- · Important Notes on exporting this product or equipment containing this product; If the end-user or application of this product is related to military affairs or weapons, its export may be controlled by "Foreign Exchange and Foreign Trade Control Law" of Japan where export license will be required before product can be exported
- This product is designed and manufactured for use in General Purpose Industrial Equipment and it is not intended to be used in equipment or system that may cause personal injury or death.
- · All servicing such as installation, wiring, operation, maintenance and etc., should be performed by qualified personnel only.
- · Tighten mounting screws with an adequate torque by taking into consideration strength of the screws and the characteristics of material to which the product will be mounted. Over tightening can damage the screw and/or material; under tightening can
- \*Example: apply 2.7 N·m 3.3 N·m torque when tightening steel screw (M5) to steel surface.
- · Install safety equipment to prevent serious accidents or loss that is expected in case of failure of this product.
- · Consult us before using this product under such special conditions and environments as nuclear energy control, aerospace, transportation, medical equipment, various safety equipments or equipments which require a lesser air contamination.
- We have been making the best effort to ensure the highest guality of our products, however, some applications with exceptionally large 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
- · 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 the product in an environment with high concentrations of sulfur or sulfuric gases, as sulfuration can lead to disconnection from the chip resistor or a poor contact connection.
- Do not input a supply voltage which significantly exceeds the rated range to the power supply of this product. Failure to heed this caution may lead to damage of the internal parts, causing smoke and/or fire and other troubles.
- The user is responsible for matching between machine and components in terms of configuration, dimensions, life expectancy, characteristics, when installing the machine or changing specification of the machine. The user is also responsible for complying with applicable laws and regulations.
- · Manufacturer's warranty will be invalid if the product has been used outside its stated specifications.
- Component parts are subject to minor change to improve performance.
- · Read and observe the instruction manual to ensure correct use of the product.

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; industrial.panasonic.com/ac/e/

Contact to



ISO9001 Certificate division

ISO14001 Certificate division

ISO 14001

Panasonic Corporation, Automotive & Industrial Systems Company, Electromechanical Control Business Division. Motor Business Unit

1-1 Morofuku 7-chome, Daito, Osaka 574-0044, Japan Tel: +81-72-871-1212 Fax: +81-72-870-3151

The contents of this catalog apply to the products as of February 2018.

- This product is for industrial equipment. Don't use this product at general household. · 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

■AQCTB01E 201802-3YE

## **Panasonic**

#### **AC Servo Motor & Driver**

MINAS A6 family / MINAS E series

# AC Servo Motor & Driver



This product is for industrial equipment. Don't use this product at general household.

2018.02 | industrial.panasonic.com/ac/e/

2018/2

**Panasonic** 

AC Servo Motor &

Driver < MINAS A6 family, MINAS

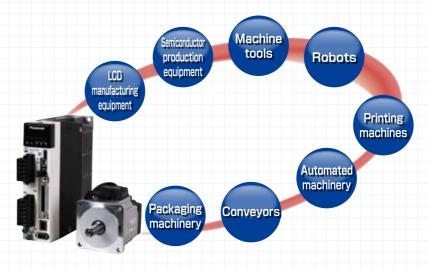
Ш

series>



More compact, more faster and more easy-to-use Servomotors that meet the demands of the present age.

The MINAS A6 family of advanced AC servomotors is changing the landscape of industrial machinery.



#### Robots

A robot is required to operate stably despite arm posture and position, workload and other conditions changing from moment to moment.

The MINAS A6 family assures stable operation by suppressing effects of load to a minimum using "adaptive load control."

#### Processing machinery

With metal processing machine, it is very difficult to render mirror-like finishing on a polygonal body.

The A6 family realizes "3.2 kHz frequency response" to improve feedback responsiveness, thus enabling mirror surfacing without generating lines or streaks.



#### Component mounting machines

The A6 family also shows its versatility when used with a component mounting machine where speed and positional accuracy are demanded. In addition to high frequency response, it can process accidental disturbances with the help of built-in "adaptive load control," thus maintaining high productivity.



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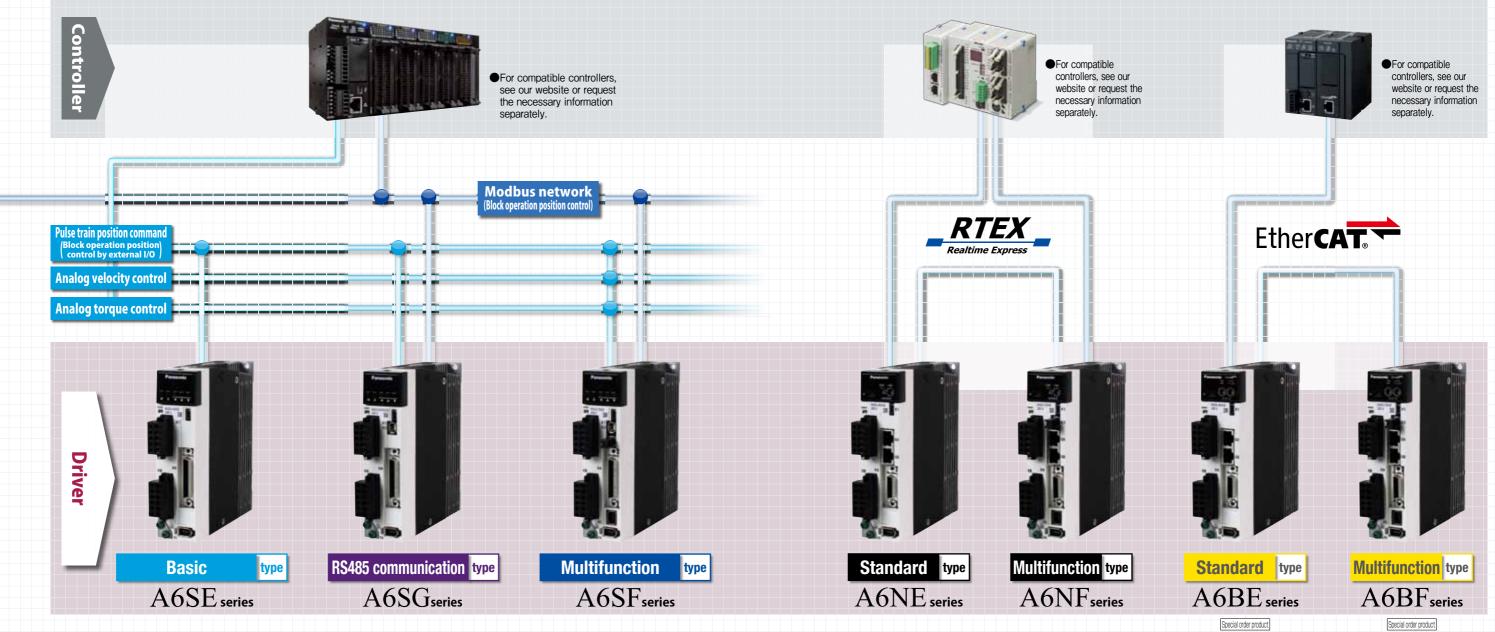
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## Servomotors that flexibly and effectively fit into

## various system configurations







Slim design and position control type

E series

Oultra-small design and pulse train command type only, DIN-rail mountable (using mounting Kit)

Rated output:50 W to 400 W

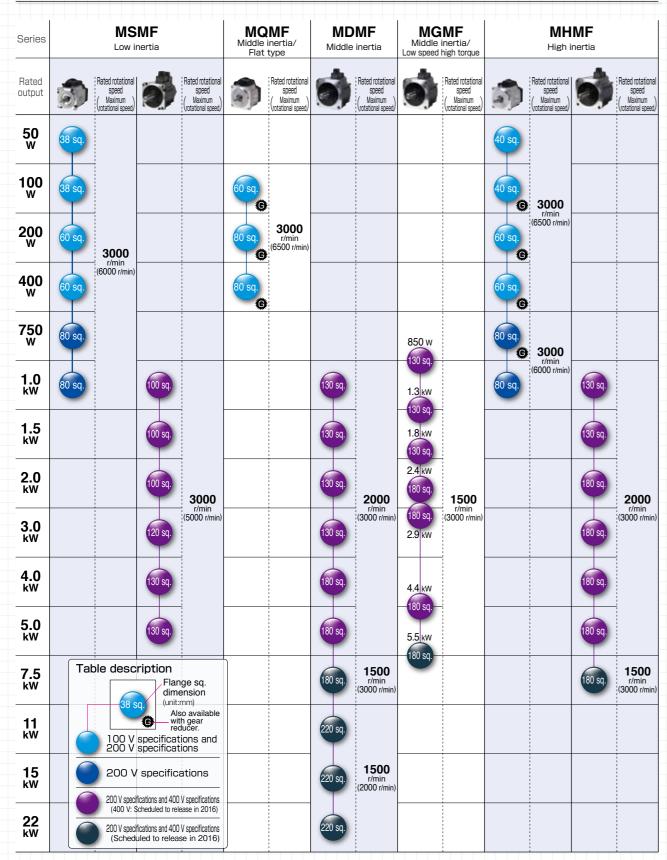


## It is MINAS A6 Family lineup that meets the

# manufacturing industry needs. MIINA



#### ■Motor line-up



#### ■Driver line-up

		Rotary motor	Linear motor / DD motor		
	Basic type	RS485 communication type		Basic	Multifunction type
	A6SE series	A6SG series	A6SF series	A6SL se	
Position control	<u> </u>	•	•	•	•
Block operation	(External contact signal only)	(External contact signal or Modbus communication)	(External contact signal or Modbus communication)	External contact sig Modbus communic	nal or (External contact signal or Modbus communication)
Speed control Internal velocity command*2 Torque control	(External contact signal only)	External contact signal or Modbus communication	(External contact signal or Modbus communication)	External contact sig	nal or (External contact signal or Modbus communication)
Torque control					
Full-close control					
Block operation			(External contact signal or Modbus communication		
Pulse					
Analog					
Modbus					
External scale					•
RS-232/RS-485					
STO (Safety Torques Off)					
igh speed communication For Realtime Express Network servo driver	Standa A6N	E series A6N	_	Standard A6NL se	
Position/Speed/Torque control				•	•
Full-close control					
External scale					
STO (Safety Torques Off)					
Servo drivers with therCAT open network		Eseries A6B	ction type Fseries	Standard  A6BL se	type Multifunction type  A6BM series  A6BM series
Position/Speed/Torque control	[Justidi U	Opena or	)	Copromi area productification de	Copposition of the product of the development of th
Full-close control			5	Ť	
External scale  STO (Safety Torques Off)			5	T T	X

device. It supports incremental system only.

industrial.panasonic.com/ac/e/

Special order product: For more information, please visit our website or request to our distributors separately.

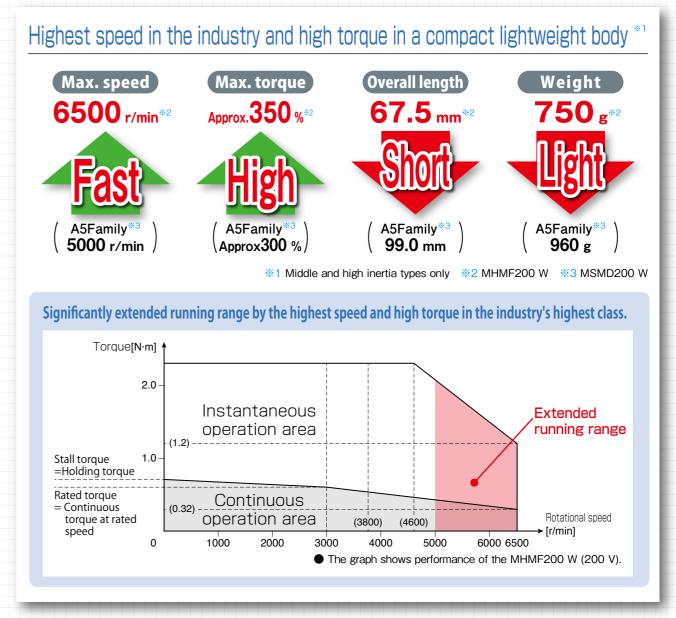
<sup>\*2</sup> When using internal speed command with Modbus, external servo ON is required.

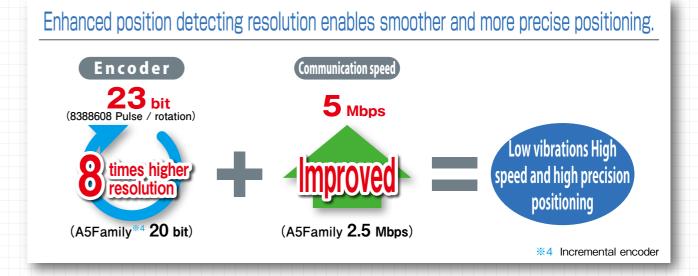
<sup>•</sup> Please check the instruction manual for necessary wiring.

# Small, light, powerful and speedy

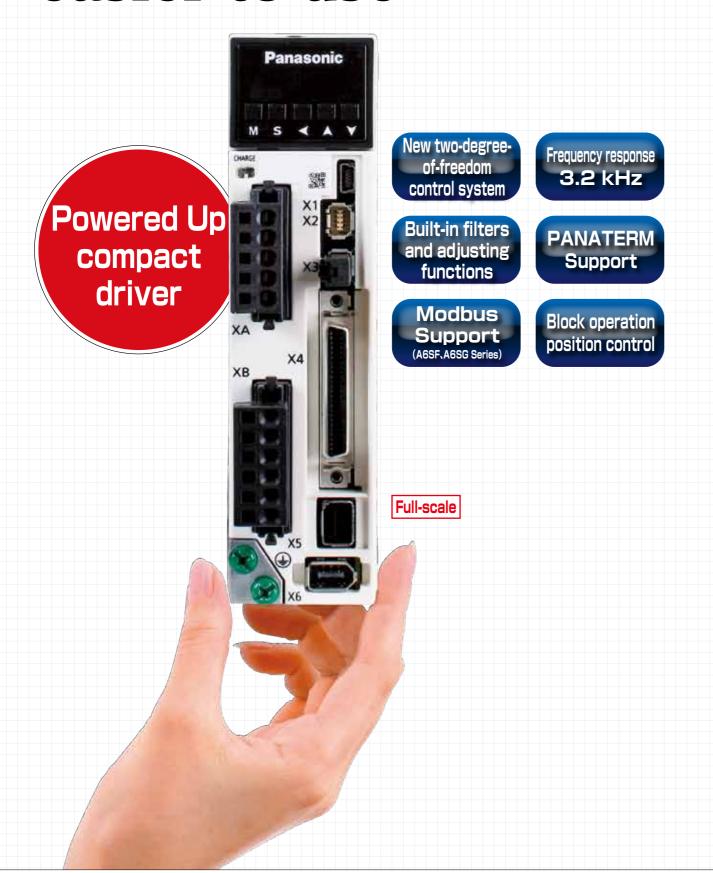








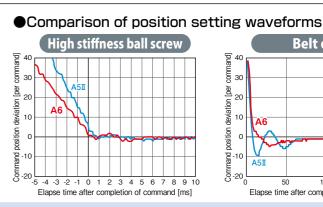
# Swifter, smarter and easier to use

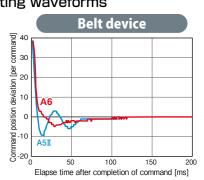




### High-speed response, high-precision positioning for quick and accurate movement

Our proprietary algorithm in addition to upgraded CPU and other hardware realized further high-speed response. Furthermore, high-precision positioning is achieved by automatically eliminating micro vibrations and machine oscillation caused by the resonance.





Example of operation with processing machine A mirror finish is obtained even if a process that tends to cause streaking.

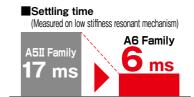




### Easy and quick setting, shortening conventional settling time by approx. 64%."

Newly developed fit gain function substantially reduces adjustment time. Adaptive notch filter and various gains can be automatically set and adjusted.

\*1 Comparison with conventional product A5IIfamily

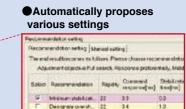










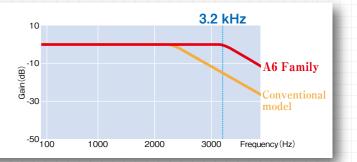


The above is a measure based on our test environment

### Realized 3.2 kHz frequency response to improve productivity

Realizes 3.2 kHz frequency response. At 139% that of conventional models \*1, it enables high-speed operation and improves productivity.

\*1 Comparison with conventional product A5IIfamily



# Reduced maintenance work and trouble.



Motors protected by a highly dust-proof, oil-tight oil seal (with protection lip) have been added to the lineup of motor products equipped with oil seals of conventional specifications. The oil seals of this type of motor are made of a material of higher heat resistance.

You can select appropriate motor type according to your application environment such as dusty, powdery or gear connection necessity.

• Oil-seals (with protective lip) are not available for MSMF motors with flange size 80 mm or smaller.

 MQMF and MHMF motors with flange size of 80 mm or smaller provided with oils seals (with protective lip) are not mounting-compatible with A5 Family models.



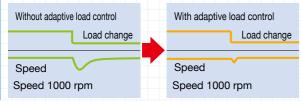
#### ■Applicable oil seals

Flange size	Motor type	With oil seal		With oil seal (with protective lip)		
80 mm or less	MSMF	0			No s	etting
	MHMF,MQMF	0	Made of nitrile rubber (NBR)		0	Made of
100 mm or more	All Type	0	TUDDOT (TVDTT)	0	fluororubber	Mounting-compatible with A5 family products

## Other driver functions

#### **Adaptive load control**

Adaptive load control automatically sets the best suitable gain table in response to fluctuations in inertia caused by changes in workload, thus keeping machines operating stably at all times.



#### Positioning function (Block operation function) Positioning is possible by using Modbus (BS 232, BS 485) or

Positioning is possible by using Modbus (RS 232, RS 485) or interface signal.

#### Friction torque compensation

This function reduces the effect of machine related friction and improves responsiveness. Three kinds of friction compensation can be set: unbalanced load compensation, which sets an offset torque that is constantly applied; kinetic friction compensation, which changes direction in response to the direction of movement; and viscous friction compensation, which changes according to the speed command.

#### Manual/Auto damping filter

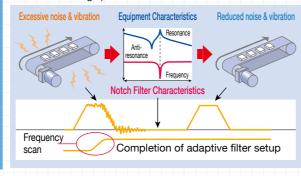
Equipped with a damping filter that is automatically set through the setup support software. This filter removes the natural vibration frequency component from the command input, greatly reducing vibration of the axis when stopping. The number of filters for simultaneous use has been increased to three from the conventional two filters. (Two from one in the two-degree-of-freedom-control mode.) The adaptive frequency has also been significantly expanded from 0.5 Hz to 300 Hz.

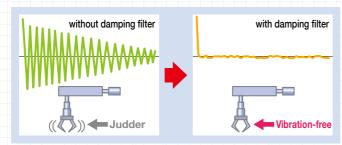
#### Manual/Auto notch filter

Equipped with auto-setting notch filters for greater convenience. Now there is no need to measure troublesome vibration frequencies.

Our notch filters automatically detect vibration and provide simple auto-setting. These notch filters greatly reduce noise and vibration caused by equipment resonance and respond quickly.

The A6 family is equipped with 5 notch filters with frequencies settable from 50 Hz to 5000 Hz. Depth can be individually adjusted within this range. (Two of the filters share automatic settings.)



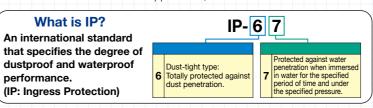


# MINAS A 6

#### IP67 enclosure rating (Motors with flange size of 80 mm or smaller are order-made products)

Direct-mount connectors are used for the motor power supply and encoder input and output to improve sealing performance of the motor to IP67.

- IP67-compatible motors with flange size of 80 mm or smaller are order-made products.
- For environmental conditions of applications, refer to P.271.





#### Lifespan diagnosis / degradation diagnosis

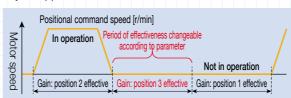
It warns expected lifetime of the motor & driver, and deterioration limit of the equipment.

#### Servo motor with gear reducer

Motors with gear reducers are also available.

#### 3-step gain

A 3-step gain switch is available in addition to the normal gain switch. This chooses appropriate gain tunings at both stopping and running. The 3-step gain switch gives you choices of 3 different tunings for normal running, stopping for faster positioning and at stopping. The right gaining tunings achieve lower vibration and quicker positioning time of your application.



#### Inertia ratio conversion

You can adjust right inertia ratio by Inertia ratio conversion input (J-SEL) of interface. When you have significant load inertia changes, it can adjust unbalanced speed and position gain turning combination. It ends up quicker response of your system.

#### Input/output signal assignment

You can use the parameters to arbitrarily allocate the universal 10 inputs and 6 outputs. (Inputs can be selected as either A contacts or B contacts). The Panaterm setup software provides an exclusive screen for a more simplified setup.

#### **Torque limiter switching**

These can be used for applications such as simplified pressure, tension control, and sensor-less homing.

#### Supports semi-/full-closed loop (8 Mpps input pulse, 4 Mpps output pulse) control.

Supports full-closed loop control. The A6SF series accommodates a command input of 8 Mpps and feedback output of 4 Mpps, enabling high-resolution, high-speed operation. Supports the industry's leading positioning resolution commands (pulse-train commands).

- The A6SE and A6SG series do not support full-closed loop control.
- Applicable scale: AB-phase feedback scale (general purpose product) and serial feedback scale (dedicated to Panasonic format product)

#### Dynamic braking

With parameter settings, you can select dynamic braking, which shorts servomotor windings U, V and W at Servo-OFF, during positive direction/ negative direction, and during power shutdown and tripping of the circuit breaker for over travel inhibition.

•The desired action sequence can be set up to accommodate your machine requirements.

#### Inrush current preventive function

This driver is equipped with a rush current preventive resistor to prevent the circuit breaker from shutting off the power supply as a result of inrush current occurring at power-on.

# A5 family A6 family Input 4 Mpps input 8 Mpps

#### Parameter initialization

Using the front panel or by connecting a PC, you can restore the parameters to the factory settings.

#### Regenerative energy discharge

A regenerative resistor is used to discharge regenerative energy, which is the energy generated when stopping a load with a large moment of inertia or when using this unit in vertical operation. This energy is returned to the driver from the motor.

- Frame A, and frame B model drivers do not contain a regenerative resistor. Optional regenerative resisters are recommended.
- Frame C to frame F model drivers contain one regenerative resistor; however, adding an optional regenerative resistor provides additional regeneration capability.

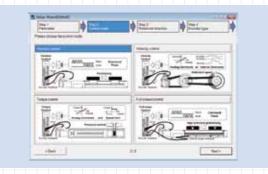
# Multifunctional software for quick adjustment support

#### **PANATERM** set-up support software

The PANATERM set-up support software, with many added features. The PANATERM assists users in setting parameters, monitoring control conditions, setup support, and analyzing mechanical operation data on the PC screen, when installed in a commercially available personal computer, and connected to the MINAS A6 Family through the USB interface. Choose either English, Japanese, Chinese, Korean-language display.

#### **Setup wizard**

This wizard supports fundamental settings in each control mode step by step, including reading of default setting. In On-line condition, Input data related to each step can be monitored in real time.



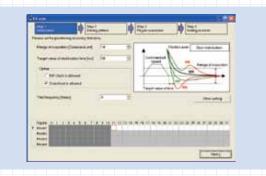
### The fit gain function for setting Two-degree-of-freedom control.

- 1) Select the adjustment method 2) Load measurement
- 3) Confirming results Adjust gain to meet your needs



#### Fit gain

This function automatically searches the best suitable stiffness setting and mode and adjusts the gain once the target in-position range and setting time are set.



#### Service Life Prediction

The service life prediction function considers the internal temperature for main components such as the fan and condenser. If the rated value is exceeded, an alarm is displayed. This approach prevents unexpected suspension of operation and allows for planning of systemized maintenance.

Note: The life span prediction value should be considered as a guide only.



#### **Encoder temperature monitor**

The Encoder Temperature Monitor is a new function capable of real-time measurement of the interior temperature of the encoder, something that has been difficult to achieve in the past. It is valuable for monitoring the motor and can be used as a diagnostic in the event of a malfunction .

#### **Other New Function**

The software offers a wide range of convenient features including motor and driver data such as load factor, voltage, and driver temperature. Moreover, the logging function records the interface history. As well, a non-rotating contributing factor display function.



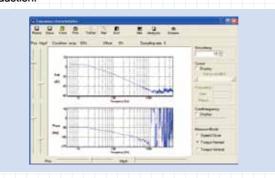
# MINAS AS

#### Please download from our web site and use after install to the PC.

https://industrial.panasonic.com/ww/products/motors-compressors/fa-motors/ac-servo-motors/minas-a5-panaterm

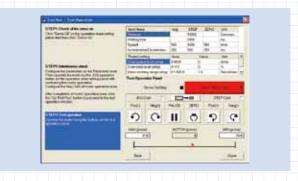
#### Frequency characteristics measurement function

Can check frequency response characteristics of the mechanism and motor. Since resonance frequency of the mechanism is measurable, it is effective for start-up time reduction

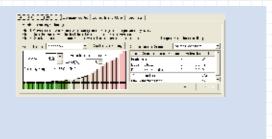


#### **Trial run**

This function supports positioning with the Z-phase search and software limit.



### Added New screen for gain adjustment, equipped with stiffness oscillation auto-reduction function



## Significant increase of measuring objects Multi-functional waveform graphic



#### Hardware configuration

Personal	CPU	800 MHz or more				
computer	Memory	System memory 512MB or more Graphics memory 32MB or more				
	Hard disk capacity	Vacancy of 512MB or more recommended				
		Windows® Vista SP1 (32 bit), Windows® 7 (32 bit, 64 bit),				
	OS Windows® 8 (32 bit, 64 bit), Windows® 10 (32 bit, 64 bit)					
		Japanese, English, Chinese (Simplified), Korean version				
	Serial communication	USB port, COM port (Communication speeds: 2400 bps to 115200 bps)				
	function	* A COM port is required to use RS232 communications. A 9600 bps or higher baud rate is recommended.				
Display	Resolution	1024 × 768 pix or more				
	Number of colors	24 bit colors (TrueColor) or more				

<CAUTION> This software is applicable only to A5 family, A6 family. To apply this software to A, AIII, E or A4 series, consult our distributors.

# Compliance with MINAS & international standards

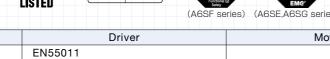












		Driver	Motor
		EN55011	
	EMC Directives	EN61000-6-2	
	EIVIC Directives	EN61000-6-4	_
		EN61800-3	
	Low-Voltage Directives	EN61800-5-1	EN60034-1
<b>EU Directives</b>	Low-voitage Directives	EN50178	EN60034-5
		ISO13849-1(PL e , Cat.3)	
		EN61508(SIL3)	
	Machinery Directives	EN62061(SILCL 3)	
	Functional safety *1	EN61800-5-2(SIL3、STO)	_
		IEC61326-3-1	
		IEC60240-1	
III. Otan danda		UL508C	UL1004-1 , UL 1004-6
UL Standards		(E164620)	(E327868)
CSA Standards		C22.2 No.14	C22.2 No.100 -04
Radio Waves Act		KN11	
(South Korea) (KC)*2		KN61000-4-2,3,4,5,6,8,11	_
C : International Electro	otechnical Commissio	n Pursuant to the directive	ve 2004/108/FC, article 9(2)

EN: Europaischen Normen

EMC : Electromagnetic Compatibility

CSA: Canadian Standards Association

UL: Underwriters Laboratories

Pursuant to the directive 2004/108/EC, article 9(2)

Panasonic Testing Centre

Panasonic Service Europe, a division of

Panasonic Marketing Europe GmbH

Winsbergring 15, 22525 Hamburg, F.R. Germany

- When export this product, follow statutory provisions of the destination country.
- A6SE, A6SG, A6NE and A6BE series doesn't correspond to the functional safety standard.
- Information related to the Korea Radio Law

This servo driver is a Class A commercial broadcasting radio wave generator not designed for home use. The user and dealer should be aware of this fact.

A 급 기기 (업무용 방송통신기자재)

이 기기는 업무용(A 급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

(대상기종 : Servo Driver)

This products is not an object of china compulsory certification (CCC).

#### Low noise, compliant with EMC directives

Radiated noise is minimized to meet EMC directives and to support international standards.

#### Compliance with EU safety standards.

Features non-software-based independent redundant circuitry for motor power isolation. Independent redundant circuitry for motor power isolation. This obviates the need for magnetic contactors to isolate the required motor in order to accommodate low-voltage machinery commands.(The final safety compliance must be applied as machine.)

-15-

Includes a function in compliance with the SEMI F47 standard for voltage sag immunity under no load or light load. Ideal for the semiconductor and LCD industries.

- Excluding the single-phase 100-V type.
- Please verify the actual compliance with your machine checking the F47 standard for voltage sag immunity.

MEMO

#### **Motor Line-up**

	tor Line-	чр							
	M	lotor	Rated output (kW)	Rated rotational speed (Max. speed) (r/min)	Rotary encoder 23-bit absolute	Enclosure	Motor lead-out configuration	Features	Applications
		80 mm sq. or less	0.05 0.1 0.2 0.4 0.75 1.0	3000 (6000)	0	IP65	Leadwire	Small capacity     Suitable for high speed application	Bonder     Semiconductor production
Low inertia	Low inerti	80 mm sq. or less	0.05 0.1 0.2 0.4 0.75 1.0	3000 (6000)	0	IP67	Connector	Suitable for all applications	equipment Packing machines etc
			1.0 1.5 2.0 3.0	3000 (5000)	0	IP67	Connector	Middle capacity     Suitable for the machines directly coupled with ball screw and high	· SMT machines · Food machines · LCD production
		100 mm sq. or more	4.0 5.0	3000 (4500)				stiffness and high repetitive application	equipment
	MQMF	80 mm sq. or less	0.1 0.2 0.4	3000 (6500)	0	IP65	Leadwire	Small capacity Flat type and suitable for low stiffness machines with belt driven	· SMT machines · Inserter machines
Mid	(Flat type)	80 mm sq. or less	0.1 0.2	3000 (6500)	0	IP67	Connector	Motors with gear reducers are also available. (See. P.261)  Coming soon	Belt drive machines     unloading robot
Middle inertia	MDMF	130 mm sq. or more	1.0 1.5 2.0 3.0 4.0 5.0	2000 (3000)	0	IP67	Connector	Middle capacity     Suitable for low stiffness machines with belt driven	· Conveyors · Robots · Machine tool etc
	MGME (Low speed/ High torque type	130 mm sq. or more	0.85 1.3 1.8 2.4 2.9 4.4	1500 (3000)	0	IP67	Connector	Middle capacity     Suitable for low speed and high torque application	· Conveyors · Robots · Textile machines etc
		80 mm sq. or less	0.05 0.1 0.2 0.4 0.75 1.0	3000 (6500) 3000 (6000)	0	IP65	Leadwire	Small capacity     Suitable for low stiffness machines with belt driven     Motors with gear	· Conveyors · Robots
High inertia	High inerti	80 mm sq. or less	0.05 0.1 0.2 0.4 0.75 1.0	3000 (6500) 3000 (6000)	0	IP67	Connector	reducers are also available. (See. P.261) Coming soon	etc
ω.		130 mm sq. or more	1.0 1.5 2.0 3.0 4.0 5.0	2000 (3000)	0	IP67	Connector	Middle capacity     Suitable for low stiffness machines with belt driven, and large load moment of inertia	· Conveyors · Robots · LCD man- ufacturing equipment etc

- (\*1) IP65 motor (Lead wire type of MSMF, MQMF, MHMF) :Except output shaft rotating part and lead wire tip part
  - IP 67 Motor: Except rotating part of output shaft ,connecting pin of motor connector and encoder connector.
- \* For possible combinations of motors and drivers, see P.23 to P.32.
- When using a rotary encoder as an absolute system (using multi-turn data), connect a battery to the absolute encoder.

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When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### MINAS A6 Series

#### Model Designation

Symbol Series name

F A6 family

\* For combination of elements of model number, refer to Index P.402.

#### Servo Motor

M S M F 5 A Z L 1 A 1 \* Special specifications

#### ① Type

#### Symbol MSM Low inertia (50 W to 5.0 kW) MQM Middle inertia (100 W to 400 W) MDM Middle inertia (1.0 kW to 5.0 kW) MGM Middle inertia (0.85 kW to 4.4 kW) MHM High inertia (50 W to 5.0 kW)

#### **3 Motor rated output**

© motor rates carpar							
Symbol	Rated output	Symbol	Rated output				
5A	50 W	15	1.5 kW				
01	100 W	18	1.8 kW				
02	200 W	20	2.0 kW				
04	400 W	24	2.4 kW				
08	750 W	29	2.9 kW				
09	0.85 kW, 1000 W	30	3.0 kW				
09	(130 mm sq.) (80 mm sq.)	40	4.0 kW				
10	1.0 kW	44	4.4 kW				
13	1.3 kW	50	5.0 kW				

#### 4 Voltage specifications 6 Design order

o romago opocimoanomo					
Symbol	Specifications				
1	100 V				
2	200 V				
Z	100 V/ 200 V common (50 W only)				

ol	Specifications	Symbol	Specifications		
	100 V	1	Standard		
	200 V	<note> When using a rotary encoder as an incl</note>			
	100 V/ 200 V common (50 W only)				

mental system (not using multi-turn data), do not connect a battery for absolute encoder. **5** Rotary encoder specifications

Symbol	Format	Pulse counts	Resolution	Wires
L	Absolute	23-bit	8388608	7

#### 7 Motor specifications: 100 mm sq. or more MSMF, MHMF, MDMF, MGMF

Symbol		Sh	aft	Holding brake		Oil seal		Encorder terminal	
		Round	Key- way	without	with	with	With protective lip	Connector JN2 (Small size)	Connector JL10 (Large size)*2
С	5	•		•		•		•	
С	6	•		•		•			•
С	7	•		•			•	•	
С	8	•		•			•		•
D	5	•			•	•		•	
D	6	•			•	•			•
D	7	•			•		•	•	
D	8	•			•		•		•
G	5		•	•		•		•	
G	6		•	•		•			•
G	7		•	•			•	•	
G	8		•	•			•		•
Н	5		•		•	•		•	
Н	6		•		•	•			•
Н	7		•		•		•	•	
Н	8		•		•		•		•

#### 7 Motor specifications: 80 mm sq. or less MSMF 50 W to 1000 W Shaft Holding brake Oil seal Motor encorder

_									terriirai		
Symbol		Round	Key-way, center tap	without	with	without	with	Connector JN	Lead wire		
Α	1	•		•		•		•			
Α	2	•		•		•			•		
В	1	•			•	•		•			
В	2	•			•	•			•		
С	1	•		•			•	•			
С	2	•		•			•		•		
D	1	•			•		•	•			
D	2	•			•		•		•		
S	1		•	•		•		•			
S	2		•	•		•			•		
Т	1		•		•	•		•			
Т	2		•		•	•			•		
U	1		•	•			•	•			
U	2		•	•			•		•		
٧	1		•		•		•	•			
٧	2		•		•		•		•		

#### 7) Motor specifications: 80 mm sq. or less MHMF 50 W to 1000 W

MQMF 100 W to 400 W					
Oil seal	Motor encorder terminal *1				

Symbol		Sh	naft	Holding	g brake		Oil sea	I	Motor e termi	
		Round	Key-way, center tap	without	with	without	with	With protective lip	Connector JN	Lead wire
Α	1	•		•		•			•	
Α	2	•		•		•				•
В	1	•			•	•			•	
В	2	•			•	•				•
С	1	•		•			•		•	
С	2	•		•			•			•
С	3	•		•				•	•	
С	4	•		•				•		•
D	1	•			•		•		•	
D	2	•			•		•			•
D	3	•			•			•	•	
D	4	•			•			•		•
S	1		•	•		•			•	
S	2		•	•		•				•
Т	1		•		•	•			•	
Т	2		•		•	•				•
U	1		•	•			•		•	
U	2		•	•			•			•
U	3		•	•				•	•	
U	4		•	•				•		•
٧	1		•		•		•		•	
٧	2		•		•		•			•
٧	3		•		•			•	•	
٧	4		•		•			•		•

- \*2 Connector on the motor side encoder. (Also applicable to screwed type.)

#### Servo Driver



#### $\ \, \textbf{ 1) Frame symbol}$ Cumbal Eroma Cumbal Eron

Symbol	Frame	Symbol	Frame
MAD	A-Frame	MDD	D-Frame
MBD	B-Frame	MED	E-Frame
MCD	C-Frame	MFD	F-Frame

#### 2 Series

Symbol	Series name
L	A6 family

#### 3 Safety Function

© <b></b>			
Symbol	Specifications		
N	without the safety function		
Т	with the safety function		

#### 4 Max. current rating

Symbol	Current rating	Symbol	Current rating
0	6 A	5	40 A
1	8 A	8	60 A
2	12 A	9	80 A
3	22 A	Α	100 A
4	24 A	В	120 A

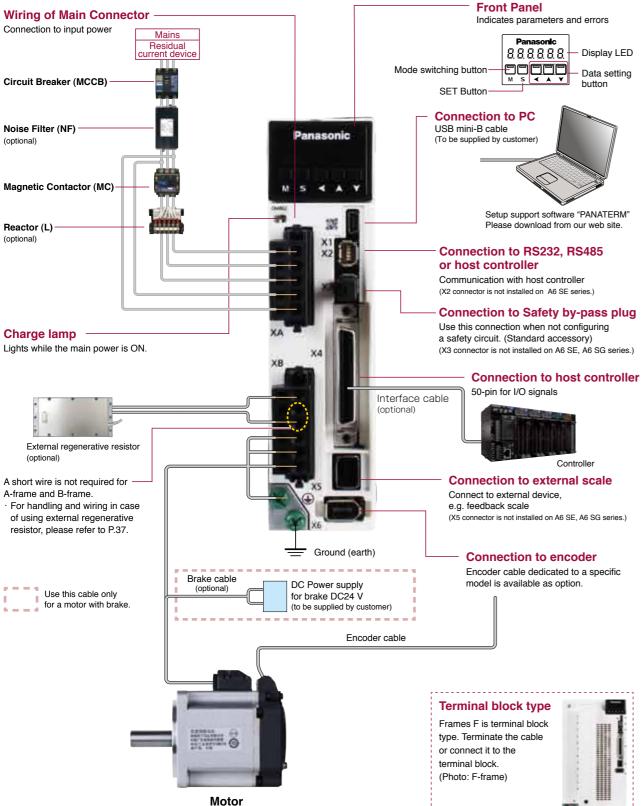
#### (5) Supply voltage specifications

	Supply voltage specification					
	Symbol	Symbol Specifications				
	1	Single phase 100 V				
	3	3-phase 200 V				
5 Sing		Single/3-phase 200 V				

#### 6 I/f specifications 7 Classification of type

Symbol (specification)	Symbol	Specification
S (Analog/Pulse)	Е	Basic type (Pulse train only)
	F	Multi fanction type (Pulse, analog, full-closed)
	G	RS485 communication type (Pulse train only)

#### <A6SF Series (Driver: A-frame Motor: 200 W)> **Wiring of Main Connector** Connection to input power Mains Residual current device



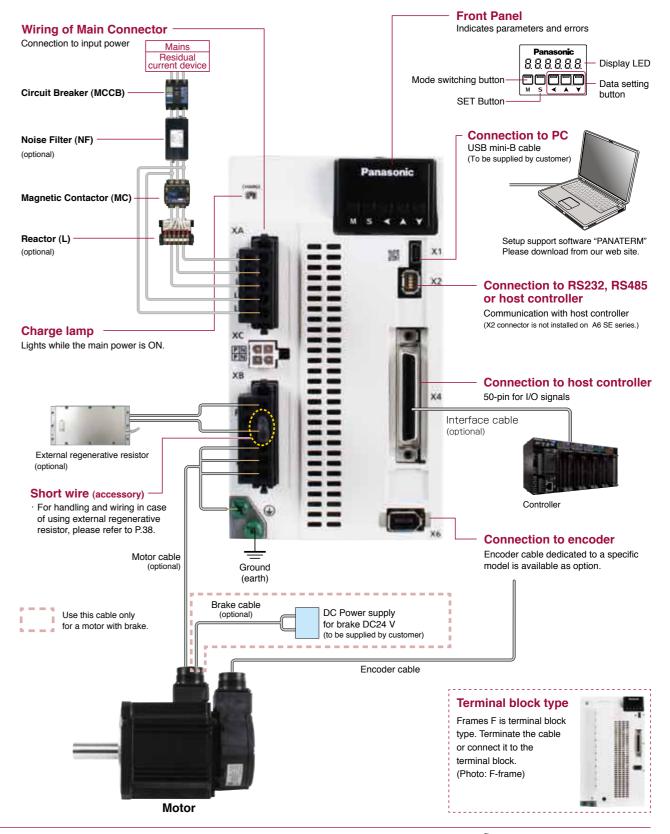
#### <Caution>

Apply adequate tightening torque to the product mounting screw by taking into consideration strength of the screw and the characteristics of material to which the product is installed. Overtightening can damage the screw and/or material; undertightening can result in loosening

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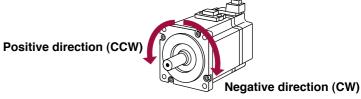
Example) Steel screw (M5) into steel section: 2.7 N·m to 3.3 N·m.

#### <A6SG Series/ A6SE Series (Driver: D-frame Motor: 1.0 kW)>



#### <Note>

Initial setup of rotational direction: positive = CCW and negative = CW. Pay an extra attention.



#### Driver and List of Applicable Peripheral Equipments

Driver	Applicable motor	Voltage (V) *1	Rated output (kW)	Required Power at the (rated load)	Circuit breaker (rated (current)	Noise filter (Single phase 3-phase)	Surge absorber  Single phase   3-phase	Ferrite core	Rated operating current of magnetic contactor contact configuration	Diameter and withstand voltage of main circuit cable	Crimp terminal for main circuit terminal block *2	Diameter and withstand voltage of control power supply cable	Crimp terminal for control power supply terminal block	Diameter and withstand voltage of motor cable *3	Diameter and withstand voltage of brake cable
	MSMF MHMF	Single	0.05												
	MSMF MQMF MHMF	phase, 100	0.1	approx. 0.4		DV0P4170	DV0P4190								
MADL	MSMF MHMF	Single/	0.05												
	MSMF MQMF MHMF	3-phase 200	0.1, 0.2	approx.	10	DV0P4170 DV0PM20042	DV0P4190 DV0P1450								0.28 mm <sup>2</sup> to 0.75 mm <sup>2</sup> /
	MSMF	Single phase, 100	0.2			DV0P4170	DV0P4190		20 A (3P+1a)						AWG22 to AWG18 100 VAC
MBDL	MQMF MHMF	Single/ 3-phase 200	0.4	approx. 0.9		DV0P4170 DV0PM20042	DV0P4190 DV0P1450			0.75 mm²/ AWG18				0.75 mm²/ AWG18	or more
14001	MSMF MQMF MHMF	Single phase, 100	0.4	approx. 0.9		D) (oD) tooo (o	DV0P4190			or more to 2.0 mm <sup>2</sup> /	ς.		ç	600 VAC or more to 2.0 mm <sup>2</sup> /	
MCDL	MSMF MHMF	Single/ 3-phase 200	0.75	approx.	15	DV0PM20042	DV0P4190 DV0P1450			AWG14 600 VAC or more	Connection to exclusive connector		Connection to exclusive connector	AWG14 600 VAC or more	
	MGMF		0.85								o exc		o exc		
	MSMF		1.0 (80 mm sq.)	approx.							lusive c		lusive c		
	MDMF MHMF		1.0								onnecto	0.7521	onnecto		
MDDL	мнмғ	Single/ 3-phase 200	1.0 (80 mm sq.)		20	DV0P4220	DV0P4190 DV0P1450	DV0P1460	30 A (3P+1a)		=	0.75 mm²/ AWG18 600 VAC	<b>=</b>		
	MSMF		1.0	annray								or more			
	MGMF		1.3	approx. 2.3											
	MSMF MDMF MHMF		1.5												
	MGMF		1.8							2.0 mm <sup>2</sup> /				2.0 mm <sup>2</sup> / AWG14	
MEDL	MSMF MDMF MHMF	3-phase 200	2.0	approx. 3.8	30	DV0PM20043	DV0P1450		60 A (3P+1a)	AWG14 600 VAC or more to 3.5 mm²/ AWG12 600 VAC				600 VAC or more to 3.5 mm²/ AWG12 600 VAC or more	0.75 mm²/ AWG18 100 VAC or more
	MGMF		2.4	approx. 4.5						or more					
	MSMF MDMF MHMF		3.0	approx. 4.5							41		44		
	MGMF	1	2.9								11 mm or smaller		11 mm or smaller	3.5 mm²/	
MFDL	MSMF MDMF MHMF	3-phase 200	4.0	approx.	50	DV0P3410	DV0P1450		100 A	3.5 mm²/ AWG12 600 VAC or more	φ <sub>5.3</sub>		ψ <sub>5.3</sub>	AWG12 600 VAC or more	
	MGMF	1	4.4	7.5					(3P+1a)	or more	Terminal		Terminal		
	MSMF MDMF MHMF		5.0								M5		M5		

<sup>\*1</sup> Select peripheral equipments for single/3phase common specification according to the power source.

#### Related page

Noise filter	. P.366	"Composition of Peripheral Equipments"
Surge absorber	.P.367	"Composition of Peripheral Equipments"
Ferrite core	.P.368	"Composition of Peripheral Equipments"
Motor/brake connector	.P.275	"Specifications of Motor connector"

#### About circuit breaker and magnetic contactor

Suitable for use on a circuit capable of delivering not more than 5000 Arms symmetrical amperes, below the maximum input voltage of the product.

If the short-circuit current of the power supply exceeds this value, install a current limit device (current limiting fuse, current limiting circuit breaker, transformer, etc.) to limit the short-circuit current.

#### <Caution>

· Select a circuit breaker and noise filter which match to the capacity of power supply (including a load condition).

#### Terminal block and protective earth terminals

- · Use a copper conductor cables with temperature rating of 75 °C or higher.
- · Use the attached exclusive connector for A-frame to E-frame, and maintain the peeled off length of 8 mm to 9 mm.

#### ■ Fastening torque list (Terminal block screw/Terminal cover fastening screw)

	Driver	Termina	al block screw		ninal cover ning screw
Frame	Terminal name	Nominal size	Fastening torque (N·m) Note)1	Nominal size	Fastening torque (N·m) Note)1
F	L1, L2, L3, L1C, L2C, P, RB, B, N, U, V, W	M5	1.0 to 1.7	МЗ	0.19 to 0.21

#### ■ Fastening torque list (Ground terminal screw/Connector to host controller [X4])

• • •		,		
	Gro	und screw		nnector to ontroller (X4)
Driver frame	Nominal size	Fastening torque (N·m) Note)1	Nominal size	Fastening torque (N·m) Note)1
MADL, MBDL, MCDL, MDDL, MEDL	M4	0.7 to 0.8	M2.6	0.3 to 0.35
MFDL	M5	1.4 to 1.6	IVIZ.0	0.3 10 0.35

#### Note)1 < Caution>

- $\cdot$  Applying fastening torque larger than the maximum value may result in damage to the product.
- · Do not turn on power without tightening all terminal block screws properly, otherwise, loose contacts may generate heat (smoking, firing) .

#### <Remarks>

· To check for looseness, conduct periodic inspection of fastening torque once a year.

<sup>\*2</sup> For the ground screw, use the same crimp terminal as that for the main circuit terminal block.

<sup>\*3</sup> The diameter of the ground cable must be equal to, or larger than that of the motor cable.

			Moto	or			Driver					Option	nal parts					■ Options			
						A6SF series	A6SG series		Power	Encoder C	able Note)3	Motor	Cable Note)3						Title	Part No.	Page
					Rating/	Multi fanction	RS485 communication		capacity		Absolute							Interface Cabl	9	DV0P4360	290
M	tor series	Power	Output	Part No.	Spec.	type /Pulse, analog,\	A6SE series	Frame	at rated	Use in the	Use in the	without	with	Brake Cable	External Regenerative	Reactor	Noise Filter			DV0P4120	290
		supply	(W)	Note)1	Dimensions (page)	\ full-closed /	Basic		\ load / (kVA)	absolute system	Incremental system	Brake	Brake	Note)3	Resistor	Single phase 3-phase	Single phase 3-phase			DV0P4121	290
							(Pulse signal input) Note)2, Note)4			(with battery box) Note)5	(without battery box							Interface Conv	version Cable	DV0P4130	290
			50	MSMF5AZL1 □ 2	51	MADLT01SF	MADLN01S			,										DV0P4131	290
		Single			101 53		MADLN11S♦	A-frame ★	Approx. 0.4						DV0P4280	DV0P227	DV0P4170	Connector Kit	Cinale rew	DV0P4132	290
		phase	100	MSMF011L1  2	102 55	MADLT11SF			Approx.	-							DV0P4170	101 1 04401	to type	D V O F IVI 20032	293
		100 V	200	MSMF021L1 ☐ 2	103	MBDLT21SF	MBDLN21S♦	B-frame ★	0.5	-					DV0P4283	DV0P228		Supply Input Connection	D-frame Double row	DV0PM20033	293
	MSMF		400	MSMF041L1 ☐ 2	57 105	MCDLT31SF	MCDLN31S♦	C-frame	Approx. 0.9	_					DV0P4282		DV0PM20042	Connector Kit for Motor	A-frame to D-frame	DV0PM20034	294
Low	(Leadwire)		50	MSMF5AZL1 □ 2	52 101	MADLT05SF	MADLN05S♦			MFECA	MFECA		MFMCA	MFMCB	D\/0D4004			Connection Connector Kit			
inertia	type / 3000 r/min		100	MSMF012L1 □ 2	54 102	MADLT05SF	MADLN05S♦	A-frame	Approx.	0 * * 0EAE (For fixed)	0 * * 0EAD (For fixed)		**0EED	0 * * 0GET	DV0P4281	DV0P227 DV0P220	DV0P4170	Motor/Encode	r Connection	DV0P4290	294
Ø	IP65	Single	200	MSMF022L1 ☐ 2	56 103	MADLT15SF	MADLN15S♦	*						Note)6			DV0PM20042		RS485, RS232	DV0PM20102	291
		phase/ 3-phase	400	MSMF042L1 ☐ 2	58	MBDLT25SF	MBDLN25S♦	B-frame	Approx.	-					DV0P4283	DVODOOO		0 1 10	Safety	DV0PM20103	291
		200 V	750	MSMF082L1  2	105 59	MCDLT35SF	MCDLN35S♦	*	0.9 Approx.	_							DV0PM20042	Connector Kit	Interface	DV0P4350	292
			750	WISINIFU02L1 2	106	WICDLISSSF	MCDLINGGS	C-frame	1.3	-						DV0P228	D V UF IVI20042		External Scale	DV0PM20026	292
			1000	MSMF092L1 ☐ 2	60 107	MDDLT45SF	MDDLN45S♦	D-frame	Approx. 1.8						DV0P4284	DV0P222	DV0P4220	Battery for Abs	Encoder	DV0PM20010 DV0P2990	302
			100	MQMF011L1	67 117	MADLT11SF	MADLN11S♦	A-frame ★	Approx. 0.4						DV0P4280	DV0P227		Battery Box fo	r Absolute Encoder	DV0P2990	302
<b>S</b>		Single phase	200	MQMF021L1 ☐ 2	69	MBDLT21SF	MBDLN21S♦	B-frame	Approx.	-					DV0P4283		DV0P4170	Note)5	For A-frame,		+
Middle	MQMF	100 V	200	MQMF021L1  4	121		WIDDEINZTO	*	0.5	-					D V 01 4200	DV0P228		Mounting Bracket	B-frame For C-frame,	DV0PM20100	303
inertia	(Leadwire) type		400	MQMF041L1  4	71 125	MCDLT31SF	MCDLN31S♦	C-frame	Approx. 0.9	MFECA 0**0EAE	MFECA 0**0EAD	N	MFMCA	MFMCB	DV0P4282		DV0PM20042	Bruonot	D-frame	DV0PM20101	303
ia Flat	3000 r/min	Cinala	100	MQMF012L1 ☐ 2 MQMF012L1 ☐ 4	68 117	MADLT05SF	MADLN05S♦		Approx.	(For fixed)	(For fixed)	0 %	**0EED	0 * * 0GET Note)6	DV0P4281	DV0P227		Encoder	with Battery Box	MFECA0 * * 0EAE	277
at type	IP65	Single phase/	200	MQMF022L1 ☐ 2	70	MADLT15SF	MADLN15S♦	A-frame ★	0.5					11010/0		DV0P220	DV0P4170	Cable	Note)5 without	MFECA0 * * 0EAD	) 277
ě		3-phase 200 V		MQMF022L1 ☐ 4 MQMF042L1 ☐ 2	121 72				Approx	-					DV0P4283	DV0P228	DV0PM20042	Motor Cable	Battery Box without Brake	MFMCA0 * * 0EED	
			400	MQMF042L1 ☐ 4	125	MBDLT25SF	MBDLN25S♦	B-frame ★	Approx. 0.9							DV0P220		Brake Cable	WILLIOUT DIAKE	MFMCB0 * * 0GET	
			50	MHMF5AZL1  2 MHMF5AZL1 4	73 129	MADLT01SF	MADLN01S♦		Approx.						D) (DD (DD)	D) /2D22=		Diake Cable	50 Ω 25 W	DV0P4280	305
		Single	100	MHMF011L1 2 MHMF011L1 4	75 133	MADLT11SF	MADLN11S♦	A-frame ★	0.4						DV0P4280	DV0P227	DV0P4170		100 Ω 25 W	DV0P4281	305
		phase 100 V	200	MHMF021L1 2 MHMF021L1 4	77	MBDLT21SF	MBDLN21S♦	B-frame	Approx.	-					DV0P4283			External regenerative	25 Ω 50 W	DV0P4282	305
			400	MHMF041L1 🗌 2	137 79	MCDLT31SF	MCDLN31S♦	★ C-frame	Approx.	-					DV0P4282	DV0P228	DV0PM20042	resistor	50 Ω 50 W	DV0P4283	305
王	MHMF			MHMF041L1  4 MHMF5AZL1  2	141 74			O manic	0.9	_					5701 1202		5 VOI 101200 12		30 Ω 100 W	DV0P4284	305
High in	(Leadwire) type		50	MHMF5AZL1  4 MHMF012L1  2	129 76	MADLT05SF	MADLN05S♦	-	Approx.	MFECA 0**0EAE	MFECA 0**0EAD		MFMCA	MFMCB	DV0P4281	DV0P227				DV0P220	304
inertia	3000 r/min		100	MHMF012L1  4	133	MADLT05SF	MADLN05S♦	A-frame ★	0.5	(For fixed)	(For fixed)	0 4	**0EED	0 * * 0GET Note)6		DV0P220	DV0P4170			DV0P222	304
	IP65	Single phase/	200	MHMF022L1 2 2 MHMF022L1 4	78 137	MADLT15SF	MADLN15S♦										DV0PM20042	Reactor		DV0P227	304
		3-phase 200 V	400	MHMF042L1 ☐ 2 MHMF042L1 ☐ 4	80 141	MBDLT25SF	MBDLN25S♦	B-frame ★	Approx. 0.9						DV0P4283	DV0P228				DV0P228	304
		200 V	750	MHMF082L1 2 2 MHMF082L1 4	81 145	MCDLT35SF	MCDLN35S♦	C-frame	Approx.							DV0P220	DV0PM20042			DV0P4170	366
			1000	MHMF092L1 ☐ 2	82	MDDLT55SF	MDDLN55S♦	D-frame	Approx.	-					DV0P4284	DV0P228	DV0P4220	Noise Filter		DV0PM20042	366
				MHMF092L1  4	149				2.3				DI			DV0P222				DV0P4220	366
	rame-A and external reg			not equipped with re or.	egenerati	ve resistors.Wh	en regeneration o	occurs,	please	e prepare an c	optional		Please note tha absolute encod			ogether wit	n 23-bit			DV0P4190	367
Note	)1 🗌 : F	Represen	ts the i	motor specifications								F	Please buy the	battery part nu	ımber "DV0P			Surge Absorbe	er	DV0P1450	367
Note Note	•	•		driver specifications cable length (03/3 m	•	•	,	m/MFF	FCANO	30FAF		•	Brake cable an orake.	a motor cables	are required	for the mo	tors with	Ferrite Core		DV0P1460	368
	,			5.19.1. (00/0 II	., 55,5 111	,	,		, .00												$\rightarrow$

incremental system can be used in combination.

Daisy Chain

Note)4 Because A6SE series driver (dedicated for position control) does not support the absolute system specification, only

DV0P24610

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A6 Series

			Moto	r			Driver					Optiona	al parts						■ Options		
						A6SF series	A6SG series			Encoder Ca	able Note)3	Motor C	able Note	te)3						Title	Part No.
									Power	Liloudei ot	able Hotojo	motor c	ADIC NOR	10,0					Interface Cable	9	DV0P4360
					Rating/	Multi fanction	RS485 communication		capacity	23-bit A	bsolute										DV0P4120
		Power	Output	Part No.	Spec.	type			/ at \						Brake	External	Reactor	Noise Filter	Interface Conv	eraion Cabla	DV0P4121 DV0P4130
Mo	tor series	supply	(W)	Note)1	Dimensions	(Pulse, analog, full-closed	A6SE series	Frame	rated	Use in the absolute	Use in the Incremental	without	wi	vith	Cable	Regenerative	Single phase	Single phase	Interface Conv	ersion Cable	DV0P4130
			(,	,	(page)	( /	Basic		(kVA)	system	system	Brake	Bra	rake	Note)3	Resistor	3-phase	3-phase			DV0P4131
					u - 3-7		(Pulse signal input)		(,	-	(without battery box)						,	, ,	Connector Kit	A frame Single row	DV0PM20032
							Note)2, Note)5			Note)6									for Power	A-frame to	D V OT IVIZOUSZ
																			Supply Input Connection	D-frame Double row type	DV0PM20033
			50	MSMF5AZL1 ☐ 1	51	MADLT01SF	MADLN01S♦												Connector Kit		
					101			A-frame	Approx.							DV0P4280	DV0P227		for Motor	A-frame to D-frame	DV0PM20034
					53			<b>★</b>	0.4							D V 01 4200	D V 01 221		Connection		D) (0D) (00005
		Single	100	MSMF011L1 ☐ 1	103	MADLT11SF	MADLN11S♦											DV0P4170	Connector Kit for Motor/	MSMF	DV0PM20035
		phase																-	Encoder Con-	MQMF	DV0PM24582
		100 V	200	MSMF021L1 ☐ 1	55	MBDLT21SF	MBDLN21S♦	B-frame	Approx.	MFECA	MFECA		FMCA		MFMCB	DV0P4283			nection		
			200	WOWI OZIEI 🗆 I	104	WIDDETZTOI	WIDDLINZIO	*	0.5	0 * * 0MJE	0 * * 0MJD		* 0NJD movable,\		0 * * 0PJT /For movable,\	D V 01 4200			Connector Kit f	or Brake Connection	
					E7					For movable, direction of	For movable, direction of		rection of otor shaft		direction of motor shaft		DV0P228			RS485, RS232	DV0PM20102
			400	MSMF041L1 ☐ 1	57 105	MCDLT31SF	MCDLN31S♦	C-frame	Approx.	\ motor shaft /	\ motor shaft /					DV0P4282		DV0PM20042	Connector Kit	Safety	DV0PM20103 DV0P4350
					105				0.0	MFECA	MFECA		FMCA		MFMCB				Connector Kit	External Scale	DV0PM20026
_	MSMF			MOMES 471 4 77 4	52	MADITOSOS	MADI NOTO A			0 * * 0MKE	0 * * 0MKD		* ONKD movable, \	١ .	0 * * 0PKT  For movable,					Encoder	DV0PM20010
8/	Connector		50	MSMF5AZL1 ☐ 1	101	MADLT05SF	MADLN05S♦			For movable, opposite direction	For movable, opposite direction		site direction notor shaft		opposite direction of motor shaft				Battery for Abs	olute Encoder	DV0P2990
<sup>≌.</sup>  /	type /							+		of motor shaft	\ of motor shaft /				MFMCB	DV0P4281	DVODOOZ			Absolute Encoder	DV0P4430
inertia	3000 r/min		100	MSMF012L1 ☐ 1	54	MADLT05SF	MADLN05S♦	A-frame	Approx.	MFECA	MFECA		FMCA		0 * * 0SJT		DV0P227		Note)6	Г А <i>(</i> D <i>(</i>	
ا س	IP67				103			*	0.5	0 * * 0TJE / For fixed, \	0 * * 0TJD / For fixed, \		* 0RJD or fixed, \		/ For fixed, \		DV0P220	DV0P4170	Mounting Bracket	For A-frame,B-frame For C-frame,D-frame	
		<b>.</b> .			56			1		direction of motor shaft	direction of motor shaft	dir	rection of otor shaft		direction of motor shaft/		1	DV0PM20042	Diacket	For movable, direction	
		Single	200	MSMF022L1 🗌 1	104	MADLT15SF	MADLN15S♦			MFECA	MFECA				MFMCB				Encoder	of motor shaft	MFECA0 * * 0MJE
		phase/			10-1					0 * * 0TKE	0**0TKD		FMCA *0RKD		0 * * 0SKT			-	Cable	For movable, opposite direction of motor shaft	MFECA0 * * 0MK
		3-phase	400	MSMF042L1 ☐ 1	58	MBDLT25SF	MBDLN25S♦	B-frame	Approx.	For fixed, opposite direction	For fixed, opposite direction	/ F	or fixed,	\	For fixed, opposite direction	DV0P4283			(with Battery Box)	For fixed, direction of motor shaft	MFECA0 * * 0TJE
		200 V	400	MISMITU4ZLI 🗆 I	105	WIDDL1233F	MIDDLINZSS	*	0.9	of motor shaft	of motor shaft		site direction notor shaft		of motor shaft	DV0F4203	DV0P228		Note)6	For fixed, opposite	MFECA0 * * 0TKE
					F0							N	Note)4		Note)7		DV0P220			direction of motor shaft	
			750	MSMF082L1 ☐ 1	59 107	MCDLT35SF	MCDLN35S♦	C-frame	Approx.								D V 01 220	DV0PM20042	Casadar	For movable, direction of motor shaft	MFECA0 * * 0MJ
					107				1.0										Encoder Cable	For movable, opposite direction of motor shaft	MFECA0**0MK
			4000	MOMEOGOLA	60	MDDLT4505	MDDINASOA		Approx.							D) (0D 400 4	DV0P228	D)/0D4000	/without \	For fixed, direction of	MFECA0 * * 0TJD
			1000	MSMF092L1 ☐ 1	108	MDDLT45SF	MDDLN45S♦	D-frame	1.8							DV0P4284	DV0P222	DV0P4220	(Battery Box)	motor shaft For fixed, opposite	
																	2 7 0			direction of motor shaft	MFECA0 * * 0TKE
			100	MQMF011L1 ☐ 1	67	MADLT11SF	MADLN11S♦	A-frame	Approx.							DV0P4280	DV0P227			For movable, direction of motor shaft	MFMCA0 * * 0NJ[
			100	MQMF011L1 🗌 3	119	WINDETTTO	WIN IDEITITIO V	*	0.4	MFECA	MFECA	MFMCA		MCA		D V 01 4200	DVOI ZZI		Motor Cable	For movable, opposite direction of motor shaft	MFMCA0 * * 0NK
		Single								0 * * 0MJE /For movable,\	0 * * 0MJD /For movable,\	0 * * 0UFD /For movable,\		k OVFD novable,\				DV0P4170	(For MSMF type)	For fixed, direction of	MFMCA0**0RJI
		phase	200	MQMF021L1   1	69	MBDLT21SF	MBDLN21S♦	B-frame	Approx.	direction of motor shaft	direction of motor shaft	direction of motor shaft	direct	ction of or shaft		DV0P4283				motor shaft	
<u>≅</u>		100 V		MQMF021L1 ☐ 3	123			*	0.5					.			DVODOOO			For fixed, opposite direction of motor shaft	MFMCA0 * * 0RK
/liddle	MQMF			MQMF041L1 □ 1	74				1.	MFECA 0 * * 0MKE	MFECA 0**0MKD	MFMCA 0**0UGI		MCA OVGD			DV0P228				MFMCA0 * * 0UFI
B /	Connector\		400	MQMF041L1 3	71 127	MCDLT31SF	MCDLN31S♦	C-frame	Approx.	/ For movable, \	/ For movable, \	/ For movable,	\ / For mo	novable, \		DV0P4282		DV0PM20042	Motor Cable	For movable, opposite	MFMCA0**0UG
inertia	type			MQMI 041L1 _ 3	127					opposite direction of motor shaft	opposite direction of motor shaft	opposite direction of motor shaft	of moto	e direction otor shaft	_				(For MQMF type)	For fixed, direction of	
	,			MQMF012L1 ☐ 1	68					MFECA	MFECA	MFMCA	MFN	MCA					(without Brake)	motor shaft	MFMCA0 * * 0WF
Flat (	3000 r/min		100	MQMF012L1 3	119	MADLT05SF	MADLN05S♦			0 * * 0TJE	0 * * 0TJD	0 * * 0WF[				DV0P4281	D) (0D007			For fixed, opposite direction of motor shaft	MFMCA0**0WG
Flat type	IP67	Single		WIGHT OTZET - O	110			A-frame	Approx.	For fixed, direction of	For fixed, direction of	For fixed, direction of	/ For fi	fixed, totion of			DV0P227			For movable, direction of motor shaft	MFMCA0**0VFI
9		phase/	000	MQMF022L1 ☐ 1	70	MADIT: -05	144D1 111-0 0	*	0.5	(motor shaft)	(motor shaft)	motor shaft/		or shaft/			DV0P220	DV0P4170	Motor Cable	For movable, opposite direction of motor shaft	MFMCA0**0VG
		3-phase	200	MQMF022L1   3	123	MADLT15SF	MADLN15S♦			MFECA	MFECA	MFMCA		MCA				DV0PM20042	(For MQMF type)	direction of motor shaft For fixed, direction of	
		200 V								0 * * 0TKE / For fixed, \	0 * * 0TKD	0 * * 0WGI		OXGD		DV0P4283		- 10	(with Brake)	motor shaft	MFMCA0 * * 0XFI
			400	MQMF042L1 ☐ 1	72	MBDLT25SF	MBDLN25S♦	B-frame	Approx.	opposite direction of motor shaft	opposite direction of motor shaft	opposite direction of motor shaft	on opposite	e direction otor shaft			DV0P228			For fixed, opposite direction of motor shaft	MFMCA0 * * 0XG
			400	MQMF042L1 ☐ 3	127	MDDF1522F	NIDDFIN529♦	± maine	0.9	, o. motor orient	, oo.o. onart /	of motor shall	, , , , , , , , , , , , , , , , , , , ,	oait			DV0P220			For movable, direction	MFMCB0 * * 0PJ1
						L														of motor shaft For movable, opposite	
<b>★</b> :F	rame-A and	d B driver	s are r	ot equipped with re	generativ	e resistors.Whe	n regeneration o	occurs	, please	prepare an o	ptional	Movable:	: For app	olication	where the ca	ble is mova	ble.	7	Brake Cable	direction of motor shaft	MFMCB0 * * 0PK
_	vternal reg														whore the co					For fixed, direction of	MFMCB0 * * 0SJT

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external regenerative resistor.

☐ : Represents the motor specifications. (refer to "Model designation" P.18.) Note)1

Note)2

\* \* : Represents the cable length (03/3 m, 05/5 m, 10/10 m, 20/20 m). Example. 3 m/MFECA0030MJE

Note)4 Cables for opposite to output shaft cannot be used with 50 W or 100 W motor. (MSMF connector type only.)

Note)5 Because A6SE series driver (dedicated for position control) does not support the absolute system specification, only incremental system can be used in combination.

Note)6 Please note that a battery is not supplied together with 23-bit absolute encoder cable (with battery box).

Please buy the battery part number "DV0P2990" separately.

Note)7 Brake cable and motor cables are required for the motors with brake.

Panasonic Corporation Electromechanical Control Business Division

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Fixed: For application where the cable is fixed.

Direction of motor shaft/Opposite direction of motor shaft : Cable direction

Encoder	For movable, direction of motor shaft	MFECA0 * * 0MJE	278
Cable	For movable, opposite direction of motor shaft	MFECA0 * * 0MKE	278
(with (Battery Box)	For fixed, direction of motor shaft	MFECA0 * * 0TJE	278
Note)6	For fixed, opposite direction of motor shaft	MFECA0 * * 0TKE	278
	For movable, direction of motor shaft	MFECA0 * * 0MJD	278
Encoder Cable	For movable, opposite direction of motor shaft	MFECA0 * * 0MKD	278
(without	For fixed, direction of motor shaft	MFECA0 * * 0TJD	278
(Bullety Box)	For fixed, opposite direction of motor shaft	MFECA0 * * 0TKD	278
	For movable, direction of motor shaft	MFMCA0 * * 0NJD	281
Motor Cable	For movable, opposite direction of motor shaft	MFMCA0 * * 0NKD	281
(For MSMF type)	For fixed, direction of motor shaft	MFMCA0**0RJD	281
	For fixed, opposite direction of motor shaft	MFMCA0**0RKD	281
	For movable, direction of motor shaft	MFMCA0 * * 0UFD	282
Motor Cable	For movable, opposite direction of motor shaft	MFMCA0 * * 0UGD	282
(without Brake)	For fixed, direction of motor shaft	MFMCA0**0WFD	282
	For fixed, opposite direction of motor shaft	MFMCA0**0WGD	282
	For movable, direction of motor shaft	MFMCA0**0VFD	285
Motor Cable	For movable, opposite direction of motor shaft	MFMCA0 * * 0VGD	285
(with Brake)	For fixed, direction of motor shaft	MFMCA0 * * 0XFD	285
	For fixed, opposite direction of motor shaft	MFMCA0 * * 0XGD	285
	For movable, direction of motor shaft	MFMCB0 * * 0PJT	289
Duales Cabl-	For movable, opposite	MFMCB0 * * 0PKT	289
Brake Cable	For fixed, direction of motor shaft	MFMCB0 * * 0SJT	289
	For fixed, opposite	MFMCB0 * * 0SKT	289
	50 Ω 25 W	DV0P4280	305
External	100 Ω 25 W	DV0P4281	305
regenerative	25 Ω 50 W	DV0P4282	305
resistor	50 Ω 50 W	DV0P4283	305
	30 Ω 100 W	DV0P4284	305
Reactor	-	-, -	304
Noise Filter	DV0P41	70, DV0PM20042	366
Surge Absorbe			367
Ferrite Core	DV0P14		368
Daisy Chain	DV0P24		307
	Note)6  Encoder Cable (without (Battery Box)  Motor Cable (For MSMF type)  Motor Cable (For MQMF type) (without Brake)  Motor Cable (For MQMF type) (with Brake)  Brake Cable  External regenerative resistor  Reactor  Noise Filter  Surge Absorbe	Note) 6  Note) 6  For fixed, opposite direction of motor shaft For movable, opposite direction of motor shaft For fixed, opposite direction of motor shaft For fixed, opposite direction of motor shaft For fixed, opposite direction of motor shaft For movable, opposite direction of motor shaft For movable, direction of motor shaft For movable, direction of motor shaft For movable, direction of motor shaft For fixed, opposite direction of motor shaft For movable, opposite direction of motor shaft For fixed, opposite direction of motor shaft For fixed, opposite direction of motor shaft For fixed, opposite direction of motor shaft For movable, direction of motor shaft For movable, direction of motor shaft For movable, opposite direction of motor shaft For fixed, opposite Opposite direction of motor shaft For	Note   Salter   Sa

Table of Part Numbers and Options 80 mm sq. or less 50 W to 1000 W

A6 Series

Connector type IP67

		Moto	or			Driver					Option	nal part	ts					■ Options			
					A6SF series	A6SG series				able Note)3	Motor (	Cable	Note)3					Interfess Only	Title	DVC	Part No.
					Multi fanction	RS485		Power	·	<u> </u>								Interface Cable	е		)P4360 )P4120
	_			Rating/	type	communication		/ at \	23-011 7	Absolute				Brake	External	Reactor	Noise Filter				)P4121
Motor series	Power supply	Output (W)	Part No. Note)1	Spec. Dimensions	(Pulse, analog, full-closed	A6SE series	Frame	rated	Use in the	Use in the	without		with	Cable	Regenerative		Single phase	Interface Conv	version Cable		P4130
	Supply	(**)	Note	(page)	iuii-cioseu /	Basic		(kVA)	absolute system	Incremental system	Brake		Brake	Note)3	Resistor	3-phase	3-phase				)P4131 )P4132
				u s 3 s /		(Pulse signal input)		(,	(with battery box)	I						,	,	Connector Kit		-	)PM20032
						Note)2, Note)4			Note)5									for Power Supply Input	to	0 1011	
			_								MFMCA		MFMCA					Connection	D-frame Double type	DV0	)PM20033
		50	MHMF5AZL1   1	73	MADLT01SF	MADLN01S♦					0 * * 7UF /Movable/fixed	d\ /M	* *7VFD Movable/fixed\					Connector Kit for Motor	A-frame to	DVO	PM20034
			MHMF5AZL1 ☐ 3	131							common-use direction of		direction of					Connection	D-frame	DVO	1 10120004
							A-frame	Approx.			\ motor shaft		motor shaft /		DV0P4280	DV0P227		Connector Kit for Motor/	MHMF 200 W to 1	.0 kW DV0	PM24582
			MHMF011L1 🗌 1	75			*				0 * * 7UG		MFMCA * * 7VGD						MHMF 50 W, 100	N DV0	PM24581
		100	MHMF011L1  3	135	MADLT11SF	MADLN11S♦					Movable/fixed common-use		Movable/fixed common-use,					nection	fau Dualta Campa	ation DVO	DM00040
											opposite directi of motor shat	tion opp	posite direction of motor shaft				DV0P4170	Connector Kit i	for Brake Conne RS485, RS232		)PM20102
											MFMCA	\ I	MFMCA						Safety		PM20103
	OiI										0 * * 0UF		* * 0VFD					Connector Kit			P4350
	Single phase		MHMF021L1 □ 1	77				Approx.			For movable, direction of motor shaft		For movable, direction of motor shaft						External Scale Encoder		PM20026 PM20010
	100 V	200	MHMF021L1  3	139	MBDLT21SF	MBDLN21S♦	B-frame	0.5							DV0P4283			Battery for Abs			P2990
											0 * * 0UG		MFMCA * * 0VGD						r Absolute Enco	der DV0	P4430
											For movable, opposite directi	e, / F	For movable, posite direction					Note)5 Mounting	For A-frame,B-fr	ame DV0	PM20100
									_		\ of motor shaf	′ ' '	of motor shaft			DV0P228		Bracket	For C-frame,D-f		
									MFECA	MFECA	MFMCA 0 * * 0WF		MFMCA **0XFD					Encodor	For movable, directly of motor shaft	otion MFE	CA0**0MJ
									0 * * 0MJE /For movable,\	0 * * 0MJD /For movable,\	/ For fixed, \ direction of	\ /	For fixed, \direction of					Encoder Cable	For movable, opp		ECA0**0Mh
		400	MHMF041L1 🗌 1	79	MCDLT31SF	MCDLN31S♦	C-frame	Approx.	direction of motor shaft	direction of motor shaft	(motor shaft)		motor shaft		DV0P4282		DV0PM20042	(with Battery Box)	For fixed, direction	Snan	ECA0**0TJ
			MHMF041L1 ☐ 3	143				0.9	MFECA	MFECA	MFMCA		MFMCA					Note)5	motor shaft For fixed, opposite		
MHMF									0 * * 0MKE	0 * * 0MKD	0 * * 0WG	\ /	* * 0XGD For fixed,						direction of motor	shaft	ECA0 * * 0TK
(Connector)									For movable, opposite direction of motor shaft	For movable, opposite direction of motor shaft	opposite directi of motor shaf	ft   opp	posite direction of motor shaft					]	For movable, directly of motor shaft	MFE	ECA0 * * 0MJ
type /									MFECA	MFECA	MFMCA		MFMCA	_				Encoder Cable	For movable, opposition of motor		CA0**0MK
3000 r/min		50	MHMF5AZL1 🗌 1	74	MADLT05SF	MADLN05S♦			0 * * 0TJE	0 * * 0TJD	0 * * 7UF /Movable/fixed	d\ /M	* *7VFD Movable/fixed\					/without \	For fixed, direction	of.	CA0**0TJI
IP67			MHMF5AZL1 ☐ 3	131					For fixed, direction of	For fixed, direction of	direction of		direction of					Battery Box	motor shaft For fixed, opposite		ECA0**0TK
							-		\motor shaft/ MFECA	\motor shaft/ MFECA	\ motor shaft		motor shaft / MFMCA		DV0P4281				For movable, dire	Silait	
			MHMF012L1 🗌 1	76			١.	Approx.	0 * * 0TKE		0 * * 7UG		* * 7VGD			DV0P227		Motor Cable	of motor shaft	IVIFIVI	/ICA0**0UF
		100	MHMF012L1  3	135	MADLT05SF	MADLN05S♦	A-frame ★	0.5	For fixed, opposite direction	For fixed, opposite direction	Movable/fixed common-use	e,    co	Movable/fixed common-use,			DV0P220		/For MHME \	For movable, opposition of motor	shaft   IVII IVI	//CA0 * * 0U(
									of motor shaft /	of motor shaft	opposite directi of motor shaf		posite direction of motor shaft				DV0P4170	(without Brake)	For fixed, direction motor shaft	n of MFM	1CA0**0W
											MFMCA		MFMCA				DV0PM20042	(maiour Brano)	For fixed, opposite direction of motor		//CA0 * * 0W
	Single	200	MHMF022L1   1	78	MADLT15SF	MADLN15S♦					0**0UF	D 0 >	* * 0VFD						For movable, dire	ation .	//CA0**0VF
	phase/		MHMF022L1 ☐ 3	139							/For movable, direction of		For movable, direction of					Motor Cable	of motor shaft For movable, opp	a aita	
	3-phase								-		\ motor shaft		motor shaft /				-	(For MHMF 200 W to 1.0 kW)	direction of motor	shaft IVII IVI	MCA0**0VG
	200 V	400	MHMF042L1 ☐ 1	80	MBDLT25SF	MBDLN25S♦	В.	Approx.			MFMCA		MFMCA * * 0VGD		DV0P4283			(with Brake)	motor shaft	IVIFIVI	//CA0**0XF
		400	MHMF042L1 ☐ 3	143	WIDDL1255F	WIDDLIN255	B-frame ★	0.9			0 * * 0UG For movable, opposite directi	e, \ / F	For movable, posite direction		DV0F4203	D) (ODOO			For fixed, opposite direction of motor		//CA0 * * 0XC
											of motor shaf	ft / of	of motor shaft			DV0P228		Motor Cable	Movable/fixed common-use, dire	ction MFM	//CA0**7UF
			MHMF082L1 🗌 1	81				Approx.			MFMCA		MFMCA			DV0P220		(For MHMF 50 W, 100 W)	of motor shaft	0	
		750	MHMF082L1  3	147	MCDLT35SF	MCDLN35S♦	C-frame	1.3			0 * * 0WF / For fixed, \	\ /	* * 0XFD / For fixed, \				DV0PM20042	(without Brake)	Movable/fixed common-use, opp		1CA0 * * 7U0
											direction of motor shaft/	1 (	direction of motor shaft/						direction of motor  Movable/fixed		
											MFMCA		MFMCA			DVADAAA		Motor Cable  /For MHMF \	common-use, dire	ction MFM	ICA0**7VF
		1000	MHMF092L1 ☐ 1 MHMF092L1 ☐ 3	82 151	MDDLT55SF	MDDLN55S♦	D-frame	Approx.			0 * * 0WG	\ /	* * 0XGD For fixed,		DV0P4284	DV0P228	DV0P4220	(50 W, 100 W)	Movable/fixed common-use, opp	osite MEM	<b>Λ</b> CΔ0 ± ± 7\/C
			IVIDIVIDUSZEI 🗌 3	151				2.0			opposite directi of motor shaf	tion   opp	posite direction of motor shaft			DV0P222		(with Brake)	direction of motor	shaft	
Eramo A an	d B drive	re ore :	not aquipped with **	aganarati:	vo resistore Wh	n regeneration :	0001120	nlocas	nropore en a	ontional	「Movoble	· For	application	whore the a	able is move	hlo	٦	- Evterne!	50 Ω 25 W		)P4280 )P4281
external reg			not equipped with re	generall	ve resisiors.vvne	ii regeneration (	occurs,	piedse	prepare an C	υμιιστίαι					able is mova able is fixed.	DIE.		External regenerative	100 Ω 25 W 25 Ω 50 W		)P4281 )P4282
J			or. notor specifications	(refer to	"Model designs	tion" P 19 \					I					r shaft · ∩	able direction	resistor	50 Ω 50 W		)P4283
•	•		friver specifications	•	•	,					[ Direction	1 01 1110	טנטו פוומוניטן	pposite uite	Juon of 111010	i Siiail . G			30 Ω 100 W		P4284
•			able length (03/3 m	•	•	,	m/MF	FCAnn	30MJF									Reactor		P220, DV0 P227, DV0	
	-		driver (dedicated for							1.								Noice Filter			V0PM20042
			n can be used in co	-			55.010	5,00011	. 50001110411011	-,								Noise Filter	DV0	P4220	
•		•	onvie not cupplied t				,											Surge Absorbe	er DV0	P4190, DV	√0P1450

Please buy the battery part number "DV0P2990" separately.

Note)5 Please note that a battery is not supplied together with 23-bit absolute encoder cable (with battery box).

DV0P1460

DV0P24610

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Ferrite Core

Daisy Chain

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		Moto	r			Driver					Optional	parts				■ Options		
									Encoder Cal	ble Note)3,5		le Note)3,5					Title	Part No.
					A6SF series	A6SG series		Power	JL10 (La			.10	-			Interface Cable	<u>e</u>	DV0P4360 DV0P4120
					Multi fanction	RS485		capacity	/One-touch		/One-touch							DV0P4120 DV0P4121
	Dower	Outnut	Part No.	Rating/	type	communication		/ at \	N/MS scre	ewed type	JL04 scre	ewed type	Evtornol			Interface Conv	version Cable	DV0P4130
Motor series	Power	Output (W)	Note)1	Spec. Dimensions	(Pulse, analog, full-closed	A6SE series	Frame	rated	23-bit A	bsolute			External Regenerative	Reactor	Noise Filter			DV0P4131
	опри,	(,	, .	(page)	( iaii olooba )	Basic		(kVA)	Use in the	Use in the	without	with	Resistor	(Single phase / 3-phase)		1	Oire et e un	DV0P4132
						(Pulse signal input)		` ′	absolute system	Incremental system	Brake	Brake				Connector Kit	A-frame Single rov	<sup>w</sup> DV0PM20032
						Note)2, Note)4			, , ,	(without battery box)						for Power Supply Input	D-frame Double ro	DV0PM20033
	OiI		MOME 400L4 D	0.4					Note)7							Connection	E-frame	DV0PM20044
	Single phase/	1000	MSMF102L1 ☐ 6 MSMF102L1 ☐ 8	61 109	MDDLT55SF	MDDLN55S♦		Approx.			MFMCD	MFMCA		DV0P228 / DV0P222		Connector Kit	A-frame to D-fram	ne DV0PM20034
	3-phase	1500	MSMF152L1 ☐ 6	62	MDDLT55SF	MDDLN55S♦	D-frame	2.3			0 * * 2EUD	0 * * 2FUD	DV0P4284	DV0PM20047 / DV0P222	DV0P4220	for Motor Connection	E-frame	DV0PM20046
_ MSMF	200 V	1500	MSMF152L1 ☐ 8	110	MIDDLISSE	MIDDEIN339			MFECA	MFECA	MFMCD	MFMCA		DV0PW20047 / DV0P222		Connector Kit		
Large size		2000	MSMF202L1 $\square$ 6 MSMF202L1 $\square$ 8	63 111	MEDLT83SF	MEDLN83S♦	E-frame	Approx. 3.8	0**0EPE	0 * * 0EPD	0**2ECD	0**2FCD	DV0P4285 Note)6	DV0P223	DV0PM20043	for Regenera- tive Resistor	E-frame	DV0PM20045
5. Jr 10 type		2000	MSMF302L1  6	64	MEDITAGOE	MEDIAMAGA		Approx.					Notejo	Disposs		live ricoloco.		DV0PM24587
3000 r/min	3-phase	3000	MSMF302L1 ☐ 8	113	MFDLTA3SF	MFDLNA3S♦		4.5	MFECA 0**0ESE	MFECA 0**0ESD	MFMCA 0**3EUT	MFMCA 0**3FUT		DV0P224	_			MSMF 1.0 kW to 2.0 kW MDMF 1.0 kW to 2.0 kW
IP67	200 V	4000	MSMF402L1  6	65	MFDLTB3SF	MFDLNB3S	F-frame		0 % % OLGE	0 % % OLOD	U* *3EUT	<u> </u>	DV0P4285		DV0P3410			MGMF 0.85 kW to 1.8 kW MHMF 1.0 kW, 1.5 kW
			MSMF402L1  8 MSMF502L1  6	114 66			-	Approx. 7.5			MFMCA	MFMCA	×2 in parallel	DV0P225			without Brake	DV0PM24588
		5000	MSMF502L1  8	115	MFDLTB3SF	MFDLNB3S					0**3ECT	0**3FCT				11_		MSMF 3.0 kW to 5.0 kW MDMF 3.0 kW to 5.0 kW
	Single	1000	MDMF102L1   6	89	MDDLT45SF	MDDLN45S♦		Approx.			MFMCD	MFMCA		DV0P228 / DV0P222		Connector Kit for Motor/		MGMF 2.4 kW to 4.4 kW MHMF 2.0 kW to 5.0 kW
	phase/ 3-phase		MDMF102L1 ☐ 8 MDMF152L1 ☐ 6	161 90			D-frame	1.8			0 * * 2EUD	0**2FUD	DV0P4284		DV0P4220	Encoder Con-		DV0PM24589
MDMF	200 V	1500	MDMF152L1  8	162	MDDLT55SF	MDDLN55S♦		Approx. 2.3	145504	145501	MEMOD	MEMOA		DV0PM20047 / DV0P222		nection		MSMF 1.0 kW to 2.0 kW MDMF 1.0 kW to 2.0 kW
Large size		2000	MDMF202L1 ☐ 6	91	MEDLT83SF	MEDLN83S♦	E-frame	Approx.	MFECA 0**0EPE	MFECA 0**0EPD	MFMCD 0 * * 2ECD	MFMCA 0**2FCD	DV0P4285	DV0P223	DV0PM20043		with Brake	MGMF 0.85 kW to 1.8 kW MHMF 1.0 kW, 1.5 kW
JL10 type		2000	MDMF202L1  8	163	WIEDETOOOI	WIEDEINOOO	L-liaile	3.8					Note)6	D V 01 220	D V OI IVIZOUTO		willi brake	DV0PM24590 MSMF 3.0 kW to 5.0 kW
2000 r/min	3-phase	3000	MDMF302L1 ☐ 6 MDMF302L1 ☐ 8	92 165	MFDLTA3SF	MFDLNA3S♦		Approx. 4.5	MFECA	MFECA	MFMCA	MFMCA		DV0P224				MDMF 3.0 kW to 5.0 kW
IP67	200 V	4000	MDMF402L1 ☐ 6	93	MFDLTB3SF	MEDI NIDOCA	f.		0 * * 0 ESE	0 * * 0ESD	0 * * 3EUT	0 * * 3FUT	DV0P4285		DV0D2440			MGMF 2.4 kW to 4.4 kW MHMF 2.0 kW to 5.0 kW
		4000	MDMF402L1 🔲 8	166	MILDELDOOL	MFDLNB3S♦	F-frame	Approx.			MFMCA	MFMCA	×2 in parallel	DV0P225	DV0P3410		RS485, RS232	DV0PM20102
≦.		5000	MDMF502L1 ☐ 6 MDMF502L1 ☐ 8	94 167	MFDLTB3SF	MFDLNB3S		7.5			0 * * 3ECT	0**3FCT		2 1 0 1 1 1 1		Connector Kit	Safety Interface	DV0PM20103 DV0P4350
Middle	Single		MGMF092L1  6	95				Approx.						D)/2D222/D)/2D22/		Connector Nit	External Scale	DV0PM20026
Φ   Ξ:	phase/	850	MGMF092L1  8	169	MDDLT45SF	MDDLN45S♦	D-frame	1.8			MFMCD	MFMCA 0**2FUD	DV0P4284	DV0P228 / DV0P221	DV0P4220		Encoder	DV0PM20010
inertia	3-phase	1300	MGMF132L1   6	96	MDDLT55SF	MDDLN55S♦	D-Iranie	Approx. 2.3			0 * * 2EUD	U↑ ↑2FUD	D V 01 4204	DV0PM20047 / DV0P222	D V 01 4220	Battery for Abs		DV0P2990
MGMF	200 V		MGMF132L1 ☐ 8 MGMF182L1 ☐ 6	170 97		-		Approx.	-		MFMCD	MFMCA				Note)7	r Absolute Encode	DV0P4430
Large size		1800	MGMF182L1  8	171	MEDLT83SF	MEDLN83S♦		3.8	MFECA	MFECA	0 * * 2ECD	0 * * 2FCD		DV0P223		Mounting	D-frame	DV0PM20101
JL10 type							E-frame		0 * * 0EPE	0 * * 0EPD	MFMCE	MFMCD	DV0P4285		DV0PM20043	Bracket	- Tamo	BV01 WIZO101
Low speed/ High torque		2400	MGMF242L1  6	98	MEDLT93SF	MEDLN93S♦	L-iranie	Approx.	MFECA	MFFCA	0**3EUT	0**3FUT	DV01 4203		D V 01 1V120043	Encoder Cable	One-touch lock ty	DE MFECA0 * * 0EPE
\ type	3-phase 200 V		MGMF242L1 ☐ 8	173				4.5	0 * * 0ESE	0 * * 0ESD	MFMCE 0**3ECT	MFMCD 0**3FCT		DV0P224		(with Battery Box)		
1500 r/min	200 V	0000	MGMF292L1 ☐ 6	99	MEDITOOF	MEDI NIDOO A			-		MFMCA	MFMCA				Note)7	Screwed type	MFECA0 * * 0ESE
IP67		2900	MGMF292L1 ☐ 8	174	MFDLTB3SF	MFDLNB3S♦	F-frame	Approx.			0 * * 3EUT	0 * * 3FUT	DV0P4285		DV0P3410	Encoder	One-touch lock ty	ne MFECA0 * * 0EPD
		4400	MGMF442L1   6	100	MFDLTB3SF	MFDLNB3S	I -irame	7.5			MFMCA	MFMCA	×2 in parallel	DV0P225	DV0F3410	Cable /without \		
	Cinala		MGMF442L1  8	175				Amment			0 * * 3ECT MFMCD	0 * * 3FCT MFMCA				Battery Box	Screwed type	MFECA0 * * 0ESD
	Single phase/	1000	MHMF102L1 ☐ 6 MHMF102L1 ☐ 8	83 153	MDDLT45SF	MDDLN45S♦		Approx. 1.8			0 * * 2EUD	0 * * 2FUD		DV0P228 / DV0P222			One-touch lock type Screwed type	MFMCD0 * * 2EUD  MFMCD0 * * 2ECD
	3-phase	1500	MHMF152L1 ☐ 6	84	MDDLT55SF	MDDLN55S♦	D-frame	Approx.			MFMCD	MFMCA	DV0P4284	DV0PM20047 / DV0P222	DV0P4220	Motor Cable		De MFMCE0 * * 2EUD
	200 V	1300	MHMF152L1 ☐ 8	154	MDDL19991	WIDDENSSS V		2.3	-		0**2ECD	0**2FCD		DV0FW20047 / DV0F222		(without Brake)	Screwed type	MFMCE0**2ECD
_ MHMF									MFECA	MFECA	MFMCE 0**2EUD	MFMCE 0**2FUD	D. /25 /					MFMCA0 * * 3EUT
Large size		2000	MHMF202L1 ☐ 6 MHMF202L1 ☐ 8	85 155	MEDLT83SF	MEDLN83S♦	E-frame	Approx.	0**0EPE	0 * * 0EPD			DV0P4285 Note)6	DV0P223	DV0PM20043		Screwed type One-touch lock tyr	MFMCA0 * * 3ECT be MFMCA0 * * 2FUD
Հ			20221 🗀 0	100					MFECA	MFECA	MFMCE 0 * * 2ECD	MFMCE 0**2FCD	14010)0				Screwed type	MFMCA0 * *2FCD
2000 r/min IP67	3-phase	3000	MHMF302L1 ☐ 6	86	MFDLTA3SF	MFDLNA3S		Approx.	0 * * 0ESE					DV0P224		Motor Cable		oe MFMCE0 * *2FUD
11 07	200 V	3000	MHMF302L1 🗌 8	157	WII DETAGGI	WII DEIVAGG	-	4.5			MFMCA 0**3EUT	MFMCA 0**3FUT	D) (0D (005	DV01 224	-	(with Brake)	Screwed type	MFMCE0 * * 2FCD  De MFMCA0 * * 3FUT
		4000	MHMF402L1 ☐ 6 MHMF402L1 ☐ 8	87 158	MFDLTB3SF	MFDLNB3S♦	F-frame	Approx.					DV0P4285 ×2 in parallel		DV0P3410		Screwed type	MFMCA0 * *3FCT
		5000	MHMF502L1  6	88	MEDI TRACE	MEDI NDOCA	1	7.5			MFMCA 0**3ECT	MFMCA 0**3FCT	XZ III paralici	DV0P225		External	30 Ω 100 W	DV0D4284
		5000	MHMF502L1 ☐ 8	159	MFDLTB3SF	MFDLNB3S♦					0 T T T T T T T T T T T T T T T T T T T	001				regenerative resistor	20 Ω 130 W	DV0P4285
,	•		notor specifications.	•	•	,					,	,,		s and motor cables e				22, DV0P223
•	•		river specifications.	•	•	,								tional screwed type N	I/MS and	Reactor		24, DV0P225 28, DV0PM20047
,	•		able length (03/3 m			, .							es can also be			Nai Fii		28, DV0PM20047 220, DV0PM20043
			Iriver (dedicated for	-		ot support the ab	solute	system	specification,		•			s, refer to P.303.	h 22-hit	Noise Filter	DV0P3	410
only in	cremental	syster	n can be used in co	mbination	٦.								a battery is no r cable (with ba	supplied together wit	11 ZJ-VIL	Surge Absorbe		190, DV0P1450
													•	illery box). iber "DV0P2990" sepa	avatalı.	Ferrite Core	DV0P1	

Please buy the battery part number "DV0P2990" separately.

