Cautions for Proper Use

- This product is intended to be used with a general industrial product, but not designed or manufactured to be used in a machine or system that may cause personal death when it is failed.
- 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.
- Please be careful when using in an environment with high concentrations of sulphur or sulphuric gases, as sulphuration can lead to disconnection from the chip resistor or a poor contact connection.
- Take care to avoid inputting a supply voltage which significantly exceeds the rated range to the power supply of this product. Failure to heed this caution may result in damage to the internal parts, causing smoking and/or a fire and other trouble.
- 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.
URL	Electric data of this product (Instruction Manual, CAD data) can be download from the following web site; <http://industrial.panasonic.com/ww/i_e/25000/motor_fa_e/motor_fa_e.html

Contact to :

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ISO14001 Certificate division
CERTIFICATE OF APPROVAL ISO14001

ISO9001 Certificate division
CERTIFICATE OF APPROVAL ISO9001

Motor Company, Matsushita Electric Industrial Co., Ltd. is an ISO14001 (Environmental Management System) and ISO9001 (Quality Management System) certificate enterprise.

The contents of this catalog apply to the products as of November. 01, 2006.

- This document is printed on recycled paper.

- Printed colors may be slightly different from the actual products.
- Specifications and design of the products are subject to change without notice for the product improvement.
- For environmental protection, this document is made of recycled paper, and printed with soybean oil ink.

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Compact AC Geared Motor | 2007/1
Catalog

COMPACT AC GEARED MOTOR

COMPACT
AC GEARED MOTOR

Motor Company
Matsushita Electric Industrial Co., Ltd.
http://panasonic.co.jp/motor/

2007/1

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Configuration and contents of catalog

Configuration

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• Information ➔ A-2 to A-60

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• Product description

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List of motors and gear heads

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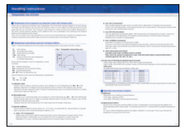

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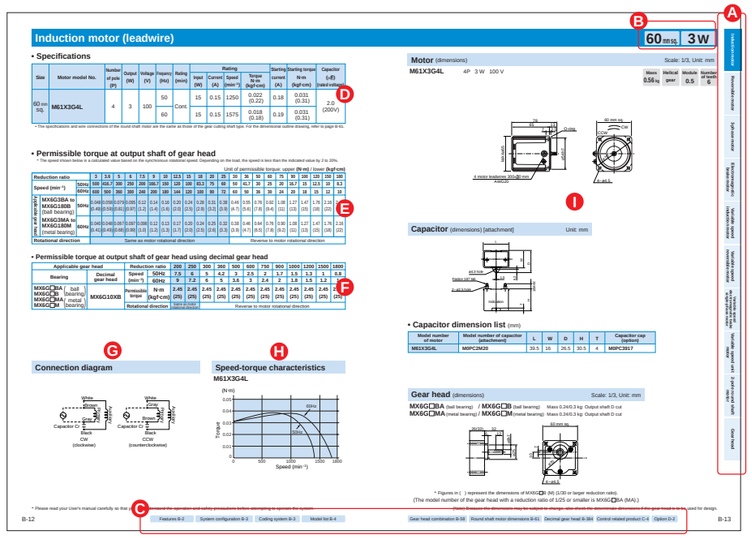
Product description

Product outline

The product is briefly described by using the following information and data.

- Overview, system block diagram, part No. description, product-specific information
- Model list
- Product information for each model

Description of product



A Index

- Each series is color coded.
  - **Motors**
  - **Controls**
- Classification is made in terms of function.

B Size and output

- Indicates the size and output shown on the page.

C Footer

- Indicates the page(s) on which related products and information are found.

• Product information (D to I)

- The facing page contains product specifications.

D Specification

- Defines major requirements such as voltage, current and torque.
- Description is basically on pinion shaft type but almost equally applicable to round shaft.

E Permissible load torque with gear head directly connected

- Specifies the allowable load torque with gear head directly connected.

F Permissible load torque with decimal gear head used

- Specifies the allowable load torque when the decimal gear head is used.

G Wiring diagram

- Represents typical wiring for the product.

H Speed-torque curve

- Represents typical speed-torque curve of the product.

I Outline drawing

- Shows dimensions of the motor (gear head).
- Dimensions of motor-gear head combination and round shaft type are shown on different pages. See the footer.

Pinion shaft motor [Japanese version]

Size	Voltage / Output	Induction: Leadwire type 100 V	Induction: Leadwire type 200 V	Induction: Sealed connector type 100 V	Induction: Sealed connector type 200 V	Reversible: Leadwire type 100 V	Reversible: Leadwire type 200 V	Reversible: Sealed connector type 100 V	Reversible: Sealed connector type 200 V	3-phase: Leadwire type 200/220 V	3-phase: Sealed connector type 200/220 V	Electromagnetic brake, single-phase: Leadwire type 100 V	Electromagnetic brake, single-phase: Leadwire type 200 V	Electromagnetic brake, 3-phase: Leadwire type 200/220 V	Variable speed induction: Leadwire type 100 V	Variable speed induction: Leadwire type 200 V	Voltage / Output	Size
		Page	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page		
42 mm sq.	1 W	M41A1G4L B-10				M4RA1G4L B-72											1 W	42 mm sq.
	3 W																3 W	
60 mm sq.	3 W	M61X3G4L B-12													M61X3GV4L B-232		3 W	60 mm sq.
	4 W					M6RX4G4L B-74											4 W	
	6 W	M61X6G4L B-14	M61X6G4Y B-14			M6RX6G4L B-76	M6RX6G4Y B-76					M6RX6GB4L B-178	M6RX6GB4Y B-178		M61X6GV4L B-234	M61X6GV4Y B-234	6 W	
70 mm sq.	10 W	M71X10G4L B-18	M71X10G4Y B-18			M7RX10G4L B-80	M7RX10G4Y B-80								M71X10GV4L B-238	M71X10GV4Y B-238	10 W	70 mm sq.
	15 W	M71X15G4L B-20	M71X15G4Y B-20			M7RX15G4L B-82	M7RX15G4Y B-82					M7RX15GB4L B-182	M7RX15GB4Y B-182		M71X15GV4L B-240	M71X15GV4Y B-240	15 W	
80 mm sq.	15 W	M81X15G4L B-24	M81X15G4Y B-24												M81X15GV4L B-244	M81X15GV4Y B-244	15 W	80 mm sq.
	20 W					M8RX20G4L B-86	M8RX20G4Y B-86										20 W	
	25 W	M81X25G4L B-26	M81X25G4Y B-26	M81X25GK4L B-42	M81X25GK4Y B-42	M8RX25G4L B-88	M8RX25G4Y B-88	M8RX25GK4L B-104	M8RX25GK4Y B-104	M8MX25G4Y B-130	M8MX25GK4Y B-146	M8RX25GB4L B-186	M8RX25GB4Y B-186	M8MX25GB4Y B-202	M81X25GV4L B-246	M81X25GV4Y B-246	25 W	
90 mm sq.	40 W	M91X40G4L B-30	M91X40G4Y B-30	M91X40GK4L B-46	M91X40GK4Y B-46	M9RX40G4L B-92	M9RX40G4Y B-92	M9RX40GK4L B-108	M9RX40GK4Y B-108	M9MX40G4Y B-134	M9MX40GK4Y B-150	M9RX40GB4L B-190	M9RX40GB4Y B-190	M9MX40GB4Y B-206	M91X40GV4L B-250	M91X40GV4Y B-250	40 W	90 mm sq.
	60 W	M91Z60G4L B-34	M91Z60G4Y B-34	M91Z60GK4L B-50	M91Z60GK4Y B-50	M9RZ60G4L B-96	M9RZ60G4Y B-96	M9RZ60GK4L B-112	M9RZ60GK4Y B-112	M9MZ60G4Y B-138	M9MZ60GK4Y B-154	M9RZ60GB4L B-194	M9RZ60GB4Y B-194	M9MZ60GB4Y B-210	M91Z60GV4L B-254	M91Z60GV4Y B-254	60 W	
	90 W	M91Z90G4L B-38	M91Z90G4Y B-38	M91Z90GK4L B-54	M91Z90GK4Y B-54	M9RZ90G4L B-100	M9RZ90G4Y B-100	M9RZ90GK4L B-116	M9RZ90GK4Y B-116	M9MZ90G4Y B-142	M9MZ90GK4Y B-158	M9RZ90GB4L B-198	M9RZ90GB4Y B-198	M9MZ90GB4Y B-214	M91Z90GV4L B-258	M91Z90GV4Y B-258	90 W	

Pinion shaft motor [Japanese version]

Size	Voltage / Output	Variable speed reversible: Leadwire type 100 V	Variable speed reversible: Leadwire type 200 V	Variable speed electromagnetic brake, single-phase: Leadwire type 100 V	Variable speed electromagnetic brake, single-phase: Leadwire type 200 V	Variable speed unit: US series 100 V	Variable speed unit: US series 200 V	Variable speed unit: UX series 100 V	Variable speed unit: UX series 200 V	C&B induction: Leadwire type 100 V	C&B induction: Leadwire type 200 V	C&B induction: Sealed connector type 100 V	C&B induction: Sealed connector type 200 V	C&B 3-phase: Leadwire type 200/220 V	C&B 3-phase: Sealed connector type 200/220 V	C&B variable speed induction: Leadwire type 100 V	C&B variable speed induction: Leadwire type 200 V	Voltage / Output	Size
		Page	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page		
42 mm sq.	1 W																	1 W	42 mm sq.
	3 W																	3 W	
60 mm sq.	3 W																	3 W	60 mm sq.
	4 W	M6RX4GV4L B-274																4 W	
	6 W	M6RX6GV4L B-276	M6RX6GV4Y B-276	M6RX6GBV4L B-314	M6RX6GBV4Y B-314	MUSN606GL B-328	MUSN606GY B-328	MUXN606GL B-328	MUXN606GY B-328									6 W	
70 mm sq.	10 W	M7RX10GV4L B-280	M7RX10GV4Y B-280															10 W	70 mm sq.
	15 W	M7RX15GV4L B-282	M7RX15GV4Y B-282	M7RX15GBV4L B-316	M7RX15GBV4Y B-316	MUSN715GL B-330	MUSN715GY B-330	MUXN715GL B-330	MUXN715GY B-330	For C&B motors, contact us.								15 W	
80 mm sq.	15 W																	15 W	80 mm sq.
	20 W	M8RX20GV4L B-286	M8RX20GV4Y B-286															20 W	
	25 W	M8RX25GV4L B-288	M8RX25GV4Y B-288	M8RX25GBV4L B-318	M8RX25GBV4Y B-318	MUSN825GL B-332	MUSN825GY B-332	MUXN825GL B-332	MUXN825GY B-332									25 W	
90 mm sq.	40 W	M9RX40GV4L B-292	M9RX40GV4Y B-292	M9RX40GBV4L B-320	M9RX40GBV4Y B-320	MUSN940GL B-334	MUSN940GY B-334	MUXN940GL B-334	MUXN940GY B-334									40 W	90 mm sq.
	60 W	M9RZ60GV4L B-296	M9RZ60GV4Y B-296			MUSN960GL B-336	MUSN960GY B-336	MUXN960GL B-336	MUXN960GY B-336									60 W	
	90 W	M9RZ90GV4L B-300	M9RZ90GV4Y B-300			MUSN990GL B-338	MUSN990GY B-338	MUXN990GL B-338	MUXN990GY B-338									90 W	

Round shaft motor [Japanese version]

Size	Voltage / Output	Induction: Leadwire type 100 V	Induction: Leadwire type 200 V	Induction: Sealed connector type 100 V	Induction: Sealed connector type 200 V	Reversible: Leadwire type 100 V	Reversible: Leadwire type 200 V	Reversible: Sealed connector type 100 V	Reversible: Sealed connector type 200 V		3-phase: Leadwire type 200/220 V	3-phase: Sealed connector type 200/220 V	Electromagnetic brake, single-phase: Leadwire type 100 V	Electromagnetic brake, single-phase: Leadwire type 200 V	Electromagnetic brake, 3-phase: Leadwire type 200/220 V	Variable speed induction: Leadwire type 100 V	Variable speed induction: Leadwire type 200 V	Voltage / Output	Size
		Page	Page	Page	Page	Page	Page	Page	Page		Page	Page	Page	Page	Page	Page	Page		
42 mm sq.	1 W	M41A1S4L B-61				M4RA1S4L B-123												1 W	42 mm sq.
	3 W																	3 W	
60 mm sq.	3 W	M61X3S4LS B-61														M61X3SV4LS B-264		3 W	60 mm sq.
	4 W					M6RX4S4LS B-123												4 W	
	6 W	M61X6S4LS B-61	M61X6S4YS B-61			M6RX6S4LS B-123	M6RX6S4YS B-123						M6RX6SB4LS B-220	M6RX6SB4YS B-220		M61X6SV4LS B-264	M61X6SV4YS B-264	6 W	
70 mm sq.	10 W	M71X10S4LS B-61	M71X10S4YS B-61			M7RX10S4LS B-123	M7RX10S4YS B-123									M71X10SV4LS B-264	M71X10SV4YS B-264	10 W	70 mm sq.
	15 W	M71X15S4LS B-61	M71X15S4YS B-61			M7RX15S4LS B-123	M7RX15S4YS B-123						M7RX15SB4LS B-220	M7RX15SB4YS B-220		M71X15SV4LS B-264	M71X15SV4YS B-264	15 W	
80 mm sq.	15 W	M81X15S4LS B-61	M81X15S4YS B-61													M81X15SV4LS B-264	M81X15SV4YS B-264	15 W	80 mm sq.
	20 W					M8RX20S4LS B-123	M8RX20S4YS B-123											20 W	
	25 W	M81X25S4LS B-61	M81X25S4YS B-61	M81X25SK4LS B-62	M81X25SK4YS B-62	M8RX25S4LS B-123	M8RX25S4YS B-123	M8RX25SK4LS B-124	M8RX25SK4YS B-124		M8MX25S4YS B-164	M8MX25SK4YS B-165	M8RX25SB4LS B-220	M8RX25SB4YS B-220	M8MX25SB4YS B-221	M81X25SV4LS B-264	M81X25SV4YS B-264	25 W	
90 mm sq.	40 W	M91X40S4LS B-61	M91X40S4YS B-61	M91X40SK4LS B-62	M91X40SK4YS B-62	M9RX40S4LS B-123	M9RX40S4YS B-123	M9RX40SK4LS B-124	M9RX40SK4YS B-124		M9MX40S4YS B-164	M9MX40SK4YS B-165	M9RX40SB4LS B-220	M9RX40SB4YS B-220	M9MX40SB4YS B-221	M91X40SV4LS B-265	M91X40SV4YS B-265	40 W	90 mm sq.
	60 W	M91Z60S4LS B-62	M91Z60S4YS B-62	M91Z60SK4LS B-62	M91Z60SK4YS B-62	M9RZ60S4LS B-124	M9RZ60S4YS B-124	M9RZ60SK4LS B-124	M9RZ60SK4YS B-124		M9MZ60S4YS B-164	M9MZ60SK4YS B-165	M9RZ60SB4LS B-220	M9RZ60SB4YS B-220	M9MZ60SB4YS B-221	M91Z60SV4LS B-265	M91Z60SV4YS B-265	60 W	
	90 W	M91Z90S4LS B-62	M91Z90S4YS B-62	M91Z90SK4LS B-62	M91Z90SK4YS B-62	M9RZ90S4LS B-124	M9RZ90S4YS B-124	M9RZ90SK4LS B-124	M9RZ90SK4YS B-124		M9MZ90S4YS B-164	M9MZ90SK4YS B-165	M9RZ90SB4LS B-220	M9RZ90SB4YS B-220	M9MZ90SB4YS B-221	M91Z90SV4LS B-265	M91Z90SV4YS B-265	90 W	

Motor

Round shaft motor [Japanese version]

Size	Voltage / Output	Variable speed reversible Leadwire type 100 V Page	Variable speed reversible Leadwire type 200 V Page
42 mm sq.	1 W		
	3 W		
60 mm sq.	3 W		
	4 W	M6RX4SV4LS B-306	
	6 W	M6RX6SV4LS B-306	M6RX6SV4YS B-306
70 mm sq.	10 W	M7RX10SV4LS B-306	M7RX10SV4YS B-306
	15 W	M7RX15SV4LS B-306	M7RX15SV4YS B-306
80 mm sq.	15 W		
	20 W	M8RX20SV4LS B-306	M8RX20SV4YS B-306
	25 W	M8RX25SV4LS B-306	M8RX25SV4YS B-306
90 mm sq.	40 W	M9RX40SV4LS B-307	M9RX40SV4YS B-307
	60 W	M9RZ60SV4LS B-307	M9RZ60SV4YS B-307
	90 W	M9RZ90SV4LS B-307	M9RZ90SV4YS B-307

2-pole motor [Japanese version]

		• Pinion shaft	• Round shaft		
Size	Voltage / Output	Induction Leadwire type 100 V Page	Induction Leadwire type 100 V Page	Induction Leadwire type 200 V Page	3-phase Leadwire type 200/220 V Page
42 mm sq.	1 W				
	3 W	M41A3G2L B-8	M41A3S2L B-344		
60 mm sq.	3 W				
	4 W				
	6 W				
70 mm sq.	10 W				
	15 W				
80 mm sq.	20 W		M81X20S2LS B-345	M81X20S2YS B-345	
	40 W		M81X40S2LS B-346	M81X40S2YS B-346	M8MX40S2YS B-356
	60 W		M81X60S2LS B-348	M81X60S2YS B-348	M8MX60S2YS B-358
90 mm sq.	60 W		M91X60S2LS B-350	M91X60S2YS B-350	M9MX60S2YS B-360
	90 W		M91Z90S2LS B-352	M91Z90S2YS B-352	M9MZ90S2YS B-362
	150 W		M91ZA5S2LS B-354	M91ZA5S2YS B-354	M9MZA5S2YS B-364

Pinion shaft motor [International standard approved]

<The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.>

Size	Voltage / Output	Induction Leadwire type 100 V Page	Induction Leadwire type 110/115 V Page	Induction Leadwire type 200 V Page	Induction Leadwire type 220/230 V Page	Induction Sealed connector type 100 V Page	Induction Sealed connector type 110/115 V Page	Induction Sealed connector type 200 V Page	Induction Sealed connector type 220/230 V Page
42 mm sq.	1 W								
	3 W								
60 mm sq.	3 W								
	4 W								
	6 W	M61X6G4LG M61X6G4LGA B-16	M61X6G4DG M61X6G4DGA B-16	M61X6G4YG M61X6G4YGA B-16	M61X6G4GG M61X6G4GG B-16				
70 mm sq.	10 W								
	15 W	M71X15G4LG M71X15G4LGA B-22	M71X15G4DG M71X15G4DGA B-22	M71X15G4YG M71X15G4YGA B-22	M71X15G4GG M71X15G4GG B-22				
80 mm sq.	15 W								
	20 W								
	25 W	M81X25G4LG M81X25G4LGA B-28	M81X25G4DG M81X25G4DGA B-28	M81X25G4YG M81X25G4YGA B-28	M81X25G4GG M81X25G4GGA B-28	M81X25GK4LG M81X25GK4LGA B-44	M81X25GK4DG M81X25GK4DGA B-44	M81X25GK4YG M81X25GK4YGA B-44	M81X25GK4GG M81X25GK4GGA B-44
90 mm sq.	40 W	M91X40G4LG M91X40G4LGA B-32	M91X40G4DG M91X40G4DGA B-32	M91X40G4YG M91X40G4YGA B-32	M91X40G4GG M91X40G4GGA B-32	M91X40GK4LG M91X40GK4LGA B-48	M91X40GK4DG M91X40GK4DGA B-48	M91X40GK4YG M91X40GK4YGA B-48	M91X40GK4GG M91X40GK4GGA B-48
	60 W	M91Z60G4LG M91Z60G4LGA B-36	M91Z60G4DG M91Z60G4DGA B-36	M91Z60G4YG M91Z60G4YGA B-36	M91Z60G4GG M91Z60G4GGA B-36	M91Z60GK4LG M91Z60GK4LGA B-52	M91Z60GK4DG M91Z60GK4DGA B-52	M91Z60GK4YG M91Z60GK4YGA B-52	M91Z60GK4GG M91Z60GK4GGA B-52
	90 W	M91Z90G4LG M91Z90G4LGA B-40	M91Z90G4DG M91Z90G4DGA B-40	M91Z90G4YG M91Z90G4YGA B-40	M91Z90G4GG M91Z90G4GGA B-40	M91Z90GK4LG M91Z90GK4LGA B-56	M91Z90GK4DG M91Z90GK4DGA B-56	M91Z90GK4YG M91Z90GK4YGA B-56	M91Z90GK4GG M91Z90GK4GGA B-56

* The models with a model number to which “A” is suffixed (not equipped with a capacitor cap) are not sold or available in Japan.

Pinion shaft motor [International standard approved]

<The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.>

Size	Voltage / Output	Reversible: Leadwire type 100 V	Reversible: Leadwire type 110/115V	Reversible: Leadwire type 200 V	Reversible: Leadwire type 220/230 V	Reversible: Sealed connector type 100 V	Reversible: Sealed connector type 110/115V	Reversible: Sealed connector type 200 V	Reversible: Sealed connector type 220/230 V	3-phase: Leadwire type 200/220/230 V	3-phase: Sealed connector type 200/220/230 V	3-phase: Sealed connector type 380/400 V	Electromagnetic brake, single-phase: Leadwire type 100 V	Electromagnetic brake, single-phase: Leadwire type 110/115V	Electromagnetic brake, single-phase: Leadwire type 200 V	Electromagnetic brake, single-phase: Leadwire type 220/230 V	Electromagnetic brake, 3-phase: Leadwire type 200/220/230 V	Voltage / Output	Size
		Page	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page		
42 mm sq.	1 W																	1 W	42 mm sq.
	3 W																	3 W	
60 mm sq.	3 W																	3 W	60 mm sq.
	4 W																	4 W	
	6 W	M6RX6G4LG M6RX6G4LGA B-78	M6RX6G4DG M6RX6G4DGA B-78	M6RX6G4YG M6RX6G4YGA B-78	M6RX6G4GG M6RX6G4GGA B-78								M6RX6GB4LG M6RX6GB4LGA B-180	M6RX6GB4DG M6RX6GB4DGA B-180	M6RX6GB4YG M6RX6GB4YGA B-180	M6RX6GB4GG M6RX6GB4GGA B-180		6 W	
70 mm sq.	10 W																	10 W	70 mm sq.
	15 W	M7RX15G4LG M7RX15G4LGA B-84	M7RX15G4DG M7RX15G4DGA B-84	M7RX15G4YG M7RX15G4YGA B-84	M7RX15G4GG M7RX15G4GGA B-84								M7RX15GB4LG M7RX15GB4LGA B-184	M7RX15GB4DG M7RX15GB4DGA B-184	M7RX15GB4YG M7RX15GB4YGA B-184	M7RX15GB4GG M7RX15GB4GGA B-184		15 W	
80 mm sq.	15 W																	15 W	80 mm sq.
	20 W																	20 W	
	25 W	M8RX25G4LG M8RX25G4LGA B-90	M8RX25G4DG M8RX25G4DGA B-90	M8RX25G4YG M8RX25G4YGA B-90	M8RX25G4GG M8RX25G4GGA B-90	M8RX25GK4LG M8RX25GK4LGA B-106	M8RX25GK4DG M8RX25GK4DGA B-106	M8RX25GK4YG M8RX25GK4YGA B-106	M8RX25GK4GG M8RX25GK4GGA B-106	M8MX25G4YG M8MX25G4YGA B-132	M8MX25GK4YG M8MX25GK4YGA B-148	M8MX25GK4CG M8MX25GK4CGA B-148	M8RX25GB4LG M8RX25GB4LGA B-188	M8RX25GB4DG M8RX25GB4DGA B-188	M8RX25GB4YG M8RX25GB4YGA B-188	M8RX25GB4GG M8RX25GB4GGA B-188	M8MX25GB4YG M8MX25GB4YGA B-204	25 W	
90 mm sq.	40 W	M9RX40G4LG M9RX40G4LGA B-94	M9RX40G4DG M9RX40G4DGA B-94	M9RX40G4YG M9RX40G4YGA B-94	M9RX40G4GG M9RX40G4GGA B-94	M9RX40GK4LG M9RX40GK4LGA B-110	M9RX40GK4DG M9RX40GK4DGA B-110	M9RX40GK4YG M9RX40GK4YGA B-110	M9RX40GK4GG M9RX40GK4GGA B-110	M9MX40G4YG M9MX40G4YGA B-136	M9MX40GK4YG M9MX40GK4YGA B-152	M9MX40GK4CG M9MX40GK4CGA B-152	M9RX40GB4LG M9RX40GB4LGA B-192	M9RX40GB4DG M9RX40GB4DGA B-192	M9RX40GB4YG M9RX40GB4YGA B-192	M9RX40GB4GG M9RX40GB4GGA B-192	M9MX40GB4YG M9MX40GB4YGA B-208	40 W	90 mm sq.
	60 W	M9RZ60G4LG M9RZ60G4LGA B-98	M9RZ60G4DG M9RZ60G4DGA B-98	M9RZ60G4YG M9RZ60G4YGA B-98	M9RZ60G4GG M9RZ60G4GGA B-98	M9RZ60GK4LG M9RZ60GK4LGA B-114	M9RZ60GK4DG M9RZ60GK4DGA B-114	M9RZ60GK4YG M9RZ60GK4YGA B-114	M9RZ60GK4GG M9RZ60GK4GGA B-114	M9MZ60G4YG M9MZ60G4YGA B-140	M9MZ60GK4YG M9MZ60GK4YGA B-156	M9MZ60GK4CG M9MZ60GK4CGA B-156	M9RZ60GB4LG M9RZ60GB4LGA B-196	M9RZ60GB4DG M9RZ60GB4DGA B-196	M9RZ60GB4YG M9RZ60GB4YGA B-196	M9RZ60GB4GG M9RZ60GB4GGA B-196	M9MZ60GB4YG M9MZ60GB4YGA B-212	60 W	
	90 W	M9RZ90G4LG M9RZ90G4LGA B-102	M9RZ90G4DG M9RZ90G4DGA B-102	M9RZ90G4YG M9RZ90G4YGA B-102	M9RZ90G4GG M9RZ90G4GGA B-102	M9RZ90GK4LG M9RZ90GK4LGA B-118	M9RZ90GK4DG M9RZ90GK4DGA B-118	M9RZ90GK4YG M9RZ90GK4YGA B-118	M9RZ90GK4GG M9RZ90GK4GGA B-118	M9MZ90G4YG M9MZ90G4YGA B-144	M9MZ90GK4YG M9MZ90GK4YGA B-160	M9MZ90GK4CG M9MZ90GK4CGA B-160	M9RZ90GB4LG M9RZ90GB4LGA B-200	M9RZ90GB4DG M9RZ90GB4DGA B-200	M9RZ90GB4YG M9RZ90GB4YGA B-200	M9RZ90GB4GG M9RZ90GB4GGA B-200	M9MZ90GB4YG M9MZ90GB4YGA B-216	90 W	

* The models with a model number to which “A” is suffixed (not equipped with a capacitor cap) are not sold or available in Japan.

Pinion shaft motor [International standard approved]

Round shaft motor [International standard approved]

<The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.>

Size	Voltage / Output	Variable speed induction – Leadwire type: 100 V	110/115V	200 V	220/230 V	Variable speed reversible – Leadwire type: 100 V	110/115V	200 V	220/230 V	Induction – Leadwire type: 100 V	110/115V	200 V	220/230 V	Induction – Sealed connector type: 100 V	110/115V	200 V	220/230 V	Voltage / Output	Size
		Page	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page		
42 mm sq.	1 W																	1 W	42 mm sq.
	3 W																	3 W	
60 mm sq.	3 W																	3 W	60 mm sq.
	4 W																	4 W	
	6 W	M61X6GV4LG M61X6GV4LGA	M61X6GV4DG M61X6GV4DGA	M61X6GV4YG M61X6GV4YGA	M61X6GV4GG M61X6GV4GGA	M6RX6GV4LG M6RX6GV4LGA	M6RX6GV4DG M6RX6GV4DGA	M6RX6GV4YG M6RX6GV4YGA	M6RX6GV4GG M6RX6GV4GGA	M61X6S4LG M61X6S4LGA	M61X6S4DG M61X6S4DGA	M61X6S4YG M61X6S4YGA	M61X6S4GG M61X6S4GGA					6 W	
		B-236	B-236	B-236	B-236	B-278	B-278	B-278	B-278	B-61	B-61	B-61	B-61						
70 mm sq.	10 W																	10 W	70 mm sq.
	15 W	M71X15GV4LG M71X15GV4LGA	M71X15GV4DG M71X15GV4DGA	M71X15GV4YG M71X15GV4YGA	M71X15GV4GG M71X15GV4GGA	M7RX15GV4LG M7RX15GV4LGA	M7RX15GV4DG M7RX15GV4DGA	M7RX15GV4YG M7RX15GV4YGA	M7RX15GV4GG M7RX15GV4GGA	M71X15S4LG M71X15S4LGA	M71X15S4DG M71X15S4DGA	M71X15S4YG M71X15S4YGA	M71X15S4GG M71X15S4GGA					15 W	
		B-242	B-242	B-242	B-242	B-284	B-284	B-284	B-284	B-61	B-61	B-61	B-61						
80 mm sq.	15 W																	15 W	80 mm sq.
	20 W																	20 W	
	25 W	M81X25GV4LG M81X25GV4LGA	M81X25GV4DG M81X25GV4DGA	M81X25GV4YG M81X25GV4YGA	M81X25GV4GG M81X25GV4GGA	M8RX25GV4LG M8RX25GV4LGA	M8RX25GV4DG M8RX25GV4DGA	M8RX25GV4YG M8RX25GV4YGA	M8RX25GV4GG M8RX25GV4GGA	M81X25S4LG M81X25S4LGA	M81X25S4DG M81X25S4DGA	M81X25S4YG M81X25S4YGA	M81X25S4GG M81X25S4GGA	M81X25SK4LG M81X25SK4LGA	M81X25SK4DG M81X25SK4DGA	M81X25SK4YG M81X25SK4YGA	M81X25SK4GG M81X25SK4GGA	25 W	
		B-248	B-248	B-248	B-248	B-290	B-290	B-290	B-290	B-61	B-61	B-61	B-61	B-62	B-62	B-62	B-62		
90 mm sq.	40 W	M91X40GV4LG M91X40GV4LGA	M91X40GV4DG M91X40GV4DGA	M91X40GV4YG M91X40GV4YGA	M91X40GV4GG M91X40GV4GGA	M9RX40GV4LG M9RX40GV4LGA	M9RX40GV4DG M9RX40GV4DGA	M9RX40GV4YG M9RX40GV4YGA	M9RX40GV4GG M9RX40GV4GGA	M91X40S4LG M91X40S4LGA	M91X40S4DG M91X40S4DGA	M91X40S4YG M91X40S4YGA	M91X40S4GG M91X40S4GGA	M91X40SK4LG M91X40SK4LGA	M91X40SK4DG M91X40SK4DGA	M91X40SK4YG M91X40SK4YGA	M91X40SK4GG M91X40SK4GGA	40 W	90 mm sq.
		B-252	B-252	B-252	B-252	B-294	B-294	B-294	B-294	B-61	B-61	B-61	B-61	B-62	B-62	B-62	B-62		
	60 W	M91Z60GV4LG M91Z60GV4LGA	M91Z60GV4DG M91Z60GV4DGA	M91Z60GV4YG M91Z60GV4YGA	M91Z60GV4GG M91Z60GV4GGA	M9RZ60GV4LG M9RZ60GV4LGA	M9RZ60GV4DG M9RZ60GV4DGA	M9RZ60GV4YG M9RZ60GV4YGA	M9RZ60GV4GG M9RZ60GV4GGA	M91Z60S4LG M91Z60S4LGA	M91Z60S4DG M91Z60S4DGA	M91Z60S4YG M91Z60S4YGA	M91Z60S4GG M91Z60S4GGA	M91Z60SK4LG M91Z60SK4LGA	M91Z60SK4DG M91Z60SK4DGA	M91Z60SK4YG M91Z60SK4YGA	M91Z60SK4GG M91Z60SK4GGA	60 W	
		B-256	B-256	B-256	B-256	B-298	B-298	B-298	B-298	B-62	B-62	B-62	B-62	B-62	B-62	B-62	B-62		
	90 W	M91Z90GV4LG M91Z90GV4LGA	M91Z90GV4DG M91Z90GV4DGA	M91Z90GV4YG M91Z90GV4YGA	M91Z90GV4GG M91Z90GV4GGA	M9RZ90GV4LG M9RZ90GV4LGA	M9RZ90GV4DG M9RZ90GV4DGA	M9RZ90GV4YG M9RZ90GV4YGA	M9RZ90GV4GG M9RZ90GV4GGA	M91Z90S4LG M91Z90S4LGA	M91Z90S4DG M91Z90S4DGA	M91Z90S4YG M91Z90S4YGA	M91Z90S4GG M91Z90S4GGA	M91Z90SK4LG M91Z90SK4LGA	M91Z90SK4DG M91Z90SK4DGA	M91Z90SK4YG M91Z90SK4YGA	M91Z90SK4GG M91Z90SK4GGA	90 W	
		B-260	B-260	B-260	B-260	B-302	B-302	B-302	B-302	B-62	B-62	B-62	B-62	B-62	B-62	B-62	B-62		

* The models with a model number to which “A” is suffixed (not equipped with a capacitor cap) are not sold or available in Japan.

Round shaft motor [International standard approved]

<The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.>

Size	Voltage / Output	Reversible: Leadwire type 100 V	Reversible: Leadwire type 110/115 V	Reversible: Leadwire type 200 V	Reversible: Leadwire type 220/230 V	Reversible: Sealed connector type 100 V	Reversible: Sealed connector type 110/115 V	Reversible: Sealed connector type 200 V	Reversible: Sealed connector type 220/230 V	3-phase: Leadwire type 200/220/230 V	3-phase: Sealed connector type 200/220/230 V	3-phase: Sealed connector type 380/400 V	Electromagnetic brake, single-phase: Leadwire type 100 V	Electromagnetic brake, single-phase: Leadwire type 110/115 V	Electromagnetic brake, single-phase: Leadwire type 200 V	Electromagnetic brake, single-phase: Leadwire type 220/230 V	Electromagnetic brake, 3-phase: Leadwire type 200/220/230 V	Voltage / Output	Size
		Page	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page		
42 mm sq.	1 W																	1 W	42 mm sq.
	3 W																	3 W	
60 mm sq.	3 W																	3 W	60 mm sq.
	4 W																	4 W	
	6 W	M6RX6S4LG M6RX6S4LGA B-123	M6RX6S4DG M6RX6S4DGA B-123	M6RX6S4YG M6RX6S4YGA B-123	M6RX6S4GG M6RX6S4GGA B-123								M6RX6SB4LG M6RX6SB4LGA B-220	M6RX6SB4DG M6RX6SB4DGA B-220	M6RX6SB4YG M6RX6SB4YGA B-220	M6RX6SB4GG M6RX6SB4GGA B-220		6 W	
70 mm sq.	10 W																	10 W	70 mm sq.
	15 W	M7RX15S4LG M7RX15S4LGA B-123	M7RX15S4DG M7RX15S4DGA B-123	M7RX15S4YG M7RX15S4YGA B-123	M7RX15S4GG M7RX15S4GGA B-123								M7RX15SB4LG M7RX15SB4LGA B-220	M7RX15SB4DG M7RX15SB4DGA B-220	M7RX15SB4YG M7RX15SB4YGA B-220	M7RX15SB4GG M7RX15SB4GGA B-220		15 W	
80 mm sq.	15 W																	15 W	80 mm sq.
	20 W																	20 W	
	25 W	M8RX25S4LG M8RX25S4LGA B-123	M8RX25S4DG M8RX25S4DGA B-123	M8RX25S4YG M8RX25S4YGA B-123	M8RX25S4GG M8RX25S4GGA B-123	M8RX25SK4LG M8RX25SK4LGA B-124	M8RX25SK4DG M8RX25SK4DGA B-124	M8RX25SK4YG M8RX25SK4YGA B-124	M8RX25SK4GG M8RX25SK4GGA B-124	M8MX25S4YG M8MX25S4YGA B-164	M8MX25SK4YG M8MX25SK4YGA B-165	M8MX25SK4CG M8MX25SK4CGA B-165	M8RX25SB4LG M8RX25SB4LGA B-220	M8RX25SB4DG M8RX25SB4DGA B-220	M8RX25SB4YG M8RX25SB4YGA B-220	M8RX25SB4GG M8RX25SB4GGA B-220	M8MX25SB4YG M8MX25SB4YGA B-221	25 W	
90 mm sq.	40 W	M9RX40S4LG M9RX40S4LGA B-123	M9RX40S4DG M9RX40S4DGA B-123	M9RX40S4YG M9RX40S4YGA B-123	M9RX40S4GG M9RX40S4GGA B-123	M9RX40SK4LG M9RX40SK4LGA B-124	M9RX40SK4DG M9RX40SK4DGA B-124	M9RX40SK4YG M9RX40SK4YGA B-124	M9RX40SK4GG M9RX40SK4GGA B-124	M9MX40S4YG M9MX40S4YGA B-164	M9MX40SK4YG M9MX40SK4YGA B-165	M9MX40SK4CG M9MX40SK4CGA B-165	M9RX40SB4LG M9RX40SB4LGA B-220	M9RX40SB4DG M9RX40SB4DGA B-220	M9RX40SB4YG M9RX40SB4YGA B-220	M9RX40SB4GG M9RX40SB4GGA B-220	M9MX40SB4YG M9MX40SB4YGA B-221	40 W	90 mm sq.
	60 W	M9RZ60S4LG M9RZ60S4LGA B-124	M9RZ60S4DG M9RZ60S4DGA B-124	M9RZ60S4YG M9RZ60S4YGA B-124	M9RZ60S4GG M9RZ60S4GGA B-124	M9RZ60SK4LG M9RZ60SK4LGA B-124	M9RZ60SK4DG M9RZ60SK4DGA B-124	M9RZ60SK4YG M9RZ60SK4YGA B-124	M9RZ60SK4GG M9RZ60SK4GGA B-124	M9MZ60S4YG M9MZ60S4YGA B-164	M9MZ60SK4YG M9MZ60SK4YGA B-165	M9MZ60SK4CG M9MZ60SK4CGA B-165	M9RZ60SB4LG M9RZ60SB4LGA B-220	M9RZ60SB4DG M9RZ60SB4DGA B-220	M9RZ60SB4YG M9RZ60SB4YGA B-220	M9RZ60SB4GG M9RZ60SB4GGA B-220	M9MZ60SB4YG M9MZ60SB4YGA B-221	60 W	
	90 W	M9RZ90S4LG M9RZ90S4LGA B-124	M9RZ90S4DG M9RZ90S4DGA B-124	M9RZ90S4YG M9RZ90S4YGA B-124	M9RZ90S4GG M9RZ90S4GGA B-124	M9RZ90SK4LG M9RZ90SK4LGA B-124	M9RZ90SK4DG M9RZ90SK4DGA B-124	M9RZ90SK4YG M9RZ90SK4YGA B-124	M9RZ90SK4GG M9RZ90SK4GGA B-124	M9MZ90S4YG M9MZ90S4YGA B-164	M9MZ90SK4YG M9MZ90SK4YGA B-165	M9MZ90SK4CG M9MZ90SK4CGA B-165	M9RZ90SB4LG M9RZ90SB4LGA B-220	M9RZ90SB4DG M9RZ90SB4DGA B-220	M9RZ90SB4YG M9RZ90SB4YGA B-220	M9RZ90SB4GG M9RZ90SB4GGA B-220	M9MZ90SB4YG M9MZ90SB4YGA B-221	90 W	

* The models with a model number to which “A” is suffixed (not equipped with a capacitor cap) are not sold or available in Japan.

Round shaft motor [International standard approved]

Size	Voltage / Output	Variable speed induction – Leadwire type – 100 V	110/115V	200 V	220/230 V	Variable speed reversible – Leadwire type – 100 V	110/115V	200 V	220/230 V
		Page	Page	Page	Page	Page	Page	Page	Page
42 mm sq.	1 W								
	3 W								
60 mm sq.	3 W								
	4 W								
	6 W	M61X6SV4LG M61X6SV4LGA	M61X6SV4DG M61X6SV4DGA	M61X6SV4YG M61X6SV4YGA	M61X6SV4GG M61X6SV4GGA	M6RX6SV4LG M6RX6SV4LGA	M6RX6SV4DG M6RX6SV4DGA	M6RX6SV4YG M6RX6SV4YGA	M6RX6SV4GG M6RX6SV4GGA
		B-264	B-264	B-264	B-264	B-306	B-306	B-306	B-306
70 mm sq.	10 W								
	15 W	M71X15SV4LG M71X15SV4LGA	M71X15SV4DG M71X15SV4DGA	M71X15SV4YG M71X15SV4YGA	M71X15SV4GG M71X15SV4GGA	M7RX15SV4LG M7RX15SV4LGA	M7RX15SV4DG M7RX15SV4DGA	M7RX15SV4YG M7RX15SV4YGA	M7RX15SV4GG M7RX15SV4GGA
		B-264	B-264	B-264	B-264	B-306	B-306	B-306	B-306
80 mm sq.	15 W								
	20 W								
	25 W	M81X25SV4LG M81X25SV4LGA	M81X25SV4DG M81X25SV4DGA	M81X25SV4YG M81X25SV4YGA	M81X25SV4GG M81X25SV4GGA	M8RX25SV4LG M8RX25SV4LGA	M8RX25SV4DG M8RX25SV4DGA	M8RX25SV4YG M8RX25SV4YGA	M8RX25SV4GG M8RX25SV4GGA
		B-264	B-264	B-264	B-264	B-306	B-306	B-306	B-306
90 mm sq.	40 W	M91X40SV4LG M91X40SV4LGA	M91X40SV4DG M91X40SV4DGA	M91X40SV4YG M91X40SV4YGA	M91X40SV4GG M91X40SV4GGA	M9RX40SV4LG M9RX40SV4LGA	M9RX40SV4DG M9RX40SV4DGA	M9RX40SV4YG M9RX40SV4YGA	M9RX40SV4GG M9RX40SV4GG
		B-265	B-265	B-265	B-265	B-307	B-307	B-307	B-307
	60 W	M91Z60SV4LG M91Z60SV4LGA	M91Z60SV4DG M91Z60SV4DGA	M91Z60SV4YG M91Z60SV4YGA	M91Z60SV4GG M91Z60SV4GGA	M9RZ60SV4LG M9RZ60SV4LGA	M9RZ60SV4DG M9RZ60SV4DGA	M9RZ60SV4YG M9RZ60SV4YGA	M9RZ60SV4GG M9RZ60SV4GGA
		B-265	B-265	B-265	B-265	B-307	B-307	B-307	B-307
	90 W	M91Z90SV4LG M91Z90SV4LGA	M91Z90SV4DG M91Z90SV4DGA	M91Z90SV4YG M91Z90SV4YGA	M91Z90SV4GG M91Z90SV4GGA	M9RZ90SV4LG M9RZ90SV4LGA	M9RZ90SV4DG M9RZ90SV4DGA	M9RZ90SV4YG M9RZ90SV4YGA	M9RZ90SV4GG M9RZ90SV4GGA
		B-265	B-265	B-265	B-265	B-307	B-307	B-307	B-307

2-pole round shaft motor [International standard approved]

<The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.>

Size	Voltage / Output	Induction – Leadwire type – 100 V	110/115V	200 V	220/230 V	3-phase – Leadwire type – 200/220/230 V
		Page	Page	Page	Page	Page
42 mm sq.	1 W					
	3 W					
60 mm sq.	3 W					
	4 W					
	6 W					
70 mm sq.	10 W					
	15 W					
80 mm sq.	20 W					
	40 W	M81X40S2LG M81X40S2LGA	M81X40S2DG M81X40S2DGA	M81X40S2YG M81X40S2YGA	M81X40S2GG M81X40S2GGA	M8MX40S2YG M8MX40S2YGA
		B-347	B-347	B-347	B-347	B-357
	60 W	M81X60S2LG M81X60S2LGA	M81X60S2DG M81X60S2DGA	M81X60S2YG M81X60S2YGA	M81X60S2GG M81X60S2GGA	M8MX60S2YG M8MX60S2YGA
		B-349	B-349	B-349	B-349	B-359
90 mm sq.	60 W	M91X60S2LG M91X60S2LGA	M91X60S2DG M91X60S2DGA	M91X60S2YG M91X60S2YGA	M91X60S2GG M91X60S2GGA	M9MX60S2YG M9MX60S2YGA
		B-351	B-351	B-351	B-351	B-361
	90 W	M91Z90S2LG M91Z90S2LGA	M91Z90S2DG M91Z90S2DGA	M91Z90S2YG M91Z90S2YGA	M91Z90S2GG M91Z90S2GGA	M9MZ90S2YG M9MZ90S2YGA
		B-353	B-353	B-353	B-353	B-363
	150 W	M91ZA5S2LG M91ZA5S2LGA	M91ZA5S2DG M91ZA5S2DGA	M91ZA5S2YG M91ZA5S2YGA	M91ZA5S2GG M91ZA5S2GGA	M9MZA5S2YG M9MZA5S2YGA
		B-355	B-355	B-355	B-355	B-365

* The models with a model number to which “A” is suffixed (not equipped with a capacitor cap) are not sold or available in Japan.

Gear head

Size		Reduction ratio	Gear head: Ball bearing (Page)	Hinge
42 mm sq.				
60 mm sq.		1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/10, 1/12.5, 1/15, 1/18	MX6G3BA – MX6G18BA B-13	
		1/20, 1/25, 1/30, 1/36	MX6G20BA – MX6G36B B-13	
		1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX6G50B – MX6G180B B-13	
70 mm sq.		1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/10, 1/12.5, 1/15, 1/18	MX7G3BA – MX7G18BA B-19	
		1/20, 1/25, 1/30, 1/36	MX7G20BA – MX7G36B B-19	
		1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX7G50B – MX7G180B B-19	
80 mm sq.		1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/10, 1/12.5, 1/15, 1/18	MX8G3B – MX8G18B B-25	
		1/20, 1/25, 1/30, 1/36	MX8G20B – MX8G36B B-25	
		1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX8G50B – MX8G180B B-25	
90 mm sq.	40 W	1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/10, 1/12.5, 1/15, 1/18	MX9G3B – MX9G18B B-31	
	40 W	1/20, 1/25, 1/30, 1/36	MX9G20B – MX9G36B B-31	
	40 W	1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX9G50B – MX9G180B B-31	
	Common to 60 W, 90 W	1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9	MZ9G3B – MZ9G9B B-35	
	Common to 60 W, 90 W	1/10, 1/12.5, 1/15, 1/18	MZ9G10B – MZ9G18B B-35	
	Common to 60 W, 90 W	1/20, 1/25, 1/30, 1/36, 1/50, 1/60	MZ9G20B – MZ9G60B B-35	
	Common to 60 W, 90 W	1/75, 1/90, 1/100, 1/120, 1/150, 1/180, 1/200	MZ9G75B – MZ9G200B B-35	
	Common to 60 W, 90 W	1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9	MY9G3B – MY9G9B B-35	○
	Common to 60 W, 90 W	1/10, 1/12.5, 1/15, 1/18	MY9G10B – MY9G18B B-35	○
	Common to 60 W, 90 W	1/20, 1/25, 1/30, 1/36, 1/50, 1/60	MY9G20B – MY9G60B B-35	○
	Common to 60 W, 90 W	1/75, 1/90, 1/100, 1/120, 1/150, 1/180, 1/200	MY9G75B – MY9G200B B-35	○

Size		Reduction ratio	Gear head: Metal bearing (Page)	Hinge
42 mm sq.				
60 mm sq.		1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/10, 1/12.5, 1/15, 1/18	MX6G3MA – MX6G18MA B-13	
		1/20, 1/25, 1/30, 1/36	MX6G20MA – MX6G36M B-13	
		1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX6G50M – MX6G180M B-13	
70 mm sq.		1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/10, 1/12.5, 1/15, 1/18	MX7G3MA – MX7G18MA B-19	
		1/20, 1/25, 1/30, 1/36	MX7G20MA – MX7G36M B-19	
		1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX7G50M – MX7G180M B-19	
80 mm sq.		1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/10, 1/12.5, 1/15, 1/18	MX8G3M – MX8G18M B-25	
		1/20, 1/25, 1/30, 1/36	MX8G20M – MX8G36M B-25	
		1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX8G50M – MX8G180M B-25	
90 mm sq.	40 W	1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/10, 1/12.5, 1/15, 1/18	MX9G3M – MX9G18M B-31	
	40 W	1/20, 1/25, 1/30, 1/36	MX9G20M – MX9G36M B-31	
	40 W	1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX9G50M – MX9G180M B-31	
	Common to 60 W, 90 W			
	Common to 60 W, 90 W			
	Common to 60 W, 90 W			
	Common to 60 W, 90 W			
	Common to 60 W, 90 W			
	Common to 60 W, 90 W			
	Common to 60 W, 90 W			

Gear head, decimal gear head

Size		Reduction ratio	Gear head: Ball bearing and metal bearing — Page	Gear head: Hinge
42 mm sq.		1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/12.5, 1/15, 1/18	M4GA3F – M4GA18F B-9	
		1/25, 1/30, 1/36, 1/50, 1/60	M4GA25F – M4GA60F B-9	
		1/75, 1/90, 1/100, 1/120, 1/150, 1/180	M4GA75F – M4GA180F B-9	
60 mm sq.				
70 mm sq.				
80 mm sq.				
90 mm sq.	40 W			
	Common to 60 W, 90 W			

Size		Reduction ratio	High torque gear head — Page	High torque gear head: Hinge
90 mm sq.		1/50, 1/60	MR9G50B – MR9G60B B-380	
		1/75, 1/90, 1/100, 1/120, 1/150, 1/180, 1/200	MR9G75B – MR9G200B B-380	
		1/50, 1/60	MP9G50B – MP9G60B B-380	○
		1/75, 1/90, 1/100, 1/120, 1/150, 1/180, 1/200	MP9G75B – MP9G200B B-380	○

Size		Reduction ratio	Right-angle gear head — Page	Right-angle gear head: Hinge
90 mm sq.	40 W	1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/12.5, 1/15, 1/18	MX9G3R – MX9G18R B-382	
		1/25, 1/30, 1/36	MX9G25R – MX9G36R B-382	
		1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX9G50R – MX9G180R B-382	
	Common to 60 W, 90 W	1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/12.5, 1/15, 1/18, 1/25	MZ9G3R – MZ9G25R B-382	
		1/30, 1/36, 1/50, 1/60,	MZ9G30R – MZ9G60R B-382	
		1/75, 1/90, 1/100, 1/120, 1/150, 1/180, 1/200	MZ9G75R – MZ9G200R B-382	

Size		Reduction ratio	Decimal gear head — Page	Applicable gear head
60 mm sq.		1/10	MX6G10XB B-384	MX6G*BA MX6G*B
70 mm sq.		1/10	MX7G10XB B-384	MX7G*BA MX7G*B
80 mm sq.		1/10	MX8G10XB B-384	MX8G*B
90 mm sq.	40 W	1/10	MX9G10XB B-384	MX9G*B
	Common to 60 W, 90 W	1/10	MZ9G10XB B-384	MZ9G*B MY9G*B MR9G*B MP9G*B

Selection by keywords

Motor selection guide

Variable speed	Protection of leadwires	Brake	Braking frequency	Operation mode	No. of phases	Type	Page
Constant	Leadwire protection not required	No brake required to stop		Continuous run required	Single-phase 2-pole	2-pole round-shaft motor (induction)	B-342
					Single-phase 4-pole	Induction motor (4-pole)	B- 4
					3-phase	3-phase motor	B-126
				Continuous run not required	Single-phase	Reversible motor	B- 64
		Brake required to stop Brake to be kept applied	Low braking frequency	Continuous run required	3-phase	3-phase motor with electromagnetic brake	B-202
				Continuous run not required	Single-phase	3-phase motor with electromagnetic brake	B-168
		Brake required to stop Continuous application not required	Low braking frequency	Normal/reverse rotation	Single-phase	Reversible motor	B- 64
					3-phase	3-phase motor with brake unit	B-126
			High braking frequency	One-directional rotation only	Single-phase	C&B motor (induction)	For C&B motors, contact us.
					3-phase	C&B motor (3-phase motor)	For C&B motors, contact us.
	Leadwire protection required	No brake required		Continuous run required	Single-phase	Induction motor with sealed connector	B- 42
					3-phase	3-phase motor with sealed connector	B-146
				Continuous run not required	Single-phase	Reversible motor with sealed connector	B-104
		Brake required Continuous application not required	Low braking frequency	Normal/reverse rotation	Single-phase	Reversible motor with sealed connector	B-104
					3-phase	3-phase motor with brake unit and sealed connector	B-146 + C-45
			High braking frequency	One-directional rotation only	Single-phase	C&B induction motor with sealed connector	For C&B motors, contact us.
					3-phase	C&B 3-phase motor with sealed connector	For C&B motors, contact us.
Variable		No brake required to stop		Continuous run required	Single-phase	Variable speed induction	B-224
					3-phase	3-phase motor (200 V) with inverter	B-146 + C-42
				Continuous run not required	Single-phase	Variable speed reversible	B-268
		Brake required to stop Brake to be kept applied		Short-time run only (30-nunute rating)		Variable speed with electromagnetic brake	B-310
		Brake required to stop Continuous application not required	Low braking frequency			Variable speed reversible	B-268
				Continuous run only	3-phase	3-phase motor (200 V) with inverter	B-126 + C-42
			High braking frequency		Single-phase	C&B motor (variable speed induction motor)	For C&B motors, contact us.

Selection by keywords

Gear head selection guide

Size	Output	Gear type	Hinge	Bearing	Part No.
42 mm sq.	1 to 3 W	Normal load gear	Without hinge	Ball bearing and metal	M4GA*F
60 mm sq.	3 to 6 W	Normal load gear		Ball bearing	MX6G*B(A)
				Metal	MX6G*M(A)
		Decimal gear		Ball bearing	MX6G10XB
70 mm sq.	10 to 15 W	Normal load gear		Ball bearing	MX7G*B(A)
				Metal	MX7G*M(A)
		Decimal gear		Ball bearing	MX7G10XB
80 mm sq.	15 to 25 W	Normal load gear		Ball bearing	MX8G*B
				Metal	MX8G*M
		Decimal gear		Ball bearing	MX8G10XB
90 mm sq.	40 W	Normal load gear		Ball bearing	MX9G*B
				Metal	MX9G*M
		Right-angle gear		Ball bearing	MX9G*R
		Decimal gear		Ball bearing	MX9G10XB
90 mm sq.	60 W or larger	Permissible torque 19.6 N·m	With hinge	Ball bearing	MY9G*B
			Without hinge		MZ9G*B
		Right-angle gear			MZ9G*R
		Decimal gear			MZ9G10XB
	60 W or larger High torque type	Permissible torque 29.4 N·m	With hinge		MP9G*B
			Without hinge		MR9G*B

• Gear heads are described on the respective page where the applicable motors are also described. For C&B gear heads, contact us.

Control device selection guide

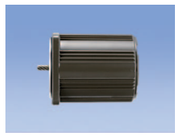
Power supply	Application	Type		Voltage	Part No.	Applicable motor	Page
Single-phase	Speed change (Speed controller)	With contact	Volume control type (pot.) International standard approved (MGSD)	100 V to 120 V	MGSD*1	3 to 90 W	C - 6
				200 V to 240 V	MGSD B2		
			High-performance type (EX)	100 V	DV113*		
				200 V	DV123*		
		With contact 48 mm sq.	Volume control type (pot.) (SD)	100 V to 120 V	DVSD48*L		C - 21
				200 V to 240 V	DVSD48*Y		
			High-performance type (EX)	100 V to 120 V	DVEX48*L		
				200 V to 240 V	DVEX48*Y		
		Unit type	Volume control type (pot.) (US)	100 V	MUSN***L	6 to 90 W	C - 36
				200 V	MUSN***Y		
			Digital display type (UX)	100 V	MUXN***L		
				200 V	MUXN***Y		
		inverter		Input single-phase 100 V Output 3-phase 200 V	M1G*A1V1X	25 to 90 W	C - 42
				Input single-phase 100 V Output 3-phase 200 V	M1G*A2V1X		
	Instantaneous stop (Brake unit)	With contact	Popular type (SD)	100 V	DZ9102	3 to 90 W	C - 47
				200 V	DZ9202		
			High-performance type (EX)	100 V	DZ9113		
				200 V	DZ9213		
		Contactless 48 mm sq.	For induction motor	100 V	DVMB481L	1 to 90 W	C - 54
				200 V	DVMB481Y		
			For reversible motor	100 V	DVMB48RL		
				200 V	DVMB48RY		
			For electromagnetic brake motor	100 V	DVMB48BL		
				200 V	DVMB48BY		
3-phase		With contact	Popular type (SD)	3-phase 200 V	DZ9302	25 to 90 W	C - 47

Product Type Contents

Motor

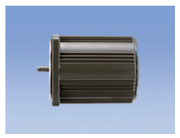
Induction motor B-1

- Motor suitable for one-directional continuous running
- Continuous rating
- A wide selection for various applications
- Best suitable for normal load
- IP20



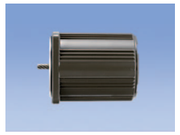
Reversible motor B-63

- Offer super instant reverse characteristics
- 30-minute rating
- Provided with internal simple braking mechanism
- Minimum overrun
- IP20



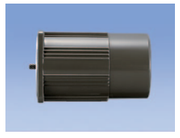
3-phase motor B-125

- Induction motor running with 3-phase supply system
- Continuous rating
- IP20



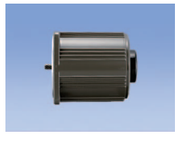
Electromagnetic brake motor B-167

- Provided with internal off brake mechanism
- High braking and load holding torque
- IP20



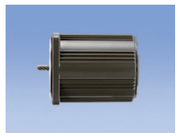
Variable speed motor B-223

- Provided with internal tachometer generator
- When used with a speed controller, enables stepless speed change device
- Speed change, braking, normal/reverse, slow start, slowdown—can be operated in various modes
- Divided into 4 variations—induction, reversible, electromagnetic brake and unit
- IP20



Safety standard approved motor

- Support UL, CE and CCC standards
  <Applicable motor>
  Induction, reversible, 3-phase, electromagnetic brake



C&B motor ..... Contact us.

- Provided with clutch and brake mechanism
- Suitable for application requiring high-frequency start/stop
- IP20

Sealed connector

- Leadwires are protected against dust, water and mechanical damage
- Motor live parts are enclosed in drip-proof and dust-proof terminal box
- Compact design, earth terminal and sealed connector for easier piping
- IP54

Pinion shaft	Induction motor	(25 to 90 W)
	3-phase motor	(25 to 90 W)

- IP40

Pinion shaft	Reversible motor	(25 to 90 W)
Round shaft	Induction motor	(25 to 90 W)
	Reversible motor	(25 to 90 W)
	3-phase motor	(25 to 90 W)

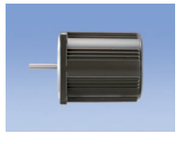
- IP20

Round shaft	Induction motor	(25 to 40 W)
	Reversible motor	(25 to 40 W)
	3-phase motor	(25 to 40 W)

Round shaft motor

- Best suitable for machine requiring no speed reduction
- Continuous rating
- Lineup of 2-pole type and 4-pole type
- IP20

4-pole motors are described on pages for pinion motor
2-pole motor **B-406**



Gear head

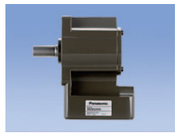
Gear head

Gear head

- Typical life expectancy
  Ball bearing type .... 10,000 hours
  Metal bearing type ... 2,000 hours
- *Described on pages where associated motors are described.

Right-angle gear head B-382

- Motor shaft and gear head output shaft are perpendicular to each other



Decimal gear head B-384

- Reduction ratio 1/10
- Can be placed between standard motor and gear head

High torque gear head B-380

- Permissible shaft torque 29.4 N·m (60 W or larger)

Outline of motor family

Options (speed controller, brake unit)

Speed controller

Contacting type C-6

MGSD type

- UL-, CE-approved international type
- Wide range of input power voltage
  Single-phase 100 V system:
  100 to 120 V
  Single-phase 200 V system:
  200 to 240 V

EX type

- Single-phase 100 V, 200 V
- Soft-start/soft-down and external speed setter

48 mm sq. contacting type..... C-21

- 48 mm x 48 mm DIN size
- SD type is provided with analog setter, and EX type is provided with soft-start/soft-down and external speed setter
- Wide range of input power voltage (common to SD and EX type)
  Single-phase 100 V system: 100 to 120 V
  Single-phase 200 V system: 200 to 240 V

Unit motor ..... B-324 + C-36

- Quick connection of motor and controller
- Simplified operation with volume type control (US)
- Digital display, PC performs various functions (UX)

Inverter C-42

- Speed controller for 3-phase motor
- Inverter control

Brake unit

Contacting type (8-pin) C-47

- Basic type of instant control
- Single-phase 100 V, 200 V
  3-phase 200 V
- Rectangular

48 mm sq. contactless type (11-pin)... C-54

- Single-phase contactless instant control
- For:
  Induction motor
  Reversible motor
  Electromagnetic brake motor
- Single-phase 100 V, 200 V
- 48 mm x 48 mm square DIN type

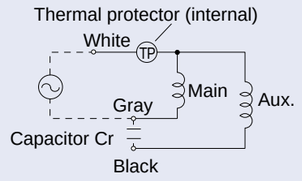
Special (produced to custom order) For details, contact our Help Desk.

Example: Built-in thermal protector (70 mm sq. or larger)

- Thermal protector is internally wired.
- The current is turned off as the temperature of motor winding exceeds the operation temperature of the thermal protector.
- Thermal protector automatically recovers as the motor winding temperature decreases. To prevent unexpected restart of the motor, turn off the motor, check safety, and then turn on the motor.

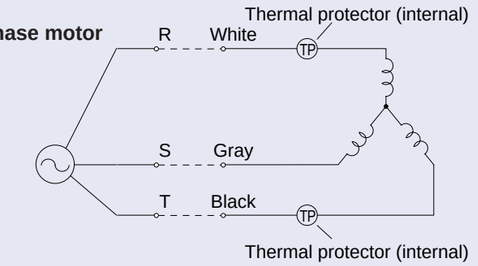
[Wiring diagram]

• Single-phase motor



CW (clockwise) connection

• 3-phase motor



CCW (counterclockwise) connection

Terminology

motor

Rating

There are limits of operation in terms of temperature rise to assure the motor performance. Rating is divided into continuous rating and short-time rating.
This defines not only the running limit against the output, but also limiting conditions such as voltage, frequency and rotational speed. These conditions are called as rated voltage, rated frequency and rated speed.

Continuous rating and short-time rating

A time rating is used to express the time during which the motor can normally output the rated power. Continuous rating indicates that the motor can provide the rated power during this period. The short-time rating indicates that the motor will reliably operate to produce the rated output for the relatively short time specified.

Output

Output represents a work which the motor can carry out in a unit time. This is determined by the rotational speed and the torque of the motor. The rated output of the motor, P0 is described in wattage **P0 (W)** as;

- **SI units**
  P0 = 0.1047 x **T** x **N**
  T : Torque **(N·m)**
  N : Rotational speed **(min⁻¹)**
- **Gravitational system of units**
  P0 = 1.027 x **T** x **N**
  T : Torque **(kgf·m)**
  N : Rotational speed **(min⁻¹)**

Rated output

An optimum output performance which the motor can generate at the rated voltage and frequency. A rotational speed and torque with which the rated output is generated is called the rated speed and torque. In general, an output is referred to as the rated output.

Starting torque (see (1) in the figure)

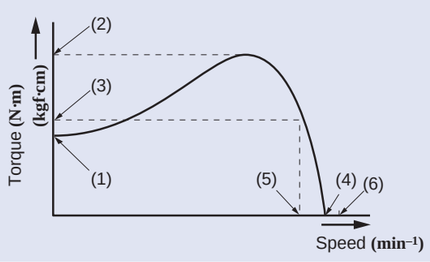
A torque which the motor generates at starting. The motor will not start if a larger load than this starting torque is applied to the motor.

Stalling torque (see (2) in the figure)

A maximum torque which the motor can generate at constant voltage and frequency. The motor will stall if a larger load than this torque is applied to the motor.

Rated toque (see (3) in the figure)

A torque of the motor generates the rated output continuously at rated voltage and frequency. This is usually referred to as a torque at the rated speed.



- Speed-torque characteristics
  (1) Starting torque
  (2) Stalling torque
  (3) Rated torque
  (4) No load speed
  (5) Rated speed
  (6) Synchronous speed

No load speed (see (4) in the figure)

Motor speed with no load applied. In the case of induction and reversible motor, this speed becomes a few percent lower (approx. 20 to 60 min-1) than a synchronous speed.

Rated rotational speed (see (5) in the figure)

Motor speed at which the motor generates the rated output. This is the most optimum speed.

Synchronous speed (see (6) in the figure)

An inherent speed determined by the number of poles of the motor and frequency of the power source.
This is described in the following formula.

$$Ns = \frac{120}{P} f \ (min^{-1})$$

where, **Ns** : Synchronous speed **(min⁻¹)**
f : Frequency **(Hz)**
P : Number of poles **(min⁻¹)**
120 : Constant

For example of 4-pole motor and power source frequency is 50 Hz, then,

$$Ns = \frac{120 \times 50}{4} = 1500 \ (min\text{-}1)$$

Slippage

Slippage can be described in the following formula as one of the rotational speed.

$$S = \frac{Ns - N}{Ns} \quad or \quad N = Ns\,(1 - S)$$

where, **Ns** : Synchronous speed **(min⁻¹)**
N : Discretionary no load speed **(min⁻¹)**

when an induction motor with 4-pole, 50 Hz runs with a slippage, S = 0.1, then,

$$N = Ns\,(1 - S) = 1500\,(1 - 0.1) = 1350\ (min^{-1})$$

Overrun

Revolutions that the motor makes from when the power source is turned off till the motor stops, and is described in the number of revolutions.

Terminology

Gear head

Gear reduction ratio

A ratio of the gear head with which the gear head reduces the motor speed. Panasonic offers two groups of gear reduction ratio: one is for 3, 5, 7.5, 12.5, 15 ... and the other is 3.6, 6, 9, 15, 18 .... which are 1.2 times the previous group so that you can obtain approx. the same output speed for both 50 and 60 Hz. When it is necessary to fine adjust the speed smoothly use a variable speed motor and controller.

Maximum permissible torque

Maximum load torque which can be applied to the output shaft. This is determined by the mechanical strength such as material of gear head, gear teeth and bearing and the size of gear head as well as the reduction ratio.

Transmission efficiency

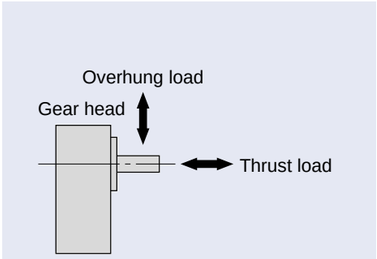
Efficiency with which motor torque is increased by the gear head, and described in %. This efficiency is determined by the bearing, friction of the gear tooth and resistance of lubricating oil. In general, this efficiency is approx. 90% per stage of the gear.
For example, 81% for 2 stage configuration, and then decreases to 75%, 70%, 65% as the number of stages increases. (In the case of metal gear head, this efficiency is approx. 85% per stage of the gear.)

Service factor

Coefficient which is used to estimate the service life of the gear head.
This value is generally derived from experience and based on type of the load and operating conditions.

Overhung load

A vertical load applied to the output shaft of the gear head. This load is produced when the mated machine is being connected through a chain belt and the like but not produced if a coupling is used instead. Maximum value of the overhung load which is applicable to the shaft is called as “permissible overhung load”. This value varies depending on the type of gear head and the distance from the edge of the shaft. This value refers to the load such as belt tension.



Thrust load

An axial load applied to the output shaft of the gear head. Maximum value of the thrust load which is applicable to the shaft is called as “permissible thrust load”. This value varies depending on the type of the gear head.

Handling instructions

Temperature rise of motor

Heat generation and insulation

When a current runs through the motor, heat is generated as well. This heat generation is caused by an electrical loss and mechanical loss. An electrical loss consists of (1) copper loss which is generated in the charged part due to the resistance of the coil or conductor, and (2) iron loss which is generated in the iron portion of the motor due to the resistance of the iron portion while the magnetic flux crosses them. Mechanical loss is caused by friction loss of the bearing and brake lining.
Part of this heat generation accumulated to the motor and other is dissipated to outside of the motor through radiation, convection and conduction. The difference between the generated heat and dissipated heat makes the motor temperature rise, and is called heat run or temperature rise of the motor.
The hottest part on the motor is winding. Insulation used to protect the winding must be kept at a temperature below its maximum allowable temperature. Panasonic small geared motor is provided with the heat resistance class 120 (E) insulation when it is used in Japan, or class 130 (B) insulation when used outside Japan.
The class 120 (E) insulation will withstand temperature up to 120˚C.

• Type and temperature of insulation

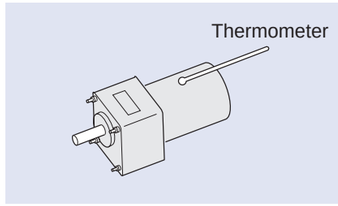
Type and temperature of insulation	Winding insulation material maximum allowable temperature	Winding temperature limit
90 (Y)	90˚C	–
105 (A)	105˚C	60K (deg)
120 (E)	120˚C	75K (deg)
130 (B)	130˚C	80K (deg)
155 (F)	155˚C	100K (deg)

When the heat resistance class 120 (E) insulation is used, the reduced maximum temperature limit on the motor frame 90˚C, at the 40˚C room temperature (max. temperature specified by JIS). This motor frame temperature will decrease to 70˚C at 20˚C room temperature. The maximum temperature limit is 50 K (deg) when measured on the frame.

Measurement of temperature rise

There are two methods to measure the temperature rise of the motor. One is to use a thermometer or thermocouple which is fixed on the center of the motor frame. The other method determines the temperature by measuring winding resistance as described below.

• Thermometer method



• Resistance method

Measure the winding resistance before and after the running, and then determine the temperature rise from the following formula.

$K\theta$: Temperature rise at the motor winding K (deg)

$$K\theta = \left(\frac{R2}{R1} - 1\right)(235 + t1) + (t1 - t2)$$

R1 : Winding resistance before running **(W)**
R2 : Winding resistance after running **(W)**
t1 : Room temperature before running **(˚C)**
t2 : Room temperature after running **(˚C)**
Note: This method applies only to copper winding.

Temperature rise of motor

Temperature rise of capacitor-run induction motor and 3-phase motor

In the case of capacitor-run induction motor, temperature rise of the motor becomes highest at no load running. This means that the electrical loss becomes the maximum under no load condition and heat generation becomes larger than the loss at full load. This is because of the increase of current at primary and auxiliary winding due to the action of phase advance capacitor, and in addition to this, loss is generated to the armature by the reversed field due to the unbalance of the current.
In the case of 3-phase motor, heat generation at no load is much smaller than that of capacitor-run induction motor. However, temperature rise becomes larger as the load is increased due to the increase of input loss.

Temperature rise/cooling curve and running condition

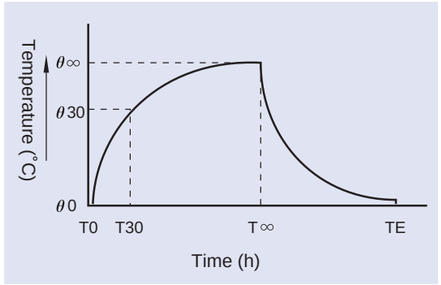
Figure 1 shows the temperature rise and cooling curve indicating relation of time lapse and motor running.

T0 : Start running
T30 : 30 minutes after starting
T∞ : Temperature rise saturates
T∞h : Stop running
TE : Natural cooling to the same temperature as ambient temperature

During the time between T0 and TE, temperature q varies as follows.

θ 0 : Ambient temperature
θ 30: Temperature after 30 minutes running
$\theta\infty$: Saturated temperature
$\theta\infty - \theta 0$ shows the temperature rise.

• Fig. 1 Temperature rise/cooling curve



Typical Panasonic motors have the following time characteristics.

T∞ : 2.5 to 3 **(h)**
TE – T∞ : 3 to 4 **(h)**

(1) Induction motor

Induction motor is rated at continuous running, and is designed so as the temperature rise, $\theta\infty - \theta 0$ of the winding is lower than 75 K (deg) (in case heat resistance class is 120 (E)) or 80 K (deg) (in case 130 (B)) international standard approved model). Therefore, the temperature does not rise beyond this when it is running continuously longer than T∞ hours.

(2) Reversible motor

Reversible motor is 30-minute rating, and is designed so as the temperature rise, $\theta 30 - \theta 0$ of the winding after minute running is lower than 75 K (deg). (in case heat resistance class is 120 (E)) or 80 K (deg) (in case 130 (B)) international standard approved model.
Therefore, the motor may be burned out if it is used longer than 30 minutes continuously.

(3) Special conditions

Normal working conditions for these motors are –10 to +40˚C, and under 85% RH. Special attention is required when using these motors under the following conditions A to E.

A. Under –10˚C environment

Output torque of the motor might be reduced since the viscosity of the grease of the gear head or motor bearing increases. Condensation may occur when the motor is subjected to a sudden drop in the temperature. If it occurs, rust will be generated and have an adverse effect to the service life.

B. Over +40˚C environment

Motor winding temperature gets very hot, and will result in deterioration of insulation and may result in burnout. Also, lubricating grease of the bearing may leak out to shorten the life of the bearing, and may result in the motor lock, and then result in burnout.

C. Over 85% RH environment

This may deteriorate the winding insulation. When the products are transported by air cargo or vessel and are subjected to high temperature and humidity, pack the products in air-tight and take a necessary treatment such as insertion of drying agents.

D. Poor-ventilation environment

Same effect may appear as the above (B) condition.
If the motor is enclosed, environmental temperature gets very high, and then may shorten the service life drastically. Make a good ventilation environment by installing a vent so that the environmental temperature is kept 40˚C or less.

E. Other unfavorable environment

Operation under these conditions must be avoided:
Place where the product is subjected to; dust, water/oil/coolant splash, explosive/flammable or corrosive gas (H_2S, SO_2, NO_2, Cl_2, etc.).

(4) In the case of international standard approved model

- When using a pinion shaft motor, use it with the gear head attached.
- When using a round shaft motor, provide a means so that the heat dissipates over the machine and equipment.

<Reference>

The table below shows size and material of heat sinks.

Motor size (model No.)	Size	Material
60 mm sq. (M6.....)	100 x 100 x 5	Aluminum
70 mm sq. (M7.....)	120 x 120 x 5	Aluminum
80 mm sq. (M8.....)	135 x 135 x 5	Aluminum
90 mm sq. (M9*X.....)	165 x 165 x 5	Aluminum
(M9*Z.....)	195 x 195 x 5	Aluminum

* The temperature of the winding should be 80 K (deg) or below when measured using resistance method after rated operation with heat sink attached.

Operation environment standard

(1) Reference

Temperature rise of winding should be limited to:
- 75 K (deg): Japanese version
- 80 K (deg): International standard approved version

(2) Measurement method

Run the motor in the worst operation pattern (in terms of temperature rise) and measure the highest motor frame temperature with a thermometer. The reading should be 90˚C or below when the ambient temperature is 40˚C.
Of course, ambient temperature will become higher if ventilation is not enough. In that case, measure the temperature at a point close to the motor.

Temperature rise of motor

Temperature rise of reversible motor

Reversible motor is 30-minute rating when it is running alone. However, when it is used with the gear head, continuous running time will be extended thanks to heat radiation effect of the gear head. The table below shows which motor can operate continuously under such condition. When these motors are operated intermittently, the temperature rise will be saturated at certain value depending on the cycle of intermittent running.

• Continuous running of reversible motor

Size	Motor model No.	Continuous running with gear head	
		50Hz	60Hz
60 mm sq.	M6RX4G4L	○	○
	M6RX6G4L	○	○
70 mm sq.	M7RX10G4L	○	×
	M7RX15G4L	○	×
80 mm sq.	M8RX20G4L	○	×
	M8RX25G4L	○	×
90 mm sq.	M9RX40G4L	×	×
	M9RX60G4L	×	×
	M9RX90G4L	×	×

*○: Continuous running is possible ×: Continuous running is not possible

• Fig. 2 Usable range of reversible motor (intermittent)

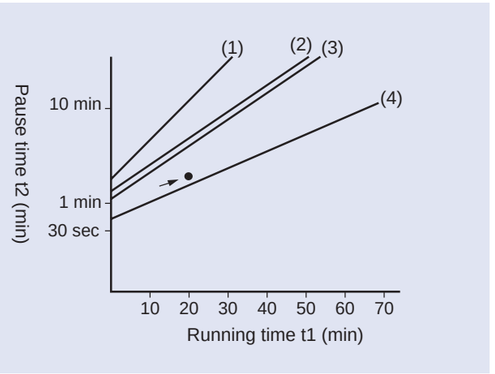


Figure 2 shows the limit curve for continuous intermittent running for the reversible motors. Horizontal axis shows the running time t1 and vertical axis shows the pause time t2. The motor can be operated for a continuous intermittent running in the range of these lines.
In this figure, each line represents as below:

(1) Motor alone running at 60 Hz
(2) Motor alone running at 50 Hz
(3) Motor with gear head running at 60 Hz
(4) Motor with gear head running at 50 Hz

For example, if you want to make continuous intermittent running of the motor alone with a cycle of t1 = 20 min and t2 = 2 min, the line under the crossing point of t1 = 20 and t2 = 2 is line (4). Hence, you can only make a continuous intermittent running with motor with gear head at 50 Hz under these conditions. If you want to run the motor alone and at 60 Hz for 20 minutes, you need to have the following pause time.

(1) 10.1 minutes for the motor alone at 60 Hz
(2) 4.6 minutes for the motor alone at 50 Hz
(3) 3.8 minutes for the motor with gear head at 60 Hz

If you fix the pause time to 2 minutes and want to see how long you can run the motor continuously, find the crossing point of t1 and each line while t2 = 2 (constant), and each value becomes as below.

(1) 2.5 minutes of running time for the motor alone at 60 Hz
(2) 7 minutes of running time for the motor alone at 50 Hz
(3) 10 minutes of running time for the motor with gear head at 60 Hz
(4) 27.5 minutes of running time for the motor with gear head at 50 Hz

Impedance protect

Impedance protect is a means to prevent burning of a motor if it becomes failure i.e. in lock state, even if it is not provided with a safety device such as thermal protector. This is because the amount of current will not increase during locking state. It is blocked by the impedance produced by thin wire coil. Without this impedance protect, the motor temperature rises to 75 K (deg) or more during locking state and winding coil may be burned.
Panasonic geared motors of 4-pole, 6 W or smaller are provided with the impedance protect and conform to UL standard UL2111.
The impedance protect should be activated only when its burning protection feature is absolutely necessary. This implies that the motor must be used under the maximum permissible temperature. The expected motor life decreases by the factor if 1/2, 1/4 and so on as the temperature increases in step of 8˚C beyond the maximum permissible temperature.

* UL standard specifies the impedance protect value to 125 K (deg) at winding for Japanese version and 135 K (deg) for international version.

Thermal protector

The thermal protector is a safety device which automatically turns off the motor current as the motor winding temperature exceeds the preset temperature and turns on the current again as the temperature drops below the preset temperature.

• Fig. 3 Operation of thermal protector

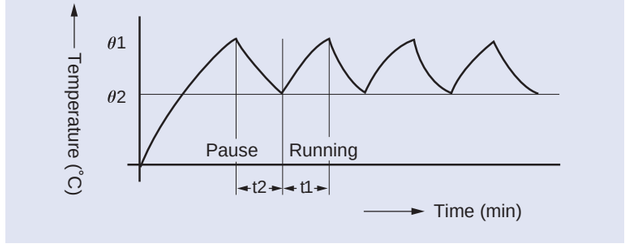


Figure 3 illustrates on/off cycle of the thermal protector. On Panasonic motors, threshold temperature is set as shown below.

Motors conforming to international standards
θ1 (open) 130˚C ± 5˚C
θ2 (closed) 90˚C ± 15˚C
Japanese version, variable speed 90 W motors
θ1 (open) 120˚C ± 5˚C
θ2 (closed) 77˚C ± 15˚C

These settings and time t1 and t2 vary depending on operating environment and loads.
For compact geared motor with thermal protector, refer to the separate Panasonic international motor catalog.

Various icons and important messages are used in this manual to avoid problems that could result in hazards to personnel and damage to properties

• The below explains what will happen if someone fails to heed a particular precaution statement.

Danger	**Danger statements are used to indicate hazards or unsafe practices which could result in severe personal injury or death.**
Caution	**Caution statements are used to indicate hazards or unsafe practices which could result in minor personal injury or product or property damage.**

• The following symbols are used to describe the type of Do and Don't.

	This symbol is used to indicate a practice that shall not be attempted.
	This symbol is used to indicate a practice that shall be done.

Danger

	Don't place a flammable object close to the speed controller and motor.	Will cause fire.
	Don't place a flammable object close to the speed controller and motor.	
	Don't make soldering joint on a round pin of the speed controller.	
	Don't damage leadwires or subject leadwires to excessive stress such as strong pressure, heavy object and clamping load.	Will cause electric shock, personal injury or fire.
	Don't use leadwires soaked in water or oil.	
	Don't use the product in a place subject to excessive vibration or shock.	Will cause electric shock, personal injury or fire.
	Never remove the speed setting knob from the controller.	Will cause electric shock or personal injury such as skin burn.
	Don't drive the 380/400 VAC 3-phase motor from the inverter.	Will cause electric shock, personal injury, fire, malfunction or damage.
	Never touch rotating member of the motor.	Will cause personal injury.
	Don't touch potentially hot motor casing.	Will cause burn injury.
	Don't attempt to carry out wiring or manual operation with wet hand.	Will cause electric shock, personal injury or fire.
	Wiring work should be done by a qualified electrician.	Wiring work done by an inexperienced person will cause electric shock.

Danger

	Install overcurrent protection device, ground-fault circuit interrupter, overtemperature protecting device, and emergency stop device.	Failure to heed these requirements will result in electric shock, personal injury or fire.
	After an earthquake, first verify safety.	
	Before transferring, wiring or checking, disconnect the power source from the motor system for safe isolation.	Energized circuit will cause electric shock.
	Securely install and fix the equipment to prevent bodily injury or fire in case of earthquake.	Failure to heed these requirements will result in electric shock, personal injury or fire.
	Provide emergency stop circuit externally for instantaneous interruption of operation and power supply.	
	Install the unit to a nonflammable construction (e.g. metal).	Installation on a flammable material may cause fire.
	Installation area should be free from excessive dust, and from splashing water and oil.	Failure to heed this precaution will result in electric shock, fire, malfunction or damage.
	Correctly run wirings to the tacho-generator.	Incorrect wiring will result in short circuit, electric shock, personal injury, etc.
	Turn off power upon power interruption or activation of overtemperature protecting device.	Unpredictable restarting will cause personal injury.
	Install the product in the control board to make its terminal block inaccessible.	Failure to heed this requirement will result in electric shock, personal injury, fire, malfunction or damage.
	After correctly connecting leadwires, insulate the live parts with insulator.	Incorrect wiring will result in short circuit, electric shock, fire or malfunction.
	Ground the motor to the earth.	Floating ground circuit will cause electric shock.

Caution

	Don't move the motor by holding leadwires or motor shaft.	Failure to heed these precautions cause bodily injury.
	Don't put the machine into unstable operation.	
	Once power failure occurs, don't come close to the machine that will unexpectedly start upon recovery of the power. Provide secure mechanism so that the restarting of the machine will not cause personal injury.	
	Don't apply excessive shock to the motor shaft.	Excessive shock will cause failure.
	Don't apply excessive shock to the product.	

⚠ Caution

⊘	**Don’t step on the product. Don’t place heavy object on the product.**	Failure to heed this instruction will result in electric shock, personal injury, malfunction or damage.
	Don’t lock the motor shaft while the motor is running.	Locked motor will cause fire, electric shock, or malfunction.
	Don’t block the motor air opening by an object.	Failure to heed this instruction will result in electric shock or fire.
	Don’t turn off and on power so frequently.	Failure to heed this instruction will result in personal injury, fire, malfunction or damage.
	Don’t pull leadwires with an excessive force.	Failure to heed this instruction will result in electric shock, personal injury or fire.
	Don’t use the equipment in highly intensive electric field.	Failure to heed these instructions will cause personal injury or fire.
	Don’t use the equipment under direct sunshine.	
	Don’t use the equipment in an environment where electro-static voltage potentials may be produced.	Induced malfunction will cause personal injury.
	Don’t drop or cause topple over of something during transportation or installation.	Failure to heed this instruction will result in personal injury or malfunction.
	Don’t use smaller variable transformer or transformer.	Failure to heed this instruction will result in fire, electric shock, or malfunction.
	Don’toperate the product outside its ratings stated on the nameplate and instruction manual.	Failure to heed this instruction will result in personal injury, electric shock, fire, malfunction or damage.
⊘	**Never attempt to perform modification, disassembly or repair.**	Failure to heed this instruction will result in fire, electric shock or personal injury.
	Perform installation by taking into consideration the mass of the body and rated output of the product.	Incorrect installation or mounting will cause personal injury or malfunction.
	Adjust the motor and speed controller ambient environmental condition to match their operating temperature and humidity.	
	Exactly follow the installing method and direction specified.	
❗	**Use the speed controller in combination with the specified motor.**	Incorrect combination will cause fire.
	Connect a ground-fault interrupter, circuit breaker and relay to the brake control relay in series so that they are turned off upon emergency stop.	Missing of one of these devices will cause malfunction.
	Test-run the securely fixed motor without load to verify normal operation, and then connect it to the mechanical system.	Operation with a wrong model or wrong wiring connection will result in personal injury.

⚠ Caution

❗	**Level of input voltage to the speed controller should correspond to the motor rated voltage.**	Operation from a voltage outside the rated voltage will cause electric shock, personal injury or fire.
	Provide protection device against slipage of electromagnetic brake or gear head, or grease leakage from gear head.	Lack of protection will cause personal injury, damage or pollution.
	Don't place any obstacle object around the motor and peripheral, which blocks air passage.	Temperature rise will cause burn injury or fire.
	Correctly run and arrange wiring.	Wrong wiring will cause personal injury or electric shock.
	Maintenance must be performed by an experienced personnel.	
	Always keep power disconnected when the power is not necessary for a long time.	Improper operation will cause personal injury.
	Scraps must be treated as industrial waste.	

Handling instructions

Operating instruction

• Before running the motor

Check the following points:

- Correct wiring to the power source?
- Secure grounding to earth?
- Appropriate fuse and circuit breaker?
- No loose connection to the machine? No loose tightening bolts?
- No oil or grease leakage nor blot?

• Trial running

Make a trial run:

(1) Without a load, turn on the motor and gear head to verify the rotational direction and speed, and check for abnormal state, i.e. vibration, noise, etc. Install the motor and gear head on the machine.

Do	**Check rotating direction**	Unexpected operation or movement will cause malfunction or personal injury.

(2) Turn on power and verify that the motor runs smoothly and the bearing and gear head produce no abnormal sounds.

• While motor is running

Check the load:

- Measure the current flow rate and adjust the load so that the current value is well below the rating described on the nameplate.
- When the reduction ratio of the gear head is 1/50 or more, the torque will exceed the permissible shaft torque even if the measured current value is lower than nameplate rating. If this is the case, decrease the load.

Check the temperature rise of the motor:

- Temperature rise will saturate by 3 hours after starting the motor. For the reversible motor and single-phase induction motor with electromagnetic brake, observe the time rating of 30 minutes.
- Keep the frame temperature 90˚C or below when the ambient temperature is 40˚C.

• At power failure:

Immediately turn off main power switch.

- Unexpected accident may occur when the power recovers while the switch is in on position; or the motor may not start if the load is too heavy and the winding may burn.

• While the motor is running:

- Do not touch the motor since it gets very hot. (Or it may result in burn injury.)
- Turn off the motor as the system shows unexpected behavior. (Consult the local agent as necessary.)

• Other precautions:

Check the starting voltage:

With the geared motor installed on the machine, check the starting voltage of the motor using a variable transformer and voltmeter. The voltage should be lower than the value shown below.

(1) Reversible motor: 70% of the rated voltage

(2) Induction motor: 80% of the rated voltage

- The machine may not start if the voltage fluctuates. The machine may not start because of change in the static friction torque due to the aging or temperature, or fluctuation of the motor.

Inspection and maintenance

Periodically perform check and maintenance to assure safe and reliable operation.

• Practical considerations for maintenance

- To secure safety during maintenance operation, turning off/on of power supply must be done by the personnel who is responsible for the current maintenance work.
- Do not touch the motor while it is still running or immediately after it stops. (Motor is hot.)
- Before starting the megger testing of the motor (to measure the insulation resistance), completely disconnect it from associated devices and components.
  Otherwise, the megger tester will damage the devices under test.

• Daily check

- Perform the daily check to prevent potential problems.
- Perform appropriate corrections upon finding any failure or defective.

Check item	Checking method	Description
Change in voltage	Voltmeter	Rated voltage ±2 to 3%. Although the specification assures normal operation within ±10% deviation, the motor performance and life are not secured.
Load curren	Ammeter	As indicated on the nameplate
Ambient temperature	Thermometer	–10 to +40˚C
Temperature rise	Thermometer	90˚C or below on frame surface (ambient temperature 40˚C)
Noise	Auditory perception	No increase in abnormal sound or noise level
Vibration	Vibrometer/feeling	No abnormal vibration
Deposition of powder dust	Visual	Flow of cooling air is not disturbed by dust and powder
Oil leakage	Visual	No oil or grease from joint to gear head or from output shaft
Insulation resistance	Insulating-resistance tester	Connect the 500 V megger across motor lead and earth terminal. The reading should be 50 MΩ or more.
Grease leakage	Visual	Check exterior and peripheral of motor and gear head for coat of grease or oil. If the leakage will affect the application, use cover as necessary for protection.
Foundation bolt	Torque wrench	Check bolts for loosening and retighten as necessary.

• Periodic check (once/1 to 2 month)

- Motor: dust accumulation
- Casing: deformation or corrosion
- Insulation resistance: 1 MΩ or more (across frame and leads)

Operating conditions

Ambient temperature	–10˚C to +40˚C
Ambient humidity	85%RH or less
Altitude	1,000 m or lower
Vibration	4.9 m/s^2 or less
Operating voltage	Nameplate rating ±10%*
Operating voltage	50 or 60 Hz as specified on the nameplate

* ±10% is not a guaranteed value for continuous running condition.

Installation requirements

Install the geared motor at the optimal location as described below for prolonged service life.

(1) Indoor free from rain and direct sunlight

(2) Free from vibration 4.9 m/s^2 or more; shock, dust, iron powder or oil mist; splash of water, oil and grinding fluid; and away from flammable materials, corrosive gas (H_2S, SO_2, NO_2, Cl_2, etc.) or flammable gas.

(3) Well ventilated dry and clean location containing negligible amount of oil or dust, and away from heat source i.e. oven.

(4) Location that allows easier access for checking and cleaning of the unit.

(5) Don't use the motor in a closed environment where the motor temperature increases, shortening the life.

Motor selection

Selecting procedure

Determination of driving mechanism

First, determine the driving mechanism and its dimensions.
And then check the conditions required for the mechanism such as the mass of the load and traveling speed.

▼

Calculation of motor speed and load

Calculate the load torque, moment of inertia and speed which are converted to those at the motor output shaft. Refer to page A-52 for the rotation speed, load torque and moment of inertia of the load for various mechanism.

▼

Check of required specifications

Check the required specifications such as positioning accuracy, holding of position, speed range, operating voltage and other environmental resistances for the mechanism and the machine.

▼

Selection of motor model

Select the most appropriate motor model to meet the required specifications.

▼

Temporary selection of the motor

Select the motor and gear head based on the defined speed at the motor shaft, load torque and moment of inertia of the load.

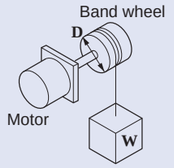
▼

Final determination of the motor and gear head

Make sure that the selected gear head and the motor combination meets all of the required specifications including mechanical strength, acceleration time and torque, then make a final determination.

Checking of load torque

Hoisting application



• SI units

$$T = \frac{1}{2} D \cdot W \ (N \cdot m)$$

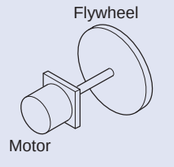
D : Diameter of drum **(m)**
W : Load **(N)**

• Gravitational system of units

$$T = \frac{1}{2} D \cdot W \ (kgf \cdot m)$$

D : Diameter of drum **(m)**
W : Load **(kgf)**

Flywheel application



• SI units

$$T = \frac{J}{9.55 \times 10^4} \cdot \frac{N}{t} \ (N \cdot m)$$

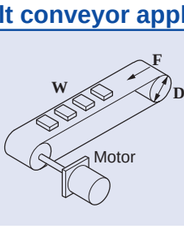
N : Rotating speed **(min^{-1})**
J : Inertia **($kg \cdot cm^2$)**
t : Time **(s)**

• Gravitational system of units

$$T = \frac{GD^2}{3750000} \cdot \frac{N}{t} \ (kgf \cdot m)$$

N : Rotating speed **(min^{-1})**
GD^2 : Flywheel effect **($kgf \cdot cm^2$)**
t : Time **(s)**

Belt conveyor application



• SI units

$$T = \frac{1}{2} D \ (F + \mu Wg) \ (N \cdot m)$$

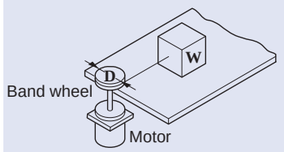
D : Diameter of roll **(m)**
W : Mass of load **(kg)**
g : Gravitational acceleration **(m/s^2)**
μ : Friction coefficient
F : External force **(N)**

• Gravitational system of units

$$T = \frac{1}{2} D \ (F + \mu Wg) \ (kgf \cdot m)$$

D : Diameter of roll **(m)**
W : Weight of load **(kgf)**
μ : Friction coefficient
F : External force **(kgf)**

Horizontal travel on contact face



• SI units

$$T = \frac{1}{2} D \cdot \mu Wg \ (N \cdot m)$$

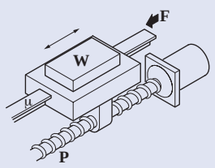
D : Diameter of drum **(m)**
W : Mass **(kg)**
μ : Friction coefficient

• Gravitational system of units

$$T = \frac{1}{2} D \cdot \mu W \ (kgf \cdot m)$$

D : Diameter of drum **(m)**
W : Weight **(kgf)**
μ : Friction coefficient

Ball screw drive



• SI units

$$T = \frac{1}{2\pi} P \ (F + \mu Wg) \ (N \cdot m)$$

F : External force **(N)**
W : Mass of load **(kg)**
μ : Friction coefficient of sliding surfaces (approx. 0.05 to 0.2)
g : Gravitational acceleration **(m/s^2)**
P : Lead of ball screw **(m)**

• Gravitational system of units

$$T = \frac{1}{2\pi} P \ (F + \mu Wg) \ (kgf \cdot m)$$

F : External force **(kgf)**
W : Weight of load **(kgf)**
μ : Friction coefficient of sliding surfaces (approx. 0.05 to 0.2)
P : Lead of ball screw **(m)**

Inertia

To describe the moment of inertia, **J** and **GD²** is used. **J** is generally called inertia and has the same value of physical moment of inertia in SI units. Unit is in **kg·m²**.
GD² (GD square) is called “flywheel effect” and generally used in industrial application with gravitational systems of units. Unit is in **kgf·m²** or **kgf·cm²**. A relation between **J** and **GD²** is described as:

$$J = GD^2 / 4$$

For the purpose of this document, both **J** for SI units and **GD²** for gravitational system of units are used. Unit of **J** should be **kg·m²** in dynamical significance, however, **kg·cm²** is used as well for convenience. Refer to pages A-52 and A-53 for calculation of **J** and **GD²** depending on the shape of the load.

Checking of permissible inertia load

When the load inertia **J** connected to the gear head is large, frequent starting of the motor or electromagnetic brake generates a large torque. If this impact is excessive, it may damage the gear head and the motor. Since inertia varies with types of the load, the tables on pages A-52 and A-53 describe how to calculate inertia of different shape loads. The inertia of the load significantly affects life expectancy of gear and electromagnetic brake. When applying the braking force by using the electromagnetic brake or brake unit, do not exceed a permissible load inertia set for a specific model.
The permissible load inertia to a 3-phase motor is the inertia applied to the motor after it stops and then starts in the opposite direction.

• Find the load inertia to the motor shaft from the following formula. (SI units system)

$$J_M = J_G \times \frac{1}{i^2}$$

J_G : Inertia of gear head output shaft **(kg·cm²)**
J_M : Permissible inertia at motor shaft **(kg·cm²)**
i : Reduction ratio (e.g. 5 if the ratio is 1/5)

* The formula also applies to **GD²** system.

• Find the permissible load inertia moment at gear head output shaft from the following formula.

When reduction ratio is 1/3 to 1/50, $J_G = J_M \times i^2$

When reduction ratio is 1/60 or larger, $J_G = J_M \times 2500$

J_G : Permissible load inertia moment at gear head output shaft **(kg·cm²)**
J_M : Permissible inertia at motor shaft **(kg·cm²)**
i : Reduction ratio (e.g. 5 if the ratio is 1/5)

Permissible inertia **(J_M)** at motor shaft varies with motors. To find the inertia for the motor in question, refer to tables on pages A50 and A51.

Motor and load inertia

The equation of motion is described as below when the inertia load is driven by the motor.

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

where,
T : Torque **(N·m)**
J : Moment of inertia **(kg·m²)**
ω : Angular speed **(rad/s)**
t : Time **(s)**
GD² : Flywheel effect **($GD^2 = 4J$)**
g : Gravitational accelerationg = 9.8 **(m/s²)**
α : Angular acceleration **(rad/s²)**

In the case of induction motor, torque generated at the starting varies depending on the speed. Therefore, an average acceleration torque is generally used, which is the averaged torque from the starting and the constant speed.
A necessary average acceleration torque T_A to accelerate the load inertia of **J (kg·cm²)** **(GD² (kgf·cm²))** up to a speed **n (min⁻¹)** in time **t (s)** can be obtained by the following formula.

• SI units

$$T_A = \frac{J}{9.55 \times 10^4} \times \frac{N}{t} \quad (N\cdot m)$$

• Gravitational system of units

$$T_A = \frac{GD^2}{3750000} \times \frac{N}{t} \quad (kgf\cdot cm)$$

Life of motor brake

Load inertia affects a lot to the life of the brake.
In the case of brake unit and variable speed motor, braking life is 2 million cycles, and in the case of a motor with electromagnetic brake, life is one million cycles.

Life of brake in the motor

Life expectancy of motor varies depending on load fluctuation. To determine the life expectancy, a factor called service factor, as shown in the table below is used.
First choose the appropriate service factor according to the type of load and multiply the result by the required power to determine the design power.

Motor self-inertia, average acceleration torque and permissible load inertia

• When using single-phase induction motor and brake unit
• When using single-phase variable speed induction motor and electric brake of speed controller
• When using 3-phase induction motor and brake unit

No. of phases	Size	Output (W)	Rotor inertia		Average acceleration torque			Permissible load inertia at motor shaft	
			J (kg·cm²)	GD² (kgf·cm²)		(N·m)	(kgf·cm)	J (kg·cm²)	GD² (kgf·cm²)
Single-phase Induction	42 mm sq.	1	0.027	0.106	50 Hz 60 Hz	0.0127 0.0146	0.13 0.15	0.0125	0.05
		3	0.027	0.106	50 Hz 60 Hz	0.0127 0.0146	0.13 0.15	0.0125	0.05
	60 mm sq.	3	0.103	0.412	50 Hz 60 Hz	0.0353 0.0333	0.36 0.34	0.125	0.50
		6	0.163	0.650	50 Hz 60 Hz	0.0549 0.0529	0.56 0.54	0.125	0.50
	70 mm sq.	10	0.221	0.883	50 Hz 60 Hz	0.0755 0.0745	0.77 0.76	0.125	0.50
		15	0.322	1.286	50 Hz 60 Hz	0.0971 0.0951	0.99 0.97	0.125	0.50
	80 mm sq.	15	0.438	1.751	50 Hz 60 Hz	0.126 0.118	1.29 1.20	0.138	0.55
		25	0.578	2.311	50 Hz 60 Hz	0.199 0.201	2.03 2.05	0.138	0.55
	90 mm sq.	40	1.287	5.146	50 Hz 60 Hz	0.319 0.319	3.25 3.25	0.4	1.60
		60	1.787	7.147	50 Hz 60 Hz	0.524 0.522	5.35 5.33	0.650	2.60
		90	2.211	8.843	50 Hz 60 Hz	0.692 0.691	7.06 7.05	0.650	2.60
3-phase	80 mm sq.	25	0.578	2.311	50 Hz 60 Hz	0.310 0.316	3.16 3.22	0.138	0.55
	90 mm sq.	40	1.287	5.146	50 Hz 60 Hz	0.667 0.513	6.81 5.23	0.4	1.60
		60	1.787	7.147	50 Hz 60 Hz	1.03 0.767	10.52 7.83	0.650	2.60
		90	2.211	8.843	50 Hz 60 Hz	1.46 1.065	14.88 10.87	0.650	2.60

• When using single-phase reversible motor and brake unit
• When using single-phase variable speed reversible motor and electric brake of speed controller

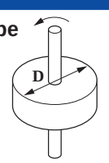
No. of phases	Size	Output (W)	Rotor inertia		Average acceleration torque			Permissible load inertia at motor shaft	
			J (kg·cm²)	GD² (kgf·cm²)		(N·m)	(kgf·cm)	J (kg·cm²)	GD² (kgf·cm²)
Single-phase Reversible	42 mm sq.	1	0.029	0.114	50 Hz 60 Hz	0.0140 0.0153	0.14 0.16	0.0125	0.05
	60 mm sq.	4	0.113	0.452	50 Hz 60 Hz	0.0402 0.0392	0.41 0.40	0.125	0.50
		6	0.173	0.691	50 Hz 60 Hz	0.0539 0.0549	0.55 0.56	0.125	0.50
	70 mm sq.	10	0.235	0.940	50 Hz 60 Hz	0.0676 0.0657	0.69 0.67	0.125	0.50
		15	0.336	1.343	50 Hz 60 Hz	0.105 0.101	1.07 1.03	0.125	0.50
	80 mm sq.	20	0.460	1.839	50 Hz 60 Hz	0.146 0.141	1.49 1.44	0.138	0.55
		25	0.600	2.399	50 Hz 60 Hz	0.218 0.205	2.22 2.09	0.138	0.55
	90 mm sq.	40	1.341	5.363	50 Hz 60 Hz	0.400 0.381	4.08 3.89	0.4	1.60
		60	1.841	7.364	50 Hz 60 Hz	0.621 0.600	6.34 6.12	0.650	2.60
		90	2.265	9.060	50 Hz 60 Hz	0.796 0.736	8.12 7.51	0.650	2.60

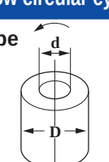
• When using single-phase electromagnetic brake motor
• When using single-phase variable speed reversible motor and electric brake of speed controller

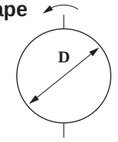
No. of phases	Size	Output (W)	Rotor inertia		Average acceleration torque			Permissible load inertia at motor shaft	
			J (kg·cm²)	GD² (kgf·cm²)		(N·m)	(kgf·cm)	J (kg·cm²)	GD² (kgf·cm²)
Single-phase Reversible	60 mm sq.	6	0.201	0.805	50 Hz 60 Hz	0.0637 0.0647	0.65 0.66	0.080	0.32
	70 mm sq.	15	0.329	1.316	50 Hz 60 Hz	0.120 0.114	1.22 1.16	0.158	0.63
	80 mm sq.	25	0.603	2.411	50 Hz 60 Hz	0.235 0.222	2.40 2.27	0.178	0.71
	90 mm sq.	40	1.362	5.446	50 Hz 60 Hz	0.439 0.420	4.48 4.29	0.735	2.94
		60	1.862	7.447	50 Hz 60 Hz	0.639 0.615	6.52 6.28	0.875	3.50
		90	2.353	9.413	50 Hz 60 Hz	0.859 0.804	8.77 8.20	1	4.0
3-phase	80 mm sq.	25	0.603	2.411	50 Hz 60 Hz	0.388 0.306	3.96 3.12	0.178	0.71
	90 mm sq.	40	1.362	5.446	50 Hz 60 Hz	0.667 0.513	6.81 5.23	0.735	2.94
		60	1.862	7.447	50 Hz 60 Hz	1.031 0.767	10.52 7.83	0.875	3.50
		90	2.286	9.143	50 Hz 60 Hz	1.429 1.065	14.58 10.87	1	4.0

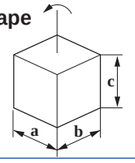
Inertia

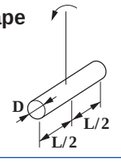
How to calculate moment of inertia

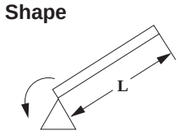
• Disk	J (Inertia calculation)	GD^2 (Flywheel effect calculation)
• Shape 	$J = \frac{1}{8} WD^2$ (kg·cm²) W : Mass (kg) D : Outer diameter (cm)	$GD^2 = \frac{1}{2} WD^2$ (kgf·cm²) W : Weight (kgf) D : Outer diameter (cm)

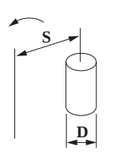
• Hollow circular cylinder	J (Inertia calculation)	GD^2 (Flywheel effect calculation)
• Shape 	$J = \frac{1}{8} W (D^2 + d^2)$ (kg·cm²) W : Mass (kg) D : Outer diameter (cm) d : Inner diameter (cm)	$GD^2 = \frac{1}{2} W (D^2 + d^2)$ (kgf·cm²) W : Weight (kgf) D : Outer diameter (cm) d : Inner diameter (cm)

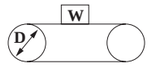
• Sphere	J (Inertia calculation)	GD^2 (Flywheel effect calculation)
• Shape 	$J = \frac{1}{8} WD^2$ (kg·cm²) W : Mass (kg) D : Diameter (cm)	$GD^2 = \frac{2}{5} WD^2$ (kgf·cm²) W : Weight (kgf) D : Diameter (cm)

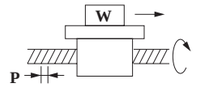
• Cube	J (Inertia calculation)	GD^2 (Flywheel effect calculation)
• Shape 	$J = \frac{1}{8} W (a^2 + b^2)$ (kg·cm²) W : Mass (kg) a.b : Length of side (cm)	$GD^2 = \frac{1}{3} W (a^2 + b^2)$ (kgf·cm²) W : Weight (kgf) a.b : Length of side (cm)

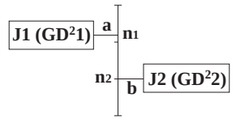
• Slender round bar	J (Inertia calculation)	GD^2 (Flywheel effect calculation)
• Shape 	$J = \frac{3D^2 + 4L^2}{48}$ (kg·cm²) W : Mass (kg) D : Outer diameter (cm) L : Length (cm)	$GD^2 = \frac{3D^2 + 4L^2}{12}$ (kgf·cm²) W : Weight (kgf) D : Outer diameter (cm) L : Length (cm)

• Straight bar	J (Inertia calculation)	GD^2 (Flywheel effect calculation)
• Shape 	$J = \frac{1}{3} WL^2$ (kg·cm²) W : Mass (kg) L : Length (cm)	$GD^2 = \frac{4}{3} WL^2$ (kgf·cm²) W : Weight (kgf) L : Length (cm)

• Discrete shaft	J (Inertia calculation)	GD^2 (Flywheel effect calculation)
• Shape 	$J = \frac{1}{8} WD^2 + WS^2$ (kg·cm²) W : Mass (kg) D : Diameter (cm) S : Turning radius (cm)	$GD^2 = \frac{1}{2} WD^2 + 4WS^2$ (kgf·cm²) W : Weight (kgf) D : Diameter (cm) S : Turning radius (cm)

• Horizontal linear motion	J (Inertia calculation)	GD^2 (Flywheel effect calculation)
• Shape 	$J = \frac{WD^2}{4}$ (kg·cm²) W : Mass on the conveyor (kg) D : Drum diameter (cm) * Inertia of drum not included	$GD^2 = WD^2$ (kgf·cm²) W : Weight on the conveyor (kgf) D : Drum diameter (cm) * Flywheel effect of drum not included

• Ball screw	J(Inertia calculation)	GD^2 (Flywheel effect calculation)
• Shape 	$J = JA + \frac{W \cdot P^2}{4\pi^2}$ (kg·cm²) W : Mass (kg) P : Lead of feed screw (cm) JA : Inertia of feed screw (kg·cm²)	$GD^2 = GD^2_A + \frac{W \cdot P^2}{\pi^2}$ (kgf·cm²) W : Weight (kgf) P : Lead of feed screw (cm) GD^2_A : Flywheel effect of feed screw (kgf·cm²)

• Reducer	J (Inertia calculation)	GD^2 (Flywheel effect calculation)
• Shape 	Equivalent all inertia on axis “a” $J = J1 + \left(\frac{n2}{n1}\right)^2 J2$ (kg·cm²) n1 : Speed of axis “a” (min⁻¹) n2 : Speed of axis “b” (min⁻¹) J1 : J of axis “a” (kg·cm²) J2 : J of axis “b” (kg·cm²)	Equivalent all flywheel effect on axis “a” $GD^2 = GD^2_1 + \left(\frac{n2}{n1}\right)^2 GD^2_2$ (kgf·cm²) n1 : Speed of axis “a” (min⁻¹) n2 : Speed of axis “b” (min⁻¹) GD^2_1 : GD^2 of axis “a” (kgf·cm²) GD^2_2 : GD^2 of axis “b” (kgf·cm²)

Motor selection

Service factor

Life expectancy of motor varies depending on load fluctuation. To determine the life expectancy, a factor called service factor, as shown in the table below is used.First choose the appropriate service factor according to the type of load and multiply the result by the required power to determine the design power.

• Service factor

Type of load	Typical load	Service factor		
		5 hours/day	8 hours/day	24 hours/day
Constant	Belt conveyor, One-directional rotation	0.8	1.0	1.5
Light-impact	Start/Stop, Cam-drive	1.2	1.5	2.0
Medium-impact	Instant FWD/REV, Instant stop	1.5	2.0	2.5
Heavy-impact	Frequent medium-impact	2.5	3.0	3.5

• Standard life expectancy

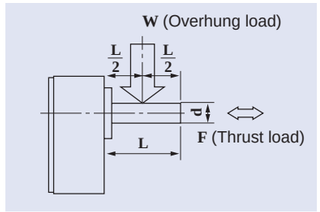
	Life (hours)
Ball bearing	10,000 hours*
Metal bearing	2,000 hours
Right-angle	5,000 hours
42 mm sq.	2,000 hours
Round shaft	10,000 hours*

* 5,000 hours when used on reversible motor

The standard life can be expected when the product is operated at service factor 1.0.
The life of a component during particular application is estimated by dividing the standard life expectancy by the service factor. If the service factor is 2.0, then the actual life will be one half the expected life.

Overhung load and thrust load

The overhung load is defined as a load applied to the output shaft in the right-angle direction. This load is generated when the gear head is coupled to the machine using a chain, belt, etc., but not when the gear head is directly connected to the coupling. As shown in the right figure, the permissible value is determined based on the load applied to the L/2 position of the output shaft. The thrust load is defined as a load applied to the output shaft in the axial direction. Because the overhung load and thrust load significantly affect the life of the bearing, take care not to allow the load during operation to exceed the permissible overhung load and thrust load shown in the table below.



• Load

Size	Model	Permissible overhung load N (kgf)	Permissible thrust load N (kgf)
42 mm sq.	M4GA□F	20 (2)	15 (2)
60 mm sq.	MX6G□B(A)	98 (10)	29 (3)
	MX6G□M(A)	49 (5)	
70 mm sq.	MX7G□B(A)	196 (20)	39 (4)
	MX7G□M(A)	98 (10)	
80 mm sq.	MX8G□B	294 (30)	49 (5)
	MX8G□M	200 (20)	
90 mm sq.	MX9G□B	392 (40)	98 (10)
	MX9G□M	294 (30)	
	MZ9G□B	588 (60)	147 (15)
	MY9G□B		
90 mm sq. High torque	MR9G□B	748 (80)	147 (15)
	MP9G□B		
90 mm sq. Right-angle	MX9G□R	392 (40)	98 (10)
	MZ9G□R	588 (60)	147 (15)

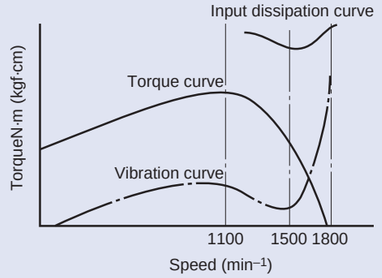
Calculation of motor capacity

1. Speed suitable for use

Fig. 1 shows the typical torque curve, input dissipation curve and vibration curve.

In Fig. 1, the motor shows variations of 1100 to 1800 [min^{-1}] according to the load. The speed most suitable for the load of the equipment is as follows:
1200 to 1250 [min^{-1}] for 50 Hz
1500 to 1550 [min^{-1}] for 60 Hz
In this speed range, as can be seen from Fig. 1, the input dissipation becomes minimum, which means that the temperature rise of the motor is reduced accordingly.
As a result, the life of the motor, the insulation life, ball bearing grease life, etc. in particular, is prolonged. Also the vibration is minimized: in particular the gear noise caused when a gear head is used is reduced optimally. As described above, an optimum speed should be considered in selecting a motor.

Fig. 1 Example of Various Characteristics (60 Hz)

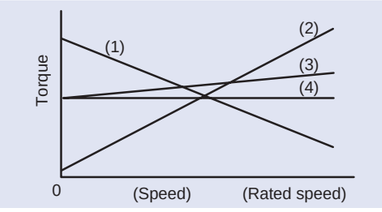


2. Examination of load of equipment

Examine the torque required for the load regarding the following three items.
- Minimum required torque at starting of the equipment
- Maximum load torque at load variations of the equipment
- Load torque at stable rotation

When the load torque is (1) to (4) in Fig. 2, the starting torque for (1), the stalling torque for (2) both the starting torque and stalling torque for (3) and (4) should be considered.

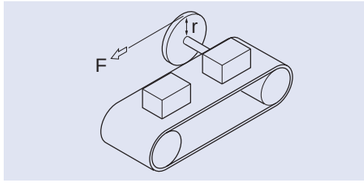
Fig. 2 Type of Load



3. Calculation of required torque

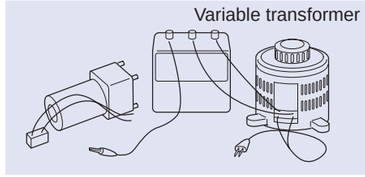
• When the load of the equipment is (1), (3) or (4) in Fig. 2
Calculate the approximate value of the required starting torque Ts. In Fig. 3 (Conveyor), for example, calculate the required force F from "T = Fr". Then select suitable motors from our catalog or the attached S-T data and check the minimum starting voltage, the minimum stable voltage and the speed in stable rotation. In accordance with the equipment load status calculated based on the above-mentioned examination, select a motor with the most suitable S-T curve.

Fig. 3. Example of belt Conveyor



4. Measurement of minimum starting voltage

Couple the motor to the load to be measured and connect a variable transformer and voltmeter as shown in the figure to the right.
Increase the voltage continuously from 0 volt at the rate of 3 V/sec with this variable transformer and measure the when the rotating part of the equipment starts and gets ready for acceleration.



5.Measurement of minimum stable voltage

Drive the equipment in a stable state. Using the above-mentioned variable transformer, decrease the voltage gradually. Measure the voltage at the limit of the motor speed allowing the equipment to function, that is, when the equipment begins to stop.

Calculation of motor capacity

6. Measurement of motor with gear head

When a motor alone is coupled to equipment, the speed is measured at output shaft section using a strobe light etc. In the case of a motor with a gear head, the speed is calculated from the following formula.

$$n = i \times n1$$

n : Motor speed **(min^{-1})**
n1 : Speed of gear output shaft or pulley etc. attached to it
i : Reduction ratio of gear head (e.g. i = 30 for 1/30)

When measuring the speed of a gear output shaft having a large reduction ratio, do not measure the number of revolutions per minute, but measure the time taken for the gear output shaft to rotate 100 turns using a stopwatch after putting a mark on the shaft. Then calculate the number of revolutions per minute from the measured time.

7. Example of motor selection

Application : Driving of conveyor
Voltage : 100 V
Speed : 30 min^{-1}
Working condition : Continuous
Frequency : 60 Hz
Select a motor that meet the above.

(1) Speed suitable for specifications
Because the required speed is 30 min^{-1}, the gear ratio that realizes a rated motor speed (60 Hz area) of 1500 to 1550 min^{-1} is 1500/30 to 1550/30 = 50 to 51.67. Therefore use a gear ratio of 1/50.

(2) Calculation of required torque
Measure the approximate load with a spring balance etc. Assume that it is **2.65 N·m (27 kgf·cm)**. After referring to our catalog, select **M81X25G4L** and install **MXBG50B** as a reduction gear.

(3) Actual measurement of minimum starting voltage, minimum stable voltage and speed
Assume that the following are obtained as a result of actual measurement.
Minimum starting voltage: 75 V
Minimum stable voltage: 55 V
Speed: 1700 min^{-1}

(4) From speed-torque curve of 4-pole 25 W induction motor
Ts : Starting torque **Ts = 0.16 N·m (1.6kgf·cm)**
Tm : Stalling torque **Tm = 0.25 N·m (2.5kgf·cm)**

The torque is proportional to the square of the voltage and the following values are obtained.

(Minimum starting torque)

$$0.16 \times \left(\frac{75}{100}\right)^2 = 9 \times 10 - 2 \text{ N·m } (0.9 \text{ kgf·cm})$$

(Minimum required stalling torque)

$$0.25 \times \left(\frac{55}{100}\right)^2 = 7 \times 10 - 2 \text{ N·m } (0.73 \text{ kgf·cm})$$

(Torque at motor speed of 1700 min^{-1})

= 0.12 N·m (1.2 kgf·cm)

From the above, it can be seen that this application is a constant torque load and that the 4-pole 25 W induction motor still has a more than sufficient capacity. In addition, as is evident from the S-T curve of the attached S-T data, Ts and Tm of the 4-pole 15 W induction motor are as follows:

Ts = 0.1 N·m (0.95kgf·cm)
Tm = 0.15 N·m (1.5kgf·cm)

Considering the voltage drop and variation when used for conveyors, Ts and Tm of the 4-pole 15 W induction motor at 90 V are assumed to be as follows:

Ts = 0.08 N·m (0.77kgf·cm)
Tm = 0.12 N·m (1.2kgf·cm)

When the voltage drop and variation or load variation is thought to be insignificant, the 4-pole 15 W induction motor and gear head MX7G50B can be used. When the voltage variation or load variation is significant, the 4-pole 25 W induction motor should be used.

Domestic and overseas standards approved motors

For motors sold domestically or exported abroad, it is necessary to ensure the safety against “Fire, electric shock and injury” that meets the corresponding standards of each country. Among such standards are the Electrical Appliance and Material Safety Law in Japan, the UL standard in the North American market, the CE marking in the European market and the CCC marking in the Chinese market. We also provide products meeting these safety standards. The descriptions of these standards are shown below.

Electrical Appliance and Material Safety Law (domestic law in Japan)

This law is a domestic law in Japan intended to regulate the manufacture, sale, etc. of electrical appliances and to prevent the occurrence of fire, electric shock, injury, etc. attributable to electrical appliances by promoting self-activities of private enterprises for ensuring the safety of electrical appliances. Among the contents of the regulation are obligations of submission of manufacturing (export) business, conformance to technical standards and indication. Electrical appliances are classified into two groups: specific electrical appliances (equivalent to ko-type in the former law) and electrical appliances other than specific electrical appliances (otsu-type in the former law).
On motors (electrical appliances other than specific electrical appliances) regulated by this law, a ⓅⓈE PSE mark is indicated and descriptions based on this law are shown.

UL (CSA) Standard (to be considered when exporting motors to North America)

This standard was established by the fire insurance company association in the United States of America. Like Japan, low voltage (115 V, 60 Hz) is used in this region, and measures against fire in particular are strongly required. Insulators used for UL-approved products are made of UL-approved incombustible materials. In addition, installation of an overheat protection device is required. In the case of motors with mounting surface dimensions of 70 mm sq., 80 mm sq. and 90 mm sq., an automatic-reset thermal protector is incorporated. In the case of motors with mounting surface dimensions of 60 mm sq., impedance protected motor design is used.
The CSA standard is a necessary requirement for exporting to Canada. It is possible to put a c-UL mark on products inspected and approved by UL in accordance with the CSA standard in addition to the UL standard. Products bearing this c-UL mark are regarded as products conforming to CSA standard and therefore can be sold in Canada.

• UL standard on motor

UL1004 (motor) : Provisions concerning motor construction and material
UL2111 (thermal protection of motor) : Provisions concerning thermal protection of motor
UL840 (insulation coordination of equipment) : Provisions concerning base items of motor insulation

Outline of safety standard motor

EN Standard (to be considered when exporting motors to Europe) CE

It is a safety standard applied within the EU's borders, most part of which is based on the IEC standard. In Europe, the power supply voltage is as high as single-phase 230 V and 3-phase 400 V and it is therefore necessary to give consideration to electric shock in particular (Low Voltage Directive). In addition, because the mechanical safety (Machinery Directive) is considered, there is a recognition that it is dangerous for a motor to move suddenly as a result of automatic resetting of the protector etc. It is therefore required that, after the occurrence of an abnormal condition activating the protector, the machine can be started only when manual resetting is made by the operator. It is necessary to put a CE mark on products that have passed the test of the EN standard and are to be exported and to show clearly their safety level. (The product level is specified in the instruction manual. In Europe, when a (safety) self-declaration is required by a user, it should be submitted to the user.) In the case of a motor with speed controller, it is necessary to show clearly the level of malfunction (including malfunction of the motor and damage to other equipment) due to electromagnetic interference. (Check the level individually.) This level is evaluated based on the motor and controller alone. Because electromagnetic interference varies significantly depending on the wiring for incorporation into equipment, this level should be regarded as a reference value and a final determination should be made after incorporation into equipment.

• EN standard on motor

Low Voltage Directive: Directive for 50 to 1000 VAC equipment

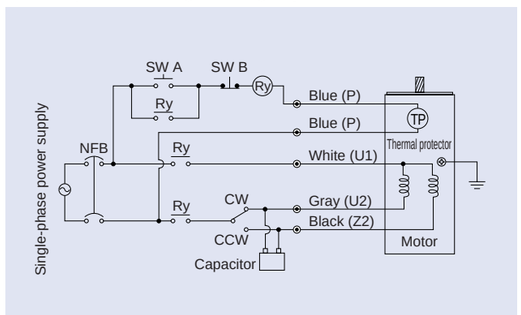
EN60034 (rating of electric machine)	: Provisions concerning general items on motor
EN60664 (insulation coordination of equipment)	: Provisions concerning base items of motor insulation
EN60204 (electric equipment of industrial machinery)	: Provisions concerning industrial motor

• Typical Example of Wiring

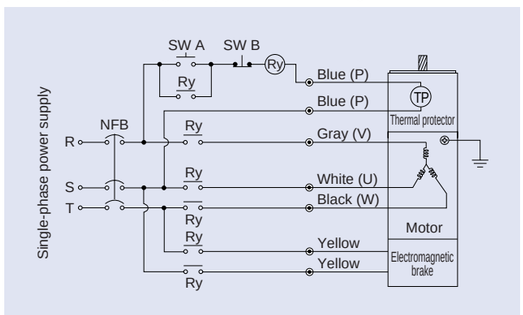
(1) The customer should verify conformance to the standards, laws, etc. on the completed equipment.

(2) The thermal protector ⓉⓅ is an automatic reset type. To prevent hazardous unintentional restart, it must be wired as shown in the figure below.
(Connect a spark killer to the electromagnetic contactor.)
Do not connect the thermal protector ⓉⓅ directly to the power source. Instead, connect it to the source through the switch SW A and SW B and relay Ⓡy.

• Example of wiring of single-phase motor



• Example of wiring of 3-phase electromagnetic brake motor



GB Standard (to be considered when exporting motors to China) CCC

In the People's Republic of China, China Compulsory Certification (CCC) is applied to products affecting health and safety of people, life and safety of animals and plants, environmental protection and public safety. Our motors are subject to CCC (excluding some motors) and a CCC certification mark is put on the main body of a certified motor.

• GB standard on motor

GB12305: Standard on safety of motor

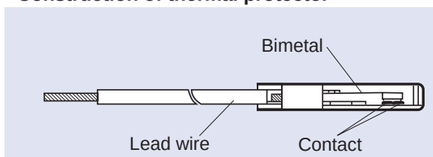
Overheat protection device

If a motor in operation is locked due to overloading or the input is increased for some reason, the temperature of the motor will rise rapidly. If the motor is left in this condition, the insulating performance in the motor will be deteriorated, leading to shortening of the life and, in the worst case, burning of the coil. In order to protect motors from such abnormal heating, our motors compliant with overseas standards are equipped with the following overheat protection device.

• Motor with thermal protector

In the case of the motors with mounting surface dimensions of 70 mm sq., 80 mm sq. and 90 mm sq., an automatic-reset thermal protector is incorporated.
The construction of the thermal protector is shown in the figure to the right. The thermal protector is of bimetallic type and silver or silver alloy, which has low electrical resistance and high thermal conductivity, is used for the contacts.

• Construction of thermal protector



Operating temperature of thermal protector

<International standard approved>	<Japanese version / Variable speed motor 90W>
open.....130±5˚C	open.....120±5˚C
close..... 90±15˚C	close..... 77±15˚C

(When the thermal protector is operating, the temperature of the coil is slightly higher than the operating temperature shown above.)

Test: It has passed a lock test of 18 days straight.

• Impedance protected motor

It is applied to the motors with mounting surface dimensions of 60 mm sq.. The impedance of the coil of the impedance protected motor is made higher so as to make smaller the current (input) increase when the motor is locked, preventing the temperature rise from exceeding a certain level. Test: It has passed a lock test of 18 days straight.

Outline of safety standard motor

General specifications for safety standard motor

Insulation resistance:

The value measured between the coil and case with a 500 VDC megger after continuous operation at normal temperature and humidity should be 50 MW or more.

Dielectric strength:

No anomaly should be found when 1.5 kV, 60 Hz is applied to between the coil and case for one minute after continuous operation at normal temperature and humidity.

Test Item \ Standard	Electrical Appliance and Material Safety Law
150 V or lower	1000 V for one minute
Higher than 150V	1500 V for one minute

The EN standard, IEC standard and GB standard specify 1500 V for one minute.

Overheat protection system:

The motors with mounting surface dimensions of 60 mm sq. is impedance-protected. The other motors incorporate an automatic-reset thermal protector.

Heat resistance class:

Specifications compliant with overseas standards Heat resistance class 130 (B)

Operating ambient temperature range:

–10˚C to +40˚C

Operating ambient humidity range:

85% RH or less

Altitude:

1000 m or less

Vibration:

4.9 m/s^2 or less

Working power supply voltage:

Rated voltage (value shown on nameplate) ±10% means a power supply voltage fluctuation range and does not refer to voltage that can be used at any time.

Working power supply frequency:

50/60 Hz (Value shown on nameplate)

Induction Motor

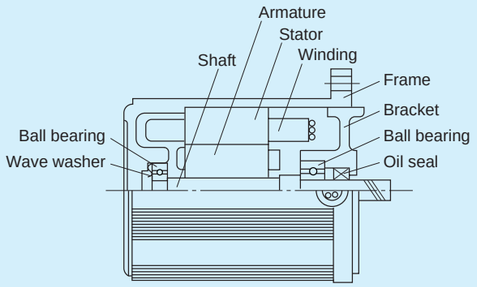
Contents

Outline of induction motor

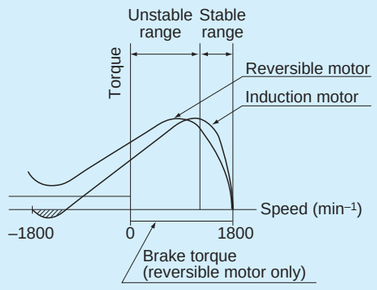
Features

- It is fitted for continuous running in one direction.
- Continuous time rating
- The motor with national specifications is of heatproof class 120 (E); the motor with specifications compliant with overseas standards is of heatproof class 130 (B).
- Because it is a capacitor-type induction motor, it has a high power factor and runs with a low noise level.
- Caution
  The induction motor cannot make a quick-reversal run because of the torque acting in the opposite direction. Therefore stop the induction motor once, change the wire connections and make a reverse run.

Construction

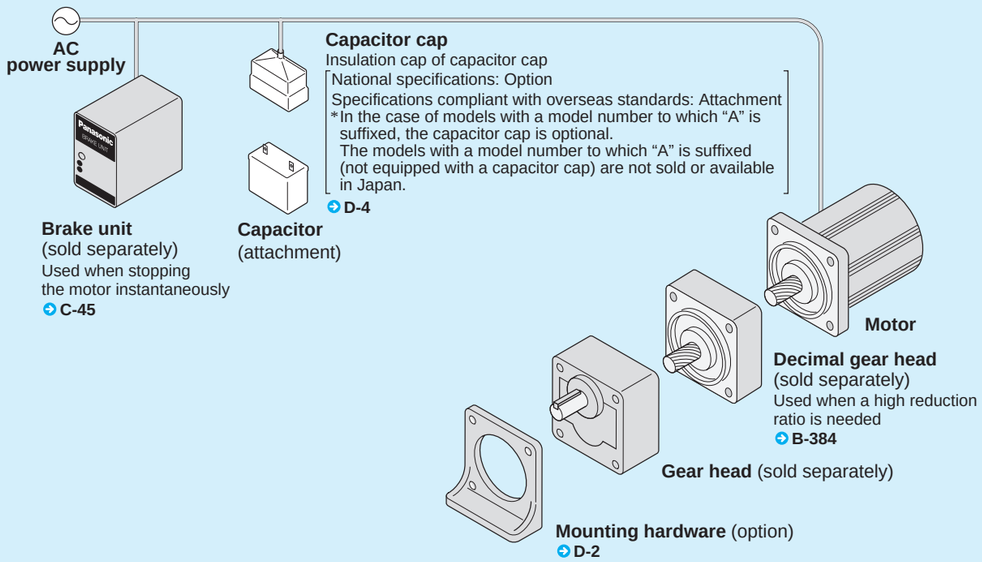


Characteristics



Note) Operation at 60 Hz

System configuration diagram



Coding system

M 9 1 X 40 G _ 4 L S A

	Size	Motor type	Output type	Output	Shape of shaft	Option	No. of poles	Voltage	Classification
	4 : 42 mm sq. 6 : 60 mm sq. 7 : 70 mm sq. 8 : 80 mm sq. 9 : 90 mm sq.	1 : Induction Motor	A : 42mm sq. only X : 40 W or smaller Z : 60 W or larger	1 : 1 W 3 : 3 W 6 : 6 W 10 : 10 W 15 : 15 W 25 : 25 W 40 : 40 W 60 : 60 W 90 : 90 W	G : Pinion shaft S : Round shaft	K : Sealed connector (Left aligned when no option is used)	4 : 4 poles 2 : 2 poles (42 mm sq. only)	L : 100 V Y : 200 V D : 110/115 V G : 220/230 V	G : Specifications compliant with overseas standards S : Round shaft (S for round shaft with national specifications only)	Motor with specifications compliant with overseas standards that is not equipped with a capacitor cap.

Corresponding model number	Shape of shaft	Classification
Specifications compliant with overseas standards Pinion shaft	G	G
Specifications compliant with overseas standards Round shaft	S	G
National specifications Pinion shaft	G	–
National specifications Round shaft	S	S
42 mm sq. round shaft specifications	S	–

Model list of induction motor

Pinion shaft motor

Applicable gear head

✪ Motor compliant with overseas standards

Hinge attached

Size	Output (W)	Leadwire type			Page	Sealed connector type			Page	Standard gear head			High torque gear head	Right-angle gear head	Decimal gear head
		Model number	Specifications			Model number	Specifications			Ball bearing	metal bearing	Ball and metal bearing			
42 mm sq.	3	M41A3G2L	100V		B- 8					–	–	M4G□F	–	–	–
	1	M41A1G4L	100V		B-10										
60 mm sq.	3	M61X3G4L	100V		B-12					MX6G□BA MX6G□B	MX6G□MA MX6G□M	–	–	–	MX6G10XB
	6	M61X6G4L	100V		B-14										
		M61X6G4Y	200V		B-14										
		M61X6G4LG(A)	100V	✪	B-16										
		M61X6G4DG(A)	110/115V	✪	B-16										
		M61X6G4YG(A)	200V	✪	B-16										
		M61X6G4GG(A)	220/230V	✪	B-16										
70 mm sq.	10	M71X10G4L	100V		B-18					MX7G□BA MX7G□B	MX7G□MA MX7G□M	–	–	–	MX7G10XB
		M71X10G4Y	200V		B-18										
	15	M71X15G4L	100V		B-20										
		M71X15G4Y	200V		B-20										
		M71X15G4LG(A)	100V	✪	B-22										
		M71X15G4DG(A)	110/115V	✪	B-22										
		M71X15G4YG(A)	200V	✪	B-22										
		M71X15G4GG(A)	220/230V	✪	B-22										
80 mm sq.	15	M81X15G4L	100V		B-24					MX8G□B	MX8G□M	–	–	–	MX8G10XB
		M81X15G4Y	200V		B-24										
	25	M81X25G4L	100V		B-26	M81X25GK4L	100V		B-42						
		M81X25G4Y	200V		B-26	M81X25GK4Y	200V		B-42						
		M81X25G4LG(A)	100V	✪	B-28	M81X25GK4LG(A)	100V	✪	B-44						
		M81X25G4DG(A)	110/115V	✪	B-28	M81X25GK4DG(A)	110/115V	✪	B-44						
		M81X25G4YG(A)	200V	✪	B-28	M81X25GK4YG(A)	200V	✪	B-44						
		M81X25G4GG(A)	220/230V	✪	B-28	M81X25GK4GG(A)	220/230V	✪	B-44						
90 mm sq.	40	M91X40G4L	100V		B-30	M91X40GK4L	100V		B-46	MX9G□B	MX9G□M	–	–	MX9G□R	MX9G10XB
		M91X40G4Y	200V		B-30	M91X40GK4Y	200V		B-46						
		M91X40G4LG(A)	100V	✪	B-32	M91X40GK4LG(A)	100V	✪	B-48						
		M91X40G4DG(A)	110/115V	✪	B-32	M91X40GK4DG(A)	110/115V	✪	B-48						
		M91X40G4YG(A)	200V	✪	B-32	M91X40GK4YG(A)	200V	✪	B-48						
		M91X40G4GG(A)	220/230V	✪	B-32	M91X40GK4GG(A)	220/230V	✪	B-48						
	60	M91Z60G4L	100V		B-34	M91Z60GK4L	100V		B-50	MZ9G□B	–	–	MR9G□B	MZ9G□R	MZ9G10XB
		M91Z60G4Y	200V		B-34	M91Z60GK4Y	200V		B-50						
		M91Z60G4LG(A)	100V	✪	B-36	M91Z60GK4LG(A)	100V	✪	B-52						
		M91Z60G4DG(A)	110/115V	✪	B-36	M91Z60GK4DG(A)	110/115V	✪	B-52						
		M91Z60G4YG(A)	200V	✪	B-36	M91Z60GK4YG(A)	200V	✪	B-52						
		M91Z60G4GG(A)	220/230V	✪	B-36	M91Z60GK4GG(A)	220/230V	✪	B-52						
	90	M91Z90G4L	100V		B-38	M91Z90GK4L	100V		B-54	MY9G□B			MP9G□B		
		M91Z90G4Y	200V		B-38	M91Z90GK4Y	200V		B-54						
		M91Z90G4LG(A)	100V	✪	B-40	M91Z90GK4LG(A)	100V	✪	B-56						
		M91Z90G4DG(A)	110/115V	✪	B-40	M91Z90GK4DG(A)	110/115V	✪	B-56						
		M91Z90G4YG(A)	200V	✪	B-40	M91Z90GK4YG(A)	200V	✪	B-56						
		M91Z90G4GG(A)	220/230V	✪	B-40	M91Z90GK4GG(A)	220/230V	✪	B-56						

* The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

* Refer to page B-380 for dimensions and permissible torque of high torque gear head.
Refer to page B-382 for dimensions and permissible torque of right-angle gear head.
Refer to page B-384 for dimensions of decimal gear head.

Model list of induction motor

Round shaft motor

✪ Motor compliant with overseas standards
Ⓟ Electrical Appliance and Material Safety Law

Size	Output (W)	Leadwire type		Sealed connector type		
		Model number	Specifications	Model number	Specifications	
42 mm sq.	3	**M41A3S2L**	100V			
	1	**M41A1S4L**	100V			
60 mm sq.	3	**M61X3S4LS**	100V			
	6	**M61X6S4LS**	100V			
		M61X6S4YS	200V			
		M61X6S4LG(A)	100V ✪			
		M61X6S4DG(A)	110/115V ✪			
		M61X6S4YG(A)	200V ✪			
		M61X6S4GG(A)	220/230V ✪			
70 mm sq.	10	**M71X10S4LS**	100V			
		M71X10S4YS	200V			
	15	**M71X15S4LS**	100V			
		M71X15S4YS	200V			
		M71X15S4LG(A)	100V ✪			
		M71X15S4DG(A)	110/115V ✪			
		M71X15S4YG(A)	200V ✪			
		M71X15S4GG(A)	220/230V ✪			
80 mm sq.	15	**M81X15S4LS**	100V			
		M81X15S4YS	200V			
	25	**M81X25S4LS**	100V	**M81X25SK4LS**	100V	Ⓟ
		M81X25S4YS	200V	**M81X25SK4YS**	200V	Ⓟ
		M81X25S4LG(A)	100V ✪	**M81X25SK4LG(A)**	100V ✪	Ⓟ
		M81X25S4DG(A)	110/115V ✪	**M81X25SK4DG(A)**	110/115V ✪	
		M81X25S4YG(A)	200V ✪	**M81X25SK4YG(A)**	200V ✪	Ⓟ
		M81X25S4GG(A)	220/230V ✪	**M81X25SK4GG(A)**	220/230V ✪	
90 mm sq.	40	**M91X40S4LS**	100V	**M91X40SK4LS**	100V	Ⓟ
		M91X40S4YS	200V	**M91X40SK4YS**	200V	Ⓟ
		M91X40S4LG(A)	100V ✪	**M91X40SK4LG(A)**	100V ✪	Ⓟ
		M91X40S4DG(A)	110/115V ✪	**M91X40SK4DG(A)**	110/115V ✪	
		M91X40S4YG(A)	200V ✪	**M91X40SK4YG(A)**	200V ✪	Ⓟ
		M91X40S4GG(A)	220/230V ✪	**M91X40SK4GG(A)**	220/230V ✪	
	60	**M91Z60S4LS**	100V	**M91Z60SK4LS**	100V	Ⓟ
		M91Z60S4YS	200V	**M91Z60SK4YS**	200V	Ⓟ
		M91Z60S4LG(A)	100V ✪	**M91Z60SK4LG(A)**	100V ✪	Ⓟ
		M91Z60S4DG(A)	110/115V ✪	**M91Z60SK4DG(A)**	110/115V ✪	
		M91Z60S4YG(A)	200V ✪	**M91Z60SK4YG(A)**	200V ✪	Ⓟ
		M91Z60S4GG(A)	220/230V ✪	**M91Z60SK4GG(A)**	220/230V ✪	
	90	**M91Z90S4LS**	100V	**M91Z90SK4LS**	100V	Ⓟ
		M91Z90S4YS	200V	**M91Z90SK4YS**	200V	Ⓟ
		M91Z90S4LG(A)	100V ✪	**M91Z90SK4LG(A)**	100V ✪	Ⓟ
		M91Z90S4DG(A)	110/115V ✪	**M91Z90SK4DG(A)**	110/115V ✪	
		M91Z90S4YG(A)	200V ✪	**M91Z90SK4YG(A)**	200V ✪	Ⓟ
		M91Z90S4GG(A)	220/230V ✪	**M91Z90SK4GG(A)**	220/230V ✪	

* The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft motor.
Dimensional outline drawing → Page B-61.
* The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

Induction motor (leadwire)

42 mm sq. 3 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min^{-1})	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
42 mm sq.	M41A3G2L	2	3	100	50	Cont.	10	0.10	2625	0.011 (0.11)	0.15	0.011 (0.11)	1.5 (200V)
					60		9	0.10	3250	0.009 (0.09)	0.15	0.011 (0.11)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-61.

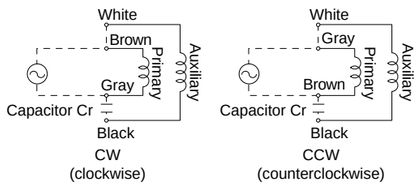
• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

Unit of permissible torque: upper **(mN·m)** / lower **(gf·cm)**

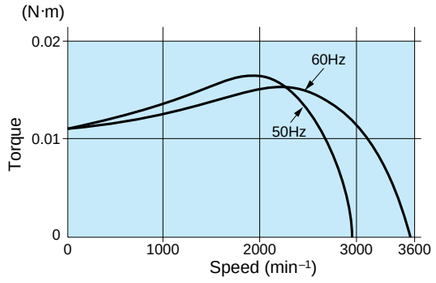
Reduction ratio			3	3.6	5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180
Speed (min^{-1})		50Hz	1000	833	600	500	400	333	240	200	167	120	100	83.3	60	50	40	33.3	30	25	20	16.7
		60Hz	1200	1000	720	600	480	400	288	240	200	144	120	100	72	60	48	40	36	30	24	20
Applicable gear head	M4GA3F to M4GA180F (metal+ball bearing)	50Hz	28 (286)	34 (347)	47 (479)	57 (581)	71 (724)	84 (857)	98 (1000)	127 (1295)	157 (1601)	186 (1897)	225 (2295)	274 (2795)	382 (3896)	461 (4702)	490 (4998)					
		60Hz	24 (245)	28 (286)	39 (398)	47 (479)	59 (602)	71 (724)	81 (826)	98 (1000)	127 (1295)	176 (1795)	186 (1897)	225 (2295)	313 (3192)	382 (3896)	490 (4998)					
Rotational direction			Same as motor rotational direction						Reverse to motor rotational direction			Same as motor rotational direction					Reverse to motor rotational direction					

Connection diagram



Speed-torque characteristics

M41A3G2L

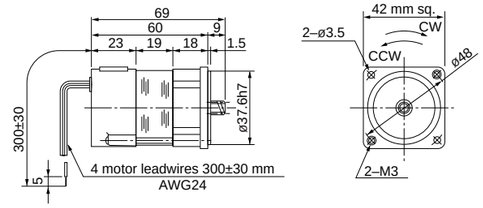


Motor (dimensions)

Scale: 1/3, Unit: mm

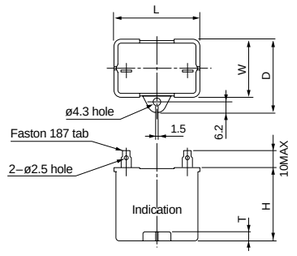
M41A3G2L 2P 3 W 100 V

Mass	Spur gear	Module	Number of teeth
0.3 kg		0.4	10



Capacitor (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

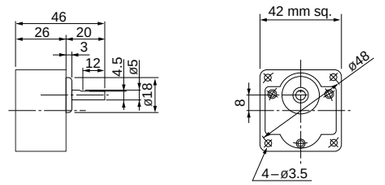
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M41A3G2L	M0PC1.5M20	39.5	16	26.5	30.5	4	M0PC3917

Gear head (dimensions)

Scale: 1/3, Unit: mm

M4GA□F (ball + metal bearing) Mass 0.2 kg: Output shaft D cut

* In the case of 42 mm sq., a ball bearing is used for the output shaft only.



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Induction motor (leadwire)

42 mm sq. 1 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
42 mm sq.	M41A1G4L	4	1	100	50	Cont.	10	0.11	1175	0.0078 (0.08)	0.11	0.015 (0.15)	1.3 (200V)
					60		10	0.11	1575	0.0059 (0.06)	0.11	0.016 (0.16)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-61.

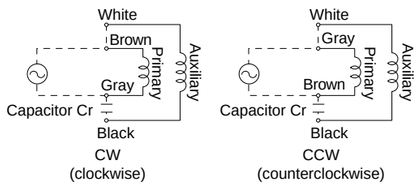
• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

Unit of permissible torque: upper **(mN·m)** / lower **(gf·cm)**

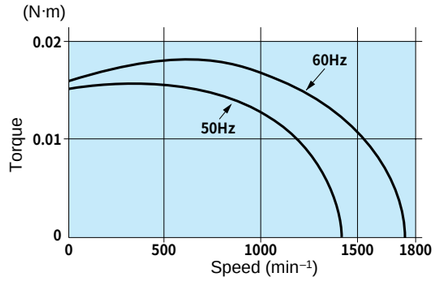
Reduction ratio			3	3.6	5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	120	100	83.3	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	144	120	100	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	M4GA3F to M4GA180F (metal+ball bearing)	50Hz	23 (235)	27 (275)	37 (377)	45 (459)	56 (571)	67 (683)	84 (857)	98 (1000)	118 (1204)	147 (1499)	176 (1795)	216 (2203)	303 (3091)	363 (3703)	411 (4192)	490 (4998)				
		60Hz	19 (194)	23 (235)	31 (316)	37 (377)	47 (479)	56 (571)	77 (785)	84 (857)	98 (1000)	137 (1397)	147 (1499)	176 (1795)	245 (2499)	303 (3091)	303 (3091)	411 (4192)	490 (4998)			
Rotational direction			Same as motor rotational direction						Reverse to motor rotational direction			Same as motor rotational direction					Reverse to motor rotational direction					

Connection diagram



Speed-torque characteristics

M41A1G4L

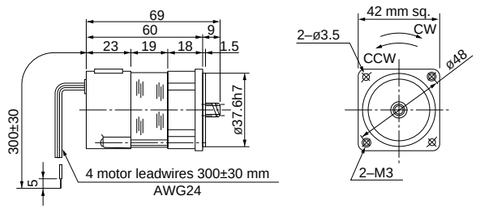


Motor (dimensions)

Scale: 1/3, Unit: mm

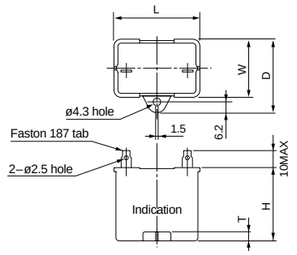
M41A1G4L 4P 1 W 100 V

Mass	Spur gear	Module	Number of teeth
0.3 kg		0.4	10



Capacitor (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

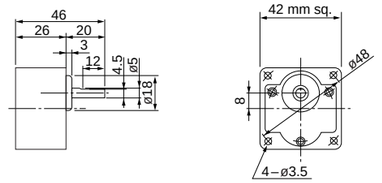
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M41A1G4L	M0PC1.3M20	39.5	16	26.5	30.5	4	M0PC3917

Gear head (dimensions)

Scale: 1/3, Unit: mm

M4GA□F (ball + metal bearing) Mass 0.2 kg: Output shaft D cut

* In the case of 42 mm sq., a ball bearing is used for the output shaft only.



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Induction motor (leadwire)

60 mm sq. 3 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
60 mm sq.	M61X3G4L	4	3	100	50	Cont.	15	0.15	1250	0.022 (0.22)	0.18	0.031 (0.31)	2.0 (200V)
					60		15	0.15	1575	0.018 (0.18)	0.19	0.031 (0.31)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-61.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

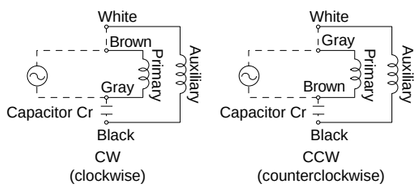
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX6G3BA to MX6G180B (ball bearing)	50Hz	0.048 (0.49)	0.058 (0.59)	0.079 (0.81)	0.095 (0.97)	0.12 (1.2)	0.14 (1.4)	0.16 (1.6)	0.20 (2.0)	0.24 (2.5)	0.28 (2.9)	0.31 (3.2)	0.38 (3.9)	0.46 (4.7)	0.55 (5.6)	0.76 (7.8)	0.92 (9.4)	1.08 (11)	1.27 (13)	1.47 (15)	1.76 (18)	2.16 (22)	2.45 (25)
	MX6G3MA to MX6G180M (metal bearing)	60Hz	0.040 (0.41)	0.048 (0.49)	0.067 (0.68)	0.097 (0.99)	0.098 (1.0)	0.12 (1.2)	0.13 (1.3)	0.17 (1.7)	0.20 (2.0)	0.24 (2.5)	0.25 (2.6)	0.32 (3.3)	0.38 (3.9)	0.46 (4.7)	0.64 (6.5)	0.76 (7.8)	0.90 (9.2)	1.08 (11)	1.27 (13)	1.47 (15)	1.76 (18)	2.16 (22)
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

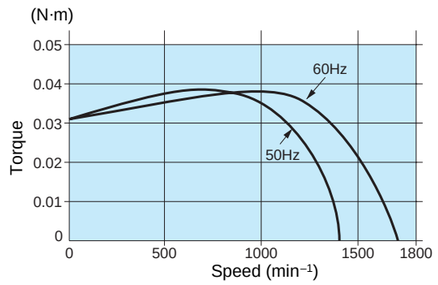
Applicable gear head			Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head		Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
				60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX6G□BA (ball bearing) MX6G□B	MX6G10XB		Permissible torque	N·m	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45
MX6G□MA (metal bearing) MX6G□M				(kgf·cm)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)
			Rotational direction		Same as motor rotational direction		Reverse to motor rotational direction									

Connection diagram



Speed-torque characteristics

M61X3G4L



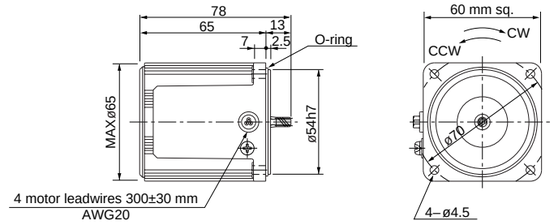
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

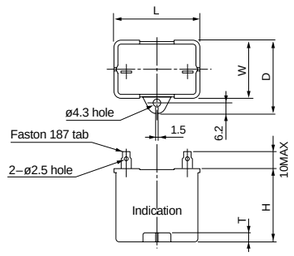
M61X3G4L 4P 3 W 100 V

Mass	Helical gear	Module	Number of teeth
0.56 kg		0.5	6



Capacitor (dimensions) [attachment]

Unit: mm



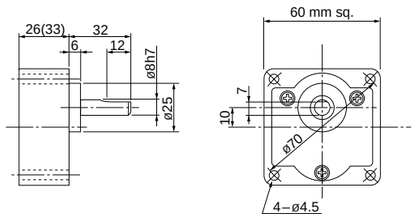
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M61X3G4L	M0PC2M20	39.5	16	26.5	30.5	4	M0PC3917

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX6G□BA (ball bearing) / **MX6G□B** (ball bearing) Mass 0.24/0.3 kg: Output shaft D cut
MX6G□MA (metal bearing) / **MX6G□M** (metal bearing) Mass 0.24/0.3 kg: Output shaft D cut



* Figures in ( ) represent the dimensions of MX6G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX6G□BA (MA).)

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Induction motor (leadwire)

60 mm sq. 6 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
60 mm sq.	M61X6G4L	4	6	100	50	Cont.	20	0.21	1250	0.048 (0.48)	0.30	0.049 (0.5)	2.5 (200V)
					60		20	0.20	1575	0.038 (0.38)	0.30	0.049 (0.5)	
	M61X6G4Y	4	6	200	50	Cont.	20	0.11	1250	0.048 (0.48)	0.15	0.049 (0.5)	0.7 (400V)
					60		20	0.10	1600	0.037 (0.37)	0.15	0.049 (0.5)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-61.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

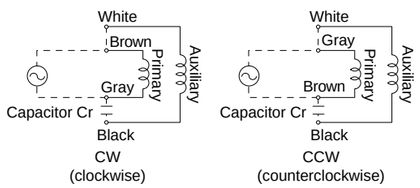
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head: MX6G3BA to MX6G180B (ball bearing)	50Hz	0.098 (1.0)	0.12 (1.2)	0.16 (1.6)	0.19 (1.9)	0.25 (2.6)	0.29 (3.0)	0.33 (3.4)	0.40 (4.1)	0.49 (5.0)	0.59 (6.0)	0.66 (6.7)	0.79 (8.1)	0.95 (9.7)	1.18 (12)	1.57 (16)	1.86 (19)	2.25 (23)	2.45 (25)	2.45 (25)			
Applicable gear head: MX6G3MA to MX6G180M (metal bearing)	60Hz	0.081 (0.83)	0.098 (1.0)	0.13 (1.3)	0.16 (1.6)	0.21 (2.1)	0.25 (2.6)	0.26 (2.7)	0.33 (3.4)	0.40 (4.1)	0.49 (5.0)	0.53 (5.4)	0.66 (6.7)	0.79 (8.1)	0.95 (9.7)	1.27 (13)	1.57 (16)	1.86 (19)	2.25 (23)	2.45 (25)			
Rotational direction		Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

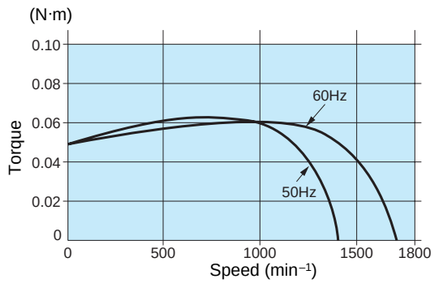
Applicable gear head: Bearing	Decimal gear head	Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
MX6G□BA (ball bearing) MX6G□B	MX6G10XB	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
MX6G□MA (metal bearing) MX6G□M			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
		Permissible torque	N·m (kgf·cm)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)
		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

Connection diagram



Speed-torque characteristics

M61X6G4L



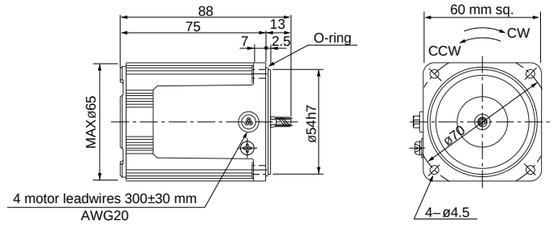
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

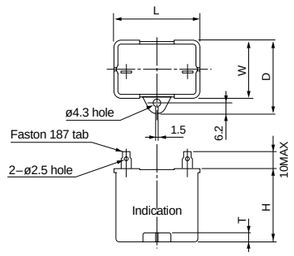
M61X6G4L 4P 6 W 100 V
M61X6G4Y 4P 6 W 200 V

Mass	Helical gear	Module	Number of teeth
0.67 kg		0.5	6



Capacitor (dimensions) [attachment]

Unit: mm



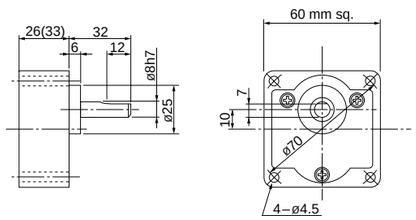
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M61X6G4L	M0PC2.5M20	39.5	16	26.5	30.5	4	M0PC3917
M61X6G4Y	M0PC0.7M40	39.5	16.2	27	27	4	M0PC3917

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX6G□BA (ball bearing) / **MX6G□B** (ball bearing) Mass 0.24/0.3 kg: Output shaft D cut
MX6G□MA (metal bearing) / **MX6G□M** (metal bearing) Mass 0.24/0.3 kg: Output shaft D cut



* Figures in ( ) represent the dimensions of MX6G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX6G□BA (MA).)

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Induction motor (leadwire)

60 mm sq. 6 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
60 mm sq.	M61X6G4LG M61X6G4LGA	4	6	100	50	Cont.	22	0.23	1275	0.045 (0.46)	0.32	0.051 (0.52)	3.5 (250V)
					60		23	0.23	1600	0.036 (0.37)	0.33	0.051 (0.52)	
	M61X6G4DG M61X6G4DGA	4	6	110 115	60 60	Cont.	21 23	0.20 0.21	1600 1625	0.036 (0.37) 0.035 (0.36)	0.33 0.34	0.047 (0.48) 0.051 (0.52)	2.5 (250V)
	M61X6G4YG M61X6G4YGA	4	6	200	50 60	Cont.	21 22	0.11 0.11	1225 1550	0.047 (0.48) 0.037 (0.38)	0.14 0.14	0.051 (0.52) 0.051 (0.52)	0.8 (450V)
	M61X6G4GG M61X6G4GGA	4	6	220 230	50 60 50 60	Cont.	22 21 23 22	0.11 0.10 0.11 0.10	1200 1550 1250 1575	0.048 (0.49) 0.037 (0.38) 0.046 (0.47) 0.036 (0.37)	0.14 0.14 0.15 0.15	0.045 (0.46) 0.045 (0.46) 0.050 (0.51) 0.051 (0.52)	0.6 (450V)

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-61.
• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

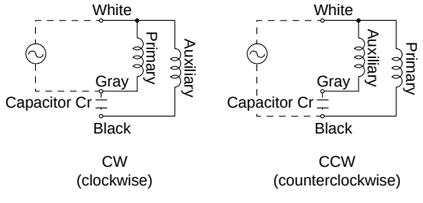
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX6G3BA to MX6G180B (ball bearing)	50Hz	0.098 (1.0)	0.12 (1.2)	0.16 (1.6)	0.19 (1.9)	0.25 (2.6)	0.29 (3.0)	0.33 (3.4)	0.40 (4.1)	0.49 (5.0)	0.59 (6.0)	0.66 (6.7)	0.79 (8.1)	0.95 (9.7)	1.18 (12)	1.57 (16)	1.86 (19)	2.25 (23)	2.45 (25)	2.45 (25)			
	MX6G3MA to MX6G180M (metal bearing)	60Hz	0.081 (0.83)	0.098 (1.0)	0.13 (1.3)	0.16 (1.6)	0.21 (2.1)	0.25 (2.6)	0.26 (2.7)	0.33 (3.4)	0.40 (4.1)	0.49 (5.0)	0.53 (5.4)	0.66 (6.7)	0.79 (8.1)	0.95 (9.7)	1.27 (13)	1.57 (16)	1.86 (19)	2.25 (23)	2.45 (25)			
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

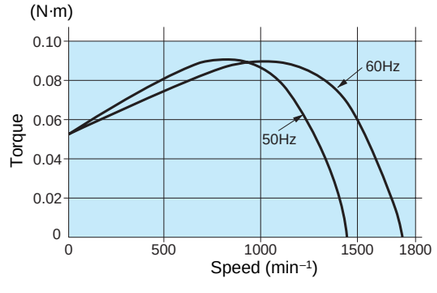
Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX6G□BA (ball bearing) MX6G□B MX6G□MA (metal bearing) MX6G□M	MX6G10XB	Permissible torque	N·m	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45
			(kgf·cm)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)
		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

Connection diagram



Speed-torque characteristics

M61X6G4LG(A)



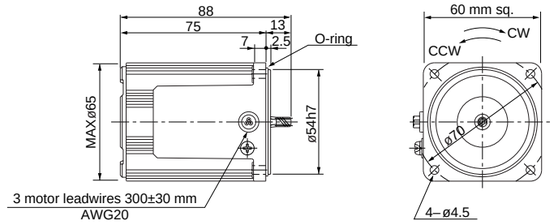
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

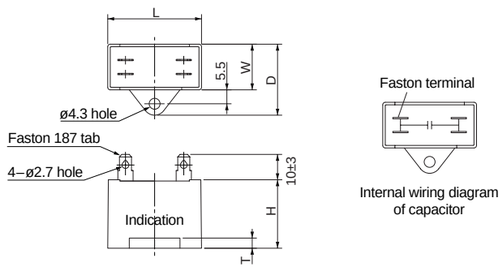
M61X6G4LG(A) 4P 6 W 100 V
M61X6G4DG(A) 4P 6 W 110 V / 115 V
M61X6G4YG(A) 4P 6 W 200 V
M61X6G4GG(A) 4P 6 W 220 V / 230 V

Mass	Helical	Module	Number of teeth
0.67 kg	gear	0.5	6



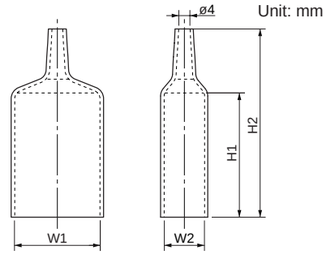
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

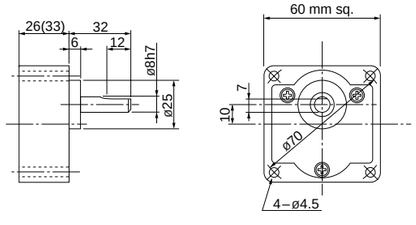
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M61X6G4LG(A)	M0PC3.5M25G	31	17	27	27	4	M0PC3117G	31	17	50	73
M61X6G4DG(A)	M0PC2.5M25G	31	17	27	27	4	M0PC3117G	31	17	50	73
M61X6G4YG(A)	M0PC0.8M45G	31	17	27	27	4	M0PC3117G	31	17	50	73
M61X6G4GG(A)	M0PC0.6M45G	31	14.5	24.5	23.5	4	M0PC3114G	31	14.5	45	68

• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX6G□BA (ball bearing) / **MX6G□B** (ball bearing) Mass 0.24/0.3 kg: Output shaft D cut
MX6G□MA (metal bearing) / **MX6G□M** (metal bearing) Mass 0.24/0.3 kg: Output shaft D cut



* Figures in ( ) represent the dimensions of MX6G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX6G□BA (MA).)
(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Induction motor (leadwire)

70 mm sq. 10 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
70 mm sq.	M71X10G4L	4	10	100	50	Cont.	26	0.27	1250	0.074 (0.76)	0.42	0.062 (0.63)	3 (200V)
					60		26	0.26	1575	0.059 (0.60)	0.40	0.062 (0.63)	
	M71X10G4Y	4	10	200	50	Cont.	27	0.14	1250	0.075 (0.77)	0.20	0.064 (0.65)	1 (400V)
					60		27	0.13	1575	0.060 (0.61)	0.20	0.064 (0.65)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-61.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

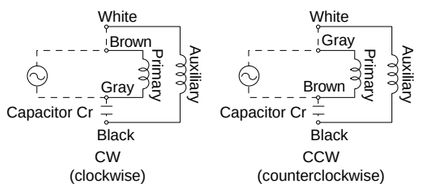
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head: MX7G3BA to MX7G180B (ball bearing)	50Hz	0.16 (1.6)	0.19 (19)	0.25 (2.0)	0.30 (3.1)	0.38 (3.9)	0.46 (4.7)	0.51 (5.2)	0.64 (6.5)	0.77 (7.9)	0.93 (9.5)	0.98 (10)	1.27 (13)	1.47 (15)	1.76 (18)	2.55 (26)	3.04 (31)	3.63 (37)	4.31 (44)	4.80 (49)	4.90 (50)	4.90 (50)		
Applicable gear head: MX7G3MA to MX7G180M (metal bearing)	60Hz	0.13 (1.3)	0.16 (1.6)	0.22 (2.2)	0.25 (2.6)	0.32 (3.3)	0.38 (3.9)	0.44 (4.5)	0.53 (5.4)	0.64 (7.9)	0.77 (7.9)	0.85 (8.7)	1.08 (11)	1.27 (13)	1.47 (15)	2.16 (22)	2.55 (26)	3.04 (31)	3.63 (37)	4.03 (41)	4.80 (49)	4.90 (50)		
Rotational direction		Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

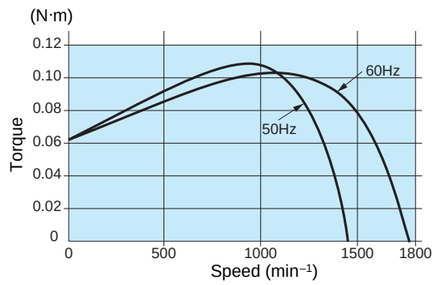
Applicable gear head: Bearing	Decimal gear head	Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
		Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX7G□BA (ball bearing) / MX7G□B	MX7G10XB	Permissible torque	N·m (kgf·cm)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)
MX7G□MA (metal bearing) / MX7G□M		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

Connection diagram



Speed-torque characteristics

M71X10G4L



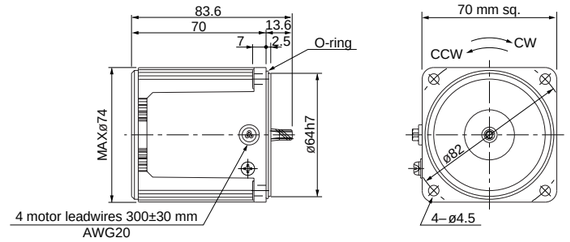
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

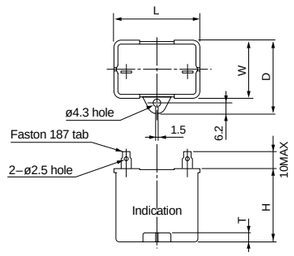
M71X10G4L 4P 10 W 100 V
M71X10G4Y 4P 10 W 200 V

Mass	Helical gear	Module	Number of teeth
0.84 kg		0.5	7



Capacitor (dimensions) [attachment]

Unit: mm



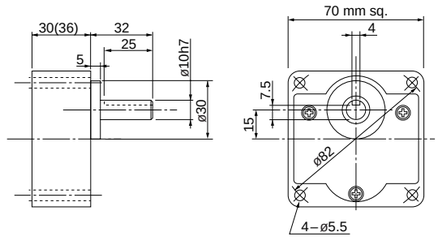
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M71X10G4L	M0PC3M20	39.5	16	26.5	30.5	4	M0PC3917
M71X10G4Y	M0PC1M40	39.5	16.2	27	27	4	M0PC3917

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX7G□BA (ball bearing) / **MX7G□B** (ball bearing) Mass 0.38/0.45 kg
MX7G□MA (metal bearing) / **MX7G□M** (metal bearing) Mass 0.38/0.45 kg

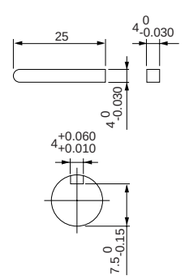


* Figures in ( ) represent the dimensions of MX7G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX7G□BA (MA).)

