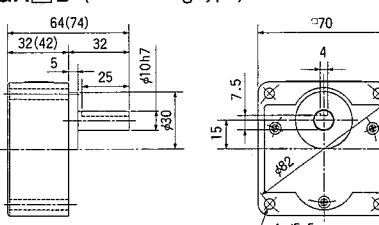
Note: The value in "( )" is for gear ratio of 1/20 or larger.

M6GA□M (metal bearing type) weight 0.34kg  
M6GA□B (ball bearing type)



Note: The value in "( )" is for gear ratio of 1/20 or larger.

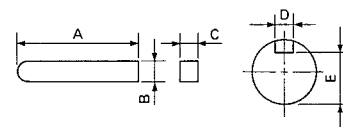
M7GA□M (metal bearing type) weight 0.34kg  
M7GA□B (ball bearing type)



Note: The value in "( )" is for gear ratio of 1/20 or larger.

Key and Key Slot

M7GA□M (B)



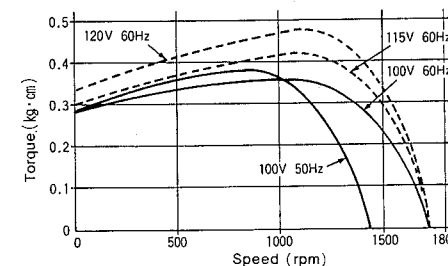
Type	A	B	C	D	E
M7GA□M (B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.050</sup> <sub>+0.010</sub>	7.5 <sup>0</sup> <sub>-0.15</sub>

Specifications

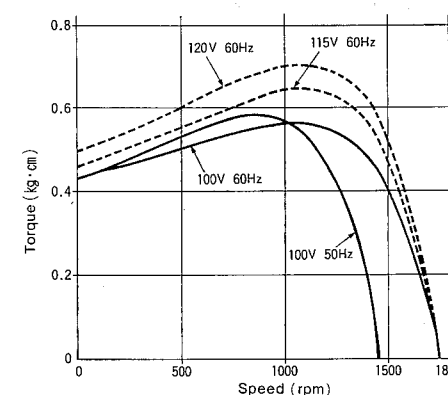
Size mmsq.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Rated load				Starting Current (A)	Starting Torque (kg·cm)	Capacitor μF (V)	Applied gearhead type		
							Input (W)	Current (A)	Speed (rpm)	Torque (kg·cm)				Metal	Ball	Decimal
60	M6IA3G4DU	4	3	100	50	CONT.	15	0.15	1300	0.22	0.20	0.28	2(200V)	M6GA□M	M6GA□B	M6GA10XM
					60		15	0.15	1600	0.18	0.20	0.28				
				115	60		15	0.14	1625	0.18	0.21	0.30	1.5(250V)			
					120		60	17	0.14	1650	0.17	0.21				
60	M6IA6G4DU	4	6	100	50	CONT.	18	0.18	1150	0.47	0.23	0.43	2.5(200V)	M6GA□M	M6GA□B	M6GA10XM
					60		19	0.19	1475	0.39	0.24	0.43				
				115	60		20	0.17	1575	0.37	0.25	0.46	2(250V)			
					120		60	21	0.17	1600	0.36	0.26				
70	M7IA10G4DU	4	10	100	50	CONT.	26	0.27	1250	0.76	0.42	0.62	3(200V)	M7GA□M	M7GA□B	M7GA10XM
					60		26	0.26	1575	0.60	0.41	0.62				
				115	60		26	0.25	1600	0.60	0.44	0.45	2(250V)			
					120		60	27	0.25	1600	0.60	0.46				

Speed-Torque Curve

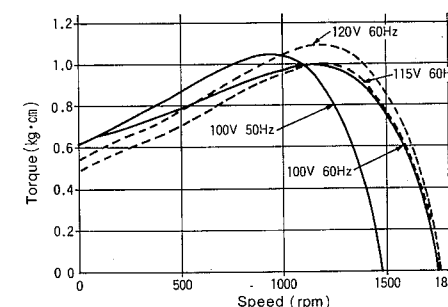
M6IA3G4DU



M6IA6G4DU



M7IA10G4DU



齒輪馬達最大承受扭力對照表

rpm表列數字乃根據馬達同步運轉之轉速，但在額定扭力負載情況下實際輸出轉速為同步運轉轉速的80~98%。灰色欄乃輸出轉速方向與馬達相同時的數據資料。白色欄乃輸出轉速方向與馬達相反時的數據資料。

GEAR HEAD를 直結했을 때의 許容軸토크

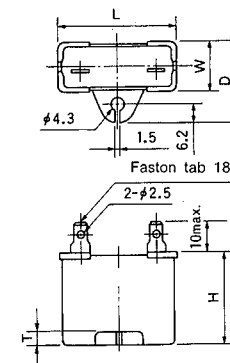
★ 回転数は 同期速度の 中間ギヤヘッドに 値(값)를 表示하고 있습니다. 一般 回転数は 負荷의 크기에 따라 表示値보다 2%~20% 적은(值)를 표시합니다.

★ 回転方向은 □ 이 모터와 同方向 他는 逆方向입니다.

																	With decimal gearhead									
	Speed (rpm)	500	300	200	180	150	120	100	90	75	60	50	30	20	15	10	9	7.5	6	5	3	2	1.5	1		
	Gear redution ratio	50Hz	3	5	7.5	—	10	12.5	15	—	20	25	30	50	75	100	150	—	200	250	300	500	750	1000	1500	
		60Hz	3.6	6	9	10	—	15	18	20	—	30	36	60	90	120	180	200	—	300	360	600	900	1200	1800	
	Maximum permissible torque (kg·cm)		0.49	0.81	1.2	1.3	1.6	2.0	2.4	2.6	3.2	3.9	4.7	7.8	11	15	22	25	25	25	25	25	25	25	25	
	Maximum permissible torque (kg·cm)		1.0	1.6	2.5	2.7	3.4	4.1	5.0	5.4	6.7	8.1	9.7	16	23	25	25	25	25	25	25	25	25	25	25	
	Maximum permissible torque (kg·cm)		1.6	2.6	3.9	4.5	5.2	6.5	7.9	8.7	10	13	15	26	37	49	50	50	50	50	50	50	50	50	50	

Note: The box (□) represents the desired gear reduction ratio, which thereby becomes part of the code for geared motor.

Capacitor



Dimensions of Capacitor (mm)

Motor Type	Capacitor Type	L	W	D	H	T
M6IA3G4DU	100V MOPC2M20	39.5	16	26.5	30.5	4
	115V 120V MOPC1.5M25	39.5	16	26.5	30.5	4
M6IA6G4DU	100V MOPC2.5M20	39.5	16	26.5	30.5	4
	115V 120V MOPC2M25	39.5	16	26.5	30.5	4
M7IA10G4DU	100V MOPC3M20	39.5	16	26.5	30.5	4
	115V 120V MOPC2M25	39.5	16	26.5	30.5	4

Geared motor maximum permissible torque table [kg·cm]

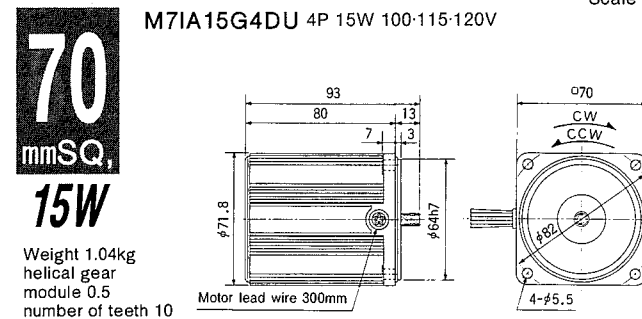
Note: rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 2~20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.



## Motor

M7IA15G4DU 4P 15W 100-115-120V

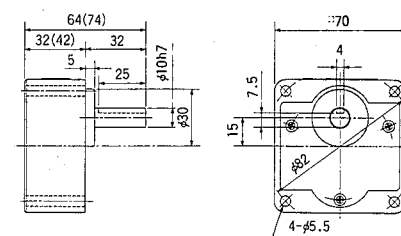
Scale 1/4 Unit mm



## Gear Head

M7GA□M (metal bearing type) weight 0.54kg  
M7GA□B (ball bearing type)

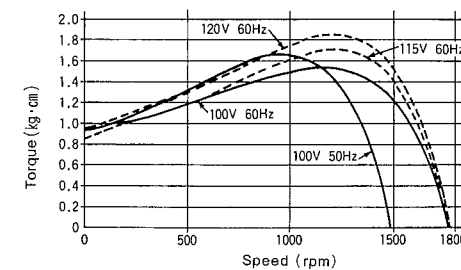
Scale 1/4 Unit mm



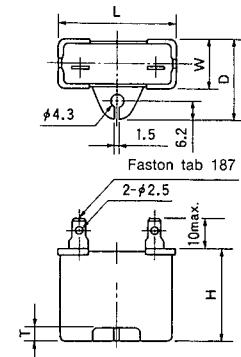
Note: The value in "( )" is for gear ratio of 1/20 or larger.

## Speed-Torque Curve

M7IA15G4DU

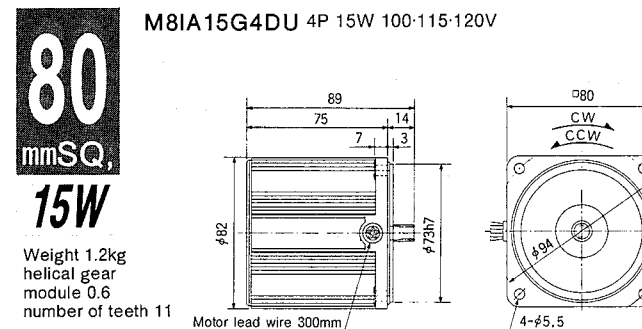
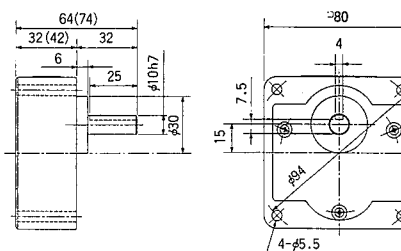


## Capacitor



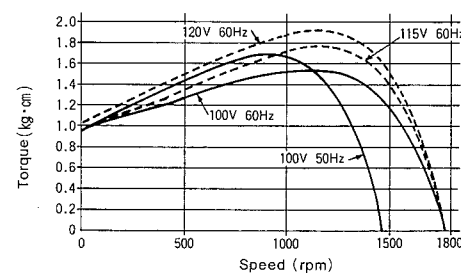
Option

M8IA15G4DU 4P 15W 100-115-120V

M8GA□M (metal bearing type) weight 0.68kg  
M8GA□B (ball bearing type)

Note: The value in "( )" is for gear ratio of 1/20 or larger.

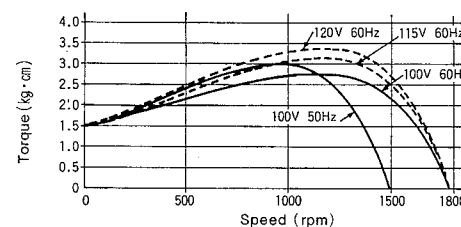
M8IA15G4DU



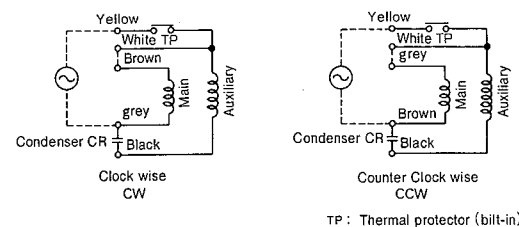
## ■Dimensions of Capacitor (mm)

Motor Type	Capacitor Type	L	W	D	H	T
M7IA15G4DU	100V MOPC4M20	39.5	16	26.5	30.5	4
	115V 120V MOPC3M25	39.5	16	26.5	30.5	4
M8IA15G4DU	100V MOPC4M20	39.5	16	26.5	30.5	4
	115V 120V MOPC3M25	39.5	16	26.5	30.5	4
M8IA25G4DU	100V MOPC6M20	39.5	17.5	28	30.5	4
	115V 120V MOPC4.5M23	39.5	16	26.5	30.5	4

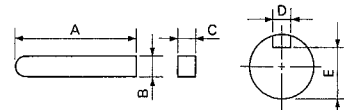
M8IA25G4DU



## Connecting Diagram



## Key and Key Slot

M7GA□M (B)  
M8GA□M (B)

Type	A	B	C	D	E
M7GA□M (B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.010</sub>	7.5 <sup>0</sup> <sub>-0.15</sub>
M8GA□M (B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.010</sub>	7.5 <sup>0</sup> <sub>-0.15</sub>

## ■Specifications

Size mmsq.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Rated load				Starting Current (A)	Starting Torque (kg·cm)	Capacitor μF (V)	Applied gearhead type		
							Input (W)	Current (A)	Speed (rpm)	Torque (kg·cm)				Metal	Ball	Decimal
70	M7IA15G4DU	4	15	100	50	CONT.	33	0.36	1300	1.1	0.63	0.90	4(200V)	M7GA□M	M7GA□B	M7GA10XM
							33	0.34	1600	0.90	0.59	0.90				
				115	60		33	0.31	1625	0.90	0.67	0.85	3(250V)			
							120	60	35	0.32	1650	0.90				
80	M8IA15G4DU	4	15	100	50	CONT.	35	0.36	1275	1.1	0.61	0.95	4(200V)	M8GA□M	M8GA□B	M8GA10XM
							37	0.37	1550	0.90	0.59	0.95				
				115	60		34	0.31	1650	0.89	0.65	0.95	3(250V)			
							120	60	35	0.31	1650	0.88				
80	M8IA25G4DU	4	25	100	50	CONT.	52	0.57	1325	1.8	1.2	1.4	6(200V)	M8GA□M	M8GA□B	M8GA10XM
							48	0.48	1625	1.5	1.1	1.4				
				115	60		50	0.49	1650	1.5	1.2	1.4	4.5(230V)			
							120	60	51	0.49	1675	1.5				

## ■Geared motor maximum permissible torque table [kg·cm]

Note: rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 2~20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.

## ■齒輪馬達最大承受扭力對照表

rpm表列數字乃根據馬達同步運轉之轉速，但在額定扭力負載情況下實際輸出轉速為同步運轉轉速的80~98%。灰色欄乃輸出軸運轉方向與馬達相同時的數據資料。白色欄乃輸出軸運轉方向與馬達相反時的數據資料。

## ■GEAR HEAD를 직결했을 때의 허용토크

★回轉數는 同期速度의 中間기어헤드에 值(값)를 表示하고 있습니다. 一般 回轉數는 負荷의 크기에 따라 表示值보다 2%~20% 적은(値)을 표시합니다.

★回轉方向은 □ 이 모터와 同方向 他는 逆方向입니다.

Speed (rpm)	With decimal gearhead																			
	500	300	200	180	150	120	100	90	75	60	50	30	20	15	10	9	7.5	6	5	3
Gear reduction ratio	3	5	7.5	10	12.5	15	18	20	25	30	36	45	60	75	90	100	120	150	180	200
Maximum permissible torque (kg·cm)	2.4	2.4	4.0	6.0	6.7	8.2	10	12	13	16	19	23	39	50	50	50	50	50	50	50
Maximum permissible torque (kg·cm)	2.4	2.4	6.0	6.7	6.7	8.2	10	12	13	16	19	23	39	56	75	80	80	80	80	80
Maximum permissible torque (kg·cm)	4.0	4.0	6.7	10	11	13	16	20	21	26	32	39	65	80	80	80	80	80	80	80

Note: The box (□) represents the desired gear reduction ratio, which thereby becomes part of the code for geared motor.

UL規格批准馬達 單相感應馬達  
UL규격 인정 모터 단상 인덕션 모터

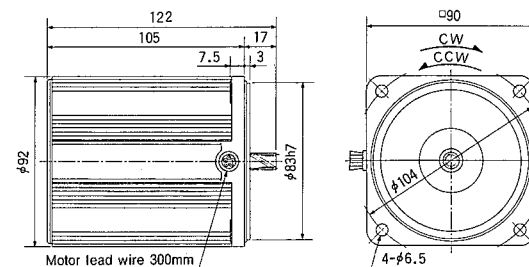
Motor

M9IA40G4DU 4P 40W 100-115-120V

Scale 1/4 Unit mm

90  
mmSQ,  
40W

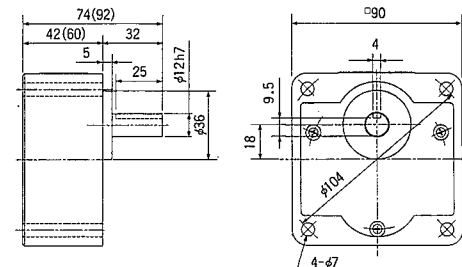
Weight 2.4kg  
helical gear  
module 0.6  
number of teeth 11



Gear Head

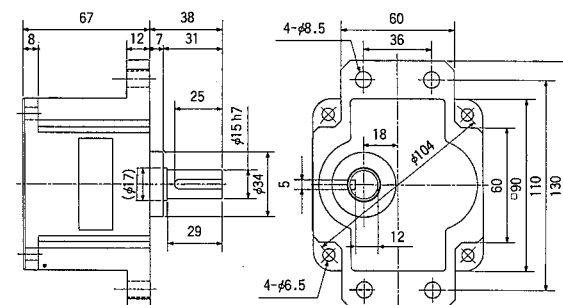
M9GA□M (metal bearing type) weight 1.2kg  
M9GA□B (ball bearing type)

Scale 1/4 Unit mm

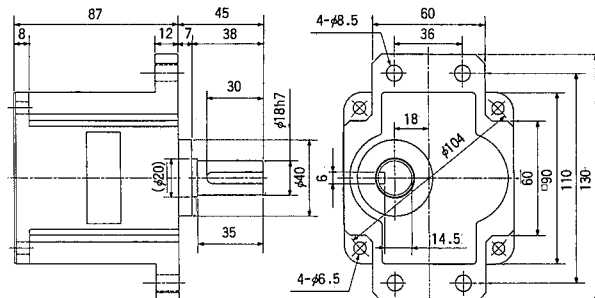


Note : The value in "( )" is for gear ratio of 1/20 or larger.

M9GC□B (ball bearing type) 1.5kg

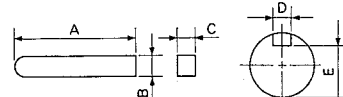


M9GS□B (ball bearing type) 1.9kg



Key and Key Slot

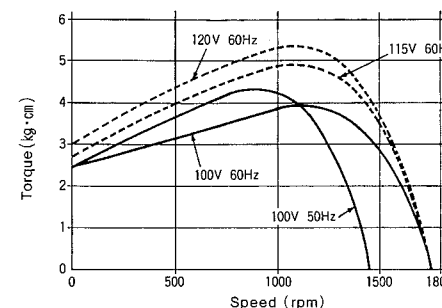
M9GA□M (B)  
M9GC□B  
M9GS□B



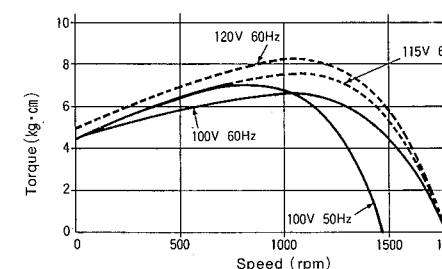
Type	A	B	C	D	E
M9GA□M (B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.010</sub>	9.5 <sup>0</sup> <sub>-0.15</sub>
M9GC□(B)	25	5 <sup>0</sup> <sub>-0.030</sub>	5 <sup>0</sup> <sub>-0.030</sub>	5 <sup>+0.050</sup> <sub>+0</sub>	12 <sup>0</sup> <sub>-0.15</sub>
M9GS□(B)	30	6 <sup>0</sup> <sub>-0.030</sub>	6 <sup>0</sup> <sub>-0.030</sub>	6 <sup>+0.050</sup> <sub>0</sub>	14.5 <sup>0</sup> <sub>-0.15</sub>

Speed-Torque Curve

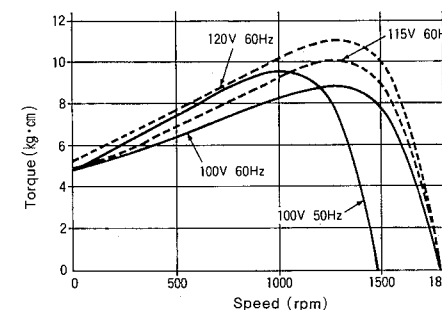
M9IA40G4DU



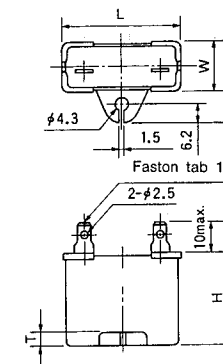
M9IC60G4DU



M9IC90G4DU



Capacitor



Option

Dimensions of Capacitor (mm)

Motor Type	Capacitor Type	L	W	D	H	T
M9IA40G4DU	100V MOPC10M20	39.5	26.7	37	32	4
	115V 120V MOPC8M23	39.5	22	32.5	30.5	4
M9IC60G4DU	100V MOPC15M20	39.5	26.7	37	41	4
	115V 120V MOPC12M23	39.5	26.7	37	41	4
M9IC90G4DU	100V MOPC25M20	50.2	31	41	42	4
	115V 120V MOPC19M23	50.2	31	41	42	4

Geared motor maximum permissible torque table [kg·cm]

Note : rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 2~20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.

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GEAR HEAD를 직결했을 때의 許容軸토크

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★回轉方向은 □ 이 모터와 同方向 他는 逆方向입니다.

Specifications

Size mmsq.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Rated load				Starting Current (A)	Starting Torque (kg·cm)	Capacitor μF(V)	Applied gearhead type								
							Input (W)	Current (A)	Speed (rpm)	Torque (kg·cm)				Metal	Ball	Decimal						
90	M9IA40G4DU	4	40	100	50	CONT.	79	0.87	1250	3.1	1.6	2.4	10(200V)	M9GA□M	M9GA□B	M9GA10XM						
					60		74	0.74	1575	2.5	1.5	2.4										
					115		76	0.72	1625	2.4	1.7	2.7										
					120		78	0.72	1650	2.4	1.8	3.0	8(230V)									
							50	114	1.3	1275	4.6	2.2					4.5	15(200V)				
90	M9IC60G4DU	4	60	100	CONT.	114	1.2	1575	3.7	2.2	4.5	12(230V)	—	M9GC□B	M9GC10XB							
				60		115	1.1	1625	3.6	2.4	4.5											
				115		121	1.1	1625	3.6	2.5	5.0											
				90		M9IC90G4DU	4	90	100	CONT.	154	1.6		1325		6.5	3.4	4.8	15(200V)	—	M9GC□B	M9GC10XB
									60		161	1.7		1625		5.3	3.1	4.8				
115	157	1.4	1650		5.3				3.5		4.8	19(230V)										
120	163	1.4	1675		5.2				3.7		5.2											

																	With decimal gearhead											
Speed (rpm)		500	300	200	180	150	120	100	90	75	60	50	30	20	15	10	9	7.5	6	5	3	2	1.5	1	0.9	0.75		
Gear reduction ratio	50Hz	3	5	7.5	—	10	12.5	15	—	20	25	30	50	75	100	150	—	200	250	300	500	750	1000	1500	—	2000		
	60Hz	3.6	6	9	10	—	15	18	20	—	30	36	60	90	120	180	200	—	300	360	600	900	1200	1800	2000	—		
Maximum permissible torque (kg·cm)		6.7	11	16	18	23	28	33	36	45	54	65	100	100	100	100	100	100	100	100	100	100	100	100	—	—		
Maximum permissible torque (kg·cm)		10	16	24	27	32	40	48	54	64	77	93	155	200	200	200	200	200	200	200	200	200	200	200	200	200		
		—	—	—	—	—	—	—	—	—	—	—	155	226	300	300	300	300	—	—	300	300	300	300	300			
Maximum permissible torque (kg·cm)		14	23	35	38	46	58	69	77	92	111	113	200	200	200	200	200	200	200	200	200	200	200	200	200	200		
		—	—	—	—	—	—	—	—	—	—	—	216	300	300	300	300	300	—	—	300	300	300	300	300			

Note : The box (□) represents the desired gear reduction ratio, which thereby becomes part of the code for geared motor.

# UL Standard Motor / Single Phase Reversible

UL規格批准馬達單相可逆式馬達  
UL규격 인정 모터 단상 리버시블 모터

Panasonic



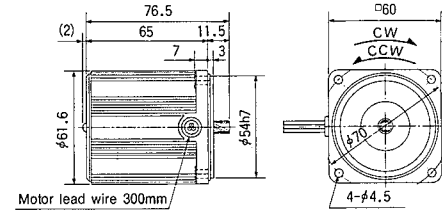
## Motor

M6RA4G4DU 4P 4W 100-115-120V

Scale 1/4 Unit mm

60  
mmSQ,  
4W

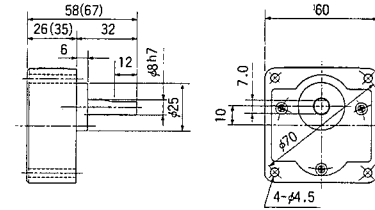
Weight 0.56kg  
helical gear  
module 0.5  
number of teeth 10



## Gear Head

M6GA□M (metal bearing type) weight 0.34kg  
M6GA□B (ball bearing type)

Scale 1/4 Unit mm

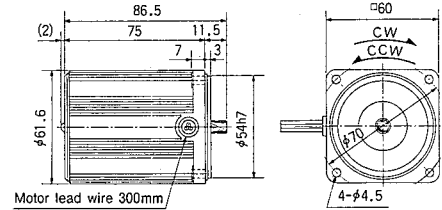


Note : The value in "( )" is for gear ratio of 1/20 or larger.

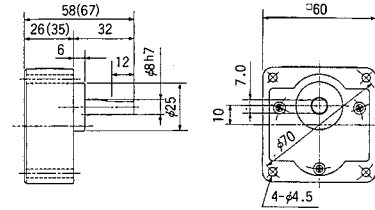
M6RA6G4DU 4P 6W 100-115-120V

60  
mmSQ,  
6W

Weight 0.67kg  
helical gear  
module 0.5  
number of teeth 10



M6GA□M (metal bearing type) weight 0.34kg  
M6GA□B (ball bearing type)

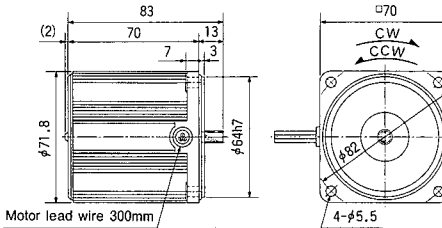


Note : The value in "( )" is for gear ratio of 1/20 or larger.

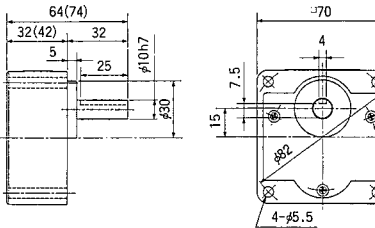
M7RA10G4DU 4P 10W 100-115-120V

70  
mmSQ,  
10W

Weight 0.84kg  
helical gear  
module 0.5  
number of teeth 10

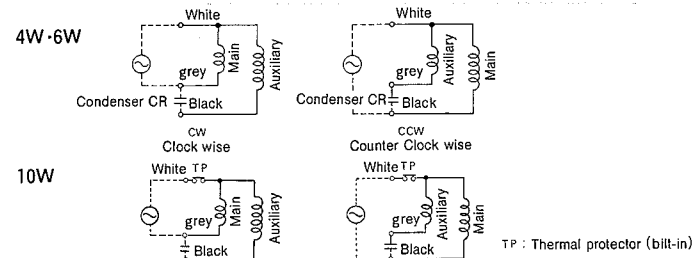


M7GA□M (metal bearing type) weight 0.54kg  
M7GA□B (ball bearing type)



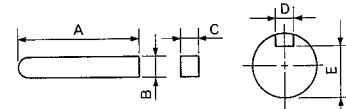
Note : The value in "( )" is for gear ratio of 1/20 or larger.

## Connecting Diagram



## Key and Key Slot

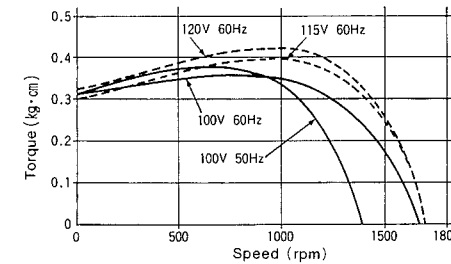
M7GA□M(B)



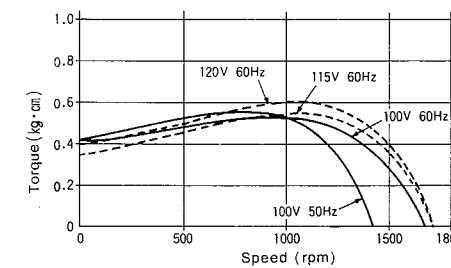
Type	A	B	C	D	E
M7GA□M(B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.010</sub>	7.5 <sup>0</sup> <sub>-0.15</sub>

## Speed-Torque Curve

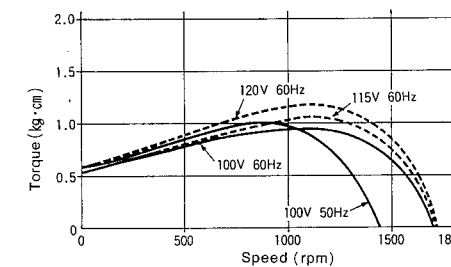
M6RA4G4DU



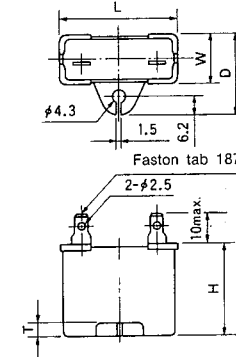
M6RA6G4DU



M7RA10G4DU



## Capacitor



Option

## Dimensions of Capacitor (mm)

Motor Type	Capacitor Type	L	W	D	H	T
M6RA4G4DU	100V MOPC3M20	39.5	16	26.5	30.5	4
	115V 120V MOPC2M25	39.5	16	26.5	30.5	4
M6RA6G4DU	100V MOPC3.5M20	39.5	16	26.5	30.5	4
	115V 120V MOPC2.3M25	39.5	16	26.5	30.5	4
M7RA10G4DU	100V MOPC4.5M20	39.5	16	26.5	30.5	4
	115V 120V MOPC3.5M25	39.5	17.5	28	30.5	4

## Geared motor maximum permissible torque table [kg·cm]

Note : rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 2~20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.

### 齒輪馬達最大承受扭力對照表

rpm表列數字乃根據馬達同步運轉之轉速，但在額定扭力負載情況下實際輸出轉速為同步運轉轉速的80~98%。灰色欄乃輸出軸運轉方向與馬達相同時的數據資料。白色欄乃輸出軸運轉方向與馬達相反時的數據資料。

### GEAR HEAD를 직결했을 때의 許容軸토크

★回轉數는 同期速度의 中面기어헤드에 值(값)를 表示하고 있습니다. 一般 回轉數는 負荷의 크기에 따라 表示值보다 2%~20% 작은(值)을 표시합니다.  
★回轉方向은 □ 이 모터와 同方向 他는 逆方向입니다.

## Specifications

Size mmsq.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Rated load				Starting Current (A)	Starting Torque (kg·cm)	Capacitor μF (V)	Applied gearhead type				Speed (rpm)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
							Input (W)	Current (A)	Speed (rpm)	Torque (kg·cm)				Metal	Ball	Decimal		Gear reduction ratio	50Hz 60Hz	500 3	300 5	200 7.5	180 —	150 10	120 12.5	100 15	90 —	75 20	60 25	50 30	30 50	20 75	15 100	10 150	9 —	7.5 200	6 250	5 300	3 500	2 750	1.5 1000	1 1500																																																																																																																																																																																																																																																																																																																																																																																																																																																											
60	M6RA4G4DU	4	4	100	50	30min	18	0.18	1050	0.32	0.20	0.30	3(200V)	M6GA□M	M6GA□B	M6GA10XM		Maximum permissible torque (kg·cm)	0.6	1.1	1.6	1.8	2.3	2.8	3.3	3.6	4.5	5.4	6.5	10	15	21	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	

Note : The box (□) represents the desired gear reduction ratio, which thereby becomes part of the code for geared motor.