Daisy Chain

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DV0PM24610

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	_		Moto	r			Driver					Option	al parts				<b>■</b> Options			
									1	Encoder C	able Note)3	Motor C	able Note)3,5					Title	Part No.	
						A6SF series	A6SG series		Power				JL10				Interface Cabl	e	DV0P4360 DV0P4120	29
		Damar	Outman	Dovi No	Rating/	Multi fanction type	RS485 communication		capacity		nall size) h lock type)	One-tou	crewed type	Futamal			Interface Conv	version Cable	DV0P4121 DV0P4130	29
N	lotor series	Power	Output (W)	Part No. Note)1	Spec. Dimensions	(Pulse, analog, full-closed	A6SE series Basic	Frame	rated load (kVA)	23-bit A	Absolute Use in the			External Regenerative Resistor	Reactor (Single phase / 3-phase)	Noise Filter			DV0P4131 DV0P4132	29
					(page)		(Pulse signal input)		(KVA)	absolute system	Incremental system	without Brake	with Brake	riesistoi			Connector Kit	A-frame Single r	ow DV0PM20032	2 29
							Note)2, Note)4				(without battery box	Diuke	Brake				for Power Supply Input Connection	D-frame Double type	DV0PM20033	
		Single phase/	1000	MSMF102L1	61 109	MDDLT55SF	MDDLN55S♦	D-fram	Approx.			MFMCD 0**2EU	MFMCA	DV0P4284	DV0P228 / DV0P222	DV0P4220	Connector Kit for Motor	A-frame to D-frame	DV0PM20034	
_	MSMF	3-phase 200 V	1500	MSMF152L1   5 MSMF152L1 7	62 111	MDDLT55SF	MDDLN55S♦		e 2.3			MFMCD	MFMCA		DV0PM20047 / DV0P222		Connection Connector Kit	E-frame	DV0PM20046	5 29
ow in	Small size JN2 type		2000	MSMF202L1 5 MSMF202L1 7	63 112	MEDLT83SF	MEDLN83S♦	E-frame	3.0	MFECA	MFECA	0 * * 2EC	0 * * 2FCD	DV0P4285 Note)6	DV0P223	DV0PM20043	for Regenera- tive Resistor	E-frame	DV0PM20045	5 29
inertia	3000 r/min IP67	3-phase	3000	MSMF302L1	64 113	MFDLTA3SF	MFDLNA3S		Approx. 4.5	0 * * 0ETE	0**0ETD	MFMCA 0 * * 3EU	MFMCA T 0**3FUT	DV0D400F	DV0P224	-			DV0PM24583 MSMF 1.0 kW to 2 MDMF 1.0 kW to 2	2.0 kW 2.0 kW <b>2</b> 9
	11 07	200 V	4000	MSMF402L1	65 115	MFDLTB3SF	MFDLNB3S♦	F-frame	Approx.			MFMCA	MFMCA	DV0P4285 ×2 in parallel	DV0P225	DV0P3410		without Brake	MGMF 0.85 kW to MHMF 1.0 kW, 1.5 DV0PM24584	5 kW
		Single	5000	MSMF502L1	66 116 89	MFDLTB3SF	MFDLNB3S♦		Approx.			0**3EC	T 0**3FCT				Connector		MSMF 3.0 kW to 5 MDMF 3.0 kW to 5 MGMF 2.4 kW to 4	5.0 kW 5.0 kW <b>2</b> 9
		Single phase/ 3-phase	1000	MDMF102L1	161	MDDLT45SF	MDDLN45S♦	D-frame	1.8			MFMCD 0**2EUI	MFMCA 0 * *2FUD	DV0P4284	DV0P228 / DV0P222	DV0P4220	Kit for Motor/ Encoder Con-		MHMF 2.0 kW to 5	5.0 kW
	MDMF	200 V	1500	MDMF152L1	163 91	MDDLT55SF	MDDLN55S	_	2.3			MFMCD	MFMCA	DV0P4285	DV0PM20047 / DV0P222		nection		MSMF 1.0 kW to 2 MDMF 1.0 kW to 2 MGMF 0.85 kW to MHMF 1.0 kW, 1.5	2.0 kW 29 1.8 kW
	Small size JN2 type		2000	MDMF202L1	164 92	MEDLTAGE	MEDLN83S	E-frame	9 3.8 Approx.	MFECA 0**0ETE	MFECA 0**0ETD	0**2EC		Note)6	DV0P223	DV0PM20043		with Brake	DV0PM24586 MSMF 3.0 kW to 5	5.0 kW
	2000 r/min IP67	3-phase 200 V	3000 4000	MDMF302L1 7 7 MDMF402L1 5	165 93	MFDLTB3SF	MFDLNB3S	_ 	4.5			MFMCA 0 * * 3EU	MFMCA T 0**3FUT	DV0P4285	DV0P224	DV0D2410			MDMF 3.0 kW to 9 MGMF 2.4 kW to 9 MHMF 2.0 kW to 9	4.4 kW
_			5000	MDMF402L1	167 94	MFDLTB3SF MFDLTB3SF	MFDLNB3S<	F-frame	Approx. 7.5			MFMCA 0**3EC	MFMCA T 0**3FCT	×2 in parallel	DV0P225	DV0P3410		RS485, RS232 Safety	DV0PM20102 DV0PM20103	3 29
ldc		0: 1	3000	MDMF502L1 7	168	WII DET B331	WII DENDSS		ļ. —			0					Connector Kit		DV0P4350 DV0PM20026	29
iddle ine		Single phase/	850	MGMF092L1 5 MGMF092L1 7	95 169	MDDLT45SF	MDDLN45S♦	D-fram	Approx.			MFMCD 0**2EU	MFMCA 0 * *2FUD	DV0P4284	DV0P228 / DV0P221	DV0P4220	Potton, for Ab	External Scale Encoder	DV0PM20010	
inertia	MGMF	3-phase 200 V	1300	MGMF132L1	96 171	MDDLT55SF	MDDLN55S♦		Approx.	-		MFMCD	MFMCA		DV0PM20047 / DV0P222		Battery for Abs Battery Box fo Note)7	r Absolute Encod	DV0P2990 er DV0P4430	30
	Small size JN2 type		1800	MGMF182L1 ☐ 5 MGMF182L1 ☐ 7	97 172	MEDLT83SF	MEDLN83S♦		Approx.	-		0 * * 2 E C l			DV0P223	-	Mounting Bracket	D-frame	DV0PM20101	1 30
	Low speed/ High torque type	3-phase 200 V	2400	MGMF242 L1 ☐ 5 MGMF242 L1 ☐ 7	98 173	MEDLT93SF	MEDLN93S♦	E-frame	Approx.	MFECA 0**0ETE	MFECA 0**0ETD	MFMCE 0 * * 3EU MFMCE 0 * * 3EC	MFMCD	DV0P4285	DV0P224	DV0PM20043	Encoder Cable (with Battery Box)		MFECA0 * * 0	ETE 2
	1500 r/min IP67		2900	MGMF292L1 ☐ 5 MGMF292L1 ☐ 7	99 175	MFDLTB3SF	MFDLNB3S♦		Approx.			MFMCA 0**3EU	MFMCA T 0**3FUT	DV0P4285		D. / D. /	Note)7 Encoder	One-touch lock t	ype	
			4400	MGMF442L1 ☐ 5 MGMF442L1 ☐ 7	100 176	MFDLTB3SF	MFDLNB3S♦	F-frame	7.5			MFMCA 0**3EC	MFMCA T 0**3FCT	×2 in parallel	DV0P225	DV0P3410	Cable (without (Battery Box)		MFECA0 * * 0	ETD 2
		Single phase/	1000	MHMF102L1 ☐ 5 MHMF102L1 ☐ 7	83 153	MDDLT45SF	MDDLN45S♦	_	Approx.			MFMCD 0**2EUI	MFMCA	1	DV0P228 / DV0P222	DV-D	2011	One-touch lock t	ype MFMCD0 * *2 MFMCD0 * *2	
		3-phase 200 V	1500	MHMF152L1 ☐ 5 MHMF152L1 ☐ 7	84 155	MDDLT55SF	MDDLN55S♦	D-fram	Approx.			MFMCD 0**2EC	MFMCA 0 0 * * 2FCD	DV0P4284	DV0PM20047 / DV0P222	DV0P4220	Motor Cable (without Brake)		ype MFMCE0 * * 2 MFMCE0 * * 2	
High ine	MHMF Small size JN2 type		2000	MHMF202L1   5 MHMF202L1 7	85 156	MEDLT83SF	MEDLN83S♦	E-frame	Approx.	MFECA 0**0ETE	MFECA 0**0ETD	MFMCE 0 * * 2EUI MFMCE	MFMCE	Note)6	DV0P223	DV0PM20043		Screwed type	ype MFMCA0 * * 3 MFMCA0 * * 3 ype MFMCA0 * * 2 MFMCA0 * * 2	3ECT 28 2FUD 28
inertia	2000 r/min IP67	3-phase 200 V	3000	MHMF302L1   5	86	MFDLTA3SF	MFDLNA3S♦		Approx.	Jan avolit	3	0**2EC	0 * *2FCD	)	DV0P224		Motor Cable (with Brake)	One-touch lock t	ype MFMCE0 * *2 MFMCE0 * *2	
		200 V	4000	MHMF302L1	157 87	MFDLTB3SF		F-frame	4.5			0**3EU		DV0P4285		DV0P3410		One-touch lock t Screwed type	ype MFMCA0 * *3 MFMCA0 * *3	
			5000	MHMF402L1	159 88 160	MFDLTB3SF	MFDLNB3S	1	Approx. 7.5			MFMCA 0**3EC	MFMCA 0 * * 3FCT	×2 in parallel	DV0P225		External regenerative	30 Ω 100 W 20 Ω 130 W	DV0P4284 DV0P4285	30
No	∟ e)1 ☐ : R	l lepresent	ts the n	notor specifications				1		<u>I</u>	<u> </u>	Note)5 U	se of JL10 type	e motor cables	enable one-touch lock	connections.	resistor	DV0P	222, DV0P223	
	•	•		river specifications.	•	•	,								04V type cables can al	so be used.	Reactor		224, DV0P225 228, DV0PM2004	7
	,			able length (03/3 m Iriver (dedicated for							,	•			s, refer to P.303. t supplied together wi	th 23-bit	Noise Filter		4220, DV0PM200	
	only inc	remental	syster	n can be used in co	mbinatio	n.						a	osolute encode	er cable (with b	attery box).		Surge Absorbe		4190, DV0P1450	
												Р	lease buy the I	pattery part nur	nber "DV0P2990" sep	arately.	Ferrite Core	DV0P		30

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Daisy Chain

DV0P24610

battery for absolute encoder. Parameter Pr. 0.15 must be set to "1" (factory settings).  A/B phase, homing signal differential input. Serial communication is also supported.  Manufacturers that support serial communication scale: Fagor Automation S.Coop., HEIDENHAIN, Magnescale Co., Ltd., Mitutoyo Corporation Nidec Sankyo Corporation, Renishaw plc  Control signal  Control signal  Input General purpose 10 inputs The function of general-purpose input is selected by parameters.  General purpose 6 outputs The function of general-purpose output is selected by parameters.  Input General purpose 6 outputs The function of general-purpose output is selected by parameters.  Input Output 2 outputs (Analog monitor: 2 output)  Input Both open collector and line driver interface can be connected. High speed line driver interface can be connected.  4 outputs (Line driver: 3 output, open collector: 1 output)	Į	\6 S	Series	Driver	Specifica	tions A6SF series (Multifanction type) Position, Speed, Torque, Full-closed type
			400.1/	Mair	n circuit	Single phase 100 V <sup>+10</sup> % to 120 V <sup>+10</sup> % 50 Hz / 60 Hz
Single phase   200 V -10 %   10 240 V +10 %   50 Hz / 60 Hz			100 V	Contr	ol circuit	Single phase 100 V $^{+10}_{-15}$ % to 120 V $^{+10}_{-15}$ % 50 Hz / 60 Hz
Single phase   200 V -10 %   10 240 V +10 %   50 Hz / 60 Hz		Input		Main		Single/3-phase 200 V $^{+10}_{-15}$ % to 240 V $^{+10}_{-15}$ % 50 Hz / 60 Hz
Aframe to   Single phase   200 V +10 % to 240 V +10 % to 50 Hz / 60 Hz		power	000.1/	circuit		Single/3-phase 200 V $^{+10}_{-15}$ % to 240 V $^{+10}_{-15}$ % 50 Hz / 60 Hz
Principle   Ambient temperature:   20 to 15 %   15 %   10 240 V   -15 %   50 Hz   60 Hz			200 V	Control	<b>D</b> .	Single phase 200 V $^{+10}_{-15}$ % to 240 V $^{+10}_{-15}$ % 50 Hz / 60 Hz
Environment   temperature   Storage temperature: ~20 °C to 85 °C (Max.temperature guarantee: 80 °C for 72 hours free from condensation")				circuit	,	Single phase $200 \text{ V} ^{+10 \%}_{-15 \%}$ to $240 \text{ V} ^{+10 \%}_{-15 \%}$ 50 Hz / 60 Hz
Altitude				temp	perature	Storage temperature: -20 °C to 65 °C
Vibration   S.88 m/s² or less, 10 Hz to 60 Hz		En	vironment	hu	midity	Both operating and storage : 20 % to 85 %RH (free from condensation*1)
Control method   IGBT PWM Sinusoidal wave drive				Al	titude	Lower than 1000 m
Encoder feedback   23-bit (8388608 resolution) absolute encoder, 7-wire serial *When using it as an incremental system (not using multifurn data), do not connect to battery for absolute encoder. Parameter Pr. 0.15 must be set to "1" (factory settings).				Vib	oration	5.88 m/s² or less, 10 Hz to 60 Hz
Encoder feedback   * When using it as an incremental system (not using multiturn data), do not connect to battery for absolute encoder. Parameter Pr. 0.15 must be set to "1" (factory settings).		Co	ntrol metho	od		IGBT PWM Sinusoidal wave drive
External scale feedback    Manufacturers that support serial communication scale: Fagor Automation S.Coop., HeIDENHAIN, Magnescale Co., Ltd., Mitutoyo Corporation Nidec Sankyo Corporation, Renishaw plc    Control signal   Input   General purpose 10 inputs   The function of general-purpose input is selected by parameters.		End	coder feedl	oack		* When using it as an incremental system (not using multiturn data), do not connect the
Analog signal   Input   3 inputs (16-bit A/D : 1 input, 12-bit A/D : 2 inputs)	Basic Spe	Ext	External scale feedback			Manufacturers that support serial communication scale: Fagor Automation S.Coop., HEIDENHAIN, Magnescale Co., Ltd., Mitutoyo Corporation
Analog signal   Input   3 inputs (16-bit A/D : 1 input, 12-bit A/D : 2 inputs)	cificati		· ·			• • •
Pulse signal  Pulse diver interface can be connected.  Pulse diver interface can be connected.  Pulse signal  Puls	ons	_	Output			·····
Pulse signal  Pulse divier interface can be connected.  Pulse signal  Pu		nterf			Input	3 inputs (16-bit A/D : 1 input, 12-bit A/D : 2 inputs)
Pulse signal  4 outputs ( Line driver: 3 output, open collector: 1 output)  Line driver output for encoder pulses (A/B/Z signal) or external feedback pulses (EX EXB/EXZ signal) open collector output also available for Z or EXZ signal.  USB USB interface to connect to computers for parameter setting or status monitoring.  RS232 1:1 communication  RS485 1: n communication (max 31)  Safety function A dedicated connector is provided for Functional Safety.  Front panel (1) 5 keys (2) LED (6-digit)  Regeneration A-frame, B,-frame: no built-in regenerative resistor (external resistor only)  C-frame to F-frame: Built-in regenerative resistor (external resistor is also enabled.)  Dynamic brake A-frame to F-frame: Built-in  Switching among the following 7 mode is enabled,  (1) Position control (2) Speed control (3) Toque control (4) Position/Speed control		ace	Analog si	gnai	Output	2 outputs (Analog monitor: 2 output)
4 outputs ( Line driver: 3 output, open collector: 1 output) Line driver output for encoder pulses (A/B/Z signal) or external feedback pulses (EX EXB/EXZ signal) open collector output also available for Z or EXZ signal.  USB USB interface to connect to computers for parameter setting or status monitoring.  RS232 1:1 communication RS485 1: n communication (max 31)  Safety function A dedicated connector is provided for Functional Safety.  Front panel (1) 5 keys (2) LED (6-digit)  Regeneration A-frame, B,-frame: no built-in regenerative resistor (external resistor only) C-frame to F-frame: Built-in regenerative resistor (external resistor is also enabled.)  Dynamic brake A-frame to F-frame: Built-in Switching among the following 7 mode is enabled, (1) Position/Speed control		connector	D. I in		Input	Both open collector and line driver interface can be connected.
Communication function  RS232 1:1 communication  RS485 1: n communication (max 31)  Safety function A dedicated connector is provided for Functional Safety.  Front panel (1) 5 keys (2) LED (6-digit)  Regeneration A-frame, B,-frame: no built-in regenerative resistor (external resistor only)  C-frame to F-frame: Built-in regenerative resistor (external resistor is also enabled.)  Dynamic brake A-frame to F-frame: Built-in  Switching among the following 7 mode is enabled,  (1) Position control (2) Speed control (3) Toque control (4) Position/Speed control			Pulse sigi	nai	Output	Line driver output for encoder pulses (A/B/Z signal) or external feedback pulses (EXA/
function  RS485 1: n communication (max 31)  Safety function  A dedicated connector is provided for Functional Safety.  Front panel (1) 5 keys (2) LED (6-digit)  Regeneration  A-frame, B,-frame: no built-in regenerative resistor (external resistor only)  C-frame to F-frame: Built-in regenerative resistor (external resistor is also enabled.)  Dynamic brake  A-frame to F-frame: Built-in  Switching among the following 7 mode is enabled,  (1) Position control (2) Speed control (3) Toque control (4) Position/Speed control					USB	USB interface to connect to computers for parameter setting or status monitoring.
Safety function  A dedicated connector is provided for Functional Safety.  Front panel  (1) 5 keys (2) LED (6-digit)  A-frame, B,-frame: no built-in regenerative resistor (external resistor only)  C-frame to F-frame: Built-in regenerative resistor (external resistor is also enabled.)  Dynamic brake  A-frame to F-frame: Built-in  Switching among the following 7 mode is enabled,  (1) Position control (2) Speed control (3) Toque control (4) Position/Speed control				on	RS232	1:1 communication
Front panel  (1) 5 keys (2) LED (6-digit)  A-frame, B,-frame: no built-in regenerative resistor (external resistor only)  C-frame to F-frame: Built-in regenerative resistor (external resistor is also enabled.)  Dynamic brake  A-frame to F-frame: Built-in  Switching among the following 7 mode is enabled,  (1) Position control (2) Speed control (3) Toque control (4) Position/Speed control					RS485	1: n communication (max 31)
Regeneration  A-frame, B,-frame: no built-in regenerative resistor (external resistor only)  C-frame to F-frame: Built-in regenerative resistor (external resistor is also enabled.)  Dynamic brake  A-frame to F-frame: Built-in  Switching among the following 7 mode is enabled,  Control mode  (1) Position control (2) Speed control (3) Toque control (4) Position/Speed control		Sat	ety functio	n		A dedicated connector is provided for Functional Safety.
C-frame to F-frame: Built-in regenerative resistor (external resistor is also enabled.)  Dynamic brake A-frame to F-frame: Built-in  Switching among the following 7 mode is enabled,  Control mode (1) Position control (2) Speed control (3) Toque control (4) Position/Speed control		Fro	nt panel			(1) 5 keys (2) LED (6-digit)
Switching among the following 7 mode is enabled,  Control mode (1) Position control (2) Speed control (3) Toque control (4) Position/Speed control		Re	generation			· · · · · · · · · · · · · · · · · · ·
Control mode (1) Position control (2) Speed control (3) Toque control (4) Position/Speed control		Dyı	namic brak	е		A-frame to F-frame: Built-in
		Co	ntrol mode			(1) Position control (2) Speed control (3) Toque control (4) Position/Speed control

<sup>\*1</sup> Air containing water vapor will become saturated with water vapor as the temperature falls, causing dew.

				(1) convo-ON input (2) Alarm cloor input (2) Gain quitab input
С	or	ntrol input		(1) servo-ON input (2) Alarm clear input (3) Gain switch input (4) Positive direction drive inhibit input (5) Negative direction drive inhibit input (6) Forced alarm input (7) Inertia ratio switch input (7) Serveral branch (8) Serveral branch (9) Forced alarm input (9) Serveral branch
С	or	ntrol output	t	<ul> <li>(1) Servo-alarm output (2) Servo-ready output (3) External brake off output</li> <li>(4) At-speed output (5) Torque in-limit output (6) Zero speed detection output</li> <li>(7) Warning output (8) Alarm clear attribute output (9) Servo on status output</li> </ul>
		Control inp		<ul> <li>(1) Deviation counter clear input (2) Command pulse inhibit input</li> <li>(3) Command division/multiplication switch input (4) Anti-vibration switch input</li> <li>(5) Torque limit switch input (6) Control mode switch input</li> </ul>
	-	Control ou	Max. command pulse frequency	<ul><li>(1) In-position output (2) Position command ON/OFF output</li><li>500 kpps (Optocoupler interface), 8 Mpps (When using line receiver input multiplied by 4)</li><li>Differential input. Selectable by parameter.</li></ul>
Pos	,	Pulse	Input pulse signal format	([1]Positive/Negative pulse [2]A/B quadrature [3]Pulse/Direction) Applicable scaling ratio: 1/1000 times to 8000 times
Position control		input	Electronic gear (Division/Multiplication of command pulse)	Any value of 1 - 2 <sup>30</sup> can be set for both numerator (which corresponds to encoder resolution) and denominator (which corresponds to command pulse resolution per motor revolution), but the combination has to be within the range shown above.
trol		Analog input	Smoothing filter Torque limit command input	Primary delay filter or FIR type filter is adaptable to the command input Individual torque limit for both positive and negative direction is enabled.
		Two-degre	Torque feed forward input ee-of-freedom control	Analog voltage can be used as torque feed forward input.  Available
	- 1		ion control	Available
	- 1	Load varia Block ope	ation suppression control	Available  Modbus (RS 232, RS 485) or interface is selectable
$\vdash$	$\neg$	Control in		(1) Internal command velocity selection input (2) Speed zero clamp input
	ŀ	Control ou	itnut	(3) Velocity command sign input (4) Control mode switch input (1) Speed coincidence output (2) Velocity command ON/OFF output
S.	ı	Analog	Velocity command input	Velocity command input with analog voltage is possible. Scale setting and command polarity vary depending on parameters. (6 V/Rated rotational speed: Default)
Speed control		input	Torque limit command input	Individual torque limit for both positive and negative direction is enabled.
8			Torque feed forward input	Analog voltage can be used as torque feed forward input.
ltro		Internal ve	elocity command	Switching the internal 8 speed is enabled by command input.
-		Soft-start/	down function	Individual setup of acceleration and deceleration is enabled, with 0 s to 10 s/1000 r/min. Sigmoid acceleration/deceleration is also enabled.
,	ľ	Speed zer	o clamp	Internal velocity command can be clamped to 0 with speed zero clamp input.
5 _	_		ee-of-freedom control	Available
lorc	!	Control in		Speed zero clamp input, torque command sign input, control mode switch input.
ue	-	Control ou Analog	itput	(1) Speed coincidence output (2) Speed in-limit output Torque command input with analog voltage is possible. Scale setting and com-
orque contro		input Speed lim	Torque command input	mand polarity vary depending on parameters. (3 V/rated torque Default)  Speed limit value with parameter is enabled.
	Ť	Control in		(1) Deviation counter clear input (2) Command pulse inhibit input (3) Command division/multiplication switch input
	ŀ	Control ou	itnut	(4) Anti-vibration switch input (5) Torque limit switch input (1) In-position output (2) Position command ON/OFF output
	ŀ	00111101 00	Max. command pulse frequency	500 kpps (Optocoupler interface), 8 Mpps (When using line receiver input multiplied by 4)
			Input pulse signal format	Differential input. Selectable by parameter. ([1]Positive/Negative pulse [2]A/B quadrature [3]Pulse/Direction)
Full-closed control	- 1	Pulse input	Electronic gear (Division/Multiplication of command pulse)	Applicable scaling ratio: 1/1000 times to 8000 times Any value of 1 - 2 <sup>30</sup> can be set for both numerator (which corresponds to encoder resolution) and denominator (which corresponds to command pulse resolution per motor revolution), but the combination has to be within the range shown above.
Sec			Smoothing filter	Primary delay filter or FIR type filter is adaptable to the command input
S		Analog	Torque limit command input	Individual torque limit for both positive and negative direction is enabled.
) ří r	-	input	Torque feed forward input	Analog voltage can be used as torque feed forward input.
2			and of outcome! and	1/40 times to 1280 times Although ratio of the encoder pulse (numerator) and external scale pulse (de-
			nge of external scale ultiplication	nominator) can be arbitrarily set in the range of 1 to 2 <sup>23</sup> for the numerator and in the range of 1 to 2 <sup>23</sup> for the denominator, this product should be used within the aforementioned range.
		division/m		the range of 1 to 2 <sup>23</sup> for the denominator, this product should be used within the
		division/m Two-degre	ee-of-freedom control ion control	the range of 1 to 2 <sup>23</sup> for the denominator, this product should be used within the aforementioned range.  Available  Available
		division/m Two-degre Anti-vibrat Load varia	ee-of-freedom control ion control tion suppression control	the range of 1 to 2 <sup>23</sup> for the denominator, this product should be used within the aforementioned range.  Available  Available  Available
		division/m Two-degre	ee-of-freedom control ion control ation suppression control ration	the range of 1 to 2 <sup>23</sup> for the denominator, this product should be used within the aforementioned range.  Available  Available  Available  Modbus (RS 232, RS 485) or interface is selectable  The load inertia is identified in real time by the driving state of the motor operating according to the command given by the controlling device and set up support software
Cor		division/m Two-degre Anti-vibrat Load varia Block ope Auto tunin	ee-of-freedom control ion control ation suppression control ration	the range of 1 to 2 <sup>23</sup> for the denominator, this product should be used within the aforementioned range.  Available  Available  Available  Modbus (RS 232, RS 485) or interface is selectable  The load inertia is identified in real time by the driving state of the motor operating according to the command given by the controlling device and set up support software "PANATERM". The gain is set automatically in accordance with the rigidity setting.
Commor		division/m Two-degre Anti-vibrat Load varia Block ope Auto tunin Division of	ee-of-freedom control ion control ation suppression control ration  g f encoder feedback pulse	the range of 1 to 2 <sup>23</sup> for the denominator, this product should be used within the aforementioned range.  Available  Available  Available  Modbus (RS 232, RS 485) or interface is selectable  The load inertia is identified in real time by the driving state of the motor operating according to the command given by the controlling device and set up support software "PANATERM". The gain is set automatically in accordance with the rigidity setting.  Set up of any value is enabled (encoder pulses count is the max.).  Over-voltage, under-voltage, over-speed, over-load, over-heat, over-current and
Common		division/m Two-degre Anti-vibrat Load varia Block ope Auto tunin	ee-of-freedom control ion control ation suppression control ration  g f encoder feedback pulse	the range of 1 to 2 <sup>23</sup> for the denominator, this product should be used within the aforementioned range.  Available  Available  Available  Modbus (RS 232, RS 485) or interface is selectable  The load inertia is identified in real time by the driving state of the motor operating according to the command given by the controlling device and set up support software "PANATERM". The gain is set automatically in accordance with the rigidity setting.  Set up of any value is enabled (encoder pulses count is the max.).

Panasonic Corporation Electromechanical Control Business Division

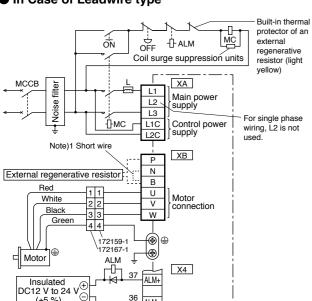
ļ	A6 Series		Driver	Specifica	tions A6SG series (RS485 commu A6SE series (Besic type)	nication type)	Position control only type
		100 V	Maii	n circuit	Single phase 100 V +10 % to	120 V +10 % 50	Hz / 60 Hz
		100 V	Conti	rol circuit	Single phase 100 V +10 % to	120 V +10 % 50	Hz / 60 Hz
	Input		Main	A-frame to D-frame	Single/3-phase 200 V +10 % to	240 V <sup>+10</sup> % 50	Hz / 60 Hz
	Input power		circuit	E-frame to F-frame	Single/3-phase 200 V +10 % to	240 V <sup>+10 %</sup> 50	Hz / 60 Hz
		200 V	Control	A-frame to D-frame	Single phase 200 V +10 % to	240 V <sup>+10</sup> % 50	Hz / 60 Hz
			circuit	E-frame to F-frame	Single phase 200 V +10 % to	240 V <sup>+10</sup> % 50	Hz / 60 Hz
	temperature			perature	Ambient temperature: 0 °C to 55 °C (free from Storage temperature: -20 °C to 65 °C (Max.temperature guarantee: 80 °C for 72 ho		densation <sup>*1</sup> )
	Env	vironment	hu	midity	Both operating and storage : 20 % to 85 %RI	H (free from conde	ensation*1)
			Altitude		Lower than 1000 m		
			Vibration		5.88 m/s² or less, 10 Hz to 60 Hz		
	Co	Control method			IGBT PWM Sinusoidal wave drive		
Basic Specifications	End	Encoder feedback			23-bit (8388608 resolution) absolute encoder, 7-wire serial  * A6SG series  When using it as an incremental system (not using multiturn data), do not connect the battery for absolute encoder. Parameter Pr. 0.15 must be set to "1" (factory settings).  * A6SE series  Since it can be used only as an incremental system, do not connect the battery for absolute encoder. Parameter Pr. 0.15 must be set to "1" (factory settings).		
				Input	General purpose 10 inputs The function of general-purpose input is sele	cted by parameter	S.
	Interface connector	Control si	gnai	Output	General purpose 6 outputs The function of general-purpose input is selected by parameters.		S.
	се со			Input	None		
	nnect	Analog sig	gnal	Output	2 outputs (Analog monitor: 2 output)		
	악	Dulas sisu	1	Input	2 inputs (Photo-coupler input, Line receiver in	nput)	
		Pulse sign	nai	Output	4 outputs ( Line driver: 3 output, open collect	or: 1 output)	
				USB	USB interface to connect to computers for pa	arameter setting or	status monitoring.
		mmunication	on	RS232	1:1 communication	* RS485, RS232	2 connector is not installed
				RS485	1: n communication (max 31)	on A6 SE series.	
	Fro	nt panel			(1) 5 keys (2) LED (6-digit)		
	Regeneration			A-frame, B,-frame: no built-in regenerative re C-frame to F-frame: Built-in regenerative res			
	Dyı	namic brak	е		A-frame to F-frame: Built-in		
	Co	ntrol mode			(1) Position control (2) Internal velocity command (3) Position/Internal velocity command		

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Co	ontrol input		<ul> <li>(1) servo-ON input (2) Alarm clear input (3) Gain switch input</li> <li>(4) Positive direction drive inhibit input (5) Negative direction drive inhibit input</li> <li>(6) Forced alarm input (7) Inertia ratio switch input</li> </ul>	
Сс	ontrol output		(1) Servo-alarm output (2) Servo-ready output (3) External brake off output (4) At-speed output (5) Torque in-limit output (6) Zero speed detection output (7) Warning output (8) Alarm clear attribute output (9) Servo on status output	
	Control inp	ut	(1) Deviation counter clear input (2) Command pulse inhibit input (3) Command division/multiplication switch input (4) Anti-vibration switch input (5) Torque limit switch input (6) Control mode switch input	
	Control out	put	(1) In-position output (2) Position command ON/OFF output	
		Max. command pulse frequency	500 kpps (Optocoupler interface) 8 Mpps (Line receiver interface)	
PC	Pulso	Input pulse signal format	Differential input. Selectable by parameter. ([1]Positive/Negative pulse [2]A/B quadrature [3]Pulse/Direction)	
Position control	Pulse input	Electronic gear (Division/Multiplica- tion of command pulse)	Applicable scaling ratio: 1/1000 times to 8000 times  Any value of 1 - 2 <sup>30</sup> can be set for both numerator (which corresponds to encoder resolution) and denominator (which corresponds to command pulse resolution per motor revolution), but the combination has to be within the range shown above.	
		Smoothing filter	Primary delay filter or FIR type filter is adaptable to the command input	
	Anti-vibration control		Available	
	Two-degree-of-freedom control		Available	
	Load variation suppression control		Available	
	Block opera	ation	Modbus (RS 232, RS 485) or interface is selectable. (A6SE : interface only.)	
	Control inp	ut	(1) Internal command velocity selection input (2) Speed zero clamp input (3) Velocity command sign input (4) Control mode switch input	
ഗ	Control output		(1) Speed coincidence output (2) Velocity command ON/OFF output	
Speed	Internal vel	ocity command	Switching the internal 8 speed is enabled by command input.	
control	Soft-start/down function		Individual setup of acceleration and deceleration is enabled, with 0 s to 10 s/1000 r/min. Sigmoid acceleration/deceleration is also enabled.	
	Zero-speed	d clamp	Internal velocity command can be clamped to 0 with speed zero clamp input.	
	Two-degree	e-of-freedom control	Available	
	Auto tuning	I	The load inertia is identified in real time by the driving state of the motor operating according to the command given by the controlling device and set up support software "PANATERM". The gain is set automatically in accordance with the rigidity setting.	
Common	Division of pulse	encoder feedback	Set up of any value is enabled (encoder pulses count is the max.).	
non	Protective function	Hard error	Over-voltage, under-voltage, over-speed, over-load, over-heat, over-current and encoder error etc.	
	Tariodon	Soft error	Excess position deviation, command pulse division error, EEPROM error etc.	
	Alarm data	trace back	Tracing back of alarm data is available	

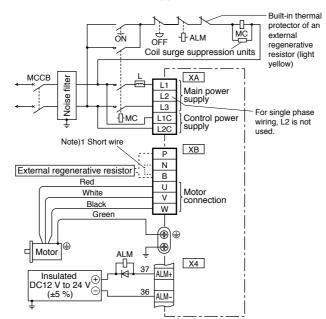
<sup>\*1</sup> Air containing water vapor will become saturated with water vapor as the temperature falls, causing dew.

## ■ In Case of Leadwire type



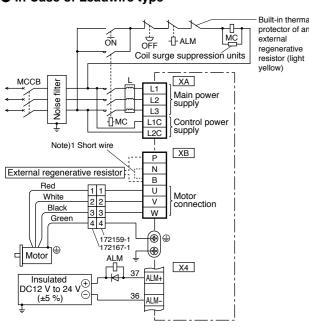
In Case of Single phase, A-frame, B-frame, 100 V / 200 V type

#### In Case of Connector type

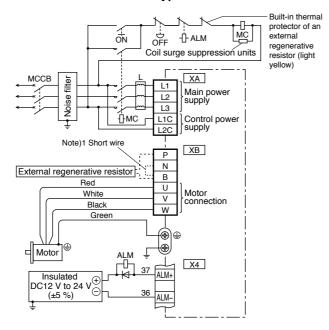


#### In Case of 3-phase, A-frame, B-frame, 200 V type

#### In Case of Leadwire type



#### In Case of Connector type



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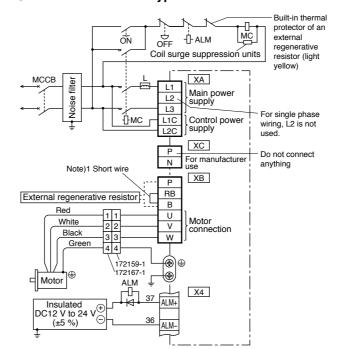
#### Note)1

Frame	Short wire	Built-in	Connection of the connector XB		
No.	(Accessory)	regenerative resistor	In case of using an external regenerative resistor	In case of not using an external regenerative resistor	
A-frame B-frame	without	without	Connect an external regenerative resistor between P-B.	Always open between P-B.	

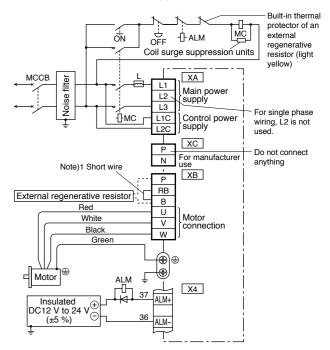
#### \* Refer to P.275 Specifications of Motor connector.

#### In Case of Single phase, C-frame, D-frame, 100 V / 200 V type

#### In Case of Leadwire type

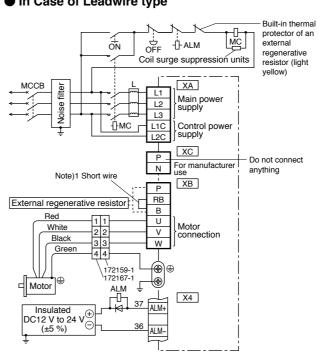


#### In Case of Connector type

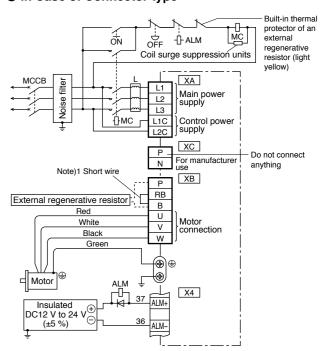


#### In Case of 3-phase, C-frame, D-frame, 200 V type

#### In Case of Leadwire type



#### In Case of Connector type



#### Note)1

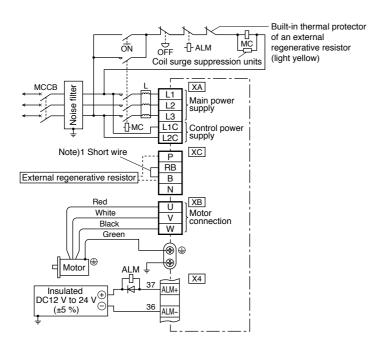
Frame	Short wire	Built-in	Connection of the connector XB		
No.	(Accessory)	regenerative resistor	In case of using an external regenerative resistor	In case of not using an external regenerative resistor	
C-frame D-frame	with	with	<ul> <li>Remove the short wire accessory from between RB-B.</li> <li>Connect an external regenerative resistor between P-B.</li> </ul>	Shorted between RB-B with an attached short wire	

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<sup>\*</sup> Refer to P.275, P.276, Specifications of Motor connector.

## In Case of 3-phase, E-frame, 200 V type

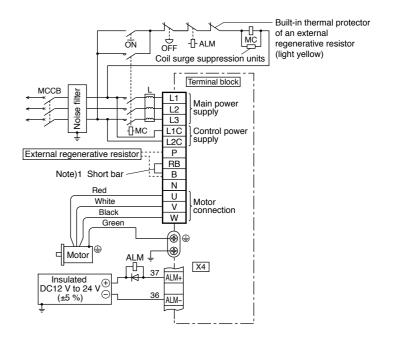
**Wiring Diagram** 



#### Note)1

Eromo	Short wire	Built-in	Connection of the	e connector XC	
Frame No.	(Accessory)	regenerative resistor	In case of using an external regenerative resistor	In case of not using an external regenerative resistor	
E-frame	with	with	Remove the short wire accessory from between RB-B.     Connect an external regenerative resistor between P-B.	Shorted between RB-B with an attached short wire	

#### In Case of 3-phase, F-frame, 200 V type



#### Note)1

	Ob and beau	Built-in	Connection of terminal block		
Frame No.	Short bar (Accessory)	regenerative resistor	In case of using an external regenerative resistor	In case of not using an external regenerative resistor	
F-frame	with	with	Remove the short bar accessory from between RB-B.     Connect an external regenerative resistor between P-B.	Shorted between RB-B with an attached short bar	

#### \* Refer to P.276, Specifications of Motor connector.

Connecting the host controller can configure a safety circuit that controls the safety functions.

When not constructing the safety circuit, use the supplied safety bypass plug.

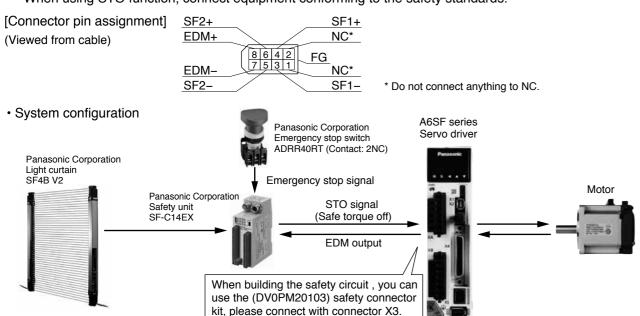
#### Outline Description of Safe Torque Off (STO)

The safe torque off (STO) function is a safety function that shuts the motor current and turns off motor output torque by forcibly turning off the driving signal of the servo driver internal power transistor. For this purpose, the STO uses safety input signal and hardware (circuit).

When STO function operates, the servo driver turns off the servo ready output signal (S-RDY) and enters STO state. When the driver becomes STO state, front panel displays the "St.". Then, when the driver's state is STO input is off and servo-on input is off, the driver automatically becomes servo-off.

#### **Safety Precautions**

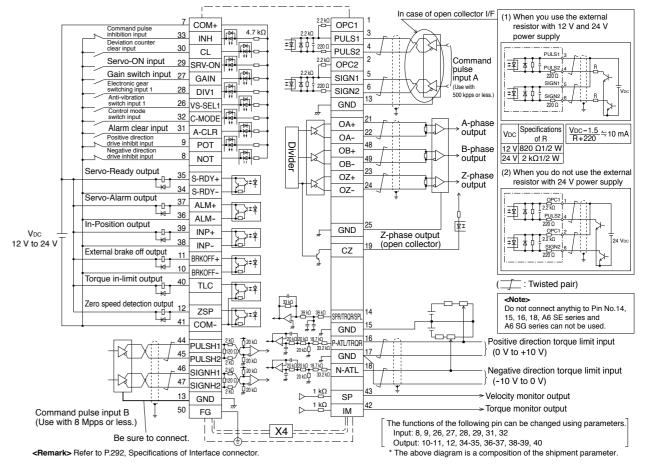
- When using the STO function, be sure to perform equipment risk assessment to ensure that the system conforms to the safety requirements.
- Even while the STO function is working, the following potential safety hazards exist. Check safety in risk assessment.
- The motor may move when external force (e.g. gravity force on vertical axis) is exerted on it. Provide an external brake, etc., as necessary to secure the motor. Note that the purpose of motor with brake is holding and it cannot be used for braking application.
- When parameter Pr5.10 Sequence at alarm is set to free run (disable dynamic brake), the motor is free run state and requires longer stop distance even if no external force is applied. Make sure that this does not cause any problem.
- When power transistor, etc., becomes defective, the motor will move to the extent equivalent of 180 electrical angle (max.). Make sure that this does not cause any problem.
- The STO turns off the current to the motor but does not turn off power to the servo driver and does not isolate it. When starting maintenance service on the servo driver, turn off the driver by using a different disconnecting device.
- External device monitor (EDM) output signal is not a safety signal. Do not use it for an application other than failure monitoring.
- Dynamic brake and external brake release signal output are not related to safety function. When designing
  the system, make sure that the failure of external brake release during STO condition does not result in
  danger condition.
- When using STO function, connect equipment conforming to the safety standards.



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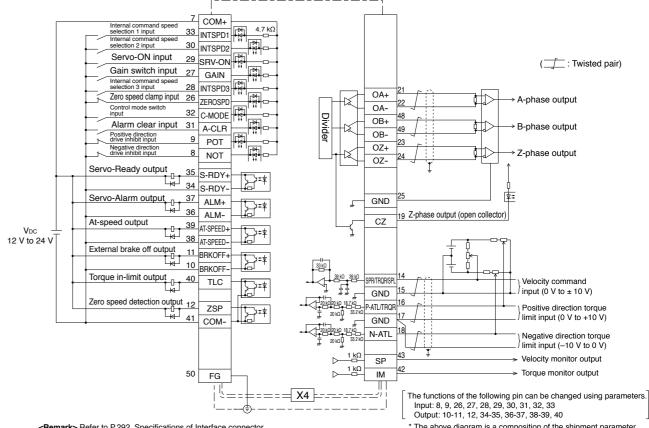
#### **Wiring Example of Position Control Mode**

Wiring to the Connector, X4



#### Wiring Example of Velocity Control Mode

\* Excluding A6SE, A6SG Series



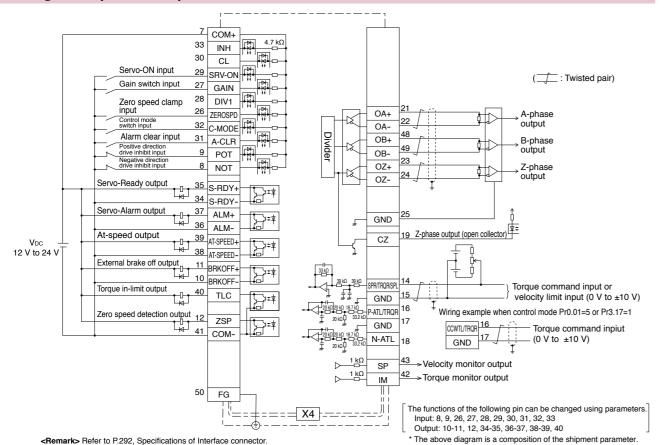
<Remark> Refer to P.292, Specifications of Interface connector.

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The above diagram is a composition of the shipment parameter

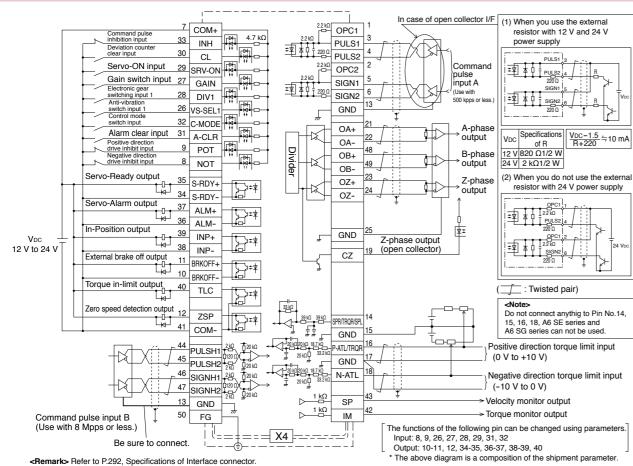
#### Wiring Example of Torque Control Mode

\* Excluding A6SE, A6SG Series



#### Wiring Example of Full-closed Control Mode

\* Excluding A6SE, A6SG Series



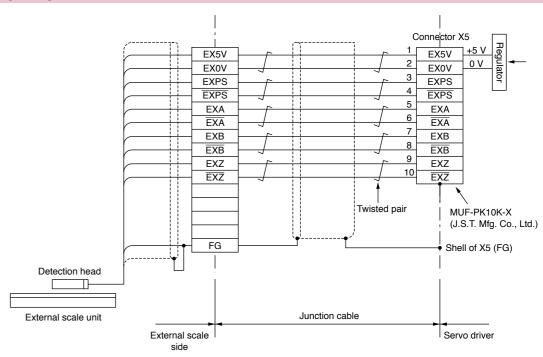
#### **Applicable External Scale**

Wiring to the Connector, X5 \* Excluding A6SE, A6SG Series

Applicable External Scale	Manufacturer	Model No.	Resolution [µm]	Maximum speed (m/s)*1
Parallel type (AB-phase)	General	_		fter 4 × multiplication : Mpps
		SL700-PL101RP/RHP SL710-PL101RP/RHP	0.1	10
	Magnescale Co., Ltd.	SR75 / SR85	0.01 to 1	3.3
	Wagnescale Oo., Ltd.	BF1	0.001/0.01	0.4/1.8
Serial type (Incremental system)		SQ10	0.05/0.1/ 0.5/1	3
	NIDEC SANKYO CORPORATION	PSLH041 + PSLG	0.1	6
		TONIC	0.001 to 5	6.48 m/s @ 1 μm
	Renishaw plc	ATOM	0.001 to 10	0.648 m/s @ 0.1 μm
		VIONIC	0.0025 to 5	0.040 11/3 @ 0.1 μ111
		S2AP/SV2AP/G2AP	0.01/0.05	3
		LAP	0.01/0.05	3
	Fagor Automation S.Coop	EXA/ EXG/ EXT	0.01/0.05	8
		H2AP-D200/H2AP-D90	29 bit/23 bit	750 r/min, 1500 r/min
		S2AP-D170,/S2AP-D90	23 bit	1500 r/min
		LIC2197P/LIC2199P	0.05/0.1	10
		LIC4193P/LIC4195P LIC4197P/LIC4199P	0.001/0.005/0.01	10
	LIFIDENILIAINI	LC195P/LC495P	0.001/0.01	3
Fagor Automation S.Coop  HEIDENHAIN  Serial type (Absolute system)	ECA 4490P	27 bits to 29 bits	7000 r/min to 550 r/min (Depends on drum size)	
(Absolute system)		RCN 2x90P/RCN 5x90P	26 bits/28 bits	1500 r/min
		RCN 8x90P	29 bit	500 r/min
	RSF Electronik	MC 15P MP/MC 15P MK	0.05/0.1	10
	Magnescale Co., Ltd.	SR77 / SR87	0.01 to 1	3.3
		AT573-SC/H	0.05	2.5
	Mitutoyo Corporation	ST700	0.1	5
		ST1300	0.001/0.01	8
			0.001	A5/0.4, A6/4
	Renishaw plc	RESOLUTE	0.05	A5/20, A6/100
			0.1	A5/40, A6/100

<sup>\*1</sup> The maximum speed is a characteristic of the driver. It is limited by the configration of the machine and the system.

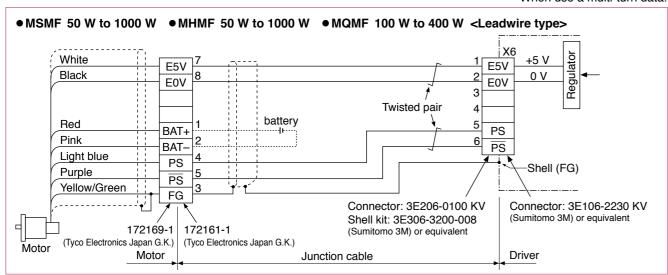
#### Wiring Diagram of X5

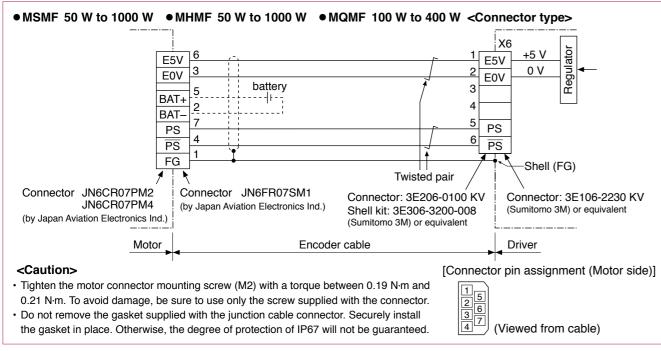


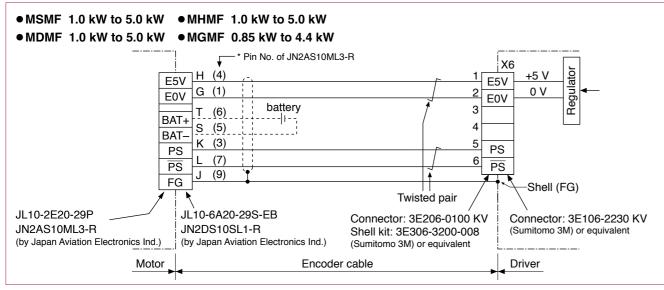
<sup>\*</sup> For more information about the external scale product, please contact the manufacturer.

#### When using a 23-bit absolute encoder as an absolute system\*.

\* When use a multi-turn data.



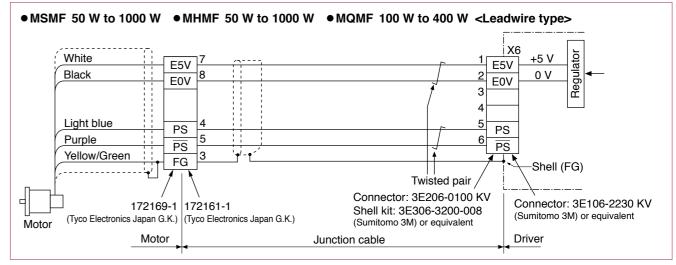


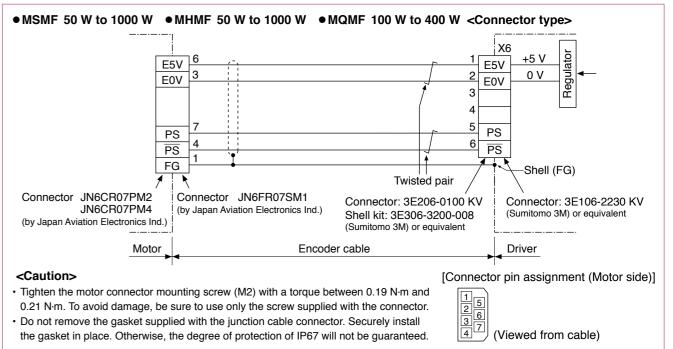


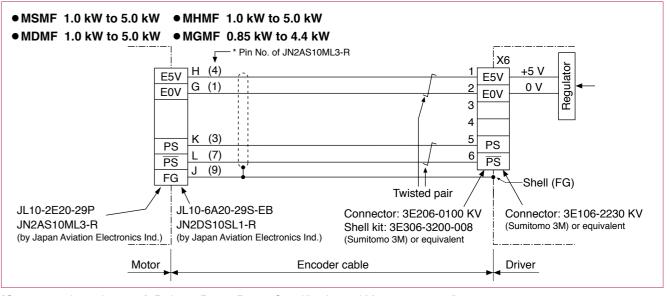
[Connector pin assignment] Refer to P.275, P.276 "Specifications of Motor connector".

#### When using a 23-bit absolute encoder as a incremental system\*.

\* When do not use a multi-turn data.







[Connector pin assignment] Refer to P.275, P.276 "Specifications of Motor connector".

Mass: 1.6 kg

#### A-frame Unit [mm] X1: USB connector X2: RS232/485 communication connecto X3: Safety function connector X4: Interface connector X5: For external scale connection X6: For encoder connection 130 For mounting Mounting bracket Main power input terminals -X2 Control power -X3 input terminal Terminals for external regenerative resistor Terminals for motor connection Mounting bracket \For mounting 7(Mounting dimensions) 6 5.2 Base mount type /Standard: Rack mount type Back-end mounting (Option: Front-end mounting) A-frame: Connector of driver side Connector XA S05B-F32SK-GGXR Connector XB S06B-F32SK-GGXR S05B-F32SK-GGXR J.S.T. Mfg. Co., Ltd. S06B-F32SK-GGXR J.S.T. Mfg. Co., Ltd. UB-M5BR-DMP14-4S (or equivalent) J.S.T. Mfg. Co., Ltd.

Tyco Electronics Japan G.K

Tyco Electronics Japan G.K

J.S.T. Mfg. Co., Ltd

J.S.T. Mfg. Co., Ltd.

J.S.T. Mfg. Co., Ltd.

All dimensions shown in this catalog are for the A6SF series, but outer dimensions

are the same as the A6SE series. For appearance, refer to P.19 and P.20.

#### B-frame

<a href="#">
<a href="#">Attached to the driver></a>
Connector of power and motor side
Connector XA | 05JFAT-SAXGF</a>

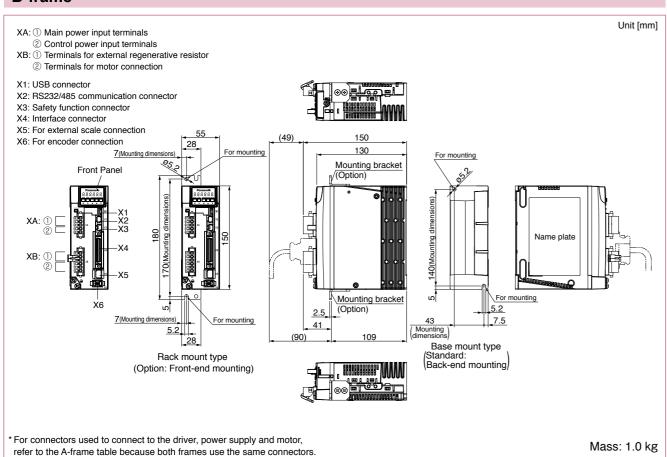
Connector XB 06JFAT-SAXGF

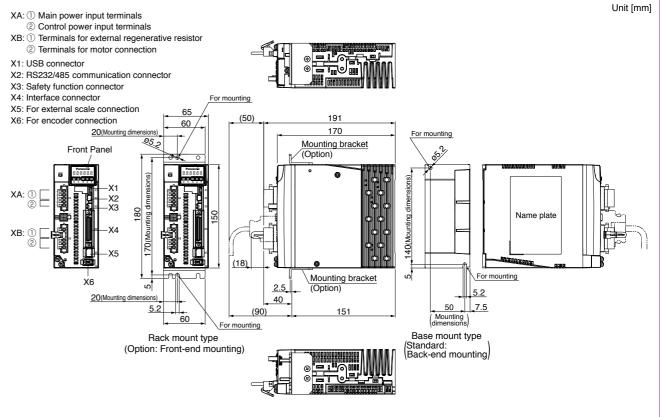
Connector X2 1-2040537-1 (or equivalent)

Connector X4 10250-52A2PE (or equivalent)
Connector X5 MUF-RS10DK-GKXR (or equivalent)

Connector X6 3E106-2230 KV (or equivalent)

Connector X3 2040537-1 (or equivalent)

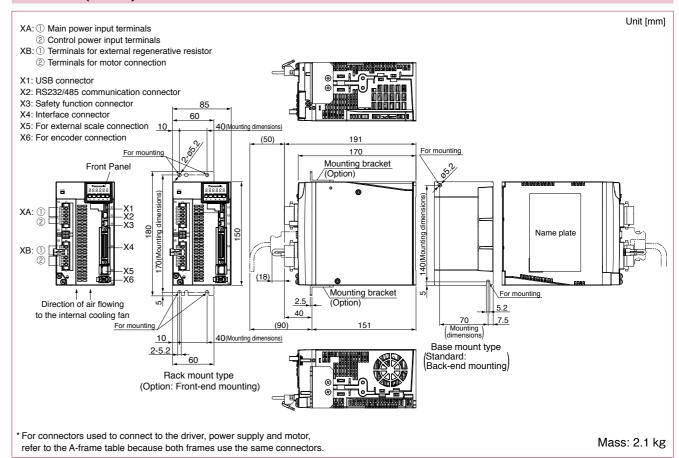




\* For connectors used to connect to the driver, power supply and motor, refer to the A-frame table because both frames use the same connectors.

#### D-frame (200 V)

C-frame



Mass: 0.8 kg

E-frame (200 V)

X2: RS232/485 communication

X3: Safety function connector

X6: For encoder connection

Direction of air flowing

to the internal cooling fan

E-frame: Connector of driver side

Connector XC 04JFAT-SAXGSA-L

F-frame (200 V)

X3: Safety function connector X4: Interface connector

X6: For encoder connection

X5: For external scale connection

Direction of air flowing to the internal cooling fan

Main power input terminals

② Control power input terminals

(4) Terminals for motor connection

3 Terminals for external regenerative resistor

X1: USB connector

E-frame: Connector of power and motor side

X2: RS232/485 communication connector

<Attached to the driver>

X5: For external scale connection

X4: Interface connector

X1: USB connector

connector

2-5.2

50(Mounting dimensions)

J.S.T. Mfg. Co., Ltd.

Connector XA S05B-JTSLSK-GSANXR J.S.T. Mfg. Co., Ltd.

Connector XB S03B-JTSLSK-GSANXR J.S.T. Mfg. Co., Ltd.

Connector XC S04B-JTSLSS-GSANXR J.S.T. Mfg. Co., Ltd.

Connector XA 05JFAT-SAXGSA-L J.S.T. Mfg. Co., Ltd. Connector XB 03JFAT-SAXGSA-L J.S.T. Mfg. Co., Ltd.

Front Pane

Front Panel

All dimensions shown in this catalog are for the A6SF series, but outer dimensions are the same as the A6SE series. For appearance, refer to P.19 and P.20.

Mounting bracket

\Mounting bracket

Mounting bracket/

\* For connectors X1 to X6 for connection to the driver, refer to the those

Mounting bracket

\Mounting bracket

listed in the A-frame table because both frames use the same connectors.

2 Control power

XC: Terminals for external

XB: Terminals for motor connection

Mounting bracket

(If re-positioned from front end)

Unit [mm]

| C30 | C30 | C30

(18)

Mass: 2.7 kg

Unit [mm]

\_\_2.5

Mass: 5.2 kg

Mounting bracket

Mounting bracket

(If re-positioned from front end)

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(If re-positioned from front end)

**MSMF** 

MQMF

**MDMF** 

**MGMF** 

MSMF

**MQMF** 

MDME

MGMF

**Dimensions** 

(50 W to 1000 W) .....

(100 W to 400 W)

(50 W to 1000 W) ......P.129

(1.0 kW to 5.0 kW)....

(1.0 kW to 5.0 kW)....

(1.0 kW to 5.0 kW).....

(0.85 kW to 4.4 kW).....

**Motors with Gear** 

**Motor Specification** 

Environmental Conditions...P.271

Built-in Holding Brake ...... P.273

Notes on [Motor specification]

Reducer

Description

Permissible Load at Output Shaft.....

Special Order Product P 177

50 W to 5.0 kW...

100 W to 400 W....

50 W to 5.0 kW...

1.0 kW to 5.0 kW ..... P.89

0.85 kW to 4.4 kW ..... P.95

**Motor Contents** 

.. P.67

.... P.73

...P.109

..P.153

....P.161

..P.261

.P.272

#### **Features**

**Features/Lineup** 

- Line-up IP67 motor: 50 W to 5.0 kW
- Max speed: 6500r/min (MHMF 50 W to 400 W)
- · Low inertia (MSMF) to High inertia (MHMF).
- Low cogging torque: Rated torque ratio 0.5 % (typical value).
- · 23-bit absolute encoder (8388608 pulse).

#### **Motor Lineup**

sq. or l

ō

mm sq.

100



#### MSME Low inertia

Max. speed : 6000 r/min Rated speed: 3000 r/min Rated output 50 W to 1000 W

Enclosure: IP65: Leadwire type IP67: Connector type

#### **MQMF** (Flat type) Middle inertia

Max. speed : 6500 r/min Rated speed: 3000 r/min Rated output: 100 W to 400 W

Enclosure: IP65: Leadwire type IP67: Connector type



#### MHME High inertia Max. speed

6500 r/min 6000 r/min (750 W,1000 W) Rated speed: 3000 r/min Rated output: 50 W to 1000 W Enclosure:

IP65: Leadwire type IP67: Connector type



#### Low inertia

Max. speed : 5000 r/min

4500 r/min (4.0 kW,5.0 kW)

Rated speed: 3000 r/min Rated output: 1.0 kW to 5.0 kW Enclosure : IP67: Connector type



#### **MDMF** Middle inertia

Max. speed : 3000 r/min Rated speed: 2000 r/min Rated output: 1.0 kW to 5.0 kW Enclosure : IP67: Connector type



#### (Low speed/ High torque type) Middle inertia

Max. speed : 3000 r/min Rated speed: 1500 r/min Enclosure : IP67: Connector type

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Enclosure : IP67: Connector type

Rated output: 0.85 kW to 4.4 kW

## High inertia

Max. speed : 3000 r/min Rated speed: 2000 r/min Rated output: 1.0 kW to 5.0 kW

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For connectors X1 to X6 for connection to the driver, refer to the those

listed in the A-frame table because both frames use the same connectors.

				AC100 V
Motor model *1			IP65	MSMF5AZL1
		Multi	unction type	MADLT01SF
Applicable	Model No.	RS48	communication type *2	MADLN01SG
driver	110.	Basic	type *2	MADLN01SE
	Frame	sym	ool	A-frame
Power supply	capacity	/	(kVA)	0.4
Rated output			(W)	50
Rated torque			(N·m)	0.16
Continuous sta	all torqu	е	(N·m)	0.16
Momentary Ma	ax. peal	torqu	ie (N·m)	0.48
Rated current			(A(rms))	1.1
Max. current			(A(o-p))	4.7
Regenerative	brake		Without option	No limit Note)2
frequency (time	es/min) I	Note)1	DV0P4280	No limit Note)2
Rated rotation	al spee	d	(r/min)	3000
Max. rotationa	l speed		(r/min)	6000
Moment of ine	rtia		Without brake	0.026
of rotor ( $\times 10^{-4}$	kg·m²)		With brake	0.029
Recommended moment of ratio of the load and the rote				30 times or less
Rotary encode	er specif	icatio	ns <sup>*3</sup>	23-bit Absolute
	Res	solutio	n per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

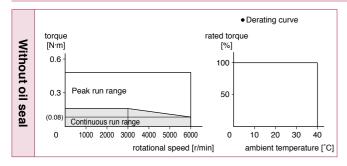
Static friction torque (N·m)	0.294 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.30
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

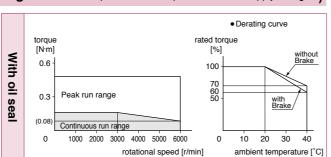
#### • Permissible load (For details, refer to P.272)

	•	•
	Radial load P-direction (N)	147
During assembly	Thrust load A-direction (N)	88.0
accombiy	Thrust load B-direction (N)	117.6
During	Radial load P-direction (N)	68.6
operation	Thrust load A, B-direction (N)	58.8

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1  $\square\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### Torque characteristics (at AC100 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





#### **Dimensions**

	Round shaft/ Key way, center tap shaft							
Motor specifications		without brake		with brake				
·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal		
Leadwire type (P65)	P.1	01	_	P.1	01	_		
Connector type (P67)	P.1	01	_	P.102		_		

**<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required. Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

#### **Specifications**

200 V MSMF 50 W [Low inertia 38 mm sq.]

				AC200 V	
Motor model *1			IP65	MSMF5AZL1	
			function type	MADLT05SF	
Applicable	Model No	RS48	5 communication type *	MADLN05SG	
driver	140.	Basic	c type *2	MADLN05SE	
	Fram	e sym	bol	A-frame	
Power supply	capacit	у	(kVA)	0.5	
Rated output			(W)	50	
Rated torque			(N·m)	0.16	
Continuous sta	all torqu	ie	(N·m)	0.16	
Momentary Ma	ax. pea	k torqı	ue (N·m)	n) 0.48	
Rated current			(A(rms))	1.1	
Max. current		(A(o-p))		4.7	
Regenerative	brake		Without option	No limit Note)2	
frequency (time	es/min)	Note)1	DV0P4281	No limit Note)2	
Rated rotation	al spee	d	(r/min)	3000	
Max. rotationa	l speed		(r/min)	6000	
Moment of ine			Without brake	0.026	
of rotor ( $\times 10^{-4}$	kg·m²)		With brake	0.029	
Recommended moment of ratio of the load and the rote				30 times or less	
Rotary encode	r speci	ficatio	ns <sup>∗3</sup>	23-bit Absolute	
	Re	solutio	n per single turn	8388608	

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

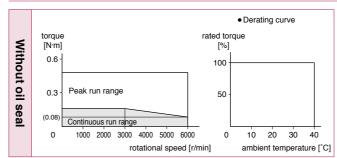
Static friction torque (N·m)	0.294 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.30
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

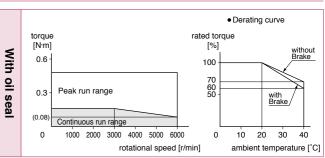
• Permissible load (For details, refer to P.272)

During assembly	Radial load P-direction (N)	147
	Thrust load A-direction (N)	88.0
	Thrust load B-direction (N)	117.6
During	Radial load P-direction (N)	68.6
operation	Thrust load A, B-direction (N)	58.8

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





#### **Dimensions**

Motor specifications	Round shaft/ Key way, center tap shaft						
	without brake			with brake			
·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
Leadwire type (P65)	P.101		_	P.101		_	
Connector type (P67)	P.101		_	P.102		_	

<a>Cautions> Reduce the moment of inertia ratio if high speed response operation is required.</a> Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

				AC100 V
Motor model *1			IP65	MSMF011L1
			function type	MADLT11SF
Applicable	Model No	RS48	5 communication type *2	MADLN11SG
driver		Basic	type *2	MADLN11SE
	Fram	e sym	bol	A-frame
Power supply	capacit	у	(kVA)	0.4
Rated output			(W)	100
Rated torque			(N·m)	0.32
Continuous sta	all torqu	ie	(N·m)	0.32
Momentary Ma	ax. pea	k torqu	ue (N·m)	0.95
Rated current			(A(rms))	1.6
Max. current			(A(o-p))	6.9
Regenerative	brake		Without option	No limit Note)2
frequency (time	s/min)	Note)1	DV0P4280	No limit Note)2
Rated rotation	al spee	d	(r/min)	3000
Max. rotationa	l speed		(r/min)	6000
Moment of ine	rtia		Without brake	0.048
of rotor (×10 <sup>-4</sup>	of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )			0.051
Recommender ratio of the loa		30 times or less		
Rotary encode	r speci	ficatio	ns*3	23-bit Absolute
	Re	solutio	on per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

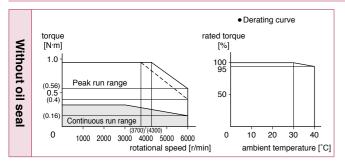
Static friction torque (N·m)	0.294 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.30
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

#### • Permissible load (For details, refer to P.272)

During assembly	Radial load P-direction (N)	147
	Thrust load A-direction (N)	88.0
	Thrust load B-direction (N)	117.6
During	Radial load P-direction (N)	68.6
operation	Thrust load A, B-direction (N)	58.8

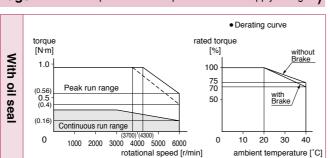
- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1  $\square\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### Torque characteristics (at AC100 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)



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#### **Dimensions**

		Round shaft/ Key way, center tap shaft							
	Motor specifications		without brake		with brake				
·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal			
	Leadwire type (P65)	P.102		_	P.102		_		
	Connector type (P67)	P.103		_	P.103		_		

**<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required. Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

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### **Specifications**

200 V MSMF 100 W [Low inertia 38 mm sq.]

				AC200 V
Motor model *1			IP65	MSMF012L1
			function type	MADLT05SF
Applicable	Model No.	RS48	5 communication type *2	MADLN05SG
driver	140.	Basic	c type *2	MADLN05SE
	Fram	e sym	bol	A-frame
Power supply	capacit	у	(kVA)	0.5
Rated output			(W)	100
Rated torque			(N·m)	0.32
Continuous sta	all torqu	ie	(N·m)	0.32
Momentary Ma	ax. pea	k torqı	ue (N·m)	0.95
Rated current			(A(rms))	1.1
Max. current			(A(o-p))	4.7
Regenerative	brake		Without option	No limit Note)2
frequency (time	es/min)	Note)1	DV0P4281	No limit Note)2
Rated rotation	al spee	d	(r/min)	3000
Max. rotationa	l speed		(r/min)	6000
Moment of ine	rtia		Without brake	0.048
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )			With brake	0.051
Recommender ratio of the loa		30 times or less		
Rotary encode	er speci	ficatio	ns*3	23-bit Absolute
	Re	solutio	on per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

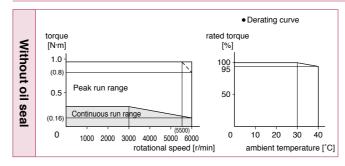
Static friction torque (N·m)	0.294 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.30
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

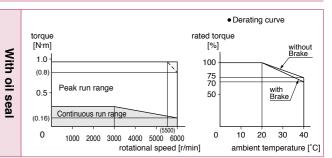
#### • Permissible load (For details, refer to P.272)

During assembly	Radial load P-direction (N)	147
	Thrust load A-direction (N)	88.0
	Thrust load B-direction (N)	117.6
During	Radial load P-direction (N)	68.6
operation	Thrust load A, B-direction (N)	58.8

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### 





#### **Dimensions**

		Round shaft/ Key way, center tap shaft						
Motor specifications		without brake		with brake				
, , , , , , , , , , , , , , , , , , , ,		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
	Leadwire type (P65)	P.102		_	P.1	02	_	
	Connector type (P67)	P.103		_	P.103		_	

<a>Cautions> Reduce the moment of inertia ratio if high speed response operation is required.</a> Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

A6N Series

Series

Series

				AC100 V
Motor model *1			IP65	MSMF021L1□□
		Multi	function type	MBDLT21SF
Applicable	Model No	RS48	5 communication type *2	MBDLN21SG
driver		Basic	type *2	MBDLN21SE
	Fram	e sym	bol	B-frame
Power supply	capacit	y	(kVA)	0.5
Rated output			(W)	200
Rated torque			(N·m)	0.64
Continuous sta	all torqu	e	(N·m)	0.64
Momentary Ma	ax. peal	k torqu	ue (N·m)	1.91
Rated current			(A(rms))	2.5
Max. current			(A(o-p))	10.6
Regenerative	brake		Without option	No limit Note)2
frequency (time	es/min)	Note)1	DV0P4283	No limit Note)2
Rated rotation	al spee	d	(r/min)	3000
Max. rotationa	l speed		(r/min)	6000
Moment of ine	rtia		Without brake	0.14
of rotor ( $\times 10^{-4} \text{ kg} \cdot \text{m}^2$ )		With brake	0.17	
Recommender ratio of the loa		30 times or less		
Rotary encode	r speci	ficatio	ns <sup>⁺3</sup>	23-bit Absolute
	Re	solutio	n per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

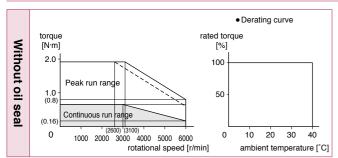
Static friction torque (N·m)	1.27 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

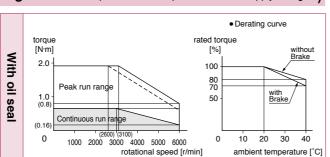
#### • Permissible load (For details, refer to P.272)

	,	,
During assembly	Radial load P-direction (N)	392
	Thrust load A-direction (N)	147
	Thrust load B-direction (N)	196
During	Radial load P-direction (N)	245
operation	Thrust load A, B-direction (N)	98.0

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### Torque characteristics (at AC100 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





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#### **Dimensions**

		Round shaft/ Key way, center tap shaft						
Motor specifications	Motor specifications without br			with brake				
·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal		
Leadwire type (P65)	P.103		_	P.104		_		
Connector type (P67)	P.104		_	P.104		_		

**<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required. Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Read the Instruction Manual carefully and understand all precautions and remarks before using the products. 200 V MSMF 200 W [Low inertia 60 mm sq.]