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MX7G□BA(B)
MX7G□MA(M)



Induction motor (leadwire)

70 mm sq. 15 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
70 mm sq.	M71X15G4L	4	15	100	50	Cont.	34	0.37	1250	0.11 (1.1)	0.61	0.077 (0.79)	4 (200V)
					60		33	0.33	1575	0.088 (0.89)	0.57	0.077 (0.79)	
	M71X15G4Y	4	15	200	50	Cont.	33	0.18	1300	0.11 (1.1)	0.30	0.077 (0.79)	1 (400V)
					60		34	0.17	1600	0.088 (0.89)	0.29	0.077 (0.79)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-61.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

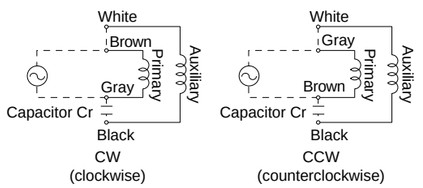
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX7G3BA to MX7G180B (ball bearing)	50Hz	0.24 (2.5)	0.28 (2.9)	0.39 (4.0)	0.47 (4.8)	0.59 (6.0)	0.71 (7.2)	0.80 (8.2)	0.98 (10)	1.18 (12)	1.37 (14)	1.57 (16)	1.86 (19)	2.25 (23)	2.74 (28)	3.82 (39)	4.61 (47)	4.90 (50)	4.90 (50)				
	MX7G3MA to MX7G180M (metal bearing)	60Hz	0.20 (2.0)	0.24 (2.5)	0.32 (3.3)	0.39 (4.0)	0.49 (5.0)	0.59 (6.0)	0.66 (6.7)	0.81 (8.3)	0.98 (10)	1.18 (12)	1.27 (13)	1.57 (16)	1.86 (19)	2.25 (23)	3.23 (33)	3.82 (39)	4.80 (49)	4.90 (50)				
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

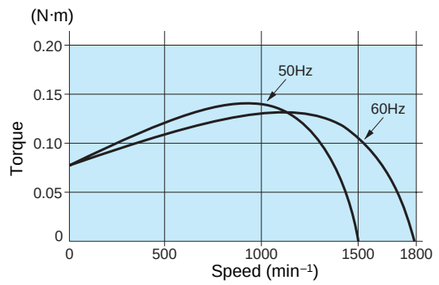
Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX7G□BA (ball bearing) MX7G□B	MX7G10XB	Permissible torque	N·m (kgf·cm)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)
MX7G□MA (metal bearing) MX7G□M		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

Connection diagram



Speed-torque characteristics

M71X15G4L



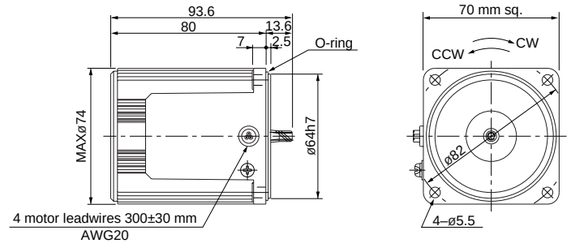
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

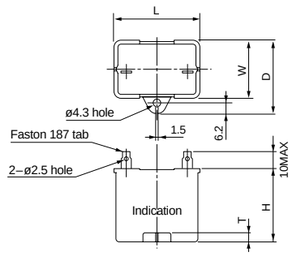
M71X15G4L 4P 15 W 100 V
M71X15G4Y 4P 15 W 200 V

Mass	Helical	Module	Number of teeth
1.1 kg	gear	0.5	7



Capacitor (dimensions) [attachment]

Unit: mm



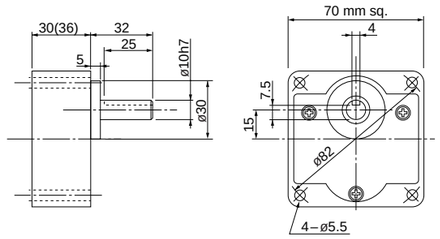
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M71X15G4L	M0PC4M20	39.5	16	26.5	30.5	4	M0PC3917
M71X15G4Y	M0PC1M40	39.5	16.2	27	27	4	M0PC3917

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX7G□BA (ball bearing) / **MX7G□B** (ball bearing) Mass 0.38/0.45 kg: Output shaft D cut
MX7G□MA (metal bearing) / **MX7G□M** (metal bearing) Mass 0.38/0.45 kg: Output shaft D cut

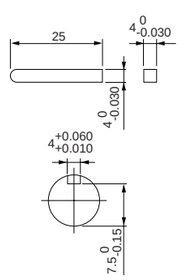


* Figures in ( ) represent the dimensions of MX7G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX7G□BA (MA).)

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MX7G□BA(B)
MX7G□MA(M)



Induction motor (leadwire)

70 mm sq. 15 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
70 mm sq.	M71X15G4LG M71X15G4LGA	4	15	100	50	Cont.	34	0.35	1250	0.11 (1.2)	0.57	0.090 (0.92)	5.5 (250V)
					60		35	0.35	1600	0.090 (0.91)	0.56	0.090 (0.92)	
	M71X15G4DG M71X15G4DGA	4	15	110 115	60 60	Cont.	34 36	0.31 0.32	1600 1625	0.090 (0.91) 0.088 (0.90)	0.58 0.61	0.090 (0.92) 0.10 (1.0)	4.5 (250V)
	M71X15G4YG M71X15G4YGA	4	15	200	50 60	Cont.	34 35	0.17 0.18	1175 1550	0.12 (1.2) 0.092 (0.94)	0.24 0.24	0.090 (0.92) 0.090 (0.92)	1.3 (450V)
	M71X15G4GG M71X15G4GGA	4	15	220 230	50 60 50 60	Cont.	35 37 36 38	0.16 0.17 0.16 0.17	1275 1600 1300 1625	0.11 (1.1) 0.090 (0.91) 0.11 (1.1) 0.088 (0.90)	0.27 0.26 0.28 0.27	0.10 (1.0) 0.10 (1.0) 0.11 (1.1) 0.11 (1.1)	1.2 (450V)

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-61.
• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

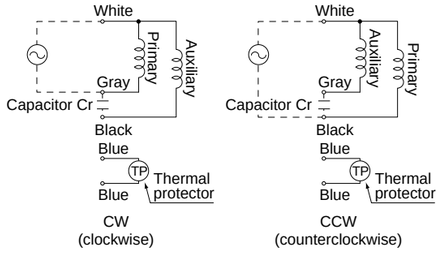
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX7G3BA to MX7G180B (ball bearing)	50Hz	0.24 (2.5)	0.28 (2.9)	0.39 (4.0)	0.47 (4.8)	0.59 (6.0)	0.71 (7.2)	0.80 (8.2)	0.98 (10)	1.18 (12)	1.37 (14)	1.57 (16)	1.86 (19)	2.25 (23)	2.74 (28)	3.82 (39)	4.61 (47)	4.90 (50)	4.90 (50)				
	MX7G3MA to MX7G180M (metal bearing)	60Hz	0.20 (2.0)	0.24 (2.5)	0.32 (3.3)	0.39 (4.0)	0.49 (5.0)	0.59 (6.0)	0.66 (6.7)	0.81 (8.3)	0.98 (10)	1.18 (12)	1.27 (13)	1.57 (16)	1.86 (19)	2.25 (23)	3.23 (33)	3.82 (39)	4.80 (49)	4.90 (50)				
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX7G□BA (ball bearing) MX7G□B (ball bearing) MX7G□MA (metal bearing) MX7G□M (metal bearing)	MX7G10XB	Permissible torque	N·m	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90
			(kgf·cm)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)
		Rotational direction		Same as motor rotational direction		Reverse to motor rotational direction									

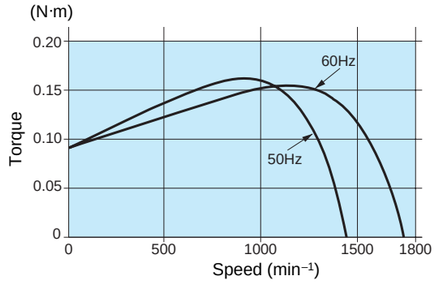
Connection diagram



(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

M71X15G4LG(A)



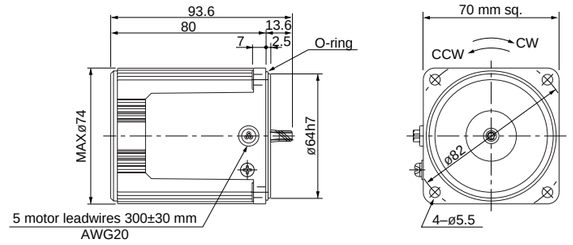
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

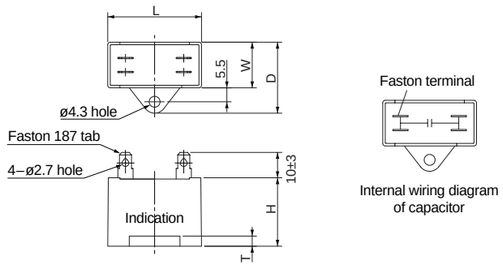
M71X15G4LG(A) 4P 15W 100 V
M71X15G4DG(A) 4P 15W 110 V / 115 V
M71X15G4YG(A) 4P 15W 200 V
M71X15G4GG(A) 4P 15W 220 V / 230 V

Mass	Helical gear	Module	Number of teeth
1.1 kg		0.5	7



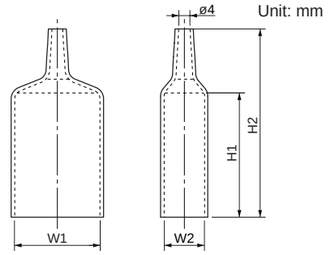
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

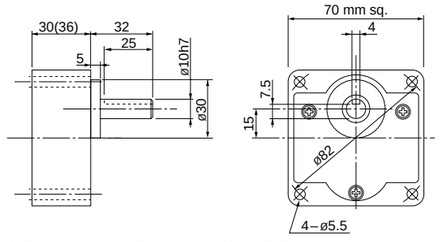
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M71X15G4LG(A)	M0PC5.5M25G	38	21	31	31	4	M0PC3821G	38	21	55	78
M71X15G4DG(A)	M0PC4.5M25G	37	18	28	27	4	M0PC3718G	37	18	50	73
M71X15G4YG(A)	M0PC1.3M45G	38	19	29	29	4	M0PC3819G	38	19	50	73
M71X15G4GG(A)	M0PC1.2M45G	37	18	28	27	4	M0PC3718G	37	18	50	73

• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX7G□BA (ball bearing) / **MX7G□B** (ball bearing) Mass 0.38/0.45 kg
MX7G□MA (metal bearing) / **MX7G□M** (metal bearing) Mass 0.38/0.45 kg

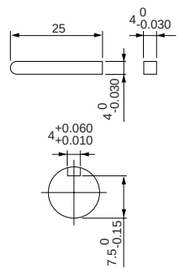


* Figures in ( ) represent the dimensions of MX7G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX7G□BA (MA).)

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MX7G□BA(B)
MX7G□MA(M)



Induction motor (leadwire)

80 mm sq. 15 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
80 mm sq.	M81X15G4L	4	15	100	50	Cont.	36	0.39	1225	0.12 (1.2)	0.62	0.10 (1.0)	4 (200V)
					60		35	0.35	1550	0.09 (0.93)	0.60	0.10 (1.0)	
	M81X15G4Y	4	15	200	50	Cont.	36	0.19	1225	0.12 (1.2)	0.30	0.10 (1.0)	1 (400V)
					60		35	0.18	1550	0.09 (0.95)	0.30	0.10 (1.0)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-61.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

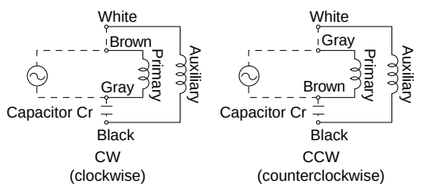
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX8G3B to MX8G180B (ball bearing)	50Hz	0.24 (2.4)	0.28 (2.9)	0.39 (4.0)	0.47 (4.8)	0.59 (6.0)	0.71 (7.2)	0.80 (8.2)	0.98 (10)	1.18 (12)	1.37 (14)	1.57 (16)	1.86 (19)	2.25 (23)	2.74 (28)	3.82 (39)	4.61 (47)	5.49 (56)	6.57 (68)	7.35 (75)	7.84 (80)	7.84 (80)	
	MX8G3M to MX8G180M (metal bearing)	60Hz	0.20 (2.0)	0.24 (2.4)	0.32 (3.3)	0.39 (4.0)	0.49 (5.0)	0.59 (6.0)	0.66 (6.7)	0.81 (8.3)	0.98 (10)	1.18 (12)	1.27 (13)	1.57 (16)	1.86 (19)	2.25 (23)	3.23 (33)	3.82 (39)	4.61 (47)	5.49 (56)	6.17 (63)	7.35 (75)	7.84 (80)		
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

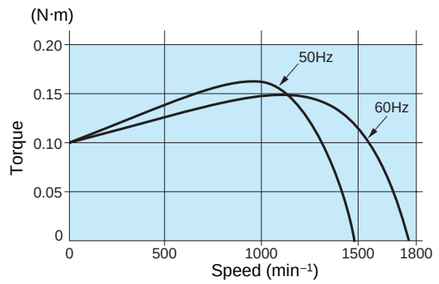
Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX8G□B (ball bearing) MX8G□M (metal bearing)	MX8G10XB	Permissible torque	N·m (kgf·cm)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)
		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

Connection diagram



Speed-torque characteristics

M81X15G4L



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

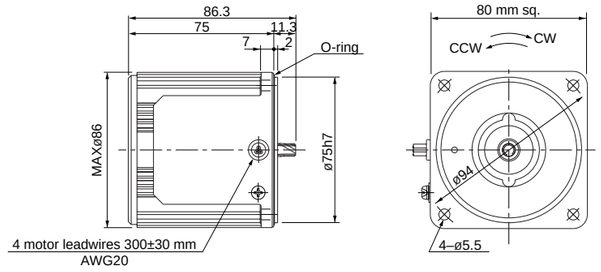
Features B-2 | System configuration B-3 | Coding system B-3 | Model list B-4

Motor (dimensions)

Scale: 1/3, Unit: mm

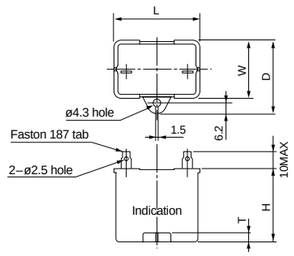
M81X15G4L 4P 15 W 100 V
M81X15G4Y 4P 15 W 200 V

Mass	Helical	Module	Number of teeth
1.2 kg	gear	0.5	9



Capacitor (dimensions) [attachment]

Unit: mm



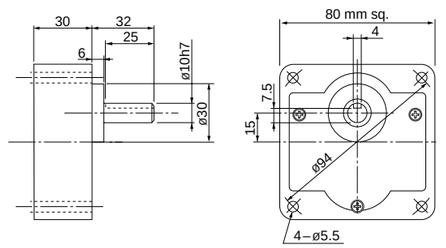
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M81X15G4L	M0PC4M20	39.5	16	26.5	30.5	4	M0PC3917
M81X15G4Y	M0PC1M40	39.5	16.2	27	27	4	M0PC3917

Gear head (dimensions)

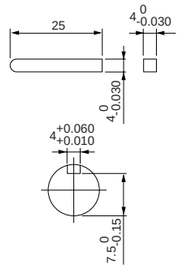
Scale: 1/3, Unit: mm

MX8G□B (ball bearing) / **MX8G□M** (metal bearing) Mass 0.6 kg



Key and keyway (dimensions) [attachment]

MX8G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-59 | Round shaft motor dimensions B-61 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Induction motor (leadwire)

80 mm sq. 25 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
80 mm sq.	M81X25G4L	4	25	100	50	Cont.	51	0.55	1250	0.19 (1.9)	0.98	0.16 (1.6)	6 (200V)
					60		49	0.48	1550	0.15 (1.5)	0.94	0.16 (1.6)	
	M81X25G4Y	4	25	200	50	Cont.	51	0.27	1250	0.19 (1.9)	0.50	0.16 (1.6)	1.5 (400V)
					60		49	0.24	1575	0.15 (1.5)	0.47	0.16 (1.6)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-61.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

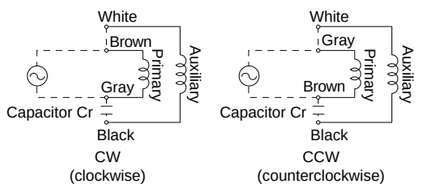
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX8G3B to MX8G180B (ball bearing)	50Hz	0.39 (4.0)	0.47 (4.8)	0.66 (6.7)	0.78 (8.0)	0.98 (10)	1.18 (12)	1.27 (13)	1.57 (16)	1.96 (20)	2.35 (24)	2.55 (26)	3.14 (32)	3.82 (39)	4.61 (47)	6.37 (65)	7.64 (78)	7.84 (80)					
	MX8G3M to MX8G180M (metal bearing)	60Hz	0.32 (3.3)	0.39 (4.0)	0.55 (5.6)	0.66 (6.7)	0.81 (8.3)	0.98 (10)	1.08 (11)	1.27 (13)	1.57 (16)	1.96 (20)	2.06 (21)	2.65 (27)	3.14 (32)	3.82 (39)	5.29 (54)	6.37 (65)	7.84 (80)					
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

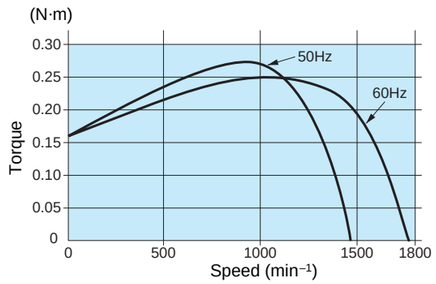
Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX8G□B (ball bearing) MX8G□M (metal bearing)	MX8G10XB	Permissible torque	N·m (kgf·cm)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)
		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

Connection diagram



Speed-torque characteristics

M81X25G4L

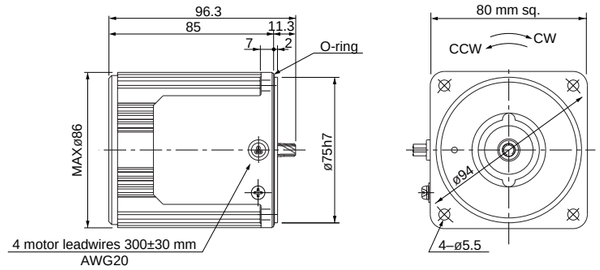


Motor (dimensions)

Scale: 1/3, Unit: mm

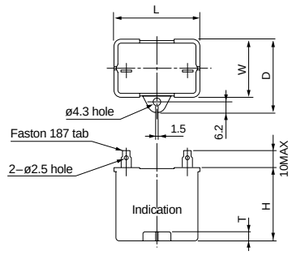
M81X25G4L 4P 25 W 100 V
M81X25G4Y 4P 25 W 200 V

Mass	Helical gear	Module	Number of teeth
1.5 kg		0.5	9



Capacitor (dimensions) [attachment]

Unit: mm



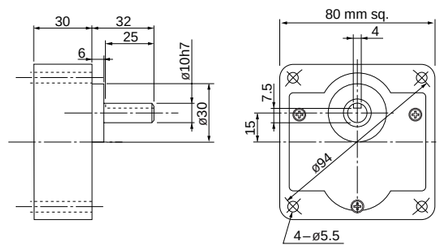
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M81X25G4L	M0PC6M20	39.5	17.5	28	30.5	4	M0PC3917
M81X25G4Y	M0PC1.5M40	39.5	22	32.5	32.5	4	M0PC3922

Gear head (dimensions)

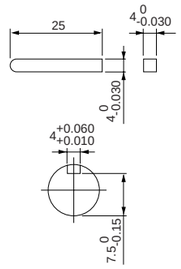
Scale: 1/3, Unit: mm

MX8G□B (ball bearing) / **MX8G□M** (metal bearing) Mass 0.6 kg



Key and keyway (dimensions) [attachment]

MX8G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Induction motor (leadwire)

80 mm sq. 25 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
80 mm sq.	M81X25G4LG M81X25G4LGA	4	25	100	50	Cont.	55	0.59	1250	0.19 (1.9)	1.1	0.16 (1.6)	8 (250V)
					60		50	0.50	1575	0.15 (1.5)	1.0	0.16 (1.6)	
	M81X25G4DG M81X25G4DGA	4	25	110	60	Cont.	52	0.50	1575	0.15 (1.5)	1.1	0.14 (1.4)	6 (250V)
				115	60		53	0.50	1600	0.15 (1.5)	1.1	0.15 (1.5)	
	M81X25G4YG M81X25G4YGA	4	25	200	50	Cont.	54	0.27	1200	0.20 (2.0)	0.43	0.16 (1.6)	2.1 (450V)
					60		54	0.27	1550	0.15 (1.6)	0.42	0.16 (1.6)	
	M81X25G4GG M81X25G4GGA	4	25	220	50	Cont.	59	0.29	1200	0.20 (2.0)	0.46	0.15 (1.5)	1.5 (450V)
					60		51	0.23	1550	0.15 (1.6)	0.44	0.15 (1.5)	
				230	50		59	0.28	1250	0.19 (1.9)	0.48	0.16 (1.6)	
					60		52	0.23	1575	0.15 (1.5)	0.45	0.16 (1.6)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-61.
• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

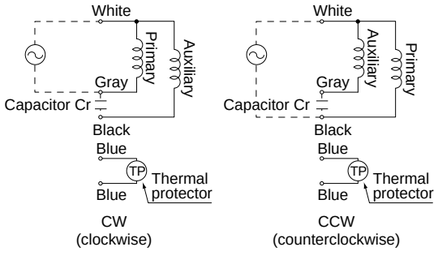
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head: MX8G3B to MX8G180B (ball bearing)	50Hz	0.39 (4.0)	0.47 (4.8)	0.66 (6.7)	0.78 (8.0)	0.98 (10)	1.18 (12)	1.27 (13)	1.57 (16)	1.96 (20)	2.35 (24)	2.55 (26)	3.14 (32)	3.82 (39)	4.61 (47)	6.37 (65)	7.64 (78)	7.84 (80)					
Applicable gear head: MX8G3M to MX8G180M (metal bearing)	60Hz	0.32 (3.3)	0.39 (4.0)	0.55 (5.6)	0.66 (6.7)	0.81 (8.3)	0.98 (10)	1.08 (11)	1.27 (13)	1.57 (16)	1.96 (20)	2.06 (21)	2.65 (27)	3.14 (32)	3.82 (39)	5.29 (54)	6.37 (65)	7.84 (80)					
Rotational direction		Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head: Bearing	Decimal gear head	Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
		Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX8G□B (ball bearing) MX8G□M (metal bearing)	MX8G10XB	Permissible torque	N·m	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84
			(kgf·cm)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)
		Rotational direction		Same as motor rotational direction		Reverse to motor rotational direction									

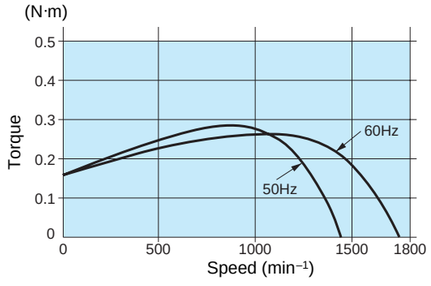
Connection diagram



(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

M81X25G4LG(A)



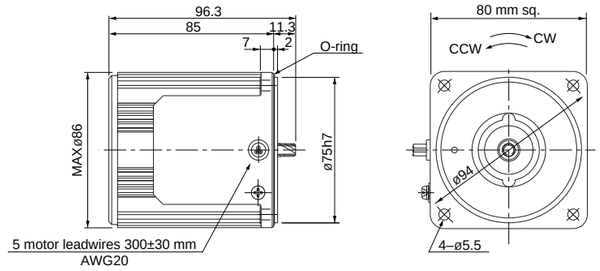
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

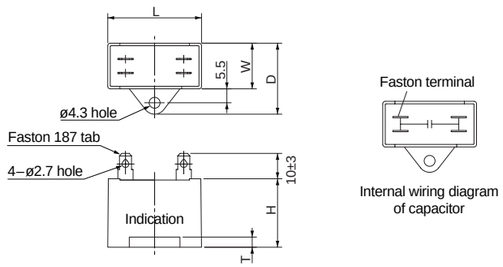
M81X25G4LG(A) 4P 25 W 100 V
M81X25G4DG(A) 4P 25 W 110 V / 115 V
M81X25G4YG(A) 4P 25 W 200 V
M81X25G4GG(A) 4P 25 W 220 V / 230 V

Mass	Helical	Module	Number of teeth
1.5 kg	gear	0.5	9



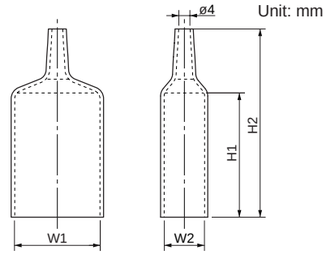
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

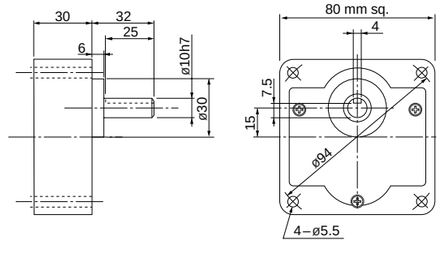
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M81X25G4LG(A)	M0PC8M25G	48	21	31	31	4	M0PC4821G	48	21	55	78
M81X25G4DG(A)	M0PC6M25G	38	21	31	31	4	M0PC3821G	38	21	55	78
M81X25G4YG(A)	M0PC2.1M45G	48	21	31	31	4	M0PC4821G	48	21	55	78
M81X25G4GG(A)	M0PC1.5M45G	38	21	31	31	4	M0PC3821G	38	21	55	78

• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

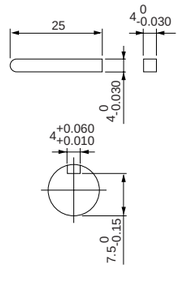
Scale: 1/3, Unit: mm

MX8G□B (ball bearing) / **MX8G□M** (metal bearing) Mass 0.6 kg



Key and keyway (dimensions) [attachment]

MX8G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Induction motor (leadwire)

90 mm sq. 40 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min^{-1})	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M91X40G4L	4	40	100	50	Cont.	78	0.86	1225	0.30 (3.1)	1.5	0.24 (2.4)	10 (200V)
					60		72	0.72	1550	0.25 (2.5)	1.5	0.25 (2.5)	
	M91X40G4Y	4	40	200	50	Cont.	79	0.43	1250	0.30 (3.1)	0.83	0.25 (2.5)	2.5 (400V)
					60		72	0.36	1575	0.24 (2.4)	0.76	0.25 (2.5)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-61.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

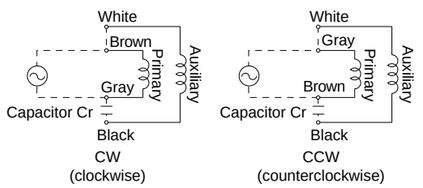
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min^{-1})		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX9G3B to MX9G180B (ball bearing)	50Hz	0.66 (6.7)	0.78 (8.0)	1.08 (11)	1.27 (13)	1.57 (16)	1.86 (19)	2.25 (23)	2.74 (28)	3.23 (33)	3.92 (40)	4.41 (45)	5.29 (54)	6.37 (65)	7.94 (81)	9.80 (100)	9.80 (100)						
	MX9G3M to MX9G180M (metal bearing)	60Hz	0.55 (5.6)	0.66 (6.7)	0.90 (9.2)	1.08 (11)	1.27 (13)	1.57 (16)	1.76 (18)	2.25 (23)	2.74 (28)	3.23 (33)	3.53 (36)	4.41 (45)	5.29 (54)	6.37 (65)	8.82 (90)	9.80 (100)						
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

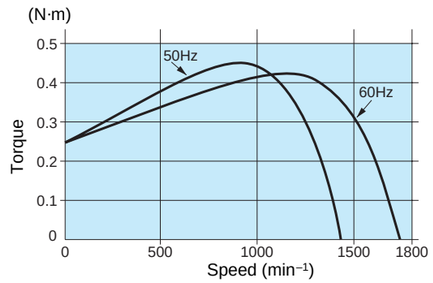
Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min^{-1})	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX9G□B (ball bearing) MX9G□M (metal bearing)	MX9G10XB	Permissible torque	N·m (kgf·cm)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)
		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

Connection diagram



Speed-torque characteristics

M91X40G4L



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

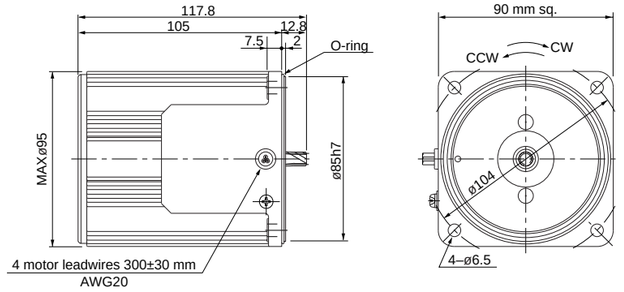
Features B-2 | System configuration B-3 | Coding system B-3 | Model list B-4

Motor (dimensions)

Scale: 1/3, Unit: mm

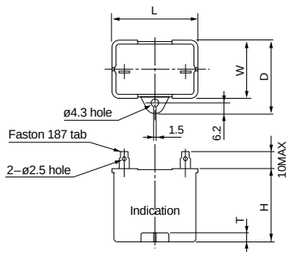
M91X40G4L 4P 40 W 100 V
M91X40G4Y 4P 40 W 200 V

Mass	Helical gear	Module	Number of teeth
2.4 kg		0.55	9



Capacitor (dimensions) [attachment]

Unit: mm



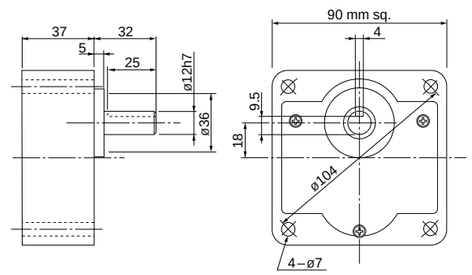
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M91X40G4L	M0PC10M20	39.5	26.7	37	32	4	M0PC3926
M91X40G4Y	M0PC2.5M40	49.7	24	34.5	34.5	4	M0PC5026

Gear head (dimensions)

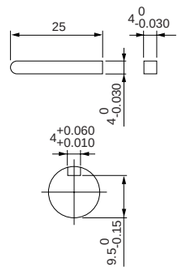
Scale: 1/3, Unit: mm

MX9G□B (ball bearing) / **MX9G□M** (metal bearing) Mass 0.8 kg



Key and keyway (dimensions) [attachment]

MX9G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-59 | Round shaft motor dimensions B-61 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Induction motor (leadwire)

cULus CE 90 mm sq. 40 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M91X40G4LG M91X40G4LGA	4	40	100	50	Cont.	76	0.83	1250	0.31 (3.1)	1.7	0.26 (2.7)	12 (250V)
					60		70	0.70	1600	0.24 (2.4)	1.5	0.26 (2.7)	
	M91X40G4DG M91X40G4DGA	4	40	110	60	Cont.	72	0.67	1625	0.24 (2.4)	1.7	0.26 (2.7)	10 (250V)
				115	60		74	0.68	1625	0.24 (2.4)	1.8	0.27 (2.8)	
	M91X40G4YG M91X40G4YGA	4	40	200	50	Cont.	77	0.39	1175	0.33 (3.3)	0.64	0.26 (2.7)	3 (450V)
					60		77	0.39	1525	0.25 (2.6)	0.62	0.26 (2.7)	
	M91X40G4GG M91X40G4GGA	4	40	220	50	Cont.	78	0.37	1250	0.31 (3.1)	0.69	0.26 (2.7)	2.5 (450V)
					60		74	0.34	1575	0.24 (2.5)	0.65	0.26 (2.7)	
				230	50		79	0.37	1275	0.30 (3.1)	0.72	0.28 (2.9)	
					60		77	0.33	1600	0.24 (2.4)	0.68	0.28 (2.9)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-61.
• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

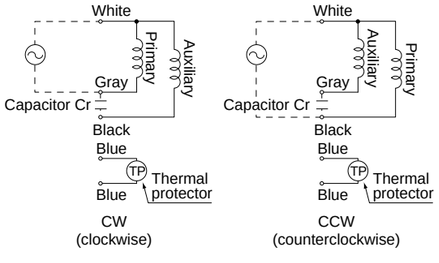
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head: MX9G3B to MX9G180B (ball bearing)	50Hz	0.66 (6.7)	0.78 (8.0)	1.08 (11)	1.27 (13)	1.57 (16)	1.86 (19)	2.25 (23)	2.74 (28)	3.23 (33)	3.92 (40)	4.41 (45)	5.29 (54)	6.37 (65)	7.94 (81)	9.80 (100)	9.80 (100)						
Applicable gear head: MX9G3M to MX9G180M (metal bearing)	60Hz	0.55 (5.6)	0.66 (6.7)	0.90 (9.2)	1.08 (11)	1.27 (13)	1.57 (16)	1.76 (18)	2.25 (23)	2.74 (28)	3.23 (33)	3.53 (36)	4.41 (45)	5.29 (54)	6.37 (65)	8.82 (90)	9.80 (100)						
Rotational direction		Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX9G□B (ball bearing) MX9G□M (metal bearing)	MX9G10XB	Permissible torque	N·m (kgf·cm)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)
		Rotational direction		Same as motor rotational direction		Reverse to motor rotational direction									

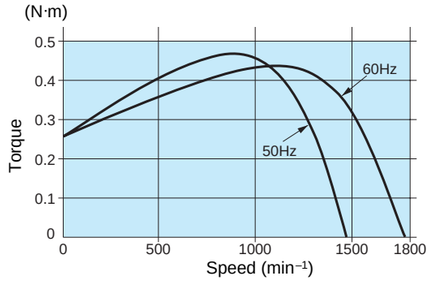
Connection diagram



(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

M91X40G4LG(A)



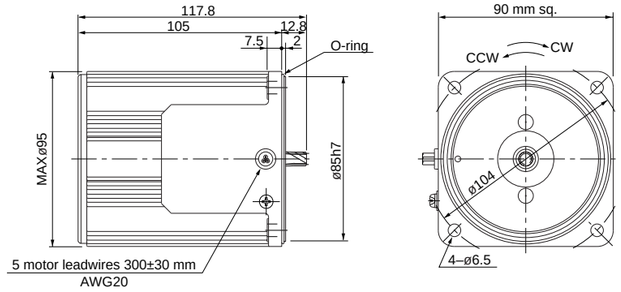
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

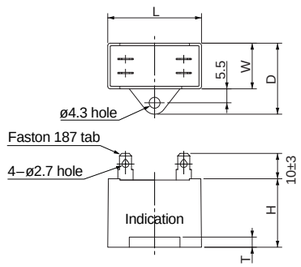
M91X40G4LG(A)	4P	40 W	100 V
M91X40G4DG(A)	4P	40 W	110 V / 115 V
M91X40G4YG(A)	4P	40 W	200 V
M91X40G4GG(A)	4P	40 W	220 V / 230 V

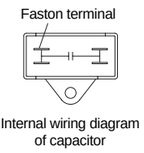
Mass	Helical gear	Module	Number of teeth
1.4 kg		0.55	9



Capacitor (dimensions) [attachment]

Unit: mm

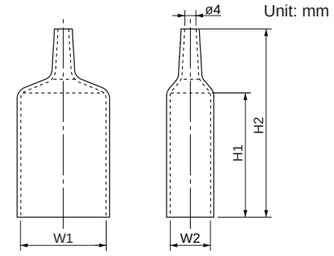




Internal wiring diagram of capacitor

Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

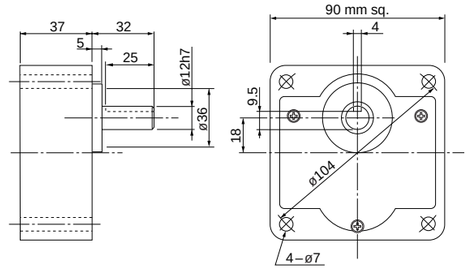
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M91X40G4LG(A)	M0PC12M25G	58	22	32	35	4	M0PC5822G	58	22	55	78
M91X40G4DG(A)	M0PC10M25G	58	21	31	31	4	M0PC5821G	58	21	55	78
M91X40G4YG(A)	M0PC3M45G	58	21	31	31	4	M0PC4821G	48	21	55	78
M91X40G4GG(A)	M0PC2.5M45G	48	21	31	31	4	M0PC4821G	48	21	55	78

• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

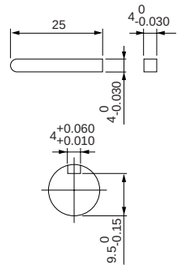
Scale: 1/3, Unit: mm

MX9G□B (ball bearing) / **MX9G□M** (metal bearing) Mass 0.8 kg



Key and keyway (dimensions) [attachment]

MX9G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Induction motor (leadwire)

90 mm sq. 60 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M91Z60G4L	4	60	100	50	Cont.	118	1.3	1250	0.46 (4.7)	2.2	0.41 (4.2)	15 (210V)
					60		117	1.2	1550	0.36 (3.7)	2.2	0.42 (4.3)	
	M91Z60G4Y	4	60	200	50	Cont.	120	0.65	1250	0.46 (4.6)	1.1	0.42 (4.3)	3.8 (400V)
					60		119	0.59	1550	0.36 (3.7)	1.1	0.44 (4.5)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-62.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

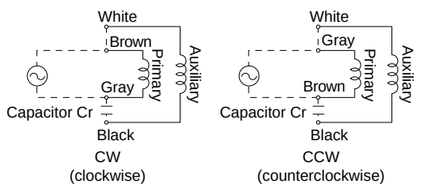
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head	MZ9G3BA to MZ9G200B (ball bearing / hinge not attached)	50Hz	0.98 (9.99)	1.18 (12)	1.57 (16)	1.96 (20)	2.35 (24)	2.94 (30)	3.14 (32)	3.92 (40)	4.70 (48)	5.59 (57)	6.27 (64)	7.55 (77)	9.11 (93)	11.0 (112)	15.2 (155)	17.8 (182)	19.6 (200)						
	MY9G3MA to MY9G200M (metal bearing / hinge attached)	60Hz	0.78 (8.0)	0.98 (9.99)	1.37 (14)	1.57 (16)	1.96 (20)	2.35 (24)	2.65 (27)	3.33 (34)	3.92 (40)	4.70 (48)	5.29 (54)	6.47 (66)	7.55 (77)	9.11 (93)	12.6 (129)	15.2 (155)	19.6 (200)						
Rotational direction			Same as motor rotational direction							Reverse to motor rotational direction						Same as motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

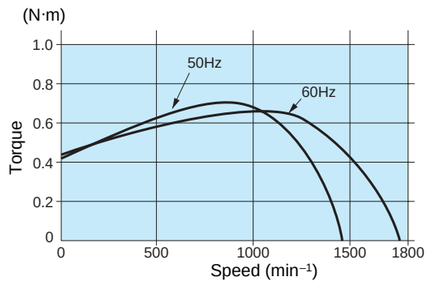
Applicable gear head		Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MZ9G□B (ball bearing / Hinge not attached) MY9G□M (metal bearing / Hinge attached)	MZ9G10XB	Permissible torque	N·m (kgf·cm)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

Connection diagram



Speed-torque characteristics

M91Z60G4L



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

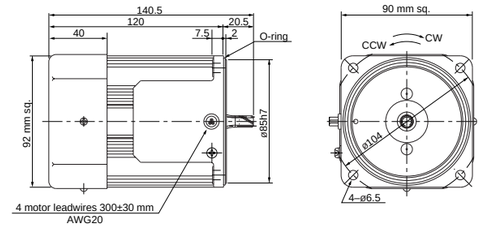
Features B-2 | System configuration B-3 | Coding system B-3 | Model list B-4

Motor (dimensions)

Scale: 1/4, Unit: mm

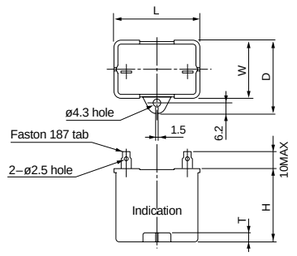
M91Z60G4L 4P 60 W 100 V (with fan)
M91Z60G4Y 4P 60 W 200 V (with fan)

Mass	Helical	Module	Number of teeth
2.7 kg	gear	0.6	9



Capacitor (dimensions) [attachment]

Unit: mm



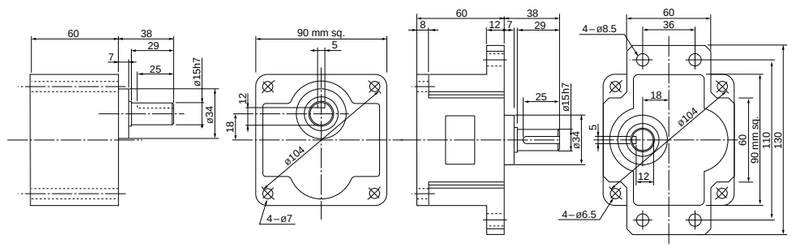
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M91Z60G4L	M0PC15M21	39.5	26.7	37	41	4	M0PC3926
M91Z60G4Y	M0PC3.8M40	50	26.7	37.5	38	4	M0PC5026

Gear head (dimensions)

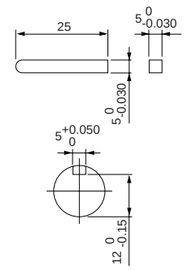
Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg
MY9G□M (metal bearing / hinge attached) Mass 1.4 kg



Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-59 | Round shaft motor dimensions B-62 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Induction motor (leadwire)

90 mm sq. 60 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M91Z60G4LG M91Z60G4LGA	4	60	100	50	Cont.	119	1.3	1250	0.46 (4.7)	2.4	0.44 (4.5)	20 (250V)
					60		112	1.2	1575	0.36 (3.7)	2.3	0.44 (4.5)	
	M91Z60G4DG M91Z60G4DGA	4	60	110	60	Cont.	120	1.1	1625	0.35 (3.6)	2.5	0.49 (5.0)	18 (250V)
				115	60		127	1.2	1625	0.35 (3.6)	2.6	0.53 (5.4)	
	M91Z60G4YG M91Z60G4YGA	4	60	200	50	Cont.	114	0.57	1225	0.47 (4.8)	1.0	0.44 (4.5)	5 (450V)
					60		122	0.62	1550	0.37 (3.8)	1.0	0.44 (4.5)	
	M91Z60G4GG M91Z60G4GGA	4	60	220	50	Cont.	121	0.58	1275	0.45 (4.6)	1.1	0.49 (5.0)	4.5 (450V)
					60		120	0.55	1600	0.36 (3.7)	1.1	0.49 (5.0)	
				230	50		129	0.61	1300	0.44 (4.5)	1.1	0.53 (5.4)	
					60		126	0.55	1625	0.35 (3.6)	1.1	0.53 (5.4)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-62.
• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

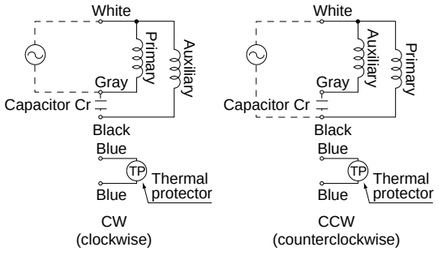
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head	MZ9G3B to MZ9G200B (ball bearing / hinge not attached)	50Hz	0.98 (9.99)	1.18 (12)	1.57 (16)	1.96 (20)	2.35 (24)	2.94 (30)	3.14 (32)	3.92 (40)	4.70 (48)	5.59 (57)	6.27 (64)	7.55 (77)	9.11 (93)	11.0 (112)	15.2 (155)	17.8 (182)	19.6 (200)						
	MY9G3B to MY9G200B (ball bearing / hinge attached)	60Hz	0.78 (8.0)	0.98 (9.99)	1.37 (14)	1.57 (16)	1.96 (20)	2.35 (24)	2.65 (27)	3.33 (34)	3.92 (40)	4.70 (48)	5.29 (54)	6.47 (66)	7.55 (77)	9.11 (93)	12.6 (129)	15.2 (155)	19.6 (200)						
Rotational direction			Same as motor rotational direction							Reverse to motor rotational direction						Same as motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	MZ9G10XB	Permissible torque	N·m	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
			(kgf·cm)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

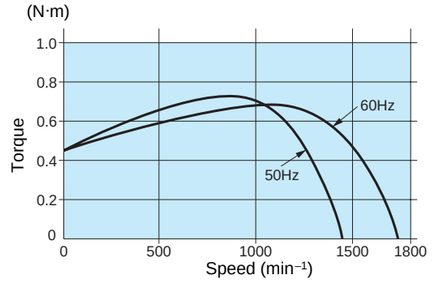
Connection diagram



(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

M91Z60G4LG(A)



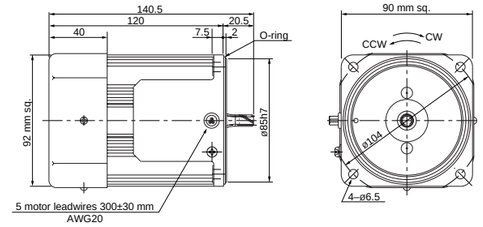
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/4, Unit: mm

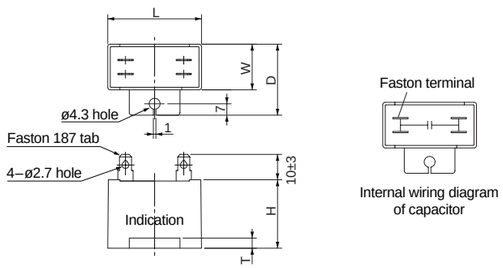
M91Z60G4LG(A) 4P 60 W 100 V (with fan)
M91Z60G4DG(A) 4P 60 W 110 V / 115 V (with fan)
M91Z60G4YG(A) 4P 60 W 200 V (with fan)
M91Z60G4GG(A) 4P 60 W 220 V / 230 V (with fan)

Mass	Helical gear	Module	Number of teeth
2.7 kg		0.6	9



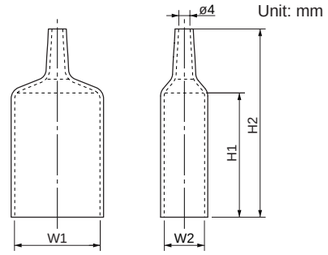
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

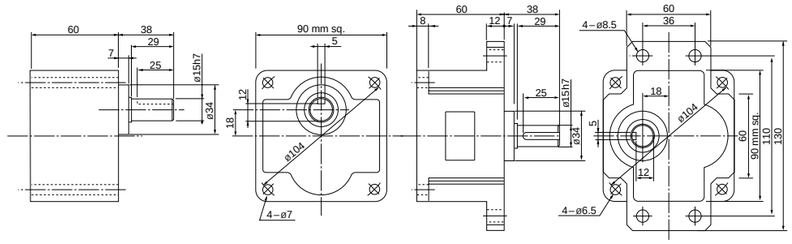
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M91Z60G4LG(A)	M0PC20M25G	58	29	44	41	4	M0PC5829G	58	29	55	78
M91Z60G4DG(A)	M0PC18M25G	58	29	44	41	4	M0PC5829G	58	29	55	78
M91Z60G4YG(A)	M0PC5M45G	58	29	44	41	4	M0PC5829G	58	29	55	78
M91Z60G4GG(A)	M0PC4.5M45G	58	23.5	38.5	37	4	M0PC5823G	58	23.5	55	78

• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

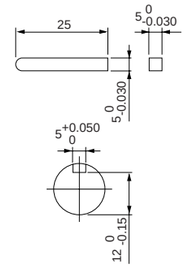
Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg
MY9G□M (metal bearing / hinge attached) Mass 1.4 kg



Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Induction motor (leadwire)

90 mm sq. 90 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min^{-1})	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M91Z90G4L	4	90	100	50	Cont.	153	1.6	1325	0.65 (6.6)	3.3	0.47 (4.8)	25 (200V)
					60		160	1.6	1625	0.53 (5.4)	3.0	0.47 (4.8)	
	M91Z90G4Y	4	90	200	50	Cont.	150	0.75	1325	0.62 (6.3)	1.7	0.47 (4.8)	5.8 (400V)
					60		160	0.80	1650	0.51 (5.2)	1.5	0.47 (4.8)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-62.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

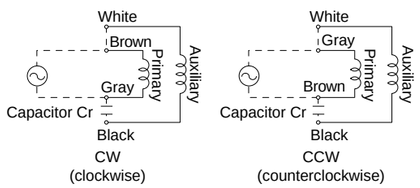
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min^{-1})		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head	MZ9G3B to MZ9G200B (ball bearing / hinge not attached)	50Hz	1.37 (14)	1.67 (17)	2.25 (23)	2.74 (28)	3.43 (35)	4.12 (42)	4.51 (46)	5.68 (58)	6.76 (69)	8.04 (82)	9.02 (92)	10.9 (111)	13.0 (133)	15.7 (160)	19.6 (200)	19.6 (200)							
	MY9G3B to MY9G200B (ball bearing / hinge attached)	60Hz	1.18 (12)	1.37 (14)	1.86 (19)	2.25 (23)	2.84 (29)	3.43 (35)	3.72 (38)	4.70 (48)	5.68 (58)	6.76 (69)	7.55 (77)	9.21 (94)	10.9 (111)	13.0 (133)	18.3 (187)	19.6 (200)							
Rotational direction			Same as motor rotational direction							Reverse to motor rotational direction						Same as motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

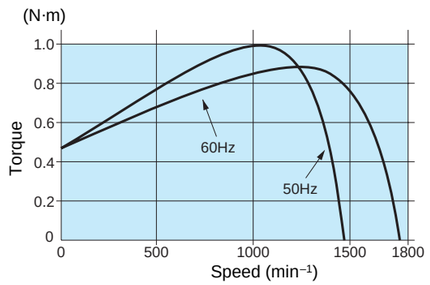
Applicable gear head		Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min^{-1})	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	MZ9G10XB	Permissible torque	N·m	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
			(kgf·cm)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

Connection diagram



Speed-torque characteristics

M91Z90G4L



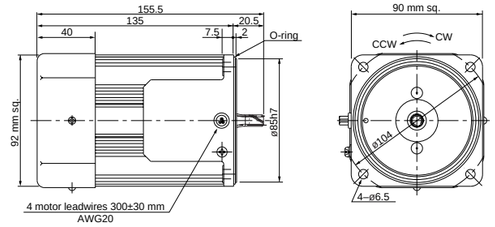
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/4, Unit: mm

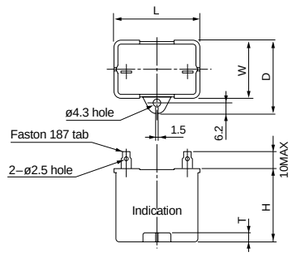
M91Z90G4L 4P 90 W 100 V (with fan)
M91Z90G4Y 4P 90 W 200 V (with fan)

Mass	Helical gear	Module	Number of teeth
3.2 kg		0.6	9



Capacitor (dimensions) [attachment]

Unit: mm



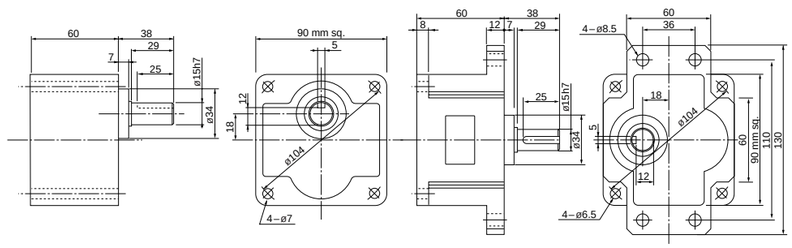
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M91Z90G4L	M0PC25M20	50.2	31	41	42	5	M0PC5032
M91Z90G4Y	M0PC5.8M40	50	30.5	41	41.5	4	M0PC5032

Gear head (dimensions)

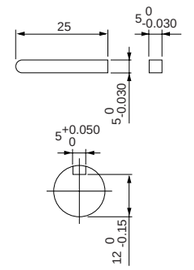
Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg
MY9G□M (metal bearing / hinge attached) Mass 1.4 kg



Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Induction motor (leadwire)

90 mm sq. 90 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M91Z90G4LG M91Z90G4LGA	4	90	100	50	Cont.	172	1.8	1250	0.69 (7.0)	3.0	0.65 (6.6)	30 (250V)
					60		177	1.8	1575	0.55 (5.6)	2.8	0.65 (6.6)	
	M91Z90G4DG M91Z90G4DGA	4	90	110	60	Cont.	168	1.6	1600	0.54 (5.5)	3.0	0.65 (6.6)	25 (250V)
				115	60		176	1.6	1600	0.54 (5.5)	3.1	0.72 (7.3)	
	M91Z90G4YG M91Z90G4YGA	4	90	200	50	Cont.	170	0.85	1225	0.70 (7.2)	1.4	0.65 (6.6)	7.5 (450V)
					60		188	0.97	1550	0.55 (5.7)	1.4	0.65 (6.6)	
	M91Z90G4GG M91Z90G4GGA	4	90	220	50	Cont.	176	0.85	1225	0.70 (7.2)	1.5	0.63 (6.4)	6 (450V)
					60		167	0.76	1575	0.55 (5.6)	1.4	0.65 (6.6)	
				230	50		185	0.89	1250	0.69 (7.0)	1.5	0.68 (6.9)	
					60		173	0.76	1600	0.54 (5.5)	1.5	0.72 (7.3)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-62.
• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

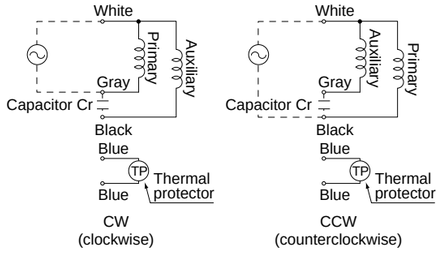
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head: MZ9G3B to MZ9G200B (ball bearing / hinge not attached)	50Hz	1.37 (14)	1.67 (17)	2.25 (23)	2.74 (28)	3.43 (35)	4.12 (42)	4.51 (46)	5.68 (58)	6.76 (69)	8.04 (82)	9.02 (92)	10.9 (111)	13.0 (133)	15.7 (160)	19.6 (200)	19.6 (200)							
Applicable gear head: MY9G3B to MY9G200B (ball bearing / hinge attached)	60Hz	1.18 (12)	1.37 (14)	1.86 (19)	2.25 (23)	2.84 (29)	3.43 (35)	3.72 (38)	4.70 (48)	5.68 (58)	6.76 (69)	7.55 (77)	9.21 (94)	10.9 (111)	13.0 (133)	18.3 (187)	19.6 (200)							
Rotational direction		Same as motor rotational direction							Reverse to motor rotational direction						Same as motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head: Bearing	Decimal gear head	Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	MZ9G10XB	Speed (min⁻¹)	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
		Permissible torque	N·m	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
			(kgf·cm)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

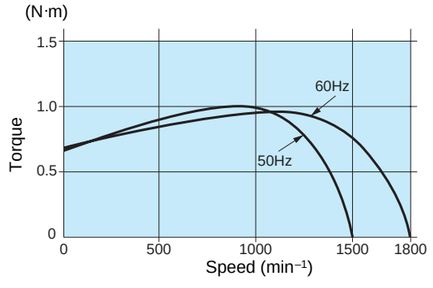
Connection diagram



(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

M91Z90G4LG(A)



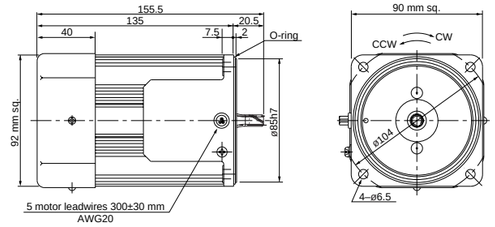
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/4, Unit: mm

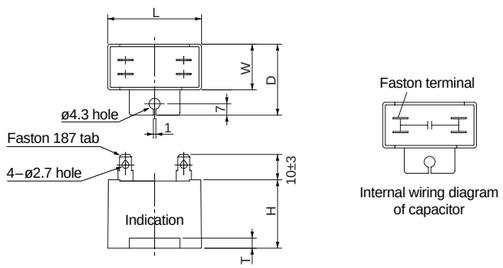
M91Z90G4LG(A) 4P 90 W 100 V (with fan)
M91Z90G4DG(A) 4P 90 W 110 V / 115 V (with fan)
M91Z90G4YG(A) 4P 90 W 200 V (with fan)
M91Z90G4GG(A) 4P 90 W 220 V / 230 V (with fan)

Mass	Helical gear	Module	Number of teeth
3.2 kg		0.6	9



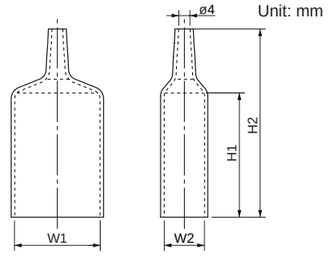
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

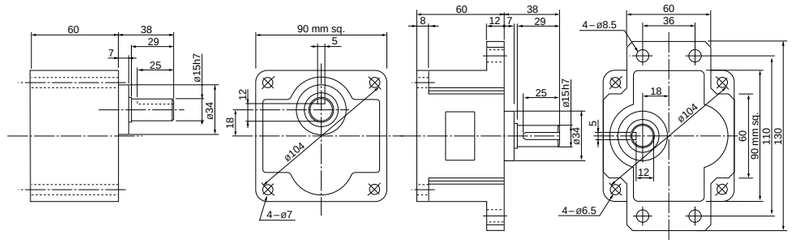
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M91Z90G4LG(A)	M0PC30M25G	58	35	50	50	4	M0PC5835G	58	35	55	78
M91Z90G4DG(A)	M0PC25M25G	58	35	50	50	4	M0PC5835G	58	35	55	78
M91Z90G4YG(A)	M0PC7.5M45G	58	35	50	50	4	M0PC5835G	58	35	55	78
M91Z90G4GG(A)	M0PC6M45G	58	29	44	41	4	M0PC5829G	58	29	55	78

• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

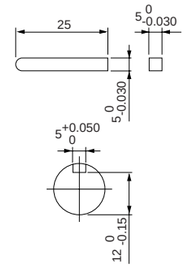
Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg
MY9G□M (metal bearing / hinge attached) Mass 1.4 kg



Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Induction motor (sealed connector)

80 mm sq. 25 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
80 mm sq.	M81X25GK4L	4	25	100	50	Cont.	51	0.55	1250	0.19 (1.9)	0.98	0.16 (1.6)	6 (200V)
					60		49	0.48	1550	0.15 (1.5)	0.94	0.16 (1.6)	
	M81X25GK4Y	4	25	200	50	Cont.	51	0.27	1250	0.19 (1.9)	0.50	0.16 (1.6)	1.5 (400V)
					60		49	0.24	1575	0.15 (1.5)	0.47	0.16 (1.6)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-62.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

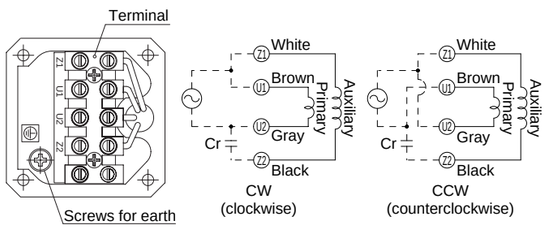
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX8G3B to MX8G180B (ball bearing)	50Hz	0.39 (4.0)	0.47 (4.8)	0.66 (6.7)	0.78 (8.0)	0.98 (10)	1.18 (12)	1.27 (13)	1.57 (16)	1.96 (20)	2.35 (24)	2.55 (26)	3.14 (32)	3.82 (39)	4.61 (47)	6.37 (65)	7.64 (78)	7.84 (80)					
	MX8G3M to MX8G180M (metal bearing)	60Hz	0.32 (3.3)	0.39 (4.0)	0.55 (5.6)	0.66 (6.7)	0.81 (8.3)	0.98 (10)	1.08 (11)	1.27 (13)	1.57 (16)	1.96 (20)	2.06 (21)	2.65 (27)	3.14 (32)	3.82 (39)	5.29 (54)	6.37 (65)	7.84 (80)					
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

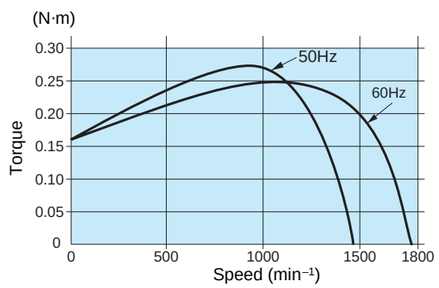
Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX8G□B (ball bearing) MX8G□M (metal bearing)	MX8G10XB	Permissible torque	N·m (kgf·cm)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)
		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

Connection diagram



Speed-torque characteristics

M81X25GK4L

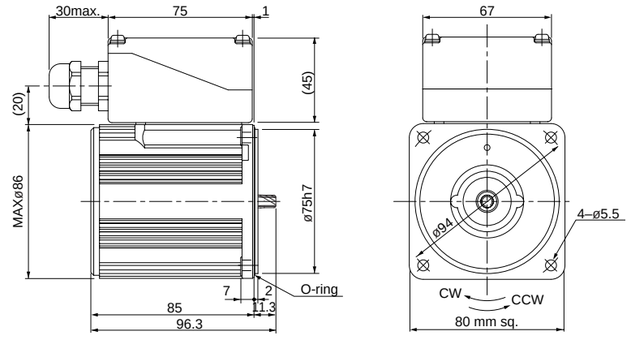


Motor (dimensions)

Scale: 1/3, Unit: mm

M81X25GK4L 4P 25W 100V
M81X25GK4Y 4P 25W 200V

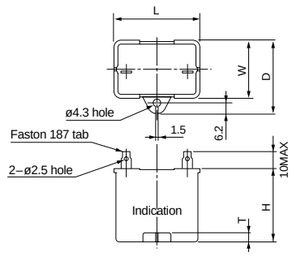
Mass	Helical	Module	Number of teeth
1.8 kg	gear	0.6	9



* Diameter of applicable cabtyre cable to be ø8 to ø12.

Capacitor (dimensions) [attachment]

Unit: mm



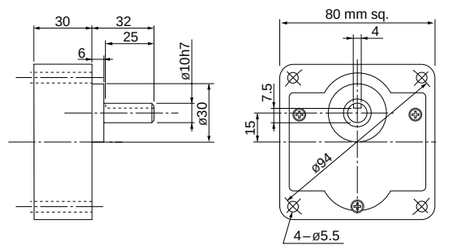
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M81X25GK4L	M0PC6M20	39.5	17.5	28	30.5	4	M0PC3917
M81X25GK4Y	M0PC1.5M40	39.5	22	32.5	32.5	4	M0PC3922

Gear head (dimensions)

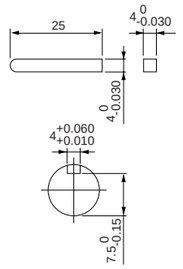
Scale: 1/3, Unit: mm

MX8G□B (ball bearing) / **MX8G□M** (metal bearing) Mass 0.6 kg



Key and keyway (dimensions) [attachment]

MX8G□B(M)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Induction motor (sealed connector)

80 mm sq. 25 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
80 mm sq.	M81X25GK4LG M81X25GK4LGA	4	25	100	50	Cont.	55	0.59	1250	0.19 (1.9)	1.1	0.16 (1.6)	8 (250V)
					60		50	0.50	1575	0.15 (1.5)	1.0	0.16 (1.6)	
	M81X25GK4DG M81X25GK4DGA	4	25	110	60	Cont.	52	0.50	1575	0.15 (1.5)	1.1	0.14 (1.4)	6 (250V)
				115	60		53	0.50	1600	0.15 (1.5)	1.1	0.15 (1.5)	
	M81X25GK4YG M81X25GK4YGA	4	25	200	50	Cont.	54	0.27	1200	0.20 (2.0)	0.43	0.16 (1.6)	2.1 (450V)
					60		54	0.27	1550	0.15 (1.6)	0.42	0.16 (1.6)	
	M81X25GK4GG M81X25GK4GGA	4	25	220	50	Cont.	59	0.29	1200	0.20 (2.0)	0.46	0.15 (1.5)	1.5 (450V)
					60		51	0.23	1550	0.15 (1.6)	0.44	0.15 (1.5)	
				230	50		59	0.28	1250	0.19 (1.9)	0.48	0.16 (1.6)	
					60		52	0.23	1575	0.15 (1.5)	0.45	0.16 (1.6)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-62.
• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

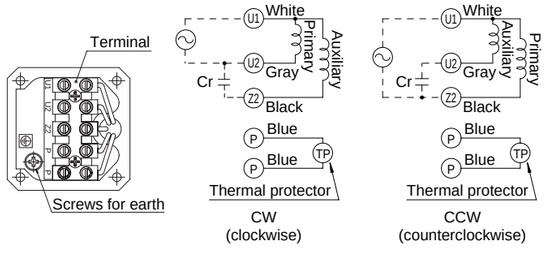
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX8G3B to MX8G180B (ball bearing)	50Hz	0.39 (4.0)	0.47 (4.8)	0.66 (6.7)	0.78 (8.0)	0.98 (10)	1.18 (12)	1.27 (13)	1.57 (16)	1.96 (20)	2.35 (24)	2.55 (26)	3.14 (32)	3.82 (39)	4.61 (47)	6.37 (65)	7.64 (78)	7.84 (80)					
	MX8G3M to MX8G180M (metal bearing)	60Hz	0.32 (3.3)	0.39 (4.0)	0.55 (5.6)	0.66 (6.7)	0.81 (8.3)	0.98 (10)	1.08 (11)	1.27 (13)	1.57 (16)	1.96 (20)	2.06 (21)	2.65 (27)	3.14 (32)	3.82 (39)	5.29 (54)	6.37 (65)	7.84 (80)					
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX8G□B (ball bearing) MX8G□M (metal bearing)	MX8G10XB	Permissible torque	N·m	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84
			(kgf·cm)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)
		Rotational direction		Same as motor rotational direction		Reverse to motor rotational direction									

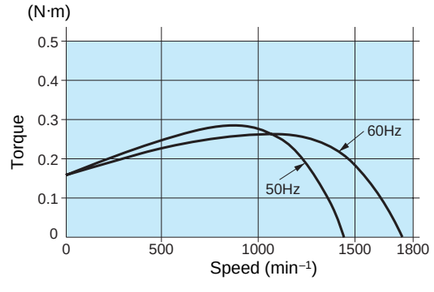
Connection diagram



(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

M81X25GK4LG(A)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

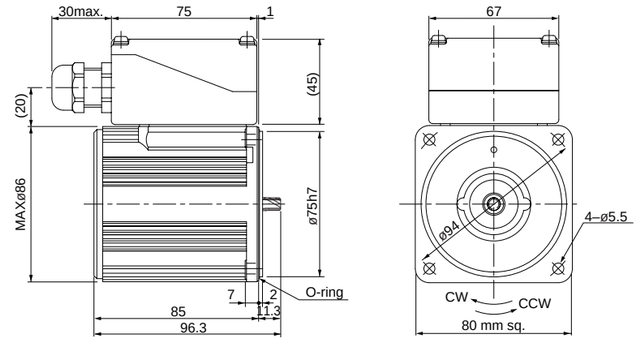
Features B-2 | System configuration B-3 | Coding system B-3 | Model list B-4

Motor (dimensions)

Scale: 1/3, Unit: mm

M81X25GK4LG(A) 4P 25 W 100 V
M81X25GK4DG(A) 4P 25 W 110 V / 115 V
M81X25GK4YG(A) 4P 25 W 200 V
M81X25GK4GG(A) 4P 25 W 220 V / 230 V

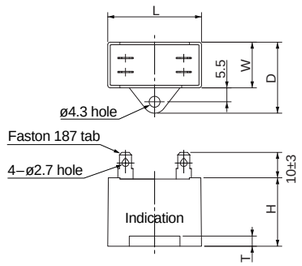
Mass	Helical	Module	Number of teeth
1.8 kg	gear	0.6	9

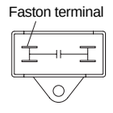


* Diameter of applicable cabtyre cable to be ø8 to ø12.

Capacitor (dimensions) [attachment]

Unit: mm

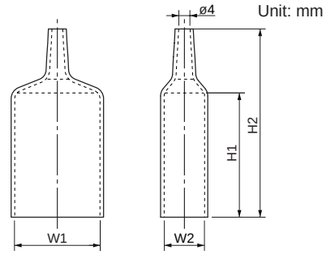




Internal wiring diagram of capacitor

Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

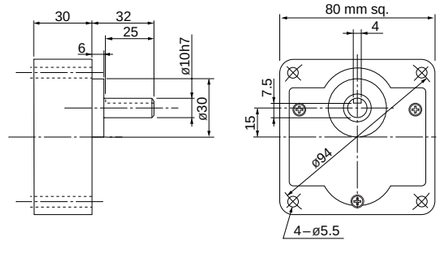
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M81X25GK4LG(A)	M0PC8M25G	48	21	31	31	4	M0PC4821G	48	21	55	78
M81X25GK4DG(A)	M0PC6M25G	38	21	31	31	4	M0PC3821G	38	21	55	78
M81X25GK4YG(A)	M0PC2.1M45G	48	21	31	31	4	M0PC4821G	48	21	55	78
M81X25GK4GG(A)	M0PC1.5M45G	38	21	31	31	4	M0PC3821G	38	21	55	78

• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

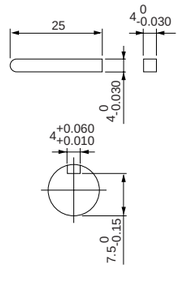
Scale: 1/3, Unit: mm

MX8G□B (ball bearing) / **MX8G□M** (metal bearing) Mass 0.6 kg



Key and keyway (dimensions) [attachment]

MX8G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-60 | Round shaft motor dimensions B-62 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Induction motor (sealed connector)

90 mm sq. 40 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M91X40GK4L	4	40	100	50	Cont.	78	0.86	1225	0.30 (3.1)	1.5	0.24 (2.4)	10 (200V)
					60		72	0.72	1550	0.25 (2.5)	1.5	0.25 (2.5)	
	M91X40GK4Y	4	40	200	50	Cont.	79	0.43	1250	0.30 (3.1)	0.83	0.25 (2.5)	2.5 (400V)
					60		72	0.36	1575	0.24 (2.4)	0.76	0.25 (2.5)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-62.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

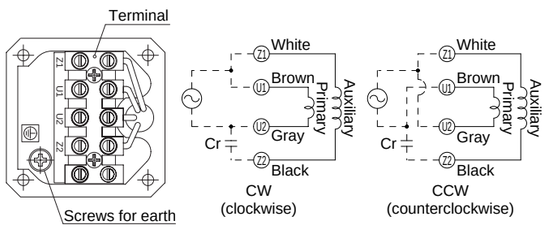
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX9G3B to MX9G180B (ball bearing)	50Hz	0.66 (6.7)	0.78 (8.0)	1.08 (11)	1.27 (13)	1.57 (16)	1.86 (19)	2.25 (23)	2.74 (28)	3.23 (33)	3.92 (40)	4.41 (45)	5.29 (54)	6.37 (65)	7.94 (81)	9.80 (100)	9.80 (100)						
	MX9G3M to MX9G180M (metal bearing)	60Hz	0.55 (5.6)	0.66 (6.7)	0.90 (9.2)	1.08 (11)	1.27 (13)	1.57 (16)	1.76 (18)	2.25 (23)	2.74 (28)	3.23 (33)	3.53 (36)	4.41 (45)	5.29 (54)	6.37 (65)	8.82 (90)	9.80 (100)						
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

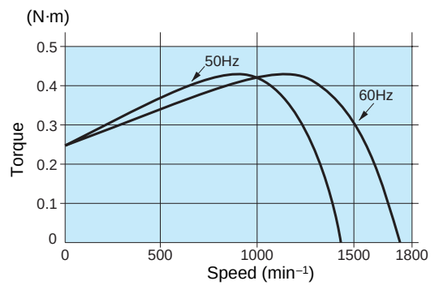
Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX9G□B (ball bearing) MX9G□M (metal bearing)	MX9G10XB	Permissible torque	N·m (kgf·cm)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)
		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

Connection diagram



Speed-torque characteristics

M91X40GK4L



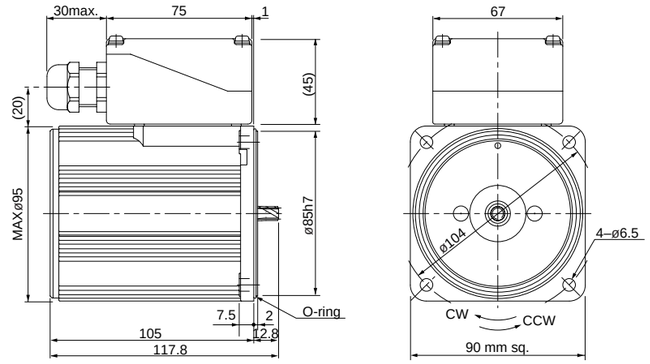
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

M91X40GK4L 4P 40 W 100 V
M91X40GK4Y 4P 40 W 200 V

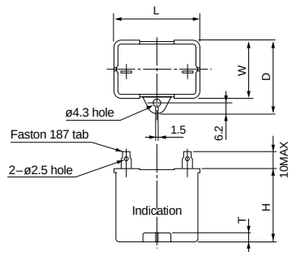
Mass	Helical gear	Module	Number of teeth
2.8 kg		0.55	9



* Diameter of applicable cabtyre cable to be ø8 to ø12.

Capacitor (dimensions) [attachment]

Unit: mm



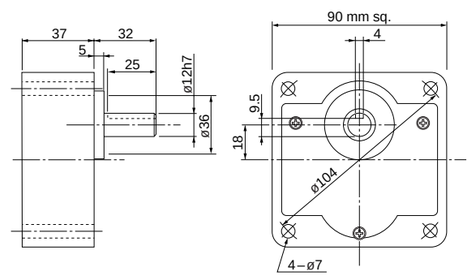
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M91X40GK4L	M0PC10M20	39.5	26.7	37	32	4	M0PC3926
M91X40GK4Y	M0PC2.5M40	49.7	24	34.5	34.5	4	M0PC5026

Gear head (dimensions)

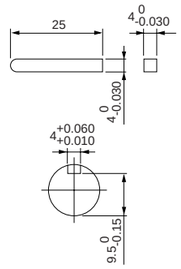
Scale: 1/3, Unit: mm

MX9G□B (ball bearing) / **MX9G□M** (metal bearing) Mass 0.8 kg



Key and keyway (dimensions) [attachment]

MX9G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Induction motor (sealed connector)

90 mm sq. 40 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M91X40GK4LG M91X40GK4LGA	4	40	100	50	Cont.	76	0.83	1250	0.31 (3.1)	1.7	0.26 (2.7)	12 (250V)
					60		70	0.70	1600	0.24 (2.4)	1.5	0.26 (2.7)	
	M91X40GK4DG M91X40GK4DGA	4	40	110 115	60	Cont.	72	0.67	1625	0.24 (2.4)	1.7	0.26 (2.7)	10 (250V)
					60		74	0.68	1625	0.24 (2.4)	1.8	0.27 (2.8)	
	M91X40GK4YG M91X40GK4YGA	4	40	200	50	Cont.	77	0.39	1175	0.33 (3.3)	0.64	0.26 (2.7)	3 (450V)
					60		77	0.39	1525	0.25 (2.6)	0.62	0.26 (2.7)	
	M91X40GK4GG M91X40GK4GGA	4	40	220	50	Cont.	78	0.37	1250	0.31 (3.1)	0.69	0.26 (2.7)	2.5 (450V)
					60		74	0.34	1575	0.24 (2.5)	0.65	0.26 (2.7)	
				230	50		79	0.37	1275	0.30 (3.1)	0.72	0.28 (2.9)	
					60		77	0.33	1600	0.24 (2.4)	0.68	0.28 (2.9)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-62.
• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

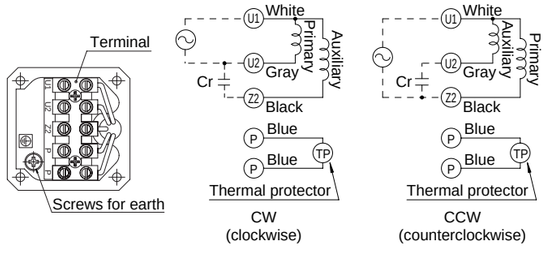
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX9G3B to MX9G180B (ball bearing)	50Hz	0.66 (6.7)	0.78 (8.0)	1.08 (11)	1.27 (13)	1.57 (16)	1.86 (19)	2.25 (23)	2.74 (28)	3.23 (33)	3.92 (40)	4.41 (45)	5.29 (54)	6.37 (65)	7.94 (81)	9.80 (100)	9.80 (100)						
	MX9G3M to MX9G180M (metal bearing)	60Hz	0.55 (5.6)	0.66 (6.7)	0.90 (9.2)	1.08 (11)	1.27 (13)	1.57 (16)	1.76 (18)	2.25 (23)	2.74 (28)	3.23 (33)	3.53 (36)	4.41 (45)	5.29 (54)	6.37 (65)	8.82 (90)	9.80 (100)						
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX9G□B (ball bearing) MX9G□M (metal bearing)	MX9G10XB	Permissible torque	N·m	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)
			(kgf·cm)												
		Rotational direction		Same as motor rotational direction		Reverse to motor rotational direction									

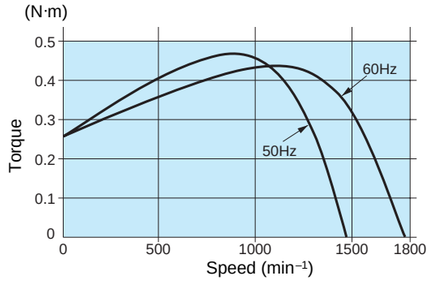
Connection diagram



(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

M91X40GK4LG(A)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

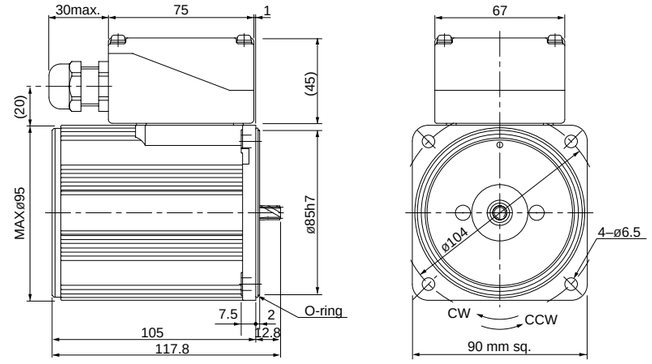
Features B-2 | System configuration B-3 | Coding system B-3 | Model list B-4

Motor (dimensions)

Scale: 1/3, Unit: mm

M91X40GK4LG(A) 4P 40 W 100 V
M91X40GK4DG(A) 4P 40 W 110 V / 115 V
M91X40GK4YG(A) 4P 40 W 200 V
M91X40GK4GG(A) 4P 40 W 220 V / 230 V

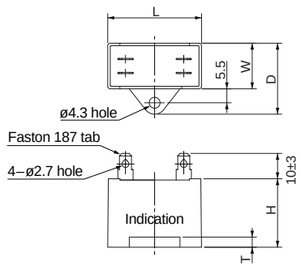
Mass	Helical	Module	Number of teeth
2.8 kg	gear	0.55	9



* Diameter of applicable cabtyre cable to be ø8 to ø12.

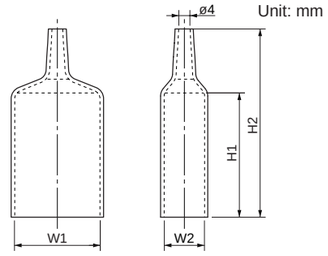
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

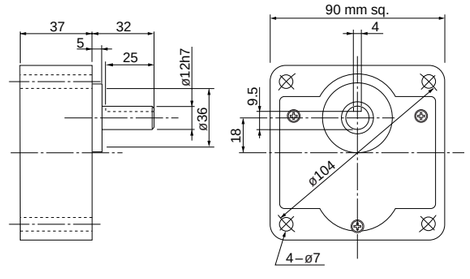
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M91X40GK4LG(A)	M0PC12M25G	58	22	32	35	4	M0PC5822G	58	22	55	78
M91X40GK4DG(A)	M0PC10M25G	58	21	31	31	4	M0PC5821G	58	21	55	78
M91X40GK4YG(A)	M0PC3M45G	58	21	31	31	4	M0PC4821G	48	21	55	78
M91X40GK4GG(A)	M0PC2.5M45G	48	21	31	31	4	M0PC4821G	48	21	55	78

• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

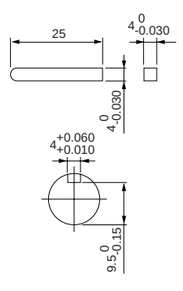
Scale: 1/3, Unit: mm

MX9G□B (ball bearing) / **MX9G□M** (metal bearing) Mass 0.8 kg



Key and keyway (dimensions) [attachment]

MX9G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-60 | Round shaft motor dimensions B-62 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Induction motor (sealed connector)

90 mm sq. 60 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M91Z60GK4L	4	60	100	50	Cont.	118	1.3	1250	0.46 (4.7)	2.2	0.41 (4.2)	15 (210V)
					60		117	1.2	1550	0.36 (3.7)	2.2	0.42 (4.3)	
	M91Z60GK4Y	4	60	200	50	Cont.	120	0.65	1250	0.46 (4.6)	1.1	0.42 (4.3)	3.8 (400V)
					60		119	0.59	1550	0.36 (3.7)	1.1	0.44 (4.5)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-62.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

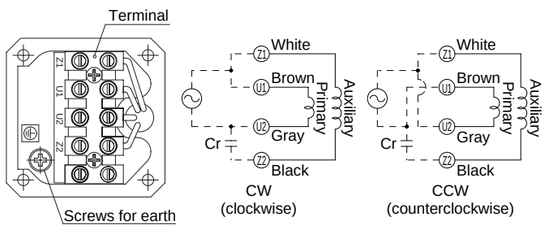
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head	MZ9G3BA to MZ9G200B (ball bearing / hinge not attached)	50Hz	0.98 (9.99)	1.18 (12)	1.57 (16)	1.96 (20)	2.35 (24)	2.94 (30)	3.14 (32)	3.92 (40)	4.70 (48)	5.59 (57)	6.27 (64)	7.55 (77)	9.11 (93)	11.0 (112)	15.2 (155)	17.8 (182)	19.6 (200)						
	MY9G3MA to MY9G200M (metal bearing / hinge attached)	60Hz	0.78 (8.0)	0.98 (9.99)	1.37 (14)	1.57 (16)	1.96 (20)	2.35 (24)	2.65 (27)	3.33 (34)	3.92 (40)	4.70 (48)	5.29 (54)	6.47 (66)	7.55 (77)	9.11 (93)	12.6 (129)	15.2 (155)	19.6 (200)						
Rotational direction			Same as motor rotational direction							Reverse to motor rotational direction						Same as motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

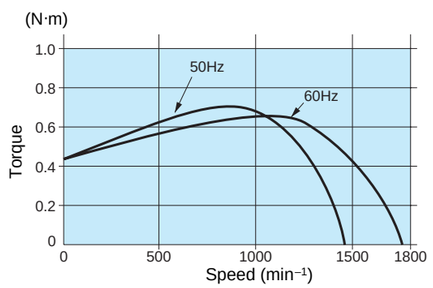
Applicable gear head		Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MZ9G□B (ball bearing / Hinge not attached) MY9G□M (metal bearing / Hinge attached)	MZ9G10XB	Permissible torque	N·m (kgf·cm)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

Connection diagram



Speed-torque characteristics

M91Z60GK4L

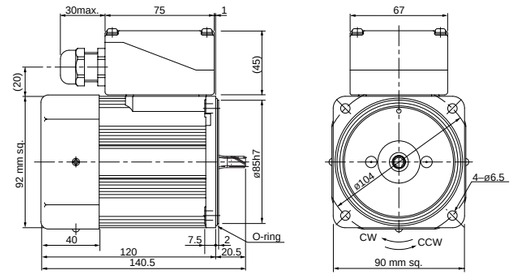


Motor (dimensions)

Scale: 1/4, Unit: mm

M91Z60GK4L 4P 60 W 100 V (with fan)
M91Z60GK4Y 4P 60 W 200 V (with fan)

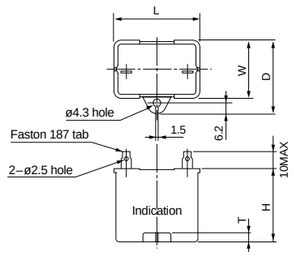
Mass	Helical	Module	Number of teeth
3.0 kg	gear	0.6	9



* Diameter of applicable cabtyre cable to be ø8 to ø12.

Capacitor (dimensions) [attachment]

Unit: mm



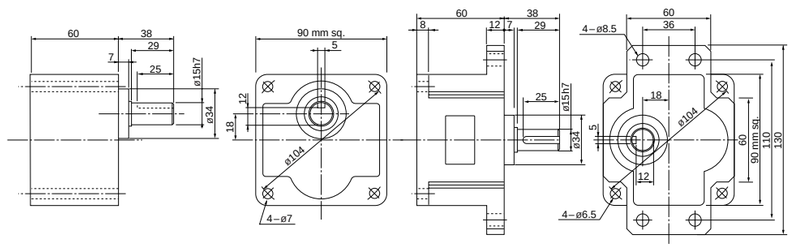
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M91Z60GK4L	M0PC15M21	39.5	26.7	37	41	4	M0PC3926
M91Z60GK4Y	M0PC3.8M40	50	26.7	37.5	38	4	M0PC5026

Gear head (dimensions)

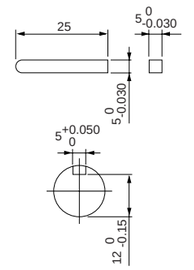
Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg
MY9G□M (metal bearing / hinge attached) Mass 1.4 kg



Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Induction motor (sealed connector)

90 mm sq. 60 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M91Z60GK4LG M91Z60GK4LGA	4	60	100	50	Cont.	119	1.3	1250	0.46 (4.7)	2.4	0.44 (4.5)	20 (250V)
					60		112	1.2	1575	0.36 (3.7)	2.3	0.44 (4.5)	
	M91Z60GK4DG M91Z60GK4DGA	4	60	110	60	Cont.	120	1.1	1625	0.35 (3.6)	2.5	0.49 (5.0)	18 (250V)
				115	60		127	1.2	1625	0.35 (3.6)	2.6	0.53 (5.4)	
	M91Z60GK4YG M91Z60GK4YGA	4	60	200	50	Cont.	114	0.57	1225	0.47 (4.8)	1.0	0.44 (4.5)	5 (450V)
					60		122	0.62	1550	0.37 (3.8)	1.0	0.44 (4.5)	
	M91Z60GK4GG M91Z60GK4GGA	4	60	220	50	Cont.	121	0.58	1275	0.45 (4.6)	1.1	0.49 (5.0)	4.5 (450V)
					60		120	0.55	1600	0.36 (3.7)	1.1	0.49 (5.0)	
				230	50		129	0.61	1300	0.44 (4.5)	1.1	0.53 (5.4)	
					60		126	0.55	1625	0.35 (3.6)	1.1	0.53 (5.4)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-62.
• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

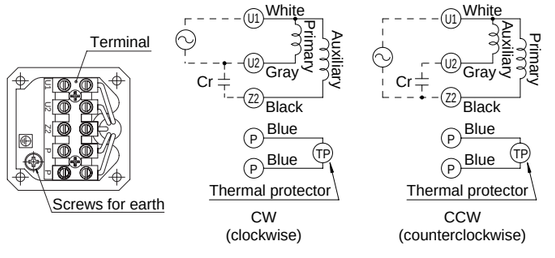
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head	MZ9G3B to MZ9G200B (ball bearing / hinge not attached)	50Hz	0.98 (9.99)	1.18 (12)	1.57 (16)	1.96 (20)	2.35 (24)	2.94 (30)	3.14 (32)	3.92 (40)	4.70 (48)	5.59 (57)	6.27 (64)	7.55 (77)	9.11 (93)	11.0 (112)	15.2 (155)	17.8 (182)	19.6 (200)						
	MY9G3B to MY9G200B (ball bearing / hinge attached)	60Hz	0.78 (8.0)	0.98 (9.99)	1.37 (14)	1.57 (16)	1.96 (20)	2.35 (24)	2.65 (27)	3.33 (34)	3.92 (40)	4.70 (48)	5.29 (54)	6.47 (66)	7.55 (77)	9.11 (93)	12.6 (129)	15.2 (155)	19.6 (200)						
Rotational direction			Same as motor rotational direction							Reverse to motor rotational direction						Same as motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	MZ9G10XB	Permissible torque	N·m	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
			(kgf·cm)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

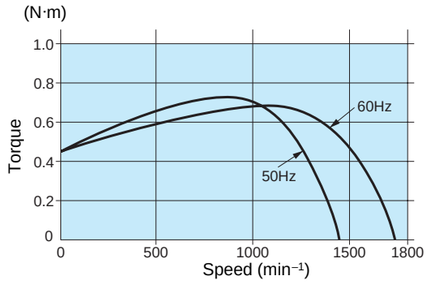
Connection diagram



(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

M91Z60GK4LG(A)



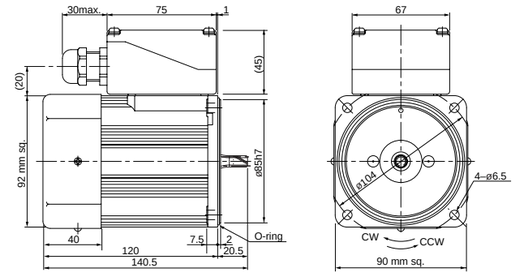
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/4, Unit: mm

M91Z60GK4LG(A) 4P 60 W 100 V (with fan)
M91Z60GK4DG(A) 4P 60 W 110 V / 115 V (with fan)
M91Z60GK4YG(A) 4P 60 W 200 V (with fan)
M91Z60GK4GG(A) 4P 60 W 220 V / 230 V (with fan)

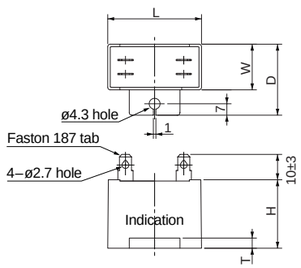
Mass	Helical gear	Module	Number of teeth
3.0 kg		0.6	9

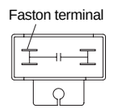


* Diameter of applicable cabtyre cable to be ø8 to ø12.

Capacitor (dimensions) [attachment]

Unit: mm

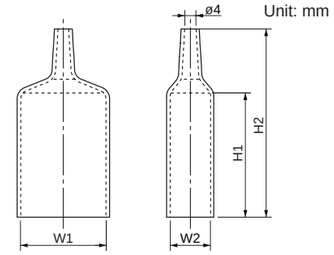




Internal wiring diagram of capacitor

Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

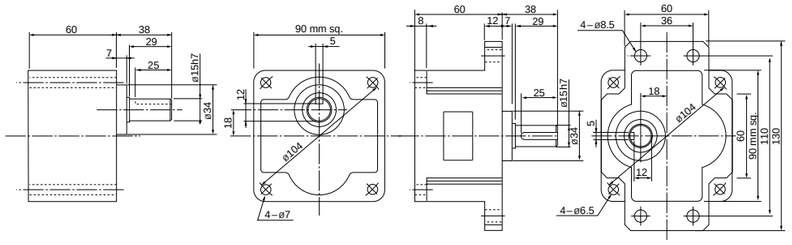
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M91Z60GK4LG(A)	M0PC20M25G	58	29	44	41	4	M0PC5829G	58	29	55	78
M91Z60GK4DG(A)	M0PC18M25G	58	29	44	41	4	M0PC5829G	58	29	55	78
M91Z60GK4YG(A)	M0PC5M45G	58	29	44	41	4	M0PC5829G	58	29	55	78
M91Z60GK4GG(A)	M0PC4.5M45G	58	23.5	38.5	37	4	M0PC5823G	58	23.5	55	78

• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg
MY9G□M (metal bearing / hinge attached) Mass 1.4 kg

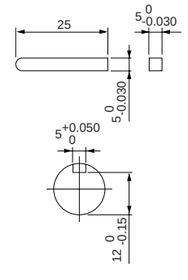


Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Induction motor (sealed connector)

90 mm sq. 90 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90mm sq.	M91Z90GK4L	4	90	100	50	Cont.	153	1.6	1325	0.65 (6.6)	3.3	0.47 (4.8)	25 (200V)
					60		160	1.6	1625	0.53 (5.4)	3.0	0.47 (4.8)	
	M91Z90GK4Y	4	90	200	50	Cont.	150	0.75	1325	0.62 (6.3)	1.7	0.47 (4.8)	5.8 (400V)
					60		160	0.80	1650	0.51 (5.2)	1.5	0.47 (4.8)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-62.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

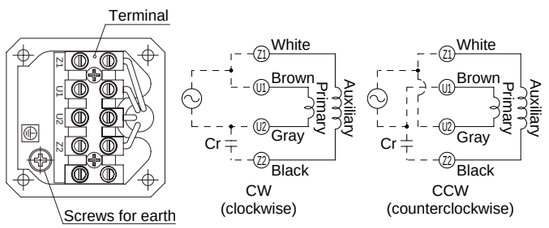
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head	MZ9G3B to MZ9G200B (ball bearing / hinge not attached)	50Hz	1.37 (14)	1.67 (17)	2.25 (23)	2.74 (28)	3.43 (35)	4.12 (42)	4.51 (46)	5.68 (58)	6.76 (69)	8.04 (82)	9.02 (92)	10.9 (111)	13.0 (133)	15.7 (160)	19.6 (200)	19.6 (200)							
	MY9G3B to MY9G200B (ball bearing / hinge attached)	60Hz	1.18 (12)	1.37 (14)	1.86 (19)	2.25 (23)	2.84 (29)	3.43 (35)	3.72 (38)	4.70 (48)	5.68 (58)	6.76 (69)	7.55 (77)	9.21 (94)	10.9 (111)	13.0 (133)	18.3 (187)	19.6 (200)							
Rotational direction			Same as motor rotational direction							Reverse to motor rotational direction						Same as motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

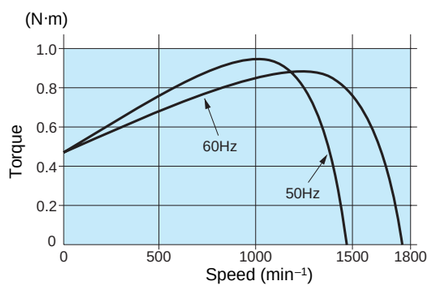
Applicable gear head		Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	MZ9G10XB	Permissible torque	N·m	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
			(kgf·cm)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

Connection diagram



Speed-torque characteristics

M91Z90GK4L



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

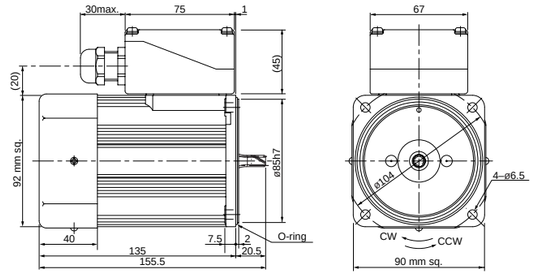
Features B-2 | System configuration B-3 | Coding system B-3 | Model list B-4

Motor (dimensions)

Scale: 1/4, Unit: mm

M91Z90GK4L 4P 90 W 100 V (with fan)
M91Z90GK4Y 4P 90 W 200 V (with fan)

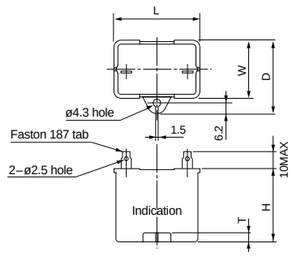
Mass	Helical gear	Module	Number of teeth
3.3 kg		0.6	9



* Diameter of applicable cabtyre cable to be ø8 to ø12.

Capacitor (dimensions) [attachment]

Unit: mm



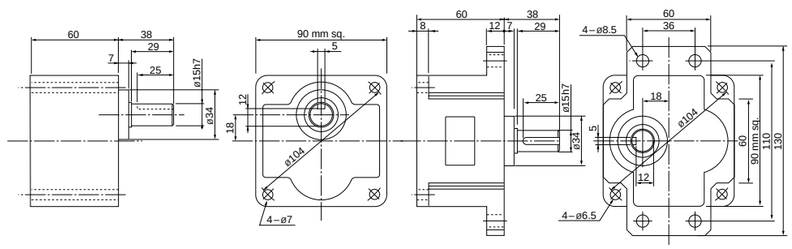
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M91Z90GK4L	M0PC25M20	50.2	31	41	42	5	M0PC5032
M91Z90GK4Y	M0PC5.8M40	50	30.5	41	41.5	4	M0PC5032

Gear head (dimensions)

Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg
MY9G□M (metal bearing / hinge attached) Mass 1.4 kg

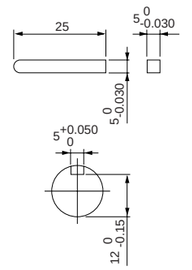


Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Gear head combination B-60 | Round shaft motor dimensions B-62 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Induction motor (sealed connector)

90 mm sq. 90 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M91Z90GK4LG	4	90	100	50	Cont.	172	1.8	1250	0.69(7.0)	3.0	0.65(6.6)	30 (250V)
	M91Z90GK4LGA				60		177	1.8	1575	0.55(5.6)	2.8	0.65(6.6)	
	M91Z90GK4DG	4	90	110	60	Cont.	168	1.6	1600	0.54(5.5)	3.0	0.65(6.6)	25 (250V)
	M91Z90GK4DGA			115	60		176	1.6	1600	0.54(5.5)	3.1	0.72(7.3)	
	M91Z90GK4YG	4	90	200	50	Cont.	170	0.85	1225	0.70(7.2)	1.4	0.65(6.6)	7.5 (450V)
	M91Z90GK4YGA				60		188	0.97	1550	0.55(5.7)	1.4	0.65(6.6)	
	M91Z90GK4GG	4	90	220	50	Cont.	176	0.85	1225	0.70(7.2)	1.5	0.63(6.4)	6 (450V)
	M91Z90GK4GGA				60		167	0.76	1575	0.55(5.6)	1.4	0.65(6.6)	
				230	50		185	0.89	1250	0.69(7.0)	1.5	0.68(6.9)	
					60		173	0.76	1600	0.54(5.5)	1.5	0.72(7.3)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-62.
• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

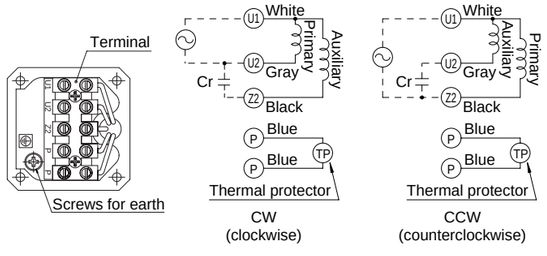
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head	MZ9G3B to MZ9G200B (ball bearing (hinge not attached))	50Hz	1.37 (14)	1.67 (17)	2.25 (23)	2.74 (28)	3.43 (35)	4.12 (42)	4.51 (46)	5.68 (58)	6.76 (69)	8.04 (82)	9.02 (92)	10.9 (111)	13.0 (133)	15.7 (160)	19.6 (200)	19.6 (200)							
	MY9G3B to MY9G200B (ball bearing (hinge attached))	60Hz	1.18 (12)	1.37 (14)	1.86 (19)	2.25 (23)	2.84 (29)	3.43 (35)	3.72 (38)	4.70 (48)	5.68 (58)	6.76 (69)	7.55 (77)	9.21 (94)	10.9 (111)	13.0 (133)	18.3 (187)	19.6 (200)							
Rotational direction			Same as motor rotational direction							Reverse to motor rotational direction						Same as motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	MZ9G10XB	Permissible torque	N·m	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
			(kgf·cm)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

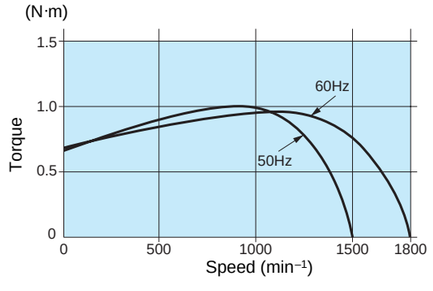
Connection diagram



(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

M91Z90GK4LG(A)



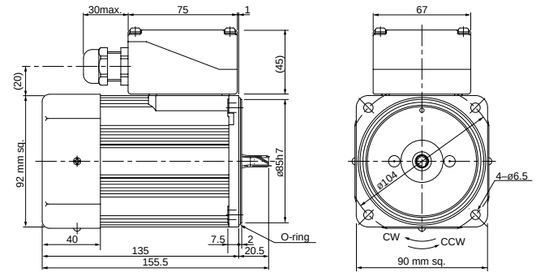
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/4, Unit: mm

M91Z90GK4LG(A) 4P 90 W 100 V (with fan)
M91Z90GK4DG(A) 4P 90 W 110 V / 115 V (with fan)
M91Z90GK4YG(A) 4P 90 W 200 V (with fan)
M91Z90GK4GG(A) 4P 90 W 220 V / 230 V (with fan)

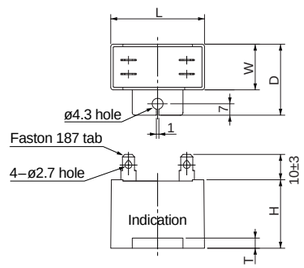
Mass	Helical gear	Module	Number of teeth
3.3 kg		0.6	9

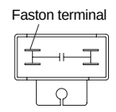


* Diameter of applicable cabtyre cable to be ø8 to ø12.

Capacitor (dimensions) [attachment]

Unit: mm

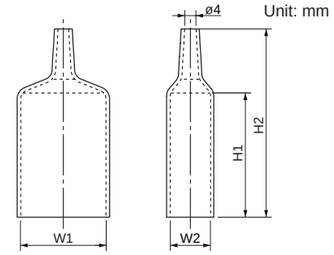




Internal wiring diagram of capacitor

Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

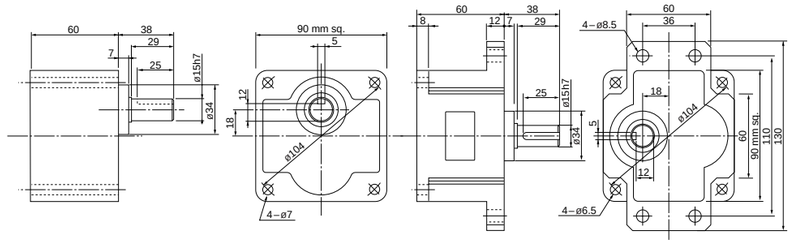
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M91Z90GK4LG(A)	M0PC30M25G	58	35	50	50	4	M0PC5835G	58	35	55	78
M91Z90GK4DG(A)	M0PC25M25G	58	35	50	50	4	M0PC5835G	58	35	55	78
M91Z90GK4YG(A)	M0PC7.5M45G	58	35	50	50	4	M0PC5835G	58	35	55	78
M91Z90GK4GG(A)	M0PC6M45G	58	29	44	41	4	M0PC5829G	58	29	55	78

• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

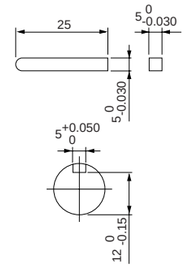
Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg
MY9G□M (metal bearing / hinge attached) Mass 1.4 kg



Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Note) MZ / MY is available for a gear head of either type.

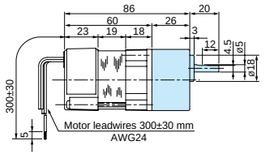
(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Induction motor (leadwire)

Gear head combination dimensions
Scale: 1/4, Unit: mm

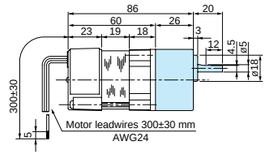
42 mm sq. 3 W

M41A3G2L + M4GA□F



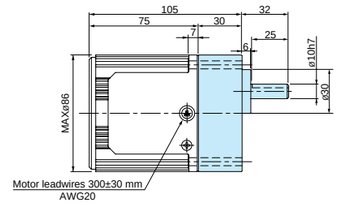
42 mm sq. 1 W

M41A1G4L + M4GA□F



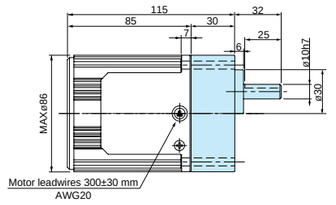
80 mm sq. 15 W

M81X15G4L + MX8G□B(M)
M81X15G4Y + MX8G□B(M)



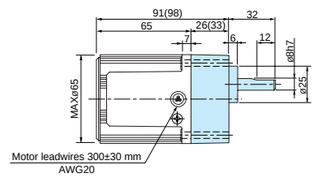
80 mm sq. 25 W

M81X25G4L + MX8G□B(M)
M81X25G4Y + MX8G□B(M)
M81X25G4LG(A) + MX8G□B(M)
M81X25G4DG(A) + MX8G□B(M)
M81X25G4YG(A) + MX8G□B(M)
M81X25G4GG(A) + MX8G□B(M)



60 mm sq. 3 W

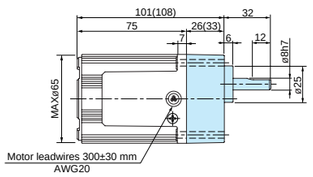
M61X3G4L + MX6G□BA(MA) / MX6G□B(M)



* Figures in ( ) represent the dimensions of MX6G□B (M) (1/30 or larger reduction ratio).
The model number of the gear head with a reduction ratio of 1/25 or smaller is MX6G□BA (MA).

60 mm sq. 6 W

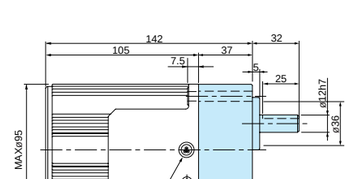
M61X6G4L + MX6G□BA(MA) / MX6G□B(M)
M61X6G4Y + MX6G□BA(MA) / MX6G□B(M)
M61X6G4LG(A) + MX6G□BA(MA) / MX6G□B(M)
M61X6G4DG(A) + MX6G□BA(MA) / MX6G□B(M)
M61X6G4YG(A) + MX6G□BA(MA) / MX6G□B(M)
M61X6G4GG(A) + MX6G□BA(MA) / MX6G□B(M)



* Figures in ( ) represent the dimensions of MX6G□B (M) (1/30 or larger reduction ratio).
The model number of the gear head with a reduction ratio of 1/25 or smaller is MX6G□BA (MA).

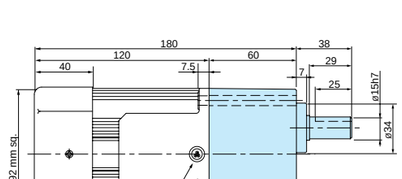
90 mm sq. 40 W

M91X40G4L + MX9G□B(M)
M91X40G4Y + MX9G□B(M)
M91X40G4LG(A) + MX9G□B(M)
M91X40G4DG(A) + MX9G□B(M)
M91X40G4YG(A) + MX9G□B(M)
M91X40G4GG(A) + MX9G□B(M)



90 mm sq. 60 W

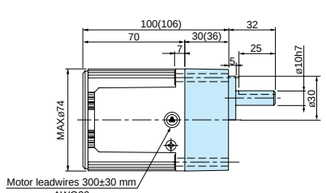
M91Z60G4L + MZ9G□B (MY9G□B)
M91Z60G4Y + MZ9G□B (MY9G□B)
M91Z60G4LG(A) + MZ9G□B (MY9G□B)
M91Z60G4DG(A) + MZ9G□B (MY9G□B)
M91Z60G4YG(A) + MZ9G□B (MY9G□B)
M91Z60G4GG(A) + MZ9G□B (MY9G□B)



* Refer to page B-380 for high torque gear head.

70 mm sq. 10 W

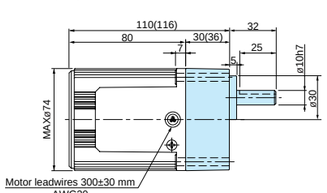
M71X10G4L + MX7G□BA(MA) / MX7G□B(M)
M71X10G4Y + MX7G□BA(MA) / MX7G□B(M)



* Figures in ( ) represent the dimensions of MX7G□B (M) (1/30 or larger reduction ratio).
The model number of the gear head with a reduction ratio of 1/25 or smaller is MX7G□BA (MA).

70 mm sq. 15 W

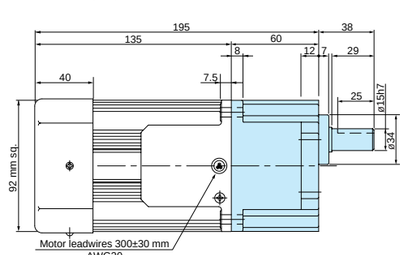
M71X15G4L + MX7G□BA(MA) / MX7G□B(M)
M71X15G4Y + MX7G□BA(MA) / MX7G□B(M)
M71X15G4LG(A) + MX7G□BA(MA) / MX7G□B(M)
M71X15G4DG(A) + MX7G□BA(MA) / MX7G□B(M)
M71X15G4YG(A) + MX7G□BA(MA) / MX7G□B(M)
M71X15G4GG(A) + MX7G□BA(MA) / MX7G□B(M)



* Figures in ( ) represent the dimensions of MX7G□B (M) (1/30 or larger reduction ratio).
The model number of the gear head with a reduction ratio of 1/25 or smaller is MX7G□BA (MA).

90 mm sq. 90 W

M91Z90G4L + MY9G□B (MZ9G□B)
M91Z90G4Y + MY9G□B (MZ9G□B)
M91Z90G4LG(A) + MY9G□B (MZ9G□B)
M91Z90G4DG(A) + MY9G□B (MZ9G□B)
M91Z90G4YG(A) + MY9G□B (MZ9G□B)
M91Z90G4GG(A) + MY9G□B (MZ9G□B)



* Refer to page B-380 for high torque gear head.

* The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
* The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

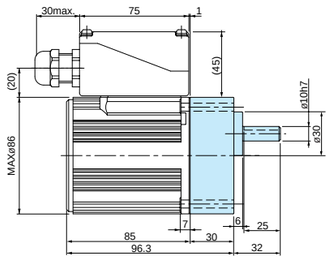
(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Induction motor (sealed connector)

Gear head combination dimensions
Scale: 1/4, Unit: mm

80 mm sq. 25 W

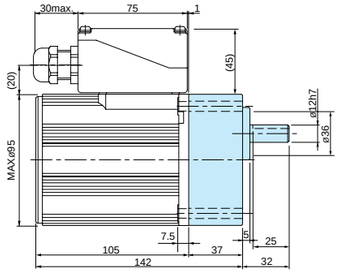
M81X25GK4L + MX8G□B(M)
M81X25GK4Y + MX8G□B(M)
M81X25GK4LG(A) + MX8G□B(M)
M81X25GK4DG(A) + MX8G□B(M)
M81X25GK4YG(A) + MX8G□B(M)
M81X25GK4GG(A) + MX8G□B(M)



* Diameter of applicable cabtyre cable to be ø8 to ø12.

90 mm sq. 40 W

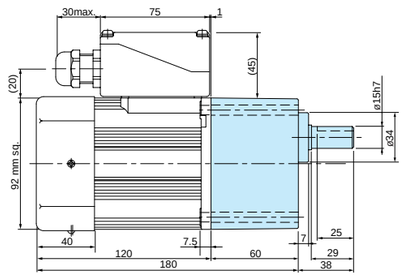
M91X40GK4L + MX9G□B(M)
M91X40GK4Y + MX9G□B(M)
M91X40GK4LG(A) + MX9G□B(M)
M91X40GK4DG(A) + MX9G□B(M)
M91X40GK4YG(A) + MX9G□B(M)
M91X40GK4GG(A) + MX9G□B(M)



* Diameter of applicable cabtyre cable to be ø8 to ø12.

90 mm sq. 60 W

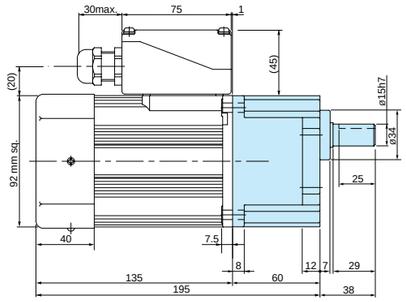
M91Z60GK4L + MZ9G□B (MY9G□B)
M91Z60GK4Y + MZ9G□B (MY9G□B)
M91Z60GK4LG(A) + MZ9G□B (MY9G□B)
M91Z60GK4DG(A) + MZ9G□B (MY9G□B)
M91Z60GK4YG(A) + MZ9G□B (MY9G□B)
M91Z60GK4GG(A) + MZ9G□B (MY9G□B)



* Diameter of applicable cabtyre cable to be ø8 to ø12.
* Refer to page B-380 for high torque gear head.

90 mm sq. 90 W

M91Z90GK4L + MY9G□B (MZ9G□B)
M91Z90GK4Y + MY9G□B (MZ9G□B)
M91Z90GK4LG(A) + MY9G□B (MZ9G□B)
M91Z90GK4DG(A) + MY9G□B (MZ9G□B)
M91Z90GK4YG(A) + MY9G□B (MZ9G□B)
M91Z90GK4GG(A) + MY9G□B (MZ9G□B)



* Diameter of applicable cabtyre cable to be ø8 to ø12.
* Refer to page B-380 for high torque gear head.

* The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
* The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Features B-2 | System configuration B-3 | Coding system B-3 | Model list B-4

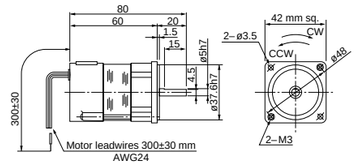
Induction motor (4-pole round shaft / leadwire)

Dimensions
Scale: 1/4, Unit: mm

42 mm sq. 1 W

Mass 0.3 kg

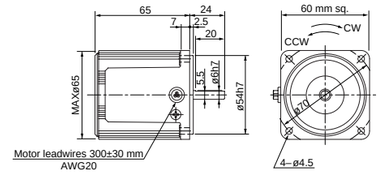
M41A1S4L



60 mm sq. 3 W

Mass 0.56 kg

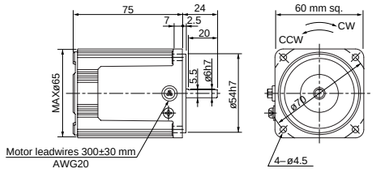
M61X3S4LS



60 mm sq. 6 W

Mass 0.67 kg

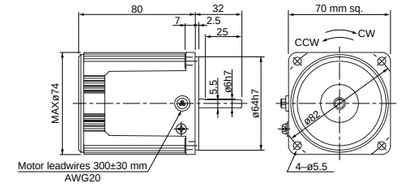
M61X6S4LS M61X6S4LG(A) M61X6S4YG(A)
M61X6S4YS M61X6S4DG(A) M61X6S4GG(A)



70 mm sq. 15 W

Mass 1.1 kg

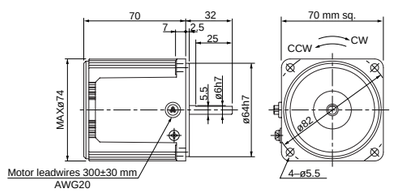
M71X15S4LS M71X15S4LG(A) M71X15S4YG(A)
M71X15S4YS M71X15S4DG(A) M71X15S4GG(A)



70 mm sq. 10 W

Mass 0.84 kg

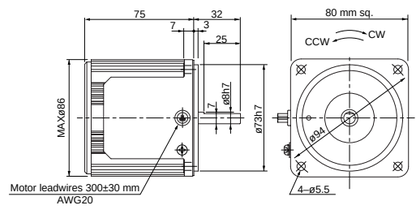
M71X10S4LS
M71X10S4YS



80 mm sq. 15 W

Mass 1.2 kg

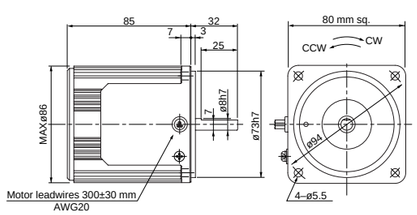
M81X15S4LS
M81X15S4YS



80 mm sq. 25 W

Mass 1.5 kg

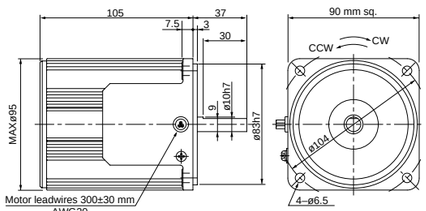
M81X25S4LS M81X25S4LG(A) M81X25S4YG(A)
M81X25S4YS M81X25S4DG(A) M81X25S4GG(A)



90 mm sq. 40 W

Mass 2.4 kg

M91X40S4LS M91X40S4LG(A) M91X40S4YG(A)
M91X40S4YS M91X40S4DG(A) M91X40S4GG(A)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Specifications B-8 to B-57 | Control related product C-4 | Option D-2

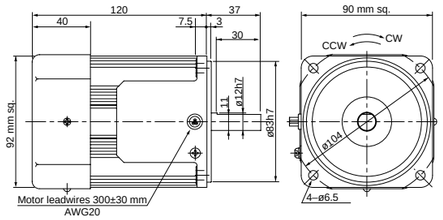
Induction motor (4-pole round shaft / leadwire)

Dimensions
Scale: 1/4, Unit: mm

90 mm sq. 60 W Mass 2.7 kg

M91Z60S4LS (with fan)
M91Z60S4YS (with fan)

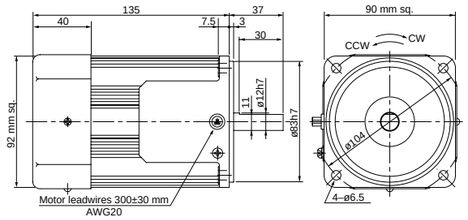
M91Z60S4LG(A) (with fan)
M91Z60S4DG(A) (with fan)
M91Z60S4YG(A) (with fan)
M91Z60S4GG(A) (with fan)



90 mm sq. 90 W Mass 3.4 kg

M91Z90S4LS (with fan)
M91Z90S4YS (with fan)

M91Z90S4LG (A) (with fan)
M91Z90S4DG(A) (with fan)
M91Z90S4YG (A) (with fan)
M91Z90S4GG(A) (with fan)



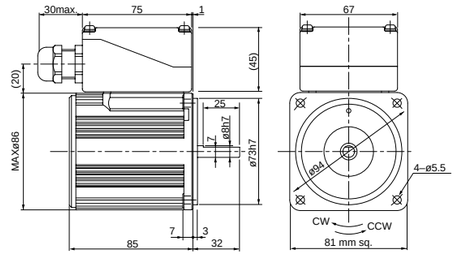
Induction motor (4-pole round shaft / sealed connector)

Dimensions
Scale: 1/4, Unit: mm

80 mm sq. 25 W Mass 1.8 kg

M81X25SK4LS
M81X25SK4YS

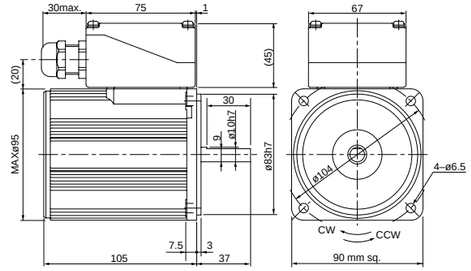
M81X25SK4LG(A)
M81X25SK4YG(A)
M81X25SK4DG(A)
M81X25SK4GG(A)



90 mm sq. 40 W Mass 2.8 kg

M91X40SK4LS
M91X40SK4YS

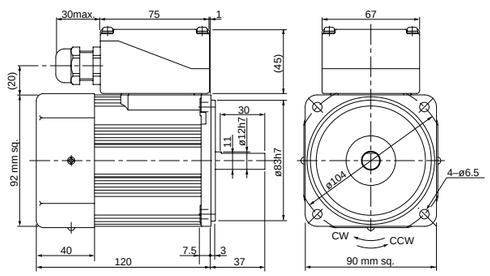
M91X40SK4LG(A)
M91X40SK4YG(A)
M91X40SK4DG(A)
M91X40SK4GG(A)



90 mm sq. 60 W Mass 3.0 kg

M91Z60SK4LS (with fan)
M91Z60SK4YS (with fan)

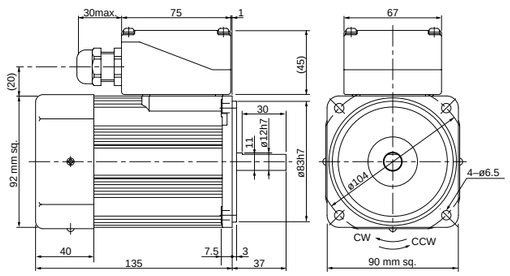
M91Z60SK4LG(A) (with fan)
M91Z60SK4DG(A) (with fan)
M91Z60SK4YG(A) (with fan)
M91Z60SK4GG(A) (with fan)



90 mm sq. 90 W Mass 3.3 kg

M91Z90SK4LS (with fan)
M91Z90SK4YS (with fan)

M91Z90SK4LG(A) (with fan)
M91Z90SK4DG(A) (with fan)
M91Z90SK4YG(A) (with fan)
M91Z90SK4GG(A) (with fan)



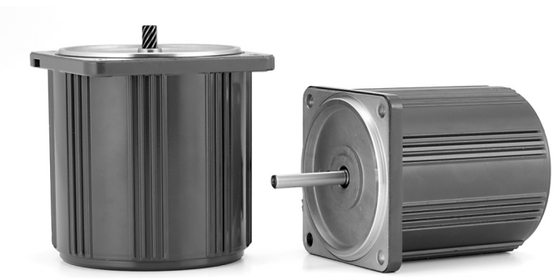
100V/200V round shaft motors with a sealed connector (with a terminal box) are covered by the Electrical Appliance and Material Safety Law. The indications on their nameplate are based on this law.

*The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
*The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Features B-2 | System configuration B-3 | Coding system B-3 | Model list B-4

Reversible Motor



Contents

Outline of reversible motor

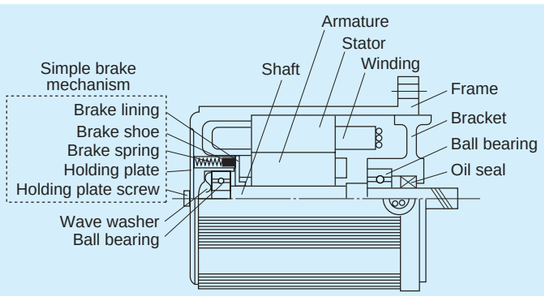
Features

- A quick-reversal run is possible.
- Because of balanced winding, it offers the same performance at both normal and reverse runs.
- The built-in simple brake mechanism makes the overrun small as compared with the induction motor, enabling a quick-reversal run.
- The time rating is 30 minutes.

  Difference between induction motor and reversible motor: The reversible motor can make a quick-reversal run. In the case of the induction motor, even if the wire connections are changed for a reverse run, it is not possible to reverse the load instantaneously because the torque (shaded area in the figure below) acting in a direction opposite to the rotating magnetic field is produced. Therefore you need to stop the induction motor once, change the wire connections and make a reverse run.

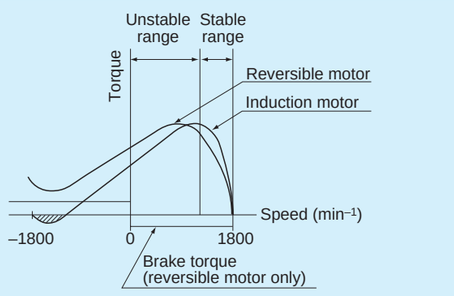
  (Note) • Limit the frequency of reversal operation to 6 cycles per minute.
  - If it is necessary that the frequency of reversal operation be 7 to 100 cycles per minute, use the C&B motor. (For running in one direction only)
  - For applications that need holding, use the electromagnetic brake motor.

Construction



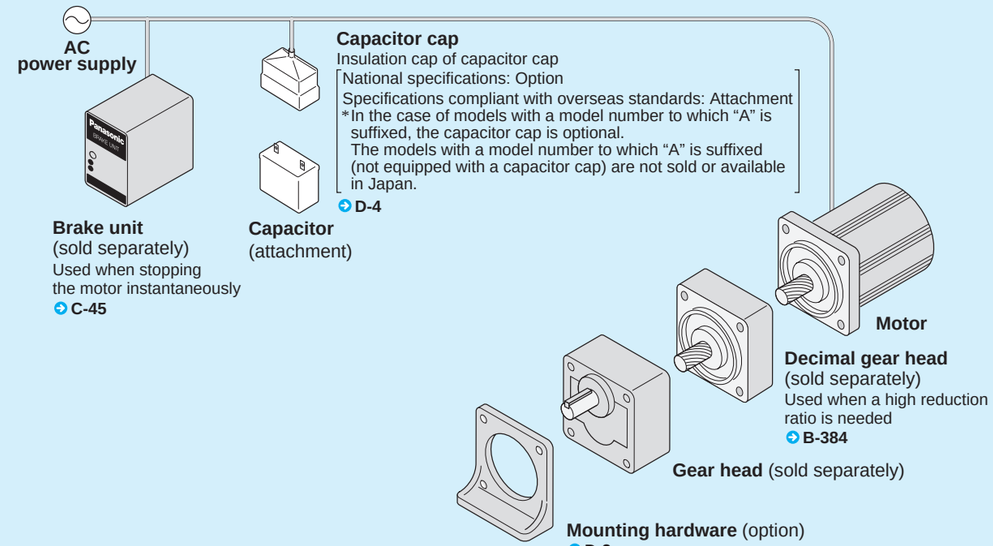
Characteristics

• Speed-torque characteristics



Note) Operation at 60 Hz

System configuration diagram



Coding system

M 9 R X 40 G 4 L S A

- **9 Size**
  - 4 : 42 mm sq.
  - 6 : 60 mm sq.
  - 7 : 70 mm sq.
  - 8 : 80 mm sq.
  - 9 : 90 mm sq.
- **R Motor type**
  - R : Reversible motor
- **X Output type**
  - A : 42mm sq. only
  - X : 40 W or smaller
  - Z : 60 W or larger
- **40 Output**
  - 1 : 1 W
  - 4 : 4 W
  - 6 : 6 W
  - 10 : 10 W
  - 15 : 15 W
  - 20 : 20 W
  - 25 : 25 W
  - 40 : 40 W
  - 60 : 60 W
  - 90 : 90 W
- **G Shape of shaft**
  - G : Pinion shaft
  - S : Round shaft
- **Option**
  - K : Sealed connector (Left aligned when no option is used)
- **4 No. of poles**
  - 4 : 4 poles
- **L Voltage**
  - L : 100 V
  - Y : 200 V
  - D : 110/115 V
  - G : 220/230 V
- **S Classification**
  - G : Specifications compliant with overseas standards
  - S : Round shaft (S for round shaft with national specifications only)
- **A**
  - Motor with specifications compliant with overseas standards that is not equipped with a capacitor cap.

Corresponding model number	Shape of shaft	Classification
Specifications compliant with overseas standards Pinion shaft	G	G
Specifications compliant with overseas standards Round shaft	S	G
National specifications Pinion shaft	G	–
National specifications Round shaft	S	S
42 mm sq. round shaft specifications	S	–

Outline of reversible motor

Overrun

In the case of the reversible motor, braking power is applied by the simple brake mechanism when the power is turned off. An overrun is defined as a revolution which the motor makes when the power is turned off. The overrun and brake torque (motor not loaded, reference value) of the reversible motor are shown in the table below.

• List of overruns of reversible motor

Size	60 mm sq.		70 mm sq.		80 mm sq.		90 mm sq.		
Output	4W	6W	10W	15W	20W	25W	40W	60W	90W
Motor model	M6RX4G4L	M6RX6G4L M6RX6G4Y M6RX6G4LG(A) M6RX6G4DG(A) M6RX6G4YG(A) M6RX6G4GG(A)	M7RX10G4L M7RX10G4Y	M7RX15G4L M7RX15G4Y M7RX15G4LG(A) M7RX15G4DG(A) M7RX15G4YG(A) M7RX15G4GG(A)	M8RX20G4L M8RX20G4Y	M8RX25G4L M8RX25G4Y M8RX25G4LG(A) M8RX25G4DG(A) M8RX25G4YG(A) M8RX25G4GG(A)	M9RX40G4L M9RX40G4Y M9RX40G4LG(A) M9RX40G4DG(A) M9RX40G4YG(A) M9RX40G4GG(A)	M9RZ60G4L M9RZ60G4Y M9RZ60G4LG(A) M9RZ60G4DG(A) M9RZ60G4YG(A) M9RZ60G4GG(A)	M9RZ90G4L M9RZ90G4Y M9RZ90G4LG(A) M9RZ90G4DG(A) M9RZ90G4YG(A) M9RZ90G4GG(A)
Brake torque x 10^{-2} N·m (kgf·cm)	0.588 (0.06)	0.588 (0.06)	1.27 (0.13)	1.27 (0.13)	1.47 (0.15)	1.47 (0.15)	3.92 (0.40)	3.92 (0.40)	3.92 (0.40)
Overrun (revolution)	5.0	5.0	4.5	4.5	5.5	5.5	6.0	6.0	6.0

(Note) The simple brake mechanism of the reversible motor cannot be used for positioning.
The simple brake mechanism of the reversible motor cannot be used for holding.

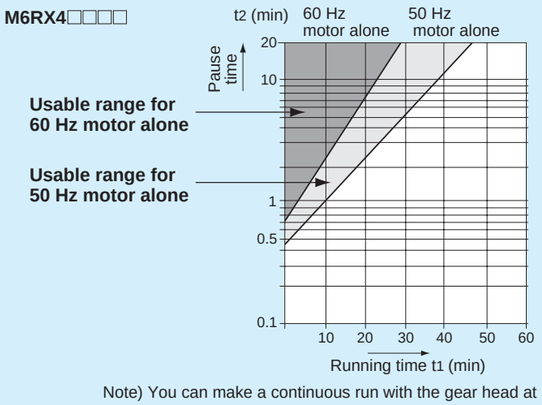
The brake torque of the reversible motor varies and changes over time.
When selecting a motor, do so allowing for such variations and changes.

Temperature rise of reversible motor

The reversible motor is of 30-minute rating when you run the motor alone, however, when you run it with the gear head or equipment, the continuous running time will be extended thanks to heat radiation effect. When you run the motor intermittently, the temperature rise will be saturated at a certain value depending on the cycle of intermittent running.
The limit of intermittent run of the reversible motor is shown in the table below.

• How to read the limit of intermittent run of reversible motor

Example: M6RX4□□□□

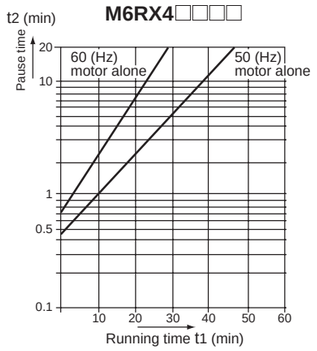


Note) You can make a continuous run with the gear head at 50 and 60 Hz.

* You can run the motor in the range above the running limit line.

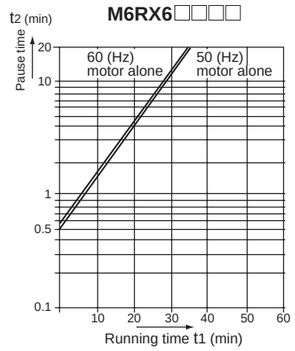
Limit of intermittent run of reversible motor

M6RX4□□□□



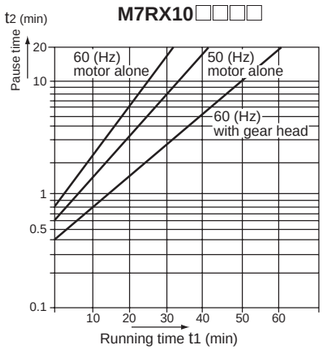
Note) You can make a continuous run with the gear head at 50 and 60 Hz.

M6RX6□□□□



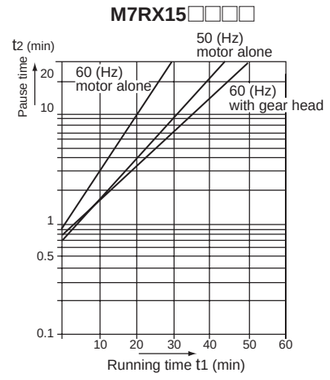
Note) You can make a continuous run with the gear head at 50 and 60 Hz.

M7RX10□□□□



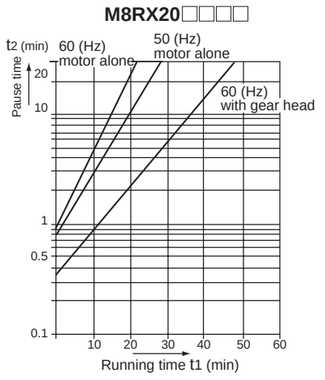
Note) You can make a continuous run with the gear head at 50.

M7RX15□□□□



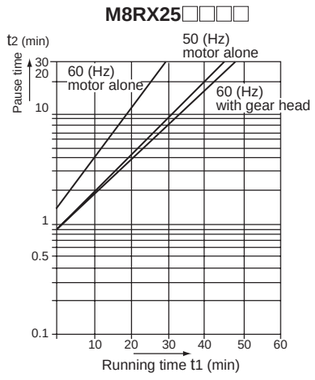
Note) You can make a continuous run with the gear head at 50.

M8RX20□□□□



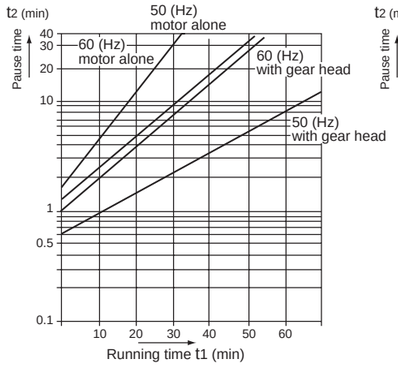
Note) You can make a continuous run with the gear head at 50.

M8RX25□□□□

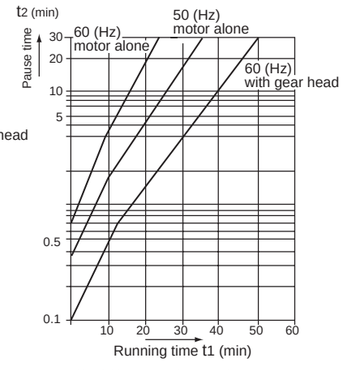


Note) You can make a continuous run with the gear head at 50.

M9RX40□□□□

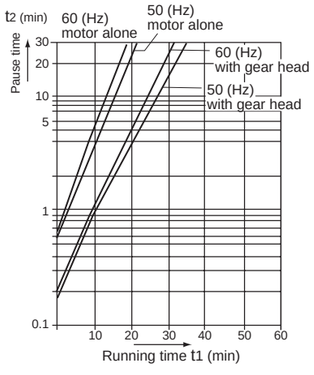


M9RZ60□□□□



Note) You can make a continuous run with the gear head at 50.

M9RZ90□□□□



Model list of reversible motor

Pinion shaft motor

Applicable gear head

✪ Motor compliant with overseas standards

Hinge attached

Size	Output (W)	Leadwire type				Sealed connector type				Standard gear head			High torque gear head	Right-angle gear head	Decimal gear head
		Model number	Specifications		Page	Model number	Specifications		Page	Ball bearing	metal bearing	Ball and metal bearing			
42 mm sq.	1	M4RA1G4L	100V		B-72					–	–	M4G□F	–	–	–
60 mm sq.	4	M6RX4G4L	100V		B-74					MX6G□BA MX6G□B	MX6G□MA MX6G□M	–	–	–	MX6G10XB
	6	M6RX6G4L	100V		B-76										
		M6RX6G4Y	200V		B-76										
		M6RX6G4LG(A)	100V	✪	B-78										
		M6RX6G4DG(A)	110/115V	✪	B-78										
		M6RX6G4YG(A)	200V	✪	B-78										
		M6RX6G4GG(A)	220/230V	✪	B-78										
70 mm sq.	10	M7RX10G4L	100V		B-80					MX7G□BA MX7G□B	MX7G□MA MX7G□M	–	–	–	MX7G10XB
		M7RX10G4Y	200V		B-80										
	15	M7RX15G4L	100V		B-82										
		M7RX15G4Y	200V		B-82										
		M7RX15G4LG(A)	100V	✪	B-84										
		M7RX15G4DG(A)	110/115V	✪	B-84										
		M7RX15G4YG(A)	200V	✪	B-84										
		M7RX15G4GG(A)	220/230V	✪	B-84										
80 mm sq.	20	M8RX20G4L	100V		B-86					MX8G□B	MX8G□M	–	–	–	MX8G10XB
		M8RX20G4Y	200V		B-86										
	25	M8RX25G4L	100V		B-88	M8RX25GK4L	100V		B-104						
		M8RX25G4Y	200V		B-88	M8RX25GK4Y	200V		B-104						
		M8RX25G4LG(A)	100V	✪	B-90	M8RX25GK4LG(A)	100V	✪	B-106						
		M8RX25G4DG(A)	110/115V	✪	B-90	M8RX25GK4DG(A)	110/115V	✪	B-106						
		M8RX25G4YG(A)	200V	✪	B-90	M8RX25GK4YG(A)	200V	✪	B-106						
		M8RX25G4GG(A)	220/230V	✪	B-90	M8RX25GK4GG(A)	220/230V	✪	B-106						
90 mm sq.	40	M9RX40G4L	100V		B-92	M9RX40GK4L	100V		B-108	MX9G□B	MX9G□M	–	–	MX9G□R	MX9G10XB
		M9RX40G4Y	200V		B-92	M9RX40GK4Y	200V		B-108						
		M9RX40G4LG(A)	100V	✪	B-94	M9RX40GK4LG(A)	100V	✪	B-110						
		M9RX40G4DG(A)	110/115V	✪	B-94	M9RX40GK4DG(A)	110/115V	✪	B-110						
		M9RX40G4YG(A)	200V	✪	B-94	M9RX40GK4YG(A)	200V	✪	B-110						
		M9RX40G4GG(A)	220/230V	✪	B-94	M9RX40GK4GG(A)	220/230V	✪	B-110						
	60	M9RZ60G4L	100V		B-96	M9RZ60GK4L	100V		B-112	MZ9G□B	–	–	MR9G□B	MZ9G□R	MZ9G10XB
		M9RZ60G4Y	200V		B-96	M9RZ60GK4Y	200V		B-112						
		M9RZ60G4LG(A)	100V	✪	B-98	M9RZ60GK4LG(A)	100V	✪	B-114						
		M9RZ60G4DG(A)	110/115V	✪	B-98	M9RZ60GK4DG(A)	110/115V	✪	B-114						
		M9RZ60G4YG(A)	200V	✪	B-98	M9RZ60GK4YG(A)	200V	✪	B-114						
		M9RZ60G4GG(A)	220/230V	✪	B-98	M9RZ60GK4GG(A)	220/230V	✪	B-114						
	90	M9RZ90G4L	100V		B-100	M9RZ90GK4L	100V		B-116	MY9G□B			MP9G□B		
		M9RZ90G4Y	200V		B-100	M9RZ90GK4Y	200V		B-116						
		M9RZ90G4LG(A)	100V	✪	B-102	M9RZ90GK4LG(A)	100V	✪	B-118						
		M9RZ90G4DG(A)	110/115V	✪	B-102	M9RZ90GK4DG(A)	110/115V	✪	B-118						
		M9RZ90G4YG(A)	200V	✪	B-102	M9RZ90GK4YG(A)	200V	✪	B-118						
		M9RZ90G4GG(A)	220/230V	✪	B-102	M9RZ90GK4GG(A)	220/230V	✪	B-118						

* The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

* Refer to page B-380 for dimensions and permissible torque of high torque gear head.
Refer to page B-382 for dimensions and permissible torque of right-angle gear head.
Refer to page B-384 for dimensions of decimal gear head.

Model list of reversible motor

Round shaft motor

✪ Motor compliant with overseas standards c UL us CE CCC
PS E Electrical Appliance and Material Safety Law

Size	Output (W)	Leadwire type		Sealed connector type	
		Model number	Specifications	Model number	Specifications
42 mm sq.	1	**M4RA1S4L**	100V		
60 mm sq.	4	**M6RX4S4LS**	100V		
	6	**M6RX6S4LS**	100V		
		M6RX6S4YS	200V		
		M6RX6S4LG(A)	100V ✪		
		M6RX6S4DG(A)	110/115V ✪		
		M6RX6S4YG(A)	200V ✪		
		M6RX6S4GG(A)	220/230V ✪		
70 mm sq.	10	**M7RX10S4LS**	100V		
		M7RX10S4YS	200V		
	15	**M7RX15S4LS**	100V		
		M7RX15S4YS	200V		
		M7RX15S4LG(A)	100V ✪		
		M7RX15S4DG(A)	110/115V ✪		
		M7RX15S4YG(A)	200V ✪		
		M7RX15S4GG(A)	220/230V ✪		
80 mm sq.	20	**M8RX20S4LS**	100V		
		M8RX20S4YS	200V		
	25	**M8RX25S4LS**	100V	**M8RX25SK4LS**	100V PS E
		M8RX25S4YS	200V	**M8RX25SK4YS**	200V PS E
		M8RX25S4LG(A)	100V ✪	**M8RX25SK4LG(A)**	100V ✪ PS E
		M8RX25S4DG(A)	110/115V ✪	**M8RX25SK4DG(A)**	110/115V ✪
		M8RX25S4YG(A)	200V ✪	**M8RX25SK4YG(A)**	200V ✪ PS E
		M8RX25S4GG(A)	220/230V ✪	**M8RX25SK4GG(A)**	220/230V ✪
90 mm sq.	40	**M9RX40S4LS**	100V	**M9RX40SK4LS**	100V PS E
		M9RX40S4YS	200V	**M9RX40SK4YS**	200V PS E
		M9RX40S4LG(A)	100V ✪	**M9RX40SK4LG(A)**	100V ✪ PS E
		M9RX40S4DG(A)	110/115V ✪	**M9RX40SK4DG(A)**	110/115V ✪
		M9RX40S4YG(A)	200V ✪	**M9RX40SK4YG(A)**	200V ✪ PS E
		M9RX40S4GG(A)	220/230V ✪	**M9RX40SK4GG(A)**	220/230V ✪
	60	**M9RZ60S4LS**	100V	**M9RZ60SK4LS**	100V PS E
		M9RZ60S4YS	200V	**M9RZ60SK4YS**	200V PS E
		M9RZ60S4LG(A)	100V ✪	**M9RZ60SK4LG(A)**	100V ✪ PS E
		M9RZ60S4DG(A)	110/115V ✪	**M9RZ60SK4DG(A)**	110/115V ✪
		M9RZ60S4YG(A)	200V ✪	**M9RZ60SK4YG(A)**	200V ✪ PS E
		M9RZ60S4GG(A)	220/230V ✪	**M9RZ60SK4GG(A)**	220/230V ✪
	90	**M9RZ90S4LS**	100V	**M9RZ90SK4LS**	100V PS E
		M9RZ90S4YS	200V	**M9RZ90SK4YS**	200V PS E
		M9RZ90S4LG(A)	100V ✪	**M9RZ90SK4LG(A)**	100V ✪ PS E
		M9RZ90S4DG(A)	110/115V ✪	**M9RZ90SK4DG(A)**	110/115V ✪
		M9RZ90S4YG(A)	200V ✪	**M9RZ90SK4YG(A)**	200V ✪ PS E
		M9RZ90S4GG(A)	220/230V ✪	**M9RZ90SK4GG(A)**	220/230V ✪

* The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft motor.
Dimensional outline drawing → Page B-123.
* The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

Reversible motor (leadwire)

42 mm sq. 1 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min^{-1})	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
42 mm sq.	M4RA1G4L	4	1	100	50	30	11	0.12	1125	0.0083 (0.085)	0.12	0.016 (0.16)	1.5 (200V)
					60		12	0.12	1550	0.0062 (0.063)	0.12	0.016 (0.16)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-123.

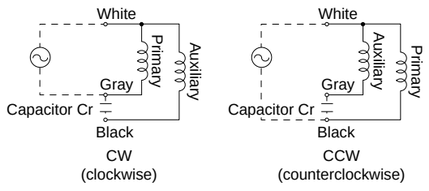
• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

Unit of permissible torque: upper **(mN·m)** / lower **(gf·cm)**

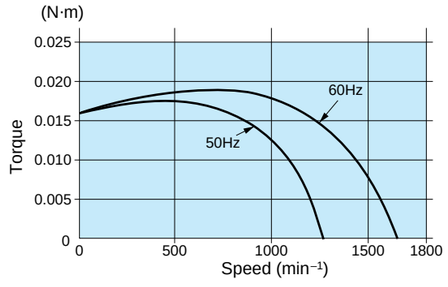
Reduction ratio			3	3.6	5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180
Speed (min^{-1})		50Hz	500	416.7	300	250	200	166.7	120	100	83.3	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	144	120	100	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	M4GA3F to M4GA180F (metal+ball bearing)	50Hz	23 (235)	27 (275)	37 (377)	45 (459)	56 (571)	67 (683)	84 (857)	98 (1000)	118 (1204)	147 (1499)	176 (1795)	216 (2203)	303 (3091)	363 (3703)	411 (4192)	490 (4998)				
		60Hz	19 (194)	23 (235)	31 (316)	37 (377)	47 (479)	56 (571)	77 (785)	84 (857)	98 (1000)	137 (1397)	147 (1499)	176 (1795)	245 (2499)	303 (3091)	303 (3091)	411 (4192)	490 (4998)			
Rotational direction			Same as motor rotational direction						Reverse to motor rotational direction			Same as motor rotational direction					Reverse to motor rotational direction					

Connection diagram



Speed-torque characteristics

M4RA1G4L

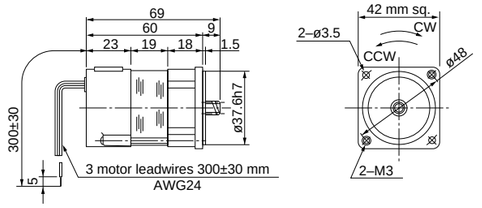


Motor (dimensions)

Scale: 1/3, Unit: mm

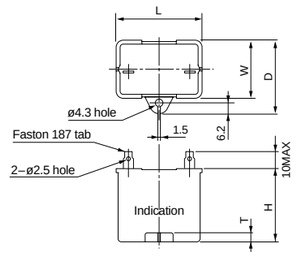
M4RA1G4L 4P 1 W 100 V

Mass	Spur gear	Module	Number of teeth
0.3 kg		0.4	10



Capacitor (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

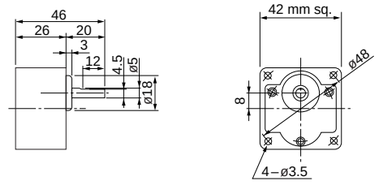
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M4RA1G4L	M0PC1.5M20	39.5	16	26.5	30.5	4	M0PC3917

Gear head (dimensions)

Scale: 1/3, Unit: mm

M4GA□F (ball + metal bearing) Mass 0.2 kg: Output shaft D cut

* In the case of 42 mm sq., a ball bearing is used for the output shaft only.



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Reversible motor (leadwire)

60 mm sq. 4 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
60 mm sq.	M6RX4G4L	4	4	100	50	30	18	0.19	1200	0.030 (0.31)	0.23	0.039 (0.40)	3.0 (200V)
					60		19	0.20	1550	0.023 (0.24)	0.24	0.040 (0.41)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-123.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

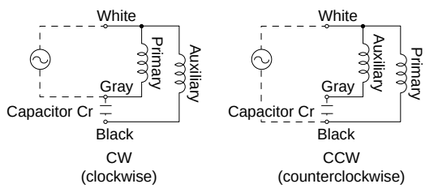
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX6G3BA to MX6G180B (ball bearing)	50Hz	0.059 (0.60)	0.071 (0.72)	0.11 (1.1)	0.13 (1.3)	0.16 (1.6)	0.19 (1.9)	0.23 (2.3)	0.27 (2.8)	0.32 (3.3)	0.39 (4.0)	0.44 (4.5)	0.53 (5.4)	0.64 (6.5)	0.76 (7.8)	0.98 (9.99)	1.18 (12)	1.47 (15)	1.76 (18)	2.06 (21)	2.45 (25)	2.45 (25)	
	MX6G3MA to MX6G180M (metal bearing)	60Hz	0.049 (0.49)	0.059 (0.60)	0.090 (0.91)	0.11 (1.1)	0.13 (1.3)	00.16 (1.6)	0.18 (1.8)	0.23 (2.3)	0.27 (2.8)	0.3 (3.1)	0.35 (3.6)	0.44 (4.5)	0.53 (5.4)	0.64 (6.5)	0.81 (8.3)	0.98 (9.99)	1.27 (13)	1.47 (15)	1.76 (18)	2.06 (21)	2.45 (25)	
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

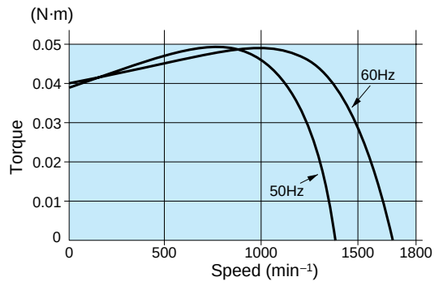
Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX6G□BA (ball bearing) MX6G□B / MX6G□MA (metal bearing) MX6G□M	MX6G10XB	Permissible torque	N·m (kgf·cm)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)
		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

Connection diagram



Speed-torque characteristics

M6RX4G4L



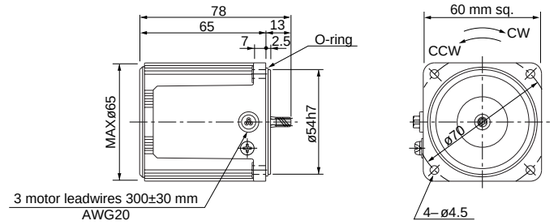
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

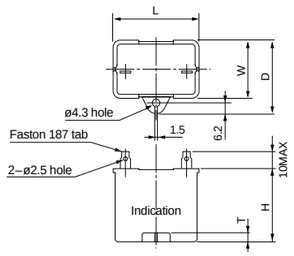
M6RX4G4L 4P 4 W 100 V

Mass	Helical gear	Module	Number of teeth
0.56 kg		0.5	6



Capacitor (dimensions) [attachment]

Unit: mm



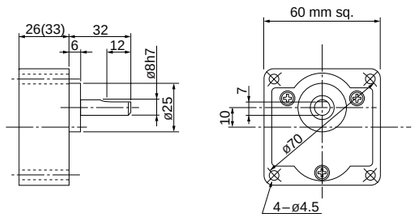
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M6RX4G4L	M0PC3M20	39.5	16	26.5	30.5	4	M0PC3917

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX6G□BA (ball bearing) / **MX6G□B** (ball bearing) Mass 0.24/0.3 kg: Output shaft D cut
MX6G□MA (metal bearing) / **MX6G□M** (metal bearing) Mass 0.24/0.3 kg: Output shaft D cut



* Figures in ( ) represent the dimensions of MX6G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX6G□BA (MA).)

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Reversible motor (leadwire)

60 mm sq. 6 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
60 mm sq.	M6RX6G4L	4	6	100	50	30	22	0.23	1250	0.047 (0.47)	0.30	0.050 (0.51)	3.5 (200V)
					60		22	0.22	1575	0.037 (0.37)	0.31	0.052 (0.53)	
	M6RX6G4Y	4	6	200	50	30	22	0.11	1275	0.045 (0.46)	0.16	0.053 (0.54)	0.9 (400V)
					60		22	0.12	1600	0.036 (0.37)	0.16	0.053 (0.54)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-123.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

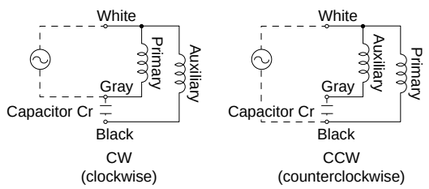
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head: MX6G3BA to MX6G180B (ball bearing)	50Hz	0.098 (1.0)	0.12 (1.2)	0.16 (1.6)	0.19 (1.9)	0.25 (2.6)	0.29 (3.0)	0.33 (3.4)	0.40 (4.1)	0.49 (5.0)	0.59 (6.0)	0.66 (6.7)	0.79 (8.1)	0.95 (9.7)	1.18 (12)	1.57 (16)	1.86 (19)	2.25 (23)	2.45 (25)	2.45 (25)			
Applicable gear head: MX6G3MA to MX6G180M (metal bearing)	60Hz	0.081 (0.83)	0.098 (1.0)	0.13 (1.3)	0.16 (1.6)	0.21 (2.1)	0.25 (2.6)	0.26 (2.7)	0.33 (3.4)	0.40 (4.1)	0.49 (5.0)	0.53 (5.4)	0.66 (6.7)	0.79 (8.1)	0.95 (9.7)	1.27 (13)	1.57 (16)	1.86 (19)	2.25 (23)	2.45 (25)			
Rotational direction		Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

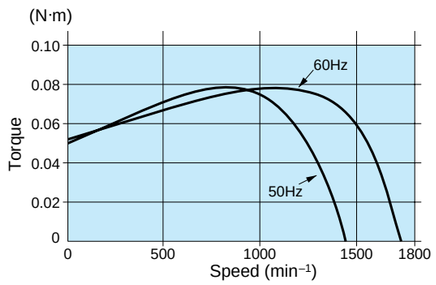
Applicable gear head: Bearing	Decimal gear head	Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
		Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX6G□BA (ball bearing) MX6G□B	MX6G10XB	Permissible torque	N·m (kgf·cm)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)
MX6G□MA (metal bearing) MX6G□M		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

Connection diagram



Speed-torque characteristics

M6RX6G4L

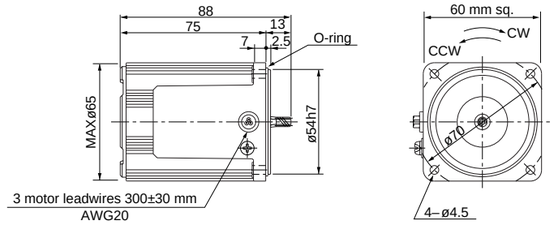


Motor (dimensions)

Scale: 1/3, Unit: mm

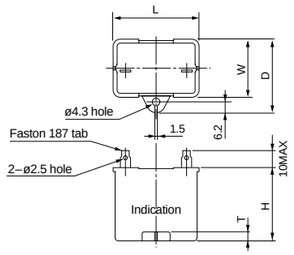
M6RX6G4L 4P 6 W 100 V
M6RX6G4Y 4P 6 W 200 V

Mass	Helical gear	Module	Number of teeth
0.67 kg		0.5	6



Capacitor (dimensions) [attachment]

Unit: mm



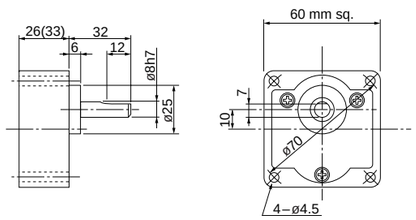
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M6RX6G4L	M0PC3.5M20	39.5	16	26.5	30.5	4	M0PC3917
M6RX6G4Y	M0PC0.9M40	39.5	16.2	27	27	4	M0PC3917

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX6G□BA (ball bearing) / **MX6G□B** (ball bearing) Mass 0.24/0.3 kg: Output shaft D cut
MX6G□MA (metal bearing) / **MX6G□M** (metal bearing) Mass 0.24/0.3 kg: Output shaft D cut



* Figures in ( ) represent the dimensions of MX6G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX6G□BA (MA).)