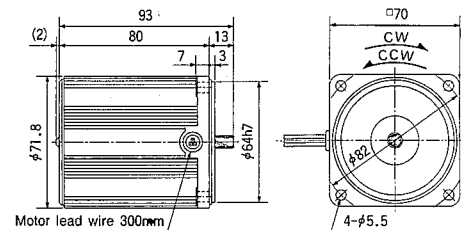
Motor

M7RA15G4DU 4P 15W 100-115-120V

Scale 1/4 Unit mm

70  
mmSQ,  
15W

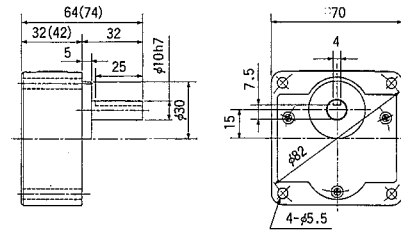
Weight 0.56kg  
helical gear  
module 0.5  
number of teeth 10



Gear Head

M7GA□M (metal bearing type) weight 0.54kg  
M7GA□B (ball bearing type)

Scale 1/4 Unit mm

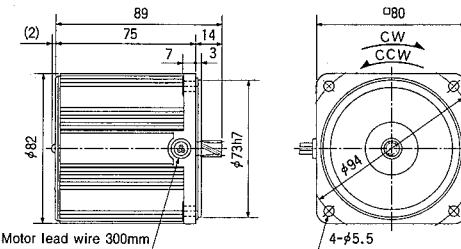


Note : The value in "( )" is for gear ratio of 1/20 or larger.

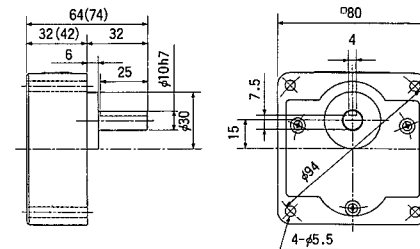
M8RA20G4DU 4P 20W 100-115-120V

80  
mmSQ,  
20W

Weight 1.2kg  
helical gear  
module 0.6  
number of teeth 11

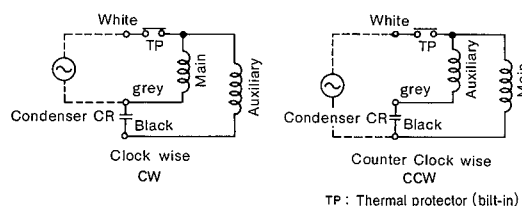


M8GA□M (metal bearing type) weight 0.68kg  
M8GA□B (ball bearing type)



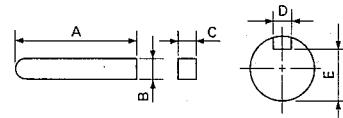
Note : The value in "( )" is for gear ratio of 1/20 or larger.

Connecting Diagram



Key and Key Slot

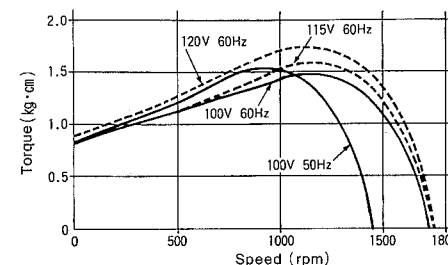
M7GA□M(B)  
M8GA□M(B)



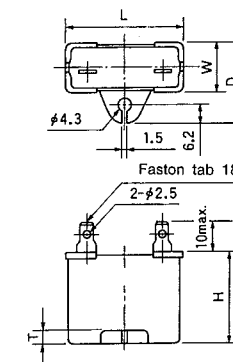
Type	A	B	C	D	E
M7GA□M(B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.010</sub>	7.5 <sup>0</sup> <sub>-0.15</sub>
M8GA□M(B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.010</sub>	7.5 <sup>0</sup> <sub>-0.15</sub>

Speed-Torque Curve

M7RA15G4DU



Capacitor

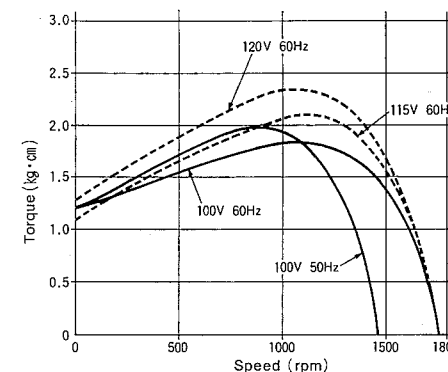


Option

Dimensions of Capacitor (mm)

Motor Type	Capacitor Type	L	W	D	H	T
M7RA15G4DU	100V MOPC6M20	39.5	17.5	28	30.5	4
	115V 120V MOPC4.5M23	39.5	16	26.5	30.5	4
M8RA20G4DU	100V MOPC7M20	39.5	22	32.5	30.5	4
	115V 120V MOPC5.5M23	39.5	17.5	28	30.5	4

M8RA20G4DU



Geared motor maximum permissible torque table (kg·cm)

Note : rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 2~20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.

齒輪馬達最大承受扭力對照表

rpm表列數字乃根據馬達同步運轉之轉速，但在額定扭力負載情況下實際輸出轉速為同步運轉轉速的80~98%。灰色欄乃輸出軸運轉方向與馬達相同時的數據資料。白色欄乃輸出軸運轉方向與馬達相反時的數據資料。

GEAR HEAD를 직결했을 때의 허용토크

★回轉數는 同期速度의 中間기어헤드에 値(값)을 表示하고 있습니다. 一般 回轉數는負荷의 크기에 따라 表示値보다 2%~20% 적은(値)을 표시합니다.  
★回轉方向은 □ 이 모터와 同方向 他는 逆方向입니다.

Specifications

Size mmsq.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Rated load				Starting	Starting	Capacitor	Applied gearhead type		
							Input (W)	Current (A)	Speed (rpm)	Torque (kg·cm)	Current (A)	Torque (kg·cm)	Capacitor μF (V)	Metal	Ball	Decimal
70	M7RA15G4DU	4	15	100	50	30min	36	0.36	1250	1.1	0.59	0.84	6(200V)	M7GA□M	M7GA□B	M7GA10XM
					60		38	0.38	1575	0.90	0.57	0.84				
				115	60		39	0.44	1575	0.90	0.61	0.80	4.5(230V)			
					120		60	41	0.35	1600	0.90	0.64				
				80	M8RA20G4DU		4	20	100	50	30min	48	0.48			
60	48	0.48	1500			1.3				0.67		1.2				
115	60	48	0.41			1575			1.2	0.70		1.1	5.5(230V)			
	120	60	50			0.42			1600	1.2		0.75		1.3		

Note : The box (□) represents the desired gear reduction ratio, which thereby becomes part of the code for geared motor.



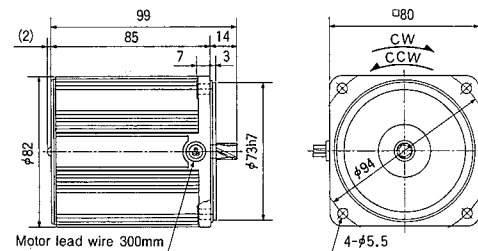
Motor

M8RA25G4DU 4P 25W 100-115-120V

Scale 1/4 Unit mm

80  
mmSQ,  
25W

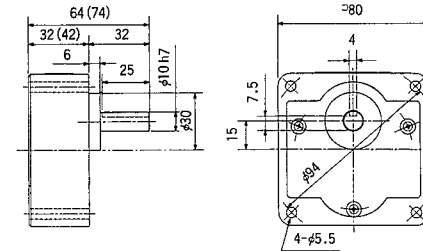
Weight 1.5kg  
helical gear  
module 0.6  
number of teeth 11



Gear Head

Scale 1/4 Unit mm

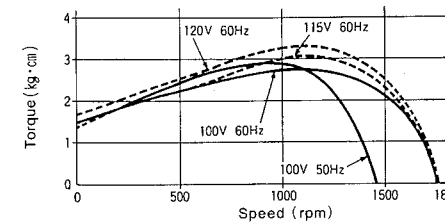
M8GA□M (metal bearing type) weight 0.68kg  
M8GA□B (ball bearing type)



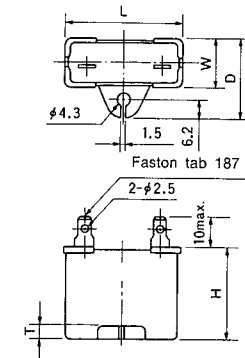
Note : The value in "( )" is for gear ratio of 1/20 or larger.

Speed-Torque Curve

M8RA25G4DU



Capacitor



Option

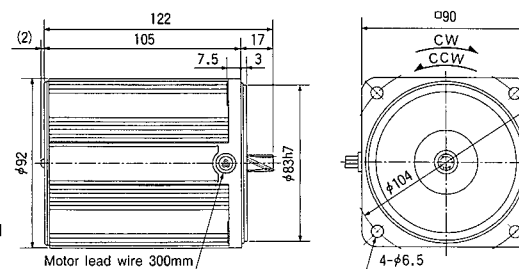
■Dimensions of Capacitor (mm)

Motor Type	Capacitor Type	L	W	D	H	T
M8RA25G4DU	100V MOPC9.5M20	39.5	22	32.5	30.5	4
	115V 120V MOPC7M23	39.5	22	32.5	30.5	4
M9RA40G4DU	100V MOPC15M20	39.5	26.7	37	41	4
	115V 120V MOPC12M23	39.5	26.7	37	41	4

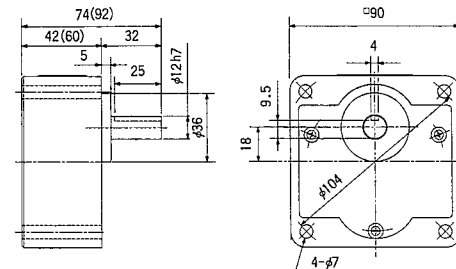
M9RA40G4DU 4P 40W 100-115-120V

90  
mmSQ,  
40W

Weight 2.4kg  
helical gear  
module 0.6  
number of teeth 11

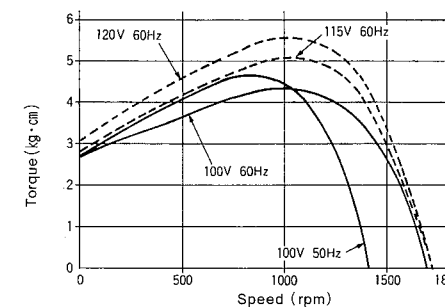


M9GA□M (metal bearing type) weight 1.2kg  
M9GA□B (ball bearing type)

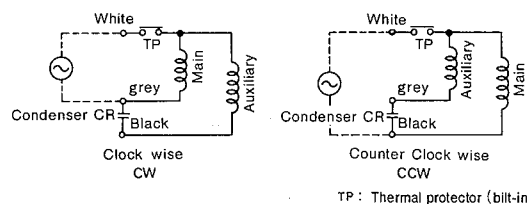


Note : The value in "( )" is for gear ratio of 1/20 or larger.

M9RA40G4DU

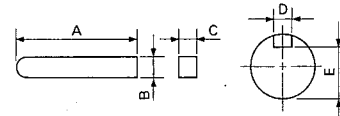


Connecting Diagram



Key and Key Slot

M8GA□M(B)  
M9GA□M(B)



Type	A	B	C	D	E
M8GA□M(B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.010</sub>	7.5 <sup>0</sup> <sub>-0.15</sub>
M9GA□M(B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.010</sub>	9.5 <sup>0</sup> <sub>-0.15</sub>

■Geared motor maximum permissible torque table (kg·cm)

Note : rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 2~20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.

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★回轉方向은 □ 이 모터와 同方向 他는 逆方向입니다.

■Specifications

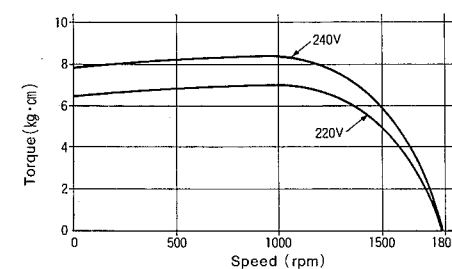
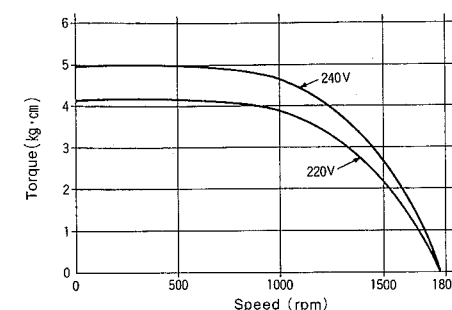
Size mmSQ.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Rated load				Starting Current (A)	Starting Torque (kg·cm)	Capacitor (μF(V))	Applied gearhead type		
							Input (W)	Current (A)	Speed (rpm)	Torque (kg·cm)				Metal	Ball	Decimal
80	M8RA25G4DU	4	25	100	50	30min	55	0.55	1300	1.9	1.0	1.4	9.5(200V) 7(230V)	M8GA□M	M8GA□B	M8GA10XM
				115	60		57	0.58	1625	1.5	1.0	1.5				
				120	60		57	0.50	1650	1.5	1.1	1.5				
				120	60		62	0.51	1650	1.5	1.1	1.7				
90	M9RA40G4DU	4	40	100	50	30min	92	0.95	1150	3.3	1.6	2.6	15(200V) 12(230V)	M9GA□M	M9GA□B	M9GA10XM
				115	60		92	0.93	1475	2.6	1.6	2.6				
				120	60		92	0.82	1550	2.5	1.7	2.8				
				120	60		96	0.81	1575	2.4	1.8	3.1				

Note : The box (□) represents the desired gear reduction ratio, which thereby becomes part of the code for geared motor.





### Speed-Torque Curve



★回轉數는 同期速度의 中面기어헤드에 值(公)을 表示하고 있습니다. 一般 回轉數는負荷의 크기에 따라 表示值보다 2%~20% 작은(値)을 표시합니다.

																	With decimal gearhead							
Speed (rpm)	500	300	200	180	150	120	100	90	75	60	50	30	20	15	10	9	7.5	6	5	3	2	1.5	1	
Gear reduction ratio	50Hz 3.6	5 6	7.5 9	— 10	10 —	12.5 15	15 18	— 20	— 20	25 30	30 36	50 60	75 90	100 120	150 180	— 200	200 —	250 300	300 360	500 600	750 900	1000 1200	1500 1800	
Maximum permissible torque (kg·cm)	4.0	6.7	10	11	13	16	20	21	26	32	39	65	80	80	80	80	80	80	80	80	80	80	80	
Maximum permissible torque (kg·cm)	6.7	11	16	18	23	28	33	36	45	54	65	100	100	100	100	100	100	100	100	100	100	100	100	



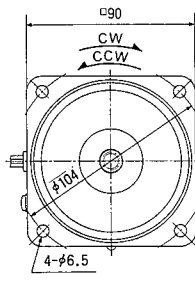
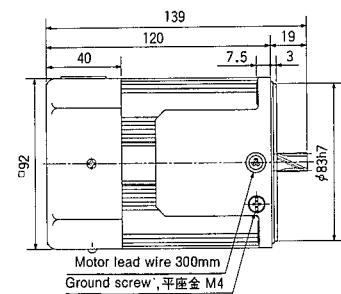
## Motor

**M9MC60G4GU 4P 60W 220-240V**

Scale 1/4 Unit mm

**90**  
mmSQ,  
**60W**

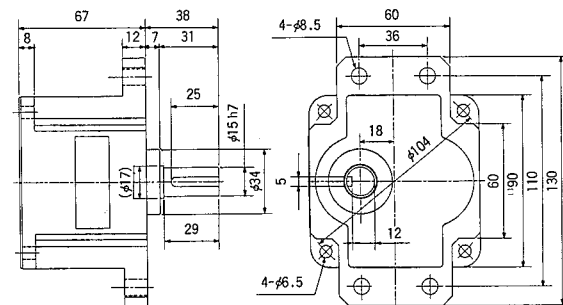
Weight 2.7kg  
helical gear  
module 0.8  
number of teeth 11



## Gear Head

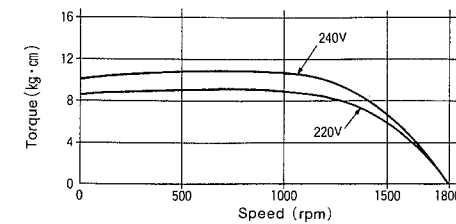
M9GC□B (ball bearing type) 1.5kg

Scale 1/4 Unit mm



### Speed-Torque Curve

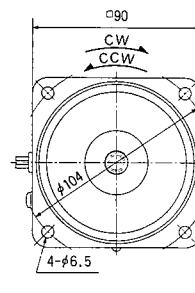
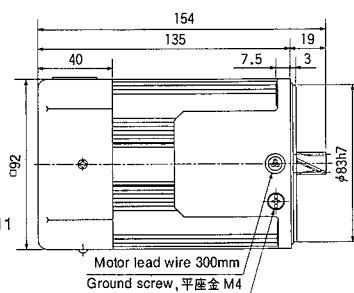
M9MC60G4GU



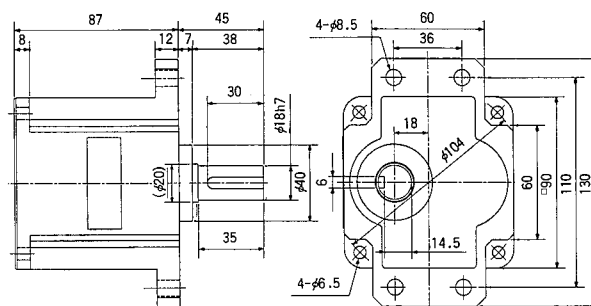
**M9MC90G4GU 4P 90W 220-240V**

**90**  
mmSQ,  
**90W**

Weight 3.0kg  
helical gear  
module 0.8  
number of teeth 11

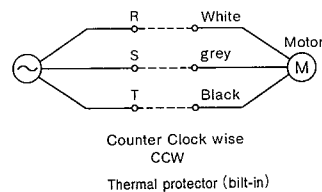


M9GS□B (ball bearing type) 1.9kg



C type 200kg·cm/max. permissible torque  
S type 300kg·cm/max. permissible torque

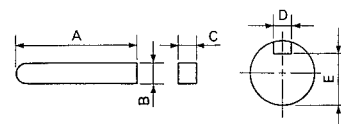
### Connecting Diagram



As for CW rotation, change the 2 leads among R. S. T. shown above.

### Key and Key Slot

M9GC□B  
M9GC□B



Type	A	B	C	D	E
M9GC□B	25	$5 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$5 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$5 \begin{smallmatrix} +0.050 \\ 0 \end{smallmatrix}$	$12 \begin{smallmatrix} 0 \\ -0.15 \end{smallmatrix}$
M9GS□B	30	$6 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$6 \begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	$6 \begin{smallmatrix} +0.050 \\ 0 \end{smallmatrix}$	$14.5 \begin{smallmatrix} 0 \\ -0.15 \end{smallmatrix}$

## ■ Specifications

Size mmsq.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Rated load				Starting Current (A)	Starting Torque (kg·cm)	Capacitor µF (V)	Applied gearhead type		
							Input (W)	Current (A)	Speed (rpm)	Torque (kg·cm)				Metal	Ball	Decimal
90	M9MC60G4GU	4	60	220	60	CONT.	97	0.40	1675	3.5	1.4	8.6	—	—	M9GC□□B	M9GC10XB
				240	60		97	0.41	1700	3.4	1.5	10			M9GS□□B	
90	M9MC90G4GU	4	90	220	60	CONT.	138	0.56	1675	5.3	2.1	15	—	—	M9GC□□B	M9GC10XB
				240	60		141	0.59	1700	5.2	2.3	18			M9GS□□B	

■ Geared motor maximum permissible torque table (kg·cm)

Note : rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 2~20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.

### ■齒輪馬達最大承受扭力對照表

rpm表則數字乃根據馬達同步運轉之轉速，但在額定扭力負載情況下實際輸出轉速為同步運轉轉速的80~98%。灰色欄乃輸出軸運轉方向與馬達相同時的數據資料。白色欄乃輸出軸運轉方向與馬達相反時的數據資料。

### ■ GEAR HEAD를 直結했을 때의 許容軸토크

★回転数は 同期速度の 中面기어헤드에 値(값)를 表示하고 있습니다. 一般 回転数は負荷의 크기에 따라 表示値보다 2%~20% 적은(値)를 표시합니다.

★回轉方向은  이 모타와 同方向 他는 逆方向입니다.

																			With decimal gearhead							
	Speed (rpm)	500	300	200	180	150	120	100	90	75	60	50	30	20	15	10	9	7.5	6	5	3	2	1.5	1	0.9	0.75
	Gear reduction ratio 50Hz 60Hz	3 3.6	5 6	7.5 9	— 10	10 15	12.5 15	15 18	20 20	25 30	30 36	50 60	75 90	100 120	150 180	200 —	200 —	200 —	250 300	300 360	500 600	750 900	1000 1200	1500 1800	2000 —	— 2000
	Maximum permissible torque (kg·cm)	10 —	16 —	24 —	27 —	32 —	40 —	48 —	54 —	64 —	77 —	93 155	155 226	200 300	200 300	200 300	200 300	200 300	200 —	200 —	200 300	200 300	200 300	200 300	200 300	200 300
	Maximum permissible torque (kg·cm)	14 —	23 —	35 —	38 —	46 —	58 —	69 —	77 —	92 —	111 —	113 216	200 216	200 300	200 300	200 300	200 300	200 300	200 —	200 —	200 300	200 300	200 300	200 300	200 300	200 300

# UL Standard Motor / Electro-Magnetic Brake Motor Single Phase Reversible

UL規格批准馬達 付帶電磁制動器馬達 單相可逆式馬達  
UL규격 인정 모터 전자 브레이크 모터 단상 리버시블 모터

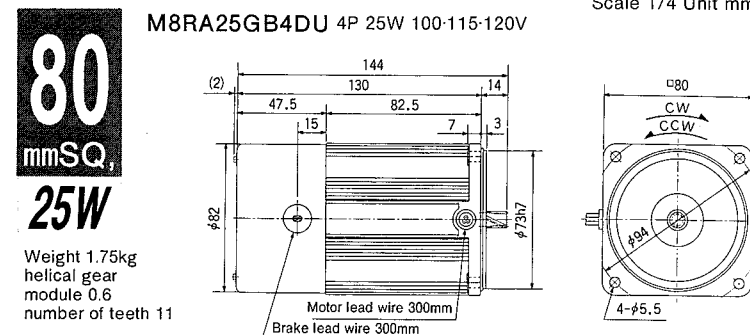
Panasonic



## Motor

M8RA25GB4DU 4P 25W 100-115-120V

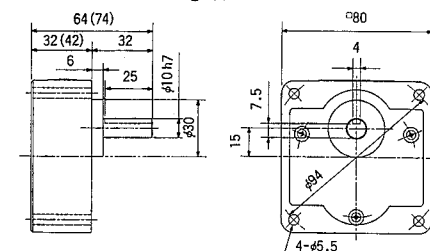
Scale 1/4 Unit mm



## Gear Head

M8GA□M (metal bearing type) weight 0.68kg  
M8GA□B (ball bearing type)

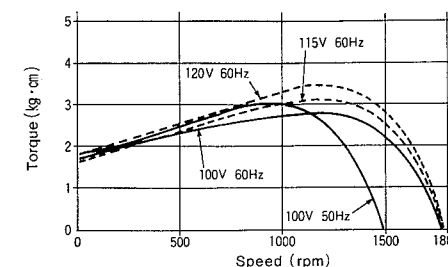
Scale 1/4 Unit mm



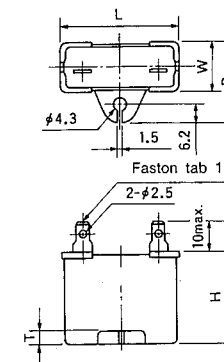
Note : The value in "( )" is for gear ratio of 1/20 or larger.

## Speed-Torque Curve

M8RA25GB4DU



## Capacitor

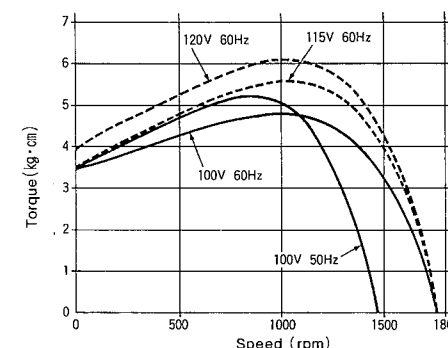


Option

## Dimensions of Capacitor (mm)

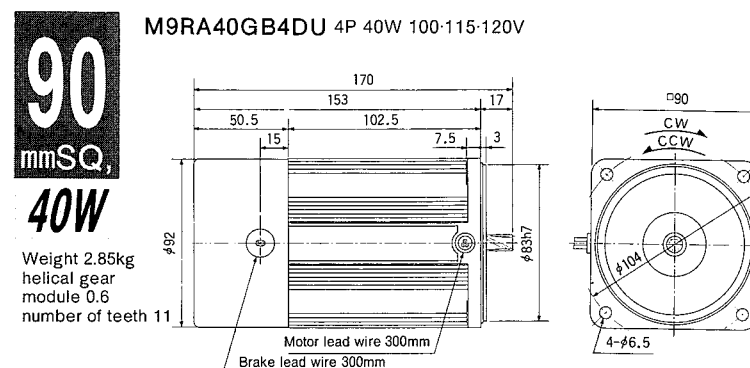
Motor Type	Capacitor Type	L	W	D	H	T
M8RA25GB4DU	100V MOPC9.5M20	39.5	22	32.5	30.5	4
	115V 120V MOPC7M23	39.5	22	32.5	30.5	4
M9RA40GB4DU	100V MOPC15M20	39.5	26.7	37	41	4
	115V 120V MOPC12M23	39.5	26.7	37	41	4

M9RA40GB4DU

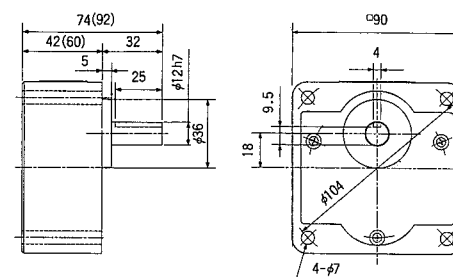


M9RA40GB4DU 4P 40W 100-115-120V

Scale 1/4 Unit mm

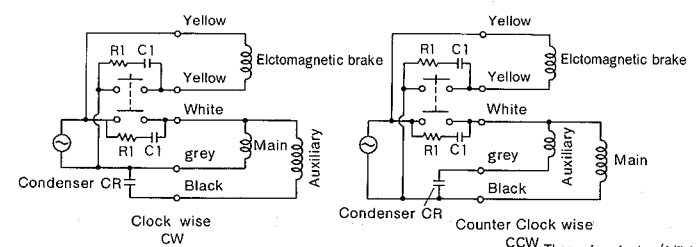


M9GA□M (metal bearing type) weight 1.2kg  
M9GA□B (ball bearing type)



Note : The value in "( )" is for gear ratio of 1/20 or larger.

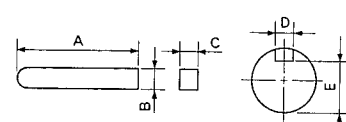
## Connecting Diagram



- (Caution 1) The brake operates to a holding condition when the electromagnetic brake is 'off'.  
(Caution 2) Use R + C inbetween the contacts. Also DV-OPO08 is available as an option.

## Key and Key Slot

M8GA□M(B)  
M9GA□M(B)



Type	A	B	C	D	E
M8GA□M(B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.010</sub>	7.5 <sup>0</sup> <sub>-0.15</sub>
M9GA□M(B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.010</sub>	9.5 <sup>0</sup> <sub>-0.15</sub>

## Geared motor maximum permissible torque table (kg·cm)

Note : rpm figures are based on synchronous speed. The actual output rpm, under rated torque conditions, is about 2~20% less than synchronous speed. A grey background indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. A white background indicates rotation in the opposite direction.

### 齒輪馬達最大承受扭力對照表

rpm表列數字乃根據馬達同步運轉之轉速，但在額定扭力負載情況下實際輸出轉速為同步運轉轉速的80~98%。灰色欄乃輸出軸運轉方向與馬達相同時的數據資料，白色欄乃輸出軸運轉方向與馬達相反時的數據資料。

### GEAR HEAD를 직결했을 때의 허용토크

★回転数は同期速度の中間値に示されています。一般に回転数は負荷の大きさに応じて表示値より2%~20%低減(値)を示します。  
★回転方向は□がモーターと同方向、△が逆方向を示します。

## Specifications

Size mmSq.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Rated load				Starting Current (A)	Starting Torque (N·cm)	Capacitor μF(V)	Applied gearhead type		
							Input (W)	Current (A)	Speed (rpm)	Torque (N·cm)				Metal	Ball	Decimal
80	M8RA25GB4DU	4	25	100	50	30min	53	0.53	1125	1.8	1.0	1.7	6	0.12	1.00	9.5
				115	60		56	0.57	1625	1.5	1.0	1.7	6	0.12	1.00	(200V)
				115	60		54	0.47	1650	1.5	1.1	1.7	8	0.13	1.00	7
				120	60		58	0.48	1675	1.5	1.1	1.8	8	0.14	1.00	(230V)
90	M9RA40GB4DU	4	40	100	50	30min	77	0.80	1300	3.0	1.6	3.5	7	0.14	2.00	15
				115	60		81	0.83	1600	2.4	1.6	3.5	7	0.14	2.00	(200V)
				115	60		81	0.71	1650	2.3	1.7	3.5	9	0.15	2.00	12
				120	60		85	0.72	1675	2.3	1.8	3.9	10	0.15	2.00	(230V)

Speed (rpm)	With decimal gearhead															
	500	300	200	180	150	120	100	90	75	60	50	30	20	15	10	9
Gear reduction ratio	3	5	7.5	10	12.5	15	18	20	25	30	36	45	60	90	180	200
Maximum permissible torque (kg·cm)	4.0	6.7	10	11	13	16	20	21	26	32	39	65	80	80	80	80
Maximum permissible torque (kg·cm)	6.7	11	16	18	23	28	33	36	45	54	65	100	100	100	100	100

Note : The box (□) represents the desired gear reduction ratio, which thereby becomes part of the code for geared motor.