#### **Specifications**

				AC200 V
Motor model*1			IP65	MSMF022L1□□
		Multif	function type	MADLT15SF
Applicable	Model No.	RS48	communication type *	MADLN15SG
driver		Basic	type *2	MADLN15SE
	Frame	sym	bol	A-frame
Power supply	capacity	1	(kVA)	0.5
Rated output			(W)	200
Rated torque			(N·m)	0.64
Continuous sta	all torque	е	(N·m)	0.64
Momentary Ma	ax. peak	torqu	ie (N·m)	1.91
Rated current			(A(rms))	1.5
Max. current	current (A(o-p))		6.5	
Regenerative I	orake		Without option	No limit Note)2
frequency (time	s/min) N	Note)1	DV0P4283	No limit Note)2
Rated rotation	al speed	t	(r/min)	3000
Max. rotationa	l speed		(r/min)	6000
Moment of ine	rtia		Without brake	0.14
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )			With brake	0.17
Recommended moment of inertia ratio of the load and the rotor Note)3			30 times or less	
Rotary encode	r specif	icatio	ns <sup>*3</sup>	23-bit Absolute
	Res	olutio	n per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

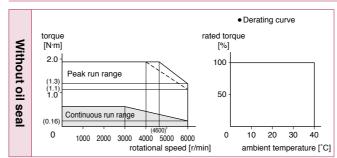
Static friction torque (N·m)	1.27 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

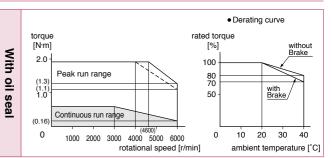
#### • Permissible load (For details, refer to P.272)

	Radial load P-direction (N)	392
During assembly	Thrust load A-direction (N)	147
	Thrust load B-direction (N)	196
During	Radial load P-direction (N)	245
operation	Thrust load A, B-direction (N)	98.0

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### 





#### **Dimensions**

	Round shaft/ Key way, center tap shaft						
Motor specifications	without brake			with brake			
	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal with oil seal		with protective lip/ with oil seal	
Leadwire type (P65)	P.103		_	P.104		_	
Connector type (P67)	P.104		_	P.104		_	

Series

Series

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

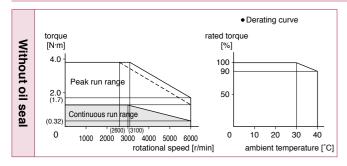
Static friction torque (N·m)	1.27 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

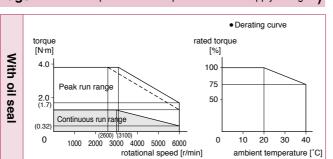
#### • Permissible load (For details, refer to P.272)

During assembly	Radial load P-direction (N)	392
	Thrust load A-direction (N)	147
	Thrust load B-direction (N)	196
During operation	Radial load P-direction (N)	245
	Thrust load A, B-direction (N)	98.0

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.48.
- \*1  $\square\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### Torque characteristics (at AC100 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





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#### **Dimensions**

		Round shaft/ Key way, center tap shaft					
Motor specifications	without brake			with brake			
·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
Leadwire type (P65)	P.105		_	P.105		_	
Connector type (P67)	P.105		_	P.106		_	

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required. Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

#### **Specifications**

200 V MSMF 400 W [Low inertia 60 mm sq.]

					AC200 V
Motor model *1			IP65		MSMF042L1□□
		Multi	function type		MBDLT25SF
Applicable	Model No	RS48	5 communication type	e *2	MBDLN25SG
driver	140.	Basic	type *2		MBDLN25SE
	Fram	e sym	bol		B-frame
Power supply	capacit	y	(kV/	A)	0.9
Rated output			(V	V)	400
Rated torque			(N·n	n)	1.27
Continuous sta	all torqu	е	(N·n	n)	1.27
Momentary Ma	ax. pea	k torqu	ue (N·n	n)	3.82
Rated current			(A(rms	s))	2.4
Max. current			(A(o-p	)))	10.2
Regenerative I	brake		Without option		No limit Note)2
frequency (time	s/min)	Note)1	DV0P4283		No limit Note)2
Rated rotation	al spee	d	(r/mi	n)	3000
Max. rotationa	l speed		(r/mi	n)	6000
Moment of ine	rtia		Without brake		0.27
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> ) Wi			With brake		0.30
Recommended moment of inertia ratio of the load and the rotor				e)3	30 times or less
Rotary encode	r speci	ficatio	ns <sup>∗3</sup>		23-bit Absolute
	Re	solutio	n per single turn		8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

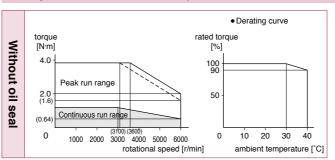
Static friction torque (N·m)	1.27 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

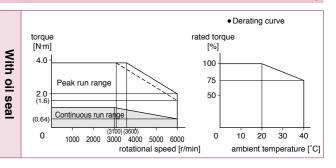
• Permissible load (For details, refer to P.272)

During assembly During operation	Radial load P-direction (N)	392
	Thrust load A-direction (N)	147
	Thrust load B-direction (N)	196
	Radial load P-direction (N)	245
	Thrust load A, B-direction (N)	98.0

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





#### **Dimensions**

	Round shaft/ Key way, center tap shaft						
Motor specifications		without brake		with brake			
пост сроспосию	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
Leadwire type (P65)	P.105		_	P.105		_	
Connector type (P67)	P.105		_	P.106		_	

A6N Series

Series

Series

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

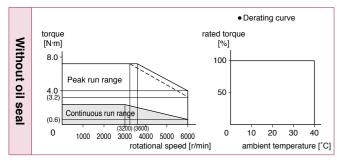
Static friction torque (N·m)	2.45 or more
Engaging time (ms)	70 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.42
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

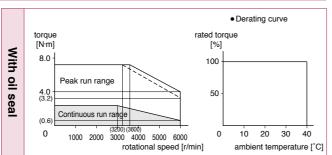
• Permissible load (For details, refer to P.272)

. •	COIDIO IOUU (* c. actumo, com	
During assembly	Radial load P-direction (N)	686
	Thrust load A-direction (N)	294
accombiy	Thrust load B-direction (N)	392
During operation	Radial load P-direction (N)	392
	Thrust load A, B-direction (N)	147

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.48.
- \*1  $\square\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





#### **Dimensions**

	Round shaft/ Key way, center tap shaft							
Motor specifications	without brake			with brake				
·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal		
Leadwire type (P65)	P.106		_	P.106				
Connector type (P67)	P.107		_	P.107		_		

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required. Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

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#### **Specifications**

200 V MSMF 1000 W [Low inertia 80 mm sq.]

					AC200 V
Motor model *1			IP65	MSMF092L1	
		Multi	function type		MDDLT45SF
Applicable	Model No.	RS48	5 communication typ	pe *2	MDDLN45SG
driver	140.	Basic	c type *2		MDDLN45SE
	Fram	e sym	bol		D-frame
Power supply	capacit	y	(k\	VA)	1.8
Rated output			(	W)	1000
Rated torque			(N	·m)	3.18
Continuous sta	all torqu	ie	(N	·m)	3.18
Momentary Ma	ax. pea	k torqı	ue (N	·m)	9.55
Rated current			(A(rm	ıs))	5.7
Max. current			(A(o-	p))	24.2
Regenerative I	brake	Without option			No limit Note)2
frequency (time	es/min)	Note)1	DV0P4284		No limit Note)2
Rated rotation	al spee	d	(r/m	nin)	3000
Max. rotationa	l speed		(r/m	nin)	6000
Moment of ine	rtia		Without brake		1.26
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )			With brake		1.36
Recommended moment of inertia ratio of the load and the rotor					15 times or less
Rotary encode	r speci	ficatio	ns*3		23-bit Absolute
	Re	solutio	on per single turn	1	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

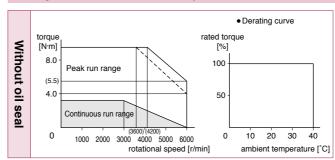
Static friction torque (N·m)	3.80 or more
Engaging time (ms)	70 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.42
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

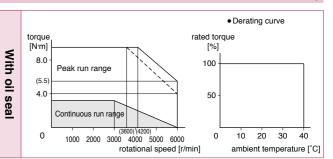
• Permissible load (For details, refer to P.272)

During assembly During operation	Radial load P-direction (N)	686
	Thrust load A-direction (N)	294
	Thrust load B-direction (N)	392
	Radial load P-direction (N)	392
	Thrust load A, B-direction (N)	147

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.48.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





#### **Dimensions**

	Round shaft/ Key way, center tap shaft						
Motor specifications		without brake		with brake			
,	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
Leadwire type (P65)	P.107		_	P.108		_	
Connector type (P67)	P.108		_	P.108		_	

				AC200 V
Motor model *1			IP67	MSMF102L1□□
		Multi	function type	MDDLT55SF
Applicable	Model No	RS48	5 communication type *2	MDDLN55SG
driver	140.	Basic	type *2	MDDLN55SE
	Fram	e sym	bol	D-frame
Power supply	capacit	y	(kVA)	2.3
Rated output			(W)	1000
Rated torque			(N·m)	3.18
Continuous sta	all torqu	е	(N·m)	3.82
Momentary Ma	ax. peal	k torqı	ue (N·m)	9.55
Rated current			(A(rms))	6.6
Max. current			(A(o-p))	28
Regenerative	brake		Without option	No limit Note)2
frequency (time	es/min)	Note)1	DV0P4284	No limit Note)2
Rated rotation	al spee	d	(r/min)	3000
Max. rotationa	l speed		(r/min)	5000
Moment of ine	rtia		Without brake	2.15
of rotor ( $\times 10^{-4}$	kg·m²)		With brake	2.47
Recommender ratio of the loa			15 times or less	
Rotary encoder specifications *3			ns <sup>*3</sup>	23-bit Absolute
Resolution per single turn				8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

Static friction torque (N·m)	8.0 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.81
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

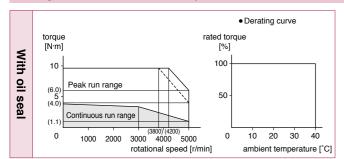
• Permissible load (For details, refer to P.272)

	. •		,
	During assembly	Radial load P-direction (N)	980
		Thrust load A-direction (N)	588
	document	Thrust load B-direction (N)	686
	During operation	Radial load P-direction (N)	490
		Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.48.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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#### Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)



#### **Dimensions**

		Key way shaft/ Round shaft							
Motor specifications	without brake			with brake					
·		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal		
Encoder connectange size (JL10)		_	P.109		_	P.1	109		
Encoder connec Small size (JN2)		_	P.109		_	P.110			

#### **<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required. Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

#### **Specifications**

					AC200 V
Motor model *1			IP67		MSMF152L1
		Multi	function type		MDDLT55SF
Applicable	Model No.	RS48	5 communication ty	pe *2	MDDLN55SG
driver	140.	Basic	c type *2		MDDLN55SE
	Fram	e sym	bol		D-frame
Power supply	capacit	у	(k'	VA)	2.3
Rated output				(W)	1500
Rated torque			(N	·m)	4.77
Continuous sta	all torqu	ie	(N	·m)	5.72
Momentary Ma	ax. pea	k torqı	ue (N	·m)	14.3
Rated current			(A(rn	ns))	8.2
Max. current		(A(o-p))		-p))	35
Regenerative	brake		Without option		No limit Note)2
frequency (time	s/min)	Note)1	DV0P4284		No limit Note)2
Rated rotation	al spee	d	(r/n	nin)	3000
Max. rotationa	l speed		(r/n	nin)	5000
Moment of ine	rtia		Without brake		3.10
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> ) Wi			With brake		3.45
Recommended moment of inertia ratio of the load and the rotor Note)3			ote)3	15 times or less	
Rotary encode	r speci	ficatio	ns*3		23-bit Absolute
	Re	solutio	on per single turr	1	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

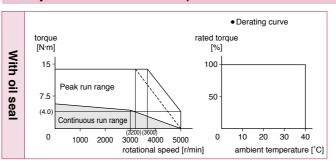
Static friction torque (N·m)	8.0 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.81
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.272)

During assembly During operation	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.48.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### 



#### **Dimensions**

		Key way shaft/ Round shaft						
	Motor specifications	without brake		with brake				
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
	Encoder connector Large size (JL10) type	_	P.110		_	P	110	
	Encoder connector Small size (JN2) type	_	P.111		_	P.	111	

		AC200 V		
Motor model <sup>*1</sup>			IP67	MSMF202L1□□
		Multi	function type	MEDLT83SF
Applicable	Model No.	RS48	5 communication type *2	MEDLN83SG
driver	140.	Basic	type *2	MEDLN83SE
	Fram	e sym	bol	E-frame
Power supply	capacit	у	(kVA)	3.8
Rated output			(W)	2000
Rated torque			(N·m)	6.37
Continuous sta	us stall torque (N·m)		7.64	
Momentary Ma	ax. pea	k torqı	ue (N·m)	19.1
Rated current (A(rm			(A(rms))	11.3
Max. current			(A(o-p))	48
Regenerative	brake		Without option	No limit Note)2
frequency (time	es/min)	Note)1	DV0P4285	No limit Note)2
Rated rotation	al spee	d	(r/min)	3000
Max. rotationa	l speed		(r/min)	5000
Moment of ine	rtia		Without brake	4.06
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )			With brake	4.41
Recommended moment of inertia ratio of the load and the rotor				15 times or less
Rotary encode	er speci	ficatio	ns <sup>⁺3</sup>	23-bit Absolute
	Re	solutic	on per single turn	8388608

#### • Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

Static friction torque (N·m)	8.0 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.81
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

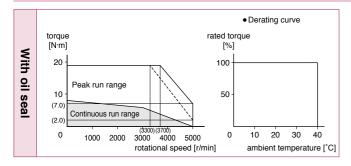
#### • Permissible load (For details, refer to P.272)

	,	,
During assembly	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
During operation	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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#### Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)



#### **Dimensions**

		Key way shaft/ Round shaft						
	Motor specifications	without brake			with brake			
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
	Encoder connector Large size (JL10) type	_	P.111		_	P.	112	
	Encoder connector Small size (JN2) type	_	P.112		_	P.	112	

#### **<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required. Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

#### **Specifications**

**200 V MSMF 3.0 kW** [Low inertia 120 mm sq.]

				AC200	) V
Motor model *1			IP67	MSMF302	L1 🗆 🗆
		Multi	function type	MFDLTA	3SF
Applicable	Model No	RS48	5 communication type	MFDLNA	\3SG
driver	110.	Basic	type *2	MFDLNA	A3SE
	Fram	e sym	bol	F-fram	ne
Power supply	capacit	y	(kVA	4.5	
Rated output			(W	3000	)
Rated torque			(N·m	9.55	
Continuous sta	all torqu	ie	(N·m	11.0	
Momentary Ma	ax. pea	. peak torque (N·m) 28.6		i	
Rated current			(A(rms)	18.1	
Max. current	current (A(o-		(A(o-p)	77	
Regenerative I	brake		Without option	No limit	Note)2
frequency (time	es/min)	Note)1	DV0P4285×2	No limit	Note)2
Rated rotation	al spee	d	(r/min	3000	)
Max. rotationa	l speed		(r/min	5000	)
Moment of ine	rtia		Without brake	7.04	
of rotor (×10 <sup>-4</sup> kg·m²) With			With brake	7.38	
Recommended moment of inertia ratio of the load and the rotor Note)3			15 times o	or less	
Rotary encode	r speci	ficatio	ns <sup>∗3</sup>	23-bit Ab	solute
	Re	solutio	on per single turn	83886	08

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

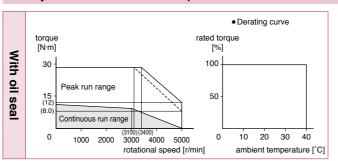
Static friction torque (N·m)	12.0 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.81
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.272)

During assembly During operation	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### 



#### **Dimensions**

	Motor specifications	Key way shaft/ Round shaft						
		without brake		with brake				
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
	Encoder connector Large size (JL10) type	_	P.113 P.113		_	P.113		
	Encoder connector Small size (JN2) type	_			_	P.	114	

				AC200 V
Motor model *1			IP67	MSMF402L1□□
		Multi	function type	MFDLTB3SF
Applicable	Model No.	RS48	5 communication type *2	MFDLNB3SG
driver	110.	Basic	type *2	MFDLNB3SE
	Fram	e sym	bol	F-frame
Power supply	capacit	у	(kVA)	7.5
Rated output			(W)	4000
Rated torque			(N·m)	12.7
Continuous sta	all torqu	ie	(N·m)	15.2
Momentary Max. peak torque			ue (N·m)	38.2
Rated current			(A(rms))	19.6
Max. current			(A(o-p))	83
Regenerative brake frequency (times/min) Note)1			Without option	No limit Note)2
		Note)1	DV0P4285×2	No limit Note)2
Rated rotational speed			(r/min)	3000
Max. rotationa	l speed		(r/min)	4500
Moment of ine	rtia		Without brake	14.4
of rotor ( $\times 10^{-4}$	kg·m²)		With brake	15.6
Recommended moment of ratio of the load and the rote				15 times or less
Rotary encode	r speci	ficatio	ns*³	23-bit Absolute
Resolution			n per single turn	8388608

#### • Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

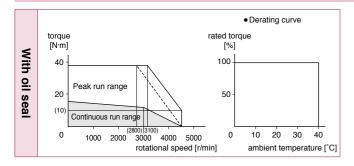
Static friction torque (N·m)	16.2 or more
Engaging time (ms)	110 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.90
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

#### • Permissible load (For details, refer to P.272)

	,	,
	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
During	Radial load P-direction (N)	784
operation	Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)



#### **Dimensions**

	Key way shaft/ Round shaft						
Motor specifications	without brake			with brake			
·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
Encoder connector Large size (JL10) type	_	P.	114	_	P.	114	
Encoder connector Small size (JN2) type	_	P.115		_	P.115		

#### **<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required. Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

#### **Specifications**

**200 V MSMF 5.0 kW** [Low inertia 130 mm sq.]

				AC200 V
Motor model *1			IP67	MSMF502L1□□
		Multi	function type	MFDLTB3SF
Applicable	Model No	RS48	5 communication type	<sup>'2</sup> MFDLNB3SG
driver	140.	Basic	c type *2	MFDLNB3SE
	Fram	e sym	bol	F-frame
Power supply	capacit	y	(kVA	7.5
Rated output			(W	5000
Rated torque			(N·m	15.9
Continuous sta	all torqu	ie	(N·m	19.1
Momentary Max. peak torque			ue (N·m	i) 47.7
Rated current			(A(rms)	24.0
Max. current			(A(o-p)	)) 102
Regenerative brake		Without option	No limit Note)2	
frequency (time	equency (times/min) Note)		DV0P4285×2	No limit Note)2
Rated rotation	Rated rotational speed			3000
Max. rotationa	l speed		(r/min	4500
Moment of ine	rtia		Without brake	19.0
of rotor ( $\times 10^{-4}$	kg·m²)		With brake	20.2
Recommended moment of ratio of the load and the rote				15 times or less
Rotary encode	r speci	ficatio	ns*3	23-bit Absolute
	Re	solutio	on per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

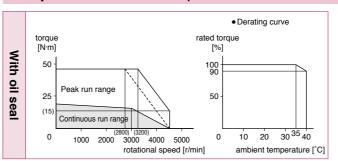
Static friction torque (N·m)	22.0 or more
Engaging time (ms)	110 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.90
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

#### • Permissible load (For details, refer to P.272)

	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
accombiy	Thrust load B-direction (N)	686
During	Radial load P-direction (N)	784
operation	Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### 



#### **Dimensions**

	Key way shaft/ Round shaft						
Motor specifications	without brake		with brake				
co. specimeaneric	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
Encoder connector Large size (JL10) type	_	P.115 P.116		_	P.116		
Encoder connector Small size (JN2) type	_			_	P	116	

A6N Series

Series

Series

				AC100 V
Motor model *1	1otor model 11 IP65			MQMF011L1
		Multi	function type	MADLT11SF
Applicable	Model No.	RS48	5 communication type *2	MADLN11SG
driver	140.	Basic	type *2	MADLN11SE
	Fram	e sym	bol	A-frame
Power supply	capacit	у	(kVA)	0.4
Rated output			(W)	100
Rated torque			(N·m)	0.32
Continuous sta	all torqu	ie	(N·m)	0.33
Momentary Max. peak torque			ue (N·m)	1.11
Rated current			(A(rms))	1.6
Max. current			(A(o-p))	7.9
Regenerative brake			Without option	No limit Note)2
frequency (time	frequency (times/min) No		DV0P4280	No limit Note)2
Rated rotational speed			(r/min)	3000
Max. rotationa	l speed		(r/min)	6500
Moment of ine	rtia		Without brake	0.15
of rotor ( $\times 10^{-4}$	of rotor ( $\times 10^{-4} \text{ kg} \cdot \text{m}^2$ )		With brake	0.18
Recommender ratio of the loa		20 times or less		
Rotary encode	Rotary encoder specifications*3			23-bit Absolute
Resolution per single turn			8388608	

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

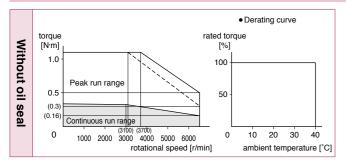
Static friction torque (N·m)	0.39 or more
Engaging time (ms)	15 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.30
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

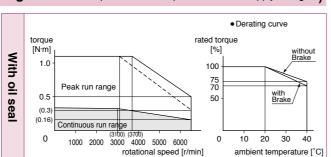
• Permissible load (For details, refer to P.272)

, , , , , , , , , , , , , , , , , , , ,						
	Radial load P-direction (N)	147				
During assembly	Thrust load A-direction (N)	88				
document	Thrust load B-direction (N)	117.6				
During operation	Radial load P-direction (N)	68.6				
	Thrust load A, B-direction (N)	58.8				

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### Torque characteristics (at AC100 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





#### **Dimensions**

	Round shaft/ Key way, center tap shaft							
Motor specifications		without brake		with brake				
·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal		
Leadwire type (P65)	P.117	P.117	P.117	P.118	P.118	P.118		
Connector type (P67)	P.119	P.119	P.119	P.120	P.120	P.120		

#### **<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required. Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

-67-

#### **Specifications**

					AC200 V
Motor model *1			IP65		MQMF012L1
		Multi	function type		MADLT05SF
Applicable	Model No.	RS48	5 communication	type *2	MADLN05SG
driver	140.	Basic	c type *2		MADLN05SE
	Fram	e sym	bol		A-frame
Power supply	capacit	y	(	kVA)	0.5
Rated output				(W)	100
Rated torque			(	N·m)	0.32
Continuous sta	all torqu	ie	(	N·m)	0.33
Momentary Ma	ax. pea	k torqı	ue (	N·m)	1.11
Rated current			(A(ı	ms))	1.1
Max. current			(A(	o-p))	5.5
Regenerative I	brake		Without option	n	No limit Note)2
frequency (time	es/min)	Note)1	DV0P4281		No limit Note)2
Rated rotation	al spee	d	(r.	/min)	3000
Max. rotationa	l speed		(r.	/min)	6500
Moment of ine	rtia		Without brak	е	0.15
of rotor (×10 <sup>-4</sup> kg·m²) With bi			With brake		0.18
Recommended moment of inertia ratio of the load and the rotor Note)3					20 times or less
Rotary encode	r speci	ficatio	ns <sup>⁺3</sup>		23-bit Absolute
	Re	solutio	on per single tu	rn	8388608

200 V MQMF 100 W [Middle inertia Flat type 60 mm sq.]

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

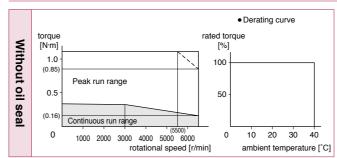
Static friction torque (N·m)	0.39 or more
Engaging time (ms)	15 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.30
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

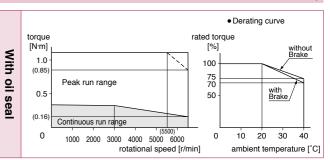
#### • Permissible load (For details, refer to P.272)

During assembly	Radial load P-direction (N)	147
	Thrust load A-direction (N)	88
	Thrust load B-direction (N)	117.6
During	Radial load P-direction (N)	68.6
operation	Thrust load A, B-direction (N)	58.8

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### 





#### **Dimensions**

		Round shaft/ Key way, center tap shaft						
Motor specifications	without brake			with brake				
·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal		
Leadwire type (P65)	P.117	P.117	P.117	P.118	P.118	P.118		
Connector type (P67)	P.119	P.119	P.119	P.120	P.120	P.120		

				AC100 V
Motor model *1			IP65	MQMF021L1
		Multi	function type	MBDLT21SF
Applicable	Model No	RS48	5 communication type *2	MBDLN21SG
driver		Basic	type *2	MBDLN21SE
	Frame	sym	bol	B-frame
Power supply	capacity	/	(kVA)	0.5
Rated output			(W)	200
Rated torque			(N·m)	0.64
Continuous sta	all torqu	е	(N·m)	0.76
Momentary Ma	ax. peak	torqı	ue (N·m)	2.23
Rated current			(A(rms))	2.1
Max. current			(A(o-p))	10.4
Regenerative	brake		Without option	No limit Note)2
frequency (time	es/min) I	Note)1	DV0P4283	No limit Note)2
Rated rotation	al speed	d	(r/min)	3000
Max. rotationa	l speed		(r/min)	6500
Moment of ine	rtia		Without brake	0.50
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )		With brake	0.59	
Recommended moment of inertia ratio of the load and the rotor Note)3			20 times or less	
Rotary encode	er specif	icatio	ns <sup>*3</sup>	23-bit Absolute
	Res	solutio	on per single turn	8388608

#### • Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

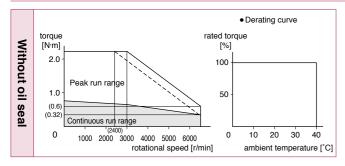
Static friction torque (N·m)	1.6 or more
Engaging time (ms)	70 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

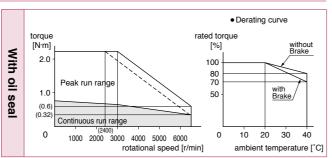
#### • Permissible load (For details, refer to P.272)

	,	,
During assembly	Radial load P-direction (N)	392
	Thrust load A-direction (N)	147
	Thrust load B-direction (N)	196
During operation	Radial load P-direction (N)	245
	Thrust load A, B-direction (N)	98

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### Torque characteristics (at AC100 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





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#### **Dimensions**

	Round shaft/ Key way, center tap shaft							
Motor specifications		without brake		with brake				
·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal		
Leadwire type (P65)	P.121	P.121	P.121	P.122	P.122	P.122		
Connector type (P67)	P.123	P.123	P.123	P.124	P.124	P.124		

**<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required. Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

#### **Specifications**

				AC200 V	
Motor model *1			IP65	MQMF022L1	
		Multi	function type	MADLT15SF	
Applicable	Model No.	RS48	5 communication type *2	MADLN15SG	
driver	140.	Basic	c type *2	MADLN15SE	
	Fram	e sym	bol	A-frame	
Power supply	capacit	y	(kVA)	0.5	
Rated output			(W)	200	
Rated torque			(N·m)	0.64	
Continuous sta	all torqu	е	(N·m)	0.76	
Momentary Ma	ax. peal	k torqı	ue (N·m)	2.23	
Rated current			(A(rms))	1.4	
Max. current			(A(o-p))	6.9	
Regenerative I	brake		Without option	No limit Note)2	
frequency (time	es/min)	Note)1	DV0P4283	No limit Note)2	
Rated rotation	al spee	d	(r/min)	3000	
Max. rotationa	l speed		(r/min)	6500	
Moment of ine	rtia		Without brake	0.50	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )		With brake	0.59		
Recommended moment of inertia ratio of the load and the rotor				20 times or less	
Rotary encode	er speci	ficatio	ns <sup>*3</sup>	23-bit Absolute	
	Re	solutio	on per single turn	8388608	

200 V MQMF 200 W [Middle inertia Flat type 80 mm sq.]

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

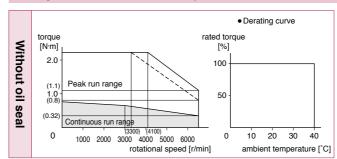
Static friction torque (N·m)	1.6 or more
Engaging time (ms)	70 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

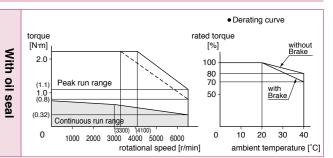
#### • Permissible load (For details, refer to P.272)

	,	,
During assembly	Radial load P-direction (N)	392
	Thrust load A-direction (N)	147
	Thrust load B-direction (N)	196
During	Radial load P-direction (N)	245
operation	Thrust load A, B-direction (N)	98

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### 





#### **Dimensions**

Motor specifications	Round shaft/ Key way, center tap shaft					
	without brake			with brake		
	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal
Leadwire type (P65)	P.121	P.121	P.121	P.122	P.122	P.122
Connector type (P67)	P.123	P.123	P.123	P.124	P.124	P.124

		AC100 V		
Motor model *1		MQMF041L1		
		Multi	function type	MCDLT31SF
Applicable	Model No.	RS48	5 communication type *2	MCDLN31SG
driver		Basic	type *2	MCDLN31SE
	Frame	sym	bol	C-frame
Power supply	capacity	/	(kVA)	0.9
Rated output			(W)	400
Rated torque			(N·m)	1.27
Continuous sta	all torqu	е	(N·m)	1.40
Momentary Ma	ax. peal	torqu	ue (N·m)	4.46
Rated current			(A(rms))	4.1
Max. current			(A(o-p))	20.3
Regenerative	brake		Without option	No limit Note)2
frequency (time	es/min) I	Note)1	DV0P4282	No limit Note)2
Rated rotation	al spee	d	(r/min)	3000
Max. rotationa	l speed		(r/min)	6500
Moment of ine	rtia		Without brake	0.98
of rotor ( $\times 10^{-4}$	kg·m²)		With brake	1.06
Recommender ratio of the loa				20 times or less
Rotary encode	er specif	icatio	ns <sup>*3</sup>	23-bit Absolute
	Res	solutio	n per single turn	8388608

#### • Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

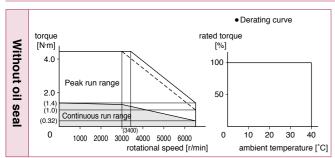
Static friction torque (N·m)	1.6 or more
Engaging time (ms)	70 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

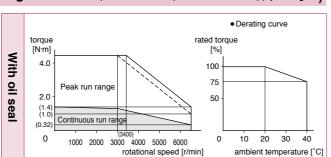
#### • Permissible load (For details, refer to P.272)

During assembly  During operation	Radial load P-direction (N)	392
	Thrust load A-direction (N)	147
	Thrust load B-direction (N)	196
	Radial load P-direction (N)	245
	Thrust load A, B-direction (N)	98

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.48.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC100 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





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#### **Dimensions**

		Round shaft/ Key way, center tap shaft							
	Motor specifications		without brake		with brake				
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip with oil seal		
	Leadwire type (P65)	P.125	P.125	P.125	P.126	P.126	P.126		
	Connector type (P67)	P.127	P.127	P.127	P.128	P.128	P.128		

**<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required. Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

# **Specifications**

				AC200 V
Motor model *1			IP65	MQMF042L1□□
		Multi	function type	MBDLT25SF
Applicable	Model No	RS48	5 communication type *2	MBDLN25SG
driver	INO.	Basic	c type *2	MBDLN25SE
	Fram	e sym	bol	B-frame
Power supply	capacit	у	(kVA)	0.9
Rated output			(W)	400
Rated torque			(N·m)	1.27
Continuous sta	all torqu	е	(N·m)	1.40
Momentary Ma	ax. peal	k torqu	ue (N·m)	4.46
Rated current			(A(rms))	2.1
Max. current			(A(o-p))	10.4
Regenerative I	brake		Without option	No limit Note)2
frequency (time	s/min)	Note)1	DV0P4283	No limit Note)2
Rated rotation	al spee	d	(r/min)	3000
Max. rotationa	l speed		(r/min)	6500
Moment of ine	rtia		Without brake	0.98
of rotor (×10 <sup>-4</sup>	kg·m²)		With brake	1.06
Recommender ratio of the loa				20 times or less
Rotary encode	r speci	ficatio	ns*3	23-bit Absolute
	Re	solutio	on per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

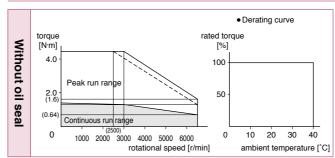
Static friction torque (N·m)	1.6 or more
Engaging time (ms)	70 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

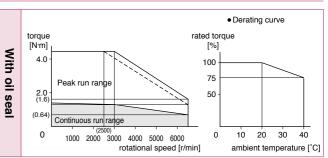
#### • Permissible load (For details, refer to P.272)

During assembly During operation	Radial load P-direction (N)	392
	Thrust load A-direction (N)	147
	Thrust load B-direction (N)	196
	Radial load P-direction (N)	245
	Thrust load A, B-direction (N)	98

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# 





#### **Dimensions**

	Round shaft/ Key way, center tap shaft							
Motor specifications		without brake		with brake				
пост сроспосто	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal		
Leadwire type (P65)	P.125	P.125	P.125	P.126	P.126	P.126		
Connector type (P67)	P.127	P.127	P.127	P.128	P.128	P.128		

Series

Series

# **Specifications**

				AC100 V
Motor model *1			IP65	MHMF5AZL1
		Multi	function type	MADLT01SF
Applicable	Model No.	RS48	5 communication type *2	MADLN01SG
driver	140.	Basic	type *2	MADLN01SE
	Fram	e sym	bol	A-frame
Power supply	capacit	у	(kVA)	0.4
Rated output			(W)	50
Rated torque			(N·m)	0.16
Continuous sta	all torqu	ie	(N·m)	0.18
Momentary Ma	ax. pea	k torqı	ue (N·m)	0.56
Rated current			(A(rms))	1.1
Max. current			(A(o-p))	5.5
Regenerative	brake		Without option	No limit Note)2
frequency (time	s/min)	Note)1	DV0P4280	No limit Note)2
Rated rotation	al spee	d	(r/min)	3000
Max. rotationa	l speed		(r/min)	6500
Moment of ine	rtia		Without brake	0.038
of rotor ( $\times 10^{-4}$	kg·m²)		With brake	0.042
Recommender ratio of the loa				30 times or less
Rotary encode	r speci	ficatio	ns <sup>*3</sup>	23-bit Absolute
	Re	solutio	n per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

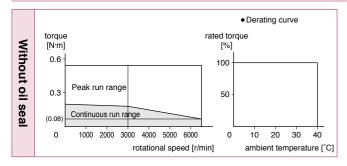
Static friction torque (N·m)	0.38 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.30
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

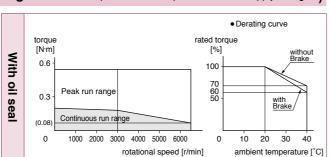
#### • Permissible load (For details, refer to P.272)

	Radial load P-direction (N)	147
During assembly	Thrust load A-direction (N)	88
document	Thrust load B-direction (N)	117.6
During	Radial load P-direction (N)	68.6
operation	Thrust load A, B-direction (N)	49

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC100 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





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#### **Dimensions**

		Round shaft/ Key way, center tap shaft							
	Motor specifications		without brake		with brake				
	·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal		
	Leadwire type (P65)	P.129	P.129	P.129	P.130	P.130	P.130		
	Connector type (P67)	P.131	P.131	P.131	P.132	P.132	P.132		

**<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required. Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

# **Specifications**

200 V MHMF 50 W [High inertia 40 mm sq.]

				AC200 V
Motor model *1			IP65	MHMF5AZL1
		Multi	function type	MADLT05SF
Applicable	Model No	RS48	5 communication type *2	MADLN05SG
driver	INO.	Basic	c type *2	MADLN05SE
	Fram	e sym	bol	A-frame
Power supply	capacit	y	(kVA)	0.5
Rated output			(W)	50
Rated torque			(N·m)	0.16
Continuous sta	all torqu	е	(N·m)	0.18
Momentary Ma	ax. peal	k torqu	ue (N·m)	0.56
Rated current			(A(rms))	1.1
Max. current			(A(o-p))	5.5
Regenerative I	brake		Without option	No limit Note)2
frequency (time	s/min)	Note)1	DV0P4281	No limit Note)2
Rated rotation	al spee	d	(r/min)	3000
Max. rotationa	l speed		(r/min)	6500
Moment of ine	rtia		Without brake	0.038
of rotor ( $\times 10^{-4}$	kg·m²)		With brake	0.042
Recommended moment of ir ratio of the load and the roto				30 times or less
Rotary encode	r speci	ficatio	ns <sup>*3</sup>	23-bit Absolute
	Re	solutio	on per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

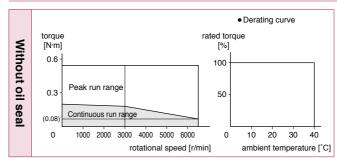
Static friction torque (N·m)	0.38 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.30
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

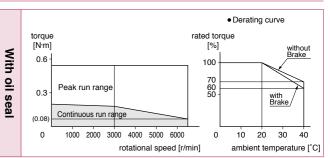
#### • Permissible load (For details, refer to P.272)

During assembly During operation	Radial load P-direction (N)	147
	Thrust load A-direction (N)	88
	Thrust load B-direction (N)	117.6
	Radial load P-direction (N)	68.6
	Thrust load A, B-direction (N)	49

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





#### **Dimensions**

Motor specifications	Round shaft/ Key way, center tap shaft							
		without brake		with brake				
	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal		
Leadwire type (P65)	P.129	P.129	P.129	P.130	P.130	P.130		
Connector type (P67)	P.131	P.131	P.131	P.132	P.132	P.132		

Series

Series

# **Specifications**

				AC100 V
Motor model *1			IP65	MHMF011L1
		Multi	function type	MADLT11SF
Applicable	Model No.	RS48	5 communication type *2	MADLN11SG
driver		Basic	type *2	MADLN11SE
	Fram	e sym	bol	A-frame
Power supply	capacit	y	(kVA)	0.4
Rated output			(W)	100
Rated torque			(N·m)	0.32
Continuous stall torque (N·m)				0.33
Momentary Max. peak torque (N·m)				1.11
Rated current (A(rms))			(A(rms))	1.6
Max. current (A(o-p))			(A(o-p))	7.9
Regenerative	brake		Without option	No limit Note)2
frequency (time	es/min)	Note)1	DV0P4280	No limit Note)2
Rated rotation	al spee	d	(r/min)	3000
Max. rotationa	l speed		(r/min)	6500
Moment of ine	rtia		Without brake	0.071
of rotor ( $\times 10^{-4}$	kg·m²)		With brake	0.074
Recommended moment of inertia ratio of the load and the rotor Note)3				30 times or less
Rotary encode	r speci	ficatio	ns <sup>∗3</sup>	23-bit Absolute
	Re	solutio	n per single turn	8388608

#### • Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

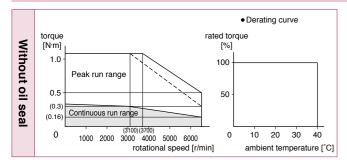
Static friction torque (N·m)	0.38 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.30
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

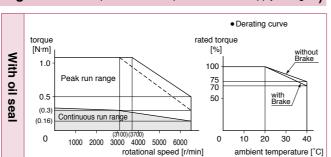
#### • Permissible load (For details, refer to P.272)

		,	,
	During assembly  During operation	Radial load P-direction (N)	147
		Thrust load A-direction (N)	88
		Thrust load B-direction (N)	117.6
		Radial load P-direction (N)	68.6
		Thrust load A, B-direction (N)	58.8

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC100 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





#### **Dimensions**

Motor specifications	Round shaft/ Key way, center tap shaft						
		without brake		with brake			
	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
Leadwire type (P65)	P.133	P.133	P.133	P.134	P.134	P.134	
Connector type (P67)	P.135	P.135	P.135	P.136	P.136	P.136	

#### **<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required. Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

# **Specifications**

200 V MHMF 100 W [High inertia 40 mm sq.]

					AC200 V	
Motor model *1			IP65		MHMF012L1	
		Multi	function type		MADLT05SF	
Applicable	Model No.	RS48	5 communication	type *2	MADLN05SG	
driver	140.	Basic	c type *2		MADLN05SE	
	Fram	e sym	bol		A-frame	
Power supply	capacit	y	(	kVA)	0.5	
Rated output				(W)	100	
Rated torque			(	N·m)	0.32	
Continuous sta	all torqu	ie	(	N·m)	0.33	
Momentary Ma	ax. pea	k torqı	ue (	N·m)	1.11	
Rated current			1)A)	(A(rms)) 1.1		
Max. current			(A(	o-p))	5.5	
Regenerative	brake		Without option		No limit Note)2	
frequency (time	es/min)	Note)1	DV0P4281		No limit Note)2	
Rated rotation	al spee	d	(r	/min)	3000	
Max. rotationa	l speed		(r	/min)	6500	
Moment of ine	rtia		Without brak	е	0.071	
of rotor (×10 <sup>-4</sup>	kg·m²)		With brake		0.074	
Recommended moment of inertia ratio of the load and the rotor				Note)3	30 times or less	
Rotary encode	r speci	ficatio	ns <sup>⁺3</sup>		23-bit Absolute	
	Re	solutio	on per single tu	rn	8388608	

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

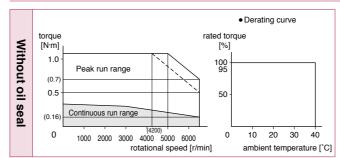
Static friction torque (N·m)	0.38 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.30
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

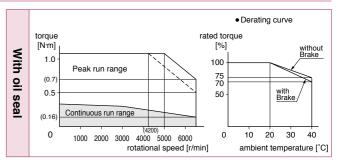
#### • Permissible load (For details, refer to P.272)

During assembly	Radial load P-direction (N)	147
	Thrust load A-direction (N)	88
	Thrust load B-direction (N)	117.6
During operation	Radial load P-direction (N)	68.6
	Thrust load A, B-direction (N)	58.8

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# 





#### **Dimensions**

Motor specifications	Round shaft/ Key way, center tap shaft						
	without brake			with brake			
	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
Leadwire type (P65)	P.133	P.133	P.133	P.134	P.134	P.134	
Connector type (P67)	P.135	P.135	P.135	P.136	P.136	P.136	

				AC100 V
Motor model *1		ı	P65	MHMF021L1
		Multifur	nction type	MBDLT21SF
Applicable	Model No.	RS485 c	communication type *2	MBDLN21SG
driver		Basic ty	ype <sup>*2</sup>	MBDLN21SE
	Frame	symbo	ol	B-frame
Power supply	capacity		(kVA)	0.5
Rated output			(W)	200
Rated torque			(N·m)	0.64
Continuous sta	all torque		(N·m)	0.76
Momentary Ma	ax. peak	torque	(N·m)	2.23
Rated current			(A(rms))	2.1
Max. current			(A(o-p))	10.4
Regenerative	brake	'	Without option	No limit Note)2
frequency (time	es/min) No	ote)1	DV0P4283	No limit Note)2
Rated rotation	al speed		(r/min)	3000
Max. rotationa	l speed		(r/min)	6500
Moment of ine	rtia	'	Without brake	0.29
of rotor (×10 <sup>-4</sup>	kg·m²)	١	With brake	0.31
Recommended moment of ratio of the load and the rote			ertia Note)3	30 times or less
Rotary encode	er specific	cations	*3	23-bit Absolute
Resolution per single			per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

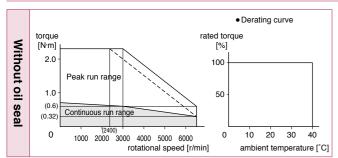
Static friction torque (N·m)	1.6 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

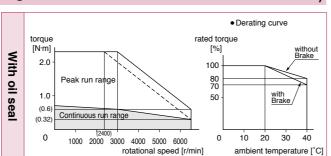
• Permissible load (For details, refer to P.272)

	Radial load P-direction (N)	392
During assembly	Thrust load A-direction (N)	147
document	Thrust load B-direction (N)	196
During operation	Radial load P-direction (N)	245
	Thrust load A, B-direction (N)	98

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC100 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





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#### **Dimensions**

		Round shaft/ Key way, center tap shaft						
	Motor specifications		without brake		with brake			
	·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
	Leadwire type (P65)	P.137	P.137	P.137	P.138	P.138	P.138	
	Connector type (P67)	P.139	P.139	P.139	P.140	P.140	P.140	

**<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required. Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

# **Specifications**

200 V MHMF 200 W [High inertia 60 mm sq.]

					AC200 V
Motor model*1		IP65			MHMF022L1□□
		Multi	function type		MADLT15SF
Applicable	Model No	RS48	5 communication type	) *2	MADLN15SG
driver	140.	Basic	type *2		MADLN15SE
	Frame	e sym	bol		A-frame
Power supply	capacity	y	(kVA	۹)	0.5
Rated output			(V	V)	200
Rated torque (N·m)				n)	0.64
Continuous sta	all torqu	е	(N·n	n)	0.76
Momentary Ma	ax. peal	c torqu	ıe (N·n	n)	2.23
Rated current			(A(rms	())	1.4
Max. current			(A(o-p	))	6.9
Regenerative I	brake		Without option		No limit Note)2
frequency (time	es/min)	Note)1	DV0P4283		No limit Note)2
Rated rotation	al spee	d	(r/mir	n)	3000
Max. rotationa	l speed		(r/mir	n)	6500
Moment of ine	rtia		Without brake		0.29
of rotor (x10 <sup>-4</sup> kg·m <sup>2</sup> )			With brake		0.31
Recommended moment of ine ratio of the load and the rotor				9)3	30 times or less
Rotary encode	r speci	icatio	ns <sup>*3</sup>		23-bit Absolute
	Res	solutio	n per single turn		8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

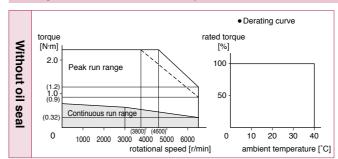
Static friction torque (N·m)	1.6 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

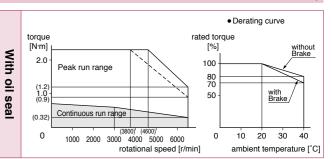
• Permissible load (For details, refer to P.272)

During assembly During operation	Radial load P-direction (N)	392
	Thrust load A-direction (N)	147
	Thrust load B-direction (N)	196
	Radial load P-direction (N)	245
	Thrust load A, B-direction (N)	98

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### 





#### **Dimensions**

	Round shaft/ Key way, center tap shaft								
Motor specifications		without brake		with brake					
motor opcomoditorio	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal			
Leadwire type (P65)	P.137	P.137	P.137	P.138	P.138	P.138			
Connector type (P67)	P.139	P.139	P.139	P.140	P.140	P.140			

				AC100 V
Motor model *1			IP65	MHMF041L1
		∕lulti1	function type	MCDLT31SF
Applicable	Model No	RS48	communication type *2	MCDLN31SG
driver	E	Basic	type *2	MCDLN31SE
	Frame	sym	bol	C-frame
Power supply	capacity		(kVA)	0.9
Rated output			(W)	400
Rated torque			(N·m)	1.27
Continuous sta	all torque		(N·m)	1.40
Momentary Ma	ax. peak	torqu	ıe (N·m)	4.46
Rated current			(A(rms))	4.1
Max. current			(A(o-p))	20.3
Regenerative	brake		Without option	No limit Note)2
frequency (time	es/min) No	ote)1	DV0P4282	No limit Note)2
Rated rotation	al speed		(r/min)	3000
Max. rotationa	l speed		(r/min)	6500
Moment of ine	rtia		Without brake	0.56
of rotor ( $\times 10^{-4}$	kg·m²)		With brake	0.58
Recommended moment of i ratio of the load and the rote				30 times or less
Rotary encode	er specific	atio	ns <sup>∗3</sup>	23-bit Absolute
Resolutio			n per single turn	8388608

#### • Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

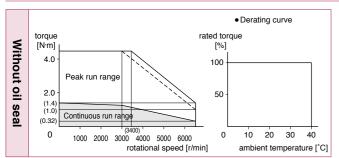
Static friction torque (N·m)	1.6 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

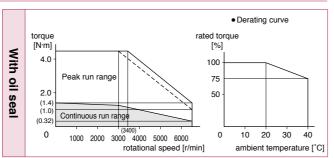
#### • Permissible load (For details, refer to P.272)

During assembly  During operation	Radial load P-direction (N)	392
	Thrust load A-direction (N)	147
	Thrust load B-direction (N)	196
	Radial load P-direction (N)	245
	Thrust load A, B-direction (N)	98

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.48.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC100 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





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#### **Dimensions**

		Round shaft/ Key way, center tap shaft							
	Motor specifications		without brake		with brake				
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal		
	Leadwire type (P65)	P.141	P.141	P.141	P.142	P.142	P.142		
	Connector type (P67)	P.143	P.143	P.143	P.144	P.144	P.144		

**<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required. Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

# **Specifications**

200 V MHMF 400 W [High inertia 60 mm sq.]

					AC200 V	
Motor model *1	IP65			MHMF042L1		
		Multi	function type		MBDLT25SF	
Applicable	Model No.	RS48	5 communication ty	pe *2	MBDLN25SG	
driver	140.	Basic	type *2		MBDLN25SE	
	Fram	e sym	bol		B-frame	
Power supply	capacit	y	(k'	VA)	0.9	
Rated output			(	(W)	400	
Rated torque			(N	·m)	1.27	
Continuous sta	all torqu	ie	(N	·m)	1.40	
Momentary Ma	ax. pea	k torqı	ue (N	·m)	4.46	
Rated current			(A(rm	ns))	2.1	
Max. current			(A(o	-p))	10.4	
Regenerative I	brake		Without option		No limit Note)2	
frequency (time	es/min)	Note)1	DV0P4283		No limit Note)2	
Rated rotation	al spee	d	(r/n	nin)	3000	
Max. rotationa	l speed		(r/n	nin)	6500	
Moment of ine	rtia		Without brake		0.56	
of rotor (×10 <sup>-4</sup>	kg·m²)		With brake		0.58	
Recommended moment of inertia ratio of the load and the rotor				ote)3	30 times or less	
Rotary encode	r speci	ficatio	ns*3		23-bit Absolute	
	Re	solutio	on per single turr	ı	8388608	

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

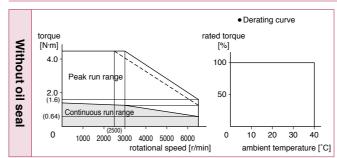
Static friction torque (N·m)	1.6 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

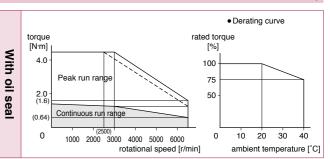
• Permissible load (For details, refer to P.272)

During assembly	Radial load P-direction (N)	392
	Thrust load A-direction (N)	147
	Thrust load B-direction (N)	196
During operation	Radial load P-direction (N)	245
	Thrust load A, B-direction (N)	98

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





#### **Dimensions**

Motor specifications	Round shaft/ Key way, center tap shaft								
		without brake		with brake					
	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal			
Leadwire type (P65)	P.141	P.141	P.141	P.142	P.142	P.142			
Connector type (P67)	P.143	P.143	P.143	P.144	P.144	P.144			

				AC200 V
Motor model *1	el <sup>-1</sup> IP65		IP65	MHMF082L1□□
		Multif	unction type	MCDLT35SF
Applicable	Model No	RS48	communication type *2	MCDLN35SG
driver		Basic	type *2	MCDLN35SE
	Frame	sym	ool	C-frame
Power supply	capacity		(kVA)	1.3
Rated output			(W)	750
Rated torque			(N·m)	2.39
Continuous sta	all torque		(N·m)	2.86
Momentary Ma	ax. peak	torqu	ie (N·m)	8.36
Rated current (A)			(A(rms))	3.8
Max. current	eurrent (A(o-p))		18.8	
Regenerative	brake		Without option	No limit Note)2
frequency (times/min) Note)1		ote)1	DV0P4283	No limit Note)2
Rated rotation	al speed		(r/min)	3000
Max. rotationa	l speed		(r/min)	6000
Moment of ine	rtia		Without brake	1.56
of rotor ( $\times 10^{-4}$	kg·m²)		With brake	1.66
Recommended moment of ine ratio of the load and the rotor			20 times or less	
Rotary encode	er specific	catio	าร <sup>∗3</sup>	23-bit Absolute
	Reso	olutio	n per single turn	8388608

#### • Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

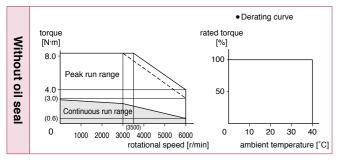
Static friction torque (N·m)	3.8 or more
Engaging time (ms)	70 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.42
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

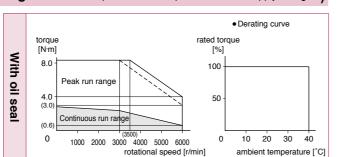
#### • Permissible load (For details, refer to P.272)

During assembly	Radial load P-direction (N)	686
	Thrust load A-direction (N)	294
	Thrust load B-direction (N)	392
During operation	Radial load P-direction (N)	392
	Thrust load A, B-direction (N)	147

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.48.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





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#### **Dimensions**

Motor specifications	Round shaft/ Key way, center tap shaft							
		without brake		with brake				
·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal		
Leadwire type (P65)	P.145	P.145	P.145	P.146	P.146	P.146		
Connector type (P67)	P.147	P.147	P.147	P.148	P.148	P.148		

**<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required. Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

# **Specifications**

200 V MHMF 1000 W [High inertia 80 mm sq.]

					AC200 V	
Motor model*1	IP65			MHMF092L1		
			function type		MDDLT55SF	
Applicable	Model No	RS48	5 communicatio	n type *2	MDDLN55SG	
driver	110.	Basic	c type *2		MDDLN55SE	
	Fram	e sym	bol		D-frame	
Power supply	capacit	y		(kVA)	2.3	
Rated output				(W)	1000	
Rated torque				(N·m)	3.18	
Continuous sta	all torqu	ie		(N·m)	3.34	
Momentary Ma	ax. pea	k torqu	ue	(N·m)	11.1	
Rated current			(A	(rms))	5.7	
Max. current			()	۹(o-p))	28.2	
Regenerative I	brake		Without op	tion	No limit Note)2	
frequency (time	es/min)	Note)1	DV0P4284		No limit Note)2	
Rated rotation	al spee	d		(r/min)	3000	
Max. rotationa	l speed			(r/min)	6000	
Moment of ine	rtia		Without brake		2.03	
of rotor ( $\times 10^{-4}$	kg·m²)		With brake		2.13	
Recommended moment of inertia ratio of the load and the rotor			Note)3	15 times or less		
Rotary encode	r speci	ficatio	ns <sup>⁺3</sup>		23-bit Absolute	
	Re	solutio	on per single	turn	8388608	

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

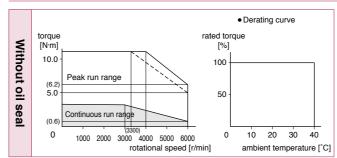
Static friction torque (N·m)	3.8 or more
Engaging time (ms)	70 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.42
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

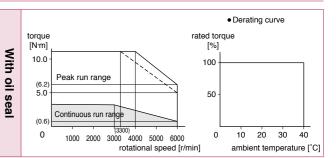
• Permissible load (For details, refer to P.272)

During assembly	Radial load P-direction (N)	686
	Thrust load A-direction (N)	294
	Thrust load B-direction (N)	392
During operation	Radial load P-direction (N)	392
	Thrust load A, B-direction (N)	147

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.48.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# 





#### **Dimensions**

Motor specifications	Round shaft/ Key way, center tap shaft								
		without brake		with brake					
	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal			
Leadwire type (P65)	P.149	P.149	P.149	P.150	P.150	P.150			
Connector type (P67)	P.151	P.151	P.151	P.152	P.152	P.152			

				AC200 V
Motor model *1		MHMF102L1		
		Multi	function type	MDDLT45SF
Applicable	Model No.	RS48	5 communication type *2	MDDLN45SG
driver		Basic	type *2	MDDLN45SE
	Frame	sym	bol	D-frame
Power supply	capacity	/	(kVA)	1.8
Rated output			(W)	1000
Rated torque (N·m)				4.77
Continuous stall torque (N·m)				5.25
Momentary Ma	ax. peak	torqı	ue (N·m)	14.3
Rated current			(A(rms))	5.2
Max. current			(A(o-p))	22
Regenerative	brake		Without option	No limit Note)2
frequency (time	es/min) I	Note)1	DV0P4284	No limit Note)2
Rated rotation	al speed	d	(r/min)	2000
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	22.9
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )			With brake	24.1
Recommended moment of inert ratio of the load and the rotor				5 times or less
Rotary encode	er specif	icatio	ns <sup>*3</sup>	23-bit Absolute
	Res	solutio	on per single turn	8388608

#### • Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

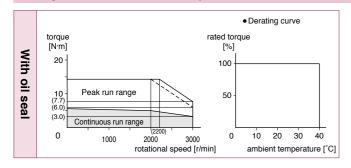
#### • Permissible load (For details, refer to P.272)

	. •		,
	During assembly	Radial load P-direction (N)	980
		Thrust load A-direction (N)	588
		Thrust load B-direction (N)	686
	During operation	Radial load P-direction (N)	490
		Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.48.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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#### Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)



#### **Dimensions**

	Key way shaft/ Round shaft							
Motor specifications		without brake		with brake				
	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal		
Encoder connector Large size (JL10) type	_	P.153		_	P.153			
Encoder connector Small size (JN2) type	_	P.153		_	P.154			

#### **<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required. Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

# **Specifications**

**200 V MHMF 1.5 kW** [High inertia 130 mm sq.]

					AC200 V	
Motor model*1		IP67			MHMF152L1	
			function type		MDDLT55SF	
Applicable	Model No.	RS48	5 communication	type *2	MDDLN55SG	
driver	110.	Basic	c type *2		MDDLN55SE	
	Fram	e sym	bol		D-frame	
Power supply	capacit	y		(kVA)	2.3	
Rated output				(W)	1500	
Rated torque				(N·m)	7.16	
Continuous sta	all torqu	ie		(N·m)	7.52	
Momentary Ma	ax. pea	k torqı	ue	(N·m) 21.5		
Rated current			(A(	rms))	8.0	
Max. current			(A	(o-p))	34	
Regenerative I	brake		Without option	on	No limit Note)2	
frequency (time	es/min)	Note)1	DV0P4284		No limit Note)2	
Rated rotation	al spee	d	1)	/min)	2000	
Max. rotationa	l speed		1)	/min)	3000	
Moment of ine	rtia		Without brak	æ	33.4	
of rotor (×10 <sup>-4</sup>	kg·m²)		With brake		34.6	
Recommended moment of inertia ratio of the load and the rotor				Note)3	5 times or less	
Rotary encode	r speci	ficatio	ns <sup>⁺3</sup>		23-bit Absolute	
Resolution per sing				ırn	8388608	

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

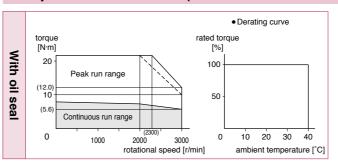
Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.272)

During assembly  During operation	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.48.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)



#### **Dimensions**

	Motor specifications	Key way shaft/ Round shaft						
		without brake			with brake			
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
	Encoder connector Large size (JL10) type	_	P.154		_	P.154		
	Encoder connector Small size (JN2) type	_	P.155		_	P.1	155	

				AC200 V
Motor model <sup>*1</sup>	model <sup>*1</sup> IP67			MHMF202L1
		Multi	function type	MEDLT83SF
Applicable	Model No	RS48	5 communication type *2	MEDLN83SG
driver		Basic	type *2	MEDLN83SE
	Fram	e sym	bol	E-frame
Power supply	capacit	у	(kVA)	3.8
Rated output			(W)	2000
Rated torque			(N·m)	9.55
Continuous sta	all torqu	ie	(N·m)	11.5
Momentary Ma	ax. pea	k torqu	ue (N·m)	28.6
Rated current			(A(rms))	12.5
Max. current			(A(o-p))	53
Regenerative	brake		Without option	No limit Note)2
frequency (time	es/min)	Note)1	DV0P4285	No limit Note)2
Rated rotation	al spee	d	(r/min)	2000
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	55.7
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )			With brake	61.0
Recommended moment of i ratio of the load and the roto				5 times or less
Rotary encode	er speci	ficatio	ns <sup>*3</sup>	23-bit Absolute
	Re	solutic	n per single turn	8388608

#### • Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

Static friction torque (N·m)	25.0 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.29
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

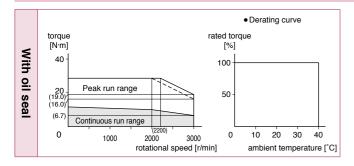
#### • Permissible load (For details, refer to P.272)

During assembly	Radial load P-direction (N)	1666
	Thrust load A-direction (N)	784
	Thrust load B-direction (N)	980
During operation	Radial load P-direction (N)	784
	Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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#### Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)



#### **Dimensions**

	Key way shaft/ Round shaft							
Motor specifications	without brake			with brake				
·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal		
Encoder connector Large size (JL10) type	_	P. <sup>-</sup>	155	_	P	156		
Encoder connector Small size (JN2) type	_	P.156		_	P.156			

#### **<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required. Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

# **Specifications**

**200 V MHMF 3.0 kW** [High inertia 176 mm sq.]

					AC200 V
Motor model *1			IP67		MHMF302L1
		Multi	function type		MFDLTA3SF
Applicable	Model No	RS48	5 communication type	e *2	MFDLNA3SG
driver	110.	Basic	c type *2		MFDLNA3SE
	Fram	e sym	bol		F-frame
Power supply	capacit	у	(kV	A)	4.5
Rated output			(V	V)	3000
Rated torque			(N·r	n)	14.3
Continuous sta	all torqu	ie	(N·r	n)	17.2
Momentary Ma	ax. pea	k torqı	ue (N·r	n)	43.0
Rated current			(A(rms	s))	17.0
Max. current			(A(o-p	)))	72
Regenerative	brake		Without option		No limit Note)2
frequency (time	es/min)	Note)1	DV0P4285×2		No limit Note)2
Rated rotation	al spee	d	(r/mi	n)	2000
Max. rotationa	l speed		(r/min)		3000
Moment of ine	rtia		Without brake		85.3
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )			With brake		90.7
Recommended moment of inert ratio of the load and the rotor				e)3	5 times or less
Rotary encode	r speci	ficatio	ns*3		23-bit Absolute
Resolution			ion per single turn		8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

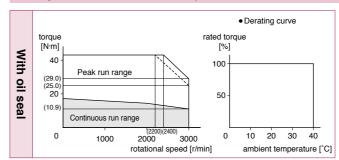
Static friction torque (N·m)	25.0 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.29
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.272)

During assembly	Radial load P-direction (N)	1666
	Thrust load A-direction (N)	784
accombiy	Thrust load B-direction (N)	980
During operation	Radial load P-direction (N)	784
	Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### 



#### **Dimensions**

	Key way shaft/ Round shaft						
Motor specifications	without brake			with brake			
·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
Encoder connector Large size (JL10) type	_	P.157		_	P.157		
Encoder connector Small size (JN2) type	_			_	P.158		

Series

Series

# **Specifications**

				AC200 V
Motor model *1	otor model *1 IP67			MHMF402L1□□
			function type	MFDLTB3SF
Applicable	Model No	RS48	5 communication type *2	MFDLNB3SG
driver	140.	Basic	type *2	MFDLNB3SE
	Fram	e sym	bol	F-frame
Power supply	capacit	у	(kVA)	7.5
Rated output			(W)	4000
Rated torque			(N·m)	19.1
Continuous sta	all torqu	ie	(N·m)	22.0
Momentary Ma	ax. pea	k torqu	ue (N·m)	57.3
Rated current			(A(rms))	20
Max. current		(A(o-p))		85
Regenerative	orake		Without option	No limit Note)2
frequency (time	es/min)	Note)1	DV0P4285×2	No limit Note)2
Rated rotation	al spee	d	(r/min)	2000
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	104
of rotor ( $\times 10^{-4}$	kg·m²)		With brake	110
Recommended moment of ratio of the load and the rot				5 times or less
Rotary encode	er speci	ficatio	ns <sup>∗3</sup>	23-bit Absolute
Resolution per single turn				8388608

#### • Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

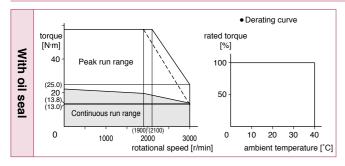
Static friction torque (N·m)	25.0 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.29
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

#### • Permissible load (For details, refer to P.272)

. •		,
	Radial load P-direction (N)	1666
During assembly	Thrust load A-direction (N)	784
document	Thrust load B-direction (N)	980
During operation	Radial load P-direction (N)	784
	Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)



#### **Dimensions**

	Key way shaft/ Round shaft						
Motor specifications		without brake		with brake			
,	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
Encoder connector Large size (JL10) type	_	P.158 P.159		_	P.158		
Encoder connector Small size (JN2) type	_			_	P.159		

#### **<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required. Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

# **Specifications**

**200 V MHMF 5.0 kW** [High inertia 176 mm sq.]

				AC200 V
Motor model *1			IP67	MHMF502L1□□
			function type	MFDLTB3SF
Applicable	Model No	RS48	5 communication type *2	MFDLNB3SG
driver	140.	Basic	type *2	MFDLNB3SE
	Fram	e sym	bol	F-frame
Power supply	capacit	у	(kVA)	7.5
Rated output			(W)	5000
Rated torque			(N·m)	23.9
Continuous sta	all torqu	ie	(N·m)	26.3
Momentary Ma	ax. pea	k torqı	ue (N·m)	71.6
Rated current			(A(rms))	23.3
Max. current			(A(o-p))	99
Regenerative	brake		Without option	No limit Note)2
frequency (time	es/min)	Note)1	DV0P4285×2	No limit Note)2
Rated rotation	al spee	d	(r/min)	2000
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	146
of rotor ( $\times 10^{-4} \text{ kg} \cdot \text{m}^2$ )			With brake	151
Recommended moment of i ratio of the load and the roto				5 times or less
Rotary encode	r speci	ficatio	ns <sup>*3</sup>	23-bit Absolute
Resolution			on per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

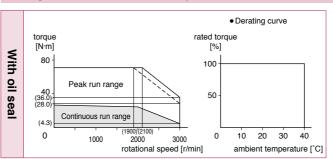
Static friction torque (N·m)	44.1 or more
Engaging time (ms)	150 or less
Releasing time (ms) Note)4	30 or less
Exciting current (DC) (A)	1.29
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.272)

During assembly During operation	Radial load P-direction (N)	1666
	Thrust load A-direction (N)	784
	Thrust load B-direction (N)	980
	Radial load P-direction (N)	784
	Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)



#### **Dimensions**

	Key way shaft/ Round shaft						
Motor specifications	without brake			with brake			
·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
Encoder connector Large size (JL10) type	_	P.159 P.160		_	P.160		
Encoder connector Small size (JN2) type	_			_	P.160		

		AC200 V		
Motor model *1		MDMF102L1		
		Multi	function type	MDDLT45SF
Applicable	Model No.	RS48	5 communication type *2	MDDLN45SG
driver		Basic	type *2	MDDLN45SE
	Fram	e sym	bol	D-frame
Power supply	capacit	y	(kVA)	1.8
Rated output			(W)	1000
Rated torque			(N·m)	4.77
Continuous sta	all torqu	e	(N·m)	5.25
Momentary Ma	ax. peal	k torqı	ue (N·m)	14.3
Rated current			(A(rms))	5.2
Max. current			(A(o-p))	22
Regenerative	brake		Without option	No limit Note)2
frequency (time	es/min)	Note)1	DV0P4284	No limit Note)2
Rated rotation	al spee	d	(r/min)	2000
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	6.18
of rotor ( $\times 10^{-4} \text{ kg} \cdot \text{m}^2$ )			With brake	7.40
Recommended moment of i ratio of the load and the roto				10 times or less
Rotary encode	er speci	ficatio	ns <sup>*3</sup>	23-bit Absolute
	Re	solutio	on per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

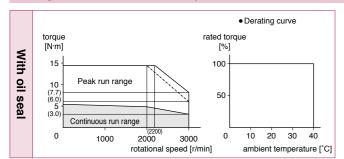
Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.272)

During assembly  During operation	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.48.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)



#### **Dimensions**

	Key way shaft/ Round shaft							
Motor specifications		without brake		with brake				
·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal		
Encoder connector Large size (JL10) type	_	P	161	_	P.	161		
Encoder connector Small size (JN2) type	_	P.161		_	P.162			

#### **<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required. Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

# **Specifications**

				AC200 V
Motor model *1			IP67	MDMF152L1
			function type	MDDLT55SF
Applicable	Model No	RS48	5 communication type *2	MDDLN55SG
driver	140.	Basic	type *2	MDDLN55SE
	Fram	e sym	bol	D-frame
Power supply	capacit	у	(kVA)	2.3
Rated output			(W)	1500
Rated torque			(N·m)	7.16
Continuous sta	all torqu	ie	(N·m)	7.52
Momentary Ma	ax. pea	k torqı	ue (N·m)	21.5
Rated current			(A(rms))	8.0
Max. current			(A(o-p))	34
Regenerative	brake		Without option	No limit Note)2
frequency (time	s/min)	Note)1	DV0P4284	No limit Note)2
Rated rotation	al spee	d	(r/min)	2000
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	9.16
of rotor ( $\times 10^{-4}$	kg·m²)		With brake	10.4
Recommended moment of ratio of the load and the rote				10 times or less
Rotary encode	r speci	ficatio	ns <sup>*3</sup>	23-bit Absolute
Resolutio			n per single turn	8388608

200 V MDMF 1.5 kW [Middle inertia 130 mm sq.]

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

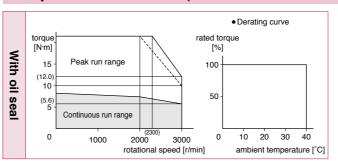
Static friction torque (N·m)	13.7 or more		
Engaging time (ms)	100 or less		
Releasing time (ms) Note)4	50 or less		
Exciting current (DC) (A)	0.79		
Releasing voltage (DC) (V)	2 or more		
Exciting voltage (DC) (V)	24±2.4		

• Permissible load (For details, refer to P.272)

During assembly During operation	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.48.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### 



#### **Dimensions**

	Key way shaft/ Round shaft						
Motor specifications		without brake			with brake		
	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
Encoder connector Large size (JL10) type	_	P.162 P.163		_	P.162		
Encoder connector Small size (JN2) type	_			_	P.163		

				AC200 V
Motor model *1			IP67	MDMF202L1
		Multi	function type	MEDLT83SF
Applicable	Model No	RS48	communication type *2	MEDLN83SG
driver		Basic	type *2	MEDLN83SE
	Fram	e sym	bol	E-frame
Power supply	capacit	у	(kVA)	3.8
Rated output			(W)	2000
Rated torque			(N·m)	9.55
Continuous sta	all torqu	ie	(N·m)	10.0
Momentary Ma	ax. pea	k torque (N·m)		28.6
Rated current			(A(rms))	9.9
Max. current			(A(o-p))	42
Regenerative	brake		Without option	No limit Note)2
frequency (time	es/min)	Note)1	DV0P4285	No limit Note)2
Rated rotation	al spee	d	(r/min)	2000
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	12.1
of rotor ( $\times 10^{-4}$	kg·m²)		With brake	13.3
Recommended moment of i ratio of the load and the rote				10 times or less
Rotary encode	er speci	ficatio	ns <sup>*3</sup>	23-bit Absolute
	Re	solutio	n per single turn	8388608

#### • Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

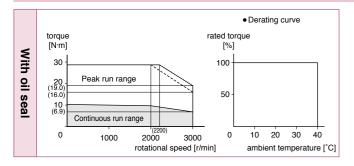
#### • Permissible load (For details, refer to P.272)

. •		,
	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
assembly	Thrust load B-direction (N)	686
During	Radial load P-direction (N)	490
operation	Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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#### Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)



#### **Dimensions**

	Key way shaft/ Round shaft						
Motor specifications		without brake		with brake			
	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
Encoder connector Large size (JL10) type	_	P	163	_	P.164		
Encoder connector Small size (JN2) type	_	P.164		_	P.164		

#### **<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required. Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

# **Specifications**

				AC200 V	
Motor model *1			IP67	MDMF302L1	
		Multi	function type	MFDLTA3SF	
Applicable	Model No.	RS48	5 communication type *2	MFDLNA3SG	
driver	INO.	Basic	type *2	MFDLNA3SE	
	Fram	e sym	bol	F-frame	
Power supply	capacit	y	(kVA)	4.5	
Rated output			(W)	3000	
Rated torque			(N·m)	14.3	
Continuous sta	all torqu	е	(N·m)	15.0	
Momentary Ma	ax. peal	k torqı	ue (N·m)	43.0	
Rated current			(A(rms))	16.4	
Max. current			(A(o-p))	70	
Regenerative I	brake		Without option	No limit Note)2	
frequency (time	es/min)	Note)1	DV0P4285×2	No limit Note)2	
Rated rotation	al spee	d	(r/min)	2000	
Max. rotationa	l speed		(r/min)	3000	
Moment of ine	rtia		Without brake	18.6	
of rotor ( $\times 10^{-4} \text{ kg} \cdot \text{m}^2$ )			With brake	19.6	
Recommender ratio of the loa				10 times or less	
Rotary encode	er speci	ficatio	ns <sup>*3</sup>	23-bit Absolute	
	Re	solutio	n per single turn	8388608	

200 V MDMF 3.0 kW [Middle inertia 130 mm sq.]

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

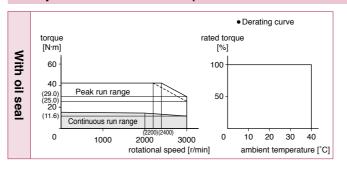
Static friction torque (N·m)	22.0 or more
Engaging time (ms)	110 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.90
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.272)

	•	•
	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
accombiy	Thrust load B-direction (N)	686
During operation	Radial load P-direction (N)	784
	Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### 



#### **Dimensions**

	Key way shaft/ Round shaft						
Motor specifications	without brake			with brake			
·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
Encoder connector Large size (JL10) type	_	P.165		_	P.165		
Encoder connector Small size (JN2) type	_			_	P.166		

				AC200 V
Motor model *1		MDMF402L1		
		Multi	function type	MFDLTB3SF
Applicable	Model No.	RS48	5 communication type *2	MFDLNB3SG
driver		Basic	type *2	MFDLNB3SE
	Fram	e sym	bol	F-frame
Power supply	capacit	у	(kVA)	7.5
Rated output			(W)	4000
Rated torque			(N·m)	19.1
Continuous sta	all torqu	ie	(N·m)	22.0
Momentary Ma	ax. pea	k torqu	ue (N·m)	57.3
Rated current			(A(rms))	20.0
Max. current			(A(o-p))	85
Regenerative	brake		Without option	No limit Note)2
frequency (time	es/min)	Note)1	DV0P4285×2	No limit Note)2
Rated rotation	al spee	d	(r/min)	2000
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	46.9
of rotor ( $\times 10^{-4} \text{ kg} \cdot \text{m}^2$ )			With brake	52.3
Recommender ratio of the loa				10 times or less
Rotary encode	er speci	ficatio	ns*3	23-bit Absolute
Resolution per single turn				8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

Static friction torque (N·m)	25.0 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.29
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

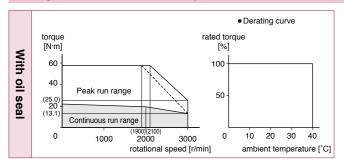
• Permissible load (For details, refer to P.272)

	Radial load P-direction (N)	1666
During assembly	Thrust load A-direction (N)	784
document	Thrust load B-direction (N)	980
During	Radial load P-direction (N)	784
operation	Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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#### Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)



#### **Dimensions**

		Key way shaft/ Round shaft						
Motor specifications		without brake		with brake				
·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal		
Encoder connector Large size (JL10) type	_	P	166	_	P.	166		
Encoder connector Small size (JN2) type	_	P.167		_	P.167			

#### **<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required. Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

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# **Specifications**

				AC200 V	
Motor model *1			IP67	MDMF502L1□□	
		Multi	function type	MFDLTB3SF	
Applicable	Model No	RS48	5 communication type *2	MFDLNB3SG	
driver	140.	Basic	c type *2	MFDLNB3SE	
	Fram	e sym	bol	F-frame	
Power supply	capacit	y	(kVA)	7.5	
Rated output			(W)	5000	
Rated torque			(N·m)	23.9	
Continuous sta	all torqu	е	(N·m)	26.3	
Momentary Ma	ax. pea	k torqı	ue (N·m)	N·m) 71.6	
Rated current			(A(rms))	23.3	
Max. current			(A(o-p))	99	
Regenerative I	brake		Without option	No limit Note)2	
frequency (time	s/min)	Note)1	DV0P4285×2	No limit Note)2	
Rated rotation	al spee	d	(r/min)	2000	
Max. rotationa	l speed		(r/min)	3000	
Moment of ine	rtia		Without brake	58.2	
of rotor (×10 <sup>-4</sup>	kg·m²)		With brake	63.0	
Recommender ratio of the loa				10 times or less	
Rotary encode	r speci	ficatio	ns*3	23-bit Absolute	
Resolution per single turn				8388608	

200 V MDMF 5.0 kW [Middle inertia 176 mm sq.]

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

Static friction torque (N·m)	44.1 or more
Engaging time (ms)	150 or less
Releasing time (ms) Note)4	30 or less
Exciting current (DC) (A)	1.29
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

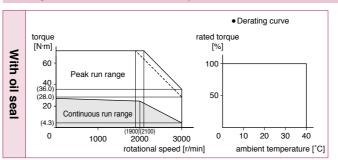
• Permissible load (For details, refer to P.272)

During assembly During operation	Radial load P-direction (N)	1666
	Thrust load A-direction (N)	784
	Thrust load B-direction (N)	980
	Radial load P-direction (N)	784
	Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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#### 



#### **Dimensions**

	Key way shaft/ Round shaft						
Motor specifications	without brake			with brake			
·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
Encoder connector Large size (JL10) type	_	P.167 P.168		_	P.168		
Encoder connector Small size (JN2) type	_			_	P.168		

Series

Series

# **Specifications**

				AC200 V
Motor model *1			IP67	MGMF092L1□□
			function type	MDDLT45SF
Applicable	Model No	RS48	5 communication type *2	MDDLN45SG
driver	140.	Basic	type *2	MDDLN45SE
	Fram	e sym	bol	D-frame
Power supply capacity (kVA)				1.8
Rated output			(W)	850
Rated torque (N·m)				5.41
Continuous stall torque (N·m)				5.41
Momentary Ma	ax. pea	k torqı	ue (N·m)	14.3
Rated current			(A(rms))	5.9
Max. current			(A(o-p))	22
Regenerative	brake		Without option	No limit Note)2
frequency (time	es/min)	Note)1	DV0P4284	No limit Note)2
Rated rotation	al spee	d	(r/min)	1500
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	6.18
of rotor ( $\times 10^{-4} \text{ kg} \cdot \text{m}^2$ )			With brake	7.40
Recommended moment of in ratio of the load and the roto				10 times or less
Rotary encode	er speci	ficatio	ns <sup>*3</sup>	23-bit Absolute
	Re	solutio	on per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

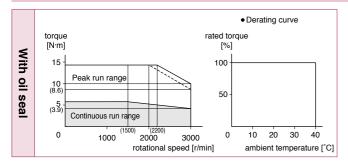
• Permissible load (For details, refer to P.272)

	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
assembly	Thrust load B-direction (N)	686
During operation	Radial load P-direction (N)	686
	Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.48.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)



#### **Dimensions**

Motor specifications	Key way shaft/ Round shaft							
		without brake		with brake				
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
	ler connector ize (JL10) type	_	P.169		_	P.169		
	ler connector ize (JN2) type	_	P.169		_	P.170		

**<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required. Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

[Middle inertia Low speed/High torque type] 200 V MGMF 1.3 kW

**Motor Specifications** 

**A6 Series** 

# **Specifications**

				AC200 V	
Motor model *1			IP67	MGMF132L1□□	
		Multi	function type	MDDLT55SF	
Applicable	Model No.	RS48	5 communication type *2	MDDLN55SG	
driver	140.	Basic	type *2	MDDLN55SE	
	Frame	sym	bol	D-frame	
Power supply	capacity	2.3			
Rated output		1300			
Rated torque		8.28			
Continuous sta	all torqu	8.28			
Momentary Ma	ax. peak	23.3			
Rated current			(A(rms))	9.3	
Max. current			(A(o-p))	37	
Regenerative	brake		Without option	No limit Note)2	
frequency (time	s/min) N	Note)1	DV0P4284	No limit Note)2	
Rated rotation	al speed	t	(r/min)	1500	
Max. rotationa	l speed		(r/min)	3000	
Moment of ine	rtia		Without brake	9.16	
of rotor ( $\times 10^{-4} \text{ kg} \cdot \text{m}^2$ )			With brake	10.4	
Recommended moment of in ratio of the load and the rotor				10 times or less	
Rotary encode	r specif	icatio	ns <sup>*3</sup>	23-bit Absolute	
	Res	olutio	n per single turn	8388608	

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

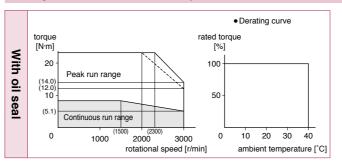
Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.272)

During assembly During operation	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	686
	Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.48.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### 



#### **Dimensions**

	Motor specifications	Key way shaft/ Round shaft							
		without brake			with brake				
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal		
	Encoder connector Large size (JL10) type	_	P.170		_	P.170			
	Encoder connector Small size (JN2) type	_	P.171		_	P.1	171		

Series

Series

				AC200 V			
Motor model *1			IP67	MGMF182L1			
		Multi	function type	MEDLT83SF			
Applicable	Model No	RS48	5 communication type *	MEDLN83SG			
driver	140.	Basic	type *2	MEDLN83SE			
	Fram	e sym	bol	E-frame			
Power supply	capacit	y	(kVA)	3.8			
Rated output			(W)	1800			
Rated torque		11.5					
Continuous sta	all torqu	ie	(N·m)	11.5			
Momentary Ma	ax. peal	k torqı	ue (N·m)	28.7			
Rated current			(A(rms))	11.8			
Max. current			(A(o-p))	42			
Regenerative	brake		Without option	No limit Note)2			
frequency (time	es/min)	Note)1	DV0P4285×2	No limit Note)2			
Rated rotation	al spee	d	(r/min)	1500			
Max. rotationa	l speed		(r/min)	3000			
Moment of ine	rtia		Without brake	12.1			
of rotor ( $\times 10^{-4}$	kg·m²)		With brake	13.3			
Recommender ratio of the loa		10 times or less					
Rotary encode	er speci	ficatio	ns <sup>*3</sup>	23-bit Absolute			
	Re	Resolution per single turn					

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

130 mm sq.

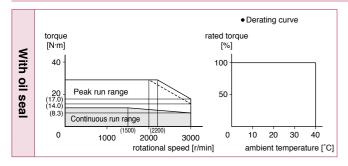
Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.272)

	,	,
During assembly	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
During operation	Radial load P-direction (N)	686
	Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)



#### **Dimensions**

Motor specifications	Key way shaft/ Round shaft							
		without brake		with brake				
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
	der connector size (JL10) type	_	P.171		_	P.172		
	der connector size (JN2) type	_	P.172		_	P.172		

**<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required. Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

[Middle inertia Low speed/High torque type] 200 V MGMF 2.4 kW

**Motor Specifications** 

**A6 Series** 

# **Specifications**

				AC200 V	
Motor model *1		IP67		MGMF242L1□□	
	N	lultifunctio	n type	MEDLT93SF	
Applicable	Model R	S485 comm	unication type *2	MEDLN93SG	
driver		asic type *	2	MEDLN93SE	
	Frame s	ymbol		E-frame	
Power supply	capacity		(kVA)	4.5	
Rated output			(W)	2400	
Rated torque			(N·m)	15.3	
Continuous sta	all torque		(N·m)	15.3	
Momentary Ma	ax. peak to	orque	(N·m)	45.2	
Rated current			(A(rms))	16.0	
Max. current			(A(o-p))	67	
Regenerative	Regenerative brake Without option		out option	No limit Note)2	
frequency (time	es/min) Not	e)1 DV0	P4285×2	No limit Note)2	
Rated rotation	al speed		(r/min)	1500	
Max. rotationa	l speed		(r/min)	3000	
Moment of ine	rtia	With	out brake	46.9	
of rotor ( $\times 10^{-4}$	kg·m²)	With	brake	52.3	
Recommender ratio of the loa		10 times or less			
Rotary encode	otary encoder specifications *3			23-bit Absolute	
	Reso	ution per	single turn	8388608	

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

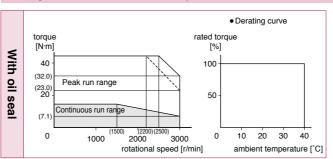
Static friction torque (N·m)	25.0 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.29
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.272)

During assembly	Radial load P-direction (N)	1666
	Thrust load A-direction (N)	784
	Thrust load B-direction (N)	980
During	Radial load P-direction (N)	1176
operation	Thrust load A, B-direction (N)	490

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### 



#### **Dimensions**

	Key way shaft/ Round shaft						
Motor specifications	without brake			with brake			
·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
Encoder connector Large size (JL10) type	_	P.173		_	P.1	173	
Encoder connector Small size (JN2) type	_	P.173 — P.174		174			

<a>Cautions> Reduce the moment of inertia ratio if high speed response operation is required.</a>

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

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Series

Series

#### AC200 V MGMF292L1 Motor model IP67 Multifunction type MFDLTB3SF RS485 communication type \*2 MFDLNB3SG Applicable driver Basic type \*2 MFDLNB3SE F-frame Frame symbol Power supply capacity (kVA) 7.5 Rated output (W) 2900 Rated torque (N·m) 18.5 Continuous stall torque (N·m) 18.5 Momentary Max. peak torque 45.2 (N·m) Rated current (A(rms)) 19.3 Max. current (A(o-p)) 67 Without option No limit Note)2 Regenerative brake frequency (times/min) Note)1 DV0P4285×2 No limit Note)2 Rated rotational speed 1500 (r/min) Max. rotational speed (r/min) 3000 Without brake 46.9 Moment of inertia of rotor ( $\times 10^{-4} \text{ kg} \cdot \text{m}^2$ ) With brake 52.3 Recommended moment of inertia 10 times or less ratio of the load and the rotor Rotary encoder specifications \*3 23-bit Absolute

 Brake specifications (For details, refer to P.273) This brake will be released when it is energized. Do not use this for braking the motor in motion.

Static friction torque (N·m)	25.0 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.29
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

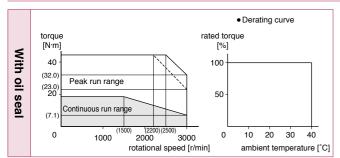
• Permissible load (For details, refer to P.272)

	,	,
	Radial load P-direction (N)	1666
During assembly	Thrust load A-direction (N)	784
	Thrust load B-direction (N)	980
During	Radial load P-direction (N)	1176
operation	Thrust load A, B-direction (N)	490

- For details of Note)1 to Note)4, refer to P.271.
- Dimensions of Driver, refer to P.49.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)

8388608



Resolution per single turn

#### **Dimensions**

			Key way shaft/ Round shaft					
	Motor specifications	without brake			with brake			
	·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
L	Encoder connector arge size (JL10) type	_	P.174		_	P.174		
;	Encoder connector Small size (JN2) type	_	P.175		_	P.	175	

#### <Cautions> Reduce the moment of inertia ratio if high speed response operation is required. Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

# **Specifications**

200 V MGMF 4.4 kW

				AC200 V	
Motor model *1			IP67	MGMF442L1□□	
			function type	MFDLTB3SF	
Applicable	Model No	RS48	5 communication type *2	MFDLNB3SG	
driver	140.	Basic	type *2	MFDLNB3SE	
	Fram	e sym	bol	F-frame	
Power supply	capacit	у	(kVA)	7.5	
Rated output			(W)	4400	
Rated torque			(N·m)	28.0	
Continuous sta	all torqu	ie	(N·m)	28.0	
Momentary Ma	ax. pea	k torqı	ue (N·m)	70.0	
Rated current	ated current (A(rms			27.2	
Max. current	rrent (A(o-p))		current (A(o-p))		96
Regenerative brake Withou		Without option	No limit Note)2		
frequency (time	es/min)	Note)1	DV0P4285×2	No limit Note)2	
Rated rotation	tional speed		(r/min)	1500	
Max. rotationa	c. rotational speed (r/mii		(r/min)	3000	
Moment of ine	nt of inertia		Without brake	58.2	
of rotor ( $\times 10^{-4}$	kg·m²)	·m²) With brake		63.0	
Recommender ratio of the loa		10 times or less			
Rotary encode	er speci	ficatio	ns <sup>*3</sup>	23-bit Absolute	
	Re	solutio	on per single turn	8388608	

[Middle inertia Low speed/High torque type]

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

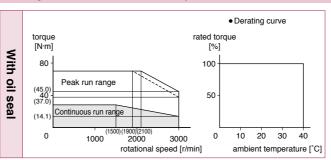
Static friction torque (N·m)	44.1 or more
Engaging time (ms)	150 or less
Releasing time (ms) Note)4	30 or less
Exciting current (DC) (A)	1.29
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.272)

During assembly	Radial load P-direction (N)	1666
	Thrust load A-direction (N)	784
	Thrust load B-direction (N)	980
During	Radial load P-direction (N)	1470
operation	Thrust load A, B-direction (N)	490

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)



#### **Dimensions**

	Key way shaft/ Round shaft						
Motor specifications	without brake			with brake			
·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
Encoder connector Large size (JL10) type	_	P.175		_	P.1	176	
Encoder connector Small size (JN2) type	_	P.176 — P.176		176			

72

[Unit: mm]

#### MSMF 50 W Leadwire type (P65) without brake without/with oil seal · Round shaft/ Key way, center tap shaft Mass: 0.32 kg Motor model (Round shaft) ① Encoder connector without oil seal with oil seal 2 Motor connector 100 V MSMF5AZL1A2 MSMF5AZL1C2 200 V • For model number of key-way, center tap shaft, please refer to

"Model Designation" in P.18. • Dimensions are subject to change without notice. Contact us or a dealer for the latest information

* Use hexagon socket head screw for installation.
4-φ3.4*

M3 depth 6

[Unit: mm]

Key way dimensions <Key way, center tap shaft>

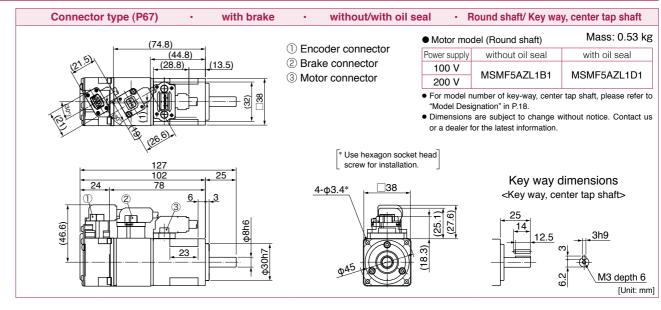
Leadwire type (P65) · with brake	without/with oil s	seal · F	Round shaft/ Key wa	y, center tap shaft
	() Fd	Motor mod	del (Round shaft)	Mass: 0.53 kg
	① Encoder connector	Power supply	without oil seal	with oil seal
	<ul><li>② Brake connector</li><li>③ Motor connector</li></ul>	100 V 200 V	MSMF5AZL1B2	MSMF5AZL1D2
		<ul><li>Model Desi</li><li>Dimensions</li></ul>	gnation" in P.18.	r tap shaft, please refer to vithout notice. Contact us
127 102 24 78 (20.8) 948 4 26.5	* Use hexagon socke screw for installation  4-\phi3.4*  \[ \begin{array}{c} \text{38} & \text{27} \\ \text{20} & \text{38} \end{array}	et head	Key way c	dimensions Inter tap shaft>  M3 depth 6
				[Unit: mm]
Connector type (P67) · without brake	e · without/with oil s	seal · F	Round shaft/ Key wa	y, center tap shaft

(44.8) ② Motor connector 100 V 200 V MSI		
(44.8) (28.8) (13.5) (20.0 V MSI	ound shaft)	Mass: 0.32 kg
(44.8) (28.8) (13.5) (200 V MSI	thout oil seal	with oil seal
	MF5AZL1A1	MSMF5AZL1C1
"Model Designation	n" in P.18. ubject to change with	ap shaft, please refer to
97 72 25 4-\phi 3.4*  38 4-\phi 3.4*  23 4-\phi 3.4*	Key way dii <key cent<="" th="" way,=""><th></th></key>	

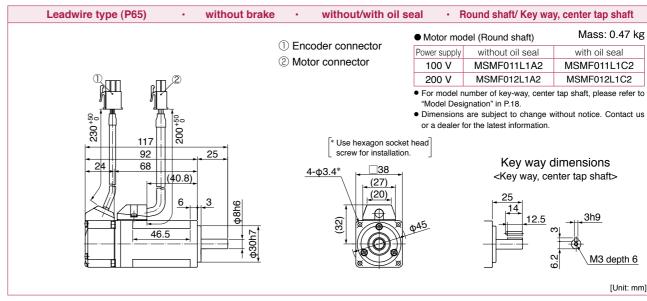
\* For motors specifications, refer to P.51, P.52.

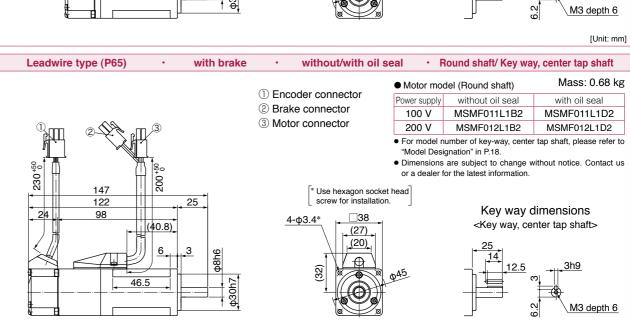
# MSMF 50 W

MSMF 50 W to 100 W



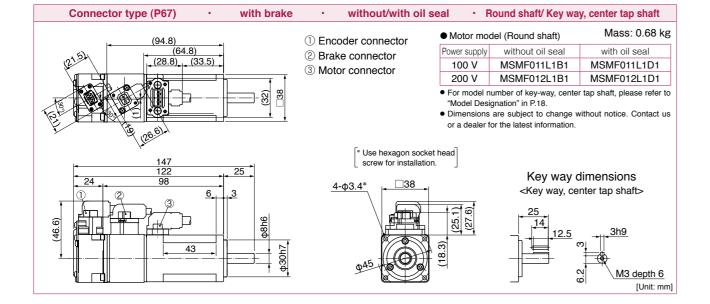






\* For motors specifications, refer to P.51 to P.54.

#### **MSMF 100 W** Connector type (P67) without brake without/with oil seal Round shaft/ Key way, center tap shaft Mass: 0.47 kg Motor model (Round shaft) (1) Encoder connector without oil seal 2 Motor connector 100 V MSMF011L1A1 MSMF011L1C1 200 V MSMF012L1A1 MSMF012L1C1 For model number of key-way, center tap shaft, please refer to "Model Designation" in P.18. • Dimensions are subject to change without notice. Contact us or a dealer for the latest information \* Use hexagon socket head Key way dimensions <u>4-φ3.4\*</u> <Key way, center tap shaft>



#### without/with oil seal Leadwire type (P65) without brake · · Round shaft/ Key way, center tap shaft Mass: 0.82 kg Motor model (Round shaft) ① Encoder connector without oil seal with oil seal 2 Motor connector MSMF021L1A2 MSMF021L1C2 100 V MSMF022L1A2 MSMF022L1C2 · For model number of key-way, center tap shaft, please refer to "Model Designation" in P.18 \* Use hexagon socket head screv • Dimensions are subject to change without notice. Contact us or a dealer for the latest information for installation. 109.5 79.5 30 Key way dimensions 4-ø4 5\* 56.5 <Key way, center tap shaft> (36)(22.5) (30)M4 depth 8 [Unit: mm]

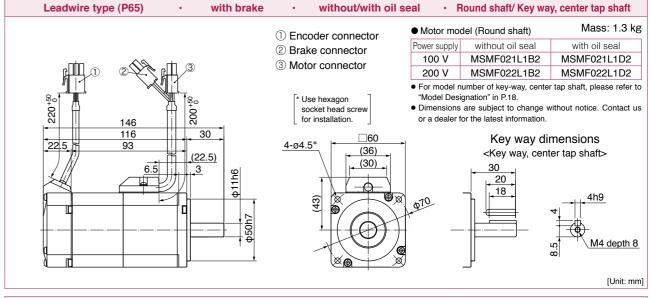
-103-

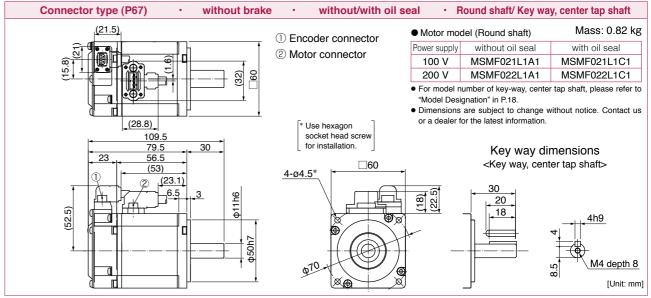
#### \* For motors specifications, refer to P.53 to P.56.