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Reversible motor (leadwire)

60 mm sq. 6 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
60 mm sq.	M6RX6G4LG M6RX6G4LGA	4	6	100	50	30	24	0.24	1300	0.044 (0.45)	0.33	0.060 (0.61)	4 (250V)
					60		26	0.26	1600	0.036 (0.37)	0.35	0.060 (0.61)	
	M6RX6G4DG M6RX6G4DGA	4	6	110	60	30	24	0.22	1600	0.036 (0.37)	0.34	0.056 (0.57)	3 (250V)
				115	60		26	0.23	1625	0.035 (0.36)	0.35	0.060 (0.61)	
	M6RX6G4YG M6RX6G4YGA	4	6	200	50	30	24	0.12	1250	0.046 (0.47)	0.15	0.060 (0.61)	1 (450V)
					60		28	0.14	1550	0.037 (0.38)	0.16	0.060 (0.61)	
	M6RX6G4GG M6RX6G4GGA	4	6	220	50	30	24	0.11	1275	0.045 (0.46)	0.15	0.056 (0.57)	0.8 (450V)
					60		26	0.12	1575	0.036 (0.37)	0.15	0.056 (0.57)	
				230	50		26	0.12	1300	0.044 (0.45)	0.15	0.060 (0.61)	
					60		28	0.12	1600	0.036 (0.37)	0.16	0.060 (0.61)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-123.
• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

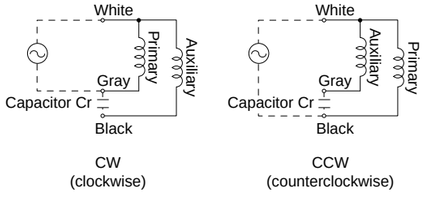
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX6G3BA to MX6G180B (ball bearing)	50Hz	0.098 (1.0)	0.12 (1.2)	0.16 (1.6)	0.19 (1.9)	0.25 (2.6)	0.29 (3.0)	0.33 (3.4)	0.40 (4.1)	0.49 (5.0)	0.59 (6.0)	0.66 (6.7)	0.79 (8.1)	0.95 (9.7)	1.18 (12)	1.57 (16)	1.86 (19)	2.25 (23)	2.45 (25)	2.45 (25)			
	MX6G3MA to MX6G180M (metal bearing)	60Hz	0.081 (0.83)	0.098 (1.0)	0.13 (1.3)	0.16 (1.6)	0.21 (2.1)	0.25 (2.6)	0.26 (2.7)	0.33 (3.4)	0.40 (4.1)	0.49 (5.0)	0.53 (5.4)	0.66 (6.7)	0.79 (8.1)	0.95 (9.7)	1.27 (13)	1.57 (16)	1.86 (19)	2.25 (23)	2.45 (25)			
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

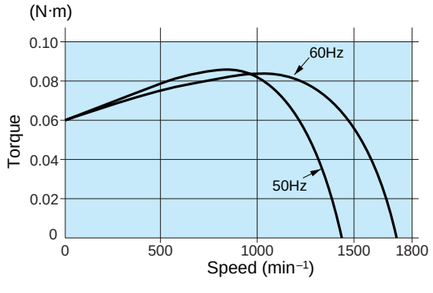
Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX6G□BA (ball bearing) MX6G□B (ball bearing) MX6G□MA (metal bearing) MX6G□M (metal bearing)	MX6G10XB	Permissible torque	N·m	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45
			(kgf·cm)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)
		Rotational direction		Same as motor rotational direction		Reverse to motor rotational direction									

Connection diagram



Speed-torque characteristics

M6RX6G4LG(A)



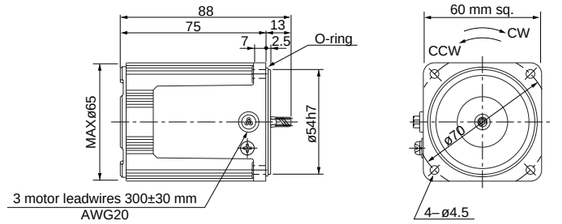
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

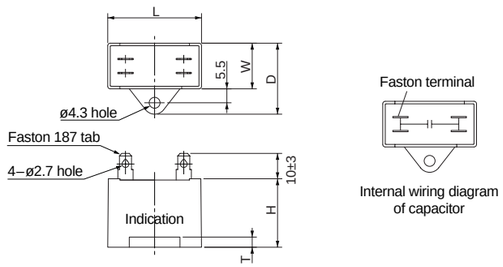
M6RX6G4LG(A) 4P 6 W 100 V
M6RX6G4DG(A) 4P 6 W 110 V / 115 V
M6RX6G4YG(A) 4P 6 W 200 V
M6RX6G4GG(A) 4P 6 W 220 V / 230 V

Mass	Helical	Module	Number of teeth
0.67 kg	gear	0.5	6



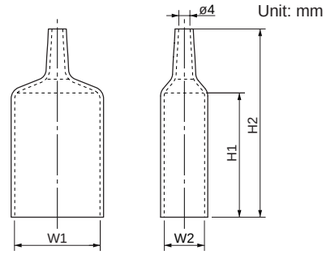
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

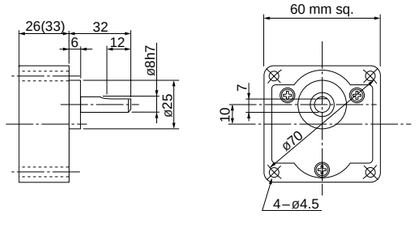
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M6RX6G4LG(A)	M0PC4M25G	37	18	28	27	4	M0PC3718G	37	18	50	73
M6RX6G4DG(A)	M0PC3M25G	31	17	27	27	4	M0PC3117G	31	17	50	73
M6RX6G4YG(A)	M0PC1M45G	37	18	28	27	4	M0PC3718G	37	18	50	73
M6RX6G4GG(A)	M0PC0.8M45G	31	17	27	27	4	M0PC3117G	31	17	50	73

• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX6G□BA (ball bearing) / **MX6G□B** (ball bearing) Mass 0.24/0.3 kg: Output shaft D cut
MX6G□MA (metal bearing) / **MX6G□M** (metal bearing) Mass 0.24/0.3 kg: Output shaft D cut



* Figures in ( ) represent the dimensions of MX6G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX6G□BA (MA).)
(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Reversible motor (leadwire)

70 mm sq. 10 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
70 mm sq.	M7RX10G4L	4	10	100	50	30	30	0.30	1150	0.084 (0.85)	0.41	0.061 (0.62)	4.5 (200V)
					60		30	0.30	1525	0.063 (0.64)	0.40	0.063 (0.64)	
	M7RX10G4Y	4	10	200	50	30	30	0.15	1200	0.082 (0.83)	0.20	0.061 (0.62)	1.2 (400V)
					60		32	0.16	1550	0.063 (0.64)	0.21	0.063 (0.64)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-123.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

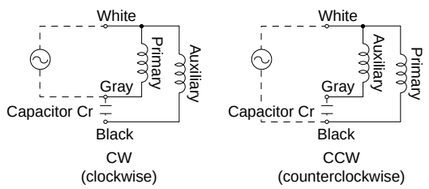
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX7G3BA to MX7G180B (ball bearing)	50Hz	0.16 (1.6)	0.19 (19)	0.25 (2.0)	0.30 (3.1)	0.38 (3.9)	0.46 (4.7)	0.51 (5.2)	0.64 (6.5)	0.77 (7.9)	0.93 (9.5)	0.98 (10)	1.27 (13)	1.47 (15)	1.76 (18)	2.55 (26)	3.04 (31)	3.63 (37)	4.31 (44)	4.80 (49)	4.90 (50)	4.90 (50)	
	MX7G3MA to MX7G180M (metal bearing)	60Hz	0.13 (1.3)	0.16 (1.6)	0.22 (2.2)	0.25 (2.6)	0.32 (3.3)	0.38 (3.9)	0.44 (4.5)	0.53 (5.4)	0.64 (7.9)	0.77 (7.9)	0.85 (8.7)	1.08 (11)	1.27 (13)	1.47 (15)	2.16 (22)	2.55 (26)	3.04 (31)	3.63 (37)	4.03 (41)	4.80 (49)	4.90 (50)		
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

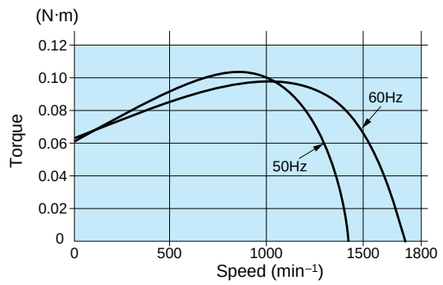
Applicable gear head			Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head		Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
				60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX7G□BA (ball bearing) MX7G□B	MX7G10XB		Permissible torque	N·m (kgf·cm)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)
MX7G□MA (metal bearing) MX7G□M			Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

Connection diagram



Speed-torque characteristics

M7RX10G4L



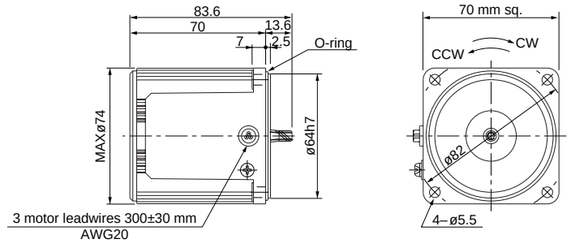
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

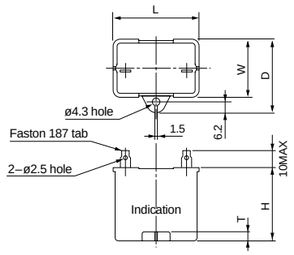
M7RX10G4L 4P 10 W 100 V
M7RX10G4Y 4P 10 W 200 V

Mass	Helical gear	Module	Number of teeth
0.84 kg		0.5	7



Capacitor (dimensions) [attachment]

Unit: mm



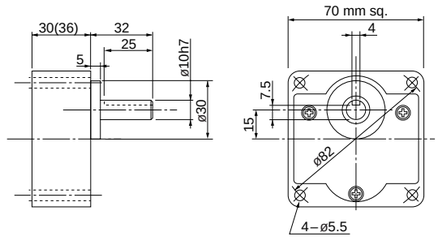
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M7RX10G4L	M0PC4.5M20	39.5	16	26.5	30.5	4	M0PC3917
M7RX10G4Y	M0PC1.2M40	39.5	18.3	29	29	4	M0PC3922

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX7G□BA (ball bearing) / **MX7G□B** (ball bearing) Mass 0.38/0.45 kg
MX7G□MA (metal bearing) / **MX7G□M** (metal bearing) Mass 0.38/0.45 kg

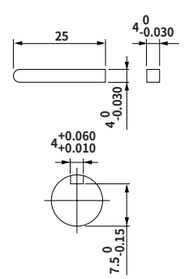


* Figures in ( ) represent the dimensions of MX7G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX7G□BA (MA).)

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MX7G□BA(B)
MX7G□MA(M)



Reversible motor (leadwire)

70 mm sq. 15 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min^{-1})	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
70 mm sq.	M7RX15G4L	4	15	100	50	30	36	0.37	1275	0.110 (1.10)	0.59	0.085 (0.86)	6 (200V)
					60		37	0.38	1575	0.088 (0.90)	0.57	0.085 (0.86)	
	M7RX15G4Y	4	15	200	50	30	36	0.19	1275	0.110 (1.10)	0.30	0.078 (0.80)	1.5 (400V)
					60		37	0.19	1575	0.088 (0.90)	0.29	0.078 (0.80)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-123.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

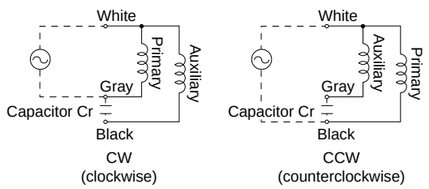
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min^{-1})		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX7G3BA to MX7G180B (ball bearing)	50Hz	0.24 (2.5)	0.28 (2.9)	0.39 (4.0)	0.47 (4.8)	0.59 (6.0)	0.71 (7.2)	0.80 (8.2)	0.98 (10)	1.18 (12)	1.37 (14)	1.57 (16)	1.86 (19)	2.25 (23)	2.74 (28)	3.82 (39)	4.61 (47)	4.90 (50)	4.90 (50)				
	MX7G3MA to MX7G180M (metal bearing)	60Hz	0.20 (2.0)	0.24 (2.5)	0.32 (3.3)	0.39 (4.0)	0.49 (5.0)	0.59 (6.0)	0.66 (6.7)	0.81 (8.3)	0.98 (10)	1.18 (12)	1.27 (13)	1.57 (16)	1.86 (19)	2.25 (23)	3.23 (33)	3.82 (39)	4.80 (49)	4.90 (50)				
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

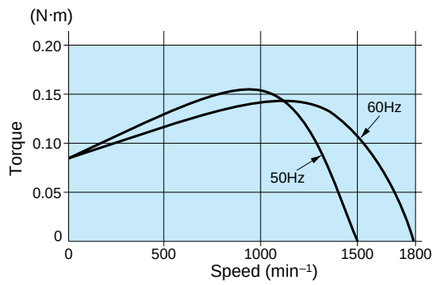
Applicable gear head			Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head		Speed (min^{-1})	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
				60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX7G□BA (ball bearing) MX7G□B	MX7G10XB		Permissible torque	N·m (kgf·cm)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)
MX7G□MA (metal bearing) MX7G□M			Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

Connection diagram



Speed-torque characteristics

M7RX15G4L



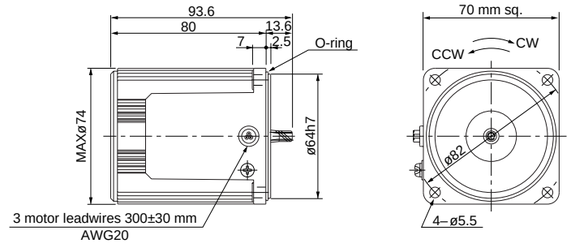
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

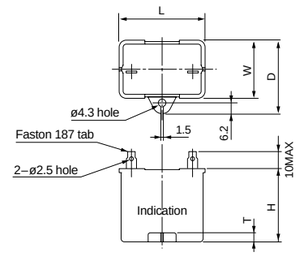
M7RX15G4L 4P 15 W 100 V
M7RX15G4Y 4P 15 W 200 V

Mass	Helical	Module	Number of teeth
1.1 kg	gear	0.5	7



Capacitor (dimensions) [attachment]

Unit: mm



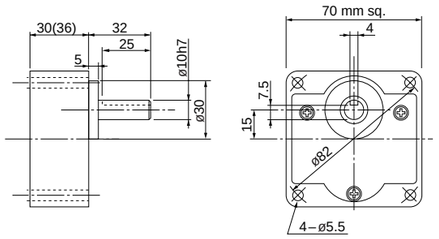
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M7RX15G4L	M0PC6M20	39.5	17.5	28	30.5	4	M0PC3917
M7RX15G4Y	M0PC1.5M40	39.5	22	32.5	32.5	4	M0PC3922

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX7G□BA (ball bearing) / **MX7G□B** (ball bearing) Mass 0.38/0.45 kg
MX7G□MA (metal bearing) / **MX7G□M** (metal bearing) Mass 0.38/0.45 kg

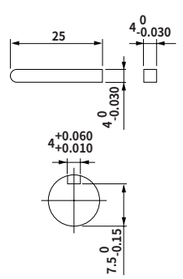


* Figures in ( ) represent the dimensions of MX7G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX7G□BA (MA).)

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MX7G□BA(B)
MX7G□MA(M)



Reversible motor (leadwire)

70 mm sq. 15 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
70 mm sq.	M7RX15G4LG M7RX15G4LGA	4	15	100	50	30	39	0.39	1250	0.12 (1.2)	0.58	0.10 (1.0)	6.5 (250V)
					60		43	0.44	1575	0.092 (0.93)	0.58	0.10 (1.0)	
	M7RX15G4DG M7RX15G4DGA	4	15	110	60	30	42	0.38	1600	0.090 (0.91)	0.60	0.10 (1.0)	5.5 (250V)
				115	60		44	0.38	1625	0.088 (0.90)	0.63	0.11 (1.1)	
	M7RX15G4YG M7RX15G4YGA	4	15	200	50	30	40	0.20	1225	0.12 (1.2)	0.27	0.10 (1.0)	1.7 (450V)
					60		50	0.25	1525	0.094 (0.96)	0.28	0.10 (1.0)	
	M7RX15G4GG M7RX15G4GGA	4	15	220	50	30	39	0.18	1225	0.12 (1.2)	0.27	0.086 (0.88)	1.3 (450V)
					60		41	0.19	1550	0.092 (0.94)	0.26	0.086 (0.88)	
				230	50		40	0.18	1275	0.11 (1.1)	0.28	0.094 (0.96)	
					60		43	0.19	1575	0.091 (0.93)	0.28	0.094 (0.96)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-123.
• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

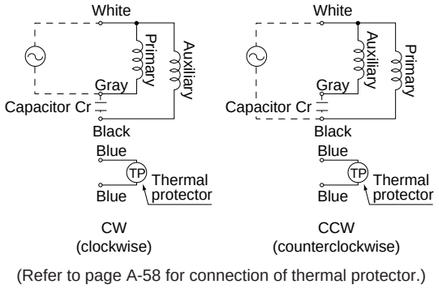
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head: MX7G3BA to MX7G180B (ball bearing)	50Hz	0.24 (2.5)	0.28 (2.9)	0.39 (4.0)	0.47 (4.8)	0.59 (6.0)	0.71 (7.2)	0.80 (8.2)	0.98 (10)	1.18 (12)	1.37 (14)	1.57 (16)	1.86 (19)	2.25 (23)	2.74 (28)	3.82 (39)	4.61 (47)	4.90 (50)	4.90 (50)				
Applicable gear head: MX7G3MA to MX7G180M (metal bearing)	60Hz	0.20 (2.0)	0.24 (2.5)	0.32 (3.3)	0.39 (4.0)	0.49 (5.0)	0.59 (6.0)	0.66 (6.7)	0.81 (8.3)	0.98 (10)	1.18 (12)	1.27 (13)	1.57 (16)	1.86 (19)	2.25 (23)	3.23 (33)	3.82 (39)	4.80 (49)	4.90 (50)				
Rotational direction		Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head: Bearing	Decimal gear head	Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
MX7G□BA (ball bearing) MX7G□B MX7G□MA (metal bearing) MX7G□M	MX7G10XB	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
		Permissible torque	N·m	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90
			(kgf·cm)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)
		Rotational direction		Same as motor rotational direction		Reverse to motor rotational direction									

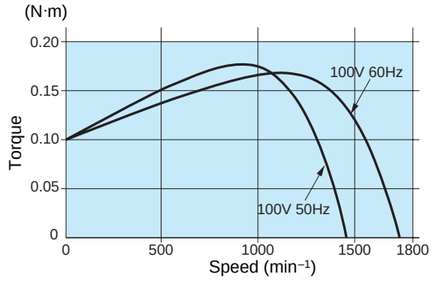
Connection diagram



(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

M7RX15G4LG(A)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

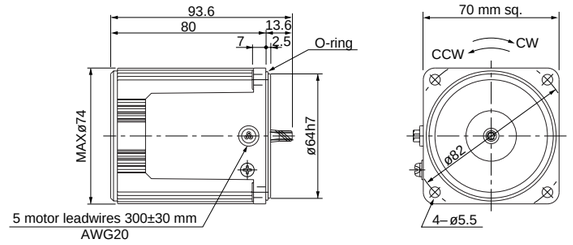
Features B-64 | System configuration B-65 | Coding system B-65 | Model list B-68

Motor (dimensions)

Scale: 1/3, Unit: mm

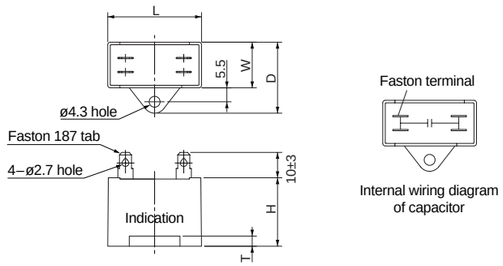
M7RX15G4LG(A) 4P 15 W 100 V
M7RX15G4DG(A) 4P 15 W 110 V / 115 V
M7RX15G4YG(A) 4P 15 W 200 V
M7RX15G4GG(A) 4P 15 W 220 V / 230 V

Mass	Helical	Module	Number of teeth
1.1 kg	gear	0.5	7



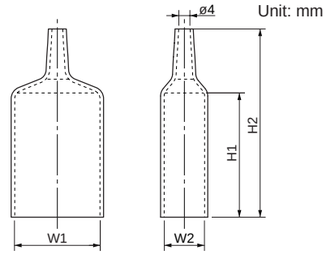
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

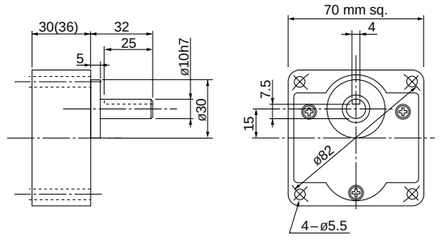
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M7RX15G4LG(A)	M0PC6.5M25G	48	19	29	29	4	M0PC4819G	48	19	55	78
M7RX15G4DG(A)	M0PC5.5M25G	38	21	31	31	4	M0PC3821G	38	21	55	78
M7RX15G4YG(A)	M0PC1.7M45G	38	21	31	31	4	M0PC3821G	38	21	55	78
M7RX15G4GG(A)	M0PC1.3M45G	38	19	29	29	4	M0PC3819G	38	19	50	73

• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX7G□BA (ball bearing) / **MX7G□B** (ball bearing) Mass 0.38/0.45 kg
MX7G□MA (metal bearing) / **MX7G□M** (metal bearing) Mass 0.38/0.45 kg

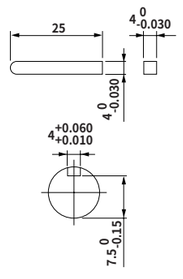


* Figures in ( ) represent the dimensions of MX7G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX7G□BA (MA).)

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MX7G□BA(B)
MX7G□MA(M)



Induction motor
Reversible motor
3-phase motor
Electromagnetic brake motor
Variable speed induction motor
Variable speed reversible motor
Variable speed electromagnetic brake single-phase motor
Variable speed unit
2-pole round shaft motor
Gear head

Gear head combination B-120 | Round shaft motor dimensions B-123 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Reversible motor (leadwire)

80 mm sq. 20 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
80 mm sq.	M8RX20G4L	4	20	100	50	30	51	0.52	1100	0.17 (1.7)	0.73	0.12 (1.2)	7 (200V)
					60		48	0.47	1475	0.13 (1.3)	0.71	0.12 (1.2)	
	M8RX20G4Y	4	20	200	50	30	52	0.26	1100	0.17 (1.7)	0.37	0.13 (1.3)	1.8 (400V)
					60		48	0.24	1475	0.13 (1.3)	0.36	0.13 (1.3)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-123.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

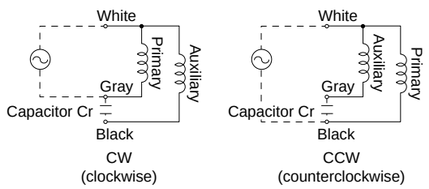
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX8G3B to MX8G180B (ball bearing)	50Hz	0.34 (3.5)	0.41 (4.2)	0.57 (5.8)	0.69 (7.0)	0.85 (8.7)	0.98 (10)	1.18 (12)	1.37 (14)	1.67 (17)	1.96 (20)	2.25 (23)	2.74 (28)	3.33 (34)	4.02 (41)	5.49 (56)	6.57 (67)	7.84 (80)	7.84 (80)					
	MX8G3M to MX8G180M (metal bearing)	60Hz	0.28 (2.9)	0.34 (3.5)	0.47 (4.8)	0.57 (5.8)	0.72 (7.3)	0.85 (8.7)	0.95 (9.7)	1.18 (12)	1.37 (14)	1.67 (17)	1.86 (19)	2.25 (23)	2.74 (28)	3.33 (34	4.61 (47)	5.49 (56)	6.86 (70)	7.84 (80)					
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

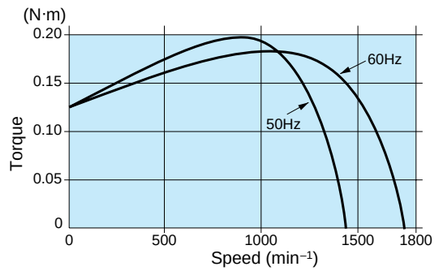
Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX8G□B (ball bearing) MX8G□M (metal bearing)	MX8G10XB	Permissible torque	N·m (kgf·cm)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)
		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

Connection diagram



Speed-torque characteristics

M8RX20G4L

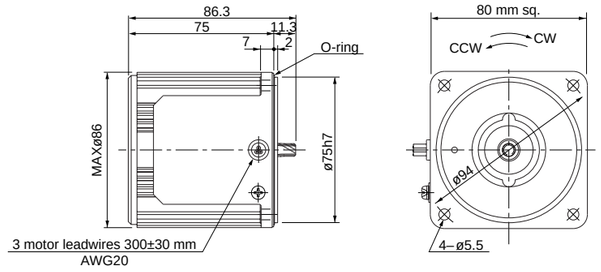


Motor (dimensions)

Scale: 1/3, Unit: mm

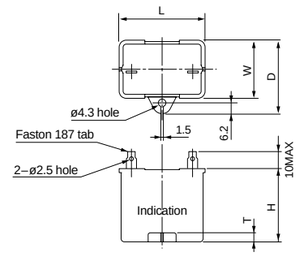
M8RX20G4L 4P 20 W 100 V
M8RX20G4Y 4P 20 W 200 V

Mass	Helical	Module	Number of teeth
1.2 kg	gear	0.5	9



Capacitor (dimensions) [attachment]

Unit: mm



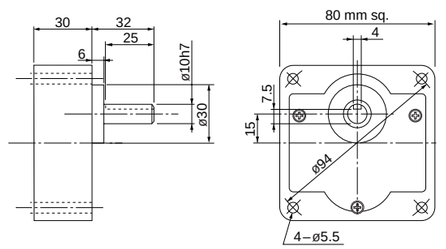
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M8RX20G4L	M0PC7M20	39.5	22	32.5	30.5	4	M0PC3922
M8RX20G4Y	M0PC1.8M40	39.5	22	32.5	32.5	4	M0PC3922

Gear head (dimensions)

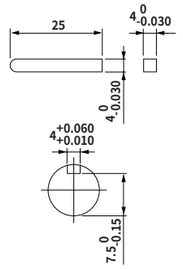
Scale: 1/3, Unit: mm

MX8G□B (ball bearing) / **MX8G□M** (metal bearing) Mass 0.6 kg



Key and keyway (dimensions) [attachment]

MX8G□B(M)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Reversible motor (leadwire)

80 mm sq. 25 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
80 mm sq.	M8RX25G4L	4	25	100	50	30	58	0.59	1275	0.19 (1.9)	1.0	0.17 (1.7)	9.5 (200V)
					60		57	0.59	1575	0.16 (1.6)	1.0	0.17 (1.7)	
	M8RX25G4Y	4	25	200	50	30	57	0.29	1275	0.19 (1.9)	0.52	0.19 (2.0)	2.4 (400V)
					60		57	0.29	1575	0.16 (1.6)	0.50	0.19 (2.0)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-123.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

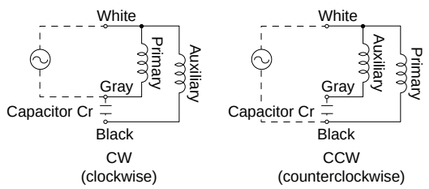
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX8G3B to MX8G180B (ball bearing)	50Hz	0.39 (4.0)	0.47 (4.8)	0.66 (6.7)	0.78 (8.0)	0.98 (10)	1.18 (12)	1.27 (13)	1.57 (16)	1.96 (20)	2.35 (24)	2.55 (26)	3.14 (32)	3.82 (39)	4.61 (47)	6.37 (65)	7.64 (78)	7.84 (80)					
	MX8G3M to MX8G180M (metal bearing)	60Hz	0.32 (3.3)	0.39 (4.0)	0.55 (5.6)	0.66 (6.7)	0.81 (8.3)	0.98 (10)	1.08 (11)	1.27 (13)	1.57 (16)	1.96 (20)	2.06 (21)	2.65 (27)	3.14 (32)	3.82 (39)	5.29 (54)	6.37 (65)	7.84 (80)					
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

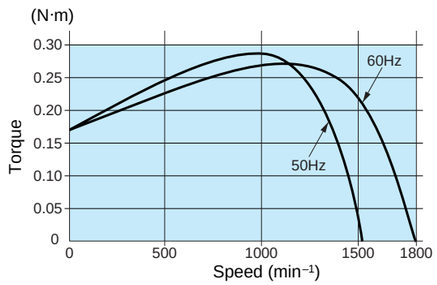
Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX8G□B (ball bearing) MX8G□M (metal bearing)	MX8G10XB	Permissible torque	N·m (kgf·cm)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)
		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

Connection diagram



Speed-torque characteristics

M8RX25G4L

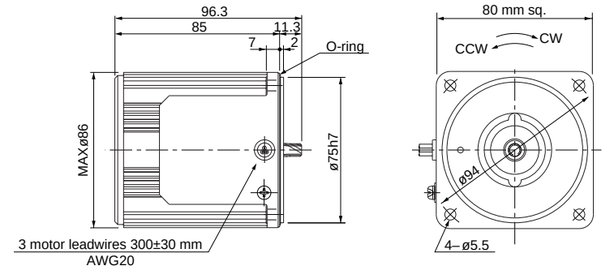


Motor (dimensions)

Scale: 1/3, Unit: mm

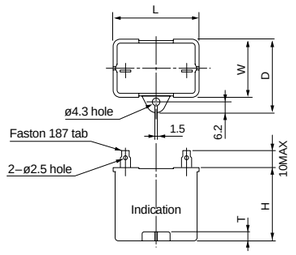
M8RX25G4L 4P 25 W 100 V
M8RX25G4Y 4P 25 W 200 V

Mass	Helical	Module	Number of teeth
1.5 kg	gear	0.5	9



Capacitor (dimensions) [attachment]

Unit: mm



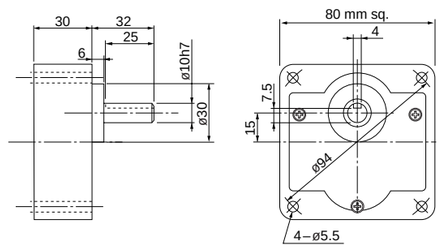
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M8RX25G4L	M0PC9.5M20	39.5	22	32.5	30.5	4	M0PC3922
M8RX25G4Y	M0PC2.4M40	49.7	24	34.5	34.5	4	M0PC5026

Gear head (dimensions)

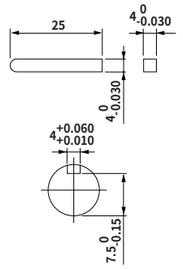
Scale: 1/3, Unit: mm

MX8G□B (ball bearing) / **MX8G□M** (metal bearing) Mass 0.6 kg



Key and keyway (dimensions) [attachment]

MX8G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Reversible motor (leadwire)

cULus CE 80 mm sq. 25 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min^{-1})	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor 容量(μF) (定格電圧)
80 mm sq.	M8RX25G4LG M8RX25G4LGA	4	25	100	50	30	59	0.60	1250	0.19 (1.9)	1.1	0.19 (1.9)	10 (250V)
					60		61	0.61	1550	0.15 (1.6)	1.1	0.19 (1.9)	
	M8RX25G4DG M8RX25G4DGA	4	25	110	60	30	58	0.53	1575	0.15 (1.5)	1.1	0.17 (1.7)	8 (250V)
				115	60		61	0.53	1600	0.15 (1.5)	1.2	0.19 (1.9)	
	M8RX25G4YG M8RX25G4YGA	4	25	200	50	30	59	0.30	1200	0.20 (2.0)	0.45	0.19 (1.9)	2.5 (450V)
					60		66	0.34	1525	0.16 (1.6)	0.46	0.19 (1.9)	
	M8RX25G4GG M8RX25G4GGA	4	25	220	50	30	60	0.28	1225	0.19 (2.0)	0.47	0.18 (1.8)	2 (450V)
					60		60	0.27	1550	0.15 (1.6)	0.46	0.18 (1.8)	
				230	50		62	0.28	1275	0.19 (1.9)	0.49	0.19 (1.9)	
					60		62	0.27	1575	0.15 (1.5)	0.48	0.19 (1.9)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-123.
• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

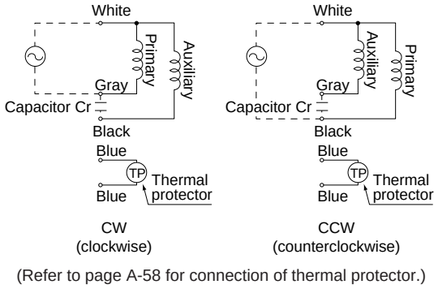
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min^{-1})		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX8G3B to MX8G180B (ball bearing)	50Hz	0.39 (4.0)	0.47 (4.8)	0.66 (6.7)	0.78 (8.0)	0.98 (10)	1.18 (12)	1.27 (13)	1.57 (16)	1.96 (20)	2.35 (24)	2.55 (26)	3.14 (32)	3.82 (39)	4.61 (47)	6.37 (65)	7.64 (78)	7.84 (80)					
	MX8G3M to MX8G180M (metal bearing)	60Hz	0.32 (3.3)	0.39 (4.0)	0.55 (5.6)	0.66 (6.7)	0.81 (8.3)	0.98 (10)	1.08 (11)	1.27 (13)	1.57 (16)	1.96 (20)	2.06 (21)	2.65 (27)	3.14 (32)	3.82 (39)	5.29 (54)	6.37 (65)	7.84 (80)					
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min^{-1})	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX8G□B (ball bearing) MX8G□M (metal bearing)	MX8G10XB	Permissible torque	N·m	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)
			(kgf·cm)												
		Rotational direction		Same as motor rotational direction		Reverse to motor rotational direction									

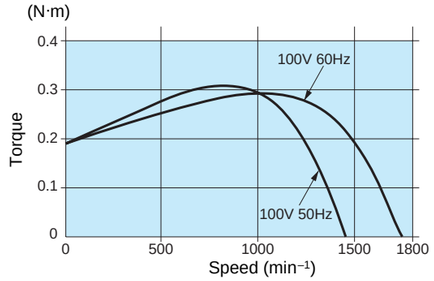
Connection diagram



(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

M8RX25G4LG(A)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

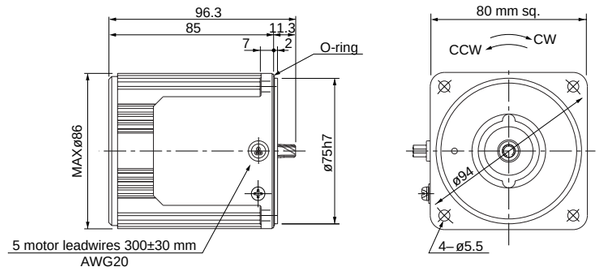
Features B-64 | System configuration B-65 | Coding system B-65 | Model list B-68

Motor (dimensions)

Scale: 1/3, Unit: mm

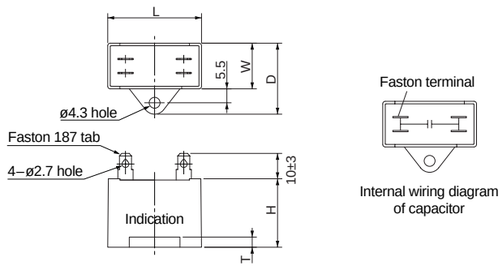
M8RX25G4LG(A) 4P 25 W 100 V
M8RX25G4DG(A) 4P 25 W 110 V / 115 V
M8RX25G4YG(A) 4P 25 W 200 V
M8RX25G4GG(A) 4P 25 W 220 V / 230 V

Mass	Helical	Module	Number of teeth
1.5 kg	gear	0.5	9



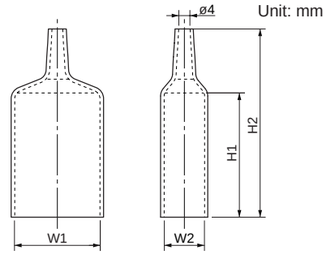
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

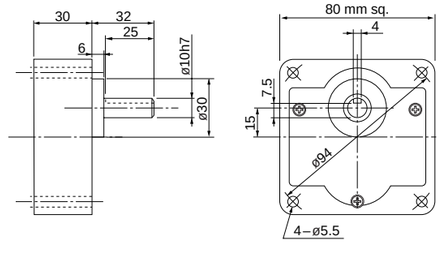
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M8RX25G4LG(A)	M0PC10M25G	58	21	31	31	4	M0PC5821G	58	21	55	78
M8RX25G4DG(A)	M0PC8M25G	48	21	31	31	4	M0PC4821G	48	21	55	78
M8RX25G4YG(A)	M0PC2.5M45G	48	21	31	31	4	M0PC4821G	48	21	55	78
M8RX25G4GG(A)	M0PC2M45G	48	19	29	29	4	M0PC4819G	48	19	55	78

• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

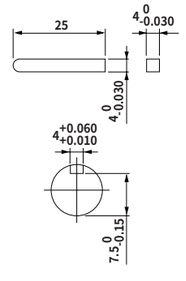
Scale: 1/3, Unit: mm

MX8G□B (ball bearing) / **MX8G□M** (metal bearing) Mass 0.6 kg



Key and keyway (dimensions) [attachment]

MX8G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-121 | Round shaft motor dimensions B-123 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Reversible motor (leadwire)

90 mm sq. 40 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min^{-1})	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M9RX40G4L	4	40	100	50	30	94	0.96	1200	0.32 (3.3)	1.6	0.27 (2.8)	15 (210V)
					60		93	0.93	1525	0.25 (2.6)	1.5	0.26 (2.7)	
	M9RX40G4Y	4	40	200	50	30	92	0.48	1200	0.32 (3.3)	0.81	0.28 (2.9)	3.8 (400V)
					60		93	0.46	1525	0.25 (2.6)	0.77	0.29 (3.0)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-123.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

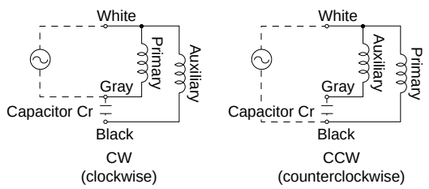
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min^{-1})		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX9G3B to MX9G180B (ball bearing)	50Hz	0.66 (6.7)	0.78 (8.0)	1.08 (11)	1.27 (13)	1.57 (16)	1.86 (19)	2.25 (23)	2.74 (28)	3.23 (33)	3.92 (40)	4.41 (45)	5.29 (54)	6.37 (65)	7.94 (81)	9.80 (100)	9.80 (100)						
	MX9G3M to MX9G180M (metal bearing)	60Hz	0.55 (5.6)	0.66 (6.7)	0.90 (9.2)	1.08 (11)	1.27 (13)	1.57 (16)	1.76 (18)	2.25 (23)	2.74 (28)	3.23 (33)	3.53 (36)	4.41 (45)	5.29 (54)	6.37 (65)	8.82 (90)	9.80 (100)						
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

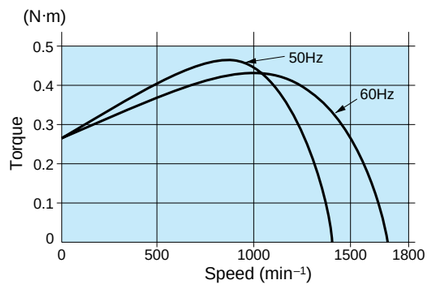
Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min^{-1})	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX9G□B (ball bearing) MX9G□M (metal bearing)	MX9G10XB	Permissible torque	N·m (kgf·cm)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)
		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

Connection diagram



Speed-torque characteristics

M9RX40G4L

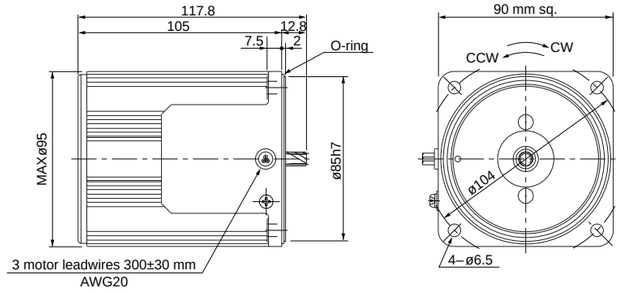


Motor (dimensions)

Scale: 1/3, Unit: mm

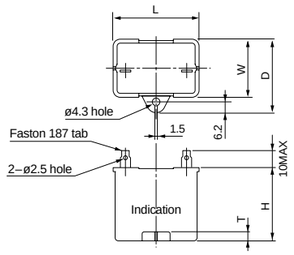
M9RX40G4L 4P 40 W 100 V
M9RX40G4Y 4P 40 W 200 V

Mass	Helical	Module	Number of teeth
2.4 kg	gear	0.55	9



Capacitor (dimensions) [attachment]

Unit: mm



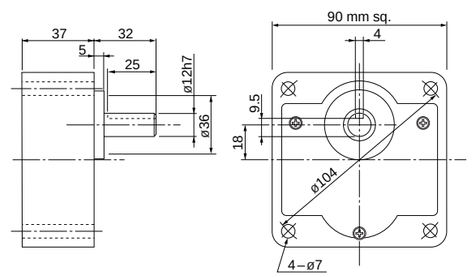
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M9RX40G4L	M0PC15M21	39.5	26.7	37	41	4	M0PC3926
M9RX40G4Y	M0PC3.8M40	50	26.7	37.5	38	4	M0PC5026

Gear head (dimensions)

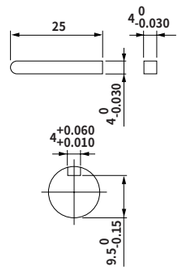
Scale: 1/3, Unit: mm

MX9G□B (ball bearing) / **MX9G□M** (metal bearing) Mass 0.8 kg



Key and keyway (dimensions) [attachment]

MX9G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Reversible motor (leadwire)

90 mm sq. 40 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M9RX40G4LG M9RX40G4LGA	4	40	100	50	30	86	0.87	1275	0.30 (3.1)	1.7	0.30 (3.1)	16 (250V)
					60		93	0.95	1575	0.24 (2.5)	1.6	0.30 (3.1)	
	M9RX40G4DG M9RX40G4DGA	4	40	110 115	60	30	91	0.83	1550	0.25 (2.5)	1.7	0.25 (2.5)	12 (250V)
					60		94	0.82	1575	0.24 (2.5)	1.8	0.29 (3.0)	
	M9RX40G4YG M9RX40G4YGA	4	40	200	50	30	91	0.45	1200	0.32 (3.2)	0.67	0.30 (3.1)	4 (450V)
					60		109	0.57	1500	0.25 (2.6)	0.70	0.30 (3.1)	
	M9RX40G4GG M9RX40G4GGA	4	40	220	50	30	88	0.40	1250	0.31 (3.1)	0.71	0.30 (3.1)	3.5 (450V)
					60		104	0.49	1550	0.25 (2.5)	0.71	0.30 (3.1)	
				230	50		92	0.40	1300	0.29 (3.0)	0.74	0.33 (3.4)	
					60		110	0.50	1575	0.24 (2.5)	0.74	0.33 (3.4)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-123.
• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

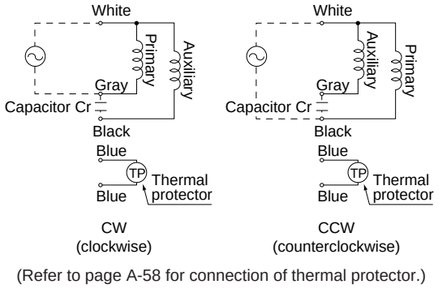
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head: MX9G3B to MX9G180B (ball bearing)	50Hz	0.66 (6.7)	0.78 (8.0)	1.08 (11)	1.27 (13)	1.57 (16)	1.86 (19)	2.25 (23)	2.74 (28)	3.23 (33)	3.92 (40)	4.41 (45)	5.29 (54)	6.37 (65)	7.94 (81)	9.80 (100)	9.80 (100)						
Applicable gear head: MX9G3M to MX9G180M (metal bearing)	60Hz	0.55 (5.6)	0.66 (6.7)	0.90 (9.2)	1.08 (11)	1.27 (13)	1.57 (16)	1.76 (18)	2.25 (23)	2.74 (28)	3.23 (33)	3.53 (36)	4.41 (45)	5.29 (54)	6.37 (65)	8.82 (90)	9.80 (100)						
Rotational direction		Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX9G□B (ball bearing) MX9G□M (metal bearing)	MX9G10XB	Permissible torque	N·m (kgf·cm)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)
		Rotational direction		Same as motor rotational direction		Reverse to motor rotational direction									

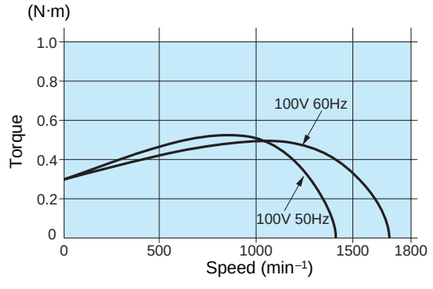
Connection diagram



(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

M9RX40G4LG(A)



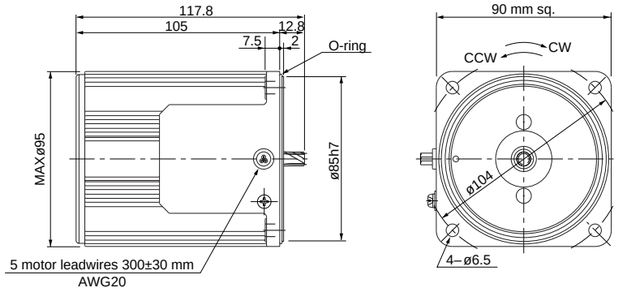
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

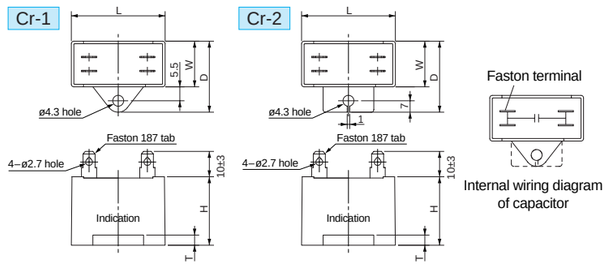
M9RX40G4LG(A) 4P 40 W 100 V
M9RX40G4DG(A) 4P 40 W 110 V / 115 V
M9RX40G4YG(A) 4P 40 W 200 V
M9RX40G4GG(A) 4P 40 W 220 V / 230 V

Mass	Helical	Module	Number of teeth
2.4 kg	gear	0.55	9



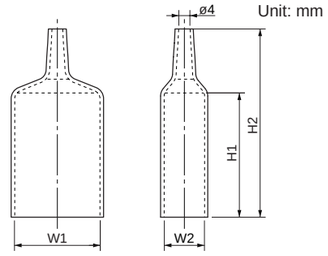
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

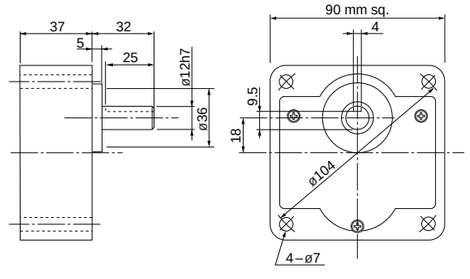
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	dimension No.	Capacitor cap (attachment)	W1	W2	H1	H2
M9RX40G4LG(A)	M0PC16M25G	58	23.5	38.5	37	4	Cr-2	M0PC5823G	58	23.5	55	78
M9RX40G4DG(A)	M0PC12M25G	58	22	32	35	4	Cr-1	M0PC5822G	58	22	55	78
M9RX40G4YG(A)	M0PC4M45G	58	23.5	38.5	37	4	Cr-2	M0PC5823G	58	23.5	55	78
M9RX40G4GG(A)	M0PC3.5M45G	58	22	32	35	4	Cr-1	M0PC5822G	58	22	55	78

• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

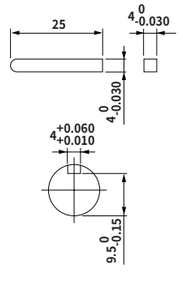
Scale: 1/3, Unit: mm

MX9G□B (ball bearing) / **MX9G□M** (metal bearing) Mass 0.8 kg



Key and keyway (dimensions) [attachment]

MX9G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Reversible motor (leadwire)

90 mm sq. 60 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M9RZ60G4L	4	60	100	50	30	144	1.5	1200	0.46 (4.7)	2.4	0.50 (5.1)	25 (200V)
					60		163	1.5	1500	0.39 (4.0)	2.3	0.53 (5.4)	
	M9RZ60G4Y	4	60	200	50	30	146	0.74	1225	0.46 (4.7)	1.2	0.53 (5.4)	6.2 (375V)
					60		153	0.77	1525	0.39 (4.0)	1.3	0.55 (5.6)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-124.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

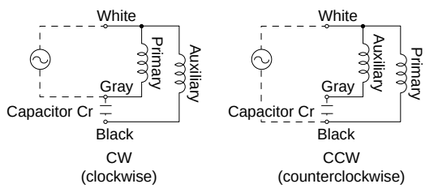
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head: MZ9G3BA to MZ9G200B (ball bearing / hinge not attached)	50Hz	0.98 (9.99)	1.18 (12)	1.57 (16)	1.96 (20)	2.35 (24)	2.94 (30)	3.14 (32)	3.92 (40)	4.70 (48)	5.59 (57)	6.27 (64)	7.55 (77)	9.11 (93)	11.0 (112)	15.2 (155)	17.8 (182)	19.6 (200)						
Applicable gear head: MY9G3MA to MY9G200M (metal bearing / hinge attached)	60Hz	0.78 (8.0)	0.98 (9.99)	1.37 (14)	1.57 (16)	1.96 (20)	2.35 (24)	2.65 (27)	3.33 (34)	3.92 (40)	4.70 (48)	5.29 (54)	6.47 (66)	7.55 (77)	9.11 (93)	12.6 (129)	15.2 (155)	19.6 (200)						
Rotational direction		Same as motor rotational direction							Reverse to motor rotational direction						Same as motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

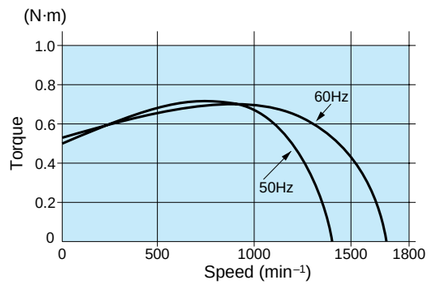
Applicable gear head: Bearing	Decimal gear head	Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
		Speed (min⁻¹)	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MZ9G□B (ball bearing / Hinge not attached) MY9G□M (metal bearing / Hinge attached)	MZ9G10XB	Permissible torque	N·m (kgf·cm)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

Connection diagram



Speed-torque characteristics

M9RZ60G4L



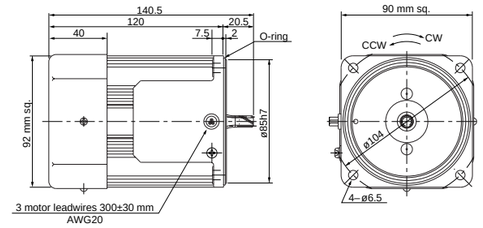
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/4, Unit: mm

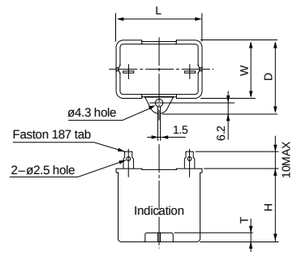
M9RZ60G4L 4P 60 W 100 V (with fan)
M9RZ60G4Y 4P 60 W 200 V (with fan)

Mass	Helical gear	Module	Number of teeth
2.7 kg		0.6	9



Capacitor (dimensions) [attachment]

Unit: mm



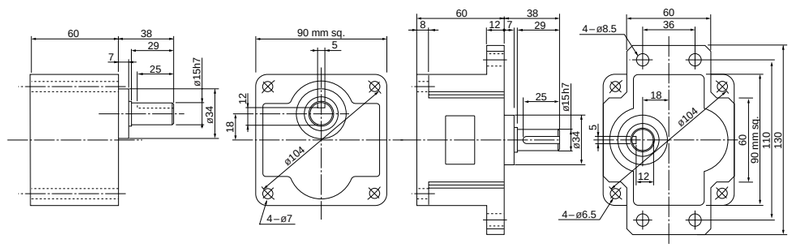
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M9RZ60G4L	M0PC25M20	50.2	31	41	42	5	M0PC5032
M9RZ60G4Y	M0PC6.2M38	50	30.5	41	41.5	4	M0PC5032

Gear head (dimensions)

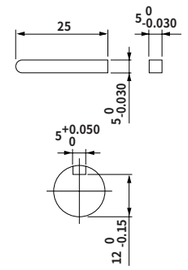
Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg
MY9G□M (metal bearing / hinge attached) Mass 1.4 kg



Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Reversible motor (leadwire)

90 mm sq. 60 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M9RZ60G4LG M9RZ60G4LGA	4	60	100	50	30	137	1.4	1250	0.46 (4.7)	2.4	0.51 (5.2)	25 (250V)
					60		147	1.5	1550	0.37 (3.8)	2.4	0.53 (5.4)	
	M9RZ60G4DG M9RZ60G4DGA	4	60	110 115	60	30	138	1.3	1575	0.36 (3.7)	2.5	0.50 (5.1)	20 (250V)
					60		144	1.3	1600	0.36 (3.7)	2.6	0.55 (5.6)	
	M9RZ60G4YG M9RZ60G4YGA	4	60	200	50	30	135	0.67	1200	0.48 (4.9)	1.0	0.51 (5.2)	6 (450V)
					60		158	0.81	1500	0.38 (3.9)	1.1	0.53 (5.4)	
	M9RZ60G4GG M9RZ60G4GGA	4	60	220	50	30	137	0.64	1225	0.47 (4.8)	1.1	0.50 (5.1)	5 (450V)
					60		145	0.67	1550	0.37 (3.8)	1.1	0.52 (5.3)	
				230	50		145	0.66	1275	0.45 (4.6)	1.1	0.57 (5.8)	
					60		151	0.67	1575	0.36 (3.7)	1.1	0.57 (5.8)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-124.
• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

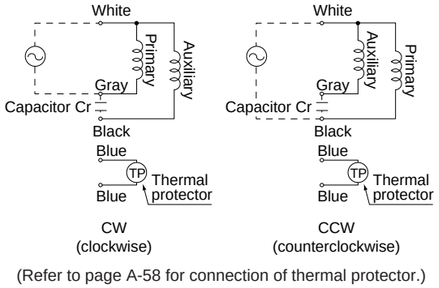
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head: MZ9G3B to MZ9G200B (ball bearing / hinge not attached)	50Hz	0.98 (9.99)	1.18 (12)	1.57 (16)	1.96 (20)	2.35 (24)	2.94 (30)	3.14 (32)	3.92 (40)	4.70 (48)	5.59 (57)	6.27 (64)	7.55 (77)	9.11 (93)	11.0 (112)	15.2 (155)	17.8 (182)	19.6 (200)						
Applicable gear head: MY9G3B to MY9G200B (ball bearing / hinge attached)	60Hz	0.78 (8.0)	0.98 (9.99)	1.37 (14)	1.57 (16)	1.96 (20)	2.35 (24)	2.65 (27)	3.33 (34)	3.92 (40)	4.70 (48)	5.29 (54)	6.47 (66)	7.55 (77)	9.11 (93)	12.6 (129)	15.2 (155)	19.6 (200)						
Rotational direction		Same as motor rotational direction			Reverse to motor rotational direction				Same as motor rotational direction															

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head: Bearing	Decimal gear head	Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
		Speed (min⁻¹)	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	MZ9G10XB	Permissible torque	N·m	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
			(kgf·cm)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

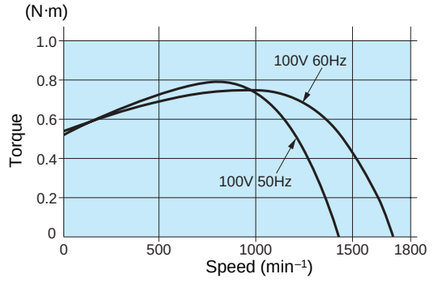
Connection diagram



(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

M9RZ60G4LG(A)



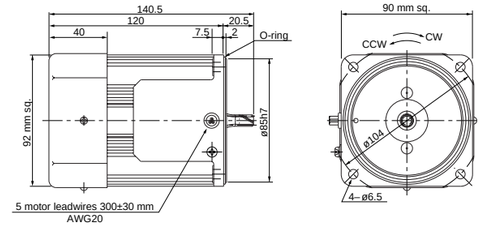
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/4, Unit: mm

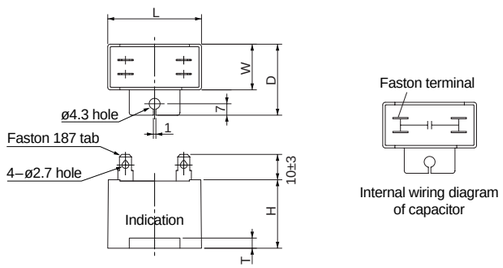
M9RZ60G4LG(A) 4P 60 W 100 V (with fan)
M9RZ60G4DG(A) 4P 60 W 110 V / 115 V (with fan)
M9RZ60G4YG(A) 4P 60 W 200 V (with fan)
M9RZ60G4GG(A) 4P 60 W 220 V / 230V (with fan)

Mass	Helical gear	Module	Number of teeth
2.7 kg		0.6	9



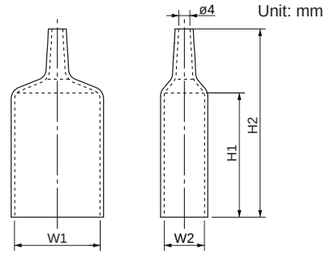
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

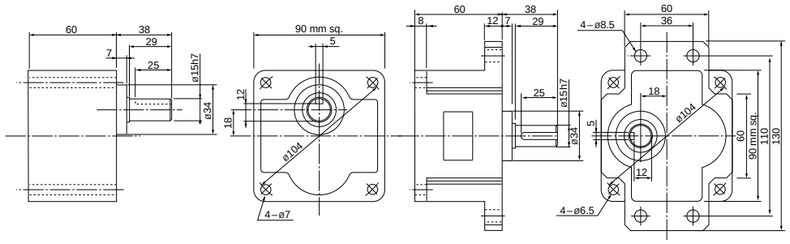
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M9RZ60G4LG(A)	M0PC25M25G	58	35	50	50	4	M0PC5835G	58	35	55	78
M9RZ60G4DG(A)	M0PC20M25G	58	29	44	41	4	M0PC5829G	58	29	55	78
M9RZ60G4YG(A)	M0PC6M45G	58	29	44	41	4	M0PC5829G	58	29	55	78
M9RZ60G4GG(A)	M0PC5M45G	58	29	44	41	4	M0PC5829G	58	29	55	78

• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

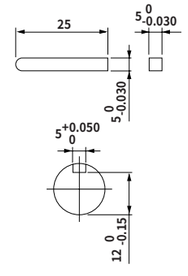
Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg **MY9G□M** (metal bearing / hinge attached) Mass 1.4 kg



Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Reversible motor (leadwire)

90 mm sq. 90 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M9RZ90G4L	4	90	100	50	30	171	1.7	1225	0.70 (7.1)	2.8	0.63 (6.4)	30 (200V)
					60		181	1.9	1525	0.56 (5.7)	2.7	0.64 (6.5)	
	M9RZ90G4Y	4	90	200	50	30	184	0.93	1150	0.72 (7.3)	1.4	0.64 (6.5)	7.5 (370V)
					60		170	0.96	1475	0.57 (5.8)	1.4	0.66 (6.7)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-124.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

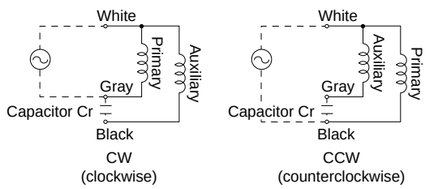
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head: MZ9G3B to MZ9G200B (ball bearing / hinge not attached)	50Hz	1.37 (14)	1.67 (17)	2.25 (23)	2.74 (28)	3.43 (35)	4.12 (42)	4.51 (46)	5.68 (58)	6.76 (69)	8.04 (82)	9.02 (92)	10.9 (111)	13.0 (133)	15.7 (160)	19.6 (200)	19.6 (200)							
Applicable gear head: MY9G3B to MY9G200B (ball bearing / hinge attached)	60Hz	1.18 (12)	1.37 (14)	1.86 (19)	2.25 (23)	2.84 (29)	3.43 (35)	3.72 (38)	4.70 (48)	5.68 (58)	6.76 (69)	7.55 (77)	9.21 (94)	10.9 (111)	13.0 (133)	18.3 (187)	19.6 (200)							
Rotational direction		Same as motor rotational direction							Reverse to motor rotational direction						Same as motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

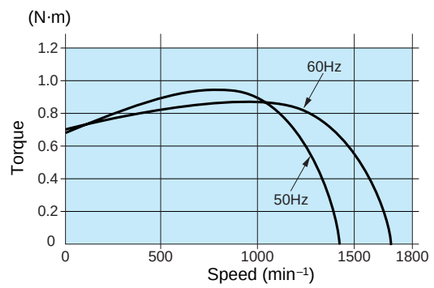
Applicable gear head: Bearing	Decimal gear head	Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
		Speed (min⁻¹)	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	MZ9G10XB	Permissible torque	N·m (kgf·cm)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)
		Rotational direction		Reverse to motor rotational direction	Same as motor rotational direction									

Connection diagram



Speed-torque characteristics

M9RZ90G4L



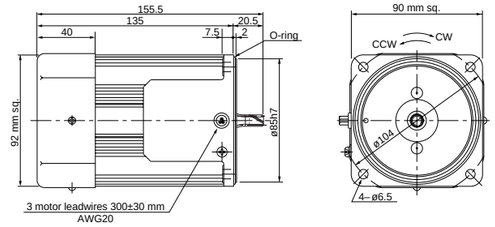
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/4, Unit: mm

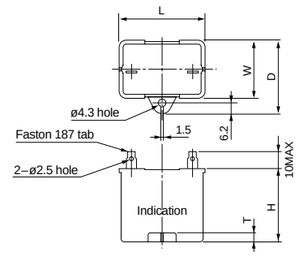
M9RZ90G4L 4P 90 W 100 V (with fan)
M9RZ90G4Y 4P 90 W 200 V (with fan)

Mass	Helical gear	Module	Number of teeth
3.2 kg		0.6	9



Capacitor (dimensions) [attachment]

Unit: mm



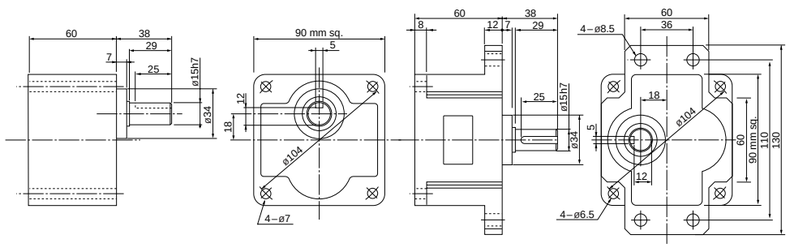
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M9RZ90G4L	M0PC30M20	50.2	31	41	42	5	M0PC5032
M9RZ90G4Y	M0PC7.5M37	50	34	45	45	6	—

Gear head (dimensions)

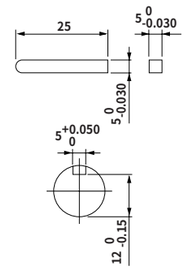
Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg
MY9G□M (metal bearing / hinge attached) Mass 1.4 kg



Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Reversible motor (leadwire)

90 mm sq. 90 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M9RZ90G4LG M9RZ90G4LGA	4	90	100	50	30	195	2.0	1175	0.73 (7.5)	3.0	0.68 (6.9)	32 (250V)
					60		203	2.0	1525	0.57 (5.8)	2.9	0.68 (6.9)	
	M9RZ90G4DG M9RZ90G4DGA	4	90	110	60	30	201	1.8	1550	0.55 (5.7)	3.1	0.72 (7.3)	28 (250V)
				115	60		209	1.8	1575	0.55 (5.6)	3.2	0.79 (8.1)	
	M9RZ90G4YG M9RZ90G4YGA	4	90	200	50	30	185	0.93	1175	0.73 (7.5)	1.4	0.68 (6.9)	8 (450V)
					60		206	1.1	1500	0.57 (5.8)	1.4	0.68 (6.9)	
	M9RZ90G4GG M9RZ90G4GGA	4	90	220	50	30	191	0.89	1225	0.70 (7.2)	1.5	0.72 (7.3)	7 (450V)
					60		197	0.90	1550	0.55 (5.7)	1.4	0.72 (7.3)	
				230	50		202	0.92	1250	0.69 (7.0)	1.6	0.79 (8.1)	
					60		204	0.88	1575	0.55 (5.6)	1.5	0.79 (8.1)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-124.
• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

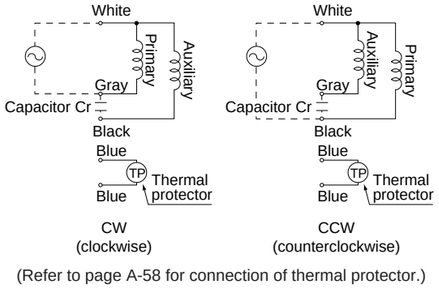
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head: MZ9G3B to MZ9G200B (ball bearing / hinge not attached)	50Hz	1.37 (14)	1.67 (17)	2.25 (23)	2.74 (28)	3.43 (35)	4.12 (42)	4.51 (46)	5.68 (58)	6.76 (69)	8.04 (82)	9.02 (92)	10.9 (111)	13.0 (133)	15.7 (160)	19.6 (200)	19.6 (200)							
Applicable gear head: MY9G3B to MY9G200B (ball bearing / hinge attached)	60Hz	1.18 (12)	1.37 (14)	1.86 (19)	2.25 (23)	2.84 (29)	3.43 (35)	3.72 (38)	4.70 (48)	5.68 (58)	6.76 (69)	7.55 (77)	9.21 (94)	10.9 (111)	13.0 (133)	18.3 (187)	19.6 (200)							
Rotational direction		Same as motor rotational direction							Reverse to motor rotational direction						Same as motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head: Bearing	Decimal gear head	Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
		Speed (min⁻¹)	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	MZ9G10XB	Permissible torque	N·m	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
			(kgf·cm)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)
		Rotational direction		Reverse to motor rotational direction	Same as motor rotational direction									

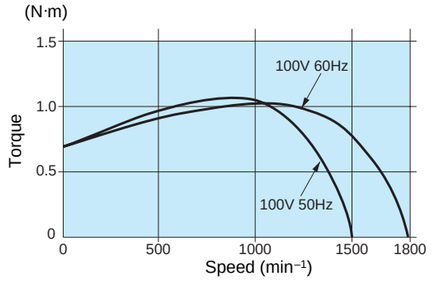
Connection diagram



(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

M9RZ90G4LG(A)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

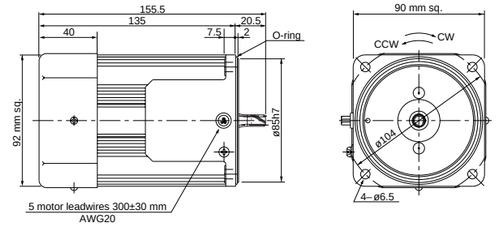
Features B-64 | System configuration B-65 | Coding system B-65 | Model list B-68

Motor (dimensions)

Scale: 1/4, Unit: mm

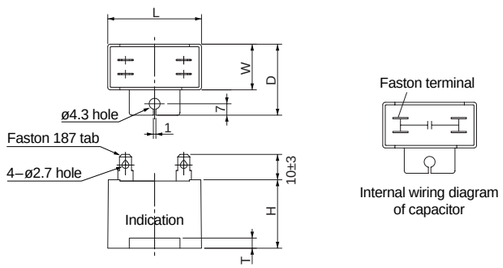
M9RZ90G4LG(A) 4P 90 W 100 V (with fan)
M9RZ90G4DG(A) 4P 90 W 110 V / 115 V (with fan)
M9RZ90G4YG(A) 4P 90 W 200 V (with fan)
M9RZ90G4GG(A) 4P 90 W 220 V / 230V (with fan)

Mass	Helical	Module	Number of teeth
3.2 kg	gear	0.6	9



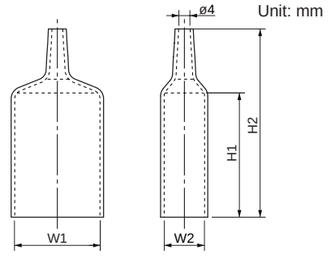
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

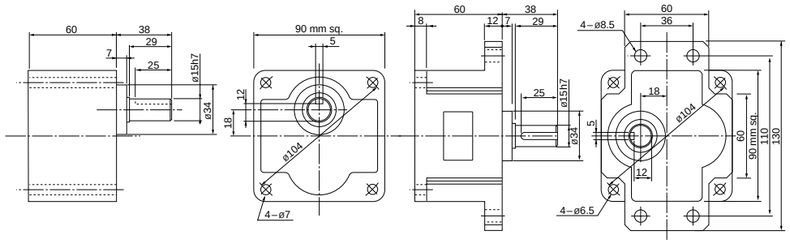
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M9RZ90G4LG(A)	M0PC32M25G	58	35	50	50	4	M0PC5835G	58	35	55	78
M9RZ90G4DG(A)	M0PC28M25G	58	35	50	50	4	M0PC5835G	58	35	55	78
M9RZ90G4YG(A)	M0PC8M45G	58	35	50	50	4	M0PC5835G	58	35	55	78
M9RZ90G4GG(A)	M0PC7M45G	58	35	50	50	4	M0PC5835G	58	35	55	78

• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

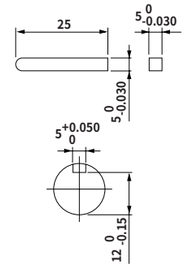
Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg **MY9G□M** (metal bearing / hinge attached) Mass 1.4 kg



Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-121 | Round shaft motor dimensions B-124 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Reversible motor (sealed connector)

80 mm sq. 25 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
80 mm sq.	M8RX25GK4L	4	25	100	50	30	58	0.59	1275	0.19 (1.9)	1.0	0.17 (1.7)	9.5 (200V)
					60		57	0.59	1575	0.16 (1.6)	1.0	0.17 (1.7)	
	M8RX25GK4Y	4	25	200	50	30	57	0.29	1275	0.19 (1.9)	0.52	0.19 (2.0)	2.4 (400V)
					60		57	0.29	1575	0.16 (1.6)	0.50	0.19 (2.0)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-124.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

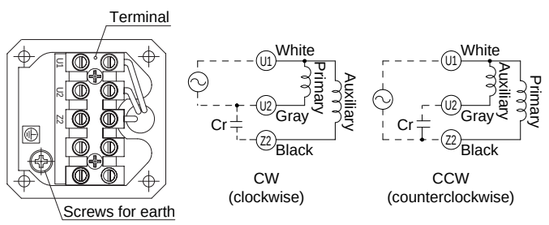
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head: MX8G3B to MX8G180B (ball bearing)	50Hz	0.39 (4.0)	0.47 (4.8)	0.66 (6.7)	0.78 (8.0)	0.98 (10)	1.18 (12)	1.27 (13)	1.57 (16)	1.96 (20)	2.35 (24)	2.55 (26)	3.14 (32)	3.82 (39)	4.61 (47)	6.37 (65)	7.64 (78)	7.84 (80)					
Applicable gear head: MX8G3M to MX8G180M (metal bearing)	60Hz	0.32 (3.3)	0.39 (4.0)	0.55 (5.6)	0.66 (6.7)	0.81 (8.3)	0.98 (10)	1.08 (11)	1.27 (13)	1.57 (16)	1.96 (20)	2.06 (21)	2.65 (27)	3.14 (32)	3.82 (39)	5.29 (54)	6.37 (65)	7.84 (80)					
Rotational direction		Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

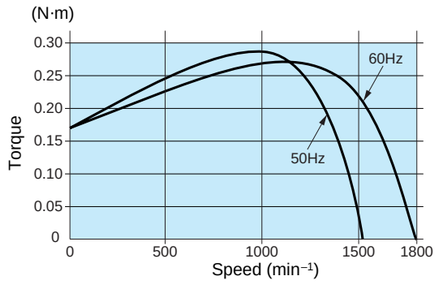
Applicable gear head: Bearing	Decimal gear head	Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
MX8G□B (ball bearing) MX8G□M (metal bearing)	MX8G10XB	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
		Permissible torque	N·m	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84
			(kgf·cm)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)
		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

Connection diagram



Speed-torque characteristics

M8RX25GK4L



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

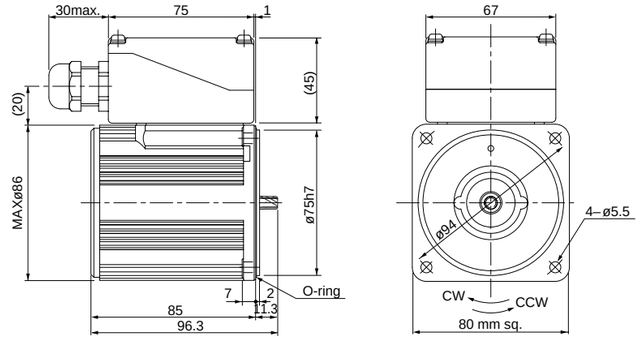
Features B-64 | System configuration B-65 | Coding system B-65 | Model list B-68

Motor (dimensions)

Scale: 1/3, Unit: mm

M8RX25GK4L 4P 25 W 100 V
M8RX25GK4Y 4P 25 W 200 V

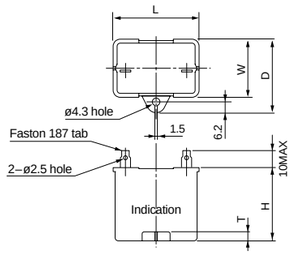
Mass	Helical	Module	Number of teeth
1.8 kg	gear	0.5	9



* Diameter of applicable cabtyre cable to be ø8 to ø12.

Capacitor (dimensions) [attachment]

Unit: mm



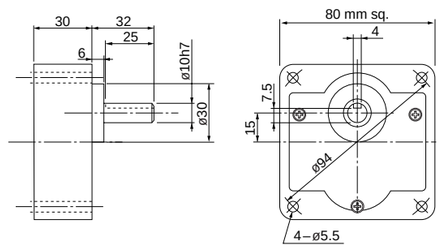
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M8RX25GK4L	M0PC9.5M20	39.5	22	32.5	30.5	4	M0PC3922
M8RX25GK4Y	M0PC2.4M40	49.7	24	34.5	34.5	4	M0PC5026

Gear head (dimensions)

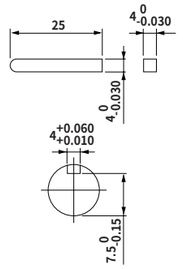
Scale: 1/3, Unit: mm

MX8G□B (ball bearing) / **MX8G□M** (metal bearing) Mass 0.6 kg



Key and keyway (dimensions) [attachment]

MX8G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-122 | Round shaft motor dimensions B-124 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Reversible motor (sealed connector)

80 mm sq. 25 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
80 mm sq.	M8RX25GK4LG M8RX25GK4LGA	4	25	100	50	30	59	0.60	1250	0.19 (1.9)	1.1	0.19 (1.9)	10 (250V)
					60		61	0.61	1550	0.15 (1.6)	1.1	0.19 (1.9)	
	M8RX25GK4DG M8RX25GK4DGA	4	25	110	60	30	58	0.53	1575	0.15 (1.5)	1.1	0.17 (1.7)	8 (250V)
				115	60		61	0.53	1600	0.15 (1.5)	1.2	0.19 (1.9)	
	M8RX25GK4YG M8RX25GK4YGA	4	25	200	50	30	59	0.30	1200	0.20 (2.0)	0.45	0.19 (1.9)	2.5 (450V)
					60		66	0.34	1525	0.16 (1.6)	0.46	0.19 (1.9)	
	M8RX25GK4GG M8RX25GK4GGA	4	25	220	50	30	60	0.28	1225	0.19 (2.0)	0.47	0.18 (1.8)	2 (450V)
					60		60	0.27	1550	0.15 (1.6)	0.46	0.18 (1.8)	
				230	50		62	0.28	1275	0.19 (1.9)	0.49	0.19 (1.9)	
					60		62	0.27	1575	0.15 (1.5)	0.48	0.19 (1.9)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-124.
• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

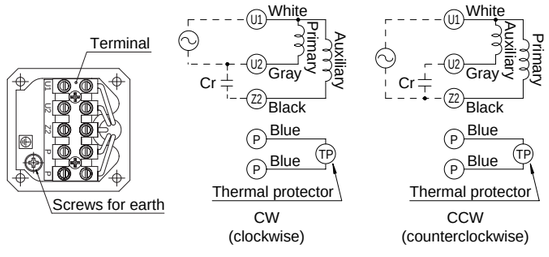
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX8G3B to MX8G180B (ball bearing)	50Hz	0.39 (4.0)	0.47 (4.8)	0.66 (6.7)	0.78 (8.0)	0.98 (10)	1.18 (12)	1.27 (13)	1.57 (16)	1.96 (20)	2.35 (24)	2.55 (26)	3.14 (32)	3.82 (39)	4.61 (47)	6.37 (65)	7.64 (78)	7.84 (80)					
	MX8G3M to MX8G180M (metal bearing)	60Hz	0.32 (3.3)	0.39 (4.0)	0.55 (5.6)	0.66 (6.7)	0.81 (8.3)	0.98 (10)	1.08 (11)	1.27 (13)	1.57 (16)	1.96 (20)	2.06 (21)	2.65 (27)	3.14 (32)	3.82 (39)	5.29 (54)	6.37 (65)	7.84 (80)					
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX8G□B (ball bearing) MX8G□M (metal bearing)	MX8G10XB	Permissible torque	N·m	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84
			(kgf·cm)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)
		Rotational direction		Same as motor rotational direction		Reverse to motor rotational direction									

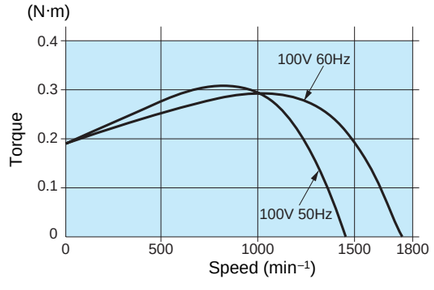
Connection diagram



(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

M8RX25GK4LG(A)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

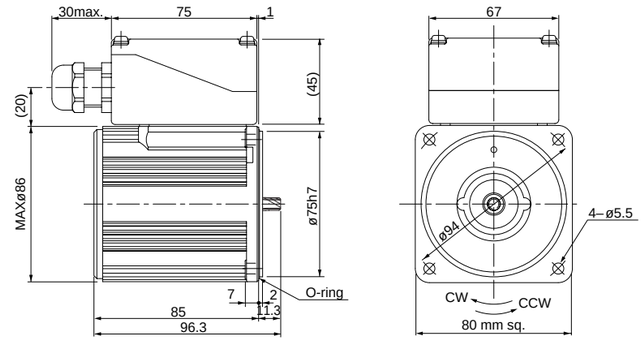
Features B-64 | System configuration B-65 | Coding system B-65 | Model list B-68

Motor (dimensions)

Scale: 1/3, Unit: mm

M8RX25GK4LG(A) 4P 25 W 100 V
M8RX25GK4DG(A) 4P 25 W 110 V / 115 V
M8RX25GK4YG(A) 4P 25 W 200 V
M8RX25GK4GG(A) 4P 25 W 220 V / 230 V

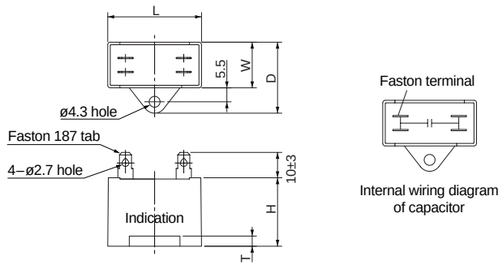
Mass	Helical	Module	Number of teeth
1.8 kg	gear	0.5	9



* Diameter of applicable cabtyre cable to be ø8 to ø12.

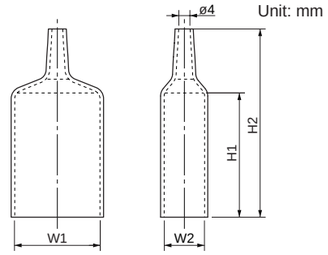
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

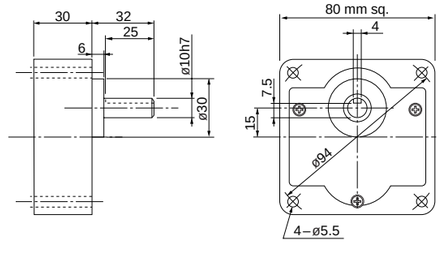
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M8RX25GK4LG(A)	M0PC10M25G	58	21	31	31	4	M0PC5821G	58	21	55	78
M8RX25GK4DG(A)	M0PC8M25G	48	21	31	31	4	M0PC4821G	48	21	55	78
M8RX25GK4YG(A)	M0PC2.5M45G	48	21	31	31	4	M0PC4821G	48	21	55	78
M8RX25GK4GG(A)	M0PC2M45G	48	19	29	29	4	M0PC4819G	48	19	55	78

• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

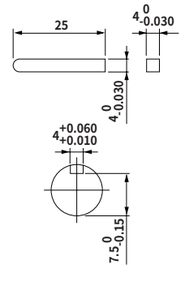
Scale: 1/3, Unit: mm

MX8G□B (ball bearing) / **MX8G□M** (metal bearing) Mass 0.6 kg



Key and keyway (dimensions) [attachment]

MX8G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-122 | Round shaft motor dimensions B-124 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Reversible motor (sealed connector)

90 mm sq. 40 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M9RX40GK4L	4	40	100	50	30	94	0.96	1200	0.32 (3.3)	1.6	0.27 (2.8)	15 (210V)
					60		93	0.93	1525	0.25 (2.6)	1.5	0.26 (2.7)	
	M9RX40GK4Y	4	40	200	50	30	92	0.48	1200	0.32 (3.3)	0.81	0.28 (2.9)	3.8 (400V)
					60		93	0.46	1525	0.25 (2.6)	0.77	0.29 (3.0)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-124.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

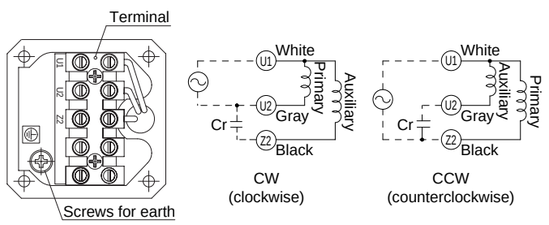
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head: MX9G3B to MX9G180B (ball bearing)	50Hz	0.66 (6.7)	0.78 (8.0)	1.08 (11)	1.27 (13)	1.57 (16)	1.86 (19)	2.25 (23)	2.74 (28)	3.23 (33)	3.92 (40)	4.41 (45)	5.29 (54)	6.37 (65)	7.94 (81)	9.80 (100)	9.80 (100)						
Applicable gear head: MX9G3M to MX9G180M (metal bearing)	60Hz	0.55 (5.6)	0.66 (6.7)	0.90 (9.2)	1.08 (11)	1.27 (13)	1.57 (16)	1.76 (18)	2.25 (23)	2.74 (28)	3.23 (33)	3.53 (36)	4.41 (45)	5.29 (54)	6.37 (65)	8.82 (90)	9.80 (100)						
Rotational direction		Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

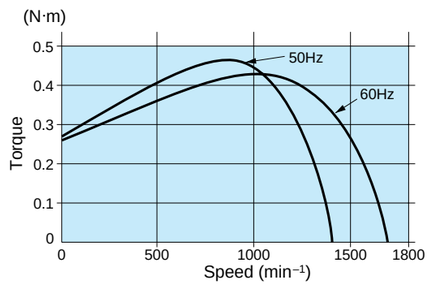
Applicable gear head: Bearing	Decimal gear head	Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
		Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX9G□B (ball bearing) MX9G□M (metal bearing)	MX9G10XB	Permissible torque	N·m	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80
			(kgf·cm)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

Connection diagram



Speed-torque characteristics

M9RX40GK4L

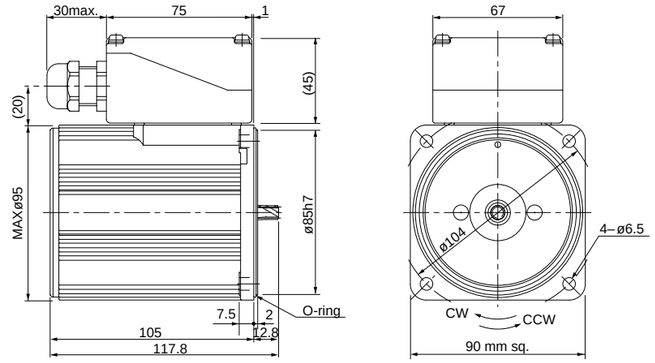


Motor (dimensions)

Scale: 1/3, Unit: mm

M9RX40GK4L 4P 40 W 100 V
M9RX40GK4Y 4P 40 W 200 V

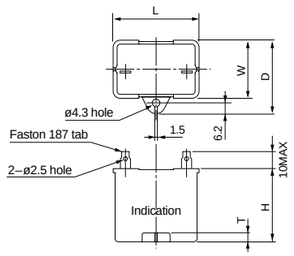
Mass	Helical	Module	Number of teeth
2.8 kg	gear	0.55	9



* Diameter of applicable cabtyre cable to be ø8 to ø12.

Capacitor (dimensions) [attachment]

Unit: mm



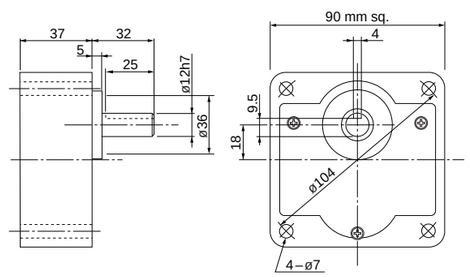
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M9RX40GK4L	M0PC15M20	39.5	26.7	37	41	4	M0PC3926
M9RX40GK4Y	M0PC3.8M40	50	26.7	37.5	38	4	M0PC5026

Gear head (dimensions)

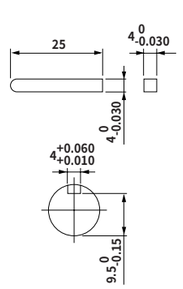
Scale: 1/3, Unit: mm

MX9G□B (ball bearing) / **MX9G□M** (metal bearing) Mass 0.8 kg



Key and keyway (dimensions) [attachment]

MX9G□B(M)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Reversible motor (sealed connector)

90 mm sq. 40 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M9RX40GK4LG M9RX40GK4LGA	4	40	100	50	30	86	0.87	1275	0.30 (3.1)	1.7	0.30 (3.1)	16 (250V)
					60		93	0.95	1575	0.24 (2.5)	1.6	0.30 (3.1)	
	M9RX40GK4DG M9RX40GK4DGA	4	40	110	60	30	91	0.83	1550	0.25 (2.5)	1.7	0.25 (2.5)	12 (250V)
				115	60		94	0.82	1575	0.24 (2.5)	1.8	0.29 (3.0)	
	M9RX40GK4YG M9RX40GK4YGA	4	40	200	50	30	91	0.45	1200	0.32 (3.2)	0.67	0.30 (3.1)	4 (450V)
					60		109	0.57	1500	0.25 (2.6)	0.70	0.30 (3.1)	
	M9RX40GK4GG M9RX40GK4GGA	4	40	220	50	30	88	0.40	1250	0.31 (3.1)	0.71	0.30 (3.1)	3.5 (450V)
					60		104	0.49	1550	0.25 (2.5)	0.71	0.30 (3.1)	
				230	50		92	0.40	1300	0.29 (3.0)	0.74	0.33 (3.4)	
					60		110	0.50	1575	0.24 (2.5)	0.74	0.33 (3.4)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-124.
• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

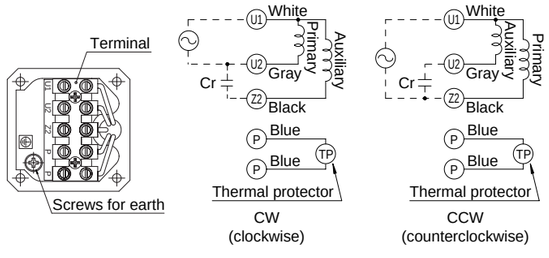
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX9G3B to MX9G180B (ball bearing)	50Hz	0.66 (6.7)	0.78 (8.0)	1.08 (11)	1.27 (13)	1.57 (16)	1.86 (19)	2.25 (23)	2.74 (28)	3.23 (33)	3.92 (40)	4.41 (45)	5.29 (54)	6.37 (65)	7.94 (81)	9.80 (100)	9.80 (100)						
	MX9G3M to MX9G180M (metal bearing)	60Hz	0.55 (5.6)	0.66 (6.7)	0.90 (9.2)	1.08 (11)	1.27 (13)	1.57 (16)	1.76 (18)	2.25 (23)	2.74 (28)	3.23 (33)	3.53 (36)	4.41 (45)	5.29 (54)	6.37 (65)	8.82 (90)	9.80 (100)						
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX9G□B (ball bearing) MX9G□M (metal bearing)	MX9G10XB	Permissible torque	N·m (kgf·cm)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)
		Rotational direction		Same as motor rotational direction		Reverse to motor rotational direction									

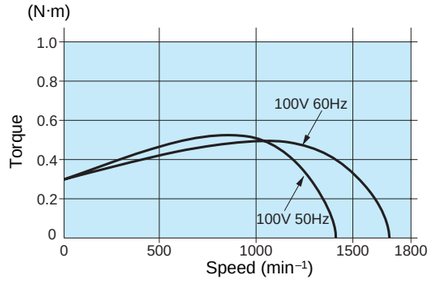
Connection diagram



(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

M9RX40GK4LG(A)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

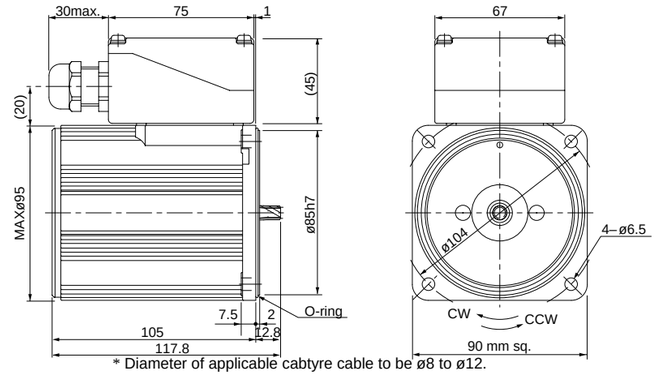
Features B-64 | System configuration B-65 | Coding system B-65 | Model list B-68

Motor (dimensions)

Scale: 1/3, Unit: mm

M9RX40GK4LG(A) 4P 40 W 100 V
M9RX40GK4DG(A) 4P 40 W 110 V / 115 V
M9RX40GK4YG(A) 4P 40 W 200 V
M9RX40GK4GG(A) 4P 40 W 220 V / 230 V

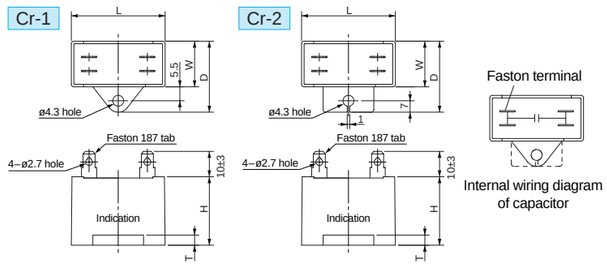
Mass	Helical	Module	Number of teeth
2.8 kg	gear	0.55	9



* Diameter of applicable cabtyre cable to be ø8 to ø12.

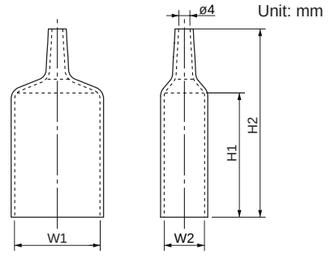
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

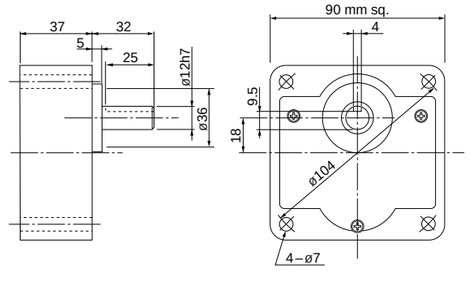
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	dimension No.	Capacitor cap (attachment)	W1	W2	H1	H2
M9RX40GK4LG(A)	M0PC16M25G	58	23.5	38.5	37	4	Cr-2	M0PC5823G	58	23.5	55	78
M9RX40GK4DG(A)	M0PC12M25G	58	22	32	35	4	Cr-1	M0PC5822G	58	22	55	78
M9RX40GK4YG(A)	M0PC4M45G	58	23.5	38.5	37	4	Cr-2	M0PC5823G	58	23.5	55	78
M9RX40GK4GG(A)	M0PC3.5M45G	58	22	32	35	4	Cr-1	M0PC5822G	58	22	55	78

• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

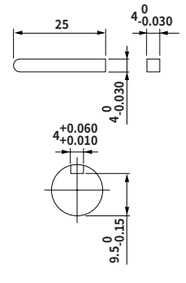
Scale: 1/3, Unit: mm

MX9G□B (ball bearing) / **MX9G□M** (metal bearing) Mass 0.8 kg



Key and keyway (dimensions) [attachment]

MX9G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-122 | Round shaft motor dimensions B-124 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Reversible motor (sealed connector)

90 mm sq. 60 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M9RZ60GK4L	4	60	100	50	30	144	1.5	1200	0.46 (4.7)	2.4	0.50 (5.1)	25 (200V)
					60		163	1.5	1500	0.39 (4.0)	2.3	0.53 (5.4)	
	M9RZ60GK4Y	4	60	200	50	30	146	0.74	1225	0.46 (4.7)	1.2	0.53 (5.4)	6.2 (375V)
					60		153	0.77	1525	0.39 (4.0)	1.3	0.55 (5.6)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-124.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

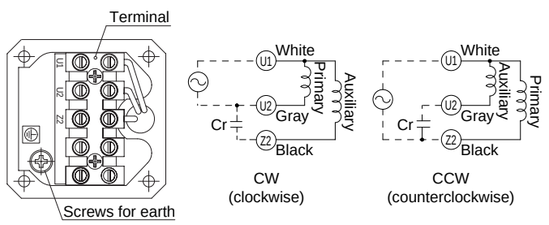
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head	MZ9G3BA to MZ9G200B (ball bearing / hinge not attached)	50Hz	0.98 (9.99)	1.18 (12)	1.57 (16)	1.96 (20)	2.35 (24)	2.94 (30)	3.14 (32)	3.92 (40)	4.70 (48)	5.59 (57)	6.27 (64)	7.55 (77)	9.11 (93)	11.0 (112)	15.2 (155)	17.8 (182)	19.6 (200)						
	MY9G3MA to MY9G200M (metal bearing / hinge attached)	60Hz	0.78 (8.0)	0.98 (9.99)	1.37 (14)	1.57 (16)	1.96 (20)	2.35 (24)	2.65 (27)	3.33 (34)	3.92 (40)	4.70 (48)	5.29 (54)	6.47 (66)	7.55 (77)	9.11 (93)	12.6 (129)	15.2 (155)	19.6 (200)						
Rotational direction			Same as motor rotational direction							Reverse to motor rotational direction						Same as motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

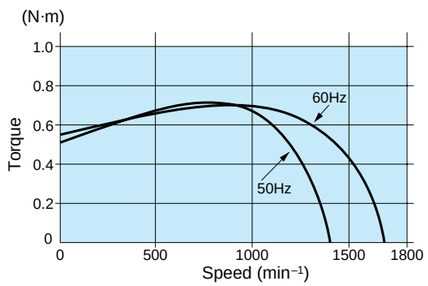
Applicable gear head		Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MZ9G□B (ball bearing / Hinge not attached) MY9G□M (metal bearing / Hinge attached)	MZ9G10XB	Permissible torque	N·m (kgf·cm)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

Connection diagram



Speed-torque characteristics

M9RZ60GK4L



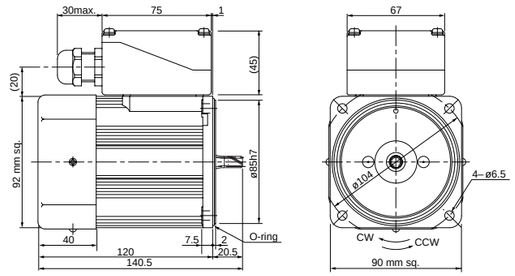
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/4, Unit: mm

M9RZ60GK4L 4P 60 W 100 V (with fan)
M9RZ60GK4Y 4P 60 W 200 V (with fan)

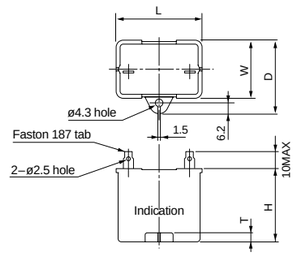
Mass	Helical	Module	Number of teeth
3.0 kg	gear	0.5	9



* Diameter of applicable cabtyre cable to be ø8 to ø12.

Capacitor (dimensions) [attachment]

Unit: mm



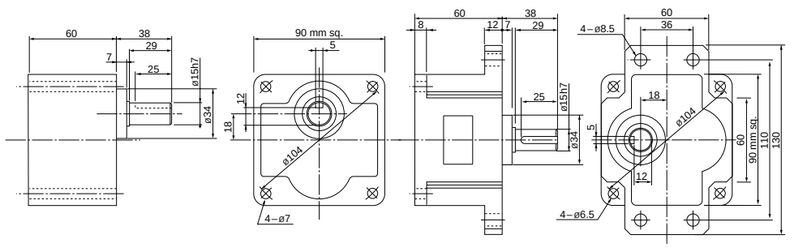
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M9RZ60GK4L	M0PC25M20	50.2	31	41	42	5	M0PC5032
M9RZ60GK4Y	M0PC6.2M38	50	30.5	41	41.5	4	M0PC5032

Gear head (dimensions)

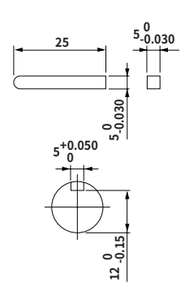
Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg
MY9G□M (metal bearing / hinge attached) Mass 1.4 kg



Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Reversible motor (sealed connector)

90 mm sq. 60 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M9RZ60GK4LG M9RZ60GK4LGA	4	60	100	50	30	137	1.4	1250	0.46 (4.7)	2.4	0.51 (5.2)	25 (250V)
					60		147	1.5	1550	0.37 (3.8)	2.4	0.53 (5.4)	
	M9RZ60GK4DG M9RZ60GK4DGA	4	60	110 115	60	30	138	1.3	1575	0.36 (3.7)	2.5	0.50 (5.1)	20 (250V)
					60		144	1.3	1600	0.36 (3.7)	2.6	0.55 (5.6)	
	M9RZ60GK4YG M9RZ60GK4YGA	4	60	200	50	30	135	0.67	1200	0.48 (4.9)	1.0	0.51 (5.2)	6 (450V)
					60		158	0.81	1500	0.38 (3.9)	1.1	0.53 (5.4)	
	M9RZ60GK4GG M9RZ60GK4GGA	4	60	220	50	30	137	0.64	1225	0.47 (4.8)	1.1	0.50 (5.1)	5 (450V)
					60		145	0.67	1550	0.37 (3.8)	1.1	0.52 (5.3)	
				230	50		145	0.66	1275	0.45 (4.6)	1.1	0.57 (5.8)	
					60		151	0.67	1575	0.36 (3.7)	1.1	0.57 (5.8)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-124.
• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

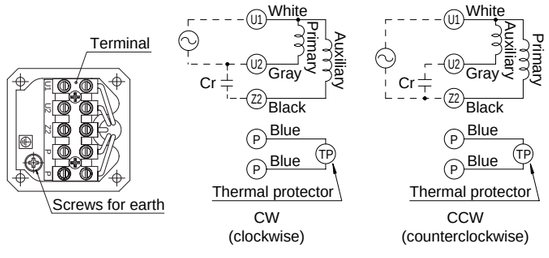
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head	MZ9G3B to MZ9G200B (ball bearing / hinge not attached)	50Hz	0.98 (9.99)	1.18 (12)	1.57 (16)	1.96 (20)	2.35 (24)	2.94 (30)	3.14 (32)	3.92 (40)	4.70 (48)	5.59 (57)	6.27 (64)	7.55 (77)	9.11 (93)	11.0 (112)	15.2 (155)	17.8 (182)	19.6 (200)						
	MY9G3B to MY9G200B (ball bearing / hinge attached)	60Hz	0.78 (8.0)	0.98 (9.99)	1.37 (14)	1.57 (16)	1.96 (20)	2.35 (24)	2.65 (27)	3.33 (34)	3.92 (40)	4.70 (48)	5.29 (54)	6.47 (66)	7.55 (77)	9.11 (93)	12.6 (129)	15.2 (155)	19.6 (200)						
Rotational direction			Same as motor rotational direction							Reverse to motor rotational direction						Same as motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	MZ9G10XB	Permissible torque	N·m	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
			(kgf·cm)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

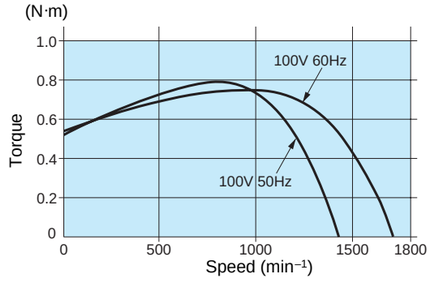
Connection diagram



(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

M9RZ60GK4LG(A)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

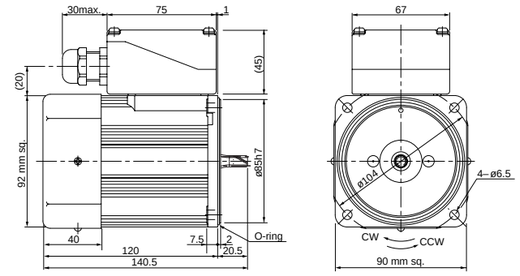
Features B-64 | System configuration B-65 | Coding system B-65 | Model list B-68

Motor (dimensions)

Scale: 1/4, Unit: mm

M9RZ60GK4LG(A) 4P 60 W 100 V (with fan)
M9RZ60GK4DG(A) 4P 60 W 110 V / 115 V (with fan)
M9RZ60GK4YG(A) 4P 60 W 200 V (with fan)
M9RZ60GK4GG(A) 4P 60 W 220 V / 230 V (with fan)

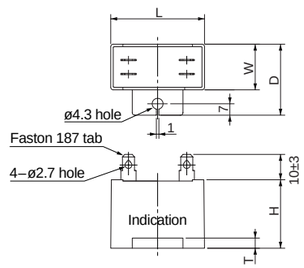
Mass	Helical gear	Module	Number of teeth
3.0 kg		0.6	9



* Diameter of applicable cabtyre cable to be ø8 to ø12.

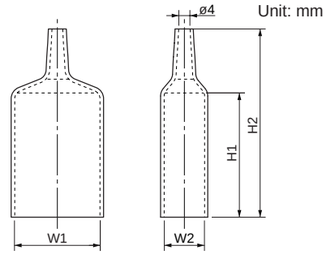
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

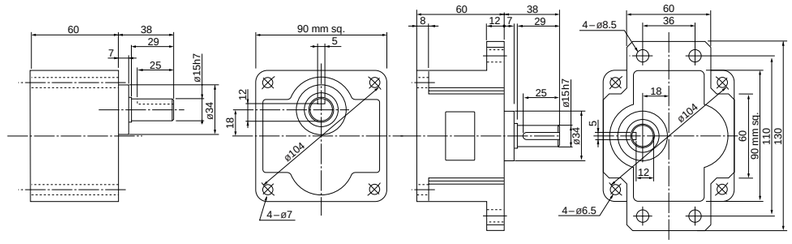
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M9RZ60GK4LG(A)	M0PC25M25G	58	35	50	50	4	M0PC5835G	58	35	55	78
M9RZ60GK4DG(A)	M0PC20M25G	58	29	44	41	4	M0PC5829G	58	29	55	78
M9RZ60GK4YG(A)	M0PC6M45G	58	29	44	41	4	M0PC5829G	58	29	55	78
M9RZ60GK4GG(A)	M0PC5M45G	58	29	44	41	4	M0PC5829G	58	29	55	78

• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg
MY9G□M (metal bearing / hinge attached) Mass 1.4 kg

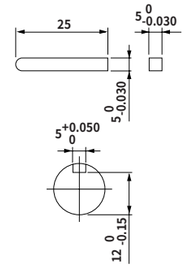


Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Gear head combination B-122 | Round shaft motor dimensions B-124 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Reversible motor (sealed connector)

90 mm sq. 90 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M9RZ90GK4L	4	90	100	50	30	171	1.7	1225	0.70 (7.1)	2.8	0.63 (6.4)	30 (200V)
					60		181	1.9	1525	0.56 (5.7)	2.7	0.64 (6.5)	
	M9RZ90GK4Y	4	90	200	50	30	184	0.93	1150	0.72 (7.3)	1.4	0.64 (6.5)	7.5 (370V)
					60		190	0.96	1475	0.57 (5.8)	1.4	0.66 (6.7)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-124.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

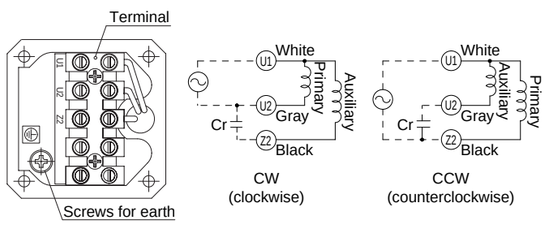
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head: MZ9G3B to MZ9G200B (ball bearing / hinge not attached)	50Hz	1.37 (14)	1.67 (17)	2.25 (23)	2.74 (28)	3.43 (35)	4.12 (42)	4.51 (46)	5.68 (58)	6.76 (69)	8.04 (82)	9.02 (92)	10.9 (111)	13.0 (133)	15.7 (160)	19.6 (200)	19.6 (200)							
Applicable gear head: MY9G3B to MY9G200B (ball bearing / hinge attached)	60Hz	1.18 (12)	1.37 (14)	1.86 (19)	2.25 (23)	2.84 (29)	3.43 (35)	3.72 (38)	4.70 (48)	5.68 (58)	6.76 (69)	7.55 (77)	9.21 (94)	10.9 (111)	13.0 (133)	18.3 (187)	19.6 (200)							
Rotational direction		Same as motor rotational direction							Reverse to motor rotational direction								Same as motor rotational direction							

• Permissible torque at output shaft of gear head using decimal gear head

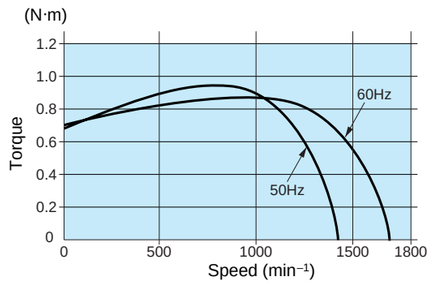
Applicable gear head: Bearing	Decimal gear head	Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
		Speed (min⁻¹)	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	MZ9G10XB	Permissible torque	N·m	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
			(kgf·cm)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

Connection diagram



Speed-torque characteristics

M9RZ90GK4L

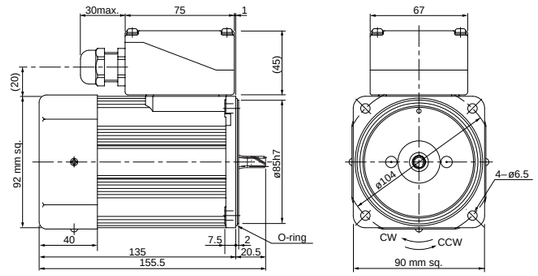


Motor (dimensions)

Scale: 1/4, Unit: mm

M9RZ90GK4L 4P 90W 100V (with fan)
M9RZ90GK4Y 4P 90W 200V (with fan)

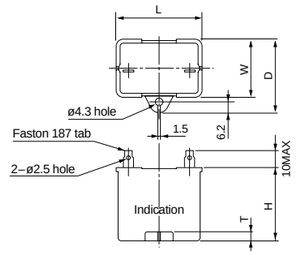
Mass	Helical gear	Module	Number of teeth
3.3 kg		0.5	9



* Diameter of applicable cabtyre cable to be ø8 to ø12.

Capacitor (dimensions) [attachment]

Unit: mm



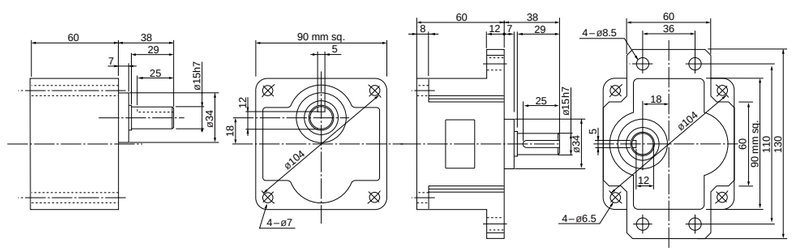
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M9RZ90GK4L	M0PC30M20	50.2	31	41	42	5	M0PC5032
M9RZ90GK4Y	M0PC7.5M37	50	34	45	45	6	—

Gear head (dimensions)

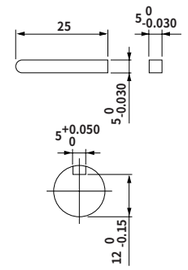
Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg
MY9G□M (metal bearing / hinge attached) Mass 1.4 kg



Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Reversible motor (sealed connector)

90 mm sq. 90 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M9RZ90GK4LG	4	90	100	50	30	195	2.0	1175	0.73 (7.5)	3.0	0.68 (6.9)	32 (250V)
	M9RZ90GK4LGA				60		203	2.0	1525	0.57 (5.8)	2.9	0.68 (6.9)	
	M9RZ90GK4DG	4	90	110	60	30	201	1.8	1550	0.55 (5.7)	3.1	0.72 (7.3)	28 (250V)
	M9RZ90GK4DGA			115	60		209	1.8	1575	0.55 (5.6)	3.2	0.79 (8.1)	
	M9RZ90GK4YG	4	90	200	50	30	185	0.93	1175	0.73 (7.5)	1.4	0.68 (6.9)	8 (450V)
	M9RZ90GK4YGA				60		206	1.1	1500	0.57 (5.8)	1.4	0.68 (6.9)	
	M9RZ90GK4GG	4	90	220	50	30	191	0.89	1225	0.70 (7.2)	1.5	0.72 (7.3)	7 (450V)
					60		197	0.90	1550	0.55 (5.7)	1.4	0.72 (7.3)	
	M9RZ90GK4GGA			230	50		202	0.92	1250	0.69 (7.0)	1.6	0.79 (8.1)	
					60		204	0.88	1575	0.55 (5.6)	1.5	0.79 (8.1)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-124.
• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

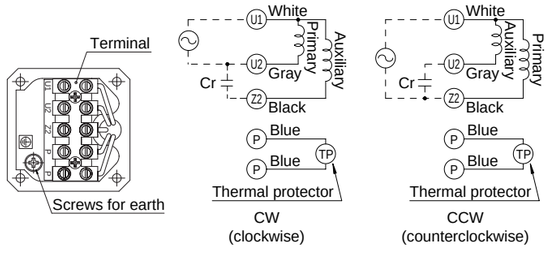
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head: MZ9G3B to MZ9G200B (ball bearing / hinge not attached)	50Hz	1.37 (14)	1.67 (17)	2.25 (23)	2.74 (28)	3.43 (35)	4.12 (42)	4.51 (46)	5.68 (58)	6.76 (69)	8.04 (82)	9.02 (92)	10.9 (111)	13.0 (133)	15.7 (160)	19.6 (200)	19.6 (200)							
Applicable gear head: MY9G3B to MY9G200B (ball bearing / hinge attached)	60Hz	1.18 (12)	1.37 (14)	1.86 (19)	2.25 (23)	2.84 (29)	3.43 (35)	3.72 (38)	4.70 (48)	5.68 (58)	6.76 (69)	7.55 (77)	9.21 (94)	10.9 (111)	13.0 (133)	18.3 (187)	19.6 (200)							
Rotational direction		Same as motor rotational direction							Reverse to motor rotational direction						Same as motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head: Bearing	Decimal gear head	Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	MZ9G10XB	Speed (min⁻¹)	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
		Permissible torque	N·m	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
			(kgf·cm)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

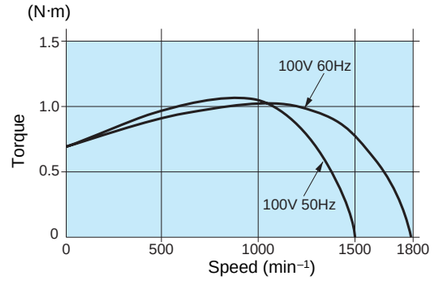
Connection diagram



(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

M9RZ90GK4LG(A)



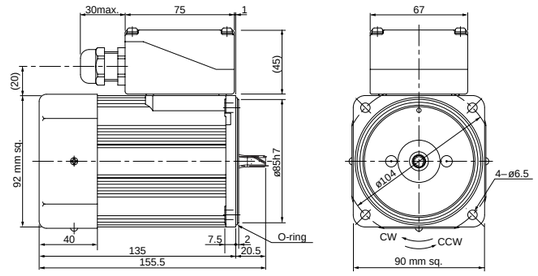
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/4, Unit: mm

M9RZ90GK4LG(A) 4P 90 W 100 V (with fan)
M9RZ90GK4DG(A) 4P 90 W 110 V / 115 V (with fan)
M9RZ90GK4YG(A) 4P 90 W 200 V (with fan)
M9RZ90GK4GG(A) 4P 90 W 220 V / 230 V (with fan)

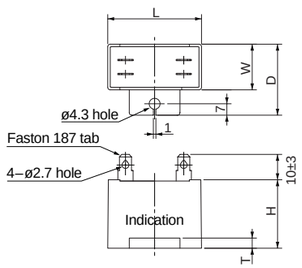
Mass	Helical	Module	Number of teeth
3.3 kg	gear	0.6	9

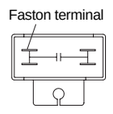


* Diameter of applicable cabtyre cable to be ø8 to ø12.

Capacitor (dimensions) [attachment]

Unit: mm

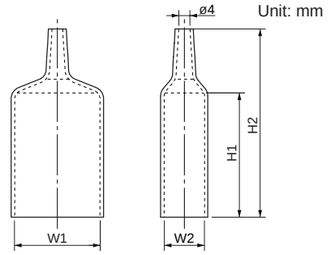




Internal wiring diagram of capacitor

Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

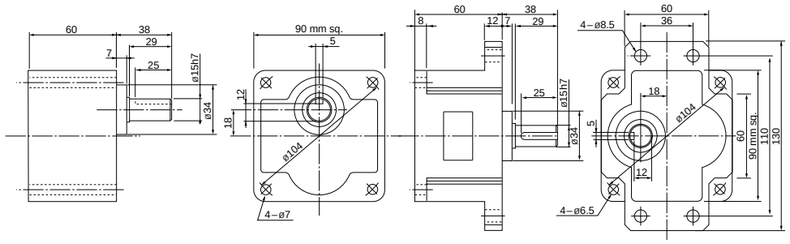
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M9RZ90GK4LG(A)	M0PC32M25G	58	35	50	50	4	M0PC5835G	58	35	55	78
M9RZ90GK4DG(A)	M0PC28M25G	58	35	50	50	4	M0PC5835G	58	35	55	78
M9RZ90GK4YG(A)	M0PC8M45G	58	35	50	50	4	M0PC5835G	58	35	55	78
M9RZ90GK4GG(A)	M0PC7M45G	58	35	50	50	4	M0PC5835G	58	35	55	78

• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg
MY9G□M (metal bearing / hinge attached) Mass 1.4 kg

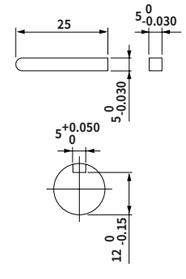


Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B

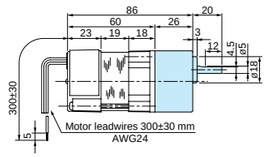


Reversible motor (leadwire)

Gear head combination dimensions
Scale: 1/4, Unit: mm

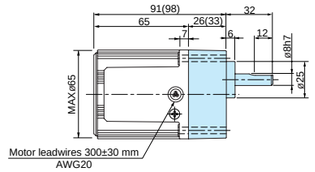
42 mm sq. 1 W

M4RA1G4L + M4GA□F



60 mm sq. 4 W

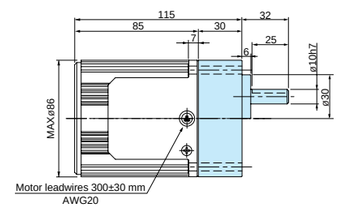
M6RX4G4L + MX6G□BA(MA) / MX6G□B(M)



* Figures in ( ) represent the dimensions of MX6G□B (M) (1/30 or larger reduction ratio).
The model number of the gear head with a reduction ratio of 1/25 or smaller is MX6G□BA (MA).

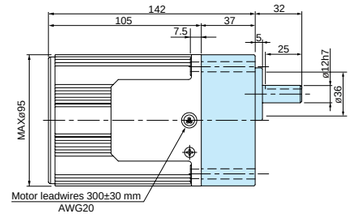
80 mm sq. 25 W

M8RX25G4L + MX8G□B(M)
M8RX25G4Y + MX8G□B(M)
M8RX25G4LG(A) + MX8G□B(M)
M8RX25G4DG(A) + MX8G□B(M)
M8RX25G4YG(A) + MX8G□B(M)
M8RX25G4GG(A) + MX8G□B(M)



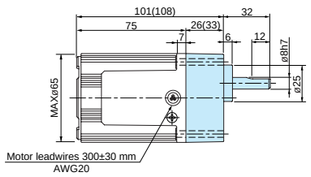
90 mm sq. 40 W

M9RX40G4L + MX9G□B(M)
M9RX40G4Y + MX9G□B(M)
M9RX40G4LG(A) + MX9G□B(M)
M9RX40G4DG(A) + MX9G□B(M)
M9RX40G4YG(A) + MX9G□B(M)
M9RX40G4GG(A) + MX9G□B(M)



60 mm sq. 6 W

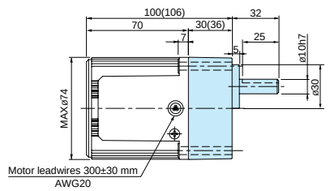
M6RX6G4L + MX6G□BA(MA) / MX6G□B(M)
M6RX6G4Y + MX6G□BA(MA) / MX6G□B(M)
M6RX6G4LG(A) + MX6G□BA(MA) / MX6G□B(M)
M6RX6G4DG(A) + MX6G□BA(MA) / MX6G□B(M)
M6RX6G4YG(A) + MX6G□BA(MA) / MX6G□B(M)
M6RX6G4GG(A) + MX6G□BA(MA) / MX6G□B(M)



* Figures in ( ) represent the dimensions of MX6G□B (M) (1/30 or larger reduction ratio).
The model number of the gear head with a reduction ratio of 1/25 or smaller is MX6G□BA (MA).

70 mm sq. 10 W

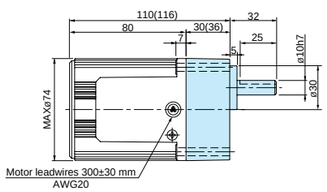
M7RX10G4L + MX7G□BA(MA) / MX7G□B(M)
M7RX10G4Y + MX7G□BA(MA) / MX7G□B(M)



* Figures in ( ) represent the dimensions of MX7G□B (M) (1/30 or larger reduction ratio).
The model number of the gear head with a reduction ratio of 1/25 or smaller is MX7G□BA (MA).

70 mm sq. 15 W

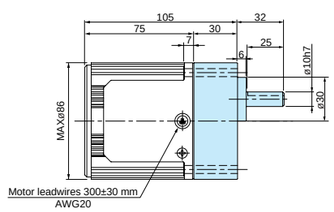
M7RX15G4L + MX7G□BA(MA) / MX7G□B(M)
M7RX15G4Y + MX7G□BA(MA) / MX7G□B(M)
M7RX15G4LG(A) + MX7G□BA(MA) / MX7G□B(M)
M7RX15G4DG(A) + MX7G□BA(MA) / MX7G□B(M)
M7RX15G4YG(A) + MX7G□BA(MA) / MX7G□B(M)
M7RX15G4GG(A) + MX7G□BA(MA) / MX7G□B(M)



* Figures in ( ) represent the dimensions of MX7G□B (M) (1/30 or larger reduction ratio).
The model number of the gear head with a reduction ratio of 1/25 or smaller is MX7G□BA (MA).

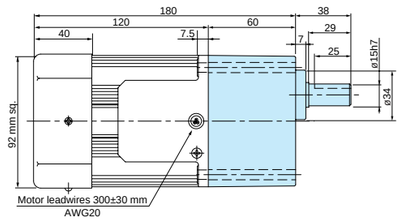
80 mm sq. 20 W

M8RX20G4L + MX8G□B(M)
M8RX20G4Y + MX8G□B(M)



90 mm sq. 60 W

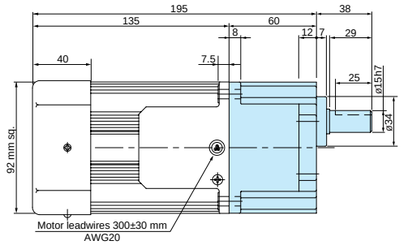
M9RZ60G4L + MZ9G□B (MY9G□B)
M9RZ60G4Y + MZ9G□B (MY9G□B)
M9RZ60G4LG(A) + MZ9G□B (MY9G□B)
M9RZ60G4DG(A) + MZ9G□B (MY9G□B)
M9RZ60G4YG(A) + MZ9G□B (MY9G□B)
M9RZ60G4GG(A) + MZ9G□B (MY9G□B)



* Refer to page B-380 for high torque gear head.

90 mm sq. 90 W

M9RZ90G4L + MY9G□B (MZ9G□B)
M9RZ90G4Y + MY9G□B (MZ9G□B)
M9RZ90G4LG(A) + MY9G□B (MZ9G□B)
M9RZ90G4DG(A) + MY9G□B (MZ9G□B)
M9RZ90G4YG(A) + MY9G□B (MZ9G□B)
M9RZ90G4GG(A) + MY9G□B (MZ9G□B)



* Refer to page B-380 for high torque gear head.

* The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
* The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

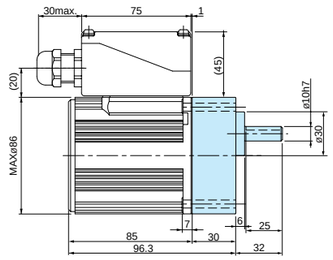
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Reversible motor (sealed connector)

Gear head combination dimensions
Scale: 1/4, Unit: mm

90 mm sq. 25 W

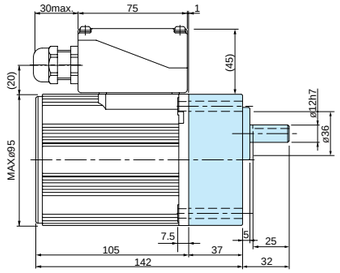
M8RX25GK4L + MX8G□B(M)
M8RX25GK4Y + MX8G□B(M)
M8RX25GK4LG(A) + MX8G□B(M)
M8RX25GK4DG(A) + MX8G□B(M)
M8RX25GK4YG(A) + MX8G□B(M)
M8RX25GK4GG(A) + MX8G□B(M)



* Diameter of applicable cabtyre cable to be ø8 to ø12.

90 mm sq. 40 W

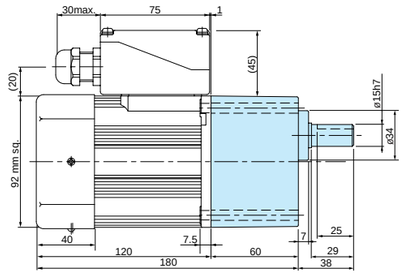
M9RX40GK4L + MX9G□B(M)
M9RX40GK4Y + MX9G□B(M)
M9RX40GK4LG(A) + MX9G□B(M)
M9RX40GK4DG(A) + MX9G□B(M)
M9RX40GK4YG(A) + MX9G□B(M)
M9RX40GK4GG(A) + MX9G□B(M)



* Diameter of applicable cabtyre cable to be ø8 to ø12.

90 mm sq. 60 W

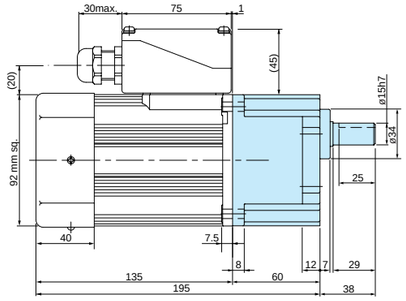
M9RZ60GK4L + MZ9G□B (MY9G□B)
M9RZ60GK4Y + MZ9G□B (MY9G□B)
M9RZ60GK4LG(A) + MZ9G□B (MY9G□B)
M9RZ60GK4DG(A) + MZ9G□B (MY9G□B)
M9RZ60GK4YG(A) + MZ9G□B (MY9G□B)
M9RZ60GK4GG(A) + MZ9G□B (MY9G□B)



* Diameter of applicable cabtyre cable to be ø8 to ø12.
* Refer to page B-380 for high torque gear head.

90 mm sq. 90 W

M9RZ90GK4L + MY9G□B (MZ9G□B)
M9RZ90GK4Y + MY9G□B (MZ9G□B)
M9RZ90GK4LG(A) + MY9G□B (MZ9G□B)
M9RZ90GK4DG(A) + MY9G□B (MZ9G□B)
M9RZ90GK4YG(A) + MY9G□B (MZ9G□B)
M9RZ90GK4GG(A) + MY9G□B (MZ9G□B)



* Diameter of applicable cabtyre cable to be ø8 to ø12.
* Refer to page B-380 for high torque gear head.

* The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
* The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

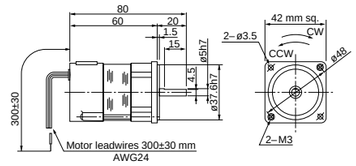
Reversible motor (4-pole round shaft / leadwire)

Dimensions
Scale: 1/4, Unit: mm

42 mm sq. 1 W

Mass 0.3 kg

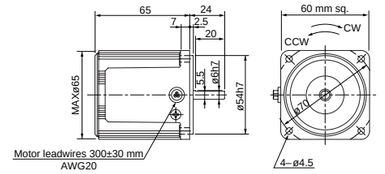
M4RA1S4L



60 mm sq. 4 W

Mass 0.56 kg

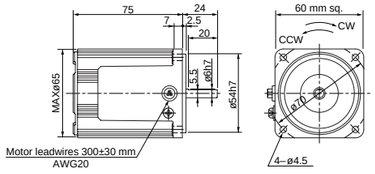
M6RX4S4LS



60 mm sq. 6 W

Mass 0.67 kg

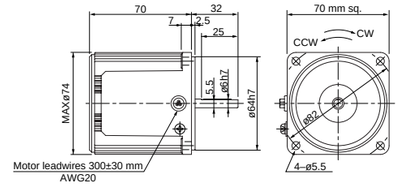
M6RX6S4LS M6RX6S4LG(A) M6RX6S4YG(A)
M6RX6S4YS M6RX6S4DG(A) M6RX6S4GG(A)



70 mm sq. 10 W

Mass 0.84 kg

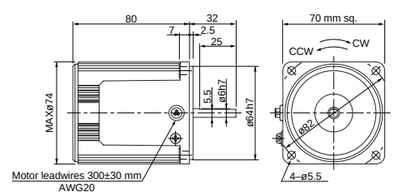
M7RX10S4LS
M7RX10S4YS



70 mm sq. 15 W

Mass 1.1 kg

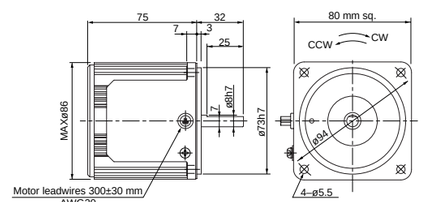
M7RX15S4LS M71X15S4LG(A) M71X15S4YG(A)
M7RX15S4YS M71X15S4DG(A) M71X15S4GG(A)



80 mm sq. 20 W

Mass 1.2 kg

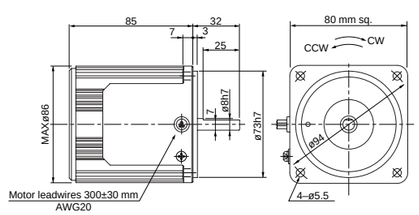
M8RX20S4LS
M8RX20S4YS



80 mm sq. 25 W

Mass 1.5 kg

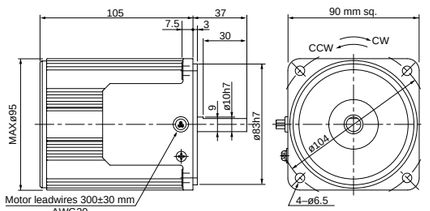
M8RX25S4LS M8RX25S4LG(A) M8RX25S4YG(A)
M8RX25S4YS M8RX25S4DG(A) M8RX25S4GG(A)



90 mm sq. 40 W

Mass 2.4 kg

M9RX40S4LS M9RX40S4LG(A) M9RX40S4YG(A)
M9RX40S4YS M9RX40S4DG(A) M9RX40S4GG(A)



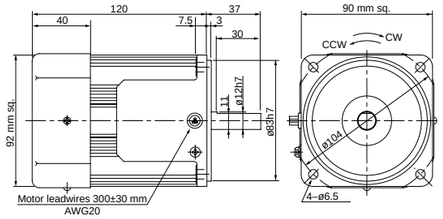
(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Reversible motor (4-pole round shaft / leadwire)

Dimensions
Scale: 1/4, Unit: mm

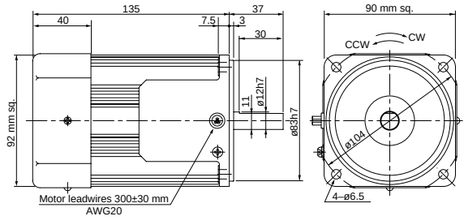
90 mm sq. 60 W Mass 2.7 kg

M9RZ60S4LS (with fan)
M9RZ60S4YS (with fan)
M9RZ60S4LG(A) (with fan)
M9RZ60S4DG(A) (with fan)
M9RZ60S4YG(A) (with fan)
M9RZ60S4GG(A) (with fan)



90 mm sq. 90 W Mass 3.4 kg

M9RZ90S4LS (with fan)
M9RZ90S4YS (with fan)
M9RZ90S4LG(A) (with fan)
M9RZ90S4DG(A) (with fan)
M9RZ90S4YG(A) (with fan)
M9RZ90S4GG(A) (with fan)

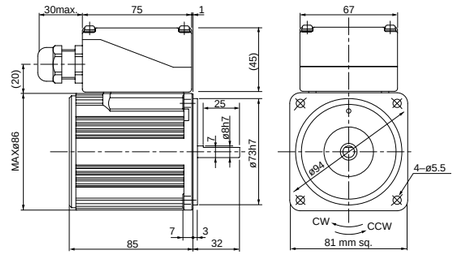


Reversible motor (4-pole round shaft /sealed connector)

Dimensions
Scale: 1/4, Unit: mm

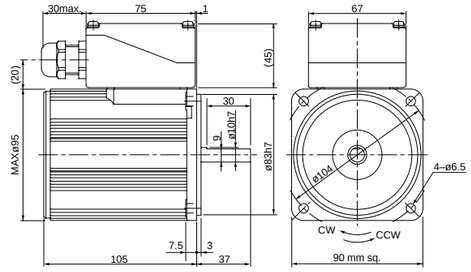
90 mm sq. 25 W Mass 1.8 kg

M8RX25SK4LS
M8RX25SK4YS
M8RX25SK4LG(A)
M8RX25SK4YG(A)
M8RX25SK4DG(A)
M8RX25SK4GG(A)



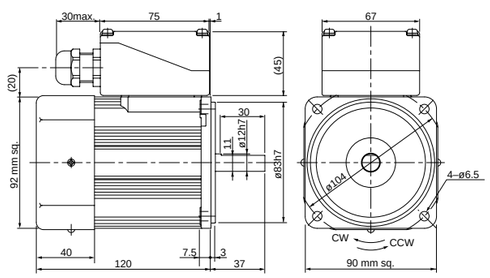
90 mm sq. 40 W Mass 2.8 kg

M9RX40SK4LS
M9RX40SK4YS
M9RX40SK4LG(A)
M9RX40SK4YG(A)
M9RX40SK4DG(A)
M9RX40SK4GG(A)



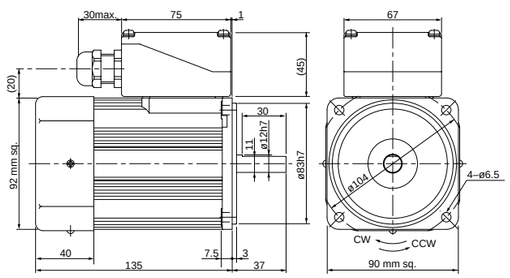
90 mm sq. 60 W Mass 3.0 kg

M9RZ60SK4LS (with fan)
M9RZ60SK4YS (with fan)
M9RZ60SK4LG(A) (with fan)
M9RZ60SK4DG(A) (with fan)
M9RZ60SK4YG(A) (with fan)
M9RZ60SK4GG(A) (with fan)



90 mm sq. 90 W Mass 3.3 kg

M9RZ90SK4LS (with fan)
M9RZ90SK4YS (with fan)
M9RZ90SK4LG(A) (with fan)
M9RZ90SK4DG(A) (with fan)
M9RZ90SK4YG(A) (with fan)
M9RZ90SK4GG(A) (with fan)



100V/200V round shaft motors with a sealed connector (with a terminal box) are covered by the Electrical Appliance and Material Safety Law. The indications on their nameplate are based on this law.

*The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
*The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

3-phase Motor

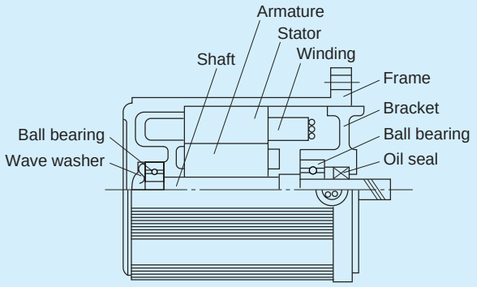
Contents

Outline of 3-phase motor

Features

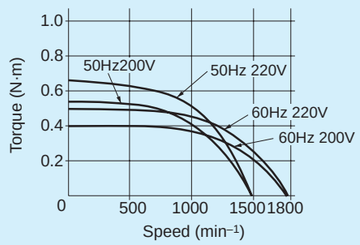
- The 3-phase motor is an induction motor for 3-phase power.
- Continuous time rating
- The motor with national specifications is of heatproof class 120 (E); the motor with specifications compliant with overseas standards is of heatproof class 130 (B).

Construction



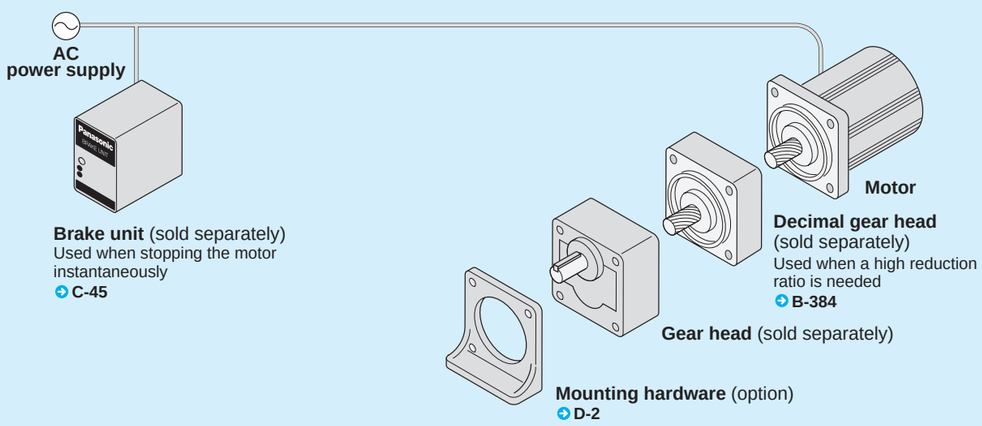
Characteristics

• Speed-torque characteristics



Example:M8MX25G4Y

System configuration diagram



Coding system

M 9 M X 40 G 4 Y S A

- **Size**
  - 8 : 80 mm sq.
  - 9 : 90 mm sq.
- **Motor type**
  - M : 3-phase motor
- **Output type**
  - X : 40 W or smaller
  - Z : 60 W or larger
- **Output**
  - 25 : 25 W
  - 40 : 40 W
  - 60 : 60 W
  - 90 : 90 W
- **Shape of shaft**
  - G : Pinion shaft
  - S : Round shaft
- **Option**
  - K : Sealed connector (Left aligned when no option is used)
- **No. of poles**
  - 4 : 4 poles
- **Voltage**
  - Y : National specifications: 200/220 V
    Specifications compliant with overseas standards: 200/220/230 V
  - C : 380/400 V
- **Classification**
  - The models with a motor model number to which “A” is suffixed are not sold or available in Japan.
  - G : Specifications compliant with overseas standards
  - S : Round shaft (S for round shaft with national specifications only)

Corresponding model number	Shape of shaft	Classification
Specifications compliant with overseas standards Pinion shaft	G	G
Specifications compliant with overseas standards Round shaft	S	G
National specifications Pinion shaft	G	–
National specifications Round shaft	S	S
42 mm sq. round shaft specifications	S	–

Model list of 3-phase motor

Pinion shaft motor

✪ Motor compliant with overseas standards

Size	Output (W)	Leadwire type			Sealed connector type		
		Model number	Specifications	Page	Model number	Specifications	Page
80 mm sq.	25	**M8MX25G4Y**	200/220V	**B-130**	**M8MX25GK4Y**	200/220V	**B-146**
		M8MX25G4YG(A)	200/220/230V ✪	**B-132**	**M8MX25GK4YG(A)**	200/220/230V ✪	**B-148**
					M8MX25GK4CG(A)	380/400V ✪	**B-148**
90 mm sq.	40	**M9MX40G4Y**	200/220V	**B-134**	**M9MX40GK4Y**	200/220V	**B-150**
		M9MX40G4YG(A)	200/220/230V ✪	**B-136**	**M9MX40GK4YG(A)**	200/220/230V ✪	**B-152**
					M9MX40GK4CG(A)	380/400V ✪	**B-152**
	60	**M9MZ60G4Y**	200/220V	**B-138**	**M9MZ60GK4Y**	200/220V	**B-154**
		M9MZ60G4YG(A)	200/220/230V ✪	**B-140**	**M9MZ60GK4YG(A)**	200/220/230V ✪	**B-156**
					M9MZ60GK4CG(A)	380/400V ✪	**B-156**
	90	**M9MZ90G4Y**	200/220V	**B-142**	**M9MZ90GK4Y**	200/220V	**B-158**
		M9MZ90G4YG(A)	200/220/230V ✪	**B-144**	**M9MZ90GK4YG(A)**	200/220/230V ✪	**B-160**
					M9MZ90GK4CG(A)	380/400V ✪	**B-160**

Round shaft motor

✪ Motor compliant with overseas standards
Ⓟ Electrical Appliance and Material Safety Law

Size	Output (W)	Leadwire type		Sealed connector type	
		Model number	Specifications	Model number	Specifications
80 mm sq.	25	**M8MX25S4YS**	200/220V	**M8MX25SK4YS**	200/220V Ⓟ
		M8MX25S4YG(A)	200/220/230V ✪	**M8MX25SK4YG(A)**	200/220/230V ✪ Ⓟ
				M8MX25SK4CG(A)	380/400V ✪
90 mm sq.	40	**M9MX40S4YS**	200/220V	**M9MX40SK4YS**	200/220V Ⓟ
		M9MX40S4YG(A)	200/220/230V ✪	**M9MX40SK4YG(A)**	200/220/230V ✪ Ⓟ
				M9MX40SK4CG(A)	380/400V ✪
	60	**M9MZ60S4YS**	200/220V	**M9MZ60SK4YS**	200/220V Ⓟ
		M9MZ60S4YG(A)	200/220/230V ✪	**M9MZ60SK4YG(A)**	200/220/230V ✪ Ⓟ
				M9MZ60SK4CG(A)	380/400V ✪
	90	**M9MZ90S4YS**	200/220V	**M9MZ90SK4YS**	200/220V Ⓟ
		M9MZ90S4YG(A)	200/220/230V ✪	**M9MZ90SK4YG(A)**	200/220/230V ✪ Ⓟ
				M9MZ90SK4CG(A)	380/400V ✪

* The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft motor.
Dimensional outline drawing → Page B-164.

<Notice>
380V/400V 3-phase round shaft motors with a sealed connector are not covered by the Electrical Appliance and Material Safety Law.

Applicable gear head

Hinge attached

Standard gear head		High torque gear head	Right-angle gear head	Decimal gear head
Ball bearing	metal bearing			
MX8G□B	**MX8G□M**	–	–	**MX8G10XB**
MX9G□B	**MX9G□M**	–	**MX9G□R**	**MX9G10XB**
MZ9G□B	–	**MR9G□B**	**MZ9G□R**	**MZ9G10XB**
MY9G□B		**MP9G□B**		

*Refer to page B-380 for dimensions and permissible torque of high torque gear head.
Refer to page B-382 for dimensions and permissible torque of right-angle gear head.
Refer to page B-384 for dimensions of decimal gear head.

3-phase motor (leadwire)

80 mm sq. 25 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)
80 mm sq.	M8MX25G4Y	4	25	200	50	Cont.	50	0.25	1350	0.18 (1.8)	0.62	0.54 (5.5)
					60		47	0.22	1625	0.15 (1.5)	0.58	0.40 (4.0)
				220	50	Cont.	54	0.27	1375	0.18 (1.8)	0.67	0.66 (6.7)
					60		49	0.23	1650	0.15 (1.5)	0.64	0.50 (5.1)

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-164.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

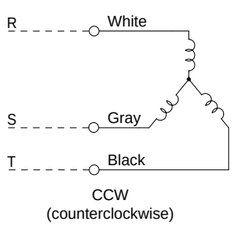
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX8G3B to MX8G180B (ball bearing)	50Hz	0.39 (4.0)	0.47 (4.8)	0.66 (6.7)	0.78 (8.0)	0.98 (10)	1.18 (12)	1.27 (13)	1.57 (16)	1.96 (20)	2.35 (24)	2.55 (26)	3.14 (32)	3.82 (39)	4.61 (47)	6.37 (65)	7.64 (78)	7.84 (80)					
	MX8G3M to MX8G180M (metal bearing)	60Hz	0.32 (3.3)	0.39 (4.0)	0.55 (5.6)	0.66 (6.7)	0.81 (8.3)	0.98 (10)	1.08 (11)	1.27 (13)	1.57 (16)	1.96 (20)	2.06 (21)	2.65 (27)	3.14 (32)	3.82 (39)	5.29 (54)	6.37 (65)	7.84 (80)					
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX8G□B (ball bearing) MX8G□M (metal bearing)	MX8G10XB	Permissible torque	N·m	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84
			(kgf·cm)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)
		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

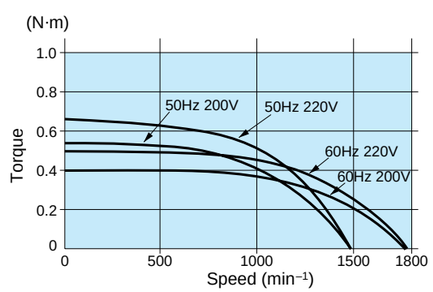
Connection diagram



Change any two lead wires of R, S and T for CW rotation.

Speed-torque characteristics

M8MX25G4Y

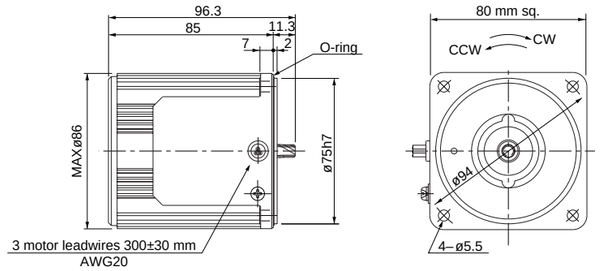


Motor (dimensions)

Scale: 1/3, Unit: mm

M8MX25G4Y 4P 25 W 200 V / 220 V

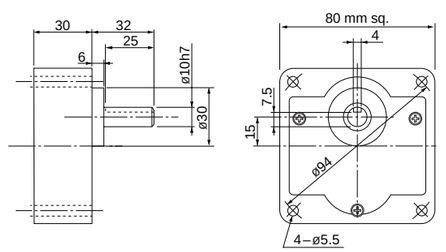
Mass	Helical gear	Module	Number of teeth
1.5 kg		0.5	9



Gear head (dimensions)

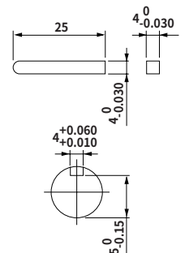
Scale: 1/3, Unit: mm

MX8G□B (ball bearing) / **MX8G□M** (metal bearing) Mass 0.6 kg



Key and keyway (dimensions) [attachment]

MX8G□B(M)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

3-phase motor (leadwire)

80 mm sq. 25 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)
80 mm sq.	M8MX25G4YG M8MX25G4YGA	4	25	200	50	Cont.	50	0.25	1350	0.18 (1.8)	0.62	0.54 (5.5)
					60		47	0.22	1625	0.15 (1.5)	0.58	0.40 (4.0)
				220	60		49	0.23	1650	0.14 (1.5)	0.64	0.50 (5.1)
				230	60		50	0.24	1675	0.14 (1.5)	0.65	0.54 (5.5)

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-164.
• The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

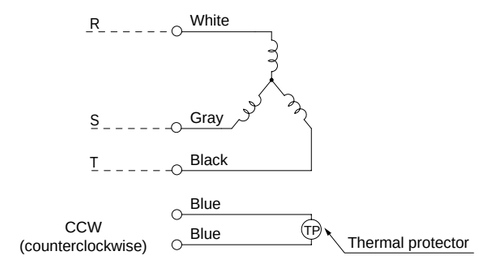
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX8G3B to MX8G180B (ball bearing)	50Hz	0.39 (4.0)	0.47 (4.8)	0.66 (6.7)	0.78 (8.0)	0.98 (10)	1.18 (12)	1.27 (13)	1.57 (16)	1.96 (20)	2.35 (24)	2.55 (26)	3.14 (32)	3.82 (39)	4.61 (47)	6.37 (65)	7.64 (78)	7.84 (80)					
	MX8G3M to MX8G180M (metal bearing)	60Hz	0.32 (3.3)	0.39 (4.0)	0.55 (5.6)	0.66 (6.7)	0.81 (8.3)	0.98 (10)	1.08 (11)	1.27 (13)	1.57 (16)	1.96 (20)	2.06 (21)	2.65 (27)	3.14 (32)	3.82 (39)	5.29 (54)	6.37 (65)	7.84 (80)					
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX8G□B (ball bearing) MX8G□M (metal bearing)	MX8G10XB	Permissible torque	N·m	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84
			(kgf·cm)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)
		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

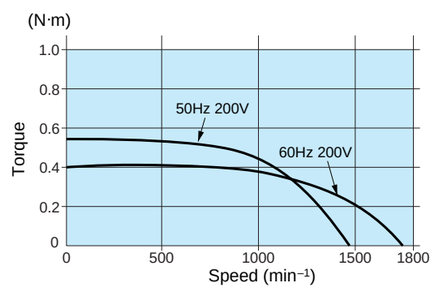
Connection diagram



Change any two lead wires of R, S and T for CW rotation.
(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

M8MX25G4YG(A)

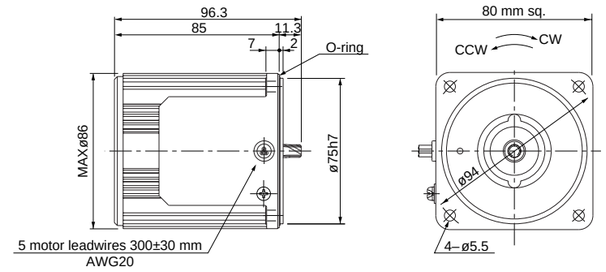


Motor (dimensions)

Scale: 1/3, Unit: mm

M8MX25G4YG(A) 4P 25 W 200 V / 220 V / 230 V

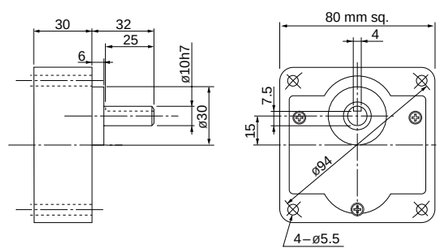
Mass	Helical	Module	Number of teeth
1.5 kg	gear	0.5	9



Gear head (dimensions)

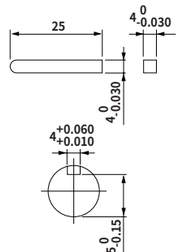
Scale: 1/3, Unit: mm

MX8G□B (ball bearing) / **MX8G□M** (metal bearing) Mass 0.6 kg



Key and keyway (dimensions) [attachment]

MX8G□B(M)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

3-phase motor (leadwire)

90 mm sq. 40 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min^{-1})	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)
90 mm sq.	M9MX40G4Y	4	40	200	50	Cont.	69	0.31	1350	0.28 (2.9)	0.90	0.72 (7.3)
					60		68	0.29	1625	0.24 (2.4)	0.82	0.51 (5.2)
				220	50	Cont.	70	0.32	1375	0.27 (2.8)	1.0	0.88 (8.9)
					60		66	0.28	1675	0.23 (2.3)	0.91	0.63 (6.4)

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-164.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

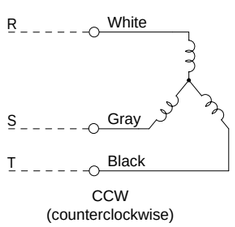
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min^{-1})		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX9G3B to MX9G180B (ball bearing)	50Hz	0.66 (6.7)	0.78 (8.0)	1.08 (11)	1.27 (13)	1.57 (16)	1.86 (19)	2.25 (23)	2.74 (28)	3.23 (33)	3.92 (40)	4.41 (45)	5.29 (54)	6.37 (65)	7.94 (81)	9.80 (100)	9.80 (100)						
	MX9G3M to MX9G180M (metal bearing)	60Hz	0.55 (5.6)	0.66 (6.7)	0.90 (9.2)	1.08 (11)	1.27 (13)	1.57 (16)	1.76 (18)	2.25 (23)	2.74 (28)	3.23 (33)	3.53 (36)	4.41 (45)	5.29 (54)	6.37 (65)	8.82 (90)	9.80 (100)						
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min^{-1})	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX9G□B (ball bearing) MX9G□M (metal bearing)	MX9G10XB	Permissible torque	N·m	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80
			(kgf·cm)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
		Rotational direction		Same as motor rotational direction		Reverse to motor rotational direction									

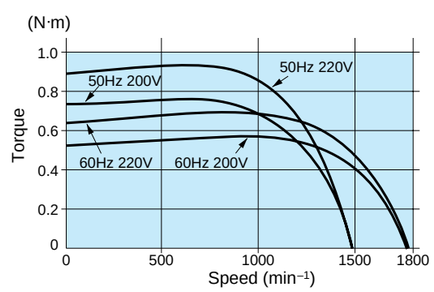
Connection diagram



Change any two lead wires of R, S and T for CW rotation.

Speed-torque characteristics

M9MX40G4Y

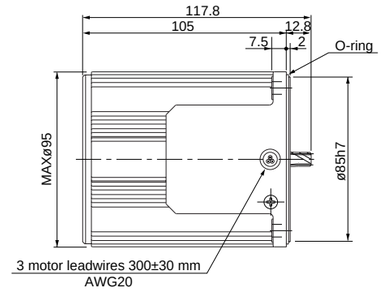


Motor (dimensions)

Scale: 1/3, Unit: mm

M9MX40G4Y 4P 40 W 200 V / 220 V

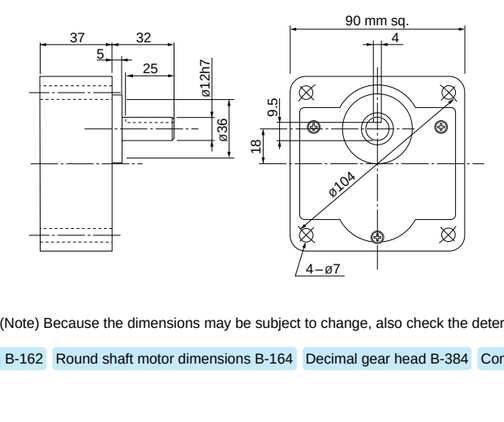
Mass	Helical gear	Module	Number of teeth
2.4 kg		0.55	9



Gear head (dimensions)

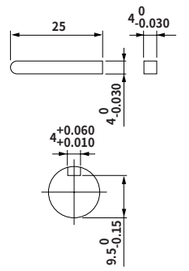
Scale: 1/3, Unit: mm

MX9G□B (ball bearing) / **MX9G□M** (metal bearing) Mass 0.8 kg



Key and keyway (dimensions) [attachment]

MX9G□B(M)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

3-phase motor (leadwire)

90 mm sq. 40 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min^{-1})	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)
90 mm sq.	M9MX40G4YG M9MX40G4YGA	4	40	200	50	Cont.	69	0.31	1350	0.28 (2.9)	0.90	0.72 (7.3)
					60		68	0.29	1625	0.24 (2.4)	0.82	0.51 (5.2)
				220	60		66	0.28	1675	0.23 (2.3)	0.91	0.63 (6.4)
				230	60		66	0.29	1675	0.23 (2.3)	0.96	0.69 (7.0)

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-164.
• The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

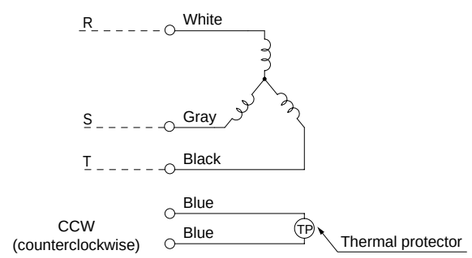
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min^{-1})		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX9G3B to MX9G180B (ball bearing)	50Hz	0.66 (6.7)	0.78 (8.0)	1.08 (11)	1.27 (13)	1.57 (16)	1.86 (19)	2.25 (23)	2.74 (28)	3.23 (33)	3.92 (40)	4.41 (45)	5.29 (54)	6.37 (65)	7.94 (81)	9.80 (100)	9.80 (100)						
	MX9G3M to MX9G180M (metal bearing)	60Hz	0.55 (5.6)	0.66 (6.7)	0.90 (9.2)	1.08 (11)	1.27 (13)	1.57 (16)	1.76 (18)	2.25 (23)	2.74 (28)	3.23 (33)	3.53 (36)	4.41 (45)	5.29 (54)	6.37 (65)	8.82 (90)	9.80 (100)						
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min^{-1})	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX9G□B (ball bearing) MX9G□M (metal bearing)	MX9G10XB	Permissible torque	N·m	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80
			(kgf·cm)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

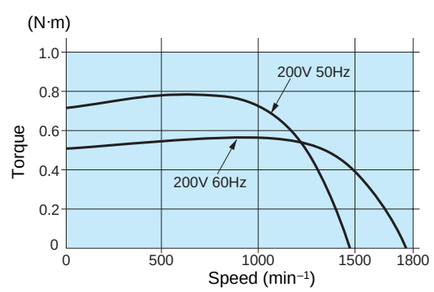
Connection diagram



Change any two lead wires of R, S and T for CW rotation.
(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

M9MX40G4YG(A)

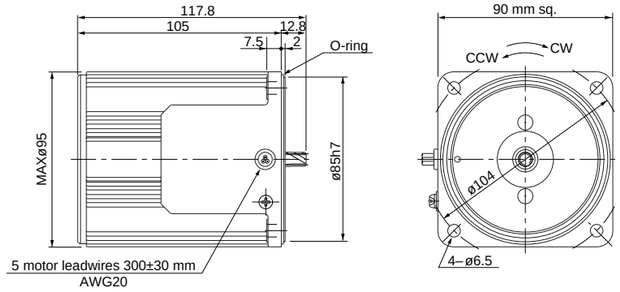


Motor (dimensions)

Scale: 1/3, Unit: mm

M9MX40G4YG(A) 4P 40 W 200 V / 220 V / 230 V

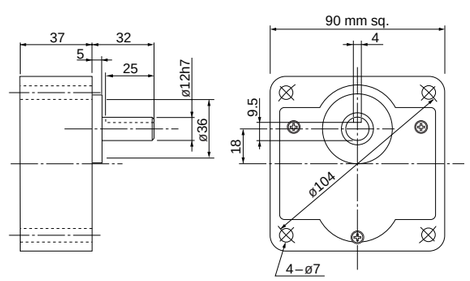
Mass	Helical	Module	Number of teeth
2.4 kg	gear	0.55	9



Gear head (dimensions)

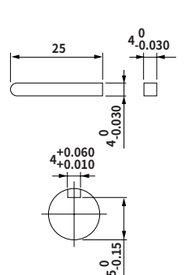
Scale: 1/3, Unit: mm

MX9G□B (ball bearing) / **MX9G□M** (metal bearing) Mass 0.8 kg



Key and keyway (dimensions) [attachment]

MX9G□B(M)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

3-phase motor (leadwire)

90 mm sq. 60 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min^{-1})	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)
90 mm sq.	M9MZ60G4Y	4	60	200	50	Cont.	101	0.45	1350	0.42 (4.3)	1.3	1.0 (10)
					60		96	0.41	1625	0.35 (3.6)	1.2	0.69 (7.0)
				220	50	Cont.	103	0.46	1375	0.41 (4.2)	1.5	1.2 (12)
					60		98	0.40	1650	0.34 (3.5)	1.3	0.87 (8.8)

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-164.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

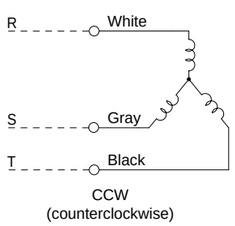
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min^{-1})		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head	MZ9G3BA to MZ9G200B (ball bearing / hinge not attached)	50Hz	0.98 (9.99)	1.18 (12)	1.57 (16)	1.96 (20)	2.35 (24)	2.94 (30)	3.14 (32)	3.92 (40)	4.70 (48)	5.59 (57)	6.27 (64)	7.55 (77)	9.11 (93)	11.0 (112)	15.2 (155)	17.8 (182)	19.6 (200)						
	MY9G3MA to MY9G200M (metal bearing / hinge attached)	60Hz	0.78 (8.0)	0.98 (9.99)	1.37 (14)	1.57 (16)	1.96 (20)	2.35 (24)	2.65 (27)	3.33 (34)	3.92 (40)	4.70 (48)	5.29 (54)	6.47 (66)	7.55 (77)	9.11 (93)	12.6 (129)	15.2 (155)	19.6 (200)						
Rotational direction			Same as motor rotational direction							Reverse to motor rotational direction						Same as motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min^{-1})	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MZ9G□B (ball bearing / Hinge not attached) MY9G□M (metal bearing / Hinge attached)	MZ9G10XB	Permissible torque	N·m	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
			(kgf·cm)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

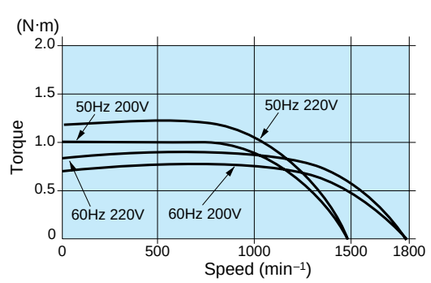
Connection diagram



Change any two lead wires of R, S and T for CW rotation.

Speed-torque characteristics

M9MZ60G4Y



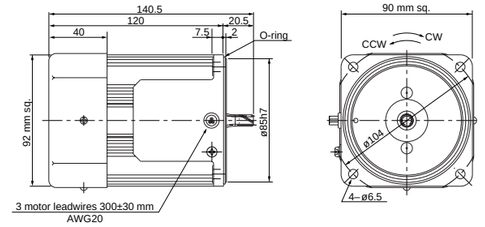
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/4, Unit: mm

M9MZ60G4Y 4P 60 W 200 V / 220 V (with fan)

Mass	Helical gear	Module	Number of teeth
2.7 kg		0.6	9

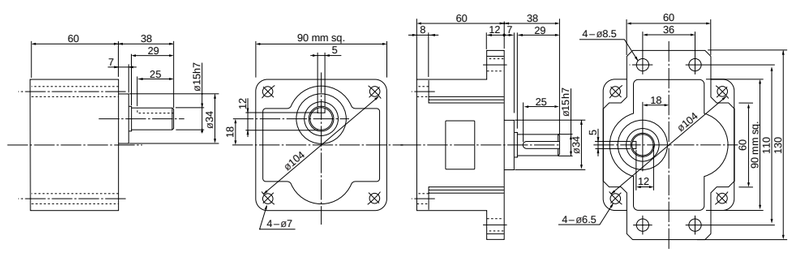


Gear head (dimensions)

Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg

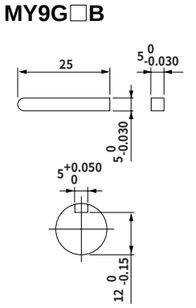
MY9G□M (metal bearing / hinge attached) Mass 1.4 kg



Note) MZ / MY is available for a gear head of either type.

Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

3-phase motor (leadwire)

90 mm sq. 60 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)
90 mm sq.	M9MZ60G4YG M9MZ60G4YGA	4	60	200	50	Cont.	101	0.45	1350	0.42 (4.3)	1.3	1.0 (10)
					60		96	0.41	1625	0.35 (3.6)	1.2	0.69 (7.0)
				220	60		98	0.40	1650	0.35 (3.5)	1.3	0.87 (8.8)
				230	60		98	0.41	1675	0.34 (3.5)	1.4	1.0 (10)

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-164.
• The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

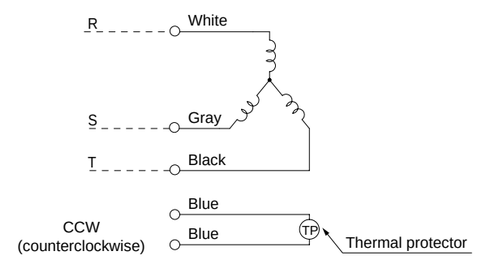
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head: MZ9G3BA to MZ9G200B (ball bearing / hinge not attached)	50Hz	0.98 (9.99)	1.18 (12)	1.57 (16)	1.96 (20)	2.35 (24)	2.94 (30)	3.14 (32)	3.92 (40)	4.70 (48)	5.59 (57)	6.27 (64)	7.55 (77)	9.11 (93)	11.0 (112)	15.2 (155)	17.8 (182)	19.6 (200)						
Applicable gear head: MY9G3MA to MY9G200M (metal bearing / hinge attached)	60Hz	0.78 (8.0)	0.98 (9.99)	1.37 (14)	1.57 (16)	1.96 (20)	2.35 (24)	2.65 (27)	3.33 (34)	3.92 (40)	4.70 (48)	5.29 (54)	6.47 (66)	7.55 (77)	9.11 (93)	12.6 (129)	15.2 (155)	19.6 (200)						
Rotational direction		Same as motor rotational direction							Reverse to motor rotational direction						Same as motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head: Bearing	Decimal gear head	Reduction ratio: Speed (min⁻¹)		250	300	360	500	600	750	900	1000	1200	1500	1800
		Speed (min⁻¹)	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MZ9G□B (ball bearing / Hinge not attached) MY9G□M (metal bearing / Hinge attached)	MZ9G10XB	Permissible torque	N·m	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
			(kgf·cm)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

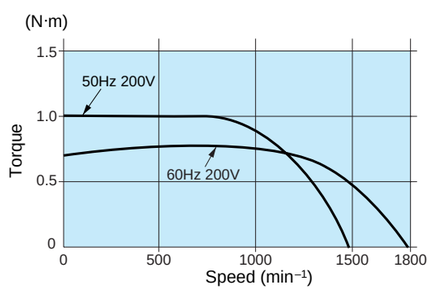
Connection diagram



Change any two lead wires of R, S and T for CW rotation.
(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

M9MZ60G4YG(A)

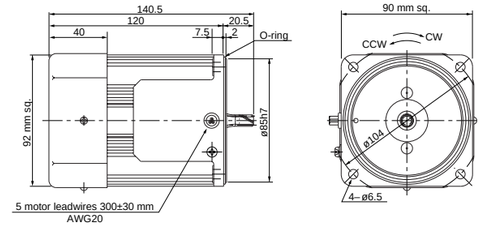


Motor (dimensions)

Scale: 1/4, Unit: mm

M9MZ60G4YG(A) 4P 60 W 200 V / 220 V / 230 V (with fan)

Mass	Helical gear	Module	Number of teeth
2.7 kg		0.6	9

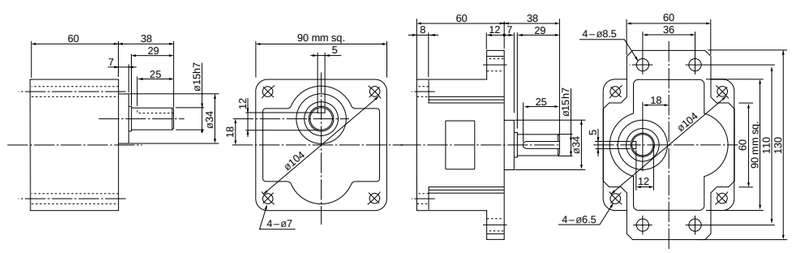


Gear head (dimensions)

Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg

MY9G□M (metal bearing / hinge attached) Mass 1.4 kg

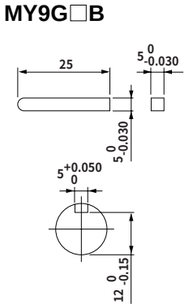


Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

3-phase motor (leadwire)

90 mm sq. 90 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min^{-1})	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)
90 mm sq.	M9MZ90G4Y	4	90	200	50	Cont.	141	0.62	1350	0.63 (6.4)	2.0	1.6 (16)
					60		137	0.56	1625	0.53 (5.4)	1.8	1.1 (11)
				220	50	Cont.	143	0.65	1400	0.62 (6.3)	2.2	2.0 (20)
					60		137	0.56	1650	0.52 (5.3)	2.0	1.4 (14)

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-164.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

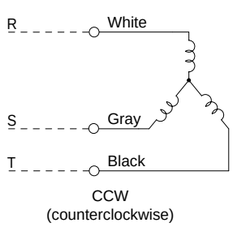
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min^{-1})	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head: MZ9G3B to MZ9G200B (ball bearing / hinge not attached)	50Hz	1.37 (14)	1.67 (17)	2.25 (23)	2.74 (28)	3.43 (35)	4.12 (42)	4.51 (46)	5.68 (58)	6.76 (69)	8.04 (82)	9.02 (92)	10.9 (111)	13.0 (133)	15.7 (160)	19.6 (200)	19.6 (200)							
Applicable gear head: MY9G3B to MY9G200B (ball bearing / hinge attached)	60Hz	1.18 (12)	1.37 (14)	1.86 (19)	2.25 (23)	2.84 (29)	3.43 (35)	3.72 (38)	4.70 (48)	5.68 (58)	6.76 (69)	7.55 (77)	9.21 (94)	10.9 (111)	13.0 (133)	18.3 (187)	19.6 (200)							
Rotational direction		Same as motor rotational direction							Reverse to motor rotational direction						Same as motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head: Bearing	Decimal gear head	Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
		Speed (min^{-1})	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	MZ9G10XB	Permissible torque	N·m (kgf·cm)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

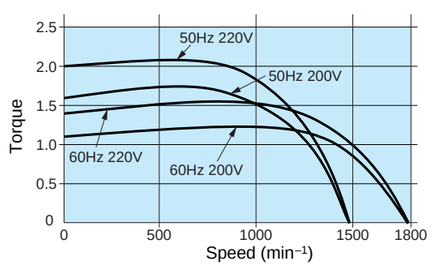
Connection diagram



Change any two lead wires of R, S and T for CW rotation.