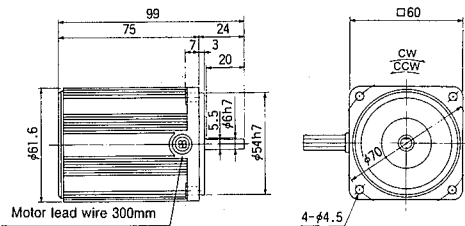
# Straight shaft

## UL Standard Motor

**60**  
mmSQ,  
**6W**

Weight 0.67kg

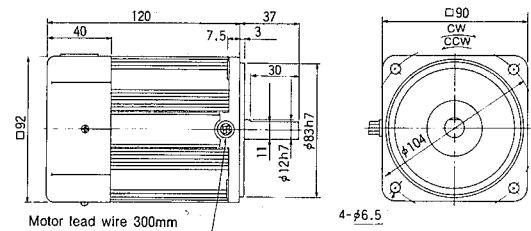
M6IA6S4DU



**90**  
mmSQ,  
**60W**

Weight 2.7kg

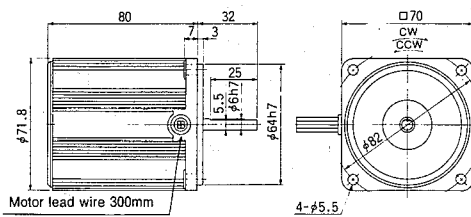
M9IC60S4DU



**70**  
mmSQ,  
**15W**

Weight 1.04kg

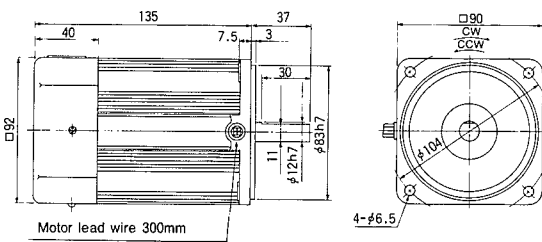
M7IA15S4DU



**90**  
mmSQ,  
**90W**

Weight 2.9kg

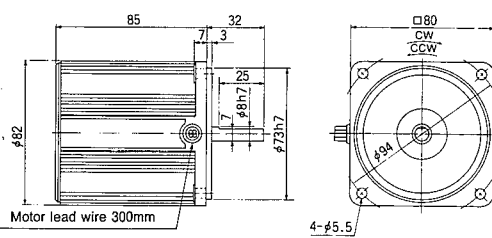
M9IC90S4DU



**80**  
mmSQ,  
**25W**

Weight 1.5kg

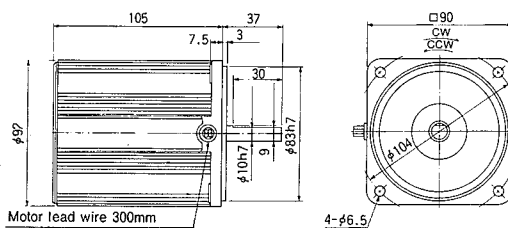
M8IA25S4DU



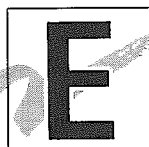
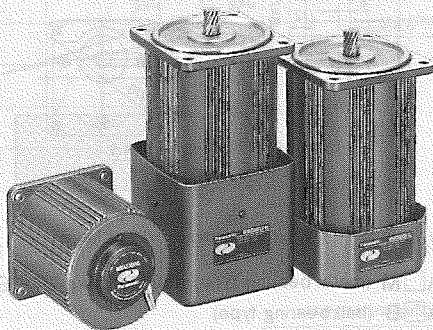
**90**  
mmSQ,  
**40W**

Weight 2.4kg

M9IA40S4DU



D



## Variable Speed Motor Variable Speed With Electro-Magnetic Brake Motor

### INDEX

- VARIABLE SPEED  
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- VARIABLE SPEED  
/SINGLE PHASE REVERSIBLE MOTOR ... 133
- VARIABLE SPEED  
/ELECTRO-MAGNETIC, REVERSIBLE ..... 141

# Variable Speed Motor / Single Phase Induction

變速馬達 單相感應馬達  
가변속 모터 단상 인덕션 모터

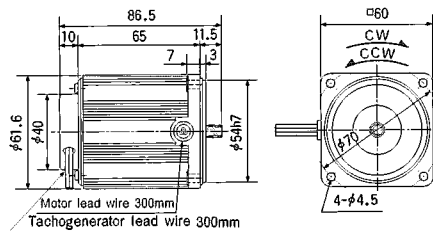
## Motor

M6IA3GV4L 4P 3W 100V

Scale 1/4 Unit mm

60  
mmSQ,  
3W

Weight 0.60kg  
helical gear  
module 0.5  
number of teeth 10

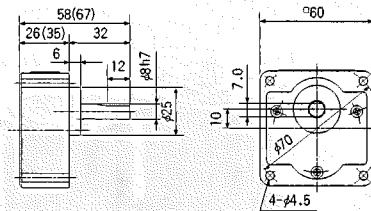


## Gear Head

Scale 1/4 Unit mm

M6GA□M (metal bearing type) weight 0.2kg

M6GA□B (ball bearing type)



Note : The value in "( )" is for gear ratio of 1/20 or larger.

M6IA6GV4L 4P 6W 100V

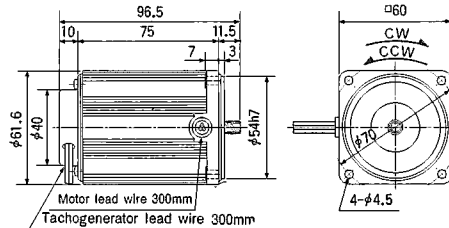
M6IA6GV4Q 4P 6W 110V

M6IA6GV4Y 4P 6W 200V

M6IA6GV4W 4P 6W 220V

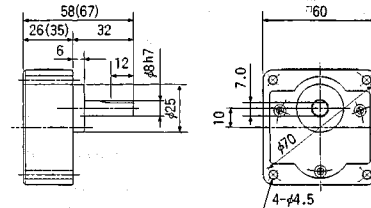
60  
mmSQ,  
6W

Weight 0.71kg  
helical gear  
module 0.5  
number of teeth 10



M6GA□M (metal bearing type) weight 0.34kg

M6GA□B (ball bearing type)



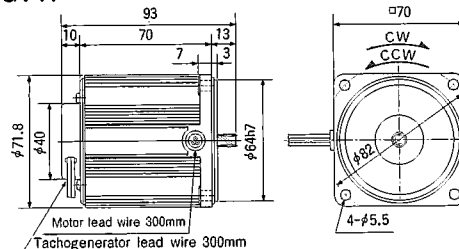
Note : The value in "( )" is for gear ratio of 1/20 or larger.

M7IA10GV4L 4P 10W 100V

M7IA10GV4Y 4P 10W 200V

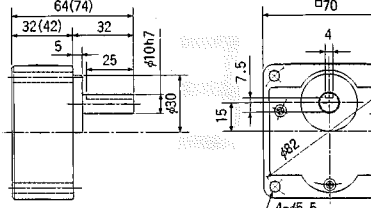
70  
mmSQ,  
10W

Weight 0.88kg  
helical gear  
module 0.5  
number of teeth 10



M7GA□M (metal bearing type) weight 0.34kg

M7GA□B (ball bearing type)



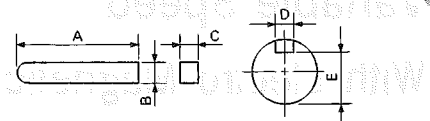
Note : The value in "( )" is for gear ratio of 1/20 or larger.

## Connecting Diagram

See page 149 to page 153 for wiring connections

## Key and Key Slot

M7GA□M(B)



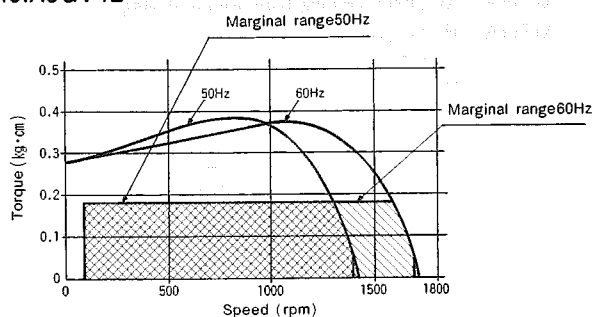
Type	A	B	C	D	E
M7GA□M	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.010</sub>	7.5 <sup>0</sup> <sub>-0.15</sub>

## Specifications

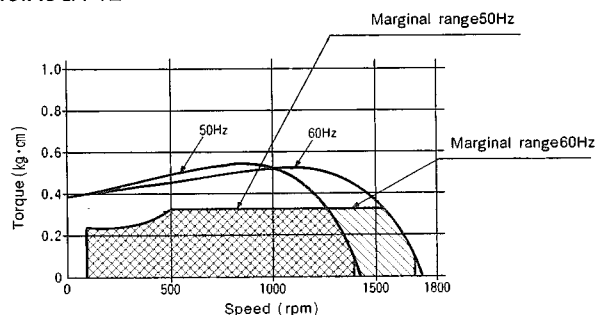
Size mmSQ.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Variable speed range (rpm)	Allowable torque (kg·cm)		Starting Current (A)	Starting Torque (kg·cm)	Condensor Capacitor μF(V)	Speed controller	Applicable gearhead type		
								1200 (rpm)	90 (rpm)					Metal	Ball	Decimal
60	M6IA3GV4L	4	3	100	50	CONT.	90~1400	0.18	0.18	0.18	0.27	2(200V)	—	M6GA□M	M6GA□B	M6GA10XM
					60		90~1700									
60	M6IA6GV4L	4	6	100	50	CONT.	90~1400	0.33	0.25	0.24	0.38	2.5(200V)	—	M6GA□M	M6GA□B	M6GA10XM
					60		90~1700									
60	M6IA6GV4Y	4	6	200	50	CONT.	90~1400	0.33	0.25	0.12	0.38	0.6(400V)	—	M6GA□M	M6GA□B	M6GA10XM
					60		90~1700									
70	M7IA10GV4L	4	10	100	50	CONT.	90~1400	0.60	0.28	0.40	0.65	4(200V)	—	M7GA□M	M7GA□B	M7GA10XM
					60		90~1700									
70	M7IA10GV4Y	4	10	200	50	CONT.	90~1400	0.60	0.28	0.20	0.65	1(400V)	—	M7GA□M	M7GA□B	M7GA10XM
					60		90~1700									

## Speed-Torque Curve

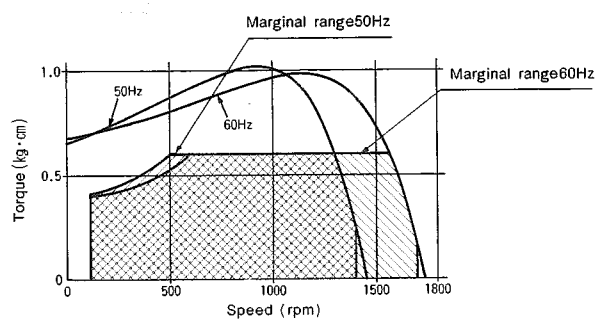
## M6IA3GV4L



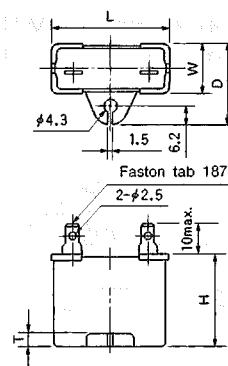
## M6IA6GV4L



## M7IA10GV4L



## Capacitor



## ■ Dimensions of Capacitor (mm)

Motor Type	Capacitor Type	L	W	D	H	T
M6IA3GV4L 100V	MZAX038	39.5	16	26.5	30.5	4
M6IA6GV4L 100V	MZAX039	39.5	16	26.5	30.5	4
M6IAGV4Y 200V	MZAX056	39.5	16.2	27	27	4
M7IA10GV4L 100V	MZAX042	39.5	16	26.5	30.5	4
M7IA10GV4Y 200V	MZAX060	39.5	16.2	27	27	4



# Variable Speed Motor / Single Phase Induction

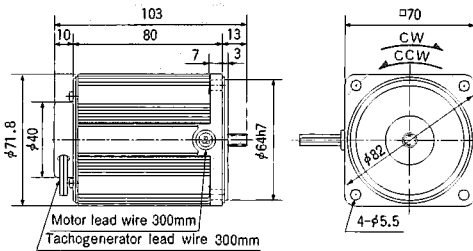
變速馬達 單相感應馬達  
가변속 모터 단상 인덕션 모터

## Motor

**70**  
mmSQ,  
**15W**

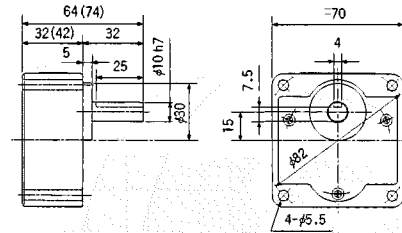
Weight 1.14kg  
helical gear  
module 0.5  
number of teeth 10

M71A15GV4L 4P 15W 100V M71A15GV4Q 4P 15W 110V  
M71A15GV4Y 4P 15W 200V M71A15GV4W 4P 15W 220V



## Gear Head

M7GA□M (metal bearing type) weight 0.54kg  
M7GA□B (ball bearing type)

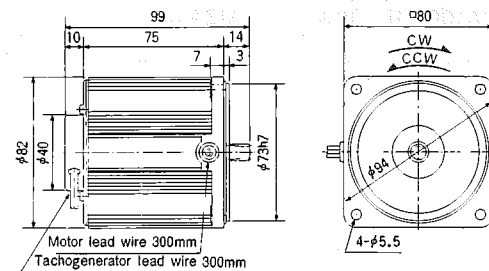


Note : The value in "( )" is for gear ratio of 1/20 or larger.

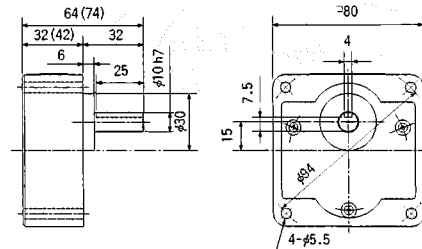
**80**  
mmSQ,  
**15W**

Weight 1.2kg  
helical gear  
module 0.6  
number of teeth 11

M81A15GV4L 4P 15W 100V  
M81A15GV4Y 4P 15W 200V



M8GA□M (metal bearing type) weight 0.68kg  
M8GA□B (ball bearing type)



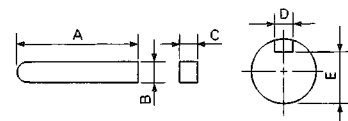
Note : The value in "( )" is for gear ratio of 1/20 or larger.

## Connecting Diagram

See page 149 to page 153 for wiring connections

## Key and Key Slot

M7GA□M(B)  
M8GA□M(B)



Type	A	B	C	D	E
M7GA□M(B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.010</sub>	7.5 <sup>0</sup> <sub>-0.15</sub>
M8GA□M(B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.010</sub>	7.5 <sup>0</sup> <sub>-0.15</sub>

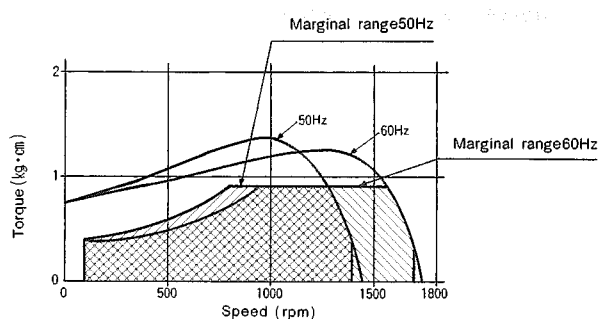
## Specifications

Size mmSQ	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Variable speed range (rpm)	Allowable torque (kg·cm)		Starting Current (A)	Starting Torque (kg·cm)	Condenser Capacitor μF(V)	Speed controller	Applicable gearhead type		
								1200 (rpm)	90 (rpm)					Metal	Ball	Decimal
70	M71A15GV4L	4	15	100	50	CONT.	90~1400	0.91	0.3	0.60	0.75	5(200V)	—	M7GA□M	M7GA□B	M7GA10XM
					60		90~1700									
70	M71A15GV4Y	4	15	200	50	CONT.	90~1400	0.91	0.3	0.30	0.75	1.3(400V)	—	M7GA□M	M7GA□B	M7GA10XM
					60		90~1700									
80	M81A15GV4L	4	15	100	50	CONT.	90~1400	1.20	0.4	0.30	1.00	6(200V)	—	M8GA□M	M8GA□B	M8GA10XM
					60		90~1700									
80	M81A15GV4Y	4	15	200	50	CONT.	90~1400	1.20	0.4	0.34	1.00	15(400V)	—	M8GA□M	M8GA□B	M8GA10XM
					60		90~1700									

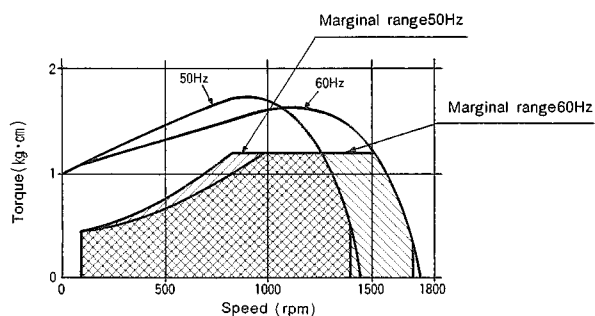


## Speed-Torque Curve

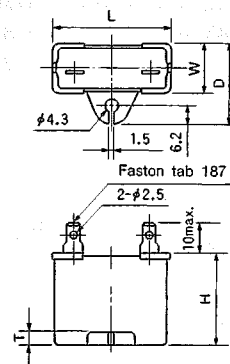
## M7IA15GV4L



## M8IA15GV4L



## Capacitor



## ■ Dimensions of Capacitor (mm)

Motor Type	Capacitor Type	L	W	D	H	T
M7IA15GV4L 100V	MZAX044	39.5	16	26.5	30.5	4
M7IA15GV4Y 200V	MZAX062	39.5	18.3	29	29	4
M8IA15GV4L 100V	MZAX045	39.5	17.05	28	30.5	4
M8IA15GV4Y 200V	MZAX063	39.5	22	32.5	32.5	4

# Variable Speed Motor / Single Phase Induction

變速馬達 單相感應馬達  
가변속 모터 단상 인덕션 모터

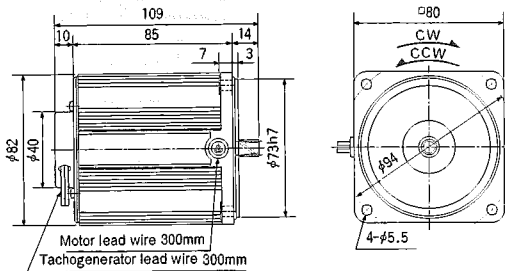
## Motor

**80**  
mmSQ,  
**25W**

Weight 1.5kg  
helical gear  
module 0.6  
number of teeth 11

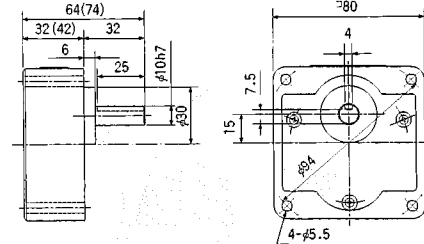
M8IA25GV4L 4P 25W 100V  
M8IA25GV4Y 4P 25W 200V

Scale 1/4 Unit mm  
M8IA25GV4Q 4P 25W 110V  
M8IA25GV4W 4P 25W 220V  
M8IA25GV4G 4P 25W 230V



## Gear Head

Scale 1/4 Unit mm  
M8GA□M (metal bearing type) weight 0.68kg  
M8GA□B (ball bearing type)



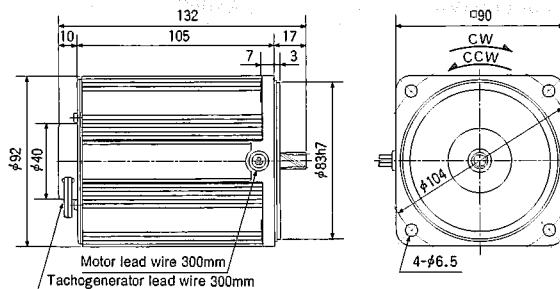
Note : The value in "□" is for gear ratio of 1/20 or larger.

**90**  
mmSQ,  
**40W**

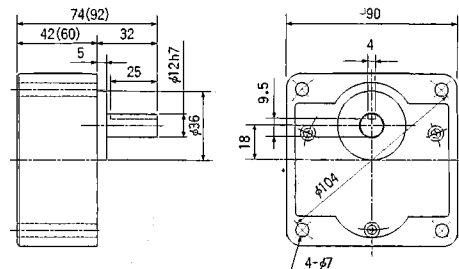
Weight 2.4kg  
helical gear  
module 0.6  
number of teeth 1

M9IA40GV4L 4P 40W 100V  
M9IA40GV4Y 4P 40W 200V

M9IA40GV4Q 4P 40W 110V  
M9IA40GV4W 4P 40W 220V  
M9IA40GV4G 4P 40W 230V



M9GA□M (metal bearing type) weight 1.2kg  
M9GA□B (ball bearing type)



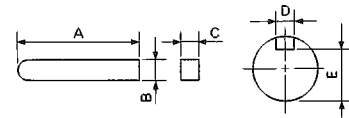
Note : The value in "□" is for gear ratio of 1/20 or larger.

## Connecting Diagram

See page 149 to page 153 for wiring connections

## Key and Key Slot

M8GA□M(B)  
M9GA□M(B)



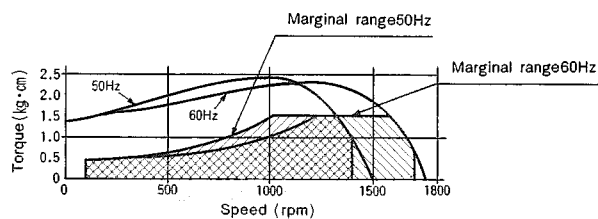
Type	A	B	C	D	E
M8GA□M(B)	25	$4^{+0.030}_{-0.030}$	$4^{+0.030}_{-0.030}$	$4^{+0.060}_{+0.010}$	$7.5^{+0}_{-0.15}$
M9GA□M(B)	25	$4^{+0.030}_{-0.030}$	$4^{+0.030}_{-0.030}$	$4^{+0.060}_{+0.010}$	$9.5^{+0}_{-0.15}$

## Specifications

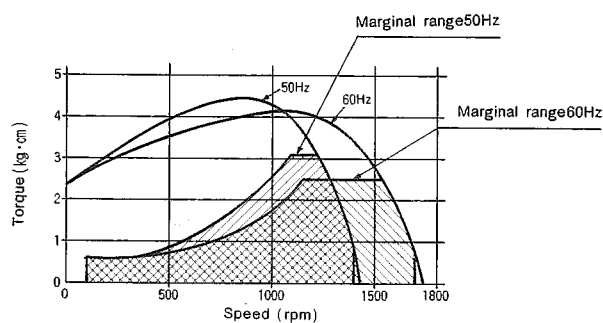
Size mmSQ	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Variable speed range (rpm)	Allowable torque (kg·cm)		Starting Current (A)	Starting Torque (kg·cm)	Condenser Capacitor μF(V)	Speed controller	Applicable gearhead type		
								1200 (rpm)	90 (rpm)					Metal	Ball	Decimal
80	M8IA25GV4L	4	25	100	50	CONT.	90~1400	1.4	0.45	1.0	1.3	8(200V)	—	M8GA□M	M8GA□	M8GA10XM
					60		90~1700	1.4	0.45	1.0	1.3					
80	M8IA25GV4Y	4	25	200	50	CONT.	90~1400	1.4	0.45	0.5	1.3	2(400V)	—	M8GA□M	M8GA□	M8GA10XM
					60		90~1700	1.4	0.45	0.5	1.3					
90	M9IA40GV4L	4	40	100	50	CONT.	90~1400	3.1	0.6	1.6	2.3	12(200V)	—	M9GA□M	M9GA□B	M9GA10XM
					60		90~1700	2.5	0.6	1.5	2.3					
90	M9IA40GV4Y	4	40	200	50	CONT.	90~1400	3.1	0.6	0.8	2.3	3(400V)	—	M9GA□M	M9GA□B	M9GA10XM
					60		90~1700	2.5	0.6	0.8	2.3					

## Speed-Torque Curve

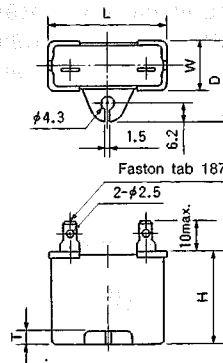
## M8IA25GV4L



## M9IA40GV4L



## Capacitor



## ■ Dimensions of Capacitor (mm)

Motor Type	Capacitor Type	L	W	D	H	T
M8IA25GV4L 100V	MZAX047	39.5	22	32.5	30.5	4
M8IA25GV4Y 200V	MZAX065	39.5	22	32.5	32.5	4
M9IA40GV4L 100V	MZAX050	39.5	26.7	37	32	4
M9IA40GV4Y 200V	MZAX068	49.7	24	34.5	34.5	4

# Variable Speed Motor / Single Phase Induction

變速馬達 單相感應馬達  
가변속 모터 단상 인덕션 모터

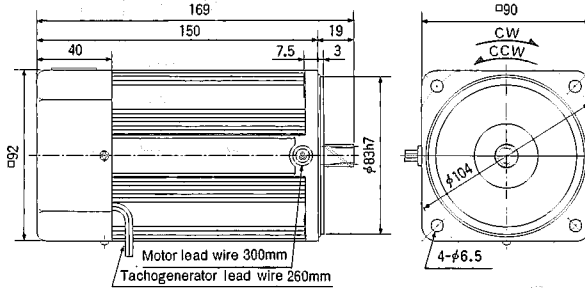
## Motor

**90**  
mmSQ,  
**60W**

Weight 3.0kg  
helical gear  
module 0.8  
number of teeth 11

M9IC60GV4L 4P 60W 100V  
M9IC60GV4Y 4P 60W 200V

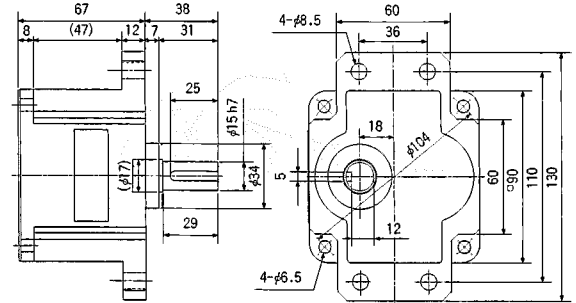
Scale 1/4 Unit mm  
M9IC60GV4Q 4P 60W 110V  
M9IC60GV4W 4P 60W 220V  
M9IC60GV4G 4P 60W 230V



## Gear Head

M9GC□B (ball bearing type) weight 1.5kg

Scale 1/4 Unit mm

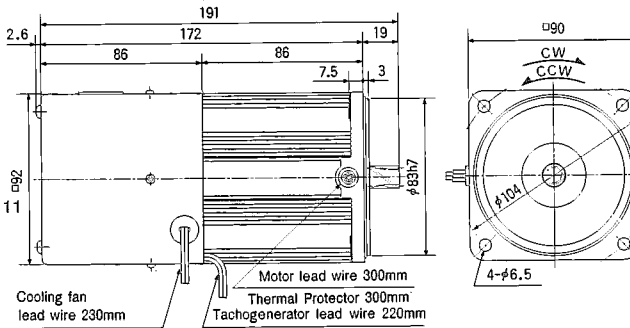


**90**  
mmSQ,  
**90W**

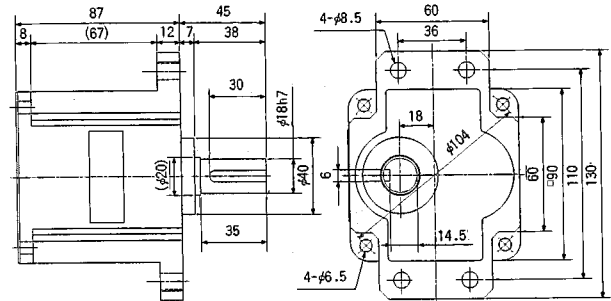
Weight 3.6kg  
helical gear  
module 0.8  
number of teeth 11

M9IC90GV4L 4P 90W 100V  
M9IC90GV4Y 4P 90W 200V

M9IC90GV4Q 4P 90W 110V  
M9IC90GV4W 4P 90W 220V  
M9IC90GV4G 4P 90W 230V



M9GS□B (ball bearing type) weight 1.9kg



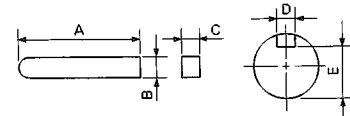
C type 200kg·cm / max. permissible torque  
S type 300kg·cm / max. permissible torque

## Connecting Diagram

See page 149 to page 153 for wiring connections

## Key and Key Slot

M9GC□B  
M9GS□B



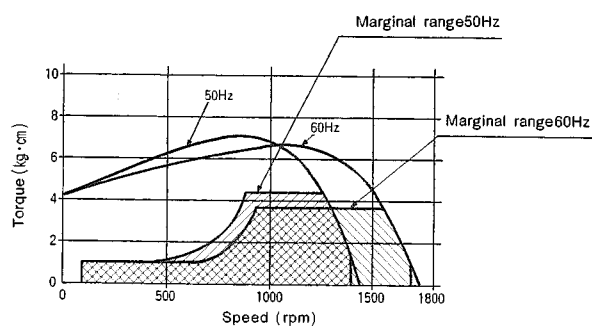
Type	A	B	C	D	E
M9GC□B	25	5 <sup>0</sup> <sub>-0.030</sub>	5 <sup>0</sup> <sub>-0.030</sub>	5 <sup>+0.050</sup> <sub>0</sub>	12 <sup>0</sup> <sub>-0.15</sub>
M9GS□B	30	6 <sup>0</sup> <sub>-0.030</sub>	6 <sup>0</sup> <sub>-0.030</sub>	6 <sup>+0.050</sup> <sub>0</sub>	14.5 <sup>0</sup> <sub>-0.15</sub>

## Specifications

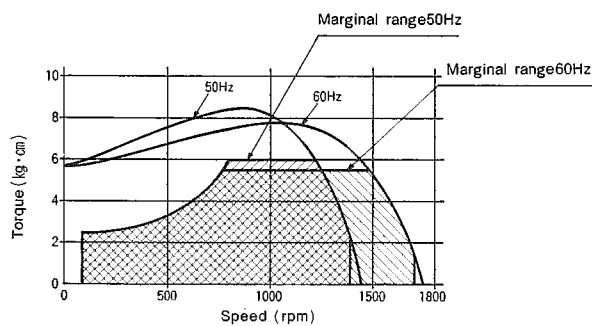
Size mmSQ.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Variable speed range (rpm)	Allowable torque (kg·cm)		Starting Current (A)	Starting Torque (kg·cm)	Condensor Capacitor μF(V)	Speed controller	Applicable gearhead type		
								1200 (rpm)	90 (rpm)					Metal	Ball	Decimal
90	M9IC60GV4L	4	60	100	50	CONT.	90~1400	4.4	1.2	2.5	4.2	20(200V)	—	—	M9GC□B	M9GC10XB
					60		90~1700	3.7	1.2	2.4	4.2					
90	M9IC60GV4Y	4	60	200	50	CONT.	90~1400	4.4	1.2	1.3	4.2	5 (400V)	—	—	M9GS□B	M9GS10XB
					60		90~1700	3.7	1.2	1.2	4.2					
90	M9IC90GV4L	4	90	100	50	CONT.	90~1400	6.0	2.5	2.9	5.5	25(200V)	—	—	M9GC□B	M9GC10XB
					60		90~1700	5.5	2.5	2.9	5.5					
90	M9IC90GV4Y	4	90	200	50	CONT.	90~1400	6.0	2.5	1.5	5.5	6.2(375V)	—	—	M9GS□B	M9GS10XB
					60		90~1700	5.5	2.5	1.5	5.5					

## Speed-Torque Curve

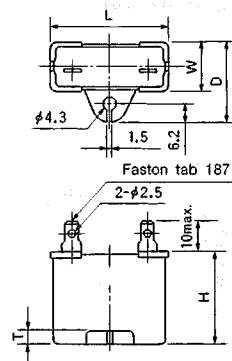
## M9IC60GV4L



## M9IC90GV4L



## Capacitor



## ■ Dimensions of Capacitor (mm)

Motor Type	Capacitor Type	L	W	D	H	T
M9IC60GV4L 100V	MZAX052	50.2	26.7	37	36	5
M9IC60GV4Y 200V	MZAX070	50	30.5	41	41.5	4
M9IC90GV4L 100V	MZAX053	50.2	31	41	42	5
M9IC90GV4Y 200V	MZAX072	50	30.5	41	41.5	4

# Variable Speed Motor / Single Phase Induction

變速馬達單相感應馬達  
가변속 모터 단상 인덕션 모터

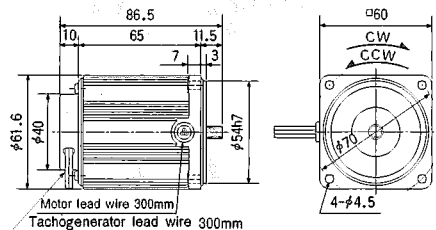
## Motor

M6RA4GV4L 4P 4W 100V

Scale 1/4 Unit mm

60  
mmSQ,  
4W

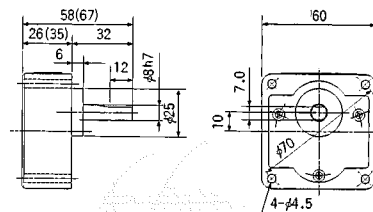
Weight 0.60kg  
helical gear  
module 0.5  
number of teeth 10



## Gear Head

Scale 1/4 Unit mm

M6GA□M (metal bearing type) weight 0.34kg  
M6GA□B (ball bearing type)



M6RA6GV4L 4P 6W 100V

M6RA6GV4Q 4P 6W 110V

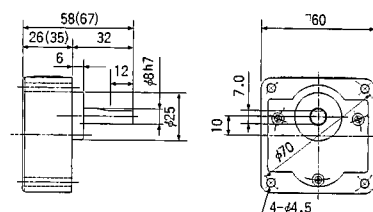
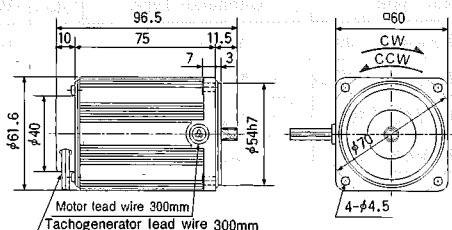
M6RA6GV4Y 4P 6W 200V