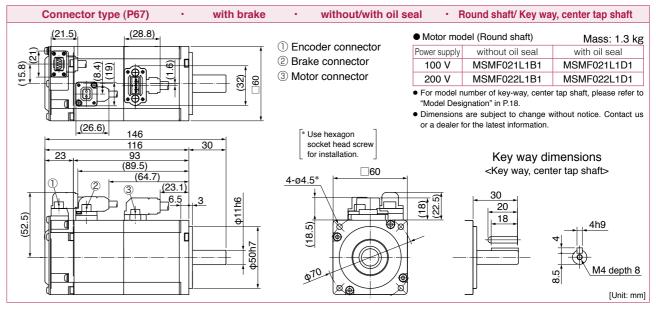
**MSMF 200 W** 

#### **MSMF 200 W**

**MSMF 200 W** 







-104-

M3 depth 6 [Unit: mm]

<sup>\*</sup> For motors specifications, refer to P.55, P.56.

**MSMF 400 W** 

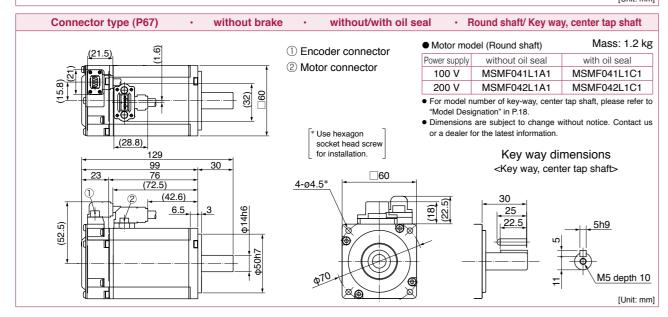
Leadwire type (P65)

with brake

#### Leadwire type (P65) without brake without/with oil seal · Round shaft/ Key way, center tap shaft Mass: 1.2 kg Motor model (Round shaft) (1) Encoder connector without oil seal Power supply 2 Motor connector MSMF041L1A2 MSMF041L1C2 100 V MSMF042L1A2 MSMF042L1C2 200 V • For model number of key-way, center tap shaft, please refer to "Model Designation" in P.18. \* Use hexagon • Dimensions are subject to change without notice. Contact us socket head screv or a dealer for the latest information for installation. Key way dimensions <Key way, center tap shaft> (36)(30)M5 depth 10 [Unit: mm]

(1) Encoder connector (2) Brake connector (3) Motor connector (3) Motor connector (4) Wildow Model (Notice (Notice State)) (5) Power supply without oil seal with oil seal (100 V MSMF041L1B2 MSMF041L) (200 V MSMF042L1B2 MSMF042L)	
(3) Motor connector 100 V MSMF041L1B2 MSMF041L	
MIT 200 V MSMF042L1B2 MSMF042L	
	antn a
• For model number of key-way, center tap shaft, please "Model Designation" in P.18. • Dimensions are subject to change without notice. Cor or a dealer for the latest information.  Key way dimensions Key way, center tap shaft.	22.5.

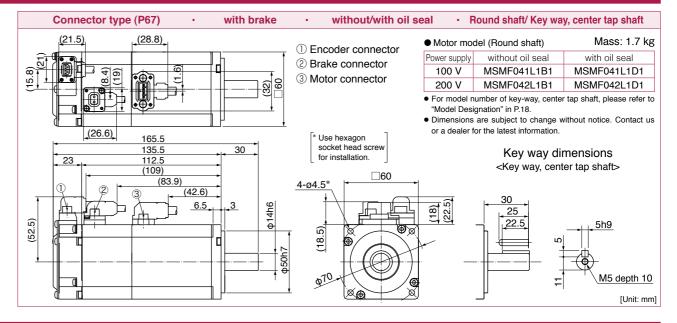
without/with oil seal



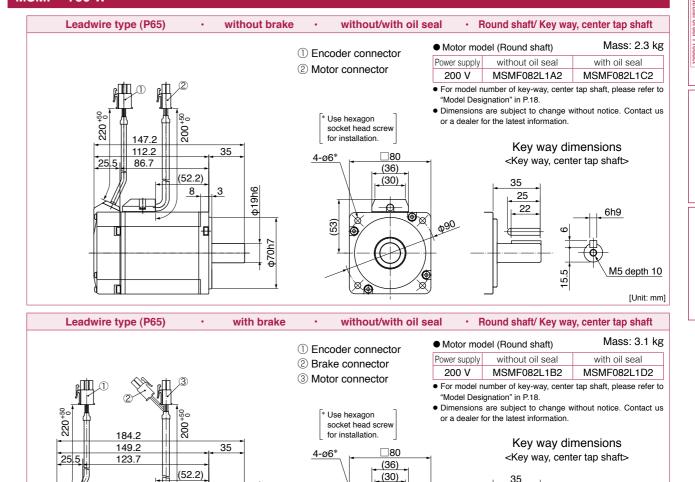
#### \* For motors specifications, refer to P.57, P.58.

#### **MSMF 400 W**

MSMF 400 W to 750 W



#### MSMF 750 W



25 22

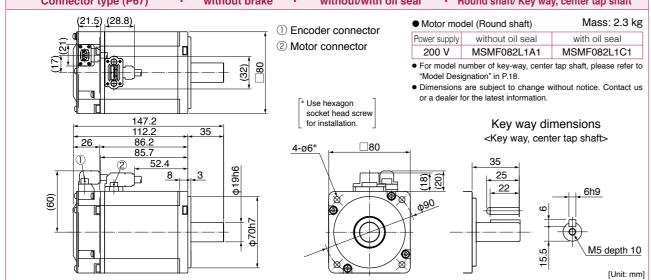
6h9

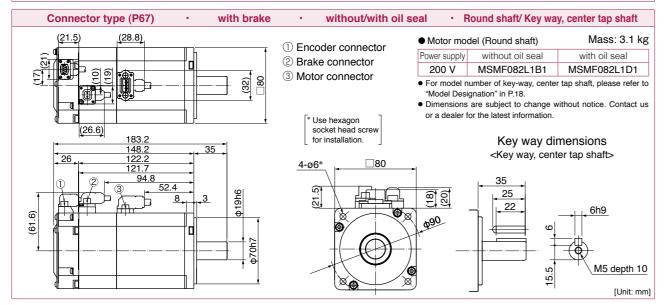
M5 depth 10

· Round shaft/ Key way, center tap shaft

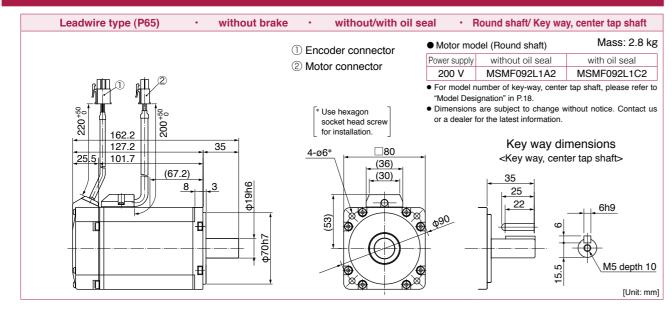
<sup>\*</sup> For motors specifications, refer to P.57 to P.59.

#### MSMF 750 W Connector type (P67) without brake • without/with oil seal · Round shaft/ Key way, center tap shaft (21.5) (28.8) Motor model (Round shaft) Encoder connector without oil seal 2 Motor connector 200 V MSMF082L1A1





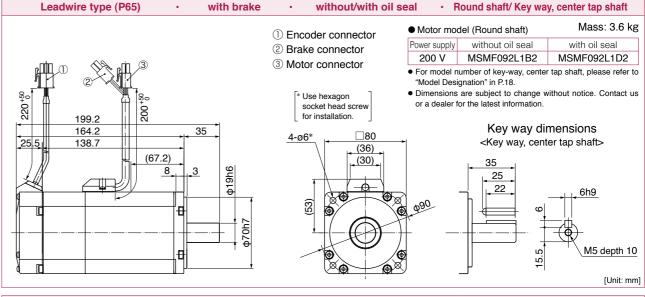
#### MSMF 1000 W

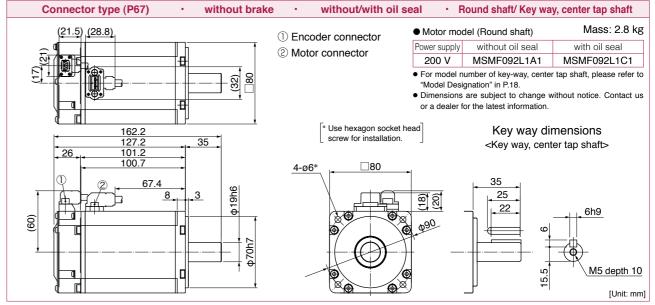


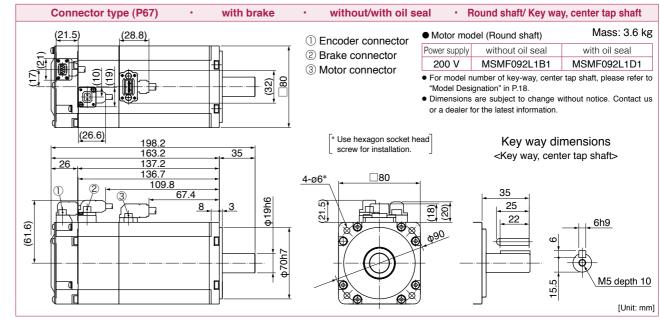
\* For motors specifications, refer to P.59, P.60.

#### MSMF 1000 W

MSMF 1000 W



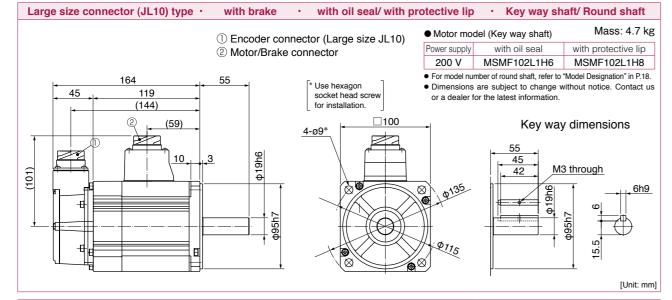


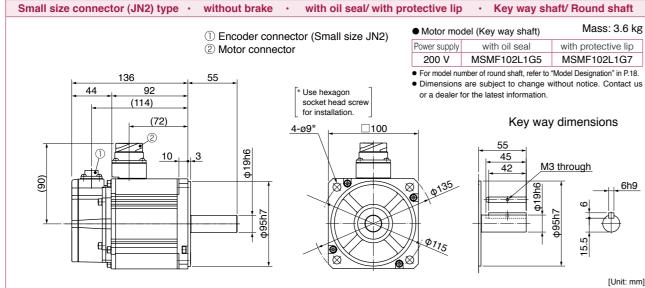


<sup>\*</sup> For motors specifications, refer to P.60.

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#### MSMF 1.0 kW Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft Mass: 3.6 kg Motor model (Key way shaft) ① Encoder connector (Large size JL10) with oil seal with protective lip 2 Motor connector 200 V MSMF102L1G6 MSMF102L1G8 • For model number of round shaft, refer to "Model Designation" in P.18. • Dimensions are subject to change without notice. Contact us 45 92 \* Use hexagon or a dealer for the latest information. socket head screv (117)for installation. Key way dimensions (72)4-ø9\* M3 through

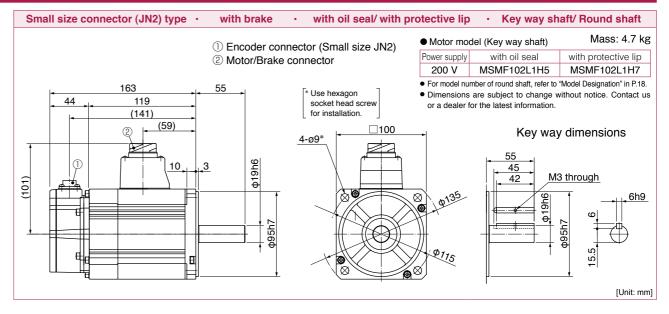




<sup>\*</sup> For motors specifications, refer to P.61.

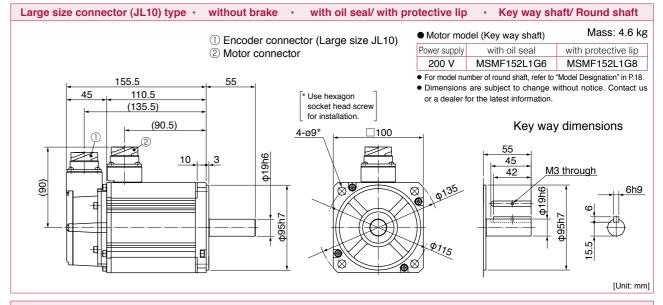
# MSMF 1.0 kW

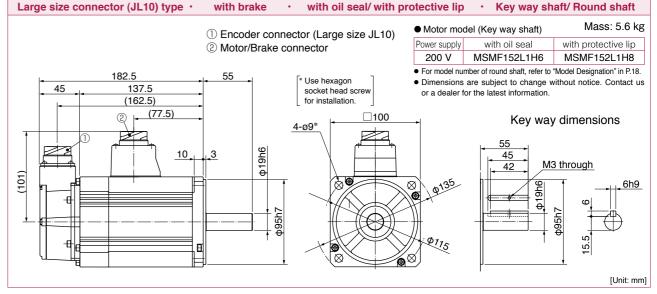
MSMF 1.0 kW to 1.5 kW



#### MSMF 1.5 kW

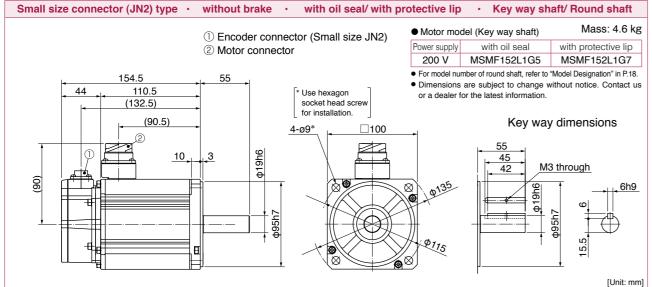
[Unit: mm]

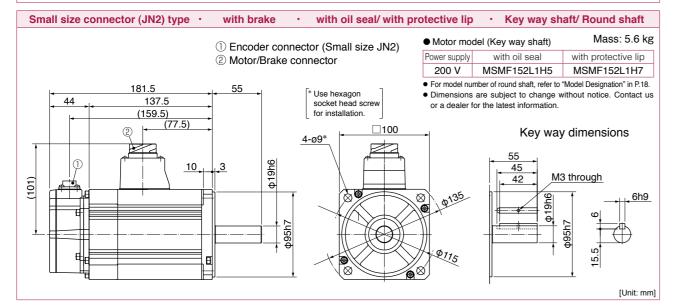




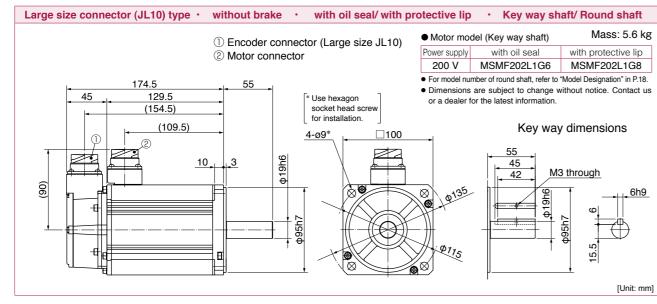
<sup>\*</sup> For motors specifications, refer to P.61, P.62.

# MSMF 1.5 kW





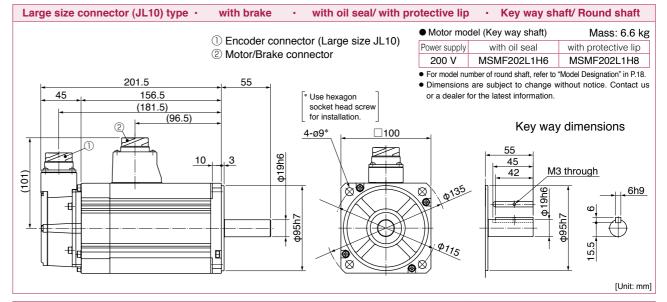
#### MSMF 2.0 kW

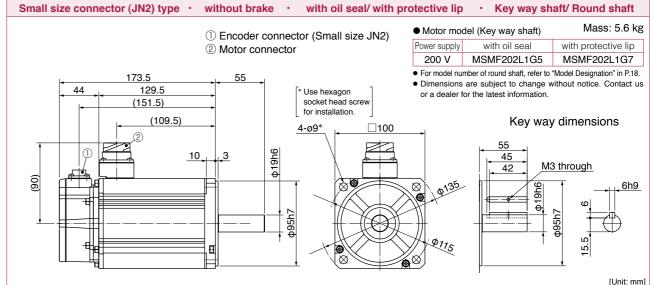


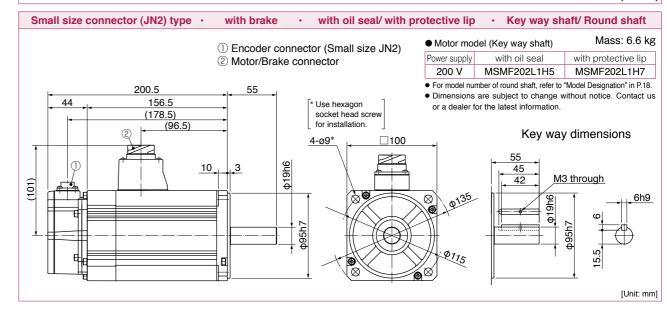
<sup>\*</sup> For motors specifications, refer to P.62, P.63.

#### MSMF 2.0 kW

MSMF 2.0 kW







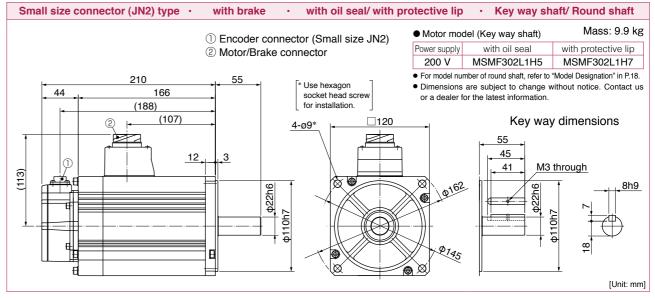
-112-

<sup>\*</sup> For motors specifications, refer to P.63.

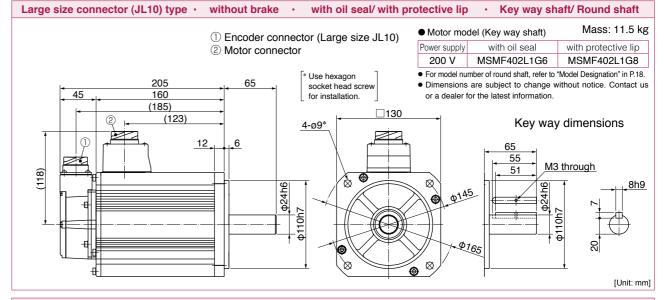
MSMF 3.0 kW

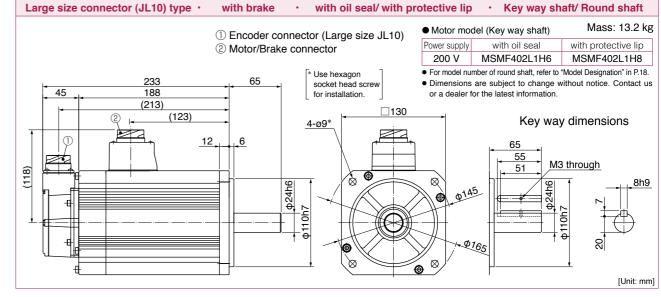
#### MSMF 3.0 kW

MSMF 3.0 kW to 4.0 kW



#### MSMF 4.0 kW

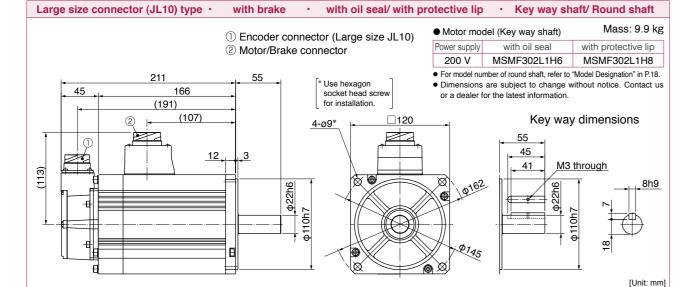




<sup>\*</sup> For motors specifications, refer to P.64, P.65.

ſ	Encoder connector (Large size JL10)	● Motor model (Key way shaft)	Mass: 8.7 kg
	) Motor connector	Power supply with oil seal	with protective lip
	, wotor commoder	200 V MSMF302L1G6	MSMF302L1G8
186 45 (166) (107) 12		For model number of round shaft, refer to     Dimensions are subject to change we or a dealer for the latest information.  Key way	"Model Designation" in P.18.
€L ⊨		<u></u>	[Unit: mm]

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



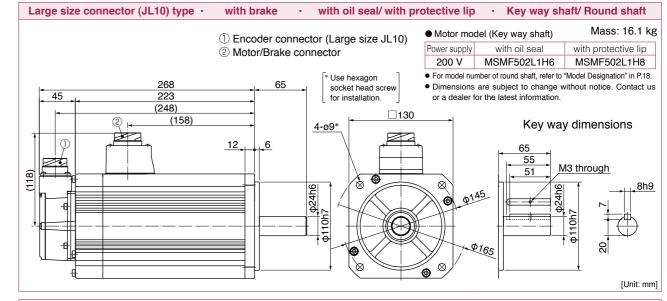
Small size connector (JN2) type · without bra	ike · with oil seal/ with p	rotective lip · Key way sh	naft/ Round shaft
① Encoder	connector (Small size JN2)	Motor model (Key way shaft)	Mass: 8.7 kg
② Motor co		Power supply with oil seal	with protective lip
_		200 V MSMF302L1G5	MSMF302L1G7
185 55 44 141 (163)	* Use hexagon socket head screw for installation.	<ul> <li>For model number of round shaft, refer to</li> <li>Dimensions are subject to change vor a dealer for the latest information.</li> </ul>	
(107) 12, 3	4-09*	55 45 41 M3	through
	ı		[Unit: mm]

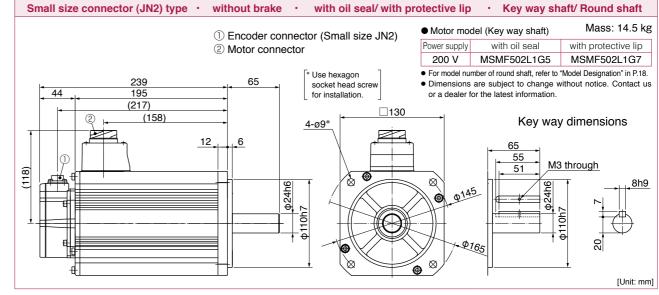
<sup>\*</sup> For motors specifications, refer to P.64.

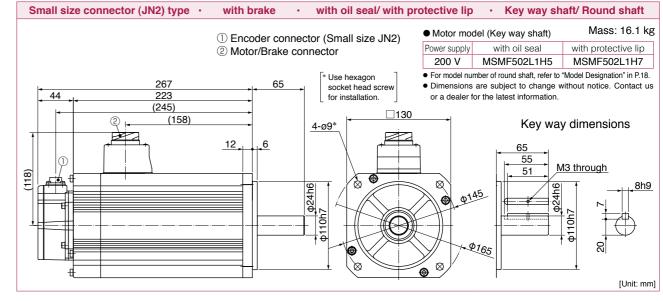
**Dimensions** 

#### MSMF 5.0 kW

MSMF 5.0 kW

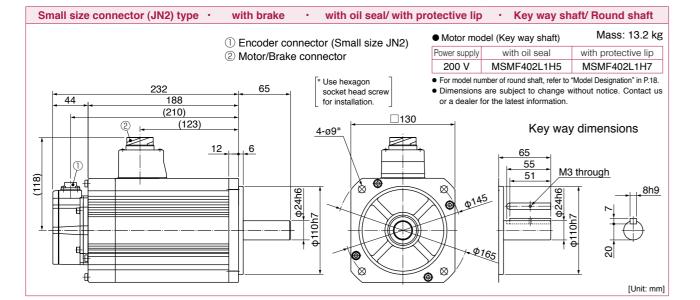






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#### Small size connector (JN2) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft Mass: 11.5 kg Motor model (Key way shaft) ① Encoder connector (Small size JN2) 2 Motor connector 200 V MSMF402L1G5 MSMF402L1G7 • For model number of round shaft, refer to "Model Designation" in P.18. \* Use hexagon • Dimensions are subject to change without notice. Contact us socket head screv 160 or a dealer for the latest information. (182)(123)Key way dimensions 4-ø9\* 12 M3 through [Unit: mm]



#### MSMF 5.0 kW

Large size connector (JL10) type · without brake · with oil seal/ with	th protective lip · Key way shaft/ Round shaft
① Encoder connector (Large size JL1)	Motor model (Key way shaft)  Mass: 14.5 kg
② Motor connector	Power supply with oil seal with protective lip
©	200 V MSMF502L1G6 MSMF502L1G8
240 65 Sucket head screw for installation.	<ul> <li>For model number of round shaft, refer to "Model Designation" in P.18.</li> <li>Dimensions are subject to change without notice. Contact us or a dealer for the latest information.</li> </ul>
② (158) 12 (158) 4-09*	30 Key way dimensions
	55 M3 through
(1) (1) (1) (1) (2) (3) (4) (4) (5) (6) (7) (7) (8) (8) (9) (9) (9) (9) (9) (9) (9) (9	9145
	Ø165
#	[Unit: mm

<sup>\*</sup> For motors specifications, refer to P.65, P.66.

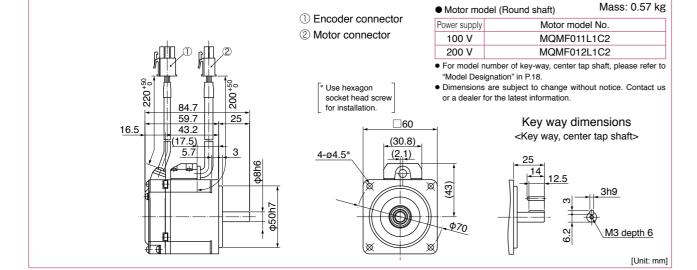
<sup>\*</sup> For motors specifications, refer to P.66.

Leadwire type (P65)

without brake

**Dimensions** 

#### **MQMF 100 W** Leadwire type (P65) without brake without oil seal · Round shaft/ Key way, center tap shaft Mass: 0.54 kg Motor model (Round shaft) (1) Encoder connector Motor model No. 2 Motor connector 100 V MQMF011L1A2 MQMF012L1A2 200 V • For model number of key-way, center tap shaft, please refer to "Model Designation" in P.18. • Dimensions are subject to change without notice. Contact us \* Use hexagon socket head screw or a dealer for the latest information Key way dimensions <Key way, center tap shaft> (30.8)(2.1)M3 depth 6



with oil seal

Leadwire type (P65) · withou	brake · with protective lip/ with o	oil seal · Round shaft/ Key way, center tap shaft
	(1) Face day assumed as	Motor model (Round shaft)     Mass: 0.61 kg
		Power supply Motor model No.
	② Motor connector	100 V MQMF011L1C4
enn en a		200 V MQMF012L1C4
		For model number of key-way, center tap shaft, please refer to "Model Designation" in P.18.
090 B86 2	1	Dimensions are subject to change without notice. Contact us
02	socket head screw for installation.	or a dealer for the latest information.
56.2		Key way dimensions
<del></del>	2.1	Key way, center tap shaft>
(14)	5 (30.8)	, , , , , , , , , , , , , , , , , , , ,
<del>                                    </del>	<u>4-ø4.5*</u> (2.1)	30
	989	12.5
<b># #</b>	× ×	(4) (4) (4) (4) (4) (4) (4) (4) (4) (4)
¶		
- <del>  </del> -++	4.949 4.949 4.949 4.949	<del>                                      </del>
	1 0 0	Φ70 P N3 depth 6
		[Unit: mm]

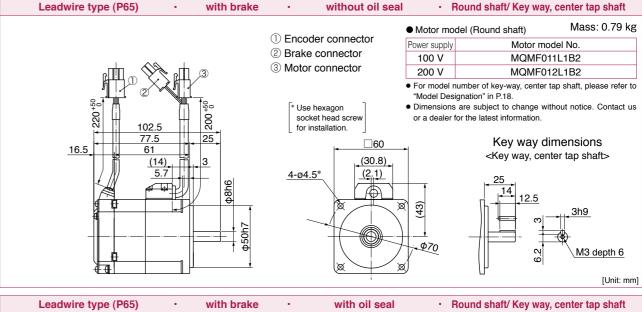
#### \* For motors specifications, refer to P.67, P.68.

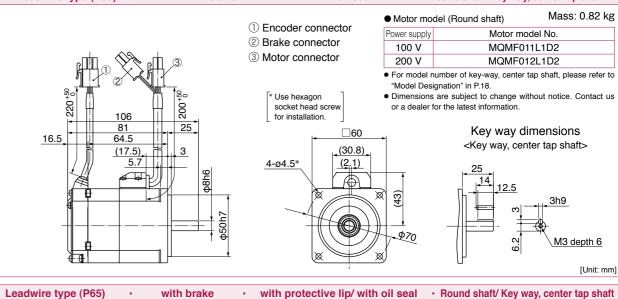
# **MQMF 100 W**

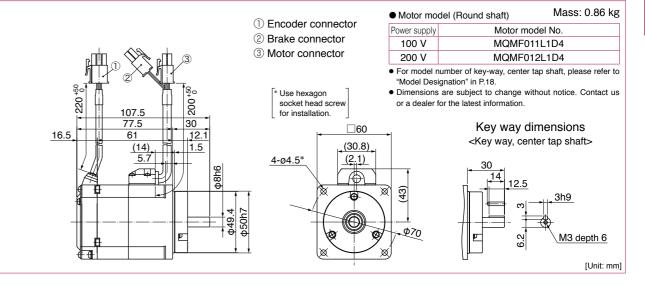
[Unit: mm]

· Round shaft/ Key way, center tap shaft

**MQMF 100 W** 







<sup>\*</sup> For motors specifications, refer to P.67, P.68.

**MQMF 100 W** 

Connector type (P67)

without brake

Motor model (Round shaft)

100 V

· Round shaft/ Key way, center tap shaft

Motor model No.

MQMF011L1B1

Mass: 0.79 kg

#### Connector type (P67) without brake without oil seal · Round shaft/ Key way, center tap shaft Mass: 0.54 kg Motor model (Round shaft) ① Encoder connector Motor model No. 2 Motor connector 100 V MQMF011L1A1 200 V MQMF012L1A1 • For model number of key-way, center tap shaft, please refer to "Model Designation" in P.18. • Dimensions are subject to change without notice. Contact us or a dealer for the latest information Use hexagon socket head Key way dimensions screw for installation. <Key way, center tap shaft>

(26.6) (12.3)	Encoder connector	<ul><li>Motor mod</li></ul>	del (Round shaft)	Mass: 0.57 kg
<b>9 ₽</b>		Power supply	Motor mo	del No.
	② Motor connector	100 V	MQMF01	1L1C1
30.8		200 V	MQMF01	2L1C1
		<ul><li>Model Design</li><li>Dimensions</li></ul>	umber of key-way, center t gnation" in P.18. are subject to change wit or the latest information.	
(21.5) (34.3) 84.7	* Use hexagon socket h screw for installation.	7	Key way dim	nensions
59.7 25 16.5, 43.2 5.7 3	4-ø4.5*	1	<key cente<="" th="" way,=""><th>r tap shaft&gt;</th></key>	r tap shaft>
9180 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	### No. 10 No. 1	φ70 (44)	25 14 12.5 8)	M3 depth 6
	i			[Unit: mm]

with oil seal

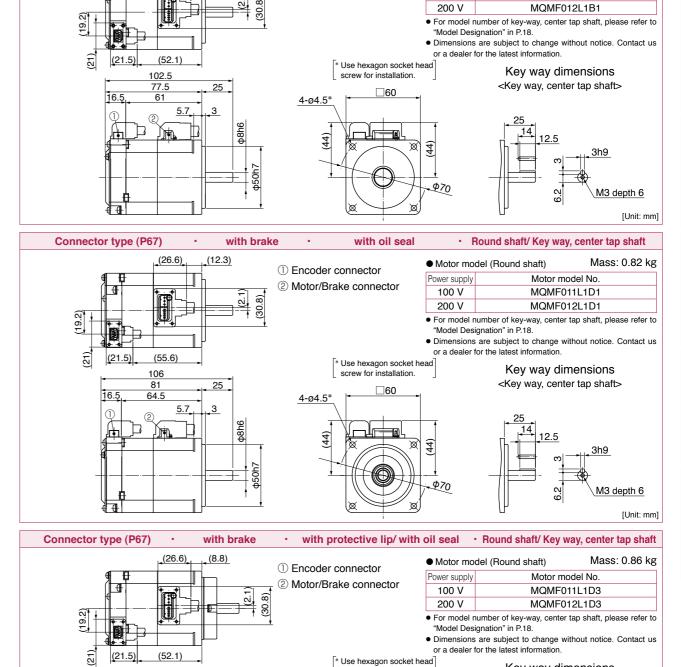
· Round shaft/ Key way, center tap shaft

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Connector type (P67) • without brake	with protective lip/ with		Round shaft/ Key w	ay, center tap shaft Mass: 0.61 kg
4 11	① Encoder connector		del (Round shaft)  Motor mo	
	② Motor connector	Power supply 100 V	MQMF01	
30.8)		200 V	MQMF01	
(30)		<ul><li>For model n "Model Desi</li><li>Dimensions</li></ul>	number of key-way, center to ignation" in P.18. are subject to change wit	ap shaft, please refer to
(86.2)	* Use hexagon socket h screw for installation.		for the latest information.  Key way dim	nensions
56.2 30 16.5 39.7 12.1	4-ø4.5*		<key cente<="" td="" way,=""><td>r tap shaft&gt;</td></key>	r tap shaft>
© 3.7. 13 9188	4 8 8		30 14 12.5	
049.4 049.4		(44)	φ,	3h9
66,69		\$70	6.2	M3 depth 6
<u> 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 </u>			П	[Unit: mm

#### \* For motors specifications, refer to P.67, P.68.

#### \* For motors specifications, refer to P.67, P.68.



screw for installation.

without oil seal

Encoder connector

② Motor/Brake connector

**MQMF 100 W** 

**MQMF 100 W** 

Connector type (P67)

with brake

Key way dimensions

<Key way, center tap shaft>

M3 depth 6

[Unit: mm]

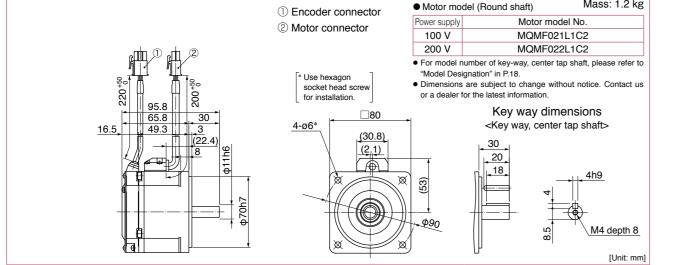
**MQMF 200 W** 

Leadwire type (P65)

without brake

**Dimensions** 

#### Leadwire type (P65) without brake without oil seal · Round shaft/ Key way, center tap shaft Motor model (Round shaft) (1) Encoder connector Motor model No. Power supply ② Motor connector 100 V MQMF021L1A2 MQMF022L1A2 200 V • For model number of key-way, center tap shaft, please refer to "Model Designation" in P.18. \* Use hexagon • Dimensions are subject to change without notice. Contact us socket head screv or a dealer for the latest information Key way dimensions <Key way, center tap shaft> 4-ø6\* (2.1) M4 depth 8



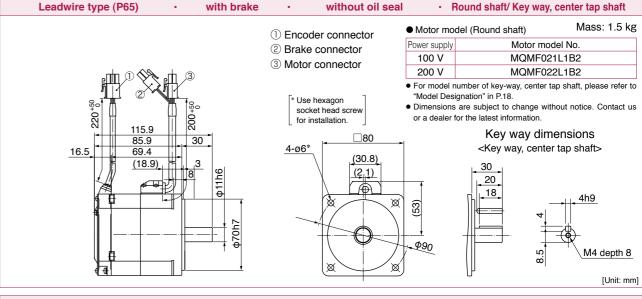
with oil seal

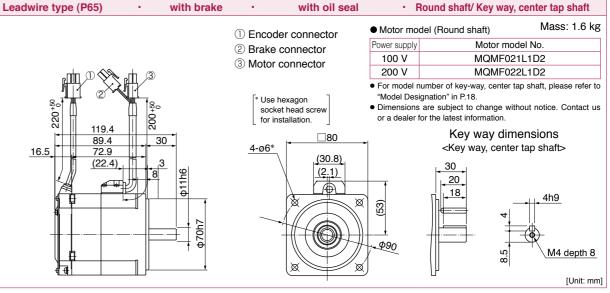
Leadwire type (P65) ·	without brake · with prote	ctive lip/ with oil seal	· Round shaft/ Key wa	y, center tap shaft
	① Encoder c ② Motor con	Power sunni	odel (Round shaft)  y Motor mod  MQMF021	
252 250 07.0	* Use hexage socket heat for installar	non "Model De end screw" • Dimension	MQMF022 number of key-way, center ta esignation" in P.18. as are subject to change with r for the latest information.	up shaft, please refer to
97.3 62.3 16.5 (18.9)	35 12.1 4-ø6*	□80 (30.8) (2,1)	Key way dime <key center<="" td="" way,=""><td></td></key>	
	4 4 70h 7 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	20	4h9
₹ 4	100	\$\text{\$\phi\}\$	8.5	M4 depth 8  [Unit: mm]

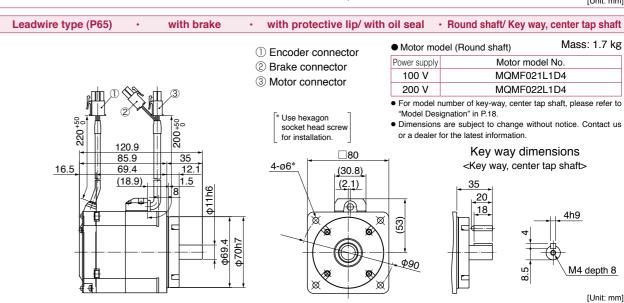
#### \* For motors specifications, refer to P.69, P.70.

# **MQMF 200 W**

**MQMF 200 W** 







<sup>\*</sup> For motors specifications, refer to P.69, P.70.

industrial.panasonic.com/ac/e/

-121-

[Unit: mm]

Mass: 1.2 kg

· Round shaft/ Key way, center tap shaft

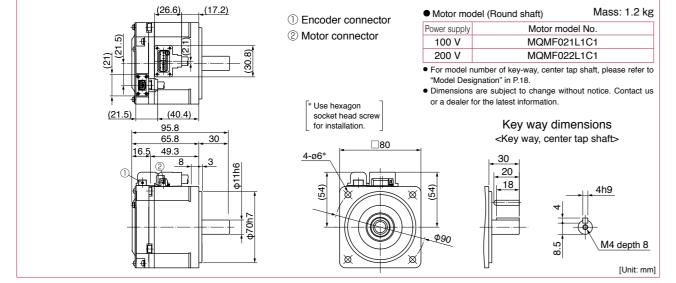
**MQMF 200 W** 

Connector type (P67)

•

without brake

#### Connector type (P67) without brake without oil seal Round shaft/ Key way, center tap shaft (13.7) Mass: 1.1 kg Motor model (Round shaft) ① Encoder connector Motor model No. Power supply ② Motor connector 100 V MQMF021L1A1 200 V MQMF022L1A1 • For model number of key-way, center tap shaft, please refer to "Model Designation" in P.18. • Dimensions are subject to change without notice. Contact us or a dealer for the latest information \* Use hexagon (36.9)socket head screw Key way dimensions <Key way, center tap shaft> 62.3 45.8 M4 depth 8 [Unit: mm]



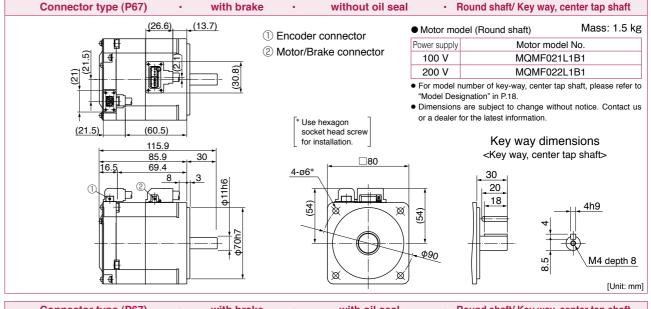
with oil seal

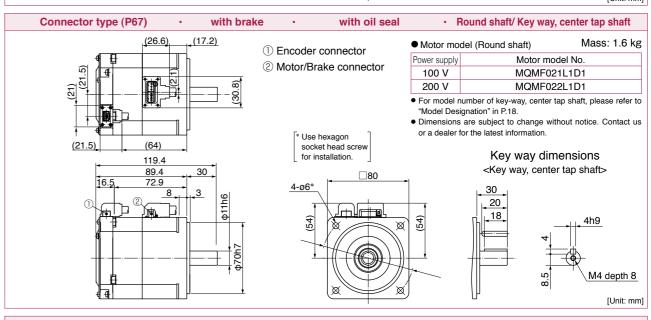
Connector type (P67) •	without brake	<ul> <li>with protective lip/ with</li> </ul>	oil seal	· Round shaft/ I	Key way, center tap shaft
(26	6.6 <u>)</u> (13.7)	Encoder connector	Motor mo	del (Round shaft)	Mass: 1.3 kg
, <del>( []</del>		_	Power supply	Mot	tor model No.
(21.5)		② Motor connector	100 V	MQ	MF021L1C3
(21)	80.00		200 V	MQ	MF022L1C3
익			For model r	number of key-way,	center tap shaft, please refer to
	<u>"                                     </u>			ignation" in P.18.	
					nge without notice. Contact us
, <del>, , , , , , , , , , , , , , , , , , </del>		* Use hexagon	or a dealer	for the latest informa	ition.
(21.5)	36.9)	socket head screw		Kovwo	u dimonoiono
-	97.3	for installation.			y dimensions
16.5.	62.3	□80	<u></u>	<ney td="" way,<=""><td>center tap shaft&gt;</td></ney>	center tap shaft>
16.5	45.8 12.1	4-ø6*	7	. 35	
	<u> </u>		<del></del>		
	<u>-                                    </u>			18	450
<b>9 1</b>		£ × × ×	(5)		<u>→  -4h9</u>
# 11			1 10		4
	φ 4.69.4 4.70h.7				<b>+</b>
<b>TI</b> . TT			Φ90	TI T	177
(∥ ∤			1 230		\M4 depth 8
		\⊗ \ ×	()	(비	$\omega_{\parallel}$
<u> </u>				П	[Unit: mm]

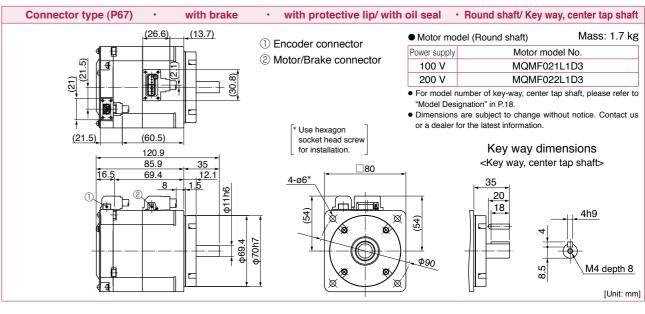
#### \* For motors specifications, refer to P.69, P.70.

# MQMF 200 W

**MQMF 200 W** 







<sup>\*</sup> For motors specifications, refer to P.69, P.70.

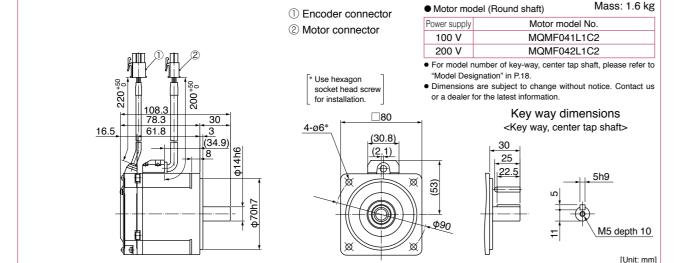
· Round shaft/ Key way, center tap shaft

Leadwire type (P65)

without brake

**Dimensions** 

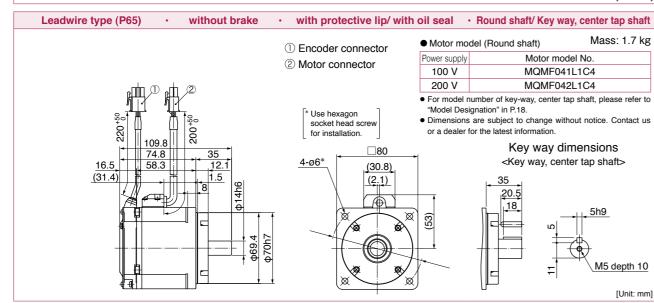
#### **MQMF 400 W** Leadwire type (P65) without brake without oil seal · Round shaft/ Key way, center tap shaft Motor model (Round shaft) (1) Encoder connector Motor model No. Power supply ② Motor connector 100 V MQMF041L1A2 MQMF042L1A2 200 V • For model number of key-way, center tap shaft, please refer to "Model Designation" in P.18. \* Use hexagon • Dimensions are subject to change without notice. Contact us socket head screv or a dealer for the latest information Key way dimensions <Key way, center tap shaft> 4-ø6\* (2.1) 25 22.5 M5 depth 10 [Unit: mm]



with oil seal

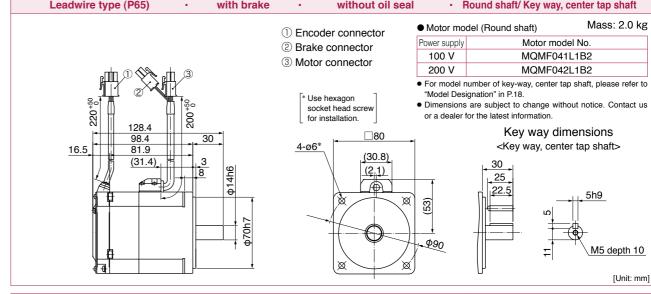
· Round shaft/ Key way, center tap shaft

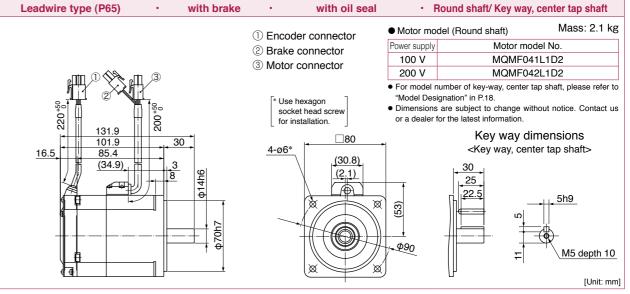
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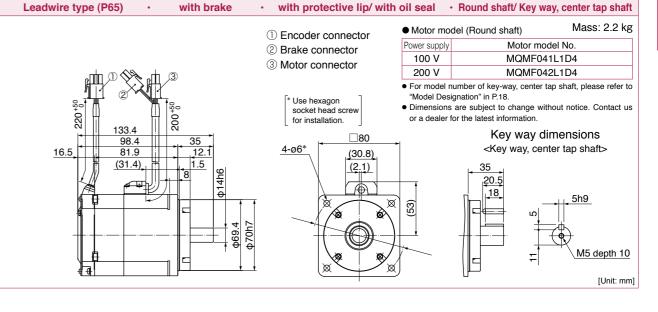


#### \* For motors specifications, refer to P.71, P.72.

# MQMF 400 W Leadwire type (P65) • with brake • without oil seal • Round shaft/ Key way, center tap shaft







<sup>\*</sup> For motors specifications, refer to P.71, P.72.

**MQMF 400 W** 

Motor model (Round shaft)

"Model Designation" in P.18.

or a dealer for the latest information

25 22.5 Motor model No.

MQMF041L1D1

MQMF042L1D1

Key way dimensions

<Key way, center tap shaft>

5h9

• For model number of key-way, center tap shaft, please refer to

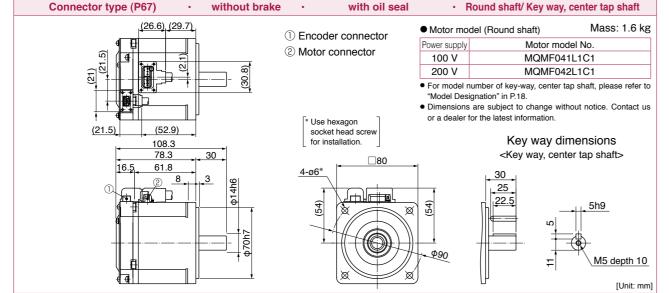
• Dimensions are subject to change without notice. Contact us

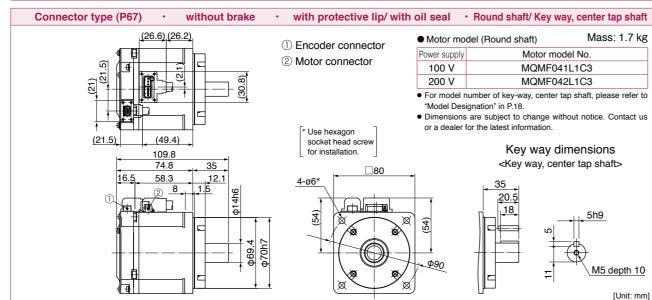
Power supply

100 V

200 V

#### **MQMF 400 W** Connector type (P67) without brake without oil seal Round shaft/ Key way, center tap shaft (26.6) (26.2) Mass: 1.5 kg Motor model (Round shaft) ① Encoder connector Motor model No. Power supply 2 Motor connector 100 V MQMF041L1A1 MQMF042L1A1 200 V For model number of key-way, center tap shaft, please refer to "Model Designation" in P.18. • Dimensions are subject to change without notice. Contact us or a dealer for the latest information \* Use hexagon (49.4)socket head screw Key way dimensions 104.8 <Key way, center tap shaft> 74.8 58.3 2 8 M5 depth 10





\* For motors specifications, refer to P.71, P.72.

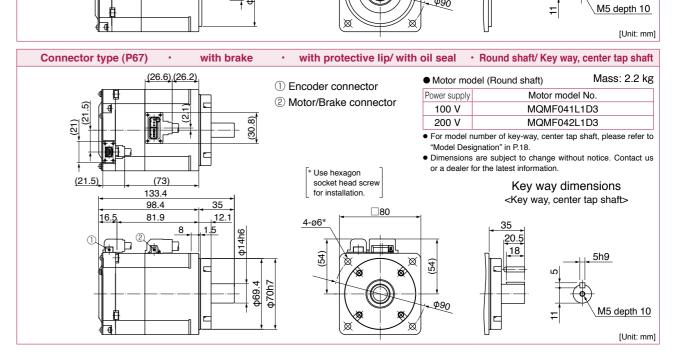
#### Connector type (P67) with brake without oil seal · Round shaft/ Key way, center tap shaft (26.6) (26.2) Mass: 2.0 kg Motor model (Round shaft) (1) Encoder connector Motor model No ower supply ② Motor/Brake connector 100 V MQMF041L1B1 200 V MQMF042L1B1 For model number of key-way, center tap shaft, please refer to "Model Designation" in P.18. • Dimensions are subject to change without notice. Contact us or a dealer for the latest information Use hexagon (73)socket head screw Key way dimensions for installation 128.4 <Key way, center tap shaft> 98.4 81.9 4-ø6\* 25 5h9 M5 depth 10 [Unit: mm] Connector type (P67) with brake with oil seal · Round shaft/ Key way, center tap shaft • (26.6) (29.7) Mass: 2.1 kg

(1) Encoder connector

② Motor/Brake connector

\* Use hexagon

socket head screw



\* For motors specifications, refer to P.71, P.72.

(21.5)

(76.5)

131.9

101.9

85.4

**MQMF 400 W** 

**MQMF 400 W** 

[Unit: mm]

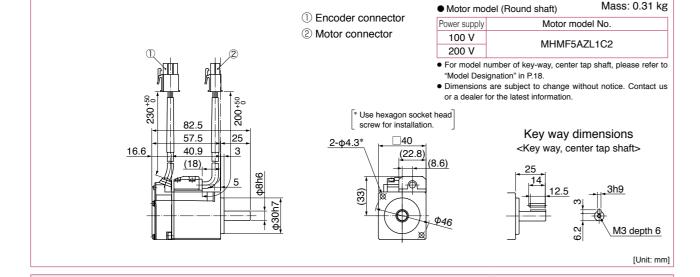
MHMF 50 W

Leadwire type (P65)

without brake

Mace: 0.54 kg

#### Leadwire type (P65) without brake without oil seal · Round shaft/ Key way, center tap shaft Mass: 0.29 kg Motor model (Round shaft) (1) Encoder connector Motor model No. 2 Motor connector 100 V MHMF5AZL1A2 200 V • For model number of key-way, center tap shaft, please refer to "Model Designation" in P.18. • Dimensions are subject to change without notice. Contact us or a dealer for the latest information \* Use hexagon socket head Key way dimensions 53.5 2-φ4.3\* <Key way, center tap shaft> 36.9 (22.8)(14) [Unit: mm]



Leadwire type (P65) · without brake · with protective lip/ with oil seal · Round shaft/ Key way, center tap shaft

with oil seal

· Round shaft/ Key way, center tap shaft

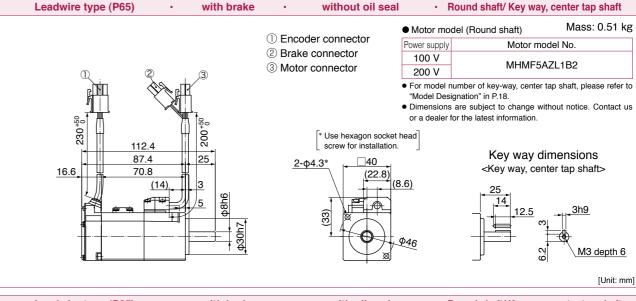
© Panasonic Corporation 2018 AQCTB01E 201802-3YE

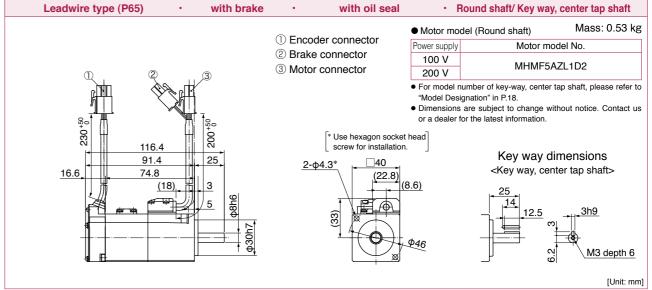
	① Encoder connector	● Motor model (Round shaft) Mass: 0.32 kg
	U Effecter conflector	Power supply Motor model No.
	② Motor connector	100 V 200 V MHMF5AZL1C4
		For model number of key-way, center tap shaft, please refer     "Model Designation" in P.18.
230 °5° °5° °5° °5° °5° °5° °5° °5° °5° °5		<ul> <li>Dimensions are subject to change without notice. Contact or a dealer for the latest information.</li> </ul>
062 83.5	* Use hexagon socket l screw for installation.	
53.5   30		Key way dimensions
16.6 36.9 12.1	<u>2-φ4.3*</u> (22.8)	<key center="" shaft="" tap="" way,=""></key>
(14) 1.5	93 de 8h6	30 14
		12.5 sh9
	\$29.6 \$30h7	946 M3 depth 6
		[Unit: m

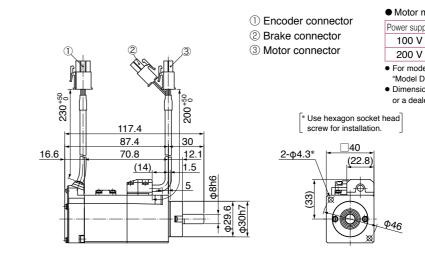
#### \* For motors specifications, refer to P.73, P.74.

# MHMF 50 W

MHMF 50 W







-130-

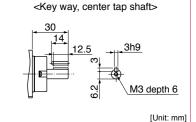
with brake

<ul><li>Motor mo</li></ul>	del (Round	shaft)	Mass. 0.34 kg		
Power supply		Motor mod	del No.		
100 V	MHMF5AZL1D4				
200 V		MCHINILIN	ZL I D4		

· with protective lip/ with oil seal · Round shaft/ Key way, center tap shaft

- For model number of key-way, center tap shaft, please refer to "Model Designation" in P.18.

   Outstanding to the control of the cont
- Dimensions are subject to change without notice. Contact us or a dealer for the latest information.



Key way dimensions

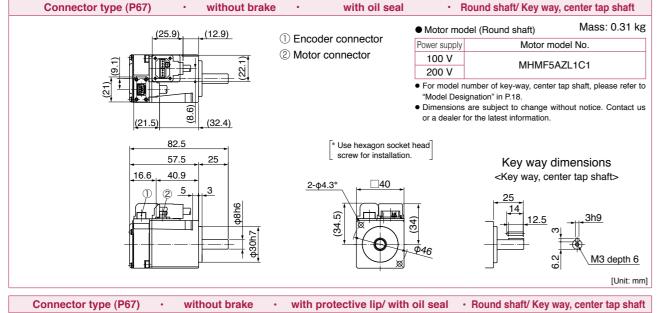
\* For motors specifications, refer to P.73, P.74.

Leadwire type (P65)

MHMF 50 W

**Dimensions** 

#### Connector type (P67) without brake without oil seal · Round shaft/ Key way, center tap shaft Mass: 0.29 kg Motor model (Round shaft) 1) Encoder connector Motor model No. 2 Motor connector 100 V MHMF5AZL1A1 200 V • For model number of key-way, center tap shaft, please refer to "Model Designation" in P.18. • Dimensions are subject to change without notice. Contact us or a dealer for the latest information 78.5 \* Use hexagon socket head screw for installation. 53.5 25 Key way dimensions 16.6 36.9 <Key way, center tap shaft> □40 ① ② 5

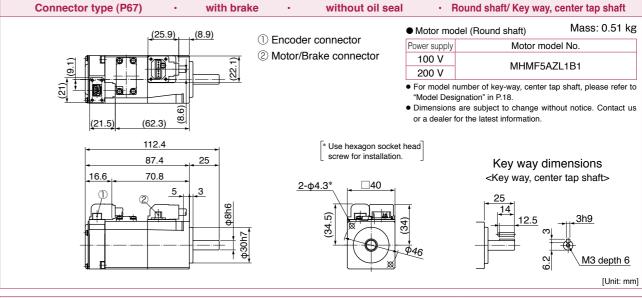


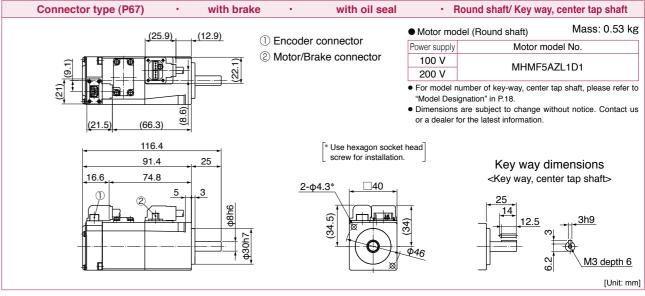
(21)	(25.9) (8.9)	① Encoder connector ② Motor connector	Power supply 100 V 200 V • For model n "Model Desi • Dimensions or a dealer f	del (Round shaft) Mass: 0.32 kg  Motor model No.  MHMF5AZL1C3  number of key-way, center tap shaft, please refer to ignation" in P.18. is are subject to change without notice. Contact us for the latest information.
		_	_	
16	83.5 53.5 6.6 36.9 12.1 2 5 1.5 88	2-φ4.3*  2-φ4.3*  40  2-φ4.3*		Key way dimensions   30  14  12.5  M3 depth 6  [Unit: mm]

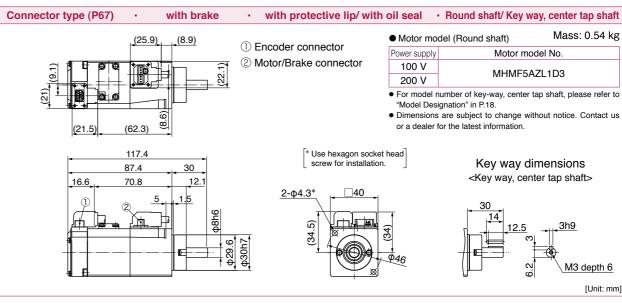
#### \* For motors specifications, refer to P.73, P.74.

MHMF 50 W

MHMF 50 W







<sup>\*</sup> For motors specifications, refer to P.73, P.74.

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**Dimensions** 

Mass: 0.65 kg

[Unit: mm]

Motor model No.

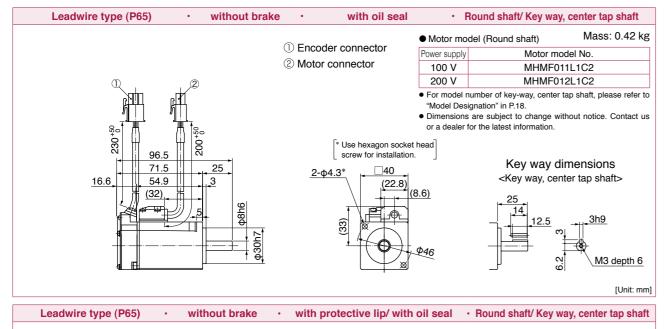
MHMF011L1D4

MHMF012L1D4

Key way dimensions

<Key way, center tap shaft>

#### **MHMF 100 W** Leadwire type (P65) without brake without oil seal · Round shaft/ Key way, center tap shaft Mass: 0.40 kg Motor model (Round shaft) (1) Encoder connector Motor model No. 2 Motor connector 100 V MHMF011L1A2 MHMF012L1A2 200 V • For model number of key-way, center tap shaft, please refer to "Model Designation" in P.18. • Dimensions are subject to change without notice. Contact us or a dealer for the latest information \* Use hexagon socket head Key way dimensions 67.5 <u>2-φ4.3\*</u> <Key way, center tap shaft> 50.9 (22.8) (28)



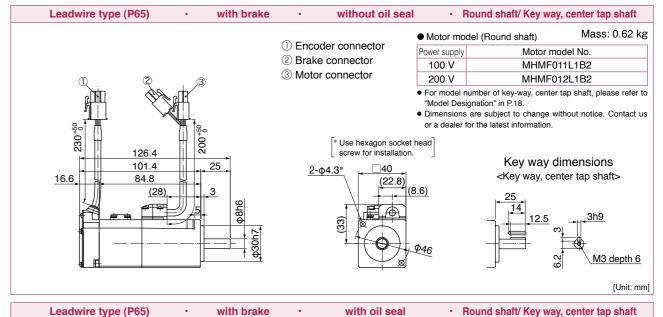
,	① Encoder connector	• Motor mod	del (Round shaft)	Mass: 0.43 kg
	-	Power supply	Motor mode	el No.
-	② Motor connector	100 V	MHMF011	L1C4
		200 V	MHMF012	L1C4
		<ul><li>Model Design</li><li>Dimensions</li></ul>	umber of key-way, center tag gnation" in P.18. are subject to change without or the latest information.	
97.5 67.5 30 16.6 50.9 12.1 (28) 1.5 9180 9.620 24000	* Use hexagon socket screw for installation  2-\ph4.3*  (22.8)	head	Key way dim  Key way, cented 30 14 12.5 2 6	
				[Unit: mm]

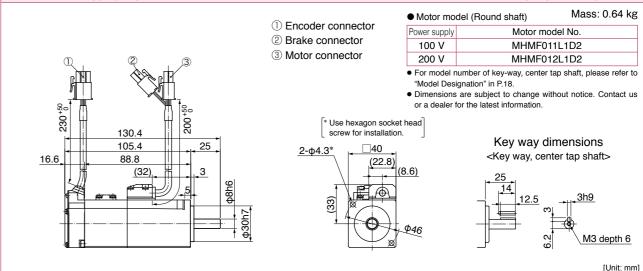
#### \* For motors specifications, refer to P.75, P.76.

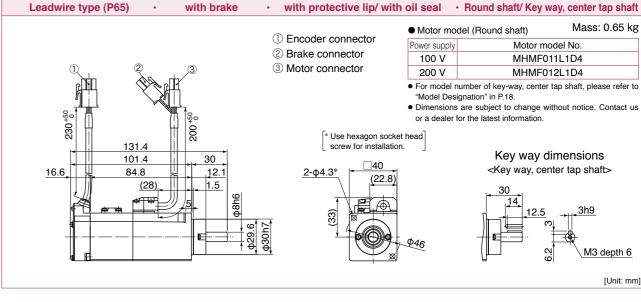
#### **MHMF 100 W**

[Unit: mm]

**MHMF 100 W** 







<sup>\*</sup> For motors specifications, refer to P.75, P.76.

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2 5

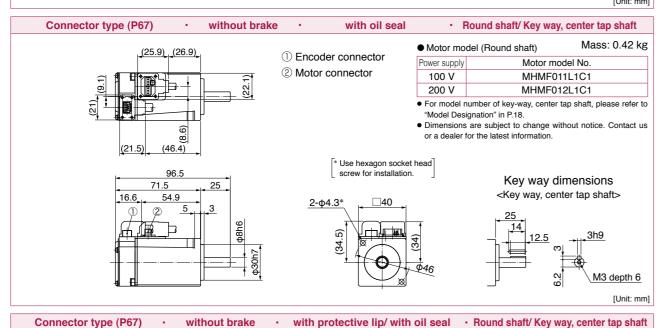
**Dimensions** 

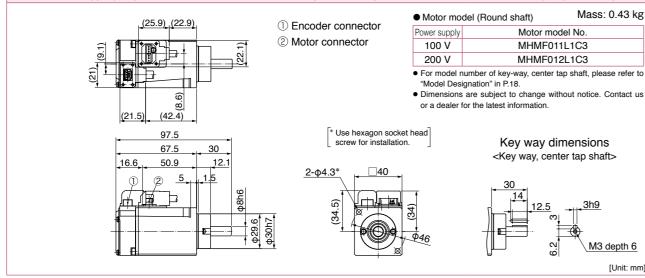
A6B Series
Special Order Product

#### **MHMF 100 W** Connector type (P67) without brake without oil seal Round shaft/ Key way, center tap shaft Mass: 0.40 kg Motor model (Round shaft) 1) Encoder connector Motor model No. 2 Motor connector 100 V MHMF011L1A1 MHMF012L1A1 200 V • For model number of key-way, center tap shaft, please refer to "Model Designation" in P.18. Dimensions are subject to change without notice. Contact us or a dealer for the latest information (42.4)\* Use hexagon socket head 92.5 screw for installation. Key way dimensions 67.5 <Key way, center tap shaft> 50.9

2-φ4.3\*

□40

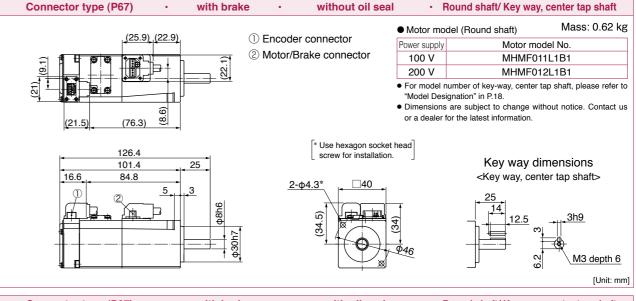


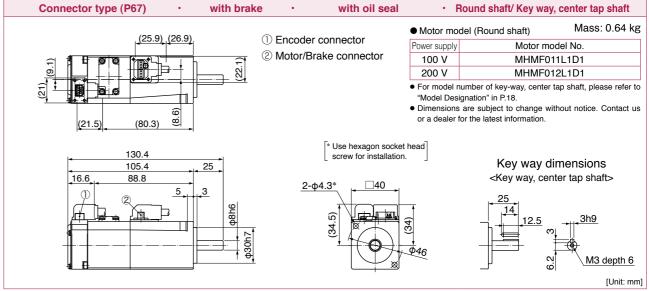


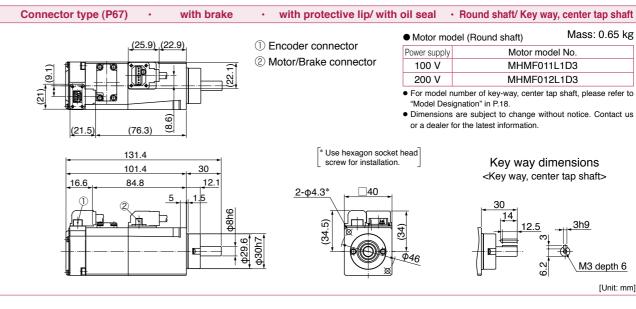
#### \* For motors specifications, refer to P.75, P.76.

**MHMF 100 W** 

**MHMF 100 W** 





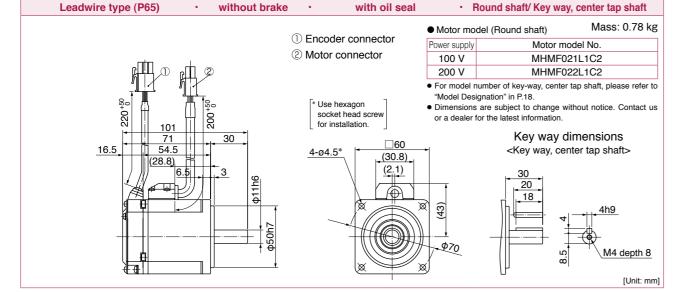


<sup>\*</sup> For motors specifications, refer to P.75, P.76.

**MHMF 200 W** 

**Dimensions** 

#### Leadwire type (P65) without brake without oil seal · Round shaft/ Key way, center tap shaft Mass: 0.75 kg Motor model (Round shaft) (1) Encoder connector Motor model No. 2 Motor connector 100 V MHMF021L1A2 MHMF022L1A2 200 V • For model number of key-way, center tap shaft, please refer to "Model Designation" in P.18. \* Use hexagon • Dimensions are subject to change without notice. Contact us socket head screv or a dealer for the latest information Key way dimensions 67.5 <Key way, center tap shaft> 4-ø4.5\* (30.8) (2.1) M4 depth 8 [Unit: mm]

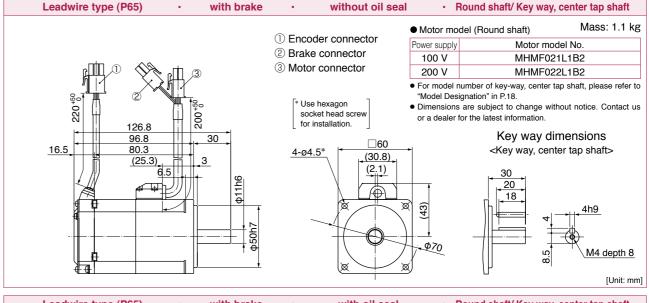


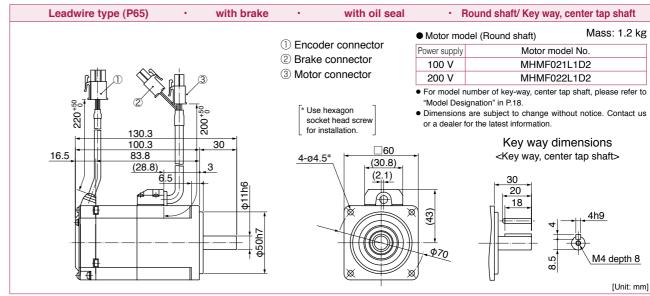
Leadwire type (P65) · without brake	<ul> <li>with protective lip/ with</li> </ul>	oil seal	<ul> <li>Round shaft/ Key way, center tap shaft</li> </ul>
	① Encoder connector	Motor mo     Power supply	del (Round shaft) Mass: 0.81 kg  Motor model No.
ntn a th a	② Motor connector	100 V	MHMF021L1C4
		200 V	MHMF022L1C4
102.5 67.5 51 12.1 (25.3) 6.5 941 0	* Use hexagon socket head screw for installation.    Go   Go   Go   Go   Go   Go   Go   G	<ul><li>Model Des</li><li>Dimensions</li></ul>	number of key-way, center tap shaft, please refer to ignation" in P.18. s are subject to change without notice. Contact us for the latest information.  Key way dimensions <key center="" shaft="" tap="" way,="">  35  20  18  4h9  M4 depth 8  [Unit: mm]</key>

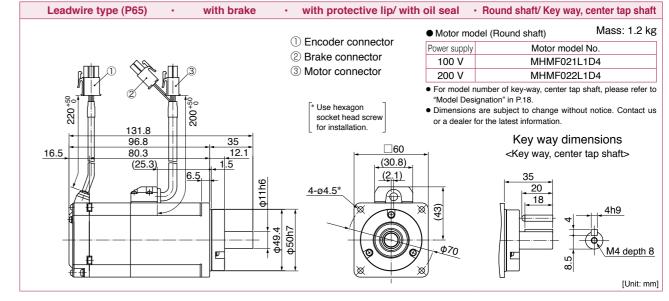
#### \* For motors specifications, refer to P.77, P.78.

# **MHMF 200 W**

**MHMF 200 W** 







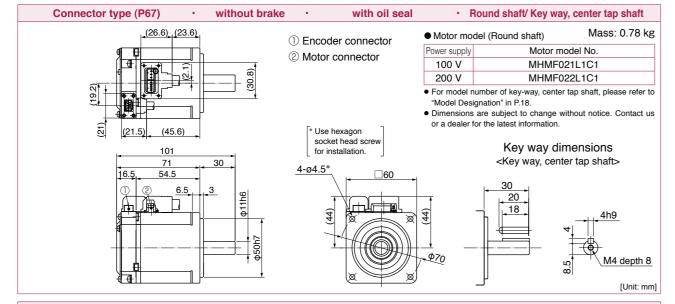
-138-

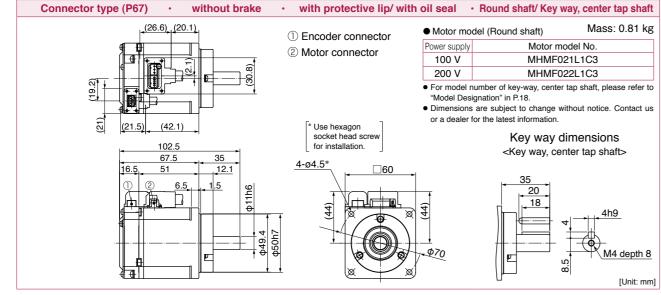
<sup>\*</sup> For motors specifications, refer to P.77, P.78.

**MHMF 200 W** 

**Dimensions** 

#### Connector type (P67) without brake without oil seal Round shaft/ Key way, center tap shaft Mass: 0.75 kg Motor model (Round shaft) (1) Encoder connector Motor model No. Power supply 2 Motor connector 100 V MHMF021L1A1 MHMF022L1A1 200 V • For model number of key-way, center tap shaft, please refer to "Model Designation" in P.18. • Dimensions are subject to change without notice. Contact us or a dealer for the latest information \* Use hexagon Key way dimensions <Key way, center tap shaft> 67.5 30 4-ø4.5\* M4 depth 8 [Unit: mm]

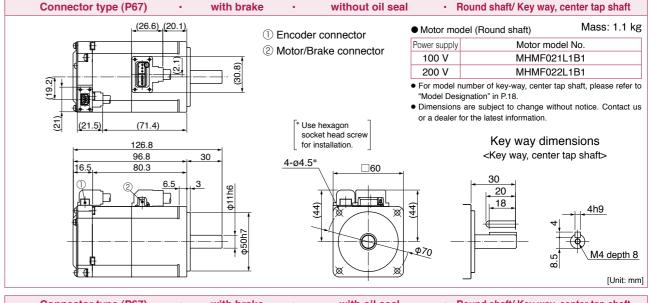


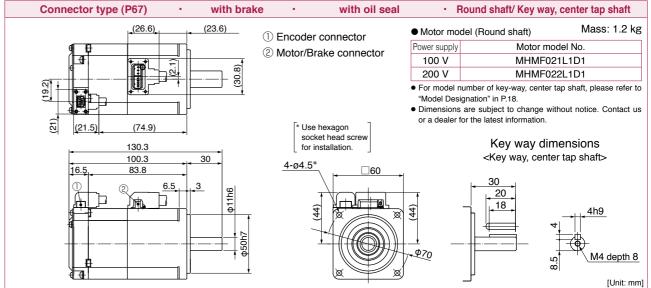


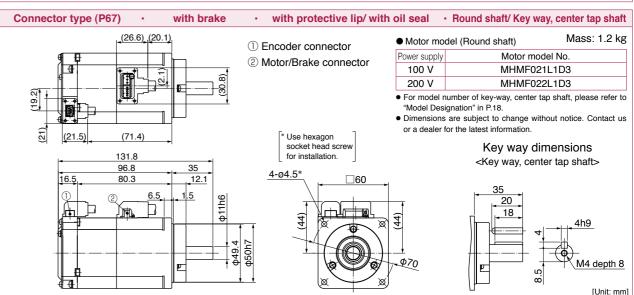
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#### \* For motors specifications, refer to P.77, P.78.

**MHMF 200 W** 

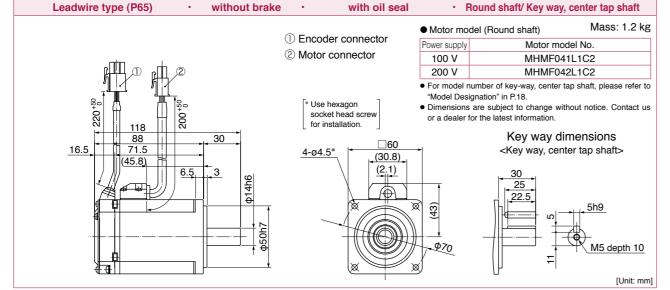






**Dimensions** 

#### **MHMF 400 W** Leadwire type (P65) without brake without oil seal · Round shaft/ Key way, center tap shaft Motor model (Round shaft) (1) Encoder connector Motor model No. 2 Motor connector 100 V MHMF041L1A2 MHMF042L1A2 200 V • For model number of key-way, center tap shaft, please refer to "Model Designation" in P.18. \* Use hexagon • Dimensions are subject to change without notice. Contact us socket head screv or a dealer for the latest information Key way dimensions 84.5 <Key way, center tap shaft> 4-ø4.5\* (30.8) (2.1)

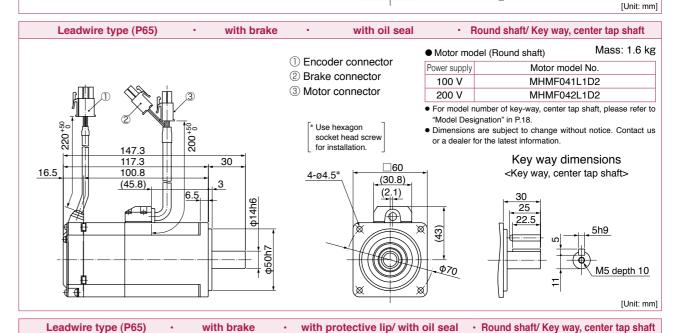


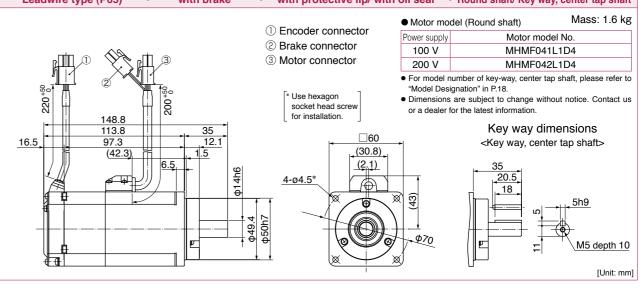
Leadwire type (P65) · without brake	with protective lip/ with	oil seal	· Round shaft/ Key way, center tap shaft
	(1) Francisco constant	<ul><li>Motor mo</li></ul>	del (Round shaft) Mass: 1.2 kg
	① Encoder connector	Power supply	Motor model No.
	② Motor connector	100 V	MHMF041L1C4
		200 V	MHMF042L1C4
	* Use hexagon socket head screw for installation.  G0 (30.8) (2.1)  4-04.5*	<ul><li>Model Des</li><li>Dimensions</li></ul>	number of key-way, center tap shaft, please refer to ignation" in P.18. s are subject to change without notice. Contact us for the latest information.  Key way dimensions <key center="" shaft="" tap="" way,="">  35  20.5  M5 depth 10  [Unit: mm]</key>

#### \* For motors specifications, refer to P.79, P.80.

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#### \* For motors specifications, refer to P.79, P.80.





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**MHMF 400 W** 

[Unit: mm]

(59.1)

84.5

· Round shaft/ Key way, center tap shaft

**Dimensions** 

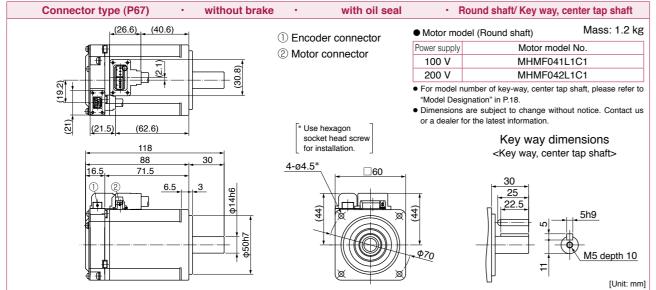
5h9

M5 depth 10

### **MHMF 400 W** Connector type (P67) without brake without oil seal · Round shaft/ Key way, center tap shaft Motor model (Round shaft) (1) Encoder connector Motor model No. Power supply 2 Motor connector 100 V MHMF041L1A1 200 V MHMF042L1A1

• For model number of key-way, center tap shaft, please refer to "Model Designation" in P.18. • Dimensions are subject to change without notice. Contact us or a dealer for the latest information \* Use hexagon

Key way dimensions <Key way, center tap shaft> 4-ø4.5\* 30



Connector type (P67) · without brake	· with protective lip/ with	n oil seal ·	Round shaft/ Key way, center tap shaft
(26.6) (37.1)	① Encoder connector	Motor mod	del (Round shaft) Mass: 1.2 kg
	Motor connector	Power supply	Motor model No.
	© Motor connector	100 V	MHMF041L1C3
808		200 V	MHMF042L1C3
(3.2)		For model n	umber of key-way, center tap shaft, please refer to
		"Model Designation	gnation" in P.18.
			are subject to change without notice. Contact us
(21.5) (59.1)	* Use hexagon	or a dealer f	or the latest information.
(39.1)	socket head screw		Key way dimensions
119.5	for installation.		<key center="" shaft="" tap="" way,=""></key>
84.5	4-ø4.5*		troy way, contor tap share
16.5 68 12.1	□60	-1	0.5
(1) (2) 6.5 <sub>1</sub> (1.5 (o)			35
① ② 6.5 1.5 9U		<u> </u>	20.5
	4 4 8 8	44	18
	" " " " " " " " " " " " " " " " " " " "	4	ω - 11+ 5h9
]			
φ49.4 φ50h7	· · · · · · · · · · · · · · · · · · ·	470	# +
		<del>\$</del> 70	E
	₹ Ø	1	\L
**************************************			Unit: mm]

-143-

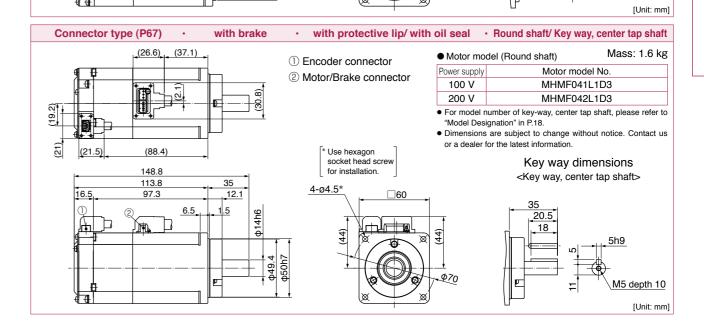
### \* For motors specifications, refer to P.79, P.80.

# \* For motors specifications, refer to P.79, P.80.

4-ø4.5\*

without oil seal

with brake



**MHMF 400 W** 

**MHMF 400 W** 

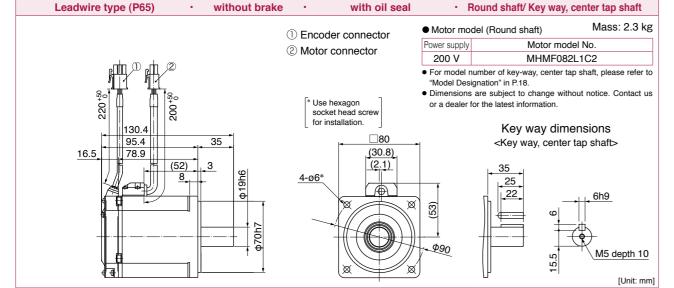
Connector type (P67)

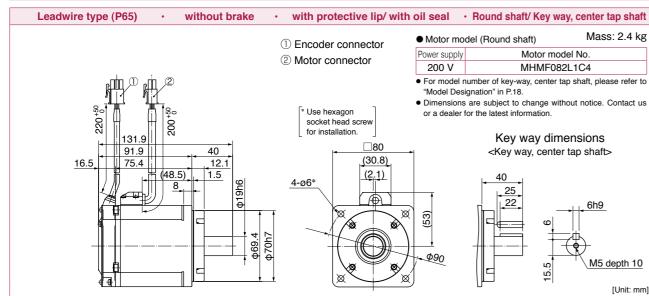
-144-

**MHMF** 750 W

**Dimensions** 

### Leadwire type (P65) without brake without oil seal Round shaft/ Key way, center tap shaft Motor model (Round shaft) (1) Encoder connector Motor model No. ② Motor connector 200 V MHMF082L1A2 • For model number of key-way, center tap shaft, please refer to "Model Designation" in P.18. • Dimensions are subject to change without notice. Contact us \* Use hexagon or a dealer for the latest information socket head screv for installation Key way dimensions 126.9 91.9 <Key way, center tap shaft> 4-ø6\* (30.8)75.4 (2.1) M5 depth 10 [Unit: mm]

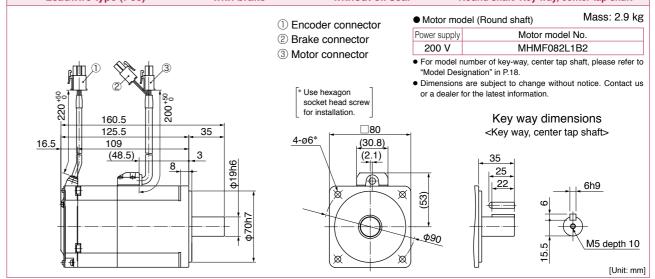


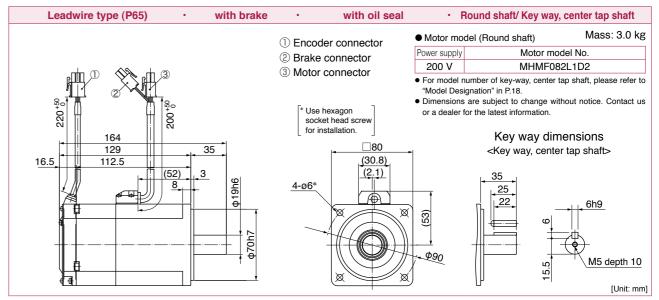


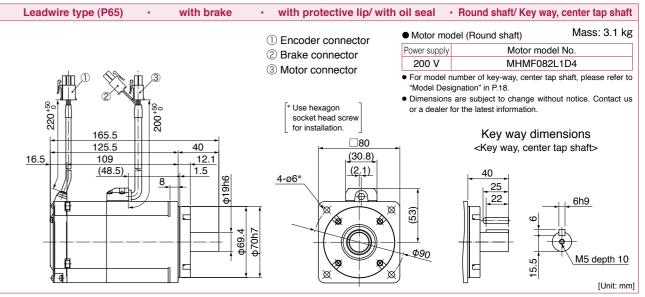
-145-

## \* For motors specifications, refer to P.81.

# MHMF 750 W Leadwire type (P65) • with brake • without oil seal • Round shaft/ Key way, center tap shaft ① Encoder connector ② Parks approximately Power supply Motor model (Round shaft) Motor model No.