Speed-torque characteristics

M9MZ90G4Y



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

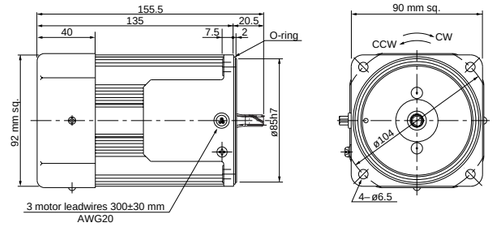
Features B-126 | System configuration B-127 | Coding system B-127 | Model list B-128

Motor (dimensions)

Scale: 1/4, Unit: mm

M9MZ90G4Y 4P 90 W 200 V / 220 V (with fan)

Mass	Helical gear	Module	Number of teeth
3.2 kg		0.6	9

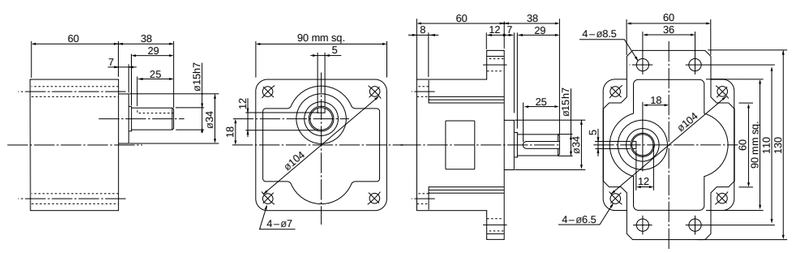


Gear head (dimensions)

Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg

MY9G□M (metal bearing / hinge attached) Mass 1.4 kg

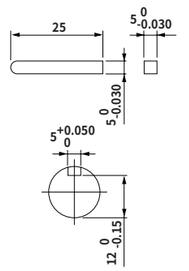


Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Gear head combination B-162 | Round shaft motor dimensions B-164 | Decimal gear head B-384 | Control related product C-4 | Option D-2

3-phase motor (leadwire)

90 mm sq. 90 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)
90 mm sq.	M9MZ90G4YG M9MZ90G4YGA	4	90	200	50	Cont.	142	0.62	1350	0.63 (6.4)	2.0	1.6 (16)
					60		138	0.56	1625	0.53 (5.4)	1.8	1.1 (11)
				220	60		137	0.56	1650	0.52 (5.3)	2.0	1.4 (14)
				230	60		137	0.58	1675	0.51 (5.2)	2.1	1.6 (16)

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-164.
• The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

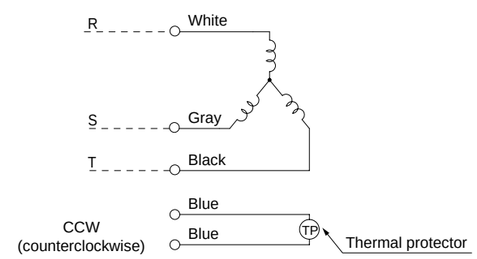
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head: MZ9G3B to MZ9G200B (ball bearing / hinge not attached)	50Hz	1.37 (14)	1.67 (17)	2.25 (23)	2.74 (28)	3.43 (35)	4.12 (42)	4.51 (46)	5.68 (58)	6.76 (69)	8.04 (82)	9.02 (92)	10.9 (111)	13.0 (133)	15.7 (160)	19.6 (200)	19.6 (200)							
Applicable gear head: MY9G3B to MY9G200B (ball bearing / hinge attached)	60Hz	1.18 (12)	1.37 (14)	1.86 (19)	2.25 (23)	2.84 (29)	3.43 (35)	3.72 (38)	4.70 (48)	5.68 (58)	6.76 (69)	7.55 (77)	9.21 (94)	10.9 (111)	13.0 (133)	18.3 (187)	19.6 (200)							
Rotational direction		Same as motor rotational direction							Reverse to motor rotational direction						Same as motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head: Bearing	Decimal gear head	Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
		Speed (min⁻¹)	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	MZ9G10XB	Permissible torque	N·m	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
			(kgf·cm)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

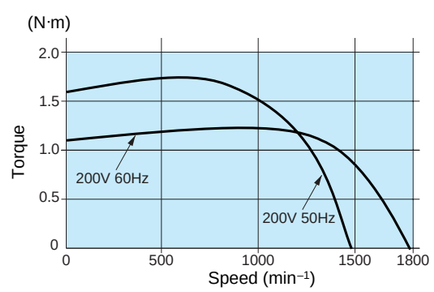
Connection diagram



Change any two lead wires of R, S and T for CW rotation.
(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

M9MZ90G4YG(A)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

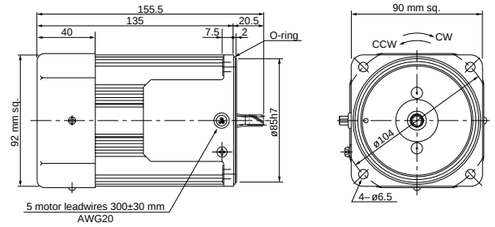
Features B-126 | System configuration B-127 | Coding system B-127 | Model list B-128

Motor (dimensions)

Scale: 1/4, Unit: mm

M9MZ90G4YG(A) 4P 90 W 200 V / 220 V / 230 V (with fan)

Mass	Helical gear	Module	Number of teeth
3.2 kg		0.6	9

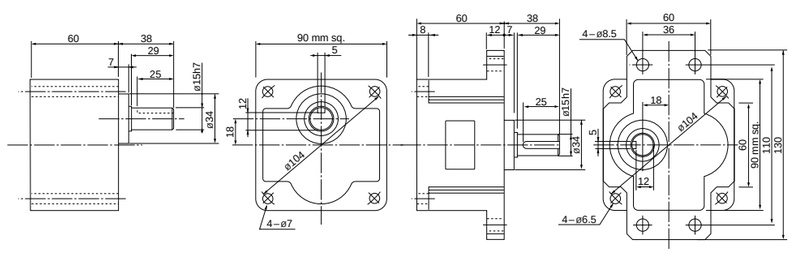


Gear head (dimensions)

Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg

MY9G□M (metal bearing / hinge attached) Mass 1.4 kg

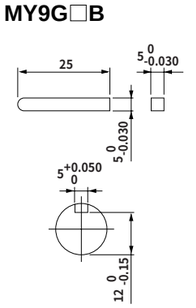


Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Gear head combination B-162 | Round shaft motor dimensions B-164 | Decimal gear head B-384 | Control related product C-4 | Option D-2

3-phase motor (sealed connector)

80 mm sq. 25 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)
80 mm sq.	M8MX25GK4Y	4	25	200	50	Cont.	50	0.25	1350	0.18 (1.8)	0.62	0.54 (5.5)
					60		47	0.22	1625	0.15 (1.5)	0.58	0.40 (4.0)
				220	50	Cont.	54	0.27	1375	0.18 (1.8)	0.67	0.66 (6.7)
					60		49	0.23	1650	0.15 (1.5)	0.64	0.50 (5.1)

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-165.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

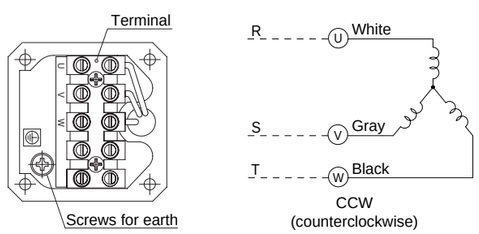
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head: MX8G3B to MX8G180B (ball bearing)	50Hz	0.39 (4.0)	0.47 (4.8)	0.66 (6.7)	0.78 (8.0)	0.98 (10)	1.18 (12)	1.27 (13)	1.57 (16)	1.96 (20)	2.35 (24)	2.55 (26)	3.14 (32)	3.82 (39)	4.61 (47)	6.37 (65)	7.64 (78)	7.84 (80)					
Applicable gear head: MX8G3M to MX8G180M (metal bearing)	60Hz	0.32 (3.3)	0.39 (4.0)	0.55 (5.6)	0.66 (6.7)	0.81 (8.3)	0.98 (10)	1.08 (11)	1.27 (13)	1.57 (16)	1.96 (20)	2.06 (21)	2.65 (27)	3.14 (32)	3.82 (39)	5.29 (54)	6.37 (65)	7.84 (80)					
Rotational direction		Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head: Bearing	Decimal gear head	Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
		Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX8G□B (ball bearing) MX8G□M (metal bearing)	MX8G10XB	Permissible torque	N·m	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84
			(kgf·cm)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)
		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

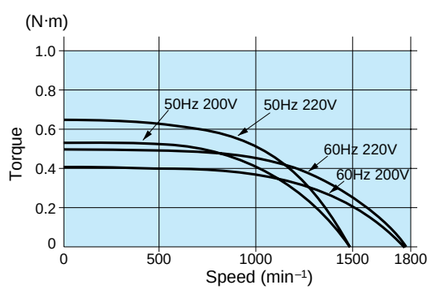
Connection diagram



Change any two lead wires of U, V and W for CW rotation.

Speed-torque characteristics

M8MX25GK4Y

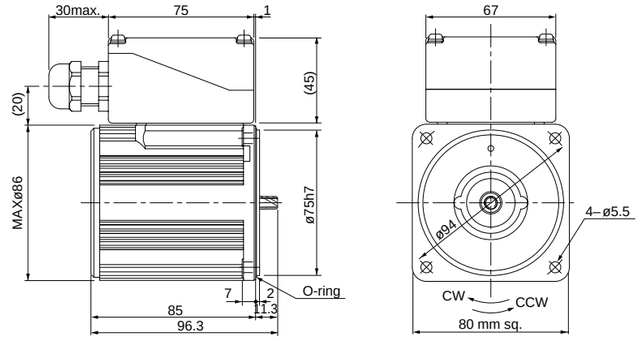


Motor (dimensions)

Scale: 1/3, Unit: mm

M8MX25GK4Y 4P 25 W 200 V / 220 V

Mass	Helical	Module	Number of teeth
1.8 kg	gear	0.5	9

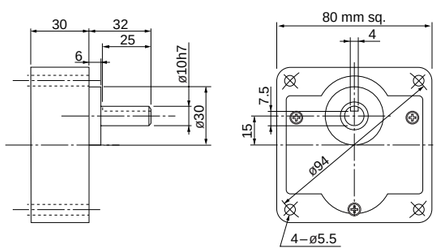


* Diameter of applicable cabtyre cable to be ø8 to ø12.

Gear head (dimensions)

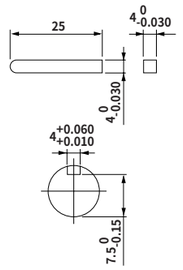
Scale: 1/3, Unit: mm

MX8G□B (ball bearing) / **MX8G□M** (metal bearing) Mass 0.6 kg



Key and keyway (dimensions) [attachment]

MX8G□B(M)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

3-phase motor (sealed connector)

80 mm sq. 25 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)
80 mm sq.	M8MX25GK4YG M8MX25GK4YGA	4	25	200	50	Cont.	50	0.25	1350	0.18 (1.8)	0.62	0.54 (5.5)
					60		47	0.22	1625	0.15 (1.5)	0.58	0.40 (4.0)
				220	60		49	0.23	1650	0.14 (1.5)	0.64	0.50 (5.1)
				230	60		50	0.24	1675	0.14 (1.5)	0.65	0.54 (5.5)
	M8MX25GK4CG M8MX25GK4CGA	4	25	380	50	Cont.	49	0.12	1325	0.18 (1.8)	0.29	0.50 (5.1)
				400	50		52	0.12	1325	0.18 (1.8)	0.32	0.56 (5.7)

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-165.
• The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

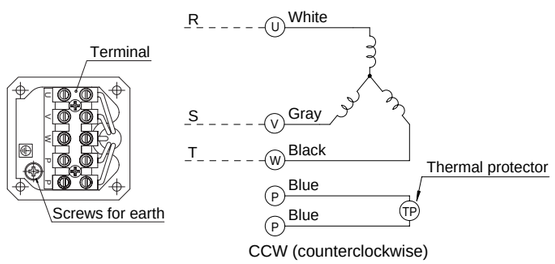
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX8G3B to MX8G180B (ball bearing)	50Hz	0.39 (4.0)	0.47 (4.8)	0.66 (6.7)	0.78 (8.0)	0.98 (10)	1.18 (12)	1.27 (13)	1.57 (16)	1.96 (20)	2.35 (24)	2.55 (26)	3.14 (32)	3.82 (39)	4.61 (47)	6.37 (65)	7.64 (78)	7.84 (80)					
	MX8G3M to MX8G180M (metal bearing)	60Hz	0.32 (3.3)	0.39 (4.0)	0.55 (5.6)	0.66 (6.7)	0.81 (8.3)	0.98 (10)	1.08 (11)	1.27 (13)	1.57 (16)	1.96 (20)	2.06 (21)	2.65 (27)	3.14 (32)	3.82 (39)	5.29 (54)	6.37 (65)	7.84 (80)					
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX8G□B (ball bearing) MX8G□M (metal bearing)	MX8G10XB	Permissible torque	N·m	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84
			(kgf·cm)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)
		Rotational direction		Same as motor rotational direction		Reverse to motor rotational direction									

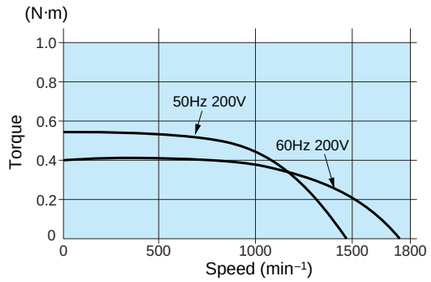
Connection diagram



Change any two lead wires of U, V and W for CW rotation.
(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

M8MX25GK4YG(A)

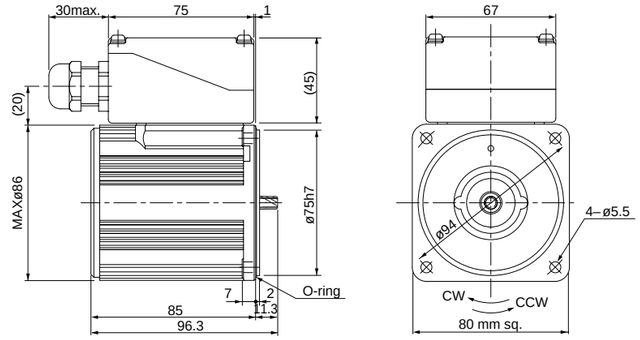


Motor (dimensions)

Scale: 1/3, Unit: mm

M8MX25GK4YG(A) 4P 25 W 200 V / 220 V / 230 V
M8MX25GK4CG(A) 4P 25 W 380 V / 400 V

Mass	Helical	Module	Number of teeth
1.8 kg	gear	0.5	9

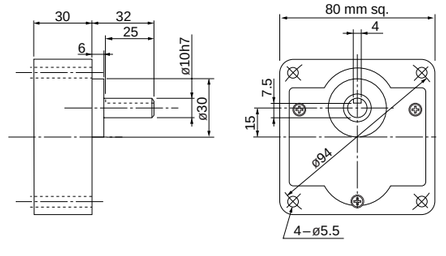


* Diameter of applicable cabtyre cable to be ø8 to ø12.

Gear head (dimensions)

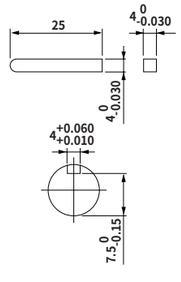
Scale: 1/3, Unit: mm

MX8G□B (ball bearing) / **MX8G□M** (metal bearing) Mass 0.6 kg



Key and keyway (dimensions) [attachment]

MX8G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

3-phase motor (sealed connector)

90 mm sq. 40 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min^{-1})	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)
90 mm sq.	M9MX40GK4Y	4	40	200	50	Cont.	69	0.31	1350	0.28 (2.9)	0.90	0.72 (7.3)
					60		68	0.29	1625	0.24 (2.4)	0.82	0.51 (5.2)
				220	50	Cont.	70	0.32	1375	0.27 (2.8)	1.0	0.88 (8.9)
					60		66	0.28	1675	0.23 (2.3)	0.91	0.63 (6.4)

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-165.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

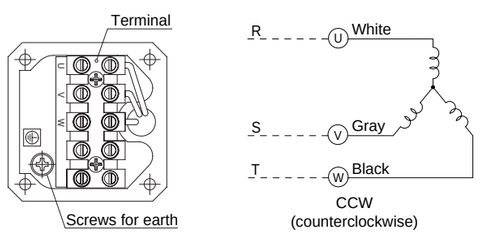
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min^{-1})	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head: MX9G3B to MX9G180B (ball bearing)	50Hz	0.66 (6.7)	0.78 (8.0)	1.08 (11)	1.27 (13)	1.57 (16)	1.86 (19)	2.25 (23)	2.74 (28)	3.23 (33)	3.92 (40)	4.41 (45)	5.29 (54)	6.37 (65)	7.94 (81)	9.80 (100)	9.80 (100)						
Applicable gear head: MX9G3M to MX9G180M (metal bearing)	60Hz	0.55 (5.6)	0.66 (6.7)	0.90 (9.2)	1.08 (11)	1.27 (13)	1.57 (16)	1.76 (18)	2.25 (23)	2.74 (28)	3.23 (33)	3.53 (36)	4.41 (45)	5.29 (54)	6.37 (65)	8.82 (90)	9.80 (100)						
Rotational direction		Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head: Bearing	Decimal gear head			200	250	300	360	500	600	750	900	1000	1200	1500	1800
		Speed (min^{-1})	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX9G□B (ball bearing) MX9G□M (metal bearing)	MX9G10XB	Permissible torque	N·m (kgf·cm)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)
		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

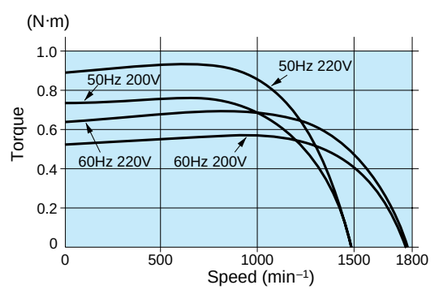
Connection diagram



Change any two lead wires of U, V and W for CW rotation.

Speed-torque characteristics

M9MX40GK4Y



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

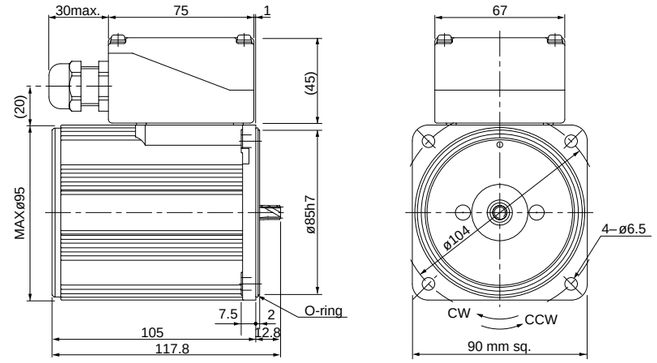
Features B-126 | System configuration B-127 | Coding system B-127 | Model list B-128

Motor (dimensions)

Scale: 1/3, Unit: mm

M9MX40GK4Y 4P 40 W 200 V / 220 V

Mass	Helical gear	Module	Number of teeth
2.8 kg		0.55	9

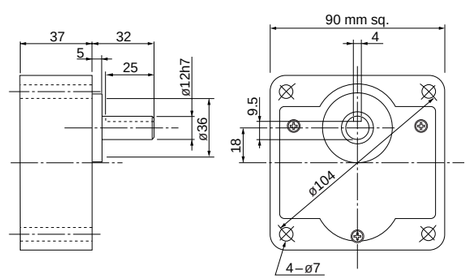


* Diameter of applicable cabtyre cable to be ø8 to ø12.

Gear head (dimensions)

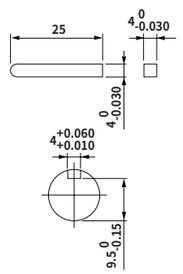
Scale: 1/3, Unit: mm

MX9G□B (ball bearing) / **MX9G□M** (metal bearing) Mass 0.8 kg



Key and keyway (dimensions) [attachment]

MX9G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-163 | Round shaft motor dimensions B-165 | Decimal gear head B-384 | Control related product C-4 | Option D-2

3-phase motor (sealed connector)

cULus CE 90 mm sq. 40 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)
90 mm sq.	M9MX40GK4YG M9MX40GK4YGA	4	40	200	50	Cont.	69	0.31	1350	0.28 (2.9)	0.90	0.72 (7.3)
					60		68	0.29	1625	0.24 (2.4)	0.82	0.51 (5.2)
				220	60		66	0.28	1675	0.23 (2.3)	0.91	0.63 (6.4)
				230	60		66	0.29	1675	0.23 (2.3)	0.96	0.69 (7.0)
	M9MX40GK4CG M9MX40GK4CGA	4	40	380	50	Cont.	68	0.15	1325	0.29 (2.9)	0.44	0.64 (6.5)
				400	50		66	0.15	1350	0.28 (2.9)	0.47	0.74 (7.6)

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-165.
• The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

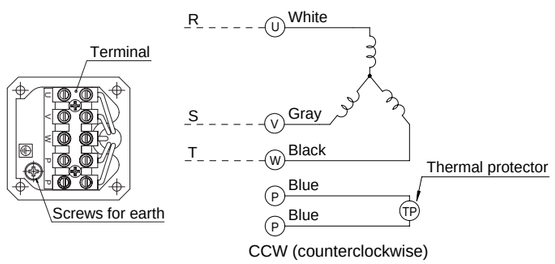
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head: MX9G3B to MX9G180B (ball bearing)	50Hz	0.66 (6.7)	0.78 (8.0)	1.08 (11)	1.27 (13)	1.57 (16)	1.86 (19)	2.25 (23)	2.74 (28)	3.23 (33)	3.92 (40)	4.41 (45)	5.29 (54)	6.37 (65)	7.94 (81)	9.80 (100)	9.80 (100)						
Applicable gear head: MX9G3M to MX9G180M (metal bearing)	60Hz	0.55 (5.6)	0.66 (6.7)	0.90 (9.2)	1.08 (11)	1.27 (13)	1.57 (16)	1.76 (18)	2.25 (23)	2.74 (28)	3.23 (33)	3.53 (36)	4.41 (45)	5.29 (54)	6.37 (65)	8.82 (90)	9.80 (100)						
Rotational direction		Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX9G□B (ball bearing) MX9G□M (metal bearing)	MX9G10XB	Permissible torque	N·m (kgf·cm)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)
		Rotational direction		Same as motor rotational direction		Reverse to motor rotational direction									

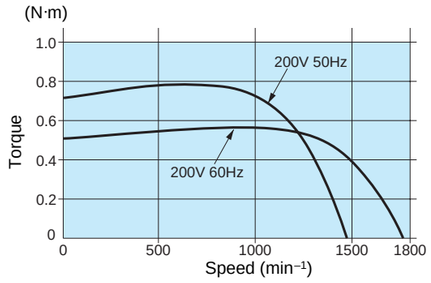
Connection diagram



CCW (counterclockwise)
Change any two lead wires of U, V and W for CW rotation.
(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

M9MX40GK4YG(A)

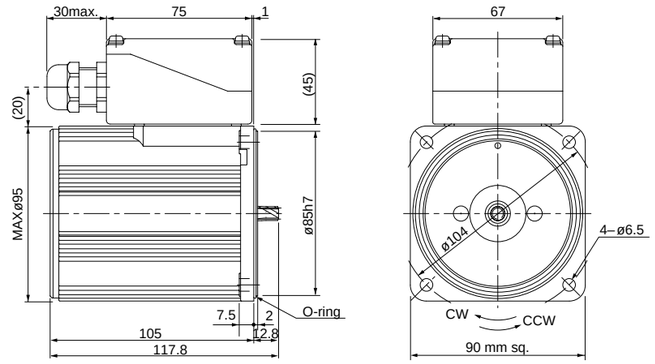


Motor (dimensions)

Scale: 1/3, Unit: mm

M9MX40GK4YG(A) 4P 40 W 200 V / 220 V / 230 V
M9MX40GK4CG(A) 4P 40 W 380 V / 400 V

Mass	Helical gear	Module	Number of teeth
2.8 kg		0.55	9

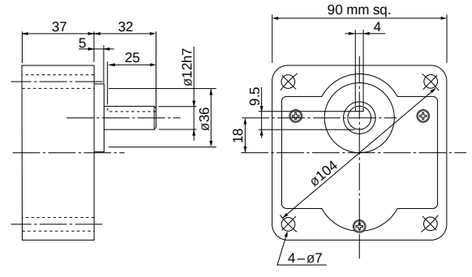


* Diameter of applicable cabtyre cable to be ø8 to ø12.

Gear head (dimensions)

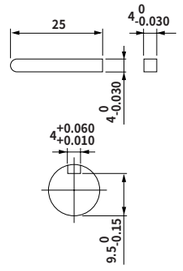
Scale: 1/3, Unit: mm

MX9G□B (ball bearing) / **MX9G□M** (metal bearing) Mass 0.8 kg



Key and keyway (dimensions) [attachment]

MX9G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

3-phase motor (sealed connector)

90 mm sq. 60 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min^{-1})	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)
90 mm sq.	M9MZ60GK4Y	4	60	200	50	Cont.	101	0.45	1350	0.42 (4.3)	1.3	1.0 (10)
					60		96	0.41	1625	0.35 (3.6)	1.2	0.69 (7.0)
				220	50	Cont.	103	0.46	1375	0.41 (4.2)	1.5	1.2 (12)
					60		98	0.40	1650	0.34 (3.5)	1.3	0.87 (8.8)

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-165.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

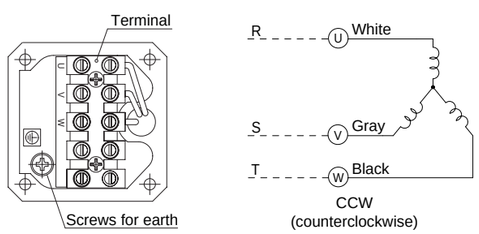
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min^{-1})	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head: MZ9G3BA to MZ9G200B (ball bearing / hinge not attached)	50Hz	0.98 (9.99)	1.18 (12)	1.57 (16)	1.96 (20)	2.35 (24)	2.94 (30)	3.14 (32)	3.92 (40)	4.70 (48)	5.59 (57)	6.27 (64)	7.55 (77)	9.11 (93)	11.0 (112)	15.2 (155)	17.8 (182)	19.6 (200)						
Applicable gear head: MY9G3MA to MY9G200M (metal bearing / hinge attached)	60Hz	0.78 (8.0)	0.98 (9.99)	1.37 (14)	1.57 (16)	1.96 (20)	2.35 (24)	2.65 (27)	3.33 (34)	3.92 (40)	4.70 (48)	5.29 (54)	6.47 (66)	7.55 (77)	9.11 (93)	12.6 (129)	15.2 (155)	19.6 (200)						
Rotational direction		Same as motor rotational direction							Reverse to motor rotational direction						Same as motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head: Bearing	Decimal gear head	Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
		Speed (min^{-1})	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MZ9G□B (ball bearing / Hinge not attached) MY9G□M (metal bearing / Hinge attached)	MZ9G10XB	Permissible torque	N·m	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
			(kgf·cm)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

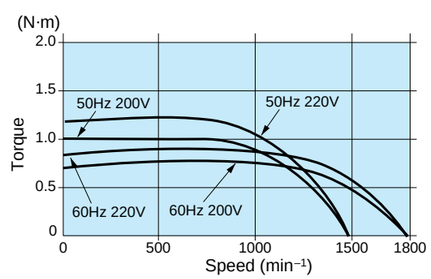
Connection diagram



Change any two lead wires of U, V and W for CW rotation.

Speed-torque characteristics

M9MZ60GK4Y



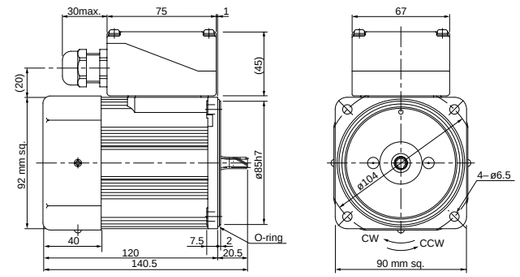
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/4, Unit: mm

M9MZ60GK4Y 4P 60 W 200 V / 220 V (with fan)

Mass	Helical gear	Module	Number of teeth
3.0 kg		0.6	9



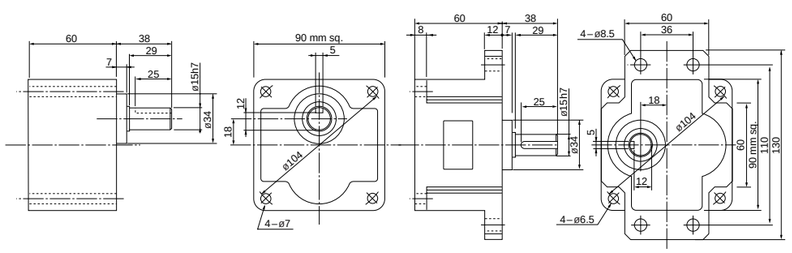
* Diameter of applicable cabtyre cable to be ø8 to ø12.

Gear head (dimensions)

Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg

MY9G□M (metal bearing / hinge attached) Mass 1.4 kg

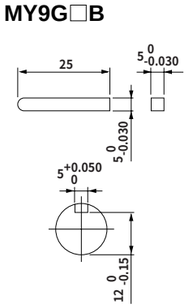


Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



3-phase motor (sealed connector)

90 mm sq. 60 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)
90 mm sq.	M9MZ60GK4YG M9MZ60GK4YGA	4	60	200	50	Cont.	101	0.45	1350	0.42 (4.3)	1.3	1.0 (10)
					60		96	0.41	1625	0.35 (3.6)	1.2	0.69 (7.0)
				220	60		98	0.40	1650	0.35 (3.5)	1.3	0.87 (8.8)
				230	60		98	0.41	1675	0.34 (3.5)	1.4	1.0 (10)
	M9MZ60GK4CG M9MZ60GK4CGA	4	60	380	50	Cont.	103	0.22	1325	0.43 (4.4)	0.62	0.88 (9.0)
				400	50		103	0.22	1325	0.43 (4.4)	0.65	1.0 (10)

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-165.
• The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

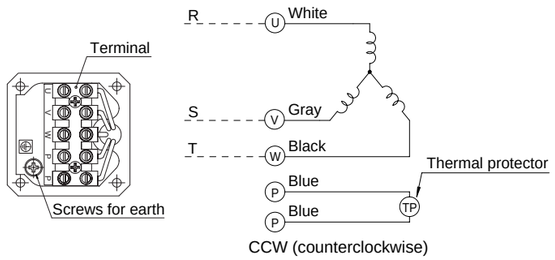
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head	MZ9G3B to MZ9G200B (ball bearing / hinge not attached)	50Hz	0.98 (9.99)	1.18 (12)	1.57 (16)	1.96 (20)	2.35 (24)	2.94 (30)	3.14 (32)	3.92 (40)	4.70 (48)	5.59 (57)	6.27 (64)	7.55 (77)	9.11 (93)	11.0 (112)	15.2 (155)	17.8 (182)	19.6 (200)						
	MY9G3B to MY9G200B (ball bearing / hinge attached)	60Hz	0.78 (8.0)	0.98 (9.99)	1.37 (14)	1.57 (16)	1.96 (20)	2.35 (24)	2.65 (27)	3.33 (34)	3.92 (40)	4.70 (48)	5.29 (54)	6.47 (66)	7.55 (77)	9.11 (93)	12.6 (129)	15.2 (155)	19.6 (200)						
Rotational direction			Same as motor rotational direction							Reverse to motor rotational direction						Same as motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	MZ9G10XB	Permissible torque	N·m	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
			(kgf·cm)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

Connection diagram

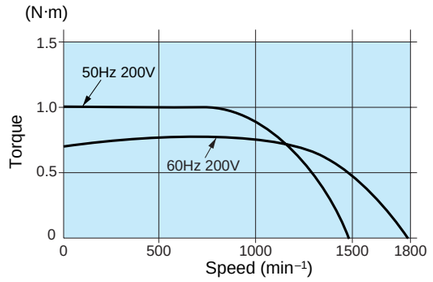


CCW (counterclockwise)

Change any two lead wires of U, V and W for CW rotation.
(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

M9MZ60GK4YG(A)

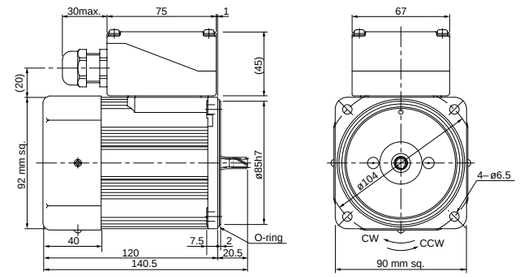


Motor (dimensions)

Scale: 1/4, Unit: mm

M9MZ60GK4YG(A) 4P 60 W 200 V / 220 V / 230 V (with fan)
M9MZ60GK4CG(A) 4P 60 W 380 V / 400 V (with fan)

Mass	Helical gear	Module	Number of teeth
3.0 kg		0.6	9

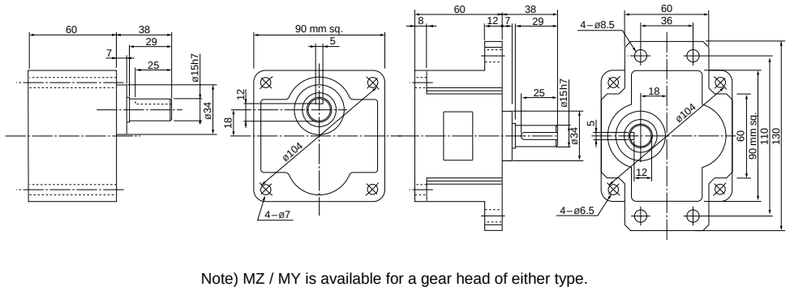


* Diameter of applicable cabtyre cable to be ø8 to ø12.

Gear head (dimensions)

Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg
MY9G□M (metal bearing / hinge attached) Mass 1.4 kg

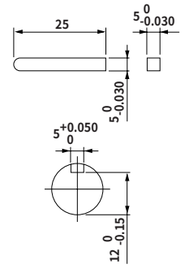


Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

3-phase motor (sealed connector)

90 mm sq. 90 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min^{-1})	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)
90 mm sq.	M9MZ90GK4Y	4	90	200	50	Cont.	141	0.62	1350	0.63 (6.4)	2.0	1.6 (16)
					60		137	0.56	1625	0.53 (5.4)	1.8	1.1 (11)
				220	50	Cont.	143	0.65	1400	0.62 (6.3)	2.2	2.0 (20)
					60		137	0.56	1650	0.52 (5.3)	2.0	1.4 (14)

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-165.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

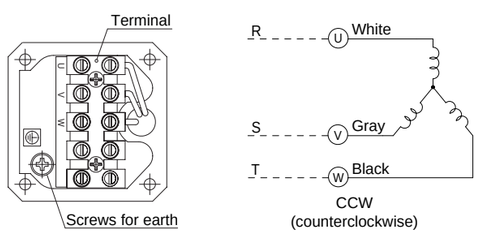
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min^{-1})	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head: MZ9G3B to MZ9G200B (ball bearing / hinge not attached)	50Hz	1.37 (14)	1.67 (17)	2.25 (23)	2.74 (28)	3.43 (35)	4.12 (42)	4.51 (46)	5.68 (58)	6.76 (69)	8.04 (82)	9.02 (92)	10.9 (111)	13.0 (133)	15.7 (160)	19.6 (200)	19.6 (200)							
Applicable gear head: MY9G3B to MY9G200B (ball bearing / hinge attached)	60Hz	1.18 (12)	1.37 (14)	1.86 (19)	2.25 (23)	2.84 (29)	3.43 (35)	3.72 (38)	4.70 (48)	5.68 (58)	6.76 (69)	7.55 (77)	9.21 (94)	10.9 (111)	13.0 (133)	18.3 (187)	19.6 (200)							
Rotational direction		Same as motor rotational direction							Reverse to motor rotational direction						Same as motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head: Bearing	Decimal gear head	Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
		Speed (min^{-1})	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	MZ9G10XB	Permissible torque	N·m (kgf·cm)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

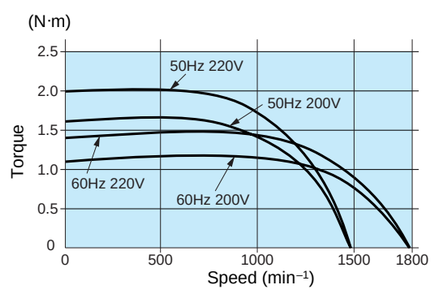
Connection diagram



Change any two lead wires of U, V and W for CW rotation.

Speed-torque characteristics

M9MZ90GK4Y



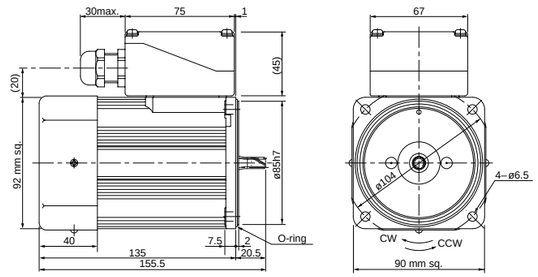
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/4, Unit: mm

M9MZ90GK4Y 4P 90 W 200 V / 220 V (with fan)

Mass	Helical gear	Module	Number of teeth
3.3 kg		0.6	9



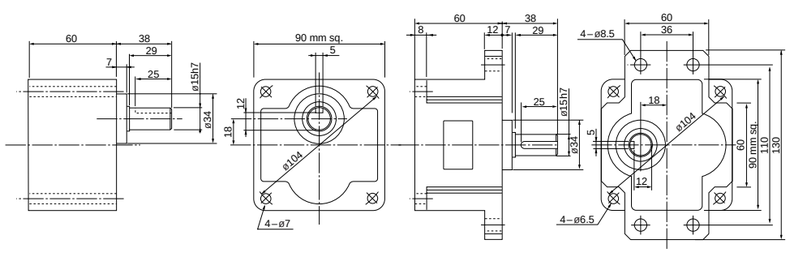
* Diameter of applicable cabtyre cable to be ø8 to ø12.

Gear head (dimensions)

Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg

MY9G□M (metal bearing / hinge attached) Mass 1.4 kg

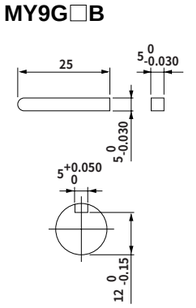


Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



3-phase motor (sealed connector)

90 mm sq. 90 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)
90 mm sq.	M9MZ90GK4YG M9MZ90GK4YGA	4	90	200	50	Cont.	142	0.62	1350	0.63 (6.4)	2.0	1.6 (16)
					60		138	0.56	1625	0.53 (5.4)	1.8	1.1 (11)
				220	60		137	0.56	1650	0.52 (5.3)	2.0	1.4 (14)
				230	60		137	0.58	1675	0.51 (5.2)	2.1	1.6 (16)
	M9MZ90GK4CG M9MZ90GK4CGA	4	90	380	50	Cont.	144	0.31	1325	0.65 (6.6)	1.0	1.4 (14)
				400	50		144	0.31	1350	0.64 (6.5)	1.0	1.6 (16)

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-165.
• The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

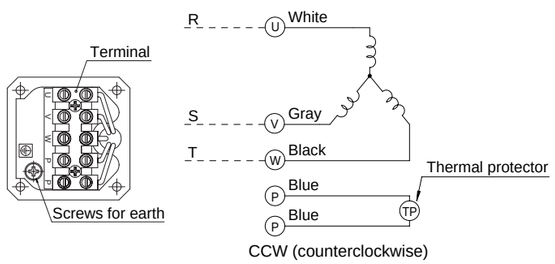
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head	MZ9G3B to MZ9G200B (ball bearing / hinge not attached)	50Hz	1.37 (14)	1.67 (17)	2.25 (23)	2.74 (28)	3.43 (35)	4.12 (42)	4.51 (46)	5.68 (58)	6.76 (69)	8.04 (82)	9.02 (92)	10.9 (111)	13.0 (133)	15.7 (160)	19.6 (200)	19.6 (200)							
	MY9G3B to MY9G200B (ball bearing / hinge attached)	60Hz	1.18 (12)	1.37 (14)	1.86 (19)	2.25 (23)	2.84 (29)	3.43 (35)	3.72 (38)	4.70 (48)	5.68 (58)	6.76 (69)	7.55 (77)	9.21 (94)	10.9 (111)	13.0 (133)	18.3 (187)	19.6 (200)							
Rotational direction			Same as motor rotational direction							Reverse to motor rotational direction						Same as motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	MZ9G10XB	Permissible torque	N·m	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
			(kgf·cm)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

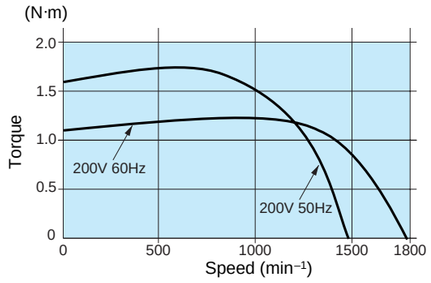
Connection diagram



CCW (counterclockwise)
Change any two lead wires of U, V and W for CW rotation.
(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

M9MZ90GK4YG(A)

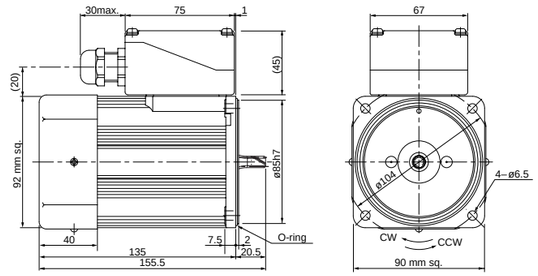


Motor (dimensions)

Scale: 1/4, Unit: mm

M9MZ90GK4YG(A) 4P 90 W 200 V / 220 V / 230 V (with fan)
M9MZ90GK4CG(A) 4P 90 W 380 V / 400 V (with fan)

Mass	Helical gear	Module	Number of teeth
3.3 kg		0.6	9

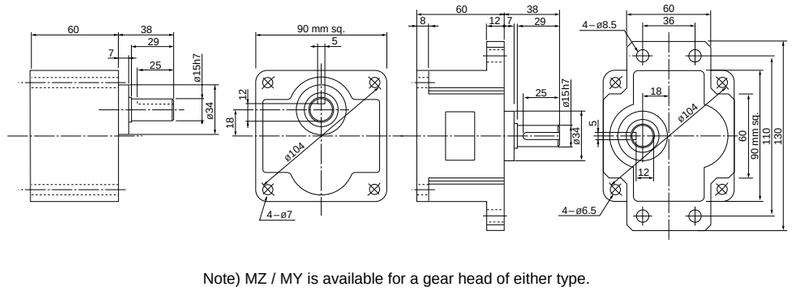


* Diameter of applicable cabtyre cable to be ø8 to ø12.

Gear head (dimensions)

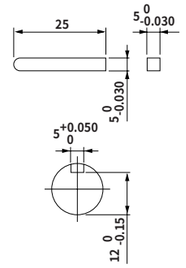
Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg
MY9G□M (metal bearing / hinge attached) Mass 1.4 kg



Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Note) MZ / MY is available for a gear head of either type.
(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

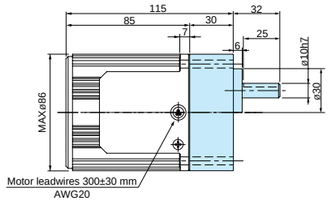
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

3-phase motor (leadwire)

Gear head combination dimensions
Scale: 1/4, Unit: mm

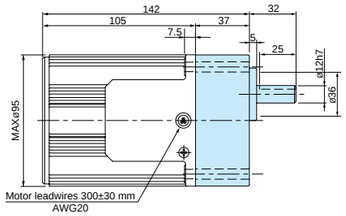
80 mm sq. 25 W

M8MX25G4Y + MX8G□B(M)
M8MX25G4YG(A) + MX8G□B(M)



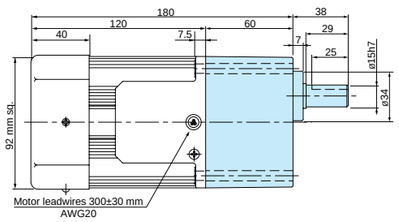
90 mm sq. 40 W

M9MX40G4Y + MX9G□B(M)
M9MX40G4YG(A) + MX9G□B(M)



90 mm sq. 60 W

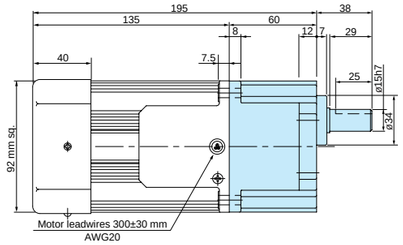
M9MZ60G4Y + MZ9G□B (MY9G□B)
M9MZ60G4YG(A) + MZ9G□B (MY9G□B)



＊Refer to page B-380 for high torque gear head.

90 mm sq. 90 W

M9MZ90G4Y + MY9G□B (MZ9G□B)
M9MZ90G4YG(A) + MY9G□B (MZ9G□B)



＊Refer to page B-380 for high torque gear head.

＊Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

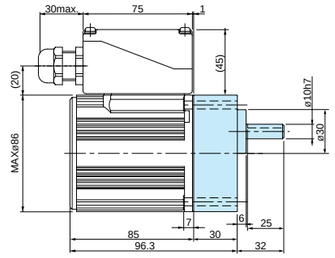
Features B-126 | System configuration B-127 | Coding system B-127 | Model list B-128

3-phase motor (sealed connector)

Gear head combination dimensions
Scale: 1/4, Unit: mm

80 mm sq. 25 W

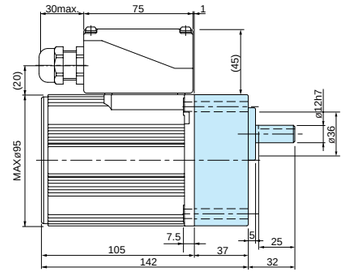
M8MX25GK4Y + MX8G□B(M)
M8MX25GK4YG(A) + MX8G□B(M)
M8MX25GK4CG(A) + MX8G□B(M)



＊Diameter of applicable cabtyre cable to be ø8 to ø12.

90 mm sq. 40 W

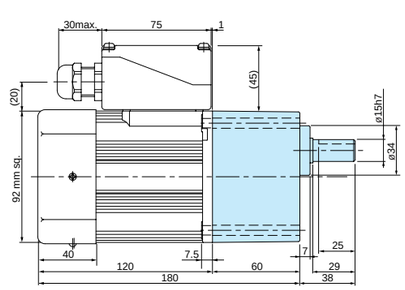
M9MX40GK4Y + MX9G□B(M)
M9MX40GK4YG(A) + MX9G□B(M)
M9MX40GK4CG(A) + MX9G□B(M)



＊Diameter of applicable cabtyre cable to be ø8 to ø12.

90 mm sq. 60 W

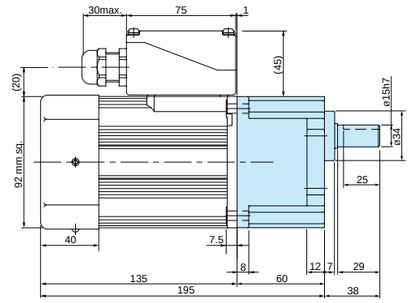
M9MZ60GK4Y + MZ9G□B (MY9G□B)
M9MZ60GK4YG(A) + MZ9G□B (MY9G□B)
M9MZ60GK4CG(A) + MZ9G□B (MY9G□B)



＊Diameter of applicable cabtyre cable to be ø8 to ø12.
＊Refer to page B-380 for high torque gear head.

90 mm sq. 90 W

M9MZ90GK4Y + MY9G□B (MZ9G□B)
M9MZ90GK4YG(A) + MY9G□B (MZ9G□B)
M9MZ90GK4CG(A) + MY9G□B (MZ9G□B)



＊Diameter of applicable cabtyre cable to be ø8 to ø12.
＊Refer to page B-380 for high torque gear head.

＊The models with a motor model number to which “A” is suffixed are not sold or available in Japan.
(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

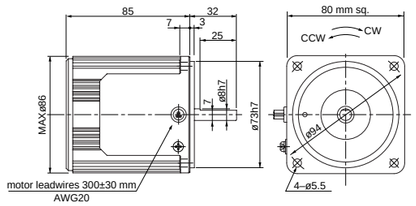
Specifications B-130 to B-161 | Control related product C-4 | Option D-2

3-phase motor (4-pole round shaft / leadwire)

Dimensions
Scale: 1/4, Unit: mm

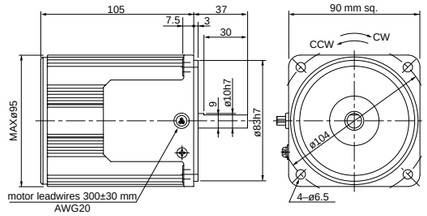
80 mm sq. 25 W — Mass 1.5 kg

M8MX25S4YS
M8MX25S4YG(A)



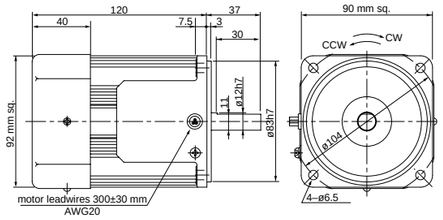
90 mm sq. 40 W — Mass 2.4 kg

M9MX40S4YS
M9MX40S4YG(A)



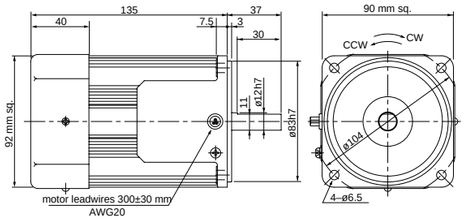
90 mm sq. 60 W — Mass 2.7 kg

M9MZ60S4YS (with fan)
M9MZ60S4YG(A) (with fan)



90 mm sq. 90 W — Mass 3.2 kg

M9MZ90S4YS (with fan)
M9MZ90S4YG(A) (with fan)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

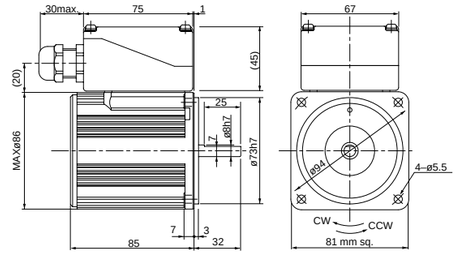
Features B-126 | System configuration B-127 | Coding system B-127 | Model list B-128

3-phase motor (4-pole round shaft / sealed connector)

Dimensions
Scale: 1/4, Unit: mm

80 mm sq. 25 W — Mass 1.8 kg

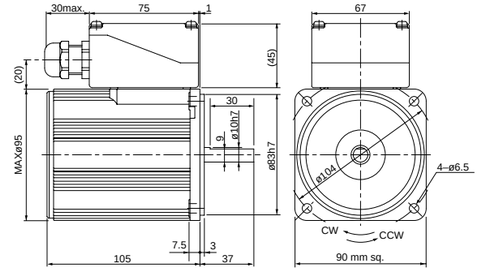
M8MX25SK4YS
M8MX25SK4YG(A)
M8MX25SK4CG(A)



* Diameter of applicable cabtyre cable to be ø8 to ø12.

90 mm sq. 40 W — Mass 2.8 kg

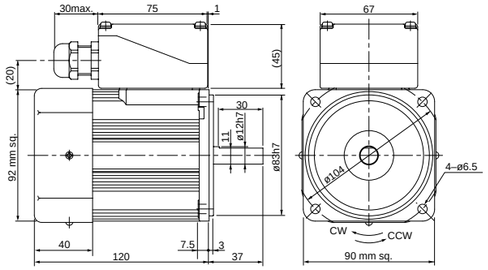
M9MX40SK4YS
M9MX40SK4YG(A)
M9MX40SK4CG(A)



* Diameter of applicable cabtyre cable to be ø8 to ø12.

90 mm sq. 60 W — Mass 3.0 kg

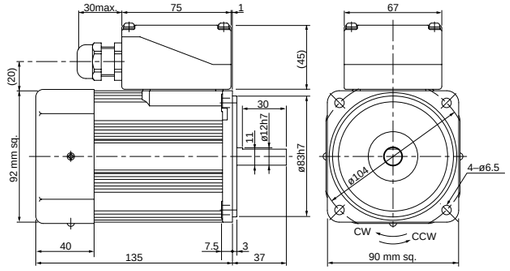
M9MZ60SK4YS (with fan)
M9MZ60SK4YG(A) (with fan)
M9MZ60SK4CG(A) (with fan)



* Diameter of applicable cabtyre cable to be ø8 to ø12.

90 mm sq. 90 W — Mass 3.3 kg

M9MZ90SK4YS (with fan)
M9MZ90SK4YG(A) (with fan)
M9MZ90SK4CG(A) (with fan)



* Diameter of applicable cabtyre cable to be ø8 to ø12.

200V/220V/230V round shaft motors with a sealed connector (with a terminal box) are covered by the Electrical Appliance and Material Safety Law. The indications on their nameplate are based on this law.

*The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Specifications B-130 to B-161 | Control related product C-4 | Option D-2

Electromagnetic brake motor

Contents

Outline of electromagnetic brake motor

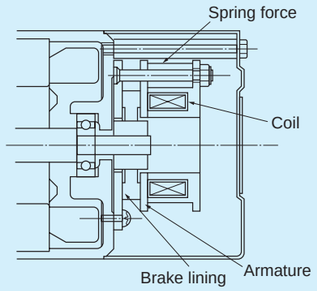
Features

- It is suitable for holding the load.
  Because the electromagnetic brake is off, when the power is turned off, it will be activated and hold the load securely.
- The brake can be used as an excellent safety brake.
  Among the examples are emergency braking at the time of power failure, load holding for a long period of time and the prevention of free-run of the machine.
- The brake will be activated instantly.
  The overrun is only 2 to 4 revolutions when the motor is used alone.
- A quick-reversal run can be frequently.
  Up to 6 cycles of start/stop can be performed through simple switching. (Secure 3 seconds or longer for a pause.)
  If it is necessary that the frequency of reversal operation is 7 to 100 cycles per minute, use the C&B motor. (For running in one direction only)
- Common power for both motor and brake can be used.
  Because the electromagnetic brake section contains a rectifier circuit, it can use the same AC power supply as the motor.

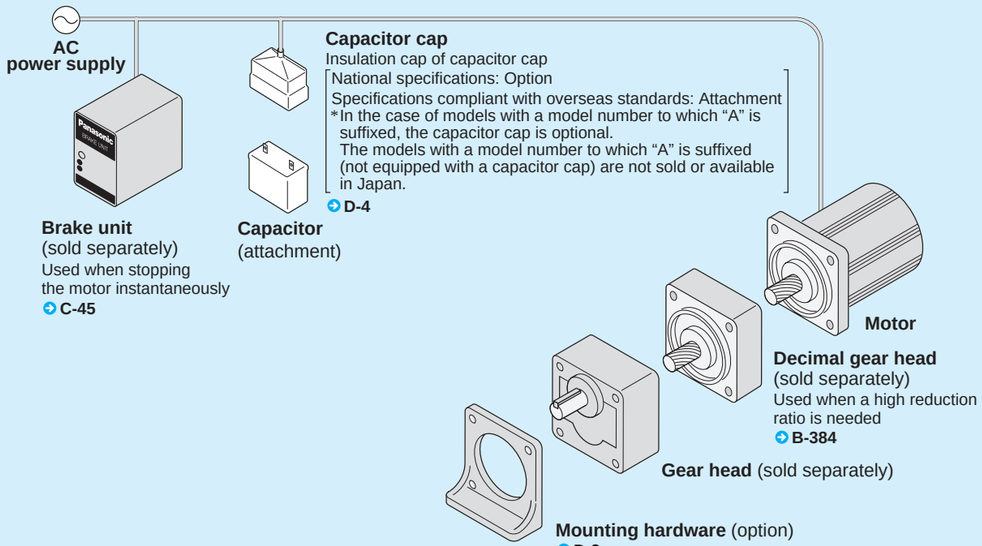
Principle of Operation

The construction of the electromagnetic brake motor is shown below. The electromagnetic brake is off.
When voltage is applied to the coil, the armature is retracted to the spring. This creates an air gap between the armature and brake lining. The motor shaft is then released from braking to run freely. When the voltage to the coil is shut off (the power is turned off), the armature is pressed against the brake lining by the spring force to stop the motor shaft.

Construction



System configuration diagram



Coding system

M 9 R X 40 G B 4 L S A

- **9** Size
  - 6 : 60 mm sq.
  - 7 : 70 mm sq.
  - 8 : 80 mm sq.
  - 9 : 90 mm sq.
- **R** Motor type
  - R : Reversible motor
  - M : 3-phase motor
- **X** Output type
  - X : 40 W or smaller
  - Z : 60 W or larger
- **40** Output
  - 6 : 6W
  - 15 : 15W
  - 25 : 25W
  - 40 : 40W
  - 60 : 60W
  - 90 : 90W
- **G** Shape of shaft
  - G : Pinion shaft
  - S : Round shaft
- **B** Option
  - B : Electromagnetic brake
- **4** No. of poles
  - 4 : 4 poles
- **L** Voltage
  - L : 100V
  - Y : Reversible motor, 3-phase motor
    - National specifications: 200/220 V
    - Specifications compliant with overseas standards: 200/220/230 V
  - D : 110/115V
  - G : 220/230V
- **S** Classification
  - G : Specifications compliant with overseas standards
  - S : Round shaft (S for round shaft with national specifications only)
- **A**
  - Motor with specifications compliant with overseas standards that is not equipped with a capacitor cap.

Corresponding model number	Shape of shaft	Classification
Specifications compliant with overseas standards Pinion shaft	G	G
Specifications compliant with overseas standards Round shaft	S	G
National specifications Pinion shaft	G	–
National specifications Round shaft	S	S
42 mm sq. round shaft specifications	S	–

Outline of electromagnetic brake motor

Various characteristics of electromagnetic brake motor

The characteristics of the electromagnetic motor include responses regarding a start time, stop time, overrun, etc. And these are all affected by the load inertia.

The characteristics of the electromagnetic motor depend on the following three elements.

1) Average acceleration torque of the motor
2) Average value of brake torque
3) Load torque and inertia

When these elements are identified, the start time and stop time will be determined. It is necessary to give sufficient attention to the load inertia in particular because it varies depending on the equipment used together with the motor. These various characteristics are shown below.

• Characteristic table [The brake response characteristics shown below are those obtained when the motor is used alone (load inertia=0).]

Number of phases	Size	Output (W)	Rotor inertia		Brake torque		Frequency (Hz)	Start time (s)	Stop time (s)	Overrun (revolutions)
			J(kg·cm²)	GD²(kgf·cm²)	N·m	(kgf·cm)				
Single-phase	60 mm sq.	6	0.201	0.805	0.049	(0.5)	50	0.07	0.08	1.5
							60	0.09	0.09	1.6
	70 mm sq.	15	0.329	1.316	0.078	(0.8)	50	0.07	0.05	1.5
							60	0.085	0.07	1.5
	80 mm sq.	25	0.603	2.411	0.10	(1.0)	50	0.05	0.13	2.2
							60	0.06	0.14	2.3
	90 mm sq.	40	1.362	5.446	0.20	(2.0)	50	0.065	0.14	3.0
							60	0.08	0.15	3.5
		60	1.862	7.447	0.39	(4.0)	50	0.055	0.11	2.5
							60	0.065	0.12	2.9
		90	2.353	9.413	0.39	(4.0)	50	0.07	0.13	2.8
							60	0.075	0.14	3.2
3-phase	80 mm sq.	25	0.603	2.411	0.10	(1.0)	50	0.05	0.13	2.2
							60	0.06	0.14	2.3
	90 mm sq.	40	1.362	5.446	0.20	(2.0)	50	0.05	0.15	3.5
							60	0.06	0.16	4.0
		60	1.862	7.447	0.39	(4.0)	50	0.06	0.12	3.0
							60	0.065	0.13	3.4
		90	2.286	9.143	0.39	(4.0)	50	0.06	0.14	3.3
							60	0.065	0.15	3.7

• Inertia

To describe the moment of inertia when handling motors, **J** and **GD²** are used. **J** is generally called Inertia and has the same value as the physical moment of inertia in SI Units. The unit is in [**kfg·m²**].

GD² is called “Flywheel Effect” and generally used in industrial applications with gravitational systems of units. The unit is in [**kfg·m²**] or [**kfg·cm²**]. The relation between **J** and **GD²** is described as follows:

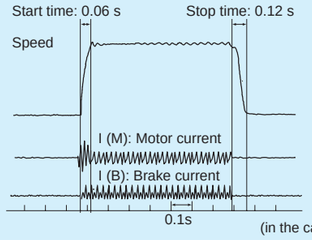
$$J = GD^2 / 4$$

In this catalog, we both use **J** for SI units and **GD²** for gravitational system of units. Unit of **J** should be [**kfg·m²**] in dynamical significance, however, [**kfg·cm²**] is used for convenience. Refer to the attached table (page A-48) for calculation of **J** and **GD²** depending on the shape of the load.

Response of electromagnetic brake motor

The following figure shows the start time, stop time and speed variation of the electromagnetic brake motor.

Electromagnetic brake motor (M8RX25GB4L) (no load)



(in the case of simultaneous switching)

(1) Start time

You can obtain the start time (**ts**) of the motor from the following formula.

• SI units

$$ts = \frac{J_M + J_L}{9.55 \times 10^4} \times \frac{n}{T_A - T_L}$$

ts : Start time (**s**)
TA : Average acceleration torque (**N·m**)
TL : Load torque (**N·m**)
JM : Motor inertia (**kg·cm²**)
JL : Load inertia (**kg·cm²**)
n : Motor speed (**min⁻¹**)

• Gravitational system of units

$$ts = \frac{GD^2_M + GD^2_L}{37500} \times \frac{n}{T_A - T_L}$$

ts : Start time (**s**)
TA : Average acceleration torque (**kgf·cm**)
TL : Load torque (**kgf·cm**)
GD²M : Rotor GD² (**kgf·cm²**)
GD²L : Load GD² (**kgf·cm²**)
n : Motor speed (**min⁻¹**)

• Average acceleration torque of electromagnetic brake motor

Number of phases	Size	Output (W)	Rotor inertia		Average acceleration torque			Permissible load inertia	
			J(kg·cm²)	GD²(kgf·cm²)		(N·m)	(kgf·cm)	J(kg·cm²)	GD²(kgf·cm²)
Single-phase Reversible	60 mm sq.	6	0.201	0.805	50Hz 60Hz	0.0637 0.0647	0.65 0.66	0.080	0.32
	70 mm sq.	15	0.329	1.316	50Hz 60Hz	0.120 0.114	1.22 1.16	0.158	0.63
	80 mm sq.	25	0.603	2.411	50Hz 60Hz	0.235 0.222	2.40 2.27	0.178	0.71
	90 mm sq.	40	1.362	5.446	50Hz 60Hz	0.439 0.420	4.48 4.29	0.735	2.94
		60	1.862	7.447	50Hz 60Hz	0.639 0.615	6.52 6.28	0.875	3.50
		90	2.353	9.413	50Hz 60Hz	0.859 0.804	8.77 8.20	1	4.0
3-phase	80 mm sq.	25	0.603	2.411	50Hz 60Hz	0.388 0.306	3.96 3.12	0.178	0.71
	90 mm sq.	40	1.362	5.446	50Hz 60Hz	0.667 0.513	6.81 5.23	0.735	2.94
		60	1.862	7.447	50Hz 60Hz	1.031 0.767	10.52 7.83	0.875	3.50
		90	2.286	9.143	50Hz 60Hz	1.429 1.065	14.58 10.87	1	4.0

Outline of electromagnetic brake motor

(2) Stop time

The brake of the electromagnetic brake motor is activated when the power is turned off. However there exists some delay time between power-off and brake activation due to the mechanism of the brake. You can obtain the stop time of the electromagnetic brake motor from the following formula.

• SI units

$$Tb = Ta + Tb_1$$

$$Tb_1 = \frac{J_M + J_L}{9.55 \times 10^4} \times \frac{n}{Tb_B}$$

Tb : Stop time of electromagnetic brake motor (s)
Ta : Absorbing time of armature :
Separate switching About 0.02 sec
Simultaneous switching About 0.1 sec
Tb1 : Braking time (s)
TbB : Brake torque of electromagnetic brake motor (N·m)

• Gravitational system of units

$$Tb = Ta + Tb_1$$

$$Tb_1 = \frac{GD^2_M + GD^2_L}{37500} \times \frac{n}{Tb_B}$$

Tb : Stop time of electromagnetic brake motor (s)
Ta : Absorbing time of armature :
Separate switching About 0.02 sec
Simultaneous switching About 0.1 sec
Tb1 : Braking time (s)
TbB : Brake torque of electromagnetic brake motor (N·m)

(3) Stop time and overrun

An overrun is defined as a revolution which the motor makes when the stop signal is inputted. You can obtain the overrun of the electromagnetic brake motor from the following formula, considering the absorbing time of the

$$nbB = a + \frac{n}{120} \times tb1 \quad \text{.....(5)}$$

where
nbB : Overrun of electromagnetic brake motor (revolution)
a : Constant due to delay
Separate switching: 0.43 (50 Hz), 0.53 (60 Hz)
Simultaneous switching: 2.15 (50 Hz), 2.65 (60 Hz)

(4) Overrun of gear head output shaft

The overrun of the gear head output shaft is obtained by dividing the overrun of the electromagnetic brake motor by the gear reduction ratio.

• Overrun in revolution $nGbB = nbB \times \frac{1}{i}$

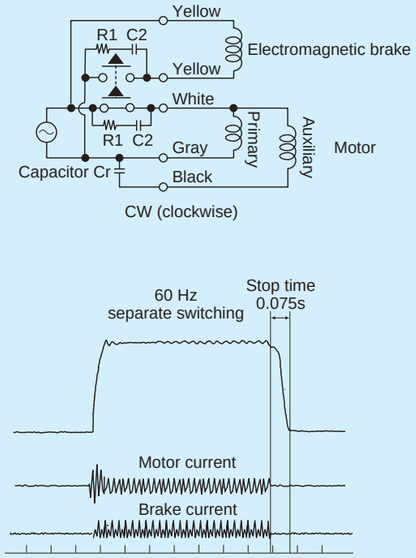
• Overrun in angle $\theta GbB = 360 nGbB$

where
nGbB :Overrun of gear head output shaft (revolution)
θGbB : Overrun of gear head output shaft (degree)
nbB : Overrun of electromagnetic brake motor (revolution)

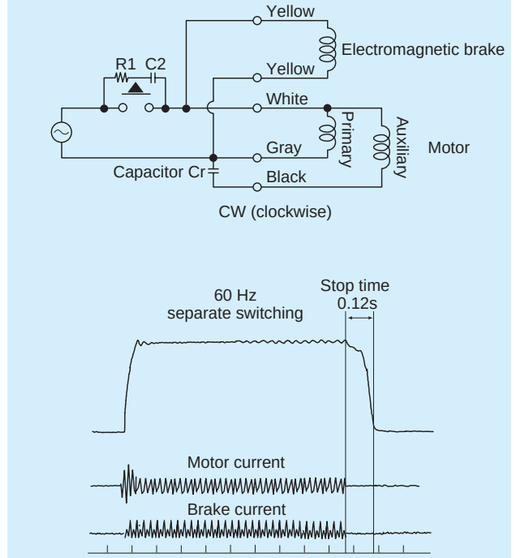
Separate switching and simultaneous switching

In the case of the electromagnetic brake motor, the stop time varies depending on the position where the switch is connected.
In the case of a simultaneous switching circuit, because the motor coil and brake coil are in a closed loop, the release time of the armature is made longer due to the effect of the residual magnetic flux to the coil, resulting in a longer stop time.
When a shorter stop time is required, use a separate switching circuit.

• Separate switching circuit



• Simultaneous switching circuit



Life expectancy

The life expectancy of the brake of the electromagnetic brake motor is one million cycles at the permissible inertia load.
The permissible inertia load of the electromagnetic brake motor is shown on page A-50, which should not be exceeded.

Model list of electromagnetic brake motor

Pinion shaft motor

Applicable gear head

✪ Motor compliant with overseas standards

Hinge attached

Size	Output (W)	single-phase motor, leadwire type				3-phase motor, leadwire type				Standard gear head		High torque gear head	Right-angle gear head	Decimal gear head
		Model number	Specifications		Page	Model number	Specifications		Page	Ball bearing	metal bearing			
60 mm sq.	4									MX6G□BA MX6G□B	MX6G□MA MX6G□M	–	–	MX6G10XB
	6	M6RX6GB4L	100V		B-178									
		M6RX6GB4Y	200V		B-178									
		M6RX6GB4LG(A)	100V	✪	B-180									
		M6RX6GB4DG(A)	110/115V	✪	B-180									
		M6RX6GB4YG(A)	200V	✪	B-180									
		M6RX6GB4GG(A)	220/230V	✪	B-180									
70 mm sq.	10									MX7G□BA MX7G□B	MX7G□MA MX7G□M	–	–	MX7G10XB
	15	M7RX15GB4L	100V		B-182									
		M7RX15GB4Y	200V		B-182									
		M7RX15GB4LG(A)	100V	✪	B-184									
		M7RX15GB4DG(A)	110/115V	✪	B-184									
		M7RX15GB4YG(A)	200V	✪	B-184									
		M7RX15GB4GG(A)	220/230V	✪	B-184									
80 mm sq.	20									MX8G□B	MX8G□M	–	–	MX8G10XB
	25	M8RX25GB4L	100V		B-186									
		M8RX25GB4Y	200V		B-186	M8MX25GB4Y	200V		B-202					
		M8RX25GB4LG(A)	100V	✪	B-188									
		M8RX25GB4DG(A)	110/115V	✪	B-188									
		M8RX25GB4YG(A)	200V	✪	B-188	M8MX25GB4YG(A)	200/220/230V	✪	B-204					
		M8RX25GB4GG(A)	220/230V	✪	B-188									
90 mm sq.	40	M9RX40GB4L	100V		B-190					MX9G□B	MX9G□M	–	MX9G□R	MX9G10XB
		M9RX40GB4Y	200V		B-190	M9MX40GB4Y	200V		B-206					
		M9RX40GB4LG(A)	100V	✪	B-192									
		M9RX40GB4DG(A)	110/115V	✪	B-192									
		M9RX40GB4YG(A)	200V	✪	B-192	M9MX40GB4YG(A)	200/220/230V	✪	B-208					
		M9RX40GB4GG(A)	220/230V	✪	B-192									
	60	M9RZ60GB4L	100V		B-194					MZ9G□B	–	MR9G□B	MZ9G□R	MZ9G10XB
		M9RZ60GB4Y	200V		B-194	M9MZ60GB4Y	200V		B-210					
		M9RZ60GB4LG(A)	100V	✪	B-196									
		M9RZ60GB4DG(A)	110/115V	✪	B-196									
		M9RZ60GB4YG(A)	200V	✪	B-196	M9MZ60GB4YG(A)	200/220/230V	✪	B-212					
		M9RZ60GB4GG(A)	220/230V	✪	B-196									
	90	M9RZ90GB4L	100V		B-198					MY9G□B		MP9G□B		
		M9RZ90GB4Y	200V		B-198	M9MZ90GB4Y	200V		B-214					
		M9RZ90GB4LG(A)	100V	✪	B-200									
		M9RZ90GB4DG(A)	110/115V	✪	B-200									
		M9RZ90GB4YG(A)	200V	✪	B-200	M9MZ90GB4YG(A)	200/220/230V	✪	B-216					
		M9RZ90GB4GG(A)	220/230V	✪	B-200									

* The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

* Refer to page B-380 for dimensions and permissible torque of high torque gear head.
Refer to page B-382 for dimensions and permissible torque of right-angle gear head.
Refer to page B-384 for dimensions of decimal gear head.

Model list of electromagnetic brake motor

Round shaft motor

✪ Motor compliant with overseas standards c UL us CE CCC
PS Electrical Appliance and Material Safety Law

Size	Output (W)	single-phase motor, leadwire type		3-phase motor, leadwire type	
		Model number	Specifications	Model number	Specifications
60 mm sq.	4				
	6	**M6RX6SB4LS**	100V		
		M6RX6SB4YS	200V		
		M6RX6SB4LG(A)	100V ✪		
		M6RX6SB4DG(A)	110/115V ✪		
		M6RX6SB4YG(A)	200V ✪		
		M6RX6SB4GG(A)	220/230V ✪		
70 mm sq.	10				
	15	**M7RX15SB4LS**	100V		
		M7RX15SB4YS	200V		
		M7RX15SB4LG(A)	100V ✪		
		M7RX15SB4DG(A)	110/115V ✪		
		M7RX15SB4YG(A)	200V ✪		
		M7RX15SB4GG(A)	220/230V ✪		
80 mm sq.	20				
	25	**M8RX25SB4LS**	100V		
		M8RX25SB4YS	200V	**M8MX25SB4YS**	200V
		M8RX25SB4LG(A)	100V ✪		
		M8RX25SB4DG(A)	110/115V ✪		
		M8RX25SB4YG(A)	200V ✪	**M8MX25SB4YG(A)**	200/220/230V ✪
		M8RX25SB4GG(A)	220/230V ✪		
90 mm sq.	40	**M9RX40SB4LS**	100V		
		M9RX40SB4YS	200V	**M9MX40SB4YS**	200V
		M9RX40SB4LG(A)	100V ✪		
		M9RX40SB4DG(A)	110/115V ✪		
		M9RX40SB4YG(A)	200V ✪	**M9MX40SB4YG(A)**	200/220/230V ✪
		M9RX40SB4GG(A)	220/230V ✪		
	60	**M9RZ60SB4LS**	100V		
		M9RZ60SB4YS	200V	**M9MZ60SB4YS**	200V
		M9RZ60SB4LG(A)	100V ✪		
		M9RZ60SB4DG(A)	110/115V ✪		
		M9RZ60SB4YG(A)	200V ✪	**M9MZ60SB4YG(A)**	200/220/230V ✪
		M9RZ60SB4GG(A)	220/230V ✪		
	90	**M9RZ90SB4LS**	100V		
		M9RZ90SB4YS	200V	**M9MZ90SB4YS**	200V
		M9RZ90SB4LG(A)	100V ✪		
		M9RZ90SB4DG(A)	110/115V ✪		
		M9RZ90SB4YG(A)	200V ✪	**M9MZ90SB4YG(A)**	200/220/230V ✪
		M9RZ90SB4GG(A)	220/230V ✪		

* The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft motor.
Dimensional outline drawing → Page B-220.
* The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

Electromagnetic brake single-phase motor (leadwire)

60 mm sq. 6 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Brake Input (W)	Brake Current (A)	Brake Friction Torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
60 mm sq.	M6RX6GB4L	4	6	100	50	30	22	0.22	1300	0.044 (0.45)	0.32	0.056 (0.57)	4	0.04	0.049 (0.5)	3.5 (200V)
					60		22	0.22	1600	0.035 (0.36)	0.32	0.056 (0.57)	4	0.04	0.049 (0.5)	
	M6RX6GB4Y	4	6	200	50	30	25	0.13	1300	0.044 (0.45)	0.17	0.056 (0.57)	4	0.02	0.049 (0.5)	0.9 (400V)
					60		25	0.13	1600	0.035 (0.36)	0.18	0.056 (0.57)	4	0.02	0.049 (0.5)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-220.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

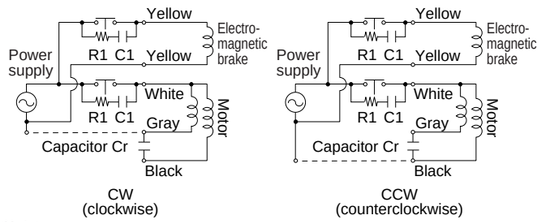
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX6G3BA to MX6G180B (ball bearing)	50Hz	0.098 (1.0)	0.12 (1.2)	0.16 (1.6)	0.19 (1.9)	0.25 (2.6)	0.29 (3.0)	0.33 (3.4)	0.40 (4.1)	0.49 (5.0)	0.59 (6.0)	0.66 (6.7)	0.79 (8.1)	0.95 (9.7)	1.18 (12)	1.57 (16)	1.86 (19)	2.25 (23)	2.45 (25)	2.45 (25)			
	MX6G3MA to MX6G180M (metal bearing)	60Hz	0.081 (0.83)	0.098 (1.0)	0.13 (1.3)	0.16 (1.6)	0.21 (2.1)	0.25 (2.6)	0.26 (2.7)	0.33 (3.4)	0.40 (4.1)	0.49 (5.0)	0.53 (5.4)	0.66 (6.7)	0.79 (8.1)	0.95 (9.7)	1.27 (13)	1.57 (16)	1.86 (19)	2.25 (23)	2.45 (25)			
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX6G□BA (ball bearing) MX6G□B (ball bearing) MX6G□MA (metal bearing) MX6G□M (metal bearing)	MX6G10XB	Permissible torque	N·m (kgf·cm)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)
		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

Connection diagram

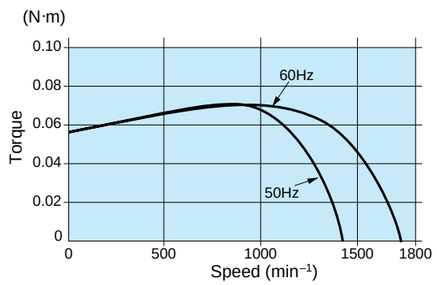


<Note>

1. Brake will be activated and held when electromagnetic brake power is turned OFF.
2. Protect the contacts by inserting the spark-killer circuit (R1+C1) between the contacts. R1+C1 is provided as an option (DV0P008, refer to page D-3).

Speed-torque characteristics

M6RX6GB4L



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

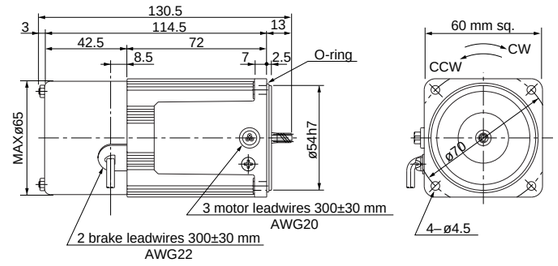
Features B-168 | System configuration B-169 | Coding system B-169 | Model list B-174

Motor (dimensions)

Scale: 1/3, Unit: mm

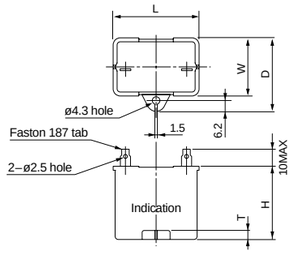
M6RX6GB4L 4P 6 W 100 V
M6RX6GB4Y 4P 6 W 200 V

Mass	Helical	Module	Number of teeth
0.85 kg	gear	0.5	6



Capacitor (dimensions) [attachment]

Unit: mm



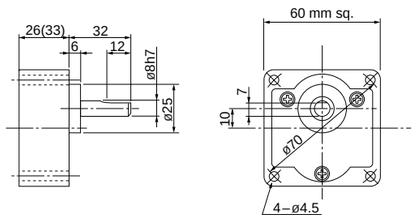
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M6RX6GB4L	M0PC3.5M20	39.5	16	26.5	30.5	4	M0PC3917
M6RX6GB4Y	M0PC0.9M40	39.5	16.2	27	27	4	M0PC3917

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX6G□BA (ball bearing) / **MX6G□B** (ball bearing) Mass 0.24/0.3 kg: Output shaft D cut
MX6G□MA (metal bearing) / **MX6G□M** (metal bearing) Mass 0.24/0.3 kg: Output shaft D cut



* Figures in ( ) represent the dimensions of MX6G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX6G□BA (MA).)

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-218 | Round shaft motor dimensions B-220 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Electromagnetic brake single-phase motor (leadwire)

60 mm sq. 6 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Brake Input (W)	Brake Current (A)	Brake Friction Torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
60 mm sq.	M6RX6GB4LG M6RX6GB4LGA	4	6	100	50	30	24	0.24	1300	0.044 (0.45)	0.34	0.063 (0.64)	4	0.04	0.049 (0.50)	4 (250V)
					60		26	0.26	1625	0.035 (0.36)	0.35	0.063 (0.64)	4	0.04	0.049 (0.50)	
	M6RX6GB4DG M6RX6GB4DGA	4	6	110 115	60 60	30	24 26	0.22 0.23	1625 1625	0.035 (0.36) 0.035 (0.36)	0.34 0.36	0.057 (0.58) 0.063 (0.64)	4 4	0.05 0.05	0.049 (0.50) 0.049 (0.50)	3 (250V)
	M6RX6GB4YG M6RX6GB4YGA	4	6	200	50	30	24	0.12	1275	0.045 (0.46)	0.15	0.063 (0.64)	4	0.02	0.049 (0.50)	1 (450V)
					60		28	0.14	1550	0.037 (0.38)	0.16	0.063 (0.64)	4	0.02	0.049 (0.50)	
	M6RX6GB4GG M6RX6GB4GGA	4	6	220	50	30	24	0.11	1275	0.045 (0.46)	0.15	0.063 (0.64)	4	0.02	0.049 (0.50)	0.8 (450V)
					60		26	0.12	1600	0.036 (0.37)	0.16	0.063 (0.64)	4	0.02	0.049 (0.50)	
				230	50		26	0.12	1300	0.044 (0.45)	0.16	0.069 (0.70)	4	0.02	0.049 (0.50)	
					60		28	0.12	1625	0.035 (0.36)	0.16	0.069 (0.70)	4	0.02	0.049 (0.50)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-220.
• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

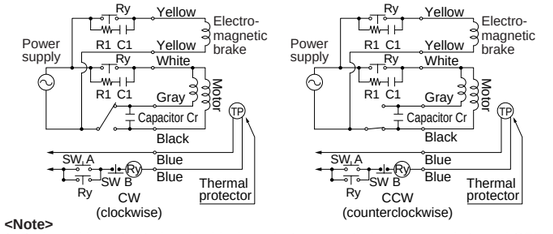
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX6G3BA to MX6G180B (ball bearing)	50Hz	0.098 (1.0)	0.12 (1.2)	0.16 (1.6)	0.19 (1.9)	0.25 (2.6)	0.29 (3.0)	0.33 (3.4)	0.40 (4.1)	0.49 (5.0)	0.59 (6.0)	0.66 (6.7)	0.79 (8.1)	0.95 (9.7)	1.18 (12)	1.57 (16)	1.86 (19)	2.25 (23)	2.45 (25)	2.45 (25)			
	MX6G3MA to MX6G180M (metal bearing)	60Hz	0.081 (0.83)	0.098 (1.0)	0.13 (1.3)	0.16 (1.6)	0.21 (2.1)	0.25 (2.6)	0.26 (2.7)	0.33 (3.4)	0.40 (4.1)	0.49 (5.0)	0.53 (5.4)	0.66 (6.7)	0.79 (8.1)	0.95 (9.7)	1.27 (13)	1.57 (16)	1.86 (19)	2.25 (23)	2.45 (25)			
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX6G□BA (ball bearing) MX6G□B MX6G□MA (metal bearing) MX6G□M	MX6G10XB	Permissible torque	N·m	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45
			(kgf·cm)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)
		Rotational direction		Same as motor rotational direction		Reverse to motor rotational direction									

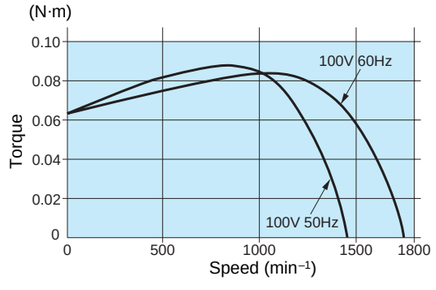
Connection diagram



<Note>
1. Brake will be activated and held when electromagnetic brake power is turned OFF.
2. Protect the contacts by inserting the spark-killer circuit (R1+C1) between the contacts. R1+C1 is provided as an option (DV0P008, refer to page D-3).
3. Refer to page A-58 for connection of thermal protector.

Speed-torque characteristics

M6RX6GB4LG(A)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

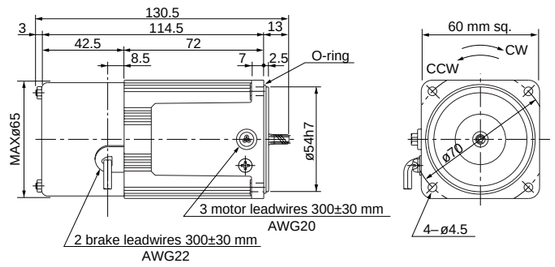
Features B-168 | System configuration B-169 | Coding system B-169 | Model list B-174

Motor (dimensions)

Scale: 1/3, Unit: mm

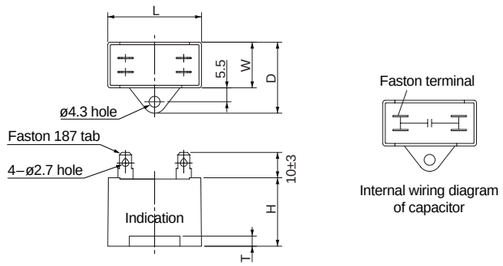
M6RX6GB4LG(A) 4P 6 W 100 V
M6RX6GB4DG(A) 4P 6 W 110 V / 115 V
M6RX6GB4YG(A) 4P 6 W 200 V
M6RX6GB4GG(A) 4P 6 W 220 V / 230 V

Mass	Helical	Module	Number of teeth
0.85 kg	gear	0.5	6



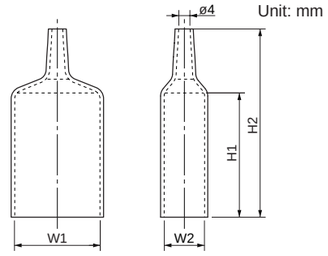
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

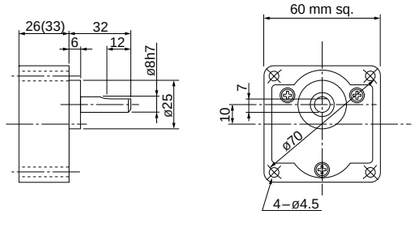
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M6RX6GB4LG(A)	M0PC4M25G	37	18	28	27	4	M0PC3718G	37	18	50	73
M6RX6GB4DG(A)	M0PC3M25G	31	17	27	27	4	M0PC3117G	31	17	50	73
M6RX6GB4YG(A)	M0PC1M45G	37	18	28	27	4	M0PC3718G	37	18	50	73
M6RX6GB4GG(A)	M0PC0.8M45G	31	17	27	27	4	M0PC3117G	31	17	50	73

• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX6G□BA (ball bearing) / **MX6G□B** (ball bearing) Mass 0.24/0.3 kg: Output shaft D cut
MX6G□MA (metal bearing) / **MX6G□M** (metal bearing) Mass 0.24/0.3 kg: Output shaft D cut



* Figures in ( ) represent the dimensions of MX6G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX6G□BA (MA).)
(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-218 | Round shaft motor dimensions B-220 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Electromagnetic brake single-phase motor (leadwire)

70 mm sq. 15 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Brake Input (W)	Brake Current (A)	Brake Friction Torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
70 mm sq.	M7RX15GB4L	4	15	100	50	30	36	0.36	1300	0.110 (1.10)	0.59	0.10 (1.0)	4	0.05	0.078 (0.80)	6 (200V)
					60		38	0.38	1600	0.088 (0.90)	0.57	0.10 (1.0)	4	0.05	0.078 (0.80)	
	M7RX15GB4Y	4	15	200	50	30	38	0.18	1300	0.110 (1.10)	0.28	0.10 (1.0)	4	0.03	0.078 (0.80)	1.5 (400V)
					60		39	0.19	1600	0.088 (0.90)	0.28	0.10 (1.0)	4	0.03	0.078 (0.80)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-220.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

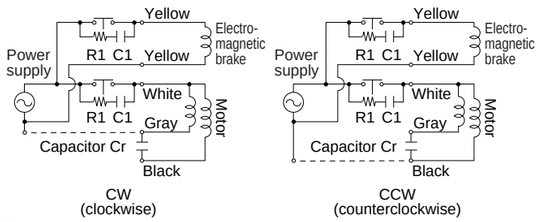
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX7G3BA to MX7G180B (ball bearing)	50Hz	0.24 (2.5)	0.28 (2.9)	0.39 (4.0)	0.47 (4.8)	0.59 (6.0)	0.71 (7.2)	0.80 (8.2)	0.98 (10)	1.18 (12)	1.37 (14)	1.57 (16)	1.86 (19)	2.25 (23)	2.74 (28)	3.82 (39)	4.61 (47)	4.90 (50)	4.90 (50)					
	MX7G3MA to MX7G180M (metal bearing)	60Hz	0.20 (2.0)	0.24 (2.5)	0.32 (3.3)	0.39 (4.0)	0.49 (5.0)	0.59 (6.0)	0.66 (6.7)	0.81 (8.3)	0.98 (10)	1.18 (12)	1.27 (13)	1.57 (16)	1.86 (19)	2.25 (23)	3.23 (33)	3.82 (39)	4.80 (49)	4.90 (50)					
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX7G□BA (ball bearing) MX7G□B (ball bearing) MX7G□MA (metal bearing) MX7G□M (metal bearing)	MX7G10XB	Permissible torque	N·m	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90
			(kgf·cm)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)
		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

Connection diagram

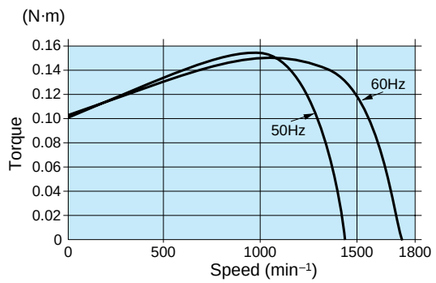


<Note>

1. Brake will be activated and held when electromagnetic brake power is turned OFF.
2. Protect the contacts by inserting the spark-killer circuit (R1+C1) between the contacts. R1+C1 is provided as an option (DV0P008, refer to page D-3).

Speed-torque characteristics

M7RX15GB4L



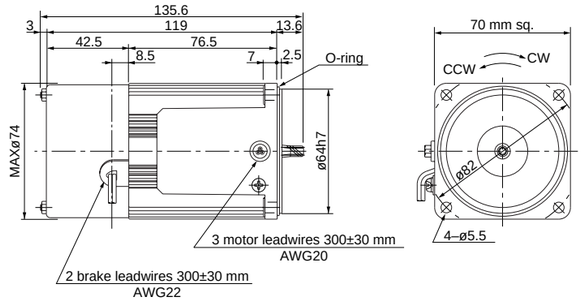
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

M7RX15GB4L 4P 15 W 100 V
M7RX15GB4Y 4P 15 W 200 V

Mass	Helical	Module	Number of teeth
1.1 kg	gear	0.5	7



Capacitor (dimensions) [attachment]

Unit: mm

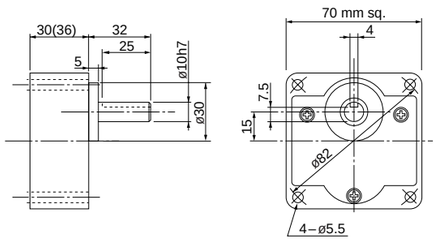
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M7RX15GB4L	M0PC6M20	39.5	17.5	28	30.5	4	M0PC3917
M7RX15GB4Y	M0PC1.5M40	39.5	22	32.5	32.5	4	M0PC3922

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX7G□BA (ball bearing) / **MX7G□B** (ball bearing) Mass 0.38/0.45 kg
MX7G□MA (metal bearing) / **MX7G□M** (metal bearing) Mass 0.38/0.45 kg

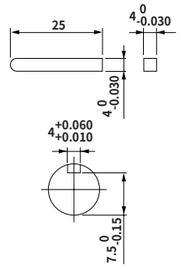


* Figures in ( ) represent the dimensions of MX7G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX7G□BA (MA).)

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MX7G□BA(B)
MX7G□MA(M)



Electromagnetic brake single-phase motor (leadwire)

70 mm sq. 15 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Brake Input (W)	Brake Current (A)	Brake Friction Torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
70 mm sq.	M7RX15GB4LG	4	15	100	50	30	36	0.36	1300	0.11 (1.1)	0.60	0.11 (1.1)	5	0.06	0.078 (0.80)	6.5 (250V)
	M7RX15GB4LGA				60		41	0.42	1600	0.090 (0.91)	0.59	0.11 (1.1)	5	0.06	0.078 (0.80)	
	M7RX15GB4DG	4	15	110	60	30	39	0.36	1625	0.088 (0.90)	0.61	0.11 (1.1)	6	0.06	0.078 (0.80)	5.5 (250V)
	M7RX15GB4DGA			115	60		42	0.36	1650	0.087 (0.89)	0.64	0.12 (1.2)	6	0.06	0.078 (0.80)	
	M7RX15GB4YG	4	15	200	50	30	38	0.19	1275	0.11 (1.1)	0.27	0.11 (1.1)	5	0.03	0.078 (0.80)	1.7 (450V)
	M7RX15GB4YGA				60		48	0.25	1550	0.092 (0.94)	0.29	0.11 (1.1)	5	0.03	0.078 (0.80)	
	M7RX15GB4GG	4	15	220	50	30	36	0.17	1275	0.11 (1.1)	0.27	0.10 (1.0)	6	0.03	0.078 (0.80)	1.3 (450V)
	M7RX15GB4GGA				60		39	0.18	1600	0.090 (0.91)	0.27	0.10 (1.0)	6	0.03	0.078 (0.80)	
				230	50		38	0.17	1300	0.11 (1.1)	0.28	0.11 (1.1)	6	0.03	0.078 (0.80)	
					60		41	0.18	1625	0.088 (0.90)	0.28	0.11 (1.1)	6	0.03	0.078 (0.80)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-220.
• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

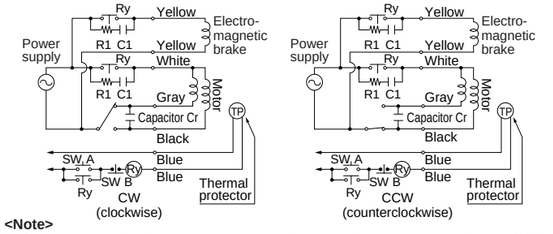
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX7G3BA to MX7G180B (ball bearing)	50Hz	0.24 (2.5)	0.28 (2.9)	0.39 (4.0)	0.47 (4.8)	0.59 (6.0)	0.71 (7.2)	0.80 (8.2)	0.98 (10)	1.18 (12)	1.37 (14)	1.57 (16)	1.86 (19)	2.25 (23)	2.74 (28)	3.82 (39)	4.61 (47)	4.90 (50)	4.90 (50)				
	MX7G3MA to MX7G180M (metal bearing)	60Hz	0.20 (2.0)	0.24 (2.5)	0.32 (3.3)	0.39 (4.0)	0.49 (5.0)	0.59 (6.0)	0.66 (6.7)	0.81 (8.3)	0.98 (10)	1.18 (12)	1.27 (13)	1.57 (16)	1.86 (19)	2.25 (23)	3.23 (33)	3.82 (39)	4.80 (49)	4.90 (50)				
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX7G□BA (ball bearing) MX7G□B (ball bearing) MX7G□MA (metal bearing) MX7G□M (metal bearing)	MX7G10XB	Permissible torque	N·m	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90
			(kgf·cm)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)
		Rotational direction		Same as motor rotational direction		Reverse to motor rotational direction									

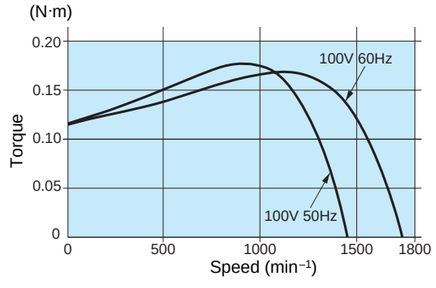
Connection diagram



<Note>
1. Brake will be activated and held when electromagnetic brake power is turned OFF.
2. Protect the contacts by inserting the spark-killer circuit (R1+C1) between the contacts. R1+C1 is provided as an option (DV0P008, refer to page D-3).
3. Refer to page A-58 for connection of thermal protector.

Speed-torque characteristics

M7RX15GB4LG(A)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

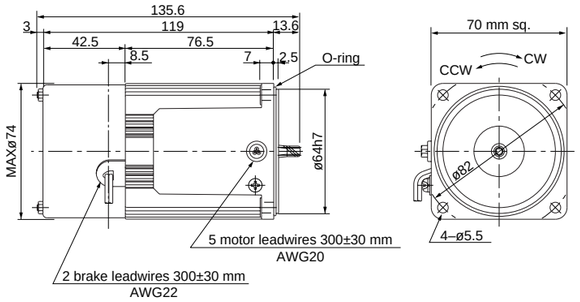
Features B-168 | System configuration B-169 | Coding system B-169 | Model list B-174

Motor (dimensions)

Scale: 1/3, Unit: mm

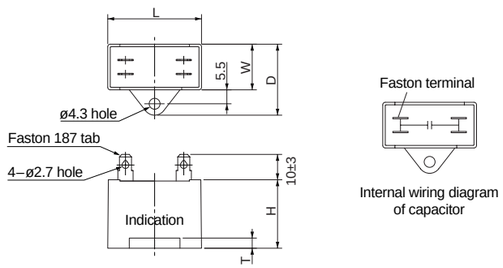
M7RX15GB4LG(A) 4P 15 W 100 V
M7RX15GB4DG(A) 4P 15 W 110 V / 115 V
M7RX15GB4YG(A) 4P 15 W 200 V
M7RX15GB4GG(A) 4P 15 W 220 V / 230 V

Mass	Helical	Module	Number of teeth
1.1 kg	gear	0.5	7



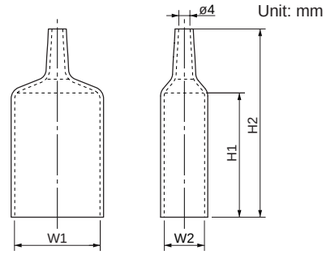
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

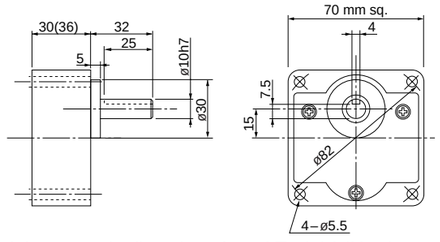
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M7RX15GB4LG(A)	M0PC6.5M25G	48	19	29	29	4	M0PC4819G	48	19	55	78
M7RX15GB4DG(A)	M0PC5.5M25G	38	21	31	31	4	M0PC3821G	38	21	55	78
M7RX15GB4YG(A)	M0PC1.7M45G	38	21	31	31	4	M0PC3821G	38	21	55	78
M7RX15GB4GG(A)	M0PC1.3M45G	38	19	29	29	4	M0PC3819G	38	19	50	73

• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX7G□BA (ball bearing) / **MX7G□B** (ball bearing) Mass 0.38/0.45 kg
MX7G□MA (metal bearing) / **MX7G□M** (metal bearing) Mass 0.38/0.45 kg

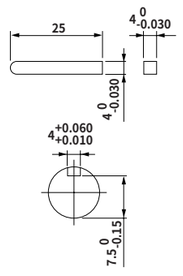


* Figures in ( ) represent the dimensions of MX7G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX7G□BA (MA).)

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MX7G□BA(B)
MX7G□MA(M)



Gear head combination B-218 | Round shaft motor dimensions B-220 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Electromagnetic brake single-phase motor (leadwire)

80 mm sq. 25 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Brake Input (W)	Brake Current (A)	Brake Friction Torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
80 mm sq.	M8RX25GB4L	4	25	100	50	30	56	0.57	1300	0.19 (1.9)	1.0	0.20 (2.0)	6	0.06	0.10 (1.0)	9.5 (200V)
					60		56	0.56	1600	0.16 (1.6)	1.0	0.20 (2.0)	6	0.06	0.10 (1.0)	
	M8RX25GB4Y	4	25	200	50	30	56	0.29	1300	0.19 (1.9)	0.52	0.20 (2.0)	6	0.03	0.10 (1.0)	2.4 (400V)
					60		56	0.28	1600	0.16 (1.6)	0.51	0.20 (2.0)	6	0.03	0.10 (1.0)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-220.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

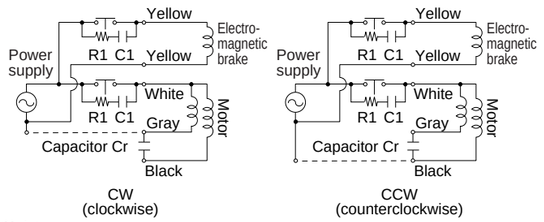
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX8G3B to MX8G180B (ball bearing)	50Hz	0.39 (4.0)	0.47 (4.8)	0.66 (6.7)	0.78 (8.0)	0.98 (10)	1.18 (12)	1.27 (13)	1.57 (16)	1.96 (20)	2.35 (24)	2.55 (26)	3.14 (32)	3.82 (39)	4.61 (47)	6.37 (65)	7.64 (78)	7.84 (80)					
	MX8G3M to MX8G180M (metal bearing)	60Hz	0.32 (3.3)	0.39 (4.0)	0.55 (5.6)	0.66 (6.7)	0.81 (8.3)	0.98 (10)	1.08 (11)	1.27 (13)	1.57 (16)	1.96 (20)	2.06 (21)	2.65 (27)	3.14 (32)	3.82 (39)	5.29 (54)	6.37 (65)	7.84 (80)					
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX8G□B (ball bearing) MX8G□M (metal bearing)	MX8G10XB	Permissible torque	N·m (kgf·cm)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)
		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

Connection diagram

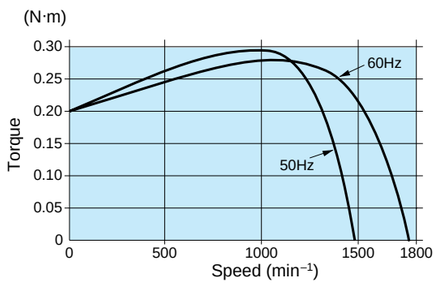


<Note>

1. Brake will be activated and held when electromagnetic brake power is turned OFF.
2. Protect the contacts by inserting the spark-killer circuit (R1+C1) between the contacts. R1+C1 is provided as an option (DV0P008, refer to page D-3).

Speed-torque characteristics

M8RX25GB4L

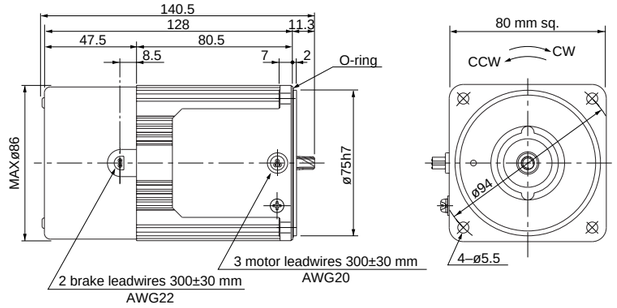


Motor (dimensions)

Scale: 1/3, Unit: mm

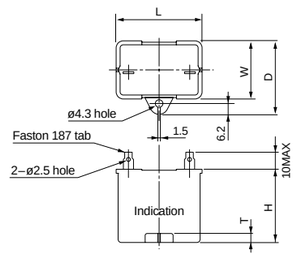
M8RX25GB4L 4P 25 W 100 V
M8RX25GB4Y 4P 25 W 200 V

Mass	Helical	Module	Number of teeth
1.8 kg	gear	0.5	9



Capacitor (dimensions) [attachment]

Unit: mm



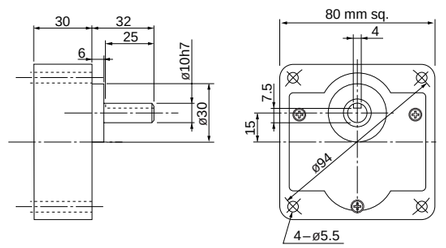
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M8RX25GB4L	M0PC9.5M20	39.5	22	32.5	30.5	4	M0PC3922
M8RX25GB4Y	M0PC2.4M40	49.7	24	34.5	34.5	4	M0PC5026

Gear head (dimensions)

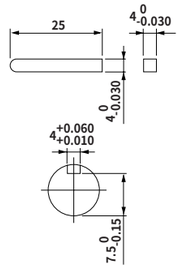
Scale: 1/3, Unit: mm

MX8G□B (ball bearing) / **MX8G□M** (metal bearing) Mass 0.6 kg



Key and keyway (dimensions) [attachment]

MX8G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Electromagnetic brake single-phase motor (leadwire)

80 mm sq. 25 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Brake Input (W)	Brake Current (A)	Brake Friction Torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
80 mm sq.	M8RX25GB4LG	4	25	100	50	30	55	0.56	1300	0.18 (1.9)	1.1	0.20 (2.0)	6	0.06	0.10 (1.0)	10 (250V)
	M8RX25GB4LGA				60		57	0.57	1600	0.15 (1.5)	1.1	0.20 (2.0)	6	0.06	0.10 (1.0)	
	M8RX25GB4DG	4	25	110	60	30	54	0.50	1625	0.15 (1.5)	1.1	0.19 (1.9)	6	0.06	0.10 (1.0)	8 (250V)
	M8RX25GB4DGA			115	60		57	0.50	1625	0.15 (1.5)	1.2	0.21 (2.1)	6	0.07	0.10 (1.0)	
	M8RX25GB4YG	4	25	200	50	30	55	0.28	1250	0.19 (1.9)	0.44	0.20 (2.0)	6	0.03	0.10 (1.0)	2.5 (450V)
	M8RX25GB4YGA				60		64	0.33	1550	0.15 (1.5)	0.45	0.20 (2.0)	6	0.03	0.10 (1.0)	
	M8RX25GB4GG	4	25	220	50	30	56	0.26	1250	0.19 (1.9)	0.46	0.19 (1.9)	6	0.03	0.10 (1.0)	2 (450V)
	M8RX25GB4GGA				60		57	0.26	1575	0.15 (1.5)	0.45	0.19 (1.9)	6	0.03	0.10 (1.0)	
				230	50		59	0.27	1275	0.19 (1.9)	0.48	0.21 (2.1)	6	0.03	0.10 (1.0)	
					60		60	0.26	1600	0.15 (1.5)	0.47	0.21 (2.1)	6	0.03	0.10 (1.0)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-220.
• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

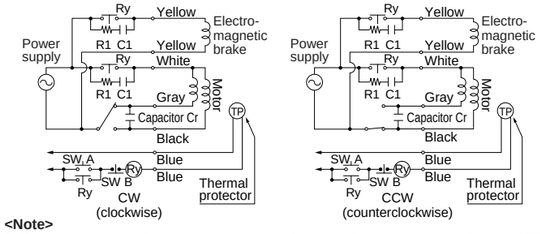
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head: MX8G3B to MX8G180B (ball bearing)	50Hz	0.39 (4.0)	0.47 (4.8)	0.66 (6.7)	0.78 (8.0)	0.98 (10)	1.18 (12)	1.27 (13)	1.57 (16)	1.96 (20)	2.35 (24)	2.55 (26)	3.14 (32)	3.82 (39)	4.61 (47)	6.37 (65)	7.64 (78)	7.84 (80)					
Applicable gear head: MX8G3M to MX8G180M (metal bearing)	60Hz	0.32 (3.3)	0.39 (4.0)	0.55 (5.6)	0.66 (6.7)	0.81 (8.3)	0.98 (10)	1.08 (11)	1.27 (13)	1.57 (16)	1.96 (20)	2.06 (21)	2.65 (27)	3.14 (32)	3.82 (39)	5.29 (54)	6.37 (65)	7.84 (80)					
Rotational direction		Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX8G□B (ball bearing) MX8G□M (metal bearing)	MX8G10XB	Permissible torque	N·m	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84
			(kgf·cm)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)
		Rotational direction		Same as motor rotational direction		Reverse to motor rotational direction									

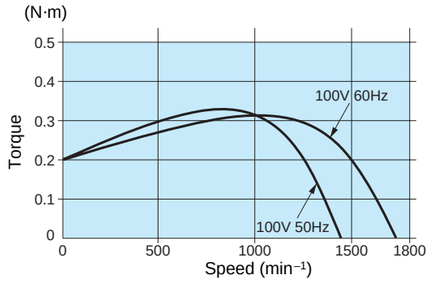
Connection diagram



<Note>
1. Brake will be activated and held when electromagnetic brake power is turned OFF.
2. Protect the contacts by inserting the spark-killer circuit (R1+C1) between the contacts. R1+C1 is provided as an option (DV0P008, refer to page D-3).
3. Refer to page A-58 for connection of thermal protector.

Speed-torque characteristics

M8RX25GB4LG(A)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

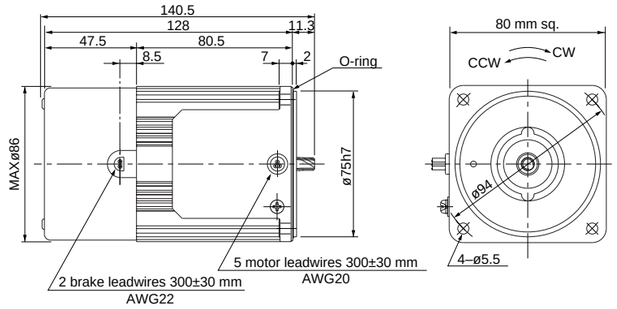
Features B-168 | System configuration B-169 | Coding system B-169 | Model list B-174

Motor (dimensions)

Scale: 1/3, Unit: mm

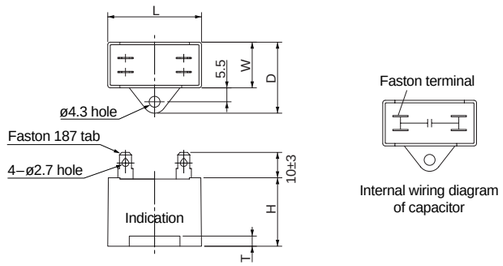
M8RX25GB4LG(A) 4P 25 W 100 V
M8RX25GB4DG(A) 4P 25 W 110 V / 115 V
M8RX25GB4YG(A) 4P 25 W 200 V
M8RX25GB4GG(A) 4P 25 W 220 V / 230 V

Mass	Helical	Module	Number of teeth
1.8 kg	gear	0.5	9



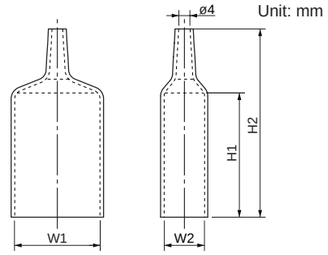
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

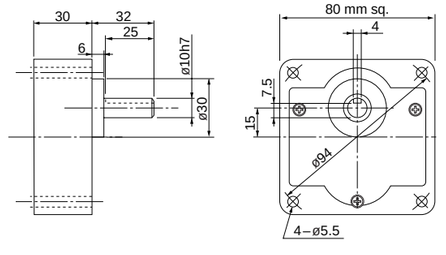
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M8RX25GB4LG(A)	M0PC10M25G	58	21	31	31	4	M0PC5821G	58	21	55	78
M8RX25GB4DG(A)	M0PC8M25G	48	21	31	31	4	M0PC4821G	48	21	55	78
M8RX25GB4YG(A)	M0PC2.5M45G	48	21	31	31	4	M0PC4821G	48	21	55	78
M8RX25GB4GG(A)	M0PC2M45G	48	19	29	29	4	M0PC4819G	48	19	55	78

• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

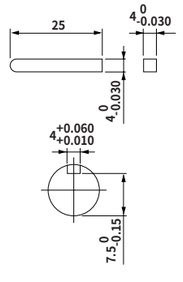
Scale: 1/3, Unit: mm

MX8G□B (ball bearing) / **MX8G□M** (metal bearing) Mass 0.6 kg



Key and keyway (dimensions) [attachment]

MX8G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-218 | Round shaft motor dimensions B-220 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Electromagnetic brake single-phase motor (leadwire)

90 mm sq. 40 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Brake Input (W)	Brake Current (A)	Brake Friction Torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M9RX40GB4L	4	40	100	50	30	79	0.81	1300	0.29 (3.0)	1.7	0.32 (3.3)	7	0.09	0.20 (2.0)	15 (210V)
					60		80	0.81	1625	0.24 (2.4)	1.6	0.32 (3.3)	7	0.09	0.20 (2.0)	
	M9RX40GB4Y	4	40	200	50	30	79	0.40	1300	0.29 (3.0)	0.85	0.32 (3.3)	7	0.05	0.20 (2.0)	3.8 (400V)
					60		80	0.41	1625	0.24 (2.4)	0.78	0.32 (3.3)	7	0.05	0.20 (2.0)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-220.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

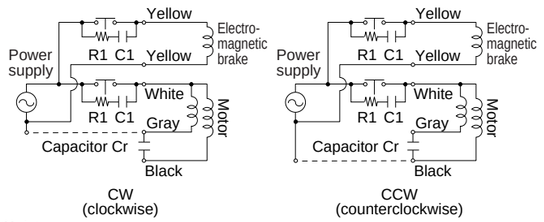
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX9G3B to MX9G180B (ball bearing)	50Hz	0.66 (6.7)	0.78 (8.0)	1.08 (11)	1.27 (13)	1.57 (16)	1.86 (19)	2.25 (23)	2.74 (28)	3.23 (33)	3.92 (40)	4.41 (45)	5.29 (54)	6.37 (65)	7.94 (81)	9.80 (100)	9.80 (100)						
	MX9G3M to MX9G180M (metal bearing)	60Hz	0.55 (5.6)	0.66 (6.7)	0.90 (9.2)	1.08 (11)	1.27 (13)	1.57 (16)	1.76 (18)	2.25 (23)	2.74 (28)	3.23 (33)	3.53 (36)	4.41 (45)	5.29 (54)	6.37 (65)	8.82 (90)	9.80 (100)						
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX9G□B (ball bearing) MX9G□M (metal bearing)	MX9G10XB	Permissible torque	N·m (kgf·cm)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)
		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

Connection diagram

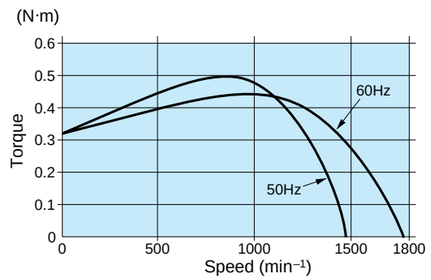


<Note>

1. Brake will be activated and held when electromagnetic brake power is turned OFF.
2. Protect the contacts by inserting the spark-killer circuit (R1+C1) between the contacts. R1+C1 is provided as an option (DV0P008, refer to page D-3).

Speed-torque characteristics

M9RX40GB4L



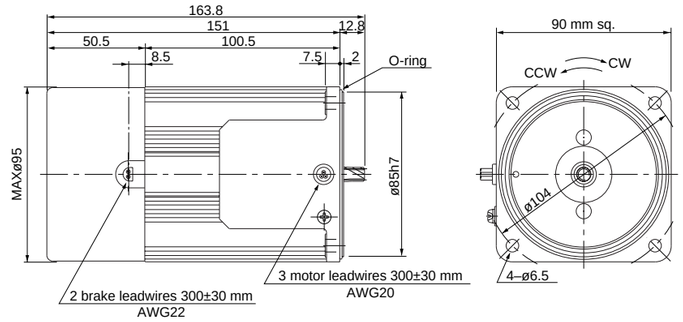
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

M9RX40GB4L 4P 40 W 100 V
M9RX40GB4Y 4P 40 W 200 V

Mass	Helical	Module	Number of teeth
2.8 kg	gear	0.55	9



Capacitor (dimensions) [attachment]

Unit: mm

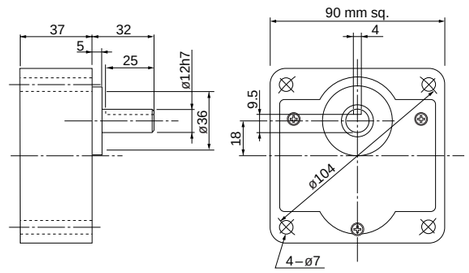
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M9RX40GB4L	M0PC15M21	39.5	26.7	37	41	4	M0PC3926
M9RX40GB4Y	M0PC3.8M40	50	26.7	37.5	38	4	M0PC5026

Gear head (dimensions)

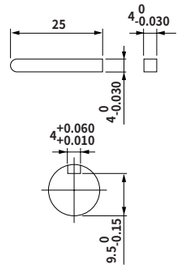
Scale: 1/3, Unit: mm

MX9G□B (ball bearing) / **MX9G□M** (metal bearing) Mass 0.8 kg



Key and keyway (dimensions) [attachment]

MX9G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Electromagnetic brake single-phase motor (leadwire)

90 mm sq. 40 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Brake Input (W)	Brake Current (A)	Brake Friction Torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M9RX40GB4LG	4	40	100	50	30	76	0.77	1325	0.29 (2.9)	1.7	0.34 (3.5)	7	0.09	0.20 (2.0)	16 (250V)
	M9RX40GB4LGA				60		83	0.86	1625	0.24 (2.4)	1.7	0.34 (3.5)	7	0.09	0.20 (2.0)	
	M9RX40GB4DG	4	40	110	60	30	77	0.70	1650	0.23 (2.4)	1.7	0.32 (3.3)	8	0.09	0.20 (2.0)	12 (250V)
	M9RX40GB4DGA			115	60		80	0.70	1650	0.23 (2.4)	1.8	0.34 (3.5)	9	0.10	0.20 (2.0)	
	M9RX40GB4YG	4	40	200	50	30	81	0.40	1275	0.30 (3.1)	0.69	0.34 (3.5)	7	0.05	0.20 (2.0)	4 (450V)
	M9RX40GB4YGA				60		103	0.54	1575	0.24 (2.5)	0.71	0.34 (3.5)	7	0.05	0.20 (2.0)	
	M9RX40GB4GG	4	40	220	50	30	80	0.36	1325	0.29 (2.9)	0.73	0.39 (4.0)	8	0.05	0.20 (2.0)	3.5 (450V)
	M9RX40GB4GGA				60		96	0.46	1625	0.24 (2.4)	0.73	0.39 (4.0)	8	0.05	0.20 (2.0)	
				230	50		84	0.36	1350	0.28 (2.9)	0.76	0.43 (4.4)	9	0.05	0.20 (2.0)	
					60		101	0.46	1625	0.24 (2.4)	0.76	0.43 (4.4)	8	0.05	0.20 (2.0)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-220.
• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

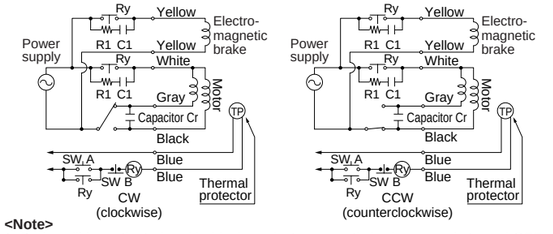
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head: MX9G3B to MX9G180B (ball bearing)	50Hz	0.66 (6.7)	0.78 (8.0)	1.08 (11)	1.27 (13)	1.57 (16)	1.86 (19)	2.25 (23)	2.74 (28)	3.23 (33)	3.92 (40)	4.41 (45)	5.29 (54)	6.37 (65)	7.94 (81)	9.80 (100)	9.80 (100)						
Applicable gear head: MX9G3M to MX9G180M (metal bearing)	60Hz	0.55 (5.6)	0.66 (6.7)	0.90 (9.2)	1.08 (11)	1.27 (13)	1.57 (16)	1.76 (18)	2.25 (23)	2.74 (28)	3.23 (33)	3.53 (36)	4.41 (45)	5.29 (54)	6.37 (65)	8.82 (90)	9.80 (100)						
Rotational direction		Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX9G□B (ball bearing) MX9G□M (metal bearing)	MX9G10XB	Permissible torque	N·m (kgf·cm)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)
		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

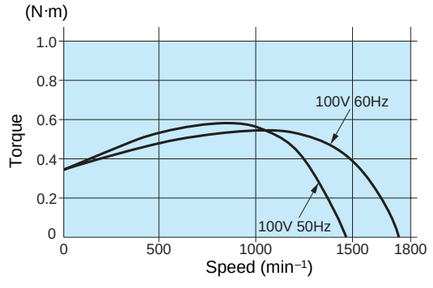
Connection diagram



<Note>
1. Brake will be activated and held when electromagnetic brake power is turned OFF.
2. Protect the contacts by inserting the spark-killer circuit (R1+C1) between the contacts. R1+C1 is provided as an option (DV0P008, refer to page D-3).
3. Refer to page A-58 for connection of thermal protector.

Speed-torque characteristics

M9RX40GB4LG(A)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

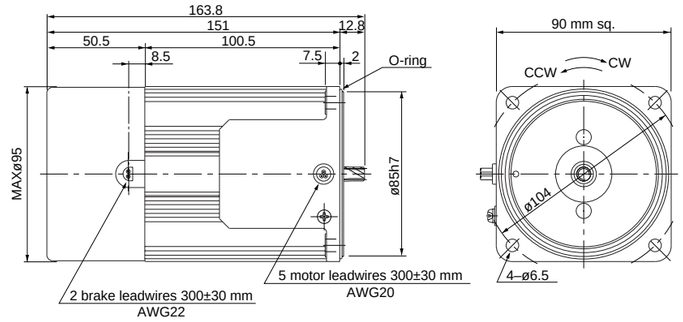
Features B-168 | System configuration B-169 | Coding system B-169 | Model list B-174

Motor (dimensions)

Scale: 1/3, Unit: mm

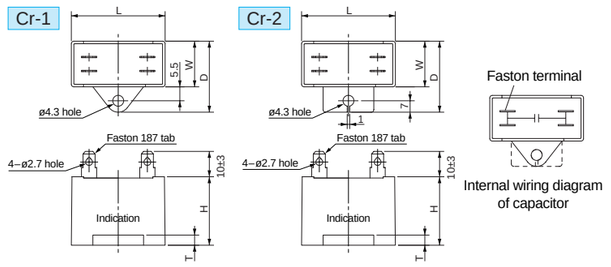
M9RX40GB4LG(A) 4P 40 W 100 V
M9RX40GB4DG(A) 4P 40 W 110 V / 115 V
M9RX40GB4YG(A) 4P 40 W 200 V
M9RX40GB4GG(A) 4P 40 W 220 V / 230 V

Mass	Helical	Module	Number of teeth
2.8 kg	gear	0.55	9



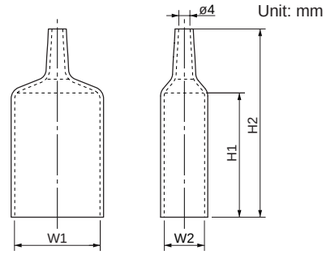
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

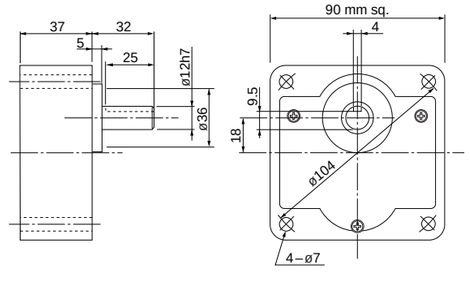
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	dimension No.	Capacitor cap (attachment)	W1	W2	H1	H2
M9RX40GB4LG(A)	M0PC16M25G	58	23.5	38.5	37	4	Cr-2	M0PC5823G	58	23.5	55	78
M9RX40GB4DG(A)	M0PC12M25G	58	22	32	35	4	Cr-1	M0PC5822G	58	22	55	78
M9RX40GB4YG(A)	M0PC4M45G	58	23.5	38.5	37	4	Cr-2	M0PC5823G	58	23.5	55	78
M9RX40GB4GG(A)	M0PC3.5M45G	58	22	32	35	4	Cr-1	M0PC5822G	58	22	55	78

• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

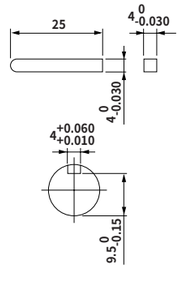
Scale: 1/3, Unit: mm

MX9G□B (ball bearing) / **MX9G□M** (metal bearing) Mass 0.8 kg



Key and keyway (dimensions) [attachment]

MX9G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-218 | Round shaft motor dimensions B-220 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Electromagnetic brake single-phase motor (leadwire)

90 mm sq. 60 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min^{-1})	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Brake Input (W)	Brake Current (A)	Brake Friction Torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M9RZ60GB4L	4	60	100	50	30	127	1.3	1275	0.45 (4.6)	2.4	0.57 (5.8)	7	0.09	0.39 (4.0)	25 (200V)
					60		133	1.3	1600	0.36 (3.7)	2.4	0.57 (5.8)	7	0.09	0.39 (4.0)	
	M9RZ60GB4Y	4	60	200	50	30	127	0.65	1275	0.45 (4.6)	1.2	0.57 (5.8)	7	0.05	0.39 (4.0)	6.2 (375V)
					60		133	0.65	1600	0.36 (3.7)	1.2	0.57 (5.8)	7	0.05	0.39 (4.0)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-220.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

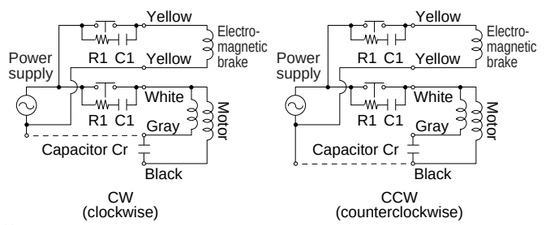
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min^{-1})	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head: MZ9G3BA to MZ9G200B (ball bearing / hinge not attached)	50Hz	0.98 (9.99)	1.18 (12)	1.57 (16)	1.96 (20)	2.35 (24)	2.94 (30)	3.14 (32)	3.92 (40)	4.70 (48)	5.59 (57)	6.27 (64)	7.55 (77)	9.11 (93)	11.0 (112)	15.2 (155)	17.8 (182)	19.6 (200)						
Applicable gear head: MY9G3MA to MY9G200M (metal bearing / hinge attached)	60Hz	0.78 (8.0)	0.98 (9.99)	1.37 (14)	1.57 (16)	1.96 (20)	2.35 (24)	2.65 (27)	3.33 (34)	3.92 (40)	4.70 (48)	5.29 (54)	6.47 (66)	7.55 (77)	9.11 (93)	12.6 (129)	15.2 (155)	19.6 (200)						
Rotational direction		Same as motor rotational direction							Reverse to motor rotational direction						Same as motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head: Bearing	Decimal gear head	Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
		Speed (min^{-1})	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MZ9G□B (ball bearing / Hinge not attached) MY9G□M (metal bearing / Hinge attached)	MZ9G10XB	Permissible torque	N·m	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
			(kgf·cm)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

Connection diagram

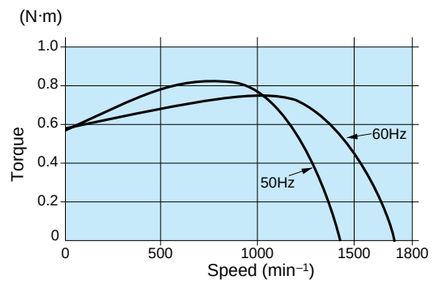


<Note>

1. Brake will be activated and held when electromagnetic brake power is turned OFF.
2. Protect the contacts by inserting the spark-killer circuit (R1+C1) between the contacts. R1+C1 is provided as an option (DV0P008, refer to page D-3).

Speed-torque characteristics

M9RZ60GB4L



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

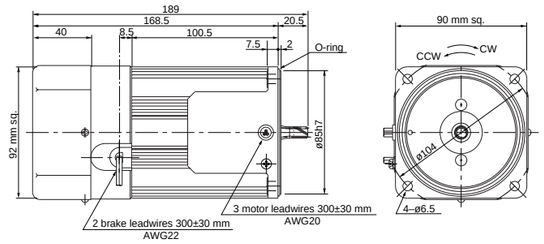
Features B-168 | System configuration B-169 | Coding system B-169 | Model list B-174

Motor (dimensions)

Scale: 1/4, Unit: mm

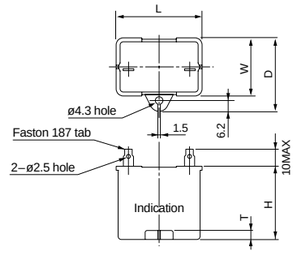
M9RZ60GB4L 4P 60 W 100 V (with fan)
M9RZ60GB4Y 4P 60 W 200 V (with fan)

Mass	Helical gear	Module	Number of teeth
2.8 kg		0.55	9



Capacitor (dimensions) [attachment]

Unit: mm



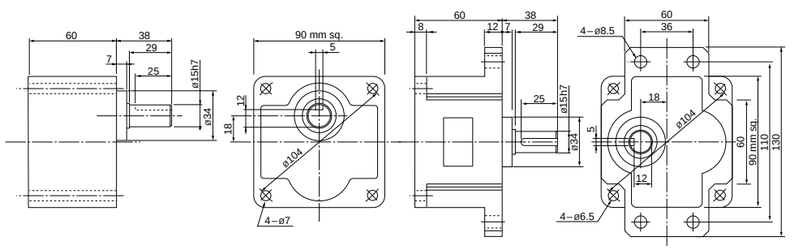
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M9RZ60GB4L	M0PC25M20	50.2	31	41	42	5	M0PC5032
M9RZ60GB4Y	M0PC6.2M38	50	30.5	41	41.5	4	M0PC5032

Gear head (dimensions)

Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg
MY9G□M (metal bearing / hinge attached) Mass 1.4 kg

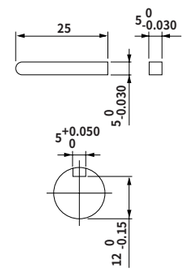


Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Gear head combination B-218 | Round shaft motor dimensions B-220 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Electromagnetic brake single-phase motor (leadwire)

90 mm sq. 60 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Brake Input (W)	Brake Current (A)	Brake Friction Torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M9RZ60GB4LG	4	60	100	50	30	126	1.3	1300	0.44 (4.5)	2.5	0.57 (5.8)	7	0.09	0.39 (4.0)	25 (250V)
	M9RZ60GB4LGA				60		134	1.4	1600	0.36 (3.7)	2.4	0.57 (5.8)	7	0.09	0.39 (4.0)	
	M9RZ60GB4DG	4	60	110	60	30	127	1.2	1625	0.35 (3.6)	2.5	0.56 (5.7)	8	0.09	0.39 (4.0)	20 (250V)
	M9RZ60GB4DGA			115	60		134	1.2	1650	0.35 (3.5)	2.6	0.62 (6.3)	9	0.10	0.39 (4.0)	
	M9RZ60GB4YG	4	60	200	50	30	121	0.60	1275	0.45 (4.6)	1.1	0.57 (5.8)	8	0.05	0.39 (4.0)	6 (450V)
	M9RZ60GB4YGA				60		146	0.76	1575	0.36 (3.7)	1.1	0.57 (5.8)	8	0.05	0.39 (4.0)	
	M9RZ60GB4GG	4	60	220	50	30	126	0.59	1300	0.44 (4.5)	1.1	0.56 (5.7)	10	0.05	0.39 (4.0)	5 (450V)
					60		133	0.62	1600	0.36 (3.7)	1.1	0.57 (5.8)	10	0.05	0.39 (4.0)	
	M9RZ60GB4GGA			230	50		135	0.62	1300	0.44 (4.5)	1.2	0.62 (6.3)	10	0.05	0.39 (4.0)	
					60		139	0.61	1625	0.35 (3.6)	1.1	0.62 (6.3)	10	0.05	0.39 (4.0)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-220.
• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

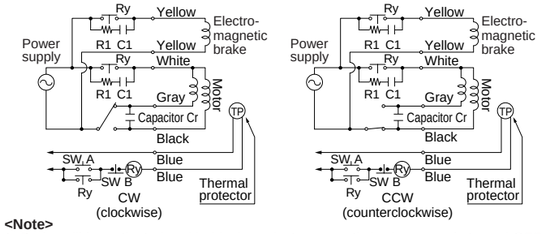
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head	MZ9G3B to MZ9G200B (ball bearing / hinge not attached)	50Hz	0.98 (9.99)	1.18 (12)	1.57 (16)	1.96 (20)	2.35 (24)	2.94 (30)	3.14 (32)	3.92 (40)	4.70 (48)	5.59 (57)	6.27 (64)	7.55 (77)	9.11 (93)	11.0 (112)	15.2 (155)	17.8 (182)	19.6 (200)						
	MY9G3B to MY9G200B (ball bearing / hinge attached)	60Hz	0.78 (8.0)	0.98 (9.99)	1.37 (14)	1.57 (16)	1.96 (20)	2.35 (24)	2.65 (27)	3.33 (34)	3.92 (40)	4.70 (48)	5.29 (54)	6.47 (66)	7.55 (77)	9.11 (93)	12.6 (129)	15.2 (155)	19.6 (200)						
Rotational direction			Same as motor rotational direction							Reverse to motor rotational direction						Same as motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	MZ9G10XB	Permissible torque	N·m	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
			(kgf·cm)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

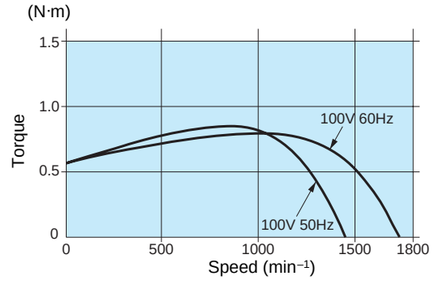
Connection diagram



<Note>
1. Brake will be activated and held when electromagnetic brake power is turned OFF.
2. Protect the contacts by inserting the spark-killer circuit (R1+C1) between the contacts. R1+C1 is provided as an option (DV0P008, refer to page D-3).
3. Refer to page A-58 for connection of thermal protector.

Speed-torque characteristics

M9RZ60GB4LG(A)



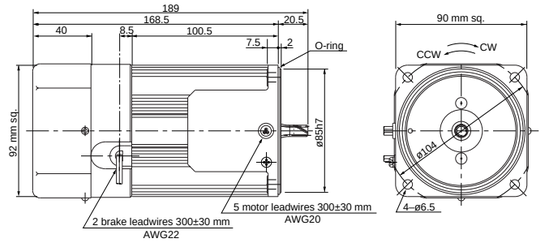
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/4, Unit: mm

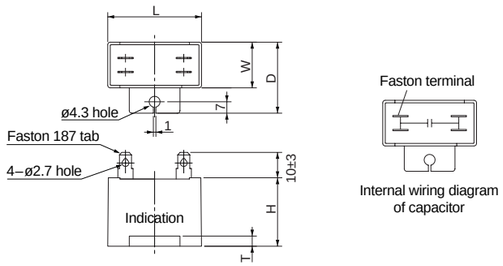
M9RZ60GB4LG(A) 4P 60 W 100 V (with fan)
M9RZ60GB4DG(A) 4P 60 W 110 V / 115 V (with fan)
M9RZ60GB4YG(A) 4P 60 W 200 V (with fan)
M9RZ60GB4GG(A) 4P 60 W 220 V / 230 V (with fan)

Mass	Helical	Module	Number of teeth
3.1 kg	gear	0.6	9



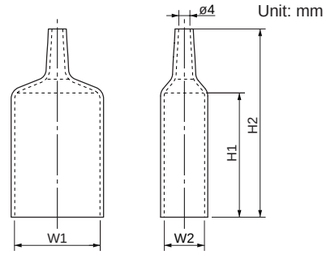
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

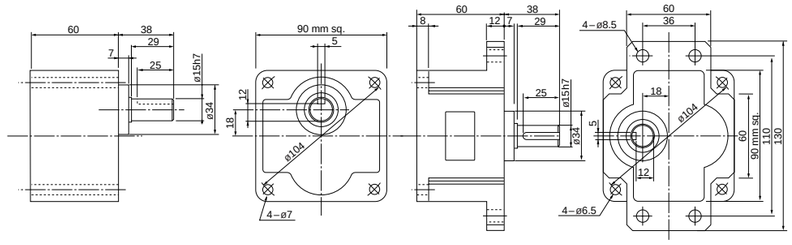
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M9RZ60GB4LG(A)	M0PC25M25G	58	35	50	50	4	M0PC5835G	58	35	55	78
M9RZ60GB4DG(A)	M0PC20M25G	58	29	44	41	4	M0PC5829G	58	29	55	78
M9RZ60GB4YG(A)	M0PC6M45G	58	29	44	41	4	M0PC5829G	58	29	55	78
M9RZ60GB4GG(A)	M0PC5M45G	58	29	44	41	4	M0PC5829G	58	29	55	78

• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

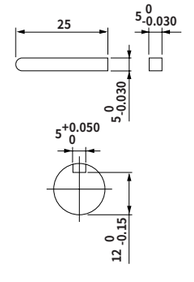
Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg
MY9G□M (metal bearing / hinge attached) Mass 1.4 kg



Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Electromagnetic brake single-phase motor (leadwire)

90 mm sq. 90 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Brake Input (W)	Brake Current (A)	Brake Friction Torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M9RZ90GB4L	4	90	100	50	30	171	1.7	1225	0.70 (7.1)	2.8	0.68 (6.9)	7	0.09	0.39 (4.0)	30 (200V)
					60		181	1.9	1525	0.56 (5.7)	2.7	0.70 (7.1)	7	0.09	0.39 (4.0)	
	M9RZ90GB4Y	4	90	200	50	30	171	0.93	1225	0.70 (7.1)	1.4	0.68 (6.9)	7	0.05	0.39 (4.0)	7.5 (370V)
					60		181	0.96	1525	0.56 (5.7)	1.4	0.70 (7.1)	7	0.05	0.39 (4.0)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-220.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

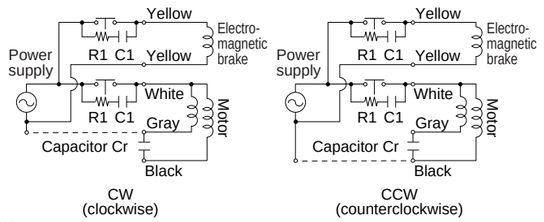
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head: MZ9G3B to MZ9G200B (ball bearing / hinge not attached)	50Hz	1.37 (14)	1.67 (17)	2.25 (23)	2.74 (28)	3.43 (35)	4.12 (42)	4.51 (46)	5.68 (58)	6.76 (69)	8.04 (82)	9.02 (92)	10.9 (111)	13.0 (133)	15.7 (160)	19.6 (200)	19.6 (200)							
Applicable gear head: MY9G3B to MY9G200B (ball bearing / hinge attached)	60Hz	1.18 (12)	1.37 (14)	1.86 (19)	2.25 (23)	2.84 (29)	3.43 (35)	3.72 (38)	4.70 (48)	5.68 (58)	6.76 (69)	7.55 (77)	9.21 (94)	10.9 (111)	13.0 (133)	18.3 (187)	19.6 (200)							
Rotational direction		Same as motor rotational direction							Reverse to motor rotational direction						Same as motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head: Bearing	Decimal gear head	Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
		Speed (min⁻¹)	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	MZ9G10XB	Permissible torque	N·m (kgf·cm)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

Connection diagram

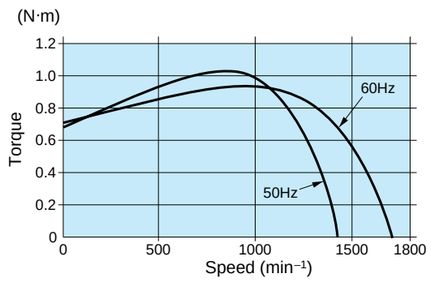


<Note>

1. Brake will be activated and held when electromagnetic brake power is turned OFF.
2. Protect the contacts by inserting the spark-killer circuit (R1+C1) between the contacts. R1+C1 is provided as an option (DV0P008, refer to page D-3).

Speed-torque characteristics

M9RZ90GB4L



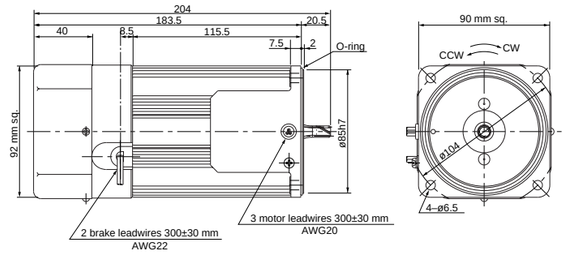
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/4, Unit: mm

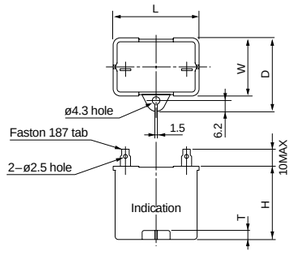
M9RZ90GB4L 4P 90 W 100 V (with fan)
M9RZ90GB4Y 4P 90 W 200 V (with fan)

Mass	Helical gear	Module	Number of teeth
3.7 kg		0.6	9



Capacitor (dimensions) [attachment]

Unit: mm



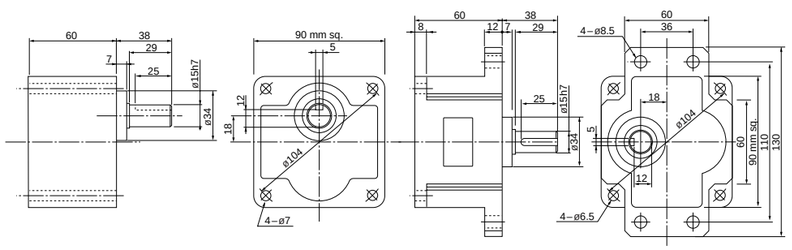
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M9RZ90GB4L	M0PC30M20	50.2	31	41	42	5	M0PC5032
M9RZ90GB4Y	M0PC7.5M37	50	34	45	45	6	—

Gear head (dimensions)

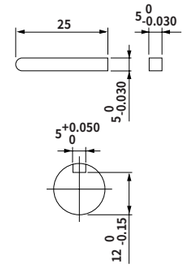
Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg
MY9G□M (metal bearing / hinge attached) Mass 1.4 kg



Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Electromagnetic brake single-phase motor (leadwire)

90 mm sq. 90 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Brake Input (W)	Brake Current (A)	Brake Friction Torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M9RZ90GB4LG	4	90	100	50	30	175	1.8	1250	0.69 (7.0)	3.0	0.72 (7.3)	7	0.09	0.39 (4.0)	32 (250V)
	M9RZ90GB4LGA				60		188	1.9	1575	0.55 (5.6)	3.0	0.72 (7.3)	7	0.09	0.39 (4.0)	
	M9RZ90GB4DG	4	90	110	60	30	181	1.7	1600	0.54 (5.5)	3.1	0.76 (7.8)	8	0.09	0.39 (4.0)	28 (250V)
	M9RZ90GB4DGA			115	60		190	1.7	1625	0.53 (5.4)	3.2	0.83 (8.5)	9	0.10	0.39 (4.0)	
	M9RZ90GB4YG	4	90	200	50	30	171	0.86	1225	0.70 (7.1)	1.4	0.72 (7.3)	8	0.05	0.39 (4.0)	8 (450V)
	M9RZ90GB4YGA				60		193	1.0	1550	0.55 (5.6)	1.4	0.72 (7.3)	8	0.05	0.39 (4.0)	
	M9RZ90GB4GG	4	90	220	50	30	179	0.84	1275	0.67 (6.8)	1.5	0.76 (7.8)	10	0.05	0.39 (4.0)	7 (450V)
	M9RZ90GB4GGA				60		184	0.84	1600	0.54 (5.5)	1.5	0.76 (7.8)	10	0.05	0.39 (4.0)	
				230	50		192	0.89	1275	0.67 (6.8)	1.6	0.83 (8.5)	10	0.05	0.39 (4.0)	
					60		192	0.84	1600	0.54 (5.5)	1.5	0.83 (8.5)	10	0.05	0.39 (4.0)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-220.
• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

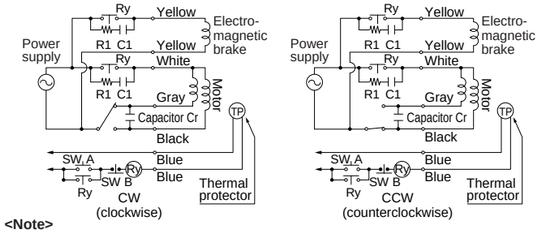
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head: MZ9G3B to MZ9G200B (ball bearing / hinge not attached)	50Hz	1.37 (14)	1.67 (17)	2.25 (23)	2.74 (28)	3.43 (35)	4.12 (42)	4.51 (46)	5.68 (58)	6.76 (69)	8.04 (82)	9.02 (92)	10.9 (111)	13.0 (133)	15.7 (160)	19.6 (200)	19.6 (200)							
Applicable gear head: MY9G3B to MY9G200B (ball bearing / hinge attached)	60Hz	1.18 (12)	1.37 (14)	1.86 (19)	2.25 (23)	2.84 (29)	3.43 (35)	3.72 (38)	4.70 (48)	5.68 (58)	6.76 (69)	7.55 (77)	9.21 (94)	10.9 (111)	13.0 (133)	18.3 (187)	19.6 (200)							
Rotational direction		Same as motor rotational direction							Reverse to motor rotational direction						Same as motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head: Bearing	Decimal gear head	Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	MZ9G10XB	Speed (min⁻¹)	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
		Permissible torque	N·m	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
			(kgf·cm)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

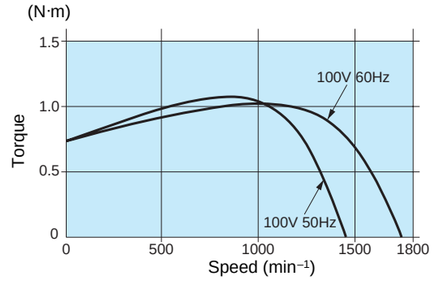
Connection diagram



<Note>
1. Brake will be activated and held when electromagnetic brake power is turned OFF.
2. Protect the contacts by inserting the spark-killer circuit (R1+C1) between the contacts. R1+C1 is provided as an option (DV0P008, refer to page D-3).
3. Refer to page A-58 for connection of thermal protector.

Speed-torque characteristics

M9RZ90GB4LG(A)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

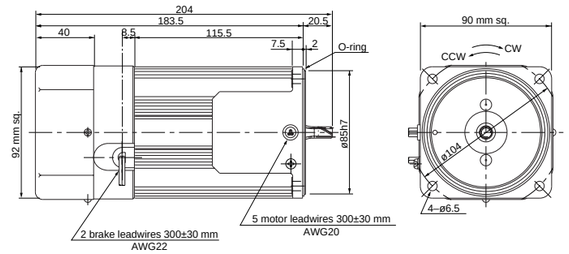
Features B-168 | System configuration B-169 | Coding system B-169 | Model list B-174

Motor (dimensions)

Scale: 1/4, Unit: mm

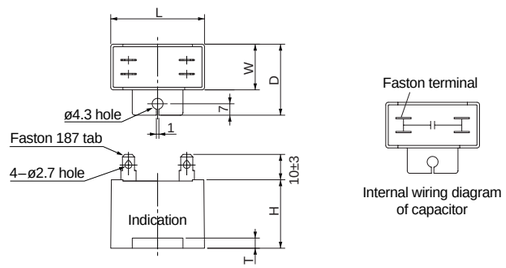
M9RZ90GB4LG(A) 4P 90 W 100 V (with fan)
M9RZ90GB4DG(A) 4P 90 W 110 V / 115 V (with fan)
M9RZ90GB4YG(A) 4P 90 W 200 V (with fan)
M9RZ90GB4GG(A) 4P 90 W 220 V / 230 V (with fan)

Mass	Helical	Module	Number of teeth
3.7 kg	gear	0.6	9



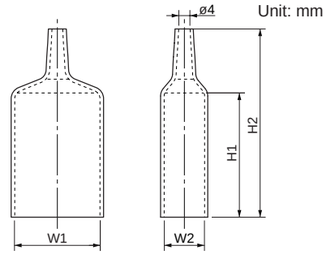
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

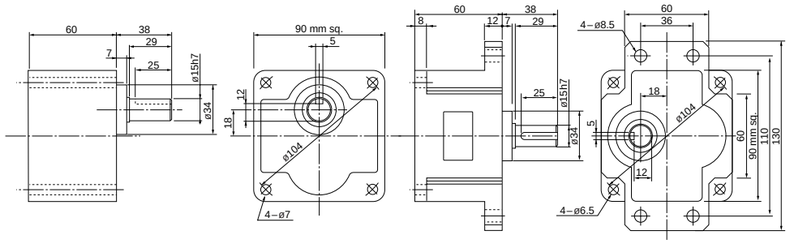
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M9RZ90GB4LG(A)	M0PC32M25G	58	35	50	50	4	M0PC5835G	58	35	55	78
M9RZ90GB4DG(A)	M0PC28M25G	58	35	50	50	4	M0PC5835G	58	35	55	78
M9RZ90GB4YG(A)	M0PC8M45G	58	35	50	50	4	M0PC5835G	58	35	55	78
M9RZ90GB4GG(A)	M0PC7M45G	58	35	50	50	4	M0PC5835G	58	35	55	78

• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

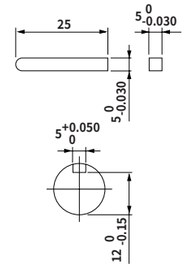
Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg
MY9G□M (metal bearing / hinge attached) Mass 1.4 kg



Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-218 | Round shaft motor dimensions B-220 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Electromagnetic brake 3-phase motor (leadwire)

80 mm sq. 25 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Brake Input (W)	Brake Current (A)	Brake Friction Torque N·m (kgf·cm)
80 mm sq.	M8MX25GB4Y	4	25	200	50	Cont.	50	0.25	1350	0.18 (1.8)	0.62	0.54 (5.5)	6	0.03	0.10 (1.0)
					60		47	0.22	1625	0.15 (1.5)	0.58	0.40 (4.0)	6	0.03	0.10 (1.0)
		4	25	220	50	Cont.	54	0.27	1375	0.18 (1.8)	0.67	0.66 (6.7)	6	0.03	0.10 (1.0)
					60		49	0.23	1650	0.15 (1.5)	0.64	0.50 (5.1)	6	0.03	0.10 (1.0)

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-221.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

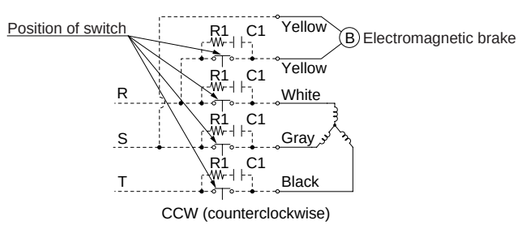
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio			3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)		50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
		60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head	MX8G3B to MX8G180B (ball bearing)	50Hz	0.39 (4.0)	0.47 (4.8)	0.66 (6.7)	0.78 (8.0)	0.98 (10)	1.18 (12)	1.27 (13)	1.57 (16)	1.96 (20)	2.35 (24)	2.55 (26)	3.14 (32)	3.82 (39)	4.61 (47)	6.37 (65)	7.64 (78)	7.84 (80)					
	MX8G3M to MX8G180M (metal bearing)	60Hz	0.32 (3.3)	0.39 (4.0)	0.55 (5.6)	0.66 (6.7)	0.81 (8.3)	0.98 (10)	1.08 (11)	1.27 (13)	1.57 (16)	1.96 (20)	2.06 (21)	2.65 (27)	3.14 (32)	3.82 (39)	5.29 (54)	6.37 (65)	7.84 (80)					
Rotational direction			Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX8G□B (ball bearing) MX8G□M (metal bearing)	MX8G10XB	Permissible torque	N·m	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84
			(kgf·cm)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)
		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

Connection diagram



CCW (counterclockwise)

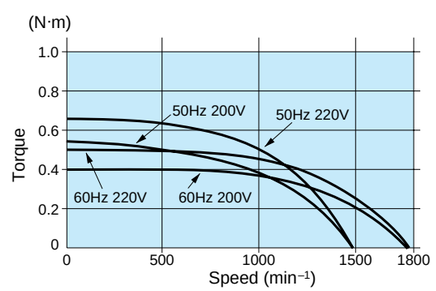
Change any two lead wires of R, S and T for CW rotation.

<Note>

1. Brake will be activated and held when electromagnetic brake power is turned OFF.
2. Protect the contacts by inserting the spark-killer circuit (R1+C1) between the contacts. R1+C1 is provided as an option (DV0P008, refer to page D-3).

Speed-torque characteristics

M8MX25GB4Y



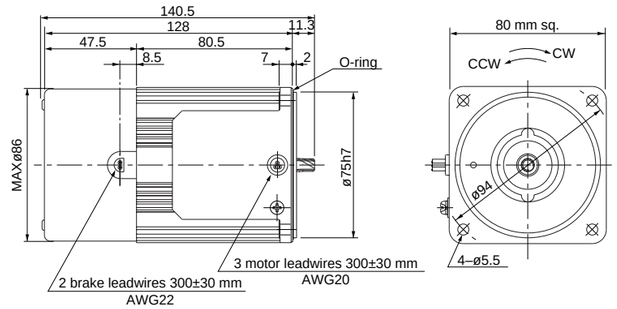
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

M8MX25GB4Y 4P 25 W 200/220 V

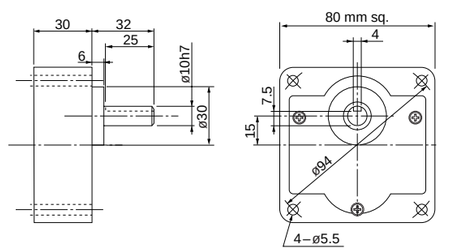
Mass	Helical	Module	Number of teeth
1.8 kg	gear	0.5	9



Gear head (dimensions)

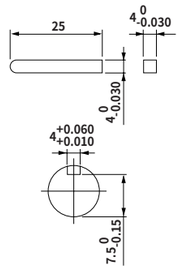
Scale: 1/3, Unit: mm

MX8G□B (ball bearing) / **MX8G□M** (metal bearing) Mass 0.6 kg



Key and keyway (dimensions) [attachment]

MX8G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Electromagnetic brake 3-phase motor (leadwire)

80 mm sq. 25 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Brake Input (W)	Brake Current (A)	Brake Friction Torque N·m (kgf·cm)
80 mm sq.	M8MX25GB4YG M8MX25GB4YGA	4	25	200	50	Cont.	50	0.25	1350	0.18 (1.8)	0.62	0.54 (5.5)	6	0.03	0.10 (1.0)
					60		47	0.22	1625	0.15 (1.5)	0.58	0.40 (4.0)	6	0.03	0.10 (1.0)
				220	60	Cont.	49	0.23	1650	0.14 (1.5)	0.64	0.50 (5.1)	6	0.03	0.10 (1.0)
				230	60	Cont.	50	0.24	1675	0.14 (1.5)	0.65	0.54 (5.5)	6	0.03	0.10 (1.0)

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-221.
• The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

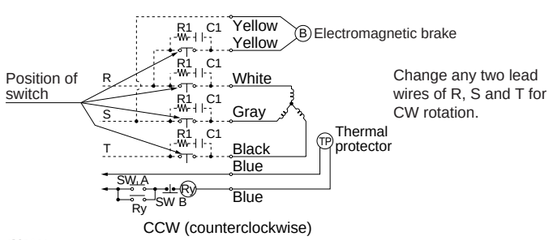
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head: MX8G3B to MX8G180B (ball bearing)	50Hz	0.39 (4.0)	0.47 (4.8)	0.66 (6.7)	0.78 (8.0)	0.98 (10)	1.18 (12)	1.27 (13)	1.57 (16)	1.96 (20)	2.35 (24)	2.55 (26)	3.14 (32)	3.82 (39)	4.61 (47)	6.37 (65)	7.64 (78)	7.84 (80)					
Applicable gear head: MX8G3M to MX8G180M (metal bearing)	60Hz	0.32 (3.3)	0.39 (4.0)	0.55 (5.6)	0.66 (6.7)	0.81 (8.3)	0.98 (10)	1.08 (11)	1.27 (13)	1.57 (16)	1.96 (20)	2.06 (21)	2.65 (27)	3.14 (32)	3.82 (39)	5.29 (54)	6.37 (65)	7.84 (80)					
Rotational direction		Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head: Bearing	Decimal gear head	Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
		Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX8G□B (ball bearing) MX8G□M (metal bearing)	MX8G10XB	Permissible torque	N·m	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84
			(kgf·cm)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)
		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

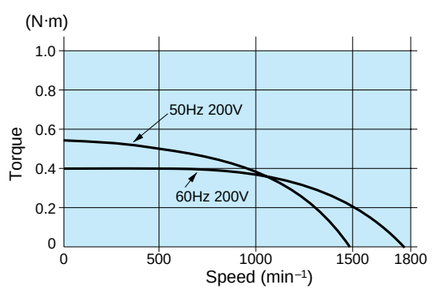
Connection diagram



<Note>
1. Brake will be activated and held when electromagnetic brake power is turned OFF.
2. Protect the contacts by inserting the spark-killer circuit (R1+C1) between the contacts. R1+C1 is provided as an option (DV0P008, refer to page D-3).
3. Refer to page A-58 for connection of thermal protector.

Speed-torque characteristics

M8MX25GB4YG(A)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

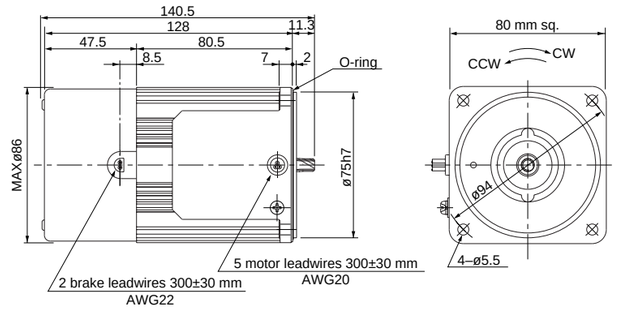
Features B-168 | System configuration B-169 | Coding system B-169 | Model list B-174

Motor (dimensions)

Scale: 1/3, Unit: mm

M8MX25GB4YG(A) 4P 25 W 200/220/230 V

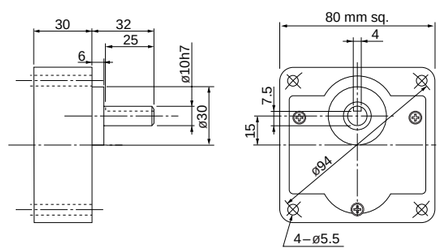
Mass	Helical	Module	Number of teeth
1.8 kg	gear	0.5	9



Gear head (dimensions)

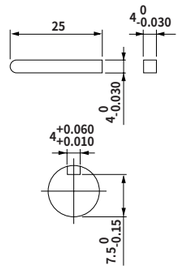
Scale: 1/3, Unit: mm

MX8G□B (ball bearing) / **MX8G□M** (metal bearing) Mass 0.6 kg



Key and keyway (dimensions) [attachment]

MX8G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-219 | Round shaft motor dimensions B-221 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Electromagnetic brake 3-phase motor (leadwire)

90 mm sq. 40 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Brake Input (W)	Brake Current (A)	Brake Friction Torque N·m (kgf·cm)
□90	M9MX40GB4Y	4	40	200	50	Cont.	69	0.31	1350	0.28 (2.9)	0.90	0.72 (7.3)	7	0.05	0.20 (2.0)
					60		68	0.29	1625	0.24 (2.4)	0.82	0.51 (5.2)	7	0.05	0.20 (2.0)
		4	40	220	50	Cont.	70	0.32	1375	0.27 (2.8)	1.00	0.88 (8.9)	7	0.05	0.20 (2.0)
					60		66	0.28	1675	0.23 (2.3)	0.91	0.63 (6.4)	7	0.05	0.20 (2.0)

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-221.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

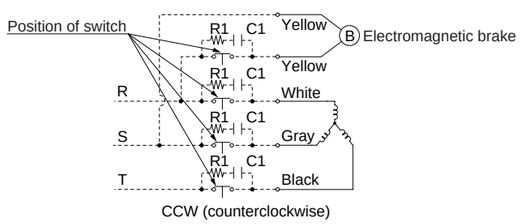
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head: MX9G3B to MX9G180B (ball bearing)	50Hz	0.66 (6.7)	0.78 (8.0)	1.08 (11)	1.27 (13)	1.57 (16)	1.86 (19)	2.25 (23)	2.74 (28)	3.23 (33)	3.92 (40)	4.41 (45)	5.29 (54)	6.37 (65)	7.94 (81)	9.80 (100)	9.80 (100)						
Applicable gear head: MX9G3M to MX9G180M (metal bearing)	60Hz	0.55 (5.6)	0.66 (6.7)	0.90 (9.2)	1.08 (11)	1.27 (13)	1.57 (16)	1.76 (18)	2.25 (23)	2.74 (28)	3.23 (33)	3.53 (36)	4.41 (45)	5.29 (54)	6.37 (65)	8.82 (90)	9.80 (100)						
Rotational direction		Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head: Bearing	Decimal gear head	Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
		Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX9G□B (ball bearing) MX9G□M (metal bearing)	MX9G10XB	Permissible torque	N·m	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80
			(kgf·cm)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

Connection diagram



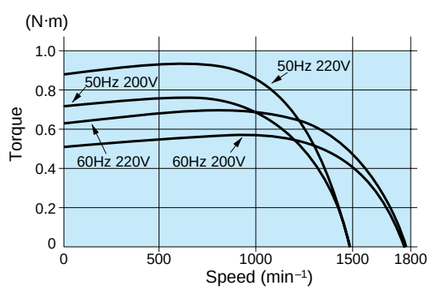
Change any two lead wires of R, S and T for CW rotation.

<Note>

1. Brake will be activated and held when electromagnetic brake power is turned OFF.
2. Protect the contacts by inserting the spark-killer circuit (R1+C1) between the contacts. R1+C1 is provided as an option (DV0P008, refer to page D-3).