M6RA6GV4W 4P 6W 220V

M6GA□M (metal bearing type) weight 0.34kg  
M6GA□B (ball bearing type)

60  
mmSQ,  
6W

Weight 0.71kg  
helical gear  
module 0.5  
number of teeth 10



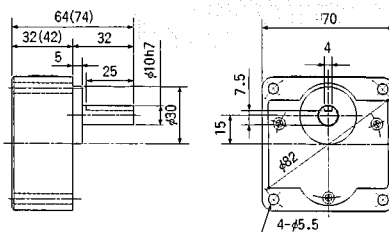
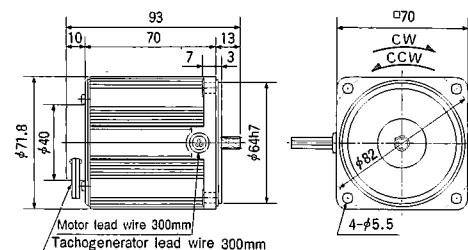
M7RA10GV4L 4P 10W 100V

M7RA10GV4Y 4P 10W 200V

M7GA□M (metal bearing type) weight 0.54kg  
M7GA□B (ball bearing type)

70  
mmSQ,  
10W

Weight 0.88kg  
helical gear  
module 0.5  
number of teeth 10

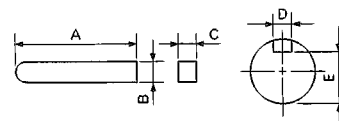


## Connecting Diagram

See page 149 to page 153 for wiring connections

## Key and Key Slot

M7GA□M (B)



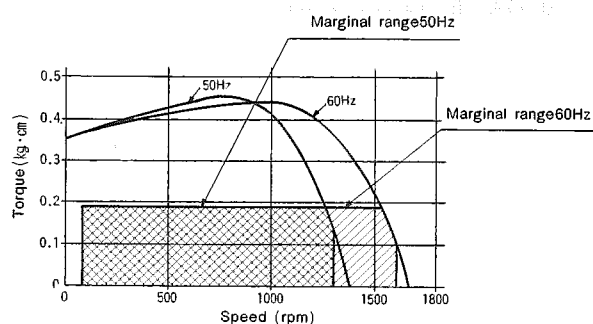
Type	A	B	C	D	E
M7GA□M (B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.010</sub>	7.5 <sup>0</sup> <sub>-0.15</sub>

## Specifications

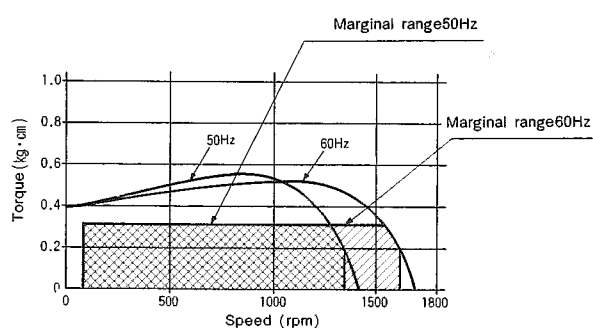
Size mmSQ.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Variable speed range (rpm)	Allowable torque (kg·cm)		Starting Current (A)	Starting Torque (kg·cm)	Condenser Capacitor μF (V)	Speed controller	Applicable gearhead type		
								1200 (rpm)	90 (rpm)					Metal	Ball	Decimal
60	M6RA4GV4L	4	4	100	50	30min	90~1400	0.19	0.19	0.22	0.35	2.5(200V)	—	M6GA□M	M6GA□B	M6GA10XM
					60		90~1700									
60	M6RA6GV4L	4	6	100	50	30min	90~1400	0.32	0.31	0.24	0.39	3(200V)	—	M6GA□M	M6GA□B	M6GA10XM
					60		90~1700									
60	M6RA6GV4Y	4	6	200	50	30min	90~1400	0.32	0.31	0.12	0.39	0.8(400V)	—	M6GA□M	M6GA□B	M6GA10XM
					60		90~1700									
70	M7RA10GV4L	4	10	100	50	30min	90~1400	0.60	0.35	0.41	0.50	4.5(200V)	—	M7GA□M	M7GA□B	M7GA10XM
					60		90~1700									
70	M7RA10GV4Y	4	10	200	50	30min	90~1400	0.60	0.35	0.21	0.50	1.2(400V)	—	M7GA□M	M7GA□B	M7GA10XM
					60		90~1700									

## Speed-Torque Curve

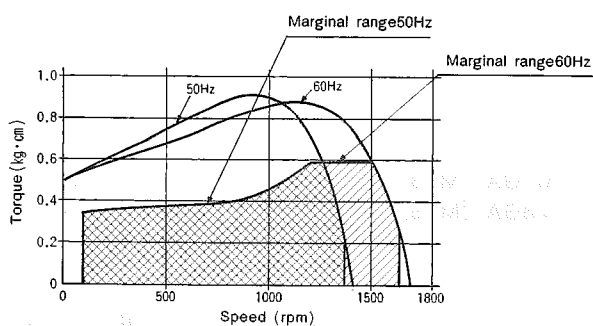
## M6RA4GV4L



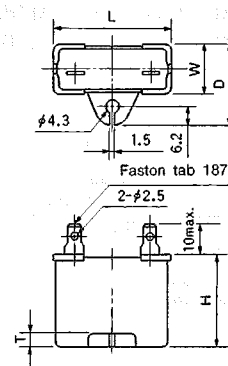
## M6RA6GV4L



## M7RA10GV4L



## Capacitor



## ■ Dimensions of Capacitor (mm)

Motor Type	Capacitor Type	L	W	D	H	T
M6RA4GV4L 100V	MZAX039	39.5	16	26.5	30.5	4
M6RA6GV4L 100V	MZAX040	39.5	16	26.5	30.5	4
M6RA6GV4Y 200V	MZAX058	39.5	16.2	27	27	4
M7RA10GV4L 100V	MZAX043	39.5	16	26.5	30.5	4
M7RA10GV4Y 200V	MZAX061	39.5	18.3	29	29	4

# Variable Speed Motor / Single Phase Reversible

變速馬達 單相感應馬達  
가변속 모터 단상 인덕션 모터

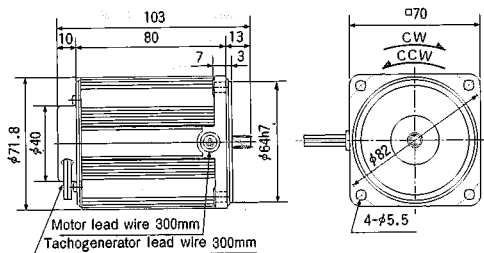
## Motor

**70**  
mmSQ,  
**15W**

Weight 1.14kg  
helical gear  
module 0.5  
number of teeth 10

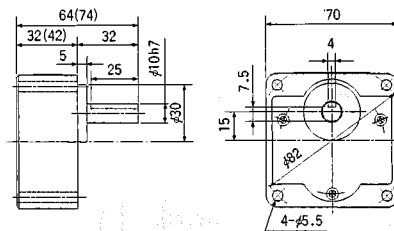
M7RA15GV4L 4P 15W 100V  
M7RA15GV4Y 4P 15W 200V

Scale 1/4 Unit mm  
M7RA15GV4Q 4P 15W 110V  
M7RA15GV4W 4P 15W 220V



## Gear Head

Scale 1/4 Unit mm  
M7GA□M (metal bearing type) weight 0.54kg  
M7GA□B (ball bearing type)

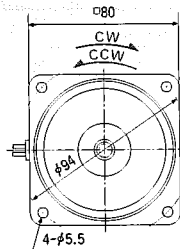


Note : The value in "( )" is for gear ratio of 1/20 or larger.

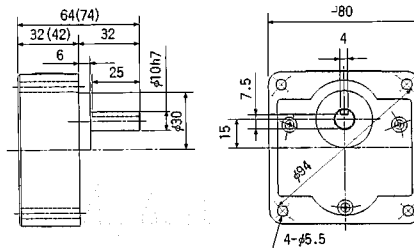
**80**  
mmSQ,  
**20W**

Weight 1.2kg  
helical gear  
module 0.6  
number of teeth 11

M8RA20GV4L 4P 20W 100V  
M8RA20GV4Y 4P 20W 200V



M8GA□M (metal bearing type) weight 0.68kg  
M8GA□B (ball bearing type)



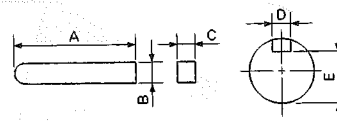
Note : The value in "( )" is for gear ratio of 1/20 or larger.

## Connecting Diagram

See page 155 to page 157 for wiring connections

## Key and Key Slot

M7GA□M (B)  
M8GA□M (B)



Type	A	B	C	D	E
M7GA□M (B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.010</sub>	7.5 <sup>0</sup> <sub>-0.15</sub>
M8GA□M (B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.010</sub>	7.5 <sup>0</sup> <sub>-0.15</sub>

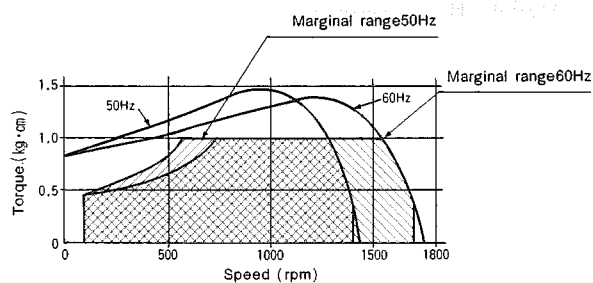
## Specifications

Size mmSQ.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Variable speed range (rpm)	Allowable torque (kg·cm)		Starting Current (A)	Starting Torque (kg·cm)	Condensor Capacitor μF (V)	Speed controller	Applicable gearhead type		
								1200 (rpm)	90 (rpm)					Metal	Ball	Decimal
70	M7RA15GV4L	4	15	100	50	30min	90~1400	1.0	0.47	0.59	0.82	6(200V)	—	M7GA□M	M7GA□B	M7GA10XM
					60		90~1700									
70	M7RA15GV4Y	4	15	200	50	30min	90~1400	1.0	0.47	0.30	0.82	1.5(400V)	—	M7GA□M	M7GA□B	M7GA10XM
					60		90~1700									
80	M8RA20GV4L	4	20	100	50	30min	90~1400	1.2	0.50	0.67	1.1	7(200V)	—	M8GA□M	M8GA□B	M8GA10XM
					60		90~1700									
80	M8RA20GV4Y	4	20	200	50	30min	90~1400	1.2	0.50	0.34	1.1	1.8(400V)	—	M8GA□M	M8GA□B	M8GA10XM
					60		90~1700									

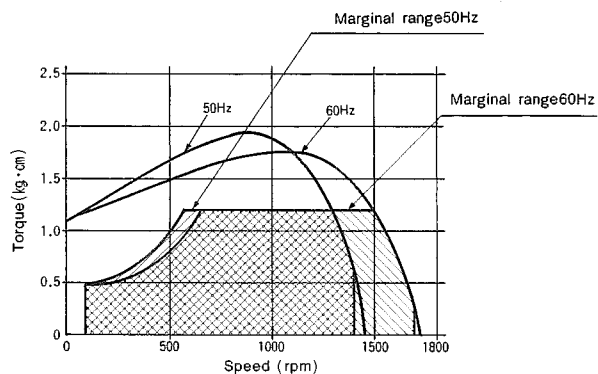


## Speed-Torque Curve

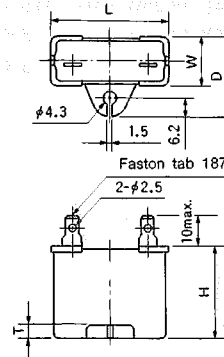
## M7RA15GV4L



## M8RA20GV4L



## Capacitor



## ■ Dimensions of Capacitor (mm)

Motor Type	Capacitor Type	L	W	D	H	T
M7RA15GV4L 100V	MZAX045	39.5	17.5	28	30.5	4
M7RA15GV4Y 200V	MZAX063	39.5	22	32.5	32.5	4
M8RA20GV4L 100V	MZAX046	39.5	22	32.5	30.5	4
M8RA20GV4Y 200V	MZAXV064	39.5	22	32.5	32.5	4

# Variable Speed Motor / Single Phase Reversible

變速馬達單相感應馬達  
가변속 모터 단상 리버시블 모터

## Motor

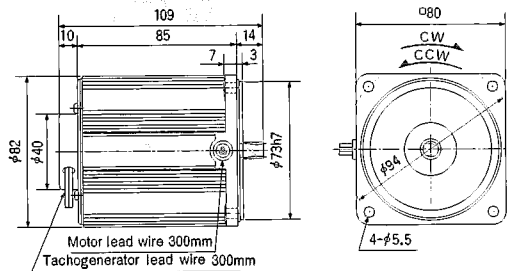
Scale 1/4 Unit mm

M8RA25GV4L 4P 25W 100V  
M8RA25GV4Y 4P 25W 200V

M8RA25GV4Q 4P 25W 110V  
M8RA25GV4W 4P 25W 220V  
M8RA25GV4G 4P 25W 230V

80  
mmSQ,  
25W

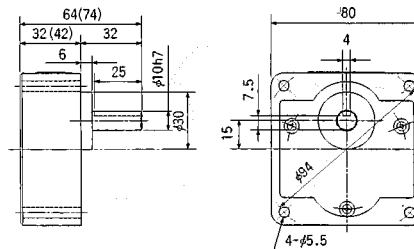
Weight 1.5kg  
helical gear  
module 0.6  
number of teeth 11



## Gear Head

Scale 1/4 Unit mm

M8GA□M (metal bearing type) weight 0.68kg  
M8GA□B (ball bearing type)



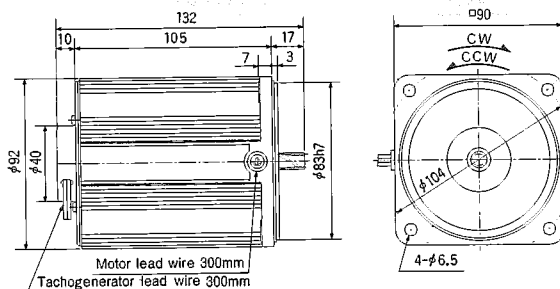
Note : The value in "( )" is for gear ratio of 1/20 or larger.

M9RA40GV4L 4P 40W 100V  
M9RA40GV4Y 4P 40W 200V

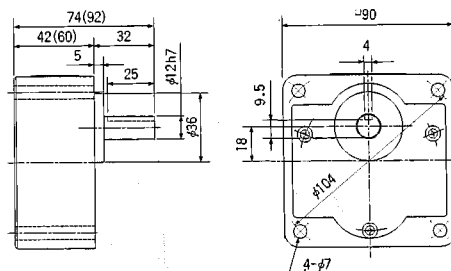
M9RA40GV4Q 4P 40W 110V  
M9RA40GV4W 4P 40W 220V  
M9RA40GV4G 4P 40W 230V

90  
mmSQ,  
40W

Weight 2.4kg  
helical gear  
module 0.6  
number of teeth 11



M9GA□M (metal bearing type) weight 1.2kg  
M9GA□B (ball bearing type)



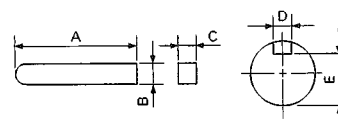
Note : The value in "( )" is for gear ratio of 1/20 or larger.

## Connecting Diagram

See page 155 to page 157 for wiring connections

## Key and Key Slot

M8GA□M (B)  
M9GA□M (B)



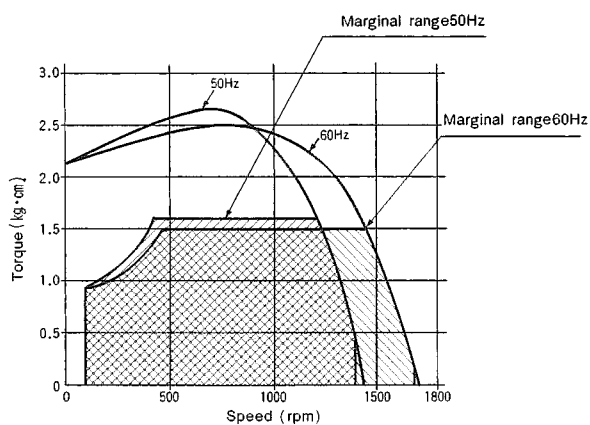
Type	A	B	C	D	E
M8GA□M (B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.010</sub>	7.5 <sup>0</sup> <sub>-0.15</sub>
M9GA□M (B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.060</sub>	9.5 <sup>0</sup> <sub>-0.15</sub>

## Specifications

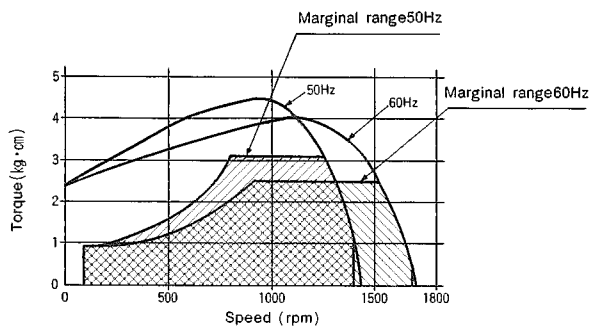
Size mmsq.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Variable speed range (rpm)	Allowable torque (kg·cm)		Starting Current (A)	Starting Torque (kg·cm)	Condenser Capacitor μF(V)	Speed controller	Applicable gearhead type		
								1200 (rpm)	90 (rpm)					Metal	Ball	Decimal
80	M8RA25GV4L	4	25	100	50	30min	90~1400	1.6	0.9	0.90	2.1	9.5(200V)	—	M8GA□M	M8GA□B	M8GA10XM
					60		90~1700									
80	M8RA25GV4Y	4	25	200	50	30min	90~1400	1.6	0.9	0.45	2.1	2.4(400V)	—	M8GA□M	M8GA□B	M8GA10XM
					60		90~1700									
90	M9RA40GV4L	4	40	100	50	30min	90~1400	3.1	1.0	1.60	2.4	15(200V)	—	M9GA□M	M9GA□B	M9GA10XM
					60		90~1700									
90	M9RA40GV4Y	4	40	200	50	30min	90~1400	3.1	1.0	0.80	2.4	3.8(400V)	—	M9GA□M	M9GA□B	M9GA10XM
					60		90~1700									

## Speed-Torque Curve

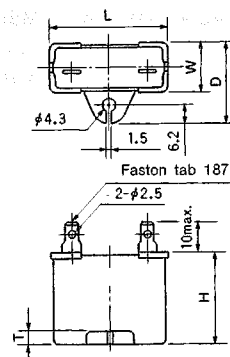
## M8RA25GV4L



## M9RA40GV4L



## Capacitor



## ■ Dimensions of Capacitor (mm)

Motor Type	Capacitor Type	L	W	D	H	T
M8RA25GV4L 100V	MZAX048	39.5	22	32.5	30.5	4
M8RA25GV4Y 200V	MZAX066	49.7	24	34.5	32.5	4
M9RA40GV4L 100V	MZAX051	39.5	26.7	37	41	4
M9RA40GV4Y 200V	MZAX069	50	26.7	37.5	38	4

# Variable Speed Motor / Single Phase Reversible

變速馬達 單相感應馬達  
가변속 모터 단상 리버시블 모터

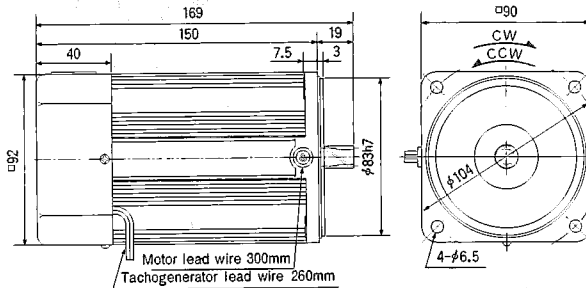
## Motor

**90**  
mmSQ,  
**60W**

Weight 3.0kg  
helical gear  
module 0.8  
number of teeth 11

M9RC60GV4L 4P 60W 100V  
M9RC60GV4Y 4P 60W 200V

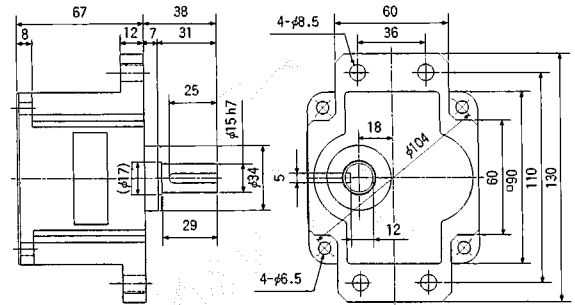
Scale 1/4 Unit mm  
M9RC60GV4Q 4P 60W 110V  
M9RC60GV4W 4P 60W 220V  
M9RC60GV4G 4P 60W 230V



## Gear Head

M9GC□B (ball bearing type) weight 1.5kg

Scale 1/4 Unit mm

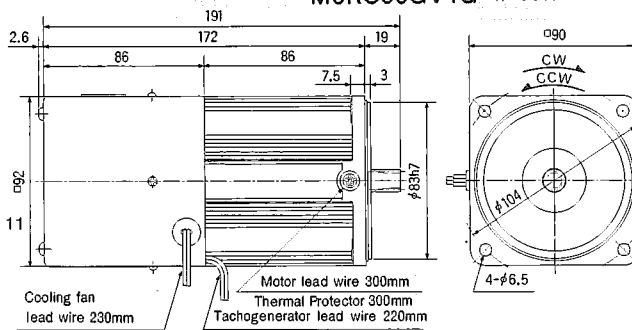


**90**  
mmSQ,  
**90W**

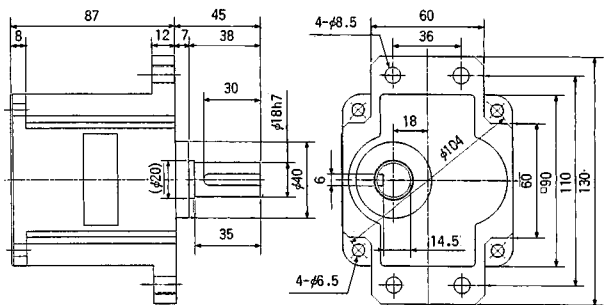
Weight 3.6kg  
helical gear  
module 0.8  
number of teeth 11

M9RC90GV4L 4P 90W 100V  
M9RC90GV4Y 4P 90W 200V

M9RC90GV4Q 4P 90W 110V  
M9RC90GV4W 4P 90W 220V  
M9RC90GV4G 4P 90W 230V



M9GS□B (ball bearing type) weight 1.9kg



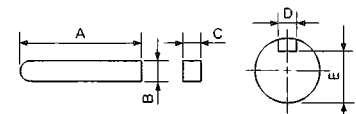
C type 200kg·cm / max. permissible torque  
S type 300kg·cm / max. permissible torque

## Connecting Diagram

See page 155 to page 157 for wiring connections

## Key and Key Slot

M9GC□B  
M9GS□B



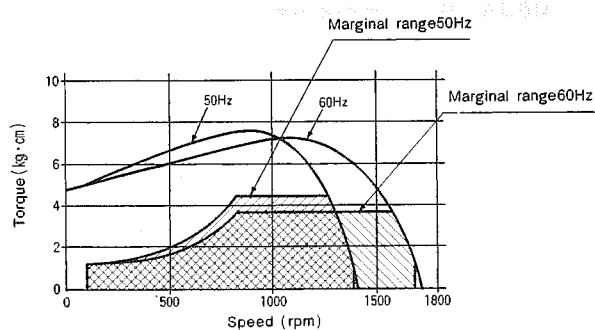
Type	A	B	C	D	E
M9GC□B	25	5 <sup>0</sup> <sub>-0.030</sub>	5 <sup>0</sup> <sub>-0.030</sub>	5 <sup>+0.050</sup> <sub>0</sub>	12 <sup>0</sup> <sub>-0.15</sub>
M9GS□B	30	6 <sup>0</sup> <sub>-0.030</sub>	6 <sup>0</sup> <sub>-0.030</sub>	6 <sup>+0.050</sup> <sub>0</sub>	14.5 <sup>0</sup> <sub>-0.15</sub>

## Specifications

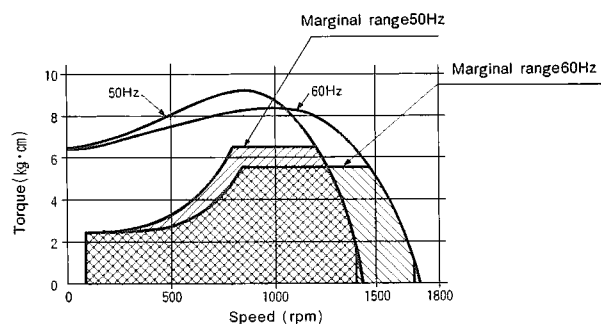
Size mmsq.	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Variable speed range (rpm)	Allowable torque (kg·cm)		Starting Current (A)	Starting Torque (kg·cm)	Condensor Capacitor μF(V)	Speed controller	Applicable gearhead type		
								1200 (rpm)	90 (rpm)					Metal	Ball	Decimal
90	M9RC60GV4L	4	60	100	50	30min	90~1400	4.4	1.2	2.9	4.7	25(200V)	—	—	M9GC□B	M9GC10XB
					60		90~1700	3.7		2.8	4.7					
90	M9RC60GV4Y	4	60	200	50	30min	90~1400	4.4	1.2	1.5	4.7	6.2(375V)	—	—	M9GS□B	M9GS10XB
					60		90~1700	3.7		1.4	4.7					
90	M9RC90GV4L	4	90	100	50	30min	90~1400	6.0	2.5	3.0	6.2	30(200V)	—	—	M9GC□B	M9GC10XB
					60		90~1700	5.5		3.0	6.2					
90	M9RC90GV4Y	4	90	200	50	30min	90~1400	6.0	2.5	1.5	6.2	7.5(370V)	—	—	M9GS□B	M9GS10XB
					60		90~1700	5.5		1.5	6.0					

## Speed-Torque Curve

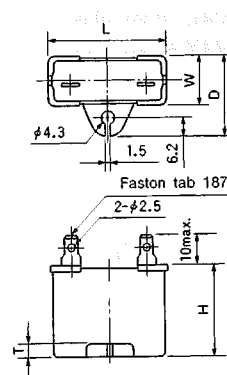
## M9RC60GV4L



## M9RC90GV4L



## Capacitor



## ■ Dimensions of Capacitor (mm)

Motor Type	Capacitor Type	L	W	D	H	T
M9RC60GV4L 100V	MZAX053	50.2	31	41	42	5
M9RC60GV4Y 200V	MZAX072	50	30.5	41	41.5	4
M9RC90GV4L 100V	MZAX54	50.2	31	41	42	5
M9RC90GV4Y 200V	MZAX073	50	34	45	45	6

# Variable Speed With Electro-Magnetic Brake Motor / Single Phase Reversible

付帶電磁制動器變速馬達 單相可逆式馬達  
전자 브레이크 가변속 모터

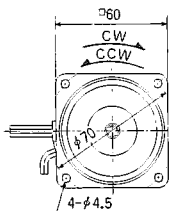
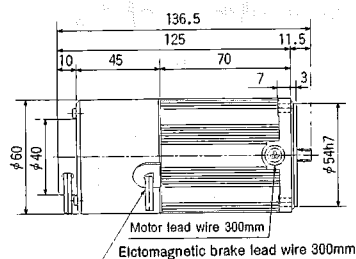
## Motor

**60**  
mmSQ,  
**6W**

Weight 0.9kg  
helical gear  
module 0.5  
number of teeth 10

M6RA6GBV4L 4P 6W 100V  
M6RA6GBV4Y 4P 6W 200V

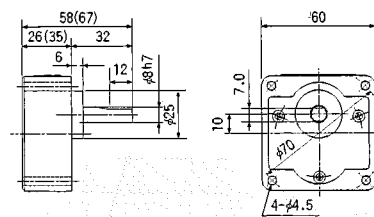
Scale 1/4 Unit mm



## Gear Head

Scale 1/4 Unit mm

M6GA□M (metal bearing type) weight 0.34kg  
M6GA□B (ball bearing type)

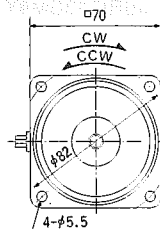
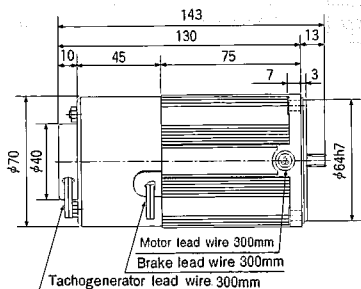


Note : The value in "( )" is for gear ratio of 1/20 or larger.

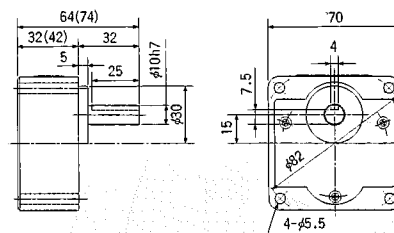
**70**  
mmSQ,  
**15W**

Weight 1.35kg  
helical gear  
module 0.5  
number of teeth 10

M7RA15GBV4L 4P 15W 100V  
M7RA15GBV4Y 4P 15W 200V



M7GA□M (metal bearing type) weight 0.54kg  
M7GA□B (ball bearing type)



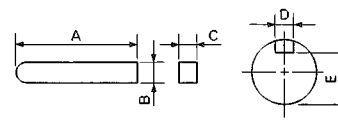
Note : The value in "( )" is for gear ratio of 1/20 or larger.