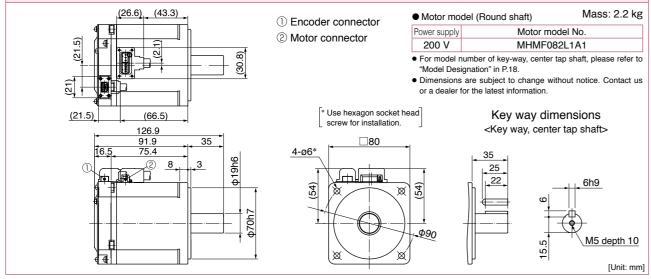


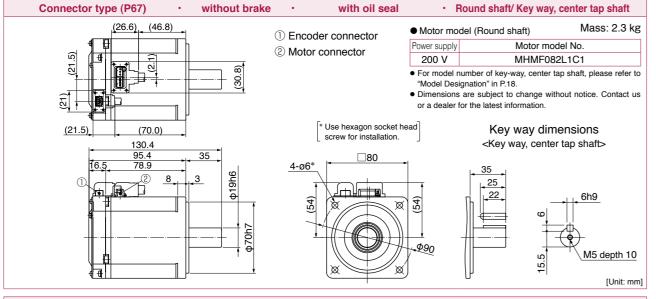
MHMF 750 W

<sup>\*</sup> For motors specifications, refer to P.81.

**Dimensions** 

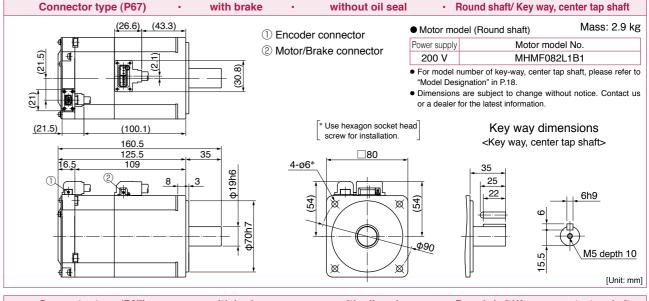
### **MHMF** 750 W Connector type (P67) without brake without oil seal · Round shaft/ Key way, center tap shaft Motor model (Round shaft) (1) Encoder connector Motor model No. ② Motor connector 200 V MHMF082L1A1 • For model number of key-way, center tap shaft, please refer to "Model Designation" in P.18. • Dimensions are subject to change without notice. Contact us

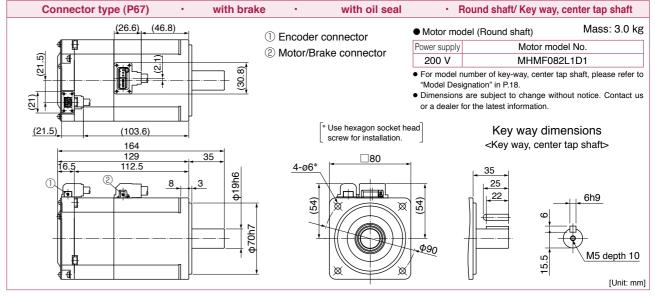


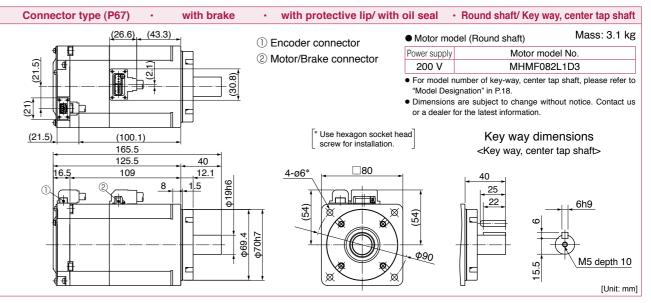


Connector type (P67) ·	without brake	· with protective lip/ with	oil seal	· Round shaft/	Key way, center tap shaft
(26.6) (43.3)	‡	① Encoder connector		odel (Round shaft	·
(21.5)		② Motor connector	Power supply 200 V		otor model No. HMF082L1C3
[2]	(30.8)			number of key-way, signation" in P.18.	center tap shaft, please refer to
			Dimensions	-	ange without notice. Contact us ation.
(21.5) (66.5)	-	* Use hexagon socket h screw for installation.	nead	•	y dimensions center tap shaft>
91.9 16.5 75.4	12.1 1.5 946	4-06*		40	·
	φ + 4   2	£5.	(54)	22	6h9 ©
<b>4</b>	690		Ф90		M5 depth 10
		ı			[OIIIL III

### \* For motors specifications, refer to P.81.







<sup>\*</sup> For motors specifications, refer to P.81.

MHMF 750 W

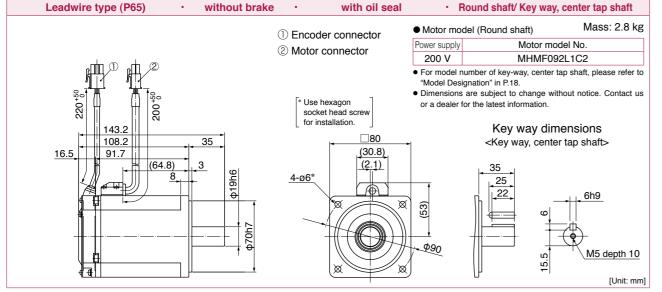
MHMF 750 W

MHMF 1000 W

MHMF092L1B2

[Unit: mm]

### Leadwire type (P65) without brake without oil seal · Round shaft/ Key way, center tap shaft Motor model (Round shaft) ① Encoder connector Motor model No. (2) Motor connector 200 V MHMF092L1A2 • For model number of key-way, center tap shaft, please refer to "Model Designation" in P.18. • Dimensions are subject to change without notice. Contact us \* Use hexagon or a dealer for the latest information socket head screw for installation. Key way dimensions <Key way, center tap shaft> (30.8)(2.1) M5 depth 10 [Unit: mm]



Leadwire type (P65) · v	without brake	· with protective lip/ with	oil seal ·	Round shaft/ Key way, center tap shaft
		① Encoder connector	Motor mod	del (Round shaft) Mass: 2.9 kg
		② Motor connector	Power supply	Motor model No.
			200 V	MHMF092L1C4
				number of key-way, center tap shaft, please refer to gnation" in P.18.
220 +50		* Use hexagon socket head screw		are subject to change without notice. Contact us for the latest information.
N       144.7       N	-1	for installation.		Key way dimensions
104.7	40	□80 (20.0)	-	<key center="" shaft="" tap="" way,=""></key>
16.5 88.2 (61.3)	12.1 1.5 9460 4 7407 4	4-06° (2.1)	φ90 Φ90	40 25 22 6h9 M5 depth 10 [Unit: mm]

### \* For motors specifications, refer to P.82.

# \* For motors specifications, refer to P.82.

### MHMF 1000 W Leadwire type (P65) with brake without oil seal · Round shaft/ Key way, center tap shaft

4-ø6\*

 Motor model (Round shaft) ① Encoder connector Power supply 2 Brake connector

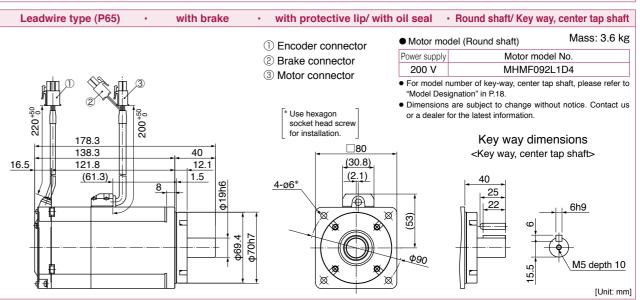
200 V 3 Motor connector • For model number of key-way, center tap shaft, please refer to

"Model Designation" in P.18. • Dimensions are subject to change without notice. Contact us or a dealer for the latest information

\* Use hexagon socket head screw for installation. Key way dimensions <Key way, center tap shaft>

(30.8)(2.1)M5 depth 10

Leadwire type (P65) with brake with oil seal · Round shaft/ Key way, center tap shaft Mass: 3.5 kg Motor model (Round shaft) ① Encoder connector Power supply Motor model No. ② Brake connector 200 V MHMF092L1D2 3 Motor connector • For model number of key-way, center tap shaft, please refer to "Model Designation" in P.18. • Dimensions are subject to change without notice. Contact us \* Use hexagon or a dealer for the latest information. socket head screw Key way dimensions 141.8 <Key way, center tap shaft> (30.8)16.5 125.3 (2.1) 4-ø6\* 6h9 M5 depth 10 [Unit: mm]



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MHMF 1000 W

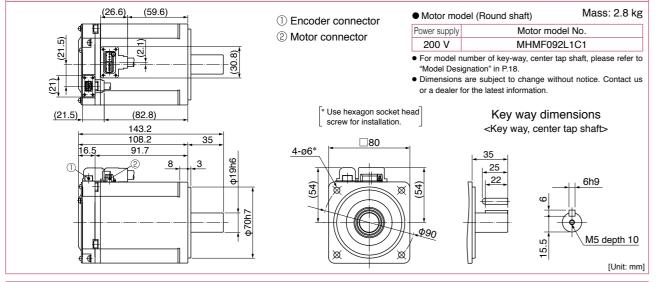
138.3

MHMF 1000 W

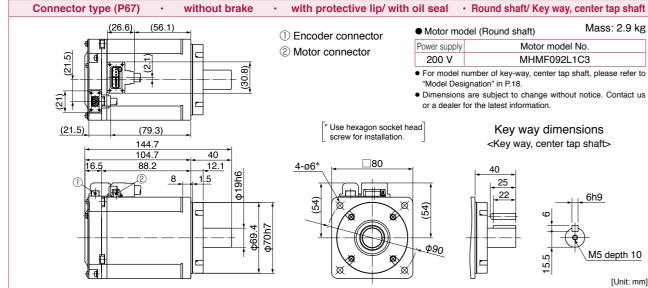
Connector type (P67)

without brake

### Connector type (P67) without brake without oil seal · Round shaft/ Key way, center tap shaft Motor model (Round shaft) (1) Encoder connector Motor model No. 2 Motor connector 200 V MHMF092L1A1 • For model number of key-way, center tap shaft, please refer to "Model Designation" in P.18. • Dimensions are subject to change without notice. Contact us or a dealer for the latest information Use hexagon socket head Key way dimensions (79.3)screw for installation. <Key way, center tap shaft> M5 depth 10 [Unit: mm]



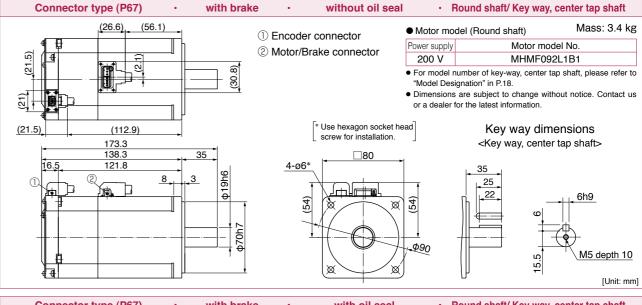
with oil seal

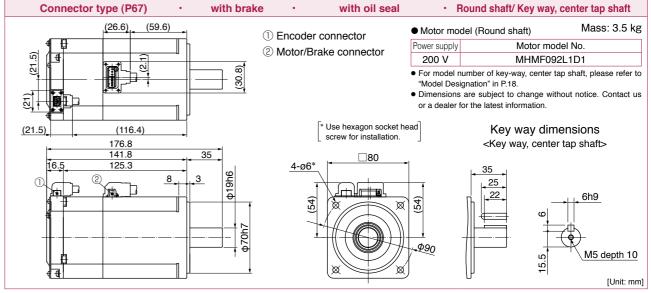


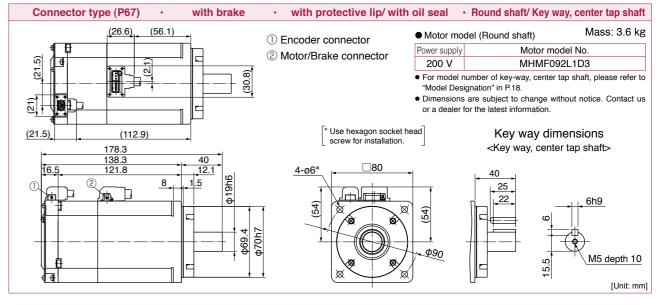
### \* For motors specifications, refer to P.82.

# MHMF 1000 W

MHMF 1000 W







<sup>\*</sup> For motors specifications, refer to P.82.

· Round shaft/ Key way, center tap shaft

MHMF 1.0 kW

(130)

Large size connector (JL10) type •

20

(116)

(158)(71)

(127)

(85)

(85)

2 Motor connector

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

\* Use hexagon

for installation.

socket head screv

① Encoder connector (Large size JL10)

4-ø9\*

① Encoder connector (Large size JL10)

4-ø9\*

\* Use hexagon

Small size connector (JN2) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

\* Use hexagon

socket head screv

① Encoder connector (Small size JN2)

4-ø9°

2 Motor connector

socket head screw

② Motor/Brake connector

Motor model (Key way shaft)

or a dealer for the latest information.

Ф<sub>165</sub>

Motor model (Kev wav shaft)

200 V MHMF102L1H6

or a dealer for the latest information.

Motor model (Key way shaft)

Power supply with oil seal

or a dealer for the latest information

41

with oil seal

For model number of round shaft, refer to "Model Designation" in P.18.

• Dimensions are subject to change without notice. Contact us

200 V MHMF102L1G5 MHMF102L1G7

For model number of round shaft, refer to "Model Designation" in P.18.

• Dimensions are subject to change without notice. Contact us

Key way dimensions

Key way dimensions

M3 through

with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

Power supply

with oil seal

45

41

200 V MHMF102L1G6 MHMF102L1G8

• For model number of round shaft, refer to "Model Designation" in P.18.

• Dimensions are subject to change without notice. Contact us

Key way dimensions

M3 through

with protective lip

[Unit: mm]

[Unit: mm]

[Unit: mm]

with protective lip

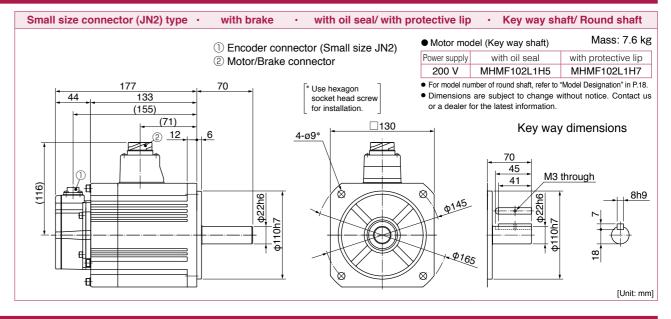
Mass: 7.6 kg

with protective lip

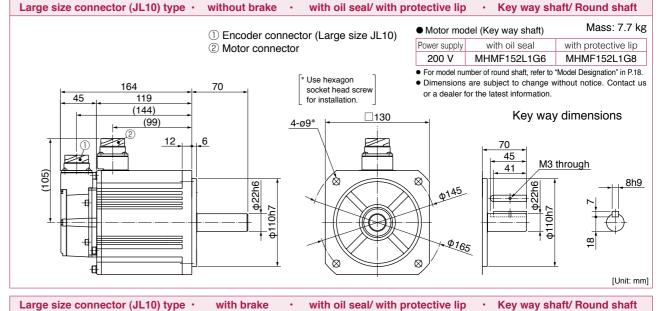
MHMF102L1H8

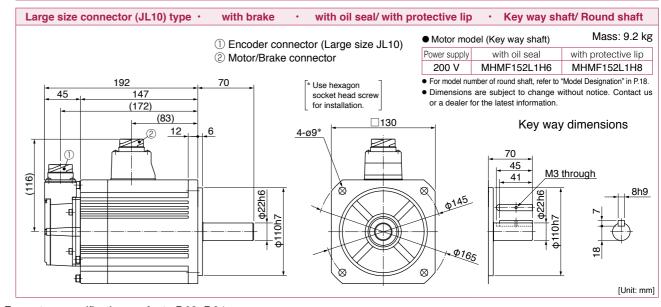
# MHMF 1.0 kW

MHMF 1.0 kW to 1.5 kW



### MHMF 1.5 kW





<sup>\*</sup> For motors specifications, refer to P.83, P.84.

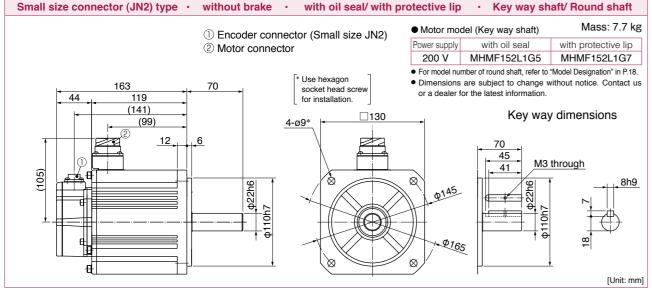
# \* For motors specifications, refer to P.83.

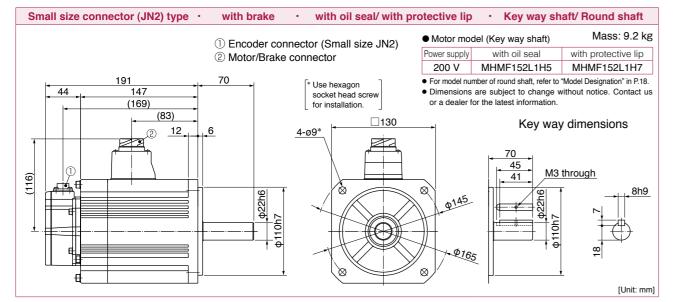
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Panasonic Corporation Electromechanical Control Business Division -153-

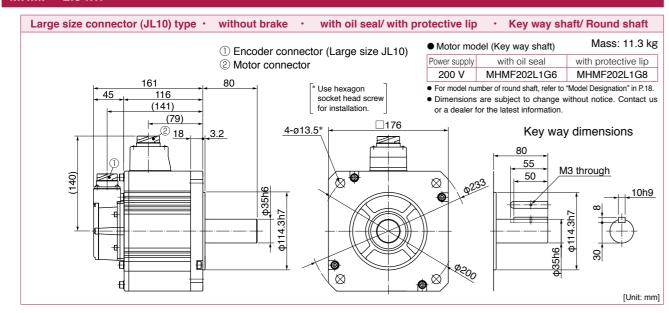
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# MHMF 1.5 kW Small size connector (JN2) type · without brake · with oil seal/ with protective lip · Key way shaft/ Bound s





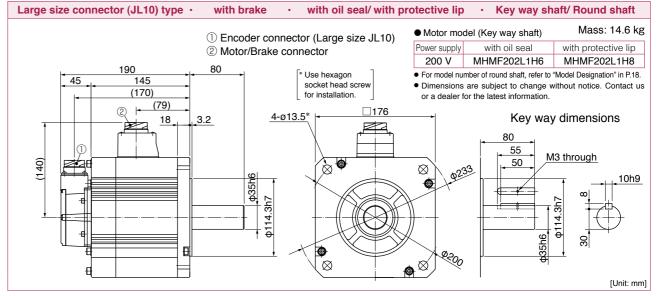
### MHMF 2.0 kW

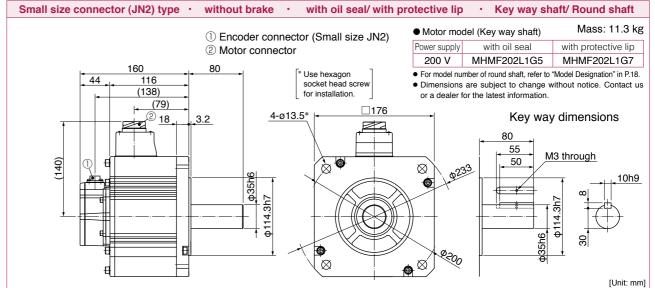


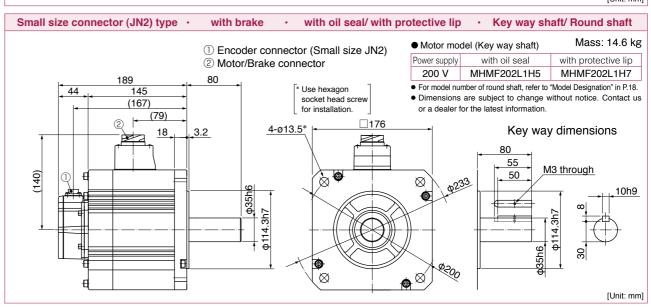
<sup>\*</sup> For motors specifications, refer to P.84, P.85.

### MHMF 2.0 kW

MHMF 2.0 kW

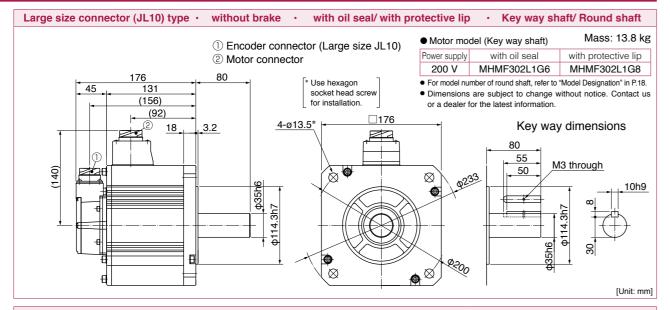


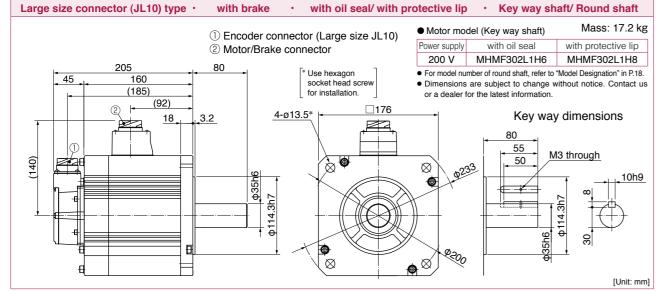


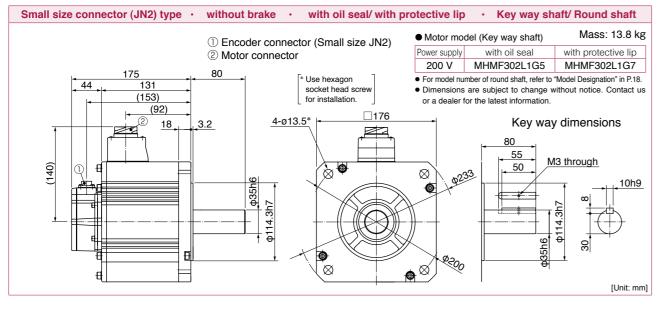


<sup>\*</sup> For motors specifications, refer to P.85.

# MHMF 3.0 kW







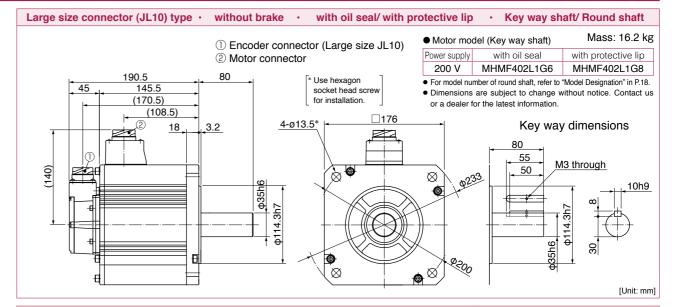
<sup>\*</sup> For motors specifications, refer to P.86.

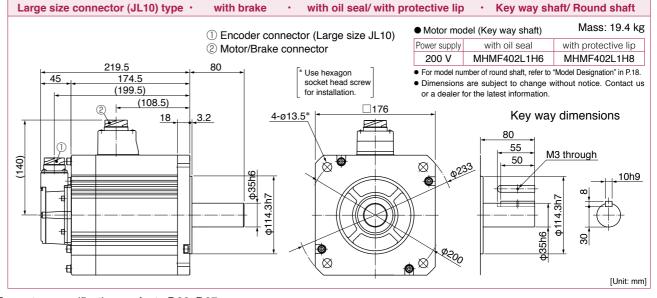
# MHMF 3.0 kW

MHMF 3.0 kW to 4.0 kW

Small size connector (JN2) type	· with brake	· with oil seal/ with p	protective lip · Key way	shaft/ Round shaft
	① Encoder conn	nector (Small size JN2)	● Motor model (Key way shaft)	Mass: 17.2 kg
	② Motor/Brake o	,	Power supply with oil seal	with protective lip
204 44 160 (182)	80	* Use hexagon socket head screw for installation.	MHMF302L1H5     For model number of round shaft, refer     Dimensions are subject to change or a dealer for the latest information.	to "Model Designation" in P.18.  e without notice. Contact us
(92) 18	φ114.3h7	013.5*		ay dimensions  M3 through  10h9
	,			[Unit: mm]

### MHMF 4.0 kW



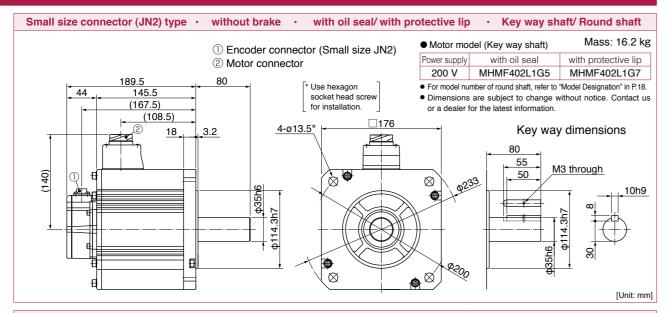


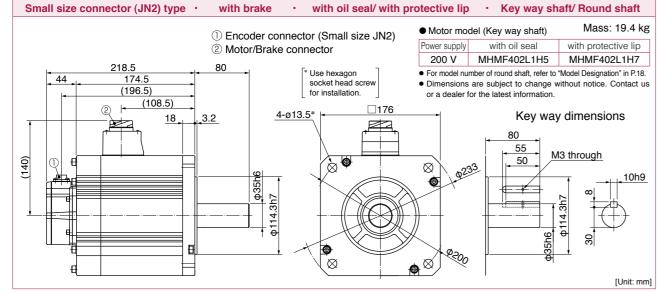
-158-

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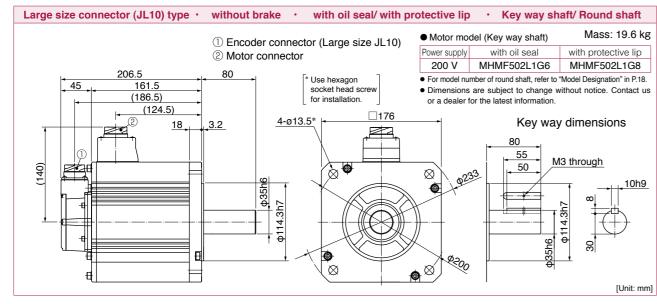
<sup>\*</sup> For motors specifications, refer to P.86, P.87.

### MHMF 4.0 kW





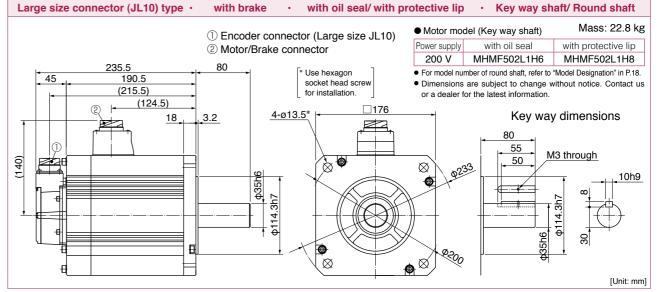
### MHMF 5.0 kW

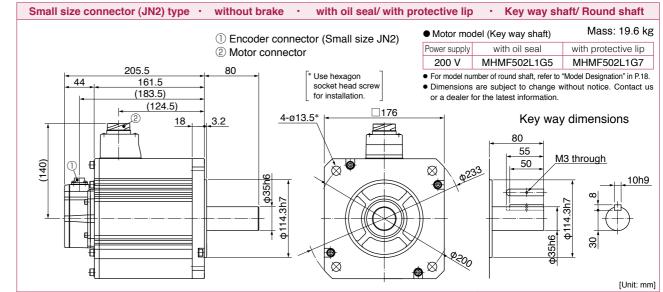


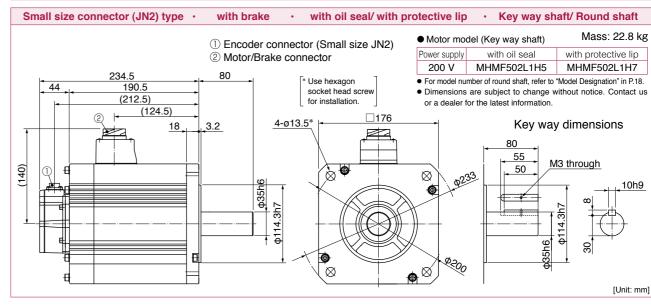
<sup>\*</sup> For motors specifications, refer to P.87, P.88.

### MHMF 5.0 kW

MHMF 5.0 kW



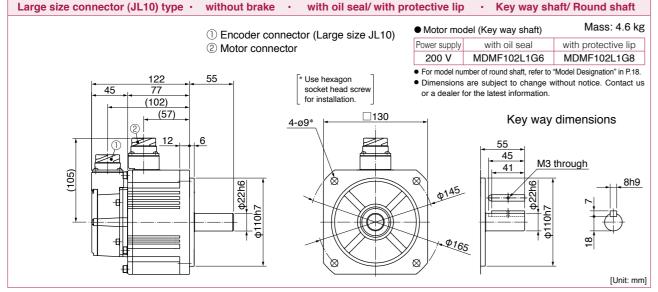


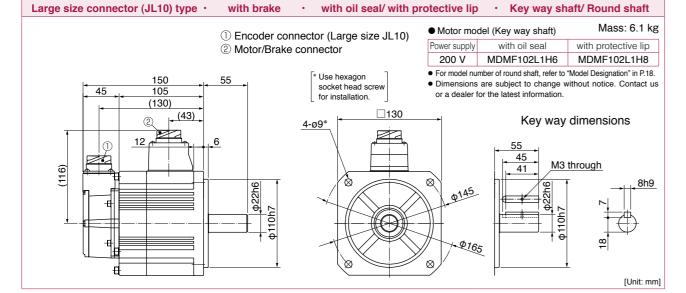


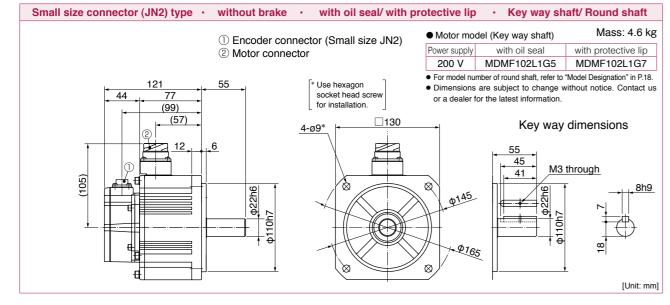
<sup>\*</sup> For motors specifications, refer to P.88.

-160-

# MDMF 1.0 kW







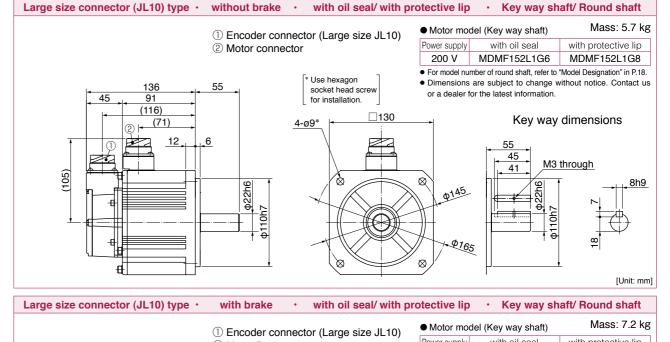
<sup>\*</sup> For motors specifications, refer to P.89.

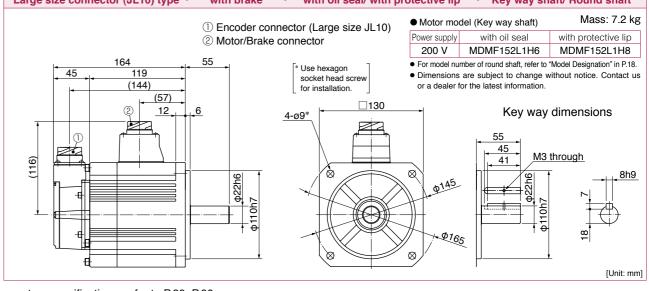
# MDMF 1.0 kW

MDMF 1.0 kW to 1.5 kW

Small size connector (JN2) type ·	with brake	with oil seal/ with p	rotective lip	<ul> <li>Key way sh</li> </ul>	aft/ Round shaft
	① Encoder con	nnector (Small size JN2)	Motor mod	el (Key way shaft)	Mass: 6.1 kg
	② Motor/Brake	,	Power supply	with oil seal	with protective lip
149	55		200 V	MDMF152L1G6	MDMF152L1G8
44 105 (127) (43)		* Use hexagon socket head screw for installation.	<ul><li>Dimensions</li></ul>		"Model Designation" in P.18. vithout notice. Contact us
2 12	6	4-ø9*		55	dimensions
91	422h6		φ145	41	through 8h9
	4110h7		\$165	0110h7	88
	<u> </u>		× × × × × × × × × × × × × × × × × × ×		(Unit: mm

### MDMF 1.5 kW

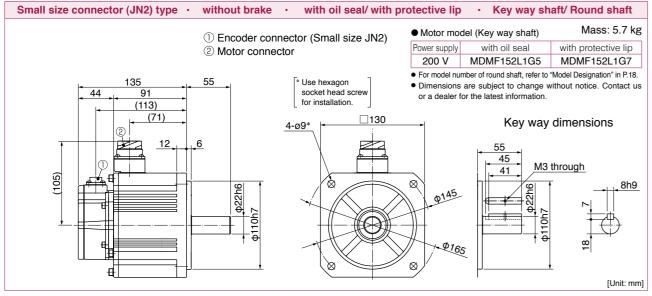


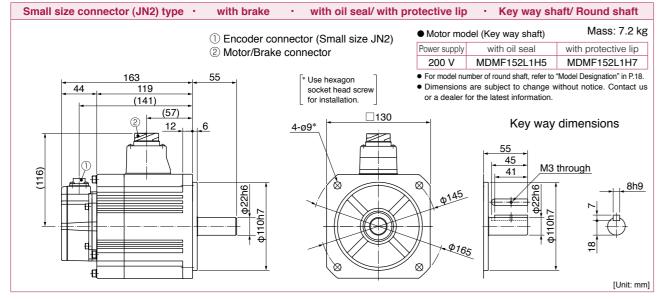


-162-

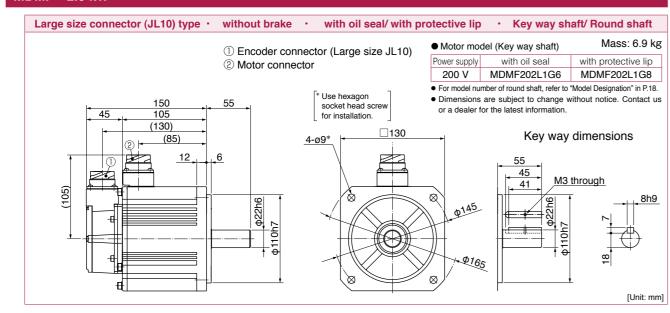
<sup>\*</sup> For motors specifications, refer to P.89, P.90.

# MDMF 1.5 kW





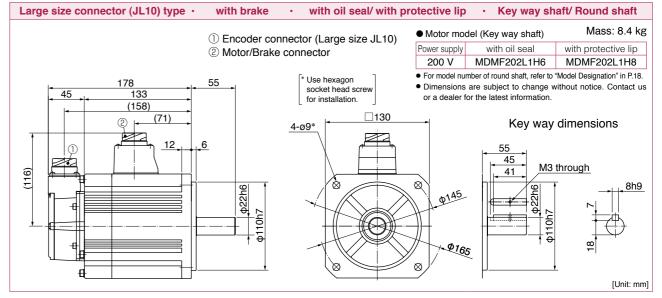
### MDMF 2.0 kW

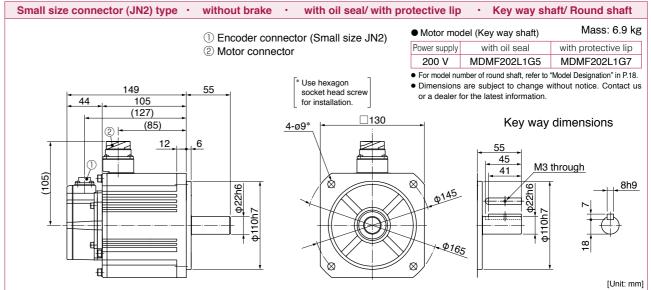


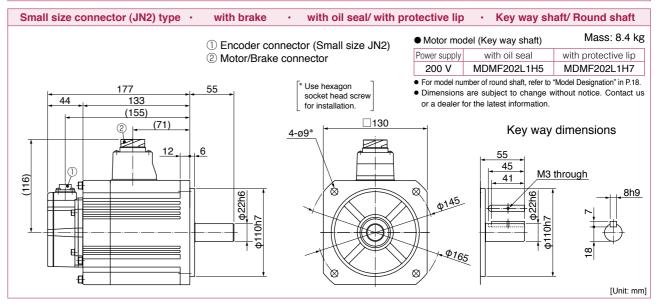
<sup>\*</sup> For motors specifications, refer to P.90, P.91.

### MDMF 2.0 kW

MDMF 2.0 kW



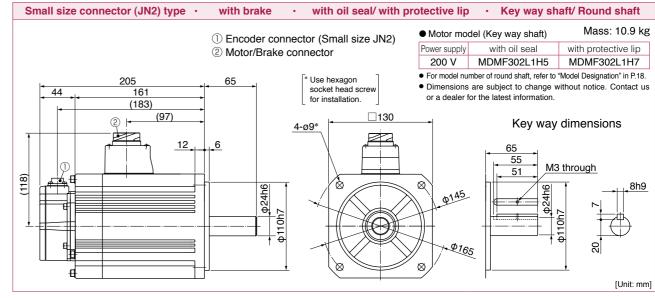




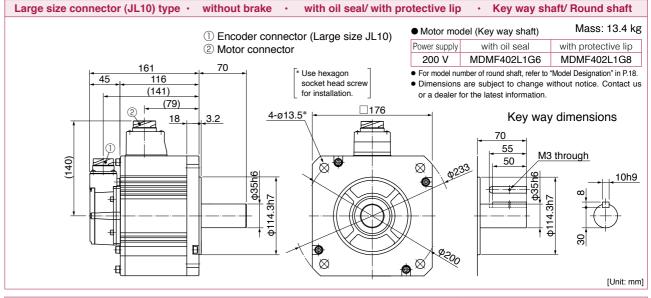
<sup>\*</sup> For motors specifications, refer to P.91.

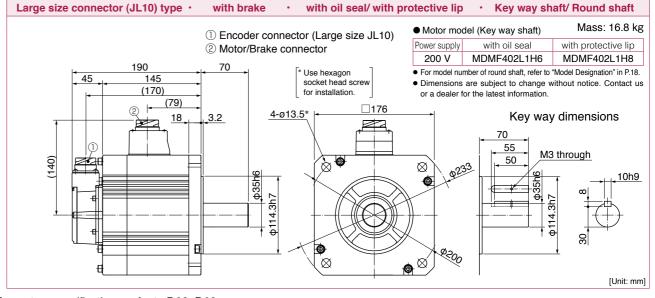
## MDMF 3.0 kW

MDMF 3.0 kW to 4.0 kW

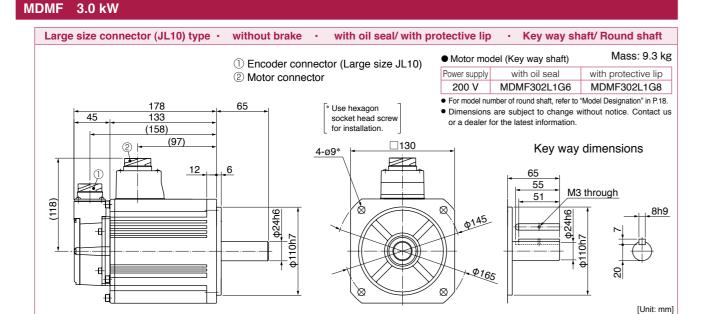


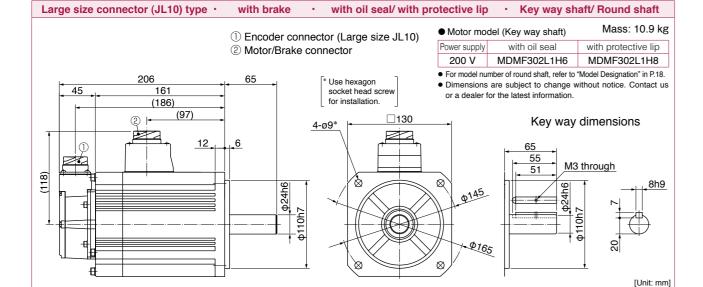
### MDMF 4.0 kW





<sup>\*</sup> For motors specifications, refer to P.92, P.93.

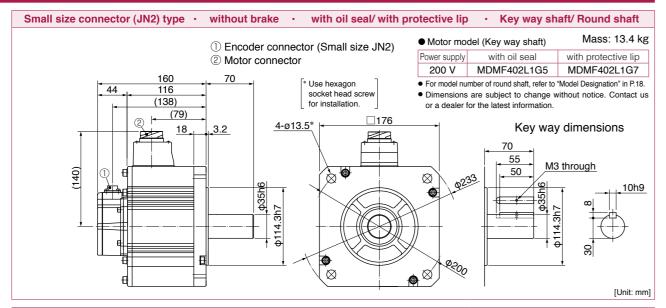


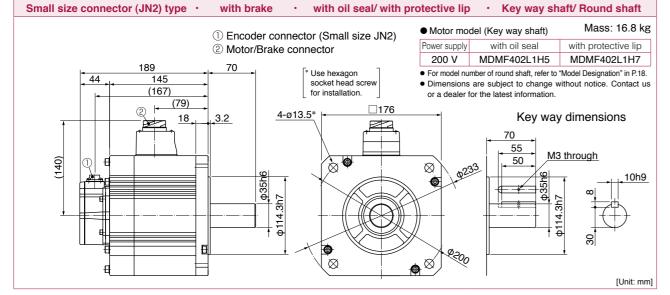


Small size connector (JN2) type ·	without brake	<ul> <li>with oil seal/ with p</li> </ul>	rotective lip	<ul> <li>Key way sh</li> </ul>	aft/ Round shaft
	① Encoder con	nector (Small size JN2)	Motor mod	lel (Key way shaft)	Mass: 9.3 kg
	② Motor connect	ctor	Power supply	with oil seal	with protective lip
			200 V	MDMF302L1G5	MDMF302L1G7
177 44 133 (155)	65	* Use hexagon socket head screw for installation.	<ul><li>Dimensions</li></ul>		"Model Designation" in P.18. vithout notice. Contact us
② (97)		<u>4-ø9*</u>		Key way	dimensions
	6			65 55 51 M3	through_
(118)	\$24h6 \$110h7		Ø145	111	8h9
	1 + 5		Ø16€	5	20 20
				1	[Unit: mm]

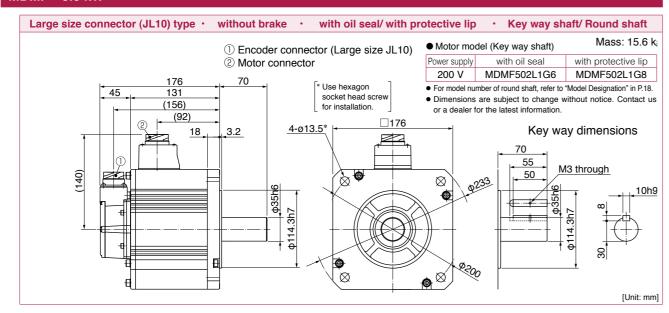
<sup>\*</sup> For motors specifications, refer to P.92.

# MDMF 4.0 kW





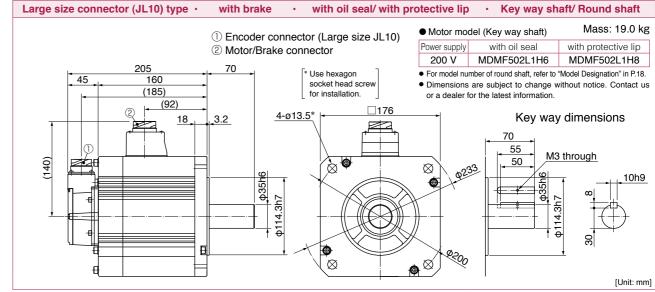
# MDMF 5.0 kW

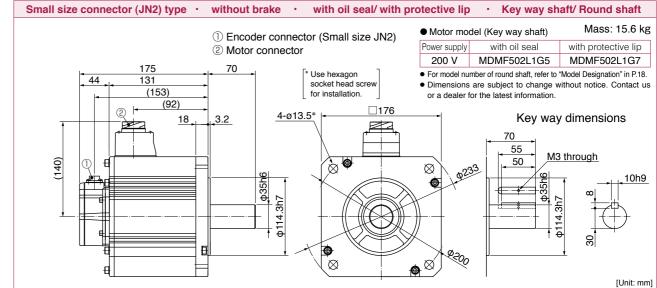


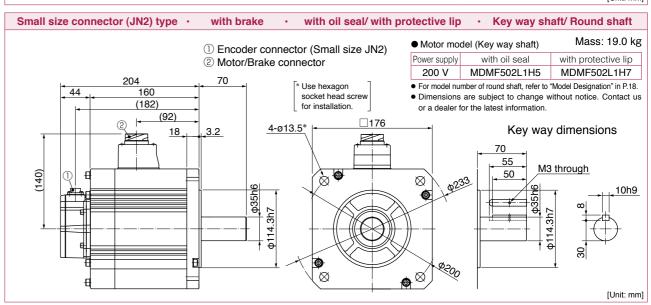
<sup>\*</sup> For motors specifications, refer to P.93, P.94.

### MDMF 5.0 kW

MDMF 5.0 kW

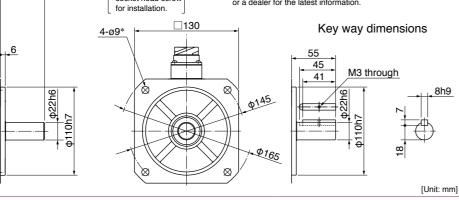


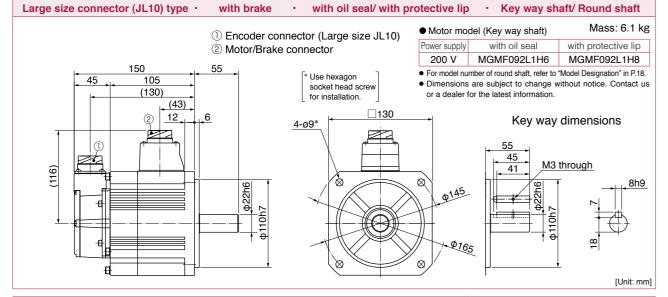


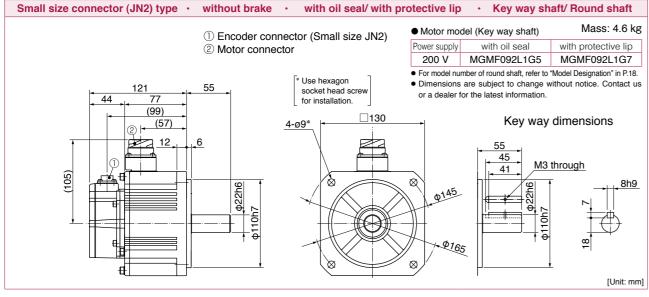


<sup>\*</sup> For motors specifications, refer to P.94.

### MGMF 0.85 kW Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft Mass: 4.6 kg Motor model (Key way shaft) ① Encoder connector (Large size JL10) with oil seal with protective lip 2 Motor connector 200 V MGMF092L1G6 MGMF092L1G8 • For model number of round shaft, refer to "Model Designation" in P.18. \* Use hexagon • Dimensions are subject to change without notice. Contact us socket head screv or a dealer for the latest information. for installation. (102)(57)



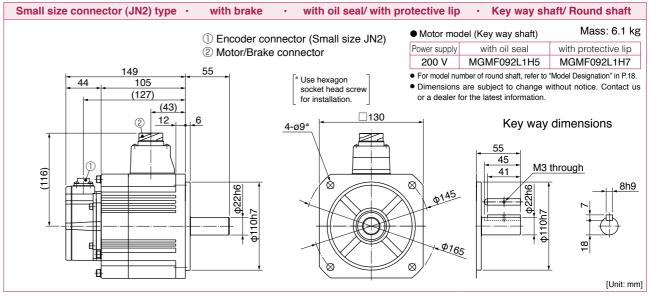




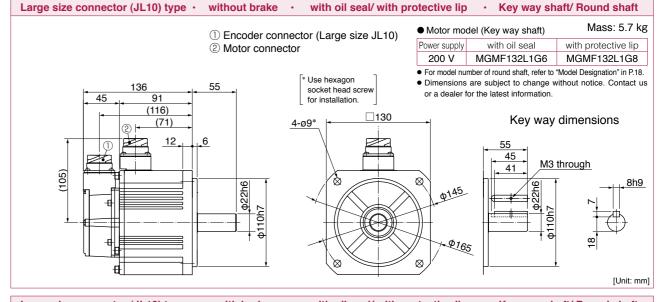
<sup>\*</sup> For motors specifications, refer to P.95.

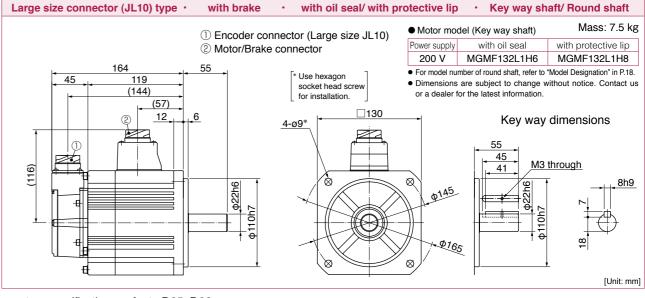
# MGMF 0.85 kW

MGMF 0.85 kW to 1.3 kW



### MGMF 1.3 kW

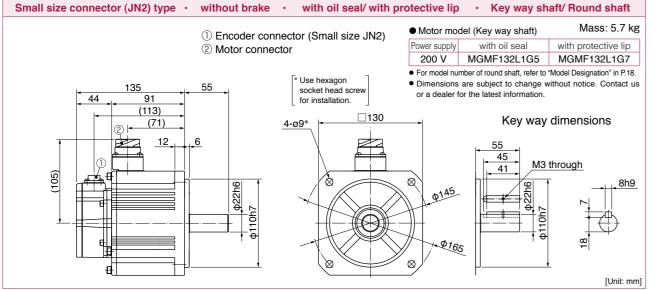


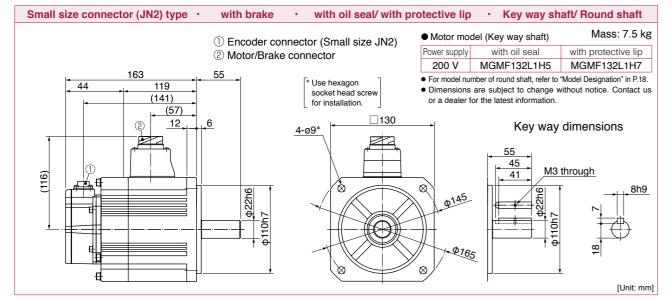


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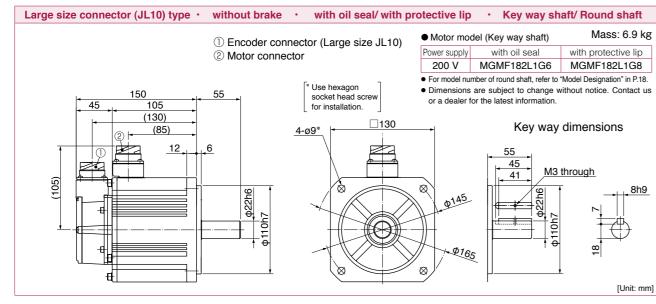
<sup>\*</sup> For motors specifications, refer to P.95, P.96.

# MGMF 1.3 kW





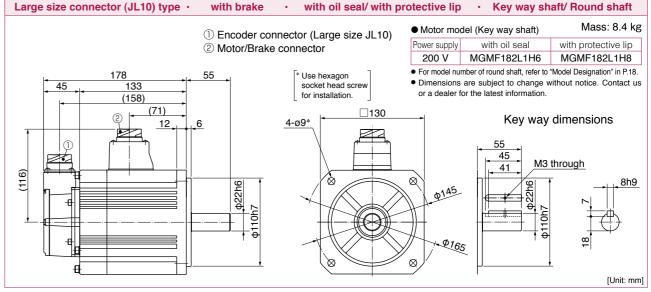
### MGMF 1.8 kW

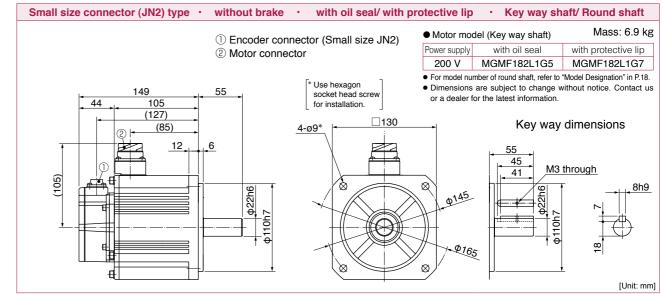


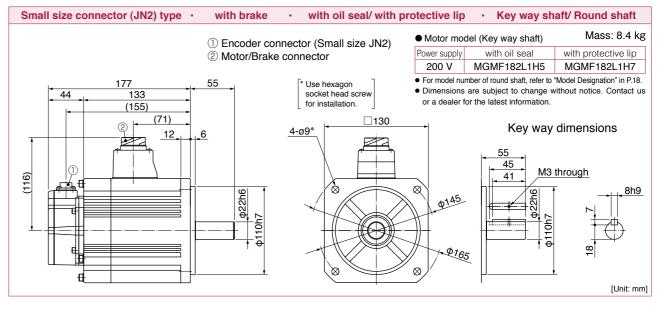
\* For motors specifications, refer to P.96, P.97.

### MGMF 1.8 kW

**MGMF 1.8 kW** 



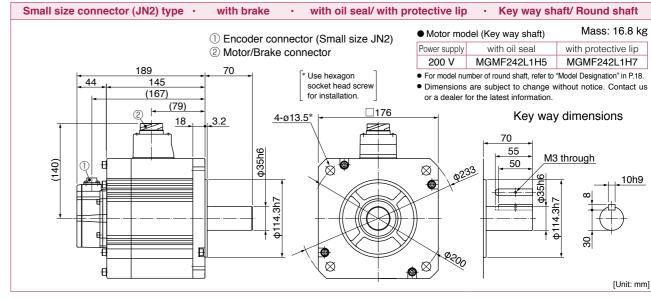




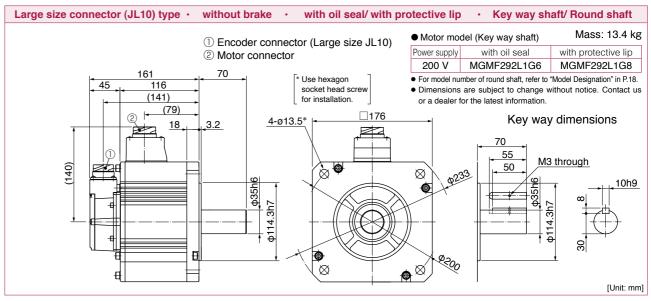
<sup>\*</sup> For motors specifications, refer to P.97.

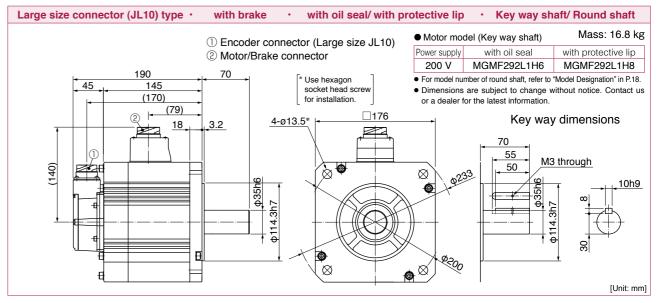
### MGMF 2.4 kW

MGMF 2.4 kW to 2.9 kW

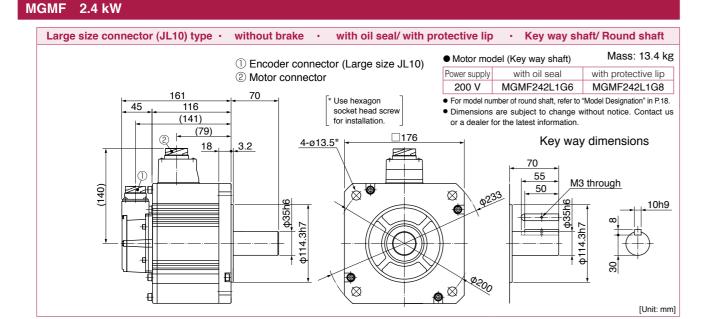


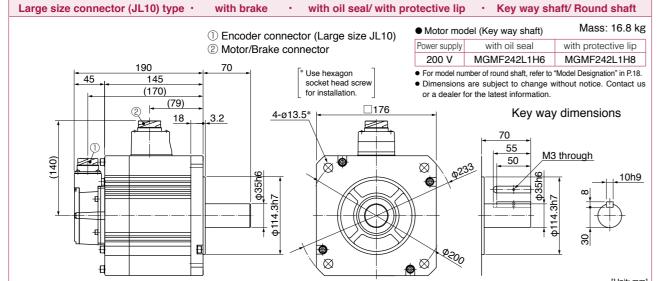
### MGMF 2.9 kW





<sup>\*</sup> For motors specifications, refer to P.98, P.99.



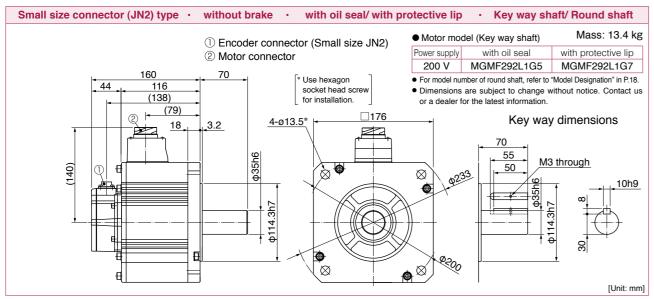


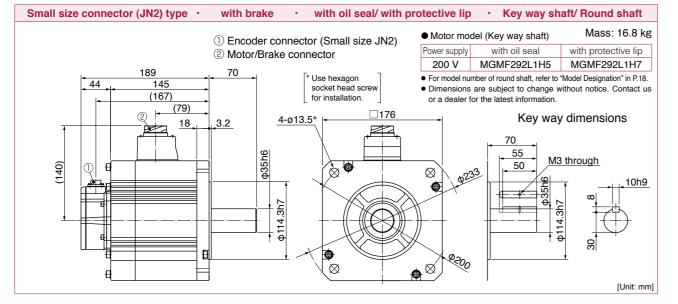
		<u> </u>			[Unit: mm]
Small size connector (JN2) type •	without brake	· with oil seal/ with p	protective lip	Key way sh	aft/ Round shaft
160 44 116 (138) (79) 18	② Motor connect	nector (Small size JN2) ctor  * Use hexagon socket head screw for installation.  ### Description of the image	Power supply 200 V  • For model numbe • Dimensions are	e subject to change with a latest information.  Key way	Mass: 13.4 kg with protective lip MGMF242L1G7 Model Designation* in P.18. rithout notice. Contact us r dimensions
					[OIIII. IIIII]

<sup>\*</sup> For motors specifications, refer to P.98.

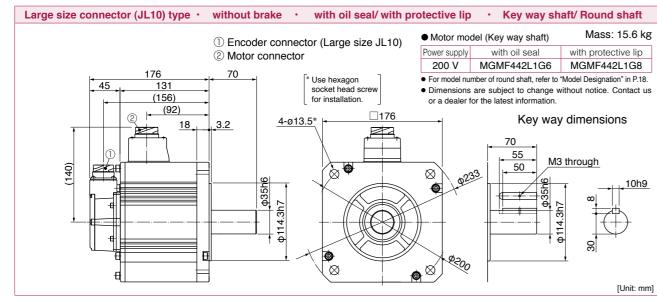
© Panasonic Corporation 2018 AQCTB01E 201802-3YE

# MGMF 2.9 kW





### MGMF 4.4 kW

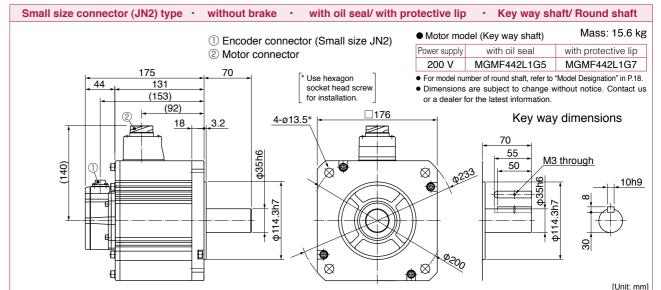


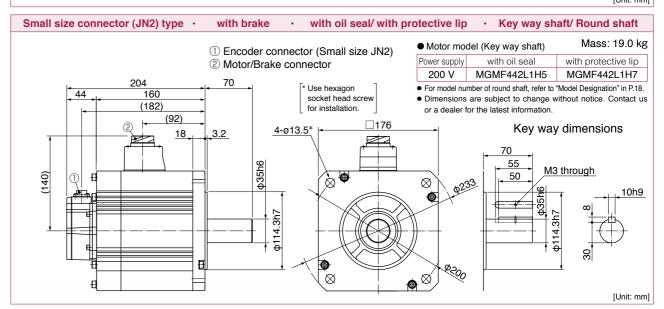
<sup>\*</sup> For motors specifications, refer to P.99, P.100.

### MGMF 4.4 kW

MGMF 4.4 kW

Large size connector (JL10) type •	with brake	with oil seal/ with process.	rotective lip	<ul> <li>Key way sh</li> </ul>	aft/ Round shaft
	① Encoder o	onnector (Large size JL10)	Motor mod	el (Key way shaft)	Mass: 19.0 kg
	② Motor/Bral	, ,	Power supply	with oil seal	with protective lip
005	70		200 V	MGMF442L1H6	MGMF442L1H8
205 45 , 160	70	* Use hexagon	<ul> <li>For model nun</li> </ul>	nber of round shaft, refer to '	"Model Designation" in P.18
(185)	-	socket head screw for installation.		are subject to change wor the latest information.	vithout notice. Contact
② <del>  (92)</del>	3.2	<u>4-ø13.5</u> *   <del>-</del> □176	<b></b>	Key way	dimensions
				70 55 50 M3	through
(140)	ф ф35h6		Ø 023	3 2949	10h
		347		6	8
		4114		45	
<u> </u>			Ø200	- 11	<u> </u>
₫   ⊨		$\bigvee \otimes$			
	-			•	[Unit: m





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<sup>\*</sup> For motors specifications, refer to P.100.

\* For combination of elements of model number, refer to Index P.402.

**A6N Series** 

A6B Series
Special Order Product

Series

Imformation

## **Features**

- Line-up IP67 motor: 1.0 kW to 5.0 kW
- Max speed: 6500r/min (MHMF 50 W to 400 W)
- · Low inertia (MSMF) to High inertia (MHMF).
- · Low cogging torque: Rated torque ratio 0.5 % (typical value).
- 23-bit absolute encoder (8388608 pulse).

# **Motor Lineup**

sd. or less



### **MSMF** Low inertia

Max. speed : 6000 r/min Rated speed: 3000 r/min Rated output: 50 W to 1000 W

Enclosure: IP65: Leadwire type



MQMF (Flat type) Middle inertia

Max. speed : 6500 r/min Rated speed: 3000 r/min Rated output:

100 W to 400 W Enclosure: IP65: Leadwire type



### MHMF High inertia

Max. speed : 6500 r/min 6000 r/min (750 W,1000 W) Rated speed: 3000 r/min Rated output:

50 W to 1000 W Enclosure: IP65: Leadwire type



### MSMF Low inertia

Max. speed : 5000 r/min 4500 r/min (4.0 kW,5.0 kW)

Rated speed: 3000 r/min

Rated output: 1.0 kW to 5.0 kW Enclosure : IP67

ō

100 mm



# MDMF Middle inertia

Max. speed : 3000 r/min Rated speed: 2000 r/min Rated output: 1.0 kW to 5.0 kW

Enclosure : IP67



(Low speed/ High torque type) Middle inertia Max. speed : 3000 r/min

Rated speed: 1500 r/min Rated output: 0.85 kW to 4.4 kW

Enclosure : IP67



# High inertia

Max. speed : 3000 r/min Rated speed: 2000 r/min Rated output: 1.0 kW to 5.0 kW Enclosure : IP67

Special Order Product **Motor Contents** 

# MSMF (200 V)

50 W to 5.0 kW.. . P.183

# MQMF (200 V)

100 W to 400 W... . P.195

# MHMF (200 V)

50 W to 5.0 kW... .P.198

# **MDMF (200 V)**

1.0 kW to 5.0 kW ...... .. P.210

# MGMF (200 V)

0.85 kW to 4.4 kW ..... P.216

# **Dimensions**

(50 W to 1000 W) ......

(1.0 kW to 5.0 kW).....

MOME (100 W to 400 W).

(50 W to 1000 W) .....

(1.0 kW to 5.0 kW).....

(1.0 kW to 5.0 kW)......P.252

(0.85 kW to 4.4 kW)......P.256

# **Motor Specification Description**

Environmental Conditions... P.271 Notes on [Motor specification] Permissible Load at

Output Shaft.....

Built-in Holding Brake ...... P.273

# **Servo Motor**

**Model Designation** 



### 1) Type

Symbol		Туре
MSM	Low inertia	(50 W to 5.0 kW)
MQM	Middle inertia	(100 W to 400 W)
MDM	Middle inertia	(1.0 kW to 5.0 kW)
MGM	Middle inertia	(0.85 kW to 4.4 kW)
MHM	High inertia	(50 W to 5.0 kW)

### 2 Series

Symbol	Series name
F	A6 family

### (3) Motor rated output

Symbol	Rated output	Symbol	Rated output
5A	50 W	15	1.5 kW
01	100 W	18	1.8 kW
02	200 W	20	2.0 kW
04	400 W	24	2.4 kW
08	750 W	29	2.9 kW
09	0.85 kW, 1000 W	30	3.0 kW
09	(130 mm sq.) (80 mm sq.)	40	4.0 kW
10	1.0 kW	44	4.4 kW
13	1.3 kW	50	5.0 kW

### 4 Voltage specifications

	Symbol	Specifications					
	2	200 V					
	Z	100 V/200 V common (50 W only)					

# 5 Rotary encoder specifications

Cyllibol	1 Offitat	i diac codina	ricsolution	VVIICO	
L	Absolute	23-bit	8388608	7	
<note> When us</note>	sing a rotary end	coder as an incre	mental system (	not using	

# multi-turn data), do not connect a battery for absolute encoder. (6) Design order

<u> </u>	.g
Symbol	Specifications
1	Standard

### 7 Motor specifications: 80 mm sq. or less Leadwire type IP65 MSMF 50 W to 1000 W

		Sh	naft	Holding	g brake	Oil seal			
Symbol		Round	Key-way, center tap	without	without with		with		
Α	2	•		•		•			
В	2	•			•	•			
С	2	•		•			•		
D	2	•			•		•		
S	2		•	•		•			
T	2		•		•	•			
U	2		•	•			•		
V	2		•		•		•		

### 7 Motor specifications: 80 mm sq. or less Leadwire type IP65 MHMF 50 W to 1000 W, MQMF 100 W to 400 W

		Sh	naft	Holding	g brake	Oil seal					
Symbol	Round	Round Key-way, center tap without		with	without	with	With protective lip				
A 2 B 2		•		•		•					
		•			•	•					
С	2	•		•			•				
C 4		•		•				•			
D	2	•			•		•				
D	4	•			•			•			
S	2		•	•		•					
Т	2		•		•	•					
U	2		•	•			•				
U	4		•	•				•			
V	2		•		•		•				
V	4		•		•			•			

### 7 Motor specifications: 100 mm sq. or more Encoder connector: JL10 IP67 MSMF, MHMF, MDMF, MGMF

	mom, mom, mom													
		Sh	naft	Holding	g brake	Oil seal								
Symbol		Round	Key-way	without	with	with	With protective lip							
С	6	•		•		•								
С	8	•		•			•							
D	6	•			•	•								
D	8	•			•		•							
G	6		•	•		•								
G	8		•	•			•							
Н	6		•		•	•								
Н	8		•		•		•							

<sup>\*</sup> Encoder connector JL10: Also applicable to screwed type

### **Servo Driver**

M	Α	D	L	N	1	5	S	E	* * *	Special specifications
	1)		2	3	4	<u>(5)</u>	6	7		

40 A 60 A

80 A

100 A

(4) Max. current rating

8 A

12 A

22 A

24 A

5 Supply voltage specifications

1

3

Symbol Current rating Symbol Current rating

8

Α

В

# 1) Frame symbol

L	Symbol	Frame	Symbol	Frame			
	MAD	A-Frame	MDD	D-Frame			
	MBD	B-Frame	MED	E-Frame			
Γ	MCD	C-Frame	MFD	F-Frame			

Symbol

Symbol	Series name
L	A6 family
② Cof	ety Function

# ② Series

	_	
ate Fernation	Symbol	Specifications
ety Function	3	3-phase 200 V
Specifications	5	Single/3-phase 200 V
without the safety function		

### (6) I/f specifications (7) Classification of type

Symbol (specification)	Symbol	Specification
	Е	Basic type (Pulse train only)
S (Analog/Pulse)	F	Multi fanction type (Pulse, analog, full-closed)
•	G	RS485 communication type (Pulse train only)

<Cautions> Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

T with the safety function

Panasonic Corporation Electromechanical Control Business Division

		Motor				Driver			Optional parts							■ Options																									
						A6SF series	A6 G series		Power	Encoder C	able Note)3	Motor Ca	able Note)3					Interface Cable	Title																						
					Rating/	Multi fanction type	RS485 communication		capacity									Іптепасе Саріє	e 	_																					
Motor	otor series	Power supply			_	S .	Output (W)	Part No. Note)1	Spec. Dimensions (page)	(Pulse, analog, full-closed	A6 SE series Basic (Pulse signal input Note)2, Note)4	Frame	at rated load (kVA)	_	Use in the Incremental system (without battery box)	without Brake	with Brake	Brake Cable Note)3	External Regenerative Resistor	Reactor Single phase 3-phase	Noise Filter (Single phase) 3-phase	Interface Conv	version Cable																		
			50	MSMF5AZL1 □ 2M	183 222	MADLT05SF	MADLN05S♦											Connector Kit	A-frame Single ro	DW.																					
			100	MSMF012L1 ☐ 2M	184 222	MADLT05SF	MADLN05S♦	A-frame ★	Approx. 0.5	rox. .5								DV0P227 DV0P220	DV0P4170	Supply Input Connection	D-frame Double ro																				
Low	MSMF (Leadwire)	Single phase/	200	MSMF022L1 ☐ 2M	185 223	MADLT15SF	MADLN15S♦			MFECA	DEAE 0**0EAD	ME	MFMCA MFMCB			DV0PM20042	Connector Kit for Motor Connection	D-frame																							
Low inertia	3000 r/min IP65	3-phase 200 V	400	MSMF042L1 ☐ 2M	186 224	MBDLT25SF	MBDLN25S♦	B-frame ★	Approx.	0 * * 0EAE (For fixed)				0 * * 0GET Note)6	DV0P4283	DV0P228		Connector Kit Motor/Encode																							
	11 03		750	MSMF082L1 ☐ 2M	187 224	MCDLT35SF	MCDLN35S♦		Approx.		-	-	_	.3 orox.	1.3 pprox.		-					_	rox.	Approx.	x.												DV0P220	DV0PM20042		Safety	
			4000	MONEO 01 4 - 014	188	MDDITAGOS	MDDINASOA		Approx.																	DV0D 400 4	DV0P228	D) (0D 4000	Connector Kit	External Scale	_										
			1000	MSMF092L1 ☐ 2M	225	MDDLT45SF	MDDLN45S♦	D-frame	O-frame 1.8					DV0P4284	DV0P222	DV0P4220		Encoder																							
Middle inertia	MQMF	MQMF Single	100	MQMF012L1 ☐ 2M MQMF012L1 ☐ 4M	195 230	MADLT05SF	MADLN05S♦	A frama	Approx.									DV0P4281	DV0P227			solute Encoder r Absolute Encode	ər																		
	MQMF (Leadwire) Single phase/ 3-phase	200	MQMF022L1 ☐ 2M MQMF022L1 ☐ 4M	196 232	MADLT15SF	MADLN15S♦	A-frame ★	0.5	0 * * 0EAE		**0EAE 0**0EAD	**0EAE 0**0EAD		FMCA * 0EED	MFMCB 0**0GET		DV0P220	DV0P4170 DV0PM20042	Note)5  Mounting	For A-frame, B-frame																					
Flat type	3000 r/min IP65	200 V	400	MQMF042L1 ☐ 2M MQMF042L1 ☐ 4M	197 234	MBDLT25SF	MBDLN25S♦	B-frame ★	Approx. 0.9					Note)6	DV0P4283	DV0P228 DV0P220		D-f wit	For C-frame, D-frame with																						
			50	MHMF5AZL1 ☐ 2M MHMF5AZL1 ☐ 4M		MADLT05SF	MADLN05S♦												Cable -	Battery Box Note)5 without																					
			100	MHMF012L1  2M	199	MADLT05SF	MADLN05S♦	A-frame	Approx.						DV0P4281	DV0P227 DV0P220		Motor Cable	Battery Box without Brake																						
				MHMF012L1   4M	238			*	0.5								DV0P4170	Brake Cable																							
High	MHMF (Leadwire)	_	200	MHMF022L1  2M MHMF022L1  4M	200 240	MADLT15SF	MADLN15S♦			MFECA	MFECA						DV0PM20042		50 Ω 25 W																						
h inertia	( type )	phase/ 3-phase							_	0**0EAE	0**0EAD		FMCA * 0EED	MFMCB 0**0GET				External	100 Ω 25 W																						
<u>rt</u> ia	3000 r/min IP65	200 V	400	MHMF042L1  2M MHMF042L1  4M	201 242	MBDLT25SF	MBDLN25S♦	B-frame ★	Approx. 0.9	(For fixed)	(For fixed)			Note)6	DV0P4283	DV0P228		regenerative resistor	25 Ω 50 W																						
			750	MHMF082L1  2M	202 244	MCDLT35SF	MCDLN35S♦	C-frame	Approx.								DV0P220	DV0PM20042		50 Ω 50 W 30 Ω 100 W	_																				
				1000	MHMF092L1 ☐ 2M MHMF092L1 ☐ 4M	203 246	MDDLT55SF	MDDLN55S♦	D-frame	Approx.				DV0P4284	DV0P228 DV0P222	DV0P4220	Reactor	1																							

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Note)1

Ontional parts

Options

Part No.

DV0P4360

DV0P4120

DV0P4121

DV0P4130

DV0P4131

DV0P4132

D-frame Double row DV0PM20033

Noise Filter

Surge Absorber

Ferrite Core

Daisy Chain

DV0PM20032

DV0PM20034

DV0P4290

DV0PM20102

DV0PM20103

DV0P4350

DV0PM20026

DV0PM20010

DV0P2990

DV0P4430

DV0PM20100

DV0PM20101

DV0P4280

DV0P4281

DV0P4282

DV0P4283

DV0P4284

DV0P220

DV0P222

DV0P227

DV0P228

DV0P4170

DV0P4220

DV0P4190

DV0P1450

DV0P1460

DV0P24610

DV0PM20042

MFECA0\*\*0EAE 277

MFECA0 \* \* 0EAD 277

MFMCA0 \* \* 0EED 281

MFMCB0 \* \* 0GET 289

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<sup>♦ :</sup> Represents the driver specifications. (refer to "Model designation" P.178.) Note)2

<sup>\* \* :</sup> Represents the cable length (03/3 m, 05/5 m, 10/10 m, 20/20 m). Example. 3 m/MFECA0030EAE

Note)4 Because A6SE series driver (dedicated for position control) does not support the absolute system specification, only incremental system can be used in combination.

Note)5 Please note that a battery is not supplied together with 23-bit absolute encoder cable (with battery box).

Please buy the battery part number "DV0P2990" separately.

Note)6 Brake cable and motor cable are required for the motor with brake.

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	Motor Driver			Optional parts				■ Options												
									Encoder Ca	ble Note)3,5	Motor	Cable Note)3,5					Title	Part No.	Page	
Motor serie	Power s supply		Part No. Note)1	Rating/ Spec. Dimensions	A6 SF series  Multi fanction type  (Pulse, analog, full-closed)	A6 SG series RS485 communication A6 SE series	Frame	Power capacity	One-touch	arge size) h lock type ewed type		JL10 buch lock type screwed type	External Regenerative	Reactor	Noise Filter		Interface Cable		DV0P4360 DV0P4120 DV0P4121 DV0P4130 DV0P4131	290 290 290 290 290
				(page)		(Pulse signal input) Note)2, Note)4		(kVA)	Use in the absolute system (with battery box) Note)7	Use in the Incremental system (without battery box	withou Brake	t with Brake	Resistor	(Single phase / 3-phase)		Connector Kit for Power Supply Input Connection	A-frame Single root type  D-frame book book book book book book book boo	D V 0 F IVI 20032	290 293 293 293	
	Single phase	/ 1000	MSMF102L1 GM MSMF102L1 8M	189 226	MDDLT55SF	MDDLN55S♦	D-frame	Approx.			MFMC 0**2E		DV0P4284	DV0P228 / DV0P222	DV0P4220	Connector Kit for Motor	A-frame to D-frame	DV0PM20034	294	
MSMF		1500	MSMF152L1	190 226 191	MDDLT55SF	MDDLN55S♦		Approx.	MFECA	MFECA	MFMC		DV0P4285	DV0PM20047 / DV0P222		Connection Connector Kit	E-frame	DV0PM20046	294	
Large siz	ре	2000	MSMF202L1	227 192	MEDLTAGE		E-frame	3.8 Approx.	0 * * 0EPE	0 * * 0EPD	0**2E		Note)6	DV0P223	DV0PM20043	for Regenera- tive Resistor	E-frame	DV0PM20045 DV0PM24587	290	
ਤੋਂ 3000 r/m IP67	3-phas 200 V		MSMF302L1  8M MSMF402L1 6M	228 193	MFDLTA3SF MFDLTB3SF	MFDLNA3S♦	E trama	4.5	MFECA 0**0ESE	MFECA 0**0ESD	MFMC 0 * * 3E	-	DV0P4285	DV0P224	DV0P3410			MSMF 1.0 kW to 2.0 kV MDMF 1.0 kW to 2.0 kV MGMF 0.85 kW to 1.8 kV	w 29	
		5000	MSMF402L1	228 194	MFDLTB3SF	MFDLNB3S	F-frame	Approx. 7.5			MFMC 0**3E		×2 in parallel	DV0P225	DV0F3410		without Brake	MHMF 1.0 kW, 1.5 kW DV0PM24588 MSMF 3.0 kW to 5.0 kV	1	
	Single	1000	MSMF502L1  8M MDMF102L1  6M MDMF102L1  8M	229 210 252	MDDLT45SF	MDDLN45S♦		Approx.			MFMC	D MFMCA		DV0P228 / DV0P222		Connector Kit for Motor/		MDMF 3.0 kW to 5.0 kV MGMF 2.4 kW to 4.4 kV MHMF 2.0 kW to 5.0 kV	w 298	
MDMF	3-phas	e 1500	MDMF152L1  6M MDMF152L1  8M	211 252	MDDLT55SF	MDDLN55S♦	D-frame				0**2E	-	DV0P4284	DV0PM20047 / DV0P222	DV0P4220	Encoder Con- nection		DV0PM24589 MSMF 1.0 kW to 2.0 kV MDMF 1.0 kW to 2.0 kV	w 29	
Large siz	ze	2000	MDMF202L1  6M MDMF202L1 8M	212 253	MEDLT83SF	MEDLN83S♦	E-frame	Approx.	MFECA 0**0EPE	MFECA 0**0EPD	MFMC 0**2E		DV0P4285 Note)6	DV0P223	DV0PM20043		with Brake	MGMF 0.85 kW to 1.8 kV MHMF 1.0 kW, 1.5 kW DV0PM24590		
2000 r/m	in 3-phas		MDMF302L1  6M MDMF302L1 8M	213 254	MFDLTA3SF	MFDLNA3S♦		Approx. 4.5	MFECA 0**0ESE	MFECA 0**0ESD	MFMC 0**3E		-	DV0P224				MSMF 3.0 kW to 5.0 kV MDMF 3.0 kW to 5.0 kV MGMF 2.4 kW to 4.4 kV	W 29	
IP67	200 V	4000	MDMF402L1 GM MDMF402L1 8M	214 254	MFDLTB3SF	MFDLNB3S♦	F-frame	Approx.	00202	0.1.0205	MFMC		DV0P4285 ×2 in parallel	DV0P225	DV0P3410		RS485, RS232	MHMF 2.0 kW to 5.0 kV DV0PM20102	29	
Middle	Single	5000	MDMF502L1	215 255 216	MFDLTB3SF	MFDLNB3S♦		Approx.			0**3E	CT 0 * * 3FC	Г			Connector Kit	Safety Interface External Scale	DV0PM20103 DV0P4350 DV0PM20026	29 29 29	
le inertia	phase 3-phas	/ 850	MGMF092L1  8M MGMF132L1  6M	256 217	MDDLT45SF		D-frame	1.8	-		MFMC 0**2E		DV0P4284	DV0P228 / DV0P221	DV0P4220	Battery for Ab	Encoder solute Encoder	DV0PM20010 DV0P2990	29	
ਕੁੱ: MGMF	200 V	1300	MGMF132L1	256 218	MDDLT55SF	MDDLN55S		2.3 Approx.	_		MFMC 0**2E		)	DV0PM20047 / DV0P222		I	r Absolute Encode		30	
Large siz	e	1800	MGMF182L1 ☐ 8M	257	MEDLT83SF	MEDLN83S♦	<b>-</b>	3.8	MFECA 0**0EPE	MFECA 0**0EPD	MFMC	E MFMCD	DVODAGOE	DV0P223	DV0PM20043	Mounting Bracket	D-frame	DV0PM20101	30	
Low spee High torqu type	3-phas		MGMF242L1 ☐ 6M MGMF242L1 ☐ 8M	219 258	MEDLT93SF	MEDLN93S♦	E-frame	Approx. 4.5	MFECA 0 * * 0ESE	MFECA 0**0ESD	0 * * 3E MFMC 0 * * 3E	E MFMCD	-	DV0P224	DV0FW20043	Encoder Cable (with Battery Box)		MFECAO* * 0EPE		
1500 r/m IP67	nin	2900	MGMF292L1	220 258	MFDLTB3SF	MFDLNB3S♦	г.	Approx.	-		MFMC 0**3E		DV0P4285		DV0D2410	Note)7 Encoder	Screwed type One-touch lock tyr	MFECA0 * * 0ESE		
		4400	MGMF442L1 ☐ 6M MGMF442L1 ☐ 8M	221 259	MFDLTB3SF	MFDLNB3S♦	F-frame	7.5			MFMC 0**3E		×2 in parallel	DV0P225	DV0P3410	(without Battery Box)	Screwed type	MFECA0 * * 0ESD		
	Single phase	1000	MHMF102L1 ☐ 6M MHMF102L1 ☐ 8M	204 248	MDDLT45SF	MDDLN45S♦	D-frame	Approx.			MFMC 0**2E		DV0P4284	DV0P228 / DV0P222	DV0P4220	, , , , , , , , , , , , , , , , , , ,	One-touch lock type	MFMCD0 * * 2EUI		
	3-phas 200 V	1500	MHMF152L1 ☐ 6M MHMF152L1 ☐ 8M	205 248	MDDLT55SF	MDDLN55S♦	rame-ب	Approx. 2.3			MFMC 0**2E			DV0PM20047 / DV0P222		Motor Cable (without Brake)	Screwed type	MFMCE0 * * 2EUI MFMCE0 * * 2ECI	D 28	
MHMF Large siz JL10 typ erti	ze oe	2000	MHMF202L1 ☐ 6M MHMF202L1 ☐ 8M	206 249	MEDLT83SF	MEDLN83S♦	E-frame	Approx.	MFECA 0 * * 0EPE	MFECA 0 * * 0EPD	MFMC 0**2E MFMC 0**2E	JD 0**2FUI MFMCE	Note)6	DV0P223	DV0PM20043		Screwed type	DE MFMCA0 * * 3EUT MFMCA0 * * 3ECT DE MFMCA0 * * 2FUE MFMCA0 * * 2FCE	T 28 D 28	
출 2000 r/m IP67	3-phas	3000	MHMF302L1 ☐ 6M MHMF302L1 ☐ 8M	207 250	MFDLTA3SF	MFDLNA3S♦		Approx.	MFECA 0**0ESE	MFECA 0**0ESD	MFMC	A MFMCA	_	DV0P224		Motor Cable (with Brake)	One-touch lock type Screwed type	MFMCE0 * * 2FUE MFMCE0 * * 2FCE	D 28	
		4000	MHMF402L1	208 250	MFDLTB3SF		F-frame	Approx.			0 * * 3E	A MFMCA	DV0P4285 ×2 in parallel	DV0P225	DV0P3410	External	Screwed type	MFMCA0 * *3FUT MFMCA0 * *3FCT		
Noto\1	· Donrag	5000	MHMF502L1 ☐ 8M	251	MFDLTB3SF	MFDLNB3S					0 * * 3E			o and mater cables a	nable and	regenerative resistor	30 Ω 100 W 20 Ω 130 W	DV0P4284 DV0P4285	30	
Note)2 $\diamondsuit$	: Represe	nts the	motor specifications. driver specifications. cable length (03/3 m,	(refer to '	Model designati	on" P.178.)	n/MFI	-CA003	30FPF		· ·	ouch lock conn		s and motor cables entional screwed type Nused.		Reactor	DV0P2	22, DV0P223 224, DV0P225 28, DV0PM20047	30	
Note)4 Beca	ause A6SE	E series	driver (dedicated for m can be used in cor	position o	control) does not						Note)6	or other possil	le combinations	s, refer to P.303. supplied together wit	h 23-bit	Noise Filter	DV0P3	220, DV0PM20043 410 190, DV0P1450	36	
Offig		iai sysit	iii can be useu iii coi	non iatioi i	•						•	absolute encod	er cable (with ba			Surge Absorbe Ferrite Core	DV0P4 DV0P1	460	30	

industrial.panasonic.com/ac/e/

Please buy the battery part number "DV0P2990" separately.

DV0P24610

Daisy Chain

A6N Series

Series

Series

# **Specifications**

				AC200 V
Motor model *1		MSMF5AZL1 M		
		Multi	function type	MADLT05SF
Applicable	Model No	RS48	5 communication type *2	MADLN05SG
driver	110.	Basic	type *2	MADLN05SE
	Fram	e sym	bol	A-frame
Power supply	capacit	у	(kVA)	0.5
Rated output			(W)	50
Rated torque			(N·m)	0.16
Continuous sta	all torqu	ie	(N·m)	0.16
Momentary Ma	ax. pea	k torqı	ue (N·m)	0.48
Rated current			(A(rms))	1.1
Max. current			(A(o-p))	4.7
Regenerative	brake		Without option	No limit Note)2
frequency (time	s/min)	Note)1	DV0P4281	No limit Note)2
Rated rotation	al spee	d	(r/min)	3000
Max. rotationa	l speed		(r/min)	6000
Moment of ine	rtia		Without brake	0.026
of rotor ( $\times 10^{-4}$	kg·m²)		With brake	0.029
Recommender ratio of the loa		30 times or less		
Rotary encode	r speci	ficatio	ns <sup>*3</sup>	23-bit Absolute
	Re	solutio	n per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

Please contact us for more information.