Speed-torque characteristics

M9MX40GB4Y



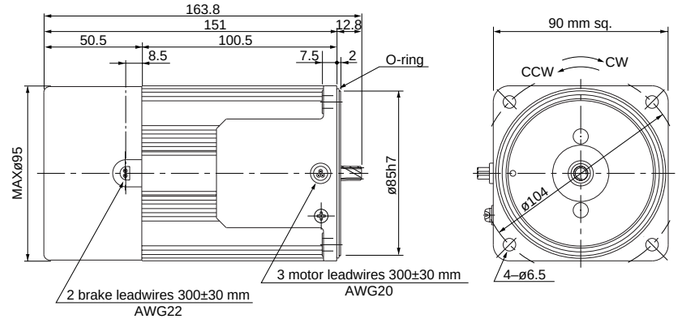
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

M9MX40GB4Y 4P 40 W 200/220 V

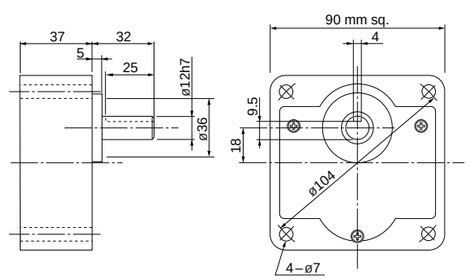
Mass	Helical gear	Module	Number of teeth
2.8 kg		0.55	9



Gear head (dimensions)

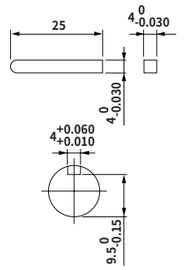
Scale: 1/3, Unit: mm

MX9G□B (ball bearing) / **MX9G□M** (metal bearing) Mass 0.8 kg



Key and keyway (dimensions) [attachment]

MX9G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Electromagnetic brake 3-phase motor (leadwire)

90 mm sq. 40 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Brake Input (W)	Brake Current (A)	Brake Friction Torque N·m (kgf·cm)
90 mm sq.	M9MX40GB4YG M9MX40GB4YGA	4	40	200	50	Cont.	69	0.31	1350	0.28 (2.9)	0.90	0.72 (7.3)	7	0.05	0.20 (2.0)
					60		68	0.29	1625	0.24 (2.4)	0.82	0.51 (5.2)	7	0.05	0.20 (2.0)
				220	60	Cont.	66	0.28	1675	0.23 (2.3)	0.91	0.63 (6.4)	7	0.05	0.20 (2.0)
				230	60	Cont.	66	0.29	1675	0.23 (2.3)	0.96	0.69 (7.0)	7	0.05	0.20 (2.0)

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-221.
• The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

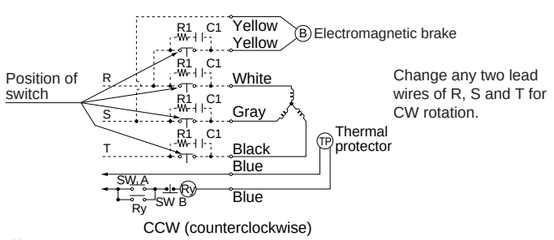
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head: MX9G3B to MX9G180B (ball bearing)	50Hz	0.66 (6.7)	0.78 (8.0)	1.08 (11)	1.27 (13)	1.57 (16)	1.86 (19)	2.25 (23)	2.74 (28)	3.23 (33)	3.92 (40)	4.41 (45)	5.29 (54)	6.37 (65)	7.94 (81)	9.80 (100)	9.80 (100)						
Applicable gear head: MX9G3M to MX9G180M (metal bearing)	60Hz	0.55 (5.6)	0.66 (6.7)	0.90 (9.2)	1.08 (11)	1.27 (13)	1.57 (16)	1.76 (18)	2.25 (23)	2.74 (28)	3.23 (33)	3.53 (36)	4.41 (45)	5.29 (54)	6.37 (65)	8.82 (90)	9.80 (100)						
Rotational direction		Same as motor rotational direction												Reverse to motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head: Bearing	Decimal gear head	Reduction ratio		200	250	300	360	500	600	750	900	1000	1200	1500	1800
		Speed (min⁻¹)	50Hz	7.5	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	9	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX9G□B (ball bearing) MX9G□M (metal bearing)	MX9G10XB	Permissible torque	N·m	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80
			(kgf·cm)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
		Rotational direction		Same as motor rotational direction	Reverse to motor rotational direction										

Connection diagram

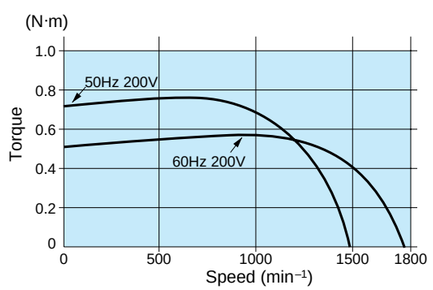


Change any two lead wires of R, S and T for CW rotation.

<Note>
1. Brake will be activated and held when electromagnetic brake power is turned OFF.
2. Protect the contacts by inserting the spark-killer circuit (R1+C1) between the contacts. R1+C1 is provided as an option (DV0P008, refer to page D-3).
3. Refer to page A-58 for connection of thermal protector.

Speed-torque characteristics

M9MX40GB4YG(A)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

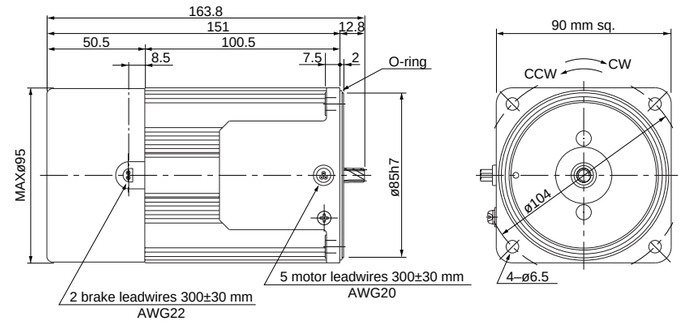
Features B-168 | System configuration B-169 | Coding system B-169 | Model list B-174

Motor (dimensions)

Scale: 1/3, Unit: mm

M9MX40GB4YG(A) 4P 40 W 200/220/230 V

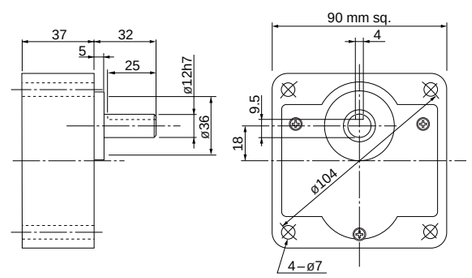
Mass	Helical	Module	Number of teeth
2.8 kg	gear	0.55	9



Gear head (dimensions)

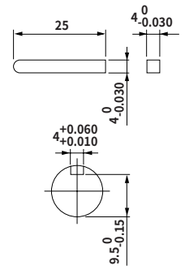
Scale: 1/3, Unit: mm

MX9G□B (ball bearing) / **MX9G□M** (metal bearing) Mass 0.8 kg



Key and keyway (dimensions) [attachment]

MX9G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-219 | Round shaft motor dimensions B-221 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Electromagnetic brake 3-phase motor (leadwire)

90 mm sq. 60 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Brake Input (W)	Brake Current (A)	Brake Friction Torque N·m (kgf·cm)
90 mm sq.	M9MZ60GB4Y	4	60	200	50	Cont.	101	0.45	1350	0.42 (4.3)	1.3	1.0 (10)	7	0.05	0.39 (4.0)
					60		96	0.41	1625	0.35 (3.6)	1.2	0.69 (7.0)	7	0.05	0.39 (4.0)
		4	60	220	50	Cont.	103	0.46	1375	0.41 (4.2)	1.5	1.2 (12)	7	0.05	0.39 (4.0)
					60		98	0.40	1650	0.34 (3.5)	1.3	0.87 (8.8)	7	0.05	0.39 (4.0)

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-221.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

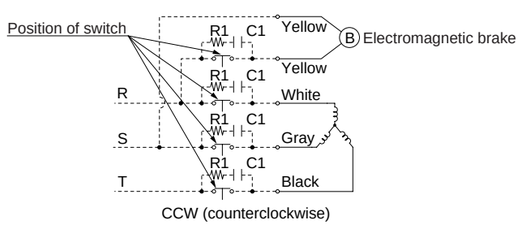
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head: MZ9G3BA to MZ9G200B (ball bearing / hinge not attached)	50Hz	0.98 (9.99)	1.18 (12)	1.57 (16)	1.96 (20)	2.35 (24)	2.94 (30)	3.14 (32)	3.92 (40)	4.70 (48)	5.59 (57)	6.27 (64)	7.55 (77)	9.11 (93)	11.0 (112)	15.2 (155)	17.8 (182)	19.6 (200)						
Applicable gear head: MY9G3MA to MY9G200M (metal bearing / hinge attached)	60Hz	0.78 (8.0)	0.98 (9.99)	1.37 (14)	1.57 (16)	1.96 (20)	2.35 (24)	2.65 (27)	3.33 (34)	3.92 (40)	4.70 (48)	5.29 (54)	6.47 (66)	7.55 (77)	9.11 (93)	12.6 (129)	15.2 (155)	19.6 (200)						
Rotational direction		Same as motor rotational direction						Reverse to motor rotational direction							Same as motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head: Bearing	Decimal gear head	Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
		Speed (min⁻¹)	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MZ9G□B (ball bearing / Hinge not attached) MY9G□M (metal bearing / Hinge attached)	MZ9G10XB	Permissible torque	N·m	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
			(kgf·cm)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

Connection diagram



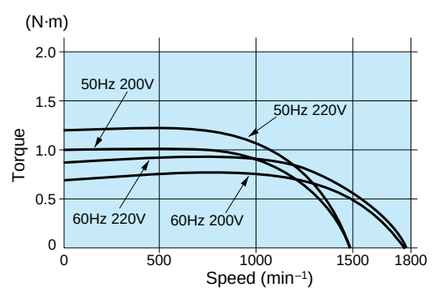
Change any two lead wires of R, S and T for CW rotation.

<Note>

1. Brake will be activated and held when electromagnetic brake power is turned OFF.
2. Protect the contacts by inserting the spark-killer circuit (R1+C1) between the contacts. R1+C1 is provided as an option (DV0P008, refer to page D-3).

Speed-torque characteristics

M9MZ60GB4Y

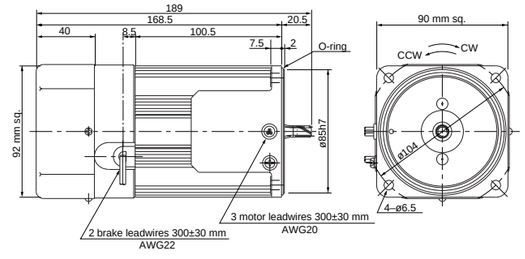


Motor (dimensions)

Scale: 1/4, Unit: mm

M9MZ60GB4Y 4P 60 W 200/220 V (with fan)

Mass	Helical	Module	Number of teeth
3.1 kg	gear	0.6	9

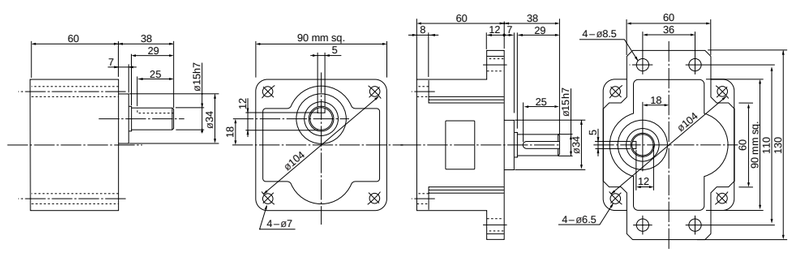


Gear head (dimensions)

Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg

MY9G□M (metal bearing / hinge attached) Mass 1.4 kg

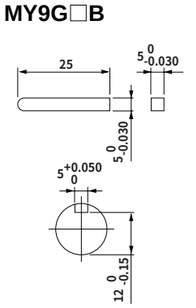


Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Electromagnetic brake 3-phase motor (leadwire)

90 mm sq. 60 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Brake Input (W)	Brake Current (A)	Brake Friction Torque N·m (kgf·cm)
90 mm sq.	M9MZ60GB4YG M9MZ60GB4YGA	4	60	200	50	Cont.	101	0.45	1350	0.42 (4.3)	1.3	1.0 (10)	7	0.05	0.39 (4.0)
					60		96	0.41	1625	0.35 (3.6)	1.2	0.69 (7.0)	7	0.05	0.39 (4.0)
				220	60	Cont.	98	0.40	1650	0.35 (3.5)	1.3	0.87 (8.8)	7	0.05	0.39 (4.0)
				230	60	Cont.	98	0.41	1675	0.34 (3.5)	1.4	1.0 (10)	7	0.05	0.39 (4.0)

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-221.
• The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

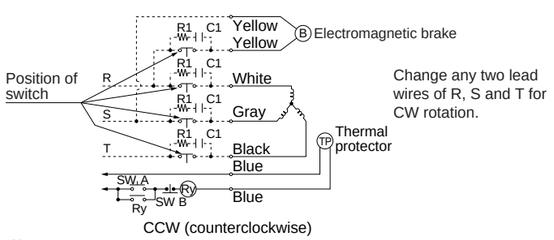
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head: MZ9G3BA to MZ9G200B (ball bearing / hinge not attached)	50Hz	0.98 (9.99)	1.18 (12)	1.57 (16)	1.96 (20)	2.35 (24)	2.94 (30)	3.14 (32)	3.92 (40)	4.70 (48)	5.59 (57)	6.27 (64)	7.55 (77)	9.11 (93)	11.0 (112)	15.2 (155)	17.8 (182)	19.6 (200)						
Applicable gear head: MY9G3MA to MY9G200M (metal bearing / hinge attached)	60Hz	0.78 (8.0)	0.98 (9.99)	1.37 (14)	1.57 (16)	1.96 (20)	2.35 (24)	2.65 (27)	3.33 (34)	3.92 (40)	4.70 (48)	5.29 (54)	6.47 (66)	7.55 (77)	9.11 (93)	12.6 (129)	15.2 (155)	19.6 (200)						
Rotational direction		Same as motor rotational direction							Reverse to motor rotational direction						Same as motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head: Bearing	Decimal gear head	Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
		Speed (min⁻¹)	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MZ9G□B (ball bearing / Hinge not attached) MY9G□M (metal bearing / Hinge attached)	MZ9G10XB	Permissible torque	N·m	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
			(kgf·cm)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

Connection diagram

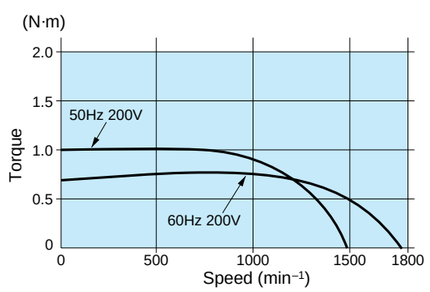


Change any two lead wires of R, S and T for CW rotation.

<Note>
1. Brake will be activated and held when electromagnetic brake power is turned OFF.
2. Protect the contacts by inserting the spark-killer circuit (R1+C1) between the contacts. R1+C1 is provided as an option (DV0P008, refer to page D-3).
3. Refer to page A-58 for connection of thermal protector.

Speed-torque characteristics

M9MZ60GB4YG(A)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

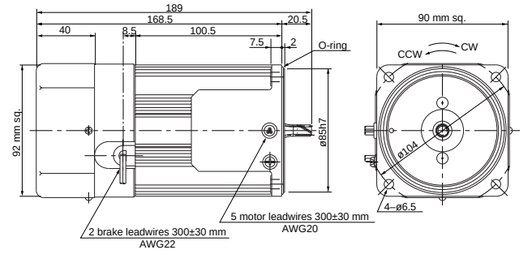
Features B-168 | System configuration B-169 | Coding system B-169 | Model list B-174

Motor (dimensions)

Scale: 1/4, Unit: mm

M9MZ60GB4YG(A) 4P 60 W 200/220/230 V (with fan)

Mass	Helical	Module	Number of teeth
3.1 kg	gear	0.6	9

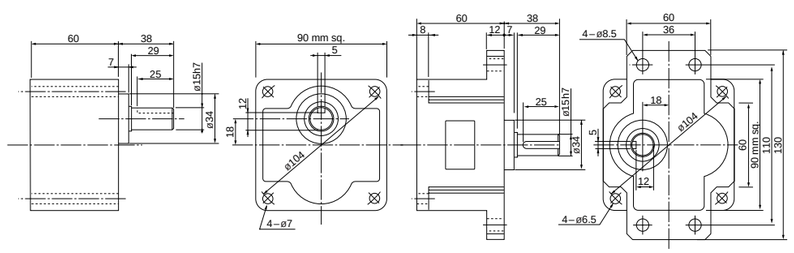


Gear head (dimensions)

Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg

MY9G□M (metal bearing / hinge attached) Mass 1.4 kg

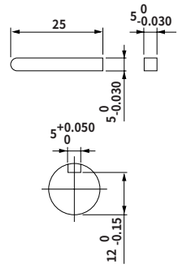


Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Gear head combination B-219 | Round shaft motor dimensions B-221 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Electromagnetic brake 3-phase motor (leadwire)

90 mm sq. 90 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Brake Input (W)	Brake Current (A)	Brake Friction Torque N·m (kgf·cm)
90 mm sq.	M9MZ90GB4Y	4	90	200	50	Cont.	141	0.62	1350	0.63 (6.4)	2.0	1.6 (16)	7	0.05	0.39 (4.0)
					60		137	0.56	1625	0.53 (5.4)	1.8	1.1 (11)	7	0.05	0.39 (4.0)
		4	90	220	50	Cont.	143	0.65	1400	0.62 (6.3)	2.2	2.0 (20)	7	0.05	0.39 (4.0)
					60		137	0.56	1650	0.52 (5.3)	2.0	1.4 (14)	7	0.05	0.39 (4.0)

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-221.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

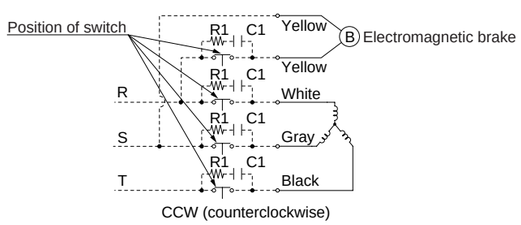
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head: MZ9G3B to MZ9G200B (ball bearing / hinge not attached)	50Hz	1.37 (14)	1.67 (17)	2.25 (23)	2.74 (28)	3.43 (35)	4.12 (42)	4.51 (46)	5.68 (58)	6.76 (69)	8.04 (82)	9.02 (92)	10.9 (111)	13.0 (133)	15.7 (160)	19.6 (200)	19.6 (200)								
Applicable gear head: MY9G3B to MY9G200B (ball bearing / hinge attached)	60Hz	1.18 (12)	1.37 (14)	1.86 (19)	2.25 (23)	2.84 (29)	3.43 (35)	3.72 (38)	4.70 (48)	5.68 (58)	6.76 (69)	7.55 (77)	9.21 (94)	10.9 (111)	13.0 (133)	18.3 (187)	19.6 (200)								
Rotational direction		Same as motor rotational direction							Reverse to motor rotational direction						Same as motor rotational direction										

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head: Bearing	Decimal gear head	Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
		Speed (min⁻¹)	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	MZ9G10XB	Permissible torque	N·m (kgf·cm)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

Connection diagram



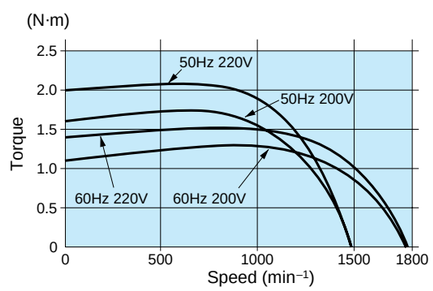
Change any two lead wires of R, S and T for CW rotation.

<Note>

1. Brake will be activated and held when electromagnetic brake power is turned OFF.
2. Protect the contacts by inserting the spark-killer circuit (R1+C1) between the contacts. R1+C1 is provided as an option (DV0P008, refer to page D-3).

Speed-torque characteristics

M9MZ90GB4Y



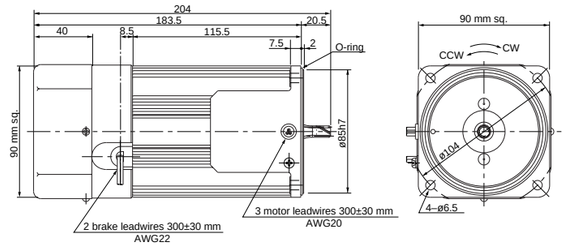
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/4, Unit: mm

M9MZ90GB4Y 4P 90 W 200/220 V (with fan)

Mass	Helical	Module	Number of teeth
3.7 kg	gear	0.6	9

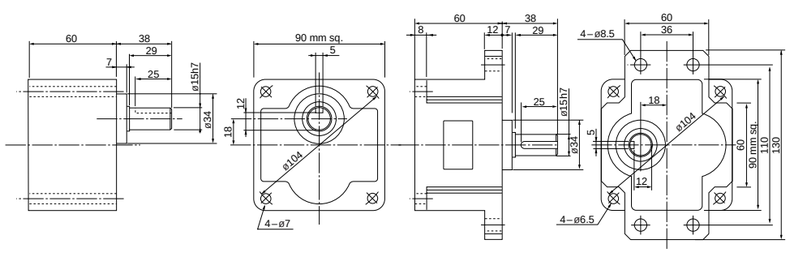


Gear head (dimensions)

Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg

MY9G□M (metal bearing / hinge attached) Mass 1.4 kg

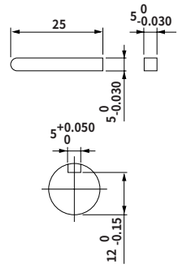


Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Electromagnetic brake 3-phase motor (leadwire)

90 mm sq. 90 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Brake Input (W)	Brake Current (A)	Brake Friction Torque N·m (kgf·cm)
90 mm sq.	M9MZ90GB4YG M9MZ90GB4YGA	4	90	200	50	Cont.	142	0.62	1350	0.63 (6.4)	2.0	1.6 (16)	7	0.05	0.39 (4.0)
					60		138	0.56	1625	0.53 (5.4)	1.8	1.1 (11)	7	0.05	0.39 (4.0)
				220	60	Cont.	137	0.56	1650	0.52 (5.3)	2.0	1.4 (14)	7	0.05	0.39 (4.0)
				230	60	Cont.	137	0.58	1675	0.51 (5.2)	2.1	1.6 (16)	7	0.05	0.39 (4.0)

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-221.
• The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

• Permissible torque at output shaft of gear head

* The speed shown below is a calculated value based on the synchronous rotational speed. Depending on the load, the speed is less than the indicated value by 2 to 20%.

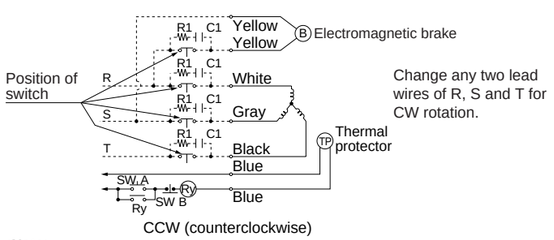
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min⁻¹)	50Hz	500	416.7	300	250	200	166.7	150	120	100	83.3	75	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	600	500	360	300	240	200	180	144	120	100	90	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head: MZ9G3B to MZ9G200B (ball bearing / hinge not attached)	50Hz	1.37 (14)	1.67 (17)	2.25 (23)	2.74 (28)	3.43 (35)	4.12 (42)	4.51 (46)	5.68 (58)	6.76 (69)	8.04 (82)	9.02 (92)	10.9 (111)	13.0 (133)	15.7 (160)	19.6 (200)	19.6 (200)							
Applicable gear head: MY9G3B to MY9G200B (ball bearing / hinge attached)	60Hz	1.18 (12)	1.37 (14)	1.86 (19)	2.25 (23)	2.84 (29)	3.43 (35)	3.72 (38)	4.70 (48)	5.68 (58)	6.76 (69)	7.55 (77)	9.21 (94)	10.9 (111)	13.0 (133)	18.3 (187)	19.6 (200)							
Rotational direction		Same as motor rotational direction							Reverse to motor rotational direction						Same as motor rotational direction									

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head: Bearing	Decimal gear head	Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
		Speed (min⁻¹)	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.8
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	MZ9G10XB	Permissible torque	N·m	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
			(kgf·cm)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)
		Rotational direction		Reverse to motor rotational direction		Same as motor rotational direction								

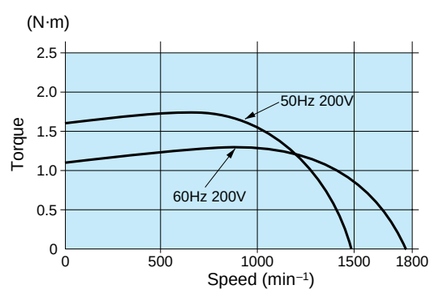
Connection diagram



<Note>
1. Brake will be activated and held when electromagnetic brake power is turned OFF.
2. Protect the contacts by inserting the spark-killer circuit (R1+C1) between the contacts. R1+C1 is provided as an option (DV0P008, refer to page D-3).
3. Refer to page A-58 for connection of thermal protector.

Speed-torque characteristics

M9MZ90GB4YG(A)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

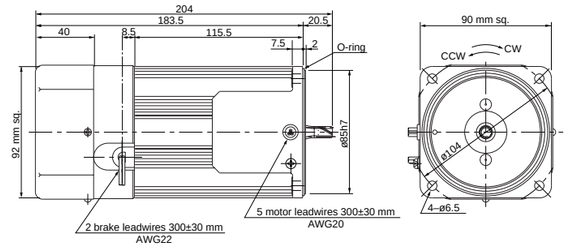
Features B-168 | System configuration B-169 | Coding system B-169 | Model list B-174

Motor (dimensions)

Scale: 1/4, Unit: mm

M9MZ90GB4YG(A) 4P 90 W 200/220/230 V (with fan)

Mass	Helical	Module	Number of teeth
3.7 kg	gear	0.6	9

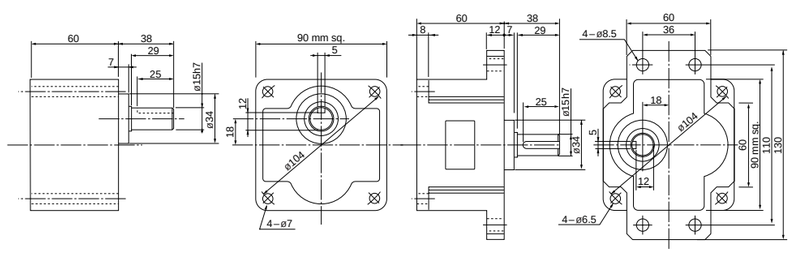


Gear head (dimensions)

Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg

MY9G□M (metal bearing / hinge attached) Mass 1.4 kg

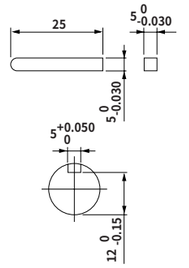


Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



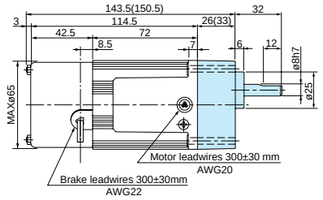
Gear head combination B-219 | Round shaft motor dimensions B-221 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Electromagnetic brake single-phase motor (leadwire) — Gear head combination dimensions

Scale: 1/4, Unit: mm

60 mm sq. 6 W

M6RX6GB4L + MX6G□BA(MA) / MX6G□B(M)
M6RX6GB4Y + MX6G□BA(MA) / MX6G□B(M)
M6RX6GB4LG(A) + MX6G□BA(MA) / MX6G□B(M)
M6RX6GB4DG(A) + MX6G□BA(MA) / MX6G□B(M)
M6RX6GB4YG(A) + MX6G□BA(MA) / MX6G□B(M)
M6RX6GB4GG(A) + MX6G□BA(MA) / MX6G□B(M)

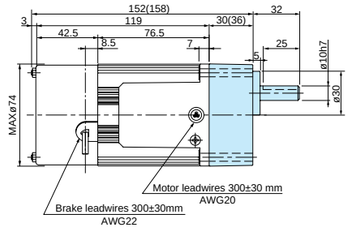


* Figures in ( ) represent the dimensions of MX6G□B (M) (1/30 or larger reduction ratio).

(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX6G□BA (MA).)

70 mm sq. 15 W

M7RX15GB4L + MX7G□BA(MA) / MX7G□B(M)
M7RX15GB4Y + MX7G□BA(MA) / MX7G□B(M)
M7RX15GB4LG(A) + MX7G□BA(MA) / MX7G□B(M)
M7RX15GB4DG(A) + MX7G□BA(MA) / MX7G□B(M)
M7RX15GB4YG(A) + MX7G□BA(MA) / MX7G□B(M)
M7RX15GB4GG(A) + MX7G□BA(MA) / MX7G□B(M)

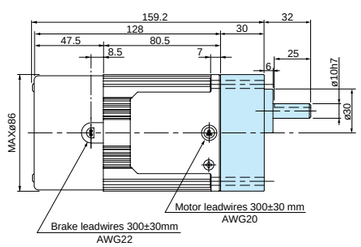


* Figures in ( ) represent the dimensions of MX7G□B (M) (1/30 or larger reduction ratio).

(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX7G□BA (MA).)

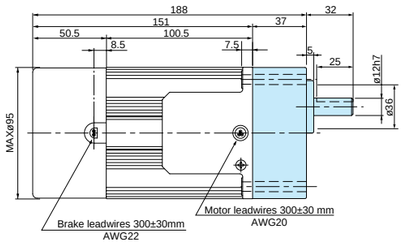
80 mm sq. 25 W

M8RX25GB4L + MX8G□B(M)
M8RX25GB4Y + MX8G□B(M)
M8RX25GB4LG(A) + MX8G□B(M)
M8RX25GB4DG(A) + MX8G□B(M)
M8RX25GB4YG(A) + MX8G□B(M)
M8RX25GB4GG(A) + MX8G□B(M)



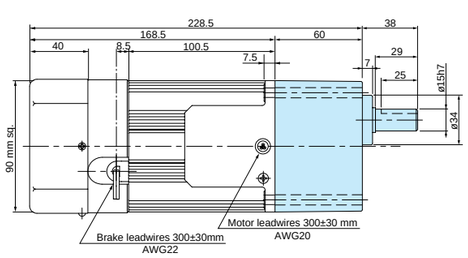
90 mm sq. 40 W

M9RX40GB4L + MX9G□B(M)
M9RX40GB4Y + MX9G□B(M)
M9RX40GB4LG(A) + MX9G□B(M)
M9RX40GB4DG(A) + MX9G□B(M)
M9RX40GB4YG(A) + MX9G□B(M)
M9RX40GB4GG(A) + MX9G□B(M)



90 mm sq. 60 W

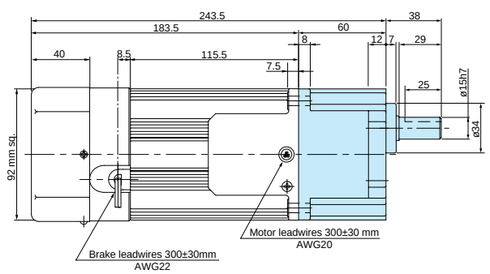
M9RZ60GB4L + MZ9G□B (MY9G□B)
M9RZ60GB4Y + MZ9G□B (MY9G□B)
M9RZ60GB4LG(A) + MZ9G□B (MY9G□B)
M9RZ60GB4DG(A) + MZ9G□B (MY9G□B)
M9RZ60GB4YG(A) + MZ9G□B (MY9G□B)
M9RZ60GB4GG(A) + MZ9G□B (MY9G□B)



* Refer to page B-380 for high torque gear head.

90 mm sq. 90 W

M9RZ90GB4L + MY9G□B (MZ9G□B)
M9RZ90GB4Y + MY9G□B (MZ9G□B)
M9RZ90GB4LG(A) + MY9G□B (MZ9G□B)
M9RZ90GB4DG(A) + MY9G□B (MZ9G□B)
M9RZ90GB4YG(A) + MY9G□B (MZ9G□B)
M9RZ90GB4GG(A) + MY9G□B (MZ9G□B)



* Refer to page B-380 for high torque gear head.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

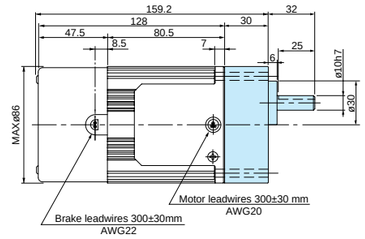
Features B-168 | System configuration B-169 | Coding system B-169 | Model list B-174

Electromagnetic brake 3-phase motor (leadwire) — Gear head combination dimensions

Scale: 1/4, Unit: mm

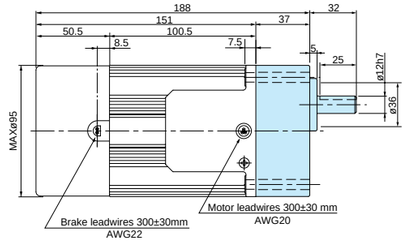
80 mm sq. 25 W

M8MX25GB4Y + MX8G□B(M)
M8MX25GB4YG(A) + MX8G□B(M)



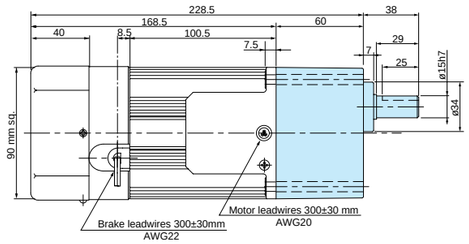
90 mm sq. 40 W

M9MX40GB4Y + MX9G□B(M)
M9MX40GB4YG(A) + MX9G□B(M)



90 mm sq. 60 W

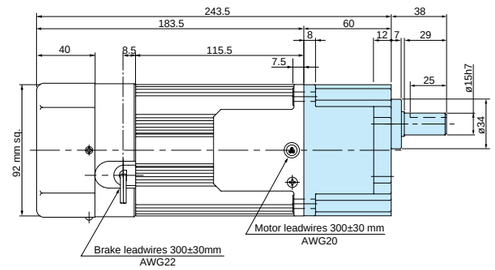
M9MZ60GB4Y + MZ9G□B (MY9G□B)
M9MZ60GB4YG(A) + MZ9G□B (MY9G□B)



* Refer to page B-380 for high torque gear head.

90 mm sq. 90 W

M9MZ90GB4Y + MY9G□B (MZ9G□B)
M9MZ90GB4YG(A) + MY9G□B (MZ9G□B)



* Refer to page B-380 for high torque gear head.

* The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
* The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

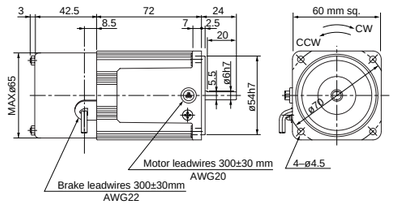
Specifications B-178 to B-217 | Control related product C-4 | Option D-2

Electromagnetic brake single-phase motor (4-pole round shaft / leadwire)

Dimensions
Scale: 1/4, Unit: mm

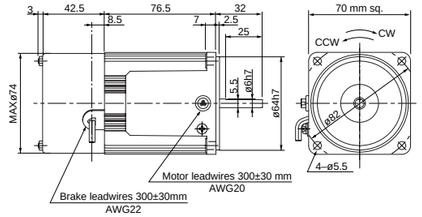
60 mm sq. 6 W — Mass 0.85 kg

M6RX6SB4LS **M6RX6SB4LG(A)**
M6RX6SB4YS **M6RX6SB4DG(A)**
M6RX6SB4YG(A)
M6RX6SB4GG(A)



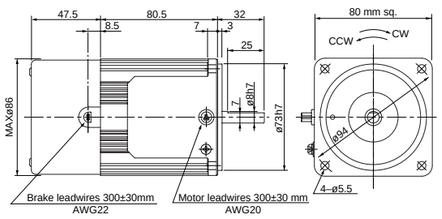
70 mm sq. 15 W — Mass 1.1 kg

M7RX15SB4LS **M7RX15SB4LG(A)**
M7RX15SB4YS **M7RX15SB4DG(A)**
M7RX15SB4YG(A)
M7RX15SB4GG(A)



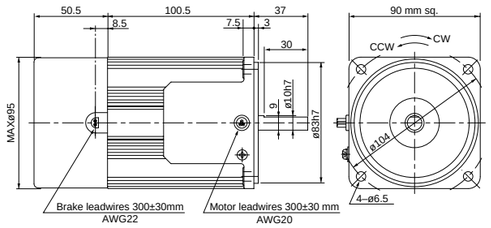
80 mm sq. 25 W — Mass 1.8 kg

M8RX25SB4LS **M8RX25SB4LG(A)**
M8RX25SB4YS **M8RX25SB4DG(A)**
M8RX25SB4YG(A)
M8RX25SB4GG(A)



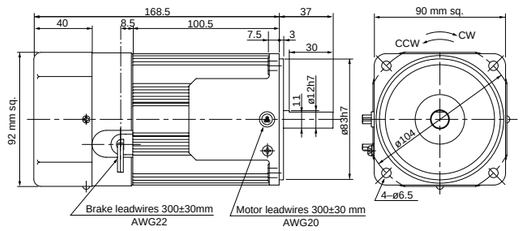
90 mm sq. 40 W — Mass 2.8 kg

M9RX40SB4LS **M9RX40SB4LG(A)**
M9RX40SB4YS **M9RX40SB4DG(A)**
M9RX40SB4YG(A)
M9RX40SB4GG(A)



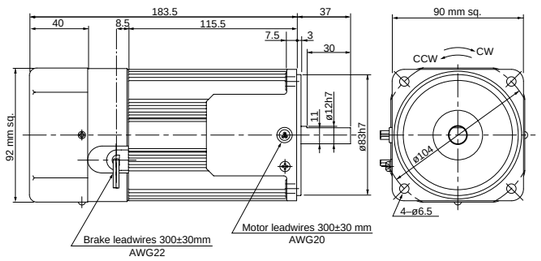
90 mm sq. 60 W — Mass 3.1 kg

M9RZ60SB4LS (with fan) **M9RZ60SB4LG(A)** (with fan)
M9RZ60SB4YS (with fan) **M9RZ60SB4DG(A)** (with fan)
M9RZ60SB4YG(A) (with fan)
M9RZ60SB4GG(A) (with fan)



90 mm sq. 90 W — Mass 3.7 kg

M9RZ90SB4LS (with fan) **M9RZ90SB4LG(A)** (with fan)
M9RZ90SB4YS (with fan) **M9RZ90SB4DG(A)** (with fan)
M9RZ90SB4YG(A) (with fan)
M9RZ90SB4GG(A) (with fan)



*The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
*The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

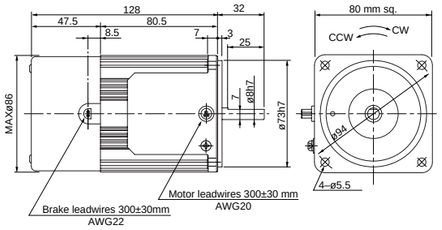
Features B-168 | System configuration B-169 | Coding system B-169 | Model list B-174

Electromagnetic brake 3-phase motor (4-pole round shaft / leadwire)

Dimensions
Scale: 1/4, Unit: mm

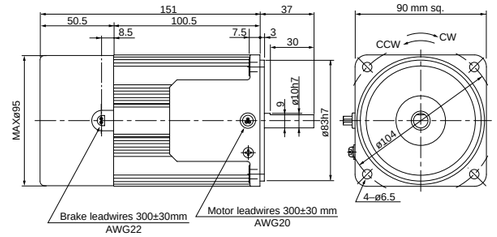
80 mm sq. 25 W — Mass 1.8 kg

M8MX25SB4YS
M8MX25SB4YG(A)



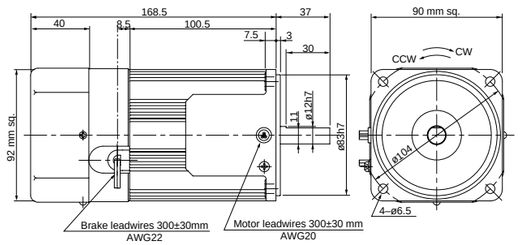
90 mm sq. 40 W — Mass 2.8 kg

M9MX40SB4YS
M9MX40SB4YG(A)



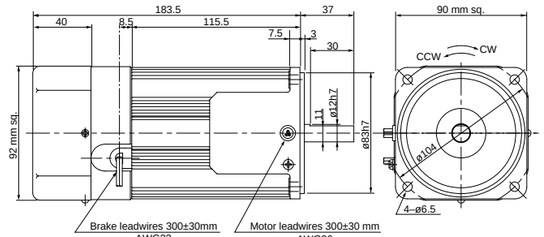
90 mm sq. 60 W — Mass 3.1 kg

M9MZ60SB4YS (with fan)
M9MZ60SB4YG(A) (with fan)



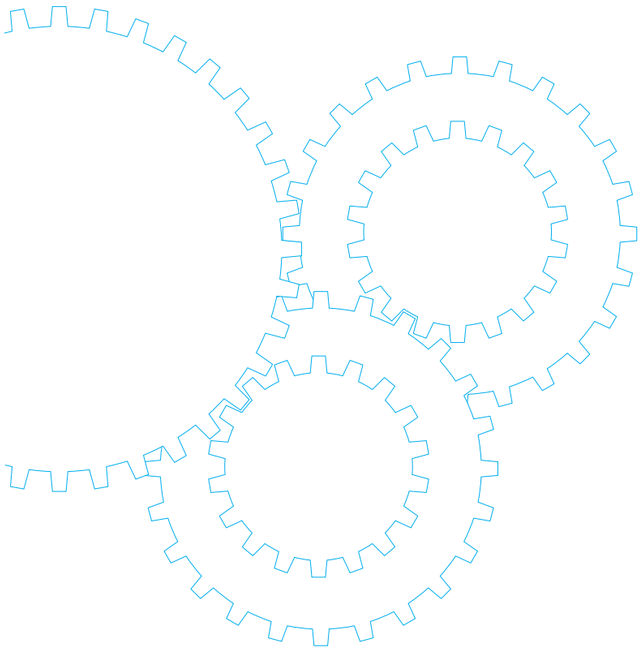
90 mm sq. 90 W — Mass 3.7 kg

M9MZ90SB4YS (with fan)
M9MZ90SB4YG(A) (with fan)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Variable Speed Induction Motor



Contents

Outline of variable speed induction motor

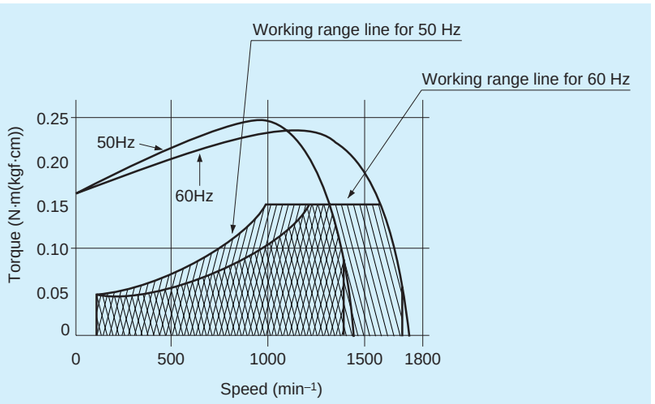
Features

- By using it together with a speed controller, you can vary the speed over a wider range (90 to 1400 min^{-1} for 50 Hz and 90 to 1700 min^{-1} for 60 Hz).
- Various functions such as variable speed, braking, normal/reverse run and soft-start/soft-stop are available.
- Feedback control with the built-in tacho-generator gives a constant speed despite of frequency change.
- The motor output is 3 W to 90 W.

Working range

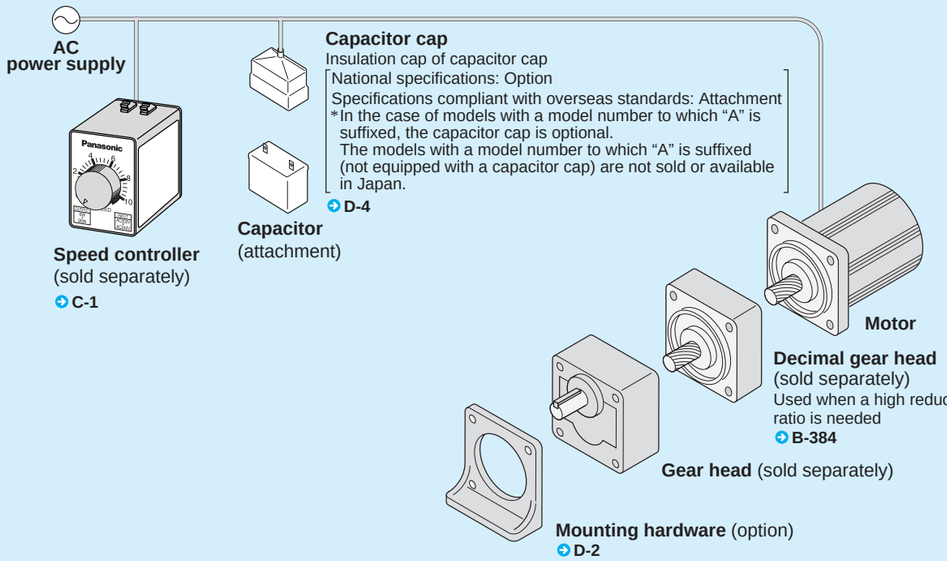
The working range line shows the working limit (at the constant rating) for the variable speed motor. The permissible torque should fall within the shaded portion.
If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

• Working range line



Example : M81X25GV4L 4P 25W

System configuration diagram



Coding system

M 9 1 X 40 G V 4 L S A

9 Size
- 6 : 60 mm sq.
- 7 : 70 mm sq.
- 8 : 80 mm sq.
- 9 : 90 mm sq.

1 Motor type
- 1 : Induction motor

X Output type
- X : 40 W or smaller
- Z : 60 W or larger

40 Output
- 3 : 3 W
- 6 : 6 W
- 10 : 10 W
- 15 : 15 W
- 25 : 25 W
- 40 : 40 W
- 60 : 60 W
- 90 : 90 W

G Shape of shaft
- G : Pinion shaft
- S : Round shaft

V Option
- V : Variable speed

4 No. of poles
- 4 : 4 poles

L Voltage
- L : 100 V
- Y : 200 V
- D : 110/115 V
- G : 220/230 V

S Classification
- Motor with specifications compliant with overseas standards that is not equipped with a capacitor cap.
- G : Specifications compliant with overseas standards
- S : Round shaft
  (S for round shaft with national specifications only)

A

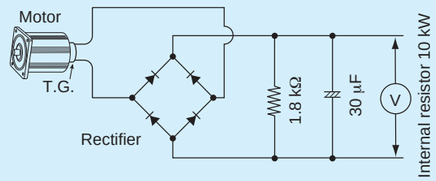
Corresponding model number	Shape of shaft	Classification
Specifications compliant with overseas standards Pinion shaft	G	G
Specifications compliant with overseas standards Round shaft	S	G
National specifications Pinion shaft	G	–
National specifications Round shaft	S	S
42 mm sq. round shaft specifications	S	–

Outline of variable speed induction motor

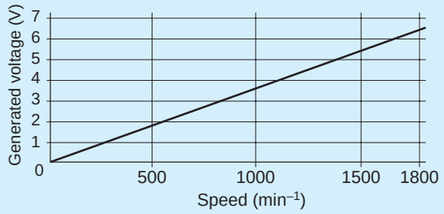
Voltage generation of tacho-generator

The tacho-generator attached directly to the variable speed motor generate a voltage almost in proportion to the motor speed as shown in the figure below. (You can measure it with an AC tester simply.)

• Voltage generation of tacho-generator



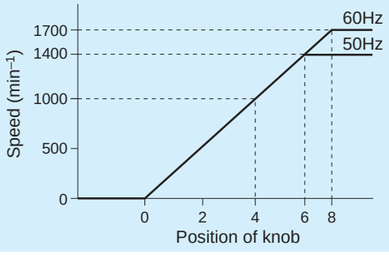
Measuring Circuit Diagram



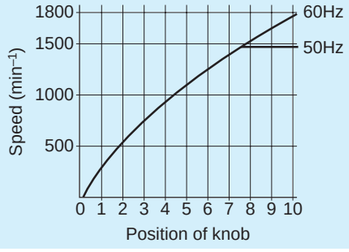
Setting of Speed

In the case of the MGSD type and SD type, the built-in speed reference is used to set the speed. In the case of the EX type, the external speed reference is used to set the speed. The figure below shows an example of the relation between the position of the speed setting knob and the speed of the motor. (Note that there is an approx. 10% fluctuation due to variations in the voltage generation of the circuit and tacho-generator.)

• MGSD type



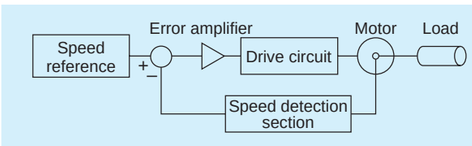
• SD and EX type



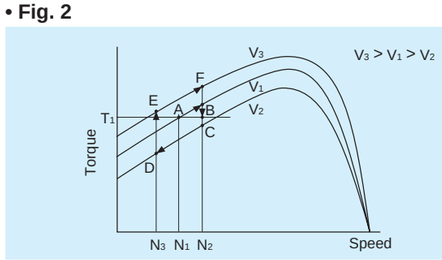
Principle of closed loop system speed control

The closed loop system speed control is described below according to Fig. 1. The motor speed is converted to a corresponding voltage in the speed detection section and compared with the voltage set in the speed setting section. The difference between them is called an error voltage. Based on the error voltage, the motor is driven through the error amplifier and drive circuit. Because the error voltage is controlled practically to zero, the speed is determined by the value set in the speed setting section. Therefore the speed scarcely changes even if the load changes, and the speed changes according to the speed setting when the setting is changed.
In the case of the closed loop system speed control, as described above, the motor speed is detected and the drive voltage is controlled so as to keep the speed constant.

• Fig. 1



• Fig. 2



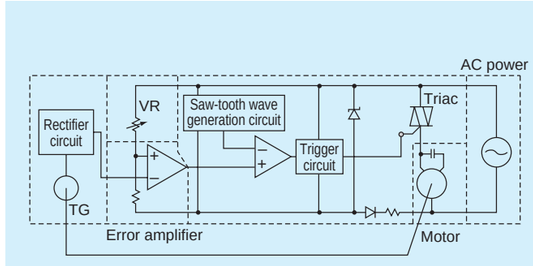
Primary voltage control through closed loop

Fig. 2 shows the relation between the motor torque and speed when the voltage (primary voltage) applied to the motor is changed. Assume that the voltage is V1, the load torque is T1 and the resulting speed is N1. If the motor is being accelerated at this point A, when the voltage is changed from V1 to V2 with the motor status at point B, the motor status moves to point C. Because load torque T1 is larger than the motor torque at point C, the speed is reduced from N2.
When the voltage is increased to V3 with the speed being N3, because the motor status moves to point E, the applied torque becomes larger than the load torque and the motor is accelerated again toward point F. By controlling the primary voltage so as to making this loop "C → D → E → F" sufficiently small and producing it continuously, a stable rotation can be obtained. In the case of the primary voltage control through closed loop, the motor speed is detected and the speed is kept constant by controlling the primary voltage according to the change of the speed.

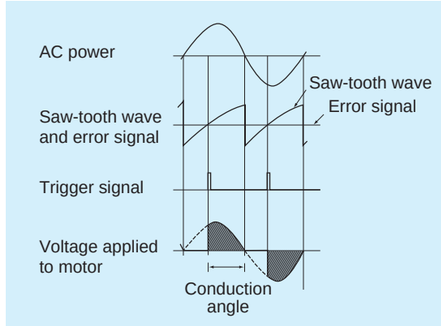
Operation of speed controller

The operation of our speed controller is described below using Fig. 3. The motor speed is detected by the tachometer generator TG and the feedback voltage is obtained through the rectifier circuit.
The difference between the voltage set with the VR and the feedback voltage is amplified by the error amplifier. Based on the saw-tooth wave obtained from the saw-tooth wave generation circuit and the error signal, the trigger signal of the triac is generated through the comparator and trigger circuit. The conduction angle of the triac is controlled with the trigger signal to adjust the voltage applied to the motor.
As a result, the motor is controlled so as to keep the speed constant. (Refer to Fig. 4.)

• Fig. 3



• Fig. 4



Model list of variable speed induction motor

Pinion shaft motor

Applicable gear head

✪ Motor compliant with overseas standards

Hinge attached

Size	Output (W)	Leadwire type				Standard gear head		High torque gear head	Right-angle gear head	Decimal gear head
		Model number	Specifications		Page	Ball bearing	metal bearing			
60 mm sq.	3	M61X3GV4L	100V		B-232	MX6G□BA MX6G□B	MX6G□MA MX6G□M	–	–	MX6G10XB
	6	M61X6GV4L	100V		B-234					
		M61X6GV4Y	200V		B-234					
		M61X6GV4LG(A)	100V	✪	B-236					
		M61X6GV4DG(A)	110/115V	✪	B-236					
		M61X6GV4YG(A)	200V	✪	B-236					
		M61X6GV4GG(A)	220/230V	✪	B-236					
70 mm sq.	10	M71X10GV4L	100V		B-238	MX7G□BA MX7G□B	MX7G□MA MX7G□M	–	–	MX7G10XB
		M71X10GV4Y	200V		B-238					
	15	M71X15GV4L	100V		B-240					
		M71X15GV4Y	200V		B-240					
		M71X15GV4LG(A)	100V	✪	B-242					
		M71X15GV4DG(A)	110/115V	✪	B-242					
		M71X15GV4YG(A)	200V	✪	B-242					
		M71X15GV4GG(A)	220/230V	✪	B-242					
80 mm sq.	15	M81X15GV4L	100V		B-244	MX8G□B	MX8G□M	–	–	MX8G10XB
		M81X15GV4Y	200V		B-244					
	25	M81X25GV4L	100V		B-246					
		M81X25GV4Y	200V		B-246					
		M81X25GV4LG(A)	100V	✪	B-248					
		M81X25GV4DG(A)	110/115V	✪	B-248					
		M81X25GV4YG(A)	200V	✪	B-248					
		M81X25GV4GG(A)	220/230V	✪	B-248					
90 mm sq.	40	M91X40GV4L	100V		B-250	MX9G□B	MX9G□M	–	MX9G□R	MX9G10XB
		M91X40GV4Y	200V		B-250					
		M91X40GV4LG(A)	100V	✪	B-252					
		M91X40GV4DG(A)	110/115V	✪	B-252					
		M91X40GV4YG(A)	200V	✪	B-252					
		M91X40GV4GG(A)	220/230V	✪	B-252					
	60	M91Z60GV4L	100V		B-254	MZ9G□B MY9G□B	–	MR9G□B MP9G□B	MZ9G□R	MZ9G10XB
		M91Z60GV4Y	200V		B-254					
		M91Z60GV4LG(A)	100V	✪	B-256					
		M91Z60GV4DG(A)	110/115V	✪	B-256					
		M91Z60GV4YG(A)	200V	✪	B-256					
		M91Z60GV4GG(A)	220/230V	✪	B-256					
	90	M91Z90GV4L	100V		B-258					
		M91Z90GV4Y	200V		B-258					
		M91Z90GV4LG(A)	100V	✪	B-260					
		M91Z90GV4DG(A)	110/115V	✪	B-260					
		M91Z90GV4YG(A)	200V	✪	B-260					
		M91Z90GV4GG(A)	220/230V	✪	B-260					

* The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

* Refer to page B-380 for dimensions and permissible torque of high torque gear head.
Refer to page B-382 for dimensions and permissible torque of right-angle gear head.
Refer to page B-384 for dimensions of decimal gear head.

Model list of variable speed induction motor

Round shaft motor

✪ Motor compliant with overseas standards

Size	Output (W)	Leadwire type		
		Model number	Specifications	
60 mm sq.	3	**M61X3SV4LS**	100V	
	6	**M61X6SV4LS**	100V	
		M61X6SV4YS	200V	
		M61X6SV4LG(A)	100V	✪
		M61X6SV4DG(A)	110/115V	✪
		M61X6SV4YG(A)	200V	✪
		M61X6SV4GG(A)	220/230V	✪
70 mm sq.	10	**M71X10SV4LS**	100V	
		M71X10SV4YS	200V	
	15	**M71X15SV4LS**	100V	
		M71X15SV4YS	200V	
		M71X15SV4LG(A)	100V	✪
		M71X15SV4DG(A)	110/115V	✪
		M71X15SV4YG(A)	200V	✪
		M71X15SV4GG(A)	220/230V	✪
80 mm sq.	15	**M81X15SV4LS**	100V	
		M81X15SV4YS	200V	
	25	**M81X25SV4LS**	100V	
		M81X25SV4YS	200V	
		M81X25SV4LG(A)	100V	✪
		M81X25SV4DG(A)	110/115V	✪
		M81X25SV4YG(A)	200V	✪
		M81X25SV4GG(A)	220/230V	✪
90 mm sq.	40	**M91X40SV4LS**	100V	
		M91X40SV4YS	200V	
		M91X40SV4LG(A)	100V	✪
		M91X40SV4DG(A)	110/115V	✪
		M91X40SV4YG(A)	200V	✪
		M91X40SV4GG(A)	220/230V	✪
	60	**M91Z60SV4LS**	100V	
		M91Z60SV4YS	200V	
		M91Z60SV4LG(A)	100V	✪
		M91Z60SV4DG(A)	110/115V	✪
		M91Z60SV4YG(A)	200V	✪
		M91Z60SV4GG(A)	220/230V	✪
	90	**M91Z90SV4LS**	100V	
		M91Z90SV4YS	200V	
		M91Z90SV4LG(A)	100V	✪
		M91Z90SV4DG(A)	110/115V	✪
		M91Z90SV4YG(A)	200V	✪
		M91Z90SV4GG(A)	220/230V	✪

* The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft motor.
  Dimensional outline drawing → Page B-264.
* The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
  The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

Possible combination of speed controller and motor

Size	Output (W)	Motor		Voltage (V)	Speed controller			
		Certified	Part No.		MGSD type	EX type	SD48 type	EX48 type
60 mm sq.	3	-----	M61X3GV4L	100	MGSDA1 ★	DV1131	DVSD48AL	DVEX48AL
	6	-----	M61X6GV4L	100	MGSDA1 ★	DV1131	DVSD48AL	DVEX48AL
		-----	M61X6GV4Y	200	MGSDB2 ★	DV1231	DVSD48AY	DVEX48AY
		✪	M61X6GV4LG(A)	100	MGSDA1 ★	-----	-----	-----
		✪	M61X6GV4DG(A)	110/115	MGSDA1 ★	-----	-----	-----
		✪	M61X6GV4YG(A)	200	MGSDB2 ★	-----	-----	-----
		✪	M61X6GV4GG(A)	220/230	MGSDB2 ★	-----	-----	-----
70 mm sq.	10	-----	M71X10GV4L	100	MGSDA1 ★	DV1131	DVSD48AL	DVEX48AL
		-----	M71X10GV4Y	200	MGSDB2 ★	DV1231	DVSD48AY	DVEX48AY
	15	-----	M71X15GV4L	100	MGSDA1 ★	DV1132	DVSD48AL	DVEX48AL
		-----	M71X15GV4Y	200	MGSDB2 ★	DV1231	DVSD48AY	DVEX48AY
		✪	M71X15GV4LG(A)	100	MGSDA1 ★	-----	-----	-----
		✪	M71X15GV4DG(A)	110/115	MGSDA1 ★	-----	-----	-----
		✪	M71X15GV4YG(A)	200	MGSDB2 ★	-----	-----	-----
		✪	M71X15GV4GG(A)	220/230	MGSDB2 ★	-----	-----	-----
80 mm sq.	15	-----	M81X15GV4L	100	MGSDA1 ★	DV1132	DVSD48AL	DVEX48AL
		-----	M81X15GV4Y	200	MGSDB2 ★	DV1231	DVSD48AY	DVEX48AY
	25	-----	M81X25GV4L	100	MGSDA1 ★	DV1132	DVSD48BL	DVEX48BL
		-----	M81X25GV4Y	200	MGSDB2 ★	DV1234	DVSD48BY	DVEX48BY
		✪	M81X25GV4LG(A)	100	MGSDA1 ★	-----	-----	-----
		✪	M81X25GV4DG(A)	110/115	MGSDA1 ★	-----	-----	-----
		✪	M81X25GV4YG(A)	200	MGSDB2 ★	-----	-----	-----
		✪	M81X25GV4GG(A)	220/230	MGSDB2 ★	-----	-----	-----
90 mm sq.	40	-----	M91X40GV4L	100	MGSDA1 ★	DV1132	DVSD48BL	DVEX48BL
		-----	M91X40GV4Y	200	MGSDB2 ★	DV1234	DVSD48BY	DVEX48BY
		✪	M91X40GV4LG(A)	100	MGSDA1 ★	-----	-----	-----
		✪	M91X40GV4DG(A)	110/115	MGSDA1 ★	-----	-----	-----
		✪	M91X40GV4YG(A)	200	MGSDB2 ★	-----	-----	-----
		✪	M91X40GV4GG(A)	220/230	MGSDB2 ★	-----	-----	-----
	60	-----	M91Z60GV4L	100	MGSDB1 ★	DV1134	DVSD48CL	DVEX48CL
		-----	M91Z60GV4Y	200	MGSDB2 ★	DV1234	DVSD48CY	DVEX48CY
		✪	M91Z60GV4LG(A)	100	MGSDB1 ★	-----	-----	-----
		✪	M91Z60GV4DG(A)	110/115	MGSDB1 ★	-----	-----	-----
		✪	M91Z60GV4YG(A)	200	MGSDB2 ★	-----	-----	-----
		✪	M91Z60GV4GG(A)	220/230	MGSDB2 ★	-----	-----	-----
	90	-----	M91Z90GV4L	100	MGSDB1 ★	DV1134	DVSD48CL	DVEX48CL
		-----	M91Z90GV4Y	200	MGSDB2 ★	DV1234	DVSD48CY	DVEX48CY
		✪	M91Z90GV4LG(A)	100	MGSDB1 ★	-----	-----	-----
		✪	M91Z90GV4DG(A)	110/115	MGSDB1 ★	-----	-----	-----
		✪	M91Z90GV4YG(A)	200	MGSDB2 ★	-----	-----	-----
		✪	M91Z90GV4GG(A)	220/230	MGSDB2 ★	-----	-----	-----

* When using a speed controller operative under a wide range of supply voltage (MGSD, SD48, EX48), the mating motor should be selected according to the voltage of the power supply to be used.

✪ **Conforming to international standards :**

★ **MGSD speed controllers are compliant with and .**

* The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
  The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

Variable speed induction motor (leadwire)

60 mm sq. 3 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min⁻¹)	Permissible Torque N·m (kgf·cm) at 1200 min⁻¹	Permissible Torque N·m (kgf·cm) at 90 min⁻¹	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
60 mm sq.	M61X3GV4L	4	3	100	50	Cont.	90 to 1400	0.018 (0.18)	0.018 (0.18)	0.21	0.026 (0.26)	2 (200V)
					60		90 to 1700	0.018 (0.18)	0.018 (0.18)	0.21	0.026 (0.26)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-264.

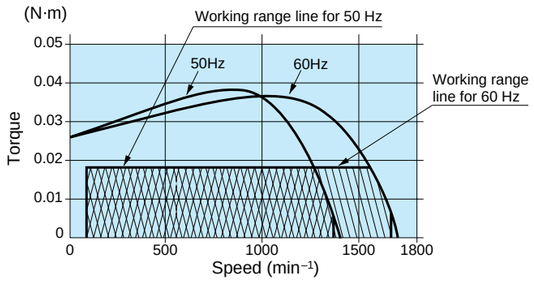
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed \ Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX6G□BA MX6G□B (ball bearing) MX6G□MA MX6G□M (metal bearing)	1200min⁻¹	50Hz	0.044 (0.4)	0.052 (0.5)	0.073 (0.7)	0.088 (0.8)	0.11 (1.1)	0.13 (1.3)	0.14 (1.4)	0.18 (1.8)	0.22 (2.2)	0.26 (2.6)	0.29 (2.9)	0.365 (3.7)
		60Hz	0.044 (0.4)	0.052 (0.5)	0.073 (0.7)	0.088 (0.8)	0.11 (1.1)	0.13 (1.3)	0.14 (1.4)	0.18 (1.8)	0.22 (2.2)	0.26 (2.6)	0.29 (2.9)	0.365 (3.7)
	90min⁻¹		0.044 (0.4)	0.052 (0.5)	0.073 (0.7)	0.088 (0.8)	0.11 (1.1)	0.13 (1.3)	0.14 (1.4)	0.18 (1.8)	0.22 (2.2)	0.26 (2.6)	0.29 (2.9)	0.365 (3.7)
	Rotational direction		Same as motor rotational direction											

Applicable gear head / Bearing	Speed \ Reduction ratio		30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX6G□BA MX6G□B (ball bearing) MX6G□MA MX6G□M (metal bearing)	1200min⁻¹	50Hz	0.39 (3.9)	0.47 (4.7)	0.65 (6.6)	0.78 (7.9)	0.98 (10)	1.18 (12)	1.31 (13)	1.57 (16)	1.96 (20)	2.35 (23)	MX6G10XB
		60Hz	0.39 (3.9)	0.47 (4.7)	0.65 (6.6)	0.78 (7.9)	0.98 (10)	1.18 (12)	1.38 (13)	1.57 (16)	1.96 (20)	2.35 (23)	
	90min⁻¹		0.39 (3.9)	0.47 (4.7)	0.65 (6.6)	0.78 (7.9)	0.98 (10)	1.18 (12)	1.38 (13)	1.57 (16)	1.96 (20)	2.35 (23)	
	Rotational direction		Reverse to motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

* Working range line

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

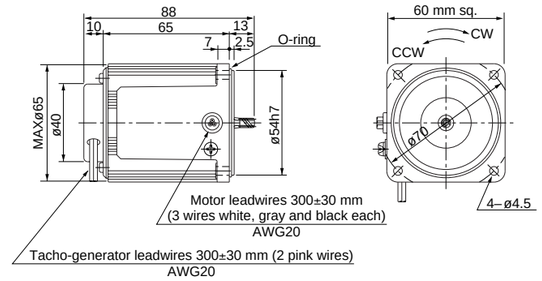
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

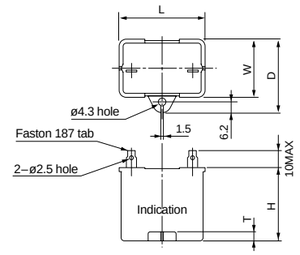
M61X3GV4L 4P 3 W 100 V

Mass	Helical gear	Module	Number of teeth
0.60 kg		0.5	6



Capacitor (dimensions) [attachment]

Unit: mm



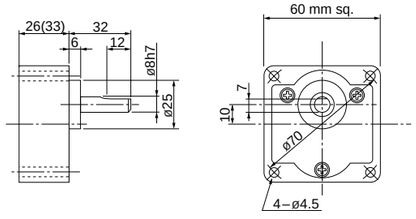
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M61X3GV4L	M0PC2M20	39.5	16	26.5	30.5	4	M0PC3917

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX6G□BA (ball bearing) / **MX6G□B** (ball bearing) Mass 0.24/0.3 kg: Output shaft D cut
MX6G□MA (metal bearing) / **MX6G□M** (metal bearing) Mass 0.24/0.3 kg: Output shaft D cut



* Figures in ( ) represent the dimensions of MX6G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX6G□BA (MA).)

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Variable speed induction motor (leadwire)

60 mm sq. 6 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min⁻¹)	Permissible Torque N·m (kgf·cm) at 1200 min⁻¹	Permissible Torque N·m (kgf·cm) at 90 min⁻¹	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
□60	M61X6GV4L	4	6	100	50	Cont.	90 to 1400	0.032 (0.32)	0.025 (0.25)	0.30	0.037 (0.37)	2.5 (200V)
					60		90 to 1700	0.032 (0.32)	0.025 (0.25)	0.30	0.037 (0.37)	
	M61X6GV4Y	4	6	200	50	Cont.	90 to 1400	0.032 (0.32)	0.025 (0.25)	0.15	0.037 (0.37)	0.6 (400V)
					60		90 to 1700	0.032 (0.32)	0.025 (0.25)	0.15	0.037 (0.37)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-264.

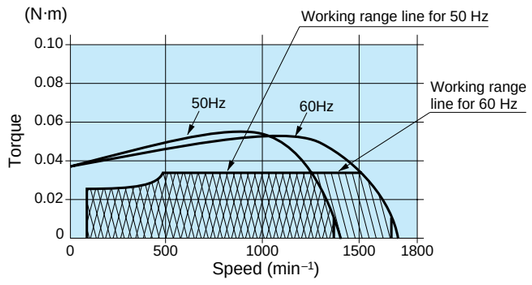
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed \ Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX6G□BA / MX6G□B (ball bearing) MX6G□MA / MX6G□M (metal bearing)	1200min⁻¹	50Hz	0.077 (0.7)	0.093 (0.9)	0.13 (1.3)	0.15 (1.5)	0.19 (1.9)	0.23 (2.3)	0.25 (2.5)	0.32 (3.2)	0.38 (3.8)	0.46 (4.6)	0.51 (5.2)	0.64 (6.5)
		60Hz	0.077 (0.7)	0.093 (0.9)	0.13 (1.3)	0.15 (1.5)	0.19 (1.9)	0.23 (2.3)	0.25 (2.5)	0.32 (3.2)	0.38 (3.8)	0.46 (4.6)	0.51 (5.2)	0.64 (6.5)
	90min⁻¹		0.06 (0.6)	0.07 (0.7)	0.10 (1.0)	0.12 (1.2)	0.15 (1.5)	0.18 (1.8)	0.20 (2.0)	0.25 (2.5)	0.30 (3.0)	0.36 (3.6)	0.40 (4.0)	0.50 (5.1)
	Rotational direction		Same as motor rotational direction											

Applicable gear head / Bearing	Speed \ Reduction ratio		30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX6G□BA / MX6G□B (ball bearing) MX6G□MA / MX6G□M (metal bearing)	1200min⁻¹	50Hz	0.69 (7.0)	0.83 (8.4)	1.16 (11)	1.39 (14)	1.74 (17)	2.09 (20)	2.33 (23)	2.45 (25)	2.45 (25)	2.45 (25)	MX6G10XB
		60Hz	0.69 (7.0)	0.83 (8.4)	1.16 (11)	1.39 (14)	1.74 (17)	2.09 (20)	2.33 (23)	2.45 (25)	2.45 (25)	2.45 (25)	
	90min⁻¹		0.54 (5.5)	0.65 (6.6)	0.90 (9.1)	1.08 (11)	1.35 (13)	1.62 (16)	1.81 (18)	2.17 (22)	2.45 (25)	2.45 (25)	
	Rotational direction		Reverse to motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

* Working range line

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

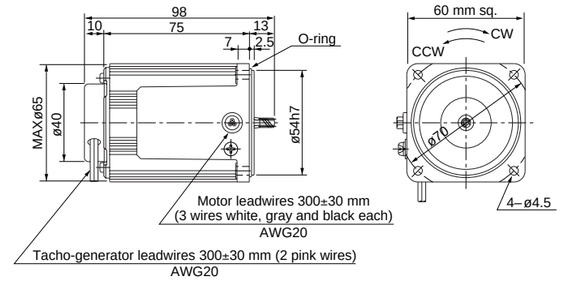
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

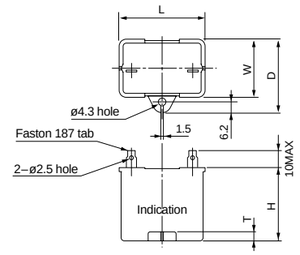
M61X6GV4L 4P 6 W 100 V
M61X6GV4Y 4P 6 W 200 V

Mass	Helical gear	Module	Number of teeth
0.71 kg		0.5	6



Capacitor (dimensions) [attachment]

Unit: mm



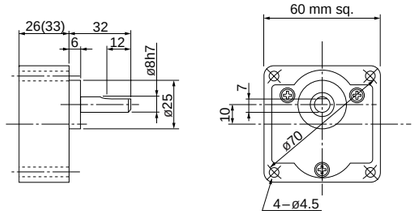
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M61X6GV4L	M0PC2.5M20	39.5	16	26.5	30.5	4	M0PC3917
M61X6GV4Y	M0PC0.6M40	39.5	16.2	27	27	4	M0PC3917

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX6G□BA (ball bearing) / **MX6G□B** (ball bearing) Mass 0.24/0.3 kg: Output shaft D cut
MX6G□MA (metal bearing) / **MX6G□M** (metal bearing) Mass 0.24/0.3 kg: Output shaft D cut



* Figures in ( ) represent the dimensions of MX6G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX6G□BA (MA).)

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Variable speed induction motor (leadwire)

60 mm sq. 6 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min⁻¹)	Permissible Torque N·m (kgf·cm) at 1200 min⁻¹	Permissible Torque N·m (kgf·cm) at 90 min⁻¹	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
60 mm sq.	M61X6GV4LG M61X6GV4LGA	4	6	100	50	Cont.	90 to 1400	0.044 (0.45)	0.034 (0.35)	0.32	0.049 (0.50)	3.5 (250V)
					60		90 to 1700	0.034 (0.35)	0.034 (0.35)	0.33	0.049 (0.50)	
	M61X6GV4DG M61X6GV4DGA	4	6	110	60	Cont.	90 to 1700	0.034 (0.35)	0.034 (0.35)	0.33	0.044 (0.45)	2.5 (250V)
				115	60		90 to 1700	0.034 (0.35)	0.034 (0.35)	0.34	0.049 (0.50)	
	M61X6GV4YG M61X6GV4YGA	4	6	200	50	Cont.	90 to 1400	0.044 (0.45)	0.034 (0.35)	0.14	0.049 (0.50)	0.8 (450V)
					60		90 to 1700	0.034 (0.35)	0.034 (0.35)	0.14	0.049 (0.50)	
	M61X6GV4GG M61X6GV4GGA	4	6	220	50	Cont.	90 to 1400	0.044 (0.45)	0.034 (0.35)	0.14	0.042 (0.43)	0.6 (450V)
					60		90 to 1700	0.034 (0.35)	0.034 (0.35)	0.14	0.042 (0.43)	
				230	50		90 to 1400	0.044 (0.45)	0.034 (0.35)	0.15	0.048 (0.49)	
					60		90 to 1700	0.034 (0.35)	0.034 (0.35)	0.15	0.049 (0.50)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-264.
• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

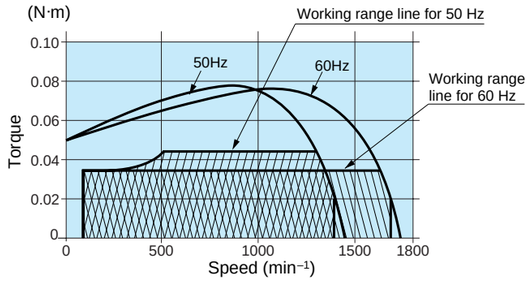
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed \ Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX6G□BA MX6G□B (ball bearing) MX6G□MA MX6G□M (metal bearing)	1200min⁻¹	50Hz	0.11 (1.1)	0.13 (1.3)	0.18 (1.8)	0.21 (2.2)	0.27 (2.7)	0.32 (3.3)	0.36 (3.6)	0.45 (4.6)	0.53 (5.5)	0.64 (6.6)	0.71 (7.3)	0.89 (9.1)
		60Hz	0.083 (0.9)	0.10 (1.0)	0.14 (1.4)	0.17 (1.7)	0.21 (2.1)	0.25 (2.6)	0.28 (2.8)	0.34 (3.5)	0.41 (4.3)	0.50 (5.1)	0.55 (5.7)	0.69 (7.1)
	90min⁻¹	50Hz	0.08 (0.9)	0.10 (1.0)	0.14 (1.4)	0.17 (1.7)	0.21 (2.1)	0.25 (2.6)	0.28 (2.8)	0.34 (3.5)	0.41 (4.3)	0.50 (5.1)	0.55 (5.7)	0.69 (7.1)
		60Hz	0.083 (0.9)	0.10 (1.0)	0.14 (1.4)	0.17 (1.7)	0.21 (2.1)	0.25 (2.6)	0.28 (2.8)	0.34 (3.5)	0.41 (4.3)	0.50 (5.1)	0.55 (5.7)	0.69 (7.1)
	Rotational direction		Same as motor rotational direction											

Applicable gear head / Bearing	Speed \ Reduction ratio		30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX6G□BA MX6G□B (ball bearing) MX6G□MA MX6G□M (metal bearing)	1200min⁻¹	50Hz	0.96 (9.8)	1.15 (12)	1.60 (16)	1.92 (20)	2.41 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	MX6G10XB
		60Hz	0.74 (7.7)	0.89 (9.2)	1.24 (13)	1.49 (15)	1.86 (19)	2.23 (23)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	
	90min⁻¹	50Hz	0.74 (7.7)	0.89 (9.2)	1.24 (13)	1.49 (15)	1.86 (19)	2.23 (23)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	
		60Hz	0.74 (7.7)	0.89 (9.2)	1.24 (13)	1.49 (15)	1.86 (19)	2.23 (23)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	
	Rotational direction		Reverse to motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

*Working range line

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

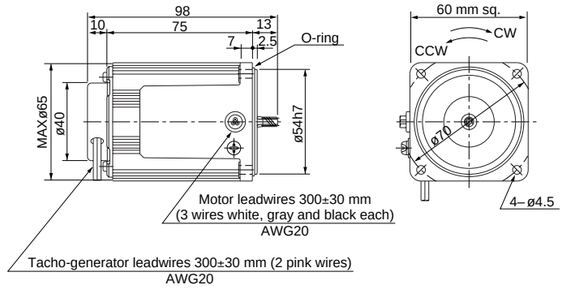
Features B-224 | System configuration B-225 | Coding system B-225 | Model list B-228

Motor (dimensions)

Scale: 1/3, Unit: mm

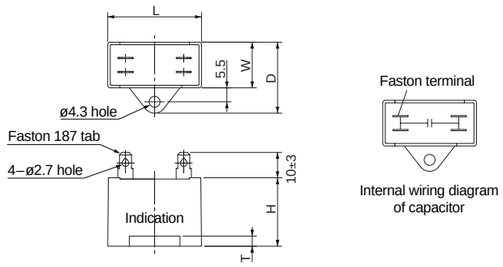
M61X6GV4LG(A) 4P 6 W 100 V
M61X6GV4DG(A) 4P 6 W 110 V / 115 V
M61X6GV4YG(A) 4P 6 W 200 V
M61X6GV4GG(A) 4P 6 W 220 V / 230 V

Mass	Helical	Module	Number of teeth
0.71 kg	gear	0.5	6



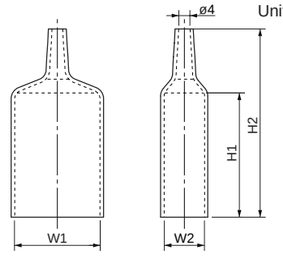
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

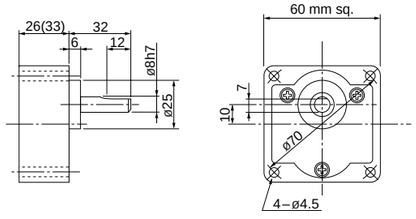
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M61X6GV4LG(A)	M0PC3.5M25G	31	17	27	27	4	M0PC3117G	31	17	50	73
M61X6GV4DG(A)	M0PC2.5M25G	31	17	27	27	4	M0PC3117G	31	17	50	73
M61X6GV4YG(A)	M0PC0.8M45G	31	17	27	27	4	M0PC3117G	31	17	50	73
M61X6GV4GG(A)	M0PC0.6M45G	31	14.5	24.5	23.5	4	M0PC3114G	31	14.5	45	68

• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX6G□BA (ball bearing) / **MX6G□B** (ball bearing) Mass 0.24/0.3 kg: Output shaft D cut
MX6G□MA (metal bearing) / **MX6G□M** (metal bearing) Mass 0.24/0.3 kg: Output shaft D cut



* Figures in ( ) represent the dimensions of MX6G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX6G□BA (MA).)
(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-262 | Round shaft motor dimensions B-264 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Variable speed induction motor (leadwire)

70 mm sq. 10 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min⁻¹)	Permissible Torque N·m (kgf·cm) at 1200 min⁻¹	Permissible Torque N·m (kgf·cm) at 90 min⁻¹	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
70 mm sq.	M71X10GV4L	4	10	100	50	Cont.	90 to 1400	0.059 (0.60)	0.027 (0.27)	0.40	0.064 (0.65)	4 (200V)
					60		90 to 1700	0.059 (0.60)	0.027 (0.27)	0.40	0.066 (0.67)	
	M71X10GV4Y	4	10	200	50	Cont.	90 to 1400	0.059 (0.60)	0.027 (0.27)	0.20	0.064 (0.65)	1 (400V)
					60		90 to 1700	0.059 (0.60)	0.027 (0.27)	0.20	0.066 (0.67)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-264.

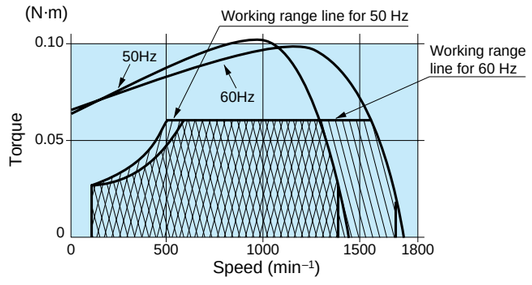
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed \ Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX7G□BA (ball bearing) MX7G□B (ball bearing) MX7G□MA (metal bearing) MX7G□M (metal bearing)	1200min⁻¹	50Hz	0.14 (1.4)	0.17 (1.7)	0.23 (2.3)	0.28 (2.8)	0.35 (3.5)	0.43 (4.3)	0.47 (4.7)	0.59 (6.0)	0.71 (7.2)	0.86 (8.7)	0.95 (9.6)	1.19 (12)
		60Hz	0.14 (1.4)	0.17 (1.7)	0.23 (2.3)	0.28 (2.8)	0.35 (3.5)	0.43 (4.3)	0.47 (4.7)	0.59 (6.0)	0.71 (7.2)	0.86 (8.7)	0.95 (9.6)	1.19 (12)
	90min⁻¹		0.065 (0.6)	0.078 (0.7)	0.11 (1.1)	0.31 (3.1)	0.16 (1.6)	0.19 (1.9)	0.21 (2.1)	0.27 (2.7)	0.32 (3.2)	0.39 (3.9)	0.43 (4.3)	0.54 (5.5)
	Rotational direction		Same as motor rotational direction											

Applicable gear head / Bearing	Speed \ Reduction ratio		30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX7G□BA (ball bearing) MX7G□B (ball bearing) MX7G□MA (metal bearing) MX7G□M (metal bearing)	1200min⁻¹	50Hz	1.29 (13)	1.54 (15)	2.15 (21)	2.58 (26)	3.22 (32)	3.87 (39)	4.30 (43)	4.90 (50)	4.90 (50)	4.90 (50)	MX7G10XB
		60Hz	1.29 (13)	1.54 (15)	2.15 (21)	2.58 (26)	3.22 (32)	3.87 (39)	4.30 (43)	4.90 (50)	4.90 (50)	4.90 (50)	
	90min⁻¹		0.59 (6.0)	0.70 (7.1)	0.98 (10)	1.18 (12)	1.47 (15)	1.77 (18)	1.97 (20)	2.36 (24)	2.95 (30)	3.54 (36)	
	Rotational direction		Reverse to motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

*Working range line

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

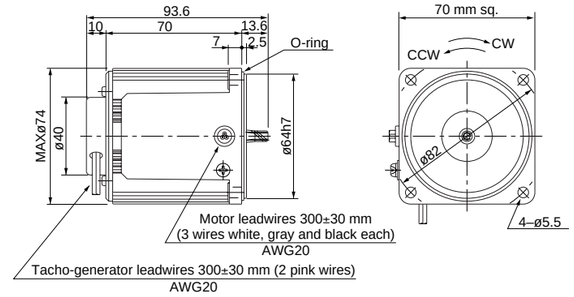
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

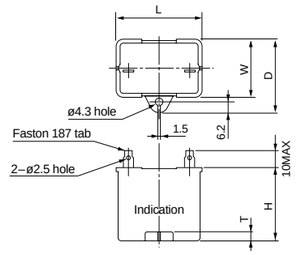
M71X10GV4L 4P 10 W 100 V
M71X10GV4Y 4P 10 W 200 V

Mass	Helical gear	Module	Number of teeth
0.88 kg		0.5	7



Capacitor (dimensions) [attachment]

Unit: mm



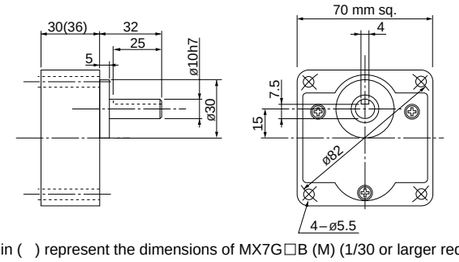
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M71X10GV4L	M0PC4M20	39.5	16	26.5	30.5	4	M0PC3917
M71X10GV4Y	M0PC1M40	39.5	16.2	27	27	4	M0PC3917

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX7G□BA (ball bearing) / **MX7G□B** (ball bearing) Mass 0.38/0.45 kg
MX7G□MA (metal bearing) / **MX7G□M** (metal bearing) Mass 0.38/0.45 kg

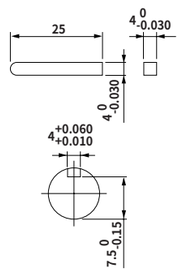


* Figures in ( ) represent the dimensions of MX7G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX7G□BA (MA).)

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MX7G□BA(B)
MX7G□MA(M)



Variable speed induction motor (leadwire)

70 mm sq. 15 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min⁻¹)	Permissible Torque N·m (kgf·cm) at 1200 min⁻¹	Permissible Torque N·m (kgf·cm) at 90 min⁻¹	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
70 mm sq.	M71X15GV4L	4	15	100	50	Cont.	90 to 1400	0.089 (0.90)	0.029 (0.29)	0.60	0.068 (0.69)	5 (200V)
					60		90 to 1700	0.089 (0.90)	0.029 (0.29)	0.56	0.068 (0.69)	
	M71X15GV4Y	4	15	200	50	Cont.	90 to 1400	0.089 (0.90)	0.029 (0.29)	0.30	0.068 (0.69)	1.3 (400V)
					60		90 to 1700	0.089 (0.90)	0.029 (0.29)	0.28	0.068 (0.69)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-264.

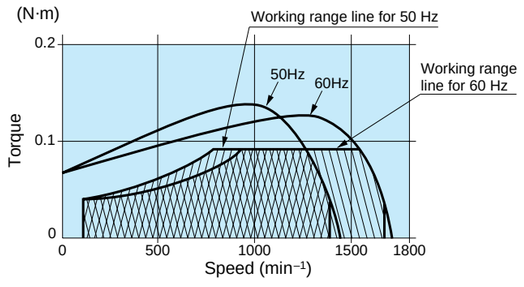
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed \ Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX7G□BA (ball bearing) MX7G□B (ball bearing) MX7G□MA (metal bearing) MX7G□M (metal bearing)	1200min⁻¹	50Hz	0.21 (2.1)	0.25 (2.5)	0.36 (3.6)	0.43 (4.3)	0.54 (5.5)	0.64 (6.5)	0.72 (7.3)	0.86 (8.7)	1.08 (11)	1.29 (13)	1.44 (14)	1.80 (18)
		60Hz	0.21 (2.1)	0.25 (2.5)	0.36 (3.6)	0.43 (4.3)	0.54 (5.5)	0.64 (6.5)	0.72 (7.3)	0.86 (8.7)	1.08 (11)	1.29 (13)	1.44 (14)	1.88 (19)
	90min⁻¹		0.070 (0.7)	0.084 (0.8)	0.11 (1.1)	0.14 (1.4)	0.17 (1.7)	0.21 (2.1)	0.23 (2.3)	0.28 (2.8)	0.35 (3.5)	0.42 (4.2)	0.47 (4.7)	0.58 (5.9)
	Rotational direction		Same as motor rotational direction											

Applicable gear head / Bearing	Speed \ Reduction ratio		30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX7G□BA (ball bearing) MX7G□B (ball bearing) MX7G□MA (metal bearing) MX7G□M (metal bearing)	1200min⁻¹	50Hz	1.92 (19)	2.30 (23)	3.20 (32)	3.84 (39)	4.80 (48)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	MX7G10XB
		60Hz	1.92 (19)	2.30 (23)	3.20 (32)	3.84 (39)	4.80 (48)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	
	90min⁻¹		0.63 (6.4)	0.75 (7.6)	1.05 (10)	1.26 (12)	1.58 (16)	1.89 (19)	2.11 (21)	2.53 (25)	3.16 (32)	3.79 (38)	
	Rotational direction		Reverse to motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

*Working range line

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

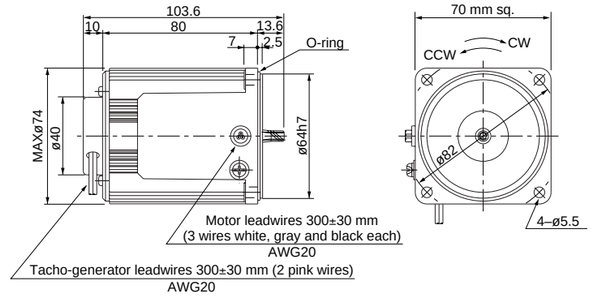
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

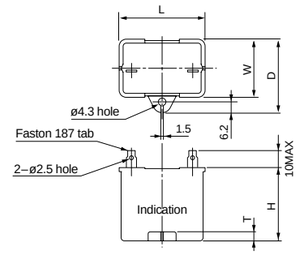
M71X15GV4L 4P 15 W 100 V
M71X15GV4Y 4P 15 W 200 V

Mass	Helical gear	Module	Number of teeth
1.1 kg		0.5	7



Capacitor (dimensions) [attachment]

Unit: mm



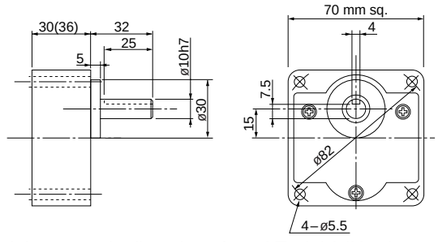
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M71X15GV4L	M0PC5M20	39.5	16	26.5	30.5	4	M0PC3917
M71X15GV4Y	M0PC1.3M40	39.5	18.3	29	29	4	M0PC3922

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX7G□BA (ball bearing) / **MX7G□B** (ball bearing) Mass 0.38/0.45 kg
MX7G□MA (metal bearing) / **MX7G□M** (metal bearing) Mass 0.38/0.45 kg

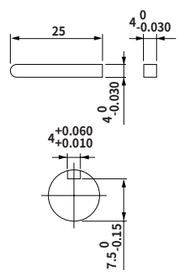


* Figures in ( ) represent the dimensions of MX7G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX7G□BA (MA).)

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MX7G□BA(B)
MX7G□MA(M)



Variable speed induction motor (leadwire)

70 mm sq. 15 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min⁻¹)	Permissible Torque N·m (kgf·cm) at 1200 min⁻¹	Permissible Torque N·m (kgf·cm) at 90 min⁻¹	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
70 mm sq.	M71X15GV4LG M71X15GV4LGA	4	15	100	50	Cont.	90 to 1400	0.11 (1.1)	0.049 (0.50)	0.57	0.080 (0.82)	5.5 (250V)
					60		90 to 1700	0.088 (0.90)	0.049 (0.50)	0.56	0.080 (0.82)	
	M71X15GV4DG M71X15GV4DGA	4	15	110 115	60	Cont.	90 to 1700	0.088 (0.90)	0.049 (0.50)	0.58	0.080 (0.82)	4.5 (250V)
					60		90 to 1700	0.088 (0.90)	0.049 (0.50)	0.61	0.088 (0.90)	
	M71X15GV4YG M71X15GV4YGA	4	15	200	50	Cont.	90 to 1400	0.11 (1.1)	0.049 (0.50)	0.24	0.080 (0.82)	1.3 (450V)
					60		90 to 1700	0.088 (0.90)	0.049 (0.50)	0.24	0.080 (0.82)	
	M71X15GV4GG M71X15GV4GGA	4	15	220	50	Cont.	90 to 1400	0.11 (1.1)	0.049 (0.50)	0.27	0.080 (0.82)	1.2 (450V)
					60		90 to 1700	0.088 (0.90)	0.049 (0.50)	0.26	0.080 (0.82)	
				230	50		90 to 1400	0.11 (1.1)	0.049 (0.50)	0.28	0.10 (1.0)	
					60		90 to 1700	0.088 (0.90)	0.049 (0.50)	0.27	0.10 (1.0)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-264.
• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

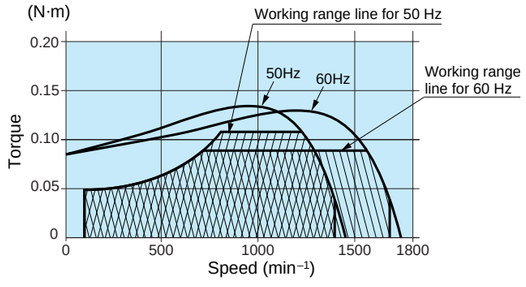
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed		Reduction ratio 3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX7G□BA (ball bearing) MX7G□B (ball bearing) MX7G□MA (metal bearing) MX7G□M (metal bearing)	1200min⁻¹	50Hz	0.27 (2.7)	0.32 (3.2)	0.45 (4.5)	0.53 (5.3)	0.67 (6.7)	0.80 (8.0)	0.89 (8.9)	1.11 (11)	1.34 (13)	1.60 (16)	1.78 (18)	2.23 (22)
		60Hz	0.21 (2.2)	0.26 (2.6)	0.36 (3.6)	0.43 (4.4)	0.53 (5.5)	0.64 (6.6)	0.71 (7.3)	0.89 (9.1)	1.07 (11)	1.28 (13)	1.43 (15)	1.78 (18)
	90min⁻¹		0.12 (1.2)	0.14 (15)	0.20 (2.0)	0.24 (2.4)	0.30 (3.0)	0.36 (3.6)	0.40 (4.1)	0.50 (5.1)	0.60 (6.1)	0.71 (7.3)	0.79 (8.1)	0.99 (10)
	Rotational direction		Same as motor rotational direction											

Applicable gear head / Bearing	Speed		Reduction ratio 30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX7G□BA (ball bearing) MX7G□B (ball bearing) MX7G□MA (metal bearing) MX7G□M (metal bearing)	1200min⁻¹	50Hz	2.41 (24)	2.89 (29)	4.01 (40)	4.81 (48)	4.9 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	MX7G10XB
		60Hz	1.92 (20)	2.31 (24)	3.21 (33)	3.85 (39)	4.81 (49)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	
	90min⁻¹		1.07 (11)	1.29 (13)	1.79 (18)	2.14 (22)	2.68 (27)	3.21 (33)	3.57 (36)	4.29 (44)	4.9 (50)	4.9 (50)	
	Rotational direction		Reverse to motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

* Working range line

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

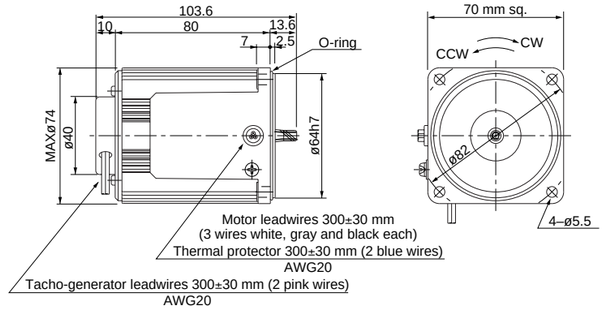
Features B-224 | System configuration B-225 | Coding system B-225 | Model list B-228

Motor (dimensions)

Scale: 1/3, Unit: mm

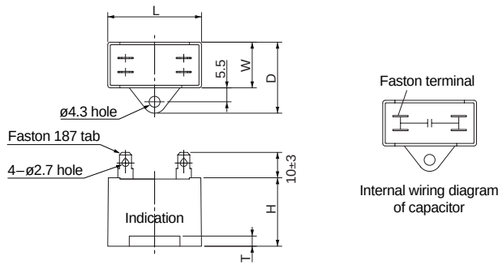
M71X15GV4LG(A) 4P 15 W 100 V
M71X15GV4DG(A) 4P 15 W 110 V / 115 V
M71X15GV4YG(A) 4P 15 W 200 V
M71X15GV4GG(A) 4P 15 W 220 V / 230 V

Mass	Helical	Module	Number of teeth
1.1 kg	gear	0.5	7



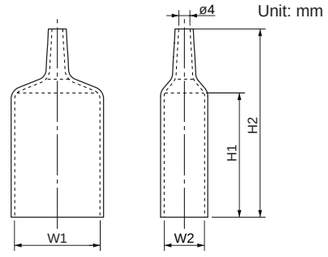
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

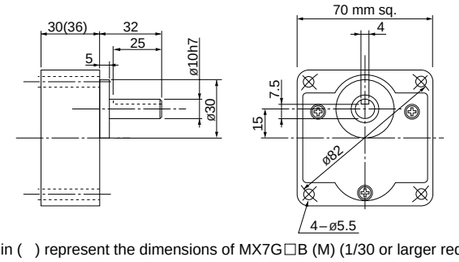
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M71X15GV4LG(A)	M0PC5.5M25G	38	21	31	31	4	M0PC3821G	38	21	55	78
M71X15GV4DG(A)	M0PC4.5M25G	37	18	28	27	4	M0PC3718G	37	18	50	73
M71X15GV4YG(A)	M0PC1.3M45G	38	19	29	29	4	M0PC3819G	38	19	50	73
M71X15GV4GG(A)	M0PC1.2M45G	37	18	28	27	4	M0PC3718G	37	18	50	73

• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX7G□BA (ball bearing) / **MX7G□B** (ball bearing) Mass 0.38/0.45 kg
MX7G□MA (metal bearing) / **MX7G□M** (metal bearing) Mass 0.38/0.45 kg

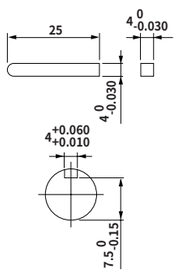


* Figures in ( ) represent the dimensions of MX7G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX7G□BA (MA).)

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MX7G□BA(B)
MX7G□MA(M)



Gear head combination B-262 | Round shaft motor dimensions B-264 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Variable speed induction motor (leadwire)

80 mm sq. 15 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min⁻¹)	Permissible Torque N·m (kgf·cm) at 1200 min⁻¹	Permissible Torque N·m (kgf·cm) at 90 min⁻¹	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
80 mm sq.	M81X15GV4L	4	15	100	50	Cont.	90 to 1400	0.12 (1.2)	0.039 (0.39)	0.72	0.12 (1.2)	6 (200V)
					60		90 to 1700	0.12 (1.2)	0.039 (0.39)	0.69	0.12 (1.2)	
	M81X15GV4Y	4	15	200	50	Cont.	90 to 1400	0.12 (1.2)	0.039 (0.39)	0.36	0.12 (1.2)	1.5 (400V)
					60		90 to 1700	0.12 (1.2)	0.039 (0.39)	0.35	0.12 (1.2)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-264.

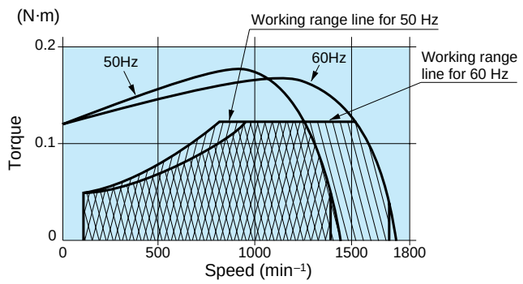
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed \ Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX8G□B (ball bearing) MX8G□M (metal bearing)	1200min⁻¹	50Hz	0.29 (2.9)	0.34 (3.4)	0.48 (4.8)	0.58 (5.9)	0.72 (7.3)	0.87 (8.8)	0.97 (9.8)	1.21 (12)	1.45 (14)	1.74 (17)	1.94 (19)	2.43 (24)
		60Hz	0.29 (2.9)	0.34 (3.4)	0.48 (4.8)	0.58 (5.9)	0.72 (7.3)	0.87 (8.8)	0.97 (9.8)	1.21 (12)	1.45 (14)	1.74 (17)	1.94 (19)	2.43 (24)
	90min⁻¹		0.094 (0.9)	0.11 (1.1)	0.15 (1.5)	0.18 (1.8)	0.23 (2.3)	0.28 (2.8)	0.31 (3.1)	0.39 (3.9)	0.47 (4.7)	0.56 (5.7)	0.63 (6.4)	0.78 (7.9)
	Rotational direction		Same as motor rotational direction											

Applicable gear head / Bearing	Speed \ Reduction ratio		30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX8G□B (ball bearing) MX8G□M (metal bearing)	1200min⁻¹	50Hz	2.62 (26)	3.14 (32)	4.37 (44)	5.24 (53)	6.55 (66)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	MX8G10XB
		60Hz	2.62 (26)	3.14 (32)	4.37 (44)	5.24 (53)	6.55 (66)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	
	90min⁻¹		0.84 (8.5)	1.01 (10)	1.41 (14)	1.69 (17)	2.12 (21)	2.54 (25)	2.83 (28)	3.39 (34)	4.24 (43)	5.09 (51)	
	Rotational direction		Reverse to motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

* Working range line

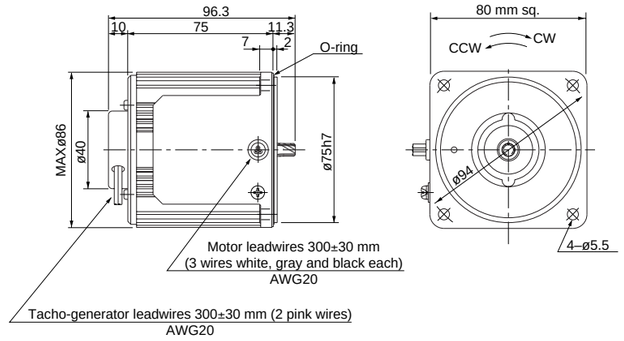
The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

Motor (dimensions)

Scale: 1/3, Unit: mm

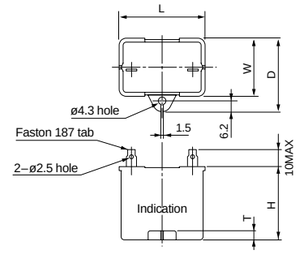
M81X15GV4L 4P 15 W 100 V
M81X15GV4Y 4P 15 W 200 V

Mass	Helical gear	Module	Number of teeth
1.2 kg		0.5	9



Capacitor (dimensions) [attachment]

Unit: mm



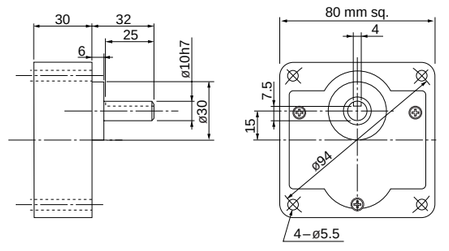
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M81X15GV4L	M0PC6M20	39.5	17.5	28	30.5	4	M0PC3917
M81X15GV4Y	M0PC1.5M40	39.5	22	32.5	32.5	4	M0PC3922

Gear head (dimensions)

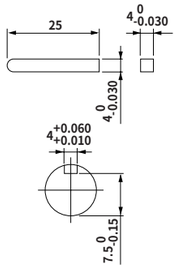
Scale: 1/3, Unit: mm

MX8G□B (ball bearing) / **MX8G□M** (metal bearing) Mass 0.6 kg



Key and keyway (dimensions) [attachment]

MX8G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Variable speed induction motor (leadwire)

80 mm sq. 25 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min^{-1})	Permissible Torque N·m (kgf·cm) at 1200 min^{-1}	Permissible Torque N·m (kgf·cm) at 90 min^{-1}	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
80 mm sq.	M81X25GV4L	4	25	100	50	Cont.	90 to 1400	0.14 (1.4)	0.039 (0.39)	1.0	0.16 (1.6)	8 (200V)
					60		90 to 1700	0.14 (1.4)	0.039 (0.39)	1.0	0.16 (1.6)	
	M81X25GV4Y	4	25	200	50	Cont.	90 to 1400	0.14 (1.4)	0.039 (0.39)	0.5	0.16 (1.6)	2 (400V)
					60		90 to 1700	0.14 (1.4)	0.039 (0.39)	0.5	0.16 (1.6)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-264.

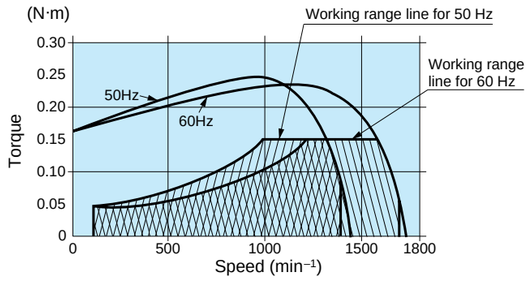
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed \ Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX8G□B (ball bearing) MX8G□M (metal bearing)	1200min^{-1}	50Hz	0.34 (3.4)	0.40 (4.0)	0.56 (5.7)	0.68 (6.9)	0.85 (8.6)	1.02 (10)	1.13 (11)	1.41 (1.4)	1.70 (17)	2.04 (20)	2.26 (23)	2.83 (28)
		60Hz	0.34 (3.4)	0.40 (4.0)	0.56 (5.7)	0.68 (6.9)	0.85 (8.6)	1.02 (10)	1.13 (11)	1.41 (1.4)	1.70 (17)	2.04 (20)	2.26 (23)	2.83 (28)
	90min^{-1}		0.094 (0.9)	0.11 (1.1)	0.15 (1.5)	0.18 (1.8)	0.23 (2.3)	0.28 (2.8)	0.31 (3.1)	0.39 (3.9)	0.47 (4.7)	0.56 (5.7)	0.63 (6.4)	0.78 (7.9)
	Rotational direction		Same as motor rotational direction											

Applicable gear head / Bearing	Speed \ Reduction ratio		30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX8G□B (ball bearing) MX8G□M (metal bearing)	1200min^{-1}	50Hz	3.06 (31)	3.67 (37)	5.10 (52)	6.12 (62)	7.65 (78)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	MX8G10XB
		60Hz	3.06 (31)	3.67 (37)	5.10 (52)	6.12 (62)	7.65 (78)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	
	90min^{-1}		0.84 (8.5)	1.01 (10)	1.41 (14)	1.69 (17)	2.12 (21)	2.54 (25)	2.83 (28)	3.39 (34)	4.24 (43)	5.09 (51)	
	Rotational direction		Reverse to motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

* Working range line

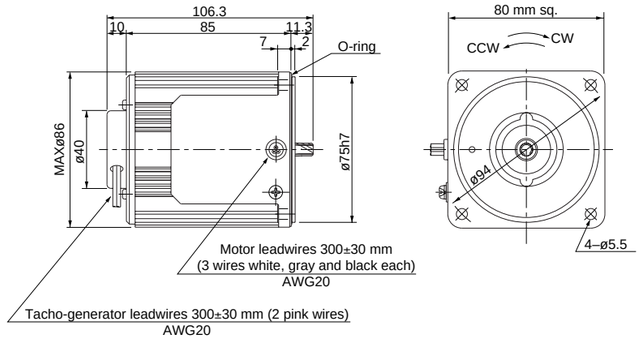
The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

Motor (dimensions)

Scale: 1/3, Unit: mm

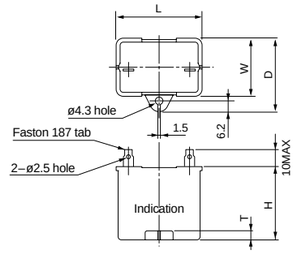
M81X25GV4L 4P 25 W 100 V
M81X25GV4Y 4P 25 W 200 V

Mass	Helical gear	Module	Number of teeth
1.5 kg		0.5	9



Capacitor (dimensions) [attachment]

Unit: mm



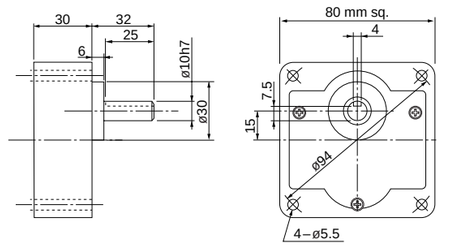
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M81X25GV4L	M0PC8M20	39.5	22	32.5	30.5	4	M0PC3922
M81X25GV4Y	M0PC2M40	39.5	22	32.5	32.5	4	M0PC3922

Gear head (dimensions)

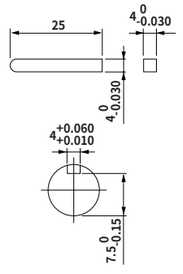
Scale: 1/3, Unit: mm

MX8G□B (ball bearing) / **MX8G□M** (metal bearing) Mass 0.6 kg



Key and keyway (dimensions) [attachment]

MX8G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Variable speed induction motor (leadwire)

80 mm sq. 25 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min⁻¹)	Permissible Torque N·m (kgf·cm) at 1200 min⁻¹	Permissible Torque N·m (kgf·cm) at 90 min⁻¹	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
80 mm sq.	M81X25GV4LG M81X25GV4LGA	4	25	100	50	Cont.	90 to 1400	0.19 (1.9)	0.049 (0.50)	1.1	0.13 (1.3)	8 (250V)
					60		90 to 1700	0.15 (1.5)	0.049 (0.50)	0.98	0.13 (1.3)	
	M81X25GV4DG M81X25GV4DGA	4	25	110	60	Cont.	90 to 1700	0.15 (1.5)	0.049 (0.50)	1.1	0.13 (1.3)	6 (250V)
				115	60		90 to 1700	0.15 (1.5)	0.049 (0.50)	1.1	0.13 (1.3)	
	M81X25GV4YG M81X25GV4YGA	4	25	200	50	Cont.	90 to 1400	0.19 (1.9)	0.049 (0.50)	0.43	0.13 (1.3)	2.1 (450V)
					60		90 to 1700	0.15 (1.5)	0.049 (0.50)	0.42	0.13 (1.3)	
	M81X25GV4GG M81X25GV4GGA	4	25	220	50	Cont.	90 to 1400	0.19 (1.9)	0.049 (0.50)	0.46	0.13 (1.3)	1.5 (450V)
					60		90 to 1700	0.15 (1.5)	0.049 (0.50)	0.44	0.13 (1.3)	
				230	50		90 to 1400	0.19 (1.9)	0.049 (0.50)	0.48	0.13 (1.3)	
					60		90 to 1700	0.15 (1.5)	0.049 (0.50)	0.45	0.13 (1.3)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-264.
• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

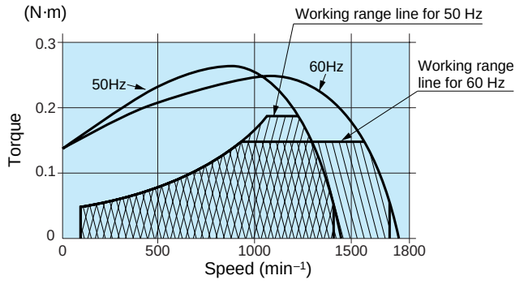
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed \ Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX8G□B (ball bearing) MX8G□M (metal bearing)	1200min⁻¹	50Hz	0.46 (4.6)	0.55 (5.5)	0.77 (7.7)	0.92 (9.2)	1.15 (12)	1.39 (14)	1.54 (15)	1.92 (19)	2.31 (23)	2.77 (28)	3.08 (31)	3.85 (38)
		60Hz	0.36 (3.6)	0.44 (4.4)	0.61 (6.1)	0.73 (7.3)	0.91 (9.1)	1.09 (11)	1.22 (12)	1.52 (15)	1.82 (18)	2.19 (22)	2.43 (24)	3.04 (30)
	90min⁻¹		0.12 (1.2)	0.14 (1.5)	0.20 (2.0)	0.24 (2.4)	0.30 (3.0)	0.36 (3.6)	0.40 (4.1)	0.50 (5.1)	0.60 (6.1)	0.71 (7.3)	0.79 (8.1)	0.99 (10)
	Rotational direction		Same as motor rotational direction											

Applicable gear head / Bearing	Speed \ Reduction ratio		30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX8G□B (ball bearing) MX8G□M (metal bearing)	1200min⁻¹	50Hz	4.16 (42)	4.99 (50)	6.93 (69)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	MX8G10XB
		60Hz	3.28 (33)	3.94 (39)	5.47 (55)	6.56 (66)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	
	90min⁻¹		1.07 (11)	1.29 (13)	1.79 (18)	2.14 (22)	2.68 (27)	3.21 (33)	3.57 (36)	4.29 (44)	5.36 (55)	6.43 (66)	
	Rotational direction		Reverse to motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

*** Working range line**

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

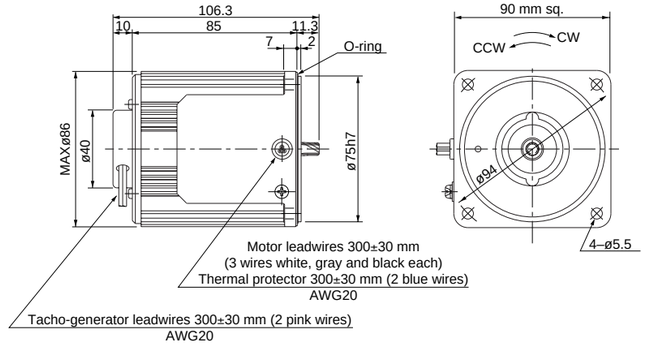
Features B-224 | System configuration B-225 | Coding system B-225 | Model list B-228

Motor (dimensions)

Scale: 1/3, Unit: mm

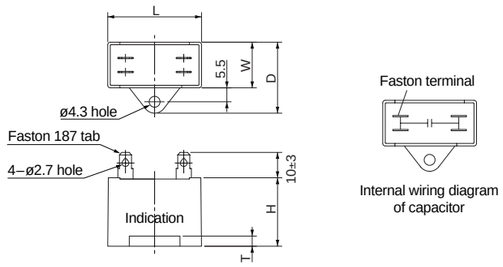
M81X25GV4LG(A) 4P 25 W 100 V
M81X25GV4DG(A) 4P 25 W 110 V / 115 V
M81X25GV4YG(A) 4P 25 W 200 V
M81X25GV4GG(A) 4P 25 W 220 V / 230 V

Mass	Helical gear	Module	Number of teeth
1.5 kg		0.5	9



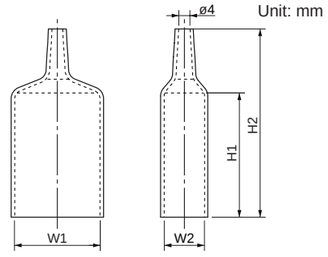
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

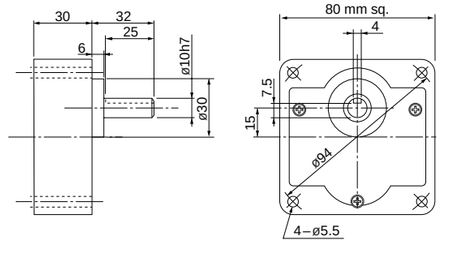
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M81X25GV4LG(A)	M0PC8M25G	48	21	31	31	4	M0PC4821G	48	21	55	78
M81X25GV4DG(A)	M0PC6M25G	38	21	31	31	4	M0PC3821G	38	21	55	78
M81X25GV4YG(A)	M0PC2.1M45G	48	21	31	31	4	M0PC4821G	48	21	55	78
M81X25GV4GG(A)	M0PC1.5M45G	38	21	31	31	4	M0PC3821G	38	21	55	78

• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

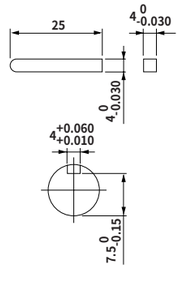
Scale: 1/3, Unit: mm

MX8G□B (ball bearing) / **MX8G□M** (metal bearing) Mass 0.6 kg



Key and keyway (dimensions) [attachment]

MX8G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-262 | Round shaft motor dimensions B-264 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Variable speed induction motor (leadwire)

90 mm sq. 40 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min^{-1})	Permissible Torque N·m (kgf·cm) at 1200 min^{-1}	Permissible Torque N·m (kgf·cm) at 90 min^{-1}	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M91X40GV4L	4	40	100	50	Cont.	90 to 1400	0.30 (3.0)	0.049 (0.5)	1.6	0.25 (2.5)	12 (200V)
					60		90 to 1700	0.24 (2.4)	0.049 (0.5)	1.6	0.25 (2.5)	
	M91X40GV4Y	4	40	200	50	Cont.	90 to 1400	0.30 (3.0)	0.049 (0.5)	0.8	0.25 (2.5)	3 (400V)
					60		90 to 1700	0.24 (2.4)	0.049 (0.5)	0.8	0.25 (2.5)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-265.

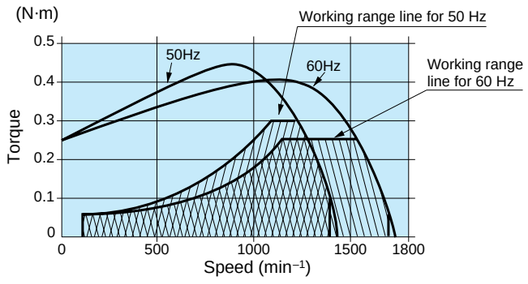
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed \ Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX9G□B (ball bearing) MX9G□M (metal bearing)	1200min^{-1}	50Hz	0.72 (7.3)	0.87 (8.8)	1.21 (12)	1.45 (14)	1.82 (18)	2.18 (22)	2.43 (24)	3.03 (30)	3.64 (37)	4.37 (44)	4.86 (49)	6.07 (61)
		60Hz	0.58 (5.9)	0.69 (7.0)	0.97 (9.8)	1.16 (11)	1.45 (14)	1.74 (17)	1.92 (19)	2.42 (24)	2.91 (29)	3.49 (35)	3.88 (39)	4.85 (49)
	90min^{-1}		0.11 (1.1)	0.14 (1.4)	0.19 (1.9)	0.23 (2.3)	0.29 (2.9)	0.35 (3.5)	0.39 (3.9)	0.49 (5.0)	0.59 (6.0)	0.71 (7.2)	0.79 (8.0)	0.99 (10)
	Rotational direction		Same as motor rotational direction											

Applicable gear head / Bearing	Speed \ Reduction ratio		30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX9G□B (ball bearing) MX9G□M (metal bearing)	1200min^{-1}	50Hz	6.54 (66)	7.84 (80)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	MX9G10XB
		60Hz	5.23 (53)	6.26 (63)	8.70 (88)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	
	90min^{-1}		1.06 (10)	1.28 (13)	1.78 (18)	2.13 (21)	2.67 (27)	3.20 (32)	3.56 (36)	4.27 (43)	5.34 (54)	6.40 (65)	
	Rotational direction		Reverse to motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

* Working range line

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

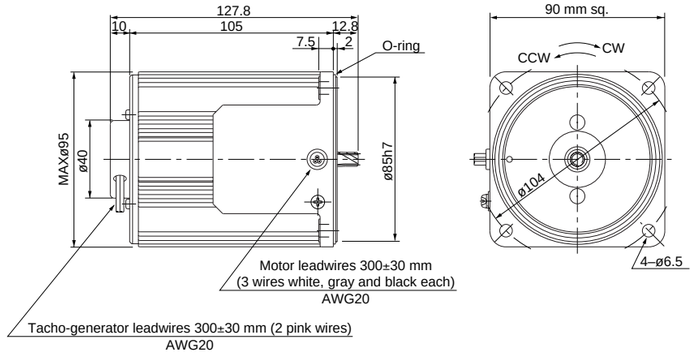
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

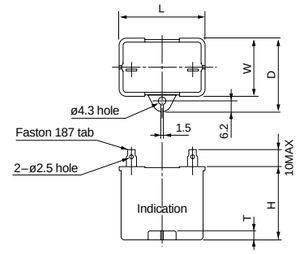
M91X40GV4L 4P 40 W 100 V
M91X40GV4Y 4P 40 W 200 V

Mass	Helical gear	Module	Number of teeth
2.4 kg		0.55	9



Capacitor (dimensions) [attachment]

Unit: mm



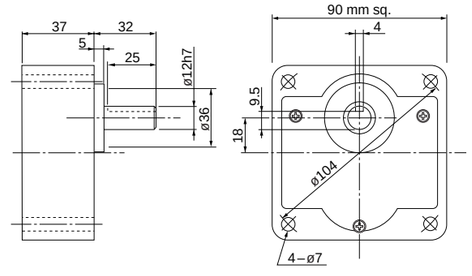
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M91X40GV4L	M0PC12M20	39.5	26.7	37	32	4	M0PC3926
M91X40GV4Y	M0PC3M40	49.7	24	34.5	34.5	4	M0PC5026

Gear head (dimensions)

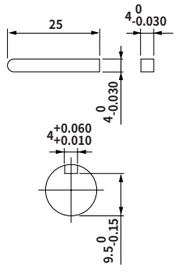
Scale: 1/3, Unit: mm

MX9G□B (ball bearing) / **MX9G□M** (metal bearing) Mass 0.8 kg



Key and keyway (dimensions) [attachment]

MX9G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Variable speed induction motor (leadwire)

90 mm sq. 40 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min⁻¹)	Permissible Torque N·m (kgf·cm) at 1200 min⁻¹	Permissible Torque N·m (kgf·cm) at 90 min⁻¹	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M91X40GV4LG M91X40GV4LGA	4	40	100	50	Cont.	90 to 1400	0.30 (3.1)	0.078 (0.80)	1.7	0.23 (2.3)	12 (250V)
					60		90 to 1700	0.24 (2.4)	0.078 (0.80)	1.5	0.23 (2.3)	
	M91X40GV4DG M91X40GV4DGA	4	40	110 115	60	Cont.	90 to 1700	0.24 (2.4)	0.078 (0.80)	1.7	0.23 (2.3)	10 (250V)
					60		90 to 1700	0.24 (2.4)	0.078 (0.80)	1.8	0.25 (2.5)	
	M91X40GV4YG M91X40GV4YGA	4	40	200	50	Cont.	90 to 1400	0.30 (3.1)	0.078 (0.80)	0.64	0.23 (2.3)	3 (450V)
					60		90 to 1700	0.24 (2.4)	0.078 (0.80)	0.62	0.23 (2.3)	
	M91X40GV4GG M91X40GV4GGA	4	40	220	50	Cont.	90 to 1400	0.30 (3.1)	0.078 (0.80)	0.69	0.23 (2.3)	2.5 (450V)
					60		90 to 1700	0.24 (2.4)	0.078 (0.80)	0.65	0.23 (2.3)	
				230	50		90 to 1400	0.30 (3.1)	0.078 (0.80)	0.72	0.25 (2.5)	
					60		90 to 1700	0.24 (2.4)	0.078 (0.80)	0.68	0.25 (2.5)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-265.
• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

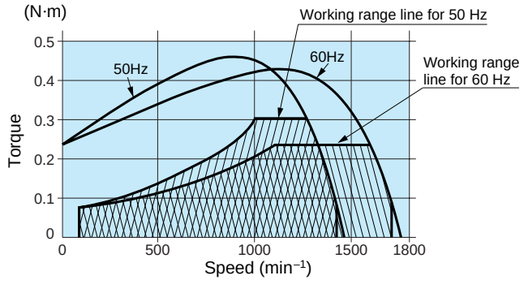
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed		Reduction ratio 3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX9G□B (ball bearing) MX9G□M (metal bearing)	1200min⁻¹	50Hz	0.73 (7.5)	0.87 (9.0)	1.22 (13)	1.46 (15)	1.82 (19)	2.19 (23)	2.43 (25)	3.04 (31)	3.65 (38)	4.37 (45)	4.86 (50)	6.08 (63)
		60Hz	0.58 (5.8)	0.70 (7.0)	0.97 (9.7)	1.17 (12)	1.46 (15)	1.75 (17)	1.94 (19)	2.43 (24)	2.92 (29)	3.50 (35)	3.89 (39)	4.86 (49)
	90min⁻¹		0.19 (1.9)	0.23 (2.3)	0.32 (3.2)	0.38 (3.9)	0.47 (4.9)	0.57 (5.8)	0.63 (6.5)	0.79 (8.1)	0.95 (9.7)	1.14 (12)	1.26 (13)	1.58 (16)
	Rotational direction		Same as motor rotational direction											

Applicable gear head / Bearing	Speed		Reduction ratio 30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX9G□B (ball bearing) MX9G□M (metal bearing)	1200min⁻¹	50Hz	6.56 (68)	7.87 (81)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	MX9G10XB
		60Hz	5.25 (52)	6.30 (63)	8.75 (87)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	
	90min⁻¹		1.71 (17)	2.05 (21)	2.84 (29)	3.41 (35)	4.26 (44)	5.12 (52)	5.69 (58)	6.82 (70)	8.53 (87)	9.80 (100)	
	Rotational direction		Reverse to motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

* Working range line

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

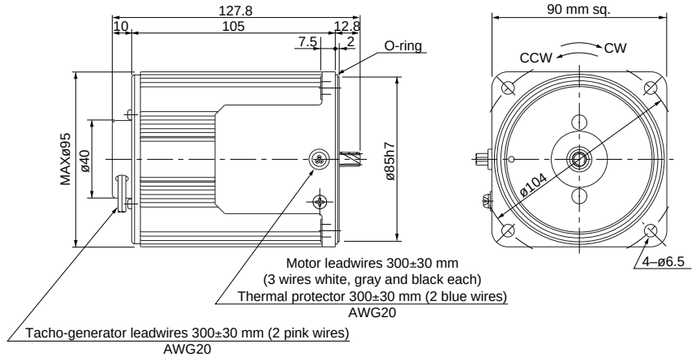
Features B-224 | System configuration B-225 | Coding system B-225 | Model list B-228

Motor (dimensions)

Scale: 1/3, Unit: mm

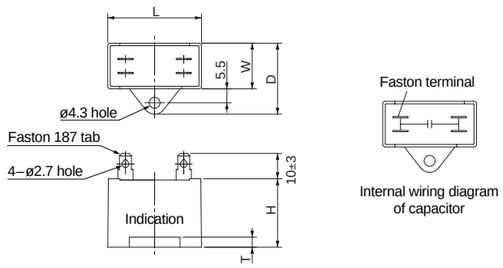
M91X40GV4LG(A) 4P 40 W 100 V
M91X40GV4DG(A) 4P 40 W 110 V / 115 V
M91X40GV4YG(A) 4P 40 W 200 V
M91X40GV4GG(A) 4P 40 W 220 V / 230 V

Mass	Helical	Module	Number of teeth
2.4 kg	gear	0.55	9



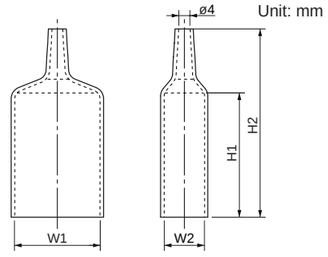
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

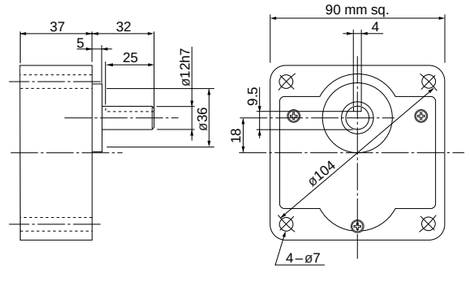
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M91X40GV4LG(A)	M0PC12M25G	58	22	32	35	4	M0PC5822G	58	22	55	78
M91X40GV4DG(A)	M0PC10M25G	58	21	31	31	4	M0PC5821G	58	21	55	78
M91X40GV4YG(A)	M0PC3M45G	58	21	31	31	4	M0PC4821G	48	21	55	78
M91X40GV4GG(A)	M0PC2.5M45G	48	21	31	31	4	M0PC4821G	48	21	55	78

• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

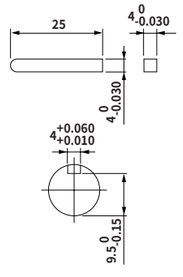
Scale: 1/3, Unit: mm

MX9G□B (ball bearing) / **MX9G□M** (metal bearing) Mass 0.8 kg



Key and keyway (dimensions) [attachment]

MX9G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-263 | Round shaft motor dimensions B-265 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Variable speed induction motor (leadwire)

90 mm sq. 60 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min⁻¹)	Permissible Torque N·m (kgf·cm) at 1200 min⁻¹	Permissible Torque N·m (kgf·cm) at 90 min⁻¹	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M91Z60GV4L	4	60	100	50	Cont.	90 to 1400	0.43 (4.3)	0.078 (0.79)	2.3	0.46 (4.6)	20 (200V)
					60		90 to 1700	0.36 (3.6)	0.078 (0.79)	2.4	0.46 (4.6)	
	M91Z60GV4Y	4	60	200	50	Cont.	90 to 1400	0.43 (4.3)	0.078 (0.79)	1.2	0.46 (4.6)	5 (400V)
					60		90 to 1700	0.36 (3.6)	0.078 (0.79)	1.2	0.46 (4.6)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-265.

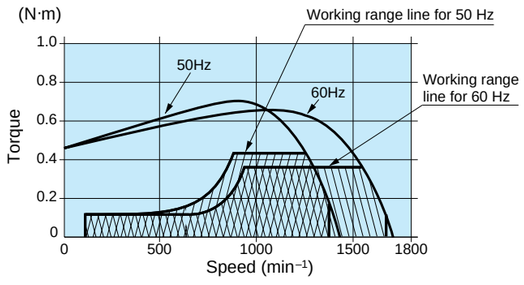
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed \ Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	1200min⁻¹	50Hz	0.98 (10)	1.17 (11)	1.57 (16)	1.87 (19)	2.35 (23)	2.80 (28)	3.14 (32)	3.92 (40)	4.70 (47)	5.60 (57)	6.27 (63)	7.55 (77)	9.01 (91)
		60Hz	0.82 (8.3)	0.98 (10)	1.31 (13)	1.57 (16)	1.96 (20)	2.35 (23)	2.62 (26)	3.28 (33)	3.92 (40)	4.70 (47)	5.29 (53)	6.32 (64)	7.55 (77)
	90min⁻¹		0.18 (1.8)	0.22 (2.2)	0.31 (3.1)	0.37 (3.7)	0.47 (4.7)	0.56 (5.7)	0.63 (6.4)	0.70 (7.1)	0.84 (8.5)	1.00 (10)	1.12 (11)	1.40 (14)	1.68 (17)
	Rotational direction		Same as motor rotational direction							Reverse to motor rotational direction					

Applicable gear head / Bearing	Speed \ Reduction ratio		36	50	60	75	90	100	120	150	180	200	Applicable decimal gear head
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	1200min⁻¹	50Hz	10.8 (110)	15.2 (155)	18.1 (184)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	MZ9G10XB
		60Hz	9.11 (92)	12.7 (129)	15.2 (155)	19.0 (193)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	
	90min⁻¹		1.81 (18)	2.50 (25)	3.00 (30)	3.75 (38)	4.50 (45)	5.00 (51)	6.00 (61)	7.50 (76)	9.00 (91)	10.0 (102)	
	Rotational direction		Same as motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

*Working range line

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

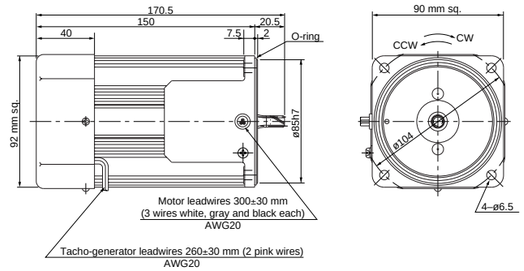
Features B-224 | System configuration B-225 | Coding system B-225 | Model list B-228

Motor (dimensions)

Scale: 1/4, Unit: mm

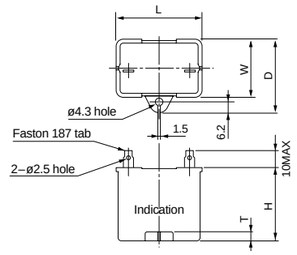
M91Z60GV4L 4P 60 W 100 V (with fan)
M91Z60GV4Y 4P 60 W 200 V (with fan)

Mass	Helical gear	Module	Number of teeth
2.7 kg		0.6	9



Capacitor (dimensions) [attachment]

Unit: mm



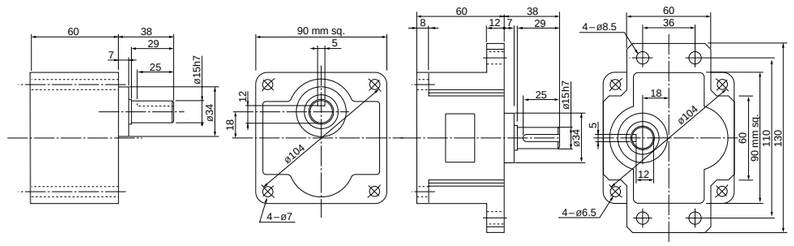
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M91Z60GV4L	M0PC20M20	50.2	26.7	37	36	5	M0PC5026
M91Z60GV4Y	M0PC5M40	50	30.5	41	41.5	4	M0PC5032

Gear head (dimensions)

Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg
MY9G□M (metal bearing / hinge attached) Mass 1.4 kg

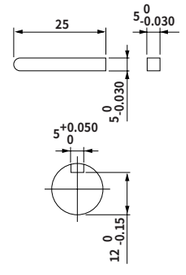


Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Gear head combination B-263 | Round shaft motor dimensions B-265 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Variable speed induction motor (leadwire)

90 mm sq. 60 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min⁻¹)	Permissible Torque N·m (kgf·cm) at 1200 min⁻¹	Permissible Torque N·m (kgf·cm) at 90 min⁻¹	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M91Z60GV4LG M91Z60GV4LGA	4	60	100	50	Cont.	90 to 1400	0.44 (4.5)	0.10 (1.0)	3.0	0.37 (3.8)	20 (250V)
					60		90 to 1700	0.35 (3.6)	0.10 (1.0)	2.7	0.37 (3.8)	
	M91Z60GV4DG M91Z60GV4DGA	4	60	110	60	Cont.	90 to 1700	0.35 (3.6)	0.10 (1.0)	3.0	0.40 (4.1)	18 (250V)
				115	60		90 to 1700	0.35 (3.6)	0.10 (1.0)	3.1	0.43 (4.4)	
	M91Z60GV4YG M91Z60GV4YGA	4	60	200	50	Cont.	90 to 1400	0.44 (4.5)	0.10 (1.0)	1.3	0.37 (3.8)	5 (450V)
					60		90 to 1700	0.35 (3.6)	0.10 (1.0)	1.2	0.37 (3.8)	
	M91Z60GV4GG M91Z60GV4GGA	4	60	220	50	Cont.	90 to 1400	0.44 (4.5)	0.10 (1.0)	1.5	0.40 (4.1)	5 (450V)
					60		90 to 1700	0.35 (3.6)	0.10 (1.0)	1.3	0.40 (4.1)	
				230	50		90 to 1400	0.44 (4.5)	0.10 (1.0)	1.5	0.43 (4.4)	
					60		90 to 1700	0.35 (3.6)	0.10 (1.0)	1.4	0.43 (4.4)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-265.
• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

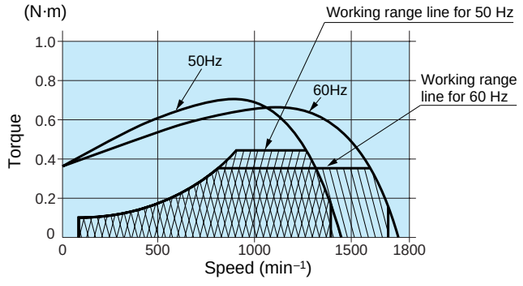
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed	Reduction ratio	3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30
MZ9G□B (ball bearing hinge not attached) MY9G□B (ball bearing hinge attached)	1200min⁻¹	50Hz	1.07 (11)	1.28 (13)	1.78 (18)	2.14 (22)	2.67 (27)	3.21 (33)	3.56 (36)	4.01 (41)	4.81 (49)	5.77 (59)	6.42 (66)	8.02 (82)	9.62 (98)
		60Hz	0.85 (8.7)	1.02 (10)	1.42 (15)	1.70 (17)	2.13 (22)	2.55 (26)	2.84 (29)	3.19 (33)	3.83 (39)	4.59 (47)	5.10 (52)	6.38 (66)	7.65 (79)
	90min⁻¹		0.24 (2.4)	0.29 (2.9)	0.41 (4.1)	0.49 (4.9)	0.61 (6.1)	0.73 (7.3)	0.81 (8.1)	0.91 (9.1)	1.09 (11)	1.31 (13)	1.46 (15)	1.82 (18)	2.19 (22)
	Rotational direction		Same as motor rotational direction							Reverse to motor rotational direction					

Applicable gear head / Bearing	Speed	Reduction ratio	36	50	60	75	90	100	120	150	180	200	Applicable decimal gear head
MZ9G□B (ball bearing hinge not attached) MY9G□B (ball bearing hinge attached)	1200min⁻¹	50Hz	10.4 (106)	14.4 (148)	17.3 (177)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	MZ9G10XB
		60Hz	8.27 (85)	11.5 (118)	13.8 (142)	17.2 (177)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	
	90min⁻¹		2.36 (24)	3.28 (33)	3.94 (39)	4.92 (49)	5.90 (59)	6.56 (66)	7.87 (79)	9.84 (98)	11.8 (118)	13.1 (131)	
	Rotational direction		Same as motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

* Working range line

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

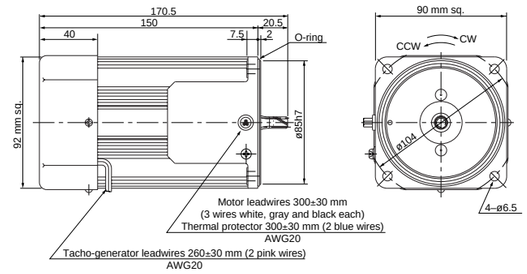
Features B-224 | System configuration B-225 | Coding system B-225 | Model list B-228

Motor (dimensions)

Scale: 1/4, Unit: mm

M91Z60GV4LG(A) 4P 60 W 100 V (with fan)
M91Z60GV4DG(A) 4P 60 W 110 V / 115 V (with fan)
M91Z60GV4YG(A) 4P 60 W 200 V (with fan)
M91Z60GV4GG(A) 4P 60 W 220 V / 230 V (with fan)

Mass	Helical gear	Module	Number of teeth
2.7 kg		0.6	9



Capacitor (dimensions) [attachment]

Unit: mm

Capacitor cap (dimensions) [attachment]

Unit: mm

• Capacitor dimension list (mm)

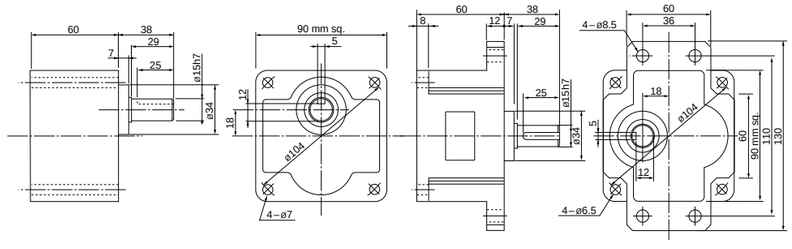
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M91Z60GV4LG(A)	M0PC20M25G	58	29	44	41	4	M0PC5829G	58	29	55	78
M91Z60GV4DG(A)	M0PC18M25G	58	29	44	41	4	M0PC5829G	58	29	55	78
M91Z60GV4YG(A)	M0PC5M45G	58	29	44	41	4	M0PC5829G	58	29	55	78
M91Z60GV4GG(A)	M0PC5M45G	58	29	44	41	4	M0PC5829G	58	29	55	78

• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg
MY9G□M (metal bearing / hinge attached) Mass 1.4 kg

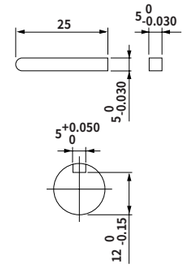


Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Induction motor
Reversible motor
3-phase motor
Electromagnetic brake motor
Variable speed induction motor
Variable speed reversible motor
Variable speed electromagnetic brake single-phase motor
Variable speed unit motor
2-pole round shaft motor
Gear head

Gear head combination B-263 | Round shaft motor dimensions B-265 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Variable speed induction motor (leadwire)

90 mm sq. 90 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min^{-1})	Permissible Torque N·m (kgf·cm) at 1200 min^{-1}	Permissible Torque N·m (kgf·cm) at 90 min^{-1}	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M91Z90GV4L	4	90	100	50	Cont.	90 to 1400	0.59 (6.0)	0.25 (2.5)	2.3	0.53 (5.4)	25 (200V)
					60		90 to 1700	0.54 (5.5)	0.25 (2.5)	2.2	0.56 (5.7)	
	M91Z90GV4Y	4	90	200	50	Cont.	90 to 1400	0.59 (6.0)	0.25 (2.5)	1.1	0.57 (5.8)	6.2 (375V)
					60		90 to 1700	0.54 (5.5)	0.25 (2.5)	1.1	0.59 (6.0)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-265.

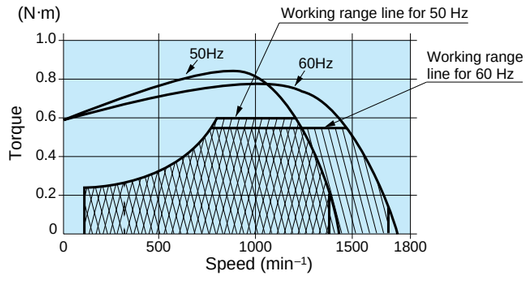
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed	Reduction ratio	3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	1200min^{-1}	50Hz	1.43 (14)	1.71 (17)	2.38 (24)	2.86 (29)	3.57 (36)	4.29 (43)	4.77 (48)	5.36 (54)	6.43 (65)	7.72 (78)	8.58 (87)	10.97 (111)	12.8 (130)
		60Hz	1.31 (13)	1.57 (16)	2.18 (22)	2.62 (26)	3.27 (33)	3.93 (40)	4.37 (44)	4.91 (50)	5.89 (60)	7.07 (72)	7.86 (80)	9.82 (100)	11.7 (119)
	90min^{-1}		0.60 (6.1)	0.72 (7.3)	1.01 (10)	1.21 (12)	1.51 (15)	1.81 (18)	2.02 (20)	2.26 (23)	2.71 (27)	3.25 (33)	3.62 (36)	4.52 (46)	5.43 (55)
	Rotational direction		Same as motor rotational direction							Reverse to motor rotational direction					

Applicable gear head / Bearing	Speed	Reduction ratio	36	50	60	75	90	100	120	150	180	200	Applicable decimal gear head
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	1200min^{-1}	50Hz	13.7 (139)	19.2 (195)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	MZ9G10XB
		60Hz	12.6 (128)	17.6 (179)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	
	90min^{-1}		5.83 (59)	8.10 (82)	9.72 (99)	12.1 (123)	14.5 (147)	16.2 (165)	19.4 (197)	19.6 (200)	19.6 (200)	19.6 (200)	
	Rotational direction		Same as motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

*Working range line

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

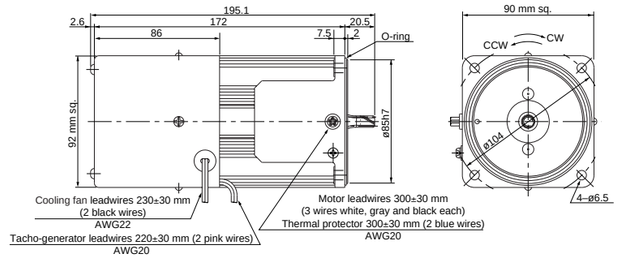
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/4, Unit: mm

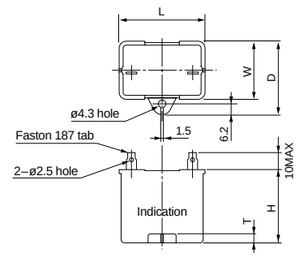
M91Z90GV4L 4P 90 W 100 V (Forced cooling fan)
M91Z90GV4Y 4P 90 W 200 V (Forced cooling fan)

Mass	Helical gear	Module	Number of teeth
3.5 kg		0.6	9



Capacitor (dimensions) [attachment]

Unit: mm



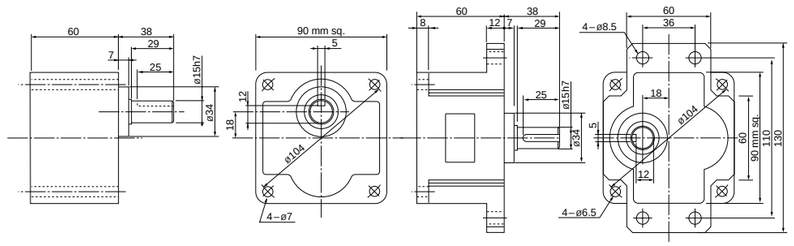
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M91Z90GV4L	M0PC25M20	50.2	31	41	42	5	M0PC5032
M91Z90GV4Y	M0PC6.2M38	50	30.5	41	41.5	4	M0PC5032

Gear head (dimensions)

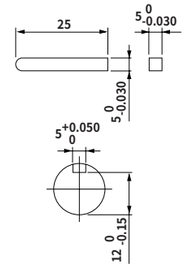
Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg
MY9G□M (metal bearing / hinge attached) Mass 1.4 kg



Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Variable speed induction motor (leadwire)

90 mm sq. 90 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min^{-1})	Permissible Torque N·m (kgf·cm) at 1200 min^{-1}	Permissible Torque N·m (kgf·cm) at 90 min^{-1}	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M91Z90GV4LG M91Z90GV4LGA	4	90	100	50	Cont.	90 to 1400	0.69 (7.0)	0.29 (3.0)	3.0	0.61 (6.2)	30 (250V)
					60		90 to 1700	0.54 (5.5)	0.29 (3.0)	2.8	0.61 (6.2)	
	M91Z90GV4DG M91Z90GV4DGA	4	90	110	60	Cont.	90 to 1700	0.54 (5.5)	0.29 (3.0)	3.0	0.61 (6.2)	25 (250V)
				115	60		90 to 1700	0.54 (5.5)	0.29 (3.0)	3.1	0.65 (6.6)	
	M91Z90GV4YG M91Z90GV4YGA	4	90	200	50	Cont.	90 to 1400	0.69 (7.0)	0.29 (3.0)	1.4	0.61 (6.2)	7.5 (450V)
					60		90 to 1700	0.54 (5.5)	0.29 (3.0)	1.4	0.61 (6.2)	
	M91Z90GV4GG M91Z90GV4GGA	4	90	220	50	Cont.	90 to 1400	0.69 (7.0)	0.29 (3.0)	1.5	0.60 (6.1)	6 (450V)
					60		90 to 1700	0.54 (5.5)	0.29 (3.0)	1.4	0.60 (6.1)	
				230	50		90 to 1400	0.69 (7.0)	0.29 (3.0)	1.5	0.65 (6.6)	
					60		90 to 1700	0.54 (5.5)	0.29 (3.0)	1.5	0.65 (6.6)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-265.
• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

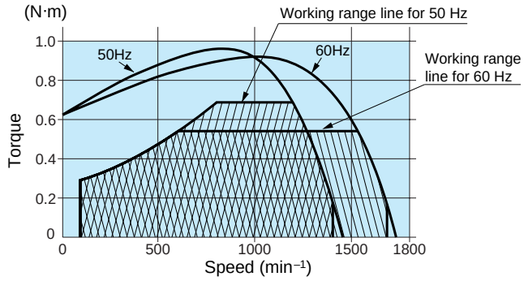
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed		Reduction ratio 3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30
MZ9G□B (ball bearing hinge not attached) MY9G□B (ball bearing hinge attached)	1200min^{-1}	50Hz	1.68 (17)	2.01 (20)	2.79 (28)	3.35 (34)	4.19 (43)	5.03 (51)	5.59 (57)	6.29 (64)	7.55 (77)	9.05 (92)	10.1 (102)	12.6 (128)	15.1 (153)
		60Hz	1.31 (13)	1.57 (16)	2.19 (22)	2.62 (27)	3.28 (33)	3.94 (40)	4.37 (45)	4.92 (50)	5.90 (60)	7.09 (72)	7.87 (80)	9.84 (100)	11.8 (120)
	90min^{-1}		0.70 (7.3)	0.85 (8.7)	1.17 (12)	1.41 (15)	1.76 (18)	2.11 (22)	2.35 (24)	2.64 (27)	3.17 (33)	3.81 (39)	4.23 (44)	5.29 (55)	6.34 (66)
	Rotational direction		Same as motor rotational direction							Reverse to motor rotational direction					

Applicable gear head / Bearing	Speed		Reduction ratio 36	50	60	75	90	100	120	150	180	200	Applicable decimal gear head
MZ9G□B (ball bearing hinge not attached) MY9G□B (ball bearing hinge attached)	1200min^{-1}	50Hz	16.3 (165)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	MZ9G10XB
		60Hz	12.8 (130)	17.7 (180)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	
	90min^{-1}		6.85 (71)	9.51 (98)	11.4 (118)	14.3 (148)	17.1 (177)	19.0 (197)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	
	Rotational direction		Same as motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

* Working range line

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

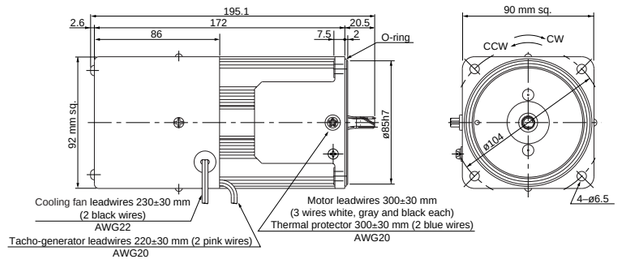
Features B-224 | System configuration B-225 | Coding system B-225 | Model list B-228

Motor (dimensions)

Scale: 1/4, Unit: mm

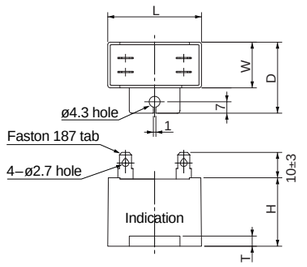
M91Z90GV4LG(A) 4P 90 W 100 V (Forced cooling fan)
M91Z90GV4DG(A) 4P 90 W 110 V / 115 V (Forced cooling fan)
M91Z90GV4YG(A) 4P 90 W 200 V (Forced cooling fan)
M91Z90GV4GG(A) 4P 90 W 220 V / 230 V (Forced cooling fan)

Mass	Helical	Module	Number of teeth
3.5 kg	gear	0.6	9



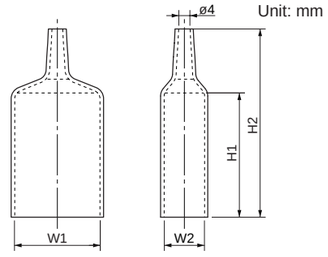
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

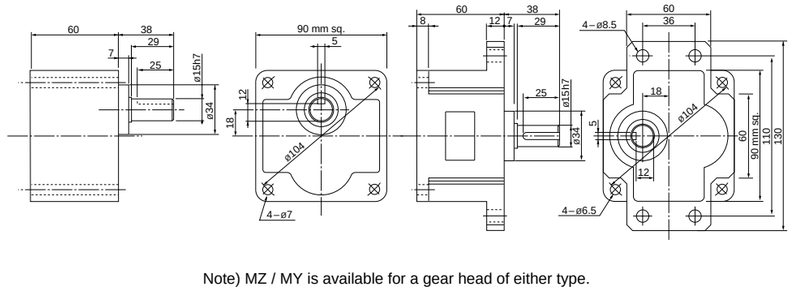
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M91Z90GV4LG(A)	M0PC30M25G	58	35	50	50	4	M0PC5835G	58	35	55	78
M91Z90GV4DG(A)	M0PC25M25G	58	35	50	50	4	M0PC5835G	58	35	55	78
M91Z90GV4YG(A)	M0PC7.5M45G	58	35	50	50	4	M0PC5835G	58	35	55	78
M91Z90GV4GG(A)	M0PC6M45G	58	29	44	41	4	M0PC5829G	58	29	55	78

• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

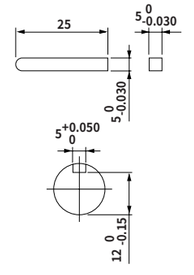
Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg
MY9G□M (metal bearing / hinge attached) Mass 1.4 kg



Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

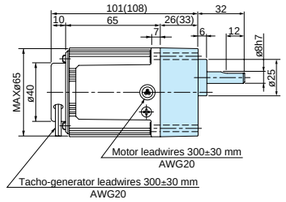
Gear head combination B-263 | Round shaft motor dimensions B-265 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Variable speed induction motor (leadwire)

Gear head combination dimensions
Scale: 1/4, Unit: mm

60 mm sq. 3 W

M61X3GV4L + MX6G□BA(MA) / MX6G□B(M)

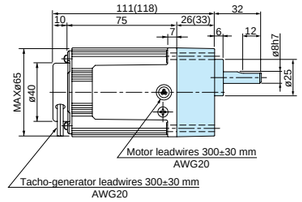


* Figures in ( ) represent the dimensions of MX6G□B (M) (1/30 or larger reduction ratio).

The model number of the gear head with a reduction ratio of 1/25 or smaller is MX6G□BA (MA).

60 mm sq. 6 W

M61X6GV4L + MX6G□BA(MA) / MX6G□B(M)
M61X6GV4Y + MX6G□BA(MA) / MX6G□B(M)
M61X6GV4LG(A) + MX6G□BA(MA) / MX6G□B(M)
M61X6GV4DG(A) + MX6G□BA(MA) / MX6G□B(M)
M61X6GV4YG(A) + MX6G□BA(MA) / MX6G□B(M)
M61X6GV4GG(A) + MX6G□BA(MA) / MX6G□B(M)

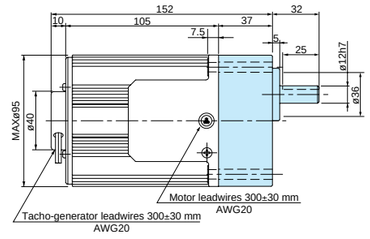


* Figures in ( ) represent the dimensions of MX6G□B (M) (1/30 or larger reduction ratio).

The model number of the gear head with a reduction ratio of 1/25 or smaller is MX6G□BA (MA).

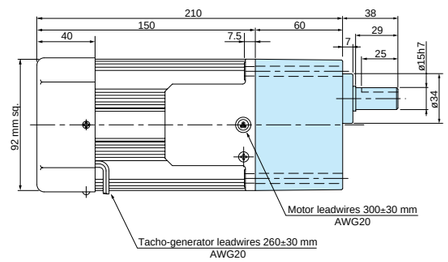
90 mm sq. 40 W

M91X40GV4L + MX9G□B(M)
M91X40GV4Y + MX9G□B(M)
M91X40GV4LG(A) + MX9G□B(M)
M91X40GV4DG(A) + MX9G□B(M)
M91X40GV4YG(A) + MX9G□B(M)
M91X40GV4GG(A) + MX9G□B(M)



90 mm sq. 60 W

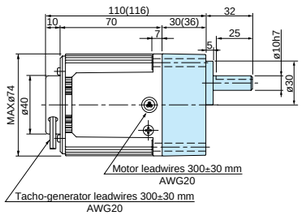
M91Z60GV4L + MZ9G□B (MY9G□B)
M91Z60GV4Y + MZ9G□B (MY9G□B)
M91Z60GV4LG(A) + MZ9G□B (MY9G□B)
M91Z60GV4DG(A) + MZ9G□B (MY9G□B)
M91Z60GV4YG(A) + MZ9G□B (MY9G□B)
M91Z60GV4GG(A) + MZ9G□B (MY9G□B)



* Refer to page B-380 for high torque gear head.

70 mm sq. 10 W

M71X10GV4L + MX7G□BA(MA) / MX7G□B(M)
M71X10GV4Y + MX7G□BA(MA) / MX7G□B(M)

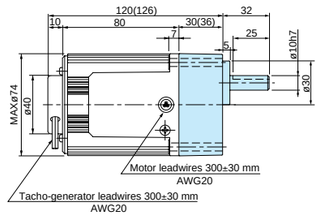


* Figures in ( ) represent the dimensions of MX7G□B (M) (1/30 or larger reduction ratio).

The model number of the gear head with a reduction ratio of 1/25 or smaller is MX7G□BA (MA).

70 mm sq. 15 W

M71X15GV4L + MX7G□BA(MA) / MX7G□B(M)
M71X15GV4Y + MX7G□BA(MA) / MX7G□B(M)
M71X15GV4LG(A) + MX7G□BA(MA) / MX7G□B(M)
M71X15GV4DG(A) + MX7G□BA(MA) / MX7G□B(M)
M71X15GV4YG(A) + MX7G□BA(MA) / MX7G□B(M)
M71X15GV4GG(A) + MX7G□BA(MA) / MX7G□B(M)

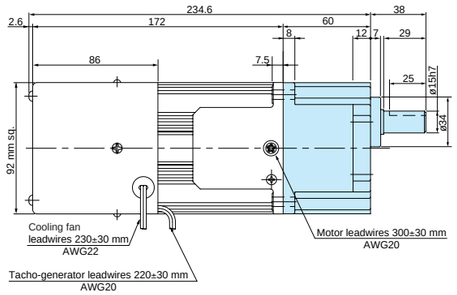


* Figures in ( ) represent the dimensions of MX7G□B (M) (1/30 or larger reduction ratio).

The model number of the gear head with a reduction ratio of 1/25 or smaller is MX7G□BA (MA).

90 mm sq. 90 W

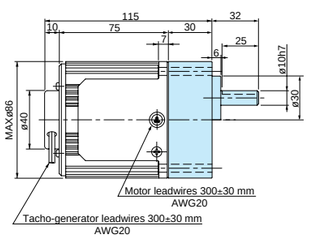
M91Z90GV4L + MY9G□B (MZ9G□B)
M91Z90GV4Y + MY9G□B (MZ9G□B)
M91Z90GV4LG(A) + MY9G□B (MZ9G□B)
M91Z90GV4DG(A) + MY9G□B (MZ9G□B)
M91Z90GV4YG(A) + MY9G□B (MZ9G□B)
M91Z90GV4GG(A) + MY9G□B (MZ9G□B)



* Refer to page B-380 for high torque gear head.

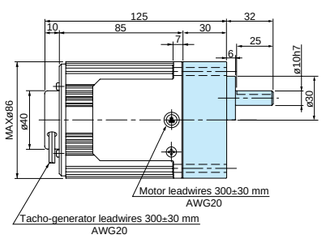
80 mm sq. 15 W

M81X15GV4L + MX8G□B(M)
M81X15GV4Y + MX8G□B(M)



80 mm sq. 25 W

M81X25GV4L + MX8G□B(M)
M81X25GV4Y + MX8G□B(M)
M81X25GV4LG(A) + MX8G□B(M)
M81X25GV4DG(A) + MX8G□B(M)
M81X25GV4YG(A) + MX8G□B(M)
M81X25GV4GG(A) + MX8G□B(M)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

*The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
*The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

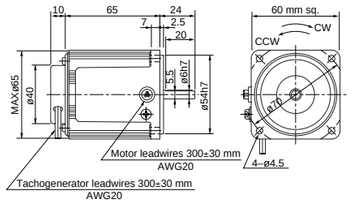
(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Variable speed induction motor (4-pole round shaft / leadwire)

Dimensions
Scale: 1/4, Unit: mm

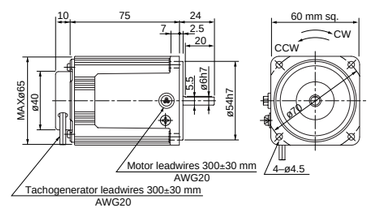
60 mm sq. 3 W — Mass 0.6 kg

M61X3SV4LS



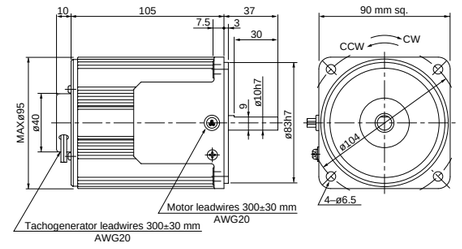
60 mm sq. 6 W — Mass 0.71 kg

M61X6SV4LS
M61X6SV4YS
M61X6SV4LG(A)
M61X6SV4YG(A)
M61X6SV4DG(A)
M61X6SV4GG(A)



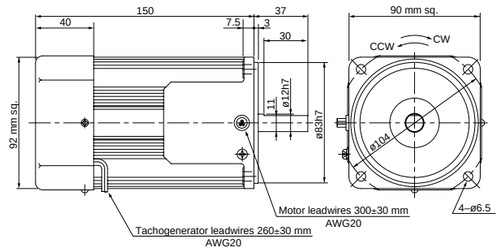
90 mm sq. 40 W — Mass 2.4 kg

M91X40SV4LS
M91X40SV4YS
M91X40SV4LG(A)
M91X40SV4YG(A)
M91X40SV4DG(A)
M91X40SV4GG(A)



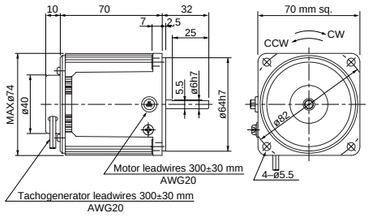
90 mm sq. 60 W — Mass 2.7 kg

M91Z60SV4LS (with fan)
M91Z60SV4YS (with fan)
M91Z60SV4LG(A) (with fan)
M91Z60SV4DG(A) (with fan)
M91Z60SV4YG(A) (with fan)
M91Z60SV4GG(A) (with fan)



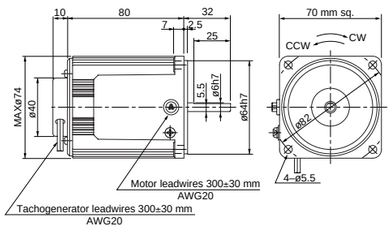
70 mm sq. 10 W — Mass 0.88 kg

M71X10SV4LS
M71X10SV4YS



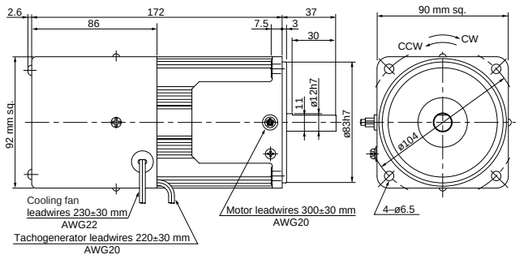
70 mm sq. 15 W — Mass 1.1 kg

M71X15SV4LS
M71X15SV4YS
M71X15SV4LG(A)
M71X15SV4YG(A)
M71X15SV4DG(A)
M71X15SV4GG(A)



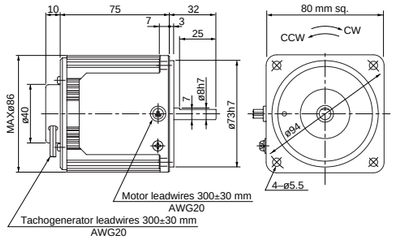
90 mm sq. 90 W — Mass 3.5 kg

M91Z90SV4LS (Forced cooling fan)
M91Z90SV4YS (Forced cooling fan)
M91Z90SV4LG(A) (Forced cooling fan)
M91Z90SV4DG (A) (Forced cooling fan)
M91Z90SV4YG (A) (Forced cooling fan)
M91Z90SV4GG(A) (Forced cooling fan)



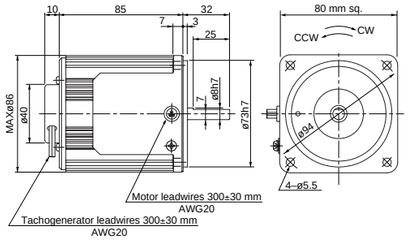
80 mm sq. 15 W — Mass 1.2 kg

M81X15SV4LS
M81X15SV4YS



80 mm sq. 25 W — Mass 1.5 kg

M81X25SV4LS
M81X25SV4YS
M81X25SV4LG(A)
M81X25SV4YG(A)
M81X25SV4DG(A)
M81X25SV4GG(A)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

*The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
*The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Variable Speed Reversible Motor

Contents

Outline of variable speed reversible motor

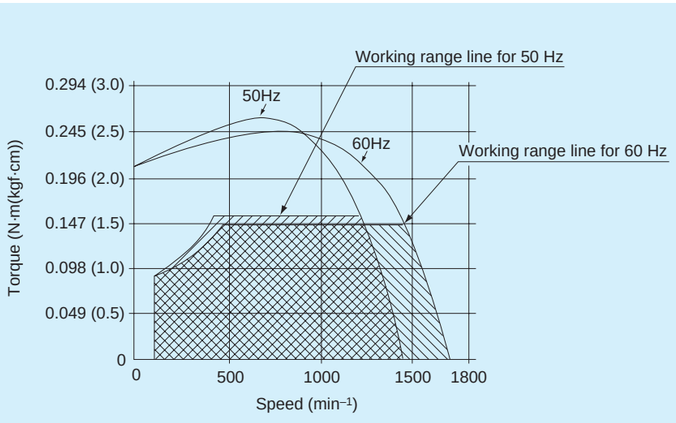
Features

- It is a variable speed motor containing a simple brake mechanism.
- The built-in simple brake mechanism makes the overrun small as compared with the induction motor, enabling a quick-reversal run.
- The time rating is 30 minutes.
- By using it together with a speed controller, you can vary the speed over a wider range (90 to 1400 min^{-1} for 50 Hz and 90 to 1700 min^{-1} for 60 Hz).
- Various functions such as variable speed, braking, normal/reverse run and soft-start/soft-stop are available.
- Feedback control with the built-in tacho-generator gives a constant speed despite of frequency change.
- The motor output is 4 W to 90 W.