## Connecting Diagram

See page 155 to page 157 for wiring connections

## Key and Key Slot

M7GA□M(B)



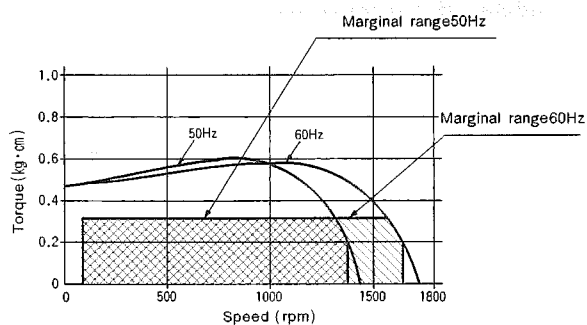
Type	A	B	C	D	E
M7GA□M(B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.010</sub>	7.5 <sup>0</sup> <sub>-0.15</sub>

## Specifications

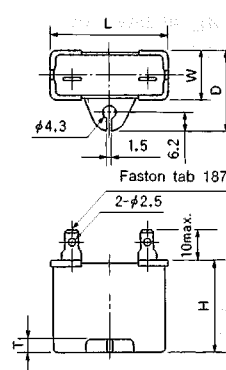
Size mmSQ	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Variable speed range (rpm)	Allowable torque (N·m)			Starting Current (A)	Starting Torque (kg·cm)			Condenser Capacitor μF(V)	Speed controller	Applicable gearhead type		
								1200 (rpm)	90 (rpm)	0.31 (rpm)							Metal	Ball	Decimal
60	M6RA6GBV4L	4	6	100	50	30min	90~1400	0.32	0.31	0.24	0.46	4	0.05	0.5	3(200V)	★P.136	M6GA□M	M6GA□B	M6GA10XM
							90~1700	0.32	0.31	0.25	0.46	4	0.05	0.5					
60	M6RA6GBV4Y	4	6	200	50	30min	90~1400	0.32	0.31	0.12	0.46	4	0.03	0.5	0.8 (400V)	★P.136	M6GA□M	M6GA□B	M6GA10XM
							90~1700	0.32	0.31	0.13	0.46	4	0.03	0.5					
70	M7RA15GBV4L	4	15	100	50	30min	90~1400	1.00	0.47	0.59	0.96	5	0.06	0.8	6 (200V)	★P.136	M7GA□M	M7GA□B	M7GA10XM
							90~1700	1.00	0.47	0.52	0.96	5	0.06	0.8					
70	M7RA15GBV4Y	4	15	200	50	30min	90~1400	1.00	0.47	0.30	0.96	5	0.03	0.8	1.5 (400V)	★P.136	M7GA□M	M7GA□B	M7GA10XM
							90~1700	1.00	0.47	0.29	0.96	5	0.03	0.8					

## Speed-Torque Curve

## M6RA6GBV4L



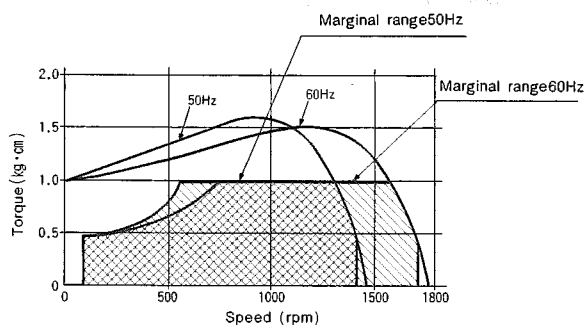
## Capacitor



## ■ Dimensions of Capacitor (mm)

Motor Type	Capacitor Type	L	W	D	H	T
M6RA6GBV4L 100V	MZAX040	39.5	16	16.5	30.5	4
M6RA6GBV4Y 200V	MZAX058	39.5	16.5	27	27	4
M7RA15GBV4L 100V	MZAX044	39.5	18	29	29	4
M7RA15GBV4Y 200V	MZAX062	39.5	22	32.5	32.5	4

## M7RA15GBV4L



# Variable Speed With Electro-Magnetic Brake Motor / Single Phase Reversible

付帶電磁制動器變速馬達 單相可逆式馬達  
전자 브레이크 가변속 모터 단상 리버시블 모터

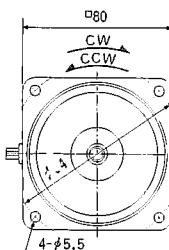
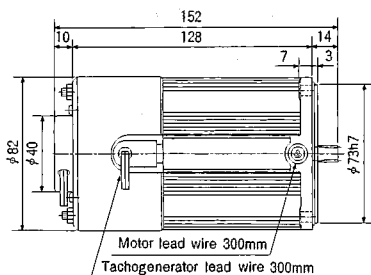
## Motor

**80**  
mmSQ,  
**25W**

Weight 1.8kg  
helical gear  
module 0.6  
number of teeth 11

M8RA25GBV4L 4P 25W 100V  
M8RA25GBV4Y 4P 25W 200V

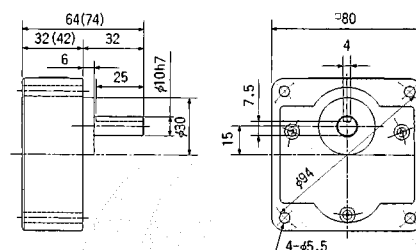
Scale 1/4 Unit mm



## Gear Head

Scale 1/4 Unit mm

M8GA□M (metal bearing type) weight 0.68kg  
M8GA□B (ball bearing type)

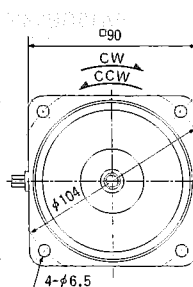
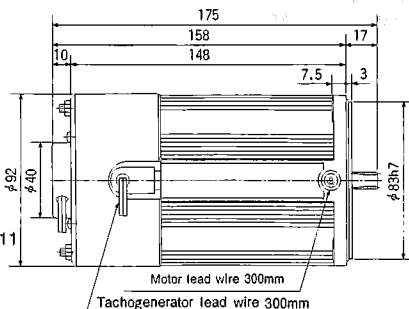


Note : The value in "( )" is for gear ratio of 1/20 or larger.

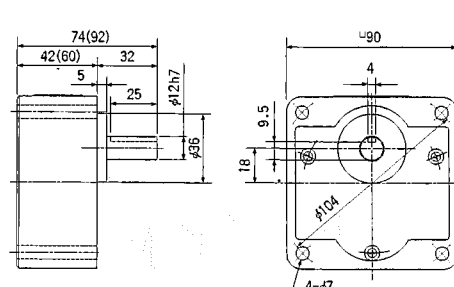
**90**  
mmSQ,  
**40W**

Weight 2.9kg  
helical gear  
module 0.6  
number of teeth 11

M9RA40GBV4L 4P 40W 100V  
M9RA40GBV4Y 4P 40W 200V



M9GA□M (metal bearing type) weight 1.2kg  
M9GA□B (ball bearing type)



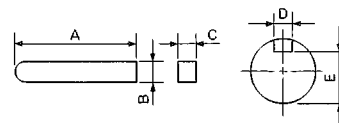
Note : The value in "( )" is for gear ratio of 1/20 or larger.

## Connecting Diagram

See page 155 to page 157 for wiring connections

## Key and Key Slot

M8GA□M (B)  
M9GA□M (B)



Type	A	B	C	D	E
M8GA□M (B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.010</sub>	7.5 <sup>0</sup> <sub>-0.15</sub>
M9GA□M (B)	25	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>+0.060</sup> <sub>+0.010</sub>	9.5 <sup>0</sup> <sub>-0.15</sub>

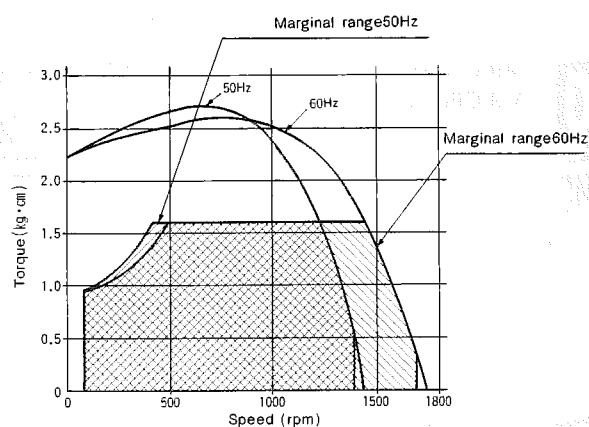
## Specifications

Size mmSQ	Type	poles	Output (W)	Voltage (V)	Frequency (Hz)	Duty	Variable speed range (rpm)	Allowable torque (N·cm)			Starting Current (A)	Starting Torque (kg·cm)			Condensor Capacitor μF (V)	Speed controller	Applicable gearhead type		
								1200 (rpm)	90 (rpm)	0.90							Metal	Ball	Decimal
80	M8RA25GBV4L	4	25	100	50	30min	90~1400	1.6	0.90	0.90	2.2	6	0.12	1.0	3.5 (200V)	★P.136	M8GA□M	M8GA□B	M8GA10XM
					60		90~1700	1.6	0.90	0.90	2.2	6	0.12	1.0					
80	M8RA25GBV4Y	4	25	200	50	30min	90~1400	1.6	0.90	0.45	2.2	6	0.06	1.0	2.4 (400V)	★P.136	M8GA□M	M8GA□B	M8GA10XM
					60		90~1700	1.6	0.90	0.45	2.2	6	0.06	1.0					
90	M9RA40GBV4L	4	40	100	50	30min	90~1400	3.1	1.0	1.60	3.3	7	0.14	2.0	15 (200V)	★P.136	M9GA□M	M9GA□B	M9GA10XM
					60		90~1700	2.5	1.0	1.60	3.3	7	0.14	2.0					
90	M9RA40GBV4Y	4	40	200	50	30min	90~1400	3.1	1.0	0.80	3.3	7	0.07	2.0	3.8 (400V)	★P.136	M9GA□M	M9GA□B	M9GA10XM
					60		90~1700	2.5	1.0	0.80	3.3	7	0.07	2.0					

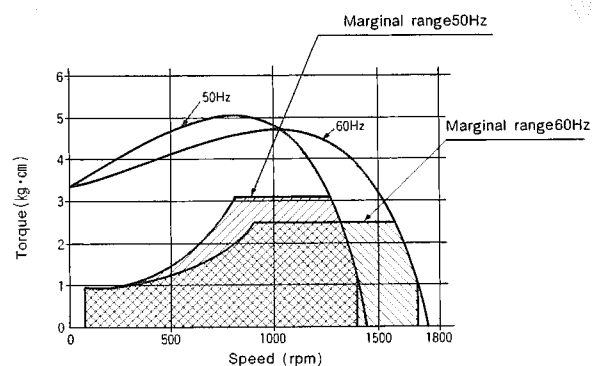


## Speed-Torque Curve

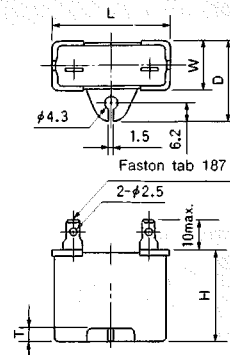
## M8RA25GBV4L



## M9RA40GBV4L



## Capacitor



## ■ Dimensions of Capacitor (mm)

Motor Type	Capacitor Type	L	W	D	H	T
M8RA25GBV4L 100V	MZAX046	39.5	22	32.5	30.5	4
M8RA25GBV4Y 200V	MZAX064	49.5	24	34.5	34.5	4
M9RA40GBV4L 100V	MZAX051	39.5	26.7	37	41	4
M9RA40GBV4Y 200V	MZAX069	49.5	27	37.5	38	4

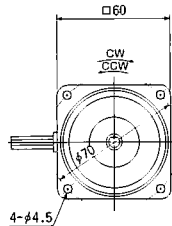
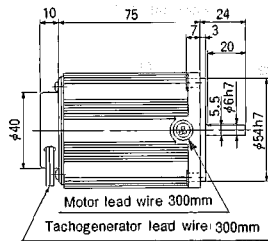
## Variable Speed Motor

Induction/Lead Wire Type

**60**  
mmSQ<sub>i</sub>  
**6W**

**M6IA6SV4L**  
**M6IA6SV4Y**

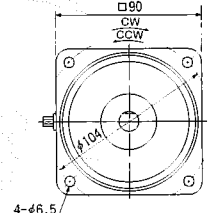
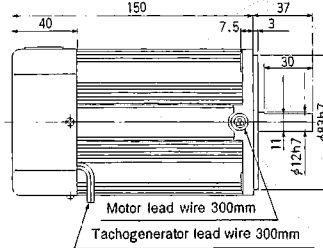
Weight 0.67kg



**90**  
mmSQ<sub>i</sub>  
**60W**

**M9IC60SV4L**  
**M9IC60SV4Y**

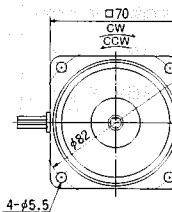
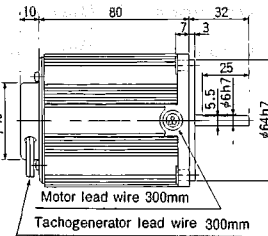
Weight 2.7kg



**70**  
mmSQ<sub>i</sub>  
**15W**

**M7IA15SV4L**  
**M7IA15SV4Y**

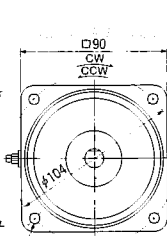
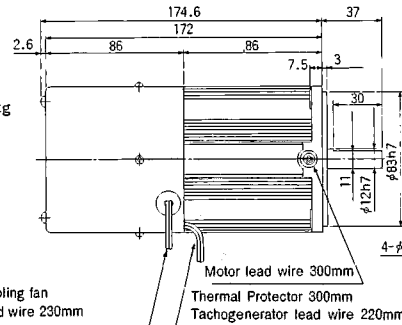
Weight 1.1kg



**90**  
mmSQ<sub>i</sub>  
**90W**

**M9IC90SV4L**  
**M9IC90SV4Y**

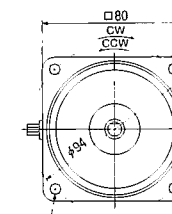
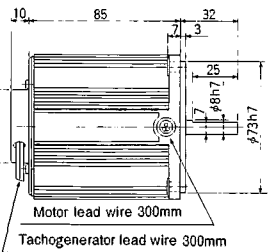
Weight 3.4kg



**80**  
mmSQ<sub>i</sub>  
**25W**

**M8IA25SV4L**  
**M8IA25SV4Y**

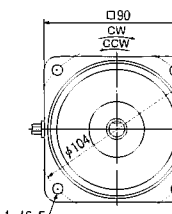
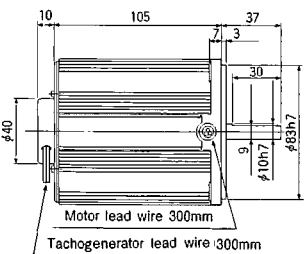
Weight 1.5kg



**90**  
mmSQ<sub>i</sub>  
**40W**

**M9IA40SV4L**  
**M9IA40SV4Y**

Weight 2.4kg



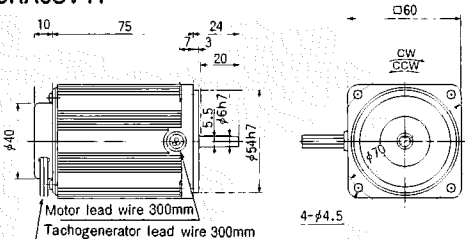
## Variable Speed Motor

Reversible/Lead Wire Type

**60**  
mmSQ  
**6W**

Weight 0.7kg

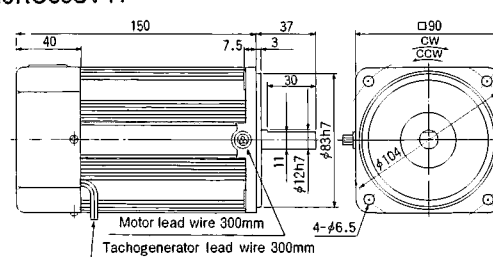
**M6RA6SV4L**  
**M6RA6SV4Y**



**90**  
mmSQ  
**60W**

Weight 3.0kg

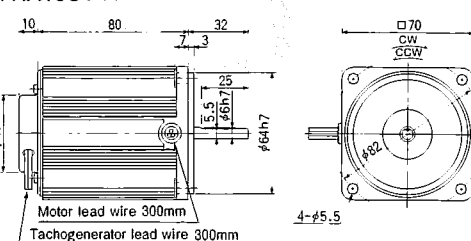
**M9RC60SV4L**  
**M9RC60SV4Y**



**70**  
mmSQ  
**15W**

Weight 1.14kg

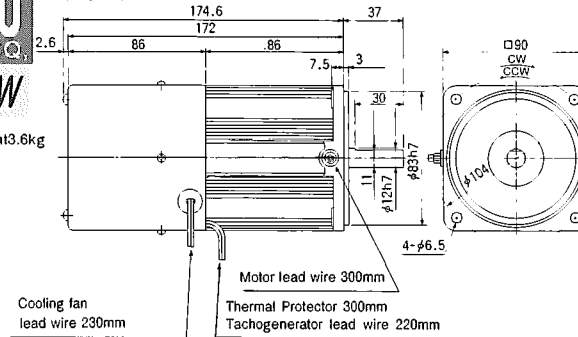
**M7RA15SV4L**  
**M7RA15SV4Y**



**90**  
mmSQ  
**90W**

Weight 3.6kg

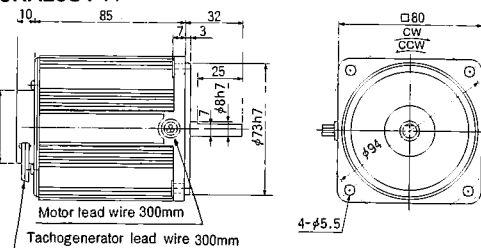
**M9RC90SV4L**  
**M9RC90SV4Y**



**80**  
mmSQ  
**25W**

Weight 1.5kg

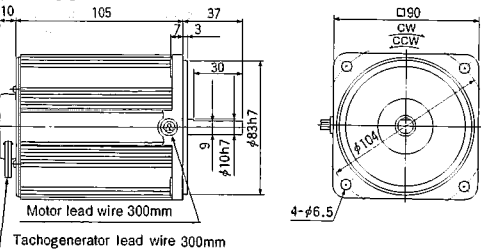
**M8RA25SV4L**  
**M8RA25SV4Y**



**90**  
mmSQ  
**40W**

Weight 2.4kg

**M9RA40SVL**  
**M9RA40SV4Y**



CONFIDENTIAL



CONFIDENTIAL



CONFIDENTIAL



CONFIDENTIAL



CONFIDENTIAL



CONFIDENTIAL

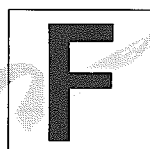


CONFIDENTIAL



CONFIDENTIAL

F



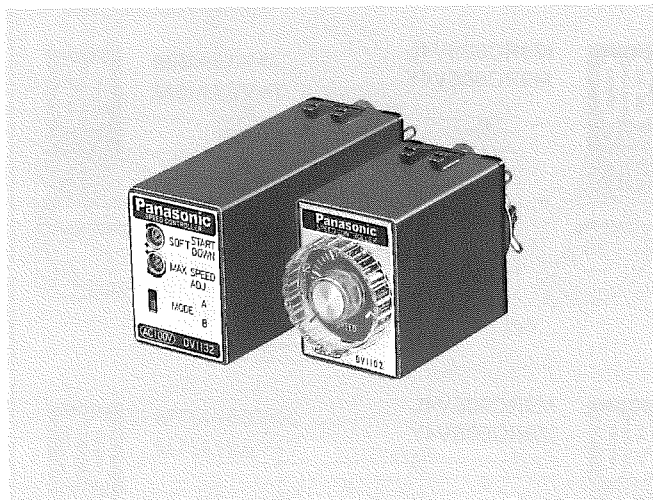
## Speed Controller Brake Unit Unit Type Din 48 Brake Unit

### INDEX

● SPEED CONTROLLER .....	149
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● SPEED CONTROLLER / OPTIONS .....	158
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● DIN 48 BRAKE UNIT .....	170
● MOTOR FRAME .....	174
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# Speed Controller

速度控制器組裝型  
스피드 콘트롤러



## SD Type

- Speed set device built -in  
The speed volume switch enables to adjust the rotation speed.
- Instant stop with electromagnetic brake is available :
- 8P compact plug-in type is applied :
- Wide variation in options are available.
- 機體內部裝有速度設定器  
只要操作前面的設定速度用旋鈕，可以隨時調整馬達的旋轉速度。  
無需另外配合速度設定器，更不必特別布線之要。
- 由於電制動器的作用，定將按需瞬時停機。
- 採用小形 8 P (脚) 插件方式。
- 可供豐富的配合用另售品  
可以按需利用松下電工所製的端子臺、插座等另售的配件。
- 速度設定器를 內藏.  
케이스 前面의 速度設定用 손잡이에 依해 모터의 回轉速度의 調整을 할 수 있습니다.
- 電氣브레이크에 依한 瞬間停止機能이 可能.
- 小形의 8 P 플러그 IN 방식을 採用.
- 豊富な 実装用 OPTION의 利用이 可能.  
松下電工製의 端子台 소켓 등 配電用 OPTION이 여러모로 利用됩니다.

## EX Type

- Soft start, soft down function available :  
Excellent in the performance of softly starting and down speed, with a max 5sec speed adjustment.
- High response in switching  
High and stable response in switch change.
- Improved the instant stop function
- Parallel operation is possible :  
Enable to operate several motors with single controller.
- Able to connect other control systems  
Able to control with the voltage signal as well.
- 可能實行緩慢啓動、逐漸減速而停機。  
慢速操作的最大調節時間範圍是 5 秒鐘，並且呈出線性的啓動、停機動作，穩定性極可觀。
- 響應性轉換功能  
因備有高穩定性、高應答性的轉換開關，按照用途能選最適特性。
- 更提高瞬時停止功能。
- 並聯運轉功能  
在一個功率的容量範圍下可控制多數臺的馬達。
- 不妨連接到其他控制系統  
如連接順序程序等其他控制系統，則能準確地控制馬達，此外利用電壓信號亦能控制。
- 소프트 스타트·소프트 다운이 可能.  
最大 5 秒까지의 時間調整이 可能, 또 소프트 스타트·소프트 다운의 直線性에 優秀합니다.
- 応答性切換이 可能.  
高安全性, 高応答性の 切換S/W가 內藏되어 있으므로 用途에 適合한 特性을 選択할 수 있습니다.
- 瞬間停止機能을 더욱 向上.
- 並列運轉이 可能.  
한個의 VOLUME으로 여러臺의 모터를 制御할 수가 있음.
- 他이 制御系와의 連結이 可能.  
시퀀스等 他의 制御系와의 連結에 依해 모터를 制御할 수 있습니다. 또 電壓信號에 있어서도 制御됩니다.



### Specifications

	SD Type												EX Type				
Model Spec	DV-1101	DV-1102	DV-1104	DV-1201	DV-1202	DV-1204	DV-1101Q	DV-1102Q	DV-1104Q	DV-1201W	DV-1202W	DV-1204W	DV-1131	DV-1132	DV-1134	DV-1231	DV-1234
Rated Voltage ※3	100V			200V			110~115V			220~230V			100V			200V	
Operation Volt Range	±10%						±10%						±10%				
Power Source Freq	50/60Hz						50/60Hz						50/60Hz				
Rated Current	0.4A	1A	2.0	0.3A	0.6A	1A	0.4A	1A	2.0	0.3A	0.6A	1A	0.4A	1A	2.0	0.3A	1A
Applicable Motor Output ※1	3~10W	15~40W	60~90W	6~20W	25~40W	60~90W	3~10W	15~40W	60~90W	6~20W	25~40W	60~90W	3~10W	15~40W	60~90W	6~20W	25~90W
Response													High response		High stability		
Speed Control Range	90~1400rpm/90~1700rpm						90~1400rpm/90~1700rpm						90~1400rpm/90~1700rpm			50~1400rpm/50~1700rpm	
Speed Variation	5%						5%						Mix. 5%			Max. 3%	
Speed Set Device	Built in (External speed set device attachable)						Built in (External speed set device attachable)						With external speed set device				
Control ※2	Run electric brake for certain period to motor						Run electric brake for certain period to motor						Run electric brake for certain period to motor				
Electric Brake Period	0.5sec						0.5sec						Max. 0.5sec				
Parallel Operation	Not suitable for parallel operation						Not suitable for parallel operation						possible				
Soft Start/Soft Stop	None						None						possible				
Operation Temperature	-10~50℃						-10~50℃						-10~50℃				
Storage temputature	-20~60℃						-20~60℃						-20~60℃				

※ 1. Suitable motors are G-series variable speed types.

※ 2. The electric brake does not have retentiveness.

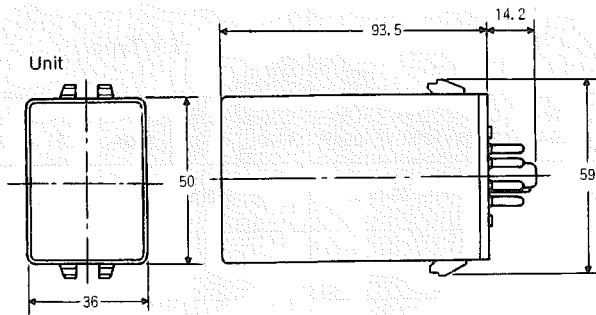
※ 3. Single phase only.

\* 1. 適用MOTOR는 当社G시리즈 可變速 MOTOR로 합니다. 또한 모터의 仕様은 카다록 등을 보아 주세요.

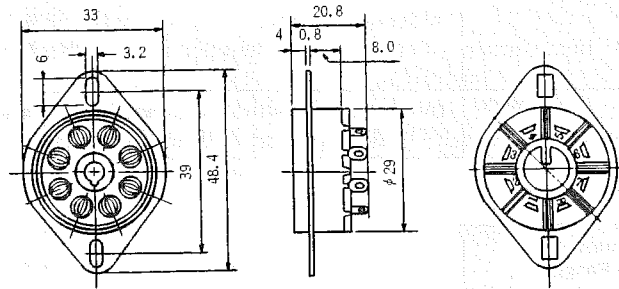
\* 2. 電氣BRAKE에는 保持力이 없습니다. REVERSIBLE MOTOR를 使用하면 항상 摺動形의 簡易

DV-1101 DV-1102 DV-1104  
DV-1201 DV-1202 DV-1204

## Dimension



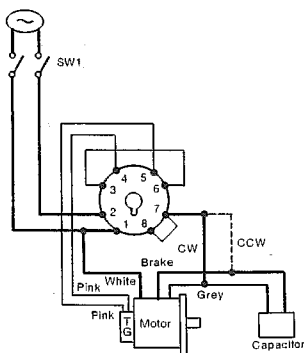
## Socket (Option)



## Wiring Diagram

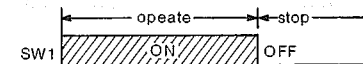
### ① Single Direction + Variable Speed (3~90W)

單向運轉+變速



From shaft side view	
CW	Clock wise
CCW	Counter clock wise

SW <sub>1</sub>	AC125V or 250V Min 5A
-----------------	-----------------------



### (Caution)

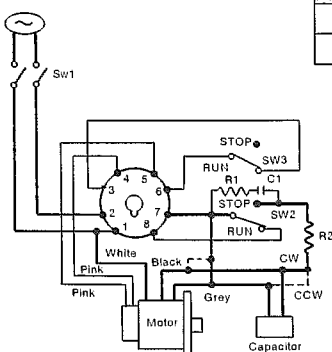
The motor rotate direction is CW when viewed from shaft side for thick wire connections. When adjusting to CCW direction. Connect as per ... Diagram.

[注] 圖中以粗線表示的布線時，就在軸面看馬達向時針方向(CW)旋轉；順着虛線結線就反時針方向(CCW)旋轉。

[주] 굵은 실선의 경우, MOTOR의 회전방향은 축에서 보아, 시계방향(CW)입니다. 반시계방향(CCW)으로 할 때는 깨선의 결선을 해 주세요.

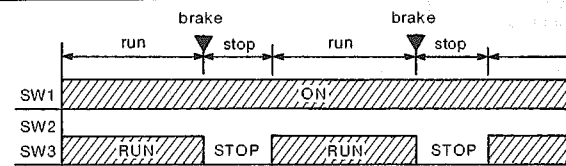
### ② Single Direction + Variable Speed + Brake (Less than 25W)

單向運轉+變速+制動



From shaft side view	
CW	Clock wise
CCW	Counter clock wise

SW <sub>1</sub> /SW <sub>2</sub>	AC125V or 250V Min 5A
SW <sub>3</sub>	DC10V 10mA
R <sub>1</sub> +C <sub>1</sub>	DV-OP008 (Option)
R <sub>2</sub>	DV-OP003 (Option)



### (Caution)

- The motor rotate direction is CW (clock wise) for thick wiring while it is CCW (counter-clock wise) for ... diagram viewed from motor shaft side.
- Changing from RUN to STOP, the control brake function for 0.5sec and the motor stops rapidly.

[注] 1. 按圖中粗線結線，就在軸面看馬達向時針方向(CW)旋轉；要使它反時針(CCW)方向旋轉，宜順着虛線結線。

2. 由[RUN]轉換到[STOP]，電制動器立即發出制動作用，馬達約0.5秒之間停機。

[주] 1. MOTOR의 회전방향은 축에서 보아 굵은 실선이 시계방향(CW)깨선이 반시계방향(CCW)의 配線입니다.

2. RUN부터 STOP으로 하면 制動(電氣BRAKE)이 約 0.5 秒間 動作하고 MOTOR가 急速停止합니다.

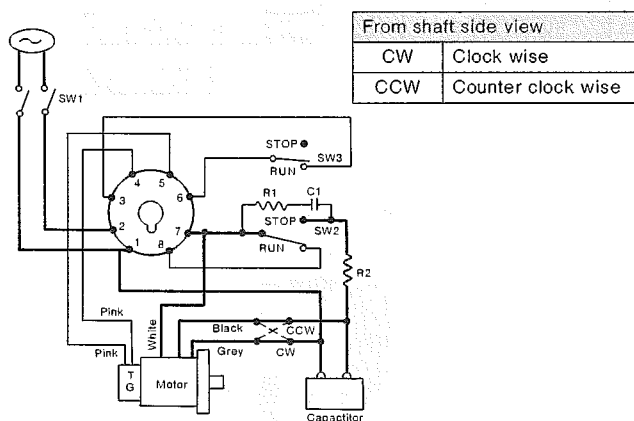


DV-1101 DV-1102 DV-1104  
DV-1201 DV-1202 DV-1204

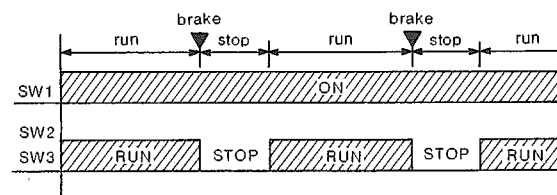
### ■Wiring Diagram

#### ③ Single Direction + Variable Speed + Brake (40~90W)

單向運轉+變速+制動



SW <sub>1</sub> /SW <sub>2</sub>	AC125V or 250V Min 5A
SW <sub>3</sub>	DC10V 10mA
R <sub>1</sub> +C <sub>1</sub>	DV-OP008 (Option)
R <sub>2</sub>	DV-OP003 (Option)



(Caution)

1. The motor rotate direction is CW (clock wise) for thick wiring while it is CCW (counter-clock wise) for ... diagram viewed from motor shaft side.
2. Changing from RUN to STOP, the control brake function for 0.5sec and the motor stops rapidly.

[注] 1. 如欲使馬達在軸面來看向時針方向(CW)旋轉, 就按圖中粗線結綫; 要反時針方向旋轉, 就按虛線結綫即可。

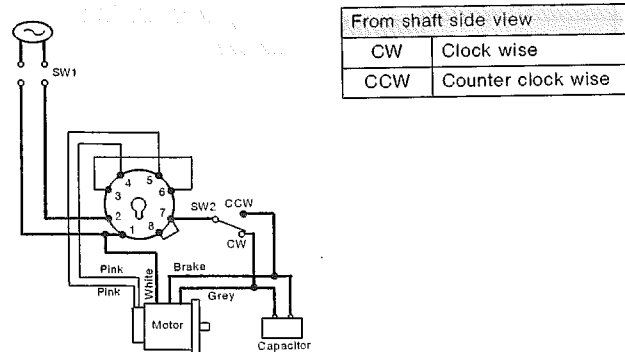
2. 由 RUN 轉換到 STOP, 電制動器立即發出制動作用, 馬達約0.5秒之間停機。

(주) 1. MOTOR의 回轉方向은 軸面에서 보아 굵은 實線이 時針方向(CW) 破線이 反時針方向(CCW)의 配線입니다.

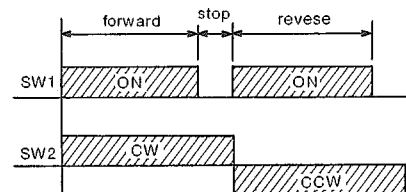
2. RUN부터 STOP으로 하면 制動(電氣BRAKE)이 約 0.5 秒間 動作하고 MOTOR가 急速停止합니다.

#### ④ Reverse + Variable Speed (3~90W)

正反向運轉+變速



SW <sub>1</sub> /SW <sub>2</sub>	AC125V or 250V Min 5A
----------------------------------	-----------------------



(Caution)

Change to SW<sub>2</sub> with a certain period after STOP

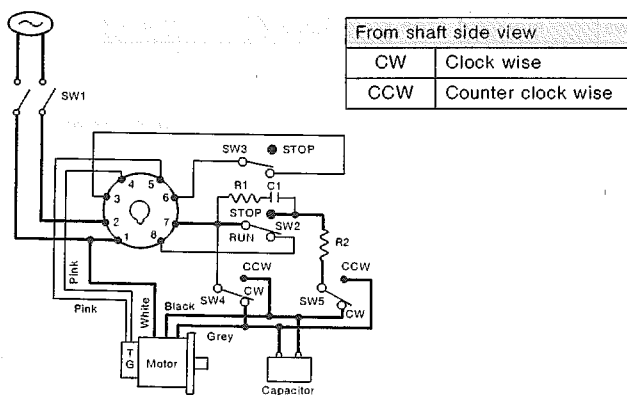
[注] 設定停止時間, 故等到馬達停機後要轉換開關SW<sub>2</sub>。

(주) 停止期間을 設定하여 回轉이 停止된 다음, SW<sub>2</sub>를 切換해 주세요.