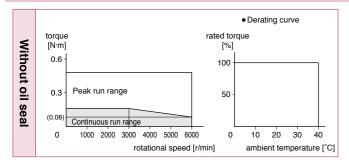
Static friction torque (N·m)	0.294 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.30
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

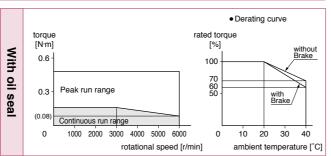
### • Permissible load (For details, refer to P.272)

	,	,
	Radial load P-direction (N)	147
During assembly	Thrust load A-direction (N)	88.0
document	Thrust load B-direction (N)	117.6
During operation	Radial load P-direction (N)	68.6
	Thrust load A, B-direction (N)	58.8

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1  $\square\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>))





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# **Dimensions**

		Round shaft/ Key way, center tap shaft							
	Motor specifications		without brake		with brake				
	·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal		
	Leadwire type (P65)	P.222		_	P.222		_		

# <Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

# **Specifications**

Special Order

				AC200 V
Motor model *1 IP65				MSMF012L1□□M
		Multi	function type	MADLT05SF
Applicable	Model No.	RS48	5 communication type *2	MADLN05SG
driver	140.	Basic	c type *2	MADLN05SE
	Fram	e sym	bol	A-frame
Power supply	capacit	y	(kVA)	0.5
Rated output			(W)	100
Rated torque			(N·m)	0.32
Continuous sta	all torqu	е	(N·m)	0.32
Momentary Ma	ax. peal	k torqı	ue (N·m)	0.95
Rated current			(A(rms))	1.1
Max. current			(A(o-p))	4.7
Regenerative I	brake		Without option	No limit Note)2
frequency (time	es/min)	Note)1	DV0P4281	No limit Note)2
Rated rotation	al spee	d	(r/min)	3000
Max. rotationa	l speed		(r/min)	6000
Moment of ine	rtia		Without brake	0.048
of rotor (×10 <sup>-4</sup>	kg·m²)		With brake	0.051
Recommender ratio of the loa				30 times or less
Rotary encode	er speci	ficatio	ns <sup>*3</sup>	23-bit Absolute
	Re	solutio	on per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

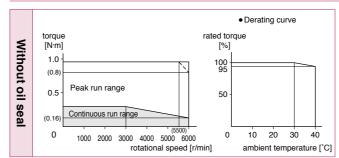
Static friction torque (N·m)	0.294 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.30
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

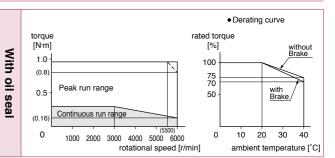
### • Permissible load (For details, refer to P.272)

During assembly	Radial load P-direction (N)	147
	Thrust load A-direction (N)	88.0
accombiy	Thrust load B-direction (N)	117.6
During operation	Radial load P-direction (N)	68.6
	Thrust load A, B-direction (N)	58.8

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





# **Dimensions**

	Round shaft/ Key way, center tap shaft								
Motor specifications		without brake		with brake					
·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal			
Leadwire type (P65)	P.222		_	P.223					

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

· Please contact us for more information.

				AC200 V
Motor model *1		MSMF022L1□□M		
		Multi	function type	MADLT15SF
Applicable	Model No.	RS48	5 communication type *2	MADLN15SG
driver		Basic	type *2	MADLN15SE
	Fram	e sym	bol	A-frame
Power supply	capacit	/	(kVA)	0.5
Rated output			(W)	200
Rated torque			(N·m)	0.64
Continuous sta	all torqu	е	(N·m)	0.64
Momentary Ma	ax. peal	c torqu	ue (N·m)	1.91
Rated current			(A(rms))	1.5
Max. current			(A(o-p))	6.5
Regenerative	brake		Without option	No limit Note)2
frequency (time	es/min)	Note)1	DV0P4283	No limit Note)2
Rated rotation	al spee	d	(r/min)	3000
Max. rotationa	l speed		(r/min)	6000
Moment of ine	rtia		Without brake	0.14
of rotor (×10 <sup>-4</sup>	kg·m²)		With brake	0.17
Recommended moment of ratio of the load and the rote				30 times or less
Rotary encode	er speci	icatio	ns <sup>*3</sup>	23-bit Absolute
	Re	solutio	on per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

Please contact us for more information.

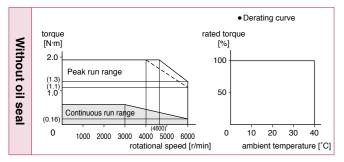
Static friction torque (N·m)	1.27 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

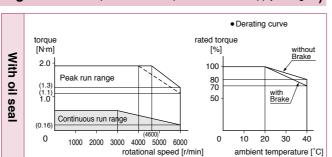
• Permissible load (For details, refer to P.272)

. •		,
	Radial load P-direction (N)	392
During assembly	Thrust load A-direction (N)	147
accombiy	Thrust load B-direction (N)	196
During operation	Radial load P-direction (N)	245
	Thrust load A, B-direction (N)	98.0

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1  $\square\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





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# **Dimensions**

		Round shaft/ Key way, center tap shaft					
	Motor specifications		without brake		with brake		
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal
	Leadwire type (P65)	P.223		_	P.223		_

### <Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

# Special Order

**Specifications** 

				AC200 V	
Motor model*1	IP65		IP65	MSMF042L1 M	
			function type	MBDLT25SF	
Applicable	Model No.	RS48	5 communication type *2	MBDLN25SG	
driver	140.	Basic	type *2	MBDLN25SE	
	Frame	e sym	bol	B-frame	
Power supply	capacit	у	(kVA)	0.9	
Rated output			(W)	400	
Rated torque			(N·m)	1.27	
Continuous sta	Continuous stall torque (I		(N·m)	1.27	
Momentary Ma	ax. peal	k torqu	ue (N·m)	3.82	
Rated current	Rated current (A(rms)		(A(rms))	2.4	
Max. current			(A(o-p))	10.2	
Regenerative	brake		Without option	No limit Note)2	
frequency (time	es/min)	Note)1	DV0P4283	No limit Note)2	
Rated rotation	ational speed (		(r/min)	3000	
Max. rotationa	l speed		(r/min)	6000	
Moment of ine	rtia		Without brake	0.27	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )		With brake	0.30		
Recommended moment of inertia ratio of the load and the rotor Note)3			30 times or less		
Rotary encode	er speci	ficatio	ns <sup>*3</sup>	23-bit Absolute	
	Re	solutio	n per single turn	8388608	

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

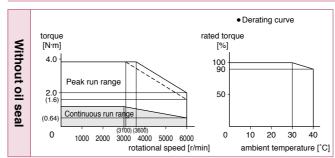
Static friction torque (N·m)	1.27 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

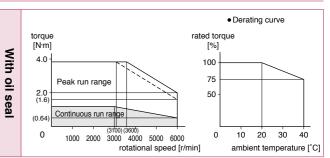
### • Permissible load (For details, refer to P.272)

	Radial load P-direction (N)	392
During assembly	Thrust load A-direction (N)	147
assembly	Thrust load B-direction (N)	196
During	Radial load P-direction (N)	245
operation	Thrust load A, B-direction (N)	98.0

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# 





# **Dimensions**

		R	ound shaft/ Key w	ay, center tap sha	aft	
Motor specifications		without brake				
	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal
Leadwire type (P65)	P.224		_	P.224		_

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<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

A6N Series

A6N Series

Series

Series

### · Please contact us for more information.

# **Specifications**

				AC200 V
Motor model *1	del <sup>-1</sup> IP65		IP65	MSMF082L1□□M
			function type	MCDLT35SF
Applicable	Model No.	RS48	5 communication type *2	MCDLN35SG
driver		Basic	type *2	MCDLN35SE
	Fram	e sym	bol	C-frame
Power supply	capacit	у	(kVA)	1.3
Rated output			(W)	750
Rated torque			(N·m)	2.39
Continuous sta	all torqu	ie	(N·m)	2.39
Momentary Ma	ax. pea	k torqu	ue (N·m)	7.16
Rated current			(A(rms))	4.1
Max. current			(A(o-p))	17.4
Regenerative	brake		Without option	No limit Note)2
frequency (time	es/min)	Note)1	DV0P4283	No limit Note)2
Rated rotation	ed rotational speed		(r/min)	3000
Max. rotationa	l speed	d (r/min)		6000
Moment of ine	rtia		Without brake	0.96
of rotor ( $\times 10^{-4} \text{ kg} \cdot \text{m}^2$ )		With brake	1.06	
	Recommended moment of inertia ratio of the load and the rotor Note)3		20 times or less	
Rotary encode	er speci	ficatio	ns <sup>*3</sup>	23-bit Absolute
	Re	solutio	n per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

Please contact us for more information.

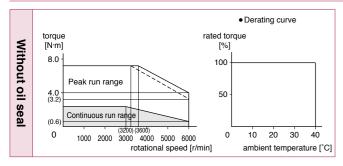
Static friction torque (N·m)	2.45 or more
Engaging time (ms)	70 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.42
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

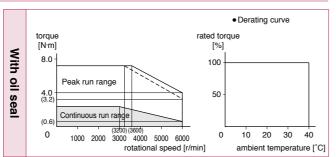
• Permissible load (For details, refer to P.272)

	,	,
	Radial load P-direction (N)	686
During assembly	Thrust load A-direction (N)	294
	Thrust load B-direction (N)	392
During	Radial load P-direction (N)	392
operation	Thrust load A, B-direction (N)	147

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.48.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





# **Dimensions**

		Round shaft/ Key way, center tap shaft					
	Motor specifications		without brake		with brake		
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal
	Leadwire type (P65)	P.224		_	P.225		_

### <Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

# **Specifications**

Special Order

				AC200 V
Motor model *1			IP65	MSMF092L1□□M
Applicable		Multifunction type		MDDLT45SF
	Model No	RS48	5 communication type	MDDLN45SG
driver	INO.	Basic	type *2	MDDLN45SE
	Fram	e sym	bol	D-frame
Power supply	capacit	у	(kVA)	1.8
Rated output			(W)	1000
Rated torque			(N·m)	3.18
Continuous sta	all torqu	ie	(N·m)	3.18
Momentary Ma	ax. pea	k torqı	ue (N·m)	9.55
Rated current			(A(rms))	5.7
Max. current			(A(o-p))	24.2
Regenerative brake		Without option	No limit Note)2	
frequency (time	es/min)	Note)1	DV0P4284	No limit Note)2
Rated rotational speed			(r/min)	3000
Max. rotational speed			(r/min)	6000
Moment of ine			Without brake	1.26
of rotor (×10 <sup>-4</sup>	kg·m²)		With brake	1.36
Recommended moment of ir ratio of the load and the roto				15 times or less
Rotary encode	er specifications *3			23-bit Absolute
	Re	solutio	n per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

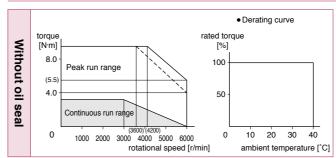
Static friction torque (N·m)	3.80 or more
Engaging time (ms)	70 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.42
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

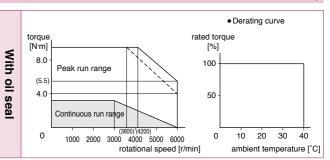
### • Permissible load (For details, refer to P.272)

	Radial load P-direction (N)	686
During assembly	Thrust load A-direction (N)	294
accombiy	Thrust load B-direction (N)	392
During	Radial load P-direction (N)	392
operation	Thrust load A, B-direction (N)	147

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.48.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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# **Dimensions**

	Round shaft/ Key way, center tap shaft						
Motor specifications	without brake			with brake			
·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with oil seal with protective lip/ with oil seal	
Leadwire type (P65)	P.225		_	P.225		_	

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

Please contact us for more information.

· Please contact us for more information

# **Specifications**

				AC200 V
Motor model *1			IP67	MSMF102L1□□M
			function type	MDDLT55SF
Applicable	Model No.	RS48	communication type *2	MDDLN55SG
driver		Basic	type *2	MDDLN55SE
	Fram	e sym	bol	D-frame
Power supply	capacit	у	(kVA)	2.3
Rated output	Rated output			1000
Rated torque			(N·m)	3.18
Continuous sta	all torqu	ıe	(N·m)	3.82
Momentary Max. peak torque			ie (N·m)	9.55
Rated current			(A(rms))	6.6
Max. current			(A(o-p))	28
Regenerative brake			Without option	No limit Note)2
frequency (times/min) Note)1		DV0P4284	No limit Note)2	
Rated rotational speed			(r/min)	3000
Max. rotationa	Max. rotational speed			5000
Moment of ine	rtia		Without brake	2.15
of rotor ( $\times 10^{-4}$	kg·m²)		With brake	2.47
Recommender ratio of the loa				15 times or less
Rotary encode	r speci	ficatio	ns <sup>∗3</sup>	23-bit Absolute
Resolution per single turn				8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

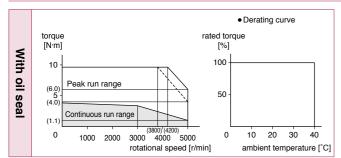
Static friction torque (N·m)	8.0 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.81
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.272)

	,	,
	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
document	Thrust load B-direction (N)	686
During	Radial load P-direction (N)	490
operation	Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.48.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)



# **Dimensions**

		Key way shaft/ Round shaft							
	Motor specifications	without brake			with brake				
	·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	With Oil 6031	with protective lip/ with oil seal		
	Encoder connector Large size (JL10) type		P.2	226	_	P.2	226		

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

# **Specifications**

					AC200 V
Motor model*1		IP67			MSMF152L1□□M
		Multi	function type		MDDLT55SF
Applicable	Model No	RS48	5 communication ty	ype *2	MDDLN55SG
driver	140.	Basic	type *2		MDDLN55SE
	Frame	sym	bol		D-frame
Power supply	capacity	,	(k	(VA)	2.3
Rated output				(W)	1500
Rated torque			1)	√m)	4.77
Continuous sta	all torqu	е	1)	√m)	5.72
Momentary Ma	ax. peak	torqu	ne (1	√m)	14.3
Rated current			(A(rı	ns))	8.2
Max. current			(A(c	p-p))	35
Regenerative I	generative brake		Without option	า	No limit Note)2
frequency (time	s/min) N	Note)1	DV0P4284		No limit Note)2
Rated rotation	al speed	t	(r/ı	min)	3000
Max. rotationa	speed		(r/ı	min)	5000
Moment of ine	Moment of inertia		Without brake	)	3.10
of rotor ( $\times 10^{-4} \text{ kg} \cdot \text{m}^2$ )		With brake		3.45	
Recommended moment of i				lote)3	15 times or less
Rotary encode	r specif	icatio	ns*3		23-bit Absolute
	Res	olutio	n per single tur	n	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

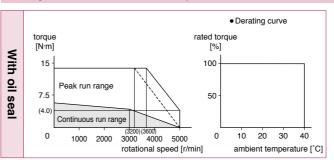
Static friction torque (N·m)	8.0 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.81
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.272)

	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
assembly	Thrust load B-direction (N)	686
During	Radial load P-direction (N)	490
operation	Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.48.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# 



# **Dimensions**

	Key way shaft/ Round shaft					
Motor specifications	without brake			with brake		
	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal
Encoder connector Large size (JL10) type	_	P.226			P.2	227

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<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

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Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

Series

Series

A6N Series

Please contact us for more information.

# **Specifications**

				AC200 V
Motor model *1			IP67	MSMF202L1□□M
		Multi	function type	MEDLT83SF
Applicable	Model No.	RS48	5 communication type *2	MEDLN83SG
driver	INO.	Basic	type *2	MEDLN83SE
	Fram	e sym	bol	E-frame
Power supply	capacit	у	(kVA)	3.8
Rated output			(W)	2000
Rated torque			(N·m)	6.37
Continuous sta	all torqu	ie	(N·m)	7.64
Momentary Ma	ax. pea	k torqı	ue (N·m)	19.1
Rated current			(A(rms))	11.3
Max. current			(A(o-p))	48
Regenerative brake frequency (times/min) Note)1		Without option	No limit Note)2	
		DV0P4285	No limit Note)2	
Rated rotational speed			(r/min)	3000
Max. rotational speed			(r/min)	5000
Moment of ine	rtia		Without brake	4.06
of rotor ( $\times 10^{-4}$	kg·m²)		With brake	4.41
Recommended moment of iner ratio of the load and the rotor				15 times or less
Rotary encode	er speci	ficatio	ns*3	23-bit Absolute
	Re	solutio	n per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

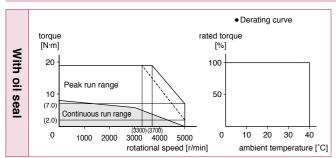
Static friction torque (N·m)	8.0 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.81
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.272)

	•	•
	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
During	Radial load P-direction (N)	490
operation	Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)



# **Dimensions**

	Key way shaft/ Round shaft						
Motor specifications	without brake			with brake			
·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
Encoder connector Large size (JL10) type	_	P.227			P.2	227	

### **<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

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# **Specifications**

				AC200 V
Motor model *1			IP67	MSMF302L1□□M
		Multif	function type	MFDLTA3SF
Applicable	Model No	RS48	communication type *2	MFDLNA3SG
driver		Basic	type *2	MFDLNA3SE
	Frame	sym	bol	F-frame
Power supply	capacity		(kVA)	4.5
Rated output			(W)	3000
Rated torque			(N·m)	9.55
Continuous sta	all torque	)	(N·m)	11.0
Momentary Ma	ax. peak	torqu	ıe (N·m)	28.6
Rated current			(A(rms))	18.1
Max. current			(A(o-p))	77
Regenerative I	orake		Without option	No limit Note)2
frequency (time	s/min) N	ote)1	DV0P4285×2	No limit Note)2
Rated rotation	al speed		(r/min)	3000
Max. rotationa	l speed		(r/min)	5000
Moment of ine	rtia		Without brake	7.04
of rotor ( $\times 10^{-4}$	kg·m²)		With brake	7.38
Recommended moment of inertia ratio of the load and the rotor Note)3			15 times or less	
Rotary encode	r specific	catio	ns*³	23-bit Absolute
	Reso	olutio	n per single turn	8388608

200 V MSMF 3.0 kW [Low inertia 120 mm sq.]

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

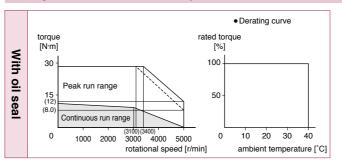
Static friction torque (N·m)	12.0 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.81
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.272)

	•	•
	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
assembly	Thrust load B-direction (N)	686
During operation	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# 



# **Dimensions**

		Key way shaft/ Round shaft						
	Motor specifications	without brake			with brake			
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
	Encoder connector Large size (JL10) type	_	P.228			P.2	228	

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

Panasonic Corporation Electromechanical Control Business Division

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

Series

A6N Series

# **Specifications**

				AC200 V
Motor model *1			IP67	MSMF402L1□□M
			function type	MFDLTB3SF
Applicable	Model No.	RS48	5 communication type *2	MFDLNB3SG
driver		Basic	type *2	MFDLNB3SE
	Fram	e sym	bol	F-frame
Power supply	capacit	у	(kVA)	7.5
Rated output			(W)	4000
Rated torque			(N·m)	12.7
Continuous stall torque			(N·m)	15.2
Momentary Max. peak torque			ue (N·m)	38.2
Rated current			(A(rms))	19.6
Max. current			(A(o-p))	83
Regenerative brake frequency (times/min) Note)1		Without option	No limit Note)2	
		Note)1	DV0P4285×2	No limit Note)2
Rated rotation	al spee	d	(r/min)	3000
Max. rotationa	l speed		(r/min)	4500
Moment of ine	rtia		Without brake	14.4
of rotor ( $\times 10^{-4}$	kg·m²)		With brake	15.6
	Recommended moment of inertia ratio of the load and the rotor			15 times or less
Rotary encode	r speci	ficatio	ns <sup>*3</sup>	23-bit Absolute
	Re	solutio	n per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

Please contact us for more information.

Static friction torque (N·m)	16.2 or more
Engaging time (ms)	110 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.90
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

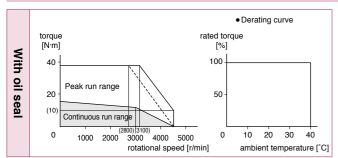
• Permissible load (For details, refer to P.272)

	,	,
During assembly	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
During operation	Radial load P-direction (N)	784
	Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)



# **Dimensions**

		Key way shaft/ Round shaft						
Motor specifications	without brake			with brake				
·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal		
Encoder connector Large size (JL10) type	_	P.228			P.2	229		

**<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

# **Specifications**

					AC200 V
Motor model*1		IP67		IP67	
			function type		MFDLTB3SF
Applicable	Model No.	RS48	5 communication ty	/pe *2	MFDLNB3SG
driver	110.	Basic	type *2		MFDLNB3SE
	Fram	e sym	bol		F-frame
Power supply	capacit	y	(k	VA)	7.5
Rated output			·	(W)	5000
Rated torque		(N·m)			15.9
Continuous sta	all torqu	ie	(1)	l·m)	19.1
Momentary Ma	ax. pea	k torqu	ne (V	l·m)	47.7
Rated current			(A(rn	ns))	24.0
Max. current			(A(o	-p))	102
Regenerative I	Regenerative brake		Without option	1	No limit Note)2
frequency (time	es/min)	Note)1	DV0P4285×2		No limit Note)2
Rated rotation	al spee	d	(r/r	nin)	3000
Max. rotational speed			(r/r	nin)	4500
Moment of ine	rtia		Without brake		19.0
of rotor ( $\times 10^{-4} \text{ kg} \cdot \text{m}^2$ )		With brake		20.2	
Recommender ratio of the loa				ote)3	15 times or less
Rotary encode	r speci	ficatio	ns*3		23-bit Absolute
	Re	solutio	n per single turi	n	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

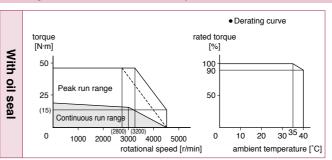
Static friction torque (N·m)	22.0 or more
Engaging time (ms)	110 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.90
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.272)

	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
assembly	Thrust load B-direction (N)	686
During operation	Radial load P-direction (N)	784
	Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# 



# **Dimensions**

	Key way shaft/ Round shaft					
Motor specifications		without brake		with brake		
	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal
Encoder connector Large size (JL10) type	_	P.229		_	P.229	

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

Panasonic Corporation Electromechanical Control Business Division

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

A6N Series

Please contact us for more information.

· Please contact us for more information.

# **Specifications**

				AC200 V
Motor model *1			IP65	MQMF012L1□□M
			function type	MADLT05SF
Applicable	Model No.	RS48	communication type *2	MADLN05SG
driver	140.	Basic	type *2	MADLN05SE
	Fram	e sym	bol	A-frame
Power supply	capacit	у	(kVA)	0.5
Rated output			(W)	100
Rated torque			(N·m)	0.32
Continuous sta	all torqu	0.33		
Momentary Max. peak torque			ie (N·m)	1.11
Rated current			(A(rms))	1.1
Max. current			(A(o-p))	5.5
Regenerative brake		Without option	No limit Note)2	
frequency (time	frequency (times/min) No		DV0P4281	No limit Note)2
Rated rotation	al spee	d	(r/min)	3000
Max. rotationa	l speed		(r/min)	6500
Moment of ine	rtia		Without brake	0.15
of rotor (×10 <sup>-4</sup>	kg·m²)		With brake	0.18
Recommended moment of iner ratio of the load and the rotor				20 times or less
Rotary encode	er speci	ficatio	ns <sup>*3</sup>	23-bit Absolute
	Re	solutio	n per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

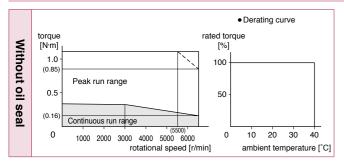
Static friction torque (N·m)	0.39 or more
Engaging time (ms)	15 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.30
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

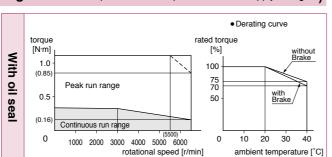
• Permissible load (For details, refer to P.272)

. •		,
	Radial load P-direction (N)	147
During assembly	Thrust load A-direction (N)	88
docombry	Thrust load B-direction (N)	117.6
During	Radial load P-direction (N)	68.6
operation	Thrust load A, B-direction (N)	58.8

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1  $\square\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





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# **Dimensions**

			Round shaft/ Key way, center tap shaft					
	Motor specifications		without brake		with brake			
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
	Leadwire type (P65)	P.230	P.230	P.230	P.231	P.231	P.231	

### <Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

# **Specifications**

Special Order

				AC200 V
Motor model *1			IP65	MQMF022L1□□M
			function type	MADLT15SF
Applicable	Model No	RS48	5 communication type	MADLN15SG
driver	110.	Basic	type *2	MADLN15SE
	Fram	e sym	bol	A-frame
Power supply	capacit	y	(kVA	0.5
Rated output			(W	200
Rated torque			(N·m	0.64
Continuous sta	all torqu	ie	(N·m	0.76
Momentary Ma	ax. pea	k torqı	ue (N·m	2.23
Rated current	Rated current			1.4
Max. current	Max. current			6.9
Regenerative I	Regenerative brake		Without option	No limit Note)2
frequency (time	s/min)	Note)1	DV0P4283	No limit Note)2
Rated rotation	al spee	d	(r/min	3000
Max. rotationa	l speed		(r/min	6500
Moment of ine	rtia		Without brake	0.50
of rotor ( $\times 10^{-4}$	kg·m²)		With brake	0.59
Recommended moment of i ratio of the load and the roto				20 times or less
Rotary encode	r speci	ficatio	ns <sup>∗3</sup>	23-bit Absolute
	Re	solutio	on per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

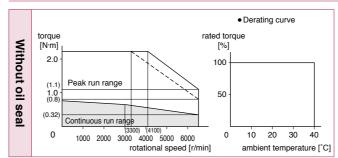
_ •	,
Static friction torque (N·m)	1.6 or more
Engaging time (ms)	70 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

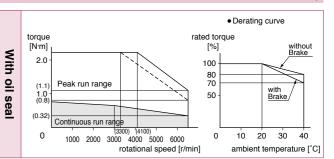
### • Permissible load (For details, refer to P.272)

	Radial load P-direction (N)	392
During assembly	Thrust load A-direction (N)	147
assembly	Thrust load B-direction (N)	196
During operation	Radial load P-direction (N)	245
	Thrust load A, B-direction (N)	98

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





# **Dimensions**

		Round shaft/ Key way, center tap shaft					
	Motor specifications		without brake		with brake		
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal
	Leadwire type (P65)	P.232	P.232	P.232	P.233	P.233	P.233

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<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

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Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

Series

A6 Family

A6N Series

# **Specifications**

		AC200 V		
Motor model *1	odel <sup>-1</sup> IP65			MQMF042L1□□M
			function type	MBDLT25SF
Applicable	Model No	RS48	5 communication type *2	MBDLN25SG
driver	140.	Basic	type *2	MBDLN25SE
	Fram	e sym	bol	B-frame
Power supply	capacit	у	(kVA)	0.9
Rated output			(W)	400
Rated torque			(N·m)	1.27
Continuous stall torque			(N·m)	1.40
Momentary Max. peak torque			ue (N·m)	4.46
Rated current			(A(rms))	2.1
Max. current			(A(o-p))	10.4
Regenerative brake frequency (times/min) Note)1			Without option	No limit Note)2
		Note)1	DV0P4283	No limit Note)2
Rated rotational speed			(r/min)	3000
Max. rotationa	l speed		(r/min)	6500
Moment of ine	rtia		Without brake	0.98
of rotor ( $\times 10^{-4}$	kg·m²)		With brake	1.06
	Recommended moment of inertratio of the load and the rotor			20 times or less
Rotary encode	er speci	ficatio	ns*³	23-bit Absolute
	Re	solutio	n per single turn	8388608

### • Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

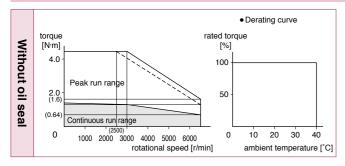
Static friction torque (N·m)	1.6 or more
Engaging time (ms)	70 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

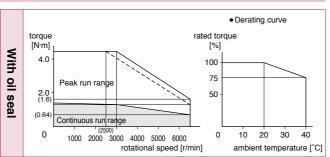
### • Permissible load (For details, refer to P.272)

. •		,
	Radial load P-direction (N)	392
During assembly	Thrust load A-direction (N)	147
document	Thrust load B-direction (N)	196
During	Radial load P-direction (N)	245
operation	Thrust load A, B-direction (N)	98

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1  $\square\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





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# **Dimensions**

N		Round shaft/ Key way, center tap shaft							
	Motor specifications		without brake			with brake	with protective lip with oil seal P.235		
	·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal			
	Leadwire type (P65)	P.234	P.234	P.234	P.235	P.235	P.235		

### <Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

# **Specifications**

Special Order

					AC200 V
Motor model *1		IP65			MHMF5AZL1 M
			function type		MADLT05SF
Applicable	Model No	RS48	5 communication type	) *2	MADLN05SG
driver	140.	Basic	c type *2		MADLN05SE
	Fram	e sym	bol		A-frame
Power supply	capacit	у	(kVA	۹)	0.5
Rated output			(V	V)	50
Rated torque			(N·n	n)	0.16
Continuous stall torque			(N·n	n)	0.18
Momentary Ma	ax. pea	k torqı	ue (N·m	n)	0.56
Rated current			(A(rms	((	1.1
Max. current			(A(o-p	))	5.5
Regenerative	brake		Without option		No limit Note)2
frequency (time	es/min)	Note)1	DV0P4281		No limit Note)2
Rated rotation	al spee	d	(r/mir	n)	3000
Max. rotationa	l speed		(r/mir	n)	6500
Moment of ine	rtia		Without brake		0.038
of rotor ( $\times 10^{-4} \text{ kg} \cdot \text{m}^2$ )		With brake		0.042	
Recommended moment of in ratio of the load and the roto				9)3	30 times or less
Rotary encode	r speci	ficatio	ns*3		23-bit Absolute
	Re	solutio	n per single turn		8388608

### • Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

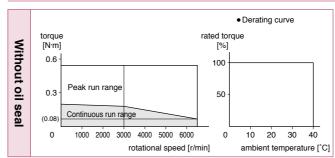
Static friction torque (N·m)	0.38 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.30
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

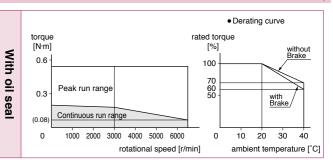
### • Permissible load (For details, refer to P.272)

	Radial load P-direction (N)	147
During assembly	Thrust load A-direction (N)	88
accombiy	Thrust load B-direction (N)	117.6
During	Radial load P-direction (N)	68.6
operation	Thrust load A, B-direction (N)	49

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





# **Dimensions**

			R	ound shaft/ Key w	ay, center tap sha	aft	with protective lip	
	Motor specifications		without brake		with brake			
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
	Leadwire type (P65)	P.236	P.236	P.236	P.237	P.237	P.237	

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

Series

A6 Family

A6N Series

# **Specifications**

				AC200 V
Motor model *1		MHMF012L1 M		
		Multi	function type	MADLT05SF
Applicable	Model No.	RS48	communication type *2	MADLN05SG
driver	110.	Basic	type *2	MADLN05SE
	Fram	e sym	bol	A-frame
Power supply	capacit	у	(kVA)	0.5
Rated output			(W)	100
Rated torque			(N·m)	0.32
Continuous sta	all torqu	ie	(N·m)	0.33
Momentary Ma	ax. pea	k torqu	ıe (N⋅m)	1.11
Rated current			(A(rms))	1.1
Max. current			(A(o-p))	5.5
Regenerative	Regenerative brake		Without option	No limit Note)2
frequency (time	s/min)	Note)1	DV0P4281	No limit Note)2
Rated rotation	al spee	d	(r/min)	3000
Max. rotationa	l speed		(r/min)	6500
Moment of ine	rtia		Without brake	0.071
of rotor (×10 <sup>-4</sup>	kg·m²)		With brake	0.074
Recommender ratio of the loa				30 times or less
Rotary encode	r speci	ficatio	ns <sup>∗3</sup>	23-bit Absolute
	Re	solutio	n per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

Please contact us for more information.

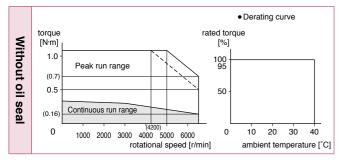
•	•
Static friction torque (N·m)	0.38 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.30
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

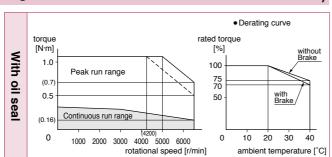
### • Permissible load (For details, refer to P.272)

	. •		,
		Radial load P-direction (N)	147
	During assembly	Thrust load A-direction (N)	88
	assembly	Thrust load B-direction (N)	117.6
	During operation	Radial load P-direction (N)	68.6
		Thrust load A, B-direction (N)	58.8

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1  $\square\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





# **Dimensions**

			R	ound shaft/ Key w	naft/ Key way, center tap shaft			
Motor specifications	without brake			with brake				
	·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
	Leadwire type (P65)	P.238	P.238	P.238	P.239	P.239	P.239	

# <Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

# **Specifications**

Special Order

					AC200 V
Motor model*1	IP65				MHMF022L1
		Multi	function type		MADLT15SF
Applicable	Model No	RS48	5 communication	type *2	MADLN15SG
driver	140.	Basic	type *2		MADLN15SE
	Frame	sym	bol		A-frame
Power supply	capacity	/		(kVA)	0.5
Rated output				(W)	200
Rated torque				(N·m)	0.64
Continuous sta	е		(N·m)	0.76	
Momentary Ma	ax. peak	torqu	ıe	(N·m)	2.23
Rated current			(A(	rms))	1.4
Max. current			(A	(o-p))	6.9
Regenerative I	orake		Without option	on	No limit Note)2
frequency (time	s/min) N	Note)1	DV0P4283		No limit Note)2
Rated rotation	al speed	t	(1	r/min)	3000
Max. rotationa	l speed		(1	r/min)	6500
Moment of ine	rtia		Without brak	е	0.29
of rotor ( $\times 10^{-4} \text{ kg} \cdot \text{m}^2$ )		With brake		0.31	
Recommended moment of i ratio of the load and the roto				Note)3	30 times or less
Rotary encode	r specif	icatio	ns*3		23-bit Absolute
	Res	olutio	n per single tu	ırn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

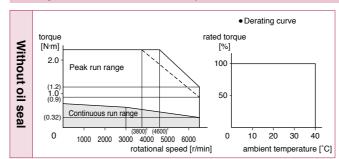
Static friction torque (N·m)	1.6 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

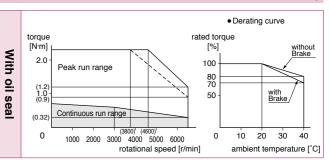
### • Permissible load (For details, refer to P.272)

	Radial load P-direction (N)	392
During assembly	Thrust load A-direction (N)	147
accombiy	Thrust load B-direction (N)	196
During operation	Radial load P-direction (N)	245
	Thrust load A, B-direction (N)	98

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





# **Dimensions**

		Round shaft/ Key way, center tap shaft						
	Motor specifications	without brake			with brake			
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
	Leadwire type (P65)	P.240	P.240	P.240	P.241	P.241	P.241	

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<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

A6N Series

### · Please contact us for more information.

# **Specifications**

				AC200 V
Motor model *1			IP65	MHMF042L1□□M
			function type	MBDLT25SF
Applicable	Model No	RS48	5 communication type *2	MBDLN25SG
driver	140.	Basic	type *2	MBDLN25SE
	Fram	e sym	bol	B-frame
Power supply	capacit	у	(kVA)	0.9
Rated output			(W)	400
Rated torque			(N·m)	1.27
Continuous sta	all torqu	ie	(N·m)	1.40
Momentary Ma	ax. pea	k torqu	ue (N·m)	4.46
Rated current			(A(rms))	2.1
Max. current			(A(o-p))	10.4
Regenerative brake frequency (times/min) Note)1		Without option	No limit Note)2	
		Note)1	DV0P4283	No limit Note)2
Rated rotational speed			(r/min)	3000
Max. rotationa	l speed		(r/min)	6500
Moment of ine	rtia		Without brake	0.56
of rotor (×10 <sup>-4</sup>	kg·m²)		With brake	0.58
	Recommended moment of i ratio of the load and the roto			30 times or less
Rotary encode	er speci	ficatio	ns*3	23-bit Absolute
	Re	solutic	n per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

Please contact us for more information.

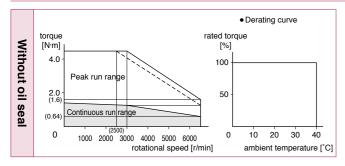
Static friction torque (N·m)	1.6 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

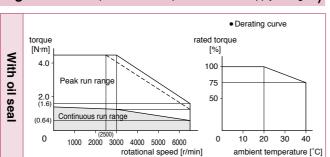
• Permissible load (For details, refer to P.272)

	,	,
	Radial load P-direction (N)	392
During assembly	Thrust load A-direction (N)	147
assembly	Thrust load B-direction (N)	196
During operation	Radial load P-direction (N)	245
	Thrust load A, B-direction (N)	98

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.47.
- \*1  $\square\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





# **Dimensions**

		Round shaft/ Key way, center tap shaft						
	Motor specifications	without brake			with brake			
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
	Leadwire type (P65)	P.242	P.242	P.242	P.243	P.243	P.243	

### <Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

# **Specifications**

Special Order

				AC200 V
Motor model *1			IP65	MHMF082L1 M
Applicable			function type	MCDLT35SF
	Model No	RS48	5 communication type	MCDLN35SG
driver	140.	Basic	type *2	MCDLN35SE
	Fram	e sym	bol	C-frame
Power supply	capacit	у	(kVA)	1.3
Rated output			(W)	750
Rated torque	Rated torque			2.39
Continuous sta	all torqu	ie	(N·m)	2.86
Momentary Ma	ax. peal	k torqı	ue (N·m)	8.36
Rated current			(A(rms))	3.8
Max. current			(A(o-p))	18.8
Regenerative	Regenerative brake		Without option	No limit Note)2
frequency (time	es/min)	Note)1	DV0P4283	No limit Note)2
Rated rotation	al spee	d	(r/min)	3000
Max. rotationa	. rotational speed		(r/min)	6000
Moment of ine	rtia		Without brake	1.56
of rotor (×10 $^{-4}$ kg·m $^2$ )			With brake	1.66
Recommender ratio of the loa				20 times or less
Rotary encode	er speci	ficatio	ns*3	23-bit Absolute
	Re	solutio	n per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

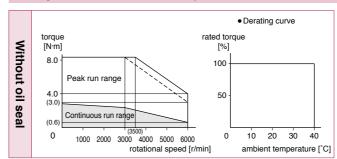
Static friction torque (N·m)	3.8 or more
Engaging time (ms)	70 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.42
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

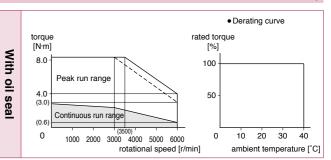
### • Permissible load (For details, refer to P.272)

	Radial load P-direction (N)	686
During assembly	Thrust load A-direction (N)	294
assembly	Thrust load B-direction (N)	392
During	Radial load P-direction (N)	392
operation	Thrust load A, B-direction (N)	147

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.48.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





# **Dimensions**

			R	ound shaft/ Key w	ay, center tap sha	aft	
	Motor specifications	without brake			with brake		
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal
	Leadwire type (P65)	P.244	P.244	P.244	P.245	P.245	P.245

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<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

Series

A6N Series

Please contact us for more information.

# **Specifications**

		AC200 V		
Motor model *1 IP65		IP65	MHMF092L1 M	
			function type	MDDLT55SF
Applicable	Model No	RS48	5 communication type *2	MDDLN55SG
driver	140.	Basic	type *2	MDDLN55SE
	Fram	e sym	bol	D-frame
Power supply	capacit	y	(kVA)	2.3
Rated output			(W)	1000
Rated torque			(N·m)	3.18
Continuous sta	all torqu	ie	(N·m)	3.34
Momentary Ma	Momentary Max. peak torque			11.1
Rated current			(A(rms))	5.7
Max. current			(A(o-p))	28.2
Regenerative brake			Without option	No limit Note)2
frequency (times/min) Note)1		DV0P4284	No limit Note)2	
Rated rotational speed			(r/min)	3000
Max. rotational speed			(r/min)	6000
Moment of ine	rtia		Without brake	2.03
of rotor ( $\times 10^{-4}$	kg·m²)		With brake	2.13
	d moment of inertia d and the rotor Note)3			15 times or less
Rotary encode	Rotary encoder specifications *3			23-bit Absolute
	Re	solutio	n per single turn	8388608

### • Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

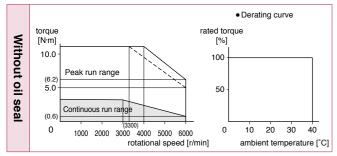
Static friction torque (N·m)	3.8 or more
Engaging time (ms)	70 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.42
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

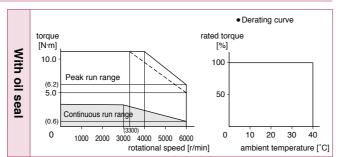
### • Permissible load (For details, refer to P.272)

	,	,
	Radial load P-direction (N)	686
During assembly	Thrust load A-direction (N)	294
document	Thrust load B-direction (N)	392
During operation	Radial load P-direction (N)	392
	Thrust load A, B-direction (N)	147

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.48.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





# **Dimensions**

		Round shaft/ Key way, center tap shaft						
	Motor specifications	without brake			with brake			
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
	Leadwire type (P65)	P.246	P.246	P.246	P.247	P.247	P.247	

### <Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

# **Specifications**

Special Order

				AC200 V
Motor model *1			IP67	MHMF102L1 M
	Multif		function type	MDDLT45SF
Applicable	Model No	RS48	communication type	MDDLN45SG
driver	INO.	Basic	type *2	MDDLN45SE
	Frame	sym	bol	D-frame
Power supply	capacity	/	(kVA	1.8
Rated output			(W	1000
Rated torque			(N·m	4.77
Continuous stall torque			(N·m	5.25
Momentary Max. peak torque			ıe (N⋅m	14.3
Rated current			(A(rms)	5.2
Max. current			(A(o-p)	22
Regenerative I	orake		Without option	No limit Note)2
frequency (time	s/min) 1	Note)1	DV0P4284	No limit Note)2
Rated rotation	al speed	b	(r/min	2000
Max. rotationa	speed		(r/min	3000
Moment of ine	rtia		Without brake	22.9
of rotor ( $\times 10^{-4} \text{ kg} \cdot \text{m}^2$ )		With brake	24.1	
Recommended moment of inertia ratio of the load and the rotor			5 times or less	
Rotary encode	r specif	icatio	ns*3	23-bit Absolute
	Res	solutio	n per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

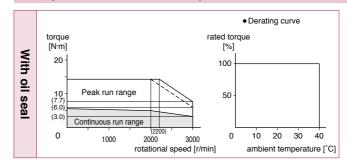
Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

### • Permissible load (For details, refer to P.272)

	•	•
During assembly During operation	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.48.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)



# **Dimensions**

		Key way shaft/ Round shaft					
	Motor specifications	without brake			with brake		
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal
	Encoder connector Large size (JL10) type	_	P.248		_	P.2	248

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<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

Series

# **Specifications**

				AC200 V
Motor model *1			IP67	MHMF152L1□□M
		Multi	function type	MDDLT55SF
Applicable	Model No	RS48	5 communication type *2	MDDLN55SG
driver	110.	Basic	type *2	MDDLN55SE
	Fram	e sym	bol	D-frame
Power supply	capacit	у	(kVA)	2.3
Rated output			(W)	1500
Rated torque			(N·m)	7.16
Continuous sta	all torqu	ie	(N·m)	7.52
Momentary Ma	ax. pea	k torqu	ue (N·m)	21.5
Rated current			(A(rms))	8.0
Max. current			(A(o-p))	34
Regenerative	brake		Without option	No limit Note)2
frequency (time	s/min)	Note)1	DV0P4284	No limit Note)2
Rated rotation	al spee	d	(r/min)	2000
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	33.4
of rotor ( $\times 10^{-4} \text{ kg} \cdot \text{m}^2$ )		With brake	34.6	
Recommended moment of i ratio of the load and the roto				5 times or less
Rotary encode	r speci	ficatio	ns <sup>*3</sup>	23-bit Absolute
	Re	solutio	n per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

Please contact us for more information.

Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

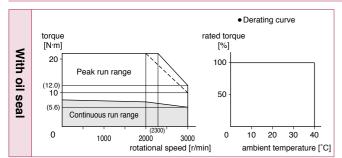
### • Permissible load (For details, refer to P.272)

	Fermissible load (For details, felor to 1.272)						
		Radial load P-direction (N)	980				
- 1	During assembly	Thrust load A-direction (N)	588				
		Thrust load B-direction (N)	686				
	During	Radial load P-direction (N)	490				
	operation	Thrust load A, B-direction (N)	196				

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.48.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)



# **Dimensions**

		Key way shaft/ Round shaft					
	Motor specifications	without brake			with brake		
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal
	Encoder connector Large size (JL10) type	_	P.2	248	_	P.2	249

### **<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

# **Specifications**

				AC200 V
Motor model*1			IP67	MHMF202L1 M
		Multi	function type	MEDLT83SF
Applicable	Model No	RS48	communication type *2	MEDLN83SG
driver	140.	Basic	type *2	MEDLN83SE
	Frame	sym	bol	E-frame
Power supply	capacity	/	(kVA)	3.8
Rated output			(W)	2000
Rated torque			(N·m)	9.55
Continuous stall torque			(N·m)	11.5
Momentary Max. peak torqu			ie (N·m)	28.6
Rated current			(A(rms))	12.5
Max. current			(A(o-p))	53
Regenerative I	brake		Without option	No limit Note)2
frequency (time	es/min) I	Note)1	DV0P4285	No limit Note)2
Rated rotation	al speed	b	(r/min)	2000
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	55.7
of rotor ( $\times 10^{-4} \text{ kg} \cdot \text{m}^2$ )		With brake	61.0	
Recommended moment of inertia ratio of the load and the rotor				5 times or less
Rotary encode	r specif	icatio	ns <sup>*3</sup>	23-bit Absolute
	Res	solutio	n per single turn	8388608

200 V MHMF 2.0 kW [High inertia 176 mm sq.]

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

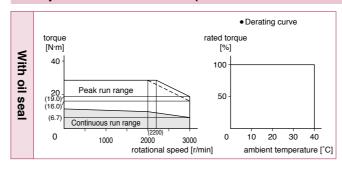
Static friction torque (N·m)	25.0 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.29
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.272)

	Radial load P-direction (N)	1666
During assembly	Thrust load A-direction (N)	784
accombiy	Thrust load B-direction (N)	980
During	Radial load P-direction (N)	784
operation	Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# 



# **Dimensions**

				Key way shaft	t/ Round shaft		
	Motor specifications	without brake			with brake		
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal
	Encoder connector Large size (JL10) type	_	P.249		_	P.2	249

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<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

Panasonic Corporation Electromechanical Control Business Division

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

Series

A6N Series

Please contact us for more information.

# **Specifications**

		AC200 V		
Motor model *1	Notor model *1 IP67		MHMF302L1□□M	
			function type	MFDLTA3SF
Applicable	Model No	RS48	5 communication type *2	MFDLNA3SG
driver	140.	Basic	type *2	MFDLNA3SE
	Fram	e sym	bol	F-frame
Power supply	capacit	у	(kVA)	4.5
Rated output			(W)	3000
Rated torque			(N·m)	14.3
Continuous sta	all torqu	ie	(N·m)	17.2
Momentary Ma	ax. pea	k torqu	ue (N·m)	43.0
Rated current			(A(rms))	17.0
Max. current			(A(o-p))	72
Regenerative brake frequency (times/min) Note)1		Without option	No limit Note)2	
		Note)1	DV0P4285×2	No limit Note)2
Rated rotational speed			(r/min)	2000
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	85.3
of rotor ( $\times 10^{-4}$	kg·m²)		With brake	90.7
Recommended moment of inerti ratio of the load and the rotor				5 times or less
Rotary encode	er speci	ficatio	ns <sup>*3</sup>	23-bit Absolute
	Re	solutio	n per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

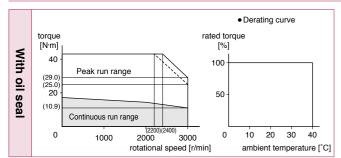
Static friction torque (N·m)	25.0 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.29
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.272)

	Radial load P-direction (N)	1666
During assembly	Thrust load A-direction (N)	784
assembly	Thrust load B-direction (N)	980
During	Radial load P-direction (N)	784
operation	Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)



# **Dimensions**

	Key way shaft/ Round shaft						
Motor specifications	without brake			with brake			
	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
Encoder connector Large size (JL10) type	_	P.250		_	P.2	250	

### **<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

**200 V MHMF 4.0 kW** [High inertia 176 mm sq.]

# **Specifications**

				AC200 V
Motor model*1			IP67	MHMF402L1 M
		Multi	function type	MFDLTB3SF
Applicable	Model No	RS48	5 communication type *2	MFDLNB3SG
driver	140.	Basic	type *2	MFDLNB3SE
	Frame	sym	bol	F-frame
Power supply	capacity	,	(kVA)	7.5
Rated output		4000		
Rated torque		(N·m)	19.1	
Continuous sta	all torqu	(N·m)	22.0	
Momentary Ma	ax. peak	torqu	ue (N·m)	57.3
Rated current			(A(rms))	20
Max. current			(A(o-p))	85
Regenerative I	brake		Without option	No limit Note)2
frequency (time	s/min) N	lote)1	DV0P4285×2	No limit Note)2
Rated rotation	al speed	d	(r/min)	2000
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	104
of rotor ( $\times 10^{-4} \text{ kg} \cdot \text{m}^2$ )		With brake	110	
Recommender ratio of the loa				5 times or less
Rotary encode	r specif	icatio	ns <sup>*3</sup>	23-bit Absolute
	Res	olutio	n per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

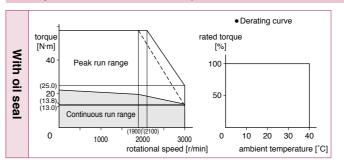
Static friction torque (N·m)	25.0 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.29
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.272)

	Radial load P-direction (N)	1666
During assembly	Thrust load A-direction (N)	784
accombiy	Thrust load B-direction (N)	980
During	Radial load P-direction (N)	784
operation	Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# 



# **Dimensions**

			Key way shaft	t/ Round shaft		
Motor specifications	without brake			with brake		
	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal
Encoder connector Large size (JL10) type	_	P.250		_	P.2	251

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<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

Series

A6N Series

# **Specifications**

				AC200 V
Motor model *1	lel <sup>*1</sup> IP67			MHMF502L1 M
			function type	MFDLTB3SF
Applicable	Model No.	RS48	5 communication type *2	MFDLNB3SG
driver	140.	Basic	type *2	MFDLNB3SE
	Fram	e sym	bol	F-frame
Power supply	capacit	у	(kVA)	7.5
Rated output			(W)	5000
Rated torque			(N·m)	23.9
Continuous sta	all torqu	ie	(N·m)	26.3
Momentary Ma	ax. pea	k torqı	ue (N·m)	71.6
Rated current			(A(rms))	23.3
Max. current			(A(o-p))	99
Regenerative brake			Without option	No limit Note)2
frequency (times/min) Note)1		DV0P4285×2	No limit Note)2	
Rated rotation	al spee	d	(r/min)	2000
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	146
of rotor ( $\times 10^{-4}$	kg·m²)		With brake	151
Recommended moment of incretio of the load and the rotor				5 times or less
Rotary encode	r speci	ficatio	ns*³	23-bit Absolute
	Re	solutio	n per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

Please contact us for more information.

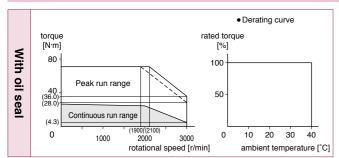
Static friction torque (N·m)	44.1 or more
Engaging time (ms)	150 or less
Releasing time (ms) Note)4	30 or less
Exciting current (DC) (A)	1.29
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.272)

	,	,
	Radial load P-direction (N)	1666
During assembly	Thrust load A-direction (N)	784
document	Thrust load B-direction (N)	980
During	Radial load P-direction (N)	784
operation	Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)



# **Dimensions**

	Motor specifications	Key way shaft/ Round shaft						
		without brake			with brake			
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
	Encoder connector Large size (JL10) type		P.2	251	_	P.2	251	

**<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

# **Specifications**

				AC200 V
Motor model *1			IP67	MDMF102L1 M
			function type	MDDLT45SF
Applicable	Model No	RS48	5 communication type *2	MDDLN45SG
driver	140.	Basic	c type *2	MDDLN45SE
	Fram	e sym	bol	D-frame
Power supply	capacit	у	(kVA)	1.8
Rated output			(W)	1000
Rated torque	Rated torque			4.77
Continuous sta	all torqu	ie	(N·m)	5.25
Momentary Ma	ax. pea	k torqı	ue (N·m)	14.3
Rated current			(A(rms))	5.2
Max. current			(A(o-p))	22
Regenerative brake			Without option	No limit Note)2
frequency (time	requency (times/min)		DV0P4284	No limit Note)2
Rated rotation	Rated rotational speed		(r/min)	2000
Max. rotationa	ax. rotational speed		(r/min)	3000
Moment of ine	rtia		Without brake	6.18
of rotor ( $\times 10^{-4}$	kg·m²)		With brake	7.40
Recommended moment of ir ratio of the load and the roto				10 times or less
Rotary encode	er speci	ficatio	ns*3	23-bit Absolute
	Re	solutio	on per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

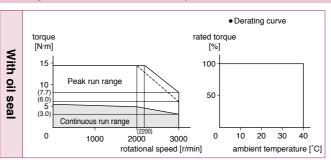
Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.272)

	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
assembly	Thrust load B-direction (N)	686
During	Radial load P-direction (N)	490
operation	Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.48.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# 



# **Dimensions**

		Key way shaft/ Round shaft					
	Motor specifications	without brake			with brake		
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal
	Encoder connector Large size (JL10) type	_	P.252		_	P.2	252

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

A6N Series

Please contact us for more information.

# **Specifications**

				AC200 V
Motor model *1			IP67	MDMF152L1□□M
			function type	MDDLT55SF
Applicable	Model No	RS48	5 communication type *2	MDDLN55SG
driver	140.	Basic	type *2	MDDLN55SE
	Fram	e sym	bol	D-frame
Power supply	capacit	у	(kVA)	2.3
Rated output			(W)	1500
Rated torque			(N·m)	7.16
Continuous sta	all torqu	ie	(N·m)	7.52
Momentary Ma	ax. pea	k torqu	ue (N·m)	21.5
Rated current			(A(rms))	8.0
Max. current			(A(o-p))	34
Regenerative	Regenerative brake frequency (times/min) Note)1		Without option	No limit Note)2
frequency (time			DV0P4284	No limit Note)2
Rated rotation	al spee	d	(r/min)	2000
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	9.16
of rotor ( $\times 10^{-4} \text{ kg} \cdot \text{m}^2$ )		With brake	10.4	
	Recommended moment of inertia ratio of the load and the rotor			10 times or less
Rotary encode	er speci	ficatio	ns*3	23-bit Absolute
	Re	solutic	on per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

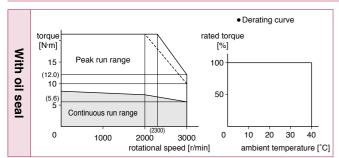
Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.272)

	,	,
	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
document	Thrust load B-direction (N)	686
During	Radial load P-direction (N)	490
operation	Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.48.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)



# **Dimensions**

	Key way shaft/ Round shaft						
Motor specifications	without brake			with brake			
	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
Encoder connector Large size (JL10) type	_	P.2	252	_	P.2	253	

### **<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

# **Specifications**

				AC200 V
Motor model *1			IP67	MDMF202L1 M
Applicable driver			function type	MEDLT83SF
	Model No	RS48	5 communication type *2	MEDLN83SG
	140.	Basic	type *2	MEDLN83SE
	Fram	e sym	bol	E-frame
Power supply	capacit	у	(kVA)	3.8
Rated output			(W)	2000
Rated torque			(N·m)	9.55
Continuous sta	all torqu	ie	(N·m)	10.0
Momentary Ma	ax. pea	k torqı	ue (N·m)	28.6
Rated current			(A(rms))	9.9
Max. current			(A(o-p))	42
Regenerative brake		Without option	No limit Note)2	
frequency (time	es/min)	Note)1	DV0P4285	No limit Note)2
Rated rotation	al spee	d	(r/min)	2000
Max. rotationa	l speed		(r/min)	3000
Moment of ine			Without brake	12.1
of rotor (×10 <sup>-4</sup>	kg·m²)		With brake	13.3
Recommended moment of i ratio of the load and the roto				10 times or less
Rotary encode	r speci	ficatio	ns <sup>*3</sup>	23-bit Absolute
	Re	solutio	n per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

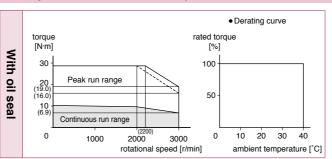
Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.272)

	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
accombiy	Thrust load B-direction (N)	686
During	Radial load P-direction (N)	490
operation	Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# 



# **Dimensions**

	Motor specifications	Key way shaft/ Round shaft					
		without brake			with brake		
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal
	Encoder connector Large size (JL10) type	_	P.253		_	P.253	

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<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

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Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

Series

A6N Series

Please contact us for more information.

### · Please contact us for more information.

# **Specifications**

				AC200 V
Motor model *1			IP67	MDMF302L1 M
		Multifunction type		MFDLTA3SF
Applicable	Model No.	RS48	communication type *2	MFDLNA3SG
driver		Basic	type *2	MFDLNA3SE
	Fram	e sym	bol	F-frame
Power supply	capacit	y	(kVA)	4.5
Rated output	Rated output			3000
Rated torque			(N·m)	14.3
Continuous sta	all torqu	ie	(N·m)	15.0
Momentary Max. peak torque			ıe (N·m)	43.0
Rated current			(A(rms))	16.4
Max. current			(A(o-p))	70
Regenerative brake			Without option	No limit Note)2
frequency (times/min) Note)1		DV0P4285×2	No limit Note)2	
Rated rotational speed			(r/min)	2000
Max. rotational speed			(r/min)	3000
Moment of ine	rtia		Without brake	18.6
of rotor ( $\times 10^{-4}$	of rotor ( $\times 10^{-4} \text{ kg} \cdot \text{m}^2$ )		With brake	19.6
Recommender ratio of the loa				10 times or less
Rotary encode	er speci	ficatio	ns <sup>∗3</sup>	23-bit Absolute
Resolution per single turn				8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

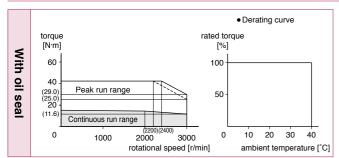
Static friction torque (N·m)	22.0 or more		
Engaging time (ms)	110 or less		
Releasing time (ms) Note)4	50 or less		
Exciting current (DC) (A)	0.90		
Releasing voltage (DC) (V)	2 or more		
Exciting voltage (DC) (V)	24±2.4		

• Permissible load (For details, refer to P.272)

	,	,
	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
During	Radial load P-direction (N)	784
operation	Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)



# **Dimensions**

	Motor specifications	Key way shaft/ Round shaft						
		without brake			with brake			
	·	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
	Encoder connector Large size (JL10) type	_	P.254			P.254		

### **<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

# **Specifications**

					AC200 V	
Motor model*1		IP67			MDMF402L1 M	
Mul		Multi	tifunction type		MFDLTB3SF	
Applicable	Model No	RS48	communication typ	MFDLNB3SG		
driver			asic type *2		MFDLNB3SE	
	Frame	ne symbol			F-frame	
Power supply	capacity	/	(kV	/A)	7.5	
Rated output			(1	W)	4000	
Rated torque			(N·	m)	19.1	
Continuous stall torque  Momentary Max. peak torque			()		22.0	
					57.3	
Rated current			(A(rm	s))	20.0	
Max. current		(A(o-p))		85		
Regenerative I	orake		Without option		No limit Note)2	
frequency (time	s/min) 1	Note)1	DV0P4285×2		No limit Note)2	
Rated rotation	al speed	t	(r/m	in)	2000	
Max. rotationa	l speed		(r/min)		3000	
Moment of ine	tia		Without brake		46.9	
of rotor ( $\times 10^{-4}$	kg·m²)		With brake		52.3	
Recommended moment of in ratio of the load and the rotor Rotary encoder specifications  Resolution					10 times or less	
			ns*³		23-bit Absolute	
			n per single turn		8388608	

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

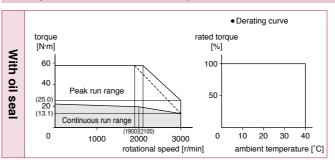
Static friction torque (N·m)	25.0 or more		
Engaging time (ms)	80 or less		
Releasing time (ms) Note)4	25 or less		
Exciting current (DC) (A)	1.29		
Releasing voltage (DC) (V)	2 or more		
Exciting voltage (DC) (V)	24±2.4		

• Permissible load (For details, refer to P.272)

	Radial load P-direction (N)	1666
During assembly	Thrust load A-direction (N)	784
	Thrust load B-direction (N)	980
During	Radial load P-direction (N)	784
operation	9	343

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

# 



# **Dimensions**

	Motor specifications	Key way shaft/ Round shaft						
		without brake			with brake			
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
	Encoder connector Large size (JL10) type	_	P.254		_	P.255		

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<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

Series

A6N Series

#### **Specifications**

				AC200 V
Motor model *1	or model *1 IP67			MDMF502L1□□M
		Multi	function type	MFDLTB3SF
Applicable	Model No	RS48	5 communication type *2	MFDLNB3SG
driver	140.	Basic	type *2	MFDLNB3SE
	Fram	e sym	bol	F-frame
Power supply	capacit	у	(kVA)	7.5
Rated output			(W)	5000
Rated torque			(N·m)	23.9
Continuous sta	all torqu	ie	(N·m)	26.3
Momentary Ma	ax. pea	k torqı	ue (N·m)	71.6
Rated current			(A(rms))	23.3
Max. current			(A(o-p))	99
Regenerative	brake		Without option	No limit Note)2
frequency (time	es/min)	Note)1	DV0P4285×2	No limit Note)2
Rated rotation	al spee	d	(r/min)	2000
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	58.2
of rotor ( $\times 10^{-4} \text{ kg} \cdot \text{m}^2$ )		With brake	63.0	
Recommended moment of irratio of the load and the rote				10 times or less
Rotary encode	er speci	ficatio	ns <sup>∗3</sup>	23-bit Absolute
Resolutio			n per single turn	8388608

#### • Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

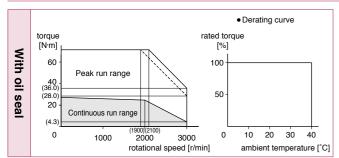
Static friction torque (N·m)	44.1 or more
Engaging time (ms)	150 or less
Releasing time (ms) Note)4	30 or less
Exciting current (DC) (A)	1.29
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

#### • Permissible load (For details, refer to P.272)

		,	,
	During assembly  During operation	Radial load P-direction (N)	1666
		Thrust load A-direction (N)	784
		Thrust load B-direction (N)	980
		Radial load P-direction (N)	784
		Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)



#### **Dimensions**

	Key way shaft/ Round shaft							
	Motor specifications		without brake		with brake			
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
	Encoder connector Large size (JL10) type	_	P.255			P.255		

#### **<Cautions>** Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

## **Specifications**

Special Order

					AC200 V	
Motor model*1		IP67			MGMF092L1□□M	
		Multi	function type		MDDLT45SF	
Applicable	Model No	RS48	communication type	*2	MDDLN45SG	
driver	INO.	Basic	type *2		MDDLN45SE	
	Frame	sym	bol		D-frame	
Power supply	capacity	,	(kVA	١)	1.8	
Rated output			(V)	/)	850	
Rated torque			(N·m	1)	5.41	
Continuous stall torque			(N·m	1)	5.41	
Momentary Ma	ax. peak	torqu	ıe (N⋅m	(N·m) 14.3		
Rated current			(A(rms)	))	5.9	
Max. current			(A(o-p))		22	
Regenerative I	orake		Without option		No limit Note)2	
frequency (time	s/min) 1	Note)1	DV0P4284		No limit Note)2	
Rated rotation	al speed	t	(r/mir	1)	1500	
Max. rotationa	speed		(r/mir	1)	3000	
Moment of ine	rtia		Without brake		6.18	
of rotor ( $\times 10^{-4} \text{ kg} \cdot \text{m}^2$ )		With brake		7.40		
Recommended moment of i ratio of the load and the roto				)3	10 times or less	
Rotary encode	r specif	icatio	ns <sup>*3</sup>		23-bit Absolute	
	Res	olutio	n per single turn		8388608	

200 V MGMF 0.85 kW

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

#### • Permissible load (For details, refer to P.272)

During assembly During operation	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	686
	Thrust load A, B-direction (N)	196

A6N Series

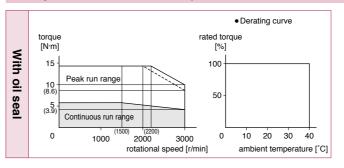
Series

Series

Imformation

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.48.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### 



#### **Dimensions**

	Key way shaft/ Round shaft						
	Motor specifications	without brake			with brake		
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal
	Encoder connector Large size (JL10) type	_	P.256			P.256	

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<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

#### · Please contact us for more information

### **Specifications**

		AC200 V		
Motor model *1	el <sup>⁺1</sup> IP67			MGMF132L1□□M
			function type	MDDLT55SF
Applicable	Model No	RS48	5 communication type *2	MDDLN55SG
driver	140.	Basic	type *2	MDDLN55SE
	Fram	e sym	bol	D-frame
Power supply	capacit	у	(kVA)	2.3
Rated output			(W)	1300
Rated torque			(N·m)	8.28
Continuous sta	all torqu	ie	(N·m)	8.28
Momentary Ma	ax. pea	k torqu	ue (N·m)	23.3
Rated current			(A(rms))	9.3
Max. current			(A(o-p))	37
Regenerative	brake		Without option	No limit Note)2
frequency (time	es/min)	Note)1	DV0P4284	No limit Note)2
Rated rotation	al spee	d	(r/min)	1500
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	9.16
of rotor ( $\times 10^{-4} \text{ kg} \cdot \text{m}^2$ )			With brake	10.4
Recommended moment of inertratio of the load and the rotor				10 times or less
Rotary encode	er speci	ficatio	ns*³	23-bit Absolute
	Re	solutio	n per single turn	8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

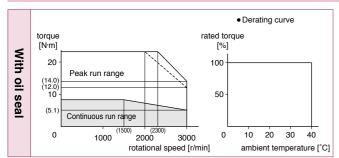
• Permissible load (For details, refer to P.272)

. •		,
During assembly During	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	686
operation	Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.48.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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#### Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)



#### **Dimensions**

		Key way shaft/ Round shaft							
	Motor specifications		without brake		with brake				
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal		
	Encoder connector Large size (JL10) type	_	P.256			P.257			

#### <Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

# **Specifications**

Special Order

					AC200 V
Motor model *1		IP67			MGMF182L1□□M
			function type		MEDLT83SF
Applicable	Model No.	RS48	5 communication typ	oe *²	MEDLN83SG
driver	140.	Basic	type *2		MEDLN83SE
	Frame	e sym	bol		E-frame
Power supply	capacit	у	(k\	/A)	3.8
Rated output			(	W)	1800
Rated torque			(N	·m)	11.5
Continuous stall torque (N·m)				m)	11.5
Momentary Ma	ax. peal	k torqı	ue (N	·m)	28.7
Rated current	Rated current			ıs))	11.8
Max. current			(A(o-	p))	42
Regenerative I	brake		Without option		No limit Note)2
frequency (time	es/min)	Note)1	DV0P4285×2		No limit Note)2
Rated rotation	al spee	d	(r/m	nin)	1500
Max. rotationa	l speed		(r/m	nin)	3000
Moment of ine	rtia		Without brake		12.1
of rotor ( $\times 10^{-4}$	kg·m²)		With brake		13.3
Recommended moment of inertia ratio of the load and the rotor				ite)3	10 times or less
Rotary encode	r speci	ficatio	ns*3		23-bit Absolute
	Re	solutio	n per single turn		8388608

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

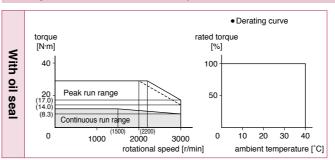
Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.272)

During assembly	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
During operation	Radial load P-direction (N)	686
	Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### 



#### **Dimensions**

		Key way shaft/ Round shaft						
	Motor specifications	without brake			with brake			
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal	
	Encoder connector Large size (JL10) type	_	P.257		_	P.2	257	

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

Series

A6N Series

# Imformation

### **Specifications**

				AC200 V
Motor model *1		MGMF242L1□□M		
			function type	MEDLT93SF
Applicable	Model No	RS48	5 communication type *2	MEDLN93SG
driver	140.	Basic	type *2	MEDLN93SE
	Fram	e sym	bol	E-frame
Power supply	capacit	y	(kVA)	4.5
Rated output			(W)	2400
Rated torque (N·m)				15.3
Continuous stall torque (N·m)				15.3
Momentary Ma	ax. pea	k torqı	ue (N⋅m)	45.2
Rated current			(A(rms))	16.0
Max. current			(A(o-p))	67
Regenerative	brake		Without option	No limit Note)2
frequency (time	s/min)	Note)1	DV0P4285×2	No limit Note)2
Rated rotation	al spee	d	(r/min)	1500
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	46.9
of rotor ( $\times 10^{-4}$	kg·m²)		With brake	52.3
Recommended moment of inertiratio of the load and the rotor				10 times or less
Rotary encode	r speci	ficatio	ns <sup>*3</sup>	23-bit Absolute
	Re	solutio	n per single turn	8388608

#### • Brake specifications (For details, refer to P.273) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

Static friction torque (N·m)	25.0 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.29
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

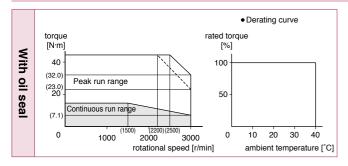
#### • Permissible load (For details, refer to P.272)

	, , ,							
	During assembly	Radial load P-direction (N)	1666					
		Thrust load A-direction (N)	784					
	document	Thrust load B-direction (N)	980					
	During operation	Radial load P-direction (N)	1176					
		Thrust load A, B-direction (N)	490					

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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#### Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)



#### **Dimensions**

	Motor specifications	Key way shaft/ Round shaft							
		without brake			with brake				
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal		
	Encoder connector Large size (JL10) type	_	P.258			P.2	258		

#### <Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

Special Order

200 V MGMF 2.9 kW

#### **Specifications**

					AC200 V	
Motor model*1			IP67		MGMF292L1□□M	
		Multi	function type		MFDLTB3SF	
Applicable	Model No	RS48	communication type	e *2	MFDLNB3SG	
driver	140.	Basic	type *2		MFDLNB3SE	
	Frame	e sym	bol		F-frame	
Power supply	ower supply capacity (kVA)				7.5	
Rated output (				V)	2900	
Rated torque		(N·n	n)	18.5		
Continuous sta	е	(N·n	n)	18.5		
Momentary Ma	ax. peal	c torqu	ıe (N·n	n)	45.2	
Rated current			(A(rms	s))	19.3	
Max. current			(A(o-p))		67	
Regenerative I	orake		Without option		No limit Note)2	
frequency (time	s/min)	Note)1	DV0P4285×2		No limit Note)2	
Rated rotation	al spee	d	(r/mi	n)	1500	
Max. rotationa	l speed		(r/mi	n)	3000	
Moment of ine	rtia		Without brake		46.9	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )			With brake		52.3	
Recommended moment of in ratio of the load and the roto				e)3	10 times or less	
Rotary encode	r speci	icatio	ns <sup>*3</sup>		23-bit Absolute	
	Res	solutio	n per single turn		8388608	

• Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

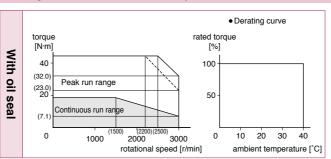
Static friction torque (N·m)	25.0 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.29
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

#### • Permissible load (For details, refer to P.272)

During assembly During operation	Radial load P-direction (N)	1666
	Thrust load A-direction (N)	784
	Thrust load B-direction (N)	980
	Radial load P-direction (N)	1176
	Thrust load A, B-direction (N)	490

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1 in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

#### 



#### **Dimensions**

Motor specifications		Key way shaft/ Round shaft							
		without brake		with brake					
	without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal			
Encoder connector Large size (JL10) type	_	P.258			P.259				

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<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

A6N Series

Series

· Round shaft/ Key way, center tap shaft

### **Specifications**

				AC200 V
Motor model *1			IP67	MGMF442L1□□M
		Multi	function type	MFDLTB3SF
Applicable	Model No	RS48	communication type *2	MFDLNB3SG
driver		Basic	type *2	MFDLNB3SE
	Fram	e sym	bol	F-frame
Power supply	capacit	у	(kVA)	7.5
Rated output			(W)	4400
Rated torque			(N·m)	28.0
Continuous sta	all torqu	ie	(N·m)	28.0
Momentary Ma	ax. pea	k torqu	ıe (N·m)	70.0
Rated current			(A(rms))	27.2
Max. current			(A(o-p))	96
Regenerative	brake		Without option	No limit Note)2
frequency (time	s/min)	Note)1	DV0P4285×2	No limit Note)2
Rated rotation	al spee	d	(r/min)	1500
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	58.2
of rotor (×10 <sup>-4</sup>	kg·m²)		With brake	63.0
	Recommended moment of inertia ratio of the load and the rotor Note)3		10 times or less	
Rotary encode	r speci	ficatio	ns <sup>*3</sup>	23-bit Absolute
	Re	solutic	n per single turn	8388608

#### • Brake specifications (For details, refer to P.273) /This brake will be released when it is energized.) Do not use this for braking the motor in motion.

Static friction torque (N·m)	44.1 or more
Engaging time (ms)	150 or less
Releasing time (ms) Note)4	30 or less
Exciting current (DC) (A)	1.29
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

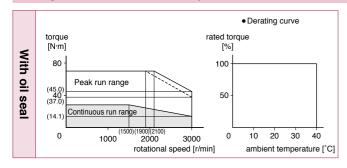
#### • Permissible load (For details, refer to P.272)

	,	,
	Radial load P-direction (N)	1666
During assembly	Thrust load A-direction (N)	784
documbry	Thrust load B-direction (N)	980
During	Radial load P-direction (N)	1470
operation	Thrust load A, B-direction (N)	490

- For details of Note)1 to Note)4, refer to P.271.
- · Dimensions of Driver, refer to P.49.
- \*1  $\square$  in the motor part number represents the motor specifications.
- \*2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.178.
- \*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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#### Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)



#### **Dimensions**

	Motor specifications	Key way shaft/ Round shaft					
			without brake		with brake		
		without oil seal	with oil seal	with protective lip/ with oil seal	without oil seal	with oil seal	with protective lip/ with oil seal
	Encoder connector Large size (JL10) type		P.259		_	P.259	

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

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Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

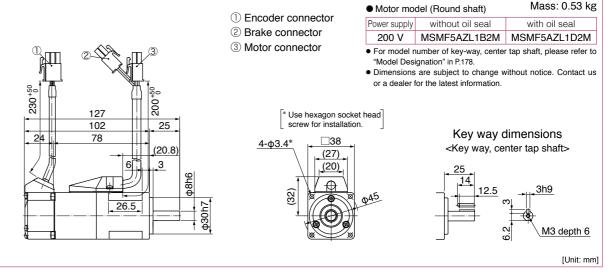
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

MSMF 50 W to 100 W

MSMF 50 W

#### Leadwire type (P65) without brake without/with oil seal · Round shaft/ Key way, center tap shaft Motor model (Round shaft) ① Encoder connector Power supply without oil seal 2 Motor connector 200 V MSMF5AZL1A2M MSMF5AZL1C2M • For model number of key-way, center tap shaft, please refer to "Model Designation" in P.178. • Dimensions are subject to change without notice. Contact us or a dealer for the latest information \* Use hexagon socket head Key way dimensions <u>4-φ3.4\*</u> <Key way, center tap shaft> (27) (20) M3 depth 6 [Unit: mm]

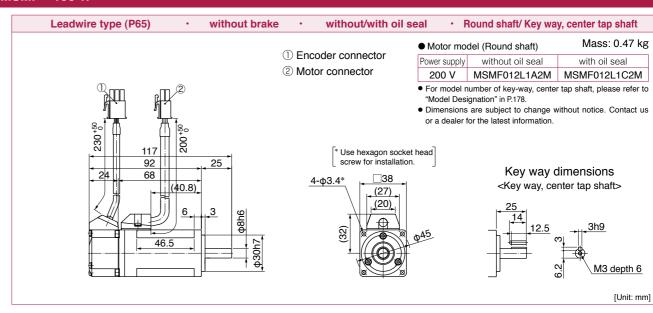
with brake



without/with oil seal

#### **MSMF 100 W**

Leadwire type (P65)



\* For motors specifications, refer to P.183, P.184

A6 Family

A6N Series

A6B

Series

# **Imformation**

Mass: 0.68 kg

M3 depth 6

[Unit: mm]

**Dimensions** 

A6 Family

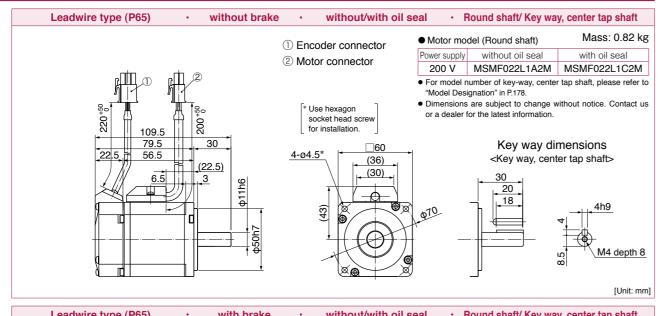
A6N Series

A6B

Series

Imformation

#### **MSMF 200 W**



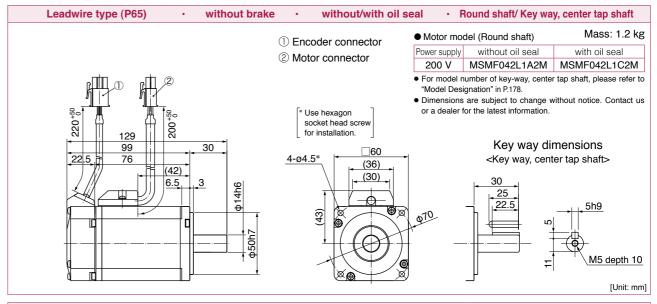
Leadwire type	e (P65)	WI	tn brake	· with	out/with oil se	eai · F	round snatt/ Key wa	y, center tap snatt
				① Encoder co	nnector	Motor mod	del (Round shaft)	Mass: 1.3 kg
				② Brake conn		Power supply	without oil seal	with oil seal
	<b>∧</b> % +					200 V	MSMF022L1B2M	MSMF022L1D2M
22.5. h	146 116 93 6.5	30 00 30 (22.5)	\$50h7	3 Motor conne	Screw	For model n     "Model Desi     Dimensions     or a dealer f	umber of key-way, center gnation" in P.178. are subject to change wor the latest information.  Key way directly way, center 30  20  18	r tap shaft, please refer to vithout notice. Contact us mensions
								[Unit: mm]

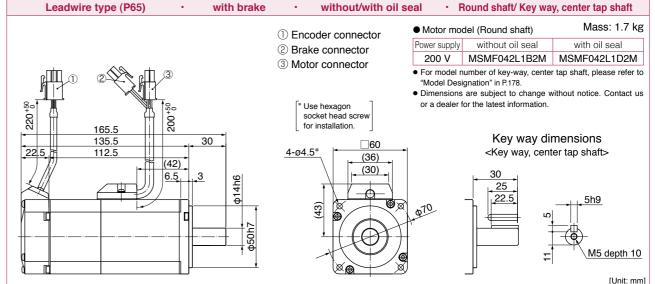
-223-

\* For motors specifications, refer to P.184, P.185.

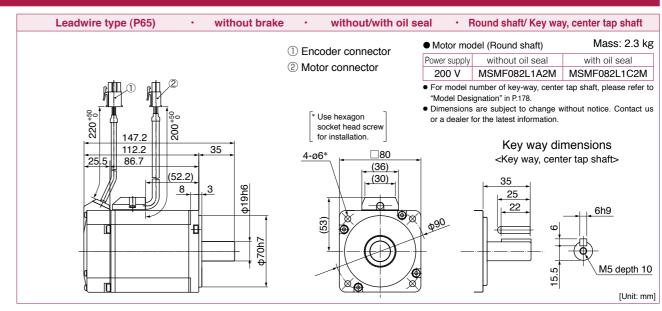
#### **MSMF 400 W**

MSMF 400 W to 750 W





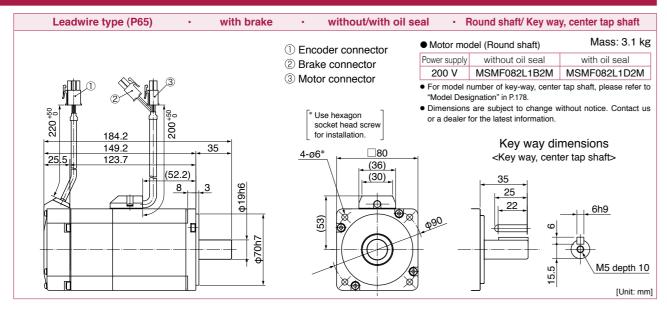
#### **MSMF** 750 W



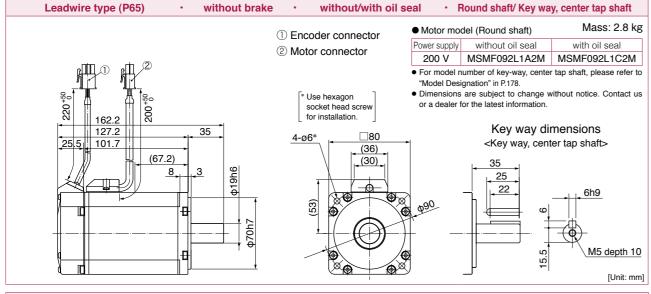
-224-

\* For motors specifications, refer to P.186, P.187.

#### MSMF 750 W



#### MSMF 1000 W

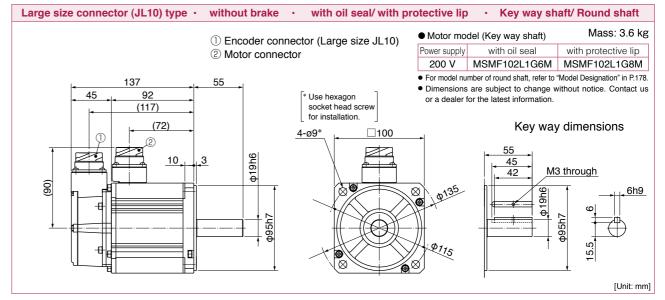


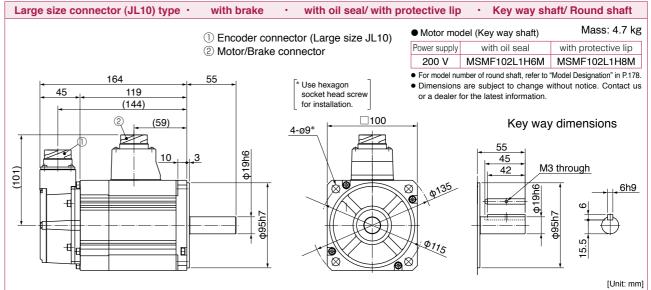
Leadwire type (P65) ·	with brake	· without/with oil s	eal · Round shaft/ Key wa	y, center tap shaft
		Encoder connector	● Motor model (Round shaft)	Mass: 3.6 kg
		② Brake connector	Power supply without oil seal	with oil seal
-t-		Motor connector	200 V MSMF092L1B2M	MSMF092L1D2M
		(a) Midtor Connector	<ul> <li>For model number of key-way, cente "Model Designation" in P.178.</li> </ul>	r tap shaft, please refer to
99+00Z 199.2		* Use hexagon socket head screw for installation.	<ul> <li>Dimensions are subject to change v or a dealer for the latest information.</li> </ul>	without notice. Contact us
164.2	5		Key way di	mensions
25.5 138.7		4-ø6*	<key cen<="" td="" way,=""><td>ter tap shaft&gt;</td></key>	ter tap shaft>
(67.2)	φ19h6 φ70h7		35 25 22 2	6h9 M5 depth 10
			_	[Unit: mm

\* For motors specifications, refer to P.187, P.188.

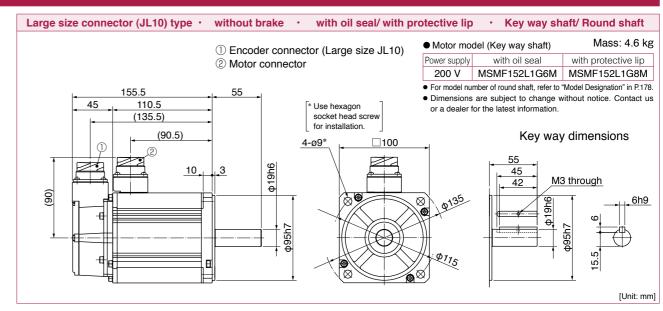
ecial Order MSMF 1.0 kW to 1.5 kW

#### MSMF 1.0 kW





#### MSMF 1.5 kW



-226-

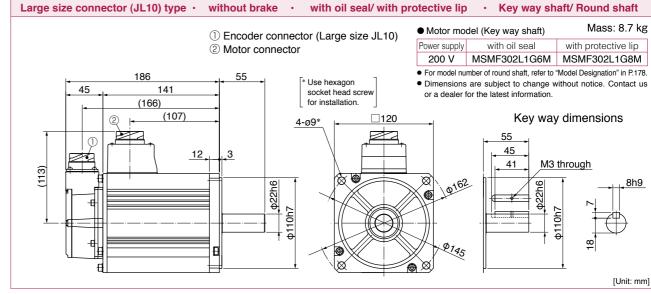
\* For motors specifications, refer to P.189, P.190.

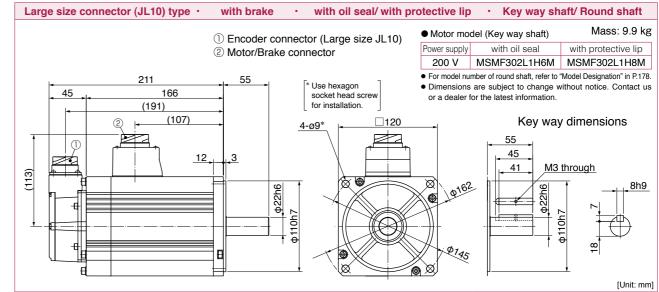
MSMF 2.0 kW

#### MSMF 3.0 kW

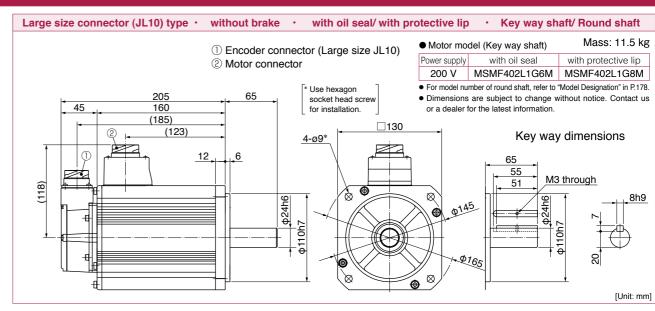
MSMF 3.0 kW to 4.0 kW

Special Order





#### MSMF 4.0 kW



<sup>\*</sup> For motors specifications, refer to P.192, P.193

industrial.panasonic.com/ac/e/

#### Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft Motor model (Key way shaft) ① Encoder connector (Large size JL10) ② Motor/Brake connector 200 V MSMF152L1H6M MSMF152L1H8M • For model number of round shaft, refer to "Model Designation" in P.178. \* Use hexagon • Dimensions are subject to change without notice. Contact us 45 137.5 socket head screv or a dealer for the latest information. (162.5) ② (77.5) Key way dimensions 10 M3 through

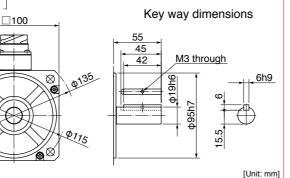
#### Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft Motor model (Key way shaft) ① Encoder connector (Large size JL10) 2 Motor connector Power supply with oil seal 129 5 \* Use hexagon (154.5)socket head screv for installation. (109.5)4-ø9\*

## 200 V MSMF202L1G6M MSMF202L1G8M • For model number of round shaft, refer to "Model Designation" in P.178. • Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Key way dimensions

[Unit: mm]

Mass: 5.6 kg

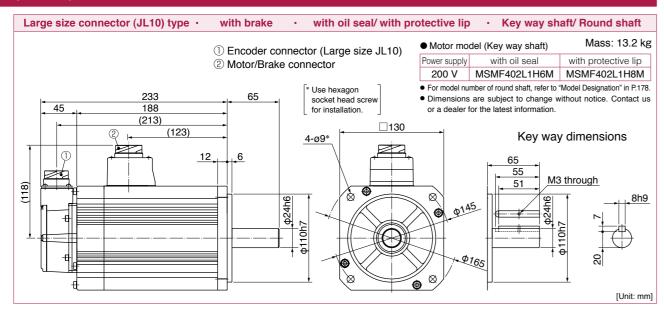
with protective lip



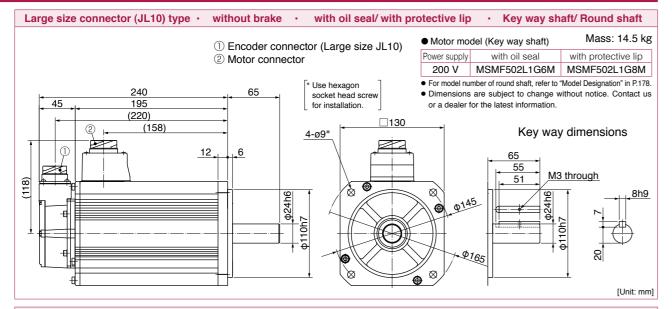
Large size connector (JL10) type · w	vith brake · with oil seal/ with pr	rotective lip · Key way shaft	/ Round shaft
	Encoder connector (Large size JL10) Motor/Brake connector	***	Mass: 6.6 kg vith protective lip ISMF202L1H8M
201.5 45 156.5 (181.5) (96.5)	Socket head screw for installation.  4-09*  100	For model number of round shaft, refer to "Mode Dimensions are subject to change without or a dealer for the latest information.  Key way dimensions to the latest information.  Key way dimensions are subject to change without or a dealer for the latest information.  Key way dimensions are subject to change without or a dealer for the latest information.	out notice. Contact us
·		ı	(Unit: mm

\* For motors specifications, refer to P.190, P.191.