Working range

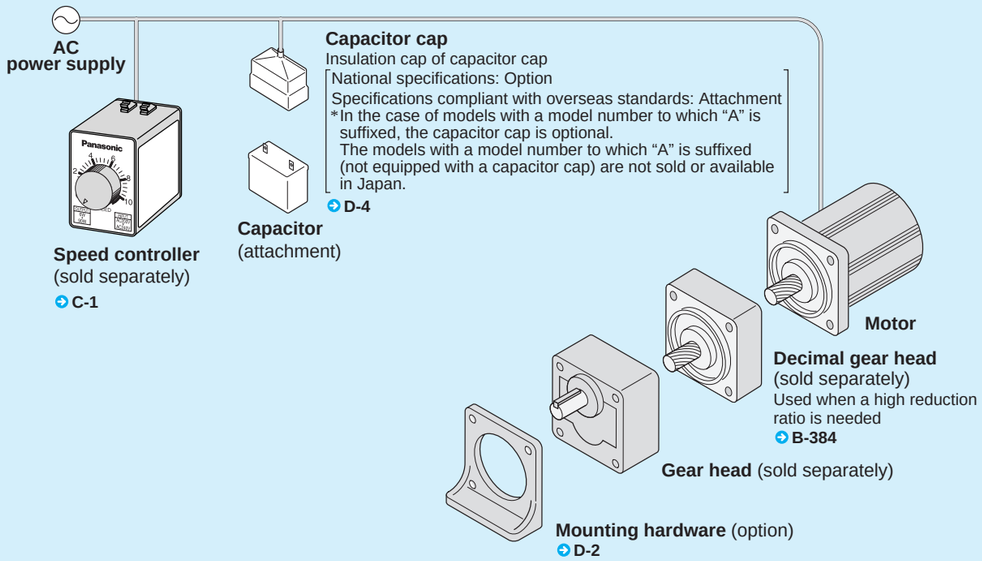
The working range line shows the working limit for the variable speed motor. (The time rating is 30 minutes.) The permissible torque should fall within the shaded portion.
If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

• Working range line



Example : M8RX25GV4L 4P 25W

System configuration diagram



Coding system

M 9 R X 40 G V 4 L S A

- **9 Size**
  - 6 : 60 mm sq.
  - 7 : 70 mm sq.
  - 8 : 80 mm sq.
  - 9 : 90 mm sq.
- **R Motor type**
  - R :Reversible motor
- **X Output type**
  - X : 40 W or smaller
  - Z : 60 W or larger
- **40 Output**
  - 4 : 4 W
  - 6 : 6 W
  - 10 : 10 W
  - 15 : 15 W
  - 20 : 20 W
  - 25 : 25 W
  - 40 : 40 W
  - 60 : 60 W
  - 90 : 90 W
- **G Shape of shaft**
  - G : Pinion shaft
  - S : Round shaft
- **V Option**
  - V : Variable speed
- **4 No. of poles**
  - 4 : 4 poles
- **L Voltage**
  - L : 100 V
  - Y : 200 V
  - D : 110/115 V
  - G : 220/230 V
- **S Classification**
  - Motor with specifications compliant with overseas standards that is not equipped with a capacitor cap.
  - G : Specifications compliant with overseas standards
    S : Round shaft
    (S for round shaft with national specifications only)
- **A**

Corresponding model number	Shape of shaft	Classification
Specifications compliant with overseas standards Pinion shaft	G	G
Specifications compliant with overseas standards Round shaft	S	G
National specifications Pinion shaft	G	–
National specifications Round shaft	S	S

Model list of variable speed reversible motor

Pinion shaft motor

Applicable gear head

✪ Motor compliant with overseas standards

Hinge attached

Size	Output (W)	Leadwire type				Standard gear head		High torque gear head	Right-angle gear head	Decimal gear head
		Model number	Specifications		Page	Ball bearing	metal bearing			
60 mm sq.	4	M6RX4GV4L	100V		B-274	MX6G□BA MX6G□B	MX6G□MA MX6G□M	–	–	MX6G10XB
	6	M6RX6GV4L	100V		B-276					
		M6RX6GV4Y	200V		B-276					
		M6RX6GV4LG(A)	100V	✪	B-278					
		M6RX6GV4DG(A)	110/115V	✪	B-278					
		M6RX6GV4YG(A)	200V	✪	B-278					
		M6RX6GV4GG(A)	220/230V	✪	B-278					
70 mm sq.	10	M7RX10GV4L	100V		B-280	MX7G□BA MX7G□B	MX7G□MA MX7G□M	–	–	MX7G10XB
		M7RX10GV4Y	200V		B-280					
	15	M7RX15GV4L	100V		B-282					
		M7RX15GV4Y	200V		B-282					
		M7RX15GV4LG(A)	100V	✪	B-284					
		M7RX15GV4DG(A)	110/115V	✪	B-284					
		M7RX15GV4YG(A)	200V	✪	B-284					
		M7RX15GV4GG(A)	220/230V	✪	B-284					
80 mm sq.	20	M8RX20GV4L	100V		B-286	MX8G□B	MX8G□M	–	–	MX8G10XB
		M8RX20GV4Y	200V		B-286					
	25	M8RX25GV4L	100V		B-288					
		M8RX25GV4Y	200V		B-288					
		M8RX25GV4LG(A)	100V	✪	B-290					
		M8RX25GV4DG(A)	110/115V	✪	B-290					
		M8RX25GV4YG(A)	200V	✪	B-290					
		M8RX25GV4GG(A)	220/230V	✪	B-290					
90 mm sq.	40	M9RX40GV4L	100V		B-292	MX9G□B	MX9G□M	–	MX9G□R	MX9G10XB
		M9RX40GV4Y	200V		B-292					
		M9RX40GV4LG(A)	100V	✪	B-294					
		M9RX40GV4DG(A)	110/115V	✪	B-294					
		M9RX40GV4YG(A)	200V	✪	B-294					
		M9RX40GV4GG(A)	220/230V	✪	B-294					
	60	M9RZ60GV4L	100V		B-296	MZ9G□B MY9G□B	–	MR9G□B MP9G□B	MZ9G□R	MZ9G10XB
		M9RZ60GV4Y	200V		B-296					
		M9RZ60GV4LG(A)	100V	✪	B-298					
		M9RZ60GV4DG(A)	110/115V	✪	B-298					
		M9RZ60GV4YG(A)	200V	✪	B-298					
		M9RZ60GV4GG(A)	220/230V	✪	B-298					
	90	M9RZ90GV4L	100V		B-300					
		M9RZ90GV4Y	200V		B-300					
		M9RZ90GV4LG(A)	100V	✪	B-302					
		M9RZ90GV4DG(A)	110/115V	✪	B-302					
		M9RZ90GV4YG(A)	200V	✪	B-302					
		M9RZ90GV4GG(A)	220/230V	✪	B-302					

* The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

* Refer to page B-380 for dimensions and permissible torque of high torque gear head.
Refer to page B-382 for dimensions and permissible torque of right-angle gear head.
Refer to page B-384 for dimensions of decimal gear head.

Model list of variable speed reversible motor

Round shaft motor

✪ Motor compliant with overseas standards

Size	Output (W)	Leadwire type		
		Model number	Specifications	
60 mm sq.	4	**M6RX4SV4LS**	100V	
	6	**M6RX6SV4LS**	100V	
		M6RX6SV4YS	200V	
		M6RX6SV4LG(A)	100V	✪
		M6RX6SV4DG(A)	110/115V	✪
		M6RX6SV4YG(A)	200V	✪
		M6RX6SV4GG(A)	220/230V	✪
70 mm sq.	10	**M7RX10SV4LS**	100V	
		M7RX10SV4YS	200V	
	15	**M7RX15SV4LS**	100V	
		M7RX15SV4YS	200V	
		M7RX15SV4LG(A)	100V	✪
		M7RX15SV4DG(A)	110/115V	✪
		M7RX15SV4YG(A)	200V	✪
		M7RX15SV4GG(A)	220/230V	✪
80 mm sq.	20	**M8RX20SV4LS**	100V	
		M8RX20SV4YS	200V	
	25	**M8RX25SV4LS**	100V	
		M8RX25SV4YS	200V	
		M8RX25SV4LG(A)	100V	✪
		M8RX25SV4DG(A)	110/115V	✪
		M8RX25SV4YG(A)	200V	✪
		M8RX25SV4GG(A)	220/230V	✪
90 mm sq.	40	**M9RX40SV4LS**	100V	
		M9RX40SV4YS	200V	
		M9RX40SV4LG(A)	100V	✪
		M9RX40SV4DG(A)	110/115V	✪
		M9RX40SV4YG(A)	200V	✪
		M9RX40SV4GG(A)	220/230V	✪
	60	**M9RZ60SV4LS**	100V	
		M9RZ60SV4YS	200V	
		M9RZ60SV4LG(A)	100V	✪
		M9RZ60SV4DG(A)	110/115V	✪
		M9RZ60SV4YG(A)	200V	✪
		M9RZ60SV4GG(A)	220/230V	✪
	90	**M9RZ90SV4LS**	100V	
		M9RZ90SV4YS	200V	
		M9RZ90SV4LG(A)	100V	✪
		M9RZ90SV4DG(A)	110/115V	✪
		M9RZ90SV4YG(A)	200V	✪
		M9RZ90SV4GG(A)	220/230V	✪

* The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft motor.
  Dimensional outline drawing Page B-306.
* The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
  The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

Possible combination of speed controller and motor

Size	Output (W)	Motor		Voltage (V)	Speed controller			
		Certified	Part No.		MGSD type	EX type	SD48 type	EX48 type
60 mm sq.	3	-----	M6RX4GV4L	100	MGSDA1 ★	DV1131	DVSD48AL	DVEX48AL
	6	-----	M6RX6GV4L	100	MGSDA1 ★	DV1131	DVSD48AL	DVEX48AL
		-----	M6RX6GV4Y	200	MGSDB2 ★	DV1231	DVSD48AY	DVEX48AY
		✪	M6RX6GV4LG(A)	100	MGSDA1 ★	-----	-----	-----
		✪	M6RX6GV4DG(A)	110/115	MGSDA1 ★	-----	-----	-----
		✪	M6RX6GV4YG(A)	200	MGSDB2 ★	-----	-----	-----
		✪	M6RX6GV4GG(A)	220/230	MGSDB2 ★	-----	-----	-----
70 mm sq.	10	-----	M7RX10GV4L	100	MGSDA1 ★	DV1131	DVSD48AL	DVEX48AL
		-----	M7RX10GV4Y	200	MGSDB2 ★	DV1231	DVSD48AY	DVEX48AY
	15	-----	M7RX15GV4L	100	MGSDA1 ★	DV1132	DVSD48AL	DVEX48AL
		-----	M7RX15GV4Y	200	MGSDB2 ★	DV1231	DVSD48AY	DVEX48AY
		✪	M7RX15GV4LG(A)	100	MGSDA1 ★	-----	-----	-----
		✪	M7RX15GV4DG(A)	110/115	MGSDA1 ★	-----	-----	-----
		✪	M7RX15GV4YG(A)	200	MGSDB2 ★	-----	-----	-----
		✪	M7RX15GV4GG(A)	220/230	MGSDB2 ★	-----	-----	-----
80 mm sq.	15	-----	M8RX20GV4L	100	MGSDA1 ★	DV1132	DVSD48AL	DVEX48AL
		-----	M8RX20GV4Y	200	MGSDB2 ★	DV1231	DVSD48AY	DVEX48AY
	25	-----	M8RX25GV4L	100	MGSDA1 ★	DV1132	DVSD48BL	DVEX48BL
		-----	M8RX25GV4Y	200	MGSDB2 ★	DV1234	DVSD48BY	DVEX48BY
		✪	M8RX25GV4LG(A)	100	MGSDA1 ★	-----	-----	-----
		✪	M8RX25GV4DG(A)	110/115	MGSDA1 ★	-----	-----	-----
		✪	M8RX25GV4YG(A)	200	MGSDB2 ★	-----	-----	-----
		✪	M8RX25GV4GG(A)	220/230	MGSDB2 ★	-----	-----	-----
90 mm sq.	40	-----	M9RX40GV4L	100	MGSDA1 ★	DV1132	DVSD48BL	DVEX48BL
		-----	M9RX40GV4Y	200	MGSDB2 ★	DV1234	DVSD48BY	DVEX48BY
		✪	M9RX40GV4LG(A)	100	MGSDA1 ★	-----	-----	-----
		✪	M9RX40GV4DG(A)	110/115	MGSDA1 ★	-----	-----	-----
		✪	M9RX40GV4YG(A)	200	MGSDB2 ★	-----	-----	-----
		✪	M9RX40GV4GG(A)	220/230	MGSDB2 ★	-----	-----	-----
	60	-----	M9RZ60GV4L	100	MGSDB1 ★	DV1134	DVSD48CL	DVEX48CL
		-----	M9RZ60GV4Y	200	MGSDB2 ★	DV1234	DVSD48CY	DVEX48CY
		✪	M9RZ60GV4LG(A)	100	MGSDB1 ★	-----	-----	-----
		✪	M9RZ60GV4DG(A)	110/115	MGSDB1 ★	-----	-----	-----
		✪	M9RZ60GV4YG(A)	200	MGSDB2 ★	-----	-----	-----
		✪	M9RZ60GV4GG(A)	220/230	MGSDB2 ★	-----	-----	-----
	90	-----	M9RZ90GV4L	100	MGSDB1 ★	DV1134	DVSD48CL	DVEX48CL
		-----	M9RZ90GV4Y	200	MGSDB2 ★	DV1234	DVSD48CY	DVEX48CY
		✪	M9RZ90GV4LG(A)	100	MGSDB1 ★	-----	-----	-----
		✪	M9RZ90GV4DG(A)	110/115	MGSDB1 ★	-----	-----	-----
		✪	M9RZ90GV4YG(A)	200	MGSDB2 ★	-----	-----	-----
		✪	M9RZ90GV4GG(A)	220/230	MGSDB2 ★	-----	-----	-----

* When using a speed controller operative under a wide range of supply voltage (MGSD, SD48, EX48), the mating motor should be selected according to the voltage of the power supply to be used.

✪ **Conforming to international standards :**

★ **MGSD speed controllers are compliant with and .**

* The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
  The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

Variable speed reversible motor (leadwire)

60 mm sq. 4 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min⁻¹)	Permissible Torque N·m (kgf·cm) at 1200 min⁻¹	Permissible Torque N·m (kgf·cm) at 90 min⁻¹	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
60 mm sq.	M6RX4GV4L	4	4	100	50	30	90 to 1400	0.019 (0.19)	0.019 (0.19)	0.22	0.028 (0.28)	2.5 (200V)
					60		90 to 1700	0.019 (0.19)	0.019 (0.19)	0.23	0.028 (0.28)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-306.

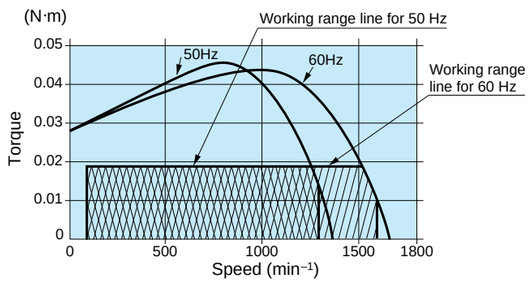
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed \ Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX6G□BA / MX6G□B (ball bearing) MX6G□MA / MX6G□M (metal bearing)	1200min⁻¹	50Hz	0.046 (0.4)	0.055 (0.5)	0.077 (0.7)	0.092 (0.9)	0.11 (1.1)	0.13 (1.3)	0.15 (1.5)	0.19 (1.9)	0.23 (2.3)	0.27 (2.7)	0.30 (3.0)	0.38 (3.8)
		60Hz	0.046 (0.4)	0.055 (0.5)	0.077 (0.7)	0.092 (0.9)	0.11 (1.1)	0.13 (1.3)	0.15 (1.5)	0.19 (1.9)	0.23 (2.3)	0.27 (2.7)	0.30 (3.0)	0.38 (3.8)
	90min⁻¹		0.046 (0.4)	0.055 (0.5)	0.077 (0.7)	0.092 (0.9)	0.11 (1.1)	0.13 (1.3)	0.15 (1.5)	0.19 (1.9)	0.23 (2.3)	0.27 (2.7)	0.30 (3.0)	0.38 (3.8)
	Rotational direction		Same as motor rotational direction											

Applicable gear head / Bearing	Speed \ Reduction ratio		30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX6G□BA / MX6G□B (ball bearing) MX6G□MA / MX6G□M (metal bearing)	1200min⁻¹	50Hz	0.41 (4.1)	0.49 (5.0)	0.69 (7.0)	0.82 (8.3)	1.03 (10)	1.24 (12)	1.38 (14)	1.65 (16)	2.07 (21)	2.45 (25)	MX6G10XB
		60Hz	0.41 (4.1)	0.49 (5.0)	0.69 (7.0)	0.82 (8.3)	1.03 (10)	1.24 (12)	1.38 (14)	1.65 (16)	2.07 (21)	2.45 (25)	
	90min⁻¹		0.41 (4.1)	0.49 (5.0)	0.69 (7.0)	0.82 (8.3)	1.03 (10)	1.24 (12)	1.38 (14)	1.65 (16)	2.07 (21)	2.45 (25)	
	Rotational direction		Reverse to motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

* Working range line

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

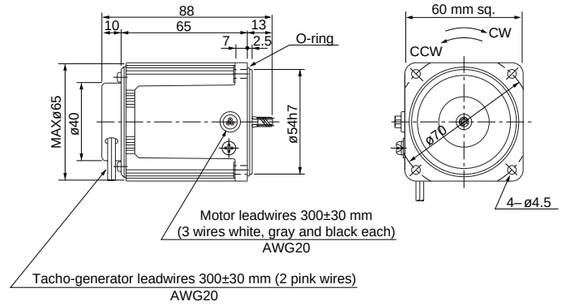
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

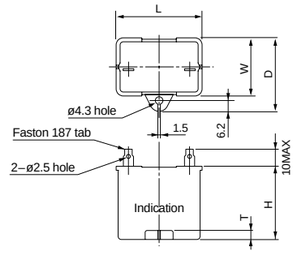
M6RX4GV4L 4P 4 W 100 V

Mass	Helical gear	Module	Number of teeth
0.60 kg		0.5	6



Capacitor (dimensions) [attachment]

Unit: mm



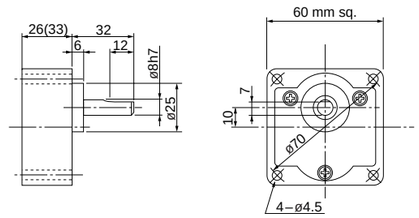
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M6RX4GV4L	M0PC2.5M20	39.5	16	26.5	30.5	4	M0PC3917

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX6G□BA (ball bearing) / **MX6G□B** (ball bearing) Mass 0.24/0.3 kg: Output shaft D cut
MX6G□MA (metal bearing) / **MX6G□M** (metal bearing) Mass 0.24/0.3 kg: Output shaft D cut



* Figures in ( ) represent the dimensions of MX6G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX6G□BA (MA).)

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Variable speed reversible motor (leadwire)

60 mm sq. 6 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min⁻¹)	Permissible Torque N·m (kgf·cm) at 1200 min⁻¹	Permissible Torque N·m (kgf·cm) at 90 min⁻¹	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
60 mm sq.	M6RX6GV4L	4	6	100	50	30	90 to 1400	0.030 (0.30)	0.030 (0.30)	0.31	0.038 (0.38)	3 (200V)
					60		90 to 1700	0.030 (0.30)	0.030 (0.30)	0.31	0.038 (0.38)	
	M6RX6GV4Y	4	6	200	50	30	90 to 1400	0.030 (0.30)	0.030 (0.30)	0.16	0.038 (0.38)	0.8 (400V)
					60		90 to 1700	0.030 (0.30)	0.030 (0.30)	0.16	0.038 (0.38)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-306.

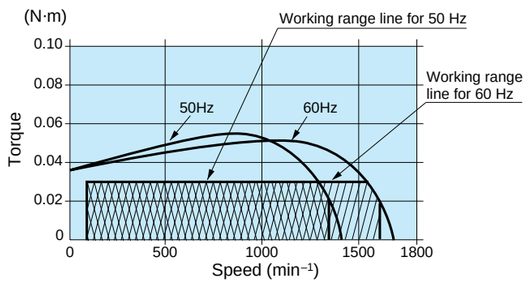
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed	Reduction ratio 3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX6G□BA MX6G□B (ball bearing) MX6G□MA MX6G□M (metal bearing)	1200min⁻¹ 50Hz	0.072 (0.7)	0.087 (0.8)	0.12 (1.2)	0.14 (1.4)	0.18 (1.8)	0.21 (2.1)	0.24 (2.4)	0.29 (2.9)	0.36 (3.6)	0.43 (4.3)	0.48 (4.8)	0.60 (6.1)
	1200min⁻¹ 60Hz	0.072 (0.7)	0.087 (0.8)	0.12 (1.2)	0.14 (1.4)	0.18 (1.8)	0.21 (2.1)	0.24 (2.4)	0.29 (2.9)	0.36 (3.6)	0.43 (4.3)	0.48 (4.8)	0.60 (6.1)
	90min⁻¹	0.072 (0.7)	0.087 (0.8)	0.12 (1.2)	0.14 (1.4)	0.18 (1.8)	0.21 (2.1)	0.24 (2.4)	0.29 (2.9)	0.36 (3.6)	0.43 (4.3)	0.48 (4.8)	0.60 (6.1)
	Rotational direction	Same as motor rotational direction											

Applicable gear head / Bearing	Speed	Reduction ratio 30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX6G□BA MX6G□B (ball bearing) MX6G□MA MX6G□M (metal bearing)	1200min⁻¹ 50Hz	0.65 (6.6)	0.78 (7.9)	1.09 (11)	1.30 (13)	1.63 (16)	1.98 (20)	2.18 (22)	2.45 (25)	2.45 (25)	2.45 (25)	MX6G10XB
	1200min⁻¹ 60Hz	0.65 (6.6)	0.78 (7.9)	1.09 (11)	1.30 (13)	1.63 (16)	1.98 (20)	2.18 (22)	2.45 (25)	2.45 (25)	2.45 (25)	
	90min⁻¹	0.65 (6.6)	0.78 (7.9)	1.09 (11)	1.30 (13)	1.63 (16)	1.98 (20)	2.18 (22)	2.45 (25)	2.45 (25)	2.45 (25)	
	Rotational direction	Reverse to motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

* Working range line

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

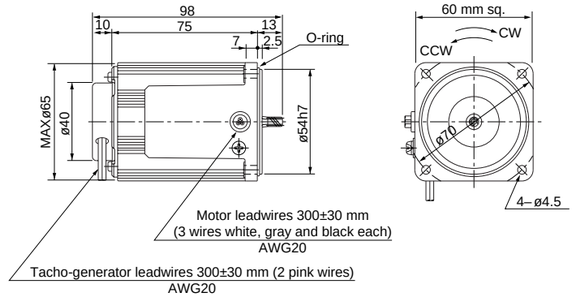
Features B-268 | System configuration B-269 | Coding system B-269 | Model list B-270

Motor (dimensions)

Scale: 1/3, Unit: mm

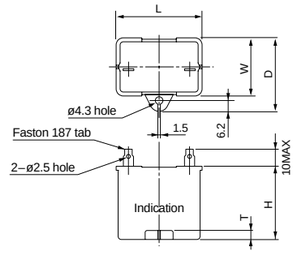
M6RX6GV4L 4P 6 W 100 V
M6RX6GV4Y 4P 6 W 200 V

Mass	Helical gear	Module	Number of teeth
0.71 kg		0.5	6



Capacitor (dimensions) [attachment]

Unit: mm



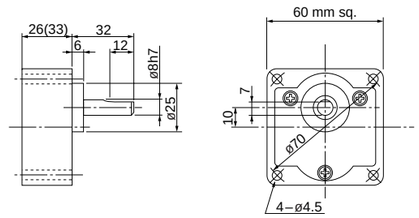
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M6RX6GV4L	M0PC3M20	39.5	16	26.5	30.5	4	M0PC3917
M6RX6GV4Y	M0PC0.8M40	39.5	16.2	27	27	4	M0PC3917

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX6G□BA (ball bearing) / **MX6G□B** (ball bearing) Mass 0.24/0.3 kg: Output shaft D cut
MX6G□MA (metal bearing) / **MX6G□M** (metal bearing) Mass 0.24/0.3 kg: Output shaft D cut



* Figures in ( ) represent the dimensions of MX6G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX6G□BA (MA).)

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-304 | Round shaft motor dimensions B-306 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Variable speed reversible motor (leadwire)

60 mm sq. 6 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min⁻¹)	Permissible Torque N·m (kgf·cm) at 1200 min⁻¹	Permissible Torque N·m (kgf·cm) at 90 min⁻¹	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
60 mm sq.	M6RX6GV4LG M6RX6GV4LGA	4	6	100	50	30	90 to 1400	0.044 (0.45)	0.044 (0.45)	0.33	0.057 (0.58)	4 (250V)
					60		90 to 1700	0.034 (0.35)	0.034 (0.35)	0.35	0.057 (0.58)	
	M6RX6GV4DG M6RX6GV4DGA	4	6	110	60	30	90 to 1700	0.034 (0.35)	0.034 (0.35)	0.34	0.051 (0.53)	3 (250V)
				115	60		90 to 1700	0.034 (0.35)	0.034 (0.35)	0.35	0.057 (0.58)	
	M6RX6GV4YG M6RX6GV4YGA	4	6	200	50	30	90 to 1400	0.044 (0.45)	0.044 (0.45)	0.15	0.057 (0.58)	1 (450V)
					60		90 to 1700	0.034 (0.35)	0.034 (0.35)	0.16	0.057 (0.58)	
	M6RX6GV4GG M6RX6GV4GGA	4	6	220	50	30	90 to 1400	0.044 (0.45)	0.044 (0.45)	0.15	0.056 (0.57)	0.8 (450V)
					60		90 to 1700	0.034 (0.35)	0.034 (0.35)	0.15	0.056 (0.57)	
				230	50		90 to 1400	0.044 (0.45)	0.044 (0.45)	0.15	0.057 (0.58)	
					60		90 to 1700	0.034 (0.35)	0.034 (0.35)	0.16	0.057 (0.58)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-306.
• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

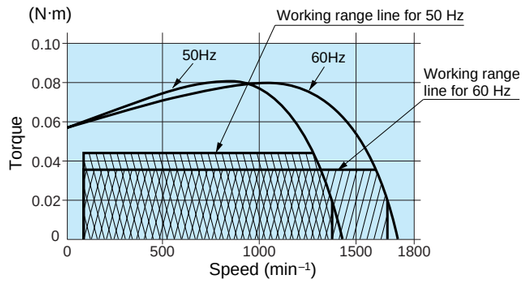
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed		Reduction ratio 3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX6G□BA (ball bearing) MX6G□B (ball bearing) MX6G□MA (metal bearing) MX6G□M (metal bearing)	1200min⁻¹	50Hz	0.11 (1.1)	0.13 (1.3)	0.18 (1.8)	0.21 (2.2)	0.27 (2.7)	0.32 (3.3)	0.36 (3.6)	0.45 (4.6)	0.53 (5.5)	0.64 (6.6)	0.71 (7.3)	0.89 (9.1)
		60Hz	0.083 (0.9)	0.10 (1.0)	0.14 (1.4)	0.17 (1.7)	0.21 (2.1)	0.25 (2.6)	0.28 (2.8)	0.34 (3.5)	0.41 (4.3)	0.50 (5.1)	0.55 (5.7)	0.69 (7.1)
	90min⁻¹	50Hz	0.11 (1.1)	0.13 (1.3)	0.18 (1.8)	0.21 (2.2)	0.27 (2.7)	0.32 (3.3)	0.36 (3.6)	0.45 (4.6)	0.53 (5.5)	0.64 (6.6)	0.71 (7.3)	0.89 (9.1)
		60Hz	0.083 (0.9)	0.10 (1.0)	0.14 (1.4)	0.17 (1.7)	0.21 (2.1)	0.25 (2.6)	0.28 (2.8)	0.34 (3.5)	0.41 (4.3)	0.50 (5.1)	0.55 (5.7)	0.69 (7.1)
	Rotational direction		Same as motor rotational direction											

Applicable gear head / Bearing	Speed		Reduction ratio 30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX6G□BA (ball bearing) MX6G□B (ball bearing) MX6G□MA (metal bearing) MX6G□M (metal bearing)	1200min⁻¹	50Hz	0.96 (9.8)	1.15 (12)	1.60 (16)	1.92 (20)	2.41 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	MX6G10XB
		60Hz	0.74 (7.7)	0.89 (9.2)	1.24 (13)	1.49 (15)	1.86 (19)	2.23 (23)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	
	90min⁻¹	50Hz	0.96 (9.8)	1.15 (12)	1.60 (16)	1.92 (20)	2.41 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	
		60Hz	0.74 (7.7)	0.89 (9.2)	1.24 (13)	1.49 (15)	1.86 (19)	2.23 (23)	2.45 (25)	2.45 (25)	2.45 (25)	2.45 (25)	
	Rotational direction		Reverse to motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

* Working range line

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

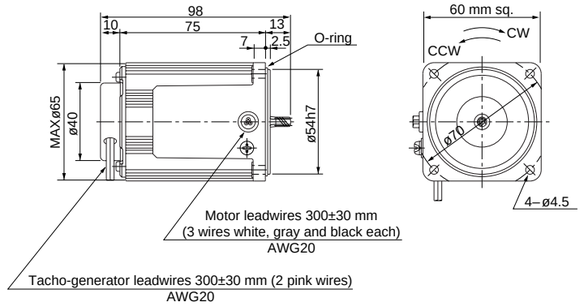
Features B-268 | System configuration B-269 | Coding system B-269 | Model list B-270

Motor (dimensions)

Scale: 1/3, Unit: mm

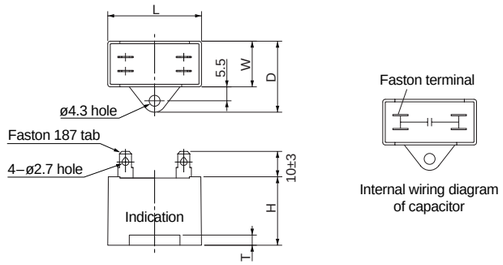
M6RX6GV4LG(A) 4P 6 W 100 V
M6RX6GV4DG(A) 4P 6 W 110 V / 115 V
M6RX6GV4YG(A) 4P 6 W 200 V
M6RX6GV4GG(A) 4P 6 W 220 V / 230 V

Mass	Helical gear	Module	Number of teeth
0.71 kg		0.5	6



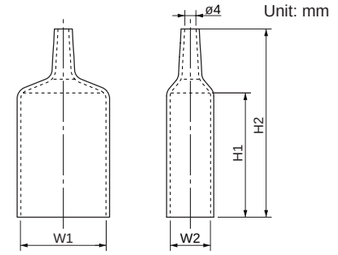
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

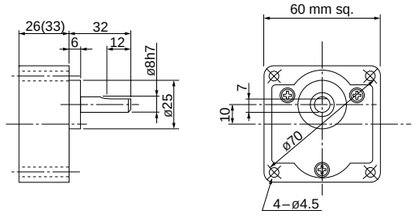
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M6RX6GV4LG(A)	M0PC4M25G	37	18	28	27	4	M0PC3718G	37	18	50	73
M6RX6GV4DG(A)	M0PC3M25G	31	17	27	27	4	M0PC3117G	31	17	50	73
M6RX6GV4YG(A)	M0PC1M45G	37	18	28	27	4	M0PC3718G	37	18	50	73
M6RX6GV4GG(A)	M0PC0.8M45G	31	17	27	27	4	M0PC3117G	31	17	50	73

• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX6G□BA (ball bearing) / **MX6G□B** (ball bearing) Mass 0.24/0.3 kg: Output shaft D cut
MX6G□MA (metal bearing) / **MX6G□M** (metal bearing) Mass 0.24/0.3 kg: Output shaft D cut



* Figures in ( ) represent the dimensions of MX6G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX6G□BA (MA).)
(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-304 | Round shaft motor dimensions B-306 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Variable speed reversible motor (leadwire)

70 mm sq. 10 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min⁻¹)	Permissible Torque N·m (kgf·cm) at 1200 min⁻¹	Permissible Torque N·m (kgf·cm) at 90 min⁻¹	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
70 mm sq.	M7RX10GV4L	4	10	100	50	30	90 to 1400	0.059 (0.60)	0.034 (0.34)	0.41	0.049 (0.5)	4.5 (200V)
					60		90 to 1700	0.059 (0.60)	0.034 (0.34)	0.40	0.049 (0.5)	
	M7RX10GV4Y	4	10	200	50	30	90 to 1400	0.059 (0.60)	0.034 (0.34)	0.20	0.049 (0.5)	1.2 (400V)
					60		90 to 1700	0.059 (0.60)	0.034 (0.34)	0.21	0.049 (0.5)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-306.

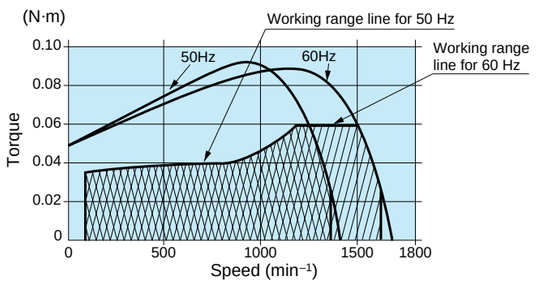
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed \ Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX7G□BA / MX7G□B (ball bearing) MX7G□MA / MX7G□M (metal bearing)	1200min⁻¹	50Hz	0.14 (1.4)	0.17 (1.7)	0.23 (2.3)	0.28 (2.8)	0.35 (3.5)	0.43 (4.3)	0.47 (4.7)	0.59 (6.0)	0.71 (7.2)	0.86 (8.7)	0.95 (9.6)	1.19 (12)
		60Hz	0.14 (1.4)	0.17 (1.7)	0.23 (2.3)	0.28 (2.8)	0.35 (3.5)	0.43 (4.3)	0.47 (4.7)	0.59 (6.0)	0.71 (7.2)	0.86 (8.7)	0.95 (9.6)	1.19 (12)
	90min⁻¹		0.082 (0.8)	0.099 (1.0)	0.13 (1.3)	0.16 (1.6)	0.20 (2.0)	0.24 (2.4)	0.27 (2.7)	0.34 (3.4)	0.41 (4.1)	0.49 (5.0)	0.55 (5.6)	0.68 (6.9)
	Rotational direction		Same as motor rotational direction											

Applicable gear head / Bearing	Speed \ Reduction ratio		30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX7G□BA / MX7G□B (ball bearing) MX7G□MA / MX7G□M (metal bearing)	1200min⁻¹	50Hz	1.29 (13)	1.54 (15)	2.15 (21)	2.58 (26)	3.22 (32)	3.87 (39)	4.30 (43)	4.90 (50)	4.90 (50)	4.90 (50)	MX7G10XB
		60Hz	1.29 (13)	1.54 (15)	2.15 (21)	2.58 (26)	3.22 (32)	3.87 (39)	4.30 (43)	4.90 (50)	4.90 (50)	4.90 (50)	
	90min⁻¹		0.74 (7.5)	0.98 (10)	1.23 (12)	1.48 (15)	1.85 (18)	2.22 (22)	2.47 (25)	2.96 (30)	3.70 (37)	4.44 (45)	
	Rotational direction		Reverse to motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

*Working range line

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

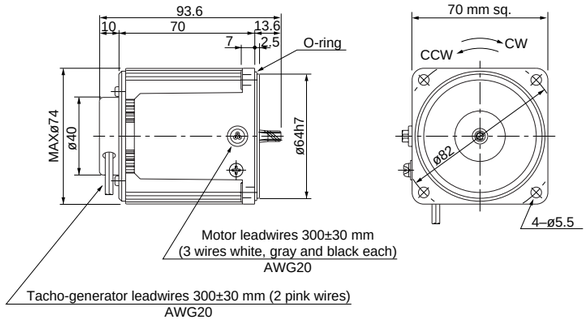
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

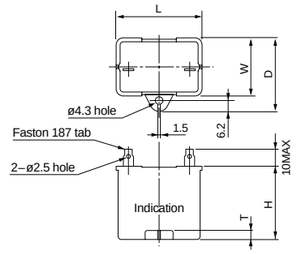
M7RX10GV4L 4P 10 W 100 V
M7RX10GV4Y 4P 10 W 200 V

Mass	Helical gear	Module	Number of teeth
0.8 kg		0.5	7



Capacitor (dimensions) [attachment]

Unit: mm



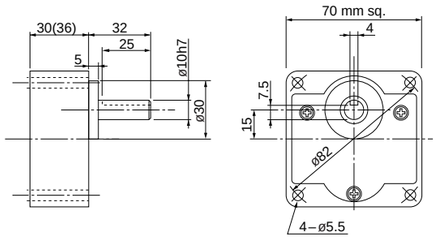
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M7RX10GV4L	M0PC4.5M20	39.5	16	26.5	30.5	4	M0PC3917
M7RX10GV4Y	M0PC1.2M40	39.5	18.3	29	29	4	M0PC3922

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX7G□BA (ball bearing) / **MX7G□B** (ball bearing) Mass 0.38/0.45 kg
MX7G□MA (metal bearing) / **MX7G□M** (metal bearing) Mass 0.38/0.45 kg

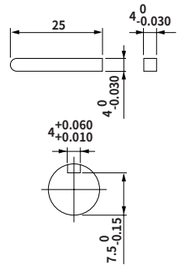


* Figures in ( ) represent the dimensions of MX7G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX7G□BA (MA).)

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MX7G□BA(B)
MX7G□MA(M)



Variable speed reversible motor (leadwire)

70 mm sq. 15 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min⁻¹)	Permissible Torque N·m (kgf·cm) at 1200 min⁻¹	Permissible Torque N·m (kgf·cm) at 90 min⁻¹	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
70 mm sq.	M7RX15GV4L	4	15	100	50	30	90 to 1400	0.098 (1.0)	0.046 (0.46)	0.59	0.080 (0.81)	6 (200V)
					60		90 to 1700	0.098 (1.0)	0.046 (0.46)	0.57	0.080 (0.81)	
	M7RX15GV4Y	4	15	200	50	30	90 to 1400	0.098 (1.0)	0.046 (0.46)	0.30	0.080 (0.81)	1.5 (400V)
					60		90 to 1700	0.098 (1.0)	0.046 (0.46)	0.30	0.080 (0.81)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-306.

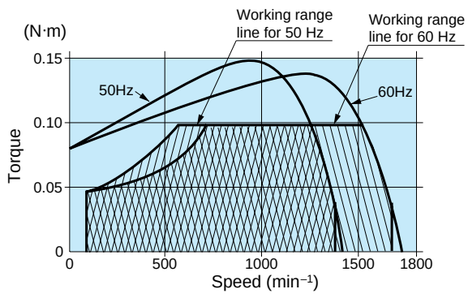
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed \ Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX7G□BA (ball bearing) MX7G□B (ball bearing) MX7G□MA (metal bearing) MX7G□M (metal bearing)	1200min⁻¹	50Hz	0.23 (2.3)	0.28 (2.8)	0.39 (3.9)	0.47 (4.7)	0.59 (6.0)	0.71 (7.2)	0.79 (8.0)	0.99 (10)	1.19 (12)	1.42 (14)	1.58 (16)	1.98 (20)
		60Hz	0.23 (2.3)	0.28 (2.8)	0.39 (3.9)	0.47 (4.7)	0.59 (6.0)	0.71 (7.2)	0.79 (8.0)	0.99 (10)	1.19 (12)	1.42 (14)	1.58 (16)	1.98 (20)
	90min⁻¹		0.11 (1.1)	0.13 (1.3)	0.18 (1.8)	0.22 (2.2)	0.27 (2.7)	0.33 (3.3)	0.37 (3.7)	0.46 (4.6)	0.55 (5.6)	0.66 (6.7)	0.74 (7.5)	0.93 (9.4)
	Rotational direction		Same as motor rotational direction											

Applicable gear head / Bearing	Speed \ Reduction ratio		30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX7G□BA (ball bearing) MX7G□B (ball bearing) MX7G□MA (metal bearing) MX7G□M (metal bearing)	1200min⁻¹	50Hz	2.13 (21)	2.56 (26)	3.56 (36)	4.27 (43)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	MX7G10XB
		60Hz	2.13 (21)	2.56 (26)	3.56 (36)	4.27 (43)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	
	90min⁻¹		1.00 (10)	1.20 (12)	1.67 (17)	2.00 (20)	2.50 (25)	3.00 (30)	3.34 (34)	4.00 (40)	4.90 (50)	4.90 (50)	
	Rotational direction		Reverse to motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

*** Working range line**

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

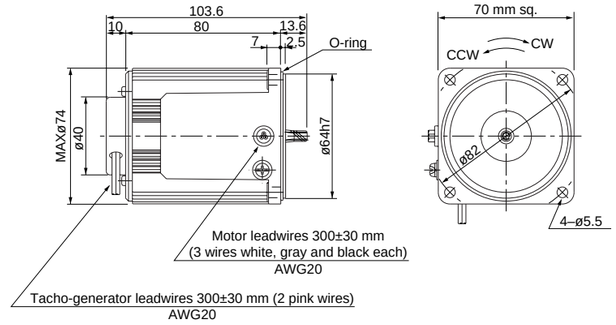
Features B-268 | System configuration B-269 | Coding system B-269 | Model list B-270

Motor (dimensions)

Scale: 1/3, Unit: mm

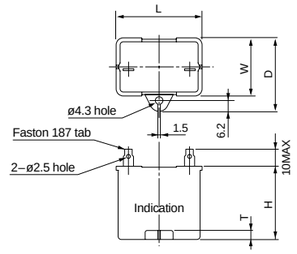
M7RX15GV4L 4P 15 W 100 V
M7RX15GV4Y 4P 15 W 200 V

Mass	Helical gear	Module	Number of teeth
1.1 kg		0.5	7



Capacitor (dimensions) [attachment]

Unit: mm



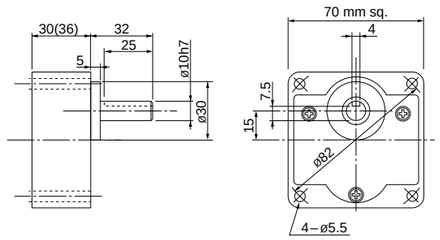
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M7RX15GV4L	M0PC6M20	39.5	17.5	28	30.5	4	M0PC3917
M7RX15GV4Y	M0PC1.5M40	39.5	22	32.5	32.5	4	M0PC3922

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX7G□BA (ball bearing) / **MX7G□B** (ball bearing) Mass 0.38/0.45 kg
MX7G□MA (metal bearing) / **MX7G□M** (metal bearing) Mass 0.38/0.45 kg

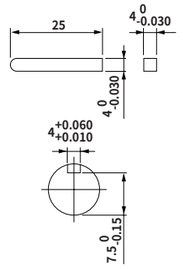


* Figures in ( ) represent the dimensions of MX7G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX7G□BA (MA).)

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MX7G□BA(B)
MX7G□MA(M)



Induction motor
Reversible motor
3-phase motor
Electromagnetic brake motor
Variable speed induction motor
Variable speed reversible motor
Variable speed electromagnetic brake single-phase motor
Variable speed unit motor
2-pole round shaft motor
Gear head

Gear head combination B-304 | Round shaft motor dimensions B-306 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Variable speed reversible motor (leadwire)

70 mm sq. 15 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min⁻¹)	Permissible Torque N·m (kgf·cm) at 1200 min⁻¹	Permissible Torque N·m (kgf·cm) at 90 min⁻¹	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
70 mm sq.	M7RX15GV4LG M7RX15GV4LGA	4	15	100	50	30	90 to 1400	0.11 (1.1)	0.069 (0.70)	0.58	0.088 (0.90)	6.5 (250V)
					60		90 to 1700	0.088 (0.90)	0.069 (0.70)	0.58	0.088 (0.90)	
	M7RX15GV4DG M7RX15GV4DGA	4	15	110	60	30	90 to 1700	0.088 (0.90)	0.069 (0.70)	0.60	0.088 (0.90)	5.5 (250V)
				115	60		90 to 1700	0.088 (0.90)	0.069 (0.70)	0.63	0.10 (1.0)	
	M7RX15GV4YG M7RX15GV4YGA	4	15	200	50	30	90 to 1400	0.11 (1.1)	0.069 (0.70)	0.27	0.088 (0.90)	1.7 (450V)
					60		90 to 1700	0.088 (0.90)	0.069 (0.70)	0.28	0.088 (0.90)	
	M7RX15GV4GG M7RX15GV4GGA	4	15	220	50	30	90 to 1400	0.11 (1.1)	0.069 (0.70)	0.27	0.082 (0.84)	1.3 (450V)
					60		90 to 1700	0.088 (0.90)	0.069 (0.70)	0.26	0.082 (0.84)	
				230	50		90 to 1400	0.11 (1.1)	0.069 (0.70)	0.28	0.10 (1.0)	
					60		90 to 1700	0.088 (0.90)	0.069 (0.70)	0.28	0.10 (1.0)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-306.
• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

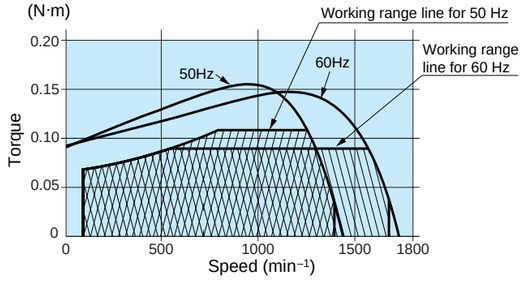
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed		Reduction ratio 3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX7G□BA (ball bearing) MX7G□B (ball bearing)	1200min⁻¹	50Hz	0.27 (2.7)	0.32 (3.2)	0.45 (4.5)	0.53 (5.3)	0.67 (6.7)	0.80 (8.0)	0.89 (8.9)	1.11 (11)	1.34 (13)	1.60 (16)	1.78 (18)	2.23 (22)
		60Hz	0.21 (2.2)	0.26 (2.6)	0.36 (3.6)	0.43 (4.4)	0.53 (5.5)	0.64 (6.6)	0.71 (7.3)	0.89 (9.1)	1.07 (11)	1.28 (13)	1.43 (15)	1.78 (18)
MX7G□MA (metal bearing) MX7G□M (metal bearing)	90min⁻¹		0.17 (1.7)	0.20 (2.0)	0.28 (2.8)	0.34 (3.4)	0.42 (4.3)	0.50 (5.1)	0.56 (5.7)	0.70 (7.1)	0.84 (8.5)	1.01 (10)	1.12 (11)	1.40 (14)
	Rotational direction		Same as motor rotational direction											

Applicable gear head / Bearing	Speed		Reduction ratio 30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX7G□BA (ball bearing) MX7G□B (ball bearing)	1200min⁻¹	50Hz	2.41 (24)	2.89 (29)	4.01 (40)	4.81 (48)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	MX7G10XB
		60Hz	1.92 (20)	2.31 (24)	3.21 (33)	3.85 (39)	4.81 (49)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	
MX7G□MA (metal bearing) MX7G□M (metal bearing)	90min⁻¹		1.51 (15)	1.81 (18)	2.52 (26)	3.02 (31)	3.77 (38)	4.53 (46)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	
	Rotational direction		Reverse to motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

*Working range line

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

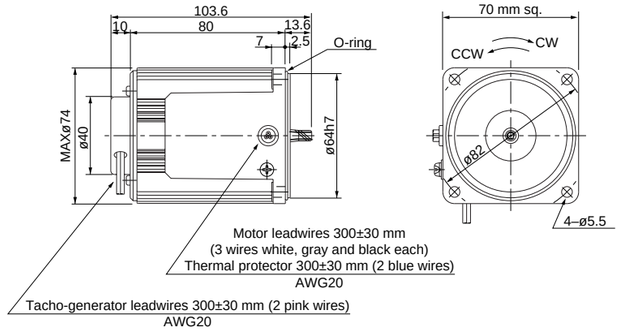
Features B-268 | System configuration B-269 | Coding system B-269 | Model list B-270

Motor (dimensions)

Scale: 1/3, Unit: mm

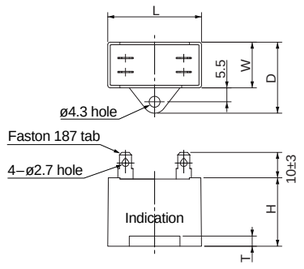
M7RX15GV4LG(A) 4P 15 W 100 V
M7RX15GV4DG(A) 4P 15 W 110 V / 115 V
M7RX15GV4YG(A) 4P 15 W 200 V
M7RX15GV4GG(A) 4P 15 W 220 V / 230 V

Mass	Helical	Module	Number of teeth
1.1 kg	gear	0.5	7



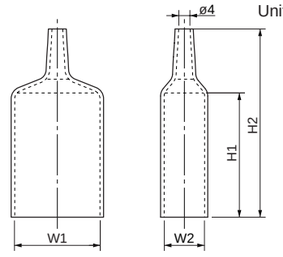
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

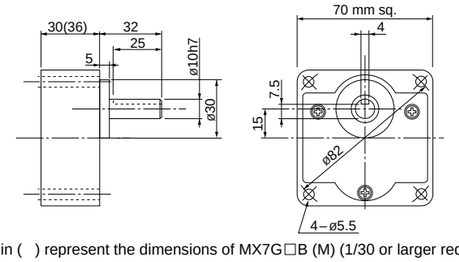
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M7RX15GV4LG(A)	M0PC6.5M25G	48	19	29	29	4	M0PC4819G	48	19	55	78
M7RX15GV4DG(A)	M0PC5.5M25G	38	21	31	31	4	M0PC3821G	38	21	55	78
M7RX15GV4YG(A)	M0PC1.7M45G	38	21	31	31	4	M0PC3821G	38	21	55	78
M7RX15GV4GG(A)	M0PC1.3M45G	38	19	29	29	4	M0PC3819G	38	19	50	73

• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX7G□BA (ball bearing) / **MX7G□B** (ball bearing) Mass 0.38/0.45 kg
MX7G□MA (metal bearing) / **MX7G□M** (metal bearing) Mass 0.38/0.45 kg

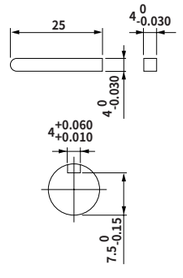


* Figures in ( ) represent the dimensions of MX7G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX7G□BA (MA).)

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MX7G□BA(B)
MX7G□MA(M)



Induction motor
Reversible motor
3-phase motor
Electromagnetic brake motor
Variable speed induction motor
Variable speed reversible motor
Variable speed electromagnetic brake single-phase motor
Variable speed unit
2-pole round shaft motor
Gear head

Gear head combination B-304 | Round shaft motor dimensions B-306 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Variable speed reversible motor (leadwire)

80 mm sq. 20 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min⁻¹)	Permissible Torque N·m (kgf·cm) at 1200 min⁻¹	Permissible Torque N·m (kgf·cm) at 90 min⁻¹	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
80 mm sq.	M8RX20GV4L	4	20	100	50	30	90 to 1400	0.12 (1.2)	0.049 (0.5)	0.73	0.12 (1.2)	7 (200V)
					60		90 to 1700	0.12 (1.2)	0.049 (0.5)	0.71	0.12 (1.2)	
	M8RX20GV4Y	4	20	200	50	30	90 to 1400	0.12 (1.2)	0.049 (0.5)	0.36	0.12 (1.2)	1.8 (400V)
					60		90 to 1700	0.12 (1.2)	0.049 (0.5)	0.36	0.12 (1.2)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-306.

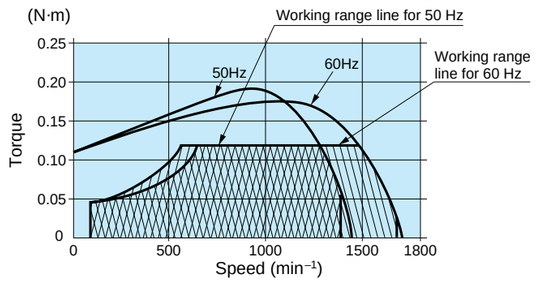
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed		Reduction ratio 3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX8G□B (ball bearing) MX8G□M (metal bearing)	1200min⁻¹	50Hz	0.29 (2.9)	0.34 (3.4)	0.48 (4.8)	0.58 (5.9)	0.72 (7.3)	0.87 (8.8)	0.97 (9.8)	1.21 (12)	1.45 (14)	1.74 (17)	1.94 (19)	2.43 (24)
		60Hz	0.29 (2.9)	0.34 (3.4)	0.48 (4.8)	0.58 (5.9)	0.72 (7.3)	0.87 (8.8)	0.97 (9.8)	1.21 (12)	1.45 (14)	1.74 (17)	1.94 (19)	2.43 (24)
	90min⁻¹		0.11 (1.1)	0.14 (1.4)	0.19 (1.9)	0.23 (2.3)	0.29 (2.9)	0.35 (3.5)	0.39 (3.9)	0.49 (5.0)	0.59 (6.0)	0.71 (7.2)	0.79 (8.0)	0.99 (10)
	Rotational direction		Same as motor rotational direction											

Applicable gear head / Bearing	Speed		Reduction ratio 30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX8G□B (ball bearing) MX8G□M (metal bearing)	1200min⁻¹	50Hz	2.62 (26)	3.14 (32)	4.37 (44)	5.24 (53)	6.55 (66)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	MX8G10XB
		60Hz	2.62 (26)	3.14 (32)	4.37 (44)	5.24 (53)	6.55 (66)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	
	90min⁻¹		1.19 (12)	1.42 (14)	1.98 (20)	2.38 (24)	2.97 (30)	3.57 (36)	3.97 (40)	4.76 (48)	5.95 (60)	7.14 (72)	
	Rotational direction		Reverse to motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

* Working range line

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

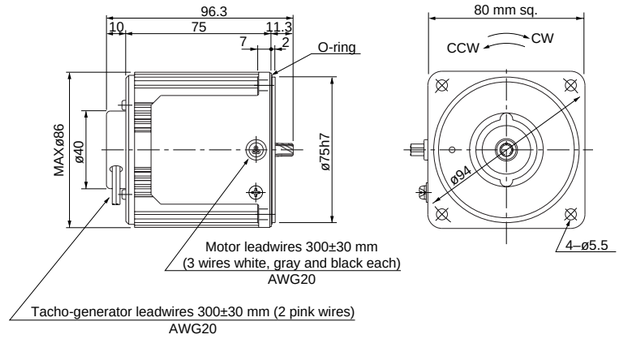
Features B-268 | System configuration B-269 | Coding system B-269 | Model list B-270

Motor (dimensions)

Scale: 1/3, Unit: mm

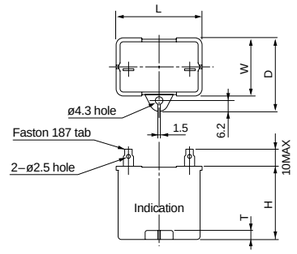
M8RX20GV4L 4P 20 W 100 V
M8RX20GV4Y 4P 20 W 200 V

Mass	Helical gear	Module	Number of teeth
1.2 kg		0.5	9



Capacitor (dimensions) [attachment]

Unit: mm



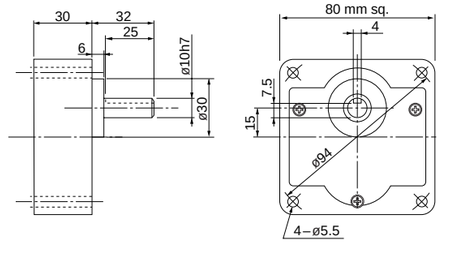
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M8RX20GV4L	M0PC7M20	39.5	22	32.5	30.5	4	M0PC3922
M8RX20GV4Y	M0PC1.8M40	39.5	22	32.5	32.5	4	M0PC3922

Gear head (dimensions)

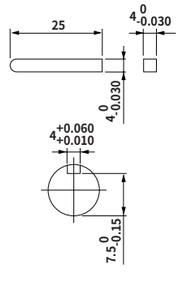
Scale: 1/3, Unit: mm

MX8G□B (ball bearing) / **MX8G□M** (metal bearing) Mass 0.6 kg



Key and keyway (dimensions) [attachment]

MX8G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-304 | Round shaft motor dimensions B-306 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Variable speed reversible motor (leadwire)

80 mm sq. 25 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min⁻¹)	Permissible Torque N·m (kgf·cm) at 1200 min⁻¹	Permissible Torque N·m (kgf·cm) at 90 min⁻¹	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
80 mm sq.	M8RX25GV4L	4	25	100	50	30	90 to 1400	0.15 (1.6)	0.088 (0.90)	1.0	0.16 (1.6)	9.5 (200V)
					60		90 to 1700	0.15 (1.6)	0.088 (0.90)	1.0	0.16 (1.6)	
	M8RX25GV4Y	4	25	200	50	30	90 to 1400	0.15 (1.6)	0.088 (0.90)	0.5	0.16 (1.6)	2.4 (400V)
					60		90 to 1700	0.15 (1.6)	0.088 (0.90)	0.5	0.16 (1.6)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-306.

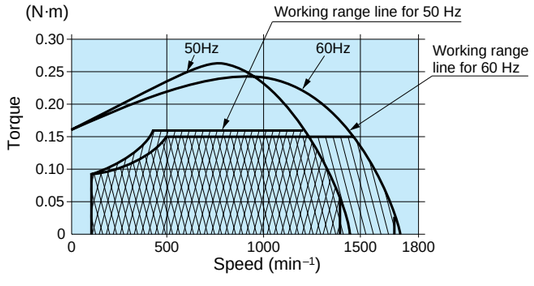
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed		Reduction ratio 3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX8G□B (ball bearing) MX8G□M (metal bearing)	1200min⁻¹	50Hz	0.34 (3.4)	0.40 (4.0)	0.56 (5.7)	0.68 (6.9)	0.85 (8.6)	1.02 (10)	1.13 (11)	1.41 (1.4)	1.70 (17)	2.04 (20)	2.26 (23)	2.83 (28)
		60Hz	0.34 (3.4)	0.40 (4.0)	0.56 (5.7)	0.68 (6.9)	0.85 (8.6)	1.02 (10)	1.13 (11)	1.41 (1.4)	1.70 (17)	2.04 (20)	2.26 (23)	2.83 (28)
	90min⁻¹		0.094 (0.9)	0.11 (1.1)	0.15 (1.5)	0.18 (1.8)	0.23 (2.3)	0.28 (2.8)	0.31 (3.1)	0.39 (3.9)	0.47 (4.7)	0.56 (5.7)	0.63 (6.4)	0.78 (7.9)
	Rotational direction		Same as motor rotational direction											

Applicable gear head / Bearing	Speed		Reduction ratio 30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX8G□B (ball bearing) MX8G□M (metal bearing)	1200min⁻¹	50Hz	3.06 (31)	3.67 (37)	5.10 (52)	6.12 (62)	7.65 (78)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	MX8G10XB
		60Hz	3.06 (31)	3.67 (37)	5.10 (52)	6.12 (62)	7.65 (78)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	
	90min⁻¹		0.84 (8.5)	1.01 (10)	1.41 (14)	1.69 (17)	2.12 (21)	2.54 (25)	2.83 (28)	3.39 (34)	4.24 (43)	5.09 (51)	
	Rotational direction		Reverse to motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

*Working range line

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

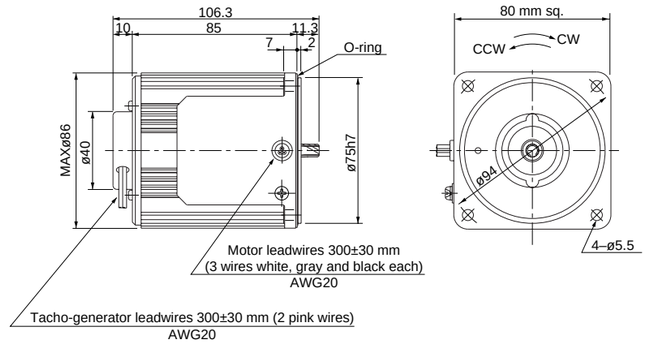
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

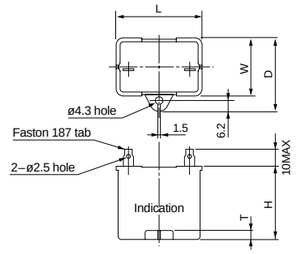
M8RX25GV4L 4P 25 W 100 V
M8RX25GV4Y 4P 25 W 200 V

Mass	Helical gear	Module	Number of teeth
1.5 kg		0.5	9



Capacitor (dimensions) [attachment]

Unit: mm



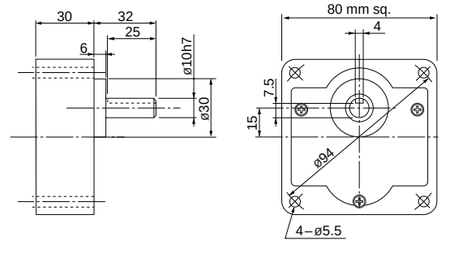
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M8RX25GV4L	M0PC9.5M20	39.5	22	32.5	30.5	4	M0PC3922
M8RX25GV4Y	M0PC2.4M40	49.7	24	34.5	34.5	4	M0PC5026

Gear head (dimensions)

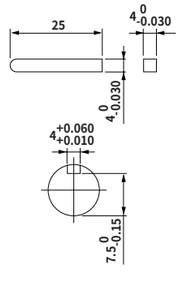
Scale: 1/3, Unit: mm

MX8G□B (ball bearing) / **MX8G□M** (metal bearing) Mass 0.6 kg



Key and keyway (dimensions) [attachment]

MX8G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Variable speed reversible motor (leadwire)

80 mm sq. 25 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min^{-1})	Permissible Torque N·m (kgf·cm) at 1200 min^{-1}	Permissible Torque N·m (kgf·cm) at 90 min^{-1}	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
80 mm sq.	M8RX25GV4LG M8RX25GV4LGA	4	25	100	50	30	90 to 1400	0.19 (1.9)	0.11 (1.1)	1.1	0.17 (1.7)	10 (250V)
					60		90 to 1700	0.15 (1.5)	0.11 (1.1)	1.1	0.17 (1.7)	
	M8RX25GV4DG M8RX25GV4DGA	4	25	110	60	30	90 to 1700	0.15 (1.5)	0.11 (1.1)	1.1	0.16 (1.6)	8 (250V)
				115	60		90 to 1700	0.15 (1.5)	0.11 (1.1)	1.2	0.17 (1.7)	
	M8RX25GV4YG M8RX25GV4YGA	4	25	200	50	30	90 to 1400	0.19 (1.9)	0.11 (1.1)	0.45	0.17 (1.7)	2.5 (450V)
					60		90 to 1700	0.15 (1.5)	0.11 (1.1)	0.46	0.17 (1.7)	
	M8RX25GV4GG M8RX25GV4GGA	4	25	220	50	30	90 to 1400	0.19 (1.9)	0.11 (1.1)	0.47	0.16 (1.6)	2 (450V)
					60		90 to 1700	0.15 (1.5)	0.11 (1.1)	0.46	0.16 (1.6)	
				230	50		90 to 1400	0.19 (1.9)	0.11 (1.1)	0.49	0.17 (1.7)	
					60		90 to 1700	0.15 (1.5)	0.11 (1.1)	0.48	0.17 (1.7)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-306.
• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

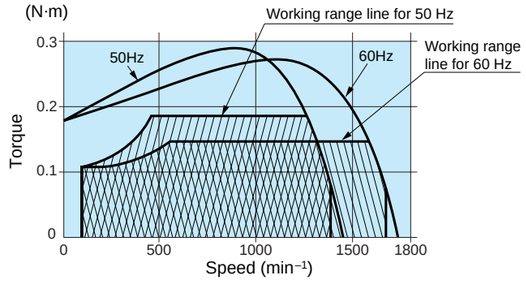
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed		Reduction ratio 3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX8G□B (ball bearing) MX8G□M (metal bearing)	1200min^{-1}	50Hz	0.46 (4.6)	0.55 (5.5)	0.77 (7.7)	0.92 (9.2)	1.15 (12)	1.39 (14)	1.54 (15)	1.92 (19)	2.31 (23)	2.77 (28)	3.08 (31)	3.85 (38)
		60Hz	0.36 (3.6)	0.44 (4.4)	0.61 (6.1)	0.73 (7.3)	0.91 (9.1)	1.09 (11)	1.22 (12)	1.52 (15)	1.82 (18)	2.19 (22)	2.43 (24)	3.04 (30)
	90min^{-1}		0.27 (2.7)	0.32 (3.2)	0.45 (4.5)	0.53 (5.3)	0.67 (6.7)	0.80 (8.0)	0.89 (8.9)	1.11 (11)	1.34 (13)	1.60 (16)	1.78 (18)	2.23 (22)
	Rotational direction		Same as motor rotational direction											

Applicable gear head / Bearing	Speed		Reduction ratio 30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX8G□B (ball bearing) MX8G□M (metal bearing)	1200min^{-1}	50Hz	4.16 (42)	4.99 (50)	6.93 (69)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	MX8G10XB
		60Hz	3.28 (33)	3.94 (39)	5.47 (55)	6.56 (66)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	
	90min^{-1}		2.41 (24)	2.89 (29)	4.01 (40)	4.81 (48)	6.01 (60)	7.22 (72)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	
	Rotational direction		Reverse to motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

*** Working range line**

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

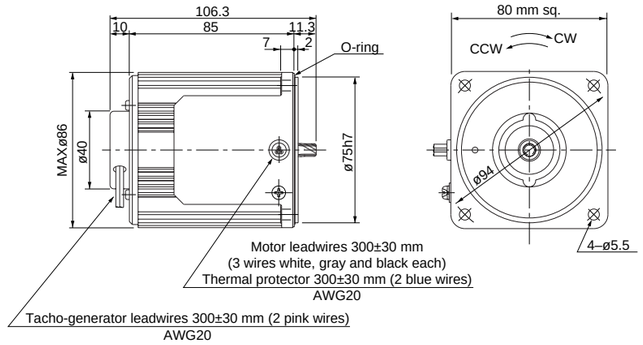
Features B-268 | System configuration B-269 | Coding system B-269 | Model list B-270

Motor (dimensions)

Scale: 1/3, Unit: mm

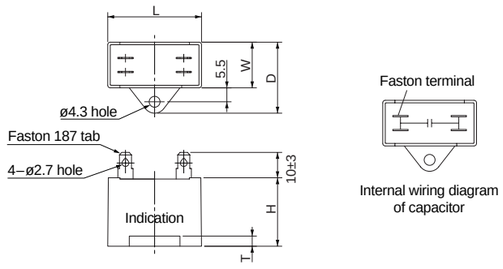
M8RX25GV4LG(A) 4P 25 W 100 V
M8RX25GV4DG(A) 4P 25 W 110 V / 115 V
M8RX25GV4YG(A) 4P 25 W 200 V
M8RX25GV4GG(A) 4P 25 W 220 V / 230 V

Mass	Helical	Module	Number of teeth
1.5 kg	gear	0.5	9



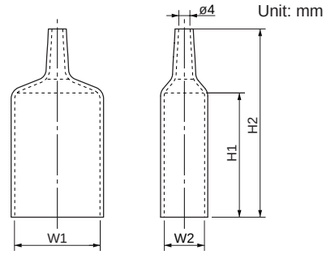
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

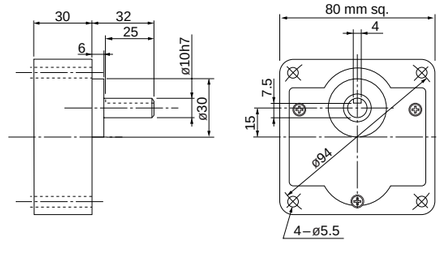
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M8RX25GV4LG(A)	M0PC10M25G	58	21	31	31	4	M0PC5821G	58	21	55	78
M8RX25GV4DG(A)	M0PC8M25G	48	21	31	31	4	M0PC4821G	48	21	55	78
M8RX25GV4YG(A)	M0PC2.5M45G	48	21	31	31	4	M0PC4821G	48	21	55	78
M8RX25GV4GG(A)	M0PC2M45G	48	19	29	29	4	M0PC4819G	48	19	55	78

• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

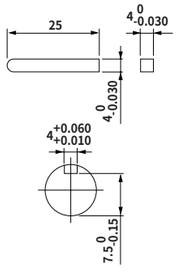
Scale: 1/3, Unit: mm

MX8G□B (ball bearing) / **MX8G□M** (metal bearing) Mass 0.6 kg



Key and keyway (dimensions) [attachment]

MX8G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-304 | Round shaft motor dimensions B-306 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Variable speed reversible motor (leadwire)

90 mm sq. 40 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min⁻¹)	Permissible Torque N·m (kgf·cm) at 1200 min⁻¹	Permissible Torque N·m (kgf·cm) at 90 min⁻¹	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M9RX40GV4L	4	40	100	50	30	90 to 1400	0.30 (3.1)	0.098 (1.0)	1.60	0.25 (2.6)	15 (210V)
					60		90 to 1700	0.24 (2.5)	0.098 (1.0)	1.60	0.25 (2.6)	
	M9RX40GV4Y	4	40	200	50	30	90 to 1400	0.30 (3.1)	0.098 (1.0)	0.80	0.25 (2.6)	3.8 (400V)
					60		90 to 1700	0.24 (2.5)	0.098 (1.0)	0.76	0.25 (2.6)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-307.

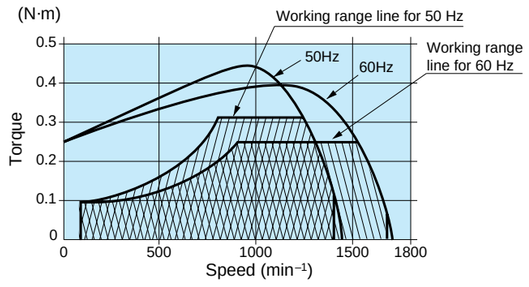
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed \ Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX9G□B (ball bearing) MX9G□M (metal bearing)	1200min⁻¹	50Hz	0.66 (6.7)	0.84 (8.5)	1.08 (11)	1.38 (14)	1.57 (16)	2.00 (20)	2.25 (22)	2.74 (27)	3.23 (32)	4.13 (42)	4.41 (44)	5.29 (53)
		60Hz	0.51 (5.2)	0.66 (6.7)	0.84 (8.5)	1.08 (11)	1.22 (12)	1.57 (16)	1.76 (17)	2.14 (21)	2.74 (27)	3.23 (32)	3.53 (36)	4.13 (42)
	90min⁻¹		0.11 (1.1)	0.14 (1.4)	0.19 (1.9)	0.23 (2.3)	0.29 (2.9)	0.35 (3.5)	0.39 (3.9)	0.49 (5.0)	0.59 (6.0)	0.71 (7.2)	0.79 (8.0)	0.99 (10)
	Rotational direction		Same as motor rotational direction											

Applicable gear head / Bearing	Speed \ Reduction ratio		30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX9G□B (ball bearing) MX9G□M (metal bearing)	1200min⁻¹	50Hz	6.37 (65)	8.15 (83)	9.8 (100)	9.8 (100)	9.8 (100)	9.8 (100)	9.8 (100)	9.8 (100)	9.8 (100)	9.8 (100)	MX9G10XB
		60Hz	5.29 (53)	6.37 (65)	8.8 (89)	9.8 (100)	9.8 (100)	9.8 (100)	9.8 (100)	9.8 (100)	9.8 (100)	9.8 (100)	
	90min⁻¹		1.06 (10)	1.28 (13)	1.78 (18)	2.13 (21)	2.67 (27)	3.20 (32)	3.56 (36)	4.27 (43)	5.34 (54)	6.40 (65)	
	Rotational direction		Reverse to motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

*Working range line

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

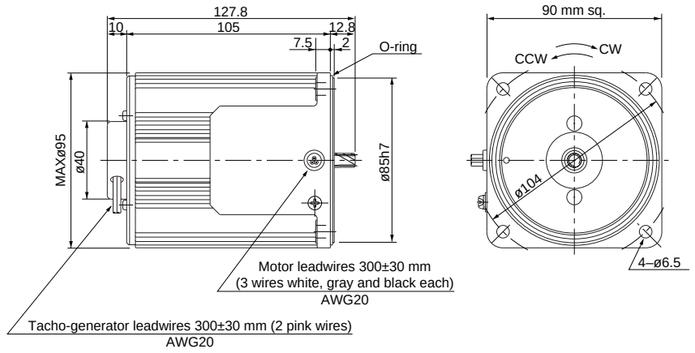
Features B-268 | System configuration B-269 | Coding system B-269 | Model list B-270

Motor (dimensions)

Scale: 1/3, Unit: mm

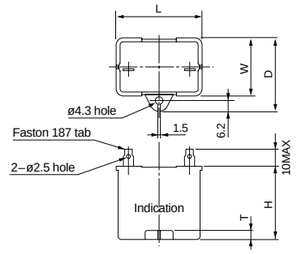
M9RX40GV4L 4P 40 W 100 V
M9RX40GV4Y 4P 40 W 200 V

Mass	Helical gear	Module	Number of teeth
2.4 kg		0.55	9



Capacitor (dimensions) [attachment]

Unit: mm



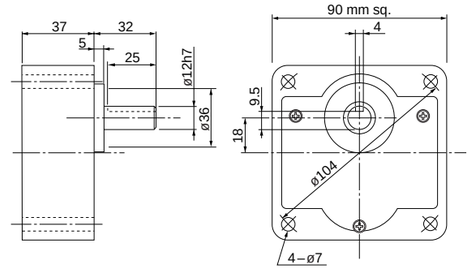
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M9RX40GV4L	M0PC15M20	39.5	26.7	37	41	4	M0PC3926
M9RX40GV4Y	M0PC3.8M40	50	26.7	37.5	38	4	M0PC5026

Gear head (dimensions)

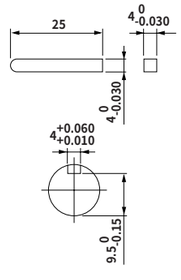
Scale: 1/3, Unit: mm

MX9G□B (ball bearing) / **MX9G□M** (metal bearing) Mass 0.8 kg



Key and keyway (dimensions) [attachment]

MX9G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-305 | Round shaft motor dimensions B-307 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Variable speed reversible motor (leadwire)

90 mm sq. 40 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min⁻¹)	Permissible Torque N·m (kgf·cm) at 1200 min⁻¹	Permissible Torque N·m (kgf·cm) at 90 min⁻¹	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M9RX40GV4LG M9RX40GV4LGA	4	40	100	50	30	90 to 1400	0.30 (3.1)	0.12 (1.2)	1.7	0.27 (2.8)	16 (250V)
					60		90 to 1700	0.25 (2.5)	0.12 (1.2)	1.6	0.27 (2.8)	
	M9RX40GV4DG M9RX40GV4DGA	4	40	110 115	60	30	90 to 1700	0.25 (2.5)	0.12 (1.2)	1.7	0.23 (2.3)	12 (250V)
					60		90 to 1700	0.25 (2.5)	0.12 (1.2)	1.8	0.25 (2.5)	
	M9RX40GV4YG M9RX40GV4YGA	4	40	200	50	30	90 to 1400	0.30 (3.1)	0.12 (1.2)	0.67	0.27 (2.8)	4 (450V)
					60		90 to 1700	0.25 (2.5)	0.12 (1.2)	0.70	0.27 (2.8)	
	M9RX40GV4GG M9RX40GV4GGA	4	40	220	50	30	90 to 1400	0.30 (3.1)	0.12 (1.2)	0.71	0.27 (2.8)	3.5 (450V)
					60		90 to 1700	0.25 (2.5)	0.12 (1.2)	0.71	0.27 (2.8)	
				230	50		90 to 1400	0.30 (3.1)	0.12 (1.2)	0.74	0.30 (3.1)	
					60		90 to 1700	0.25 (2.5)	0.12 (1.2)	0.74	0.30 (3.1)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-307.
• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

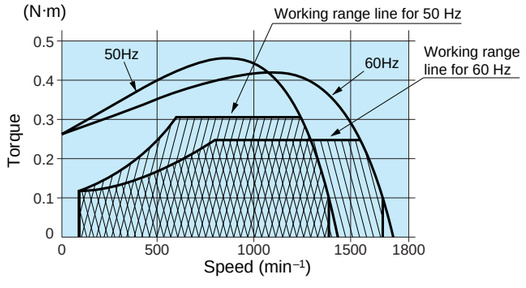
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed		Reduction ratio 3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX9G□B (ball bearing) MX9G□M (metal bearing)	1200min⁻¹	50Hz	0.73 (7.5)	0.87 (9.0)	1.22 (13)	1.46 (15)	1.82 (19)	2.19 (23)	2.43 (25)	3.04 (31)	3.65 (38)	4.37 (45)	4.86 (50)	6.08 (63)
		60Hz	0.61 (6.1)	0.73 (7.3)	1.01 (10)	1.22 (12)	1.52 (15)	1.82 (18)	2.03 (20)	2.53 (25)	3.04 (30)	3.65 (36)	4.05 (41)	5.06 (51)
	90min⁻¹		0.29 (2.9)	0.35 (3.5)	0.49 (4.9)	0.58 (5.8)	0.73 (7.3)	0.87 (8.7)	0.97 (9.7)	1.22 (12)	1.46 (15)	1.75 (17)	1.94 (19)	2.43 (24)
	Rotational direction		Same as motor rotational direction											

Applicable gear head / Bearing	Speed		Reduction ratio 30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX9G□B (ball bearing) MX9G□M (metal bearing)	1200min⁻¹	50Hz	6.56 (68)	7.87 (81)	9.8 (100)	9.8 (100)	9.8 (100)	9.8 (100)	9.8 (100)	9.8 (100)	9.8 (100)	9.8 (100)	MX9G10XB
		60Hz	5.47 (55)	6.56 (66)	9.11 (91)	9.8 (100)	9.8 (100)	9.8 (100)	9.8 (100)	9.8 (100)	9.8 (100)	9.8 (100)	
	90min⁻¹		2.62 (26)	3.15 (31)	4.37 (44)	5.25 (52)	6.56 (66)	7.87 (79)	8.75 (87)	9.8 (100)	9.8 (100)	9.8 (100)	
	Rotational direction		Reverse to motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

*Working range line

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

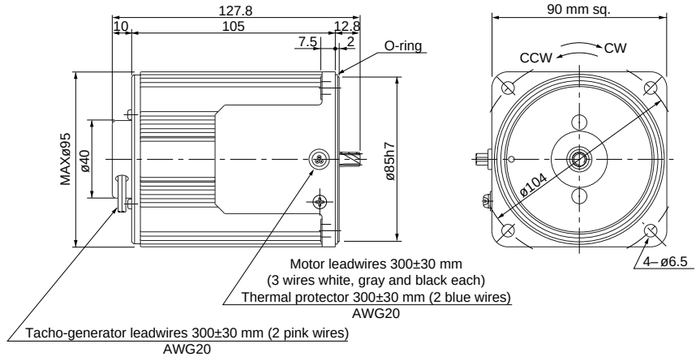
Features B-268 | System configuration B-269 | Coding system B-269 | Model list B-270

Motor (dimensions)

Scale: 1/3, Unit: mm

M9RX40GV4LG(A) 4P 40 W 100 V
M9RX40GV4DG(A) 4P 40 W 110 V / 115 V
M9RX40GV4YG(A) 4P 40 W 200 V
M9RX40GV4GG(A) 4P 40 W 220 V / 230 V

Mass	Helical	Module	Number of teeth
2.4 kg	gear	0.55	9



Capacitor (dimensions) [attachment]

Unit: mm

Capacitor cap (dimensions) [attachment]

Unit: mm

• Capacitor dimension list (mm)

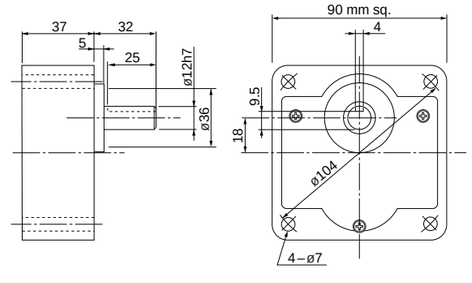
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M9RX40GV4LG(A)	M0PC16M25G	58	23.5	38.5	37	4	M0PC5823G	58	23.5	55	78
M9RX40GV4DG(A)	M0PC12M25G	58	22	32	35	4	M0PC5822G	58	22	55	78
M9RX40GV4YG(A)	M0PC4M45G	58	23.5	38.5	37	4	M0PC5823G	58	23.5	55	78
M9RX40GV4GG(A)	M0PC3.5M45G	58	22	32	35	4	M0PC5822G	58	22	55	78

• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

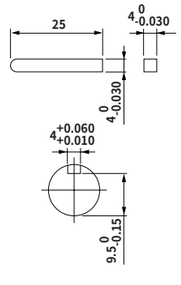
Scale: 1/3, Unit: mm

MX9G□B (ball bearing) / **MX9G□M** (metal bearing) Mass 0.8 kg



Key and keyway (dimensions) [attachment]

MX9G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-305 | Round shaft motor dimensions B-307 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Variable speed reversible motor (leadwire)

90 mm sq. 60 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min⁻¹)	Permissible Torque N·m (kgf·cm) at 1200 min⁻¹	Permissible Torque N·m (kgf·cm) at 90 min⁻¹	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M9RZ60GV4L	4	60	100	50	30	90 to 1400	0.43 (4.4)	0.12 (1.2)	3.0	0.46 (4.6)	25 (200V)
					60		90 to 1700	0.36 (3.7)	0.12 (1.2)	2.8	0.46 (4.6)	
	M9RZ60GV4Y	4	60	200	50	30	90 to 1400	0.43 (4.4)	0.12 (1.2)	1.4	0.46 (4.6)	6.2 (375V)
					60		90 to 1700	0.36 (3.7)	0.12 (1.2)	1.3	0.46 (4.6)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-307.

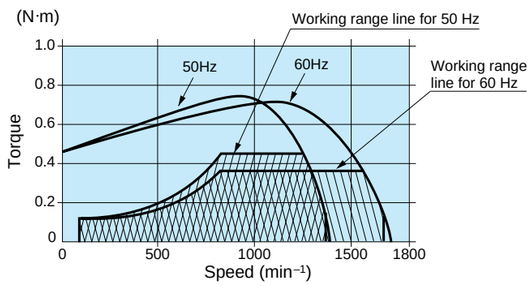
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed	Reduction ratio	3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	1200min⁻¹	50Hz	1.04 (10)	1.25 (12)	1.74 (17)	2.08 (21)	2.61 (26)	3.13 (31)	3.48 (35)	3.91 (39)	4.69 (47)	5.63 (57)	6.26 (63)	7.82 (79)	9.39 (95)
		60Hz	0.87 (8.8)	1.04 (10)	1.45 (14)	1.74 (17)	2.18 (22)	2.61 (26)	2.91 (29)	3.27 (33)	3.91 (39)	4.69 (47)	5.22 (53)	6.52 (66)	7.83 (79)
	90min⁻¹		0.18 (1.8)	0.22 (2.2)	0.31 (3.1)	0.37 (3.7)	0.47 (4.7)	0.56 (5.7)	0.63 (6.4)	0.70 (7.1)	0.85 (8.6)	1.02 (10)	1.13 (11)	1.41 (14)	1.71 (17)
	Rotational direction		Same as motor rotational direction							Reverse to motor rotational direction					

Applicable gear head / Bearing	Speed	Reduction ratio	36	50	60	75	90	100	120	150	180	200	Applicable decimal gear head
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	1200min⁻¹	50Hz	10.1 (103)	14.0 (142)	16.8 (171)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	MZ9G10XB
		60Hz	8.42 (85)	11.7 (119)	14.0 (142)	17.5 (178)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	
	90min⁻¹		1.83 (18)	2.55 (26)	3.06 (31)	3.82 (38)	4.59 (46)	5.10 (52)	6.12 (62)	7.65 (78)	9.18 (93)	10.2 (104)	
	Rotational direction		Same as motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

*Working range line

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

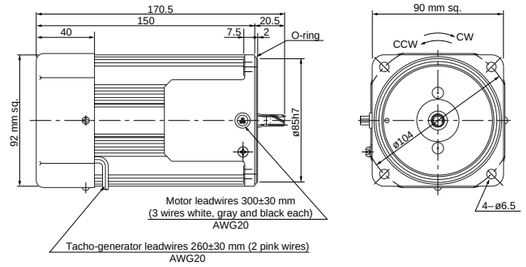
Features B-268 | System configuration B-269 | Coding system B-269 | Model list B-270

Motor (dimensions)

Scale: 1/4, Unit: mm

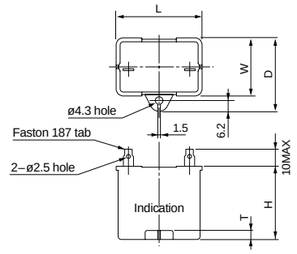
M9RZ60GV4L 4P 60 W 100 V (with fan)
M9RZ60GV4Y 4P 60 W 200 V (with fan)

Mass	Helical gear	Module	Number of teeth
2.7 kg		0.6	9



Capacitor (dimensions) [attachment]

Unit: mm



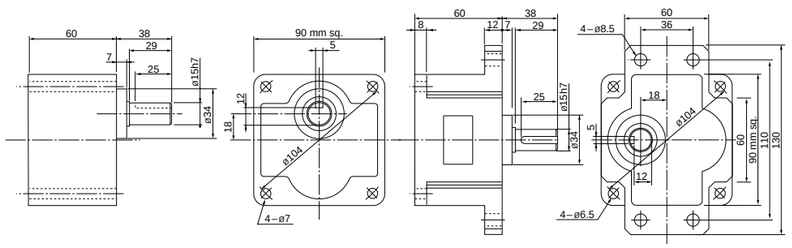
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M9RZ60GV4L	M0PC25M20	50.2	31	41	42	5	M0PC5032
M9RZ60GV4Y	M0PC6.2M38	50	30.5	41	41.5	4	M0PC5032

Gear head (dimensions)

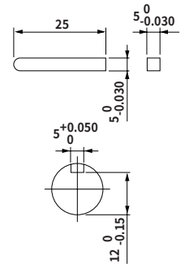
Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg **MY9G□M** (metal bearing / hinge attached) Mass 1.4 kg



Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-305 | Round shaft motor dimensions B-307 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Variable speed reversible motor (leadwire)

90 mm sq. 60 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min^{-1})	Permissible Torque N·m (kgf·cm) at 1200 min^{-1}	Permissible Torque N·m (kgf·cm) at 90 min^{-1}	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M9RZ60GV4LG M9RZ60GV4LGA	4	60	100	50	30	90 to 1400	0.45 (4.6)	0.14 (1.4)	3.0	0.46 (4.7)	25 (250V)
					60		90 to 1700	0.36 (3.7)	0.14 (1.4)	2.8	0.48 (4.9)	
	M9RZ60GV4DG M9RZ60GV4DGA	4	60	110 115	60	30	90 to 1700	0.36 (3.7)	0.14 (1.4)	3.0	0.43 (4.4)	20 (250V)
					60		90 to 1700	0.36 (3.7)	0.14 (1.4)	3.1	0.48 (4.9)	
	M9RZ60GV4YG M9RZ60GV4YGA	4	60	200	50	30	90 to 1400	0.45 (4.6)	0.14 (1.4)	1.3	0.46 (4.7)	6 (450V)
					60		90 to 1700	0.36 (3.7)	0.14 (1.4)	1.2	0.48 (4.9)	
	M9RZ60GV4GG M9RZ60GV4GGA	4	60	220	50	30	90 to 1400	0.45 (4.6)	0.14 (1.4)	1.4	0.43 (4.4)	5 (450V)
					60		90 to 1700	0.36 (3.7)	0.14 (1.4)	1.3	0.43 (4.4)	
				230	50		90 to 1400	0.45 (4.6)	0.14 (1.4)	1.5	0.48 (4.9)	
					60		90 to 1700	0.36 (3.7)	0.14 (1.4)	1.4	0.48 (4.9)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-307.
• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

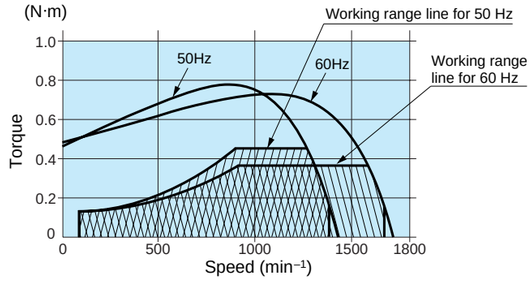
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed		Reduction ratio 3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30
MZ9G□B (ball bearing hinge not attached) MY9G□B (ball bearing hinge attached)	1200min^{-1}	50Hz	1.09 (11)	1.31 (13)	1.82 (19)	2.19 (22)	2.73 (28)	3.28 (34)	3.65 (37)	4.10 (42)	4.92 (50)	5.90 (60)	6.56 (67)	8.20 (84)	9.84 (101)
		60Hz	0.87 (9.0)	1.05 (11)	1.46 (15)	1.75 (18)	2.19 (22)	2.62 (27)	2.92 (30)	3.28 (34)	3.94 (40)	4.72 (49)	5.25 (54)	6.56 (67)	7.87 (81)
	90min^{-1}		0.34 (3.4)	0.41 (4.1)	0.57 (5.7)	0.68 (6.8)	0.85 (8.5)	1.02 (10)	1.13 (11)	1.28 (13)	1.53 (15)	1.84 (18)	2.04 (20)	2.55 (26)	3.06 (31)
	Rotational direction		Same as motor rotational direction							Reverse to motor rotational direction					

Applicable gear head / Bearing	Speed		Reduction ratio 36	50	60	75	90	100	120	150	180	200	Applicable decimal gear head
MZ9G□B (ball bearing hinge not attached) MY9G□B (ball bearing hinge attached)	1200min^{-1}	50Hz	10.6 (109)	14.8 (151)	17.7 (181)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	MZ9G10XB
		60Hz	8.50 (87)	11.8 (121)	14.2 (146)	17.7 (182)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	
	90min^{-1}		3.31 (33)	4.59 (46)	5.51 (55)	6.89 (69)	8.27 (83)	9.19 (92)	11.0 (110)	13.8 (138)	16.5 (165)	18.4 (184)	
	Rotational direction		Same as motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

*Working range line

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

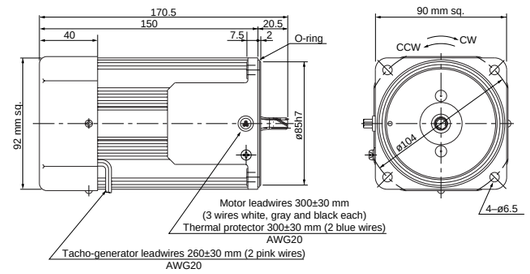
Features B-268 | System configuration B-269 | Coding system B-269 | Model list B-270

Motor (dimensions)

Scale: 1/4, Unit: mm

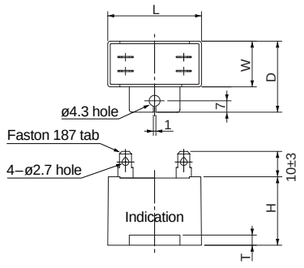
M9RZ60GV4LG(A) 4P 60 W 100 V (with fan)
M9RZ60GV4DG(A) 4P 60 W 110 V / 115 V (with fan)
M9RZ60GV4YG(A) 4P 60 W 200 V (with fan)
M9RZ60GV4GG(A) 4P 60 W 220 V / 230 V (with fan)

Mass	Helical	Module	Number of teeth
2.7 kg	gear	0.6	9



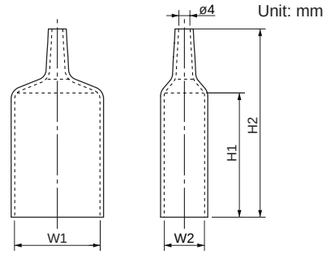
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

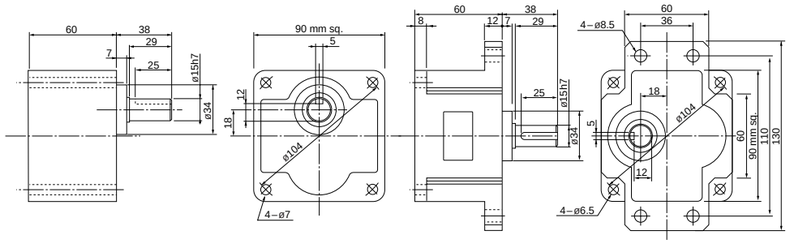
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M9RZ60GV4LG(A)	M0PC25M25G	58	35	50	50	4	M0PC5835G	58	35	55	78
M9RZ60GV4DG(A)	M0PC20M25G	58	29	44	41	4	M0PC5829G	58	29	55	78
M9RZ60GV4YG(A)	M0PC6M45G	58	29	44	41	4	M0PC5829G	58	29	55	78
M9RZ60GV4GG(A)	M0PC5M45G	58	29	44	41	4	M0PC5829G	58	29	55	78

• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

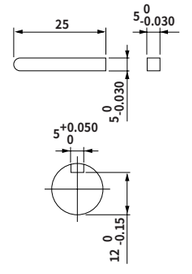
Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg
MY9G□M (metal bearing / hinge attached) Mass 1.4 kg



Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-305 | Round shaft motor dimensions B-307 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Variable speed reversible motor (leadwire)

90 mm sq. 90 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min⁻¹)	Permissible Torque N·m (kgf·cm) at 1200 min⁻¹	Permissible Torque N·m (kgf·cm) at 90 min⁻¹	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M9RZ90GV4L	4	90	100	50	30	90 to 1400	0.59 (6.0)	0.25 (2.5)	2.9	0.61 (6.2)	30 (200V)
					60		90 to 1700	0.54 (5.5)	0.25 (2.5)	2.9	0.61 (6.2)	
	M9RZ90GV4Y	4	90	200	50	30	90 to 1400	0.59 (6.0)	0.25 (2.5)	1.6	0.59 (6.0)	7.5 (370V)
					60		90 to 1700	0.54 (5.5)	0.25 (2.5)	1.5	0.59 (6.0)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-307.

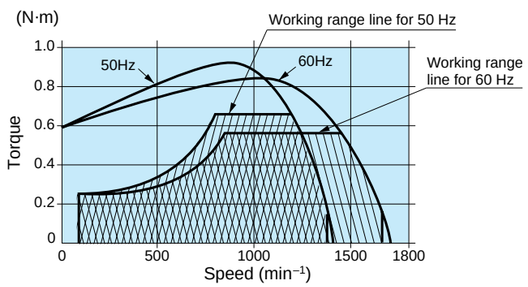
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed		Reduction ratio 3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	1200min⁻¹	50Hz	1.43 (14)	1.71 (17)	2.38 (24)	2.86 (29)	3.57 (36)	4.29 (43)	4.77 (48)	5.36 (54)	6.43 (65)	7.72 (78)	8.58 (87)	10.7 (109)	12.8 (130)
		60Hz	1.31 (13)	1.57 (16)	2.18 (22)	2.62 (26)	3.27 (33)	3.93 (40)	4.37 (44)	4.91 (50)	5.89 (60)	7.07 (72)	7.86 (80)	9.82 (100)	11.7 (119)
	90min⁻¹		0.60 (6.1)	0.72 (7.3)	1.01 (10)	1.21 (12)	1.51 (15)	1.81 (18)	2.02 (20)	2.27 (23)	2.70 (27)	2.89 (29)	3.62 (36)	4.52 (46)	5.43 (55)
	Rotational direction		Same as motor rotational direction							Reverse to motor rotational direction					

Applicable gear head / Bearing	Speed		Reduction ratio 36	50	60	75	90	100	120	150	180	200	Applicable decimal gear head
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	1200min⁻¹	50Hz	13.8 (140)	19.3 (196)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	MZ9G10XB
		60Hz	12.7 (129)	17.6 (179)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	
	90min⁻¹		5.86 (59)	8.10 (82)	9.72 (99)	12.1 (123)	14.5 (147)	16.2 (165)	19.4 (197)	19.6 (200)	19.6 (200)	19.6 (200)	
	Rotational direction		Same as motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

*Working range line

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

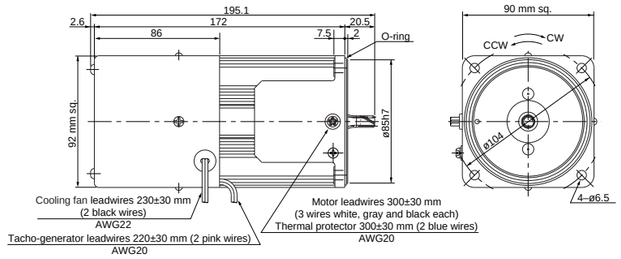
Features B-268 | System configuration B-269 | Coding system B-269 | Model list B-270

Motor (dimensions)

Scale: 1/4, Unit: mm

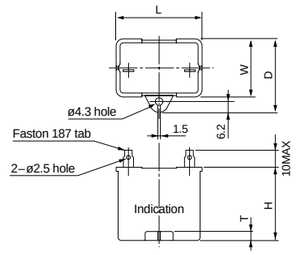
M9RZ90GV4L 4P 90 W 100 V (Forced cooling fan)
M9RZ90GV4Y 4P 90 W 200 V (Forced cooling fan)

Mass	Helical gear	Module	Number of teeth
3.3 kg		0.6	9



Capacitor (dimensions) [attachment]

Unit: mm



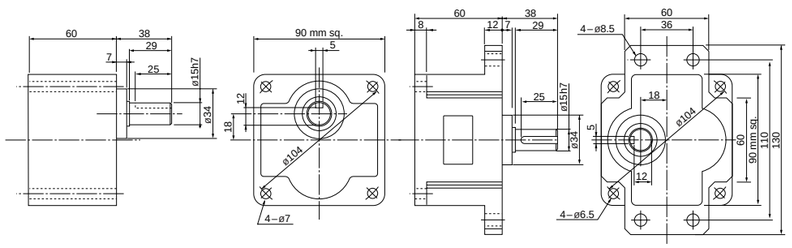
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M9RZ90GV4L	M0PC30M20	50.2	31	41	42	5	M0PC5032
M9RZ90GV4Y	M0PC7.5M37	50	34	45	45	6	—

Gear head (dimensions)

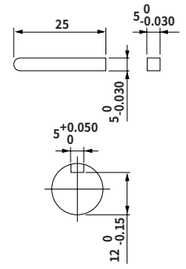
Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg **MY9G□M** (metal bearing / hinge attached) Mass 1.4 kg



Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Gear head combination B-305 | Round shaft motor dimensions B-307 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Variable speed reversible motor (leadwire)

cULus CE 90 mm sq. 90 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min⁻¹)	Permissible Torque N·m (kgf·cm) at 1200 min⁻¹	Permissible Torque N·m (kgf·cm) at 90 min⁻¹	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M9RZ90GV4LG M9RZ90GV4LGA	4	90	100	50	30	90 to 1400	0.69 (7.0)	0.39 (4.0)	3.0	0.66 (6.7)	32 (250V)
					60		90 to 1700	0.55 (5.6)	0.39 (4.0)	2.9	0.66 (6.7)	
	M9RZ90GV4DG M9RZ90GV4DGA	4	90	110	60	30	90 to 1700	0.55 (5.6)	0.39 (4.0)	3.1	0.66 (6.7)	28 (250V)
				115	60		90 to 1700	0.55 (5.6)	0.39 (4.0)	3.2	0.72 (7.3)	
	M9RZ90GV4YG M9RZ90GV4YGA	4	90	200	50	30	90 to 1400	0.69 (7.0)	0.39 (4.0)	1.4	0.66 (6.7)	8 (450V)
					60		90 to 1700	0.55 (5.6)	0.39 (4.0)	1.4	0.66 (6.7)	
	M9RZ90GV4GG M9RZ90GV4GGA	4	90	220	50	30	90 to 1400	0.69 (7.0)	0.39 (4.0)	1.5	0.66 (6.7)	7 (450V)
					60		90 to 1700	0.55 (5.6)	0.39 (4.0)	1.4	0.66 (6.7)	
				230	50		90 to 1400	0.69 (7.0)	0.39 (4.0)	1.6	0.72 (7.3)	
					60		90 to 1700	0.55 (5.6)	0.39 (4.0)	1.5	0.72 (7.3)	

• The specifications and wire connections of the round shaft motor are the same as those of the pinion shaft type. For the dimensional outline drawing, refer to page B-307.
• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

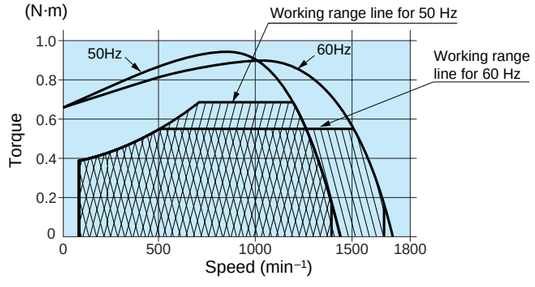
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed		Reduction ratio 3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30
MZ9G□B (ball bearing hinge not attached) MY9G□B (ball bearing hinge attached)	1200min⁻¹	50Hz	1.68 (17)	2.01 (20)	2.79 (28)	3.35 (34)	4.19 (43)	5.03 (51)	5.59 (57)	6.29 (64)	7.55 (77)	9.05 (92)	10.1 (102)	12.6 (128)	15.1 (153)
		60Hz	1.34 (14)	1.60 (16)	2.23 (23)	2.67 (27)	3.34 (34)	4.01 (41)	4.46 (45)	5.01 (51)	6.01 (61)	7.22 (73)	8.02 (82)	10.0 (102)	12.0 (122)
	90min⁻¹		0.95 (9.7)	1.14 (12)	1.58 (16)	1.90 (19)	2.37 (24)	2.84 (29)	3.16 (32)	3.55 (36)	4.26 (44)	5.12 (52)	5.69 (58)	7.11 (73)	8.53 (87)
	Rotational direction		Same as motor rotational direction							Reverse to motor rotational direction					

Applicable gear head / Bearing	Speed		Reduction ratio 36	50	60	75	90	100	120	150	180	200	Applicable decimal gear head
MZ9G□B (ball bearing hinge not attached) MY9G□B (ball bearing hinge attached)	1200min⁻¹	50Hz	16.3 (165)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	MZ9G10XB
		60Hz	13.0 (132)	18.0 (184)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	
	90min⁻¹		9.21 (94)	12.8 (131)	15.4 (157)	19.2 (197)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	
	Rotational direction		Same as motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

*Working range line

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

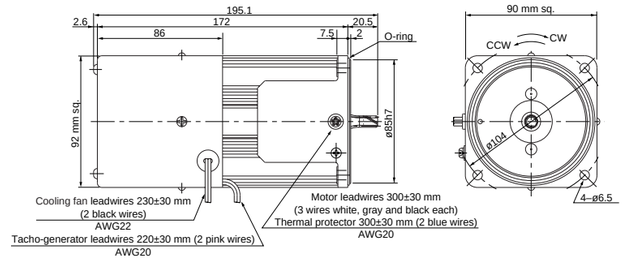
Features B-268 | System configuration B-269 | Coding system B-269 | Model list B-270

Motor (dimensions)

Scale: 1/4, Unit: mm

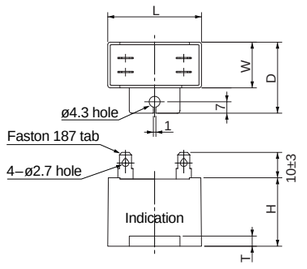
M9RZ90GV4LG(A) 4P 90 W 100 V (Forced cooling fan)
M9RZ90GV4DG(A) 4P 90 W 110 V / 115 V (Forced cooling fan)
M9RZ90GV4YG(A) 4P 90 W 200 V (Forced cooling fan)
M9RZ90GV4GG(A) 4P 90 W 220 V / 230 V (Forced cooling fan)

Mass	Helical	Module	Number of teeth
3.5 kg	gear	0.6	9



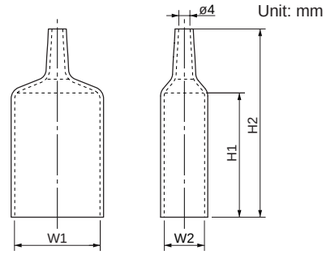
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

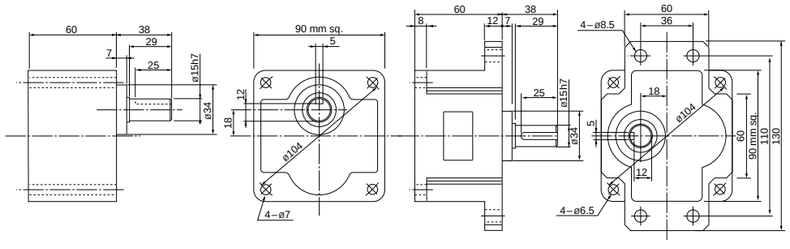
Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M9RZ90GV4LG(A)	M0PC32M25G	58	35	50	50	4	M0PC5835G	58	35	55	78
M9RZ90GV4DG(A)	M0PC28M25G	58	35	50	50	4	M0PC5835G	58	35	55	78
M9RZ90GV4YG(A)	M0PC8M45G	58	35	50	50	4	M0PC5835G	58	35	55	78
M9RZ90GV4GG(A)	M0PC7M45G	58	35	50	50	4	M0PC5835G	58	35	55	78

• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.

Gear head (dimensions)

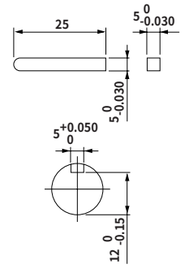
Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg
MY9G□M (metal bearing / hinge attached) Mass 1.4 kg



Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

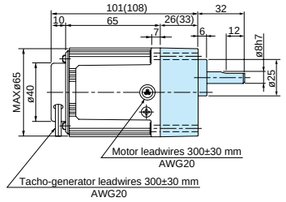
Gear head combination B-305 | Round shaft motor dimensions B-307 | Decimal gear head B-384 | Control related product C-4 | Option D-2

Variable speed reversible motor (leadwire)

Gear head combination dimensions
Scale: 1/4, Unit: mm

60 mm sq. 4 W

M6RX4GV4L + MX6G□BA(MA) / MX6G□B(M)

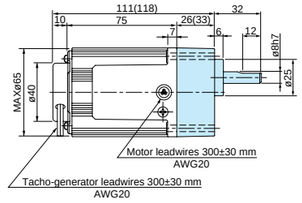


* Figures in ( ) represent the dimensions of MX6G□B (M) (1/30 or larger reduction ratio).

The model number of the gear head with a reduction ratio of 1/25 or smaller is MX6G□BA (MA).

60 mm sq. 6 W

M6RX6GV4L + MX6G□BA(MA) / MX6G□B(M)
M6RX6GV4Y + MX6G□BA(MA) / MX6G□B(M)
M6RX6GV4LG(A) + MX6G□BA(MA) / MX6G□B(M)
M6RX6GV4DG(A) + MX6G□BA(MA) / MX6G□B(M)
M6RX6GV4YG(A) + MX6G□BA(MA) / MX6G□B(M)
M6RX6GV4GG(A) + MX6G□BA(MA) / MX6G□B(M)

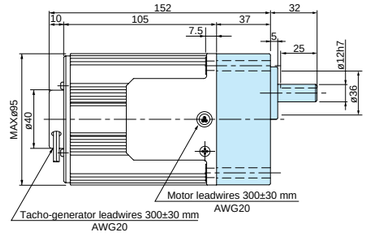


* Figures in ( ) represent the dimensions of MX6G□B (M) (1/30 or larger reduction ratio).

The model number of the gear head with a reduction ratio of 1/25 or smaller is MX6G□BA (MA).

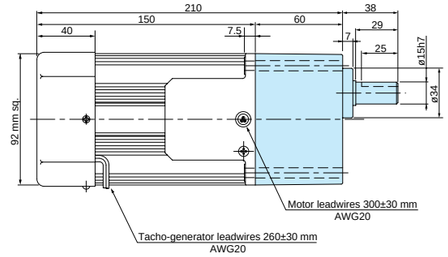
90 mm sq. 40 W

M9RX40GV4L + MX9G□B(M)
M9RX40GV4Y + MX9G□B(M)
M9RX40GV4LG(A) + MX9G□B(M)
M9RX40GV4DG(A) + MX9G□B(M)
M9RX40GV4YG(A) + MX9G□B(M)
M9RX40GV4GG(A) + MX9G□B(M)



90 mm sq. 60 W

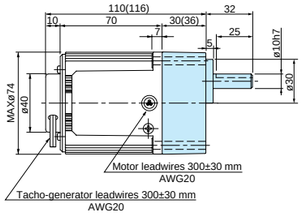
M9RZ60GV4L + MZ9G□B (MY9G□B)
M9RZ60GV4Y + MZ9G□B (MY9G□B)
M9RZ60GV4LG(A) + MZ9G□B (MY9G□B)
M9RZ60GV4DG(A) + MZ9G□B (MY9G□B)
M9RZ60GV4YG(A) + MZ9G□B (MY9G□B)
M9RZ60GV4GG(A) + MZ9G□B (MY9G□B)



* Refer to page B-380 for high torque gear head.

70 mm sq. 10 W

M7RX10GV4L + MX7G□BA(MA) / MX7G□B(M)
M7RX10GV4Y + MX7G□BA(MA) / MX7G□B(M)

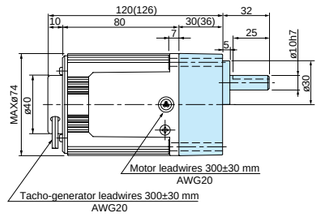


* Figures in ( ) represent the dimensions of MX7G□B (M) (1/30 or larger reduction ratio).

The model number of the gear head with a reduction ratio of 1/25 or smaller is MX7G□BA (MA).

70 mm sq. 15 W

M7RX15GV4L + MX7G□BA(MA) / MX7G□B(M)
M7RX15GV4Y + MX7G□BA(MA) / MX7G□B(M)
M7RX15GV4LG(A) + MX7G□BA(MA) / MX7G□B(M)
M7RX15GV4DG(A) + MX7G□BA(MA) / MX7G□B(M)
M7RX15GV4YG(A) + MX7G□BA(MA) / MX7G□B(M)
M7RX15GV4GG(A) + MX7G□BA(MA) / MX7G□B(M)

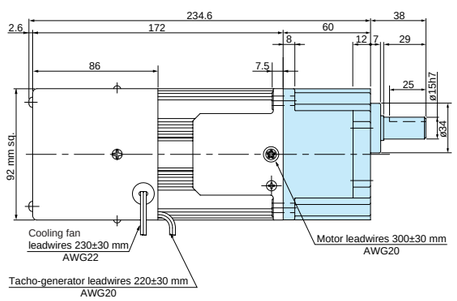


* Figures in ( ) represent the dimensions of MX7G□B (M) (1/30 or larger reduction ratio).

The model number of the gear head with a reduction ratio of 1/25 or smaller is MX7G□BA (MA).

90 mm sq. 90 W

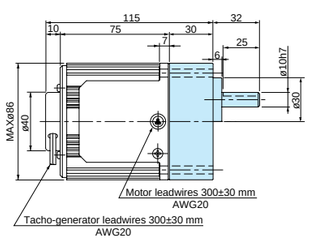
M9RZ90GV4L + MY9G□B (MZ9G□B)
M9RZ90GV4Y + MY9G□B (MZ9G□B)
M9RZ90GV4LG(A) + MY9G□B (MZ9G□B)
M9RZ90GV4DG(A) + MY9G□B (MZ9G□B)
M9RZ90GV4YG(A) + MY9G□B (MZ9G□B)
M9RZ90GV4GG(A) + MY9G□B (MZ9G□B)



* Refer to page B-380 for high torque gear head.

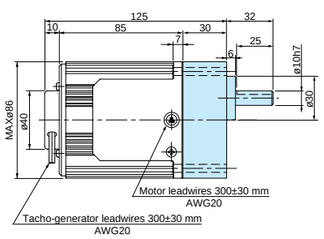
80 mm sq. 20 W

M8RX20GV4L + MX8G□B(M)
M8RX20GV4Y + MX8G□B(M)



80 mm sq. 25 W

M8RX25GV4L + MX8G□B(M)
M8RX25GV4Y + MX8G□B(M)
M8RX25GV4LG(A) + MX8G□B(M)
M8RX25GV4DG(A) + MX8G□B(M)
M8RX25GV4YG(A) + MX8G□B(M)
M8RX25GV4GG(A) + MX8G□B(M)



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

*The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
*The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

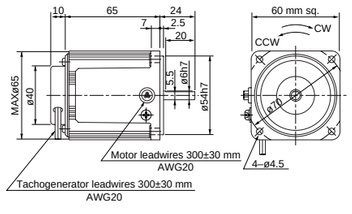
(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Variable speed reversible motor (4-pole round shaft / leadwire)

Dimensions
Scale: 1/4, Unit: mm

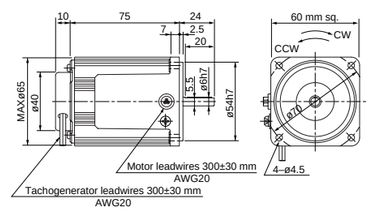
60 mm sq. 4 W — Mass 0.6 kg

M6RX4SV4LS



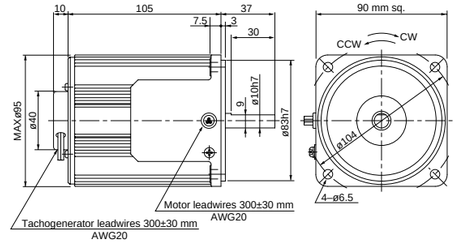
60 mm sq. 6 W — Mass 0.71 kg

M6RX6SV4LS
M6RX6SV4YS
M6RX6SV4LG(A)
M6RX6SV4YG(A)
M6RX6SV4DG(A)
M6RX6SV4GG(A)



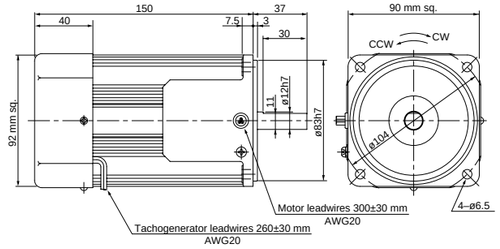
90 mm sq. 40 W — Mass 2.4 kg

M9RX40SV4LS
M9RX40SV4YS
M9RX40SV4LG(A)
M9RX40SV4YG(A)
M9RX40SV4DG(A)
M9RX40SV4GG(A)



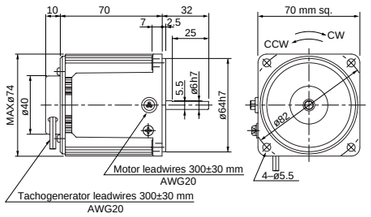
90 mm sq. 60 W — Mass 2.7 kg

M9RZ60SV4LS (with fan)
M9RZ60SV4YS (with fan)
M9RZ60SV4LG(A) (with fan)
M9RZ60SV4DG(A) (with fan)
M9RZ60SV4YG(A) (with fan)
M9RZ60SV4GG(A) (with fan)



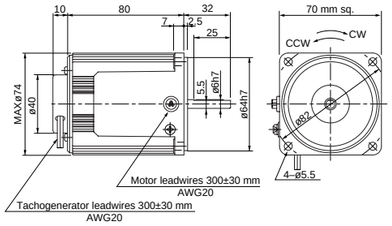
70 mm sq. 10 W — Mass 0.88 kg

M7RX10SV4LS
M7RX10SV4YS



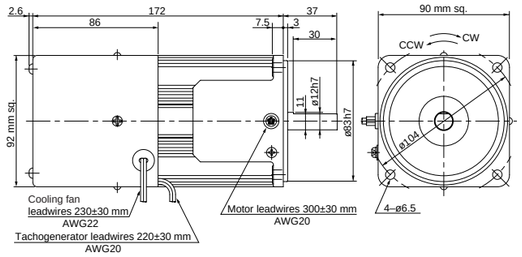
70 mm sq. 15 W — Mass 1.1 kg

M7RX15SV4LS
M7RX15SV4YS
M7RX15SV4LG(A)
M7RX15SV4YG(A)
M7RX15SV4DG(A)
M7RX15SV4GG(A)



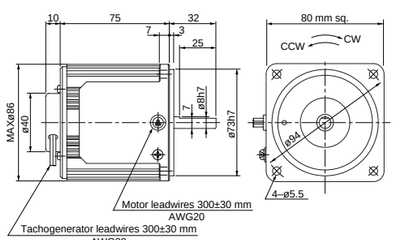
90 mm sq. 90 W — Mass 3.5 kg

M9RZ90SV4LS (Forced cooling fan)
M9RZ90SV4YS (Forced cooling fan)
M9RZ90SV4LG(A) (Forced cooling fan)
M9RZ90SV4DG(A) (Forced cooling fan)
M9RZ90SV4YG(A) (Forced cooling fan)
M9RZ90SV4GG(A) (Forced cooling fan)



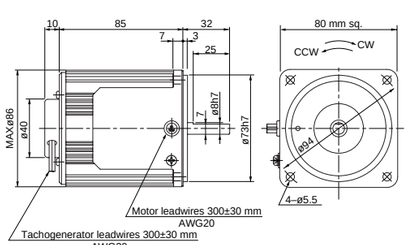
80 mm sq. 20 W — Mass 1.2 kg

M8RX20SV4LS
M8RX20SV4YS



80 mm sq. 25 W — Mass 1.5 kg

M8RX25SV4LS
M8RX25SV4YS
M8RX25SV4LG(A)
M8RX25SV4YG(A)
M8RX25SV4DG(A)
M8RX25SV4GG(A)

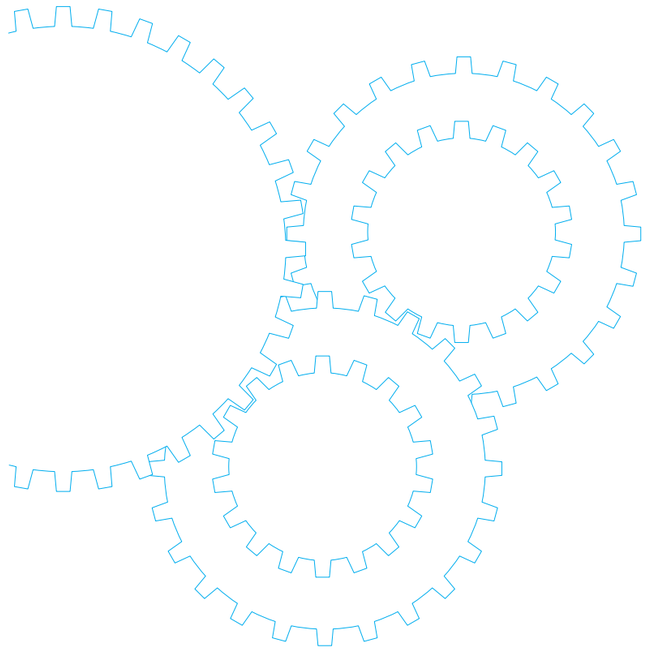


* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

*The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
*The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Variable Speed Electromagnetic Brake Single-phase Motor



Contents

Outline of
Variable speed electromagnetic brake single-phase motor

Features

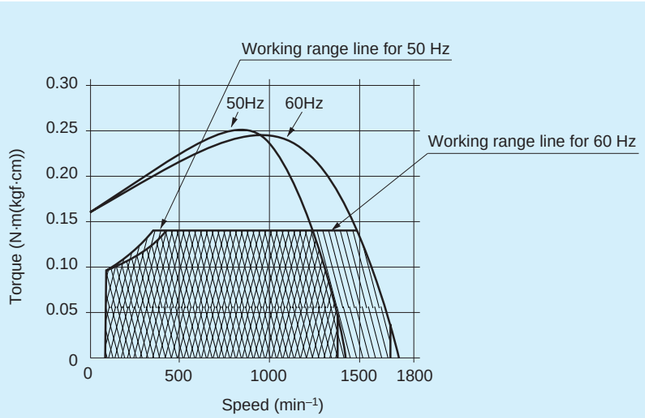
- It is an electromagnetic brake variable speed motor.
- By using it together with a speed controller, you can vary the speed over a wider range (90 to 1400 min^{-1} for 50 Hz and 90 to 1700 min^{-1} for 50 Hz).
- Various functions such as variable speed, braking, normal/reverse run and soft-start/soft-down stop are made available by using it together with a speed controller.
- Feedback control with the built-in tacho-generator gives a constant speed despite of frequency change.
- The motor output is 6 W to 40 W.

* For the method of using the electromagnetic brake, refer to the electromagnetic brake motor (page B-168).

Working range

* The working range of the electromagnetic brake variable speed motor is shown in the figure below. (The time rating is 30 minutes.)
The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

• Working range line

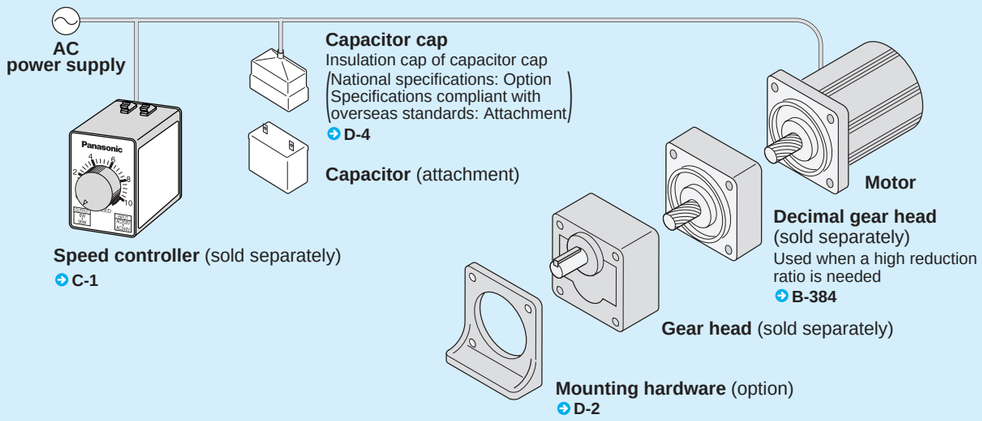


Example : M8RX25GBV4L

Others

For the principle of operation etc., refer to page B-226.

System configuration diagram



Coding system

M	9	R	X	40	G	BV	4	L
	Size	Motor type	Output type	Output	Shape of shaft	Option	No. of poles	Voltage
	6 : 60 mm sq. 7 : 70 mm sq. 8 : 80 mm sq. 9 : 90 mm sq.	R : Reversible motor	X : 40 W or smaller	6 : 6 W 15 : 15 W 25 : 25 W 40 : 40 W	G : Pinion shaft	B : Electromagnetic brake V : Variable speed	4 : 4 poles	L : 100 V Y : 200 V

Model list of
Variable speed electromagnetic brake single-phase motor

Pinion shaft motor

Size	Output (W)	Leadwire type		
		Model number	Specifications	Page
60 mm sq.	6	M6RX6GBV4L	100V	B-314
		M6RX6GBV4Y	200V	B-314
70 mm sq.	15	M7RX15GBV4L	100V	B-316
		M7RX15GBV4Y	200V	B-316
80 mm sq.	25	M8RX25GBV4L	100V	B-318
		M8RX25GBV4Y	200V	B-318
90 mm sq.	40	M9RX40GBV4L	100V	B-320
		M9RX40GBV4Y	200V	B-320

Applicable gear head

Standard gear head		Decimal gear head
Ball bearing	metal bearing	
MX6G□BA	MX6G□MA	MX6G10XB
MX6G□B	MX6G□M	
MX7G□BA	MX7G□MA	MX7G10XB
MX7G□B	MX7G□M	
MX8G□B	MX8G□M	MX8G10XB
MX9G□B	MX9G□M	MX9G10XB

*Refer to page B-384 for dimensions of decimal gear head.

Possible combination of speed controller and motor

Size	Output (W)	Motor		Voltage (V)	Speed controller			
		Certified	Part No.		MGSD type	EX type	SD48 type	EX48 type
60 mm sq.	6	-----	M6RX6GBV4L	100	MGSDA1	DV1131	DVSD48AL	DVEX48AL
		-----	M6RX6GBV4Y	200	MGSDB2	DV1231	DVSD48AY	DVEX48AY
70 mm sq.	15	-----	M7RX15GBV4L	100	MGSDA1	DV1132	DVSD48AL	DVEX48AL
		-----	M7RX15GBV4Y	200	MGSDB2	DV1231	DVSD48AY	DVEX48AY
80 mm sq.	25	-----	M8RX25GBV4L	100	MGSDA1	DV1132	DVSD48BL	DVEX48BL
		-----	M8RX25GBV4Y	200	MGSDB2	DV1234	DVSD48BY	DVEX48BY
90 mm sq.	40	-----	M9RX40GBV4L	100	MGSDA1	DV1132	DVSD48BL	DVEX48BL
		-----	M9RX40GBV4Y	200	MGSDB2	DV1234	DVSD48BY	DVEX48BY

* When using a speed controller operative under a wide range of supply voltage (MGSD, SD48, EX48), the mating motor should be selected according to the voltage of the power supply to be used.

Variable speed electromagnetic brake single-phase motor (leadwire)

60 mm sq. 6 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min⁻¹)	Permissible Torque N·m (kgf·cm) at 1200 min⁻¹	Permissible Torque N·m (kgf·cm) at 90 min⁻¹	Starting current (A)	Starting torque N·m (kgf·cm)	Brake Input (W)	Brake Current (A)	Brake Friction Torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
60 mm sq.	M6RX6GBV4L	4	6	100	50	30	90 to 1400	0.030 (0.30)	0.030 (0.30)	0.31	0.038 (0.38)	4	0.04	0.049 (0.5)	3 (200V)
					60		90 to 1700	0.030 (0.30)	0.030 (0.30)	0.31	0.038 (0.38)	4	0.04	0.049 (0.5)	
	M6RX6GBV4Y	4	6	200	50	30	90 to 1400	0.030 (0.30)	0.030 (0.30)	0.16	0.038 (0.38)	4	0.02	0.049 (0.5)	0.8 (400V)
					60		90 to 1700	0.030 (0.30)	0.030 (0.30)	0.16	0.038 (0.38)	4	0.02	0.049 (0.5)	

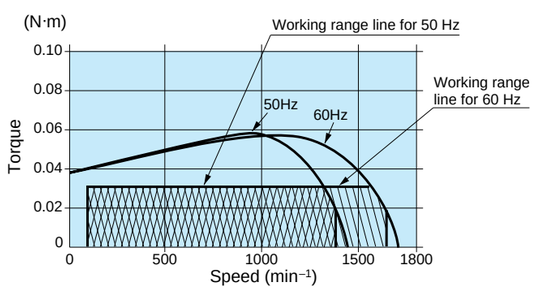
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed \ Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX6G□BA MX6G□B (ball bearing) MX6G□MA MX6G□M (metal bearing)	1200min⁻¹	50Hz	0.072 (0.7)	0.087 (0.8)	0.12 (1.2)	0.14 (1.4)	0.18 (1.8)	0.21 (2.1)	0.24 (2.4)	0.29 (2.9)	0.36 (3.6)	0.43 (4.3)	0.48 (4.8)	0.60 (6.1)
		60Hz	0.072 (0.7)	0.087 (0.8)	0.12 (1.2)	0.14 (1.4)	0.18 (1.8)	0.21 (2.1)	0.24 (2.4)	0.29 (2.9)	0.36 (3.6)	0.43 (4.3)	0.48 (4.8)	0.60 (6.1)
	90min⁻¹		0.072 (0.7)	0.087 (0.8)	0.12 (1.2)	0.14 (1.4)	0.18 (1.8)	0.21 (2.1)	0.24 (2.4)	0.29 (2.9)	0.36 (3.6)	0.43 (4.3)	0.48 (4.8)	0.60 (6.1)
	Rotational direction		Same as motor rotational direction											

Applicable gear head / Bearing	Speed \ Reduction ratio		30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX6G□BA MX6G□B (ball bearing) MX6G□MA MX6G□M (metal bearing)	1200min⁻¹	50Hz	0.65 (6.6)	0.78 (7.9)	1.09 (11)	1.30 (13)	1.63 (16)	1.98 (20)	2.18 (22)	2.45 (25)	2.45 (25)	2.45 (25)	MX6G10XB
		60Hz	0.65 (6.6)	0.78 (7.9)	1.09 (11)	1.30 (13)	1.63 (16)	1.98 (20)	2.18 (22)	2.45 (25)	2.45 (25)	2.45 (25)	
	90min⁻¹		0.65 (6.6)	0.78 (7.9)	1.09 (11)	1.30 (13)	1.63 (16)	1.98 (20)	2.18 (22)	2.45 (25)	2.45 (25)	2.45 (25)	
	Rotational direction		Reverse to motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

* Working range line

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

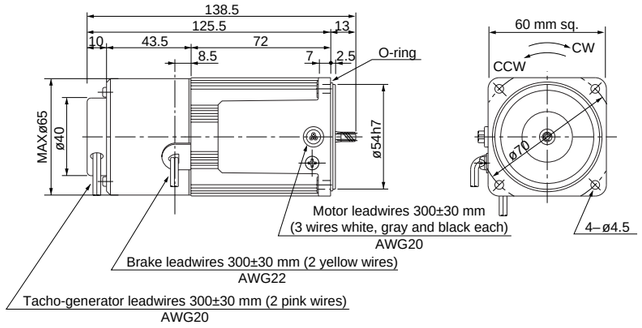
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

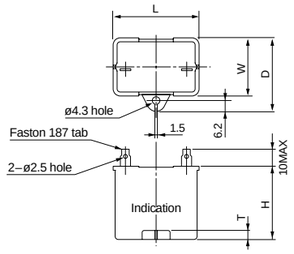
M6RX6GBV4L 4P 6 W 100 V
M6RX6GBV4Y 4P 6 W 200 V

Mass	Helical gear	Module	Number of teeth
0.9 kg		0.5	6



Capacitor (dimensions) [attachment]

Unit: mm



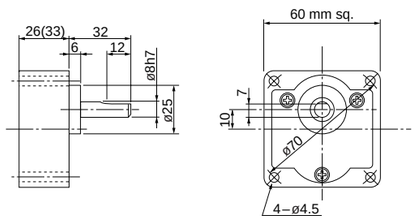
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M6RX6GBV4L	M0PC3M20	39.5	16	26.5	30.5	4	M0PC3917
M6RX6GBV4Y	M0PC0.8M40	39.5	16.2	27	27	4	M0PC3917

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX6G□BA (ball bearing) / **MX6G□B** (ball bearing) Mass 0.24/0.3 kg: Output shaft D cut
MX6G□MA (metal bearing) / **MX6G□M** (metal bearing) Mass 0.24/0.3 kg: Output shaft D cut



* Figures in ( ) represent the dimensions of MX6G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX6G□BA (MA).)

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Variable speed electromagnetic brake single-phase motor (leadwire)

70 mm sq. 15 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min⁻¹)	Permissible Torque N·m (kgf·cm) at 1200 min⁻¹	Permissible Torque N·m (kgf·cm) at 90 min⁻¹	Starting current (A)	Starting torque N·m (kgf·cm)	Brake Input (W)	Brake Current (A)	Brake Friction Torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
70 mm sq.	M7RX15GBV4L	4	15	100	50	30	90 to 1400	0.098 (1.0)	0.046 (0.46)	0.59	0.080 (0.81)	4	0.05	0.078 (0.80)	6 (200V)
					60		90 to 1700	0.098 (1.0)	0.046 (0.46)	0.57	0.080 (0.81)	4	0.05	0.078 (0.80)	
	M7RX15GBV4Y	4	15	200	50	30	90 to 1400	0.098 (1.0)	0.046 (0.46)	0.30	0.080 (0.81)	4	0.03	0.078 (0.80)	1.5 (400V)
					60		90 to 1700	0.098 (1.0)	0.046 (0.46)	0.30	0.080 (0.81)	4	0.03	0.078 (0.80)	

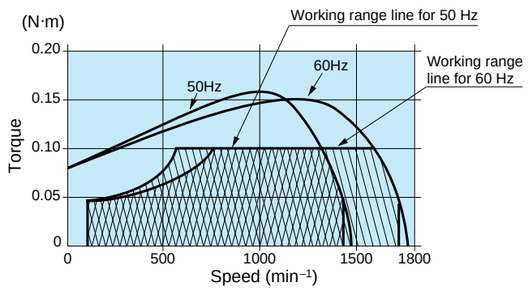
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed \ Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX7G□BA / MX7G□B (ball bearing) MX7G□MA / MX7G□M (metal bearing)	1200min⁻¹	50Hz	0.23 (2.3)	0.28 (2.8)	0.39 (3.9)	0.47 (4.7)	0.59 (6.0)	0.71 (7.2)	0.79 (8.0)	0.99 (10)	1.19 (12)	1.42 (14)	1.58 (16)	1.98 (20)
		60Hz	0.23 (2.3)	0.28 (2.8)	0.39 (3.9)	0.47 (4.7)	0.59 (6.0)	0.71 (7.2)	0.79 (8.0)	0.99 (10)	1.19 (12)	1.42 (14)	1.58 (16)	1.98 (20)
	90min⁻¹		0.11 (1.1)	0.13 (1.3)	0.18 (1.8)	0.22 (2.2)	0.27 (2.7)	0.33 (3.3)	0.37 (3.7)	0.46 (4.6)	0.55 (5.6)	0.66 (6.7)	0.74 (7.5)	0.93 (9.4)
	Rotational direction		Same as motor rotational direction											

Applicable gear head / Bearing	Speed \ Reduction ratio		30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX7G□BA / MX7G□B (ball bearing) MX7G□MA / MX7G□M (metal bearing)	1200min⁻¹	50Hz	2.13 (21)	2.56 (26)	3.56 (36)	4.27 (43)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	MX7G10XB
		60Hz	2.13 (21)	2.56 (26)	3.56 (36)	4.27 (43)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	
	90min⁻¹		1.00 (10)	1.20 (12)	1.67 (17)	2.00 (20)	2.50 (25)	3.00 (30)	3.34 (34)	4.00 (40)	4.90 (50)	4.90 (50)	
	Rotational direction		Reverse to motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

* Working range line

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

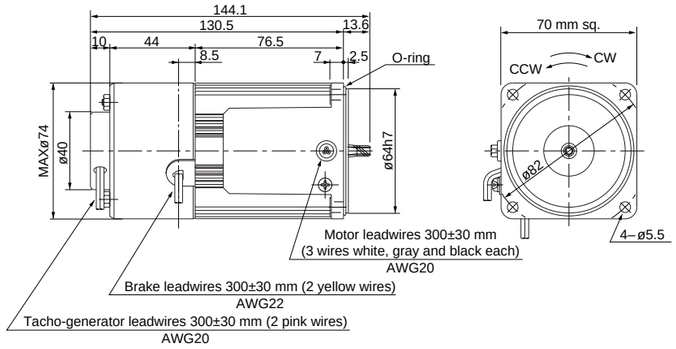
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

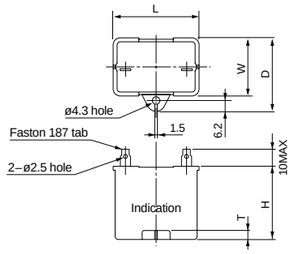
M7RX15GBV4L 4P 15 W 100 V
M7RX15GBV4Y 4P 15 W 200 V

Mass	Helical gear	Module	Number of teeth
1.4 kg		0.5	7



Capacitor (dimensions) [attachment]

Unit: mm



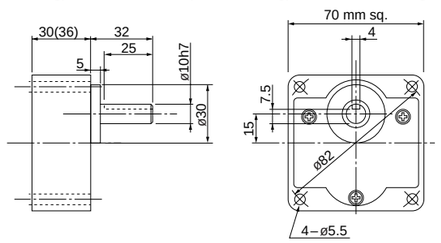
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M7RX15GBV4L	M0PC6M20	39.5	17.5	28	30.5	4	M0PC3917
M7RX15GBV4Y	M0PC1.5M40	39.5	22	32.5	32.5	4	M0PC3922

Gear head (dimensions)

Scale: 1/3, Unit: mm

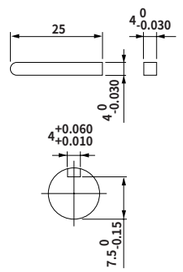
MX7G□BA (ball bearing) / **MX7G□B** (ball bearing) Mass 0.38/0.45 kg
MX7G□MA (metal bearing) / **MX7G□M** (metal bearing) Mass 0.38/0.45 kg



* Figures in ( ) represent the dimensions of MX7G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX7G□BA (MA).)

Key and keyway (dimensions) [attachment]

MX7G□BA(B)
MX7G□MA(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Variable speed electromagnetic brake single-phase motor (leadwire)

80 mm sq. 25 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min⁻¹)	Permissible Torque N·m (kgf·cm) at 1200 min⁻¹	Permissible Torque N·m (kgf·cm) at 90 min⁻¹	Starting current (A)	Starting torque N·m (kgf·cm)	Brake Input (W)	Brake Current (A)	Brake Friction Torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
80 mm sq.	M8RX25GBV4L	4	25	100	50	30	90 to 1400	0.15 (1.5)	0.088 (0.90)	1.0	0.16 (1.6)	6	0.06	0.10 (1.0)	9.5 (200V)
					60		90 to 1700	0.15 (1.5)	0.088 (0.90)	1.0	0.16 (1.6)	6	0.06	0.10 (1.0)	
	M8RX25GBV4Y	4	25	200	50	30	90 to 1400	0.15 (1.5)	0.088 (0.90)	0.5	0.16 (1.6)	6	0.03	0.10 (1.0)	2.4 (400V)
					60		90 to 1700	0.15 (1.5)	0.088 (0.90)	0.5	0.16 (1.6)	6	0.03	0.10 (1.0)	

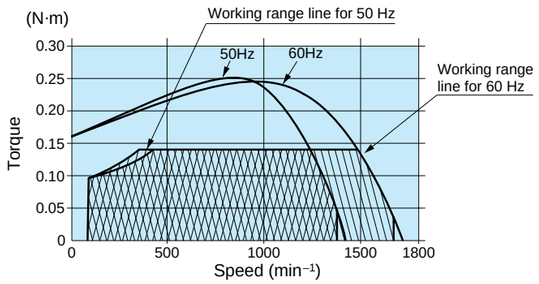
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed / Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX8G□B (ball bearing) MX8G□M (metal bearing)	1200min⁻¹	50Hz	0.34 (3.4)	0.40 (4.0)	0.56 (5.7)	0.68 (6.9)	0.85 (8.6)	1.02 (10)	1.13 (11)	1.41 (1.4)	1.70 (17)	2.04 (20)	2.26 (23)	2.83 (28)
		60Hz	0.34 (3.4)	0.40 (4.0)	0.56 (5.7)	0.68 (6.9)	0.85 (8.6)	1.02 (10)	1.13 (11)	1.41 (1.4)	1.70 (17)	2.04 (20)	2.26 (23)	2.83 (28)
	90min⁻¹		0.094 (0.9)	0.11 (1.1)	0.15 (1.5)	0.18 (1.8)	0.23 (2.3)	0.28 (2.8)	0.31 (3.1)	0.39 (3.9)	0.47 (4.7)	0.56 (5.7)	0.63 (6.4)	0.78 (7.9)
	Rotational direction		Same as motor rotational direction											

Applicable gear head / Bearing	Speed / Reduction ratio		30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX8G□B (ball bearing) MX8G□M (metal bearing)	1200min⁻¹	50Hz	3.06 (31)	3.67 (37)	5.10 (52)	6.12 (62)	7.65 (78)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	MX8G10XB
		60Hz	3.06 (31)	3.67 (37)	5.10 (52)	6.12 (62)	7.65 (78)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	
	90min⁻¹		0.84 (8.5)	1.01 (10)	1.41 (14)	1.69 (17)	2.12 (21)	2.54 (25)	2.83 (28)	3.39 (34)	4.24 (43)	5.09 (51)	
	Rotational direction		Reverse to motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

*** Working range line**

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

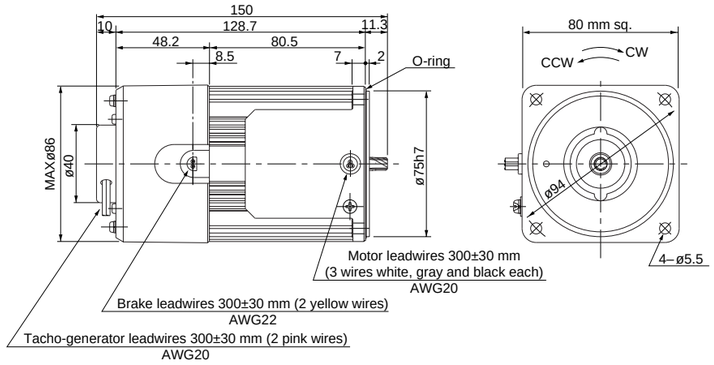
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

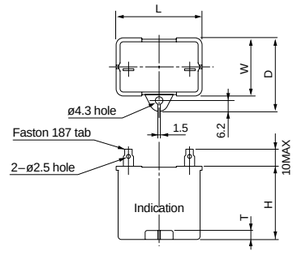
M8RX25GBV4L 4P 25 W 100 V
M8RX25GBV4Y 4P 25 W 200 V

Mass	Helical gear	Module	Number of teeth
1.8 kg		0.5	9



Capacitor (dimensions) [attachment]

Unit: mm



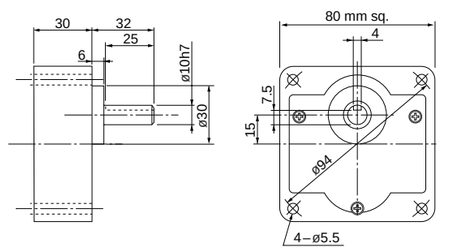
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M8RX25GBV4L	M0PC9.5M20	39.5	22	32.5	30.5	4	M0PC3922
M8RX25GBV4Y	M0PC2.4M40	49.7	24	34.5	34.5	4	M0PC5026

Gear head (dimensions)

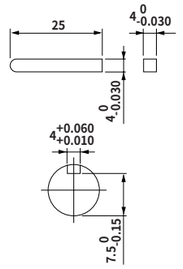
Scale: 1/3, Unit: mm

MX8G□B (ball bearing) / **MX8G□M** (metal bearing) Mass 0.6 kg



Key and keyway (dimensions) [attachment]

MX8G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Variable speed electromagnetic brake single-phase motor (leadwire)

90 mm sq. 40 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min⁻¹)	Permissible Torque N·m (kgf·cm) at 1200 min⁻¹	Permissible Torque N·m (kgf·cm) at 90 min⁻¹	Starting current (A)	Starting torque N·m (kgf·cm)	Brake Input (W)	Brake Current (A)	Brake Friction Torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M9RX40GBV4L	4	40	100	50	30	90 to 1400	0.30 (3.0)	0.098 (1.0)	1.60	0.25 (2.6)	7	0.09	0.20 (2.0)	15 (210V)
					60		90 to 1700	0.24 (2.4)	0.098 (1.0)	1.60	0.25 (2.6)	7	0.09	0.20 (2.0)	
	M9RX40GBV4Y	4	40	200	50	30	90 to 1400	0.30 (3.0)	0.098 (1.0)	0.80	0.25 (2.6)	7	0.05	0.20 (2.0)	3.8 (400V)
					60		90 to 1700	0.24 (2.4)	0.098 (1.0)	0.76	0.25 (2.6)	7	0.05	0.20 (2.0)	

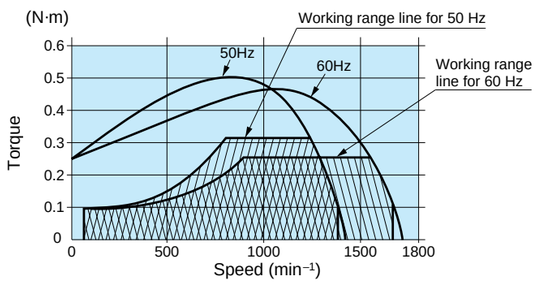
• Permissible torque at output shaft of gear head

Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed \ Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX9G□B (ball bearing) MX9G□M (metal bearing)	1200min⁻¹	50Hz	0.66 (6.7)	0.84 (8.5)	1.08 (11)	1.38 (14)	1.57 (16)	2.00 (20)	2.25 (22)	2.74 (27)	3.23 (32)	4.13 (42)	4.41 (44)	5.29 (53)
		60Hz	0.51 (5.2)	0.66 (6.7)	0.84 (8.5)	1.08 (11)	1.22 (12)	1.57 (16)	1.76 (17)	2.14 (21)	2.74 (27)	3.23 (32)	3.53 (36)	4.13 (42)
	90min⁻¹		0.11 (1.1)	0.14 (1.4)	0.19 (1.9)	0.23 (2.3)	0.29 (2.9)	0.35 (3.5)	0.39 (3.9)	0.49 (5.0)	0.59 (6.0)	0.71 (7.2)	0.79 (8.0)	0.99 (10)
	Rotational direction		Same as motor rotational direction											

Applicable gear head / Bearing	Speed \ Reduction ratio		30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX9G□B (ball bearing) MX9G□M (metal bearing)	1200min⁻¹	50Hz	6.37 (65)	8.15 (83)	9.8 (100)	9.8 (100)	9.8 (100)	9.8 (100)	9.8 (100)	9.8 (100)	9.8 (100)	9.8 (100)	MX9G10XB
		60Hz	5.29 (53)	6.37 (65)	8.8 (89)	9.8 (100)	9.8 (100)	9.8 (100)	9.8 (100)	9.8 (100)	9.8 (100)	9.8 (100)	
	90min⁻¹		1.06 (10)	1.28 (13)	1.78 (18)	2.13 (21)	2.67 (27)	3.20 (32)	3.56 (36)	4.27 (43)	5.34 (54)	6.40 (65)	
	Rotational direction		Reverse to motor rotational direction										

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

* Working range line

The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

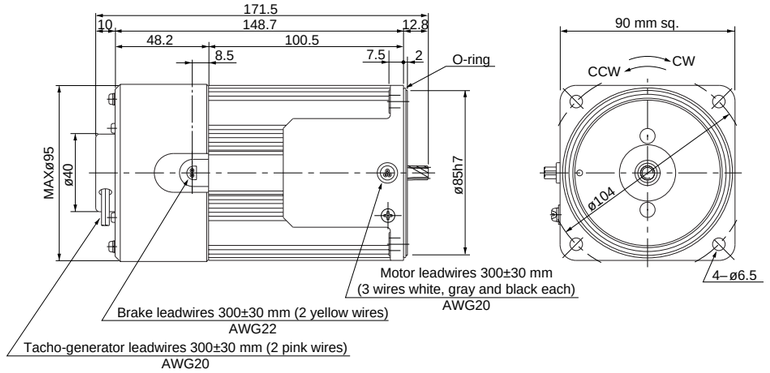
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Motor (dimensions)

Scale: 1/3, Unit: mm

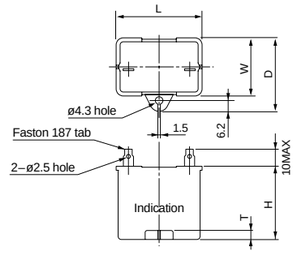
M9RX40GBV4L 4P 40 W 100 V
M9RX40GBV4Y 4P 40 W 200 V

Mass	Helical gear	Module	Number of teeth
2.9 kg		0.55	9



Capacitor (dimensions) [attachment]

Unit: mm



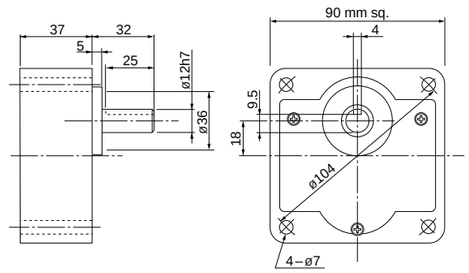
• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M9RX40GBV4L	M0PC15M20	39.5	26.7	37	41	4	M0PC3926
M9RX40GBV4Y	M0PC3.8M40	50	26.7	37.5	38	4	M0PC5026

Gear head (dimensions)

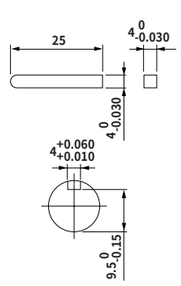
Scale: 1/3, Unit: mm

MX9G□B (ball bearing) / **MX9G□M** (metal bearing) Mass 0.8 kg



Key and keyway (dimensions) [attachment]

MX9G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

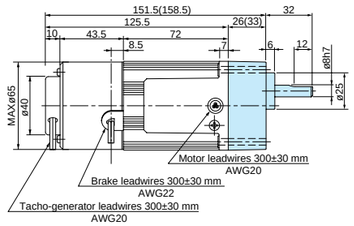
Variable speed electromagnetic brake single-phase motor (leadwire)

Gear head combination dimensions

Scale: 1/4, Unit: mm

60 mm sq. 6 W

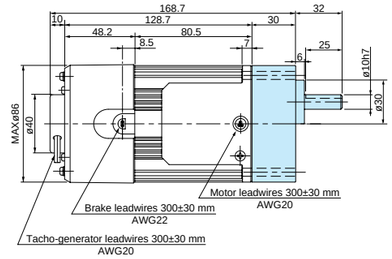
M6RX6GBV4L + MX6G□BA(MA) / MX6G□B(M)
M6RX6GBV4Y + MX6G□BA(MA) / MX6G□B(M)



* Figures in ( ) represent the dimensions of MX6G□B (M) (1/30 or larger reduction ratio).
The model number of the gear head with a reduction ratio of 1/25 or smaller is MX6G□BA (MA).

80 mm sq. 25 W

M8RX25GBV4L + MX8G□B(M)
M8RX25GBV4Y + MX8G□B(M)



70 mm sq. 15 W

M7RX15GBV4L + MX7G□BA(MA) / MX7G□B(M)
M7RX15GBV4Y + MX7G□BA(MA) / MX7G□B(M)

* Figures in ( ) represent the dimensions of MX7G□B (M) (1/30 or larger reduction ratio).
The model number of the gear head with a reduction ratio of 1/25 or smaller is MX7G□BA (MA).

90 mm sq. 40 W

M9RX40GBV4L + MX9G□B(M)
M9RX40GBV4Y + MX9G□B(M)

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Features B-310 | System configuration B-311 | Coding system B-311 | Model list B-312

Variable Speed Unit Motor

Contents

Outline of variable speed unit motor

Features

• A variable speed motor is combined with a one-touch connection speed controller.
• The speed controller is available in an analog setting type (MUSN series) or a digital setting type (MUXN series).

<MUSN series>
• Analog setting type with a speed setting knob, RUN-STOP and rotational direction change
• The cable can be extended up to 5 m using an option
(A 1-meter extension cable is included with the motor.)

<MUXN series>
• Multifunction digital setting type using a microcomputer
1. The speed can be set digitally.
2. The motor speed can be converted to the gear head speed and conveyor speed instantaneously.
3. The actual speed can be displayed digitally.
4. Soft-start/soft-down function
5. Set conditions backup function
6. Set lock function

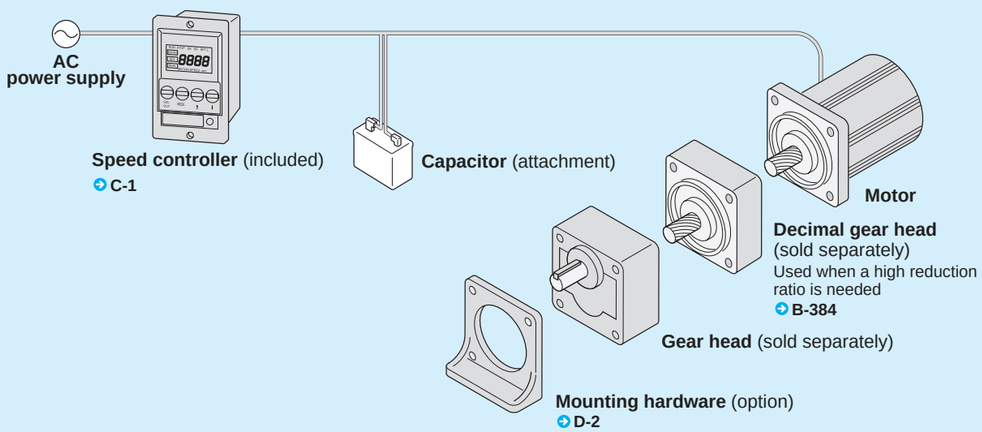
• The cable can be extended up to 5 m using an option
(A 1-meter extension cable is included with the motor.)

Specifications

	MUSN Series	MUXN Series
Output	6W : 15W : 25W : 40W : 60W : 90W	6W : 15W : 25W : 40W : 60W : 90W
Rated voltage	100 / 200V	100 / 200V
Power supply frequency	50Hz / 60Hz	50Hz / 60Hz
Speed control range	90 to 1400min^{-1} / 90 to 1700min^{-1}	90 to 1400min^{-1} / 90 to 1700min^{-1}
Speed variation	5% (standard value)	5% (standard value)
Speed setting	Analog setting	Digital setting
Operating temperature range	–10 to 40˚C	0 to 40˚C
Storage temperature range	–20 to 60˚C	–10 to 60˚C
Soft-start/soft-down time	————	0.1 to 30 sec

• The 90 W models contain a thermal protector to prevent burnout for 90 W.

System configuration diagram



* For the 40 W or lower models, the capacitor is built into the speed controller.

Coding system

MUSN Motor type
- MUSN :US series
- MUXN :UX series

8 Size
- 6 : 60 mm sq.
- 7 : 70 mm sq.
- 8 : 80 mm sq.
- 9 : 90 mm sq.

25 Output
- 6 : 6 W
- 15 : 15 W
- 25 : 25 W
- 40 : 40 W
- 60 : 60 W
- 90 : 90 W

G Shape of shaft
- G : Pinion shaft

L Voltage
- L : 100 V
- Y : 200 V

Model list of variable speed unit motor

Pinion shaft motor / speed controller (Set)

Size	Output (W)	MUSN Series			MUXN Series		
		Model number	Specifications	Page	Model number	Specifications	Page
60 mm sq.	6	MUSN606GL	100V	B-328	MUXN606GL	100V	B-328
		MUSN606GY	200V	B-328	MUXN606GY	200V	B-328
70 mm sq.	15	MUSN715GL	100V	B-330	MUXN715GL	100V	B-330
		MUSN715GY	200V	B-330	MUXN715GY	200V	B-330
80 mm sq.	25	MUSN825GL	100V	B-332	MUXN825GL	100V	B-332
		MUSN825GY	200V	B-332	MUXN825GY	200V	B-332
90 mm sq.	40	MUSN940GL	100V	B-334	MUXN940GL	100V	B-334
		MUSN940GY	200V	B-334	MUXN940GY	200V	B-334
	60	MUSN960GL	100V	B-336	MUXN960GL	100V	B-336
		MUSN960GY	200V	B-336	MUXN960GY	200V	B-336
	90	MUSN990GL	100V	B-338	MUXN990GL	100V	B-338
		MUSN990GY	200V	B-338	MUXN990GY	200V	B-338

Applicable gear head

Hinge attached

Standard gear head		High torque gear head	Right-angle gear head	Decimal gear head
Ball bearing	metal bearing			
MX6G□BA MX6G□B	MX6G□MA MX6G□M	–	–	MX6G10XB
MX7G□BA MX7G□B	MX7G□MA MX7G□M	–	–	MX7G10XB
MX8G□B	MX8G□M	–	–	MX8G10XB
MX9G□B	MX9G□M	–	MX9G□R	MX9G10XB
MZ9G□B	–	MR9G□B	MZ9G□R	MZ9G10XB
MY9G□B		MP9G□B		

*Refer to page B-380 for dimensions and permissible torque of high torque gear head.
Refer to page B-382 for dimensions and permissible torque of right-angle gear head.
Refer to page B-384 for dimensions of decimal gear head.

Variable speed unit motor

60 mm sq. 6 W

• Unit specifications

Size	Unit	Set configuration			
		Motor		Speed Controller	
	Motor model No.	Motor model No.	Voltage	Motor model No.	Page
60 mm sq.	MUSN606GL	M61X6GD4L	100V	DVUS606L	C-36
	MUXN606GL			DVUX606L	C-36
	MUSN606GY	M61X6GD4Y	200V	DVUS606Y	C-36
	MUXN606GY			DVUX606Y	C-36

* The motor or speed controller is not sold singly. Place an order using the unit model number.

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min^{-1})	Permissible Torque N·m (kgf·cm) at 1200 min^{-1}	Permissible Torque N·m (kgf·cm) at 90 min^{-1}	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
60 mm sq.	M61X6GD4L	4	6	100	50	Cont.	90 to 1400	0.032 (0.32)	0.025 (0.25)	0.30	0.037 (0.37)	2.5 (200V)
					60		90 to 1700	0.032 (0.32)	0.025 (0.25)	0.30		
	M61X6GD4Y	4	6	200	50	Cont.	90 to 1400	0.032 (0.32)	0.025 (0.25)	0.15	0.037 (0.37)	0.6 (400V)
					60		90 to 1700	0.032 (0.32)	0.025 (0.25)	0.15		

• Permissible torque at output shaft of gear head

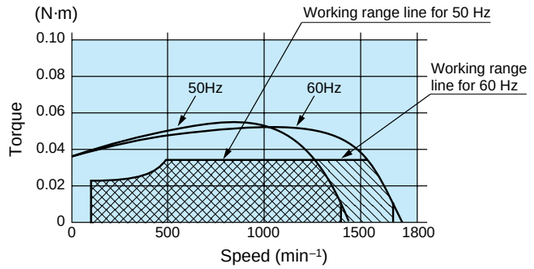
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed	Reduction ratio	3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX6G□BA (ball bearing) MX6G□B / MX6G□MA (metal bearing) MX6G□M	1200min^{-1}	50Hz	0.077 (0.7)	0.093 (0.9)	0.13 (1.3)	0.15 (1.5)	0.19 (1.9)	0.23 (2.3)	0.25 (2.5)	0.32 (3.2)	0.38 (3.8)	0.46 (4.6)	0.51 (5.2)	0.64 (6.5)
		60Hz	0.077 (0.7)	0.093 (0.9)	0.13 (1.3)	0.15 (1.5)	0.19 (1.9)	0.23 (2.3)	0.25 (2.5)	0.32 (3.2)	0.38 (3.8)	0.46 (4.6)	0.51 (5.2)	0.64 (6.5)
	90min^{-1}		0.06 (0.6)	0.07 (0.7)	0.10 (1.0)	0.12 (1.2)	0.15 (1.5)	0.18 (1.8)	0.20 (2.0)	0.25 (2.5)	0.30 (3.0)	0.36 (3.6)	0.40 (4.0)	0.50 (5.1)
	Rotational direction		Same as motor rotational direction											

Applicable gear head / Bearing	Speed	Reduction ratio	30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX6G□BA (ball bearing) MX6G□B / MX6G□MA (metal bearing) MX6G□M	1200min^{-1}	50Hz	0.69 (7.0)	0.83 (8.4)	1.16 (11)	1.39 (14)	1.74 (17)	2.09 (20)	2.33 (23)	2.45 (25)	2.45 (25)	2.45 (25)	MX6G10XB
		60Hz	0.69 (7.0)	0.83 (8.4)	1.16 (11)	1.39 (14)	1.74 (17)	2.09 (20)	2.33 (23)	2.45 (25)	2.45 (25)	2.45 (25)	
	90min^{-1}		0.54 (5.5)	0.65 (6.6)	0.90 (9.1)	1.08 (11)	1.35 (13)	1.62 (16)	1.81 (18)	2.17 (22)	2.45 (25)	2.45 (25)	
	Rotational direction		Reverse to motor rotational direction										

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

* Working range line

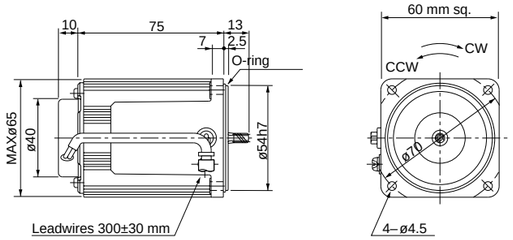
The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

Motor (dimensions)

Scale: 1/3, Unit: mm

M61X6GD4L 4P 6 W 100 V
M61X6GD4Y 4P 6 W 200 V

Mass	Helical gear	Module	Number of teeth
0.71 kg		0.5	6

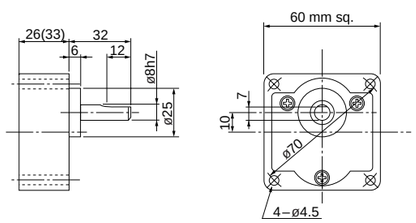


* The motor or speed controller is not sold singly. Place an order using the unit model number.

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX6G□BA (ball bearing) / **MX6G□B** (ball bearing) Mass 0.24/0.3 kg: Output shaft D cut
MX6G□MA (metal bearing) / **MX6G□M** (metal bearing) Mass 0.24/0.3 kg: Output shaft D cut



* Figures in ( ) represent the dimensions of MX6G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX6G□BA (MA).)

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Variable speed unit motor

70 mm sq. 15 W

• Unit specifications

Size	Unit	Set configuration			
		Motor		Speed Controller	
	Motor model No.	Motor model No.	Voltage	Motor model No.	Page
70 mm sq.	MUSN715GL	M71X15GD4L	100V	DVUS715L	C-36
	MUXN715GL			DVUX715L	C-36
	MUSN715GY	M71X15GD4Y	200V	DVUS715Y	C-36
	MUXN715GY			DVUX715Y	C-36

* The motor or speed controller is not sold singly. Place an order using the unit model number.