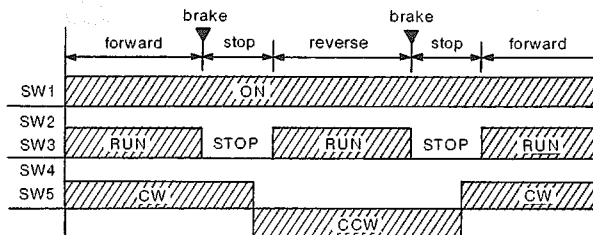
## Wiring Diagram

### ⑤ Reverse + Variable Speed + Brake (Less than 25W)

正反向運轉+變速+制動



SW <sub>1</sub> /SW <sub>2</sub> SW <sub>4</sub> /SW <sub>5</sub>	AC125V or 250V Min 5A
SW <sub>3</sub>	DC10V 10mA
R <sub>1</sub> +C <sub>1</sub>	DV-OP008 (Option)
R <sub>2</sub>	DV-OP003 (Option)



(Caution)

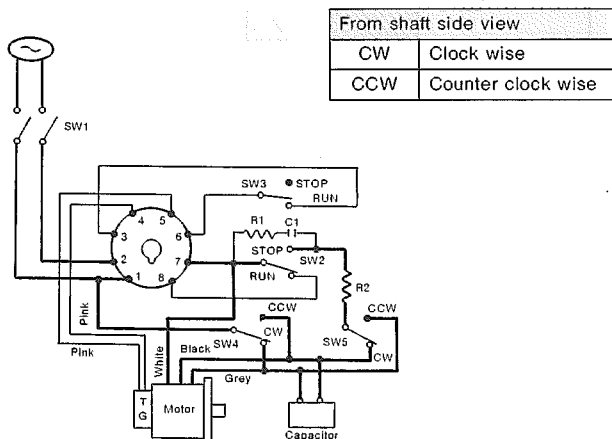
1. Changing from RUN to STOP, the control brake function for 0.5sec and the motor stops rapidly.
2. During this 0.5sec, do not operate SW<sub>4</sub> nor SW<sub>5</sub>.
3. The Switching for SW<sub>4</sub> and SW<sub>5</sub> should be earlier than STOP from RUN of SW<sub>2</sub> and SW<sub>3</sub>.

(注) 1. 由「RUN」轉換到「STOP」, 電制動器立即發出制動作用, 馬達約0.5秒之間停機。  
2. 停機約0.5秒之間不可操作SW<sub>4</sub>、SW<sub>5</sub>。  
3. 將SW<sub>2</sub>、SW<sub>3</sub>開關由「STOP」轉換到「RUN」之前, 應預先轉換SW<sub>4</sub>、SW<sub>5</sub>開關。

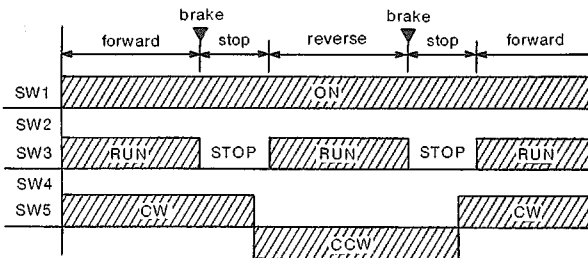
(주) 1. RUN부터 STOP으로 하면 制動(電氣BREAK)이 약 0.5 秒間 動作하고 MOTOR가急速停止합니다.  
2. 이러한 약 5 秒間에 SW<sub>4</sub>, SW<sub>5</sub>를 操作하지 마세요.  
3. SW<sub>4</sub>, SW<sub>5</sub>의 切換은 SW<sub>2</sub>, SW<sub>3</sub>의 STOP부터 RUN의 切換보다 빨리 해 주세요.

### ⑥ Reverse + Variable Speed + Brake (40~90W)

正反向運轉+變速+制動



SW <sub>1</sub> /SW <sub>2</sub> SW <sub>4</sub> /SW <sub>5</sub>	AC125V or 250V Min 5A
SW <sub>3</sub>	DC10V 10mA
R <sub>1</sub> +C <sub>1</sub>	DV-OP008 (Option)
R <sub>2</sub>	DV-OP003 (Option)



(Caution)

1. Changing from RUN to STOP, the control brake function for 0.5sec and the motor stops rapidly.
2. During this 0.5sec, do not operate SW<sub>4</sub> nor SW<sub>5</sub>.

(注) 1. 由「RUN」轉換到「STOP」, 電制動器立即發出制動作用, 馬達約0.5秒之間停機。  
2. 停機約0.5秒之間不可操作SW<sub>4</sub>、SW<sub>5</sub>。  
3. 將SW<sub>2</sub>、SW<sub>3</sub>開關由「STOP」轉換到「RUN」之前, 應預先轉換SW<sub>4</sub>、SW<sub>5</sub>開關。

(주) 1. RUN부터 STOP으로 하면 制動(電氣BREAK)이 약 0.5 秒間 動作하고 MOTOR가急速停止합니다.  
2. 이러한 약 5 秒間에 SW<sub>4</sub>, SW<sub>5</sub>를 操作하지 마세요.  
3. SW<sub>4</sub>, SW<sub>5</sub>의 切換은 SW<sub>2</sub>, SW<sub>3</sub>의 STOP부터 RUN의 切換보다 빨리 해 주세요.



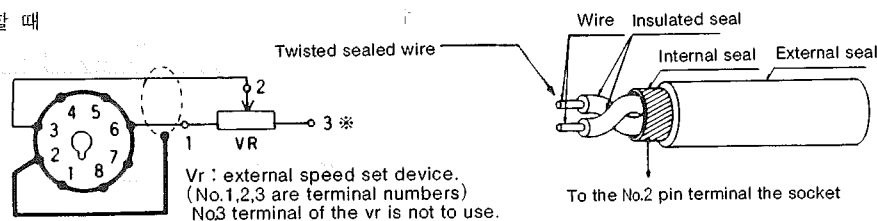
## The following is the explanations of external speed set device (DC-OP002)

外部速度設定器(DV-OP002)의 使用方法을 説明합니다.

### ●When Distance Control is Necessary

需要遙控操作時

遠隔操作이 必要할 때



mountable frame

#### (Caution)

1. The speed set should be '0'.
2. Adjust the wire connection as short as possible.  
In this case, use the twisted sealed wire.
3. It is recommended to use the mountable frame rather than speed set device for distance control.

[注] 1. 主機速度調整器の刻度を調整に「0」位置。

2. 布線長度應盡量縮短，如果產生誤動作時，宜採用雙扭的屏蔽線，而把屏蔽部連接到「2」接線柱。

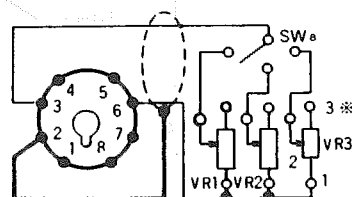
(주) 1. 本체의 速度設定器는 目盛(눈금)을 「0」으로 해 주세요.

2. 配線은 되도록 짧게 해 주세요, 이 때에 TWIST의 SHLD線으로 2番端子로 接続해 주세요.
3. 遠隔操作의 方法으로 外部速度設定器보다도 埋込用 付着枠(틀)을 권장합니다.

### ●When Multi-Stage Speed Set is Necessary

需要設定多級速度時:

多段階速度 設定이 必要할 때



VR1 VR2 VR3	DV- OP220
SW8	DC 10V 10mA

VR: external speed set device  
※No.3 terminal of VR is not used.

#### (Caution)

1. The speed set should be '0'.
2. Change the speed with external speed set device VR1, VR2 and VR3, and switch with SW8.

[注] 1. 主機速度設定器の刻度を調整に「0」位置。

2. 操作外部速度設定器VR1、VR2、VR3分別設定速度，並使用開關SW8來轉換。
3. 不用DV-OP002時，可用與20kΩ 1/4W、B特性相同者而代替。

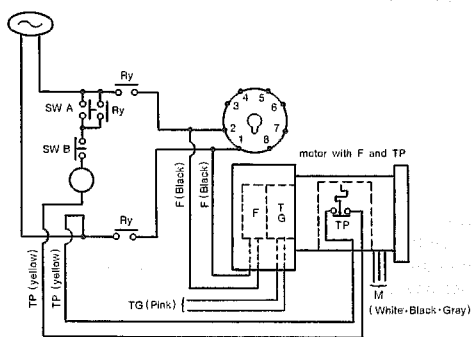
(주) 1. 本체의 速度設定器는 目盛(눈금)을 「0」으로 해 주세요.

2. 外部速度設定器 VR1、VR2、VR3에 依해 各各 速度를 設定하여 SWITCH SW8에 依해 切換해 주세요.

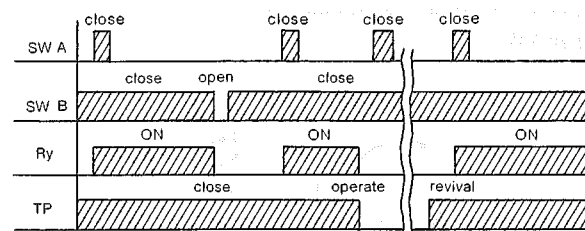
# Wiring Diagram

## ⑦ With Cooling Fan Motor (F)/Thermal Protector (TP) Motor Wire Connection (90W)

付帶 { 冷却用風扇馬達(F) } 電動機の布線  
{ 過熱防止裝置(TP) }



SW A	Momentary N O Contact
SW B	Momentary N C Contact
RY	ACJ125V or 220VW Min 5A, 3a Contact



### (Caution)

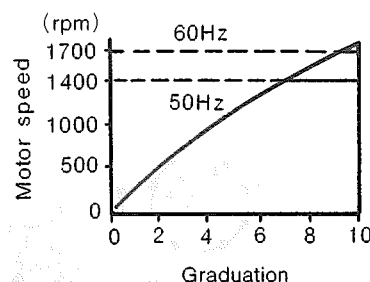
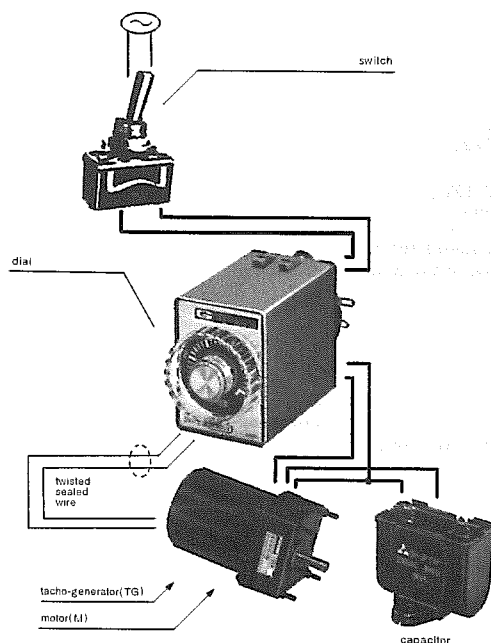
1. The wire connection should follow as per above diagram since thermal protector (TP) automatically revives.
2. When the TP operates, a certain period of cooling time is necessary until revival.
3. The cooling fan motor (F) should be connected between source terminal ① and ②.
4. Motor (M) and tachogenerator (TG) and other wire connections should follow as per its explanations dependent upon its purpose.

### (注)

1. 過熱防止裝置(TP)[接点容量125V、5A或250V、3A]は自動復位型、其布線應按左圖配置。
2. 機器過熱TP發出功能時、經過冷却時間恢復正常後始能自動復位。
3. 冷却用風扇馬達(F)必須連接到電源端子①~②之間。
4. 馬達(M)、轉速傳感器(TG)等其他布線、是可以依照目的而參照前述的電氣布線法實行爲宜。
5. 其他布線宜分別參照有關布線項目。

1. THERMAL PROTECTOR(TP)[接点容量 125V 5A 또는 250V 3A]는 自動復位型으로 필히 위 그림의 配線으로 사용해 주세요.
2. TP가 동작하면 復歸할 때까지 冷却時期가 必要합니다.
3. 冷却用 FAN MOTOR(F)는 電源端子 ①~②間에 接続을 해 주세요.
4. MOTOR(M) TACHOGENERATOR(T.G)等의 他配線은 目的에 따라 다음에 記述하는 電氣配線에 準하여 配線하여 주세요.

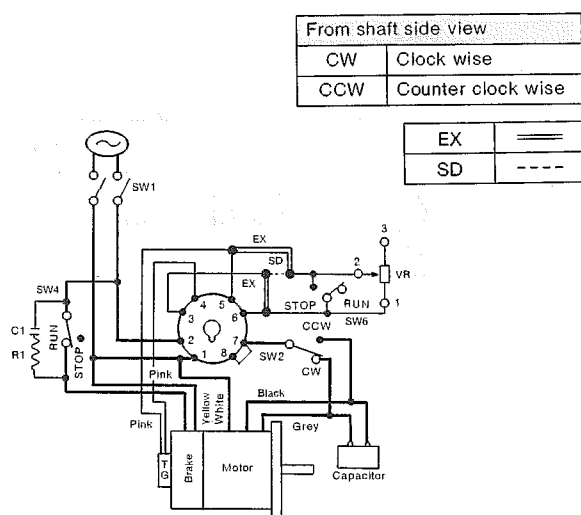
## Wire Connection / For Single Direction Operation



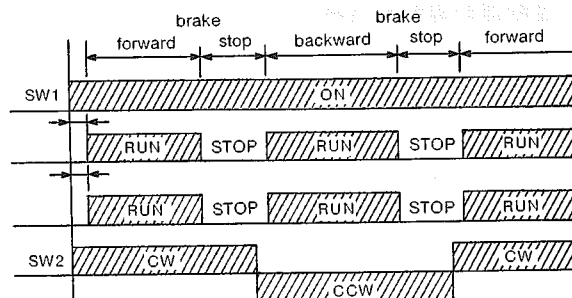
- Adjust the motor speed with the speed volume dial.
- The thick wiring shows the main circuit. Use approx 0.75mm<sup>2</sup> wires.
- When the tachogenerator (TG) wiring becomes longer than 1m, Use a twisted sealed wire of 2 cores.

- 本体 上面の 速度 設定器에 의해 MOTOR의 回轉速度를 變速할 수 있습니다.
- 굵은 實線은 主回路를 表示합니다.
- G0.75mm<sup>2</sup> 정도의 電線을 使用해 주세요.
- 速度發電機(T.G)의 配線이 長어질 경우(1m 이상)는 2芯의 TWIST의 SEALED선을 使用 配線하고 SEALED부를 2番端子에 接続해 주세요.

不配用控制器的電制動器時



$SW_1/SW^2/SW^9$	AC125V or 250V Min 5A
$SW_6$	DC10V 10mA
$R_1+C_1$	DV-OP008 (Option)
$R_2$	DV-OP002 (Option)



1. Leave a certain period until the motor stops, then switch SW<sub>2</sub>.
2. The power source SW<sub>1</sub> shall be switched 0.5sec faster than the operation start signals of SW<sub>6</sub> and SW<sub>7</sub>.
3. When operating RUN-STOP, leave the SW<sub>1</sub> 'ON', and control with SW<sub>6</sub> and SW<sub>9</sub>.  
When leaving non-operated for a long time, turn OFF SW<sub>1</sub>.
4. Set the external speed set at '0', and adjust the speed with the external speedset device VR.

1. 必需設定停止時間，等到旋轉停止後始可再發SW<sub>2</sub>。
2. 電源開關SW<sub>1</sub>，要在由開關SW<sub>6</sub>、SW<sub>9</sub>發出邏輯啟動信號的至少0.5秒以前，應預先接通。
3. 反覆進行運轉——停止時，在接通SW<sub>1</sub>的狀態下操作SW<sub>6</sub>和SW<sub>9</sub>，則可用小信號控制馬達。如果較長時間停機時，必須關掉SW<sub>1</sub>。
4. 使用SD型控制時，先把主機速度設定器的刻度歸「零」，要用外部的速度設定器VR來調速即可。

2. 電源 SWITCH SW1 投入の 時間은 SW4,SW9에 依한運轉始動의 信號보다더 約 0.5秒 以上 빨리 해 주세요.
3. 運轉停止을 할 때는 SW1을 「ON」그대로 SW6,SW9로서 操作해 주세요. 小信號로서 MOTOR를 制御할 수 있습니다. 또한 長時間 停止(切斷)할 때는 SW1을 꺼내 주세요.
4. 本体의 速度設定器는 目盛(눈금)을 「0」으로 外部速度設定器 VR로서 速度調整해 주세요.

DV-1131 DV-1132 DV-1134  
DV-1231 DV-1234

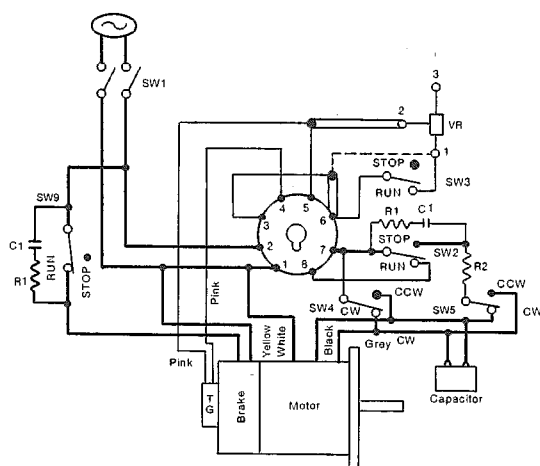
## ■ Wire Connection for Electro-Magnet Brake Motor

⑨ When Electric Brake of Controller is Not Used at The Same Time

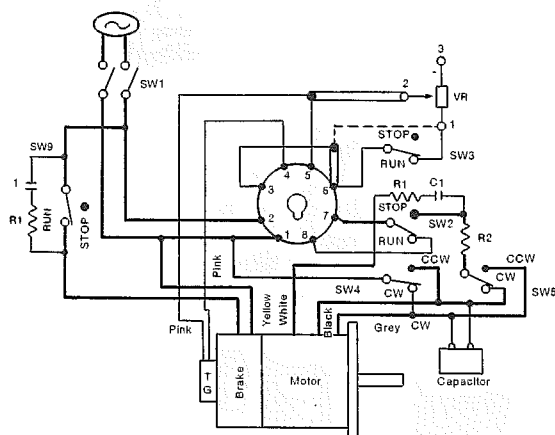
配用控制器的電制動器時

(Less than 25W)

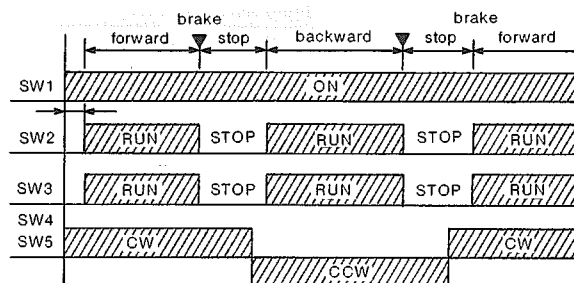
From shaft side view	
CW	Clock side
CCW	Countor clok wise



(40W)



SW <sub>1</sub> /SW <sub>2</sub> /SW <sub>9</sub> SW <sub>4</sub> /SW <sub>5</sub>	AC125V or 250V Min 5A
SW <sub>3</sub>	DC10V 10mA
R <sub>2</sub>	DV-OP008 (Option)
R <sub>1</sub> +C <sub>1</sub>	DV-OP003 (Option)
VR	DV-OP002 (Option)



(Caution)

1. When changing from RUN to STOP the electric brake operates and the motor suddenly stops.
2. Operate SW<sub>4</sub> and SW<sub>5</sub> after motor stops.
3. The switching for SW<sub>4</sub> and SW<sub>5</sub> shall be faster than the switching from stop to RUN with SW<sub>2</sub>, SW<sub>3</sub> and SW<sub>9</sub>.
4. The power source SW<sub>1</sub> Should be switched 0.5sec faster than the operation start signal of SW<sub>2</sub>, SW<sub>3</sub> and SW<sub>9</sub>.
5. When operating RUN-STOP, leave the SW<sub>1</sub> on, and operate with SW<sub>2</sub>, SW<sub>3</sub> and SW<sub>9</sub>.

[注] 1. 由「RUN」轉換到「STOP」，電制動器發出制動作用，馬達立即停止。

2. 等到馬達停穩後，始可操作開關SW<sub>2</sub>、SW<sub>3</sub>、SW<sub>9</sub>。

3. 應先轉換SW<sub>4</sub>、SW<sub>5</sub>開關，然後才可使SW<sub>2</sub>、SW<sub>3</sub>、SW<sub>9</sub>開關由「STOP」轉換「RUN」狀態。

4. 先接通電源開關SW<sub>1</sub>，即由開關SW<sub>2</sub>、SW<sub>3</sub>、SW<sub>9</sub>發出啟動信號的至少0.5秒以前接通為要。

5. 如欲反覆進行運轉——停止時，應在接通SW<sub>1</sub>的狀態下操作SW<sub>2</sub>、SW<sub>3</sub>、SW<sub>9</sub>各開關。可利用小信號控制馬達動作。工作完畢或較長時間不用時，必須關掉SW<sub>1</sub>，斷開電源。

(주) 1. RUN에서 STOP으로 하면 전기 BRAKE(制動)가 동작하여 MOTOR가急停止합니다.

2. MOTOR가停止한 다음 SW4, SW5를操作해 주세요.

3. SW4, SW5의切換은 SW2, SW3, SW9의 STOP부터 RUN의切換보다 빨리해 주세요.

4. 電源 SWITCH SW1 投入의 時間은 SW2, SW3, SW9에 依한 運轉始動의 信號보다도 約 0.5秒 以上 빨리 해 주세요.

5. 運轉停止를 할 때는 SW1을「0」그대로 SW2, SW3, SW9로서 操作해 주세요. 小信號로서 MOTOR를 制動할 수 있습니다. 또한 長時間 停止할 때는 SW1을 끊어 주세요.

## Operation Speed Meter

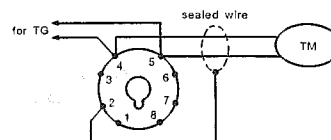
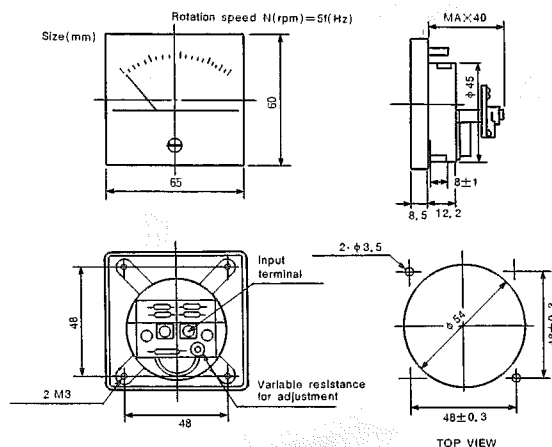
### ● Model DVOP001

The motor speed can be easily indicated. This model especially designed for Panasonic controllers only.

TMW Motor Speed Meter

TGW Tache-generator

MOTOR의 회전속도의 표시가 간단히 됩니다. 또한 이 METER는 당사의 콘트롤을 용으로 専用設計된 것입니다.



TM : Motor Speed Meter  
TG : Tache-generator

### (Caution)

1. Connect parallel with the speed generator (TG)
2. When the wires for the rotation speed meter (TM) becomes too long, use a twisted sealed wire in place.
3. Adjust the meter with the volume in the back of TM.  
How to adjustW
  1. Measure the motor speed with the rotate measurement.
  2. Measure the frequency F of the voltage from TG. Rotation speed N (RPM) = 5F (Hz)

### (주)

1. 속도発電機(TG)와 並列로(나란히)配線해 주세요.
2. 회전속도 METER(TM)의 配線이 길어질 때에는 프라스틱 실드線を 利用해 주세요.
3. TM의 뒷면의 半固定 VOLUME으로서 "눈금"을 校正해 주세요.  
校正方法
  1. 회전計에 依해 MOTOR의 回転속도를 測定한다.
  2. TG의 発生하는 電圧의 周波数f를 測定한다.

## External Speed Set

### ● Model DVOP002 20kΩ 1/4WB equivalent 20kΩ 1/4WB (m/m)

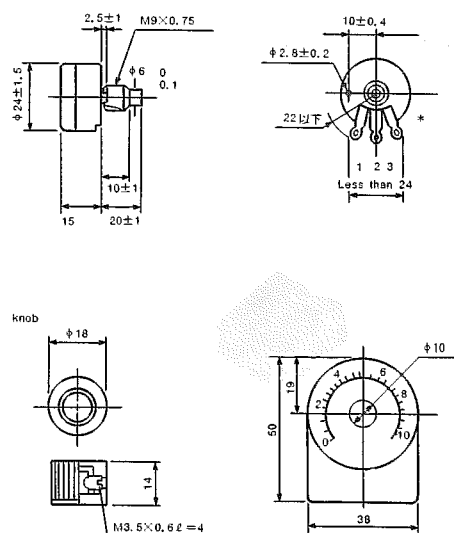
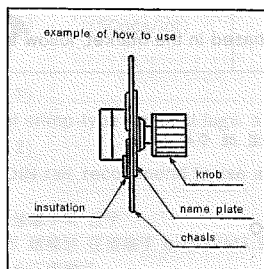
(Packaged in EX type only)

Use a insulation paper between the mounting chasis and the terminal in order to keep certain insulation.

### (Caution)

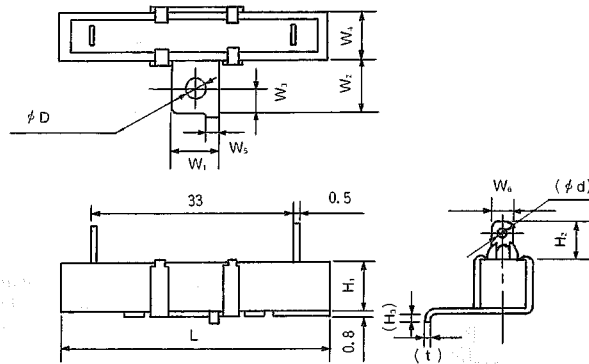
In case the terminal accidentally grounds, the speed controller will damage.

端子와 付着사시의 絶縁을 確保하기 爲해 絶縁紙를 使用해 주세요.



## External Resistance for Brake Use

● Model: DVOP003  
5.6Ω 10W



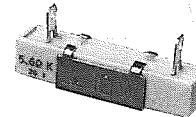
Dimensions (mm)												
$L_3 \pm 2.0$	$W_1 \pm 0.5$	$W_2 \pm 1.0$	$W_3 \pm 0.5$	$W_4$	$W_5 \pm 0.3$	$W_6 \pm 0.5$	$H_1 \pm 0.5$	$H_3 \pm 0.3$	$(H_3)$	$(D)$	$(d)$	$(t)$
48.0	12.0	14.0	6.0	$10.5 \pm 1.5$	3.0	4.8	10.5	9.0	2.2	2.8	2.5	0.6

(Caution)

DV-OP003 is 5.6Ω  
When purchasing from generally in the market, select A4.7Ω ~ 5.8Ω  
(more than 10W) type.

(주) DV-OP003은 5.6Ω입니다.

市販의 抵抗 器를 使用하실 때는 10W以上 4.7Ω~6.8Ω를 選定해 주세요.

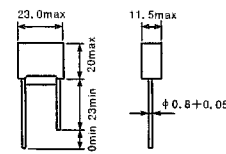


## Spark Killer

● Model: DVOP008

Use a spark killer in order to protect the main speed controller and the switches.

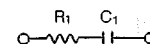
SPEED CONTROLLER의 回路와 SWITCH를 保護하기 爲해 스파크 킬러를 使用해 주세요.



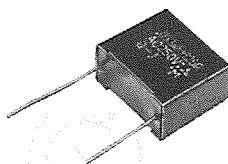
(Caution)

When using spark killer generally purchased in the market, follow the instructions shown below:

(주) 市販品을 使用하실 때는 다음 仕様으로 해 주세요.





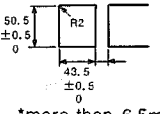


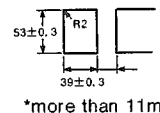


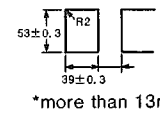


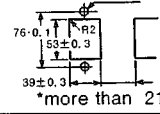


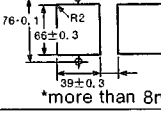
$R_1 = 10 \sim 100\Omega$  (More than 1/4W)  
 $C_1 = 0.1 \sim 0.33\mu F$  (AC125V 100V or 250V 200V)  
(Matsushita Electric Works Ltd.)







### ■ Mounting Frame (Mathushita Electric Works)

	Shape	Color	Model No.	Picture of the front face	Size of mount hole (mm)
					Recommended hole
H Type		grey	⊙AT7851		 $50.5 \pm 0.5$ $43.5 \pm 0.5$ *more than 6.5mm
		brack	⊙AT7852		
		silver gray	⊙AT7853		
K Type		grey	⊙AT7811		 $53 \pm 0.3$ $38 \pm 0.3$ *more than 11mm
		brack	⊙AT7812		
		silver gray	⊙AT7813		
MHP Type		grey	⊙AT7821		 $53 \pm 0.3$ $39 \pm 0.3$ *more than 13mm
		brack	⊙AT7822		
		silver gray	⊙AT7823		
MHP-M Type		grey	⊙AT7831		 $76 \pm 0.1$ $53 \pm 0.3$ $39 \pm 0.3$ *more than 21mm
S Type		grey	⊙AT7841		 $76 \pm 0.1$ $65 \pm 0.3$ $39 \pm 0.3$ *more than 8mm

(Caution 1) All thickness of adapted panel is between 1.0~3.5mm

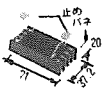
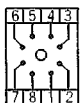

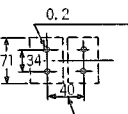
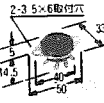

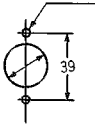

(Caution 2) \* : The distance between holes when mounting the controllers parallelly.

주 1) 適用판넬 두께는 모두 1.0~3.5mm입니다.

주 2) \* 並列(나란히)판넬카트할 때의 구멍의 間隔

### ■ Ultra Compact Timer/Option

#### ● (Exposed Type)

Model	Internal Wiring	Mounted Condition	Mounting Hole
 DIN terminal stand ATT803	 Main body No. is same as terminal no.	 The DIN rail height should be added to A	1) Easy mounting for DIN rail 
 Socket AW 68102 Comes to each speed controller		 Use a M3 screw nut.	 Mounting pitch W When mounting horizontally, keep the pitch More than 78mm
 Holding spring AT7808 (50pcs/lot)			

(Caution 1)

In case of crimp-type terminal lugs, a crimp-type terminal lugs which is already connected is fixed by UP terminal (For M3.5 screw).

(Caution 2)

Without DIN rail, recommend to use a small round terminal stand AT7802.

주 1) 圧着端子의 경우

미리 結線된 圧着端子 up端子(M3.5 나사못)으로 固定한다.

適合 圧着端子

① 裸丸形端子

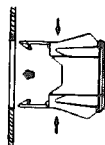
② 絶緣紙付裸丸形端子

③ 先間形端子

주 2) DIN 레일을 사용하지 않는 때는 小型丸 端子台 AT 7802를 사용 해 주세요.

## ● How to Mount

- ① Insert the mounting frame from front of the panel out.  
 付着枠(틀)을 패널리트 全面에서 挿入해 주세요.



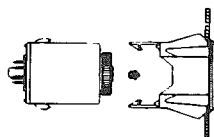
### (Caution)

The panel cannot be inserted when the controller body is attached to the mounting frame.

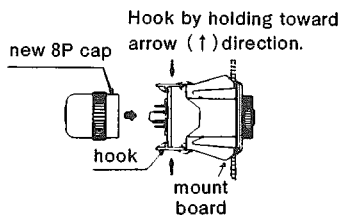
주) 본체가 埋込枠(틀)에 裝着한 狀態로 的 插입은 不可能합니다.  
 (但S TYPE 원터치 埋込用 組立틀의 경우 順序의 制約은 받지 않습니다.)

- ② After Attaching the panel, insert the controller body from the back.

후部를 베스에 걸쳐 埋込枠(틀)에 固定해 주세요. 확실작



- ③ Hook and fix the mounting.



### (Caution)

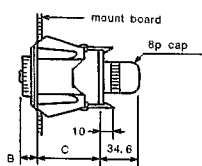
When the controller contacts to the edge of the frame, move the hook towards the arrow direction shown in the picture. for wire connection, use NEW-8PCAP (AD-8013)

주) 본체가 組立枠(틀) 손잡이에 닿았을 때 "후"部를 확실 方向으로 눌러서 壓주어 주세요. 接統配線에는 NEW 8P캡 (AD 8013)을 使用해 주세요.

## ● How to Remove

Follow the opposite way of the mounting instructions.

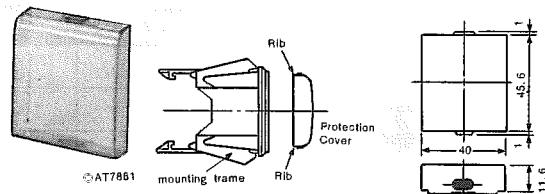
조립 方法의 逆順序로 해제가 됩니다.