#### MSMF 4.0 kW



#### MSMF 5.0 kW

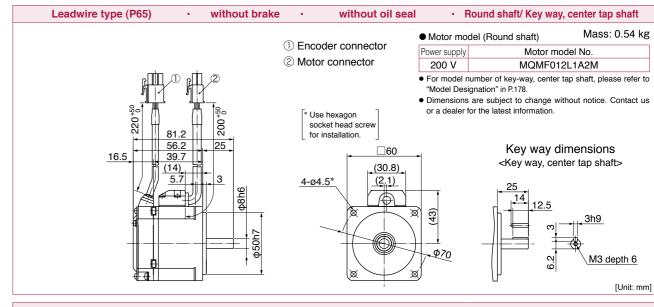


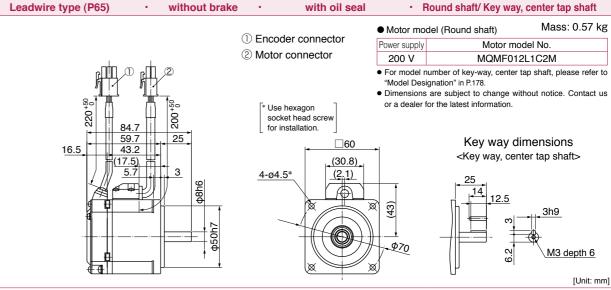
Large size connector (JL10) type •	with brake ·	with oil seal/ with pr	otective lip	· Key way sh	aft/ Round shaft
	① Encoder conne	ector (Large size JL10)	Motor model	(Key way shaft)	Mass: 16.1 kg
	② Motor/Brake co	` ` ` '	Power supply	with oil seal	with protective lip
	•		200 V N	ISMF502L1H6M	MSMF502L1H8M
45 223 (248)	65	* Use hexagon socket head screw for installation.	<ul> <li>Dimensions are</li> </ul>		"Model Designation" in P.178. vithout notice. Contact us
② ├- (158)		4-ø9*	-	Key way	/ dimensions
	12 6			65	
				51 N	13 through
118		911007	Ø 0145	ф24h6	7 10011 8h9
			<b>●</b> ⊗ → •16	35	
					[Unit: mm]

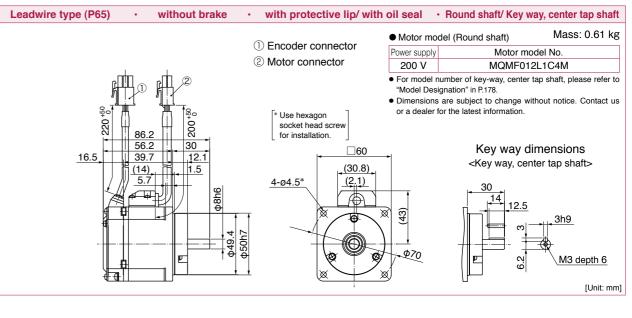
\* For motors specifications, refer to P.193, P.194.

Special Order **MQMF 100 W** 

#### **MQMF** 100 W



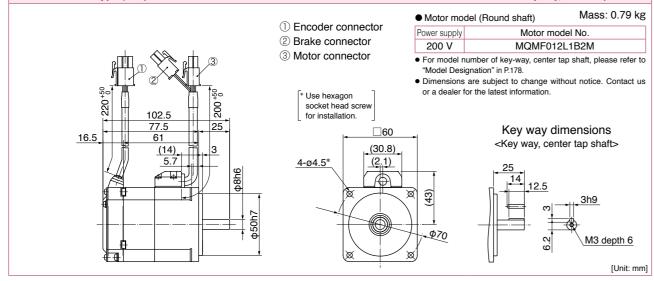


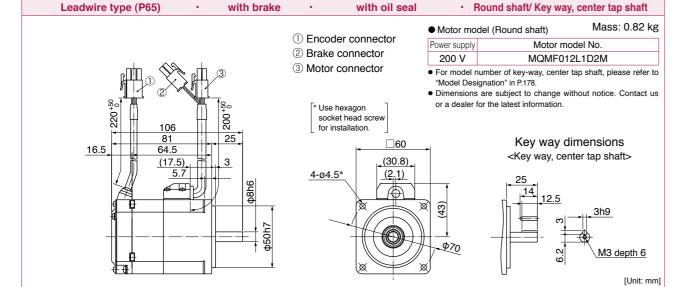


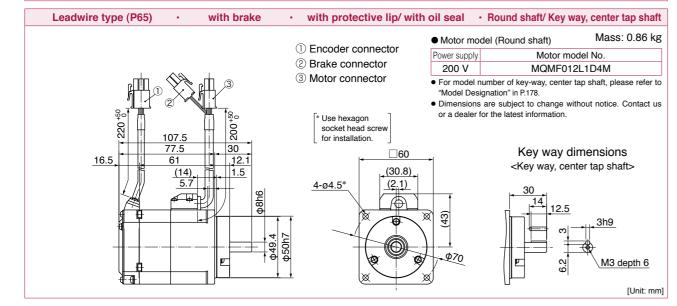
-230-

<sup>\*</sup> For motors specifications, refer to P.195.

#### **MQMF 100 W** Leadwire type (P65) with brake without oil seal · Round shaft/ Key way, center tap shaft Motor model (Round shaft) 1) Encoder connector Motor model No. 2 Brake connector 200 V MQMF012L1B2M 3 Motor connector





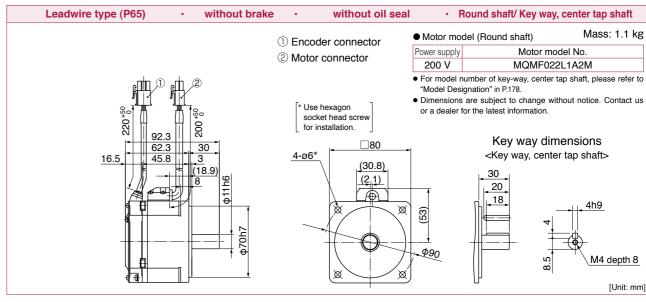


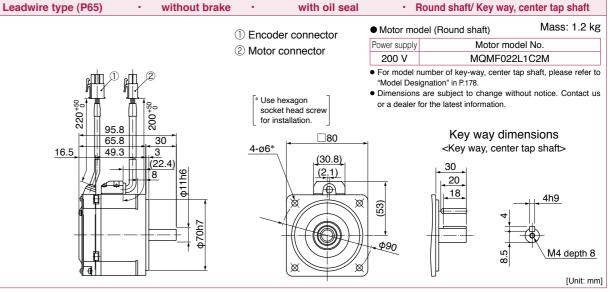
#### \* For motors specifications, refer to P.195.

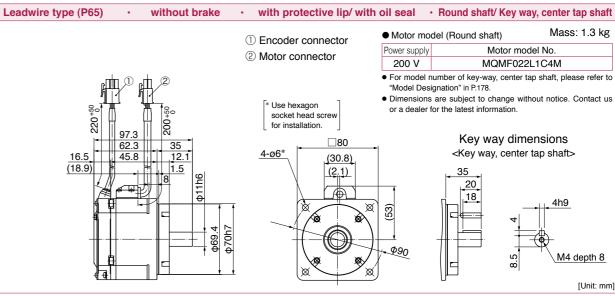
# **MQMF 200 W**

**MQMF 200 W** 

Special Order







-232-

<sup>\*</sup> For motors specifications, refer to P.196.

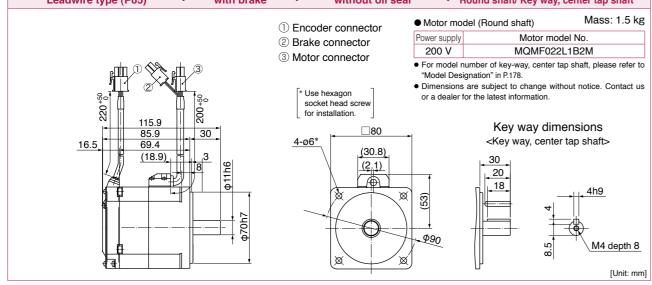
Leadwire type (P65)

with brake

**Dimensions** 

A6N Series

#### **MQMF 200 W** Leadwire type (P65) with brake without oil seal · Round shaft/ Key way, center tap shaft Motor model (Round shaft) 1) Encoder connector Motor model No. Power supply ② Brake connector 200 V MQMF022L1B2M 3 Motor connector



	Encoder connector	<ul><li>Motor mod</li></ul>	el (Round shaft)	Mass. 1.6 Kg
	② Brake connector	Power supply	Motor n	nodel No.
	Motor connector	200 V	MQMF0	22L1D2M
	* Use hexagon socket head screw	<ul><li>Model Desig</li><li>Dimensions a</li></ul>	nation" in P.178.	er tap shaft, please refer to without notice. Contact us
000	_ for installation. ☐ 80		Key way d	imensions
16.5 89.4 30	4-ø6*	-	<key cen<="" th="" way,=""><th></th></key>	
(22.4) 3 8 941 to 4	(2,1)	(53)	30 20 18	

with oil seal

· Round shaft/ Key way, center tap shaft

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[Unit: mm]

Leadwire type (P65) · with brake	<ul> <li>with protective lip/ with</li> </ul>	n oil seal · Round shaft/ Key	way, center tap shaft
	① Encoder connector ② Brake connector ③ Motor connector		Mass: 1.7 kg model No. 022L1D4M
3 9,0 120 9,0 120 120 120 120 120 120 120 120 120 12	* Use hexagon socket head screw for installation.	<ul> <li>For model number of key-way, cent "Model Designation" in P.178.</li> <li>Dimensions are subject to change or a dealer for the latest information</li> </ul>	without notice. Contact us
16.5 69.4 12.1 (18.9) 1.5	4-ø6* (30.8) (2,1)		limensions nter tap shaft>
4069.4 0 0 11 h6		(E) 18 T	449
		090	M4 depth 8 [Unit: mm]

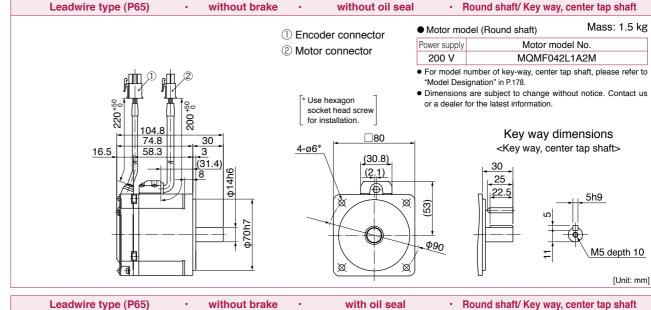
<sup>\*</sup> For motors specifications, refer to P.196.

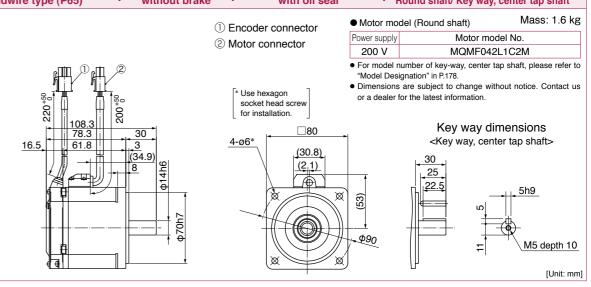
#### \* For motors specifications, refer to P.197.

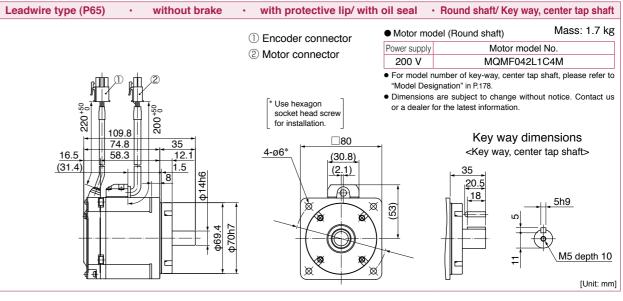
#### **MQMF 400 W**

**MQMF 400 W** 

Special Order







A6 Family

A6N Series

A6B Series

Series

**Imformation** 

[Unit: mm]

Leadwire type (P65)

with oil seal

	Encoder connector     Brake connector     Motor connector		Mass: 2.1 kg otor model No. QMF042L1D2M
131.9 101.9 85.4 (34.9) 3 8 1410	3 Motor connector  * Use hexagon socket head screw for installation.	For model number of key-way "Model Designation" in P.178. Dimensions are subject to ch or a dealer for the latest inform  Key N	r, center tap shaft, please refer to

with brake

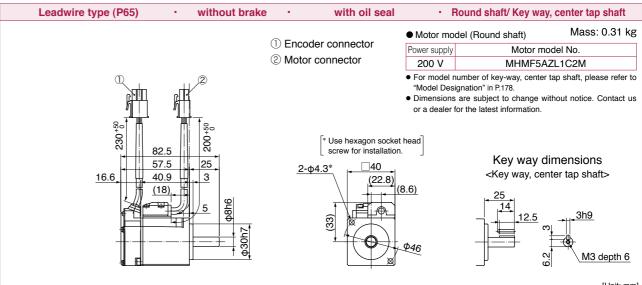
	① Encoder connector	<ul><li>Motor mo</li></ul>	del (Round shaft)	/lass: 2.2 kg
	② Brake connector	Power supply	Motor model No.	
	-	200 V	MQMF042L1D4N	Л
133.4 98.4 35 16.5 81.9 12.1 (31.4) 1.5 8	3 Motor connector  * Use hexagon socket head screw for installation.	"Model Des  Dimensions or a dealer		ice. Contact us

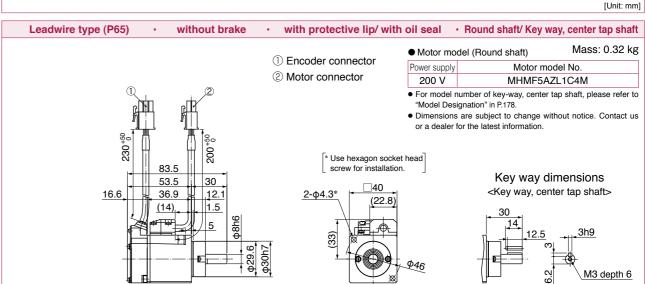
#### \* For motors specifications, refer to P.197.

#### MHMF 50 W

Special Order MHMF 50 W

Leadwire type (P65)	· without brake	<ul> <li>without oil seal</li> </ul>	Round shaft/ Key way, center tap shaft
		① Encoder connector	● Motor model (Round shaft) Mass: 0.29 kg  Power supply Motor model No.
230 ° 00 ° 00 ° 00 ° 00 ° 00 ° 00 ° 00 °	2000,000	② Motor connector  [* Use hexagon socket	
16.6 36	.5 25	(33)	Key way dimensions   3.6)  25 14 12.5 8 M3 depth 6
			[Unit: mm]





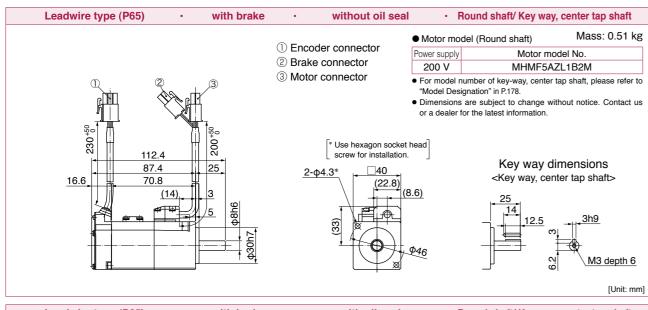
· Round shaft/ Key way, center tap shaft

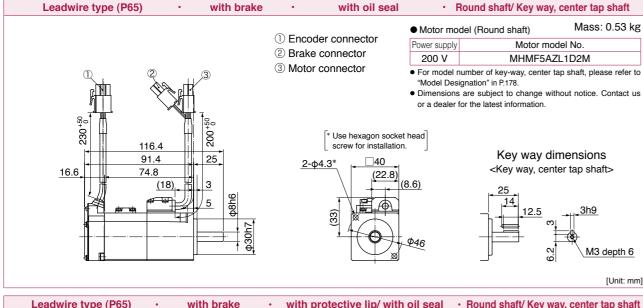
[Unit: mm]

<sup>\*</sup> For motors specifications, refer to P.198.

[Unit: mm]

#### MHMF 50 W



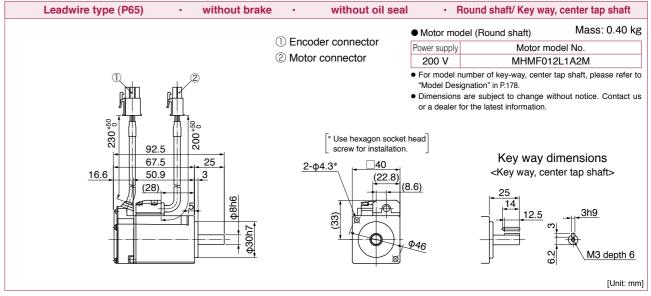


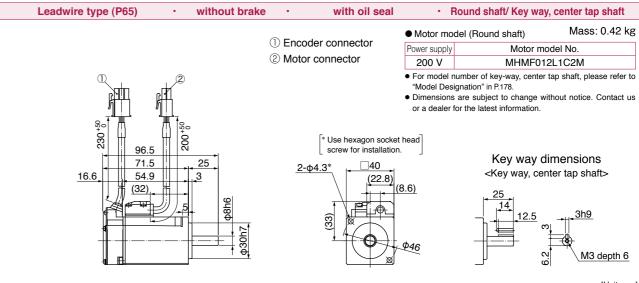
Leadwire type (P03)	with brake	with protective lip/ with	i Oli Scai	noullu silaiv Key wa	ay, center tap snart
		① Encoder connector ② Brake connector	Power supply	el (Round shaft)  Motor mod	
	3	3 Motor connector	<ul><li>Model Desig</li><li>Dimensions</li></ul>	MHMF5AZ imber of key-way, center to pation" in P.178. are subject to change with or the latest information.	ap shaft, please refer to
16.6	117.4 87.4 70.8 12.1 (14) 1.5 948 968 10.8	* Use hexagon socke screw for installation  2- $\varphi$ 4.3*  (22.8)		Key way din  Key way, cent 30 12.5 N<	
					[Unit: mm

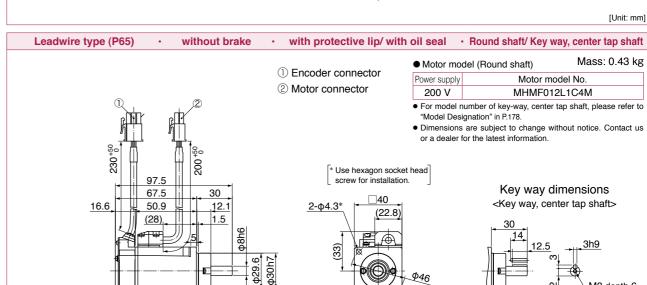
#### \* For motors specifications, refer to P.198.

#### MHMF 100 W

Special Order

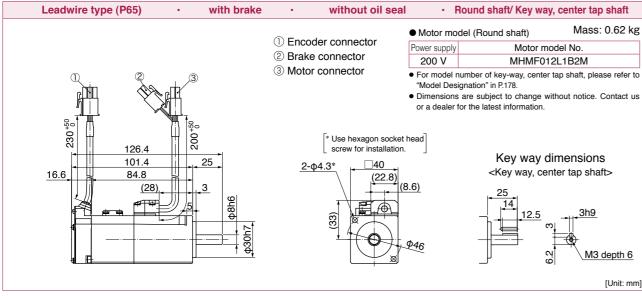


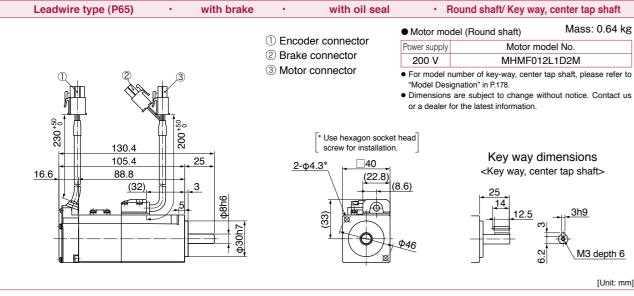




<sup>\*</sup> For motors specifications, refer to P.199.

## MHMF 100 W





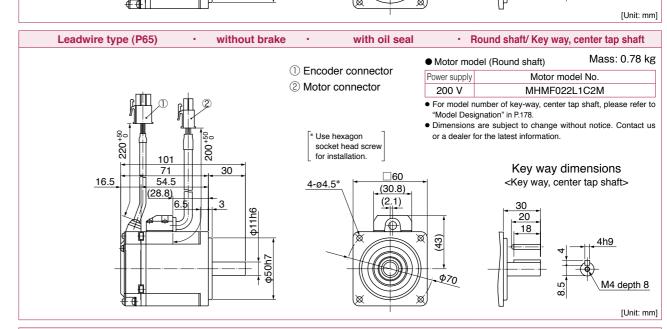
Leadwire type (P65) ·	with brake •	with protective lip/ with	oil seal ·	Round shaft/ Key way, center tap shaft
		D. F	Motor mod	del (Round shaft) Mass: 0.65 kg
	(	① Encoder connector	Power supply	Motor model No.
		2) Brake connector	200 V	MHMF012L1D4M
	(3)	3) Motor connector		umber of key-way, center tap shaft, please refer to gnation" in P.178.
	]_			are subject to change without notice. Contact us or the latest information.
131.4 101.4 16.6 84.8 (28)	30 12.1 1.5 9.82 0.00 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5	* Use hexagon socket screw for installation  2-\phi 4.3*  (22.8)		Key way dimensions Key way, center tap shaft> 30 14 12.5 M3 depth 6
				[I Init: mm]

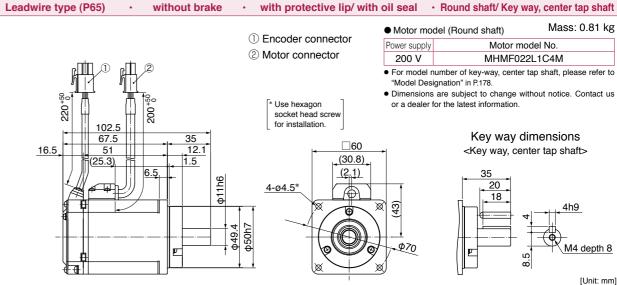
#### \* For motors specifications, refer to P.199.

#### \* For motors specifications, refer to P.200.

Special Order

МНМ	200 W							
	Leadwire type (P65)	•	without brake	•	without oil seal	• F	Round shaft/ Key wa	ay, center tap shaft
	67	7.5 7.5 11	30 30 4011ve 4011ve 4050n7	② Mot	coder connector for connector	Power supply 200 V  For model n "Model Desi Dimensions or a dealer 1	MHMF0 number of key-way, cente gnation" in P.178. are subject to change ior the latest information.  Key way <key ce<="" th="" way,=""><th>dimensions enter tap shaft&gt;</th></key>	dimensions enter tap shaft>



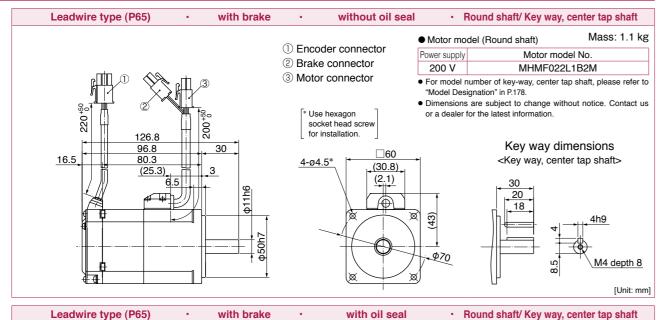


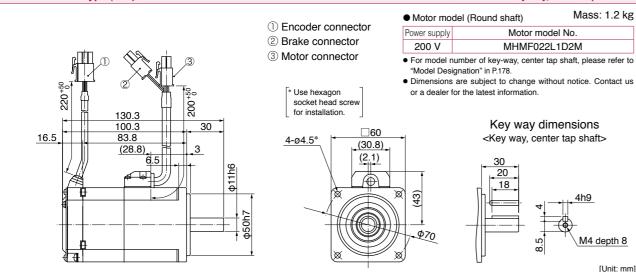
A6N Series

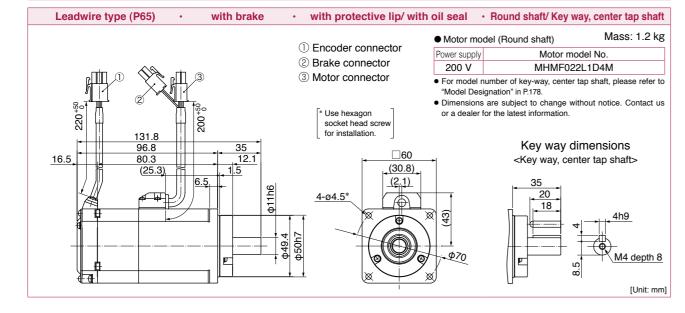
A6B Series

**Imformation** 

#### **MHMF 200 W**





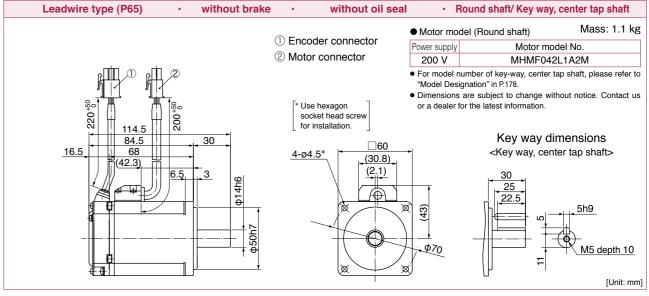


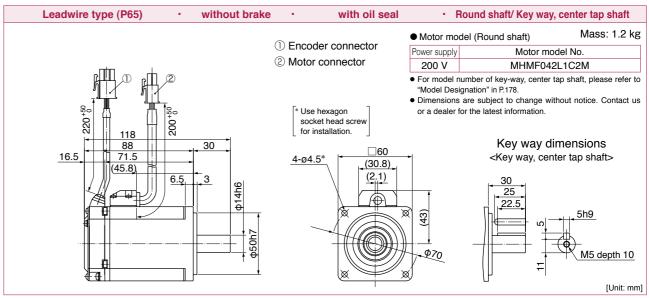
#### \* For motors specifications, refer to P.200.

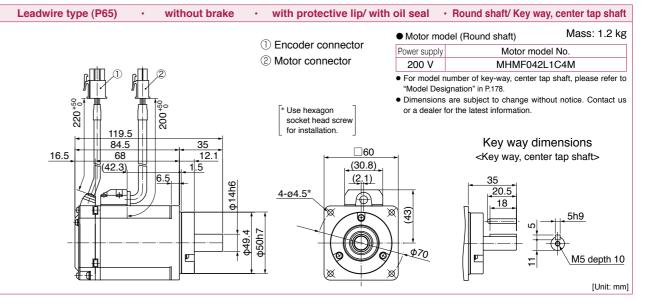
#### **MHMF 400 W**

**MHMF 400 W** 

Special Order

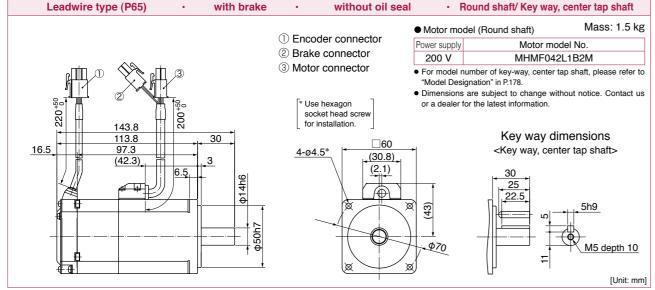


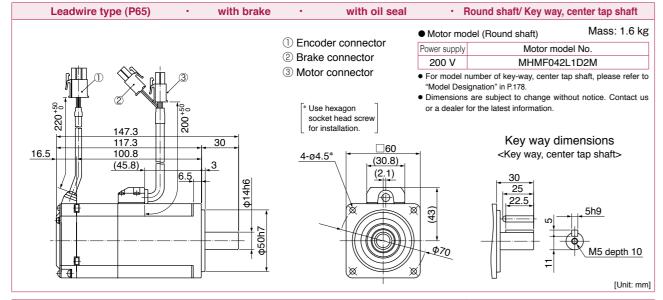


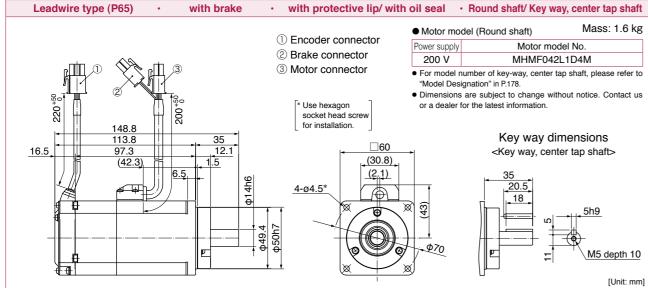


<sup>\*</sup> For motors specifications, refer to P.201.

# MHMF 400 W Leadwire type (P65) with brake without oil seal Round shaft/ Key way center tan shaft





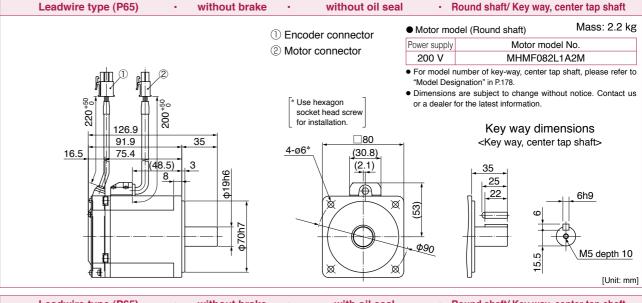


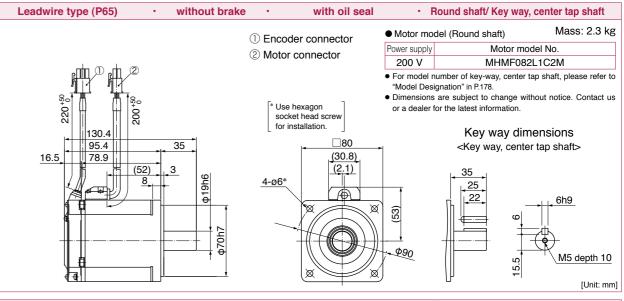
\* For motors specifications, refer to P.201.

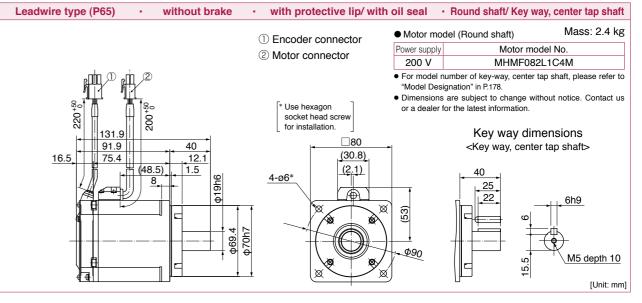
# MHMF 750 W

MHMF 750 W

Special Order







\* For motors specifications, refer to P.202.

· Round shaft/ Key way, center tap shaft

• For model number of key-way, center tap shaft, please refer to

• Dimensions are subject to change without notice. Contact us

MHMF092L1A2M

Key way dimensions

<Key way, center tap shaft>

· Round shaft/ Key way, center tap shaft

• For model number of key-way, center tap shaft, please refer to

• Dimensions are subject to change without notice. Contact us

Motor model No.

MHMF092L1C2M

Key way dimensions

<Key way, center tap shaft>

Motor model No.

MHMF092L1C4M

Key way dimensions

<Key way, center tap shaft>

For model number of key-way, center tap shaft, please refer to

• Dimensions are subject to change without notice. Contact us

6h9

M5 depth 10

Mass: 2.9 kg

M5 depth 10

[Unit: mm]

[Unit: mm]

Motor model (Round shaft)

"Model Designation" in P.178.

Motor model (Round shaft)

"Model Designation" in P.178.

· with protective lip/ with oil seal · Round shaft/ Key way, center tap shaft

Power supply

200 V

Motor model (Round shaft)

"Model Designation" in P.178.

or a dealer for the latest information.

or a dealer for the latest information.

Power supply

200 V

or a dealer for the latest information

Power supply

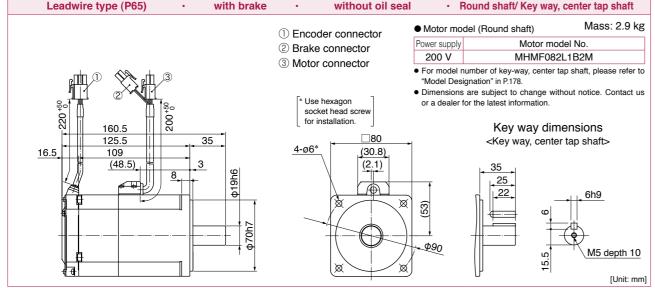
200 V

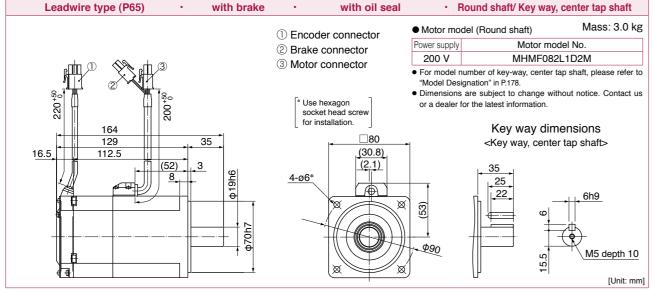
M5 depth 10

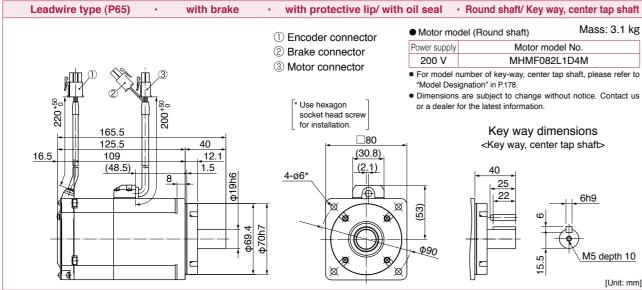
Mass: 2.8 kg

[Unit: mm]

#### **MHMF** 750 W Leadwire type (P65) with brake without oil seal Motor model (Round shaft) (1) Encoder connector







<sup>\*</sup> For motors specifications, refer to P.202.

## \* For motors specifications, refer to P.203.

104.7

88.2

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Special Order

MHMF 1000 W

MHMF 1000 W

104.7

Leadwire type (P65)

143.2

108.2

91.7

16.5

Leadwire type (P65)

without brake

without brake

without brake

40

12.1

without oil seal

(30.8)

(2.1)

with oil seal

(30.8)

(2.1)

① Encoder connector

② Motor connector

\* Use hexagon

4-ø6\*

socket head screw

for installation.

① Encoder connector

2 Motor connector

\* Use hexagon

① Encoder connector

② Motor connector

\* Use hexagon

socket head screw for installation.

(30.8)

(2.1)

4-ø6\*

socket head screw

Leadwire type (P65)





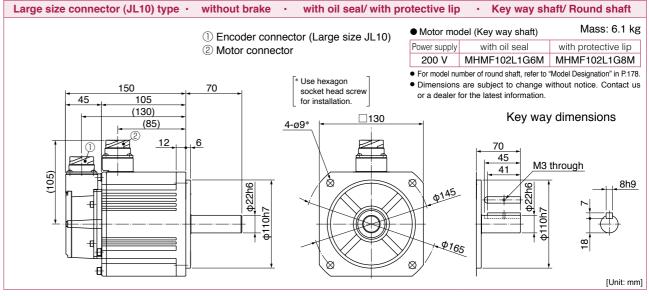
Leadwire type (P65)

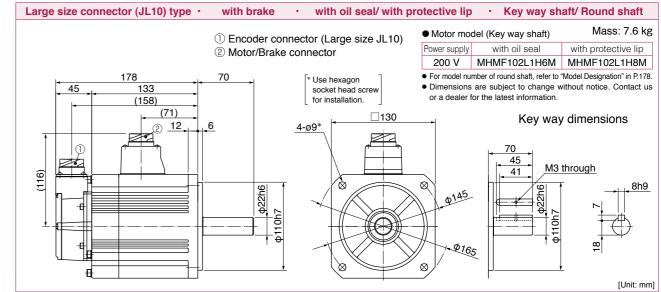
with brake

**Dimensions** 

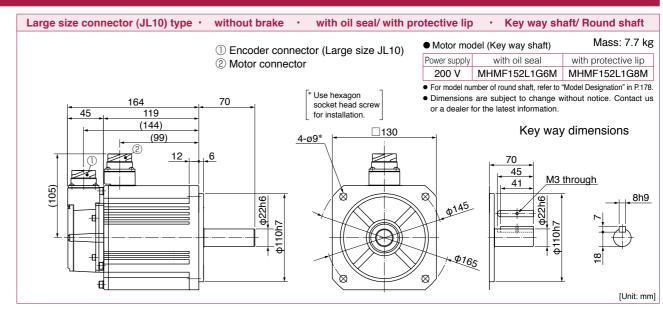
#### MHMF 1.0 kW

MHMF 1.0 kW to 1.5 kW





#### MHMF 1.5 kW



<sup>\*</sup> For motors specifications, refer to P.204, P.205.

Leadwire type (P65)	· with brake	without oil seal	Round shaft/ Key way, center tap shaft
173.3 138.3 16.5 121.8 (61.3)		① Encoder connector ② Brake connector ③ Motor connector  * Use hexagon socket head screw for installation.	Motor model (Round shaft)  Mass: 3.4 kg  Power supply  Motor model No.  MHMF092L1B2M  For model number of key-way, center tap shaft, please refer to "Model Designation" in P.178.  Dimensions are subject to change without notice. Contact us or a dealer for the latest information.  Key way dimensions  Key way, center tap shaft>  Key way, center tap shaft>  M5 depth 10  [Unit: mm]

	① Encoder connector ② Brake connector	Motor model (Round shaft)      Power supply     Motor m	Mass: 3.5 kg
		200 V MHMF09	2L1D2M
176.8 141.8 125.3 (64.8) 3 9461.0 2402.0		For model number of key-way, center "Model Designation" in P.178.     Dimensions are subject to change w or a dealer for the latest information.      Key way dir <a href="#">Key way dir <a href="#">Key way center <a href="#">Key way center <a href="#">Way dir <a href="#">Key way center <a href="#">Key way center <a href="#">Way dir <a href="#">Key way dir <a href="#">Key way center <a href="#">Way dir <a href="#">Key way dir <a href="#">Key way center <a href="#">Key way dir <a href="#">Key way dir <a href="#">Key way dir <a href="#">Key way center <a href="#">Way dir <a href="#">Key way dir <a href="#">Key way dir <a href="#">Key way center <a href="#">Way dir <a href="#">Key way dir <a href="#">Key way dir <a href="#">Key way center <a href="#">Way dir <a href="#">Key way dir <a href="#">Key way center <a href="#">Way dir <a href="#">Key way center <a href="#">Way dir <a href="#">Xey way center <a href="#">Yey wa</a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a>	tap shaft, please refer to vithout notice. Contact us

with oil seal

Leadwire type (P65) •	with brake	<ul> <li>with protective lip/ with</li> </ul>	oil seal ·	Round shaft/ Key way, center tap shaft
		Encoder connector     Brake connector     Motor connector	Power supply 200 V	del (Round shaft) Mass: 3.6 kg  Motor model No.  MHMF092L1D4M
178.3 138.3 121.8 (61.3)	40 12.1 1.5 8 40 12.1 1.5 8 469 4	* Use hexagon socket head screw for installation.    80   (30.8)   (2.1)	"Model Design Dimensions or a dealer for the state of the	umber of key-way, center tap shaft, please refer to gnation" in P.178.  are subject to change without notice. Contact us or the latest information.  Key way dimensions <rey center="" shaft="" tap="" way,="">  40  40  6h9  M5 depth 10  [Unit: mm]</rey>

<sup>\*</sup> For motors specifications, refer to P.203.

[Unit: mm]

· Round shaft/ Key way, center tap shaft

A6 Family

A6N Series

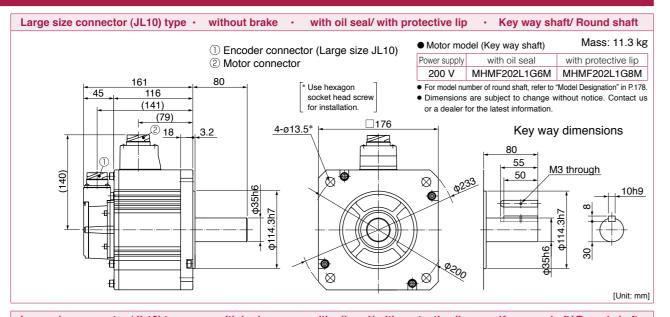
A6B Series

Series

Imformation

**Dimensions** 

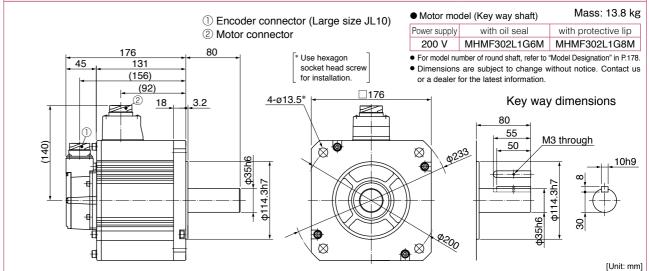
#### MHMF 2.0 kW

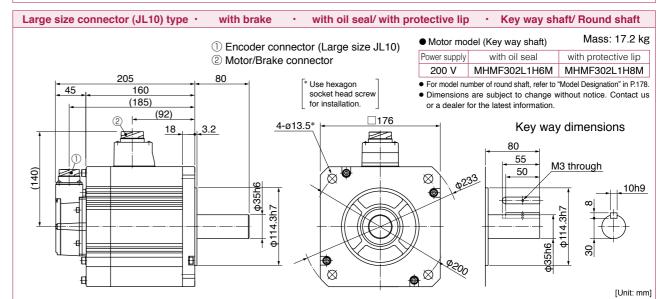


① Encoder connector (Large size JL10) ② Motor/Brake connector  190 80  190 145 145 179 18 3.2  4-013.5  176  Motor model (Key way shaft)  Mass: 14.6 kg  Power supply with oil seal with protective lip  200 V MHMF202L1H6M MHMF202L1H8M  • For model number of round shaft, refer to "Model Designation" in P.178. • Dimensions are subject to change without notice. Contact us or a dealer for the latest information.  Key way dimensions  80  104  105  105  107  106  107  107  108  109  109  109  109  109  109  109	Large size connector (JL10) type · with bral	ke · with oil seal/ with protect	tive lip · Key way shaft/ Round shaft
Key way dimensions  80  10h9  10h9	① Encode ② Motor/B	er connector (Large size JL10)  Brake connector  Power  20  * Use hexagon socket head screw  Dim  *	otor model (Key way shaft)  Mass: 14.6 kg er supply with oil seal with protective lip  O V MHMF202L1H6M MHMF202L1H8M  model number of round shaft, refer to "Model Designation" in P.178. nensions are subject to change without notice. Contact us
	18 3.2	4-013.5 A-013.5	80 55 M3 through 10h9

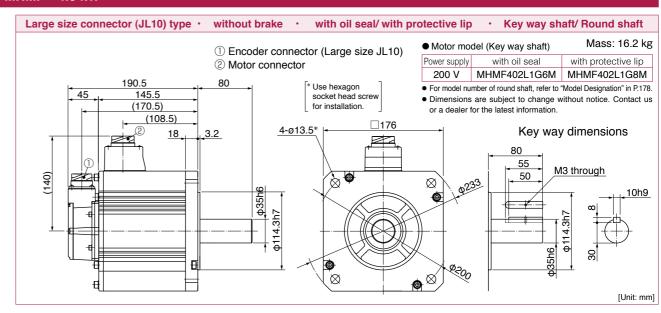
\* For motors specifications, refer to P.205, P.206.

# Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft Motor model (Key way shaft) ① Encoder connector (Large size JL10)





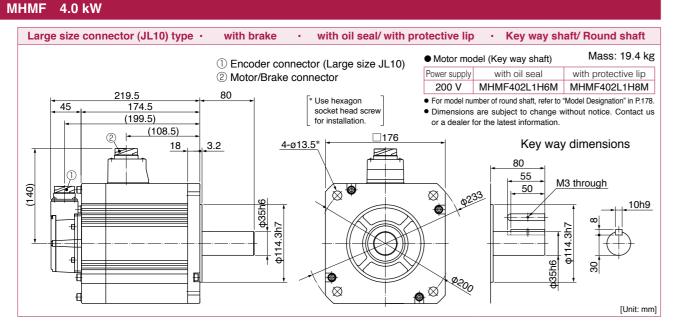
#### MHMF 4.0 kW



\* For motors specifications, refer to P.207, P.208

-250-

#### MDMF 1.0 kW



#### MHMF 5.0 kW

Large size connector (JL10) type ·	without brake · with oil seal/ with	protective lip · Key way sh	aft/ Round shaft
	① Encoder connector (Large size JL10)	● Motor model (Key way shaft)	Mass: 19.6 kg
	② Motor connector	Power supply with oil seal	with protective lip
206.5	. 80	200 V MHMF502L1G6M	MHMF502L1G8M
45 161.5 (186.5) (124.5)	* Use hexagon socket head screw for installation.	<ul> <li>For model number of round shaft, refer to</li> <li>Dimensions are subject to change wor a dealer for the latest information.</li> </ul>	
2 18	3.2 4-Ø13.5* □176		dimensions
(140)	9	80 55 50 M	3 through
	4.3h7		24E 10h9
B B	1 = 1 = 1	\$500 B	30
<b>4</b>	\\\ \times\	<u> </u>	[Unit: mm]

Large size connector (JL10) type •	with brake	· with oil seal/ with pr	otective lip · Key	way shaft/ Round shaft
235.5 45 190.5 (215.5) (2) (124.5)	① Encoder conn ② Motor/Brake c	ector (Large size JL10)	Motor model (Key way see	shaft) Mass: 22.8 kg eal with protective lip .1H6M MHMF502L1H8M ft, refer to "Model Designation" in P.178 change without notice. Contact us
(140)	414.3h7		80 55 50	M3 through
			Ø 200	(Unit: mr

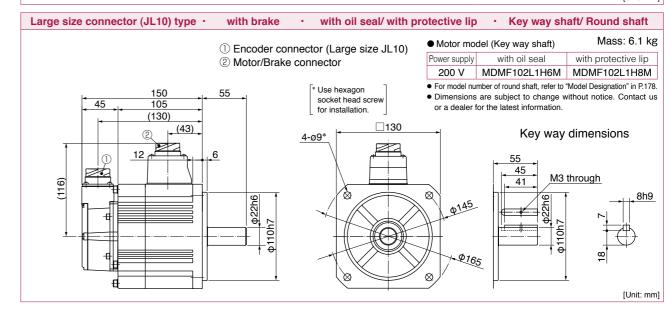
-251-

© Panasonic Corporation 2018 AQCTB01E 201802-3YE

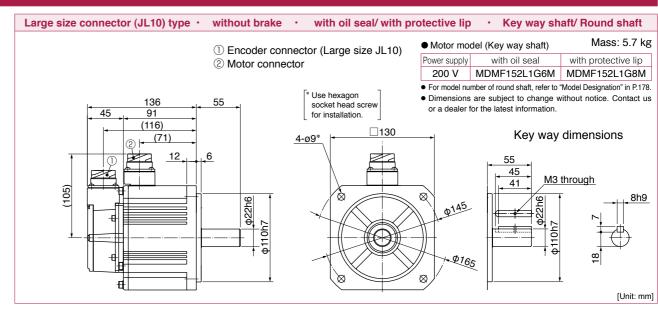
\* For motors specifications, refer to P.208, P.209.

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft Motor model (Key way shaft) ① Encoder connector (Large size JL10) with oil seal with protective lip ② Motor connector 200 V MDMF102L1G6M MDMF102L1G8M For model number of round shaft, refer to "Model Designation" in P.178. \* Use hexagon • Dimensions are subject to change without notice. Contact us socket head screw or a dealer for the latest information. for installation. (102) (57) Key way dimensions 4-ø9\* M3 through [Unit: mm]

MDMF 1.0 kW to 1.5 kW



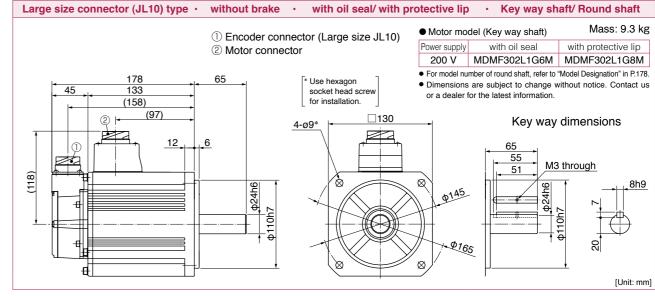
#### MDMF 1.5 kW

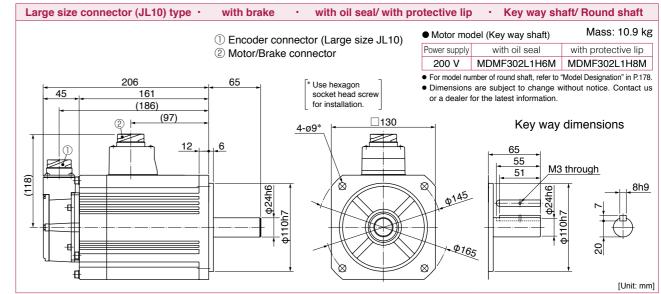


\* For motors specifications, refer to P.210, P.211.

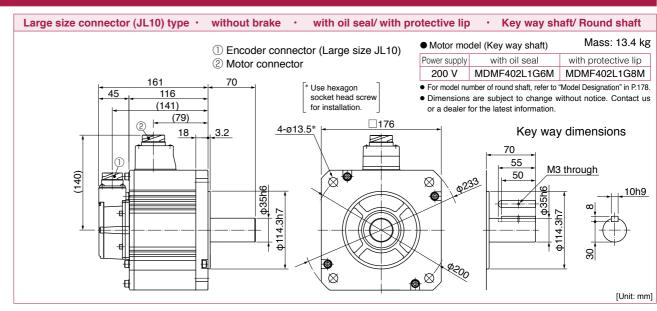
#### MDMF 3.0 kW

MDMF 3.0 kW to 4.0 kW

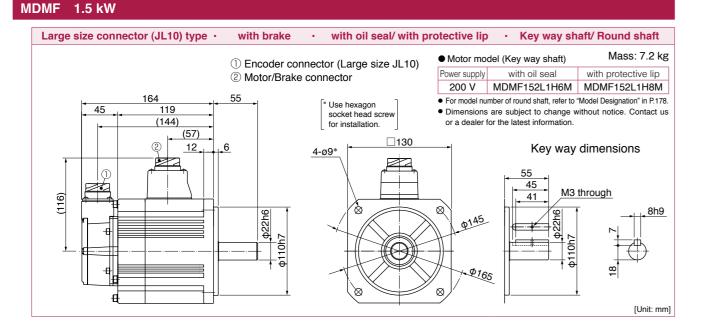




#### MDMF 4.0 kW



<sup>\*</sup> For motors specifications, refer to P.213, P.214



#### MDMF 2.0 kW

Large size connector (JL10) type ·	without brake	· with oil seal/ with pr	rotective lip	<ul> <li>Key way sh</li> </ul>	aft/ Round shaft
	① Encoder con	nector (Large size JL10)	Motor mod	del (Key way shaft)	Mass: 6.9 kg
	② Motor connec	, ,	Power supply	with oil seal	with protective lip
			200 V	MDMF202L1G6M	MDMF202L1G8M
45 105	55	* Use hexagon socket head screw for installation.	<ul> <li>Dimensions</li> </ul>		"Model Designation" in P.178. vithout notice. Contact us
(130) (85) 12	<u>i</u>	4-09*		<del>- 55</del>   <del>- 45</del>	dimensions through
(105)	422h6		0145	110h7	819
		8	Ø 165		- [Unit: mm]

Large size connector (JL10) type •	with brake	· with oil seal/ with pr	rotective lip	<ul> <li>Key way sh</li> </ul>	aft/ Round shaft
	(1) Encoder con	nector (Large size JL10)	Motor mod	del (Key way shaft)	Mass: 8.4 kg
	② Motor/Brake		Power supply	with oil seal	with protective lip
	O		200 V	MDMF202L1H6M	MDMF202L1H8M
178 45 (158) (2) (71) 12	9 422h6 4110h7	* Use hexagon socket head screw for installation.	<ul> <li>Dimensions</li> </ul>	are subject to change we or the latest information.  Key way	Model Designation* in P.178. vithout notice. Contact us  dimensions  through
Ф				I	[Unit: mm]

<sup>\*</sup> For motors specifications, refer to P.211, P.212.

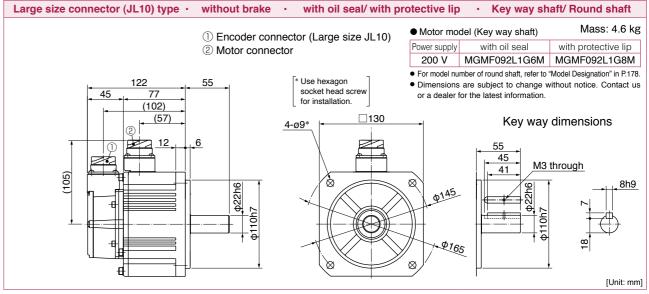
MDMF 4.0 kW

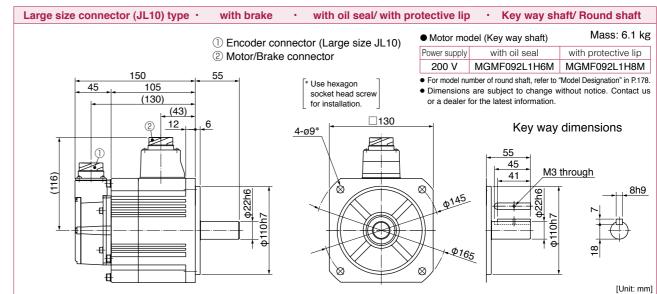
**A6 Series** 

**Dimensions** 

#### **MGMF 0.85 kW**

MGMF 0.85 kW to 1.3 kW





#### MGMF 1.3 kW

[Unit: mm]

Large size connector (JL10) type · without be	rake · with oil seal/ with pr	rotective lip	· Key way sh	aft/ Round shaft
① Encode	er connector (Large size JL10)		del (Key way shaft)	Mass: 5.7 kg
② Motor o	connector	Power supply 200 V	with oil seal MGMF132L1G6M	with protective lip MGMF132L1G8M
136 55 45 91	* Use hexagon socket head screw for installation.	<ul><li>For model nu</li><li>Dimensions</li></ul>	imber of round shaft, refer to a sare subject to change we for the latest information.	"Model Designation" in P.17
(116) (71) (71) (12) (6) (9)	4-09*	× ×	55 45 41 M3	through
0.000	0 110h7	Ø145	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	
#		⊗ <i>/</i> /	,	<u>t</u> [Unit: m

<sup>\*</sup> For motors specifications, refer to P.216, P.217.

#### Large size connector (JL10) type • with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft Motor model (Key way shaft) ① Encoder connector (Large size JL10) with oil seal ② Motor/Brake connector 200 V MDMF402L1H6M MDMF402L1H8M For model number of round shaft, refer to "Model Designation" in P.178. \* Use hexagon 145 socket head screv • Dimensions are subject to change without notice. Contact us (170)for installation. or a dealer for the latest information. ② (79) 4-ø13.5\* Key way dimensions 18 55 M3 through \_ 50 $\boxtimes$ $\boxtimes$

#### MDMF 5.0 kW

Large size connector (JL10) type ·	without brake · with oil seal/ with p	rotective lip · Key way sh	aft/ Round shaft
	① Encoder connector (Large size JL10)	Motor model (Key way shaft)	Mass: 15.6 kg
	② Motor connector	Power supply with oil seal	with protective lip
, 176	, 70 , , , , , ,	200 V MDMF502L1G6M	MDMF502L1G8M
45 131 (156)	* Use hexagon socket head screw for installation.	<ul> <li>For model number of round shaft, refer to</li> <li>Dimensions are subject to change w or a dealer for the latest information.</li> </ul>	•
② (92) 18	3.2 4-ø13.5*		/ dimensions
0140		⊗ x <sub>2</sub> 33	3 through
1		\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	ω 10h9
	<u>e</u> .		<u>+</u>     <del>(</del> ·- <del> </del> <del>)</del> -
			08
4 =	, , , , , , , , , , , , , , , , , , ,	<b>♦</b> 8200	<u>. I</u>
		· ·	[Unit: mm]

Ч			[Unit: mm]
Large size connector (JL10) type •	with brake · with oil seal/ with pro	otective lip · Key way sha	aft/ Round shaft
205 45 160 (185) (92) 2 18	1 Encoder connector (Large size JL10) 2 Motor/Brake connector  70  * Use hexagon socket head screw for installation.  4-ø13.5*  176	Motor model (Key way shaft)      Power supply with oil seal     200 V MDMF502L1H6M     For model number of round shaft, refer to *     Dimensions are subject to change w or a dealer for the latest information.      Key way      70      55      M3	Mass: 19.0 kg with protective lip MDMF502L1H8M Model Designation* in P.178. rithout notice. Contact us dimensions through
•		× 8500	 [Unit: mm]

<sup>\*</sup> For motors specifications, refer to P.214, P.215.

A6 Family

A6N Series

A6B

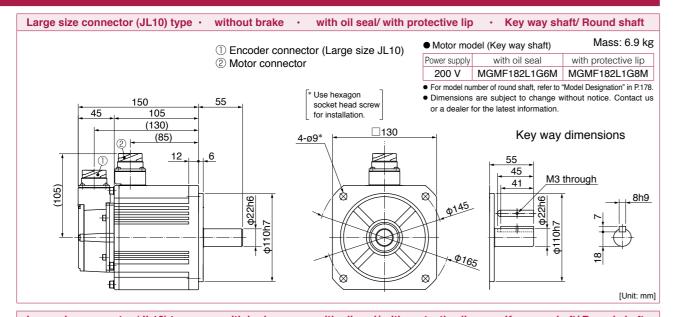
Series

Series

Imformation

**Dimensions** 

#### **MGMF 1.8 kW**



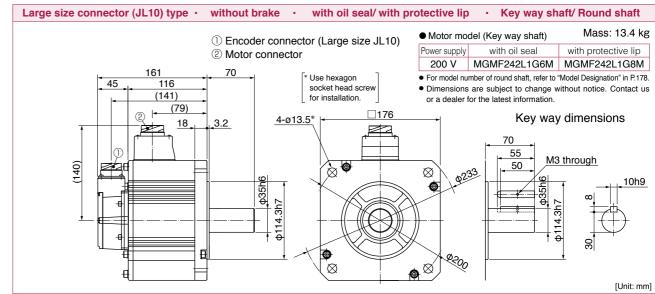
Large size connector (JL10) type ·	with brake	<ul> <li>with oil seal/ with pr</li> </ul>	otective lip	<ul> <li>Key way sh</li> </ul>	aft/ Round shaft
	① Encoder conn	ector (Large size JL10)	Motor mo	del (Key way shaft)	Mass: 8.4 kg
	② Motor/Brake o	` ` ` '	Power supply	with oil seal	with protective lip
	© 11.01011 21 and 0		200 V	MGMF182L1H6M	MGMF182L1H8M
178 45 133 (158)	55	* Use hexagon socket head screw for installation.	<ul> <li>Dimensions</li> </ul>		"Model Designation" in P.178. vithout notice. Contact us
(71)	6	4-ø9*	•	Key way	dimensions
(116)	422h6 0h7	8	Ø 145	41 M3	through 8h9
	+ 0		Ø16	<del>                                    </del>	82
ч 1			_/	I	[Unit: mm]

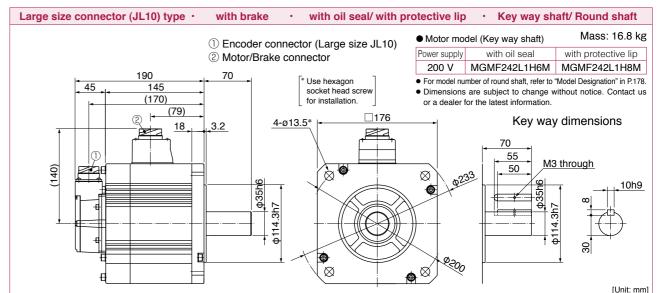
\* For motors specifications, refer to P.217, P.218.

#### MGMF 2.4 kW

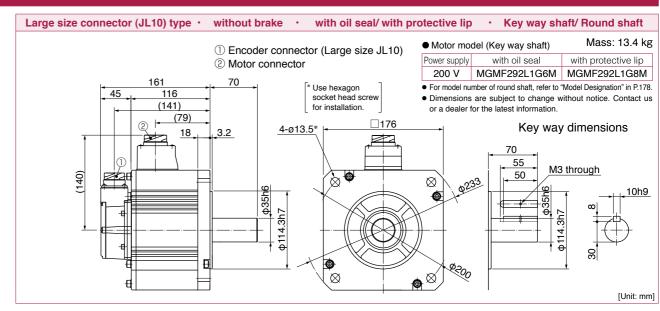
MGMF 2.4 kW to 2.9 kW

Special Order



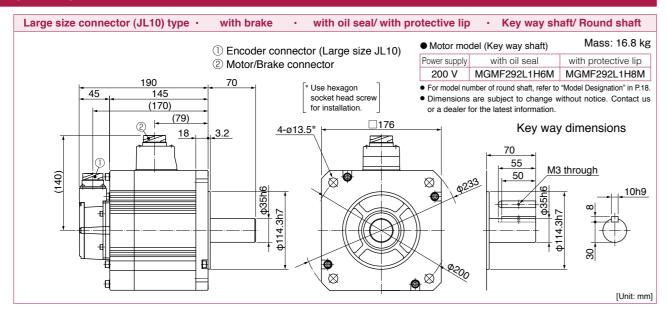


#### MGMF 2.9 kW

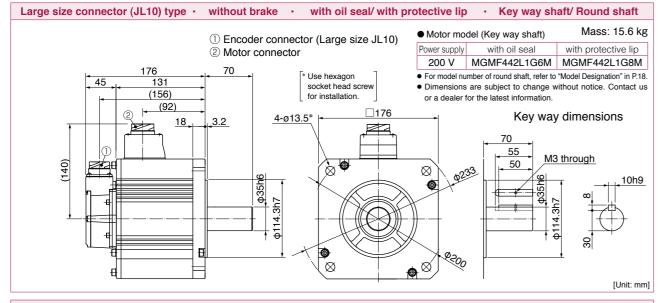


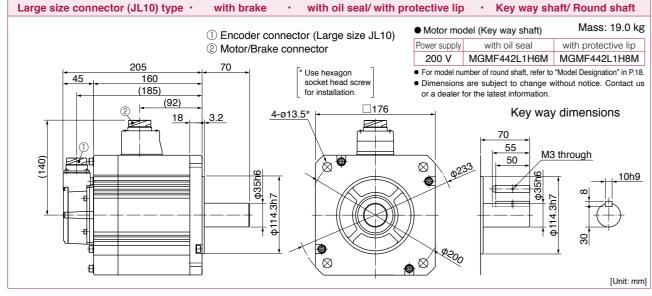
\* For motors specifications, refer to P.219, P.220

#### MGMF 2.9 kW



#### MGMF 4.4 kW





<sup>\*</sup> For motors specifications, refer to P.220, P.221.

**MEMO** 

### **Motor Types with Gear Reducer**

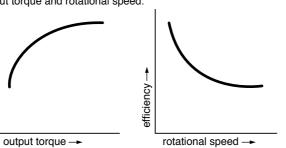




Reduction		Type of			
ratio	100	200	400	750	reducer
1/5	•	•	•	•	
1/9	•	•	•	•	For high
1/15	•	•	•	•	precision
1/25	•	•	•	•	

- \* MQMF 750 W is not prepared.
- \* MHMF 100 W 1/25, 400 W 1/25 are not prepared.

Efficiency of the gear reducer show the following inclination in relation	1
to output torque and rotational speed.	



## **Specifications of Motor with Gear Reducer**

	Items	Specifications			
	Backlash	3 minutes or smaller (initial value) at output shaft of the reducer			
	Composition of gear	Planetary gear			
	Gear efficiency	76 % to 87 %			
Gear reducer	Lubrication	Grease lubrication			
Gear reducer	Rotational direction at output shaft	Same direction as the motor output shaft			
	Mounting method	Flange mounting			
	Permissible moment of inertia of the load (conversion to the motor shaft)	10 times or smaller than rotor moment of inertia of the moto			
	Enclosure rating	IP44 (at gear reducer)			
	Ambient temperature	0 °C to 40 °C (free from freezing)			
	Storage temperature	-20 °C to 65 °C (Max.temperature guarantee: 80 °C for 72 hours free from condensation)			
Environment	Ambient humidity, Storage humidity	20 % to 85 % RH (free from condensation)			
	Vibration	Lower than 49 m/s² (5G) at runninng, 24.5 m/s² (2.5G) at stall			
	Impact	Lower than 98 m/s <sup>2</sup> (10G)			
	Altitude	Lower than 1000 m			

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#### **Model Designation**

High inertia

100 W to 750 W

The Combination of the Driver and the Motor

Model Designation/

M (	Q N	1	F Mo	O otor r	1 ated out	<b>1</b>	L	3	}	1	N	- N: S	Standard
Тур	е		Sy	mbol	Specification	ons							
Middle				01	100 W	'			М	otor ty	pes w	ith gea	ar reducer
Flat t				02	200 W	'					Reduct	ion	Motor output (

Coming soon

Symbol	Series	Ц	Voltage	specification	or
F	A6 family		Symbol	Rated outpu	it
			1	100 V	
			2	200 V	

04

80

Symbol	Reduction	M	otor ou	utput (\	N)	Type of			
Symbol	ratio	100	200	400	750	réducer			
1N	1/5	•	•	•	•				
2N	1/9	•	•	•	•	For high			
3N	1/15	•	•	•	•	precision			
4N	1/25	•	•	•	•				
* MQMF 750 W is not prepared. * MHMF 100 W 1/25, 400 W 1/25 are not prepared.									

400 W

750 W

Rotary 6	Rotary encoder specifications —									
Symbol	Format	Pulse counts	Resolution	Wire						
L	Absolute	23-bit	8388608	7						

#### **Motor structure**

Symbol	Format	Puise counts	Resolution	vvire	ĺ
L	Absolute	23-bit	8388608	7	
<note></note>					

Cumbal	Motor I/F	Shaft	Holding	g brake
Symbol	IVIOLOI I/I	Key way	without	with
3	Connector	•	•	
4	Connector	•		•
7	Leadwire	•	•	
8		•		•

Symbol

MQMF

MHMF

When using it as an incremental system (not using multiturn data), do not connect the battery for absolute encoder.

#### The Combination of the Driver and the Motor

				Dri	ver			
	MC	otor		A6SF series	A6SE series			
	Power	Output		Multi fanction type	Basic type			
Motor series	supply	(W)	Part No.*	art No.* Pulse, analog, full-closed				
	Single	100	MQMF011L □□ N	MADLT11SF	MADLN11SE			
	phase	200	MQMF021L  N	MBDLT21SF	MBDLN21SE			
MQMF Middle inertia	100 V	400	MQMF041L □□ N	MCDLT31SF	MCDLN31SE			
Flat type	Single phase/ 3-phase 200 V	100	MQMF012L  N	MADLT05SF	MADLN05SE			
		200	MQMF022L □□ N	MADLT15SF	MADLN15SE			
		400	MQMF042L □□ N	MBDLT25SF	MBDLN25SE			
	Single	100	MHMF011L 🗆 🗆 N	MADLT11SF	MADLN11SE			
	phase	200	MHMF021L □□ N	MBDLT21SF	MBDLN21SE			
	100 V	400	MHMF041L 🗆 🗆 N	MCDLT31SF	MCDLN31SE			
MHMF High inertia	Oin ala	100	MHMF012L 🗆 🗆 N	MADLT05SF	MADLN05SE			
High inertia	Single phase/	200	MHMF022L □□ N	MADLT15SF	MADLN15SE			
	3-phase	400	MHMF042L 🗆 🗆 N	MBDLT25SF	MBDLN25SE			
	200 V	750	MHMF082L 🗆 🗆 N	MCDLT35SF	MCDLN35SE			

Please refer to the above "Model Designation".

Imformation

A6N Series

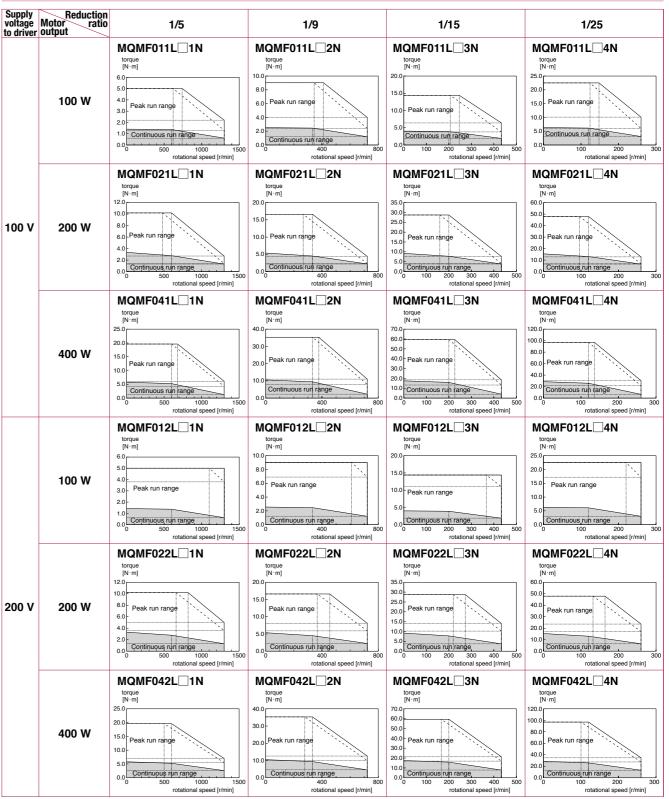
A6B Series
Special Order Product

#### **Table of Motor Specifications**

	Part No.*	Motor Output	Reduction ratio	Output	Rated speed	Max. speed	Rated torque	Peak max. torque	(motor + conv to moto	of inertia reducer/ erted or shaft)	Ма	iss	Permissible radial load	Permissible thrust load
		(141)	_	(w)	(u/mim)	(u/maim)	(N1.ma)	(N1)	w/o brake		w/o brake		(A1)	(NI)
	MQMF01□L□1N	(w)	1/5	(W) 85	(r/min) 600	(r/min) 1300	(N·m)	(N·m) 5.01	J(×10 <sup>-4</sup>	0.240	1,2	g) 1.4	(N) 490	(N) 245
	MQMF01□L□2N		1/9	85	333	722	2.45	9.02	0.200	0.230	1.2	1.4	588	294
	MQMF01 L 3N	100	1/15	81	200	433	3.89	14.4	0.207	0.237	1.4	1.7	784	392
MQMF	MQMF01 L 4N		1/25	76	120	260	6.08	22.5	0.287	0.317	2.6	2.9	1670	833
	MQMF02 L 1N		1/5	175	600	1300	2.78	10.2	0.650	0.740	1.9	2.3	490	245
Middle inertiaa Flat type		_												
e ine	MQMF02 L 2N	200	1/9	157	333	722	4.49	16.6	0.770	0.860	3.0	3.4	1180	588
rtiaa	MQMF02 L 3N	-	1/15	163	200	433	7.78	28.7	0.800	0.890	3.4	3.8	1470	735
Flat	MQMF02_L_4N		1/25	163	120	260	13.0	47.9	0.790	0.880	3.4	3.8	1670	833
type	MQMF04_L_1N		1/5	331	600	1300	5.27	19.6	1.35	1.43	3.4	3.9	980	490
	MQMF04□L□2N	400	1/9	331	333	722	9.49	35.3	1.25	1.33	3.4	3.9	1180	588
	MQMF04□L□3N		1/15	335	200	433	16.0	59.4	1.28	1.36	3.8	4.3	1470	735
	MQMF04□L□4N		1/25	327	120	260	26.0	96.9	1.31	1.39	5.4	5.9	2060	1030
	MHMF01□L□1N		1/5	85	600	1300	1.36	5.01	0.131	0.134	1.0	1.2	490	245
	MHMF01□L□2N	100	1/9	85	333	722	2.45	9.02	0.121	0.124	1.0	1.2	588	294
	MHMF01□L□3N		1/15	81	200	433	3.89	14.4	0.124	0.127	1.1	1.3	784	392
	MHMF02□L□1N		1/5	175	600	1300	2.78	10.2	0.437	0.457	1.5	1.8	490	245
	MHMF02□L□2N	200	1/9	157	333	722	4.49	16.6	0.563	0.583	2.5	2.8	1180	588
MHMF	MHMF02□L□3N	200	1/15	163	200	433	7.78	28.7	0.592	0.612	2.9	3.2	1470	735
ᄪ	MHMF02□L□4N		1/25	163	120	260	13.0	47.9	0.583	0.603	2.9	3.2	1670	833
igh inertia	MHMF04□L□1N		1/5	339	600	1300	5.39	19.6	0.930	0.950	2.8	3.2	980	490
ertia	MHMF04□L□2N	400	1/9	332	333	722	9.51	35.3	0.833	0.853	2.8	3.2	1180	588
	MHMF04□L□3N		1/15	335	200	433	16.0	59.4	0.862	0.882	3.2	3.6	1470	735
	MHMF082L□1N		1/5	672	600	1200	10.7	38.4	2.38	2.48	4.3	5.0	980	490
	MHMF082L□2N		1/9	645	333	667	18.5	68.4	2.32	2.42	5.6	6.3	1470	735
	MHMF082L□3N	750	1/15	637	200	400	30.4	111	2.25	2.35	6.0	6.7	1760	882
	MHMF082L□4N	_	1/25	637	120	240	50.7	186	2.22	2.32	6.0	6.7	2060	1030

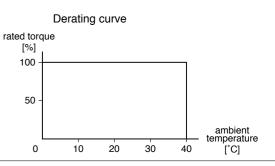
<sup>\*</sup> The symbols of the voltage specifications and the motor structure are entered in ☐ of the motor part number. Please refer to "Model Designation" in P.262.

#### MQMF series (100 W to 400 W)



Dotted line represents the torque at 10 % less supply voltage to driver.

<sup>\*</sup> The symbols of the motor structure are entered in  $\square$  of the motor part number. Please refer to "Model Designation" in P.262.



A6N Series

A6B Series
Special Order Product

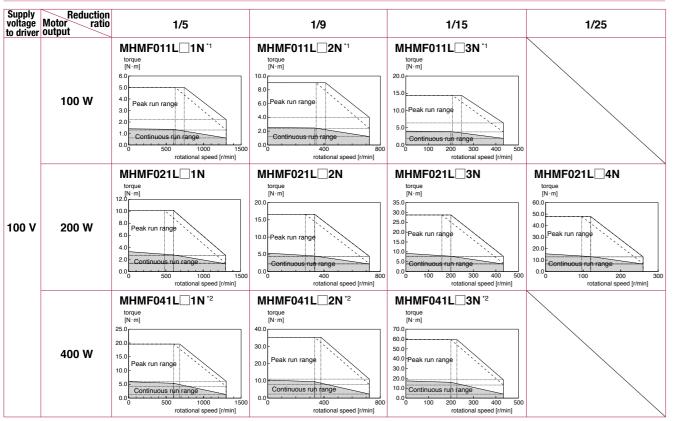
1/25

MHMF022L 4N

MHMF082L 4N \*3

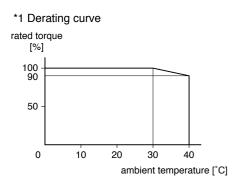
torque [N·m]

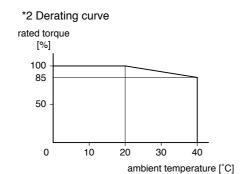
#### MHMF series (100 W to 750 W)



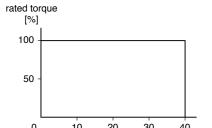
Dotted line represents the torque at 10 % less supply voltage to driver.

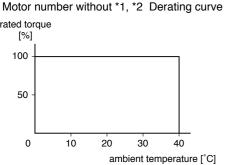
\* The symbols of the motor structure are entered in  $\square$  of the motor part number. Please refer to "Model Designation" in P.262.

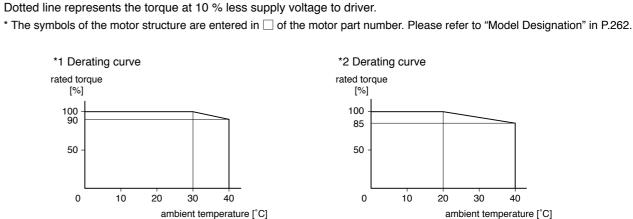


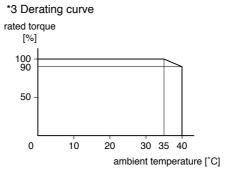


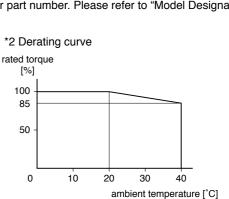
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MHMF012L 3N 1

Continuous run range, 0 100 200 300

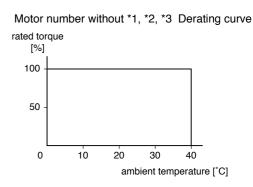
MHMF022L 3N

MHMF042L 3N 2

MHMF082L 3N 3

80.0

torque [N·m]



Panasonic Corporation Electromechanical Control Business Division

Supply voltage Motor ratio to driver output

100 W

200 W

400 W

750 W

200 V

1/5

MHMF012L 1N 11

0.0 Continuous run range

MHMF022L 1N

MHMF042L 1N '2

MHMF082L 1N

1/9

MHMF012L 2N 1

MHMF022L 2N

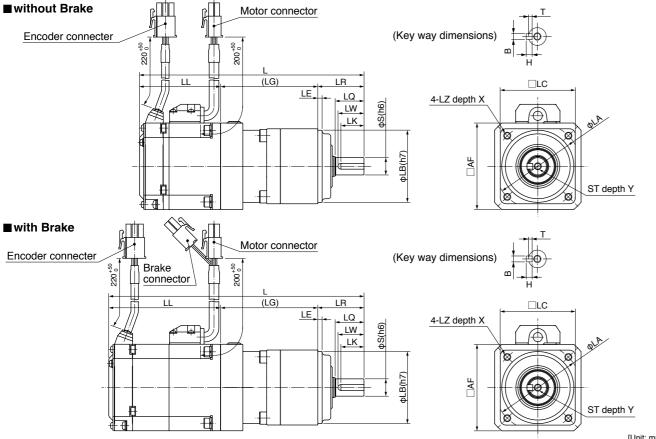
MHMF042L 2N 2

Peak run range

MHMF082L 2N

torque [N·m]

## **MQMF** series (Leadwire type)



													_			!				[Uni	it: mm	
Motor Part No.*	Motor output (W)	Reduction ratio	L Without Brake with Brake	LL Brake with	(LG)	LR	LQ	LW	LK	s	В×Т	Н	ST	Y	LB	LA	LE	LZ	LC	х	AF	
MQMF01□L□1N		1/5	155.7	56.2																		
WGWF01_L_1N		1/5	177	77.5	67.5																	
MQMF01□L□2N		1/9	155.7	56.2	07.5	32	20	18	16	12	4×2.5	4	M5	10	50	60		M5	52	12		
WIGNIFUT_L_ZN	100	1/9	177	77.5		32	20	10	10	12	482.5	7	IVIO	10	30	00	3	IVIO	32	12	60	
MQMF01□L□3N	100	1/15	171.7	56.2	02.5	83.5	83.5											J				00
WGWI OI_L_SI		1/13	193	77.5	00.0																	
MQMF01□L□4N		1/25	199.7	56.2	93.5	50	30	26	22	19	6×3.5	6	M6	12	70	90		М6	78	20		
MGMI OI L 414		1/23	221	77.5	30.5	30	50	20		13	0.0.0		IVIO	12	70	30		IVIO	70	20		
MQMF02□L□1N		1/5	166.8	62.3	72.5	32	20	18	16	12	4×2.5	4	M5	10	50	60		M5	52	12		
		170	190.4	85.9	72.0	02					172.0	Ľ.	1410		00	- 00			J			
MQMF02□L□2N		1/9	201.8	62.3	89.5																	
	200		225.4	85.9													3				80	
MQMF02□L□3N		1/15	212.3	62.3		50	30	26	22	19	6×3.5	6	M6	12	70	90	_	M6	78	20		
			235.9	85.9	100							_										
MQMF02□L□4N		1/25	212.3	62.3																		
			235.9	85.9																		
MQMF04□L□1N		1/5	214.3	74.8																		
			237.9	98.4	89.5																	
MQMF04□L□2N		1/9	214.3	74.8		50	30	26	22	19	6×3.5	6	M6	12	70	90	3	M6	78			
	400		237.9	98.4																20	80	
MQMF04□L□3N		1/15	224.8	74.8	100																	
	-		248.4	98.4		100																
MQMF04□L□4N		1/25	239.8	74.8	104	61	40	35	30	24	8×4	7	M8	16	90	115	5	M8	98			
			263.4	98.4															1 '		1	

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#### **MQMF** series (Connector type)

#### **■** without Brake Encoder connecter Motor connector (Key way dimensions) (LG) 4-LZ depth X LW LK ST depth Y ■ with Brake Encoder connecter Motor/Brake connector (Key way dimensions) (LG) LR LE 4-LZ depth X LW LK ST depth Y Motor Reduction (W) L without Brake with Brake Brake Motor Part No.\* (LG) LR LQ LW LK S B×T H ST Y LB LA LE LZ LC X AF 56.2 155.7 $MQMF01 \square L \square 1N$ 177 77.5 67.5 155.7 56.2 MQMF01 L2N 1/9 32 20 18 16 12 4×2.5 4 M5 10 50 60 M5 52 12 177 77.5 60 171.7 56.2 MQMF01 L 3N 1/15 193 77.5 56.2 199.7 MQMF01 L 4N 1/25 50 30 26 22 19 6×3.5 6 M6 12 70 90 M6 78 20 221 77.5 166.8 62.3 MQMF02 L 1N 1/5 10 50 M5 52 12 72.5 32 20 18 16 12 4×2.5 4 M5 190.4 85.9 201.8 62.3 1/9 $MQMF02\Box L\Box 2N$ 225.4 85.9 80 212.3 MQMF02 L 3N 1/15 M6 78 20 50 30 26 22 19 6×3.5 6 M6 12 70 90 235.9 85.9 100 212.3 62.3 $MQMF02 \square L \square 4N$ 1/25 235.9 85.9 74.8 214.3 MQMF04 L 1N 1/5 237.9 98.4 74.8 214.3 MQMF04 L2N 1/9 50 30 26 22 19 6×3.5 6 M6 12 70 90 3 M6 78 237.9 98.4 20 80 224.8 74.8 $MQMF04\square L\square3N$ 1/15 248.4 98.4 239.8

40 35 30 24

-268-

8×4

1/25

263.4

MQMF04 L 4N

16 90

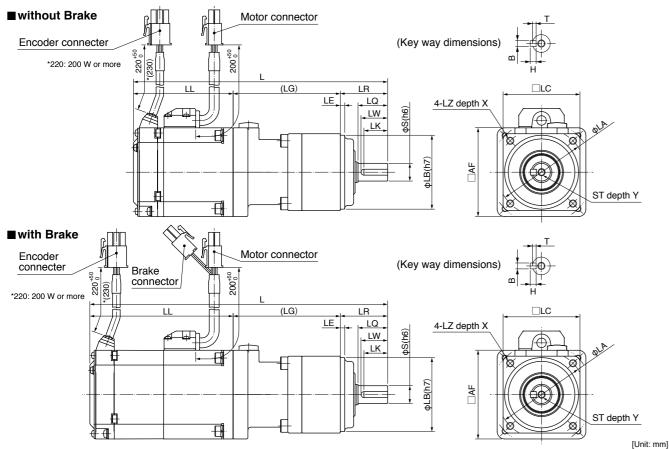
7 M8

115 5 M8 98

<sup>\*</sup> The symbols of the voltage specifications and the motor structure are entered in  $\square$  of the motor part number. Please refer to "Model Designation" in P.262.

 $<sup>^{\</sup>star}$  The symbols of the voltage specifications and the motor structure are entered in  $\square$  of the motor part number Please refer to "Model Designation" in P.262.

# MHMF series (Leadwire type)



Motor Part No.*	Motor output (W)	Reduction ratio	L without Brake with Brake	LL without Brake with Brake	(LG)	LR	LQ	LW	LK	s	B×T	Н	ST	Y	LB	LA	LE	LZ	LC	х	AF
MHMF01□L□1N		1/5	167	67.5																	
		1/3	200.9	101.4	67.5																
MHMF01□L□2N	100	1/9	167	67.5	07.5	32	20	18	16	12	4×2.5	4	M5	10	50	60	3	M5	52	12	40
INITIAL CILLEIN	100	1/3	200.9	101.4		02	20			'-		7	IVIO	10	50	00	"	IVIO	52	'-	10
MHMF01 L 3N		1/15	177.5	67.5	78																
		1710	211.4	101.4																	
MHMF02□L□1N		1/5	172	67.5	72.5	32	20	18	16	12	4×2.5	4	M5	10	50	60		M5	52	12	
		.,,	201.3	96.8	7 2.0			10			172.0		1410		00	00					
MHMF02□L□2N		1/9	207	67.5	89.5																
	200	.,,	236.3	96.8													3				60
MHMF02 L3N		1/15	217.5	67.5		50 30	30	26	22	19	6×3.5	6	M6	12	70	90		M6	78	20	
			246.8	96.8	96.8						0110.0	·									
MHMF02□L□4N	<b>F02</b> L 4N 1/25 217.5 67.5																				
		0	246.8	96.8																	
MHMF04 L 1N		1/5	224	84.5																	
			253.3	113.8	89.5																
MHMF04□L□2N	400	1/9	224	84.5	00.0	50	30	26	22	19	6×3.5	6	M6	12	70	90	3	M6	78	20	60
			253.3	113.8																	
MHMF04□L□3N		1/15	234.5	84.5	100																
			263.8	113.8																	
MHMF082L□1N		1/5	235.4	91.9	93.5	50	30	26	22	19	6×3.5	6	M6	12	70	90	3	M6	78		
			269	125.5																	
MHMF082L□2N		1/9	250.4	91.9	97.5																
	750		284	84 125.5															20	80	
MHMF082L□3N	1/15 262.9 91.9		61	40	35	30	24	8×4	7	M8	16	90	115	5	M8	98					
	-		296.5	125.5	110					) 24 8×4	24 8X4		IVIO	10	90						
MHMF082L□4N		1/25	262.9	91.9		110															
			296.5	125.5																	

\* The symbols of the voltage specifications and the motor structure are entered in  $\square$  of the motor part number. Please refer to "Model Designation" in P.262.