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min^{-1})	Permissible Torque N·m (kgf·cm) at 1200 min^{-1}	Permissible Torque N·m (kgf·cm) at 90 min^{-1}	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
70 mm sq.	M71X15GD4L	4	15	100	50	Cont.	90 to 1400	0.089 (0.90)	0.029 (0.29)	0.60	0.068 (0.69)	5 (200V)
					60		90 to 1700	0.089 (0.90)	0.029 (0.29)	0.56	0.068 (0.69)	
	M71X15GD4Y	4	15	200	50	Cont.	90 to 1400	0.089 (0.90)	0.029 (0.29)	0.30	0.068 (0.69)	1.3 (400V)
					60		90 to 1700	0.089 (0.90)	0.029 (0.29)	0.28	0.068 (0.69)	

• Permissible torque at output shaft of gear head

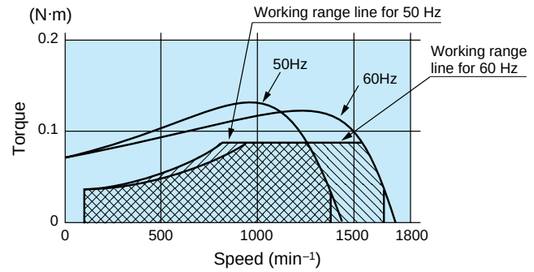
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed \ Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX7G□BA (ball bearing) MX7G□B (ball bearing) MX7G□MA (metal bearing) MX7G□M (metal bearing)	1200min^{-1}	50Hz	0.21 (2.1)	0.25 (2.5)	0.36 (3.6)	0.43 (4.3)	0.54 (5.5)	0.64 (6.5)	0.72 (7.3)	0.86 (8.7)	1.08 (11)	1.29 (13)	1.44 (14)	1.80 (18)
		60Hz	0.21 (2.1)	0.25 (2.5)	0.36 (3.6)	0.43 (4.3)	0.54 (5.5)	0.64 (6.5)	0.72 (7.3)	0.86 (8.7)	1.08 (11)	1.29 (13)	1.44 (14)	1.88 (19)
	90min^{-1}		0.070 (0.7)	0.084 (0.8)	0.11 (1.1)	0.14 (1.4)	0.17 (1.7)	0.21 (2.1)	0.23 (2.3)	0.28 (2.8)	0.35 (3.5)	0.42 (4.2)	0.47 (4.7)	0.58 (5.9)
	Rotational direction		Same as motor rotational direction											

Applicable gear head / Bearing	Speed \ Reduction ratio		30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX7G□BA (ball bearing) MX7G□B (ball bearing) MX7G□MA (metal bearing) MX7G□M (metal bearing)	1200min^{-1}	50Hz	1.92 (19)	2.30 (23)	3.20 (32)	3.84 (39)	4.80 (48)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	MX7G10XB
		60Hz	1.92 (19)	2.30 (23)	3.20 (32)	3.84 (39)	4.80 (48)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	4.90 (50)	
	90min^{-1}		0.63 (6.4)	0.75 (7.6)	1.05 (10)	1.26 (12)	1.58 (16)	1.89 (19)	2.11 (21)	2.53 (25)	3.16 (32)	3.79 (38)	
	Rotational direction		Reverse to motor rotational direction										

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

* Working range line

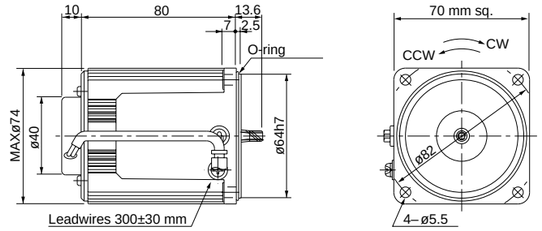
The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

Motor (dimensions)

Scale: 1/3, Unit: mm

M71X15GD4L 4P 15 W 100 V
M71X15GD4Y 4P 15 W 200 V

Mass	Helical gear	Module	Number of teeth
1.1 kg		0.5	7

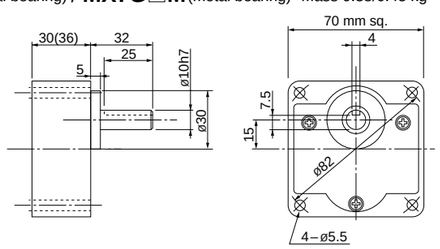


* The motor or speed controller is not sold singly. Place an order using the unit model number.

Gear head (dimensions)

Scale: 1/3, Unit: mm

MX7G□BA (ball bearing) / **MX7G□B** (ball bearing) Mass 0.38/0.45 kg
MX7G□MA (metal bearing) / **MX7G□M** (metal bearing) Mass 0.38/0.45 kg

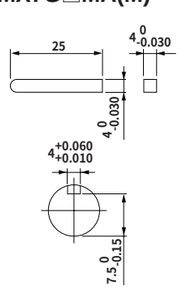


* Figures in ( ) represent the dimensions of MX7G□B (M) (1/30 or larger reduction ratio).
(The model number of the gear head with a reduction ratio of 1/25 or smaller is MX7G□BA (MA).)

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MX7G□BA(B)
MX7G□MA(M)



Variable speed unit motor

80 mm sq. 25 W

• Unit specifications

Size	Unit	Set configuration			
		Motor		Speed Controller	
	Motor model No.	Motor model No.	Voltage	Motor model No.	Page
80 mm sq.	MUSN825GL	M81X25GD4L	100V	DVUS825L	C-36
	MUXN825GL			DVUX825L	C-36
	MUSN825GY	M81X25GD4Y	200V	DVUS825Y	C-36
	MUXN825GY			DVUX825Y	C-36

* The motor or speed controller is not sold singly. Place an order using the unit model number.

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min^{-1})	Permissible Torque N·m (kgf·cm) at 1200 min^{-1}	Permissible Torque N·m (kgf·cm) at 90 min^{-1}	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
80 mm sq.	M81X25GD4L	4	25	100	50	Cont.	90 to 1400	0.14 (1.4)	0.039 (0.39)	1.0	0.16 (1.6)	8 (200V)
					60		90 to 1700	0.14 (1.4)	0.039 (0.39)	1.0	0.16 (1.6)	
	M81X25GD4Y	4	25	200	50	Cont.	90 to 1400	0.14 (1.4)	0.039 (0.39)	0.5	0.16 (1.6)	2 (400V)
					60		90 to 1700	0.14 (1.4)	0.039 (0.39)	0.5	0.16 (1.6)	

• Permissible torque at output shaft of gear head

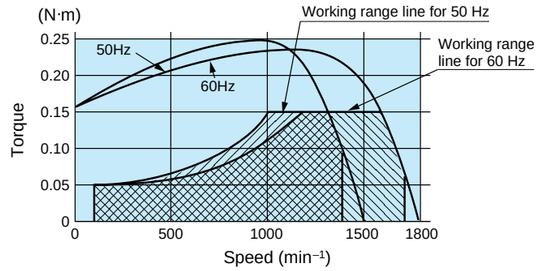
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed \ Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX8G□B (ball bearing) MX8G□M (metal bearing)	1200min^{-1}	50Hz	0.34 (3.4)	0.40 (4.0)	0.56 (5.7)	0.68 (6.9)	0.85 (8.6)	1.02 (10)	1.13 (11)	1.41 (1.4)	1.70 (17)	2.04 (20)	2.26 (23)	2.83 (28)
		60Hz	0.34 (3.4)	0.40 (4.0)	0.56 (5.7)	0.68 (6.9)	0.85 (8.6)	1.02 (10)	1.13 (11)	1.41 (1.4)	1.70 (17)	2.04 (20)	2.26 (23)	2.83 (28)
	90min^{-1}		0.094 (0.9)	0.11 (1.1)	0.15 (1.5)	0.18 (1.8)	0.23 (2.3)	0.28 (2.8)	0.31 (3.1)	0.39 (3.9)	0.47 (4.7)	0.56 (5.7)	0.63 (6.4)	0.78 (7.9)
	Rotational direction		Same as motor rotational direction											

Applicable gear head / Bearing	Speed \ Reduction ratio		30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX8G□B (ball bearing) MX8G□M (metal bearing)	1200min^{-1}	50Hz	3.06 (31)	3.67 (37)	5.10 (52)	6.12 (62)	7.65 (78)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	MX8G10XB
		60Hz	3.06 (31)	3.67 (37)	5.10 (52)	6.12 (62)	7.65 (78)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	7.84 (80)	
	90min^{-1}		0.84 (8.5)	1.01 (10)	1.41 (14)	1.69 (17)	2.12 (21)	2.54 (25)	2.83 (28)	3.39 (34)	4.24 (43)	5.09 (51)	
	Rotational direction		Reverse to motor rotational direction										

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

* Working range line

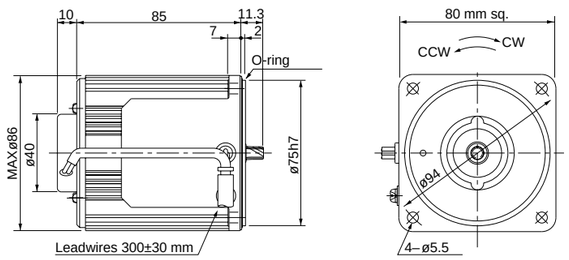
The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

Motor (dimensions)

Scale: 1/3, Unit: mm

M81X25GD4L 4P 25 W 100 V
M81X25GD4Y 4P 25 W 200 V

Mass	Helical gear	Module	Number of teeth
1.5 kg		0.5	9

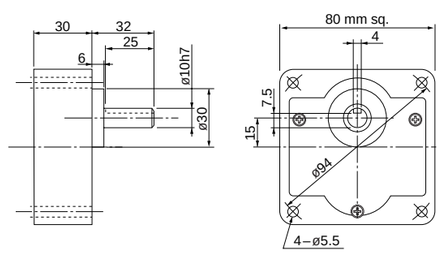


* The motor or speed controller is not sold singly. Place an order using the unit model number.

Gear head (dimensions)

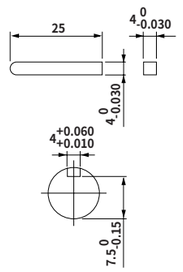
Scale: 1/3, Unit: mm

MX8G□B (ball bearing) / **MX8G□M** (metal bearing) Mass 0.6 kg



Key and keyway (dimensions) [attachment]

MX8G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Variable speed unit motor

90 mm sq. 40 W

• Unit specifications

Size	Unit	Set configuration			
		Motor		Speed Controller	
	Motor model No.	Motor model No.	Voltage		
90 mm sq.	MUSN940GL	M91X40GD4L	100V	DVUS940L	C-36
	MUXN940GL			DVUX940L	C-36
	MUSN940GY	M91X40GD4Y	200V	DVUS940Y	C-36
	MUXN940GY			DVUX940Y	C-36

* The motor or speed controller is not sold singly. Place an order using the unit model number.

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min^{-1})	Permissible Torque N·m (kgf·cm) at 1200 min^{-1}	Permissible Torque N·m (kgf·cm) at 90 min^{-1}	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M91X40GD4L	4	40	100	50	Cont.	90 to 1400	0.30 (3.0)	0.049 (0.5)	1.6	0.25 (2.5)	12 (200V)
					60		90 to 1700	0.24 (2.4)	0.049 (0.5)	1.6	0.25 (2.5)	
	M91X40GD4Y	4	40	200	50	Cont.	90 to 1400	0.30 (3.0)	0.049 (0.5)	0.8	0.25 (2.5)	3 (400V)
					60		90 to 1700	0.24 (2.4)	0.049 (0.5)	0.8	0.25 (2.5)	

• Permissible torque at output shaft of gear head

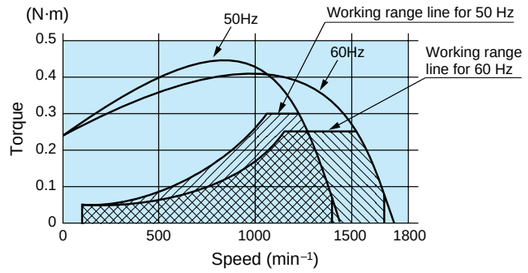
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed	Reduction ratio	3	3.6	5	6	7.5	9	10	12.5	15	18	20	25
MX9G□B (ball bearing) MX9G□M (metal bearing)	1200min^{-1}	50Hz	0.72 (7.3)	0.87 (8.8)	1.21 (12)	1.45 (14)	1.82 (18)	2.18 (22)	2.43 (24)	3.03 (30)	3.64 (37)	4.37 (44)	4.86 (49)	6.07 (61)
		60Hz	0.58 (5.9)	0.69 (7.0)	0.97 (9.8)	1.16 (11)	1.45 (14)	1.74 (17)	1.92 (19)	2.42 (24)	2.91 (29)	3.49 (35)	3.88 (39)	4.85 (49)
	90min^{-1}		0.11 (1.1)	0.14 (1.4)	0.19 (1.9)	0.23 (2.3)	0.29 (2.9)	0.35 (3.5)	0.39 (3.9)	0.49 (5.0)	0.59 (6.0)	0.71 (7.2)	0.79 (8.0)	0.99 (10)
	Rotational direction		Same as motor rotational direction											

Applicable gear head / Bearing	Speed	Reduction ratio	30	36	50	60	75	90	100	120	150	180	Applicable decimal gear head
MX9G□B (ball bearing) MX9G□M (metal bearing)	1200min^{-1}	50Hz	6.54 (66)	7.84 (80)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	MX9G10XB
		60Hz	5.23 (53)	6.26 (63)	8.70 (88)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	
	90min^{-1}		1.06 (10)	1.28 (13)	1.78 (18)	2.13 (21)	2.67 (27)	3.20 (32)	3.56 (36)	4.27 (43)	5.34 (54)	6.40 (65)	
	Rotational direction		Reverse to motor rotational direction										

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

* Working range line

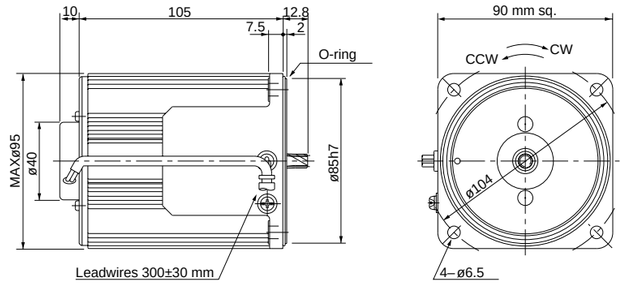
The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

Motor (dimensions)

Scale: 1/3, Unit: mm

M91X40GD4L 4P 40 W 100 V
M91X40GD4Y 4P 40 W 200 V

Mass	Helical gear	Module	Number of teeth
2.4 kg		0.55	9

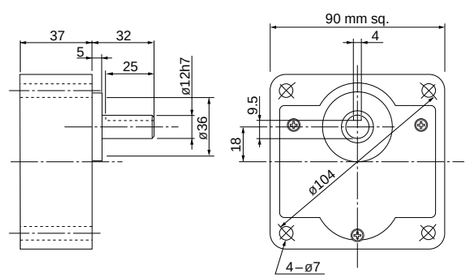


* The motor or speed controller is not sold singly. Place an order using the unit model number.

Gear head (dimensions)

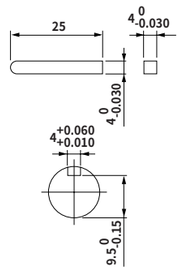
Scale: 1/3, Unit: mm

MX9G□B (ball bearing) / **MX9G□M** (metal bearing) Mass 0.8 kg



Key and keyway (dimensions) [attachment]

MX9G□B(M)



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Variable speed unit motor

90 mm sq. 60 W

• Unit specifications

Size	Unit	Set configuration			
		Motor		Speed Controller	
	Motor model No.	Motor model No.	Voltage	Motor model No.	Page
90 mm sq.	MUSN960GL	M91Z60GD4L	100V	DVUS960L	C-36
	MUXN960GL			DVUX960L	C-36
	MUSN960GY	M91Z60GD4Y	200V	DVUS960Y	C-36
	MUXN960GY			DVUX960Y	C-36

* The motor or speed controller is not sold singly. Place an order using the unit model number.

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min⁻¹)	Permissible Torque N·m (kgf·cm) at 1200 min⁻¹	Permissible Torque N·m (kgf·cm) at 90 min⁻¹	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M91Z60GD4L	4	60	100	50	Cont.	90 to 1400	0.43 (4.3)	0.078 (0.79)	2.3	0.46 (4.6)	20 (200V)
					60		90 to 1700	0.36 (3.6)	0.078 (0.79)	2.4	0.46 (4.6)	
	M91Z60GD4Y	4	60	200	50	Cont.	90 to 1400	0.43 (4.3)	0.078 (0.79)	1.2	0.46 (4.6)	5 (400V)
					60		90 to 1700	0.36 (3.6)	0.078 (0.79)	1.2	0.46 (4.6)	

• Permissible torque at output shaft of gear head

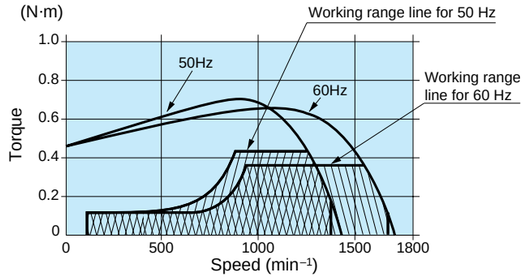
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed	Reduction ratio	3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	1200min⁻¹	50Hz	0.98 (10)	1.17 (11)	1.57 (16)	1.87 (19)	2.35 (23)	2.80 (28)	3.14 (32)	3.92 (40)	4.70 (47)	5.60 (57)	6.27 (63)	7.55 (77)	9.01 (91)
		60Hz	0.82 (8.3)	0.98 (10)	1.31 (13)	1.57 (16)	1.96 (20)	2.35 (23)	2.62 (26)	3.28 (33)	3.92 (40)	4.70 (47)	5.29 (53)	6.32 (64)	7.55 (77)
	90min⁻¹		0.18 (1.8)	0.22 (2.2)	0.31 (3.1)	0.37 (3.7)	0.47 (4.7)	0.56 (5.7)	0.63 (6.4)	0.70 (7.1)	0.84 (8.5)	1.00 (10)	1.12 (11)	1.40 (14)	1.68 (17)
	Rotational direction		Same as motor rotational direction							Reverse to motor rotational direction					

Applicable gear head / Bearing	Speed	Reduction ratio	36	50	60	75	90	100	120	150	180	200	Applicable decimal gear head
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	1200min⁻¹	50Hz	10.8 (110)	15.2 (155)	18.1 (184)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	MZ9G10XB
		60Hz	9.11 (92)	12.7 (129)	15.2 (155)	19.0 (193)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	
	90min⁻¹		1.81 (18)	2.50 (25)	3.00 (30)	3.75 (38)	4.50 (45)	5.00 (51)	6.00 (61)	7.50 (76)	9.00 (91)	10.0 (102)	
	Rotational direction		Same as motor rotational direction										

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

* Working range line

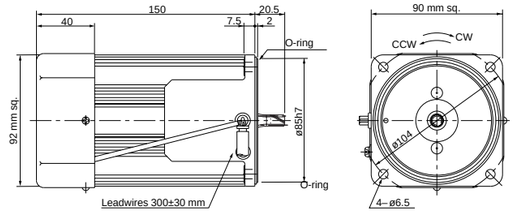
The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

Motor (dimensions)

Scale: 1/4, Unit: mm

M91Z60GD4L 4P 60 W 100 V (with fan)
M91Z60GD4Y 4P 60 W 200 V (with fan)

Mass	Helical gear	Module	Number of teeth
2.7 kg		0.6	9

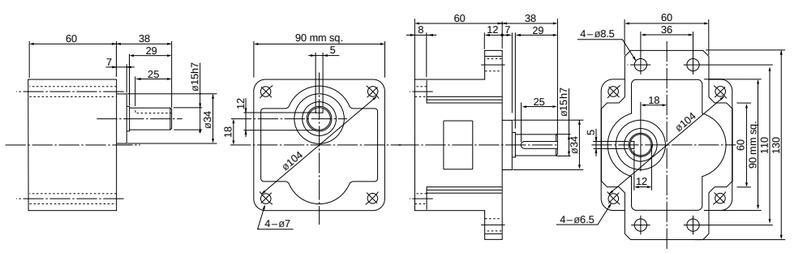


* The motor or speed controller is not sold singly. Place an order using the unit model number.

Gear head (dimensions)

Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg
MY9G□M (metal bearing / hinge attached) Mass 1.4 kg

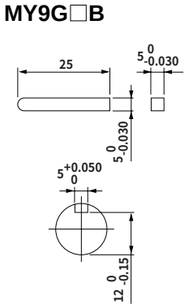


Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Variable speed unit motor

90 mm sq. 90 W

• Unit specifications

Size	Unit	Set configuration			
		Motor		Speed Controller	
	Motor model No.	Motor model No.	Voltage	Motor model No.	Page
90 mm sq.	MUSN990GL	M91Z90GD4L	100V	DVUS990L	C-36
	MUXN990GL			DVUX990L	C-36
	MUSN990GY	M91Z90GD4Y	200V	DVUS990Y	C-36
	MUXN990GY			DVUX990Y	C-36

* The motor or speed controller is not sold singly. Place an order using the unit model number.

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Variable speed range Speed (min^{-1})	Permissible Torque N·m (kgf·cm) at 1200 min^{-1}	Permissible Torque N·m (kgf·cm) at 90 min^{-1}	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M91Z90GD4L	4	90	100	50	Cont.	90 to 1400	0.59 (6.0)	0.25 (2.5)	2.3	0.53 (5.4)	25 (200V)
					60		90 to 1700	0.54 (5.5)	0.25 (2.5)	2.2	0.56 (5.7)	
	M91Z90GD4Y	4	90	200	50	Cont.	90 to 1400	0.59 (6.0)	0.25 (2.5)	1.1	0.57 (5.8)	6.2 (375V)
					60		90 to 1700	0.54 (5.5)	0.25 (2.5)	1.1	0.59 (6.0)	

• Permissible torque at output shaft of gear head

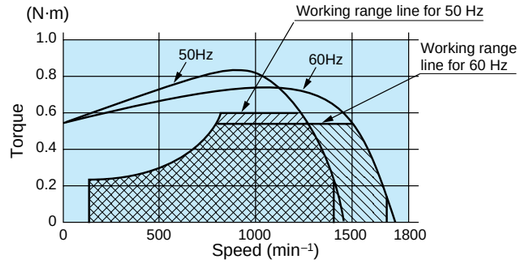
Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Applicable gear head / Bearing	Speed \ Reduction ratio		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	1200min^{-1}	50Hz	1.43 (14)	1.71 (17)	2.38 (24)	2.86 (29)	3.57 (36)	4.29 (43)	4.77 (48)	5.36 (54)	6.43 (65)	7.72 (78)	8.58 (87)	10.97 (111)	12.8 (130)
		60Hz	1.31 (13)	1.57 (16)	2.18 (22)	2.62 (26)	3.27 (33)	3.93 (40)	4.37 (44)	4.91 (50)	5.89 (60)	7.07 (72)	7.86 (80)	9.82 (100)	11.7 (119)
	90min^{-1}		0.60 (6.1)	0.72 (7.3)	1.01 (10)	1.21 (12)	1.51 (15)	1.81 (18)	2.02 (20)	2.26 (23)	2.71 (27)	3.25 (33)	3.62 (36)	4.52 (46)	5.43 (55)
	Rotational direction		Same as motor rotational direction							Reverse to motor rotational direction					

Applicable gear head / Bearing	Speed \ Reduction ratio		36	50	60	75	90	100	120	150	180	200	Applicable decimal gear head
MZ9G□B (ball bearing / hinge not attached) MY9G□B (ball bearing / hinge attached)	1200min^{-1}	50Hz	13.7 (139)	19.2 (195)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	MZ9G10XB
		60Hz	12.6 (128)	17.6 (179)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	
	90min^{-1}		5.83 (59)	8.10 (82)	9.72 (99)	12.1 (123)	14.5 (147)	16.2 (165)	19.4 (197)	19.6 (200)	19.6 (200)	19.6 (200)	
	Rotational direction		Same as motor rotational direction										

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Speed-torque characteristics



Connection diagram

* For the connection diagram showing wiring with the speed controller, refer to pages C-6 to C-35.

* Working range line

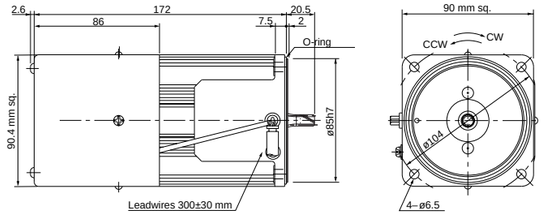
The working range line shows the working limit for the variable speed motor. The permissible torque should fall within the shaded portion. If you use the motor with the permissible torque exceeding the working range line (falling within the portion not shaded), the motor may be burned out due to a high temperature rise or the gear tooth may be damaged.

Motor (dimensions)

Scale: 1/4, Unit: mm

M91Z90GD4L 4P 90 W 100 V (Forced cooling fan)
M91Z90GD4Y 4P 90 W 200 V (Forced cooling fan)

Mass	Helical gear	Module	Number of teeth
3.5 kg		0.6	9

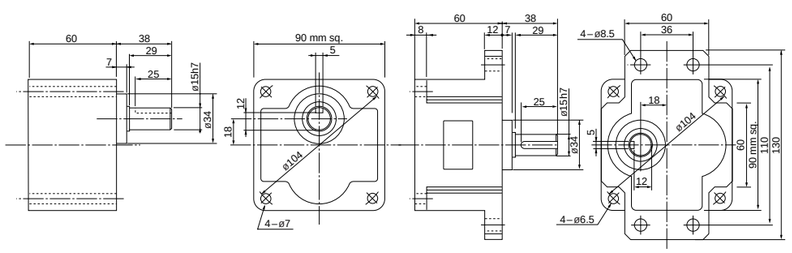


* The motor or speed controller is not sold singly. Place an order using the unit model number.

Gear head (dimensions)

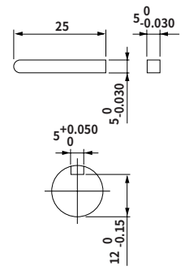
Scale: 1/4, Unit: mm

MZ9G□B (ball bearing / hinge not attached) Mass 1.4 kg **MY9G□M** (metal bearing / hinge attached) Mass 1.4 kg



Key and keyway (dimensions) [attachment]

MZ9G□B
MY9G□B



Note) MZ / MY is available for a gear head of either type.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

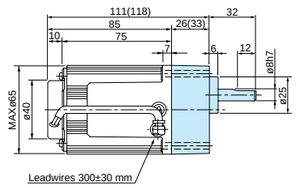
Variable speed unit motor

Gear head combination dimensions

Scale: 1/4, Unit: mm

60 mm sq. 6 W

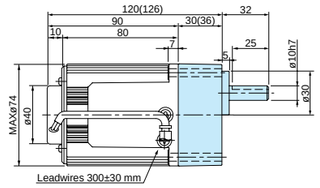
M61X6GD4L + MX6G□BA(MA) / MX6G□B(M)
M61X6GD4Y + MX6G□BA(MA) / MX6G□B(M)



* Figures in ( ) represent the dimensions of MX6G□B (M) (1/30 or larger reduction ratio).
The model number of the gear head with a reduction ratio of 1/25 or smaller is MX6G□BA (MA).

70 mm sq. 15 W

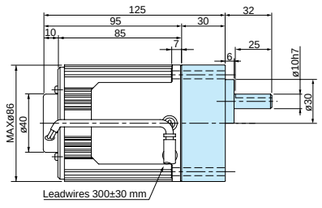
M71X15GD4L + MX7G□BA(MA) / MX7G□B(M)
M71X15GD4Y + MX7G□BA(MA) / MX7G□B(M)



* Figures in ( ) represent the dimensions of MX7G□B (M) (1/30 or larger reduction ratio).
The model number of the gear head with a reduction ratio of 1/25 or smaller is MX7G□BA (MA).

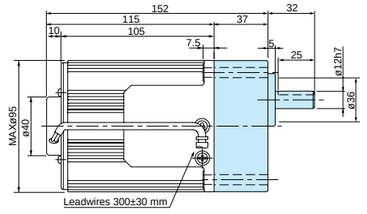
80 mm sq. 25 W

M81X25GD4L + MX8G□B(M)
M81X25GD4Y + MX8G□B(M)



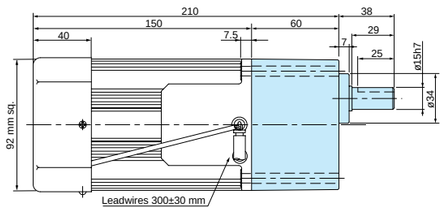
90 mm sq. 40 W

M91X40GD4L + MX9G□B(M)
M91X40GD4Y + MX9G□B(M)



90 mm sq. 60 W

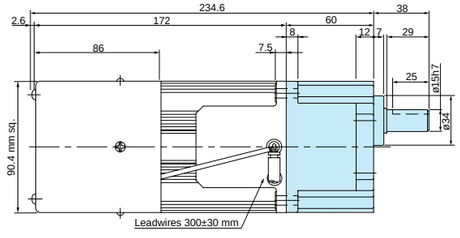
M91Z60GD4L + MZ9G□B (MY9G□B)
M91Z60GD4Y + MZ9G□B (MY9G□B)



* Refer to page B-380 for high torque gear head.

90 mm sq. 90 W

M91Z90GD4L + MY9G□B (MZ9G□B)
M91Z90GD4Y + MY9G□B (MZ9G□B)



* Refer to page B-380 for high torque gear head.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

2-pole round shaft motor

Contents

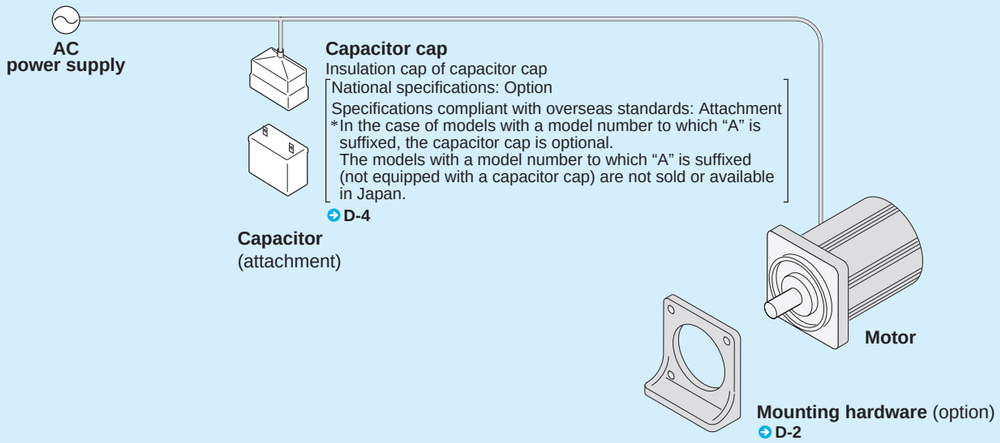
2-pole round shaft motor

Outline of motor

Features

- High-speed induction motor (50Hz: 3000min^{-1}, 60Hz: 3600min^{-1})
- Continuous time rating

System configuration diagram



Coding system

M 9 1 X 60 S 2 L S A

- **Size**
  - 4 : 42 mm sq.
  - 8 : 80 mm sq.
  - 9 : 90 mm sq.
- **Motor type**
  - 1 : Induction Motor
  - M : 3-phase motor
- **Output type**
  - A : 42mm sq. only
  - X : 40 W or smaller
  - Z : 60 W or larger
- **Output**
  - 3 : 3 W
  - 20 : 20 W
  - 40 : 40 W
  - 60 : 60 W
  - 90 : 90 W
  - A5 : 150 W
- **Shape of shaft**
  - S : Round shaft
- **No. of poles**
  - 2 : 2 poles
- **Voltage**
  - L : 100 V
  - Y : Induction motor : 200 V
    3-phase motor
    National specifications : 200/220 V
    Specifications compliant with overseas standards : 200/220/230 V
  - D : 110/115V
  - G : 220/230V
- **Classification**
  - Motor with specifications compliant with overseas standards that is not equipped with a capacitor cap.
  - S : Round shaft
    (S for round shaft with national specifications only)

Corresponding model number	Shape of shaft	Classification
Specifications compliant with overseas standards Round shaft	S	G
National specifications Round shaft	S	S
42 mm sq. round shaft specifications	S	–
- **A**
  - Motor with specifications compliant with overseas standards that is not equipped with a capacitor cap.

Model list

Size	Output (W)	Single-phase induction motor				3-phase motor		
		Model number	Specifications		Page	Model number	Specifications	Page
42 mm sq.	3	M41A3S2L	100V		B-344			
80 mm sq.	20	M81X20S2LS	100V		B-345			
		M81X20S2YS	200V		B-345			
	40	M81X40S2LS	100V		B-346	M8MX40S2YS	200/220V	B-356
		M81X40S2YS	200V		B-346	M8MX40S2YG(A)	200/220/230V ✪	B-357
		M81X40S2LG(A)	100V	✪	B-347			
		M81X40S2DG(A)	110/115V	✪	B-347			
		M81X40S2YG(A)	200V	✪	B-347			
		M81X40S2GG(A)	220/230V	✪	B-347			
	60	M81X60S2LS	100V		B-348	M8MX60S2YS	200/220V	B-358
		M81X60S2YS	200V		B-348	M8MX60S2YG(A)	200/220/230V ✪	B-359
		M81X60S2LG(A)	100V	✪	B-349			
		M81X60S2DG(A)	110/115V	✪	B-349			
		M81X60S2YG(A)	200V	✪	B-349			
		M81X60S2GG(A)	220/230V	✪	B-349			
90 mm sq.	60	M91X60S2LS	100V		B-350	M9MX60S2YS	200/220V	B-360
		M91X60S2YS	200V		B-350	M9MX60S2YG(A)	200/220/230V ✪	B-361
		M91X60S2LG(A)	100V	✪	B-351			
		M91X60S2DG(A)	110/115V	✪	B-351			
		M91X60S2YG(A)	200V	✪	B-351			
		M91X60S2GG(A)	220/230V	✪	B-351			
	90	M91Z90S2LS	100V		B-352	M9MZ90S2YS	200/220V	B-362
		M91Z90S2YS	200V		B-352	M9MZ90S2YG(A)	200/220/230V ✪	B-363
		M91Z90S2LG(A)	100V	✪	B-353			
		M91Z90S2DG(A)	110/115V	✪	B-353			
		M91Z90S2YG(A)	200V	✪	B-353			
		M91Z90S2GG(A)	220/230V	✪	B-353			
	150	M91ZA5S2LS	100V		B-354	M9MZA5S2YS	200/220V	B-364
		M91ZA5S2YS	200V		B-354	M9MZA5S2YG(A)	200/220/230V ✪	B-365
		M91ZA5S2LG(A)	100V	✪	B-355			
		M91ZA5S2DG(A)	110/115V	✪	B-355			
		M91ZA5S2YG(A)	200V	✪	B-355			
		M91ZA5S2GG(A)	220/230V	✪	B-355			

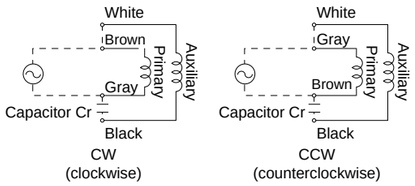
* The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

2-pole round shaft motor (Induction motor) 42 mm sq. 3 W

• Specifications

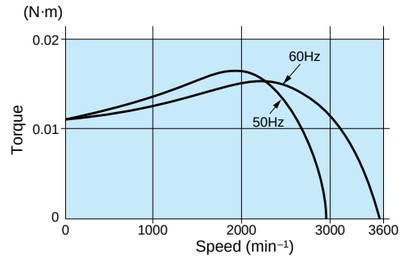
Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
42 mm sq.	M41A3S2L	2	3	100	50	Cont.	10	0.10	2625	0.011 (0.11)	0.15	0.011 (0.11)	1.5 (200V)
					60		9	0.10	3250	0.009 (0.09)	0.15	0.011 (0.11)	

Connection diagram



Speed-torque characteristics

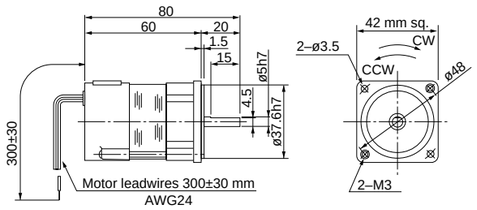
M41A3S2L



Motor (dimensions) Scale: 1/3, Unit: mm

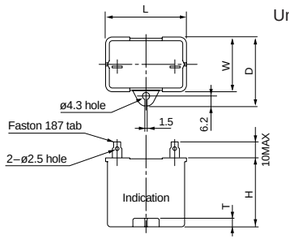
M41A3S2L 2P 3 W 100 V

Mass **0.3 kg**



Capacitor (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M41A3S2L	M0PC1.5M20	39.5	16	26.5	30.5	4	M0PC3917

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

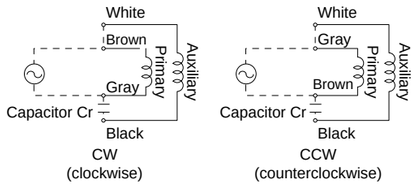
Features B-342 | System configuration B-342 | Coding system B-342 | Model list B-343

2-pole round shaft motor (Induction motor) 80 mm sq. 20 W

• Specifications

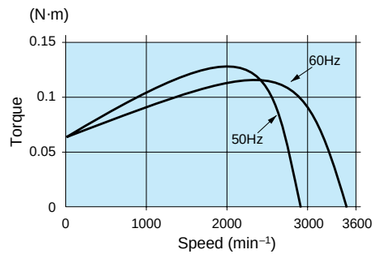
Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
80 mm sq.	M81X20S2LS	2	20	100	50	Cont.	40	0.40	2575	0.074 (0.75)	0.83	0.064 (0.65)	6 (200V)
					60		38	0.38	3175	0.060 (0.61)	0.82	0.064 (0.65)	
	M81X20S2YS	2	20	200	50	Cont.	40	0.20	2575	0.074 (0.75)	0.42	0.063 (0.64)	1.5 (400V)
					60		39	0.20	3150	0.061 (0.62)	0.41	0.063 (0.64)	

Connection diagram



Speed-torque characteristics

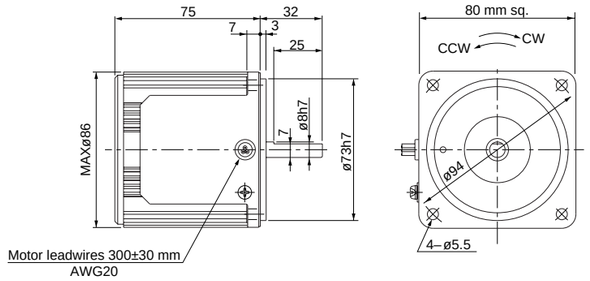
M81X20S2LS



Motor (dimensions) Scale: 1/3, Unit: mm

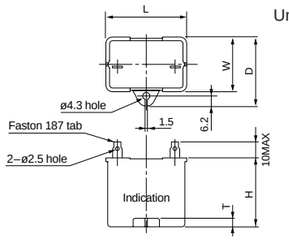
M81X20S2LS 2P 20 W 100 V
M81X20S2YS 2P 20 W 200 V

Mass **1.2 kg**



Capacitor (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M81X20S2LS	M0PC6M20	39.5	17.5	28	30.5	4	M0PC3917
M81X20S2YS	M0PC1.5M40	39.5	22	32.5	32.5	4	M0PC3922

• The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

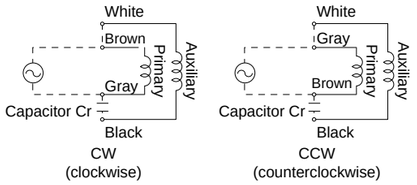
Option D-2

2-pole round shaft motor (Induction motor) 80 mm sq. 40 W

• Specifications

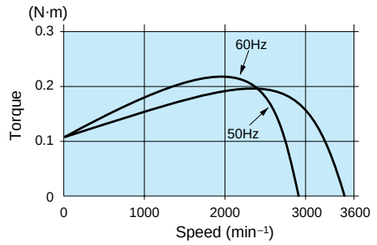
Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
80 mm sq.	M81X40S2LS	2	40	100	50	Cont.	70	0.70	2550	0.14 (1.5)	1.5	0.10 (1.0)	10 (200V)
					60		68	0.70	3125	0.12 (1.2)	1.4	0.10 (1.0)	
	M81X40S2YS	2	40	200	50	Cont.	66	0.33	2525	0.14 (1.5)	0.67	0.11 (1.2)	2.5 (400V)
					60		69	0.36	3075	0.12 (1.3)	0.66	0.11 (1.2)	

Connection diagram



Speed-torque characteristics

M81X40S2LS

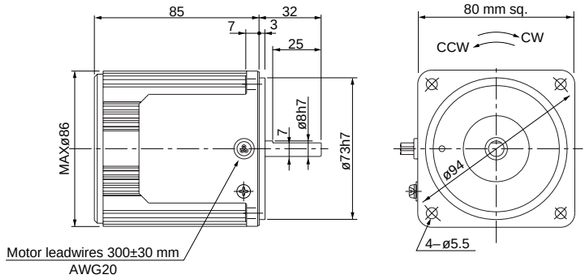


Motor (dimensions)

Scale: 1/3, Unit: mm

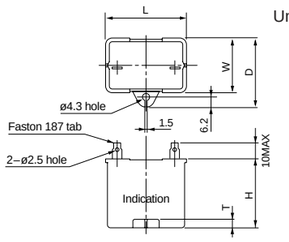
M81X40S2LS 2P 40 W 100 V
M81X40S2YS 2P 40 W 200 V

Mass 1.5 kg



Capacitor (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M81X40S2LS	M0PC10M20	39.5	26.7	37	32	4	M0PC3926
M81X40S2YS	M0PC2.5M40	49.7	24	34.5	34.5	4	M0PC5026

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Features B-342 | System configuration B-342 | Coding system B-342 | Model list B-343

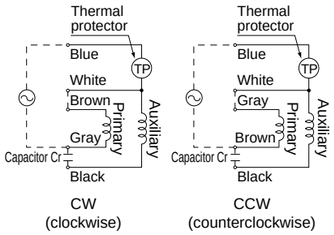
2-pole round shaft motor (Induction motor) 80 mm sq. 40 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
80 mm sq.	M81X40S2LG M81X40S2LGA	2	40	100	50	Cont.	72	0.71	2575	0.15 (1.5)	1.6	0.10 (1.0)	10 (250V)
					60		70	0.70	3150	0.12 (1.2)	1.5	0.10 (1.0)	
	M81X40S2DG M81X40S2DGA	2	40	110 115	60 60	Cont.	69 71	0.62 0.62	3225 3275	0.12 (1.2) 0.12 (1.2)	1.6 1.7	0.10 (1.0) 0.10 (1.0)	8 (250V)
	M81X40S2YG M81X40S2YGA	2	40	200	50 60	Cont.	71 73	0.36 0.38	2425 3025	0.16 (1.6) 0.13 (1.3)	0.65 0.64	0.10 (1.0) 0.10 (1.0)	2.5 (450V)
	M81X40S2GG M81X40S2GGA	2	40	220 230	50 60 50 60	Cont.	72 66 73 65	0.34 0.30 0.33 0.29	2525 3125 2600 3200	0.15 (1.5) 0.12 (1.2) 0.15 (1.5) 0.12 (1.2)	0.69 0.67 0.71 0.69	0.10 (1.0) 0.10 (1.0) 0.10 (1.0) 0.10 (1.0)	1.7 (450V)

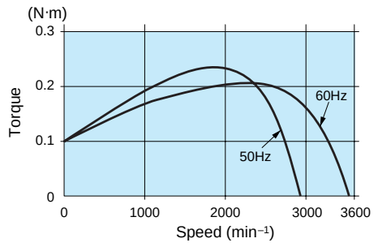
• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

Connection diagram



Speed-torque characteristics

M81X40S2LG(A)

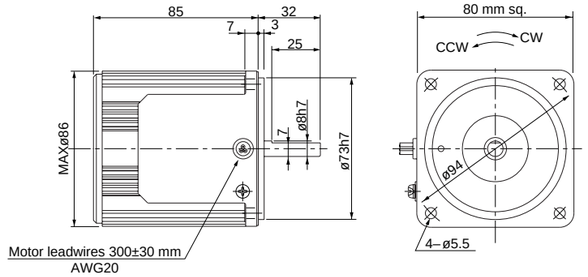


Motor (dimensions)

Scale: 1/3, Unit: mm

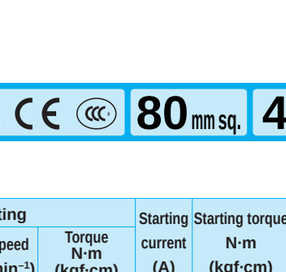
M81X40S2LG(A) 2P 40 W 100 V
M81X40S2DG(A) 2P 40 W 110 V / 115 V
M81X40S2YG(A) 2P 40 W 200 V
M81X40S2GG(A) 2P 40 W 220 V / 230 V

Mass 1.5 kg



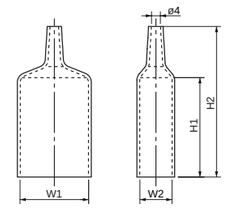
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M81X40S2LG(A)	M0PC10M25G	58	21	31	31	4	M0PC5821G	58	21	55	78
M81X40S2DG(A)	M0PC8M25G	48	21	31	31	4	M0PC4821G	48	21	55	78
M81X40S2YG(A)	M0PC2.5M45G	48	21	31	31	4	M0PC4821G	48	21	55	78
M81X40S2GG(A)	M0PC1.7M45G	38	21	31	31	4	M0PC3821G	38	21	55	78

• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

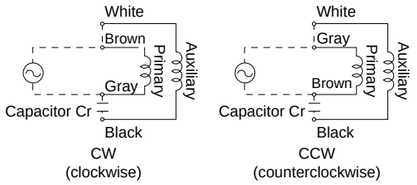
Option D-2

2-pole round shaft motor (Induction motor) — 80 mm sq. 60 W

• Specifications

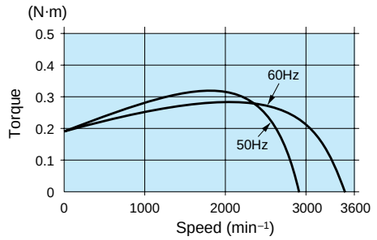
Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
80 mm sq.	M81X60S2LS	2	60	100	50	Cont.	111	1.1	2500	0.23 (2.3)	1.9	0.19 (1.9)	12 (200V)
					60		114	1.2	3050	0.19 (1.9)	1.9	0.19 (1.9)	
	M81X60S2YS	2	60	200	50	Cont.	112	0.56	2475	0.23 (2.4)	0.97	0.18 (1.8)	3.0 (400V)
					60		117	0.59	3025	0.20 (2.0)	0.96	0.18 (1.8)	

Connection diagram



Speed-torque characteristics

M81X60S2LS

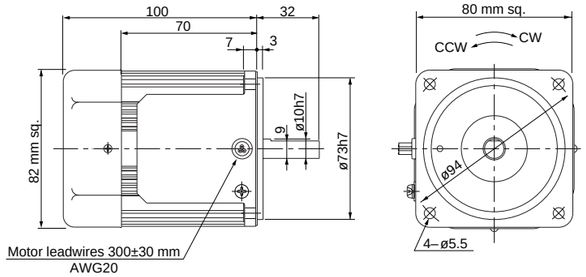


Motor (dimensions)

Scale: 1/3, Unit: mm

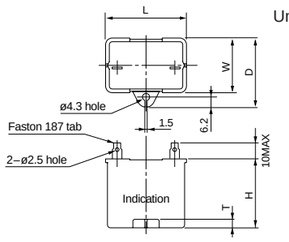
M81X60S2LS 2P 60 W 100 V (with fan)
M81X60S2YS 2P 60 W 200 V (with fan)

Mass 1.8 kg



Capacitor (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M81X60S2LS	M0PC12M20	39.5	26.7	37	32	4	M0PC3926
M81X60S2YS	M0PC3M40	49.7	24	34.5	34.5	4	M0PC5026

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Features B-342 | System configuration B-342 | Coding system B-342 | Model list B-343

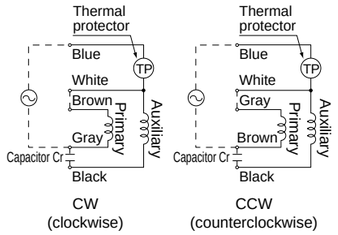
2-pole round shaft motor (Induction motor) — 80 mm sq. 60 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
80 mm sq.	M81X60S2LG M81X60S2LGA	2	60	100	50	Cont.	113	1.1	2450	0.23 (2.4)	1.9	0.18 (1.8)	18 (250V)
					60		118	1.2	3050	0.19 (1.9)	1.9	0.18 (1.8)	
	M81X60S2DG M81X60S2DGA	2	60	110	60	Cont.	105	0.95	3100	0.18 (1.9)	1.9	0.18 (1.8)	12 (250V)
				115	60		108	0.94	3175	0.18 (1.8)	2.0	0.18 (1.8)	
	M81X60S2YG M81X60S2YGA	2	60	200	50	Cont.	126	0.64	2250	0.25 (2.6)	0.82	0.18 (1.8)	5 (450V)
					60		143	0.74	2725	0.21 (2.1)	0.87	0.18 (1.8)	
	M81X60S2GG M81X60S2GGA	2	60	220	50	Cont.	114	0.52	2475	0.23 (2.4)	0.84	0.18 (1.8)	4 (450V)
					60		122	0.58	3050	0.19 (1.9)	0.86	0.18 (1.8)	
				230	50		119	0.52	2550	0.22 (2.3)	0.87	0.18 (1.8)	
					60		125	0.57	3125	0.18 (1.9)	0.90	0.18 (1.8)	

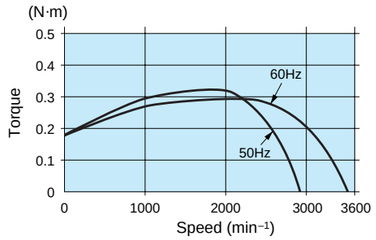
• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

Connection diagram



Speed-torque characteristics

M81X60S2LG(A)

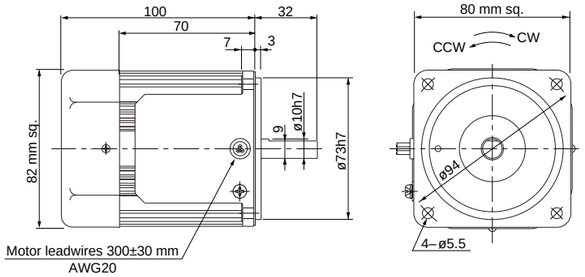


Motor (dimensions)

Scale: 1/3, Unit: mm

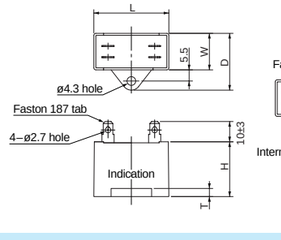
M81X60S2LG(A) 2P 60 W 100 V (with fan)
M81X60S2DG(A) 2P 60 W 110 V / 115 V (with fan)
M81X60S2YG(A) 2P 60 W 200 V (with fan)
M81X60S2GG(A) 2P 60 W 220 V / 230 V (with fan)

Mass 1.8 kg



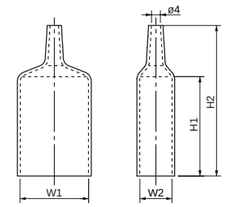
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M81X60S2LG(A)	M0PC18M25G	58	29	44	41	4	M0PC5829G	58	29	55	78
M81X60S2DG(A)	M0PC12M25G	58	22	32	35	4	M0PC5822G	58	22	55	78
M81X60S2YG(A)	M0PC5M45G	58	29	44	41	4	M0PC5829G	58	29	55	78
M81X60S2GG(A)	M0PC4M45G	58	23.5	38.5	37	4	M0PC5823G	58	23.5	55	78

• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

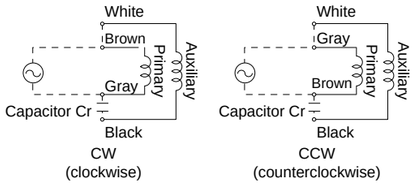
Option D-2

2-pole round shaft motor (Induction motor) 90 mm sq. 60 W

• Specifications

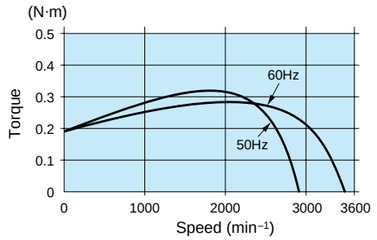
Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min^{-1})	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M91X60S2LS	2	60	100	50	Cont.	92	0.95	2725	0.20 (2.1)	2.9	0.17 (1.8)	14 (200V)
					60		89	0.90	3325	0.16 (1.7)	2.8	0.17 (1.8)	
	M91X60S2YS	2	60	200	50	Cont.	94	0.48	2725	0.20 (2.1)	1.4	0.17 (1.8)	3.5 (400V)
					60		90	0.46	3300	0.16 (1.7)	1.4	0.17 (1.8)	

Connection diagram



Speed-torque characteristics

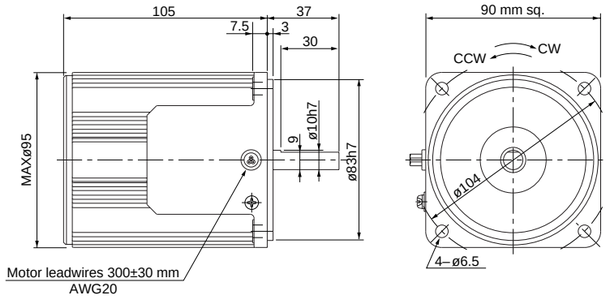
M91X60S2LS



Motor (dimensions) Scale: 1/3, Unit: mm

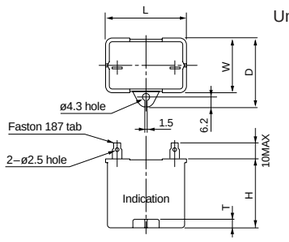
M91X60S2LS 2P 60 W 100 V
M91X60S2YS 2P 60 W 200 V

Mass 2.4 kg



Capacitor (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M91X60S2LS	M0PC14M20	39.5	26.7	37	41	4	M0PC3926
M91X60S2YS	M0PC3.5M40	49.7	24	34.5	34.5	4	M0PC5026

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Features B-342 | System configuration B-342 | Coding system B-342 | Model list B-343

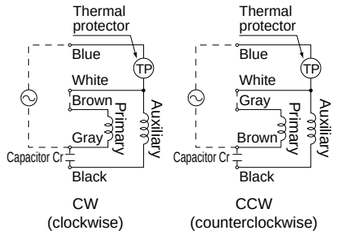
2-pole round shaft motor (Induction motor) 90 mm sq. 60 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min^{-1})	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M91X60S2LG M91X60S2LGA	2	60	100	50	Cont.	93	0.98	2725	0.21 (2.1)	3.1	0.16 (1.6)	14 (250V)
					60		89	0.90	3325	0.17 (1.8)	2.9	0.16 (1.6)	
	M91X60S2DG M91X60S2DGA	2	60	110 115	60 60	Cont.	91 94	0.83 0.82	3375 3375	0.17 (1.7) 0.17 (1.7)	3.2 3.3	0.16 (1.6) 0.16 (1.6)	12 (250V)
	M91X60S2YG M91X60S2YGA	2	60	200	50 60	Cont.	92 98	0.46 0.53	2700 3275	0.21 (2.2) 0.17 (1.8)	1.3 1.3	0.16 (1.6) 0.16 (1.6)	4 (450V)
	M91X60S2GG M91X60S2GGA	2	60	220 230	50 60 50 60	Cont.	93 91 97 92	0.45 0.42 0.46 0.41	2725 3325 2750 3350	0.21 (2.1) 0.17 (1.8) 0.21 (2.1) 0.17 (1.7)	1.4 1.4 1.5 1.4	0.16 (1.6) 0.16 (1.6) 0.16 (1.6) 0.16 (1.6)	3 (450V)

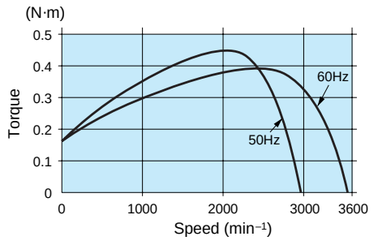
• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

Connection diagram



Speed-torque characteristics

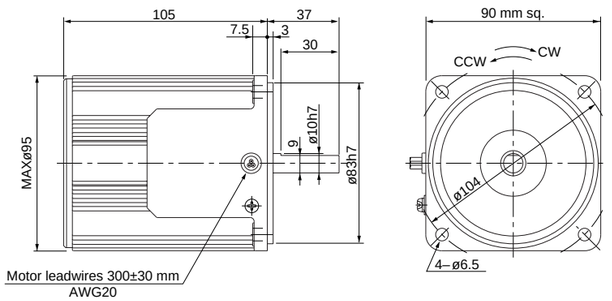
M91X60S2LG(A)



Motor (dimensions) Scale: 1/3, Unit: mm

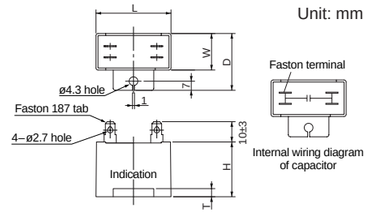
M91X60S2LG(A) 2P 60 W 100 V
M91X60S2DG(A) 2P 60 W 110 V / 115 V
M91X60S2YG(A) 2P 60 W 200 V
M91X60S2GG(A) 2P 60 W 220 V / 230 V

Mass 2.4 kg



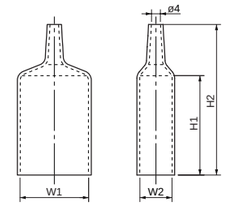
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M91X60S2LG(A)	M0PC14M25G	58	22	32	35	4	M0PC5822G	58	22	55	78
M91X60S2DG(A)	M0PC12M25G	58	22	32	35	4	M0PC5822G	58	22	55	78
M91X60S2YG(A)	M0PC4M45G	58	23.5	38.5	37	4	M0PC5823G	58	23.5	55	78
M91X60S2GG(A)	M0PC3M45G	58	21	31	31	4	M0PC4821G	48	21	55	78

• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Option D-2

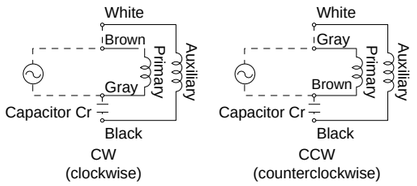
2-pole round shaft motor (Induction motor)

90 mm sq. 90 W

• Specifications

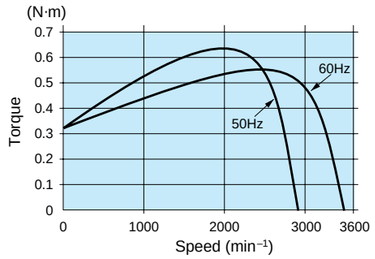
Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min^{-1})	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M91Z90S2LS	2	90	100	50	Cont.	151	1.6	2700	0.32 (3.3)	4.1	0.32 (3.3)	25 (200V)
					60		153	1.6	3275	0.26 (2.7)	3.8	0.32 (3.3)	
	M91Z90S2YS	2	90	200	50	Cont.	153	0.78	2675	0.32 (3.3)	2.0	0.32 (3.3)	6.2 (375V)
					60		157	0.82	3250	0.26 (2.7)	2.0	0.32 (3.3)	

Connection diagram



Speed-torque characteristics

M91Z90S2LS

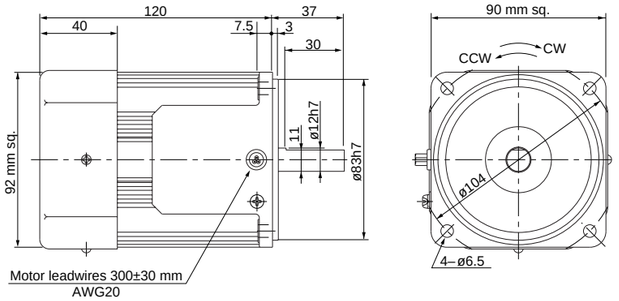


Motor (dimensions)

Scale: 1/3, Unit: mm

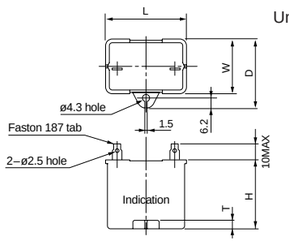
M91Z90S2LS 2P 90 W 100 V (with fan)
M91Z90S2YS 2P 90 W 200 V (with fan)

Mass 2.7 kg



Capacitor (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M91Z90S2LS	M0PC25M20	50.2	31	41	42	5	M0PC5032
M91Z90S2YS	M0PC6.2M38	50	30.5	41	41.5	4	M0PC5032

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Features B-342 | System configuration B-342 | Coding system B-342 | Model list B-343

2-pole round shaft motor (Induction motor)

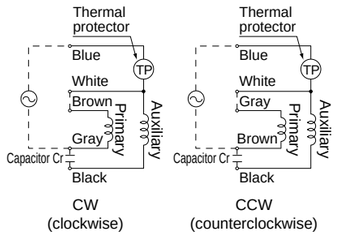
cULus CE **90 mm sq. 90 W**

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min^{-1})	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M91Z90S2LG M91Z90S2LGA	2	90	100	50	Cont.	151	1.5	2675	0.32 (3.3)	3.8	0.33 (3.4)	28 (250V)
					60		160	1.8	3250	0.26 (2.7)	3.6	0.33 (3.4)	
	M91Z90S2DG M91Z90S2DGA	2	90	110	60	Cont.	158	1.5	3300	0.26 (2.7)	3.9	0.33 (3.4)	25 (250V)
				115	60		165	1.5	3325	0.26 (2.6)	4.0	0.33 (3.4)	
	M91Z90S2YG M91Z90S2YGA	2	90	200	50	Cont.	150	0.76	2600	0.33 (3.4)	1.6	0.33 (3.4)	7 (450V)
					60		176	0.98	3175	0.27 (2.8)	1.6	0.33 (3.4)	
	M91Z90S2GG M91Z90S2GGA	2	90	220	50	Cont.	152	0.69	2650	0.32 (3.3)	1.7	0.33 (3.4)	6 (450V)
					60		165	0.81	3225	0.27 (2.7)	1.6	0.33 (3.4)	
				230	50		162	0.72	2700	0.32 (3.2)	1.7	0.33 (3.4)	
					60		168	0.79	3275	0.26 (2.7)	1.7	0.33 (3.4)	

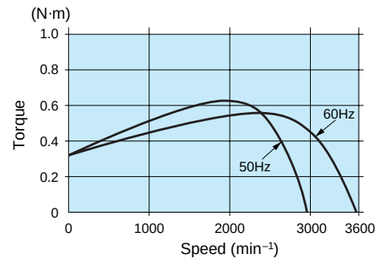
• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

Connection diagram



Speed-torque characteristics

M91Z90S2LG(A)

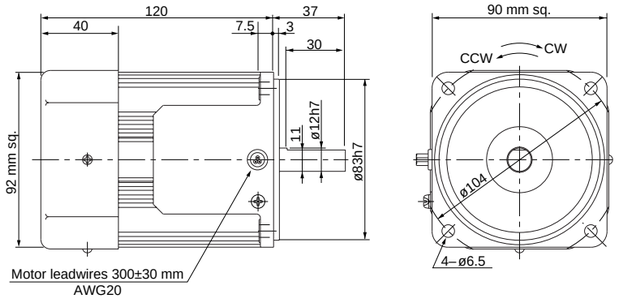


Motor (dimensions)

Scale: 1/3, Unit: mm

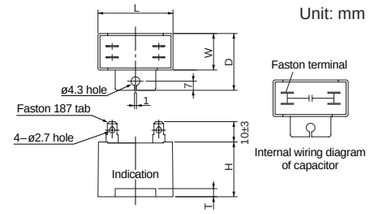
M91Z90S2LG(A) 2P 90 W 100 V (with fan)
M91Z90S2DG(A) 2P 90 W 110 V / 115 V (with fan)
M91Z90S2YG(A) 2P 90 W 200 V (with fan)
M91Z90S2GG(A) 2P 90 W 220 V / 230 V (with fan)

Mass 2.7 kg



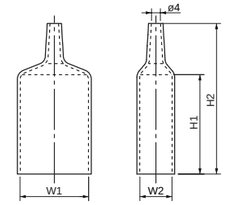
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M91Z90S2LG(A)	M0PC28M25G	58	35	50	50	4	M0PC5835G	58	35	55	78
M91Z90S2DG(A)	M0PC25M25G	58	35	50	50	4	M0PC5835G	58	35	55	78
M91Z90S2YG(A)	M0PC7M45G	58	35	50	50	4	M0PC5835G	58	35	55	78
M91Z90S2GG(A)	M0PC6M45G	58	29	44	41	4	M0PC5829G	58	29	55	78

• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

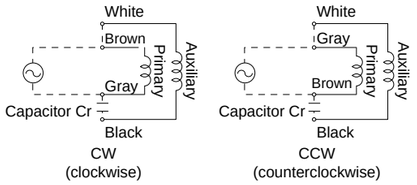
Option D-2

2-pole round shaft motor (Induction motor) — 90 mm sq. 150 W

• Specifications

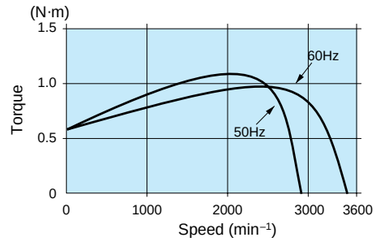
Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M91ZA5S2LS	2	150	100	50	Cont.	240	2.5	2700	0.53 (5.4)	6.1	0.58 (5.9)	40 (180V)
					60		251	2.7	3275	0.44 (4.5)	5.9	0.58 (5.9)	
	M91ZA5S2YS	2	150	200	50	Cont.	235	1.2	2725	0.53 (5.4)	3.2	0.53 (5.4)	10 (400V)
					60		240	1.3	3300	0.43 (4.4)	3.0	0.53 (5.4)	

Connection diagram



Speed-torque characteristics

M91ZA5S2LS

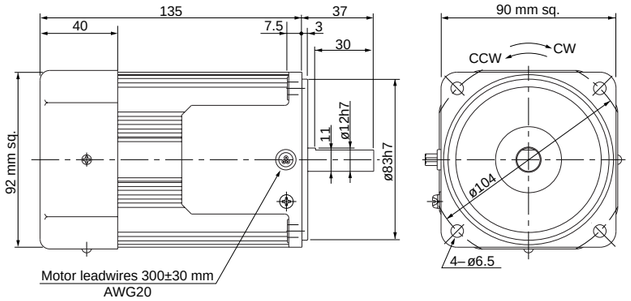


Motor (dimensions)

Scale: 1/3, Unit: mm

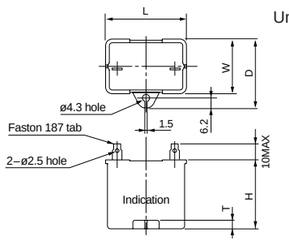
M91ZA5S2LS 2P 150 W 100 V (with fan)
M91ZA5S2YS 2P 150 W 200 V (with fan)

Mass 3.2 kg



Capacitor (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (option)
M91ZA5S2LS	M0PC40M18	50.2	35	45.5	47	5	—
M91ZA5S2YS	M0PC10M40	50	34	45	45	6	—

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Features B-342 | System configuration B-342 | Coding system B-342 | Model list B-343

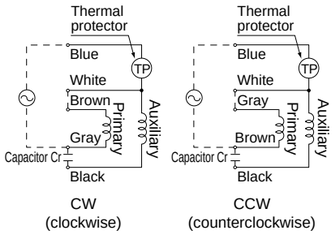
2-pole round shaft motor (Induction motor) — cULus CE 90 mm sq. 150 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min⁻¹)	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)	Capacitor (μF) (rated voltage)
90 mm sq.	M91ZA5S2LG M91ZA5S2LGA	2	150	100	50	Cont.	232	2.3	2625	0.55 (5.6)	5.4	0.50 (5.1)	40 (250V)
					60		250	2.7	3200	0.45 (4.6)	5.2	0.50 (5.1)	
	M91ZA5S2DG M91ZA5S2DGA	2	150	110 115	60 60	Cont.	238 253	2.3 2.2	3275 3300	0.44 (4.5) 0.43 (4.4)	5.6 5.8	0.53 (5.4) 0.53 (5.4)	35 (250V)
	M91ZA5S2YG M91ZA5S2YGA	2	150	200	50	Cont.	236	1.3	2525	0.57 (5.8)	2.3	0.50 (5.1)	10 (450V)
					60		271	1.5	3075	0.47 (4.7)	2.2	0.50 (5.1)	
	M91ZA5S2GG M91ZA5S2GGA	2	150	220	50	Cont.	230	1.1	2625	0.55 (5.6)	2.4	0.47 (4.8)	8 (450V)
					60		243	1.2	3200	0.45 (4.6)	2.3	0.47 (4.8)	
				230	50		237	1.1	2650	0.54 (5.5)	2.5	0.53 (5.4)	
					60		245	1.2	3250	0.44 (4.5)	2.4	0.53 (5.4)	

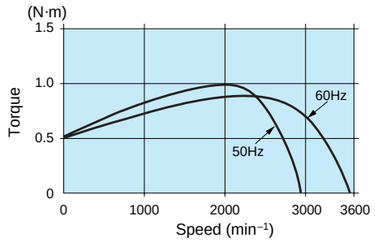
• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

Connection diagram



Speed-torque characteristics

M91ZA5S2LG(A)

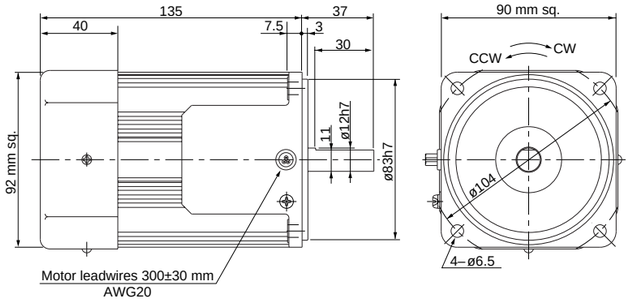


Motor (dimensions)

Scale: 1/3, Unit: mm

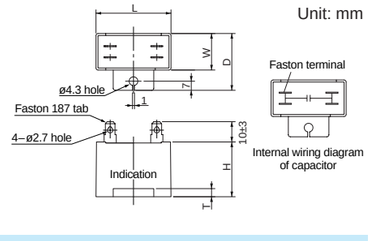
M91ZA5S2LG(A) 2P 150 W 100 V (with fan)
M91ZA5S2DG(A) 2P 150 W 110 V / 115 V (with fan)
M91ZA5S2YG(A) 2P 150 W 200 V (with fan)
M91ZA5S2GG(A) 2P 150 W 220 V / 230 V (with fan)

Mass 3.2 kg



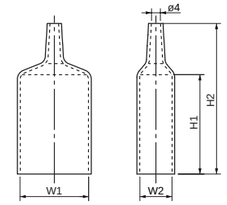
Capacitor (dimensions) [attachment]

Unit: mm



Capacitor cap (dimensions) [attachment]

Unit: mm



• Capacitor dimension list (mm)

Model number of motor	Model number of capacitor (attachment)	L	W	D	H	T	Capacitor cap (attachment)	W1	W2	H1	H2
M91ZA5S2LG(A)	M0PC40M25G	58	41	56	58	4	M0PC5841G	58	41	55	78
M91ZA5S2DG(A)	M0PC35M25G	58	41	56	58	4	M0PC5841G	58	41	55	78
M91ZA5S2YG(A)	M0PC10M45G	58	35	50	50	4	M0PC5835G	58	35	55	78
M91ZA5S2GG(A)	M0PC8M45G	58	35	50	50	4	M0PC5835G	58	35	55	78

• The models with a motor model number to which "A" is suffixed are not equipped with a capacitor cap.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

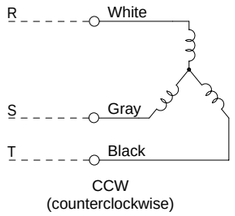
Option D-2

2-pole round shaft motor (3-phase motor) 80 mm sq. 40 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating: Input (W)	Rating: Current (A)	Rating: Speed (min^{-1})	Rating: Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)
80 mm sq.	M8MX40S2YS	2	40	200	50	Cont.	68	0.24	2525	0.14 (1.5)	0.66	0.30 (3.1)
					60		67	0.22	3050	0.12 (1.2)	0.64	0.24 (2.5)
				220	50		69	0.24	2650	0.13 (1.4)	0.72	0.37 (3.8)
					60		65	0.22	3175	0.12 (1.2)	0.70	0.29 (3.0)

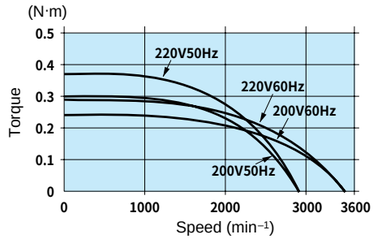
Connection diagram



Change any two lead wires of R, S and T for CW rotation.

Speed-torque characteristics

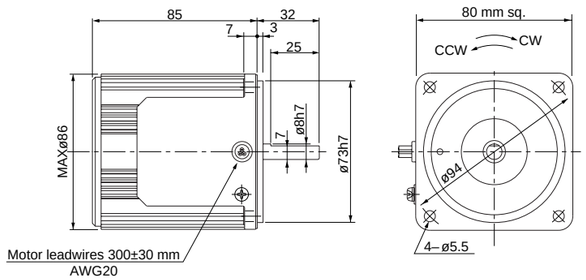
M8MX40S2YS



Motor (dimensions) Scale: 1/3, Unit: mm

M8MX40S2YS 2P 40 W 200 V / 220 V

Mass 1.5 kg



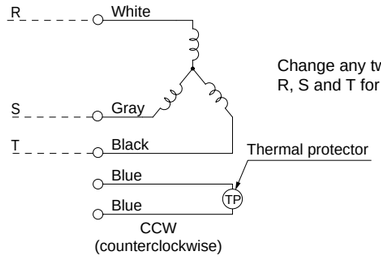
2-pole round shaft motor (3-phase motor) cULus CE 80 mm sq. 40 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating: Input (W)	Rating: Current (A)	Rating: Speed (min^{-1})	Rating: Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)
80 mm sq.	M8MX40S2YG M8MX40S2YGA	2	40	200	50	Cont.	72	0.24	2525	0.14 (1.5)	0.66	0.30 (3.1)
				200	60		67	0.22	3050	0.12 (1.2)	0.64	0.24 (2.4)
				220	60		68	0.22	3175	0.12 (1.2)	0.70	0.29 (3.0)
				230	60		68	0.22	3200	0.12 (1.2)	0.70	0.31 (3.2)

• The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

Connection diagram

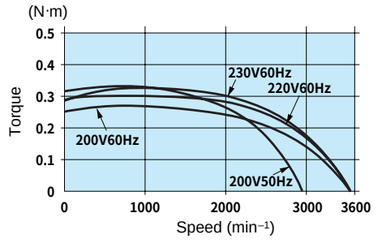


Change any two lead wires of R, S and T for CW rotation.

(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

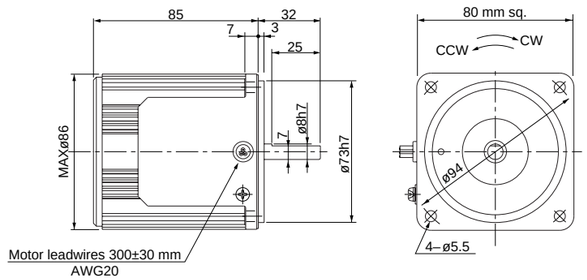
M8MX40S2YG(A)



Motor (dimensions) Scale: 1/3, Unit: mm

M8MX40S2YG(A) 2P 40 W 200 V / 220 V / 230 V

Mass 1.5 kg



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

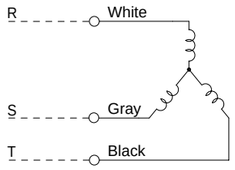
(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

2-pole round shaft motor (3-phase motor) — 80 mm sq. 60 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating: Input (W)	Rating: Current (A)	Rating: Speed (min^{-1})	Rating: Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)
80 mm sq.	M8MX60S2YS	2	60	200	50	Cont.	115	0.38	2325	0.24 (2.4)	0.85	0.38 (3.9)
					60		118	0.37	2750	0.20 (2.1)	0.81	0.30 (3.1)
				220	50		113	0.38	2525	0.22 (2.3)	0.92	0.44 (4.5)
					60		105	0.33	3025	0.18 (1.9)	0.88	0.36 (3.7)

Connection diagram

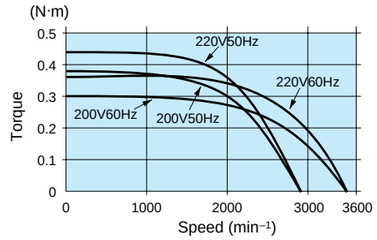


CCW
(counterclockwise)

Change any two lead wires of R, S and T for CW rotation.

Speed-torque characteristics

M8MX60S2YS

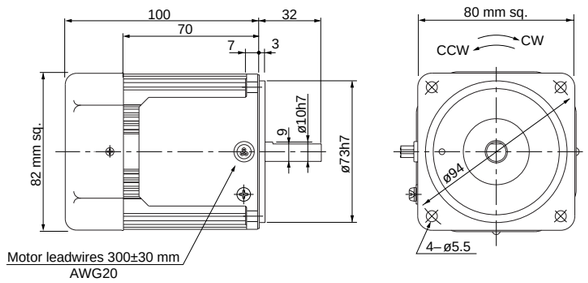


Motor (dimensions)

Scale: 1/3, Unit: mm

M8MX60S2YS 2P 60 W 200 V / 220 V (with fan)

Mass **1.8 kg**



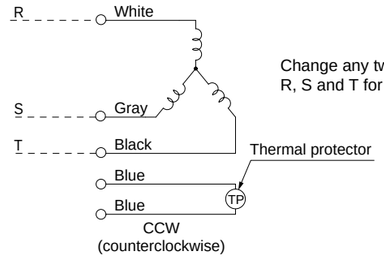
2-pole round shaft motor (3-phase motor) — 80 mm sq. 60 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating: Input (W)	Rating: Current (A)	Rating: Speed (min^{-1})	Rating: Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)
80 mm sq.	M8MX60S2YG M8MX60S2YGA	2	60	200	50	Cont.	115	0.38	2325	0.24 (2.4)	0.85	0.38 (3.9)
				200	60		118	0.37	2750	0.20 (2.1)	0.81	0.30 (3.1)
				220	60		105	0.33	3025	0.18 (1.9)	0.88	0.36 (3.7)
				230	60		105	0.33	3050	0.18 (1.9)	0.88	0.39 (4.0)

• The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

Connection diagram



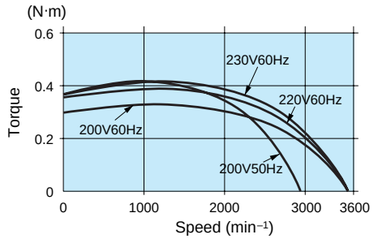
Change any two lead wires of R, S and T for CW rotation.

CCW
(counterclockwise)

(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

M8MX60S2YG(A)

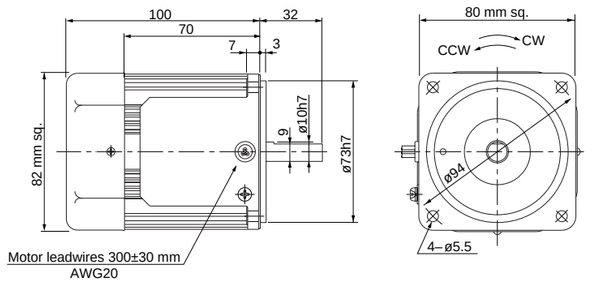


Motor (dimensions)

Scale: 1/3, Unit: mm

M8MX60S2YG(A) 2P 60 W 200 V / 220 V / 230 V (with fan)

Mass **1.8 kg**



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

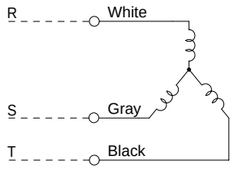
(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

2-pole round shaft motor (3-phase motor) 90 mm sq. 60 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min^{-1})	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)
90 mm sq.	M9MX60S2YS	2	60	200	50	Cont.	82	0.32	2825	0.20 (2.1)	1.9	0.96 (9.7)
					60		79	0.29	3400	0.16 (1.7)	1.7	0.69 (7.0)
				220	50		86	0.32	2875	0.20 (2.1)	2.1	1.1 (11)
					60		81	0.29	3450	0.16 (1.7)	1.9	0.84 (8.5)

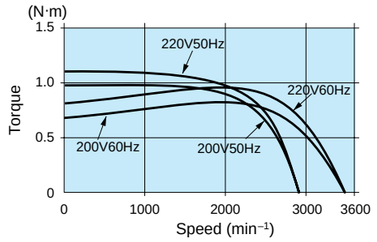
Connection diagram



Change any two lead wires of R, S and T for CW rotation.

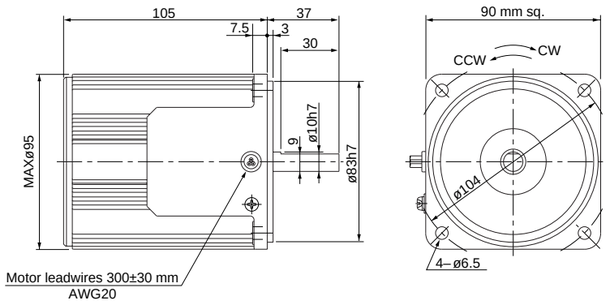
Speed-torque characteristics

M9MX60S2YS



Motor (dimensions) Scale: 1/3, Unit: mm

M9MX60S2YS 2P 60 W 200 V / 220 V (with fan) **Mass 2.4 kg**



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Features B-342 | System configuration B-342 | Coding system B-342 | Model list B-343

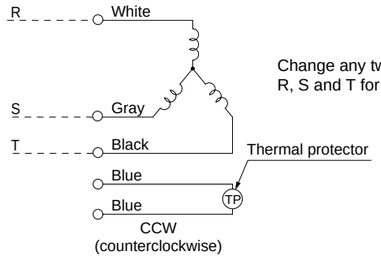
2-pole round shaft motor (3-phase motor) 90 mm sq. 60 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min^{-1})	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)
90 mm sq.	M9MX60S2YG M9MX60S2YGA	2	60	200	50	Cont.	87	0.32	2825	0.20 (2.1)	1.9	0.96 (9.7)
				200	60		87	0.31	3400	0.17 (1.7)	1.7	0.69 (7.0)
				220	60		87	0.30	3450	0.17 (1.7)	1.9	0.84 (8.5)
				230	60		87	0.30	3450	0.17 (1.7)	1.9	0.90 (9.2)

• The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

Connection diagram

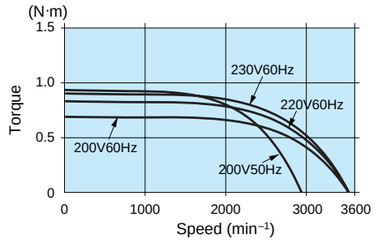


Change any two lead wires of R, S and T for CW rotation.

(Refer to page A-58 for connection of thermal protector.)

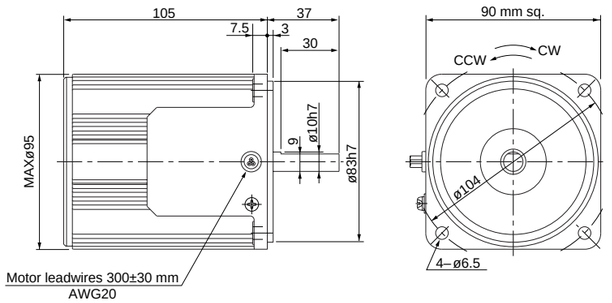
Speed-torque characteristics

M9MX60S2YG(A)



Motor (dimensions) Scale: 1/3, Unit: mm

M9MX60S2YG(A) 2P 60W 200 V / 220 V / 230 V (with fan) **Mass 2.4 kg**



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Option D-2

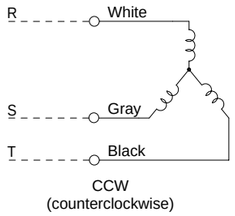
2-pole round shaft motor (3-phase motor)

90 mm sq. 90 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating				Starting current (A)	Starting torque N·m (kgf·cm)
							Input (W)	Current (A)	Speed (min^{-1})	Torque N·m (kgf·cm)		
90 mm sq.	M9MZ90S2YS	2	90	200	50	Cont.	144	0.71	2700	0.31 (3.2)	2.3	1.6 (16)
					60		134	0.53	3225	0.26 (2.7)	2.1	1.2 (12)
				220	50		167	0.96	2750	0.31 (3.2)	2.5	1.9 (19)
					60		137	0.59	3300	0.25 (2.6)	2.3	1.4 (15)

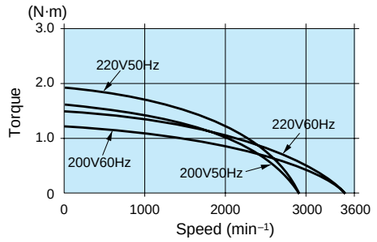
Connection diagram



Change any two lead wires of R, S and T for CW rotation.

Speed-torque characteristics

M9MZ90S2YS

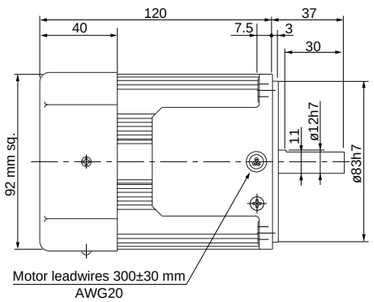


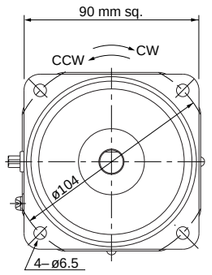
Motor (dimensions)

Scale: 1/3, Unit: mm

M9MZ90S2YS 2P 90 W 200 V / 220 V (with fan)

Mass **2.7** kg





2-pole round shaft motor (3-phase motor)

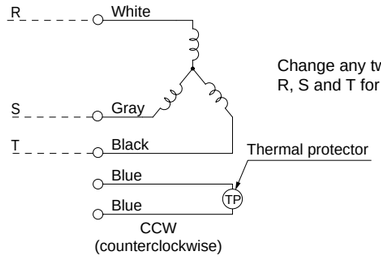
90 mm sq. 90 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating				Starting current (A)	Starting torque N·m (kgf·cm)
							Input (W)	Current (A)	Speed (min^{-1})	Torque N·m (kgf·cm)		
90 mm sq.	M9MZ90S2YG M9MZ90S2YGA	2	90	200	50	Cont.	144	0.71	2700	0.32 (3.2)	2.3	1.6 (16)
				200	60		134	0.53	3225	0.27 (2.7)	2.1	1.2 (12)
				220	60		137	0.59	3300	0.26 (2.7)	2.3	1.4 (15)
				230	60		142	0.65	3325	0.26 (2.6)	2.4	1.5 (15)

• The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

Connection diagram

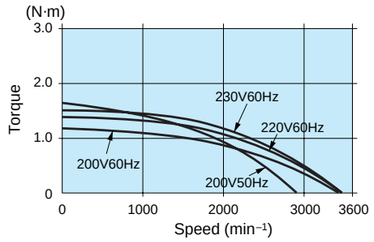


Change any two lead wires of R, S and T for CW rotation.

(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

M9MZ90S2YG(A)

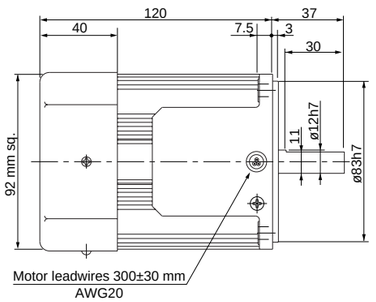


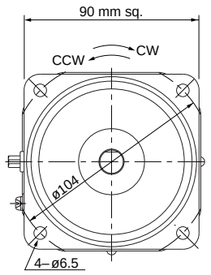
Motor (dimensions)

Scale: 1/3, Unit: mm

M9MZ90S2YG(A) 2P 90 W 200 V / 220 V / 230 V (with fan)

Mass **2.7** kg





* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

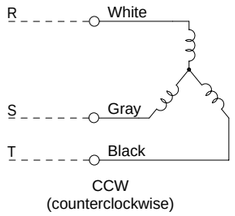
(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

2-pole round shaft motor (3-phase motor) 90 mm sq. 150 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min^{-1})	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)
90 mm sq.	M9MZA5S2YS	2	150	200	50	Cont.	235	1.1	2850	0.51 (5.2)	5.2	2.6 (26)
					60		227	0.81	3400	0.43 (4.4)	4.7	1.8 (19)
				220	50		274	1.5	2875	0.50 (5.1)	5.4	3.0 (31)
					60		233	0.87	3450	0.43 (4.4)	4.8	2.2 (23)

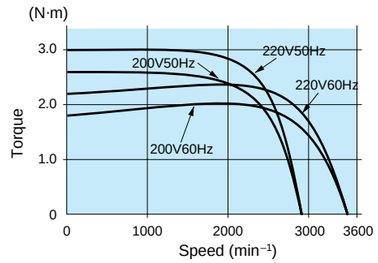
Connection diagram



Change any two lead wires of R, S and T for CW rotation.

Speed-torque characteristics

M9MZA5S2YS

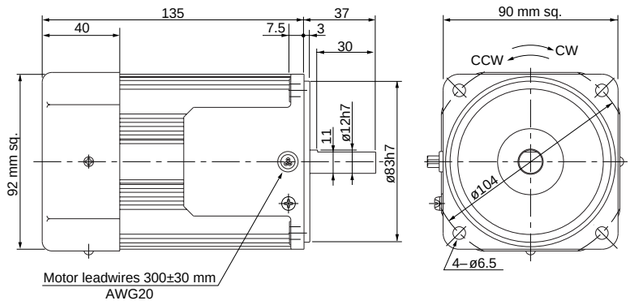


Motor (dimensions)

Scale: 1/3, Unit: mm

M9MZA5S2YS 2P 150 W 200 V / 220 V (with fan)

Mass **3.2 kg**



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Features B-342 | System configuration B-342 | Coding system B-342 | Model list B-343

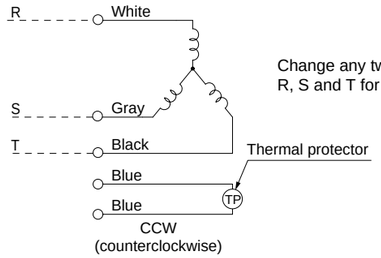
2-pole round shaft motor (3-phase motor) 90 mm sq. 150 W

• Specifications

Size	Motor model No.	Number of pole (P)	Output (W)	Voltage (V)	Frequency (Hz)	Rating (min)	Rating Input (W)	Rating Current (A)	Rating Speed (min^{-1})	Rating Torque N·m (kgf·cm)	Starting current (A)	Starting torque N·m (kgf·cm)
90 mm sq.	M9MZA5S2YG M9MZA5S2YGA	2	150	200	50	Cont.	236	1.3	2850	0.50 (5.1)	5.2	2.5 (25)
				200	60		207	0.84	3425	0.42 (4.3)	4.7	1.8 (18)
				220	60		218	0.99	3475	0.41 (4.2)	4.8	2.2 (22)
				230	60		229	1.2	3475	0.41 (4.2)	4.8	2.3 (23)

• The models with a motor model number to which "A" is suffixed are not sold or available in Japan.

Connection diagram

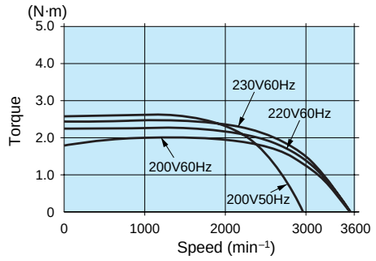


Change any two lead wires of R, S and T for CW rotation.

(Refer to page A-58 for connection of thermal protector.)

Speed-torque characteristics

M9MZA5S2YG(A)

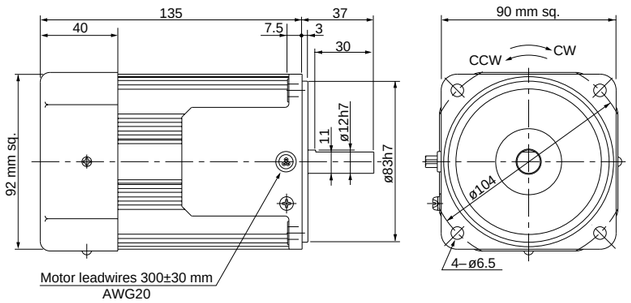


Motor (dimensions)

Scale: 1/3, Unit: mm

M9MZA5S2YG(A) 2P 150 W 200 V / 220 V / 230 V (with fan)

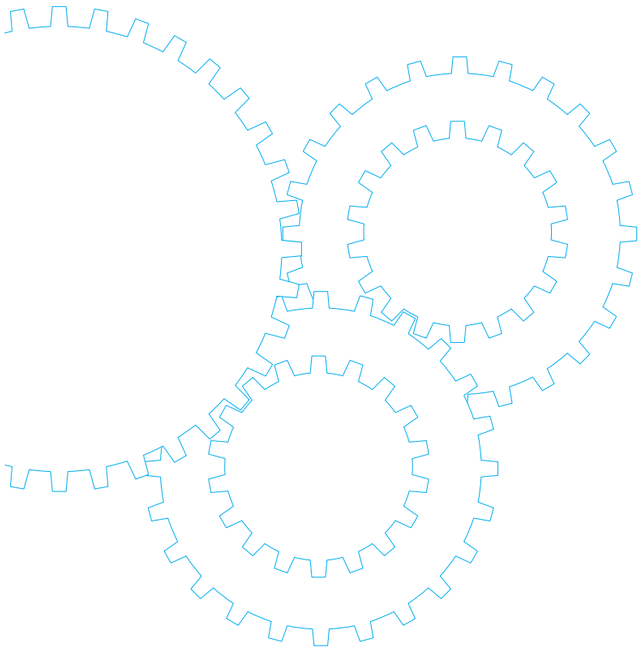
Mass **3.2 kg**



(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Option D-2

Gear Head



Contents

Outline of gear head

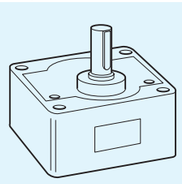
Features

- Various types of gear heads are available.
- The X type is available in a metal bearing model and or a ball bearing type.
- The P type (90 mm sq. only) is high torque type: its maximum permissible shaft torque is 29.4 N·m (300 kgf·cm)
- 22 reduction ratios from 1/3 to 1/180 are available for the X type; 23 reduction ratios from 1/3 to 1/200 are available for the Y and Z types.
  When the decimal gear head (reduction ratio: 1/10) is used, a reduction ratio of up to 1/1800 (1/2000 for the Y and Z types) can be attained.
- The X type and Z type of 90 mm sq. are available in right-angle type.

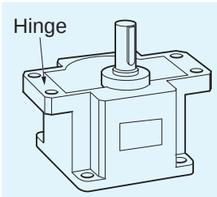
Gear type

A : 3 W or smaller / Hinge not attached (42 mm sq.)
X : 40 W or smaller / Hinge not attached
Z : 60 W or larger / Hinge not attached
Y : 60 W or larger / Hinge attached
R : 60 W or larger, High torque type / Hinge not attached
P : 60 W or larger, High torque type / Hinge attached

• Hinge not attached



• Hinge attached



• Gear type and reduction ratio list

Gear type		Motor capacity	Hinge	Reduction ratio																					
				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
A		3 W or smaller	Not attached	○	○	○	○	○	○	–	○	○	○	–	○	○	○	○	○	○	○	○	○	○	○	–
X		40 W or smaller	Not attached	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–
Y		60W, 90W	attached	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Z			Not attached	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
P			attached	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○
R			Not attached	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○
Right-angle	X	40 W or smaller	Not attached	○	○	○	○	○	○	–	○	○	○	–	○	○	○	○	○	○	○	○	○	○	○	–
	Z	60W, 90W	Not attached	○	○	○	○	○	○	–	○	○	○	–	○	○	○	○	○	○	○	○	○	○	○	○

• Gear type and reduction ratio list (decimal gear head used)

Gear type		Motor capacity	Hinge	Reduction ratio												
				1/200	1/250	1/300	1/360	1/500	1/600	1/750	1/900	1/1000	1/1200	1/1500	1/1800	1/2000
X		40 W or smaller	Not attached	○	○	○	○	○	○	○	○	○	○	○	○	–
Y, P		60W, 90W	attached	○	○	○	○	○	○	○	○	○	○	○	○	○
Z, R			Not attached	○	○	○	○	○	○	○	○	○	○	○	○	○
Right-angle	X	40 W or smaller	Not attached	–	○	○	○	○	○	○	○	○	○	○	○	–
	Z	60W, 90W	Not attached	–	○	○	○	○	○	○	○	○	○	○	○	○

Coding system

M X 9 G 30 B A

- **X** Output type
  - X : 40 W or smaller / Hinge not attached
  - Z : 60 W or larger / Hinge not attached
  - Y : 60 W or larger / Hinge attached
  - R : 60 W or larger, High torque type / Hinge not attached
  - P : 60 W or larger, High torque type / Hinge attached
- **9** Size
  - 6 : 60 mm sq.
  - 7 : 70 mm sq.
  - 8 : 80 mm sq.
  - 9 : 90 mm sq.
- **G** Gear head
- **30** Reduction ratio
  - (Example) 30: Reduction ratio of 1/30
- **B** Bearing
  - B : Ball bearing
  - M : Metal bearing
  - XB : Decimal gear head
  - R : Right-angle gear head
    (90 mm sq.: Applicable to MX and MZ only)
- **A** Thin gear head
  - A : Applicable to 60 mm sq. and 70 mm sq. gear heads with a reduction ratio of 1/25 or smaller, Blank for others

* The motor and gear are sold separately.

M 4 G A 30 F

- **4** Size
  - 4 : 42 mm sq.
- **G** Gear head
- **A** Type
  - For 42 mm sq.
- **30** Reduction ratio
  - (Example) 30 : Reduction ratio of 1/30
- **F** Bearing
  - F : Ball bearing + Metal bearing

* The motor and gear are sold separately.

Calculation of torque at output shaft of gear head

• Standard gear head only

$$N_G = \frac{N_M}{i}$$

$$T_G = T_M \times i \times \eta$$

N_G : Speed of gear head (**min**$^{-1}$)
N_M : Motor speed (**min**$^{-1}$)
i : Reduction ratio of gear head
T_G : Output torque of gear head (**N·m**)
T_M : Motor torque (**N·m**)
η : Gear head efficiency

• With decimal gear head

$$N_G = \frac{N_M}{i \times i_D}$$

$$T_G = T_M \times i \times i_D \times \eta \times \eta_D$$

N_G : Speed of gear head (**min**$^{-1}$)
N_M : Motor speed (**min**$^{-1}$)
i : Reduction ratio of gear head
T_G : Output torque of gear head (**N·m**)
T_M : Motor torque (**N·m**)
η : Gear head efficiency
i_D : Reduction ratio of decimal gear head
η_D : Decimal gear head efficiency

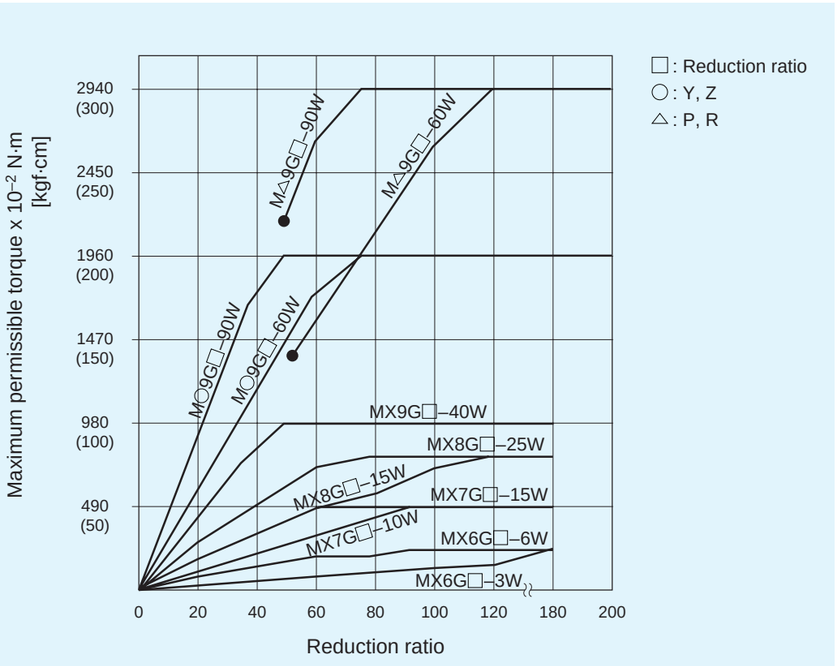
* In the case of the variable speed motor, regard the serviceability limit torque as the motor torque.

Outline of gear head

Maximum permissible torque

There is a limit to the strength of a gear due to its material and construction. The usable load torque determined based on this limit is called permissible torque. As can be seen from the above-mentioned formula, the load becomes larger when the reduction ratio is increased. If the gear head is used with the load exceeding the permissible torque, its life expectancy will be shortened significantly. Refer to the following graph and the permissible torque for each model and use the gear head at an appropriate load.

• Maximum permissible torque



Nominal reduction ratio and actual reduction ratio

Note that there is a difference between the nominal reduction ratio and actual reduction ratio of each gear head. Refer to the table below. When using the gear head, calculate the speed based on the actual reduction ratio.

• Gear head

Nominal reduction ratio	Actual reduction ratio								
	M4GA□	MX6G□	MX7G□	MX8G□	MX9G□	MZ9G□ MY9G□	MR9G□ MP9G□	Right-angle type MX9G□R	Right-angle type MZ9G□R
1/3	1/3	1/2.96	1/2.99	1/3.01	1/2.98	1/3.02	—	1/3.05	1/3.00
1/3.6	1/3.6	1/3.59	1/3.64	1/3.60	1/3.59	1/3.61	—	1/3.65	1/3.62
1/5	1/5	1/5.04	1/4.95	1/4.98	1/5.00	1/5.03	—	1/5.06	1/4.97
1/6	1/6	1/6.01	1/6.08	1/5.96	1/6.00	1/6.02	—	1/5.93	1/6.00
1/7.5	1/7.5	1/7.49	1/7.48	1/7.48	1/7.54	1/7.58	—	1/7.50	1/7.57
1/9	1/9	1/9.07	1/8.98	1/9.00	1/9.07	1/9.06	—	1/9.09	1/9.14
1/10	—	1/9.91	1/10.1	1/9.99	1/9.90	1/10.2	—	—	—
1/12.5	1/12.5	1/12.7	1/12.6	1/12.5	1/12.5	1/12.3	—	1/12.5	1/12.6
1/15	1/15	1/15.1	1/14.9	1/14.9	1/14.9	1/14.8	—	1/15.2	1/15.2
1/18	1/18	1/18.0	1/18.0	1/18.1	1/18.0	1/18.0	—	1/17.8	1/17.8
1/20	—	1/19.8	1/19.8	1/20.1	1/20.0	1/19.9	—	—	—
1/25	1/25	1/25.0	1/25.3	1/25.1	1/25.3	1/25.5	—	1/25.0	1/25.3
1/30	1/30	1/29.7	1/30.2	1/30.3	1/30.4	1/30.1	—	1/30.2	1/30.4
1/36	1/36	1/36.4	1/36.4	1/36.4	1/36.5	1/36.1	—	1/36.3	1/36.2
1/50	1/50	1/50.4	1/49.8	1/49.8	1/50.2	1/50.9	1/50.9	1/49.4	1/49.6
1/60	1/60	1/59.6	1/59.9	1/61.2	1/61.3	1/60.5	1/60.5	1/60.5	1/59.8
1/75	1/75	1/75.8	1/75.4	1/76.2	1/74.6	1/76.0	1/76.0	1/74.1	1/75.6
1/90	1/90	1/90.1	1/90.8	1/90.5	1/88.3	1/89.8	1/89.8	1/90.7	1/90.0
1/100	1/100	1/98.9	1/100.7	1/98.0	1/97.8	1/98.6	1/98.6	1/100.0	1/101.2
1/120	1/120	1/119.3	1/119.2	1/122.5	1/120.0	1/121.2	1/121.2	1/121.2	1/121.9
1/150	1/150	1/148.9	1/147.6	1/148.9	1/146.5	1/150.4	1/150.4	1/154.6	1/151.1
1/180	1/180	1/179.3	1/180.0	1/183.5	1/177.0	1/182.1	1/182.1	1/182.2	1/182.2
1/200	—	—	—	—	—	1/202.1	1/202.1	—	1/202.4

• Decimal gear head

Nominal reduction ratio	Actual reduction ratio				
	MX6G10XB	MX7G10XB	MX8G10XB	MX9G10XB	MZ9G10XB
1/10	1/10.04	1/9.93	1/9.94	1/10.0	1/9.97

Outline of gear head

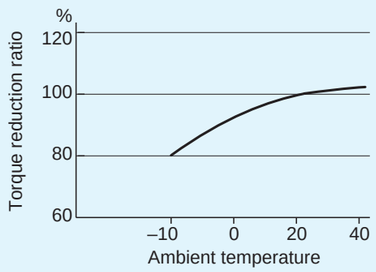
Gear head efficiency

Model No.	Reduction ratio																						Decimal gear head
	3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	50	60	75	90	100	120	150	180	200	10
M4GA□F			72%				—	61%			—		52%					41%						—
MX6G□B MX7G□B MX8G□B MX9G□B						81%												75%					—	81%
MZ9G□B MY9G□B			81%					75%							70%									81%
MR9G□B MP9G□B							—												70%					81%
MX6G□M MX7G□M MX8G□M MX9G□M						72%												61%					—	81%
MX9G□R			60%				—	60%			—		60%						45%				—	81%
MZ9G□R			60%				—	60%			—		60%					54%		45%				81%

* When the decimal gear head is used, the total efficiency is the product of gear head efficiency and decimal gear head efficiency.

Gear head efficiency and ambient temperature

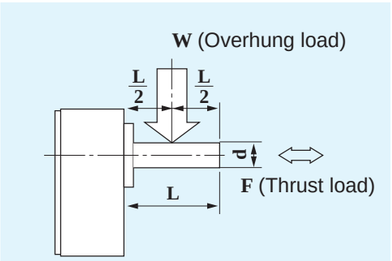
Calculate the actual gear head efficiency by multiplying the above-shown gear head efficiency at room temperature by the torque reduction ratio shown below.



Overhung load and thrust load

The overhung load is defined as a load applied to the output shaft in the right-angle direction. This load is generated when the gear head is coupled to the machine using a chain, belt, etc., but not when the gear head is directly connected to the coupling. As shown in the figure below, the permissible value is determined based on the load applied to the L/2 position of the output shaft.
The thrust load is defined as a load applied to the output shaft in the axial direction.
Because the overhung load and thrust load significantly affect the life of the bearing, take care not to allow the load during operation to exceed the permissible overhung load and thrust load shown in the table below.

• Overhung load and thrust load



• Permissible load list

Size	Model	Permissible overhung load N (kgf)	Permissible thrust load N (kgf)
42 mm sq.	M4GA□F	20 (2)	15 (2)
60 mm sq.	MX6G□B(A)	98 (10)	29 (3)
	MX6G□M(A)	49 (5)	
70 mm sq.	MX7G□B(A)	196 (20)	39 (4)
	MX7G□M(A)	98 (10)	
80 mm sq.	MX8G□B	294 (30)	49 (5)
	MX8G□M	200 (20)	
90 mm sq.	MX9G□B	392 (40)	98 (10)
	MX9G□M	294 (30)	
	MZ9G□B	588 (60)	147 (15)
	MY9G□B		
90 mm sq. High torque type	MR9G□B	748 (80)	147 (15)
	MP9G□B		
90 mm sq. Right-angle type	MX9G□R	392 (40)	98 (10)
	MZ9G□R	588 (60)	147 (15)

Service factor

Life expectancy of motor varies depending on load fluctuation. To determine the life expectancy, a factor called service factor, as shown in the table below is used.First choose the appropriate service factor according to the type of load and multiply the result by the required power to determine the design power.

• Service factor

Type of load	Typical load	Service factor		
		5 hours/day	8 hours/day	24 hours/day
Constant	Belt conveyor, One-directional rotation	0.8	1.0	1.5
Light-impact	Start/Stop, Cam-drive	1.2	1.5	2.0
Medium-impact	Instant FWD/REV, Instant stop	1.5	2.0	2.5
Heavy-impact	Frequent medium-impact	2.5	3.0	3.5

The required allowable shaft torque T_A of the gear head can be determined based on the service factor and actual load torque T_1:

$T_A = T_1 \times S_f$

T_A : Allowable torque of gear head (N·m)
T_1 : Actual load torque (N·m)
S_f : Service factor

Use the motor so that the allowable torque T_A calculated from the formula above falls within the allowable torque range.
* Though it seems that the motor can be operated even in overload when the service factor is 0.8, note that the service factor is defined for the allowable torque of the gear head. If the motor is operated in overload, the life of insulator may be shortened or the motor may be burned out due to an abnormal temperature rise.

Outline of gear head

Standard life expectancy

Standard life expectancy: Standard life expectancy when operated for 8 hours/day at the standard load (Service factor=1.0)
***** The oil seal is excluded because it is a consumable.

• Calculation of life expectancy
Calculate the life expectancy while referring to the service factor table shown below.
When the service factor is 2.0, for example, the life expectancy is calculated as follows:
Life expectancy = 10,000 (h) / 2.0 = 5,000 (h)

• Standard life expectancy

	Life (hours)
Ball bearing Decimal gear head	10,000 hours*
Metal bearing	2,000 hours
Right-angle	5,000 hours
42 mm sq.	2,000 hours

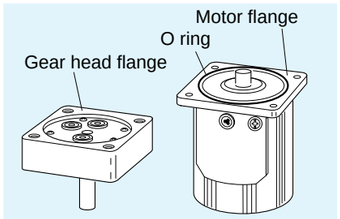
* 5,000 hours when used on reversible motor

Preparation

(1) Prepare a gear head that matches a motor described in this manual.
Use of incompatible gear head will cause malfunction.

(2) Check O-ring being correctly placed in a right place. If it is not, this may result in grease in the gear head coming out.

(3) Wipe off any grease on the gear head flange surface.



Assembling

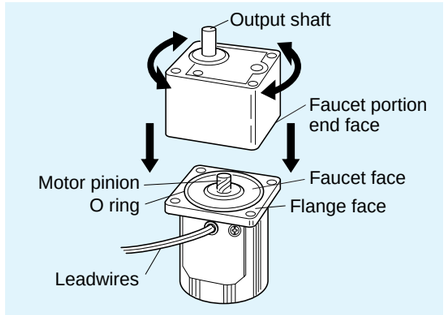
(1) Place the unit so that the motor shaft faces up.
Direction of the motor lead and output shaft of gear head must match an application.

(2) Do not contact a tooth tip of pinion shaft to a tooth tip of gear head.
Set each toothes of motor and gear head correctly and gently press and turn the gear head in counter and counter-clockwise.

(3) To attach the gear head to an application, use the " attaching screws" supplied with the gear head and tighten the screws with appropriate torque and with care not to pinch the O ring, so that the there is no gap between motor flange and gear flange.

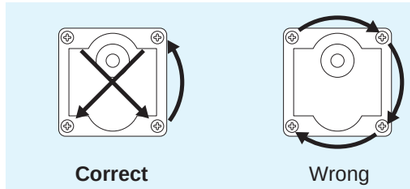
(4) The recommended torque is shown below.

Size	Screw size	Tightening torque
42 mm sq.	M3	6 to 1 N·m
60 mm sq.	M4	2 to 2.5 N·m
70 mm sq.	M5	2.5 to 3 N·m
80 mm sq.	M5	2.5 to 3 N·m
90 mm sq.	M6	3.5 to 4.5 N·m



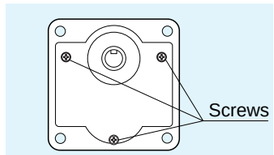
Assemble the motor shaft facing up.

(5) Tighten the screws correctly.



<Note>
Do not forcedly assemble the motor and gear head. Do not damage the tooth of the motor pinion and gear head. Incorrect assembly results in abnormal noise generation or shortened unit life.

DON'T	**Don't touch screws on the output shaft of gear head.**	Will cause malfunction.



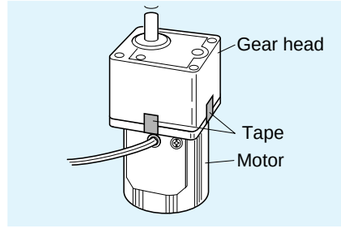
Considerations for installation of gear head

You may experience a sliping gear contact due to broken pinion tooth, locked gear or leaked grease as the gear head life comes closer.
Place a safety device to keep safe operation at any time even if such problems take place.

- Place a drop-proof device in an verticlly motioned application like a lifter.
- Place a device to open the door in a door application just in case the gear head is locked.
- Place an oil pan to prevent oil from coming out in an application like food/textile etc.
- Do not place an encoder, sensor, contact, etc near a gear head where the grease may leaking out. If not, please have a protection from grease.
- Have a routain check of the gear head to avoid unexpected accident.

<Precautions>
Keep the gear head attached to the motor. Otherwise, the O ring may become distorted or damaged, causing grease leakage.

- When reassembling, first replace the O ring with a new one.
- When installing a motor associated with the gear head to the application device, temporarily secure the motor and gear head with a tape until assembly completes.



Considerations for storage of gear head

When storing the gear head as a single unit, place it with the output shaft facing down.
(To prevent grease leakage)

Model list of gear head

Gear head (Cannot be used for C&B motor)

• Ball bearing

Size		Reduction ratio	Model No.	Hinge
60 mm sq.		1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/10, 1/12.5, 1/15, 1/18	MX6G3BA – MX6G18BA	
		1/20, 1/25, 1/30, 1/36	MX6G20BA – MX6G36B	
		1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX6G50B – MX6G180B	
70 mm sq.		1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/10, 1/12.5, 1/15, 1/18	MX7G3BA – MX7G18BA	
		1/20, 1/25, 1/30, 1/36	MX7G20BA – MX7G36B	
		1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX7G50B – MX7G180B	
80 mm sq.		1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/10, 1/12.5, 1/15, 1/18	MX8G3B – MX8G18B	
		1/20, 1/25, 1/30, 1/36	MX8G20B – MX8G36B	
		1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX8G50B – MX8G180B	
90 mm sq.	40W	1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/10, 1/12.5, 1/15, 1/18	MX9G3B – MX9G18B	
		1/20, 1/25, 1/30, 1/36	MX9G20B – MX9G36B	
		1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX9G50B – MX9G180B	
	Common to 60 W, 90 W	1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9	MZ9G3B – MZ9G9B	
		1/10, 1/12.5, 1/15, 1/18	MZ9G10B – MZ9G18B	
		1/20, 1/25, 1/30, 1/36, 1/50, 1/60	MZ9G20B – MZ9G60B	
		1/75, 1/90, 1/100, 1/120, 1/150, 1/180, 1/200	MZ9G75B – MZ9G200B	
		1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9	MY9G3B – MY9G9B	○
		1/10, 1/12.5, 1/15, 1/18	MY9G10B – MY9G18B	○
		1/20, 1/25, 1/30, 1/36, 1/50, 1/60	MY9G20B – MY9G60B	○
		1/75, 1/90, 1/100, 1/120, 1/150, 1/180, 1/200	MY9G75B – MY9G200B	○

* For the specifications for each item, refer to the page of the motor to which it can be applied.

• Metal bearing

Size		Reduction ratio	Model No.	Hinge
60 mm sq.		1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/10, 1/12.5, 1/15, 1/18	MX6G3MA – MX6G18MA	
		1/20, 1/25, 1/30, 1/36	MX6G20MA – MX6G36M	
		1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX6G50M – MX6G180M	
70 mm sq.		1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/10, 1/12.5, 1/15, 1/18	MX7G3MA – MX7G18MA	
		1/20, 1/25, 1/30, 1/36	MX7G20MA – MX7G36M	
		1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX7G50M – MX7G180M	
80 mm sq.		1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/10, 1/12.5, 1/15, 1/18	MX8G3M – MX8G18M	
		1/20, 1/25, 1/30, 1/36	MX8G20M – MX8G36M	
		1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX8G50M – MX8G180M	
90 mm sq.	40W	1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/10, 1/12.5, 1/15, 1/18	MX9G3M – MX9G18M	
		1/20, 1/25, 1/30, 1/36	MX9G20M – MX9G36M	
		1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX9G50M – MX9G180M	

* For the specifications for each item, refer to the page of the motor to which it can be applied.

• Ball bearing and metal bearing

Size	Reduction ratio	Model No.	Hinge
42mm sq.	1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/12.5, 1/15, 1/18	M4GA3F – M4GA18F	
	1/25, 1/30, 1/36, 1/50, 1/60	M4GA25F – M4GA60F	
	1/75, 1/90, 1/100, 1/120, 1/150, 1/180	M4GA75F – M4GA180F	

* For the specifications for each item, refer to the page of the motor to which it can be applied.

• High torque gear head

Size	Reduction ratio	Model No.	Hinge
90 mm sq.	1/50, 1/60	MR9G50B – MR9G60B	
	1/75, 1/90, 1/100, 1/120, 1/150, 1/180, 1/200	MR9G75B – MR9G200B	
	1/50, 1/60	MP9G50B – MP9G60B	○
	1/75, 1/90, 1/100, 1/120, 1/150, 1/180, 1/200	MP9G75B – MP9G200B	○

• Right-angle gear head

Size		Reduction ratio	Model No.	Hinge
90 mm sq.	40W	1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/12.5, 1/15, 1/18	MX9G3R – MX9G18R	
		1/25, 1/30, 1/36,	MX9G25R – MX9G36R	
		1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180	MX9G50R – MX9G180R	
	Common to 60 W, 90 W	1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/12.5, 1/15, 1/18, 1/25	MZ9G3R – MZ9G25R	
		1/30, 1/36, 1/50, 1/60,	MZ9G30R – MZ9G60R	
		1/75, 1/90, 1/100, 1/120, 1/150, 1/180, 1/200	MZ9G75R – MZ9G200R	

Model list of gear head

Gear head accessory

• Ball bearing / Metal bearing / Ball bearing and metal bearing

Size		Reduction ratio	Model No.	Accessory			
				Screw (mm)	Flat washer	Hexagon nut	Key
42 mm sq.		1/3 to 1/180	**M4GA3F – M4GA180F**	**M3** x **38** pan head screw: 2	For **M3**: 2	**M3**: 2	—
60 mm sq.		1/3 to 1/25	**MX6G3BA – MX6G25BA**	**M4** x **40** pan head screw: 4	For **M4**: 4	**M4**: 4	—
		1/30 to 1/180	**MX6G30B – MX6G180B**	**M4** x **50** pan head screw: 4	For **M4**: 4	**M4**: 4	—
70 mm sq.		1/3 to 1/25	**MX7G3BA – MX7G25BA**	**M5** x **50** pan head screw: 4	For **M5**: 4	**M5**: 4	**4** x **4** x **25** one-end round: 1
		1/30 to 1/180	**MX7G30B – MX7G180B**	**M5** x **55** pan head screw: 4	For **M5**: 4	**M5**: 4	**4** x **4** x **25** one-end round: 1
80 mm sq.		1/3 to 1/180	**MX8G3B – MX8G180B**	**M5** x **55** pan head screw: 4	For **M5**: 4	**M5**: 4	**4** x **4** x **25** one-end round: 1
90 mm sq.	40W	1/3 to 1/180	**MX9G3B – MX9G180B**	**M6** x **65** pan head screw: 4	For **M6**: 4	**M6**: 4	**4** x **4** x **25** one-end round: 1
	Common to 60 W, 90 W	1/3 to 1/200	**MZ9G3B – MZ9G200B**	**M6** x **85** hexagon socket head bolt: 4	For **M6**: 4	**M6**: 4	**5** x **5** x **25** one-end round: 1
		1/3 to 1/200	**MY9G3B – MY9G200B**	**M6** x **25** hexagon socket head bolt: 4	For **M6**: 4	**M6**: 4	**5** x **5** x **25** one-end round: 1

• High torque gear head

Size	Reduction ratio	Model No.	Accessory			
			Screw (mm)	Flat washer	Hexagon nut	Key
90 mm sq.	1/50 to 1/200	**MR9G50B – MR9G200B**	**M6** x **20** hexagon socket head bolt: 4	For **M6**: 4	—	**6** x **6** x **30** one-end round: 1
	1/50 to 1/200	**MP9G50B – MP9G200B**	**M6** x **25** hexagon socket head bolt: 4	For **M6**: 4	**M6**: 4	**6** x **6** x **30** one-end round: 1

• Right-angle gear head

Size		Reduction ratio	Model No.	Accessory			
				Screw (mm)	Flat washer	Hexagon nut	Key
90 mm sq.	40W	1/3 to 1/180	**MX9G3R – MX9G180R**	**M6** x **20** hexagon socket head bolt: 4	For **M6**: 4	—	**4** x **4** x **25** one-end round: 1
	Common to 60 W, 90 W	1/3 to 1/200	**MZ9G3R – MZ9G200R**	**M6** x **20** hexagon socket head bolt: 4	For **M6**: 4	—	**5** x **5** x **25** one-end round: 1

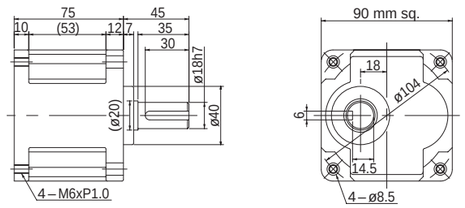
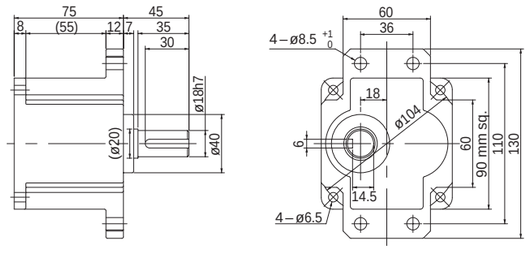
Decimal gear head (Cannot be used for C&B motor)

Size		Reduction ratio	Model No.	Applicable gear head	Page
60 mm sq.		1/10	**MX6G10XB**	**MX6G□BA** **MX6G□B**	**B-384**
70 mm sq.		1/10	**MX7G10XB**	**MX7G□BA** **MX7G□B**	**B-384**
80 mm sq.		1/10	**MX8G10XB**	**MX8G□B**	**B-384**
90 mm sq.	40W	1/10	**MX9G10XB**	**MX9G□B**	**B-384**
	Common to 60 W, 90 W	1/10	**MZ9G10XB**	**MZ9G□B** **MY9G□B** **MR9G□B** **MP9G□B**	**B-384**

• Decimal gear head fixing screw (option) (page D-2)

Size		Reduction ratio	Applicable gear head	Gear fixing screw Model No.
60 mm sq.		**MX6G10XB**	**MX6G□BA** **MX6G□B** **MX6G□MA** **MX6G□M**	**M0PM4001**
70 mm sq.		**MX7G10XB**	**MX7G□BA** **MX7G□B** **MX7G□MA** **MX7G□M**	**M0PM5001**
80 mm sq.		**MX8G10XB**	**MX8G□B** **MX8G□M**	**M0PM5002**
90 mm sq.	40W	**MX9G10XB**	**MX9G□B** **MX9G□M**	**M0PM6003**
	Common to 60 W, 90 W	**MZ9G10XB**	**MZ9G□B**	**M0PM6004**
			MY9G□B **MR9G□B** **MP9G□B**	**M0PM6002**

• Type of high torque gear head

Model No.	Dimensions (Scale: 1/4, Unit: mm)	Gear fixing screw
MR9G□B (Ball bearing, Hinge not attached)	 **Mass 1.7 kg**	**M6 x 20**
MP9G□B (Ball bearing, Hinge attached)	 **Mass 1.7 kg**	**M6 x 25**

Allowable shaft torque with high torque gear head directly connected

* The number of revolutions is calculated based on the synchronous rotating speed (1500 min^{-1}, 1800 min^{-1}). Usually, actual speed is slow by 2 to 20% the value shown in the table, depending on load condition.

• Hinge not attached 90 mm sq. / 60W Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		50	60	75	90	100	120	150	180	200
Speed (min^{-1})	50Hz	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	36	30	24	20	18	15	12	10	9
Applicable gear head: MR9G50B–MR9G200B (ball bearing, hinge not attached)	50Hz	15.2 (155)	18.2 (186)	22.1 (225)	26.5 (270)	29.4 (300)				
	60Hz	12.7 (130)	15.2 (155)	18.6 (190)	22.1 (225)	24.6 (251)	29.4 (300)			
Rotational direction		Same as motor rotational direction								

• Hinge not attached 90 mm sq. / 90W Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		50	60	75	90	100	120	150	180	200
Speed (min^{-1})	50Hz	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	36	30	24	20	18	15	12	10	9
Applicable gear head: MR9G50B–MR9G200B (ball bearing, hinge not attached)	50Hz	21.2 (216)	25.5 (260)	29.4 (300)						
	60Hz	17.6 (180)	21.2 (216)	26.7 (272)	29.4 (300)					
Rotational direction		Same as motor rotational direction								

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head: Bearing	Decimal gear head	Reduction ratio		500	600	750	900	1000	1200	1500	1800	2000
MR9G□B (ball bearing, hinge not attached)	MZ9G10XB	Speed (min^{-1})	50Hz	3	2.5	2	1.7	1.5	1.3	1	0.83	0.75
			60Hz	3.6	3	2.4	2	1.8	1.5	1.2	1	0.9
		Permissible torque	N·m (kgf·cm)	29.4 (300)	29.4 (300)	29.4 (300)	29.4 (300)	29.4 (300)	29.4 (300)	29.4 (300)	29.4 (300)	29.4 (300)
		Rotational direction		Same as motor rotational direction								

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Allowable shaft torque with high torque gear head directly connected

* The number of revolutions is calculated based on the synchronous rotating speed (1500 min^{-1}, 1800 min^{-1}). Usually, actual speed is slow by 2 to 20% the value shown in the table, depending on load condition.

• With hinge Sq.90mm/60W Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Speed reduction ratio		50	60	75	90	100	120	150	180	200
Rotating speed (min^{-1})	50Hz	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	36	30	24	20	18	15	12	10	9
Applicable gear head: MP9G50B–MP9G200B (Ball bearing, with hinge)	50Hz	15.2 (155)	18.2 (186)	22.1 (225)	26.5 (270)	29.4 (300)				
	60Hz	12.7 (130)	15.2 (155)	18.6 (190)	22.1 (225)	24.6 (251)	29.4 (300)			
Rotation direction		Same as on the motor								

• With hinge Sq.90mm/90W Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

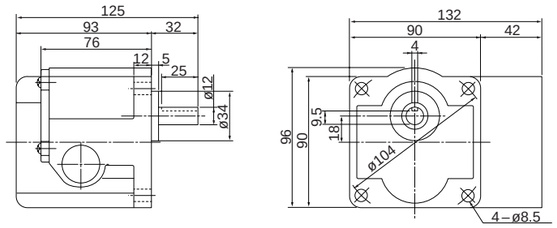
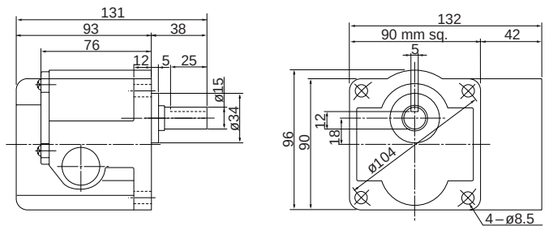
Speed reduction ratio		50	60	75	90	100	120	150	180	200
Rotating speed (min^{-1})	50Hz	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	36	30	24	20	18	15	12	10	9
Applicable gear head: MP9G50B–MP9G200B (Ball bearing, with hinge)	50Hz	21.2 (216)	25.5 (260)	29.4 (300)						
	60Hz	17.6 (180)	21.2 (216)	26.7 (272)	29.4 (300)					
Rotation direction		Same as on the motor								

• When intermediate gear head is used

Applicable gear head: Bearing	Intermediate gear head	Speed reduction ratio		500	600	750	900	1000	1200	1500	1800	2000
MP9G*B ((Ball bearing, with hinge)	MZ9G10XB	Rotating speed (min^{-1})	50Hz	3	2.5	2	1.7	1.5	1.3	1	0.83	0.75
			60Hz	3.6	3	2.4	2	1.8	1.5	1.2	1	0.9
		Allowable shaft torque	N·m (kgf·cm)	29.4 (300)	29.4 (300)	29.4 (300)	29.4 (300)	29.4 (300)	29.4 (300)	29.4 (300)	29.4 (300)	29.4 (300)
		Rotation direction		Same as on the motor								

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

• Type of right-angle gear head

Model No.	Dimensions (Scale: 1/4, Unit: mm)	Gear fixing screw
MX9G□R (Ball bearing)	 **Mass 2.5 kg**	**M6 x 20**
MZ9G□R (Ball bearing)	 **Mass 2.5 kg**	**M6 x 20**

*** Cannot be attached to the C&B motor.**

Allowable shaft torque with right-angle type gear head directly connected

* The number of revolutions is calculated based on the synchronous rotating speed (1500 min^{-1}, 1800 min^{-1}).
Usually, actual speed is slow by 2 to 20% the value shown in the table, depending on load condition.

• 90 mm sq. / 40W Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180
Speed (min^{-1})	50Hz	500	416.7	300	250	200	166.7	120	100	83.3	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3
	60Hz	600	500	360	300	240	200	144	120	100	72	60	50	36	30	24	20	18	15	12	10
Applicable gear head: MX9G3R – MX9G180R (ball bearing)	50Hz	0.60 (6.1)	0.72 (7.3)	0.98 (10)	1.18 (12)	1.47 (15)	1.76 (18)	2.45 (25)	2.94 (30)	3.53 (36)	5.00 (51)	6.00 (61)	7.18 (73)	9.80 (100)							
	60Hz	0.50 (5.1)	0.60 (6.1)	0.82 (8.4)	0.98 (10)	1.23 (13)	1.47 (15)	2.04 (21)	2.45 (25)	2.94 (30)	4.17 (43)	5.00 (51)	5.98 (61)	8.17 (83)	9.80 (100)						
Rotational direction		Same as motor rotational direction																			

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800
Bearing	Decimal gear head	Speed (min^{-1})	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.83
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1
MX9G25R – MX9G180R	MX9G10XB	Permissible torque	N·m (kgf·cm)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)	9.80 (100)
		Rotational direction		Same as motor rotational direction										

Allowable shaft torque with right-angle type gear head directly connected

* The number of revolutions is calculated based on the synchronous rotating speed (1500 min^{-1}, 1800 min^{-1}).
Usually, actual speed is slow by 2 to 20% the value shown in the table, depending on load condition.

• 90 mm sq. / 60W Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min^{-1})	50Hz	500	416.7	300	250	200	166.7	120	100	83.3	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	600	500	360	300	240	200	144	120	100	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head: MZ9G3R – MZ9G200R (ball bearing)	50Hz	0.90 (9.2)	1.15 (12)	1.50 (15)	1.92 (20)	2.20 (22)	2.81 (29)	3.70 (38)	4.40 (45)	5.62 (57)	7.40 (75)	8.80 (90)	11.2 (114)	14.8 (151)	18.9 (193)	19.6 (200)						
	60Hz	0.70 (7.1)	0.90 (9.2)	1.17 (12)	1.50 (15)	1.72 (18)	2.20 (22)	2.90 (30)	3.44 (35)	4.40 (45)	5.79 (59)	7.40 (75)	8.80 (90)	116 (118)	14.8 (151)	15.3 (156)	19.6 (200)					
Rotational direction		Same as motor rotational direction																				

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800	2000
Bearing	MX9G10XB	Speed (min^{-1})	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.83	0.75
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1	0.9
MZ9G25R – MZ9G200R	MZ9G10XB	Permissible torque	N·m (kgf·cm)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)
		Rotational direction		Same as motor rotational direction											

• 90 mm sq. / 90W Unit of permissible torque: upper **(N·m)** / lower **(kgf·cm)**

Reduction ratio		3	3.6	5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180	200
Speed (min^{-1})	50Hz	500	416.7	300	250	200	166.7	120	100	83.3	60	50	41.7	30	25	20	16.7	15	12.5	10	8.3	7.5
	60Hz	600	500	360	300	240	200	144	120	100	72	60	50	36	30	24	20	18	15	12	10	9
Applicable gear head: MZ9G3R – MZ9G200R (ball bearing)	50Hz	1.30 (13)	1.59 (16)	2.30 (24)	2.82 (29)	3.30 (34)	4.05 (41)	5.60 (57)	6.80 (69)	8.34 (85)	10.6 (108)	12.7 (130)	15.6 (159)	19.6 (200)								
	60Hz	1.06 (11)	1.30 (13)	1.88 (19)	2.30 (23)	2.69 (27)	3.30 (34)	4.56 (47)	5.54 (57)	6.80 (69)	8.15 (83)	10.6 (108)	12.7 (130)	16.0 (163)	19.6 (200)							
Rotational direction		Same as motor rotational direction																				

• Permissible torque at output shaft of gear head using decimal gear head

Applicable gear head		Reduction ratio		250	300	360	500	600	750	900	1000	1200	1500	1800	2000
Bearing	MX9G10XB	Speed (min^{-1})	50Hz	6	5	4.2	3	2.5	2	1.7	1.5	1.3	1	0.83	0.75
			60Hz	7.2	6	5	3.6	3	2.4	2	1.8	1.5	1.2	1	0.9
MZ9G25R – MZ9G200R	MZ9G10XB	Permissible torque	N·m (kgf·cm)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)
		Rotational direction		Same as motor rotational direction											

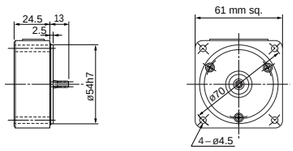
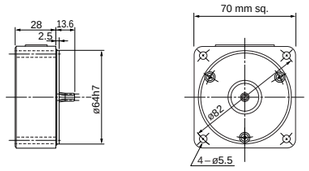
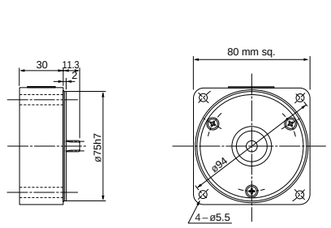
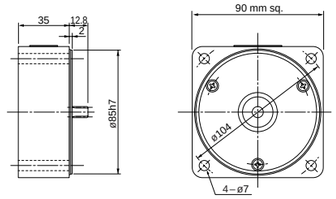
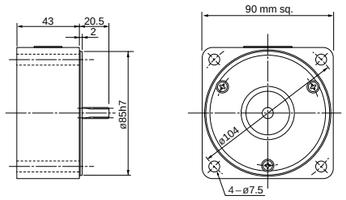
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

(Note) Because the dimensions may be subject to change, also check the determinate dimensions if the gear head is to be used for design.

Decimal gear head

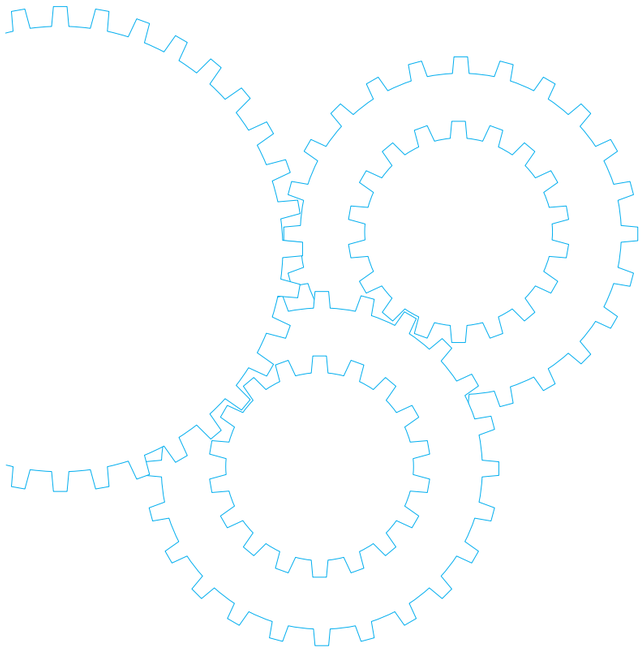
• Type of decimal gear head

* The decimal gear head fixing screw is sold separately. * Shown in □ is a gear ratio.

Model No.	Dimensions Scale: 1/4, Unit: mm	Applicable gear head	Gear fixing screw (option)
MX6G10XB	Mass **0.23** kg 	**MX6G□BA** **MX6G□B** **MX6G□MA** **MX6G□M**	**M0PM4001** • M4 x 85 • Cross recessed pan head screw
MX7G10XB	Mass **0.35** kg 	**MX7G□BA** **MX7G□B** **MX7G□MA** **MX7G□M**	**M0PM5001** • M5 x 95 • Cross recessed pan head screw
MX8G10XB	Mass **0.39** kg 	**MX8G□B** **MX8G□M**	**M0PM5002** • M5 x 85 • Cross recessed pan head screw
MX9G10XB	Mass **0.53** kg 	**MX9G□B** **MX9G□M**	**M0PM6003** • M6 x 100 • Cross recessed pan head screw
MZ9G10XB	Mass **0.65** kg 	**MZ9G□B**	**M0PM6004** • M6 x 125 • Hexagon socket head bol
		MY9G□B **MP9G□B** **MR9G□B**	**M0PM6002** • M6 x 65 • Hexagon socket head bol

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Speed Controller



Contents

Speed Controller Overview

Overview of Speed Controllers

- These controllers vary speed of compact geared motors.
- The lineup of the speed controllers is divided into the following 4 types to meet various applications and configuration.

1. Separate type speed controller	Speed controller of the basic configuration
2. 48 mm sq. speed controller	Separate speed controller housed in 48 mm sq. DIN size
3. Unit type speed controller	A set of a motor and speed controller: Both can be connected through a single-touch connector.
4. Inverter	Speed controller for 3-phase motor

Product designation

• Separate type speed controller

• MGSD type

MGSD B 2

- MGSD: Series
- B: Output

A	100 V	3 to 40 W
B	100 V	60 to 90 W
B	200 V	6 to 90 W

- 2: Input power
  - 1 : Single phase 100 to 120 VAC
  - 2 : Single phase 200 to 240 VAC

• EX type

DV 11 31

- DV: Speed controller
- 11: Voltage
  - 11 : 100 V
  - 12 : 200 V
- 31: Code

Code	Type	Compatible motor output	
		100 V	200 V
31	EX	3 to 10 W	6 to 20 W
32	EX	15 to 40 W	–
34	EX	60 to 90 W	25 to 90 W

• 48 mm sq. speed controller

DV SD 48 A L

- DV: Speed controller
- SD: Voltage
  - SD : Potentiometer
  - EX : High-performance
- 48: Code
  - 48 mm sq.
- A: Output
  - A : 3 to 20 W
  - B : 25 to 40 W
  - C : 60 to 90 W
- L: Voltage
  - L : 100 to 120 V
  - Y : 200 to 240 V

• Unit type speed controller

MUSN 8 25 G L

- MUSN
  - MUSN : US series
  - MUXN : UX series
- 8: Size
  - 6 : 60 mm sq.
  - 7 : 70 mm sq.
  - 8 : 80 mm sq.
  - 9 : 90 mm sq.
- 25: Output
  - 6 : 6 W
  - 15 : 15 W
  - 25 : 25 W
  - 40 : 40 W
  - 60 : 60 W
  - 90 : 90 W
- G: Shape of shaft
  - Toothed
- L: Toothed
  - L : 100 V
  - Y : 200 V

• Inverter

M1G 4A 1 V1X

- M1G: Series
- 4A: Motor output
  - Compatible motor output
  - 4A : 25 W, 40 W
  - 9A : 60 W, 90 W
- 1: Voltage
  - Power system
  - 1 : Single phase AC100 to 110 V 50/60 Hz
  - 2 : Single phase AC200 to 230 V 50/60 Hz
- V1X: Shape
  - With control

Speed controller

• Possible combination of speed controller and motor

	Size	Output (W)	Motor		Voltage (V)	Speed controller			
			Certified	Part No.		MGSD type	EX type	SD48 type	EX48 type
Variable speed induction motor	60 mm sq.	3	-----	M61X3GV4L	100	MGSDA1 ★	DV1131	DVSD48AL	DVEX48AL
		6	-----	M61X6GV4L	100	MGSDA1 ★	DV1131	DVSD48AL	DVEX48AL
			-----	M61X6GV4Y	200	MGSDB2 ★	DV1231	DVSD48AY	DVEX48AY
			✪	M61X6GV4LG(A)	100	MGSDA1 ★	-----	-----	-----
			✪	M61X6GV4DG(A)	110/115	MGSDA1 ★	-----	-----	-----
			✪	M61X6GV4YG(A)	200	MGSDB2 ★	-----	-----	-----
			✪	M61X6GV4GG(A)	220/230	MGSDB2 ★	-----	-----	-----
	70 mm sq.	10	-----	M71X10GV4L	100	MGSDA1 ★	DV1131	DVSD48AL	DVEX48AL
			-----	M71X10GV4Y	200	MGSDB2 ★	DV1231	DVSD48AY	DVEX48AY
		15	-----	M71X15GV4L	100	MGSDA1 ★	DV1132	DVSD48AL	DVEX48AL
			-----	M71X15GV4Y	200	MGSDB2 ★	DV1231	DVSD48AY	DVEX48AY
			✪	M71X15GV4LG(A)	100	MGSDA1 ★	-----	-----	-----
			✪	M71X15GV4DG(A)	110/115	MGSDA1 ★	-----	-----	-----
			✪	M71X15GV4YG(A)	200	MGSDB2 ★	-----	-----	-----
			✪	M71X15GV4GG(A)	220/230	MGSDB2 ★	-----	-----	-----
	80 mm sq.	15	-----	M81X15GV4L	100	MGSDA1 ★	DV1132	DVSD48AL	DVEX48AL
			-----	M81X15GV4Y	200	MGSDB2 ★	DV1231	DVSD48AY	DVEX48AY
		25	-----	M81X25GV4L	100	MGSDA1 ★	DV1132	DVSD48BL	DVEX48BL
			-----	M81X25GV4Y	200	MGSDB2 ★	DV1234	DVSD48BY	DVEX48BY
			✪	M81X25GV4LG(A)	100	MGSDA1 ★	-----	-----	-----
			✪	M81X25GV4DG(A)	110/115	MGSDA1 ★	-----	-----	-----
			✪	M81X25GV4YG(A)	200	MGSDB2 ★	-----	-----	-----
			✪	M81X25GV4GG(A)	220/230	MGSDB2 ★	-----	-----	-----
	90 mm sq.	40	-----	M91X40GV4L	100	MGSDA1 ★	DV1132	DVSD48BL	DVEX48BL
			-----	M91X40GV4Y	200	MGSDB2 ★	DV1234	DVSD48BY	DVEX48BY
			✪	M91X40GV4LG(A)	100	MGSDA1 ★	-----	-----	-----
			✪	M91X40GV4DG(A)	110/115	MGSDA1 ★	-----	-----	-----
			✪	M91X40GV4YG(A)	200	MGSDB2 ★	-----	-----	-----
			✪	M91X40GV4GG(A)	220/230	MGSDB2 ★	-----	-----	-----
		60	-----	M91Z60GV4L	100	MGSDB1 ★	DV1134	DVSD48CL	DVEX48CL
			-----	M91Z60GV4Y	200	MGSDB2 ★	DV1234	DVSD48CY	DVEX48CY
			✪	M91Z60GV4LG(A)	100	MGSDB1 ★	-----	-----	-----
			✪	M91Z60GV4DG(A)	110/115	MGSDB1 ★	-----	-----	-----
			✪	M91Z60GV4YG(A)	200	MGSDB2 ★	-----	-----	-----
			✪	M91Z60GV4GG(A)	220/230	MGSDB2 ★	-----	-----	-----
		90	-----	M91Z90GV4L	100	MGSDB1 ★	DV1134	DVSD48CL	DVEX48CL
			-----	M91Z90GV4Y	200	MGSDB2 ★	DV1234	DVSD48CY	DVEX48CY
			✪	M91Z90GV4LG(A)	100	MGSDB1 ★	-----	-----	-----
			✪	M91Z90GV4DG(A)	110/115	MGSDB1 ★	-----	-----	-----
			✪	M91Z90GV4YG(A)	200	MGSDB2 ★	-----	-----	-----
			✪	M91Z90GV4GG(A)	220/230	MGSDB2 ★	-----	-----	-----

* When using a speed controller operative under a wide range of supply voltage (MGSD, SD48, EX48), the mating motor should be selected according to the voltage of the power supply to be used.

✪ **Conforming to international standards :** c UL us CE CCC

★ **MGSD speed controllers are compliant with** c UL us **and** CE.

* The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

	Size	Output (W)	Motor		Voltage (V)	Speed controller			
			Certified	Part No.		MGSD type	EX type	SD48 type	EX48 type
Variable speed reversible motor	60 mm sq.	3	-----	M6RX4GV4L	100	MGSDA1 ★	DV1131	DVSD48AL	DVEX48AL
		6	-----	M6RX6GV4L	100	MGSDA1 ★	DV1131	DVSD48AL	DVEX48AL
			-----	M6RX6GV4Y	200	MGSDB2 ★	DV1231	DVSD48AY	DVEX48AY
			✪	M6RX6GV4LG(A)	100	MGSDA1 ★	-----	-----	-----
			✪	M6RX6GV4DG(A)	110/115	MGSDA1 ★	-----	-----	-----
			✪	M6RX6GV4YG(A)	200	MGSDB2 ★	-----	-----	-----
			✪	M6RX6GV4GG(A)	220/230	MGSDB2 ★	-----	-----	-----
	70 mm sq.	10	-----	M7RX10GV4L	100	MGSDA1 ★	DV1131	DVSD48AL	DVEX48AL
			-----	M7RX10GV4Y	200	MGSDB2 ★	DV1231	DVSD48AY	DVEX48AY
		15	-----	M7RX15GV4L	100	MGSDA1 ★	DV1132	DVSD48AL	DVEX48AL
			-----	M7RX15GV4Y	200	MGSDB2 ★	DV1231	DVSD48AY	DVEX48AY
			✪	M7RX15GV4LG(A)	100	MGSDA1 ★	-----	-----	-----
			✪	M7RX15GV4DG(A)	110/115	MGSDA1 ★	-----	-----	-----
			✪	M7RX15GV4YG(A)	200	MGSDB2 ★	-----	-----	-----
			✪	M7RX15GV4GG(A)	220/230	MGSDB2 ★	-----	-----	-----
	80 mm sq.	15	-----	M8RX20GV4L	100	MGSDA1 ★	DV1132	DVSD48AL	DVEX48AL
			-----	M8RX20GV4Y	200	MGSDB2 ★	DV1231	DVSD48AY	DVEX48AY
		25	-----	M8RX25GV4L	100	MGSDA1 ★	DV1132	DVSD48BL	DVEX48BL
			-----	M8RX25GV4Y	200	MGSDB2 ★	DV1234	DVSD48BY	DVEX48BY
			✪	M8RX25GV4LG(A)	100	MGSDA1 ★	-----	-----	-----
			✪	M8RX25GV4DG(A)	110/115	MGSDA1 ★	-----	-----	-----
			✪	M8RX25GV4YG(A)	200	MGSDB2 ★	-----	-----	-----
			✪	M8RX25GV4GG(A)	220/230	MGSDB2 ★	-----	-----	-----
	90 mm sq.	40	-----	M9RX40GV4L	100	MGSDA1 ★	DV1132	DVSD48BL	DVEX48BL
			-----	M9RX40GV4Y	200	MGSDB2 ★	DV1234	DVSD48BY	DVEX48BY
			✪	M9RX40GV4LG(A)	100	MGSDA1 ★	-----	-----	-----
			✪	M9RX40GV4DG(A)	110/115	MGSDA1 ★	-----	-----	-----
			✪	M9RX40GV4YG(A)	200	MGSDB2 ★	-----	-----	-----
			✪	M9RX40GV4GG(A)	220/230	MGSDB2 ★	-----	-----	-----
		60	-----	M9RZ60GV4L	100	MGSDB1 ★	DV1134	DVSD48CL	DVEX48CL
			-----	M9RZ60GV4Y	200	MGSDB2 ★	DV1234	DVSD48CY	DVEX48CY
			✪	M9RZ60GV4LG(A)	100	MGSDB1 ★	-----	-----	-----
			✪	M9RZ60GV4DG(A)	110/115	MGSDB1 ★	-----	-----	-----
			✪	M9RZ60GV4YG(A)	200	MGSDB2 ★	-----	-----	-----
			✪	M9RZ60GV4GG(A)	220/230	MGSDB2 ★	-----	-----	-----
		90	-----	M9RZ90GV4L	100	MGSDB1 ★	DV1134	DVSD48CL	DVEX48CL
			-----	M9RZ90GV4Y	200	MGSDB2 ★	DV1234	DVSD48CY	DVEX48CY
			✪	M9RZ90GV4LG(A)	100	MGSDB1 ★	-----	-----	-----
			✪	M9RZ90GV4DG(A)	110/115	MGSDB1 ★	-----	-----	-----
			✪	M9RZ90GV4YG(A)	200	MGSDB2 ★	-----	-----	-----
			✪	M9RZ90GV4GG(A)	220/230	MGSDB2 ★	-----	-----	-----
Variable speed motor with electromagnetic brake	60 mm sq.	6	-----	M6RX6GBV4L	100	MGSDA1 ★	DV1131	DVSD48AL	DVEX48AL
			-----	M6RX6GBV4Y	200	MGSDB2 ★	DV1231	DVSD48AY	DVEX48AY
	70 mm sq.	15	-----	M7RX15GBV4L	100	MGSDA1 ★	DV1132	DVSD48AL	DVEX48AL
			-----	M7RX15GBV4Y	200	MGSDB2 ★	DV1231	DVSD48AY	DVEX48AY
	80 mm sq.	25	-----	M8RX25GBV4L	100	MGSDA1 ★	DV1132	DVSD48BL	DVEX48BL
			-----	M8RX25GBV4Y	200	MGSDB2 ★	DV1234	DVSD48BY	DVEX48BY
	90 mm sq.	40	-----	M9RX40GBV4L	100	MGSDA1 ★	DV1132	DVSD48BL	DVEX48BL
			-----	M9RX40GBV4Y	200	MGSDB2 ★	DV1234	DVSD48BY	DVEX48BY

* When using a speed controller operative under a wide range of supply voltage (MGSD, SD48, EX48), the mating motor should be selected according to the voltage of the power supply to be used.

✪ **Conforming to international standards :** c UL us CE CCC ★ **MGSD speed controllers are compliant with** c UL us **and** CE.

* The models with a motor model number to which “A” is suffixed are not equipped with a capacitor cap.
The models with a motor model number to which “A” is suffixed are not sold or available in Japan.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Speed controller

MGSD type

EX type

• Features

<MGSD type>

- Internal speed changer
  Motor speed can be adjusted from the speed setting knob on the front panel.
  Not necessary to install and connect an external speed changer to the controller.
- Electric brake enables instantaneous stop.
- Compact 8P plug-in configuration.
- Variable installation options are available.
  Terminal blocks, sockets and other various options (from Matsushita Electric Works, Ltd.) for panel board can be used.
- Compliant with international standards: c UL us CE

<EX type>

- Soft-start/soft-down
  Time can be adjusted up to 5 seconds.
  Excellent soft-start/soft-down linearity.
- Selectable response
  High-stable and high-response can be selected with the internal changeover switch to meet the characteristic of the application.
  (Factory setting: high-response)
- Excellent instantaneous stop capability
- Parallel operation
  Two or more motors can be controlled from a single control knob.
- Can link with various control systems
  Can control motor(s) in conjunction with different controlling systems such as sequencer. The voltage signal can also be used as control signal.

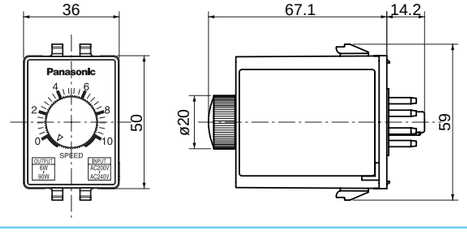
• Standard specification (MGSD type)

	MGSDA1	MGSDB1	MGSDB2
Supply voltage	Single phase 100 to 120 VAC		Single phase 200 to 240 VAC
Supply voltage tolerance	±10% (at rated voltage)		
Power frequency	50/60 Hz		
Rated input current	1.0 A	2.0 A	1.0 A
Compatible motor output	3 to 40 W	60 to 90 W	6 to 90 W
Speed control range	50Hz : 90 to 1400 min^{-1} 60Hz : 90 to 1700 min^{-1}		
Speed regulation (against load)	5% : 1000 min^{-1}, Typical variation at 80% rated torque		
Speed setting	Internal		
Braking *1	Activated while electric braking current is flowing.		
Electric braking time	0.5 sec (typ.): Amount of braking current is 2 to 3 times the rated current.		
Parallel operation	Not applicable		
Product weight	80 g		

*1 Electric braking has no mechanical holding mechanism.

• Outline drawing

MGSD type



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

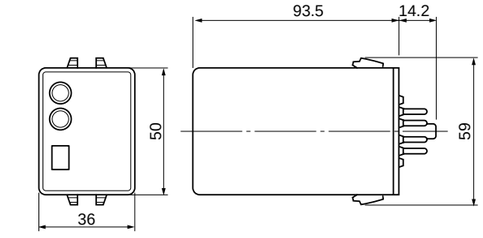
• Standard specification (EX type)

Characteristic \ Part No.	EX type				
	DV1131	**DV1132**	**DV1134**	**DV1231**	**DV1234**
Rated voltage	Single phase 100 V			Single phase 200 V	
Operating voltage range	±10% (at rated voltage)				
Power frequency	50/60 Hz				
Rated current	0.4 A	1 A	2.0 A	0.3 A	1 A
Compatible motor output * 1	3 to 10 W	15 to 40 W	60 to 0 W	6 to 20 W	25 to 90 W
Operation change	High-response		High-stability		
Speed control range	90 to 1400 min^{-1} / 90 to 1700 min^{-1}		50 to 1400 min^{-1} / 50 to 1700 min^{-1}		
Speed variation	5% or more		3% or less		
Speed setting	From external controller, e.g. external speed changer *3				
Braking* 2	Active while electric braking current is flowing.				
Electric braking time	5 sec typ. The braking current will be turned off before the 5-sceond limit as the motor stops. (Braking current is 2 to 3 times the rated current.)				
Parallel operation	Enabled				
Soft-start/soft-down capability	Available (typically up to 5 sec (0 to max. speed))				
Operating temperature range	–10 to 50˚C				
Storage temperature	–20 to 60˚C				

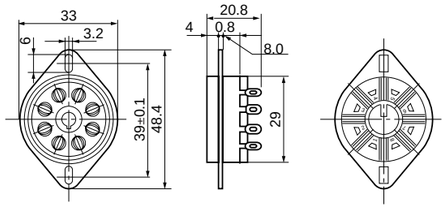
*1 Applicable to Matsushita compact speed variable geared motors. Select motors with applicable output.
*2 Electric braking has no mechanical brake holding mechanism.
To provide brake holding, use our C&B motor or variable speed motor containing electromagnetic brake.
When braking a load having excessively high inertia, durability and life expectancy of motor shaft and gear should be taken into consideration. Use the motor within the allowable inertia.
*3 EX type is supplied with the external speed changer.

• Outline drawing

EX type



Socket (accessory)

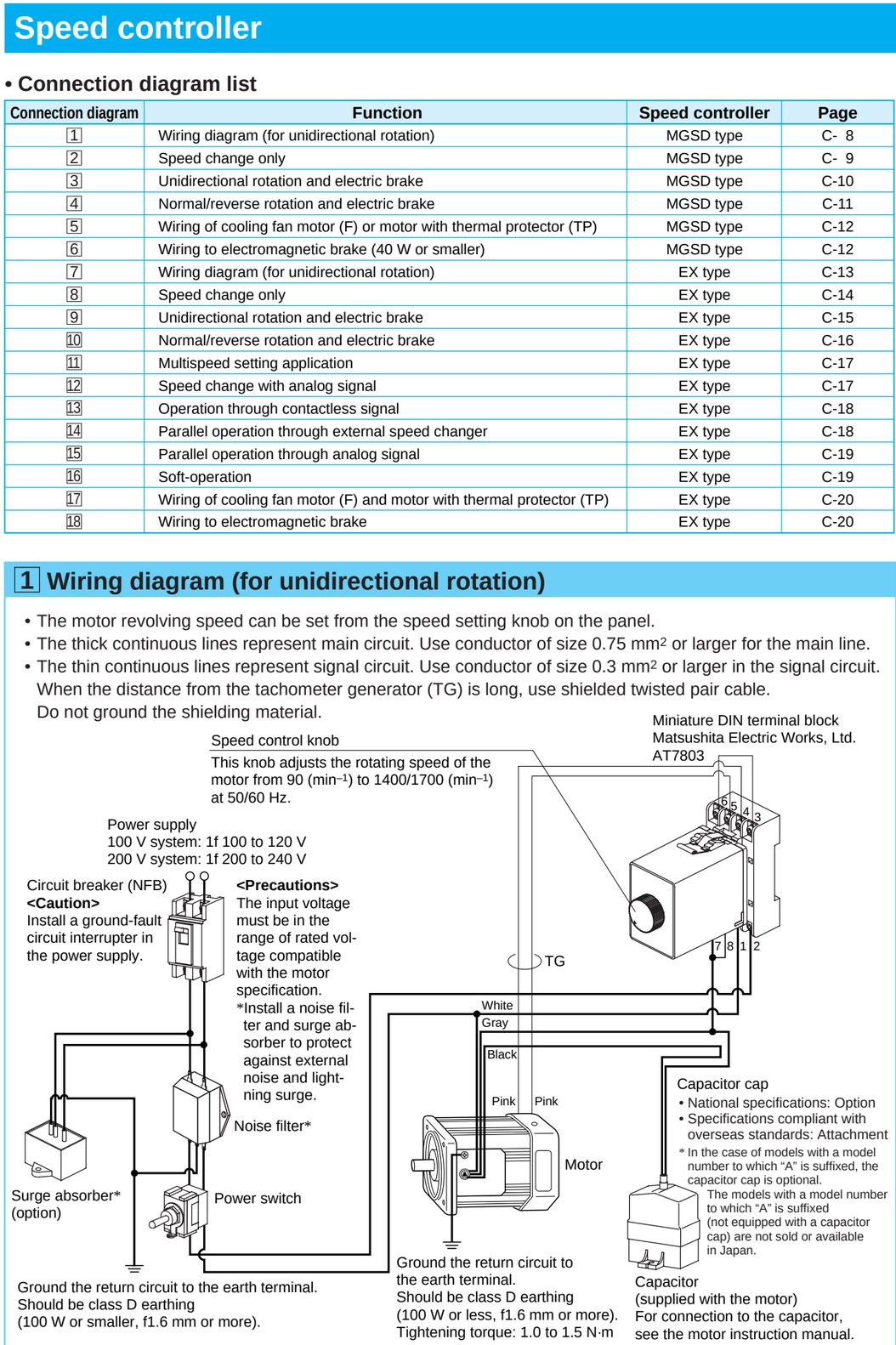


* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

• Connection diagram list

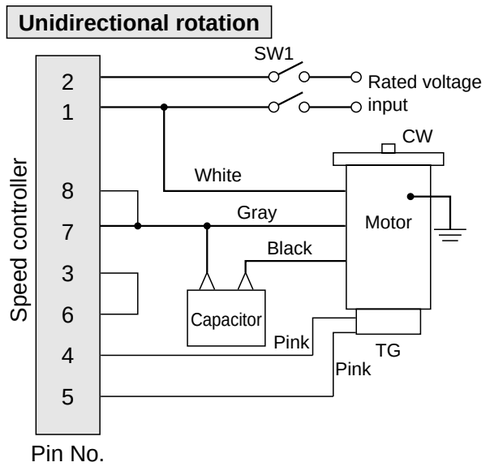
1 Wiring diagram (for unidirectional rotation)

- The motor revolving speed can be set from the speed setting knob on the panel.
- The thick continuous lines represent main circuit. Use conductor of size 0.75 mm² or larger for the main line.
- The thin continuous lines represent signal circuit. Use conductor of size 0.3 mm² or larger in the signal circuit. When the distance from the tachometer generator (TG) is long, use shielded twisted pair cable. Do not ground the shielding material.

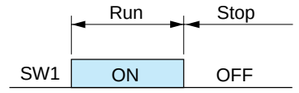


2 Speed change only

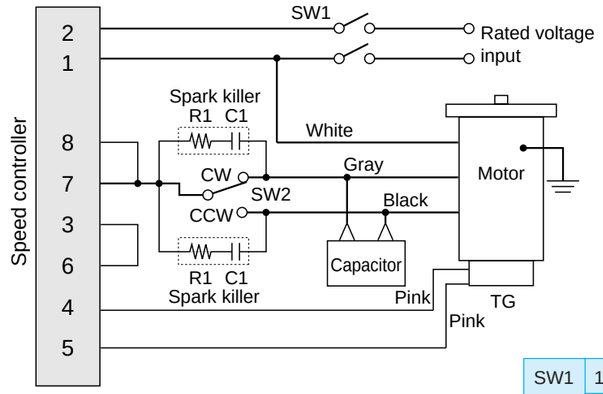
Unidirectional rotation

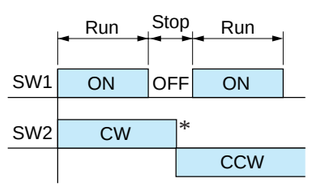


Rotating direction viewed from shaft end	
CW	Clockwise
CCW	Counterclockwise



Normal/reverse rotation





SW1 : Power switch
SW2 : Normal/reverse selector switch

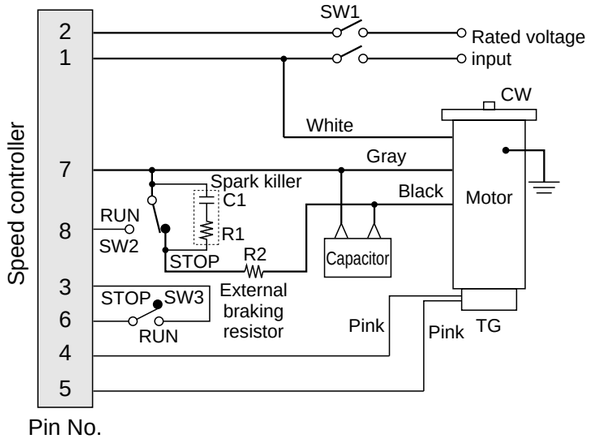
SW1	100 V supply system	5 A or more at 125 VAC
SW2	200 V supply system	5 A or more at 250 VAC
Spark killer R1+C1		DV0P008 (option)

<Precautions>

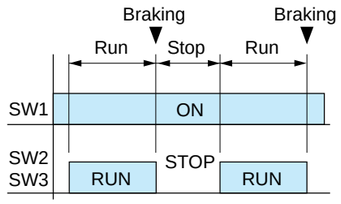
1. To change rotating direction of induction motor:
   Provide a motor halt period. Switch over SW2 after complete stop of the motor.
2. To change rotating direction of reversible motor:
   A motor halt period is not necessary. Switch over SW2 while keeping SW1 turned ON. When configuring SW2 with relay contacts, use a relay having large gap between contacts (e.g. HG/HP relay from Matsushita Electric Works, Ltd.) to prevent malfunction due to short-circuited capacitor.
3. For motors for cooling fan and motors with thermal protector, also refer to page C-12.
4. When using independent relay contacts for SW2 to change over normal/reverse, interlock both contacts so that they will not close simultaneously.
5. The spark killer consisting of R1 and C1 must be used to protect the relay contacts.