### ● Size of Band CC nn

frame type	B	C
H type K type	13.1	52.8
MHP type MHP-M type S type	14.8	51.3

## ■ Protection Cover



付着枠(틀) 全面으로부터 保護카바의 확살→部를 눌러서 리프를 서서히 組立枠(틀)窓(창)안쪽에 리프를 겁니다. 이때 付着枠(틀)에 本體가 挿入되어 있어도 保護카바의 付着에는 支障이 없습니다.

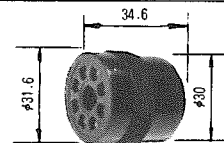
### FeaturesW

1. Prevents mal-operation after speed set, and prevents dust invasion.
2. Can be applied to all easy mounting attach types.

1. 速度設定後의 誤動作을 防止하고 簡易防止카바로 됩니다.
2. 원 터치 埋込付着틀의 全 TYPE에 適用됩니다.

## ■ New 8P Cap

### ● Shape



Unit : mm

◎AD8013

## Maintenance

The following maintenance is required for longer life and reliability:

- ① To check smooth operation
- ② To check no unusual noise
- ③ To check over heat

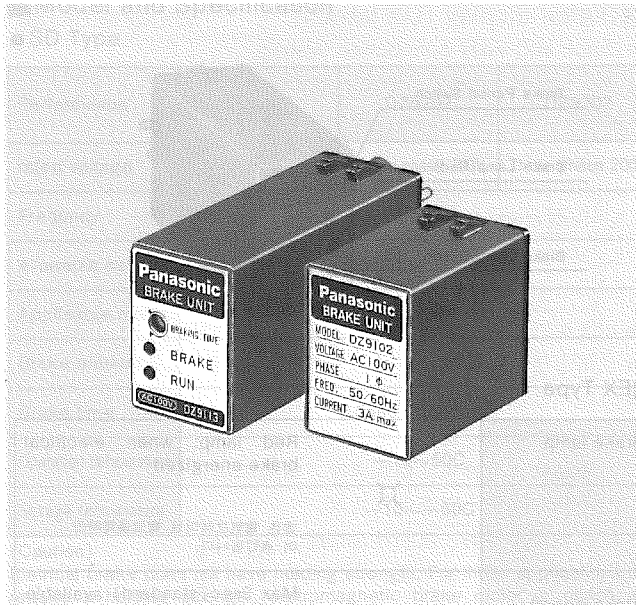
作業의 能率을 올려 本機械의 壽命을 길게 하기 위해서는 다음과 같은 平常의 補修가 重要합니다.

- ① 運轉이 円滿하게 行해지고 있는가
- ② 運轉中에 異常한 소리가 나지 않는가
- ③ 異常 發熱은 나지 않는가.

## Damage and Counter Measures

[故障의 原因과 其措置]

Phenomenon	Where to check	Contents to Check	Judge the Cause	Countermeasures
How motor does Not rotate:	Wire Connection	If it is proper	Check the connection	Re-connect properly
	Terminal No. (①~⑦)	Change the speed set volt and check the volt change.	Controller damaged if voltage does not change.  If the volt change from 0 to power source V:  1. Motor defect  2. Overload  3. Condensor defect	
Motor rotates but speed does Note change:	Wire connection	If it is proper	Check the wire connections	Reduce the load
	Speed Generator terminal (③~⑤)	To Have approx: AC6V/1,700RPM AC5V/1,400RPM of voltage.	If not, it is speed generator defect.  If such volt is Measured, it is speed controller defect.	



## ■SD·EX Type

Brake unit enables to instantly stop the motor electrically. The electrical brake helps a longer life and reliability, as well as making inching operation possible. Our unique technical development realized a compact, light weight, and high reliability design.

本制動組件是為瞬時停止馬達的電制動裝置。既採用電氣制動器，耐用性可觀，並能進行寸動操作。

驅使本廠獨創的控制技術，具有小形、輕量、可靠性優異等良好特長。

브레이크 유닛트는 모터를 瞬間停止 시키기 위한 電氣브레이크 裝置입니다. 電氣브레이크 때문에 IN CHING動作도 可能합니다.

当社独自の 制御技術에 의해 小形, 輕量, 高信頼性を 實現 하고 있습니다.

## ■Features

- 8 plug in type
- Inching operation possible
- Contact type (SD) and non-contact type (EX) as standard options.
- Wide variations in

- 採用 8 P (脚) 挿入方式。
- 可能進行寸動操作。
- 帶觸點方式(SD型)、無觸點方式(EX型)的標準化。
- 準備多種另售配件，按需提供。
- 松下電工の終端臺、插座等配電盤用另售品，按需選用。

- 8 P 플러그 IN方式의 採用.
- IN CHING動作이 可能.
- 有接点 方式(SD TYPE)無接点 方式 (EX TYPE)을 標準化
- 豊富な 実装用 OPTION의 利用이 可能.
- 松下電工製の 端子台 소켓 等 配電盤用 OPTION이 여러 모로 利用될 수 있음.

## Brake Unit

### 制動器組件

### 브레이크 유닛

#### SD Type

- Compact 8P plug type
- Connect with the SSR(non-contact relay), which the electrical signal enables to "run" and "instant stop".
- Electrical brake period is 0.5 sec as standard.

- 小形 8 腳插入方式。
- 可以配合市售的 SSR(無觸點繼電器)使用。  
如與 SSR 併用, 則能經過電氣信號控制「運轉」「瞬時停止」。
- 電制動器的標準動作時間為 0.5 秒。

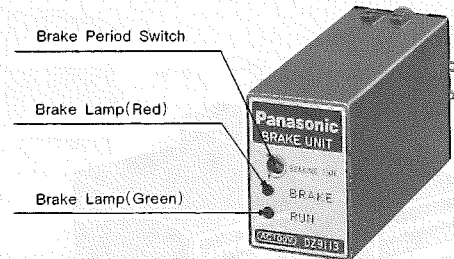
- 小形, 8 P 플러그 IN 방식
- 市販의 SSR(無接點릴레이)과의 併用도 可能.  
SSR과 併用함에 있어 電氣信號에 依해 「運轉」「瞬間停止」를 制御할 수 있습니다.
- 電氣브레이크 動作時間은 標準值(치) 0.5秒입니다.

#### EX Type

- Control with electrical signal.
- Able to adjust electrical brake period is Within the range 0.1-2 sec.
- Equips a indication lamp for "run" and "instant stop".

- 可利用電氣信號進行控制, 即以電氣信號控制「運轉」「瞬時停止」「滑行停止」。
- 可能調整電制動器的動作時間。  
在 0.1 ~ 2 秒的範圍內任意選擇制動動作時間。
- 備有顯示「運轉」「瞬時停止」的表示燈。

- 電氣信號에 依해 制御가 可能.  
電氣信號에 依한 「運轉」「瞬間停止」「惰走停止」가 制御됩니다.
- 電氣브레이크 動作時間의 調整이 可能.  
0.1 ~ 2 秒의 範圍로 最適한 動作時間을 選擇할 수 있습니다.
- 「運轉」「時間停止」의 表示 "LAMP"를 裝備.



#### EX Type

Brake lamp		Red lamp: when electrical brake energized  赤色 電氣브레이크 電流通電時만이 点灯됩니다.
Brake period volume switch		Max 2sec (standard) available to adjust to avoid heat rise, shorter adjustment is recommendable.  最大 2 秒 (標準值)까지 可變됨. 長時間 通電하면 모터의 溫度가  상승되므로 停止可能한 範圍로 되도록  짧게 調整해 주세요.
Operation lamp		Green lamp: At run  綠色 運轉時(RUN)点灯함.

## Model and Specification

### SD Type

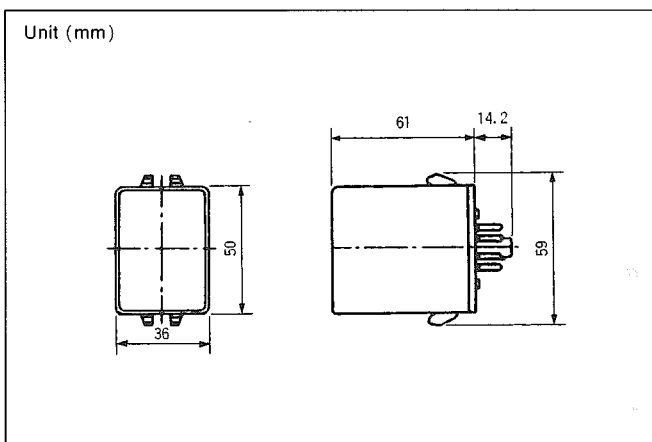
Performance	DZ9102	DZ9202	DZ9302
rated voltage	Single phase 100V	Single phase 200V	Three phase 200V
Frequency	50/60Hz		
Allowable current	Operation current		
Applicable motor	3~90W		
Brake method			
Brake time	0.5sec (standard)		
Operation temperature	-10~50C		
Storage temperature	-10~-60C		

(Caution)

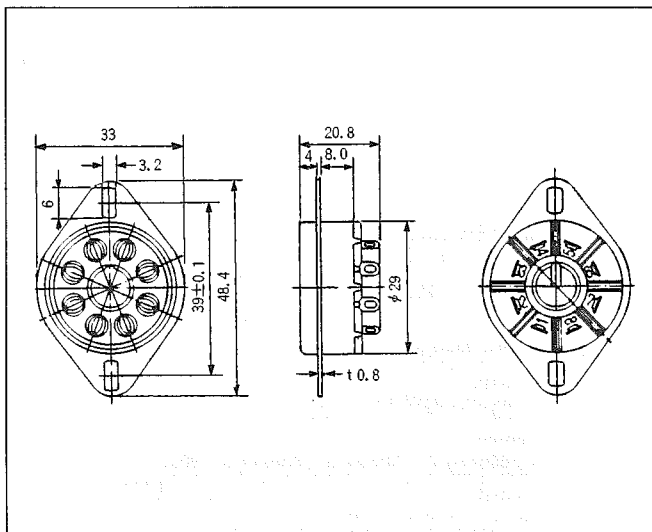
Electrical brake does not have holding strength. For those applications that require a holding strength, electromagnetic brake motor or clutch and brake motor is recommended.

## Dimension

### SD Type



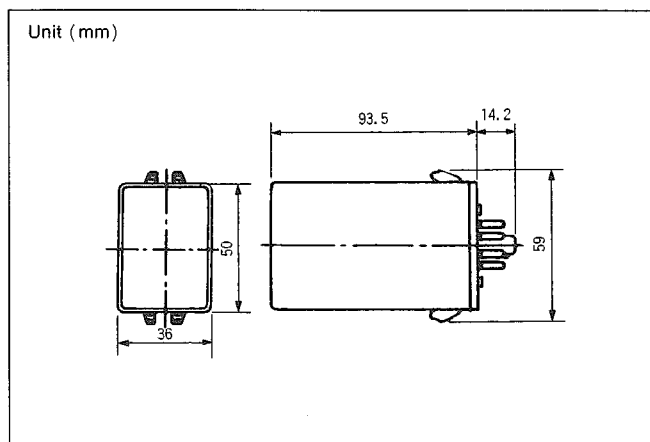
### SD·EX Type Options (Enclosed)



### EX Type

Performance	DZ9113	DZ9213
rated voltage	Single phase 100V	Single phase 200V
Frequency	50/60Hz	
Allowable current	Operation current	
Applicable motor	3~90W	
Brake method	Energize the motor with a constant period of electrical brake.	
Brake time	0.5sec (standard)	
Operation temperature	-10~50C	
Storage temperature	-10~-60C	

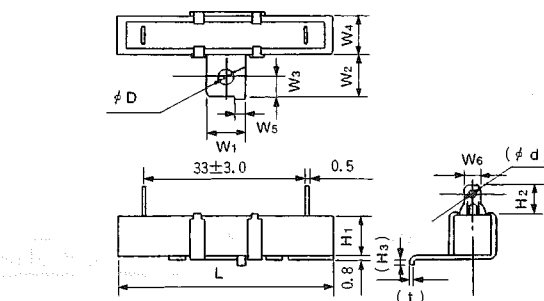
### EX Type



### External Resistor For Brake Control

(Enclosed only in SD type DZ9302)

Model : DV-OP003 5.6Ω 10W

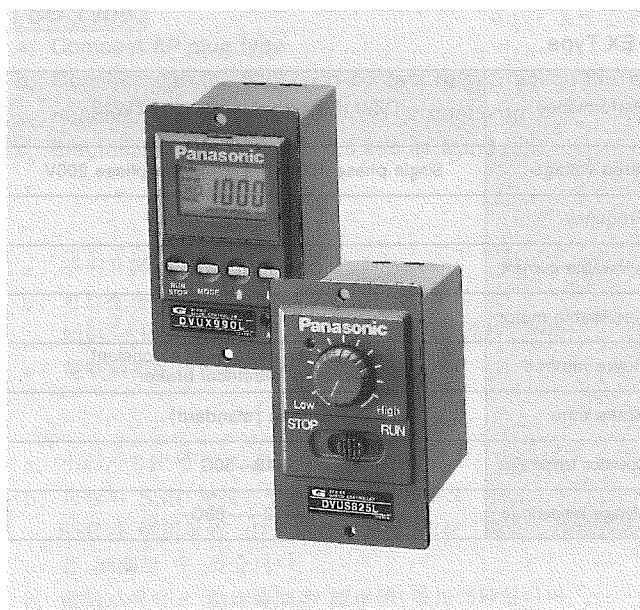


Measurement (mm)										
L±2.0	W1±0.5	W2±1.0	W3±0.5	W4	W5±0.3	W6±0.5	H1±1.5	H2±1.3	(H3)	(D)
48.0	12.0	14.0	6.0	10.5±1.5	3.0	5.2	10.5	9.0	2.2	3.8
										(d)
										(t)
										0.6

## Unit Type / Variable Speed Controller

組件型 速度控制器

스피드 콘트롤러 유닛트 타입



The new unit type motor, having award the G-mark (good design) from the ministry of trade and industry of Japan, carries the most attractive design and easy-to-use features first introduced into the market.



### ■ Digital display (UX series)

- Quick and easy connection system
- Max 5m of extension cable(optional)
- Multi-function with built-in micro-processor
  1. Digital speed setting/read out
  2. Instant conversion of gearhead and machine speed
  3. Soft start/soft down functions
  4. Memory function of set condition
  5. Set-lock function

- 用連接器一動作連接方式的速度控制器。
- 如用零售的配件，則能延長到最大 5 米長。
- 因採用微電腦，大有增多功能。
  1. 可用數字設定旋轉速度。
  2. 瞬時快速地換算齒輪頭速度、輸送機速度。
  3. 以數字顯示出實際工作速度。
  4. 具有緩慢啟動、逐漸停止功能。
  5. 具有設定條件的後備、保存功能。
  6. 設定後可以門鎖。

- 콘넥타로 원 터치 接續의 스피드 콘트롤.
- OPTION을 사용하여 最大 5M까지 延長 可能.
- 마이콘의 採用으로 多機能.

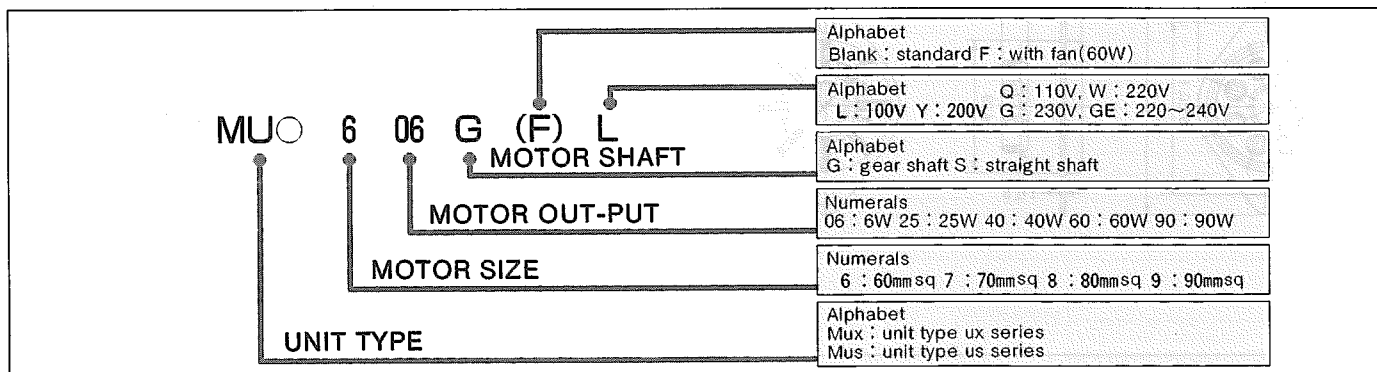
1. 回轉速度를 디지털設定합니다.
2. 기어헤드速度나 콰이어 速度를 瞬間換算합니다.
3. 實際의 速度를 디지털表示합니다.
4. 소프트 스타트 다운機能.
5. 設定條件의 백 업 機能.
6. 셋트 록 機能.

### ■ US Series

- Quick and easy connection system
- Max 5m extension cable(optional)
- 用連接器一動作連接方式的速度控制器。
- 如用另售的配件，則能延長到最大 5 米長。

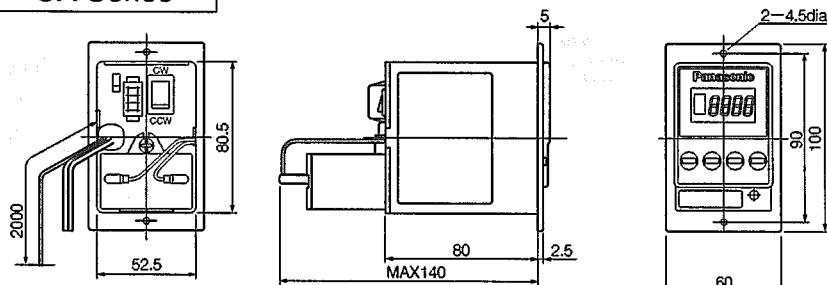
- 콘넥타로 원 터치 接續의 스피드 콘트롤.
- OPTION을 사용하여 最大 5M까지 延長 可能.

### ■ Coding

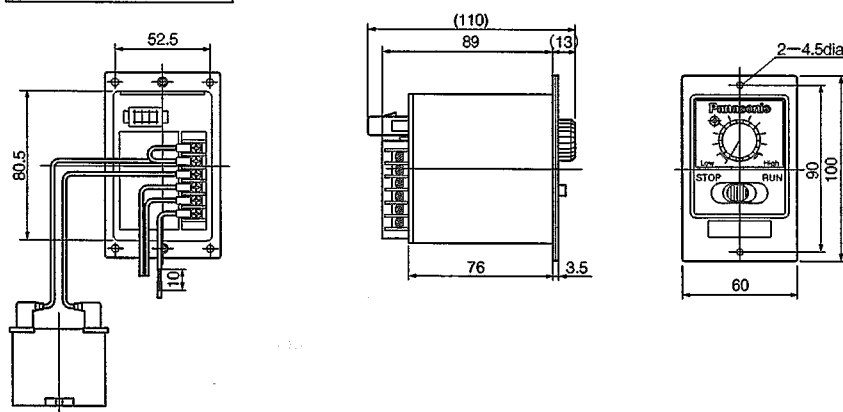


## ■ Dimensions

## UX Series

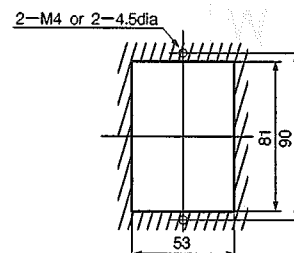


## US Series

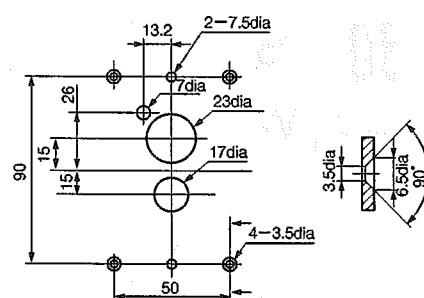


■ Mounting Hole

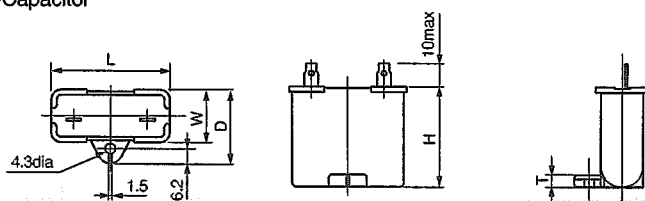
### 1.Square Hole (for UX and US)



## 2.Circle Hole (for US)



● Capacitor



MODEL	CAPACITOR	L	W	D	H	T
DVUS960L 100V	MOPC20M20	50.2	26.7	37	36	5
DVUS960Y 200V	MOPC5M40	50	30.5	41	41.5	4
DVUS990L 100V	MOPC25M20	50.2	31	41	42	5
DVUS990Y 200V	MOPC6.2M37	50	30.5	41	41.5	4

## ■ MODEL TYPES

MOTOR OUT-PUT	UNIT MODEL	MOTOR MODEL	CONTROLLER MODEL	APPLIABLE GEARHEAD MODEL		
				BALL BEARING	METAL BEARING	DECIMAL GEARHEAD
6W	MU○606G○	M6IA6GD4○	DVU○606○	M6GA□B	M6GA□M	M6GA10XM
15W	MU○715G○	M7IA15GD4○	DVU○715○	M7GA□B	M7GA□M	M7GA10XM
25W	MU○825G○	M8IA25GD4○	DVU○825○	M8GA□B	M8GA□M	M8GA10XM
40W	MU○940G○	M9IA40GD4○	DVU○940○	M9GA□B	M9GA□M	M9GA10XM
60W	MU○960G○	M9IC60GD4○	DVU○960○	M9GC□B M9GS□B	—	M9GC10XB
60W (with fan)	MU○960GF○	M9IC60GFD4○	DVU○960○	M9GC□B M9GS□B	—	M9GC10XB
90W	MU○990G○	M9IC90GD4○	DVU○990○	M9GC□B M9GS□B	—	M9GC10XB



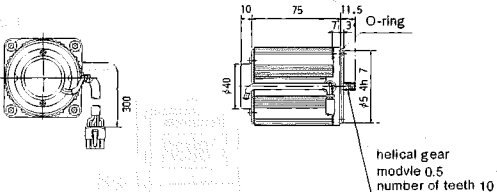
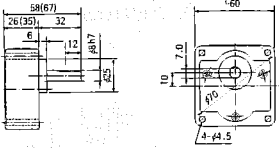
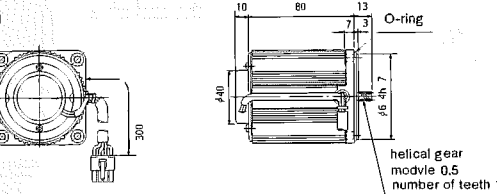
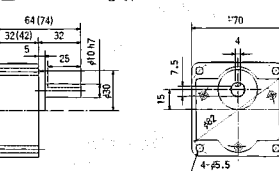
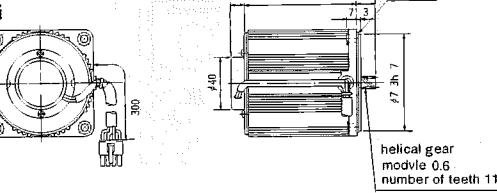
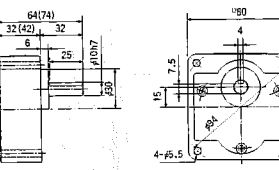
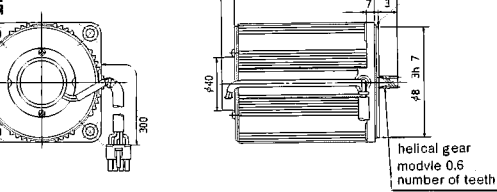
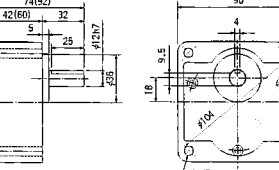
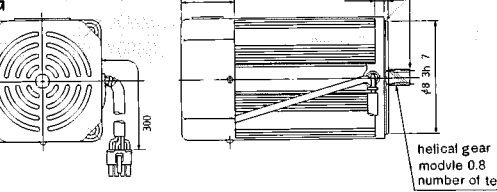
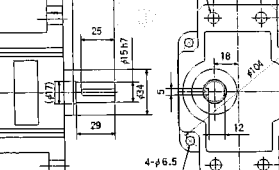
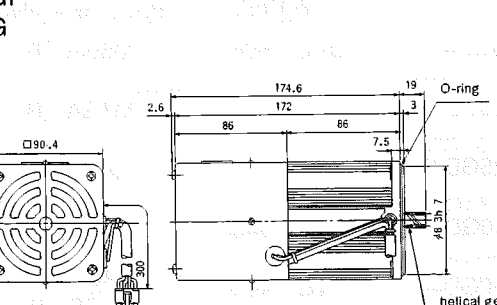
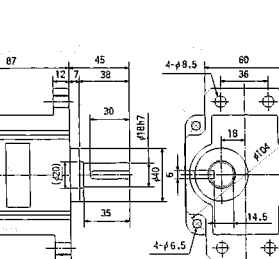
# Unit Type / Variable Speed Controller

組件型 速度控制器

스피드 콘트롤러 유닛트 타입

## Body Dimension

## Applicable Gearhead

<p><b>60</b> mmSQ</p>	<p><b>6</b> W</p>	<p>● Unit model No. MU□606G</p> 	<p>M6GA□M (Metal bearing type) weight 0.34kg M6GA□B (ball bearing type)</p>  <p>Note: The value in "□" is for gear ratio of 1/20 or larger.</p>
<p><b>70</b> mmSQ</p>	<p><b>15</b> W</p>	<p>● Unit model No. MU□715G</p> 	<p>M7GA□M (Metal bearing type) weight 0.54kg M7GA□B (ball bearing type)</p>  <p>Note: The value in "□" is for gear ratio of 1/20 or larger.</p>
<p><b>80</b> mmSQ</p>	<p><b>25</b> W</p>	<p>● Unit model No. MU□825G</p> 	<p>M8GA□M (Metal bearing type) weight 0.68kg M8GA□B (ball bearing type)</p>  <p>Note: The value in "□" is for gear ratio of 1/20 or larger.</p>
<p><b>90</b> mmSQ</p>	<p><b>40</b> W</p>	<p>● Unit model No. MU□940G</p> 	<p>M9GA□M (Metal bearing type) weight 1.2kg M9GA□B (ball bearing type)</p>  <p>Note: The value in "□" is for gear ratio of 1/20 or larger.</p>
	<p><b>60</b> W</p>	<p>● Unit model No. MU□960G</p> 	<p>M9GC□B (ball bearing type) weight 1.5kg</p> 
	<p><b>60</b> W</p>	<p>● Unit model No. MU□960GF MU□990G</p> 	<p>M9GS□B (ball bearing type) weight 1.9kg</p>  <p>C type 200kg·cm / max. permissible torque S type 300kg·cm / max. permissible torque</p>



## ■ Torque-Speed Performance (50Hz/60Hz)

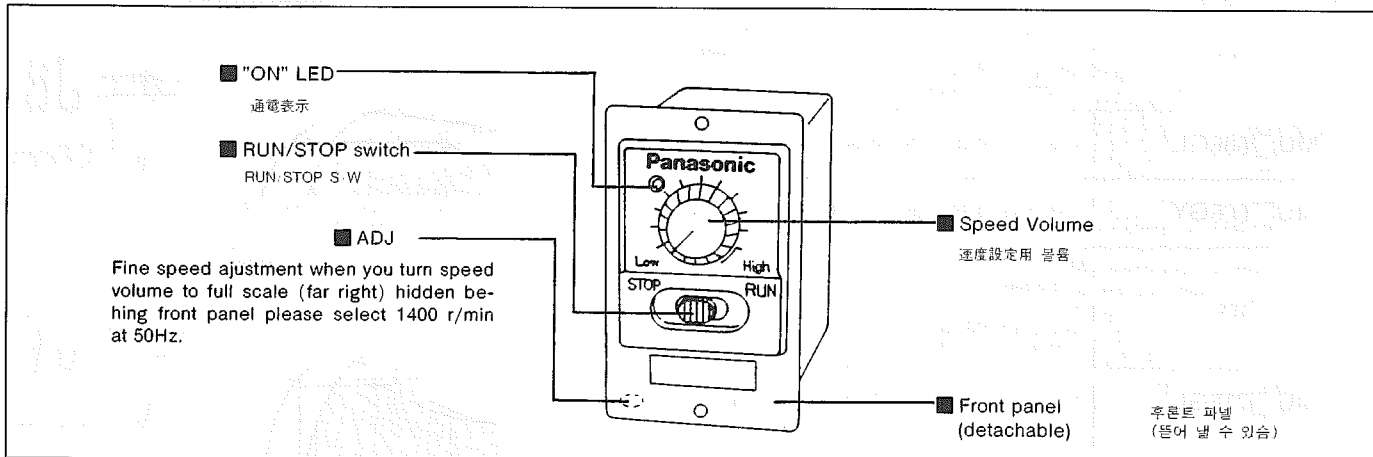
Type	Maximin permissible torque (kg·cm)		Starting current (A)	Starting torque (kg·cm)	
	1200 speed (rpm)	90 speed (rpm)			
MU□606GL	0.33/0.33	0.25/0.25	0.24/0.24	0.38/0.38	
MU□606GY	0.33/0.33	0.25/0.25	0.12/0.12	0.38/0.38	
Type	Maximin permissible torque (kg·cm)		Starting current (A)	Starting torque (kg·cm)	
	1200 speed (rpm)	90 speed (rpm)			
MU□715GL	0.91/0.91	0.3/0.3	0.60/0.56	0.75/0.75	
MU□715GY	0.91/0.91	0.3/0.3	0.30/0.28	0.75/0.75	
Type	Maximin permissible torque (kg·cm)		Starting current (A)	Starting torque (kg·cm)	
	1200 speed (rpm)	90 speed (rpm)			
MU□825GL	1.4/1.4	0.45/0.45	1.0/1.0	1.3/1.3	
MU□825GY	1.4/1.4	0.45/0.45	0.5/0.5	1.3/1.3	
Type	Maximin permissible torque (kg·cm)		Starting current (A)	Starting torque (kg·cm)	
	1200 speed (rpm)	90 speed (rpm)			
MU□940GL	3.1/2.5	0.6/0.6	1.6/1.5	2.3/2.3	
MU□940GY	3.1/2.5	0.6/0.6	0.8/0.8	2.3/2.3	
Type	Maximin permissible torque (kg·cm)		Starting current (A)	Starting torque (kg·cm)	
	1200 speed (rpm)	90 speed (rpm)			
MU□960GL	4.4/3.7	1.2/1.2	2.5/2.4	4.2/4.2	
MU□960GY	4.4/3.7	1.2/1.2	1.3/1.2	4.2/4.2	
Type	Maximin permissible torque (kg·cm)		Starting current (A)	Starting torque (kg·cm)	
	1200 speed (rpm)	90 speed (rpm)			
MU□960GFL	4.4/3.7	1.9/1.9	2.5/2.4	4.2/4.2	
MU□960GFY	4.4/3.7	1.9/1.9	1.3/1.2	4.2/4.2	
Type	Maximin permissible torque (kg·cm)		Starting current (A)	Starting torque (kg·cm)	
	1200 speed (rpm)	90 speed (rpm)			
MU□990GL	6.0/5.5	2.5/2.5	2.9/2.9	5.5/5.5	
MU□990GY	6.0/5.5	2.5/2.5	1.5/1.5	5.5/5.5	

# Unit Type / US Series

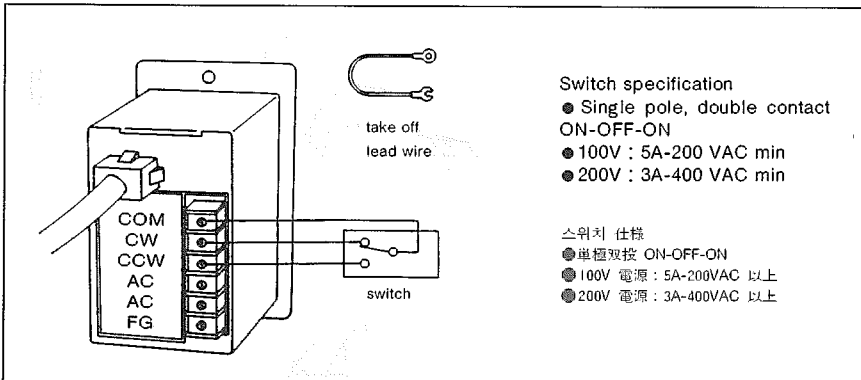
組裝型US系統

UNIT TYPE US SERIES

## Function



## Direction change



## Option/Extension code

콘트롤러와 모터를 分離해서 付着시키는 경우 이 때에는 OPTION의 「延長コード」를 使用해 주세요. 最大 5M까지 延長할 수 있습니다.  
 品名 CORD의 길이  

model No.	length
DVOP0321	1m
DVOP0322	2m
DVOP0323	3m
DVOP0324	4m
DVOP0325	5m

### ▶ 單向運轉:

只要換裝速度控制器背面終端臺的結線，可以變更旋轉方向。選擇“CW”(時針)、“CCW”(反時針)某一方向，按其連接到所要的接線柱。

### ▶ 正反向運轉:

在“CW”“CCW”的端子處增設開關，則能進行正反兩方向運轉。

**注意事項** 未有馬達停穩，請勿操作轉換開關。

Direction from motor opinion 모터 피니온으로 부터 본 回轉方向	
CW 時針方向	Connect "CW" and "COM" "CW"와 "COM"을 接統함
CCW 反時針方向	Connect "CCW" and "COM" "CCW"와 "COM"을 接統함

### Caution

The rotation direction of the gearhead output shaft maybe opposite, due to the combinations of the gear-ratio.

### Caution

Change the switch when motor stops.

When mounting the motor and controller at a distance.

### ▶ 一方向運轉

스피드 콘트롤 裏面의 端子臺의 結線을 바꿈으로 해서 回轉方向의 變換합니다. 端子를 "CW" "CCW" 어느 한쪽을 接統하여 주십시오.

### ▶ 正逆運轉

"CW" "CCW"의 端子에 S/W를 增設하면 正逆運轉이 可能

### 注意事項

모터를 停止시킨 다음 S/W를 切換해 주세요.

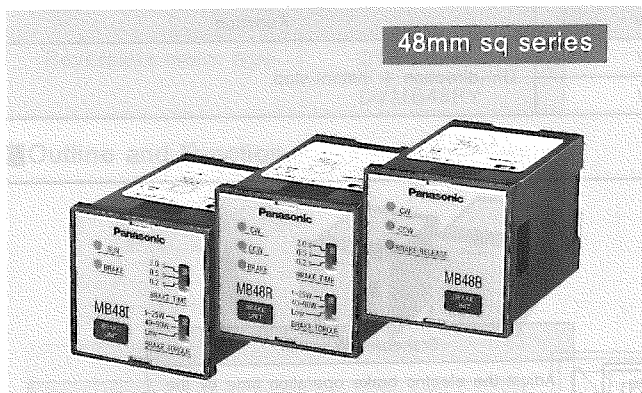
**注意事項** 它與齒輪頭組裝時，由於減速比的關係，齒輪頭的輸出軸會有時向馬達的逆方向轉動。

### 注意事項

기어헤드와 組合시키면 기어헤드의 出力軸의 回轉方向은 減速比에 依해 모터의 回轉方向과 逆으로 되는 경우가 있습니다.

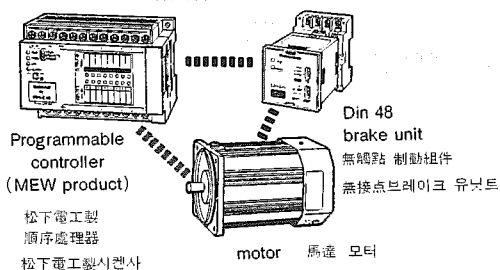
48mm方型系統

無接点 BRAKE UNIT 48m/m SERIES



### System build-up

(Able to connect the programmable controller directly without any power relay, resistor nor thyristors)

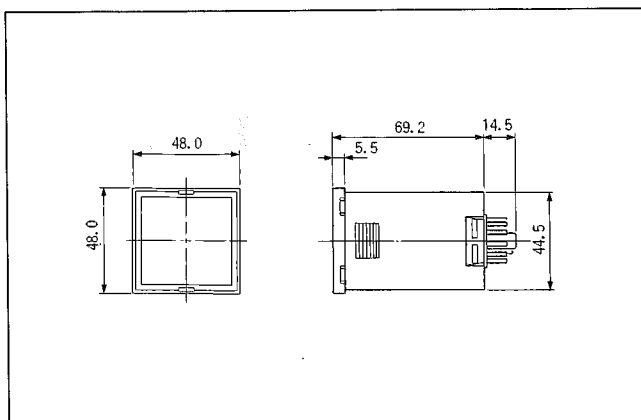


### Model

Applicable motor	Model No.	Voltage
Induction motor	DVMB48IL	100V
	DVMB48IY	200V
Reversible motor	DVMB48RL	100V
	DVMB48RY	200V
Electromagnetic brake motor	DVMB48BL	100V
	DVMB48BY	200V

주) 1, 3 相 모터에는 適用이 안됨. 2, DVMB48B는 電磁 BRAKE가 動作되지 않음.

### Body Dimension



### Features

- Maintenance free/easy to maintain.  
This new din 48 square-size brake unit, getting rid of those complicated wiring connection, has realized an easy mounting and maintenance.
- Wide variety of motor capacity to select ready to apply from 1W to 90W, while the brake torque switch enables to select motors more than 40W. Brake resistor is unnecessary for easy connection.
- Din 48 square size standard design  
Easily fits to the din size standard control panel, which gets rid of extra work.
- Soft brake function.

#### ● 無需維修保養。

不必進行繼電器控制盤等所需的布線工作。

無觸點制動機組48毫米方型系列

因採用無觸點方式，實現無需進行維修保養。

#### ● 馬達容量的調整範圍較寬。

可以在 1 W ~ 90 W 範圍內任意選擇所需容量，對 40 W 以上的馬達，經過制動力矩開關的操作也能隨意選擇。不必用制動阻力，布線工作也極其簡便。

#### ● 控制面盤的標準化。

#### ● 可供豐富種類的另售配件。

#### ● 有軟式制動功能。

### Options (to prepare other than the brake unit)

#### Terminal stand (11pin)

Model ATA4822

端子台 (11 pin)

品名 ATA4822

#### 11cap

Model ATA4822

11 帽

#### Mounting frame

Model ATA4811

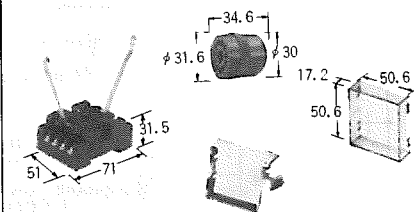
取付枠 (管)

#### Protection cover

Model AOM4801

保護 COVER (DIN 48 用)

品名 AOM 4801



# Din 48 Brake Unit (For Induction Motor)

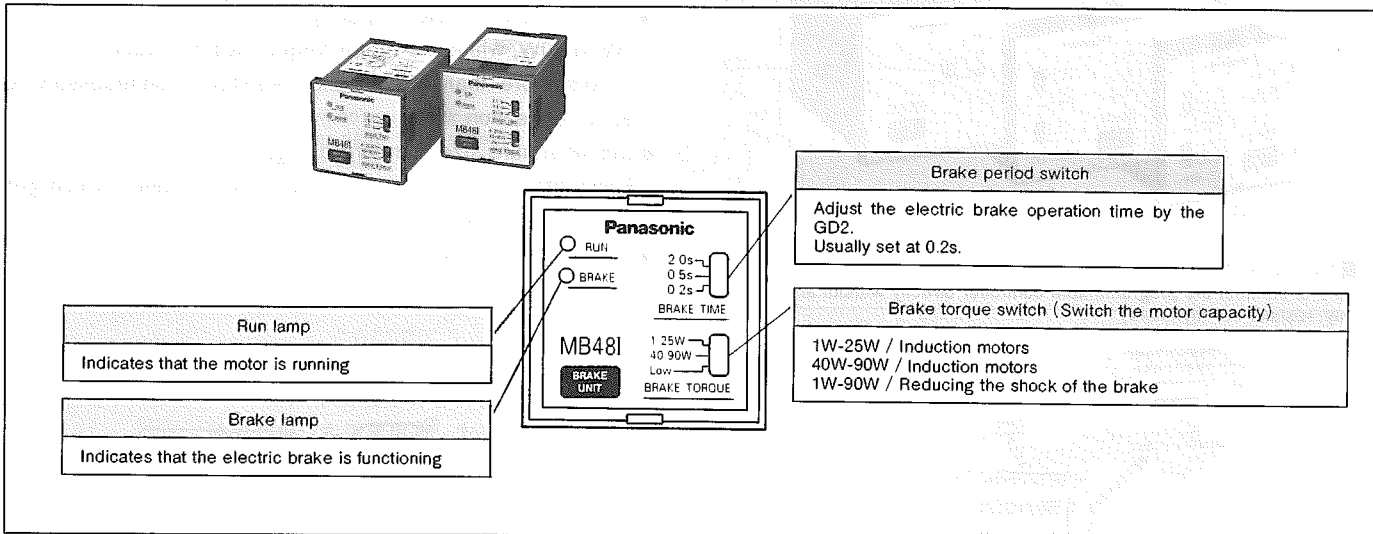
48mm方型系統

無接点 BRAKE UNIT 48m/m SERIES

Induction motor type	Model no	Voltage	Function
	DVMB48IL	100V	
	DVMB48IY	200V	

Uni-direction + instant stop

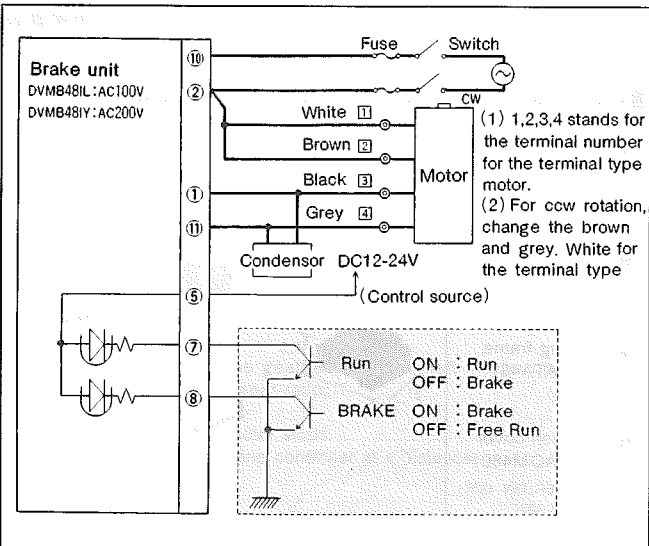
## Outline and Function



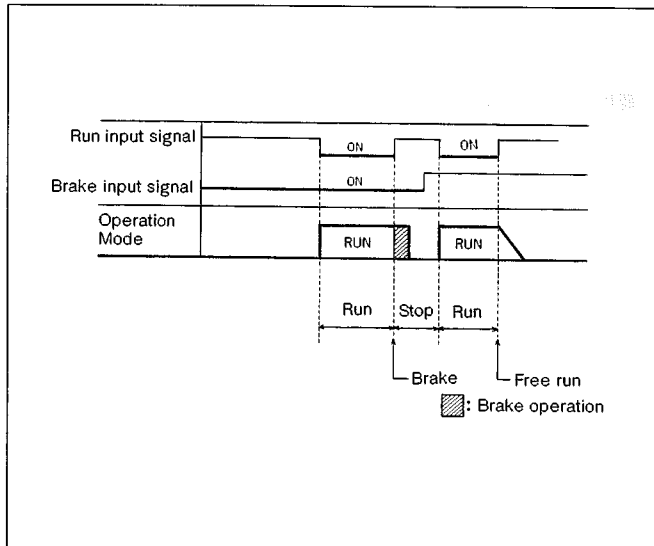
## Specifications

Model	DVMB48IL/Y
Rated voltage	Single phase 100/200 $\pm 10\%$
Frequency	50/60Hz
Brake torque switch	Change by switch ● 1W~25W ● 40W~90W ● Soft Brake
Brake time	Change by switch
Control input voltage	DC12~24V
Operation temperature	-10°C ~ +40°C

## Wiring diagram



## Operation



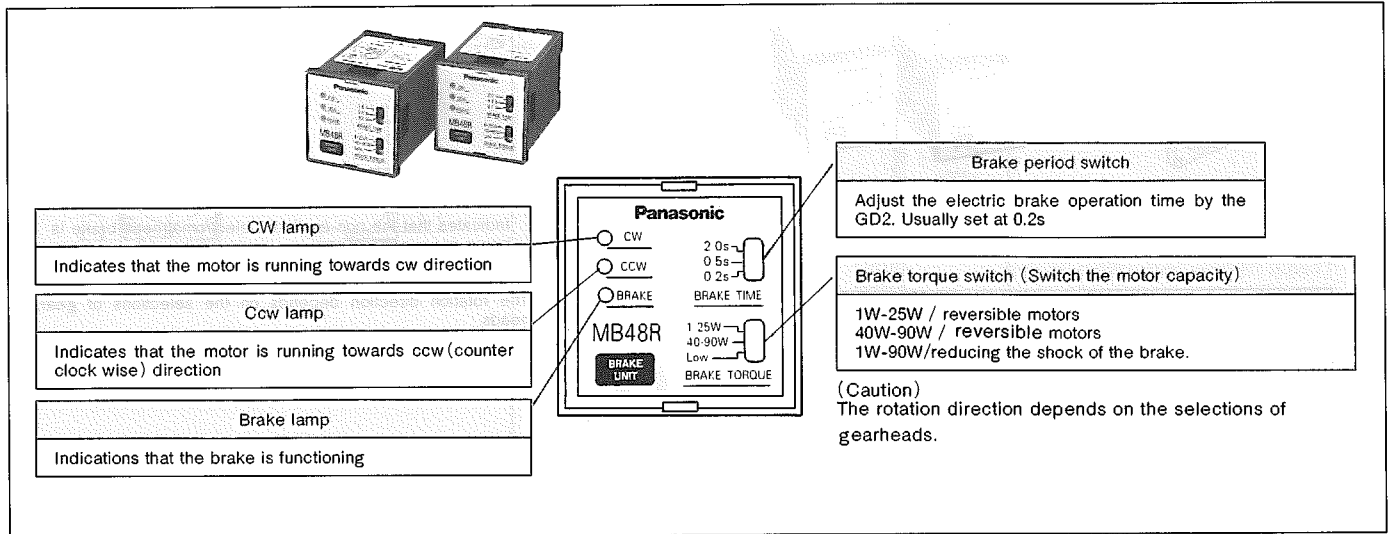
### Caution

1. Use one brake unit for one motor.
2. The thick lines shows the main circuit. Use a 0.75mm<sup>2</sup> wire.
3. Avoid to input a operation signal during electrical brake.



Reversible motor type	Model no	Voltage	Function
	DVMB48RL	100V	
	DVMB48RY	200V	Reverse + instant stop

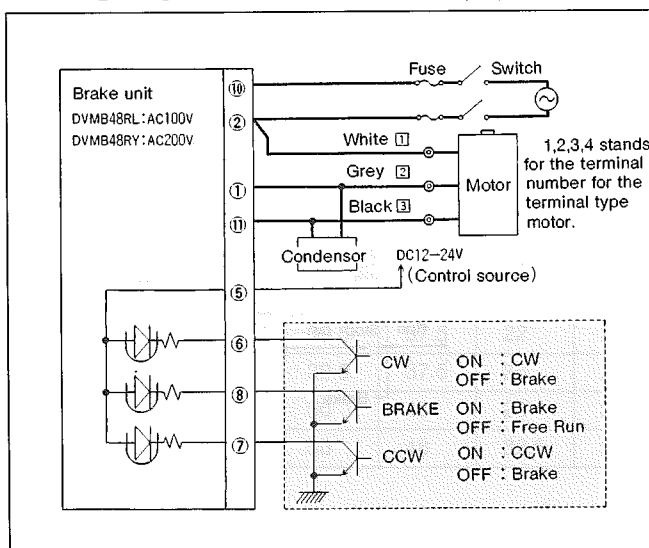
## Outline and Function



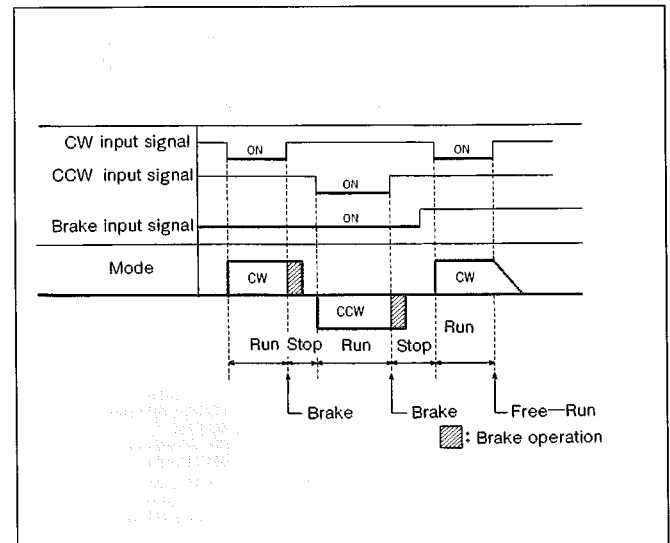
## Specifications

Model	DVMB48RL/Y
Rated voltage	Single phase 100/200V $\pm 10\%$
Frequency	50/60Hz
Brake torque switch	Change by switch ● 1W~25W ● 40W~90W ● Soft Brake
Brake time	Change by switch
Control input voltage	DC12~24V
Operation temperature	-10°C ~ +40°C

## Wiring diagram



## Operation



### Caution

- Use one brake unit for one motor.
- The thick lines shows the main circuit. Use a 0.75mm<sup>2</sup> wire.
- Avoid to input a operation signal during electrical brake.

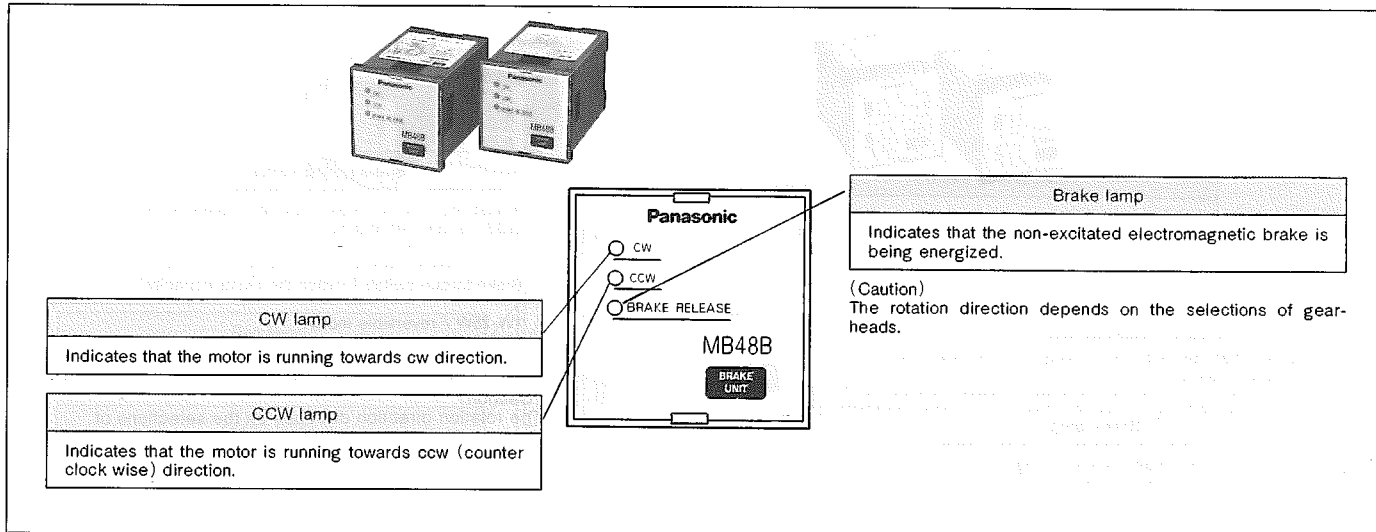
# Din 48 Brake Unit (For Electro-Magnetic Brake Motor)

48mm方型系統

無接点 BRAKE UNIT 48m/m SERIES

Electro-magnetic brake motor type	Model no	Voltage	Function
	DVMB48BL	100V	
	DVMB48BY	200V	

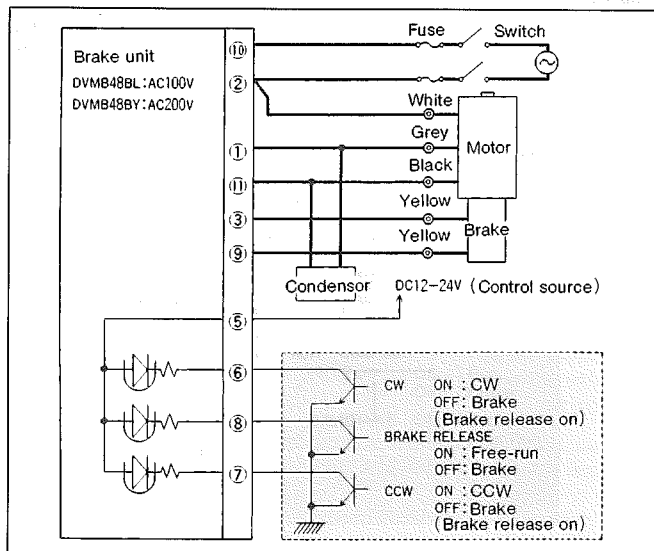
## Outline and Function



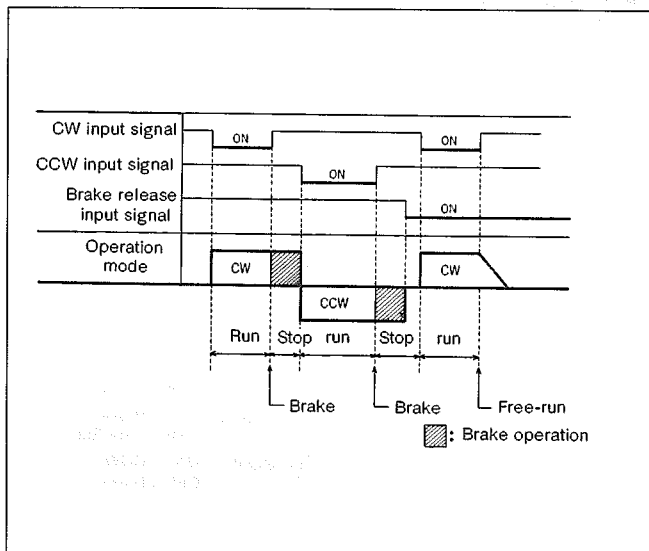
## Specifications

Model	DVMB48BL/Y
Rated voltage	Single phase 100/200V $\pm 10\%$
Frequency	50/60Hz
Brake torque switch	—
Brake time	—
Control input voltage	DC12~24V
Operation temperature	-10°C ~ +40°C

## Wiring diagram



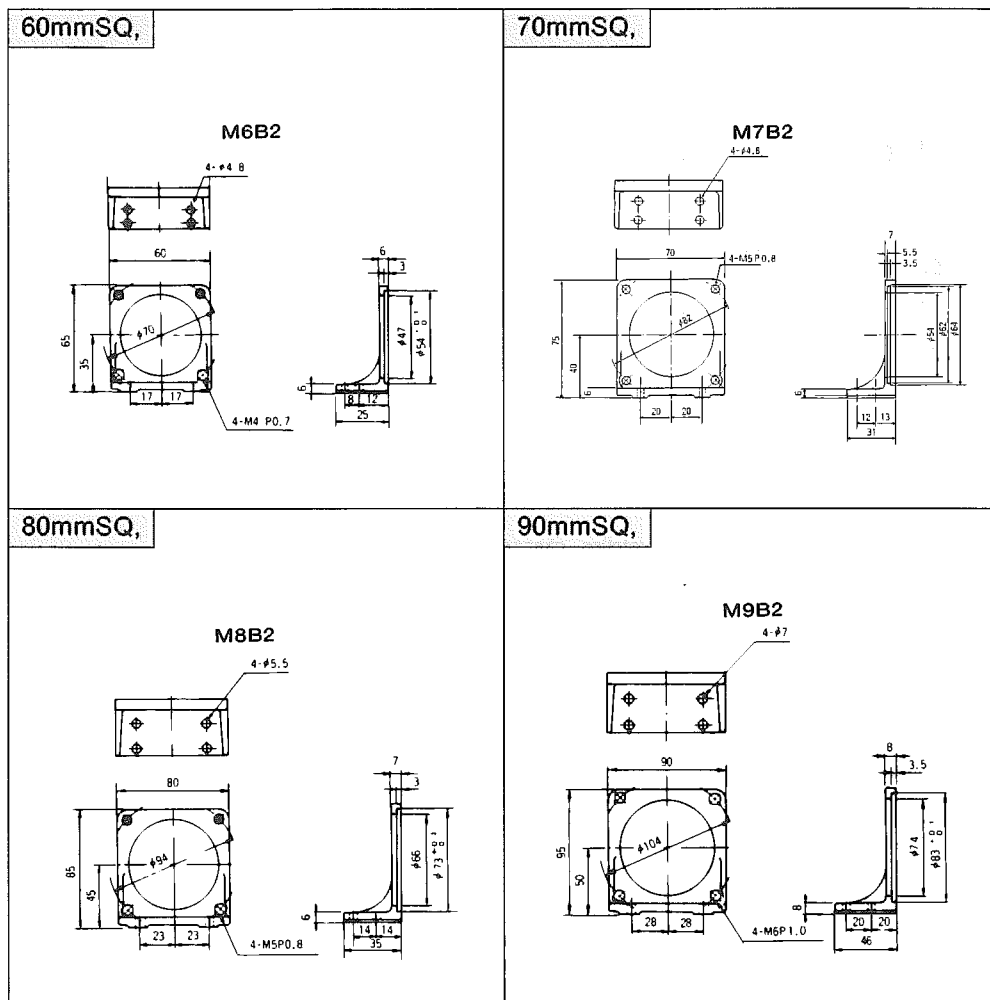
## Operation



### Caution

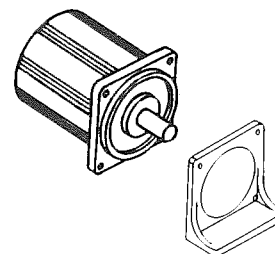
1. Use one brake unit for one motor.
2. The thick lines shows the main circuit. Use a 0.75mm<sup>2</sup> wire.
3. Avoid to input a operation signal during electrical brake.

## Mounting Frame and Dimensions

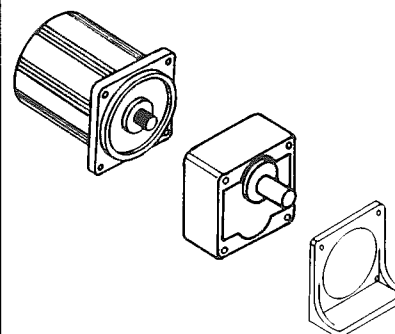


## How to Mount

### 1. Motor + Frame



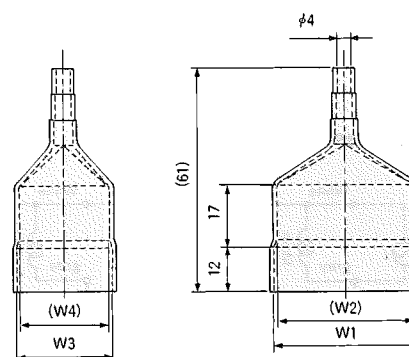
### 2. Motor + Geared + Frame



## Capacitor Cap

This part is designed to prevent capacitor terminals from coming into contact with other metal parts and to prevent accidents when the equipment is touched by human operators. Please order as required for your particular system.

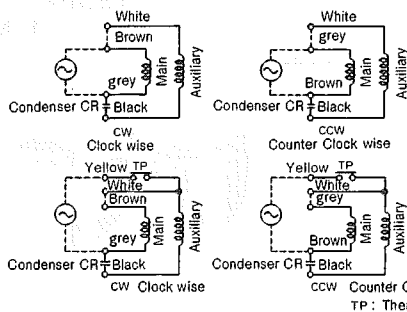
Type	w1	w2	w3	w4
MOPC3917	39.5	37.5	17	15
MOPC3922	39.5	37.5	22	20
MOPC3926	39.5	37.5	26	25
MOPC5026	50	48	26	22
MOPC5032	50	48	32.5	29.5



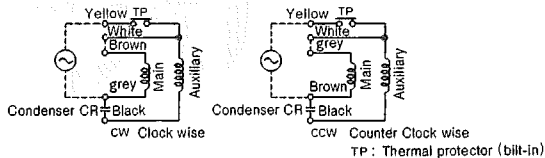


## Connecting Diagram

## Single Phase Induction Motor

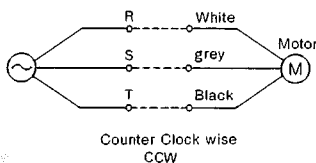


## UL Standard Motor



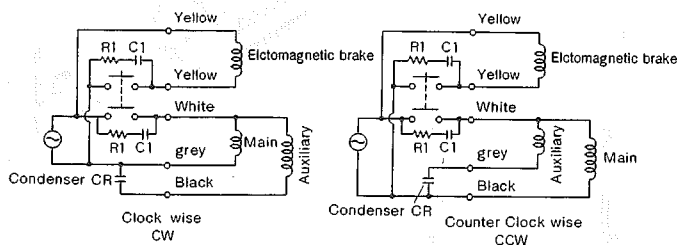
TP : Thermal protector (built-in)

## Three Phase Induction Motor



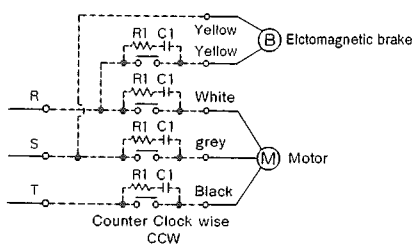
As for CW rotation, change the 2 leads among R, S, T. shown above.

## Electro-Magnetic Brake Motor / Single Phase Induction



- (Caution 1) The brake operates to a holding condition when the electromagnetic brake is 'off'.  
 (Caution 2) Use R + C inbetween the contacts.  
 Also DV-OPO08 is available as an option.

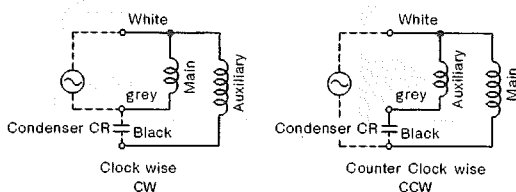
## Electro-Magnetic Brake Motor / Three Phase Induction



As for CW rotation, change the 2 leads among R, S, T. shown above.

- (Caution 1) The brake operates to a holding condition when the electromagnetic brake is 'off'.  
 (Caution 2) Use R + C inbetween the contacts.  
 Also DV-OPO08 is available as an option.

## Single Phase Reversible Motor





## Cautions for Proper Use

- Install a safety equipments or apparatus in your application, when a serious accident or loss of property is expected due to the failure of this product.
- Consult us if the application of this product is under such special conditions and environments as nuclear energy control, aerospace, transportation, medical equipment, various safety equipments or equipments which require a least air contamination.
- We have been making the best effort to ensure the highest quality of the products, however, application of exceptionally larger external noise disturbance and static electricity, or failure in input power, wiring and components may result in unexpected action. It is highly recommended that you make a fail-safe design and secure the safety in the operative range.
- If the motor shaft is not electrically grounded, it may cause an electrolytic corrosion to the bearing, depending on the condition of the machine and its mounting environment, and may result in the bearing noise. Checking and verification by customer is required.
- Failure of this product depending on its content, may generate smoke of about one cigarette. Take this into consideration when the application of the machine is clean room related.
- Read and observe the instruction manual without fail for proper usage of the products.

### Repair

Consult to the dealer from whom you have purchased this product for details of repair work.  
When the product is incorporated to the machine you have purchased, consult to the machine manufacturer or its dealer.

### Electric Data

Electric data of this product (Instruction Manual, CAD data) can be download from the following web site;  
<[http://industrial.panasonic.com/jp/i/fa\\_motor.html](http://industrial.panasonic.com/jp/i/fa_motor.html)>

Contact to :

### Motor Company Matsushita Electric Industrial Co., Ltd.

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Tel : +81-72-871-1212  
Fax: +81-72-870-3151



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