3 Unidirectional rotation and electric brake

25 W or smaller

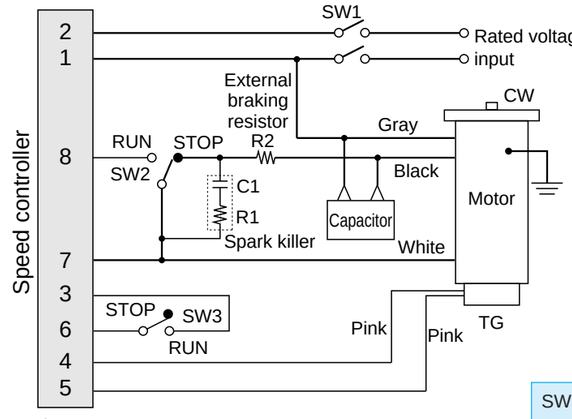


• Connection according to this wiring diagram causes the motor to rotate clockwise when viewed from the motor shaft end. To run the motor counterclockwise, interchange the connecting point of black and gray leads.



SW1 : Power switch
SW2 : RUN/STOP switch
SW3 : Brake start switch

40 W or larger



SW1	100 V supply system	5 A or more at 125 VAC
SW2	200 V supply system	5 A or more at 250 VAC
SW3		DC10 V 10 mA
Spark killer R1+C1		DV0P008 (option)
External braking resistor R2		DV0P003 (option)

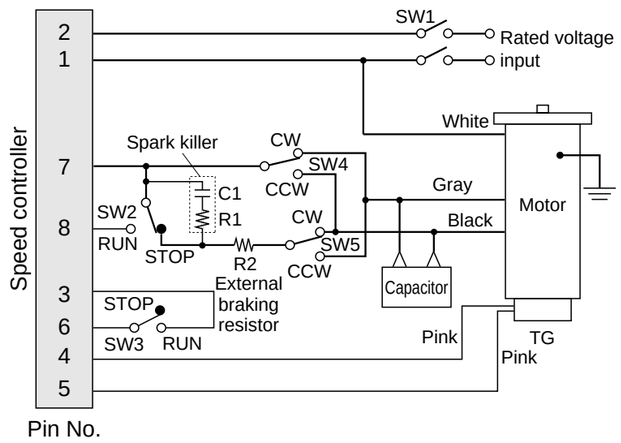
<Precautions>

1. When SW2 and SW3 are switched from RUN to STOP, electric braking is applied for approx. 0.5 sec, and the motor stops instantly.
   Difference in switching time between SW2 and SW3 must be 0.1 sec or shorter. If SW2 (SW3) is in RUN position while SW3 (SW2) is in STOP, abnormal operation occurs (full speed rotation for a short time) and motor temperature rises excessively.
2. The number of start/stop operations must be 6/min. or less.
3. For motors for cooling fan and motors with thermal protector, also refer to page C-12.
4. The spark killer consisting of R1 and C1 must be used to protect the relay contacts.
5. R2 limits flow of discharging current upon short-circuiting of the capacitor during braking.

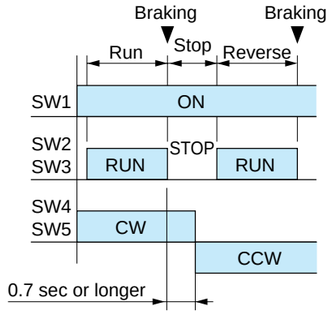
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

4 Normal/reverse rotation and electric brake

25 W or smaller

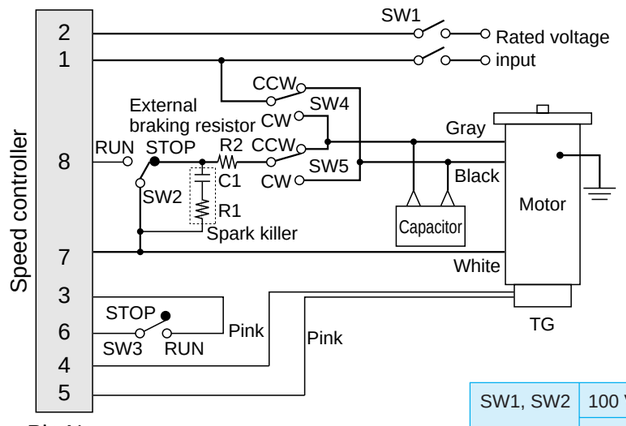


Rotating direction viewed from shaft end	
CW	Clockwise
CCW	Counterclockwise



SW1 : Power switch
SW2 : RUN/STOP switch
SW3 : Braking start switch
SW4 : Normal/reverse selector switch

40 W or larger



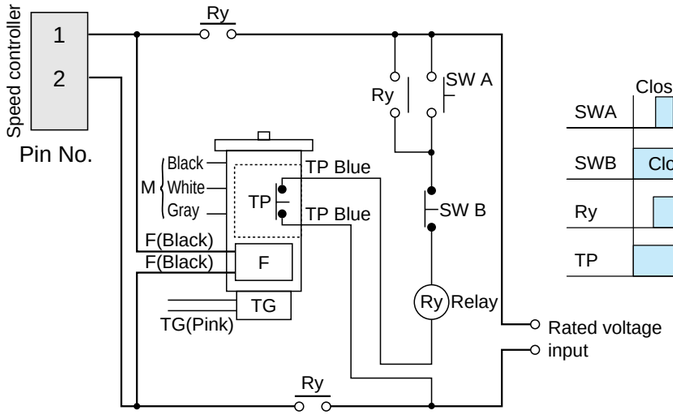
SW1, SW2	100 V supply system	5 A or more at 125 VAC
SW4, SW5	200 V supply system	5 A or more at 250 VAC
SW3		DC10 V 10m A
Spark killer R1+C1		DV0P008 (option)
External braking resistor R2		DV0P003 (option)

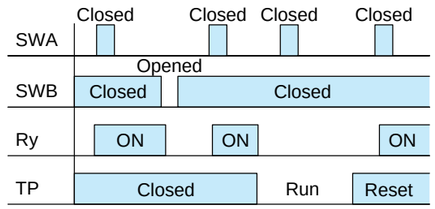
<Precautions>

1. When SW2 and SW3 are switched from RUN to STOP, electric braking is applied for approx. 0.5 sec, and the motor stops instantly. (Do not operate SW4 and SW5 until the motor stops.)
   Difference in switching time between SW2 and SW3 must be 0.1 sec or smaller. If SW2 (SW3) is in RUN position while SW3 (SW2) is in STOP, abnormal operation occurs (full speed rotation for a short time) and motor temperature rises excessively.
2. Do not change the motor rotating direction (SW4, SW5) while the motor is running.
3. The number of start/stop operations must be 6/min. or less.
4. For motors for cooling fan and motors with thermal protector, also refer to page C-12.
5. The spark killer consisting of R1 and C1 must be used to protect the relay contacts.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

5 Wiring of cooling fan motor (F) or motor with thermal protector (TP)





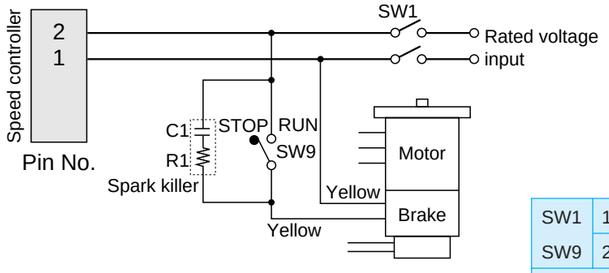
SW A		Momentary N.O. contact
SW B		Momentary N.C. contact
Relay Ry	100 V supply system	125 VAC 5 A or more 3a contact
	200 V supply system	250 VAC 5 A or more 3a contact

<Precautions>

1. The thermal protector (TP) is an automatic reset type. To prevent hazards caused by restarting, connect the TP as shown above. Don't connect TP directly to the power supply.
2. Once the TP operates, cooling period is required before the operation can restart.
3. Connect the cooling fan motor (F) across pins 1 and 2 on the power terminal.
4. Motor (M) and tachometer generator (TG) should be connected according to corresponding wiring diagram shown later.

6 Wiring to electromagnetic brake (40 W or smaller)

• Variable speed motor with electromagnetic brake should be wired as shown below.



SW1	100 V supply system	5 A or more at 125 VAC
SW9	200 V supply system	5 A or more at 250 VAC
Spark killer R1+C1		DV0P008 (option)

<Precautions>

1. Operate SW9 simultaneously with RUN/STOP switching of other switches, if any. Placing other switch to RUN position while the brake is active (SW9 at STOP position) causes the motor to generate heat.
2. For remaining wirings, refer to corresponding wiring diagram.

7 Wiring diagram (for unidirectional rotation)

- The thick continuous lines represent main circuit. Use conductor of size 0.75 mm² or larger for the main line.
- The thin continuous lines represent signal circuit. Use conductor of size 0.3 mm² or larger in the signal circuit. When the distance from the tachometer generator (TG) is long, use shielded twisted pair cable.

• Soft-start/down control

Soft-start and soft-down times can be adjusted by a single setting.
Use this feature to protect the load from shock caused by sharp speed change at startup and shutdown of the motor.
To disable the soft operation, turn the control fully clockwise.

• Maximum speed control

Use this control to adjust the revolving speed when the external speed changer is set at the top speed.
Adjust the speed to 1400 (min⁻¹) or below at 50 Hz; or 1700 (min⁻¹) or below at 60 Hz.

• Operation changeover switch

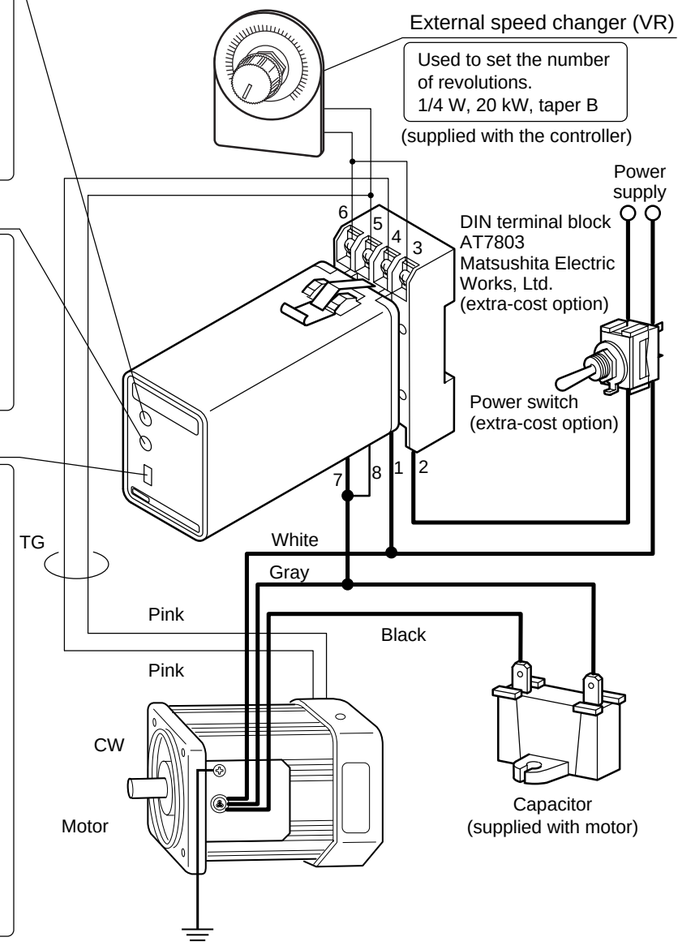
Select "high-stable" or "high-response":

<High-stable>

- Keeps the rotation speed variation low against variation in load.
- Enables a wide range of speed control.
- Suitable for capability control.
- May fail to maintain constant rotation speed upon sharp load change.

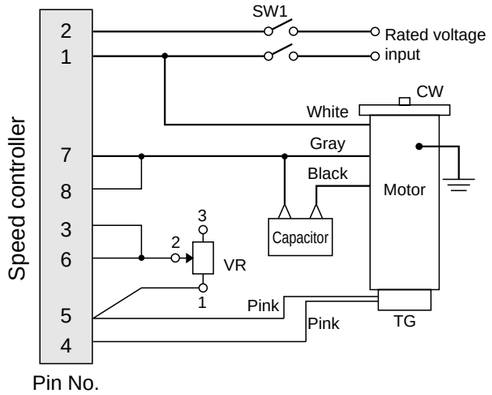
<High-response>

- Enables quick response with low hunting.
- Suitable for positioning application.
- May fail to keep rotation speed variation low against variation in load.
- Not suitable for controlling wide range of speed.

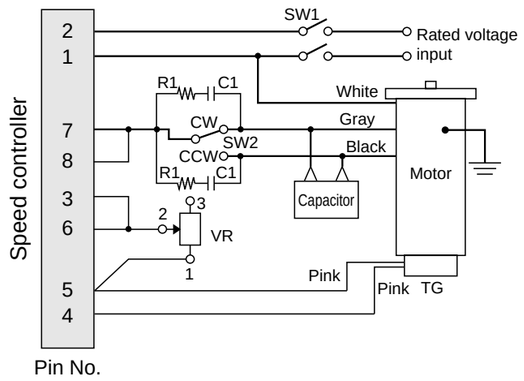


8 Speed change only

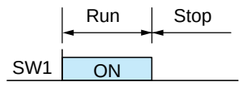
Unidirectional rotation



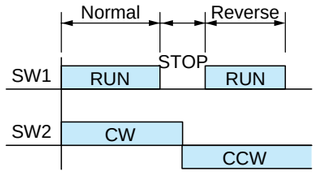
Normal/reverse rotation



This wiring diagram causes the motor to rotate clockwise when viewed from the motor shaft end.
To run the motor counterclockwise, interchange the connecting point of black and gray leads.



SW1	100 V supply system	5 A or more at 125 VAC
SW2	200 V supply system	5 A or more at 250 VAC
R1+C1		DV0P008 (option)



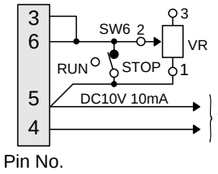
SW1 : Power switch
SW2 : Normal/reverse selector switch

<Precautions>

1. To change rotating direction of induction motor:
   Provide a motor halt period. Switch over SW2 after complete stop of the motor.
2. To change rotating direction of reversible motor:
   A motor halt period is not necessary. Switch over SW2 while keeping SW1 turned ON. When configuring SW2 with relay contacts, use a relay having large gap between contacts (e.g. HG/HP relay from Matsushita Electric Works, Ltd.) to prevent malfunction due to short-circuited capacitor.
3. For motors for cooling fan and motors with thermal protector, also refer to page C-20.
4. When using independent relay contacts for SW2 to change over normal/reverse, interlock both contacts so that they will not close simultaneously.
5. The spark killer consisting of R1 and C1 must be used to protect the relay contacts.

Start/stop control with small signal

- With the external speed changer connected, the motor can be started/stopped with a small signal through SW6 contact while the power switch SW1 (see diagram above) is on. The SW6 provides shorter start-up time than SW1.



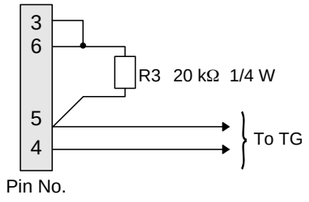
External speed changer (DVOP002)
1/4 W, 20 kW, taper B
To TG

<Precautions>

1. Power (SW1) should be turned on at least 0.5 sec before turning on of the start signal (SW6).
2. When the motor is not operated for a prolonged time, turn off power switch (SW1).

Operation from maximum speed control

- When no external speed changer is required, the speed can be adjusted from the maximum speed control.

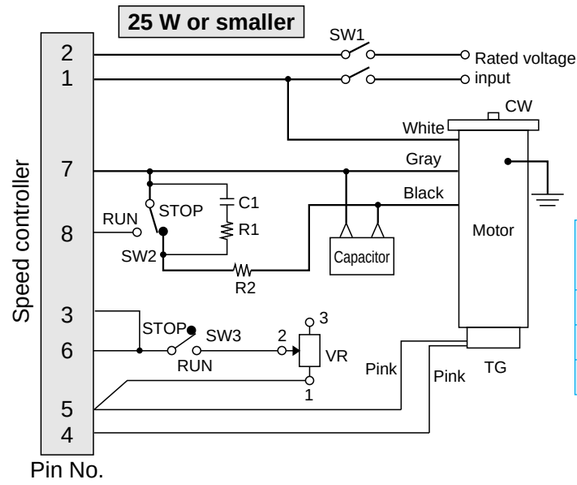


<Precautions>

1. Connect a fixed resistor (R3) in place of external speed changer (VR).

9 Unidirectional rotation and electric brake

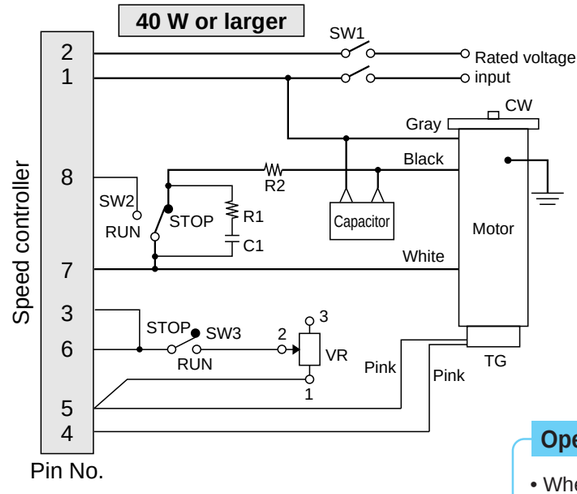
25 W or smaller

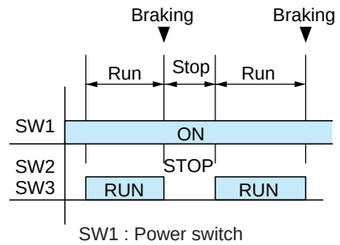


- Connection according to this wiring diagram causes the motor to rotate clockwise when viewed from the motor shaft end. To run the motor counterclockwise, interchange the connecting point of black and gray leads.

SW1	100 V supply system	5 A or more at 125 VAC
SW2	200 V supply system	5 A or more at 250 VAC
SW3		DC10 V 10 mA
R1+C1		DV0P008 (option)
R2		DV0P003 (option)

40 W or larger





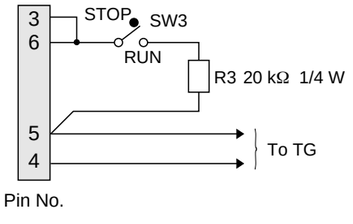
SW1 : Power switch
SW2 : RUN/STOP switch
SW3 : Brake start switch

<Precautions>

1. When SW2 and SW3 are switched from RUN to STOP, electric braking is applied for approx. 5 sec, or until the motor stops.
   SW2 and SW3 must be operated simultaneously. Otherwise, abnormal operation occurs (full speed rotation for a short time), causing the motor temperature rises excessively.
2. The number of start/stop cycles must be 6/min. or less.
3. When using cooling fan motor or motor with thermal protector, also see page C-20.
4. Insert R1 and C1 to protect relay contact.
5. R2 restricts discharge current in case of capacitor short circuit during braking.

Operation from maximum speed control

- When no external speed changer is required, the speed can be adjusted from the maximum speed control.



<Precautions>

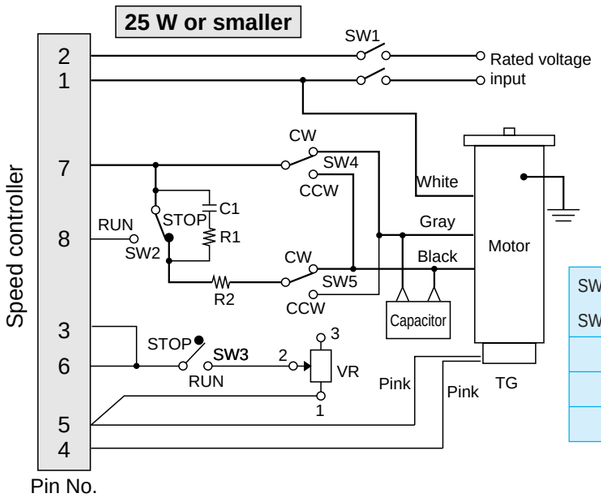
1. Connect a fixed resistor (R3) in place of external speed changer (VR).

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

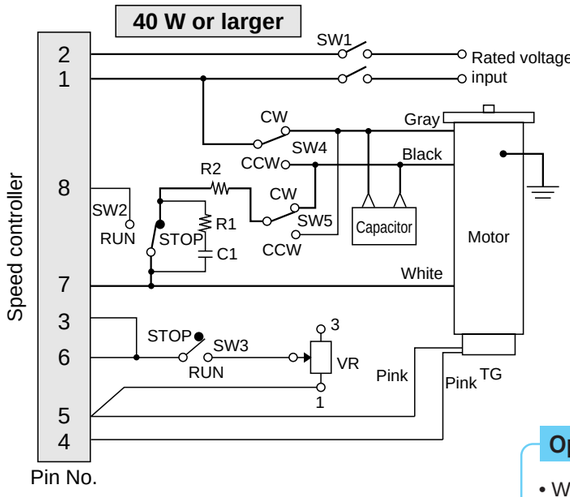
Speed controller

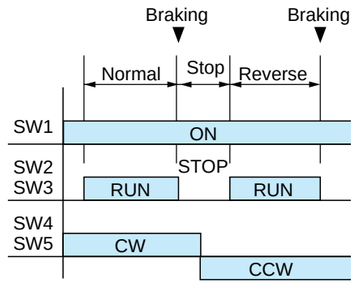
10 Normal/reverse rotation and electric brake



Rotating direction viewed from shaft end	
CW	Clockwise
CCW	Counterclockwise

SW1, SW2	100 V supply system	5 A or more at 125 VAC
SW4, SW5	200 V supply system	5 A or more at 250 VAC
SW3		DC10 V 10 mA
R1+C1		DV0P008 (option)
R2		DV0P003 (option)



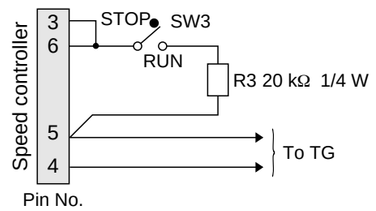


SW1 : Power switch
SW2 : RUN/STOP switch
SW3 : Braking start switch
SW4,SW5 : Normal/reverse selector switch

<Precautions>
1. When SW2 and SW3 are switched from RUN to STOP, electric braking is applied for approx. 5 sec, or until the motor stops. (Do not operate SW4 and SW5 until the motor stops completely.) SW2 and SW3 must be operated simultaneously. Otherwise, abnormal operation occurs (full speed rotation for a short time), causing the motor temperature rises excessively.
2. Do not change the rotating direction (SW4, SW5) while the motor is running.
3. The number of start/stop cycles must be 6/min. or less.
4. When using cooling fan motor or motor with thermal protector, also see page C-20.
5. Insert R1 and C1 to protect relay contact.
6. R2 restricts discharge current in case of capacitor short circuit during braking.

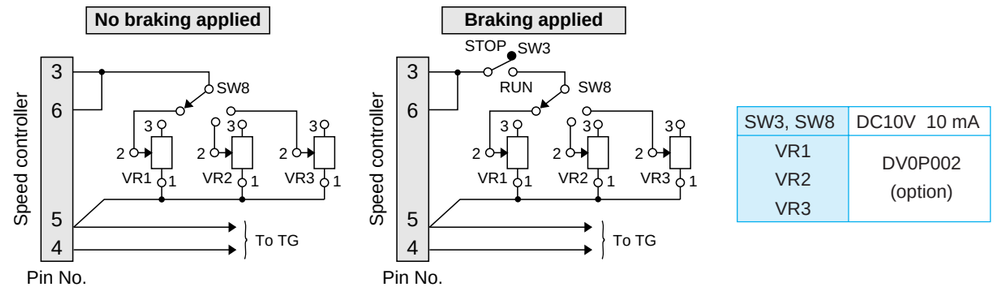
Operation from maximum speed control

• When no external speed changer is required, the speed can be adjusted from the maximum speed control.



<Precautions>
1. Connect a fixed resistor (R3) in place of external speed changer (VR).

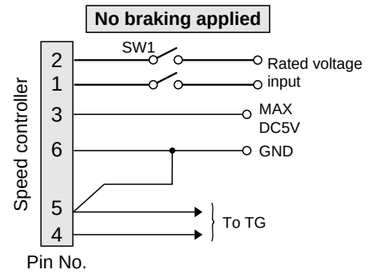
11 Multispeed setting application

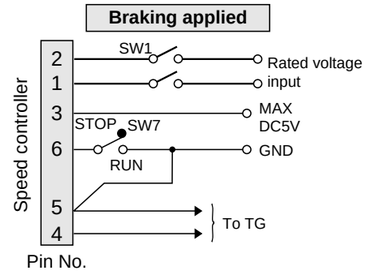


SW3, SW8	DC10V 10 mA
VR1 VR2 VR3	DV0P002 (option)

<Precautions>
1. Set external speed changers VR1, VR2 and VR3 to 3 different speeds and select the desired speed from SW8.
2. When activating the brake, simultaneously switch over SW3 and RUN-STOP of other switches.
3. For remaining wirings, refer to the corresponding wiring diagrams.

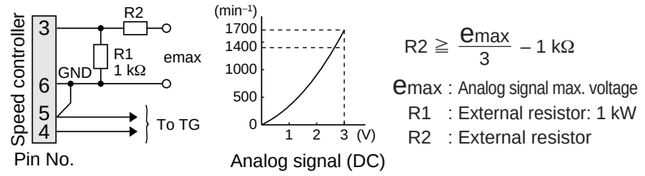
12 Speed change with analog signal





SW1	100 V supply system	5 A or more at 125 VAC
	200 V supply system	5 A or more at 250 VAC
SW7		DC10 V 10 mA

<Precautions>
1. Turn on power switch SW1 approx. 0.5 sec earlier than the analog start signal.
2. For repetitive run/stop operations, use the analog signal while keeping SW1 ON.
3. Soft-operation can be adjusted from the soft-start and soft-down controls or by using analog signal.
4. On the maximum speed control, set the maximum motor revolving speed that may be achieved at the maximum analog signal value (e.g. 3 VDC).
5. The absolute maximum rating of analog signal is 5 VDC. The system should be designed to use standard 3 VDC analog signal. If the signal voltage exceeds 3 VDC, the circuit diagram shown below should be used for wiring.



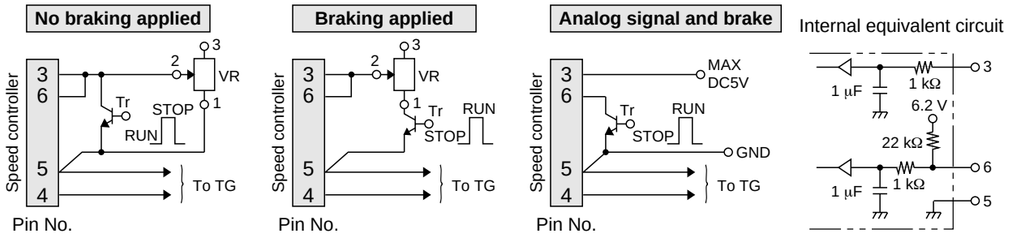
$$R2 \geqq \frac{e_{max}}{3} - 1\,k\Omega$$

emax : Analog signal max. voltage
R1 : External resistor: 1 kW
R2 : External resistor

6. Revolution speed “0” signal should not exceed 0.1 VDC.
7. The input speed pattern (curve) may not be exactly reflected on the motor speed, due to inertial effect of the load, especially during stop sequence.
8. The percentage ripple of analog voltage signal should be 2% or less.
9. For other wirings, refer to the corresponding circuit/wiring diagrams.
10. When using the braking feature, motor wiring (pins 1, 7 and 8) should be in accordance with pages C-8 and C-9. To activate braking, switch SW2 and SW7 at the same time.
    If SW2 is in RUN position while SW7 is in STOP, abnormal operation occurs (full speed rotation for a short time); or if SW7 is in RUN position while SW2 is in STOP, motor temperature rises excessively.

13 Operation through contactless signal

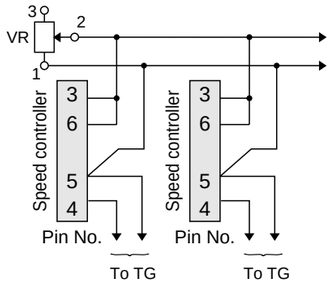
• Small signal relays SW3, SW6 and SW7 can be replaced with transistor.



14 Parallel operation through external speed changer

<Precautions>

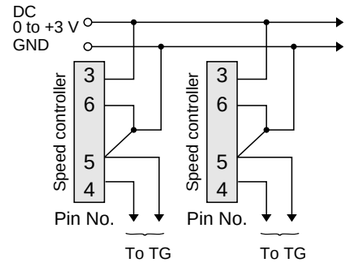
1. The resistance Rs of the external speed changer VR should be as follows:
   Rs = 20/N (kΩ)
   where, N is the number of motors.
2. For synchronous operation or ratio operation, desired revolving speeds must be set from the maximum speed control.
   Soft-start and soft-down controls and operation changeover switch must be set to the same position.
3. Wirings from the external speed changer VR should be connected to the same pins (No.5 and 6) on the controller.
4. Malfunction may occur as the number of devices operated in parallel increases.
   To secure correct operation, connect a noise filter to each unit.
5. For other electrical connections, refer to corresponding circuit/wiring diagrams.



15 Parallel operation through analog signal

<Precautions>

The input impedance of the controller is approx. 100 kΩ. The output impedance of the analog signal source should be determined based on the total input impedance of the speed controllers.



16 Soft-operation

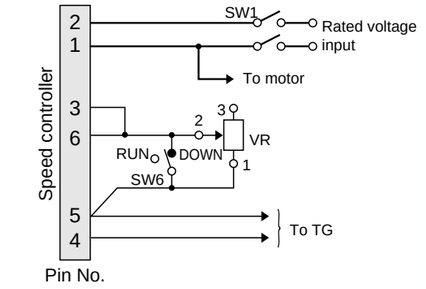
• Soft-start, soft-down

<Precautions>

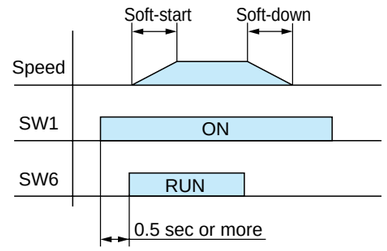
1. Power switch SW1 should be turned on approx. 0.5 sec before the operation start signal from SW6.
2. When repeating run/stop cycles, turn on/off only SW6 while keeping SW1 turned ON. In this way, the motor can be controlled by using a small signal. To stop operation for a long time, also turn off SW1.
3. Soft-start/soft-down period is the time required for the equipment to start up from stop state to full speed when the external speed changer is set at maximum value.
4. Soft-start/soft-down control, when at the full clockwise position, disables the soft-down function. As the stop signal is input, power supply to the motor is turned off immediately. However, the revolving speed gradually decreases in proportion to the inertia of the load and motor starts free-running stop sequence.
5. Soft-start/soft-down control can set maximum time length of approx. 5 seconds (Typ. at FCCW). The setting may be exceeded if the inertia of the load is too large.
6. For other electrical connections, refer to corresponding circuit/wiring diagrams.

• Soft-start and electric brake

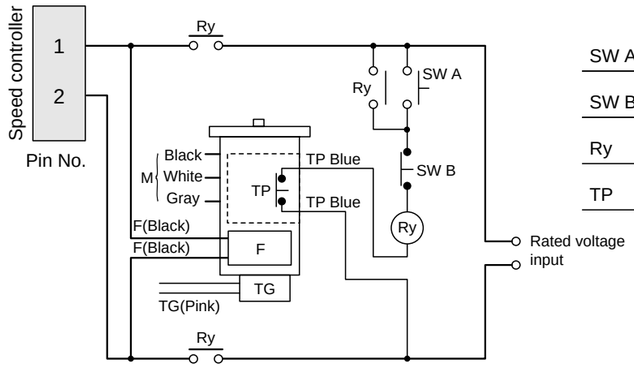
Electrical wirings are the same as for “Unidirectional rotation and electric brake” and “Normal/reverse rotation and electric brake”.
Adjust the soft-start time from the soft-start/down control.

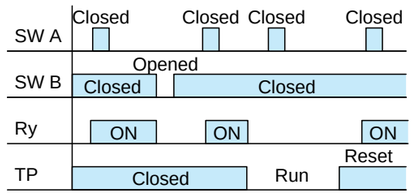


SW1	100 V supply system	5 A or more at 125 VAC
	200 V supply system	5 A or more at 250 VAC
SW6		DC10 V 10 mA



17 Wiring of cooling fan motor and motor with thermal protector





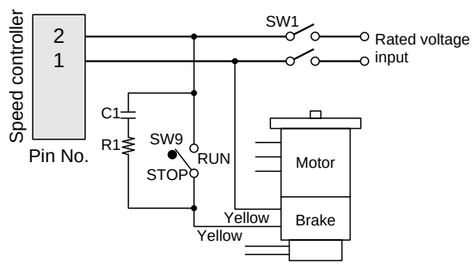
SW A		Momentary N.O. contact
SW B		Momentary N.C. contact
Ry	100 V supply system	125 VAC 5 A or more 3a contact
	200 V supply system	250 VAC 5 A or more 3a contact

<Precautions>

1. The thermal protector (TP) is an automatic reset type. To prevent hazards caused by restarting, connect the TP as shown above. Don't connect TP directly to the power supply.
2. Once the TP operates, cooling period is required before the operation can restart.
3. Connect the cooling fan motor (F) across pins 1 and 2 on the power terminal.
4. Motor (M) and tachometer generator (TG) should be connected according to corresponding wiring diagram shown later.

18 Wiring to electromagnetic brake

• Variable speed motor with electromagnetic brake should be wired as shown below.

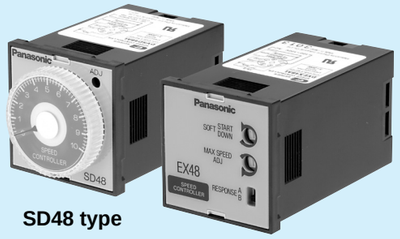


SW1	100 V supply system	5 A or more at 125 VAC
SW9	200 V supply system	5 A or more at 250 VAC
R1+C1		DV0P008 (option)

<Precautions>

1. SW9 should be switched to RUN or STOP at the same time as the other switches are switched to RUN or STOP.
   If the other switches are set to RUN while the brake is energized (SW9 in STOP position), the motor will generate heat.
2. For other wirings, refer to the corresponding circuit/wiring diagrams.
   If the application is speed change without using electric braking (page C-14), perform wiring according to “Start/stop control with small signal”.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.



SD48 type

EX48 type

• Features

- First DIN 48 size in the industry
  Compact space saving model (control panel)
  (standardized panel machining holes)
  A wide choice of options (recommended by Matsushita Electric Works, Ltd.)
- Simplified and neat wiring arrangement
  Main circuit and signal inputs are isolated on the terminal block.
  Use of 8-pin terminal block requires fewer wiring connections.
- Can operate under a wide range of power supply voltage (100V→100 to 120V, 200V→200 to 240V)

• Standard specification

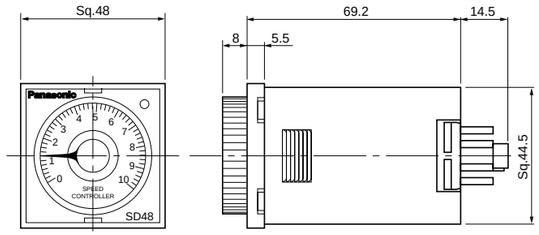
Characteristic \ Part No.	SD48 type						EX48 type					
	DVSD 48AL	DVSD 48BL	DVSD 48CL	DVSD 48AY	DVSD 48BY	DVSD 48CY	DVEX 48AL	DVEX 48BL	DVEX 48CL	DVEX 48AY	DVEX 48BY	DVEX 48CY
Rated voltage	AC100 to 120 V			AC200 to 240 V			AC100 to 120 V			AC200 to 240 V		
Operating voltage range	±10% (at rated voltage)						±10% (at rated voltage)					
Power frequency	50/60Hz						50/60 Hz					
Rated current	0.5 A	1.0 A	2.0 A	0.3 A	0.5 A	1.0 A	0.5 A	1.0 A	2.0 A	0.3 A	0.5 A	1.0 A
Compatible motor output *1	3 to 20 W	25 to 40 W	60 to 90 W	3 to 20 W	25 to 40 W	60 to 90 W	3 to 20 W	25 to 40 W	60 to 90 W	3 to 20 W	25 to 40 W	60 to 90 W
Speed variation	90 to 1400 min^{-1} / 90 to 1700 min^{-1}						Mode A (high-response mode): 50 to 1400 min^{-1} / 50 to 1700 min^{-1} Mode B (high-response mode): 90 to 1400 min^{-1} / 90 to 1700 min^{-1} *2					
Speed setting	Internal						External speed changer, analog voltage, maximum speed setting control					
Brake *3	Applies braking force to the motor by feeding electric braking current to the motor for 0.5 sec (typ)						Applies braking force to the motor by feeding electric braking current to the motor for 5 sec (typ) (Turns off electric braking current even within 5 sec as the motor stops.)					
Parallel operation	Not possible						Possible					
Soft-start/down	Not applicable						Variable up to 5 sec (typ) (0 to max. revolving speed)					
Operating temperature range	–10 to 50˚C						–10 to 50˚C					
Storage temperature	–20 to 60˚C						–20 to 60˚C					

*1. Applicable to Panasonic compact geared motors and variable speed motors.
*2. EX48 models are set to mode A (high-stable) upon shipment.
*3. Electric braking has no mechanical brake holding force.
To provide the holding force, use a variable speed motor with electromagnetic braking feature.

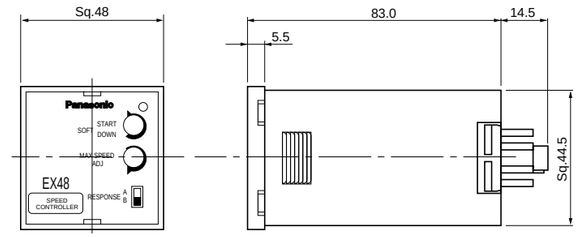
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

• Outline drawing

48 mm sq. SD48 type



48 mm sq. EX48 type



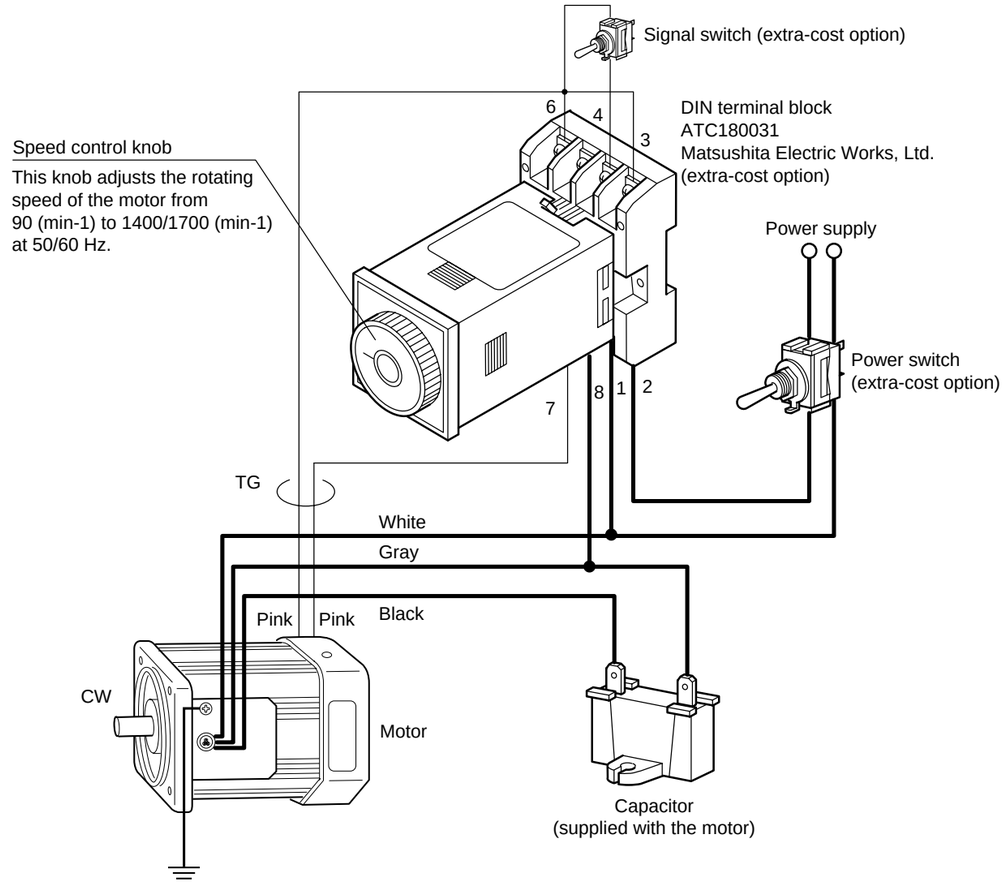
• Connection diagram list

Connection diagram	Function	Speed controller	Page
1	Wiring diagram (for unidirectional rotation)	SD48 type	C-23
2	Speed change only	SD48 type	C-24
3	Unidirectional rotation and electric brake	SD48 type	C-25
4	Normal/reverse rotation and electric brake	SD48 type	C-26
5	Wiring of cooling fan motor (F) or motor with thermal protector (TP)	SD48 type	C-27
6	Wiring to electromagnetic brake	SD48 type	C-27
7	Wiring diagram (for unidirectional rotation)	EX48 type	C-28
8	Speed change only	EX48 type	C-29
9	Unidirectional rotation and electric brake	EX48 type	C-30
10	Normal/reverse rotation and electric brake	EX48 type	C-31
11	Multispeed setting application	EX48 type	C-32
12	Speed change with analog signal	EX48 type	C-32
13	Operation through contactless signal	EX48 type	C-32
14	Parallel operation through external speed changer	EX48 type	C-33
15	Parallel operation through analog signal	EX48 type	C-33
16	Soft-operation	EX48 type	C-34
17	Wiring of cooling fan motor (F) and motor with thermal protector (TP)	EX48 type	C-35
18	Wiring to electromagnetic brake	EX48 type	C-35

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

1 Wiring diagram (for unidirectional rotation)

- The motor revolving speed can be set from the speed setting knob on the panel.
- The thick continuous lines represent main circuit. Use conductor of size 0.75 mm^2 (AWG 18) or larger for the main line.
- The thin continuous lines represent signal circuit. Use conductor of size 0.3 mm^2 or larger in the signal circuit. When the distance from the tachometer generator (TG) is long, use shielded twisted pair cable. Do not ground the shielding material.



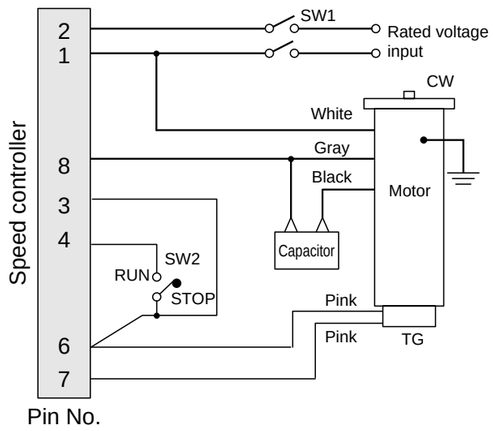
• Rotating direction viewed from shaft end

CW : Clockwise
CCW : Counterclockwise

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

2 Speed change only

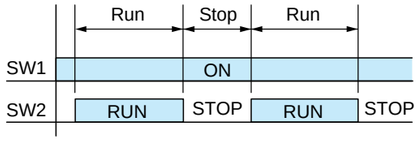
Unidirectional rotation



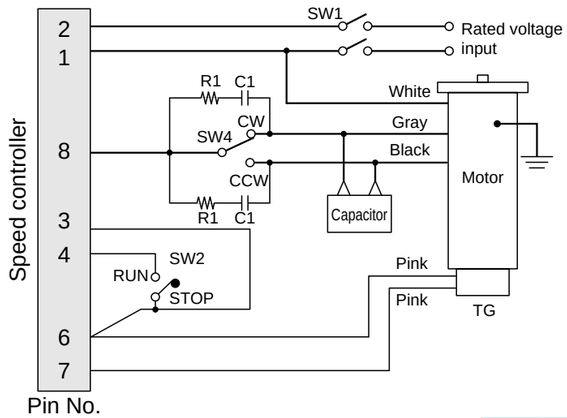
Pin No.

Rotating direction viewed from shaft end	
CW	Clockwise
CCW	Counterclockwise

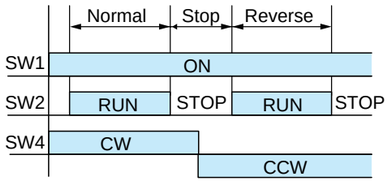
- This wiring diagram causes the motor to rotate clockwise when viewed from the motor shaft end. To run the motor counterclockwise, interchange the connecting point of black and gray leads.



Normal/reverse rotation



Pin No.



SW1 : Power switch
SW2 : RUN/STOP switch
SW4 : Normal/reverse selector switch

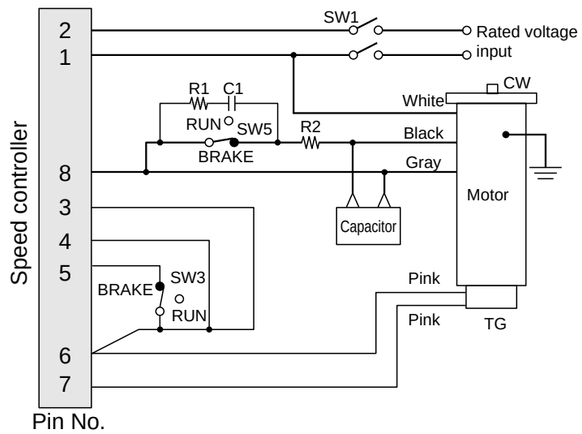
SW1	100 to 120 V supply system	5 A or more at 125 VAC
SW4	200 to 240 V supply system	5 A or more at 250 VAC
R1, C1		DV0P008 (option)

<Precautions>

1. To change rotating direction of induction motor:
   Provide a motor halt period. Switch over SW4 after complete stop of the motor.
2. To change rotating direction of reversible motor:
   A motor halt period is not necessary. Switch over SW4 while keeping SW1 turned ON. When configuring SW4 with relay contacts, use a relay having large gap between contacts (e.g. HG/HP relay from Matsushita Electric Works, Ltd.) to prevent malfunction due to short-circuited capacitor.
3. For motors for cooling fan and motors with thermal protector, also refer to page C-27.
4. When using independent relay contacts for SW4 to change over normal/reverse, interlock both contacts so that they will not close simultaneously.
5. The spark killer consisting of R1 and C1 must be used to protect the relay contacts.

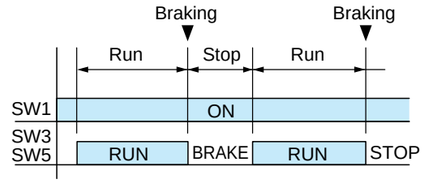
3 Unidirectional rotation and electric brake

25 W or smaller



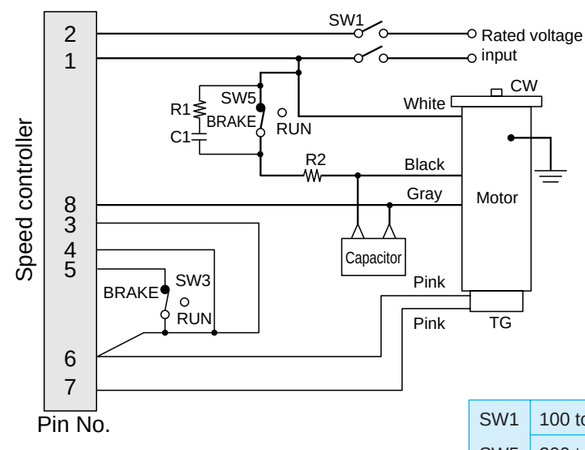
Pin No.

- Connection according to this wiring diagram causes the motor to rotate clockwise when viewed from the motor shaft end. To run the motor counterclockwise, interchange the connecting point of black and gray leads.



SW1 : Power switch
SW3 : Brake start switch
SW5 : RUN/STOP switch

40 W or larger



Pin No.

SW1	100 to 120 V supply system	5 A or more at 125 VAC
SW5	200 to 240 V supply system	5 A or more at 250 VAC
SW3		DC10 V 10 mA
R1, C1		DV0P008 (option)
R2		DV0P003 (option)

<Precautions>

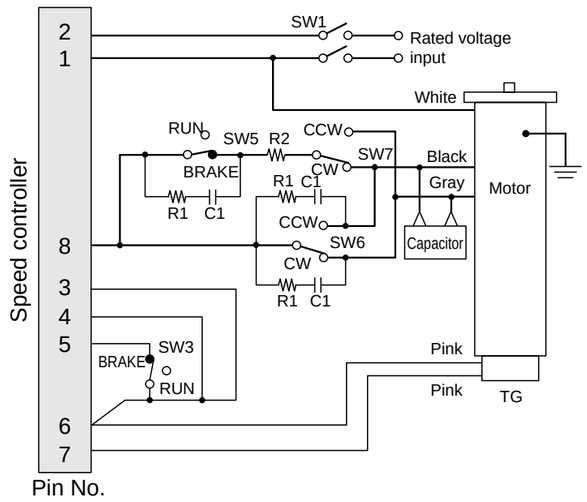
1. When SW3 and SW5 are moved from RUN to STOP, electric braking operates for approx. 0.5 sec causing the motor to stop immediately. SW3 and SW5 must be turned on/off simultaneously. Otherwise, abnormal operation occurs (full speed rotation for a short time), causing the motor temperature to rise excessively.
2. The number of start/stop operations must be 6/min. or less.
3. For motors for cooling fan and motors with thermal protector, also refer to page C-27.
4. The spark killer consisting of R1 and C1 must be used to protect the relay contacts.
5. R2 limits flow of discharging current upon short-circuiting of the capacitor during braking.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

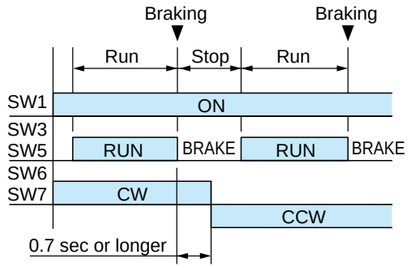
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

4 Normal/reverse rotation and electric brake

25 W or smaller

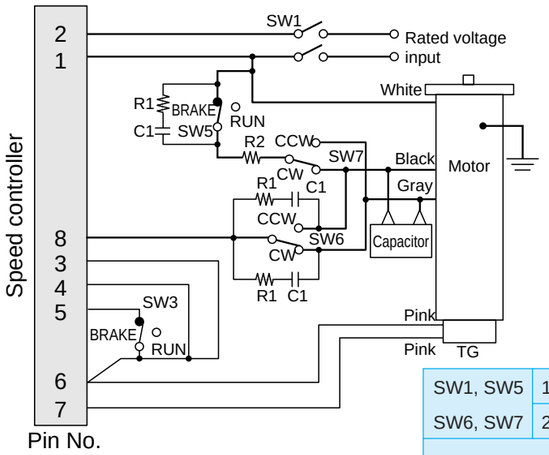


Rotating direction viewed from shaft end	
CW	Clockwise
CCW	Counterclockwise



SW1 : Power switch
SW3 : Braking start switch
SW5 : RUN/STOP switch
SW6,SW7 : Normal/reverse selector switch

40 W or larger

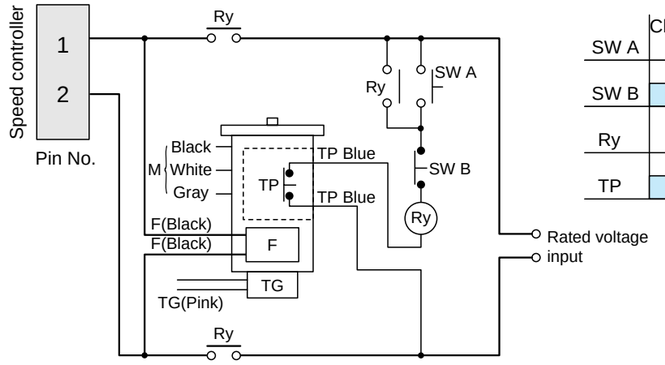


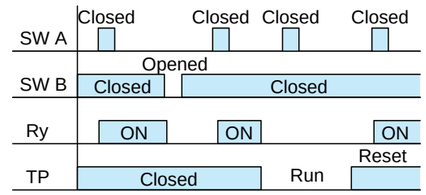
SW1, SW5	100 to 120 V supply system	5 A or more at 125 VAC
SW6, SW7	200 to 240 V supply system	5 A or more at 250 VAC
SW3		DC10 V 10 mA
R1, C1		DV0P008 (option)
R2		DV0P003 (option)

<Precautions>

1. When SW3 and SW5 are moved from RUN to STOP, electric braking operates for approx. 0.5 sec causing the motor to stop immediately. (Do not operate SW6 and SW7 until the motor stops completely.) SW3 and SW5 must be turned on/off simultaneously. Otherwise, abnormal operation occurs (full speed rotation for a short time), causing the motor temperature to rise excessively.
2. Never change the direction of rotation (CCW/CW, SW6, SW7) while the motor is running.
3. The number of start/stop cycles must be 6/min. or less.
4. When using cooling fan motor or motor with thermal protector, also see page C-27.
5. Insert R1 and C1 to protect relay contact.
6. R2 restricts discharge current in case of capacitor short circuit during braking.

5 Wiring of cooling fan motor (F) or motor with thermal protector (TP)





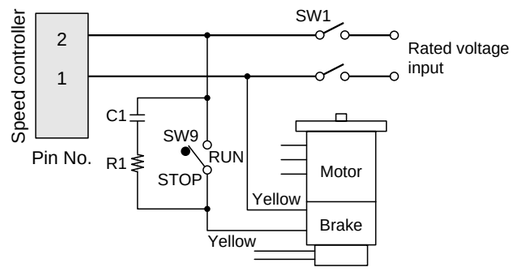
SW A		Momentary N.O. contact
SW B		Momentary N.C. contact
Ry	100 to 120 V supply system	125 VAC 5 A or more 3a contact
	200 to 240 V supply system	250 VAC 5 A or more 3a contact

<Precautions>

1. The thermal protector (TP) is an automatic reset type. To prevent hazards caused by restarting, connect the TP as shown above. Don't connect TP directly to the power supply.
2. Once the TP operates, cooling period is required before the operation can restart.
3. Connect the cooling fan motor (F) across pins 1 and 2 on the power terminal.
4. Motor (M) and tachometer generator (TG) should be connected according to corresponding wiring diagram shown later.

6 Wiring to electromagnetic brake

• Variable speed motor with electromagnetic brake should be wired as shown below.



SW1	100 to 120 V supply system	5 A or more at 125 VAC
SW9	200 to 240 V supply system	5 A or more at 250 VAC
R1+C1		DV0P008 (option)

<Precautions>

1. Operate SW9 simultaneously with RUN/STOP (BRAKE) switching of other switches, if any. Placing other switches to RUN position while the brake is active (SW9 at STOP position) causes the motor to generate heat.
2. For remaining wirings, refer to corresponding wiring diagram.

7 Wiring diagram (for unidirectional rotation)

- The thick continuous lines represent main circuit. Use conductor of size approx. 0.75 mm².
- The thin continuous lines represent signal circuit. Use conductor of size approx. 0.3 mm².
  When the distance from the tachometer generator (TG) is long, use shielded twisted pair cable.

• Soft-start/down control

Soft-start and soft-down times can be adjusted by a single setting.
Use this feature to protect the load from shock caused by sharp speed change at startup and shutdown of the motor.
To disable the soft operation, turn the control fully clockwise.

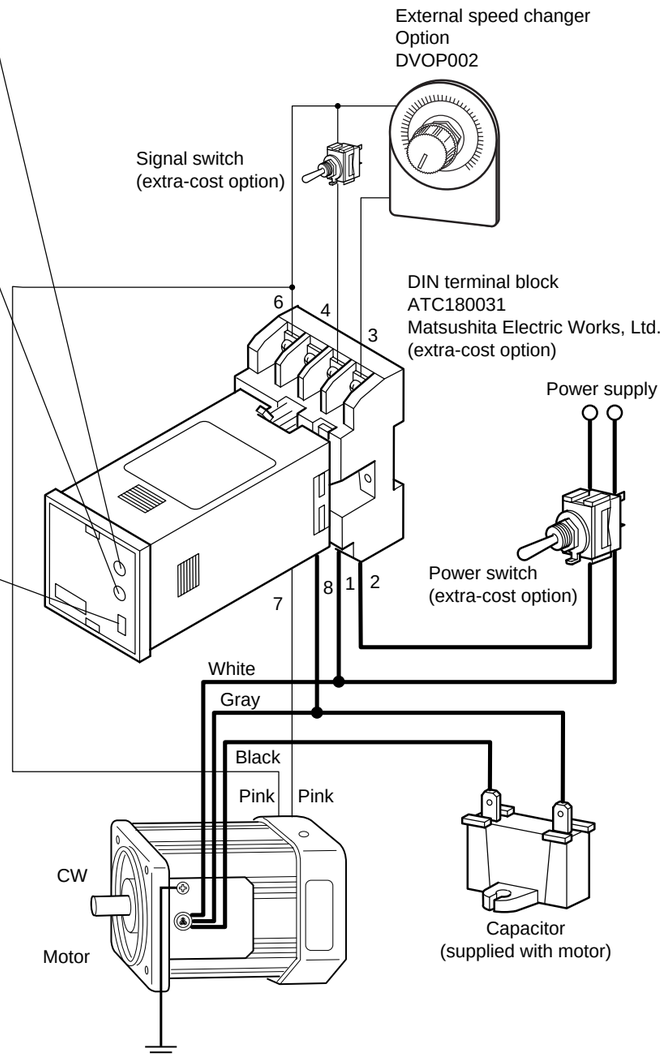
• Maximum speed control

Use this control to adjust the revolving speed when the external speed changer is set at the top speed.
Adjust the speed to 1400 (min-1) or below at 50 Hz; or 1700 (min-1) or below at 60 Hz.
If the external speed setting is not required, the maximum speed control can also be used for setting the speed.

• Response changeover switch

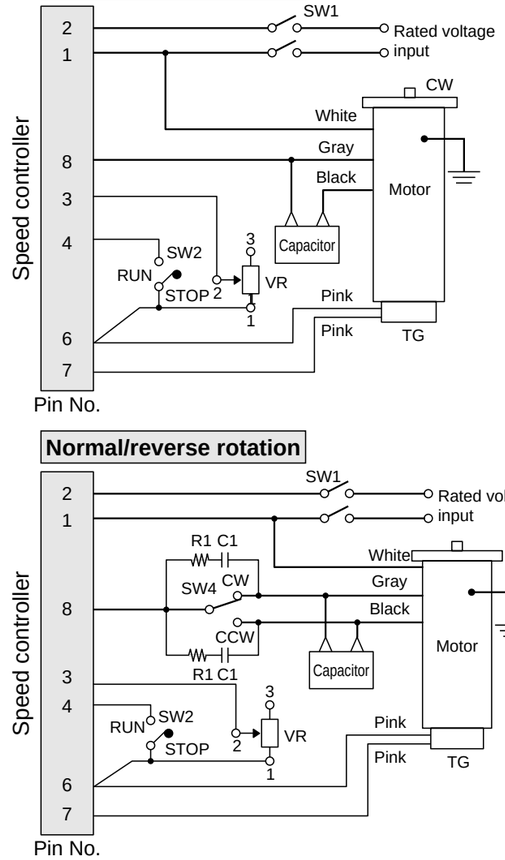
A: High-stable mode
- Keeps the rotation speed variation low against variation in load.
- Enables a wide range of speed control.
- Suitable for capability control.
- May fail to maintain constant rotation speed upon sharp load change.

B: High-response mode
- Enables quick response with low hunting.
- Suitable for positioning application.
- May fail to keep rotation speed variation low against variation in load.
- Not suitable for controlling wide range of speed change.



8 Speed change only

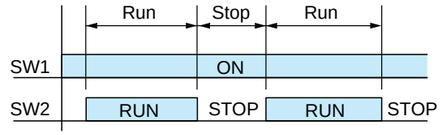
Unidirectional rotation



Pin No.

Rotating direction viewed from shaft end	
CW	Clockwise
CCW	Counterclockwise

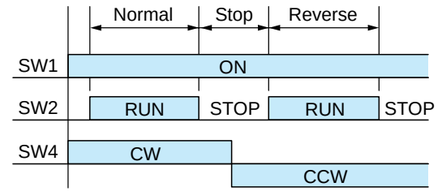
• This wiring diagram causes the motor to rotate clockwise when viewed from the motor shaft end. To run the motor counterclockwise, interchange the connecting point of black and gray leads. interchange the connecting point of black and gray leads.



Normal/reverse rotation

Pin No.

SW1	100 to 120 V supply system	5 A or more at 125 VAC
SW4	200 to 240 V supply system	5 A or more at 250 VAC
SW2		DC10 V 10 mA
R1, C1		DV0P008 (option)
VR		DV0P003 (option)



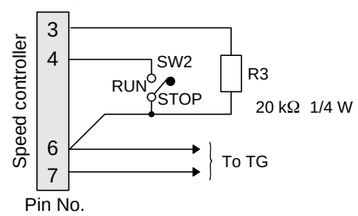
SW1 : Power switch
SW2 : RUN/STOP switch
SW4 : Normal/reverse selector switch

<Precautions>

1. To change rotating direction of induction motor: Provide a motor halt period. Switch over SW2 after complete stop of the motor.
2. To change rotating direction of reversible motor: A motor halt period is not necessary. Switch over SW2 while keeping SW1 turned ON. When configuring SW2 with relay contacts, use a relay having large gap between contacts (e.g. HG/HP relay from Matsushita Electric Works, Ltd.) to prevent malfunction due to short-circuited capacitor.
3. For motors for cooling fan and motors with thermal protector, also refer to page C-35.
4. When using independent relay contacts for SW2 to change over normal/reverse, interlock both contacts so that they will not close simultaneously.
5. The spark killer consisting of R1 and C1 must be used to protect the relay contacts.

Operation from maximum speed control

• When no external speed changer is required, the speed can be adjusted from the maximum speed control.

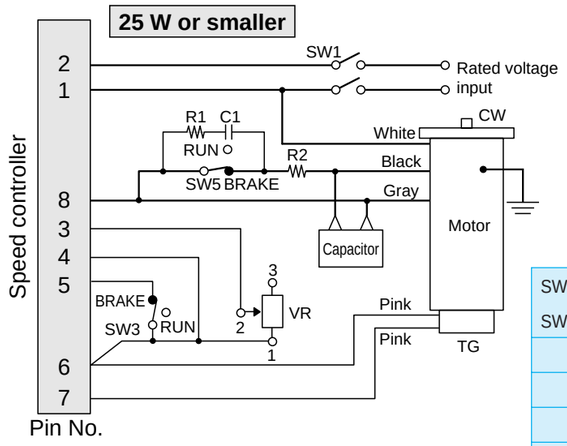


Pin No.

<Precautions>
Connect a fixed resistor (R3) in place of external speed changer (VR).
Even if the R3 is not used (connection across pins 3 and 6 are open), the speed can be adjusted from the maximum speed control within its adjustable range (not full range but almost by half).

9 Unidirectional rotation and electric brake

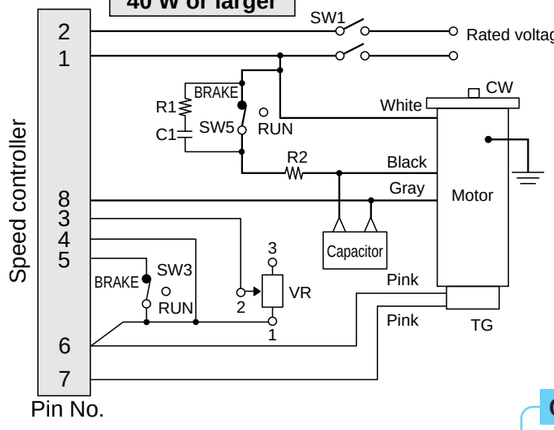
25 W or smaller

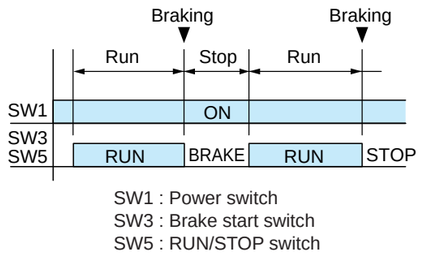


- Connection according to this wiring diagram causes the motor to rotate clockwise when viewed from the motor shaft end. To run the motor counterclockwise, interchange the connecting point of black and gray leads.

SW1	100 to 120 V supply system	5 A or more at 125 VAC
SW5	200 to 240 V supply system	5 A or more at 250 VAC
SW3		DC10 V 10 mA
R1, C1		DV0P008 (option)
R2		DV0P003 (option)
VR		DV0P002 (option)

40 W or larger





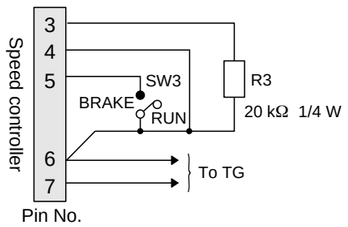
SW1 : Power switch
SW3 : Brake start switch
SW5 : RUN/STOP switch

<Precautions>

1. When SW3 and SW5 are switched from RUN to STOP, electric braking is applied for approx. 5 sec, or until the motor stops.
   SW3 and SW5 must be operated simultaneously. Otherwise, abnormal operation occurs (full speed rotation for a short time), causing the motor temperature to rise excessively.
2. The number of start/stop cycles must be 6/min. or less.
3. When using cooling fan motor or motor with thermal protector, also see page C-35.
4. Insert R1 and C1 to protect relay contact.
5. R2 restricts discharge current in case of capacitor short circuit during braking.

Operation from maximum speed control

- When no external speed changer is required, the speed can be adjusted from the maximum speed control.

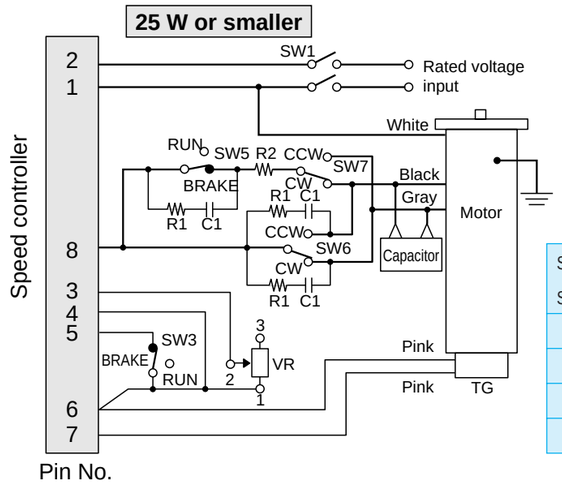


<Precautions>
Connect a fixed resistor (R3) in place of external speed changer (VR).
Even if the R3 is not used (connection across pins 3 and 6 are open), the speed can be adjusted from the maximum speed control within its adjustable range (not full range but almost by half).

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

10 Normal/reverse rotation and electric brake

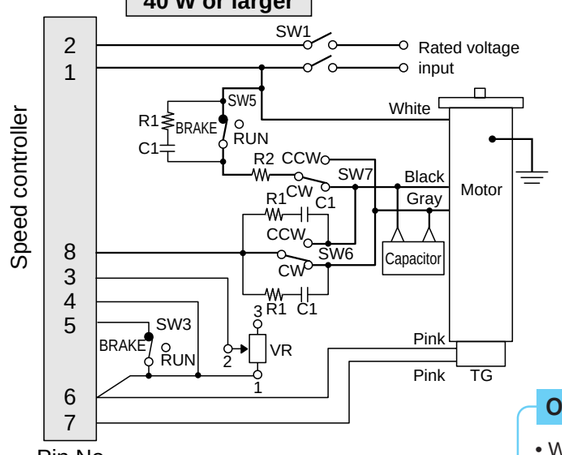
25 W or smaller

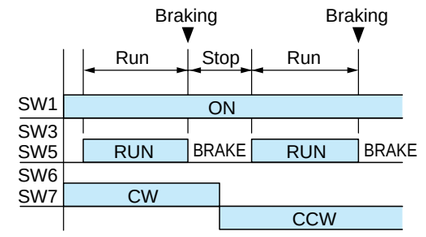


Rotating direction viewed from shaft end	
CW	Clockwise
CCW	Counterclockwise

SW1, SW5	100 to 120 V supply system	5 A or more at 125 VAC
SW6, SW7	200 to 240 V supply system	5 A or more at 250 VAC
SW3		DC10 V 10 mA
R1, C1		DV0P008 (option)
R2		DV0P003 (option)
VR		DV0P002 (option)

40 W or larger





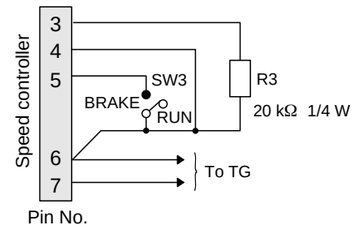
SW1 : Power switch
SW3 : Braking start switch
SW5 : RUN/STOP switch
SW6,SW7 : Normal/reverse selector switch

<Precautions>

1. When SW3 and SW5 are switched from RUN to STOP, electric braking is applied for approx. 5 sec, or until the motor stops. (Do not operate SW6 and SW7 until the motor stops completely.) SW3 and SW5 must be operated simultaneously. Otherwise, abnormal operation occurs (full speed rotation for a short time), causing the motor temperature to rise excessively.
2. Do not change the rotating direction (SW6, SW7) while the motor is running.
3. The number of start/stop cycles must be 6/min. or less.
4. When using cooling fan motor or motor with thermal protector, also see page C-35.
5. Insert R1 and C1 to protect relay contact.
6. R2 restricts discharge current in case of capacitor short circuit during braking.

Operation from maximum speed control

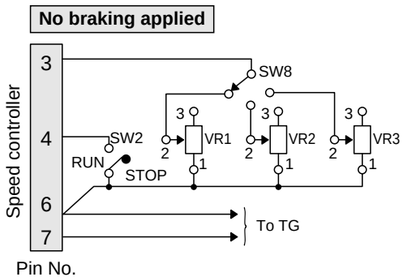
- When no external speed changer is required, the speed can be adjusted from the maximum speed control.

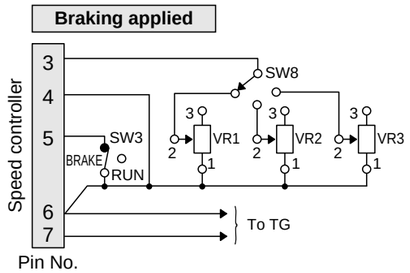


<Precautions>
Connect a fixed resistor (R3) in place of external speed changer (VR).
Even if the R3 is not used (connection across pins 3 and 6 are open), the speed can be adjusted from the maximum speed control within its adjustable range (not full range but almost by half).

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

11 Multispeed setting application



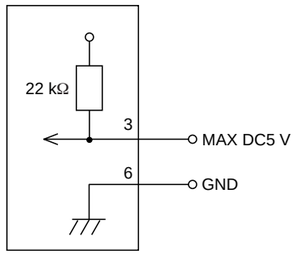


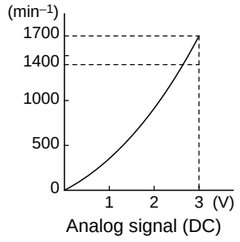
SW2 SW3 SW8	DC10V 10 mA
VR1 VR2 VR3	DV0P002 (option)

<Precautions>

1. Set external speed changers VR1, VR2 and VR3 to 3 different speeds and select the desired speed from SW8.
2. When activating the brake, simultaneously switch over SW3 and RUN-STOP of other switches.
3. For remaining wirings, refer to the corresponding wiring diagrams.

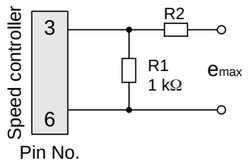
12 Speed change with analog signal





<Precautions>

1. Soft-operation can be adjusted from the soft-start and soft-down controls or by using analog signal.
2. The absolute maximum rating of analog signal is 5 VDC.
   The system should be designed to use standard 3 VDC analog signal. If the signal voltage exceeds 3 VDC, the circuit diagram shown below should be used for wiring.



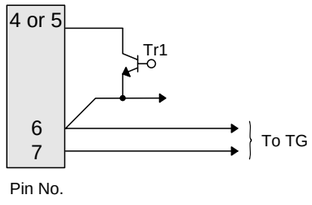
$$R2 \geqq \frac{e_{max}}{3} - 1\ k\Omega$$

emax : Analog signal max. voltage
R1 : External resistor: 1 kW
R2 : External resistor

3. Revolution speed “0” signal should not exceed 0.1 VDC.
4. The percentage ripple of analog voltage signal should be 2% or less.
5. For other wirings, refer to the corresponding circuit/wiring diagrams.

13 Operation through contactless signal

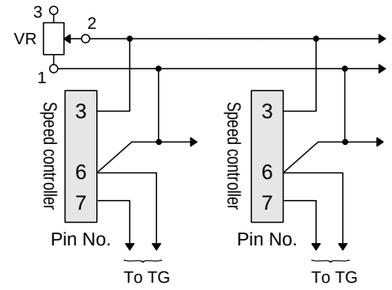
• Small signal relays SW2 and SW3 can be replaced with transistor.



14 Parallel operation through external speed changer

<Precautions>

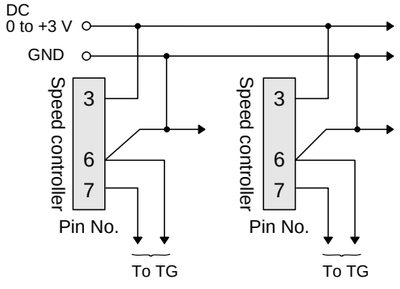
1. The resistance Rs of the external speed changer VR should be as follows:
   Rs = 20/N (kΩ)
   where, N is the number of motors.
2. For synchronous operation or ratio operation, desired revolving speeds must be set from the maximum speed control.
   Soft-start and soft-down controls and operation changeover switch must be set to the same position.
3. Wirings from the external speed changer VR should be connected to the same pins (No.3 and No.6) on the controller.
4. Malfunction may occur as the number of devices operated in parallel increases.
   To secure correct operation, connect a noise filter to each unit.
5. For other electrical connections, refer to corresponding circuit/wiring diagrams.



15 Parallel operation through analog signal

<Precautions>

The input impedance of the controller is approx. 22 kΩ.
The output impedance of the analog signal source should be determined based on the total input impedance of the speed controllers.
For other precautions, refer to [14] Parallel operation through external speed changer and [12] Speed change with analog signal.

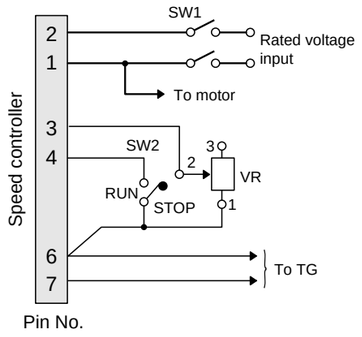


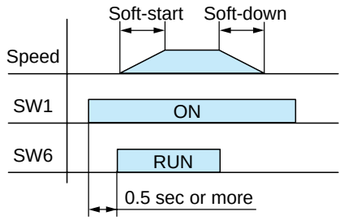
16 Soft-operation

• Soft-start, soft-down

<Precautions>

1. Power switch SW1 should be turned on approx. 0.5 sec before the operation start signal from SW6.
2. When repeating run/stop cycles, turn on/off only SW6 while keeping SW1 turned ON. In this way, the motor can be controlled by using a small signal. To stop operation for a long time, also turn off SW1.
3. Soft-start/soft-down period is the time required for the equipment to start up from stop state to full speed when the external speed changer is set at maximum value.
4. Soft-start/soft-down control, when at the full clockwise position, disables the soft-start/soft-down function.
   As the stop signal is input, power supply to the motor is turned off immediately. However, the revolving speed gradually decreases in proportion to the inertia of the load and motor starts free-running stop sequence.
5. Soft-start/soft-down control can set maximum time length of approx. 5 seconds (Typ. at FCCW). The setting may be exceeded if the inertia of the load is too large.
6. For other electrical connections, refer to corresponding circuit/wiring diagrams.



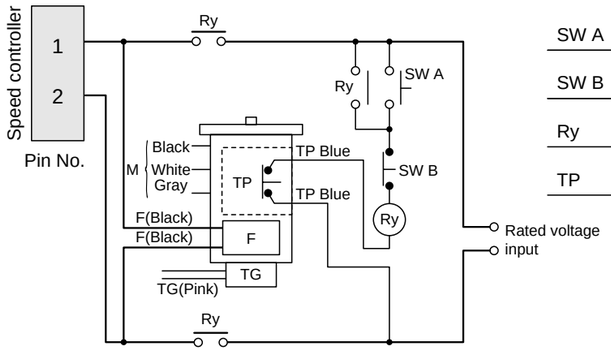


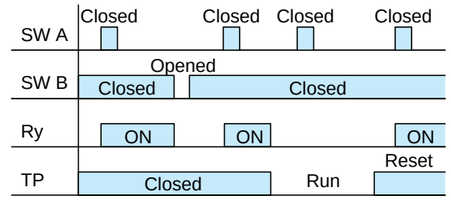
SW1	100 to 120 V supply system	5 A or more at 125 VAC
	200 to 240 V supply system	5 A or more at 250 VAC
SW2		DC10 V 10 mA
VR		DV0P002 (option)

• Soft-start and electric brake

Electrical wirings are the same as for “Unidirectional rotation and electric brake” and “Normal/reverse rotation and electric brake”.
Adjust the soft-start time from the soft-start/soft-down control.

17 Wiring of cooling fan motor and motor (F) with thermal protector (TP)





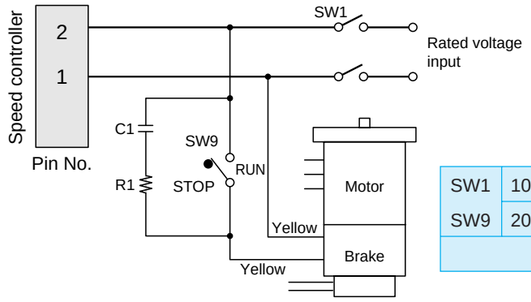
SW A		Momentary N.O. contact
SW B		Momentary N.C. contact
Ry	100 to 120 V supply system	5 A or more at 125 VAC 3a contact
	200 to 240 V supply system	5 A or more at 250 VAC 3a contact

<Precautions>

1. The thermal protector (TP) is an automatic reset type. To prevent hazards caused by restarting, connect the TP as shown above. Don't connect TP directly to the power supply.
2. Once the TP operates, cooling period is required before the operation can restart.
3. Connect the cooling fan motor (F) across pins 1 and 2 on the power terminal.
4. Motor (M) and tachometer generator (TG) should be connected according to corresponding wiring diagram shown later.

18 Wiring to electromagnetic brake

• Variable speed motor with electromagnetic brake should be wired as shown below.



SW1	100 to 120 V supply system	5 A or more at 125 VAC
SW9	200 to 240 V supply system	5 A or more at 250 VAC
R1+C1		DV0P008 (option)

<Precautions>

1. SW9 should be switched to RUN or STOP at the same time as the other switches are switched to RUN or STOP.
   If the other switches are set to RUN while the brake is energized (SW9 in STOP position), the motor will generate heat.
2. For other wirings, refer to the corresponding circuit/wiring diagrams.

UX series　　US series

▼Quick-connect speed controller
▼Industry's first digital speed controller
- Digital control, digital display
- Quick conversion of gear head speed and conveyor speed
- Soft-start, soft-down
- Set locking function

• Features

<UX series>

- Provided with quick-connect socket
- Can be extended up to 5 m through extension cable (option)
- The CPU enables the following various functions:
  1. Digital setting of revolving speeds
  2. Instantaneous conversion of gear head speed and conveyor speed
  3. Digital display of actual speed
  4. Soft-start, soft-down
  5. Backup of setting conditions
  6. Set locking

<US series>

- Provided with quick-connect socket
- Can be extended up to 5 m through extension cable (option)

• Part No.

Capacity	Voltage	UX series	US series
6 W	100 V	**DVUX606L**	**DVUS606L**
	200 V	**DVUX606Y**	**DVUS606Y**
15 W	100 V	**DVUX715L**	**DVUS715L**
	200 V	**DVUX715Y**	**DVUS715Y**
25 W	100 V	**DVUX825L**	**DVUS825L**
	200 V	**DVUX825Y**	**DVUS825Y**
40 W	100 V	**DVUX940L**	**DVUS940L**
	200 V	**DVUX940Y**	**DVUS940Y**
60 W	100 V	**DVUX960L**	**DVUS960L**
	200 V	**DVUX960Y**	**DVUS960Y**
90 W	100 V	**DVUX990L**	**DVUS990L**
	200 V	**DVUX990Y**	**DVUS990Y**

• Specification

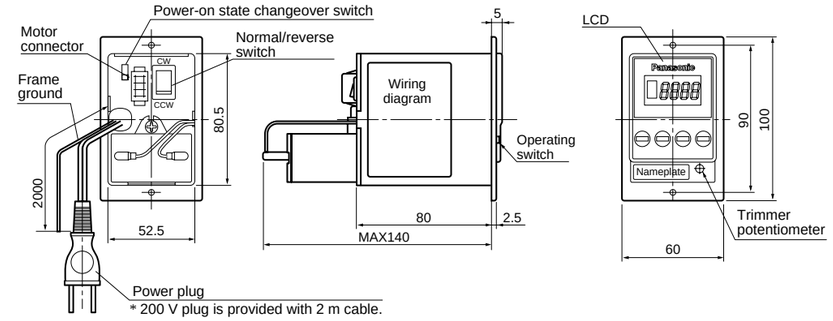
	UX series	US series
Output	6 W : 15 W : 25 W : 40 W : 60 W : 90 W	6 W : 15 W : 25 W : 40 W : 60 W : 90 W
Rated voltage	100 / 200 V	100 / 200 V
Power frequency	50 Hz / 60 Hz	50 Hz / 60 Hz
Speed control range	90 to 1400 min^{-1} / 90 to 1700 min^{-1}	90 to 1400 min^{-1} / 90 to 1700 min^{-1}
Speed variation	5% (standard value)	5% (standard value)
Speed setting	Digital	Analog
Operating temperature	0 to 40˚C	–10 to 40˚C
Storage temperature	–10 to 60˚C	–20 to 60˚C
Soft-start/soft-down time	0.1 to 30 sec	———

• 90 W version is provided with thermal burn-out protector.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

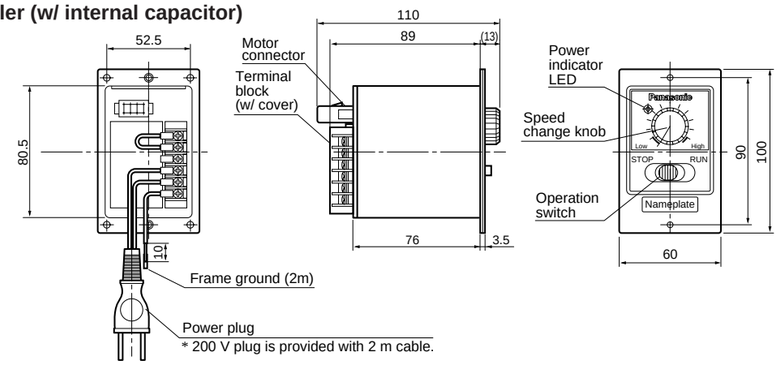
• Outline drawing

UX series

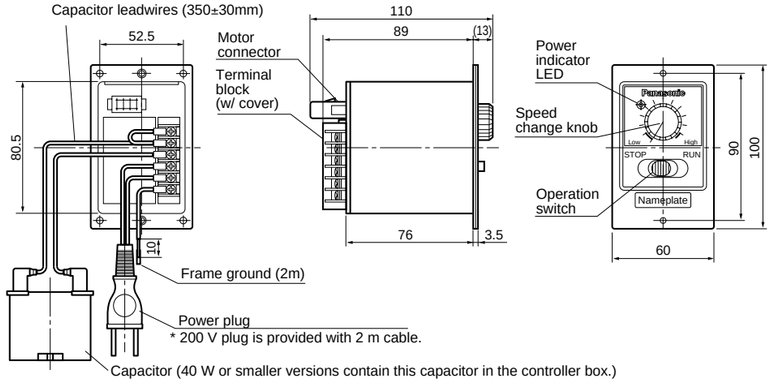


US series

• 40 W or smaller (w/ internal capacitor)

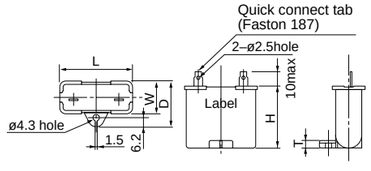


• 60 W or larger



Capacitor

(mm)

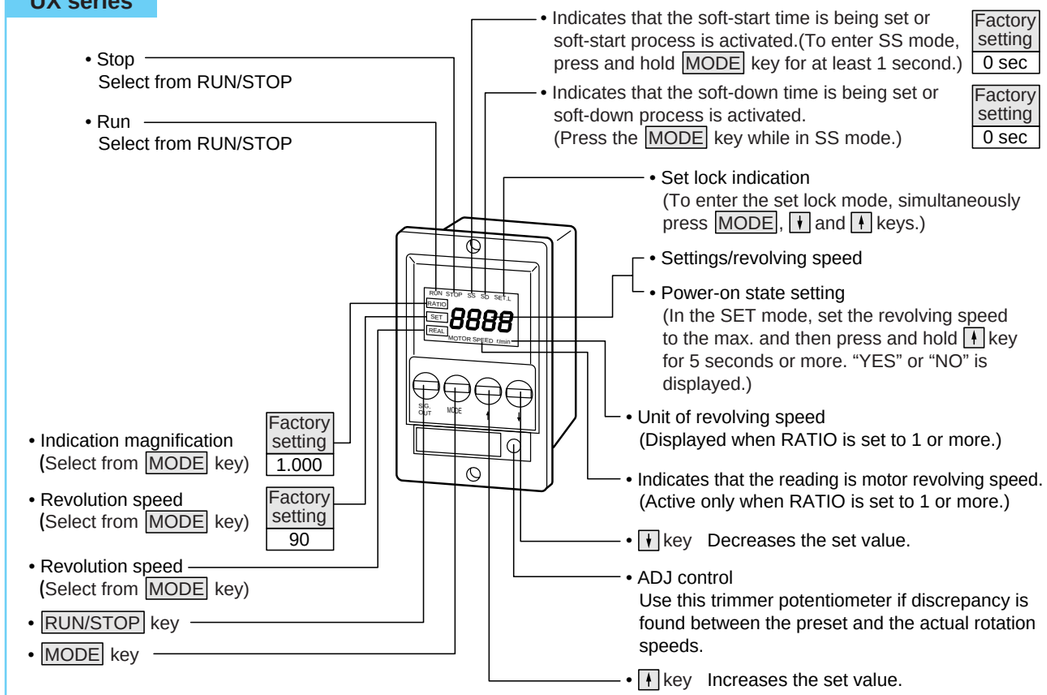


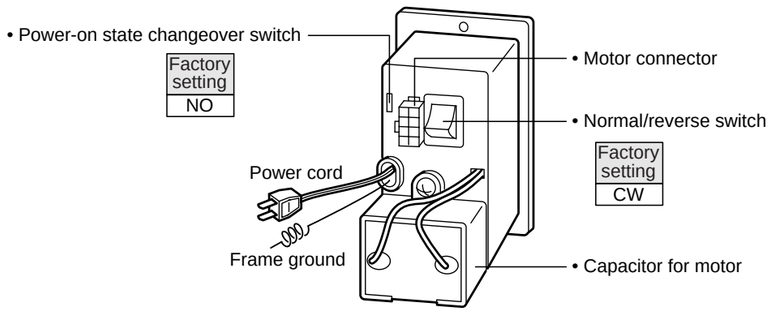
Designation	Capacitor part No.	L	W	D	H	T
MUSN960GL 100 V	**M0PC20M20**	50.2	26.7	37	36	4
MUSN960GY 200 V	**M0PC5M40**	50	30.5	41	41.5	4
MUSN990GL 100 V	**M0PC25M20**	50.2	31	41	42	4
MUSN990GY 200 V	**M0PC6.2M37**	50	30.5	41	41.5	4

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

• Names and functions

UX series

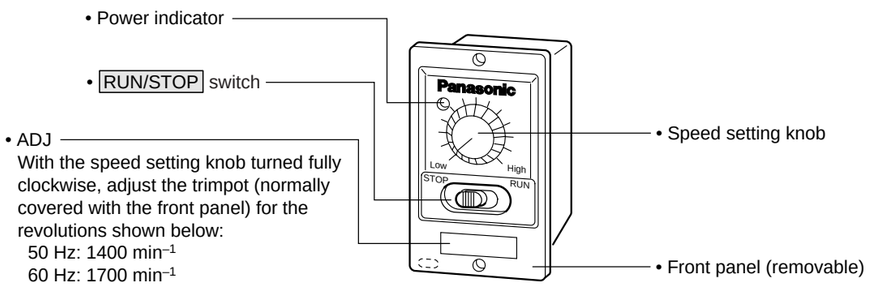




<CAUTION>

1. When using a gear head, check the direction of rotation of its output shaft. The direction is not common to all models.
2. The fan of a fan-cooled motor starts to run as the controller is turned

US series



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

• Modes of operation (UX series)

▶ RATIO mode

By setting the speed in unit of motor revolving speed multiplied by the factor or by displaying the actual speed, gear head output shaft speed or belt conveyor travel speed can be converted. The RATIO mode is used to set the factor. Selection of indication magnification can be made from ▲ and ▼ keys.

Reduction gear ratio setting value (to display the settings in terms of gear head output shaft speed)
<“SET” or “REAL” reading = motor revolving speed divided by gear reduction settings>

The reduction ratios of Panasonic gear head are stored in the unit, choose the suitable one by using ▲ and ▼ keys:
1.000 → 3 →... 100 ...→ 202 ...→ 1000 ...→ 2020

Multiple number setting value (to display the settings in terms of the speed of belt conveyor)
<“SET” or “REAL” reading = motor revolving speed multiplied by multiplication factor)

Multiplication can be set by the factor of 0.005 to 0.995: select the desired one from ▲ and ▼ keys.
1.000 → 0.995 →...→ 0.015 → 0.010 → 0.005
(in unit of 0.005)

▶ SET mode

In this mode, the revolving speed can be set to a value within the range shown below, by using ▲ and ▼ keys.
[With reading magnification 1.000]
Value can be set in unit of 10 min^{-1}.

<Example>
- Power frequency 50Hz :
  90→100→110 ...→ 1400 min^{-1}
- Power frequency 60Hz :
  90→100→110 ...→ 1400 ...1700 min^{-1}

[With reading magnification other than 1.000]
Readings are based on the reading magnification setting in RATIO mode and gear reduction ratio setting. Desired value can be selected among the values shown below, by using ▲ and ▼ keys.

<Example> Reduction gear ratio = 3
Selection unit is 10/3 min^{-1}. The reading rounds off fraction.
- Power frequency 50 Hz:
  29.9 → 33.3 → 36.6 ...→ 466.6 min^{-1}
- Power frequency 60 Hz:
  29.9 → 33.3 → 36.6 ...→ 466.6 ...→ 566.6 min^{-1}

<Example> Magnification = 0.500
Selection unit is 10 x 0.500. The reading rounds off fraction.
- Power frequency 50 Hz:
  45.0 → 50.0 → 55.0 ...→ 700.0
- Power frequency 60 Hz:
  45.0 → 50.0 → 55.0 ...→ 700.0 ... 850.0

[Note] Exception: reading magnification 1.000
“MOTOR SPEED r/min” is displayed.
Only “r/min” is displayed when the value exceeds 1.000.
Otherwise, nothing is displayed.

▶ REAL mode

In the REAL mode, motor's real revolutions multiplied by the reading magnification is displayed.
[Reading magnification 1.000]
The speed is displayed in unit of 5 min^{-1}.

<Example>
0 → 5 ...→ 90 → 100 → 110 ...→ 1400 ...→ 1700 min^{-1}
[With reading magnification other than 1.000]
Readings are based on the reading magnification setting in RATIO mode and gear reduction ratio setting.

<Example> Reduction gear ratio = 3
Selection unit is 5/3 min^{-1}. The reading rounds off fraction.
0 → 1.6 ...→ 29.9 → 33.3 → 36.6 ...→ 466.6 ...→ 566.6 min^{-1}

<Example> Magnification = 0.500
Selection unit is 10 x 0.500. The reading rounds off fraction.
0 → 2.5 ...→ 45.0 → 50.0 → 55.0 ...→ 700.0 ...→ 850.0

[Note] Exception: reading magnification 1.000
“MOTOR SPEED r/min” is displayed.
Only “r/min” is displayed when the value exceeds 1.000.
Otherwise, nothing is displayed.

▶ RATIO mode

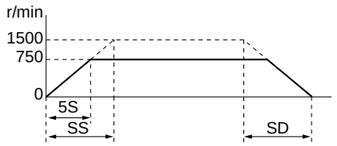
The soft-start time is set in this mode from ▲ and ▼ keys in unit of 0.1 sec, up to 30 sec.
0 → 0.1 → 0.2 → 0.3 → 0.4 ...→ 29.9 30.0 sec

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

▶ SD setting mode

The soft-down time is set in this mode from ↑ and ↓ keys in unit of 0.1 sec, up to 30 sec.

Note 1) Soft-start/down



The soft-start/down time is defined as the time required to change revolving speed between 0 min^{-1} and 1500 min^{-1}.

<Example>

When the soft-start time is set to 10 seconds and "SET" revolving speed is 750 min^{-1}, then,

$$10 \times \frac{750\ min^{-1}}{1500\ min^{-1}} = 5$$

This means that 5 seconds are required to change from 0 min^{-1} to 750 min^{-1}. The same applies to "SD".

Note 2)

In the practical application, speed change time will be longer than the set soft-start/down time if the load inertia is large.

▶ Power-on state setting

The state of the unit upon power-up can be preset from the power-on state setting switch.

(1) " YES"

Upon power-on, the unit reproduces the state as it was turned off.

Previous state		Upon power-on
"RUN"	→	Startup (after approx. 1 sec)
"STOP"	→	Stop

(2) " NO"

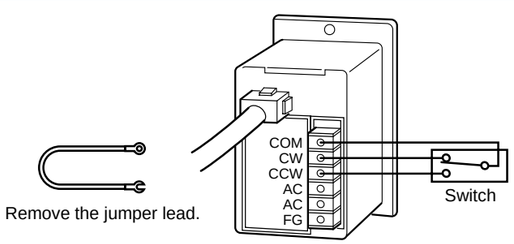
Upon power-on, the unit is in stop mode regardless of the state at the previous power off.
To restart, operate RUN-STOP key.

Previous state		Upon power-on
"RUN"	→	Stop
"STOP"	→	Stop

• Operating method (US series)

1. Connect the "motor connector".
2. Make sure that the RUN/STOP switch is in "STOP" position. Connect the power cable to the AC source.
3. Turn on power. "Power" indicator will light.
4. Place the RUN/STOP switch in "RUN" position, and the motor starts.
   CAUTION: Do not place the switch lever in between RUN and STOP.
5. To stop the motor, move the lever to "STOP" position.
   Note that the RUN/STOP switch does not turn on/off power supply: when not using the motor for a long period, turn off the main power switch.
6. The electric fan, if used with the motor, rotates as the power to the speed controller is turned on and stops as the controller power source is turned off.

• Changing direction of rotation (US series)



Switch specification
• Single-pole double-throw: ON-OFF-ON • 100 V power: 5 A at 200 VAC or more • 200 V power: 3 A at 400 VAC or more

Direction when viewed from motor output shaft end	
Clockwise	Connect COM to CW
Counterclockwise	Connect COM to CCW

• Unidirectional rotatio

Terminal "CW" or "CCW" on the controller rear panel should be left open.

[Note]

When a gear head is connected, the direction of its output shaft may or may not be the same as that of motor shaft depending on the reduction ratio.

• Normal/reverse rotation

When it is necessary to select the rotating direction, connect the switch as shown in the figure.

[Note]

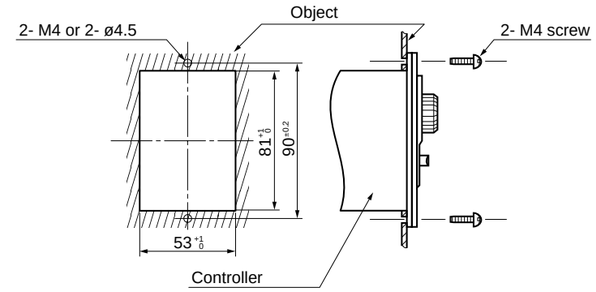
Do not operate this switch while the motor is running.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

• Mounting method (UX series, US series)

<Mounting through square holes>

UX series, US series

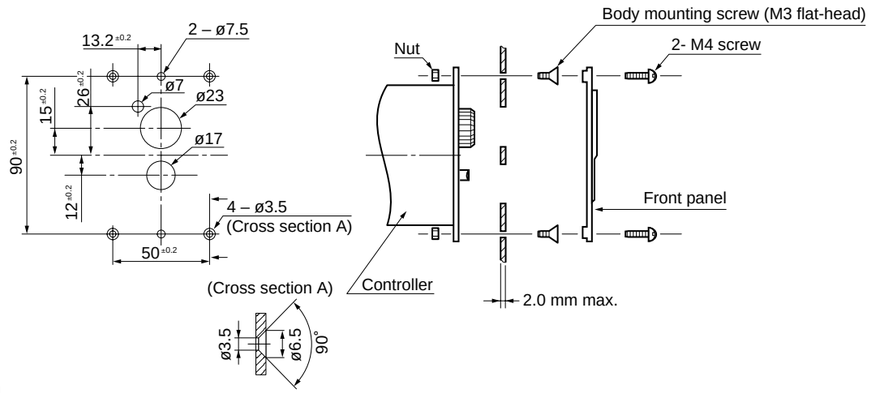


Mounting procedure

1. Drill 2 square holes in the object.
2. Secure the controller and front panel with 2 M4 screws.

<Mounting without using square hole>

US series only



Caution

Wall thickness of the equipment where the controller is to be mounted should be 2 mm or less.

Mounting procedure

1. Drill 2 square holes in the wall of the object.
2. Remove the front panel from the controller.
3. Secure the controller body with M3 flat-head screws and nuts.
4. Place the front panel on the wall and secure the panel with M4 screws and nuts.

<To install controller and motor separately>

When installing the speed controller at a distance more than 1 m from the motor, use optional "extension cord" that is supplied as standard accessory (allowable distance 5 m).

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Speed controller

• Features

- Extremely compact and low noise (compared with preceding models).
- Can control 3-phase 200 V motor by using single-phase 100 V power (use of voltage doubler).
  Single-phase 200 V version is available.
- Easy to operate control knob.
- External normal/reverse switches.
- Applicable to 3-phase motors.

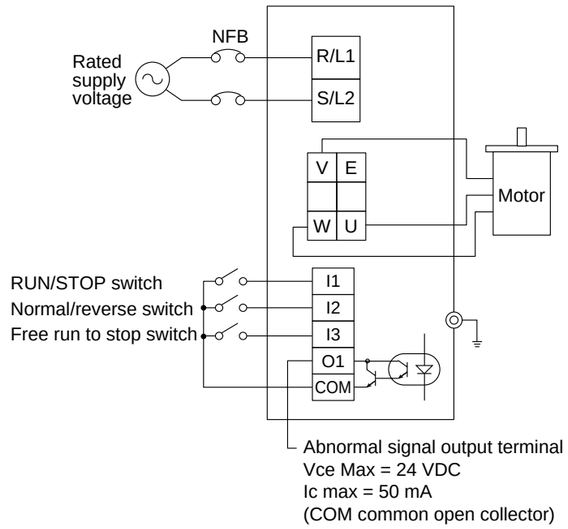
• Standard specification

	Part number		M1G4A1V1X	M1G9A1V1X	M1G4A2V1X	M1G9A2V1X
Output rating	Applicable motor (W)	*1	25/40	60/90	25/40	60/90
	Output volt-ampere (kVA)	*2	0.11/0.16	0.19/0.27	0.11/0.16	0.20/0.28
	Rated output current (A)		0.28/0.4	0.49/0.7	0.28/0.4	0.49/0.7
	Rated output voltage		3-phase 200 to 220 VAC		3-phase 200 to 230 VAC	
Power source	Voltage		Single-phase 100 to 110 VAC		Single-phase 200 to 230 VAC	
	Permissible voltage variation		±10%			
	Frequency		50/60Hz ±5%			
Control method	Controlling system		Low noise sine-wave PWM			
	Output frequency range	*3	1.0 to 120Hz (factory setting: 60 Hz)			
	Acceleration/deceleration time setting	*4	0 to 30 sec			
	Overload current rating		150% 1 min.			
	Regenerative braking torque	*5	Short time average deceleration torque 100%			
	Frequency setting		Panel control			
	Operation switch, normal/reverse switch		Panel switch			
	External signal		(input): operation instruction, normal/reverse instruction, free-run stop; (output): abnormal signal			
Protective function			Undervoltage, overcurrent, overvoltage, instantaneous power interruption, stall, overload shutdown, self-diagnosis trip			
	Electronic-thermal		25 W/40 W	60 W/90 W	25 W/40 W	60 W/90 W
Environmental condition	Ambient temperature		–10˚C to +40˚C (no freezing)			
	Ambient humidity		90% RH (no dewing)			
	Atmosphere		Indoor (free from foreign objects such as corrosive gas and dust)			
	Altitude		Up to 1,000 m			
Protective construction			Closed type (IP20)			

*1. Panasonic 3-phase compact geared motors MoM series 4 models.
*2. Measured at rated output voltage at 220 V (M1GoA1V1X), 230 V (M1GoA2V1X).
*3. When using a gear head, keep the output frequency 60 Hz, or below.
*4. When set to “0”, actual time is 0.05 sec.
*5. Regenerative braking torque refers to a short-time averaged deceleration and not a continuous torque.
Deceleration at a frequency higher than the fundamental frequency provides lower torque. No internal braking resistor is provided.
* Before using the product, carefully read through “Instruction manual” to understand the safety precautions and operation of it.

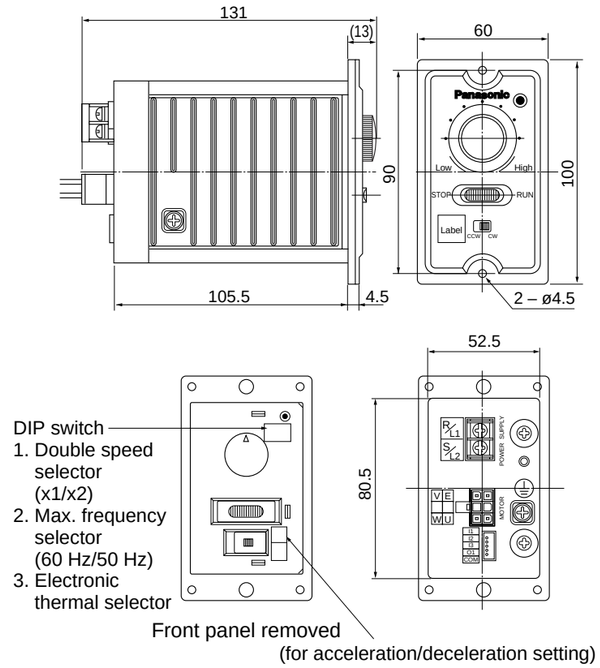
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

• Layout drawing



Prepare optional parts before connecting the unit to motor external terminal.

• Outline drawing

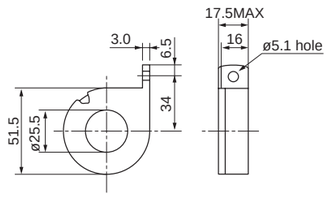


* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

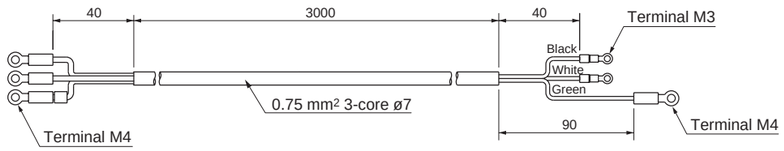
Speed controller

• Option

• Data line filter (DV0P031)

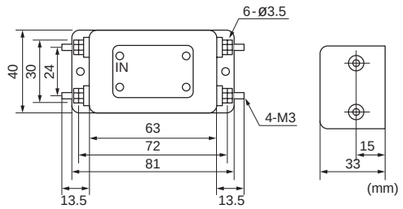


• Power supply cord (DV0P137)

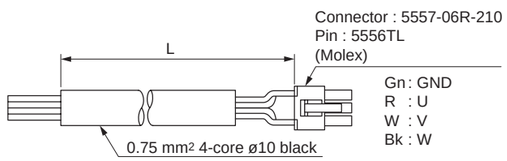


Bk : Power supply
W : Power supply
Gn : GND

• Noise filter (DV0P140)

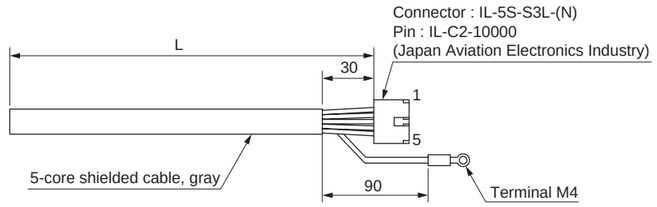


• Motor extension cord



Option part No.	L (m)
DV0P13802	2
DV0P13803	3
DV0P13805	5

• External control extension cord



Option part No.	L (m)
DV0P13902	2
DV0P13903	3
DV0P13905	5

Connector No.	Conductor color	Terminal symbol
1	W	I1
2	R	I2
3	Bk	I3
4	Y	O1
5	Gn	COM

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Brake Unit

Contents

Brake Unit Overview

Outline of Brake Unit

- These units are electric brakes that can stop motor immediately.
- These brake units are divided into the contact (separate) type and contactless (48 mm sq.) type.
- Separate type brake units can be used with 3-phase motor.
- The contactless 48 mm sq. type brake units can be used with induction motor, reversible motor and electromagnetic brake motor.

Product designation

• Separate type

DZ9 — Separate type brake unit

1 — Voltage
- 1: Single-phase 100 VAC
- 2: Single-phase 200 VAC
- 3: 3-phase 200 VAC

02 — Type
- SD type
- EX type

• Sq.48 mm contactless brake unit

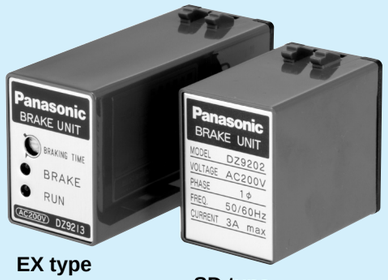
DVMB — Brake unit

48 — Size
- 48 mm sq.

1 — Output
- 1: For induction motor
- 2: For reversible motor
- 3: For electromagnetic brake motor

L — Voltage
- L : 100 V
- Y : 200 V

Brake Unit — Contacting type



EX type SD type

- These brake units are electric brakes used to instantaneously stop motors.
- These electric brakes have longer life expectancy and can perform inching operation.

• Features

<SD type>

1. Compact 8P plug-in configuration.
2. Can be used in combination with other commercially available SSR (contactless relay).
   These combinations enable the use of electrical signals for “run” and “quick stop” control of motors.
3. The electric brake operates for approx. 0.5 sec.

<EX type>

1. Can be controlled using electrical signal.
   Electrical signal can be used for “run”, “quick stop” and “coast to stop” control of motors.
2. Operation time of the electric brake is adjustable.
   Operation time is set to a suitable value within the range from 0.1 to 2 sec
3. “Run” and “Instantaneous stop” lamps are provided.

• Names and functions

• Braking time control

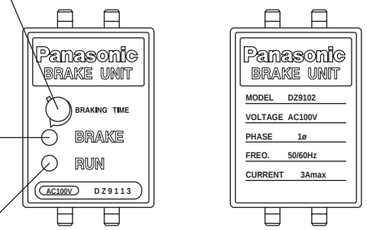
Adjusts the time up to 2 sec (standard). Since longer braking current increases motor temperature, the shortest time necessary to stop the motor is the recommended setting.

• Brake lamp

Lights in red while the braking current is flowing.

• Run lamp

Lights in green while the motor is running.



EX type SD type

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Brake Unit — Contacting type

• Models and applicable motors

		SD type			EX type	
	Rated voltage	DZ9102	DZ9202	DZ9302	DZ9113	DZ9213
Induction motor Reversible motor	Single-phase 100 V	○	------	------	○	------
	Single-phase 200 V	------	○	------	------	○
3-phase motor	3-phase 200 V	------	------	○	------	------

• Specification

<SD type>

Item \ Part No.	DZ9102	DZ9202	DZ9302
Rated voltage	Single-phase 100 V	Single-phase 200 V	3-phase 200 VAC
Power frequency	50/60 Hz		
Permissible current	Operation current 3 A		
Applicable motor	3 to 90 W		
Braking method	Feeds electric braking current for a specified time		
Electric braking time	0.5 sec (typ)		
Operating temperature	–10 to 50˚C		
Storage temperature	–10 to 60˚C		

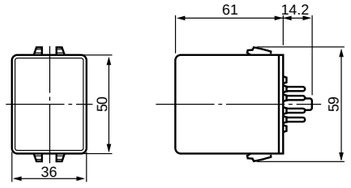
<EX type>

Item \ Part No.	DZ9113	DZ9213
Rated voltage	Single-phase 100 V	Single-phase 200 V
Power frequency	50/60 Hz	
Permissible current	Operation current 3 A	
Applicable motor	3 to 90 W	
Braking method	Feeds electric braking current for a specified time	
Electric braking time	Variable up to 2 sec (typ)	
Operating temperature	–10 to 50˚C	
Storage temperature	–10 to 60˚C	

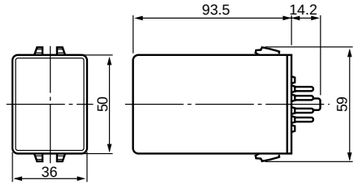
[Notes]
1. Electric braking system has no holding torque.
2. For application requiring holding force, use Panasonic electromagnetic brake motor.
3. When braking a load with excessively large inertia, related issues are strength and life of motor shaft and gear. For these subjects, consult us.
4. When using motor other than compact geared motor, consult us.

• Outline drawing

SD type

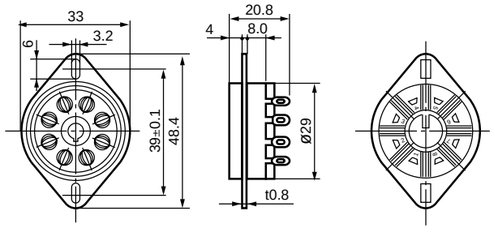


EX type

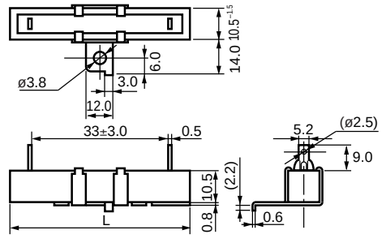


Accessories

• Socket (common to SD and EX)



• External resistor for braking (for DZ9302 only)

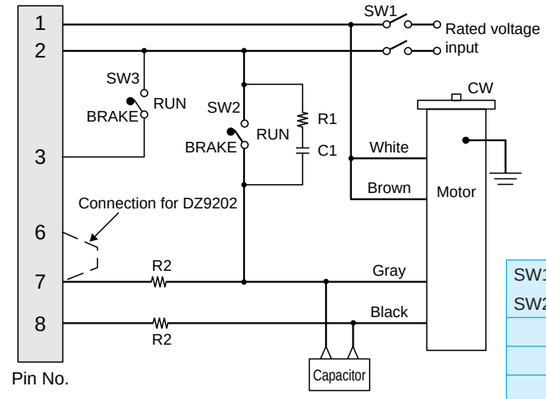


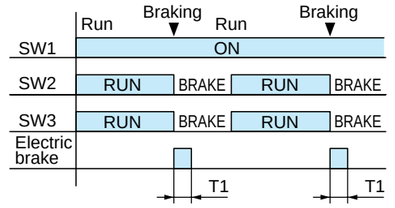
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Brake Unit — Contacting SD type

The thick continuous lines in the circuit diagram below represent main circuit. Use conductor of approx. 0.75 mm². The thin continuous lines represent signal circuit. Use conductor of size approx. 0.3 mm².

• DZ9102 and DZ9202 fundamental electrical wiring diagram (induction motor)





• When wired as shown above, the motor turns clockwise when viewed from the shaft end. To turn it counterclockwise, exchange brown and gray leads.

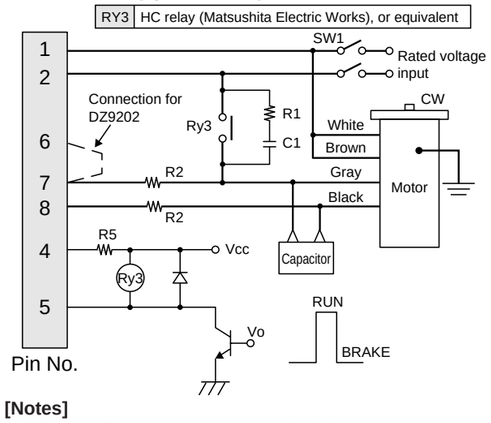
SW1	100 V supply system	5 A or more at 125 VAC	
SW2	200 V supply system	5 A or more at 250 VAC	
SW3		DC10V 10mA	
R1+C1		DVOP008 (option)	
Motor		25 W or smaller	40 W or larger
R2	100 V supply system	0 Ω	30 Ω (approx. 100 W)
	200 V supply system	0 Ω	100 Ω (approx. 100 W)

[Notes]
1. When SW2 and SW3 are switched from RUN to BRAKE, electric brake is applied for approx. 0.5 sec (T1) causing the motor to stop quickly.
2. Both SW2 and SW3 should be switched from RUN to BRAKE at the same time.
3. The wattage of R2 depends on frequency of start and stop operations. First check the power dissipation.

Control signal

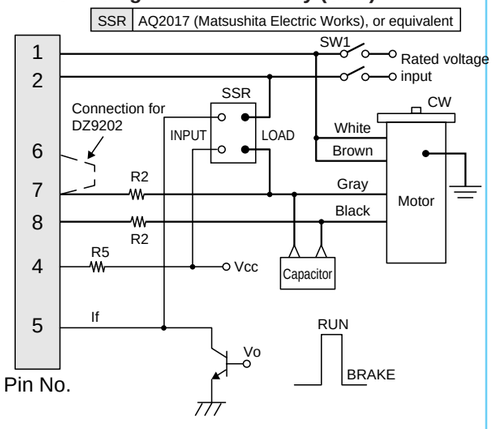
• When using power relay

RY3 | HC relay (Matsushita Electric Works), or equivalent



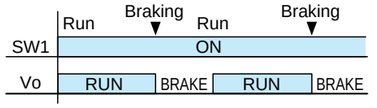
• When using contactless relay (SSR)

SSR | AQ2017 (Matsushita Electric Works), or equivalent



[Notes]
1. Use 0 W R5 when Vcc is below 6 VDC.
   When Vcc is 6 VDC or higher, determine the value of R5 according to the equation shown below.
   Ripple of Vcc should be 5% or below. (Internal resistance 220 W)
   - Resistance of R5 $R5 = \frac{Vcc - 6\ V}{If}$ at If = 15 to 20 mA
   - Example Vcc = 24 V If = 20 mA

     $R5 = \frac{24 - 6}{20 \times 10^{-3}} = 900\ \Omega \fallingdotseq 1\ k\Omega$



2. Also refer to SSR handling precaution (see contactless relay catalog).

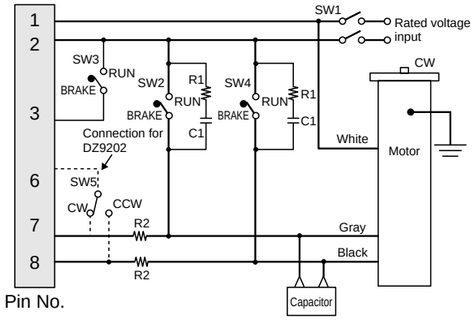
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Brake Unit

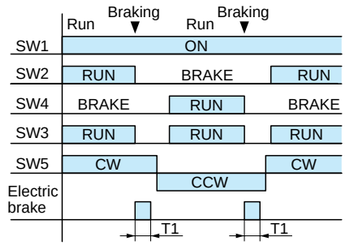
Contacting SD type

The thick continuous lines in the circuit diagram below represent main circuit. Use conductor of approx. 0.75 mm². The thin continuous lines represent signal circuit. Use conductor of size approx. 0.3 mm².

• DZ9102 and DZ9202 standard electrical diagram (reversible motor)



Rotating direction viewed from shaft end	
CW	Clockwise
CCW	Counterclockwise

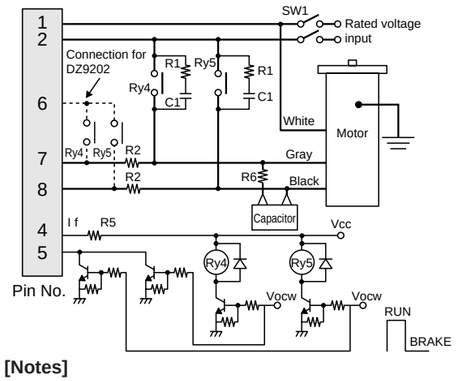


[Notes]
1. When SW2 (SW4) and SW3 are switched from RUN to BRAKE, electric brake is applied for approx. 0.5 sec (T1) causing the motor to stop quickly.
2. Never place both SW2 and SW4 in RUN position at the same time.
3. Never select RUN while electric brake is applied (T1).
4. When using DZ9202, do not operate SW5 while the electric brake is being applied (T1).
5. The wattage of R2 should be determined based on frequency of start and stop operations. First check the power dissipation.

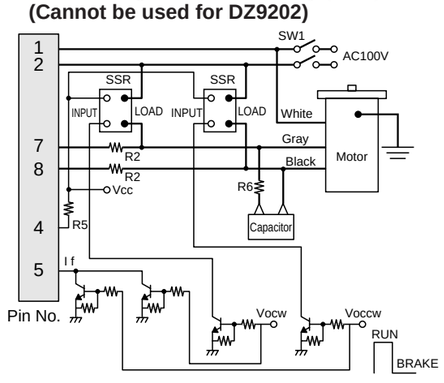
SW1, SW2	100 V supply system	5 A or more at 125 VAC	
SW4, SW5	200 V supply system	5 A or more at 250 VAC	
SW3		DC10 V 10 mA	
R1+C1		DV0P008 (option)	
Motor		25 W or smaller	40 W or larger
R2	100 V supply system	0 Ω	30 Ω (approx. 100 W)
	200 V supply system	0 Ω	100 Ω (approx. 100 W)

Control signal

• When using power relay

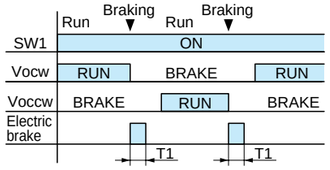


• When using contactless relay (SSR) (Cannot be used for DZ9202)



[Notes]
1. Use 0 W R5 when Vcc is below 6 VDC.
   When Vcc is 6 VDC or higher, determine the value of R5 according to the equation shown in description for induction motor.
   Ripple of Vcc should be 5% or below. (Internal resistance 220 W)
2. Ry4 and Ry5 should be relay or electromagnetic contactor with the rated voltage two or more times the power supply voltage and the rated current 3 A or more.
3. Do not place Vocw and Voccw in RUN at the same time.
4. Be sure to use resistor R6 to protect relay, SSR and capacitor. Current will flow through R6 - 2 A 90 W; 1.7 A 60 W; 1 A 40 W; 0.6 A 25 W; 0.4 A 15 W.
5. Also refer to SSR handling precaution (see contactless relay catalog).

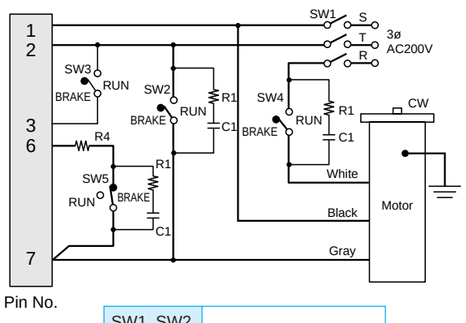
SSR	AQP107 (Matsushita Electric Works), or equivalent
R6	10 Ω



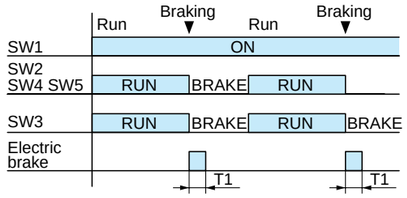
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

The thick continuous lines in the circuit diagram below represent main circuit. Use conductor of approx. 0.75 mm². The thin continuous lines represent signal circuit. Use conductor of size approx. 0.3 mm².

• DZ9302 fundamental electrical wiring diagram (3-phase motor)

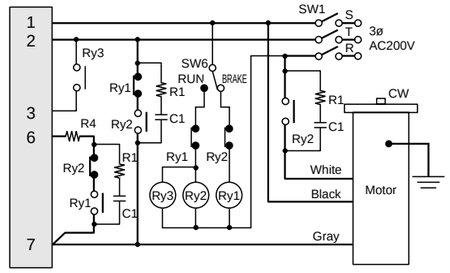


SW1, SW2 SW4, SW5	AC250 V 10 A min.
SW3	DC10 V 10 mA
R1+C1	DV0P008 (option)
R4	Accessory

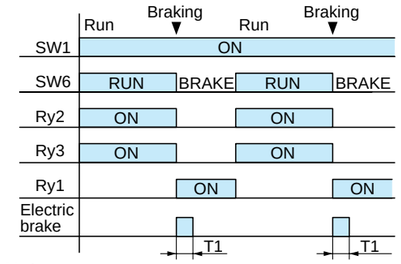


[Notes]
1. When SW2, SW3 and SW4 are switched from RUN to BRAKE, electric brake is applied for approx. 0.5 sec (T1) causing the motor to stop quickly.
2. Do not place these switches to RUN position while the electric braking is applied (T1).
3. A massive amount of current will flow through SW2, SW4 and SW5. Use a disconnecting device (switch or relay) rated at 10 A or more. When using a relay, use HP/HG (Matsushita Electric Works, Ltd.) or equivalent.

• For application using inching motion frequently
If SW2 and SW5 emit long sparks, use of the following circuit is recommended.



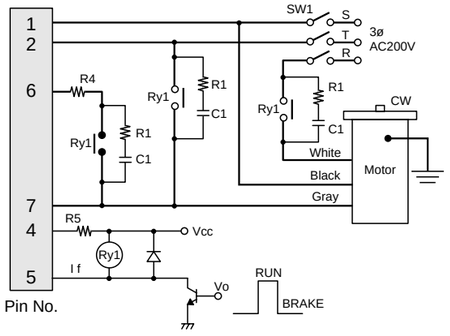
SW1, SW6	AC250 V 10 A min.
RY1, RY2	Relay HP/HG (Matsushita Electric Works, Ltd.) or equivalent
R1+C1	DV0P008 (option)
R4	Accessory
RY3	Twin contact or Au-clad contact relay



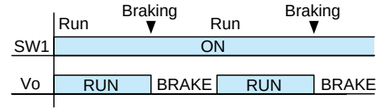
[Notes]
Ry1 and Ry2 should be interlocked to avoid simultaneous “ON”.

Control signal

• When using power relay



RY1	Relay HP/HG (Matsushita Electric Works, Ltd.) or equivalent



[Notes]
1. Use 0 W R5 when Vcc is below 6 VDC.
   When Vcc is 6 VDC or higher, determine the value of R5 according to the equation shown below.
   Ripple of Vcc should be 5% or below.
   (Internal resistance 220 W)

   • Resistance of R5 $R5 = \frac{Vcc - 6\ V}{If}$ at If = 15 to 20 mA

   • Example Vcc = 24 V If = 20 mA

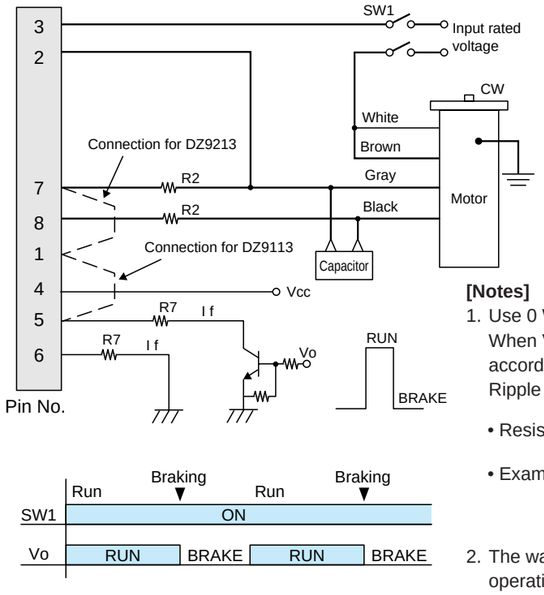
   $R5 = \frac{24 - 6}{20 \times 10^{-3}} = 900\ \Omega \fallingdotseq 1\ k\Omega$

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Brake Unit — Contacting EX type

The thick continuous lines in the circuit diagram below represent main circuit. Use conductor of approx. 0.75 mm². The thin continuous lines represent signal circuit. Use conductor of size approx. 0.3 mm².

• DZ9113/DZ9213 fundamental electrical wiring diagram (unidirectional rotation and braking)



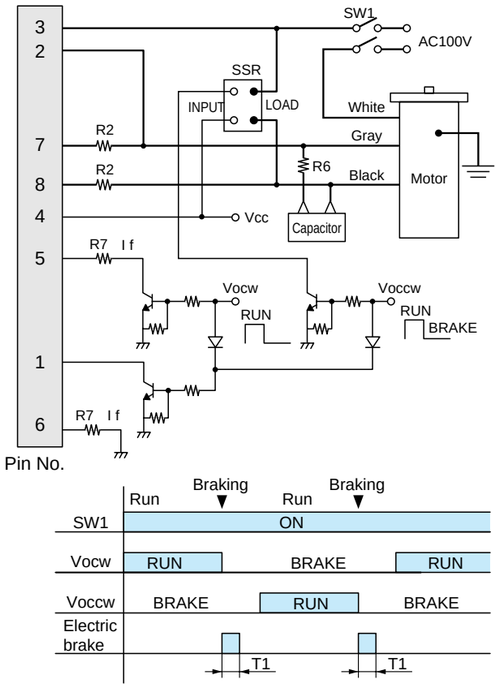
• When wired as shown left, the motor turns clockwise when viewed from the shaft end. To turn it counterclockwise, exchange brown and gray leads.

SW1	100 V supply system	5 A or more at 125 VAC	
	200 V supply system	5 A or more at 250 VAC	
Motor		25 W or smaller	40 W or larger
R2	100 V supply system	0 Ω	30 Ω (approx. 100 W)
	200 V supply system	0 Ω	100 Ω (approx. 100 W)

[Notes]

1. Use 0 W R5 when Vcc is below 6 VDC.
   When Vcc is 6 VDC or higher, determine the value of R5 according to the equation shown below.
   Ripple of Vcc should be 5% or below. (Internal resistance 90 W)
   - Resistance of R7 $R7 = \frac{Vcc(MIN) - 6\ V}{If}$ at If = 32 to 45 mA
   - Example: Vcc (MIN) = 12 V If = 40 mA
     $R7 = \frac{12 - 6}{40 \times 10^{-3}} = 150\ \Omega$
2. The wattage of R2 depends on frequency of start and stop operations. First check the power dissipation.

• DZ9113 application wiring diagram (normal/reverse rotation and braking)



Motor	Single-phase 100 V Reversible motor
SSR	AQP107 (Matsushita Electric Works, Ltd.) or equivalent
R6	10 Ω

[Notes]

1. For information on R2, SW1, etc., not found in this figure, refer to the fundamental electrical diagram shown above.
2. For information on the SSR, refer to the related documents available from the contactless relay manufacturer.
3. The rated voltage of SSR should be 2 times or more the power supply voltage and the surge rating should be 100 A or more.
4. Be sure to use resistor R6 to protect SSR and capacitor.
   Current will flow through R6 - 2 A 90 W; 0.7 A 60 W; 1 A 40 W; 0.6 A 25 W; 0.4 A 15 W. Determine the wattage by first checking the heat dissipation.
5. Never turn on the motor while the electric braking is operating (T1).
6. Do not place Vocw and Voccw in RUN position at the same time.
7. For Vcc and R7, refer to “Unidirectional rotation and braking” above.

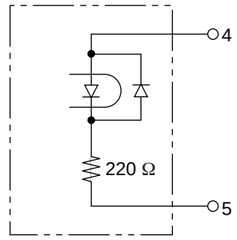
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Brake Unit — SD type, EX type

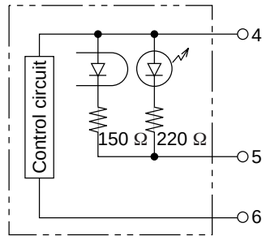
The thick continuous lines in the circuit diagram below represent main circuit. Use conductor of approx. 0.75 mm². The thin continuous lines represent signal circuit. Use conductor of size approx. 0.3 mm².

• Contactless signal input driving

• These are internal equivalent circuits that may be used for contactless signal driving devices such as TTL and MOSIC.

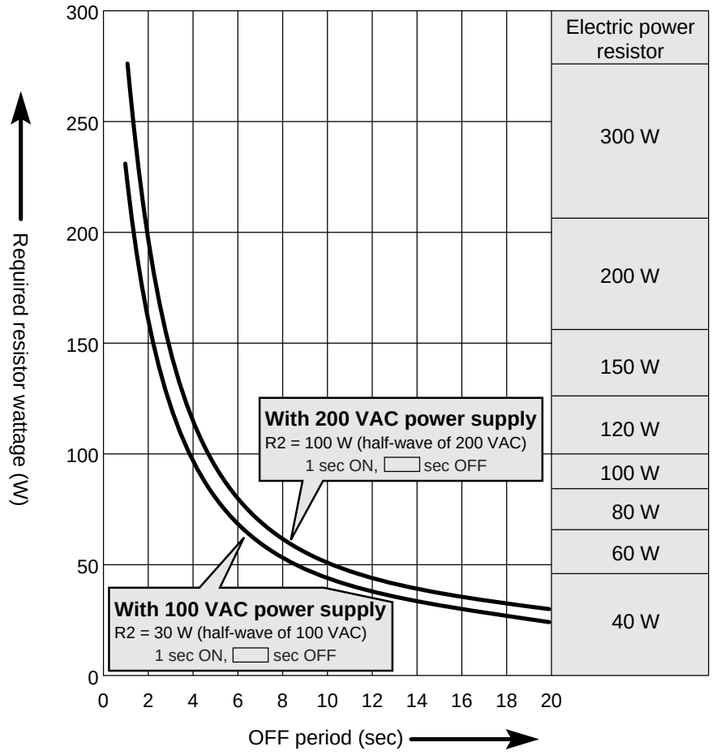


SD type



EX type

• Wattage of fixed resistor (R2)



[Notes]

The curves shown above are required wattage of electric power resistor R2 to maintain the surface temperature of it at 200˚C or below when it is driven with WR (average on/off cycle power) and 35% load factor.
Load factor = 35% ON duration (braking time) = 1 sec (fixed)

1. When 100 VAC supply WR = 476/(Toff + 1)
2. When 200 VAC supply WR = 571/(Toff + 1)

Example: 10 sec run; 5 sec stop; 1 sec braking; under 100 VAC
WR = 476 / [(10 + 5 + 1) + 1] = 31.7 W

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Brake Unit

48 mm sq. contactless type

• Features

- **Maintenance-free**
  Unlike a relay control panel, wiring is not necessary. Contactless configuration requires no maintenance.
- **Various motor capacities can be selected.**
  Can support 1 W to 90 W motors. With 40 W or larger motors, selection can be made with the brake torque switch.
  Brake resistor is not required and wiring is simplified.
- **Easier standardization of panel design**
  Control panel can be sized to DIN standard at lower total cost.
- **Various options**
  One option, mounting frame, for example, allows installation of the unit on the panel.
- **Soft-braking capability**
  The brake torque switch has “LOW” position. In this position, the brake torque is reduced.
- **Braking time**
  Time is simply adjustable from the selector switch.

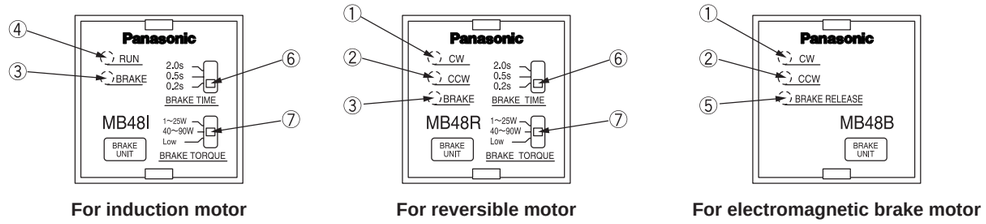
• Specification

Item \ Part No.	DVMB481L	DVMB481Y	DVMB48RL	DVMB48RY	DVMB48BL	DVMB48BY
Rated voltage	Single-phase 100 VAC	Single-phase 200 VAC	Single-phase 100 VAC	Single-phase 200 VAC	Single-phase 100 VAC	Single-phase 200 VAC
Operating voltage	±10% at rated voltage					
Power frequency	50/60 Hz					
Applicable motor	Induction motor		Reversible motor		Electromagnetic brake motor	
Selection of applicable motor	Selectable from changeover switch		• 1 W to 25 W • 40 W to 90 W • LOW		---	
Electric brake operating time	Selectable from changeover switch 2/0.5/0.2 sec				---	
Normal/reverse rotation	×		○		○	
Electric brake	○		○		×	
Electromagnetic brake drive	×		×		○	
Control voltage input	DC12 to 24 V (±10%)					
Operating temperature	–10˚C to 40˚C					
Storage temperature	–20˚C to 60˚C					
Operating humidity	85% RH or below (no dewing)					

[Notes]
1. Electric braking system has no holding torque.
2. Reversible motor is provided with a simple constant sliding brake with slight holding force. For application requiring larger holding force, use Panasonic electromagnetic brake motor.
3. When braking a load with excessively large inertia, related issues are strength and life of motor shaft and gear. For these subjects, consult us.
4. When using motor other than compact geared motor, consult us.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

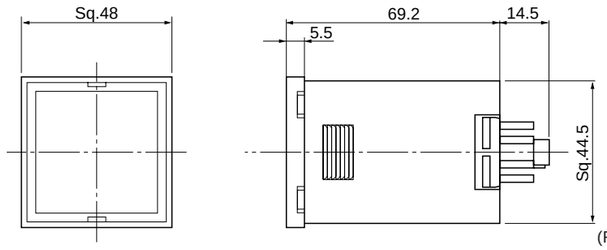
• Names and functions



For induction motor | For reversible motor | For electromagnetic brake motor

	Name	Functional description
1	CW lamp	Indicates that the motor output shaft is rotating CW.
2	CCWlamp	Indicates that the motor output shaft is rotating CCW.
3	BRAKElamp	Indicates that the electric brake is being applied.
4	RUNlamp	Indicates that the motor is operating.
5	BRAKE RELEASElamp	Indicates that current is flowing through the electromagnetic brake. (Brake is released as the electromagnetic brake is energized.)
6	BRAKE TIME selector	Adjust the application time of electric brake according to inertia of the load. Standard setting is 0.2 sec (recommended)
7	BRAKE TORQUE selector (selection of motor output)	1 W to 25 W — For motor of 1 W to 25 W 40 W to 90 W — For motor of 40 W to 90 W Low — To reduce impact during braking with motor of 1 W to 90 W

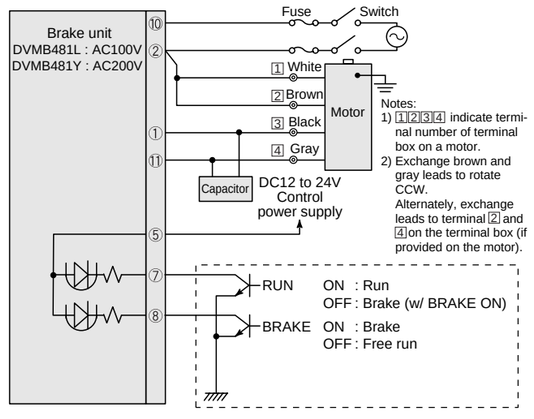
• Outline drawing



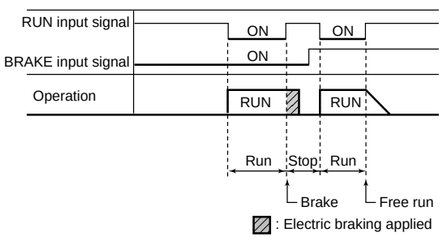
(For recommended terminals, refer to page D-5.)

• Fundamental electrical wiring diagram (induction motor)

<Wiring diagram>



<Operating method>



[Notes]
1. Connect the brake unit only to a single motor.
2. The thick continuous lines represent main circuit. Use conductor of size approx. 0.75 mm^2.
3. Never input RUN signal while electric braking is applied.

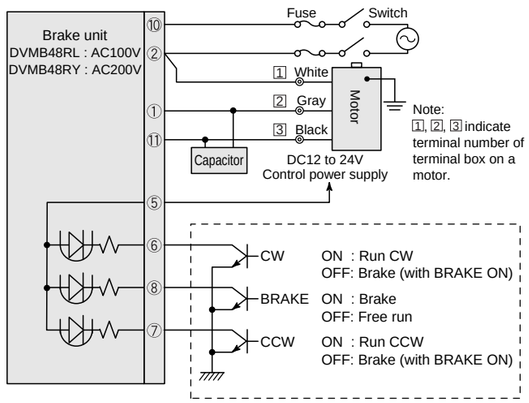
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Brake Unit

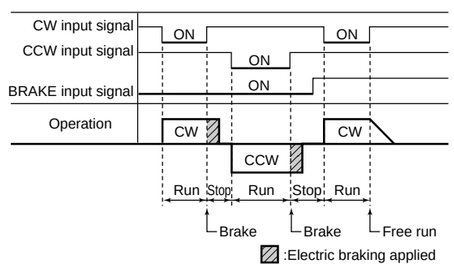
48 mm sq. contactless type

• Fundamental electrical wiring diagram (reversible motor)

<Wiring diagram>



<Operating method>

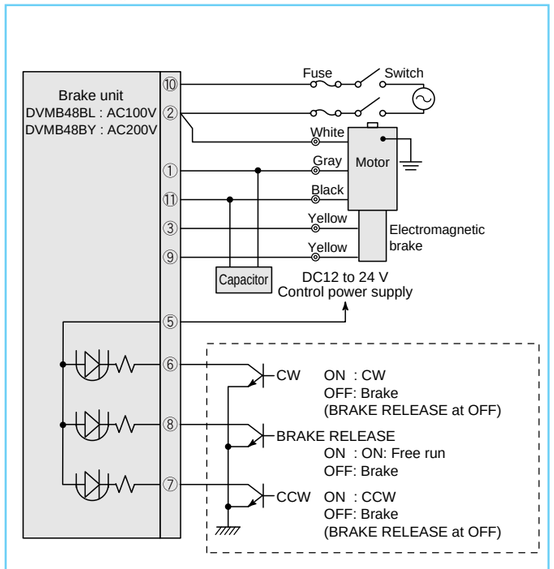


[Notes]

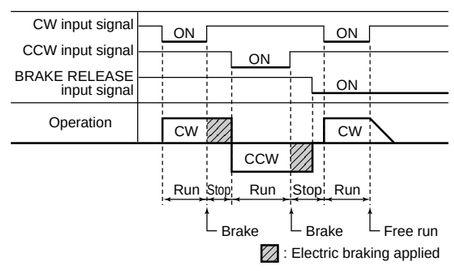
1. Connect the brake unit only to a single motor.
2. The thick continuous lines represent main circuit. Use conductor of size approx. 0.75 mm^2.
3. Never input CW and CCW signals simultaneously. The motor won't turn and may be damaged (burnt) by excessive current.
4. Do not apply the direction change and run signal while electric braking is being applied.

• Fundamental electrical wiring diagram (electromagnetic brake motor)

<Wiring diagram>



<Operating method>

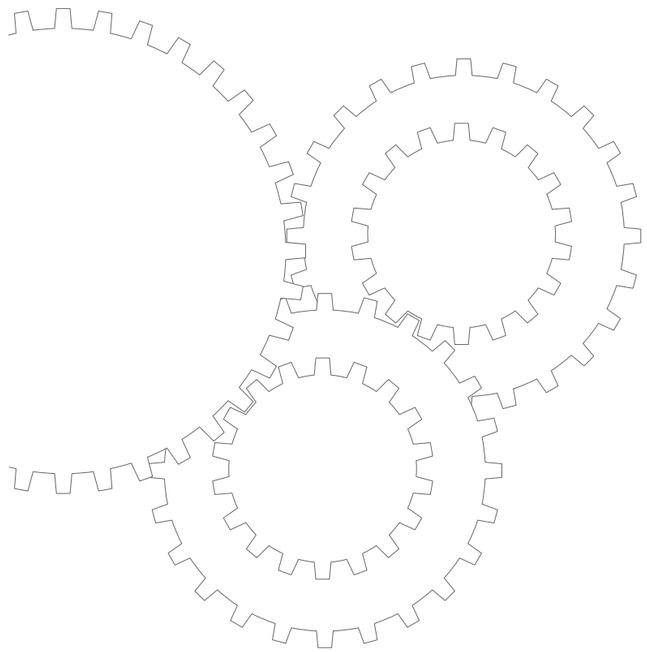


[Notes]

1. Connect the brake unit only to a single motor.
2. The thick continuous lines represent main circuit. Use conductor of size approx. 0.75 mm^2.
3. Never input CW and CCW signals simultaneously. The motor won't turn and may be damaged (burnt) by excessive current.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Options

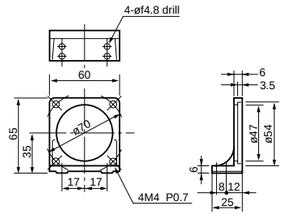


Options

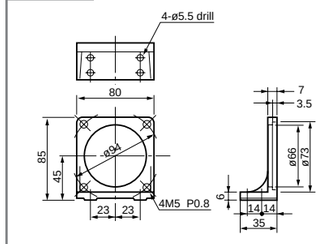
• Mounting frame and dimensions

<Outer-base type*>

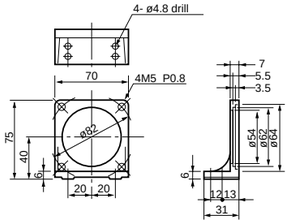
60 mm sq. M6B2



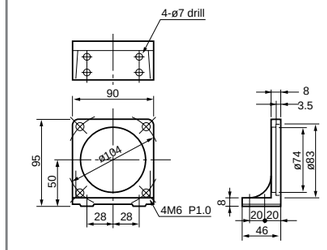
80 mm sq. M8B2



70 mm sq. M7B2

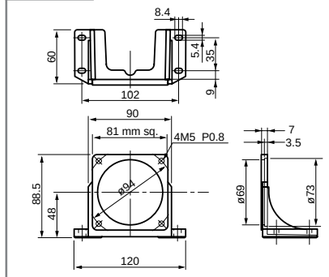


90 mm sq. M9B2

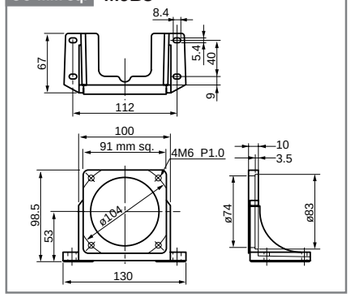


<Inner-base type*>

80 mm sq. M8B3



90 mm sq. M9B3

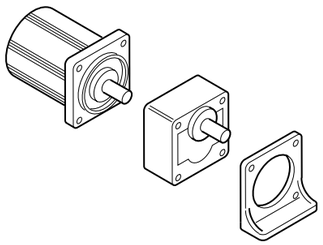


* Not attachable to a hinged gear head or C&B motor.

* Outer-base type: A motor is attached outside the base mounting position.
* Inner-base type: A motor is attached inside the base mounting position.

• Mounting arrangement

Motor + Gear head + Mounting frame



• Application

Size	Mounting frame Part No.
60 mm sq.	**M6B2**
70 mm sq.	**M7B2**
80 mm sq.	**M8B2**
	M8B3
90 mm sq.	**M9B2**
	M9B3

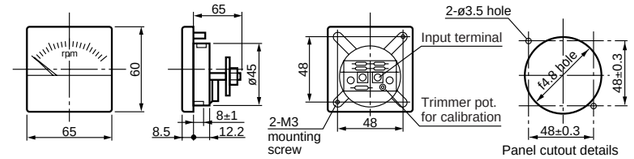
• Decimal gear head mounting screw

Part No.	Size	Supporting model	Standard quantity	Specification
M0PM4001	60 mm sq.	MX6G10XB	4 pcs.	Cross recessed pan head screw M4 x 85
M0PM5001	70 mm sq.	MX7G10XB	4 pcs.	Cross recessed pan head screw M5 x 95
M0PM5002	80 mm sq.	MX8G10XB	4 pcs.	Cross recessed pan head screw M6 x 115
M0PM6002	90 mm sq.	MZ9G10XB	4 pcs.	Cross recessed pan head screw M6 x 65
M0PM6003	90 mm sq.	MX9G10XB	4 pcs.	Cross recessed pan head screw M6 x 100
M0PM6004	90 mm sq.	MZ9G10XB	4 pcs.	Cross-recessed hex head bolt M6 x 125

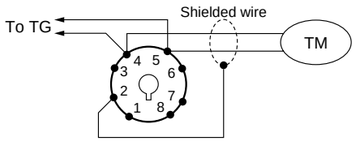
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

• Tachometer (DV0P001)

The motor speed can be easily indicated.
This meter is especially designed for Panasonic controllers only.



<Accessories>
Mounting hardware M3 [2- flat washer, 2- spring washer, 2- hexagon nut



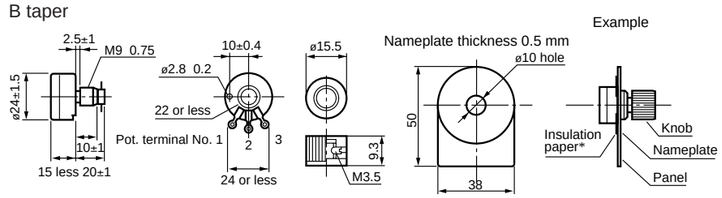
TM: Tachometer
TG: Tachometer generator

<Precautions>

1. Tachometer should be wired in parallel with TG.
2. When the wires for the tachometer (TM) becomes too long, use a twisted shielded wire in place.
3. Calibrate the readings with the trimmer potentiometer on the back of TM.
   Calibration : 1. Measure the motor speed with a revolution counter.
   2. Measure the frequency f of the voltage from TG.
   Rotation speed N (min^{-1}) = 5f (Hz)

• External speed setter (DV0P002)

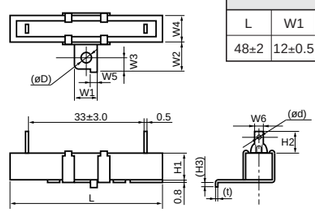
20 kΩ 1/4 W B taper



* Insert the insulation paper to positively isolate the terminals and chassis.

• External braking resistor (DV0P003)

5.6 Ω 10 W



Size (mm)												
L	W1	W2	W3	W4	W5	W6	H1	H2	H3	D	d	t
48±2	12±0.5	14±1	6±0.5	10.5±1.5	3±0.3	5.2±0.5	10.5±1.5	9^{+3}_{-1}	(2.2)	(3.8)	(2.5)	(0.6)

<Notice>
DVOP003 has 5.6 Ω resistance.
When using commercial resistor, select 4.7 to 6.8 W and power rating 10 Ω or more.

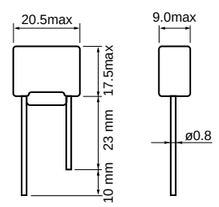
<Precautions>

- The resistor dissipates heat: do not touch.
- Mount the resistor to nonflammable material.

• Spark killer (DV0P008)

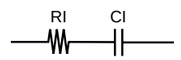
0.1 μF 120 Ω

Use a spark killer to protect the main speed control circuit and switches.



<Notice>

1. DVOP008 internal capacitor is 0.1 mF and internal resistance is 120 W. When using commercially available ones, follow the



R1 = 10 – 200 Ω (1/4 W or larger)
C1 = 0.1 – 0.33 μF (125/250 VAC)

2. This spark killer cannot be used for 400 V model.
   Use a spark killer rated at 400 V or higher.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Options

• Unit type motor extension cord

When the distance between the controller and the motor is longer than 1 m, use a suitable extension cord shown right.

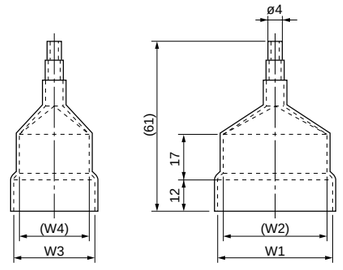
Part No.	Length
DV0P0321	1 m
DV0P0322	2 m
DV0P0323	3 m
DV0P0324	4 m
DV0P0325	5 m

The 1 m cord is supplied with the motor.

• Capacitor cap

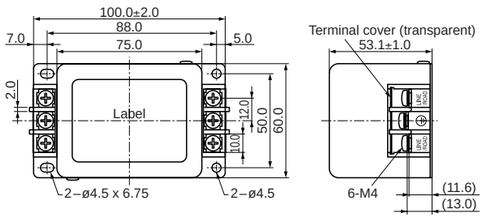
Part No.	W1	W2	W3	W4
M0PC3917	39.5	37.5	17	15
M0PC3922	39.5	37.5	22	20
M0PC3926	39.5	37.5	26	25
M0PC5026	50	48	26	22
M0PC5032	50	48	32.5	29.5

[Notes] 1. 10 caps are packed in one bag.
2. We accept the order for caps in unit of bag.

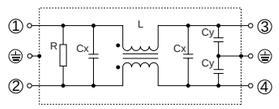


• Noise filter

DV0P3611-5

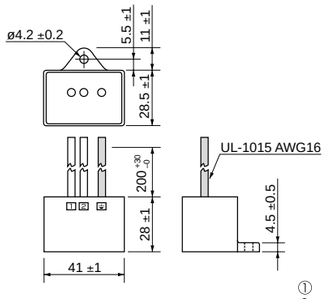


<Circuit diagram>

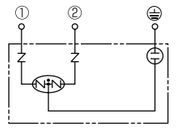


• Surge absorber

DVOP4190

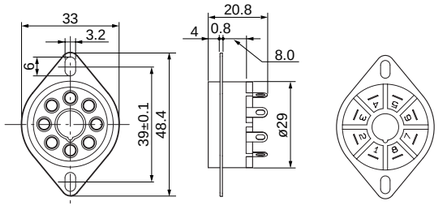


<Circuit diagram>



• 8-pin socket

DV0P4560



* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Recommended components

Matsushita Electric Works, Ltd.

• Combination of the set and recommended components
(The customer should arrange the recommended components.)
These are products of Matsushita Electric Works, Ltd.

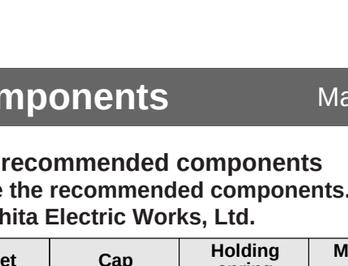
		DIN terminal block	Socket	Cap	Holding spring	Mounting frame	Protective cover	Rail Fastening plate
Speed controller	MGSD	AT7803 ATC180031	AW68102	AD8013	AT7808 (only for MGSD)	AT785* AT781* AT782* AT7831 AT7841 (for flush mounting)	AT7881 (only for MGSD)	———
	EX	AT7803	AW68102 (accessory)			———	———	
	SD48 EX48	ATC180031	AW68102	AD8013	———	ATA4811	AQM4801	ATA48011 ATA4806
Brake unit	SD	AT7803	AW68102 (accessory)	AD8013	AT7808 (only for SD)	AT785* AT781* AT782* AT7831 AT7841 (for flush mounting)	———	———
	EX					———		
	MB48	ATC180041	———	ATA4861	———	ATA4811	AQM4801	ATA48011 ATA4806

• DIN terminal block

AT7803

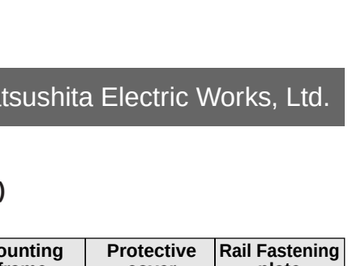
8-pin

ATC180031



8-pin

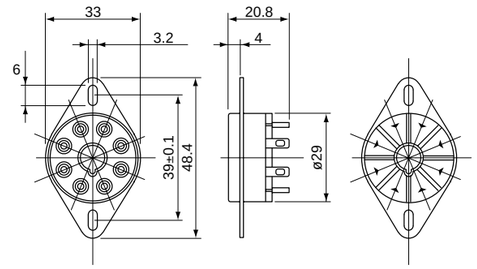
ATC180041



11-pin

• Socket

AW68102



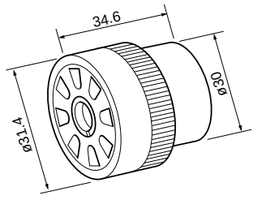
8-pin

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

Recommended components

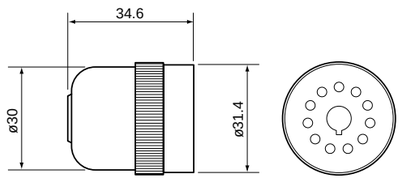
• Cap

AD8013



8-pin

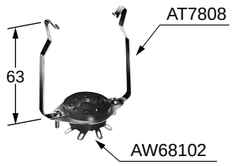
ATA4861



11-pin

• Holding spring

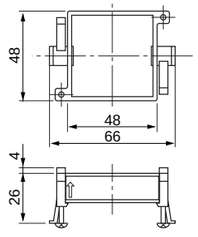
AT7808

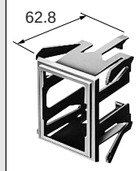
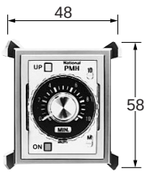
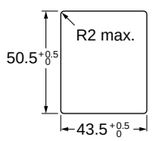
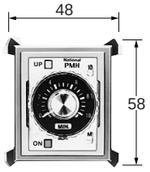
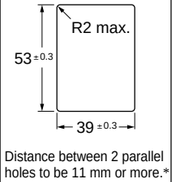
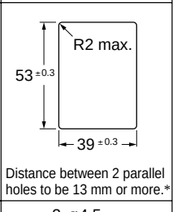
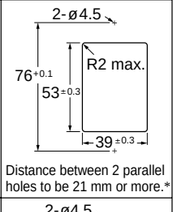
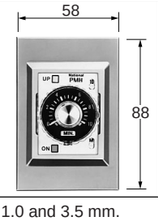
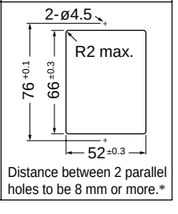


Available in unit of 50 pcs./bag

• Mounting frame

ATA4811



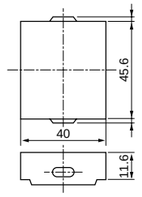
	Shape	Color	Model No.	Front view	Size of mount hole (unit: mm) Recommended hole size
H type		Gray	◎AT7851		 Distance between 2 parallel holes to be 6.5 mm or more.*
		Black	◎AT7852		
		Silver gray	◎AT7853		
K type		Gray	◎AT7811		 Distance between 2 parallel holes to be 11 mm or more.*
		Black	◎AT7812		
		Silver gray	◎AT7813		
MHP type		Gray	◎AT7821		 Distance between 2 parallel holes to be 13 mm or more.*
		Black	◎AT7822		
		Silver gray	◎AT7823		
MHP type		Gray	◎AT7831		 Distance between 2 parallel holes to be 21 mm or more.*
S type		Gray	◎AT7841		 Distance between 2 parallel holes to be 8 mm or more.*

Note 1: Compatible panel thickness is between 1.0 and 3.5 mm.
Note 2: * The distance between holes when mounting the controllers in parallel.
Note 3: Mounting frames shown above are not applicable for EX type controller.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

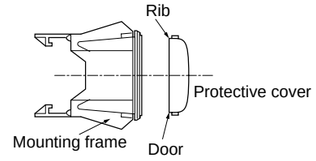
• Protective cover

AT7881

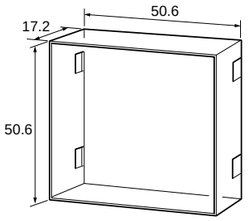


Snap the protective cover into the mounting frame, accessing from the front side of the frame, with the protective cover rib kept warped by fingers pressing on the arrow mark on the protective cover. This can be done, whether or not the mounting frame has a unit in it.

1. The cover attached after the speed setting prevents wrong operation and serves as a dust cover.
2. The cover is applicable to any of the flush type mounting frames.

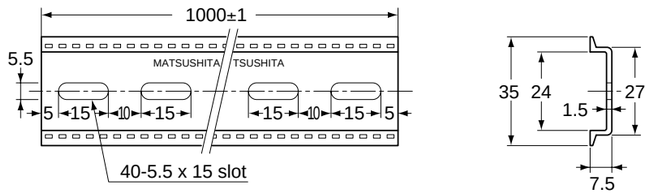


AQM4801



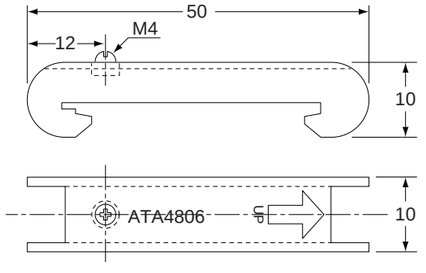
• DIN rail

ATA48011



• Fastening plate

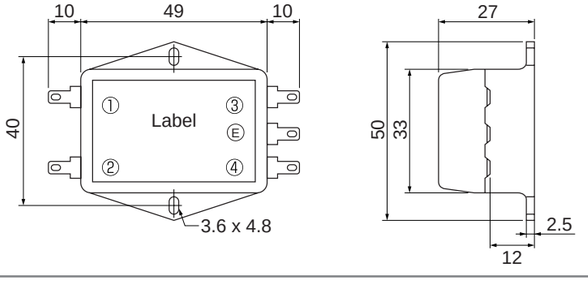
ATA4806



• Noise filter

MR-2043

Manufacturer:
NEC Tokin Corporation

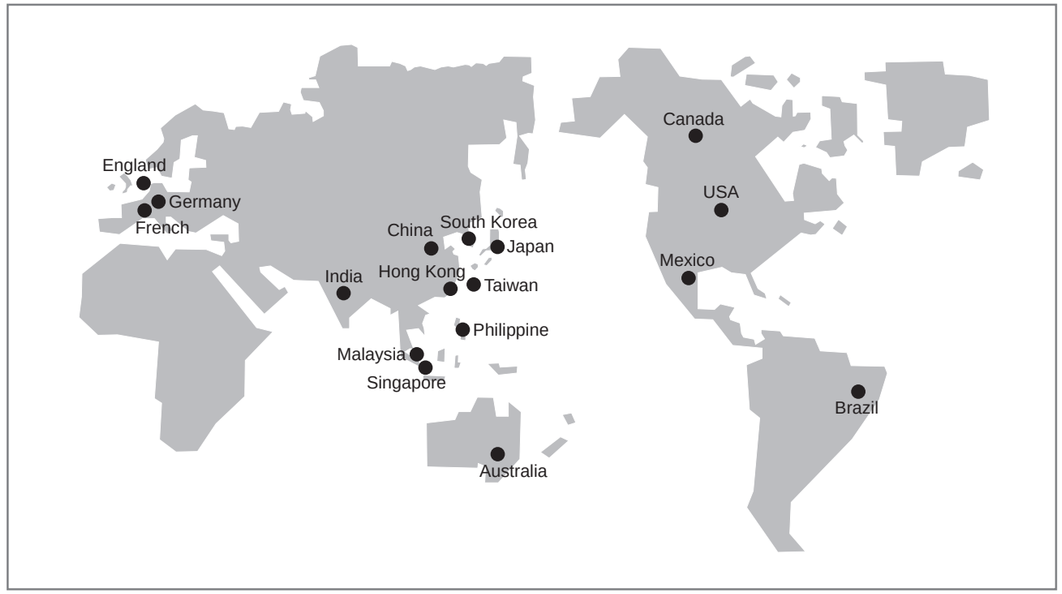


* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

World power supply system

• World power system map

The table below shows the power supply system of major countries.



• Major power system standards

Country	Phase	Voltage	Frequency
Japan	Single-phase	100V, 200V	50/60Hz
	3-phase	200V	
USA	Single-phase	115V	60Hz
	3-phase	230V	
Canada	Single-phase	120V	60Hz
	3-phase	208V, 240V	
Taiwan	Single-phase	110V, 220V	60Hz
	3-phase	220V, 380V	
Hong Kong	Single-phase	200V	50Hz
	3-phase	346V	
China	Single-phase	220V	50Hz
	3-phase	380V	
South Korea	Single-phase	110V, 220V	60Hz
	3-phase	200V, 380V	
Malaysia	Single-phase	240V	50Hz
	3-phase	415V	

Country	Phase	Voltage	Frequency
Philippine	Single-phase	115V, 220V	60Hz
	3-phase	230V	
Singapore	Single-phase	230V	50Hz
	3-phase	400V	
French	Single-phase	230V	50Hz
	3-phase	400V	
Germany	Single-phase	230V	50Hz
	3-phase	400V	
England	Single-phase	230V	50Hz
	3-phase	400V	
Mexico	Single-phase	127V	60Hz
	3-phase	220V	
India	Single-phase	230V, 240V	50Hz
	3-phase	400V, 415V	
Australia	Single-phase	240V	50Hz
	3-phase	415V	

<Caution>

Connecting the power source to a motor having rating (voltage, phase, frequency) different from the system specification causes the hazardous operating conditions. For availability of compatible motors, consult us.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

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Variable speed unit motor

The motor and speed controller are to be purchased by the set.

Gear head

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