#### MHMF series (Connector type) **■** without Brake Encoder connecter Motor connector (Key way dimensions) LR LE \_ LQ 4-LZ depth X LW LK. ST depth Y ■ with Brake Encoder connecter Motor/Brake connector (Key way dimensions) (LG) LR - LE \_ LQ 4-LZ depth X LW LK ST depth Y Motor output (W) L without Brake UL without Brake Brake ULG) Motor Part No.\* LR LQ LW LK S BxT H ST Y LB LA LE LZ LC X AF 167 67.5 MHMF01 L 1N 1/5 200.9 101.4 167 67.5 MHMF01 L2N 100 1/9 32 20 18 16 12 4×2.5 4 M5 10 50 60 3 M5 52 12 40 200.9 101.4 67.5 177.5 MHMF01 L 3N 1/15 211.4 101.4 67.5 172 72.5 32 20 18 16 12 4×2.5 4 M5 10 50 60 MHMF02 L 1N 1/5 M5 52 12 201.3 96.8 207 67.5 1/9 MHMF02 L 2N 96.8 236.3 200 67.5 217.5 1/15 MHMF02 L 3N 30 26 22 19 6×3.5 6 M6 12 70 90 M6 78 20 96.8 246.8 100 67.5 217.5 MHMF02 $\square$ L $\square$ 4N 1/25 96.8 246.8 224 84.5 MHMF04 L 1N 1/5 113.8 253.3 224 84.5 MHMF04 L 2N 400 1/9 30 | 26 | 22 | 19 | 6×3.5 | 6 | M6 | 12 | 70 | 90 | 3 | M6 | 78 | 20 | 60 253.3 113.8 234.5 84.5 MHMF04 L 3N 1/15 263.8 113.8 91.9 235.4 MHMF082L 1N 1/5 93.5 50 30 26 22 19 6×3.5 6 M6 12 70 90 3 M6 78 269 125.5 91.9 250.4 MHMF082L 2N 1/9 284 125.5 750 20 80 262.9 91.9 MHMF082L 3N 1/15 40 35 30 24 7 M8 16 90 115 5 M8 98 8×4

-270-

1/25

296.5

262.9

296.5

125.5

91.9

125.5

MHMF082L 4N

 $<sup>^*</sup>$  The symbols of the voltage specifications and the motor structure are entered in  $\square$  of the motor part number. Please refer to "Model Designation" in P.262.

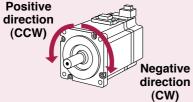
#### **Environmental Conditions**

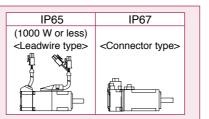
Ite	m	Conditions					
Ambient ten	nperature *1	0 °C to 40 °C (free from freezing)					
Ambient humidity		20 % to 85 % RH (free from condensation)					
Storage temperature *2		-20 °C to 65 °C (Max.temperature guarantee: 80 °C for 72 hours free from condensation 5)					
Storage humidity		20 % to 85 % RH (free from condensation*5)					
Vibration Motor only		Lower than 49 m/s <sup>2</sup> (5 G) at running, 24.5 m/s <sup>2</sup> (2.5 G) at stall					
Impact	Motor only	Lower than 98 m/s <sup>2</sup> (10 G)					
Enclosure IP65 *3		MSMF, MQMF, MHMF (except rotating portion of output shaft and leadwire end.)  (MSMF, MQMF, MHMF In case of leadwire type.)					
rating (Motor only) IP67 *3*4		IP67 motor (except rotating portion of output shaft and connecting pin part of the motor connector and the encoder connector)					
Altitude		Lower than 1000 m					

- \*1 Ambient temperature to be measured at 5 cm away from the motor.
- \*2 Permissible temperature for short duration such as transportation.
- \*3 These motors conform to the test conditions specified in EN standards (EN60529, EN60034-5). Do not use these motors in application where water proof performance is required such as continuous wash-down operation.
- \*4 This condition is applied when the connector mounting screw are tightened to the recommended tightening torque.
- \*5 Air containing water vapor will become saturated with water vapor as the temperature falls, causing dew.

#### <Note>

Initial setup of rotational direction: positive = CCW and negative = CW. Pay an extra attention.





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## Notes on [Motor specification] page

Note) 1. Regenerative resistors are not built in drivers of A and B frames. When regeneration occurs, prepare an optional external regenerative resistor.

#### [At AC100 V of power voltage]

Regenerative brake frequency represents the frequency of the motor's stops from the rated speed with deceleration without load.

- If the load is connected, frequency will be defines as 1/(m+1), where m=load moment of inertia/ rotor moment of inertia.
- · When the motor speed exceeds the rated speed, regenerative brake frequency is in inverse proportion to the square of (running speed/rated speed).
- Power supply voltage is AC115 V (at 100 V of the main voltage).
- If the supply voltage fluctuates, frequency is in inverse proportion to the square of (Running supply voltage/115) relative to the value in the table.
- · When regeneration occurs continuously such cases as running speed frequently changes or vertical feeding, consult us or a dealer.

#### [At AC200 V of power voltage]

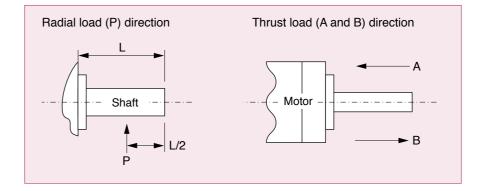
Regenerative brake frequency represents the frequency of the motor's stops from the rated speed with deceleration without load.

- If the load is connected, frequency will be defines as 1/(m+1), where m=load moment of inertia/ rotor moment of inertia.
- · When the motor speed exceeds the rated speed, regenerative brake frequency is in inverse proportion to the square of (running speed/rated speed).
- Power supply voltage is AC230 V (at 200 V of the main voltage). If the supply voltage fluctuates, frequency is in inverse proportion to the square of (Running supply voltage/230) relative to the value in the table.
- · When regeneration occurs continuously such cases as running speed frequently changes or vertical feeding, consult us or a dealer.
- Note) 2. If the effective torque is within the rated torque, there is no limit in generative brake.
- Note) 3. Consult us or a dealer if the load moment of inertia exceeds the specified value.
- Note) 4. Releasing time values represent the ones with DC-cutoff using a varistor.

#### Permissible Load at Output Shaft

The radial 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 radial load and thrust load significantly affect the life of the bearing, take care not to allow the load during operation to exceed the permissible radial load and thrust load shown in the table below.



#### **Built-in Holding Brake**

In the applications where the motor drives the vertical axis, this brake would be used to hold and prevent the work (moving load) from falling by gravity while the power to the servo is shut off.

Use this built-in brake for "Holding" purpose only, that is to hold the stalling status. Never use this for "Brake" purpose to stop the load in motion.

#### Output Timing of BRK-OFF Signal

- For the brake release timing at power-on, or braking timing at Servo-OFF/Servo-Alarm while the motor is in motion, refer to the Operating Instructions (Overall).
- With the parameter, Pr4.38 (Setup of mechanical brake action while the motor is in motion), you can set up a time between when the motor enters to a free-run from energized status and when BRK-OFF signal turns off (brake will be engaged), when the Servo-OFF or alarm occurs while the motor is in motion. For details, download a copy of the instruction manual from our website.

#### <Note>

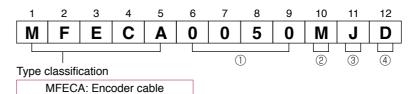
- 1. The lining sound of the brake (chattering and etc.) might be generated while running the motor with built-in brake, however this does not affect any functionality.
- 2. Magnetic flux might be generated through the motor shaft while the brake coil is energized (brake is open). Pay an extra attention when magnetic sensors are used nearby the motor.

#### ● Specifications of Built-in Holding Brake

Motor series	Motor output	Static friction torque N·m	Rotor inertia × 10 <sup>-4</sup> kg·m²	Engaging time ms	Releasing time ms	Exciting current DC A (at cool-off)	Releasing voltage DC V Exciting voltage DC V	Permissible work (J) per one braking	Permissible total work × 10 <sup>3</sup> J	Permissible angular acceleration rad/s <sup>2</sup>
	50 W,100 W	0.294 or more	0.002	35 or less	20 or less	0.30	4	39.2	4.9	
MONTE	200 W,400 W	1.27 or more	0.018	50 or less	15 or less	0.36	1 or more	137	44.1	
MSMF (80 mm sq.) or less	750 W	2.45 or more					24±1.2	196	147	30000
( 61 1666 )	1000 W	3.80 or more	0.075	70 or less 20 or		0.42	1 or more 24±2.4	185	80.0	
	1.0 kW, 1.5 kW, 2.0 kW	8.0 or more	0.175	50 or less	15 or less	0.81		600	50	
MSMF	3.0 kW	12.0 or more		80 or less	_		2 or more		900	10000
(100 mm sq.) or more	4.0 kW	16.2 or more	4.40	440	50	0.00	24±2.4	1470	2160	10000
	5.0 kW	22.0 or more	1.12	110 or less	50 or less	0.90		1545	2000	
MQMF	100 W	0.39 or more	0.018	15 or less		0.30	1 or more	105	44.1	00000
(80 mm sq.) or less	200 W, 400 W	1.6 or more	0.075	70 or less	20 or less	0.36	24±2.4	185	80	30000
	50 W, 100 W	0.38 or more	0.002	35 or less		0.30	_	39.2	4.9	
MHMF (80 mm sq.) or less	200 W, 400 W	1.6 or more	0.018	50 or less	20 or less	0.36	1 or more	105	44.1	30000
( or less /	750 W, 1000 W	3.8 or more	0.075	70 or less		0.42	24±2.4	185	80	
	1.0 kW, 1.5 kW	13.7 or more	1.12	100 or less	50 or less	0.79		1470	2160	10000
MHMF (100 mm sq.) or more	2.0 kW, 3.0 kW, 4.0 kW	25.0 or more	4.7	80 or less	25 or less	1.29	2 or more 24±2.4	1800	3000	5440
	5.0 kW	44.1 or more	4.1	150 or less	30 or less	-		1800	3100	5108
	1.0 kW, 1.5 kW, 2.0 kW	13.7 or more	1.12	100 or less	50 or less	0.79		1470	2160	10000
MDMF /100 mm sq.\	3.0 kW	22.0 or more		110 or less		0.90	2 or more	1545	2000	
or more	4.0 kW	25.0 or more	4.7	80 or less	25 or less	1.00	24±2.4	1000	3000	5440
	5.0 kW	44.1 or more	4.1	150 or less	30 or less	1.29		1800	3100	5108
MGMF	0.85 kW, 1.3 kW, 1.8 kW	13.7 or more	1.12	100 or less	50 or less	0.79	2 or more	1470	2160	10000
(100 mm sq.) or more	2.9 kW	25.0 or more	4.7	80 or less	25 or less	1.20	24±2.4	1800	3000	5440
	4.4 kW	44.1 or more	3.93	150 or less	30 or less	1.29		1800	3100	5108

- · Releasing time values represent the ones with DC-cutoff using a varistor.
- Above values (except static friction torque, releasing voltage and excitation current) represent typical values.
- Backlash of the built-in holding brake is kept ±1° or smaller at ex-factory point.
- Service life of the number of acceleration/deceleration with the above permissible angular acceleration is more than 10 million times. (Life end is defined as when the brake backlash drastically changes.)

#### **Encoder Cable**



#### ① Cable length

Cable part No. Designation

0030	3 m
0050	5 m
0100	10 m
0200	20 m

#### ② Cable type

Е	PVC cable with shie	eld by Oki Electric Cable Co., 0.20 mm <sup>2</sup> × 4P(8-wire), 3P(6-wire)
М	Hitachi Cable, Ltd.	Highly bendable type
Т	Hitachi Cable, Ltd.	Standard bendable type

#### ③ Cable end (Encoder side)

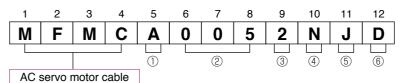
Α	Tyco Electronics Japan G.K. connector	
J	Japan Aviation Electronics Industry, Ltd.	connector (Direction of motor shaft)
K	Japan Aviation Electronics Industry, Ltd.	connector (Opposite direction of motor shaft)
Р	Japan Aviation Electronics Industry, Ltd.	plug connector
S	"S" shaped cannonplug	

T Japan Aviation Electronics Industry, Ltd. plug connector

#### 4 Cable end (Driver side)

D	Connector (Without battery box
Е	Connector (With battery box)

#### Motor Cable, Brake Cable



#### ① Type classification

Α	Standard	
В	Special	
:	Design order	

#### ② Cable length

_	J
003	3 m
005	5 m
010	10 m
020	20 m

# ③ Sectional area of cable core

0	0.75 mm <sup>2</sup>
1	1.25 mm <sup>2</sup>
2	2.0 mm <sup>2</sup>
3	3.5 mm <sup>2</sup>
7	0.3 mm <sup>2</sup>

#### 4 Cable type

ROBO-TOP⊚ is a trade mark of DYDEN CORPORATION

E	ROBO-TOP <sub>®</sub> 4-wire by DYDEN CORPORATION
F	ROBO-TOP <sub>®</sub> 6-wire by DYDEN CORPORATION
G	ROBO-TOP <sub>®</sub> 2-wire by DYDEN CORPORATION
N	4-wire by Hitachi Cable, Ltd. (Highly bendable type)
Р	4-wire by Hitachi Cable, Ltd. (Standard bendable type)
R	2-wire by Hitachi Cable, Ltd. (Highly bendable type)
S	2-wire by Hitachi Cable, Ltd. (Standard bendable type)
U	4-wire for A6 series small motor* (Highly bendable type)
V	6-wire for A6 series small motor* (Highly bendable type)
W	4-wire for A6 series small motor* (Standard bendable type)
X	6-wire for A6 series small motor* (Standard bendable type)

#### \* 80 mm sq. or less

#### ⑤ Cable end at motor side

С	S type cannon plug			
Е	Tyco Electronics Japan G.K. connector			
F	Japan Aviation Electronics Industry, Ltd.	connector	(Direction of motor shaft)	
G	Japan Aviation Electronics Industry, Ltd.	connector	(Opposite direction of motor shaft)	
J	Japan Aviation Electronics Industry, Ltd.	connector	(Direction of motor shaft)	
K	Japan Aviation Electronics Industry, Ltd.	connector	(Opposite direction of motor shaft)	
U	Japan Aviation Electronics Industry, Ltd.	plug conne	ctor	

#### (6) Cable end at driver side

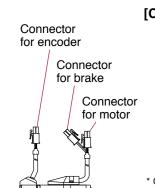
D	Rod terminal
Т	Clamp terminal

PIN No.	Application		
Α	with Brake	: Brake	
А	without Brake	e: NC	
В	with Brake	: Brake	
Ь	without Brake	e: NC	
С	NC		
D	U-ph	ase	
E	V-phase		
F	W-phase		
G	Ground		
Н	Ground		
	A 14	_	

#### <Remarks> Do not connect anything to NC.

#### 50 W to 1000 W 80 mm sq. or less

• When the motors of <MSMF, MQMF, MHMF (Leadwire type)> are used, they are connected as shown below. Connector: Tyco Electronics Japan G.K. (The figures below show connectors for the motor.)



#### [Connector for encoder]

ation
+*
_*
ELD)
;
;
/
/

Connector pin diagram is viewed from the direction of the arrow.

<Remarks> Do not connect anything

NC

\* When using the motor as an incremental system. BAT+ and BAT- can be left unconnected

#### [Connector for motor]

	PIN No.	Application
	1	U-phase
4 3	2	V-phase
172167-1	3	W-phase
	4	Ground

\* Connector pin diagram is viewed from the direction of the arrow.

#### [Connector for Brake]

1 2	
172165-1	

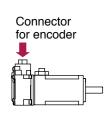
Brake Electromagnetic brake is a nonpolar device.

PIN No. Application

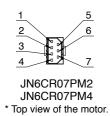
Brake

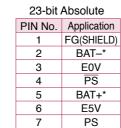
\* Connector pin diagram is viewed from the direction of the arrow

• When the motors of <MSMF, MQMF, MHMF (Connector type)> are used, they are connected as shown below. Connector: Made by Japan Aviation Electronics Industry, Ltd. (The figures below show connectors for the motor.)



Connector





PIN No. Application

U-phase

V-phase

W-phase

Ground

Tightening torque of the screw (M2) 0.19 N·m to 0.21 N·m

- \* Be sure to use only the screw supplied with the connector, to avoid damage
- When using the motor as an incremental system. BAT+ and BAT- can be left unconnected.

#### <MSMF>



3 PΕ JN8AT04NJ1

Tightening torque of the screw (M2)

- 0.085 N·m to 0.095 N·m (screwed to plastic)
- \* Be sure to use only the screw supplied with the connector, to avoid damage.
- Secure the gasket in place without removing it from the connector.

with Brake

\* Top view of the motor.

#### <MHMF 50 W. 100 W>



JN11AH06NN2 Top view of the motor.

#### <MQMF, MHMF 200 W to 1000 W>



JN11AH06NN1

#### PIN No. Application PIN No. Application U-phase U-phase V-phase V-phase W-phase W-phase NC Brake NC Brake PΕ Ground PE Ground

Tightening torque of the screw (M2) 0.085 N·m to 0.095 N·m

without Brake

- \* Electromagnetic brake is a nonpolar device.
- \* Be sure to use only the screw supplied with the connector, to avoid damage
- Secure the gasket in place without removing it from the connector.

<Remarks> Do not connect anything to NC.

# [Motor with brake] <MSMF> Connector for brake



Top view of the motor

Brake 2 Brake JN4AT02PJM-R

PIN No. Application

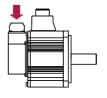
Tightening torque of the screw (M2) 0.19 N·m to 0.21 N·m

- \* Electromagnetic brake is a nonpolar device.
- Be sure to use only the screw supplied with the connector, to avoid damage.
- \* Secure the gasket in place without removing it from the connector.

#### 0.85 kW to 5.0 kW 100 mm sq. or more

- When the motors of <MSMF, MDMF, MGMF, MHMF> are used, they are connected as shown below. Connector: Made by Japan Aviation Electronics Industry, Ltd. (The figures below show connectors for the motor.)
- Connector for encoder

#### IP67 motor Connector for encoder (Large size)



IP67 motor Connector for encoder (Small size)



#### <Large size Encoder connector>



JL10-2A20-29P

23-bit Absolute

PIN NO.	Application
Α	NC
B C	NC
С	NC
D	NC
D E F	NC
F	NC
G	E0V
Н	E5V
J	FG(SHIELD)
K	PS
L	PS
М	NC
N	NC
Р	NC
R	NC
S T	BAT-*
T	BAT+*

<Small size Encoder connector>

/ 6 5 8 \
/ / Š Š Š Š Ž \
(4°5°6°7 8°9°10
\ 8 9 10 /
/ 8 8 10 /
(000)

JN2AS10ML3-R

23-bit Absolute PIN No. Application E0V 2 NC PS 3 4 E5V BAT-5 BAT+\* PS 8 NC 9 FG(SHIELD)

#### <Remarks>

10

Do not connect anything to NC.

\* When using the motor as an incremental system, BAT+ and BAT- can be left unconnected.

NC

#### Connector for motor/brake

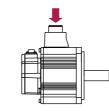
Table for motor connector and brake connector

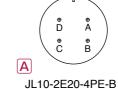
Motor	Motor output	200	200 V
part No.	Motor output	without Brake	with Brake
MSMF	1.0 kW to 2.0 kW	Α	С
	3.0 kW to 5.0 kW	В	D
MDMF	1.0 kW to 2.0 kW	Α	С
IVIDIVIE	3.0 kW to 5.0 kW	В	D

Motor	Motor output	200 V		
part No. Motor output		without Brake	with Brake	
MGMF	0.85 kW to 1.8 kW	Α	С	
	2.9 kW to 4.4 kW	В	D	
	1.0 kW to 1.5 kW	Α	С	
MHMF	2.0 kW to 5.0 kW	В	D	

\* Electromagnetic brake is a nonpolar device.

#### Connector for motor/brake





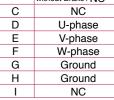
В

JL10-2E22-22PE-B			
PIN No.	Application		
Α	U-phase		
В	V-phase		
С	W-phase		
D	Ground		



		G	with
	G	with	
		- 11	with
	Н	with	
	Α		
		F	
		I	
		В	

JL10-2E20-10FE-D			
PIN No.	Application		
G	with Brake	: Brake	
G	without Brak	e: NC	
Н	with Brake	:Brake	
П	without Brak	e: NC	
Α	NC		
F	U-phase		
I	V-ph	ase	
В	W-ph	nase	
Е	Gro	und	
D	Ground		
С	NC		



Part No.	MFECA0 * * 0EAD	80 mm sq. or less Applicable model	MSMF 50 W to 1000 W, MQMF 100 W to 400 W MHMF 50 W to 1000 W (Leadwire type)		
Specifications	23-bit absolute encoder When used in incremental system (without battery box)				

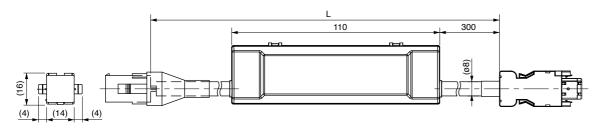
Title	Part No.	Manufacturer	L (m)	Part No.(ex.)
Connector (Driver side)	3E206-0100 KV	Sumitomo 3M	3	MFECA0030EAD
Shell kit	3E306-3200-008	(or equivalent)	5	MFECA0050EAD
Connector (Motor side)	172161-1	Tyco Electronics Japan	10	MFECA0100EAD
Connector pin	170365-1	G.K.	20	MFECA0200EAD
Cable	0.20 mm <sup>2</sup> x3P (6-wire)	Oki Flectric Cable Co., Ltd.		

Part No.	MFECA0 * * 0EAE	80 mm sq. or less Applicable model	MSMF 50 W to 1000 W, MQMF 100 MHMF 50 W to 1000 W (Leadwire type)	W to 400 W
Specifications	23-bit absolute encoder When used in absolute system (with battery box) *			

<sup>\*</sup> Battery is not included. Please buy the absolute encoder battery "DV0P2990" separately.

[Unit: mm]

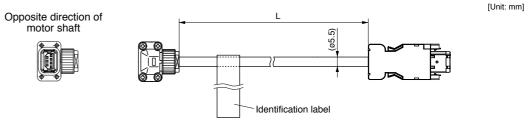
[Unit: mm]



Title	Part No.	Manufacturer	L (m)	Part No.(ex.)
Connector (Driver side)	3E206-0100 KV	Sumitomo 3M	3	MFECA0030EAE
Shell kit	3E306-3200-008	(or equivalent)	5	MFECA0050EAE
Connector (Motor side)	172161-1	Tyco Electronics Japan	10	MFECA0100EAE
Connector pin	170365-1	G.K.	20	MFECA0200EAE
Cable	0.20 mm <sup>2</sup> x4P (8-wire)	Oki Flectric Cable Co., Ltd.		

	MFECA0 * * 0MJD (Highly bendable type, Direction of motor shaft)	80 mm sq.	MSMF 50 W to 1000 W	
Part No.	MFECA0 * * 0MKD (Highly bendable type, Opposite direction of motor shaft)	or less	MQMF 100 W to 400 W	
Part No.	MFECA0 * * 0TJD (Standard bendable type, Direction of motor shaft)	Applicable model		
	MFECA0 * * 0TKD (Standard bendable type, Opposite direction of motor shaft)		(Connector type)	
Specifications	23-bit absolute encoder When used in incremental system (without battery box)			

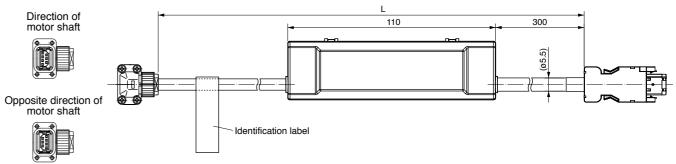
Direction of motor shaft



Title	Part No.	Manufacturer	L (m)	Part No.(ex.)
Connector (Driver side)	3E206-0100 KV	Sumitomo 3M	3	MFECA0030MJD
Shell kit	3E306-3200-008	(or equivalent)	5	MFECA0050MJD
Connector (Motor side)	JN6FR07SM1	Japan Aviation	10	MFECA0100MJD
Connector pin	LY10-C1-A1-10000	Electronics Ind.	20	MFECA0200MJD
Cable	AWG24 4-wire, AWG22 2-wire (ø5.5)	Hitachi Cable, Ltd.		

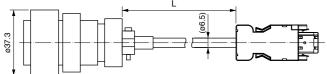
\* Battery is not included. Please buy the absolute encoder battery "DV0P2990" separately.

[Unit: mm]



Title	Part No.	Manufacturer	L (m)	Part No.(ex.)
Connector (Driver side)	3E206-0100 KV	Sumitomo 3M	3	MFECA0030MJE
Shell kit	3E306-3200-008	(or equivalent)	5	MFECA0050MJE
Connector (Motor side)	JN6FR07SM1	Japan Aviation	10	MFECA0100MJE
Connector pin	LY10-C1-A1-10000	Electronics Ind.	20	MFECA0200MJE
Cable	AWG24 4-wire、AWG22 2-wire (φ5.5)	Hitachi Cable, Ltd.		

Part No.	MFECA0 * * 0EPD	100 mm sq. or more Applicable model	0.85 kW to 5.0 kW
Specifications	23-bit absolute encoder When used in incremental system (without battery box) <a href="Large-ne-touch-locktype"></a>		

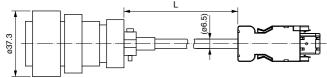


 L	[Unit: mr
(6.6.5)	

Title	Part No.	Manufacturer
Connector (Driver side)	3E206-0100 KV	Sumitomo 3M
Shell kit	3E306-3200-008	(or equivalent)
Connector (Motor side)	JL10-6A20-29S-EB	Japan Aviation
Cable clamp	JL04-2022CK(09)-R	Electronics Ind.
Cable	0.2 mm <sup>2</sup> x3P (6-wire)	Oki Electric Cable Co., Ltd.

L (m)	Part No.(ex.)
3	MFECA0030EPD
5	MFECA0050EPD
10	MFECA0100EPD
20	MFECA0200EPD

Part No.	MFECA0 * * 0ESD	100 mm sq. or more Applicable model	0.85 kW to 5.0 kW
Specifications	23-bit absolute encoder W <large screwed="" type=""></large>	When used in incremental system (without battery box)	



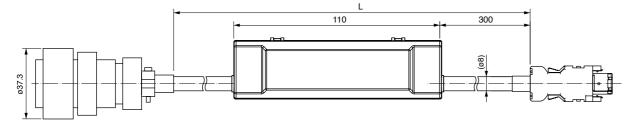
[Unit: mm]

Title	Part No.	Manufacturer	L (m)	Part No.(ex.)
Connector (Driver side)	3E206-0100 KV	Sumitomo 3M	3	MFECA0030ESD
Shell kit	3E306-3200-008	(or equivalent)	5	MFECA0050ESD
Connector (Motor side)	N/MS3106B20-29S	Japan Aviation	10	MFECA0100ESD
Cable clamp	N/MS3057-12A	Electronics Ind.	20	MFECA0200ESD
Cable	0.2 mm <sup>2</sup> ×3P (6-wire)	Oki Electric Cable Co., Ltd.		

Part No.	MFECA0 * * 0EPE	100 mm sq. or more Applicable model	0.85 kW to 5.0 kW (IP67 motor)
Specifications	23-bit absolute encoder When used in absolute system (with battery box) *		
openiinalinis	<large lock="" one-touch="" type=""></large>		

\* Battery is not included. Please buy the absolute encoder battery "DV0P2990" separately.

[Unit: mm]



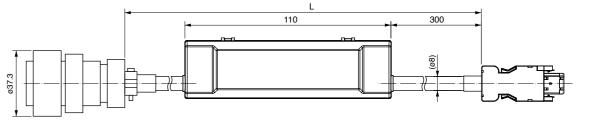
Title Part No.		Manufacturer
Connector (Driver side) 3E206-0100 KV		Sumitomo 3M
Shell kit	3E306-3200-008	(or equivalent)
Connector (Motor side) JL10-6A20-29S-EB		Japan Aviation
Cable clamp	JL04-2022CK(09)-R	Electronics Ind.
Cable	0.2 mm <sup>2</sup> ×3P (6-wire)	Oki Electric Cable Co., Ltd.

L (m)	Part No.(ex.)	
3	MFECA0030EPE	
5	MFECA0050EPE	
10	MFECA0100EPE	
20	MFECA0200EPE	

Part No.	MFECA0 * * 0ESE	100 mm sq. or more Applicable model	0.85 kW to 5.0 kW (IP67 motor)
Specifications	23-bit absolute encoder V <large screwed="" type=""></large>	23-bit absolute encoder When used in absolute system (with battery box) * <large screwed="" type=""></large>	

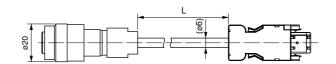
\* Battery is not included. Please buy the absolute encoder battery "DV0P2990" separately.

[Unit: r	۲
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Title	Part No.	Manufacturer	L (m)	Part No.(ex.)
Connector (Driver side)	3E206-0100 KV	Sumitomo 3M	3	MFECA0030ESE
Shell kit	3E306-3200-008	(or equivalent)	5	MFECA0050ESE
Connector (Motor side)	N/MS3106B20-29S	Japan Aviation	10	MFECA0100ESE
Cable clamp	N/MS3057-12A	Electronics Ind.	20	MFECA0200ESE
Cable	0.2 mm <sup>2</sup> ×4P (8-wire)	Oki Electric Cable Co., Ltd.		·

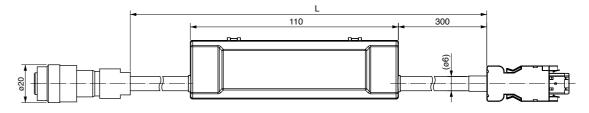
Part No.	MFECA0 * * 0ETD	100 mm sq. or more Applicable model	0.85 kW to 5.0 kW (IP67 motor)	
Specifications	23-bit absolute encoder When used in incremental system (without battery box) <small lock="" one-touch="" type=""></small>			



Title	Part No.	Manufacturer	L (m)	Part No.(ex.)
Connector (Driver side)	3E206-0100 KV	Sumitomo 3M	3	MFECA0030ETD
Shell kit	3E306-3200-008	(or equivalent)	5	MFECA0050ETD
Connector (Motor side)	JN2DS10SL1-R	Japan Aviation	10	MFECA0100ETD
Connector pin	JN1-22-22S-PKG100	Electronics Ind.	20	MFECA0200ETD
Cable	0.2 mm <sup>2</sup> ×3P (6-wire)	Oki Electric Cable Co., Ltd.		

Part No.	MFECA0 * * 0ETE	100 mm sq. or more Applicable model	0.85 kW to 5.0 kW (IP67 motor)
Specifications	23-bit absolute encoder When used in absolute system (with battery box) * <small lock="" one-touch="" type=""></small>		solute system (with battery box) *

\* Battery is not included. Please buy the absolute encoder battery "DV0P2990" separately.



Title	Part No.	Manufacturer	L (m)	Part No.(ex.)
Connector (Driver side)	3E206-0100 KV	Sumitomo 3M	3	MFECA0030ETE
Shell kit	3E306-3200-008	(or equivalent)	5	MFECA0050ETE
Connector (Motor side)	JN2DS10SL1-R	Japan Aviation	10	MFECA0100ETE
Connector pin	JN1-22-22S-PKG100	Electronics Ind.	20	MFECA0200ETE
Cable	0.2 mm <sup>2</sup> x3P (6-wire)	Oki Flectric Cable Co., Ltd.		·

[Unit: mm]

[Unit: mm]

[Unit: mm]

=\_\_\_\_

Title	Part No.	Manufacturer
Connector	172159-1	Tyco Electronics Japan
Cable clamp	170366-1	G.K.
Rod terminal	AI0.75-8GY	PHOENIX CONTACT
Nylon insulated round terminal	N1.25-M4	J.S.T Mfg. Co., Ltd.
Cable	ROBO-TOP 600V 0.75 mm <sup>2</sup> 4-wire	DYDEN CORPORATION

L (m)	Part No.(ex.)		
3	MFMCA0030EED		
5	MFMCA0050EED		
10	MFMCA0100EED		
20	MFMCA0200EED		
	3 5 10		

	MFMCA0 * * 0NJD (Highly bendable type, Direction of motor shaft)	90
Part No.	MFMCA0 * * 0RJD (Standard bendable type, Direction of motor shaft)	80 mm sq. or less
Part No.	MFMCA0 * * 0NKD (Highly bendable type, Opposite direction of motor shaft)	Applicable model
	$\textbf{MFMCA0} \; * \; * \; \textbf{0RKD} \; (\textbf{Standard bendable type, Opposite direction of motor shaft)}$	

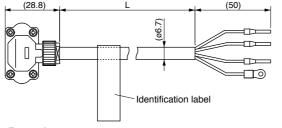
MSMF 50 W to 1000 W (Connector type) MSMF 200 W to 1000 W

(Connector type)

[Unit: mm]



Opposite direction of motor shaft



#### <Remarks>

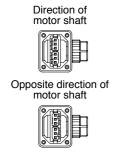
Motor cable for opposite direction of motor shaft cannot be used with a motor 50 W and 100 W.

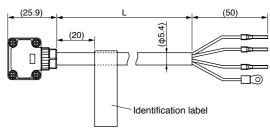
Title	Part No.	Manufacturer
Connector	JN8FT04SJ1	Japan Aviation
Cable clamp	ST-TMH-S-C1B-3500	Electronics Ind.
Rod terminal	AI0.75-8GY	PHOENIX CONTACT
Nylon insulated round terminal	N1.25-M4	J.S.T Mfg. Co., Ltd.
Cable	AWG18 4-wire (φ6.7 mm)	Hitachi Cable, Ltd.

Part No.(ex.)
MFMCA0030NJD
MFMCA0050NJD
MFMCA0100NJD
MFMCA0200NJD

Part No.	MFMCA0 * * 7UFD	(Movable/fixed common-use, direction of motor shaft	80 mm sq. or less	MHMF 50 W, 100 W
rait No.	MFMCA0 * * 7UGD	(Movable/fixed common-use, opposite directionof motor shaft)	Applicable model	(Connector type)
	Direction of	(25.9)	(50)	[Unit: mm]

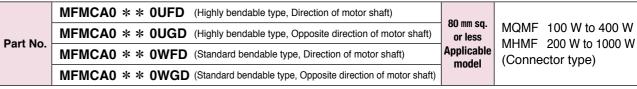
-281-

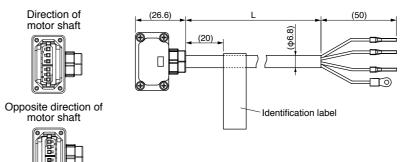




Title	Part No.	Manufacturer
Connector	JN11FH06SN2	Japan Aviation
Cable clamp	JN11S10K4A1	Electronics Ind.
Rod terminal	AI0.75-8GY	PHOENIX CONTACT
Nylon insulated round terminal	N1.25-M4	J.S.T Mfg. Co., Ltd.
Cable	AWG22 6-wire (φ5.4 mm)	NIKKO ELECTRIC WIRE CO.,LTD

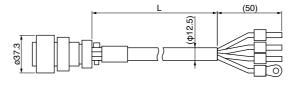
	L (m)	Part No.(ex.)
	3	MFMCA0037UFD
	5	MFMCA0057UFD
	10	MFMCA0107UFD
	20	MFMCA0207UFD
וכ		





Title	Part No.	Manufacturer	L (m)	Part No.(ex.)
Connector	JN11FH06SN1	Japan Aviation	3	MFMCA0030UFD
Cable clamp	JN11S35H3A1	Electronics Ind.	5	MFMCA0050UFD
Rod terminal	AI0.75-8GY	PHOENIX CONTACT	10	MFMCA0100UFD
Nylon insulated round terminal	N1.25-M4	J.S.T Mfg. Co., Ltd.	20	MFMCA0200UFD
Cable	AWG18 6-wire (φ6.8)	NIKKO ELECTRIC WIRE CO.,LTD		

Part No.	MFMCDO * * 2EUD	100 mm sq. or more Applicable model	MHMF	1.0 kW to 2.0 kW, 1.0 kW, 1.5 kW, ouch lock type>		1.0 kW to 2.0 kW 0.85 kW to 1.8 kW
----------	-----------------	--	------	---	--	---------------------------------------



Title	Part No.	Manufacturer	L (m)	Part No.(ex.)	
Connector	JL10-6A20-4SE-EB	Japan Aviation	3	MFMCD0032EUD	
Cable clamp	JL04-2022CK(14)-R	Electronics Ind.	5	MFMCD0052EUD	
Rod terminal	NTUB-2	J.S.T Mfg. Co., Ltd.	10	MFMCD0102EUD	
lylon insulated round terminal	N2-M4	J.S.T Mfg. Co., Ltd.	20	MFMCD0202EUD	
Cable	ROBO-TOP 600V 2.0mm <sup>2</sup> 4-wire	DYDEN CORPORATION			

Part No.	MFMCDO * * 2ECD	100 mm sq. or more Applicable model	MSMF MHMF <screw< th=""><th>1.0 kW to 2.0 kW, 1.0 kW, 1.5 kW, ed type&gt;</th><th></th><th>1.0 kW to 2.0 kW 0.85 kW to 1.8 kW</th></screw<>	1.0 kW to 2.0 kW, 1.0 kW, 1.5 kW, ed type>		1.0 kW to 2.0 kW 0.85 kW to 1.8 kW
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Title	Part No.	Manufacturer	L (m)	Part No.(ex.)
Connector	JL04V-6A20-4SE-EB-R	Japan Aviation	3	MFMCD0032ECD
Cable clamp	JL04-2022CK(14)-R	Electronics Ind.	5	MFMCD0052ECD
Rod terminal	NTUB-2	J.S.T Mfg. Co., Ltd.	10	MFMCD0102ECD
Nylon insulated round terminal	N2-M4	J.S.T Mfg. Co., Ltd.	20	MFMCD0202ECD
Cable	ROBO-TOP 600V 2.0mm <sup>2</sup> 4-wire	DYDEN CORPORATION	•	

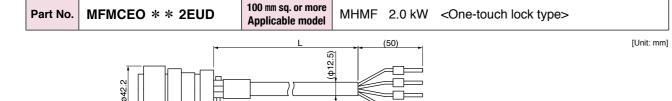
Part No. MFMCEO \* \* 2ECD

MHMF 2.0 kW <Screwed type>

[Unit: mm]

[Unit: mm]

[Unit: mm]



Title	Part No.	Manufacturer	L (m	)
Connector	JL10-6A22-22SE-EB	Japan Aviation	3	
Cable clamp	JL04-2022CK(14)-R	Electronics Ind.	5	Т
Rod terminal	NTUB-2	J.S.T Mfg. Co., Ltd.	10	$\top$
Nylon insulated round terminal	N2-M4	J.S.T Mfg. Co., Ltd.	20	
Cable	ROBO-TOP DP6/2501 2.0 mm <sup>2</sup> 4-wire	DYDEN CORPORATION		

100 mm sq. or more

	L (m)	Part No.(ex.)
	3	MFMCE0032EUD
	5	MFMCE0052EUD
	10	MFMCE0102EUD
	20	MFMCE0202EUD
ı		

	/ ippiioubio ii		
<b> </b>	L	<b>&gt;</b>  ∢	(50)
	) ( <del>0</del> (5) (5)		
	 	L G	

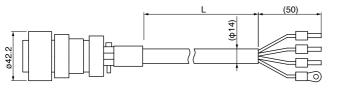
Title	Part No.	Manufacturer		
Connector	JL04V-6A22-22SE-EB-R	Japan Aviation		
Cable clamp	JL04-2022CK(14)-R	Electronics Ind.		
Rod terminal	NTUB-2	J.S.T Mfg. Co., Ltd.		
Nylon insulated round terminal	N2-M4	J.S.T Mfg. Co., Ltd.		
Cable	ROBO-TOP 600V 2.0 mm <sup>2</sup> 4-wire	DYDEN CORPORATION		

L (m)	Part No.(ex.)
3	MFMCE0032ECD
5	MFMCE0052ECD
10	MFMCE0102ECD
20	MFMCE0202ECD
	3 5 10

Part No. MFMCE0 * * 3EUT	100 mm sq. or more Applicable model	MGMF	2.4 kW	<one-touch lock="" type=""></one-touch>	
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[Unit: mm]

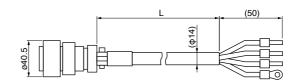
[Unit: mm]



Title	Part No.	Manufacturer
Connector	JL10-6A22-22SE-EB	Japan Aviation
Cable clamp	JL04-2022CK(14)-R	Electronics Ind.
Rod terminal	TMENTC3.5-11S	NICHIFU Co., Ltd.
Nylon insulated round terminal	N5.5-5	J.S.T Mfg. Co., Ltd.
Cable	ROBO-TOP DP6/2501 3.5 mm <sup>2</sup> 4-wire	DYDEN CORPORATION

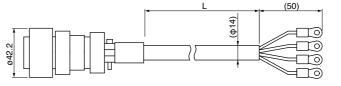
L (m)	Part No.(ex.)
3	MFMCE0033EUT
5	MFMCE0053EUT
10	MFMCE0103EUT
20	MFMCE0203EUT

Part No. MFMCE0 \* \* 3ECT 100 mm sq. or more Applicable model MGMF 2.4 kW <Screwed type>



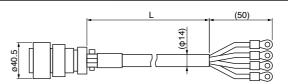
Title	Part No.	Manufacturer	L (m)	Part No.(ex.)
Connector	JL04V-6A22-22SE-EB-R	Japan Aviation	3	MFMCE0033ECT
Cable clamp	JL04-2022CK(14)-R	Electronics Ind.	5	MFMCE0053ECT
Rod terminal	TMENTC3.5-11S	NICHIFU Co., Ltd.	10	MFMCE0103ECT
Nylon insulated round terminal	N5.5-5	J.S.T Mfg. Co., Ltd.	20	MFMCE0203ECT
Cable	ROBO-TOP 600V 3.5 mm <sup>2</sup> 4-wire	DYDEN CORPORATION		





Title	Part No.	Manufacturer	L (m)	Part No.(ex.)
Connector	JL10-6A22-22SE-EB	Japan Aviation	3	MFMCA0033EUT
Cable clamp	JL04-2022CK(14)-R	Electronics Ind.	5	MFMCA0053EUT
Nylon insulated round terminal	N5.5-5	J.S.T Mfg. Co., Ltd.	10	MFMCA0103EUT
Cable	ROBO-TOP DP6/2501 3.5 mm <sup>2</sup> 4-wire	DYDEN CORPORATION	20	MFMCA0203EUT

Part No.	MFMCAO * * 3ECT	100 mm sq. or more Applicable model	NALINAE	3.0 kW to 5.0 kW, 3.0 kW to 5.0 kW,	3.0 kW to 5.0 kW 2.9 kW to 4.4 kW
		Applicable model	<screw< th=""><th>ed type&gt;</th><th></th></screw<>	ed type>	



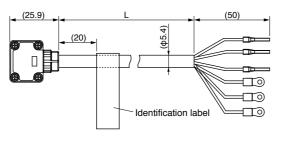
Title	Part No.	Manufacturer	L (m)	Part No.(ex.)
Connector	JL04V-6A22-22SE-EB-R	Japan Aviation	3	MFMCA0033ECT
Cable clamp	JL04-2022CK(14)-R	Electronics Ind.	5	MFMCA0053ECT
Nylon insulated round terminal	N5.5-5	J.S.T Mfg. Co., Ltd.	10	MFMCA0103ECT
Cable	ROBO-TOP 600V 3.5 mm <sup>2</sup> 4-wire	DYDEN CORPORATION	20	MFMCA0203ECT

[Unit: mm]

80 mm sq. (Movable/fixed common-use, MFMCA0 \* \* 7VFD MHMF 50 W, 100 W direction of motor shaft or less Part No. **Applicable** /Movable/fixed common-use, (Connector type) MFMCA0 \* \* 7VGD opposite directionof motor shaft model [Unit: mm]

Direction of motor shaft

Opposite direction of motor shaft



Title	Part No.	Manufacturer			
Connector	JN11FH06SN2	Japan Aviation			
Cable clamp	JN11S10K4A1	Electronics Ind.			
Rod terminal	AI0.75-8GY	PHOENIX CONTACT			
Nylon insulated round terminal	N1.25-M4	J.S.T Mfg. Co., Ltd.			
Cable	AWG22 6-wire (φ5.4 mm)	NIKKO ELECTRIC WIRE CO.,LTD			

	L (m)	Part No.(ex.)
	3	MFMCA0037VFD
	5	MFMCA0057VFD
	10	MFMCA0107VFD
	20	MFMCA0207VFD
.TD		

	MFMCA0 * * 0VFD (Highly bendable type, Direction of motor shaft)	90 mm on
Part No.	MFMCA0 * * 0VGD (Highly bendable type, Opposite direction of motor shaft)	80 mm sq. or less
Part No.	MFMCA0 * * 0XFD (Standard bendable type, Direction of motor shaft)	Applicable model
	MFMCA0 * * 0XGD (Standard bendable type, Opposite direction of motor shaft)	

MQMF 100 W to 400 W MHMF 200 W to 1000 W (Connector type)

Part No.(ex.)

MFMCA0030VFD

MFMCA0050VFD

MFMCA0100VFD

MFMCA0200VFD

L (m)

3

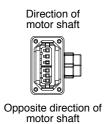
5

10

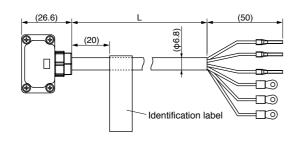
20

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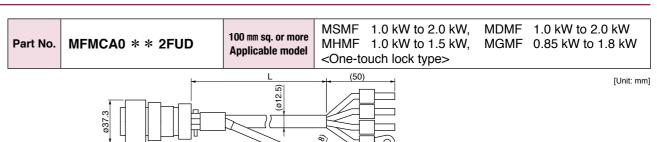
[Unit: mm]





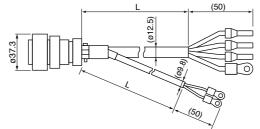


Title	Part No.	Manufacturer
Connector	JN11FH06SN1	Japan Aviation
Cable clamp	JN11S35H3A1	Electronics Ind.
Rod terminal	AI0.75-8GY	PHOENIX CONTACT
Nylon insulated round terminal	N1.25-M4	J.S.T Mfg. Co., Ltd.
Cable	AWG18 6-wire (φ6.8 mm)	NIKKO ELECTRIC WIRE CO.,LTD

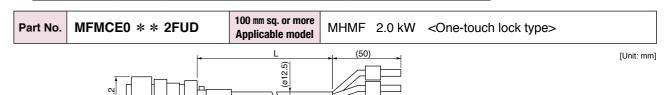


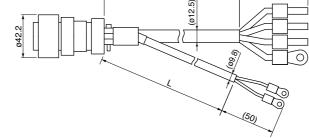
Title		Part No.	Manufacturer		L (m)	Part No.(ex.)
Connector		JL10-6A20-18SE-EB	Japan Aviation		3	MFMCA0032FUD
Cable clamp		JL042022CK(14)-R	Electronics Ind.		5	MFMCA0052FUD
Rod terminal		NTUB-2	J.S.T Mfg. Co., Ltd.		10	MFMCA0102FUD
Nylon insulated	n insulated Earth N2-M4			20	MFMCA0202FUD	
round terminal	Brake	INDEXT. INDEX. I				
Cable		ROBO-TOP 600V 2.0 mm <sup>2</sup> 4-wire ROBO-TOP 600V 0.75 mm <sup>2</sup> 2-wire	DYDEN CORPORATION			





Title		Part No.	Manufacturer	L (m)	Part No.(ex.)
Connector		JL04V-6A20-18SE-EB-R	Japan Aviation	3	MFMCA0032FCD
Cable clamp		JL04-2022CK(14)-R	Electronics Ind.	5	MFMCA0052FCD
Rod terminal		NTUB-2	J.S.T Mfg. Co., Ltd.	10	MFMCA0102FCD
Nylon insulated	Earth	N2-M4	J.S.T Mfg. Co., Ltd.	20	MFMCA0202FCD
round terminal	Brake	N1.25-M4	3.3.1 Mig. Co., Ltd.		
Cable		ROBO-TOP 600V 2.0 mm <sup>2</sup> 4-wire ROBO-TOP 600V 0.75 mm <sup>2</sup> 2-wire	DYDEN CORPORATION		





Title		Part No.	Manufacturer	L (m)	Part No.(ex.)
Connector		JL10-6A24-11SE-EB	Japan Aviation	3	MFMCE0032FUD
Cable clamp		JL04-2428CK(17)-R	Electronics Ind.	5	MFMCE0052FUD
Rod terminal		NTUB-2	J.S.T Mfg. Co., Ltd.	10	MFMCE0102FUD
Nylon insulated	Earth	N2-M4	J.S.T Mfg. Co., Ltd.	20	MFMCE0202FUD
round terminal	Brake	N1.25-M4	J.S. I Wilg. Co., Ltd.		
Cable		ROBO-TOP DP6/2501 2.0 mm <sup>2</sup> 4-wire	DYDEN CORPORATION		

Part No.	MFMCE0 * * 2FCD	100 mm sq. or more Applicable model	MHMF 2.0 kW	<screwed type=""></screwed>
	043.7	(012.5)	(50)	[Unit: mm]

Title		Part No.	Manufacturer	
Connecto	r	JL04V-6A24-11SE-EB-R	Japan Aviation	
Cable clan	пр	JL04-2428CK(17)-R	Electronics Ind.	
Rod termin	nal	NTUB-2	J.S.T Mfg. Co., Ltd.	
Nylon insulated	Earth	N2-M4	J.S.T Mfg. Co., Ltd.	
round terminal Brake		N1.25-M4	J.S.1 Wilg. Co., Ltd.	
Cable		ROBO-TOP 600V 2.0 mm <sup>2</sup> 4-wire ROBO-TOP 600V 0.75 mm <sup>2</sup> 2-wire	DYDEN CORPORATION	

L (m)	Part No.(ex.)
3	MFMCE0032FCD
5	MFMCE0052FCD
10	MFMCE0102FCD
20	MFMCE0202FCD

[Unit: mm]

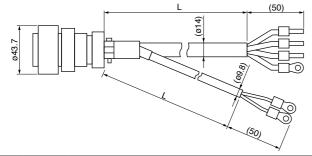
[Unit: mm]

Part No.	MFMCD0 * * 3FUT	100 mm sq. or more Applicable model	MGMF	2.4 kW	<one-touch lock="" type=""></one-touch>
	042.2	L (410)	(50)		

Title		Part No.	Manufacturer
Connecto	r	JL10-6A24-11SE-EB	Japan Aviation
Cable clan	np		
Rod termin	nal	TMENTC3.5-11S NICHIFU Co	
Nylon insulated	Earth	N5.5-5	J.S.T Mfg. Co., Ltd.
round terminal Brake		N1.25-M4	3.3.1 Wilg. 30., Eta.
Cable		ROBO-TOP DP6/2501 3.5 mm <sup>2</sup> 4-wire ROBO-TOP DP6/2501 0.75 mm <sup>2</sup> 2-wire	DYDEN CORPORATION

L (m)	Part No.(ex.)
3	MFMCD0033FUT
5	MFMCD0053FUT
10	MFMCD0103FUT
20	MFMCD0203FUT

Part No. MFMCD0 \* \* 3FCT | 100 mm sq. or more Applicable model | MGMF 2.4 kW <Screwed type>

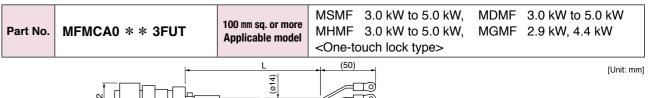


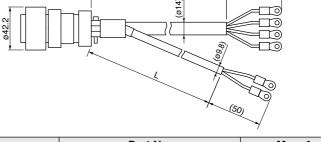
This	nroduct	dnes	not	correspor	nd i	tΩ	IP67

Title		Part No.	Manufacturer
Connecto	r	JL04V-6A24-11SE-EB-R	Japan Aviation
Cable clan	пр	JL04-2428CK(17)-R	Electronics Ind.
Rod termin	nal	TMENTC3.5-11S	NICHIFU Co., Ltd.
Nylon insulated	Earth	N5.5-5	J.S.T Mfg. Co., Ltd.
round terminal	Brake	N1.25-M4	J.S. I Wilg. Co., Ltd.
Cable		ROBO-TOP 600V 3.5 mm <sup>2</sup> 4-wire ROBO-TOP 600V 0.75 mm <sup>2</sup> 2-wire	DYDEN CORPORATION

	L (m)	Part No.(ex.)
	3	MFMCD0033FCT
	5	MFMCD0053FCT
	10	MFMCD0103FCT
	20	MFMCD0203FCT
$\neg$		

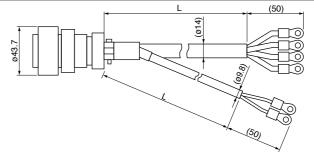
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Title		Part No.	Manufacturer	L (m)	Part No.(ex.)
Connector		JL10-6A24-11SE-EB	Japan Aviation	3	MFMCA0033FUT
Cable clamp		JL04-2428CK(17)-R	Electronics Ind.	5	MFMCA0053FUT
Nylon insulated   Earth round terminal   Brake   Cable		N5.5-5	J.S.T Mfg. Co., Ltd.	10	MFMCA0103FUT
		N1.25-M4	3.3.1 Wilg. Co., Ltd.	20	MFMCA0203FUT
		ROBO-TOP DP6/2501 3.5 mm <sup>2</sup> 4-wire ROBO-TOP DP6/2501 0.75 mm <sup>2</sup> 2-wire	DYDEN CORPORATION		

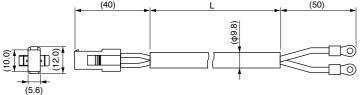




This product does not correspond to IP67.

Title		Part No.	Manufacturer	L (m)	Part No.(ex.)
Connector		JL04V-6A24-11SE-EB-R	Japan Aviation	3	MFMCA0033FCT
Cable clamp		JL04-2428CK(17)-R	Electronics Ind.	5	MFMCA0053FCT
Nylon insulated		N5.5-5	J.S.T Mfg. Co., Ltd.	10	MFMCA0103FCT
		N1.25-M4	J.S.1 Wilg. Co., Ltd.	20	MFMCA0203FCT
Cable		ROBO-TOP 600V 3.5 mm <sup>2</sup> 4-wire ROBO-TOP 600V 0.75 mm <sup>2</sup> 2-wire	DYDEN CORPORATION		

_						
ı	Part No.	MFMCB0 * * 0GET	80 mm sq. or less Applicable model	50 W to 1000 W, 50 W to 1000 W re type)	MQMF	100 W to 400 W



Title	Part No.	Manufacturer	L (m	1)
Connector	172157-1	Tyco Electronics Japan	3	
Connector pin	170366-1, 170362-1	G.K.	5	$\Box$
Nylon insulated round terminal	N1.25-M4	J.S.T Mfg. Co., Ltd.	10	П
Cable	ROBO-TOP 600V 0.75 mm <sup>2</sup> 2-wire	DYDEN CORPORATION	20	$\Box$

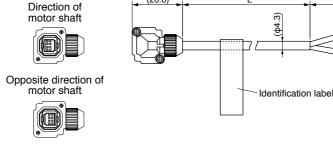
L (m)	Part No.(ex.)
3	MFMCB0030GET
5	MFMCB0050GET
10	MFMCB0100GET
20	MFMCB0200GET

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	MFMCB0 * * 0PJT (Highly bendable type, Direction of motor shaft)	80 mm sq.	
Part No.	MFMCB0 * * 0PKT (Highly bendable type, Opposite direction of motor shaft)	or less	MSMF 50 W to 1000 W
Part No.	MFMCB0 * * 0SJT (Standard bendable type, Direction of motor shaft)	Applicable model	(Connector type)
	$\textbf{MFMCB0} \   \textbf{*} \   \textbf{*} \   \textbf{0SKT} \   (\textbf{Standard bendable type, Opposite direction of motor shaft)}$		

[Unit: mm]

[Unit: mm]

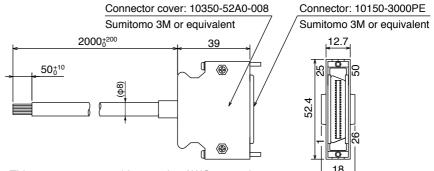


Title	Part No.	Manufacturer	L (m)	Part No.(ex.)
Connector	JN4FT02SJMR	Japan Aviation	3	MFMCB0030PJT
Connector pin	ST-TMH-S-C1B-3500	Electronics Ind.	5	MFMCB0050PJT
Nylon insulated round terminal	N1.25-M4	J.S.T Mfg. Co., Ltd.	10	MFMCB0100PJT
Cable	AWG22 2-wire (φ4.3)	Hitachi Cable, Ltd.	20	MFMCB0200PJT

**Interface Cable Options A6 Series** 

#### **Cable for Interface**

Part No. DV0P4360



This 2 m connector cable contains AWG28 conductors.

[Unit: mm]

#### Table for wiring

	3								
Pin No.	color	Pin No.	color	Pin No.	color	Pin No.	color	Pin No.	color
1	Orange (Red1)	11	Orange (Black2)	21	Orange (Red3)	31	Orange (Red4)	41	Orange (Red5)
2	Orange (Black1)	12	Yellow (Black1)	22	Orange (Black3)	32	Orange (Black4)	42	Orange (Black5)
3	Gray (Red1)	13	Gray (Red2)	23	Gray (Red3)	33	Gray (Red4)	43	Gray (Red5)
4	Gray (Black1)	14	Gray (Black2)	24	Gray (Black3)	34	White (Red4)	44	White (Red5)
5	White (Red1)	15	White (Red2)	25	White (Red3)	35	White (Black4)	45	White (Black5)
6	White (Black1)	16	Yellow (Red2)	26	White (Black3)	36	Yellow (Red4)	46	Yellow (Red5)
7	Yellow (Red1)	17	Yel (Blk2)/Pink (Blk2)	27	Yellow (Red3)	37	Yellow (Black4)	47	Yellow (Black5)
8	Pink (Red1)	18	Pink (Red2)	28	Yellow (Black3)	38	Pink (Red4)	48	Pink (Red5)
9	Pink (Black1)	19	White (Black2)	29	Pink (Red3)	39	Pink (Black4)	49	Pink (Black5)
10	Orange (Red2)	20	_	30	Pink (Black3)	40	Grav (Black4)	50	Grav (Black5)

#### <Remarks>

Color designation of the cable e.g.) Pin-1 Cable color: Orange (Red1): One red dot on the cable

#### <Caution>

Pin No.50 is connected to the shell (housing) of the connector but the braided wire of the cable is not connected to the shell (housing) of the connector.

#### **Interface Conversion Cable**

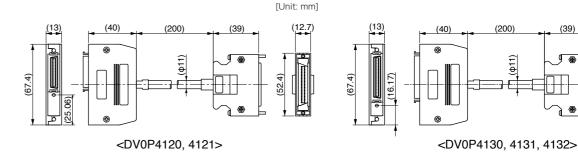
Part No. DV0P4120, 4121, 4130, 4131, 4132

Interface cables for old product (XX series or V series) can be connected to the current product by using the connector conversion cable shown below.

DV0P4120	MINAS XX → A6 series (A5II, A5, A4, A series) for position control/ velocity control
DV0P4121	MINAS XX → A6 series (A5II, A5, A4, A series) for torque control
DV0P4130	MINAS V → A6 series (A5II, A5, A4, A series) for position control
DV0P4131	MINAS V → A6 series (A5II, A5, A4, A series) for velocity control
DV0P4132	MINAS V → A6 series (A5II, A5, A4, A series) for torque control

<sup>\*</sup> For details of wiring, contact our sales department.

Converts 36-pin configuration to 50-pin.



[Unit: mm]

[Unit: mm]

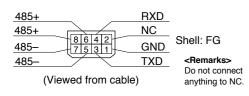
#### Connector Kit for Communication Cable (for RS485, RS232) (Excluding A6SE, A6NE, A6BE Series)

Part No. DV0PM20102

#### Components

Title	Part No.	Manufacturer	Note
Connector	CIF-PCNS08KK-072R	J.S.T Mfg. Co., Ltd.	For Connector X2 (8-pins)

• Pin disposition of connector, connector X2

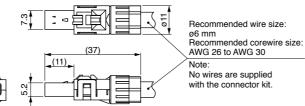


Dimensions



[Unit: mm]

[Unit: mm]



#### Connector Kit for Safety (Excluding A6SE, A6SG, A6NE, A6BE Series)

Part No. DV0PM20103

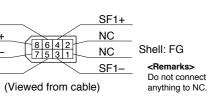
#### Components

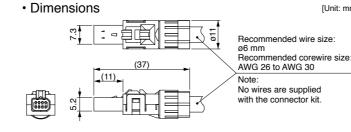
EDM+

EDM-

Title	Part No.	Manufacturer	Note
Connector	CIF-PCNS08KK-071R	J.S.T Mfg. Co., Ltd.	For Connector X3 (8-pins)

· Pin disposition of connector, connector X3





#### Safety bypass plug (Excluding A6SE, A6SG, A6NE, A6BE Series)

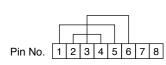
Part No. DV0PM20094

#### Components

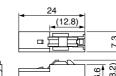
Title	Part No.	Manufacturer	Note
Connector	CIF-PB08AK-GF1R	J.S.T Mfg. Co., Ltd.	For Connector X3

· Internal wiring

(Wiring of the following has been applied inside the plug.)



· Dimensions (Resin color : black)



#### <Remarks>

• For crimp tool etc., necessary to produce a cable, access the web site of the manufacturer or consult with the manufacturer for details. For inquiries of manufacturer, refer to P.308 "List of Peripheral Equipments".

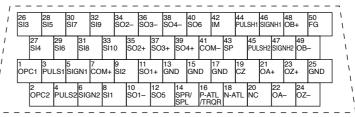
#### **Connector Kit for Interface**

Part No. DV0P4350

#### Components

Title	Part No.	Number	Manufacturer	Note
Connector	10150-3000PE	1	Sumitomo 3M	For Connector X4 (50-
Connector cover	10350-52A0-008	1	(or equivalent)	pins)

· Pin disposition (50 pins) (viewed from the soldering side)



- 1) Check the stamped pin-No. on the connector body while making a wiring.
- 2) For the function of each signal title or its symbol, refer to the operating manual.
- 3) Do not connect anything to NC pins in the above table.

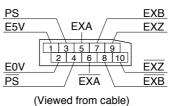
#### Connector Kit for External Scale (Excluding A6SE, A6SG, A6NE, A6BE Series)

#### Part No. DV0PM20026

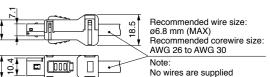
#### Components

Title	Part No.	Manufacturer	Note
Connector	MUF-PK10K-X	J.S.T Mfg. Co., Ltd.	For Connector X5 (10-pins)

• Pin disposition of connector, connector X5







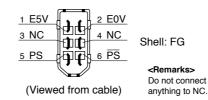
#### Connector Kit for Encoder

#### Part No. DV0PM20010

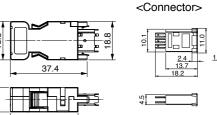
#### Components

Title	Part No.	Manufacturer	Note
Connector (Driver side)	3E206-0100 KV	Sumitomo 3M	For Connector X6
Shell kit	3E306-3200-008	(or equivalent)	For Connector X6

· Pin disposition of connector, connector X6







#### <Remarks>

industrial.panasonic.com/ac/e/

Connector X1: use with commercially available cable.

· Configuration of connector X1: USB mini-B



#### **Connector Kit for Power Supply Input**

Part No. DV0PM20032 (For A-frame to D-frame: Single row type)

#### Components

• Please refer to the Dimensions of driver P.47 for connector XA.

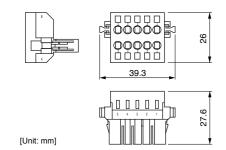
#### Manufacturer Title Part No. Number Note 05JFAT-SAXGF Connector 1 J.S.T Mfg. Co., Ltd. For Connector XA 2 J-FAT-OT Handle lever

Part No. DV0PM20033 (For A-frame to D-frame: Double row type)

#### Components

Title	Part No.	Number	Manufacturer	Note
Connector	05JFAT-SAXGSA-C	1	LC T Mfg. Co. Ltd	For Connector XA
Handle lever	J-FAT-OT	2	J.S.T Mfg. Co., Ltd.	For Connector XA

#### Dimensions



\* When connection multiple axes in series, make sure the sum of the current value does not exceed the rated current (11.25 A) of DV0PM20033.

#### Remarks · ...

When using drivers MDDL \* 55 \* \* in single-phase power supply, do not use DV0PM20033.

Driver part No.	Power supply	Rated input current
MADL * 01 * *	Single phase 100 V	1.7 A
MADL * 11 * *	Single phase 100 V	2.0 A
MADL*05**	Single phase/3-phase 200 V	1.6 A/0.9 A
MADL * 15 * *	Single phase/3-phase 200 V	2.0 A/1.1 A
MBDL * 21 * *	Single phase 100 V	4.5 A
MBDL * 25 * *	Single phase/3-phase 200 V	3.7 A/2.1 A
MCDL*31**	Single phase 100 V	7.0 A
MCDL * 35 * *	Single phase/3-phase 200 V	6.4 A/3.4 A
MDDL * 45 * *	Single phase/3-phase 200 V	7.9 A/4.6 A
MDDL * 55 * *	Single phase/3-phase 200 V	13.6 A/7.2 A

Part No. DV0PM20044 (For E-frame)

#### Components

•				
Title	Part No.	Number	Manufacturer	Note
Connector	05JFAT-SAXGSA-L	1	LC T Mfa Co. Ltd	For Connector XA
Handle lever	J-FAT-OT-L	2	J.S.T Mfg. Co., Ltd.	For Connector XA

#### **Connector Kit for Regenerative Resistor Connection**

Part No. DV0PM20045 (For E-frame)

#### Components

Title	Part No.	Number	Manufacturer	Note
Connector	04JFAT-SAXGSA-L	1	LOTME On Ltd	200 V: For Connector XC
Handle lever	J-FAT-OT-L	2	J.S.T Mfg. Co., Ltd.	* Jumper wire is included.

#### <Remarks>

• For crimp tool etc., necessary to produce a cable, access the web site of the manufacturer or consult with the manufacturer for details. For inquiries of manufacturer, refer to P.308 "List of Peripheral Equipments".

#### Connector Kit for Motor Connection (Driver side)

Part No. DV0PM20034 (For A-frame to D-frame)

**Connector Kit for Motor/Encoder Connection** 

#### · Components

Components

• Please refer to the Dimensions of driver P.47 for connector XB.

Title	Part No.	Number	Manufacturer	Note
Connector	06JFAT-SAXGF	1	LC T Mfg. Co. Ltd	For Connector XB
Handle lever	J-FAT-OT	2	J.S.T Mfg. Co., Ltd.	* Jumper wire is included.

Part No. DV0PM20046 (For E-frame)

• Please refer to the Dimensions of driver P.49 for connector XB.

•				
Title	Part No.	Number	Manufacturer	Note
Connector	03JFAT-SAXGSA-L	1	LC T Mfa Co Ltd	For Connector XB
Handle lever	J-FAT-OT-L	2	J.S.T Mfg. Co., Ltd.	For Connector AB

#### Connector Kit for Motor/Encoder Connection

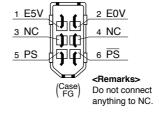
\* When IP65 or IP67 are necessary, the customer must give appropriate processing

Part No.	DV0P4290	80 mm sq. or less Applicable model	MHMF	50 W to 1000 W *, 50 W to 1000 W * ire type IP65)	MQMF	100 W to 400 W
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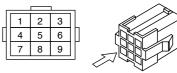
#### Components

Part No.	Number	Manufacturer	Note	
3E206-0100 KV	1	Sumitomo 3M (or equivalent)	For Connector X6 (6-pins)	
3E306-3200-008	1			
172161-1	1	Tyco Electronics Japan G.K.	For Encoder cable (9-pins)	
170365-1	9			
172159-1	1	Tyco Electronics Japan	For Motor cable	
170366-1	4	G.K.	(4-pins)	
-	3E206-0100 KV 3E306-3200-008 172161-1 170365-1 172159-1	3E206-0100 KV 1 3E306-3200-008 1 172161-1 1 170365-1 9 172159-1 1	3E206-0100 KV         1         Sumitomo 3M (or equivalent)           3E306-3200-008         1         Tyco Electronics Japan G.K.           170365-1         9         G.K.           172159-1         1         Tyco Electronics Japan O.K.	

· Pin disposition of connector, · Pin disposition of connector connector X6 for encoder cable



(Viewed from cable)



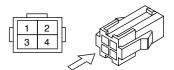
Connector pin diagram is viewed from the direction

PIN No.	Application	
1	BAT+*	
2	BAT-*	
3	FG(SHIELD)	,
4	PS	
5	PS	
6	NC	
7	E5V	
8	E0V	
9	NC	

\* When using the motor as an incremental system, BAT+ and BAT- can be

#### <Remarks> Do not connect anything

· Pin disposition of connector for motor cable



\* MSMF092L1 2, MHMF092L1 1

\* Connector pin diagram is viewed from the direction

٠. ٠	
PIN No.	Application
1	U-phase
2	V-phase
3	W-phase
4	Ground

\* When you connect the battery for absolute encoder, refer to P.302, "When you make your own cable for 23-bit absolute encoder"

#### <Remarks>

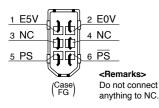
· For crimp tool etc., necessary to produce a cable, access the web site of the manufacturer or consult with the manufacturer for details. For inquiries of manufacturer, refer to P.308 "List of Peripheral Equipments".

Part No.	DV0PM20035	80 mm sq. or less Applicable model	MSMF	50 W to 1000 W * (Connector type IP67)

Components

Title	Part No.	Number	Manufacturer	Note
Connector (Driver side)	3E206-0100 KV	1	Sumitomo 3M	For Connector V6 (6 pine)
Shell kit	3E306-3200-008	1	(or equivalent)	For Connector X6 (6-pins)
Encoder connector	JN6FR07SM1	1	Japan Aviation	For Encoder cable
Socket contact	LY10-C1-A1-10000	7	Electronics Ind.	(7-pins)
Motor connector	JN8FT04SJ1	1	Japan Aviation	For Motor cable
Socket contact	ST-TMH-S-C1B-3500	4	Electronics Ind.	(4-pins)

connector X6



(Viewed from cable)

#### <Remarks>

Secure the gasket in place without removing it from the connector.

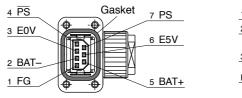
Otherwise, the degree of protection of IP67 will not be guaranteed.

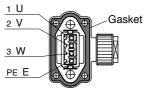
 Pin disposition of connector
 Pin disposition of connector for encoder cable

· Pin disposition of connector for motor cable

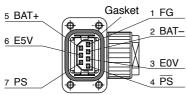
\* MSMF092L1 1

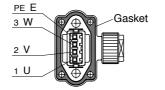
#### [Direction of motor shaft]





#### [Opposite direction of motor shaft]





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\* Pins 2 and 5 are left unused (NC) when used in incremental system.

#### <Remarks>

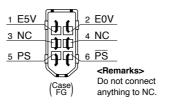
• For crimp tool etc., necessary to produce a cable, access the web site of the manufacturer or consult with the manufacturer for details. For inquiries of manufacturer, refer to P.308 "List of Peripheral Equipments".

MHMF 50 W, 100 W with/without brake 80 mm sq. or less Part No. DV0PM24581 Applicable model (Connector type IP67) common use

#### Components

Title	Part No.	Number	Manufacturer	Note
Connector (Driver side)	3E206-0100 KV	1	Sumitomo 3M	For Connector X6 (6-pins)
Shell kit	3E306-3200-008	1	(or equivalent)	For Connector A6 (6-pins)
Encoder connector	JN6FR07SM1	1	Japan Aviation	For Encoder cable
Socket contact	LY10-C1-A1-10000	7	Electronics Ind.	(7-pins)
Motor connector	JN11FH06SN2	1	Japan Aviation	For Motor cable
Socket contact	JN11S10K4A1	6	Electronics Ind.	(6-pins)

· Pin disposition of connector · Pin disposition of connector connector X6



(Viewed from cable)

#### <Remarks>

Secure the gasket in place without removing it from the connector Otherwise, the degree of

protection of IP67 will not be guaranteed.

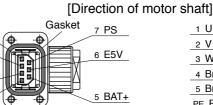
#### for encoder cable 4 PS

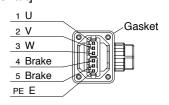
3 E0V

2 BAT-

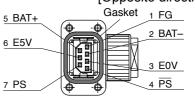
1 FG

· Pin disposition of connector for motor cable

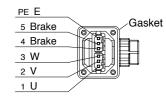




#### [Opposite direction of motor shaft]



\* Pins 2 and 5 are left unused (NC) when used in incremental system.



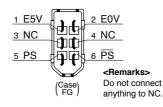
\* 4-pin and 5-pin are not used in case of no brake.

Part No.	DV0PM24582	80 mm sq. or less Applicable model	MQMF 100 W to 400 W, MHMF 200 W to 1000 W (Connector type IP67)	with/without brake common use	
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#### Components

Title	Part No.	Number	Manufacturer	Note
Connector (Driver side)	3E206-0100 KV	1	Sumitomo 3M	For Connector X6 (6-pins)
Shell kit	3E306-3200-008	1	(or equivalent)	For Connector A6 (6-pins)
Encoder connector	JN6FR07SM1	1	Japan Aviation	For Encoder cable
Socket contact	LY10-C1-A1-10000	7	Electronics Ind.	(7-pins)
Motor connector	JN11FL06SN1	1	Japan Aviation	For Motor cable
Socket contact	JN11S35H3A1	6	Electronics Ind.	(6-pins)

 Pin disposition of connector
 Pin disposition of connector connector X6



(Viewed from cable)

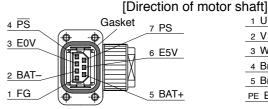
#### <Remarks>

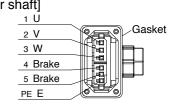
Secure the gasket in place without removing it from the connector.

Otherwise, the degree of protection of IP67 will not be guaranteed.

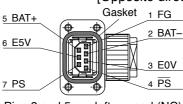
#### for encoder cable

#### · Pin disposition of connector for motor cable

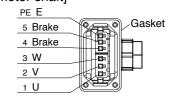




#### [Opposite direction of motor shaft]



\* Pins 2 and 5 are left unused (NC) when used in incremental system.



\* 4-pin and 5-pin are not used in case of no brake.

A6N Series

A6B Series
Special Order Product

Imformation

100 mm sq. or more Applicable model

(IP67 motor) Encoder JN2 <Small size connector> Without MSMF 1.0 kW \* to 2.0 kW, MDMF 1.0 kW to 2.0 kW brake MHMF 1.0 kW \*, 1.5 kW, MGMF 0.85 kW to 1.8 kW

\* MSMF102L1 , MHMF102L1

\* MSMF102L1 . MHMF102L1 .

#### Components

Title	Part No.	Number	Manufacturer	Note
Connector (Driver side)	3E206-0100 KV	1	Sumitomo 3M	For Connector X6 (6-pins)
Shell kit	3E306-3200-008	1	(or equivalent)	For Connector Xo (o-pins)
Encoder connector	JN2DS10SL1-R	1	Japan Aviation	For Encoder cable
Connector pin	JN1-22-22S-PKG100	5	Electronics Ind.	(One-touch lock type)
Motor connector	JL10-6A20-4SE-EB	1	Japan Aviation	For Motor cable
Cable clamp	JL04-2022-CK(14)-R	JL04-2022-CK(14)-R 1 Electronics Ind.	(One-touch lock type)	

Part No.	00 mm sq. or more	DV0PM24585	(IP67 motor) Encoder JN2 <small connector="" size=""> MSMF 1.0 kW * to 2.0 kW, MDMF 1.0 kW to 2.0 kW MHMF 1.0 kW *. 1.5 kW. MGMF 0.85 kW to 1.8 kW</small>	With brake
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#### Components

Title	Part No.	Number	Manufacturer	Note
Connector (Driver side)	3E206-0100 KV	1	Sumitomo 3M	For Connector VC (C nine)
Shell kit	3E306-3200-008	1	(or equivalent)	For Connector X6 (6-pins)
Encoder connector	JN2DS10SL1-R	1	Japan Aviation	For Encoder cable
Connector pin	JN1-22-22S-PKG100	5	Electronics Ind.	(One-touch lock type)
Motor connector	JL10-6A20-18SE-EB	1	Japan Aviation	For Motor cable
Cable clamp	JL04-2022-CK(14)-R	1	Electronics Ind.	(One-touch lock type)

Part No.	MSMF 1.0	DV0PM24587 100 mm sq. o Applicable	(IP67 motor) Encoder JL10 <large connector="" size=""> MSMF 1.0 kW * to 2.0 kW, MDMF 1.0 kW to 2.0 kW MHMF 1.0 kW *, 1.5 kW, MGMF 0.85 kW to 1.8 kW</large>	Without brake
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#### Components

	I			_
Title	Part No.	Number	Manufacturer	Note
Connector (Driver side)	3E206-0100 KV	1	Sumitomo 3M	For Connector X6 (6-pins)
Shell kit	3E306-3200-008	1	(or equivalent)	For Connector A6 (6-pins)
Encoder connector	JL10-6A20-29S-EB	1	Japan Aviation	For Encoder cable
Cable clamp	JL04-2022-CK(14)-R	1	Electronics Ind.	(One-touch lock type)
Motor connector	JL10-6A20-4SE-EB	1	Japan Aviation	For Motor cable
Cable clamp	JL04-2022-CK(14)-R	1	Electronics Ind.	(One-touch lock type)

Part No.	DV0PM24589	100 mm sq. or more Applicable model	MSME 10kW/*to20kW/ MINME 10kW/to20kW/	With brake
_			* MSMF102L1□□, MHMF102	2L1 🗆 🗆

#### Components

Title	Part No.	Number	Manufacturer	Note	
Connector (Driver side)	3E206-0100 KV	1	Sumitomo 3M	For Connector X6 (6-pins)	
Shell kit	3E306-3200-008	1	(or equivalent)	For Connector Ao (o-pins)	
Encoder connector	JL10-6A20-29S-EB	1	Japan Aviation	For Encoder cable	
Cable clamp	JL04-2022-CK(14)-R	1	Electronics Ind.	(One-touch lock type)	
Motor connector	JL10-6A20-18SE-EB	1	Japan Aviation	For Motor cable	
Cable clamp	JL04-2022-CK(14)-R	1	Electronics Ind.	(One-touch lock type)	

#### <Remarks>

• For crimp tool etc., necessary to produce a cable, access the web site of the manufacturer or consult with the manufacturer for details. For inquiries of manufacturer, refer to P.308 "List of Peripheral Equipments".

	100	(IP67 motor) Encoder JN2 <small connector="" size=""></small>					
Part No.	DV0PM24584	100 mm sq. or more Applicable model	MSMF	3.0 kW to 5.0 kW,	MDMF	3.0 kW to 5.0 kW	Without brake
		Applicable illead	MHMF	2.0 kW to 5.0 kW,	MGMF	2.4 kW to 4.4 kW	Diake

#### Components

Title	Part No.	Number	Manufacturer	Note	
Connector (Driver side)	3E206-0100 KV	1	Sumitomo 3M	For Connector VC (C nine)	
Shell kit	3E306-3200-008	1	(or equivalent)	For Connector X6 (6-pins)	
Encoder connector	JN2DS10SL1-R	1	Japan Aviation	For Encoder cable	
Connector pin	JN1-22-22S-PKG100	5	Electronics Ind.	(One-touch lock type)	
Motor connector	JL10-6A22-22SE-EB	1	Japan Aviation	For Motor cable	
Cable clamp	JL04-2022-CK(14)-R	1	Electronics Ind.	(One-touch lock type)	

Part No.	DV0PM24586	100 mm sq. or more Applicable model	MSMF	otor) Encoder JN2 < 3.0 kW to 5.0 kW, 2.0 kW to 5.0 kW,	MDMF	3.0 kW to 5.0 kW	With brake
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#### Components

Title	Part No.	Number	Manufacturer	Note	
Connector (Driver side)	3E206-0100 KV	1	Sumitomo 3M	For Connector V6 (6 nine)	
Shell kit	3E306-3200-008	1	(or equivalent)	For Connector X6 (6-pins)	
Encoder connector	JN2DS10SL1-R	1	Japan Aviation	For Encoder cable	
Connector pin	JN1-22-22S-PKG100	5	Electronics Ind.	(One-touch lock type)	
Motor connector	JL10-6A24-11SE-EB	1	Japan Aviation	For Motor cable	
Cable clamp	Cable clamp JL04-2428-CK(17)-R		Electronics Ind.	(One-touch lock type)	

Part No.	DV0PM24588	100 mm sq. or more Applicable model	MSMF	otor) Encoder JL10 3.0 kW to 5.0 kW, 2.0 kW to 5.0 kW,	MDMF		Without brake	
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#### Components

Title	Part No.	Number	Manufacturer	Note
Connector (Driver side)	3E206-0100 KV	3E206-0100 KV 1 Sumitomo		For Connector VC (C nine)
Shell kit	3E306-3200-008	1	(or equivalent)	For Connector X6 (6-pins)
Encoder connector	JL10-6A20-29S-EB	1	Japan Aviation	For Encoder cable
Cable clamp	JL04-2022-CK(14)-R	1	Electronics Ind.	(One-touch lock type)
Motor connector	Motor connector JL10-6A22-22SE-EB		Japan Aviation	For Motor cable
Cable clamp	JL04-2022-CK(14)-R	1	Electronics Ind.	(One-touch lock type)

ı	Part No.	DV0PM24590	100 mm sq. or more Applicable model	MSMF 3.0 kW to 5.0 kW, MDMF 3.0 kW to 5.0 kW $ _{h}$	With brake
			Applicable illedel	MHMF 2.0 kW to 5.0 kW, MGMF 2.4 kW to 4.4 kW	brake

#### Components

Title	Part No.	Number	Manufacturer	Note	
Connector (Driver side)	3E206-0100 KV	1	Sumitomo 3M	For Connector X6 (6-pins)	
Shell kit	3E306-3200-008	1	(or equivalent)		
Encoder connector	JL10-6A20-29S-EB	1	Japan Aviation	For Encoder cable	
Cable clamp	JL04-2022-CK(14)-R	1	Electronics Ind.	(One-touch lock type)	
Motor connector JL10-6A24-11SE-EB		1	Japan Aviation	For Motor cable	
Cable clamp	JL04-2428-CK(17)-R	1	Electronics Ind.	(One-touch lock type)	

#### <Remarks>

• For crimp tool etc., necessary to produce a cable, access the web site of the manufacturer or consult with the manufacturer for details. For inquiries of manufacturer, refer to P.308 "List of Peripheral Equipments".

#### Connector Kit for Motor/Encoder Connection \* When IP65 or IP67 are necessary, the customer must give appropriate processing.

(IP67 motor) Encoder JN2 <Small size connector>
MSMF 1.0 kW \* to 2.0 kW, MDMF 1.0 kW to 2.0 kW
MIME 1.0 kW \* 1.5 kW, MCMF 0.05 kW to 2.0 kW

MHMF 1.0 kW \*, 1.5 kW, MGMF 0.85 kW to 1.8 kW | MGMF 0.85 kW | MGMF 0.8

\* MSMF102L1 . , MHMF102L1 .

\* MSMF102L1 , MHMF102L1

#### Components

Part No. DV0PM20036

Title	Part No.	Number	Manufacturer	Note	
Connector (Driver side)	(Driver side) 3E206-0100 KV		Sumitomo 3M	For Connector VC (C nine)	
Shell kit	3E306-3200-008	1	(or equivalent)	For Connector X6 (6-pins)	
Encoder connector	JN2DS10SL1-R	1	Japan Aviation	For Encoder cable	
Connector pin	nector pin JN1-22-22S-PKG100		Electronics Ind.	(One-touch lock type)	
Motor connector	JL04V-6A20-4SE-EB-R	1	Japan Aviation	For Motor cable	
Cable clamp	JL04-2022CK(14)-R	1	Electronics Ind.	(Screwed type)	

Part No.	DV0PM20038 100 mm sq. or mo	1  MSME  1  O kW  fo 2 O kW  MIDME  1  O kW fo 2 O kW	With brake
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#### Components

Title	Part No.	Number	Manufacturer	Note	
Connector (Driver side)	3E206-0100 KV	1	Sumitomo 3M	For Connector V6 (6 pine)	
Shell kit	3E306-3200-008	1	(or equivalent)	For Connector X6 (6-pins)	
Encoder connector	JN2DS10SL1-R	1	Japan Aviation	For Encoder cable	
Connector pin	JN1-22-22S-PKG100	5	Electronics Ind.	(One-touch lock type)	
Motor connector	JL04V-6A20-18SE-EB-R	1	Japan Aviation	For Motor cable	
Cable clamp	JL04-2022CK(14)-R	1	Electronics Ind.	(Screwed type)	

Part No.	DV0P4310	100 mm sq. or more Applicable model	(IP67 motor) Encoder JL10 <large connector="" size=""> MSMF 1.0 kW * to 2.0 kW, MDMF 1.0 kW to 2.0 kW MHMF 1.0 kW *, 1.5 kW, MGMF 0.85 kW to 1.8 kW</large>	Without brake
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#### Components

Title	Part No.	Number	Manufacturer	Note
Connector (Driver side)	3E206-0100 KV	1	Sumitomo 3M	For Connector X6 (6-pins)
Shell kit	3E306-3200-008		(or equivalent)	For Connector A6 (6-pins)
Encoder connector	N/MS3106B20-29S	1	Japan Aviation	For Encoder cable
Cable clamp	N/MS3057-12A	1	Electronics Ind.	(Screwed type)
Motor connector N/MS3106B20-4S		1	Japan Aviation	For Motor cable
Cable clamp	N/MS3057-12A	1	Electronics Ind.	(Screwed type)

Part No.	DV0P4330	100 mm sq. or more Applicable model		With brake
_			* MSMF102L1□□, MHMF102	2L1 🗆 🗆

#### Components

Title	Part No.	Number	Manufacturer	Note
Connector (Driver side)	3E206-0100 KV	1	Sumitomo 3M	For Connector X6 (6-pins)
Shell kit	3E306-3200-008	1	(or equivalent)	For Connector Ao (o-pins)
Encoder connector	N/MS3106B20-29S	1	Japan Aviation	For Encoder cable
Cable clamp	N/MS3057-12A	1	Electronics Ind.	(Screwed type)
Motor connector	N/MS3106B20-18S	1	Japan Aviation	For Motor cable
Cable clamp	N/MS3057-12A	1	Electronics Ind.	(Screwed type)

#### <Remarks>

• For crimp tool etc., necessary to produce a cable, access the web site of the manufacturer or consult with the manufacturer for details. For inquiries of manufacturer, refer to P.308 "List of Peripheral Equipments".

		100 mm sq. or more	(IP67 motor) Encoder JN2 <small connector="" size=""></small>	Vithout
Part No.	DV0PM20037	Applicable model	INSME 30 KW to 50 KW MIDNE 30 KW to 50 KW I.	brake
		Applicable illouel	MHMF 2.0 kW to 5.0 kW, MGMF 2.4 kW to 4.4 kW	Diake

#### Components

Title	Part No.	Number	Manufacturer	Note
Connector (Driver side)	3E206-0100 KV	1	Sumitomo 3M	For Connector V6 (6 nine)
Shell kit	3E306-3200-008	1	(or equivalent)	For Connector X6 (6-pins)
Encoder connector	JN2DS10SL1-R	1	Japan Aviation	For Encoder cable
Connector pin	JN1-22-22S-PKG100	5	Electronics Ind.	(One-touch lock type)
Motor connector	JL04V-6A22-22SE-EB-R	1	Japan Aviation	For Motor cable
Cable clamp	JL04-2022CK(14)-R	1	Electronics Ind.	(Screwed type)

art No.	DV0PM20039	100 mm sq. or more Applicable model	MSMF	otor) Encoder JN2 < 3.0 kW to 5.0 kW, 2.0 kW to 5.0 kW,	MDMF	3.0 kW to 5.0 kW	With brake	
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#### Components

Title	Part No.	Number	Manufacturer	Note
Connector (Driver side)	3E206-0100 KV	1 Sumitomo 3M		For Connector X6 (6-pins)
Shell kit	3E306-3200-008	1	(or equivalent)	For Connector X6 (6-pins)
Encoder connector	JN2DS10SL1-R	1	Japan Aviation	For Encoder cable
Connector pin	JN1-22-22S-PKG100	5	Electronics Ind.	(One-touch lock type)
Motor connector	JL04V-6A24-11SE-EB-R	1	Japan Aviation	For Motor cable
Cable clamp	JL04-2428CK(17)-R	1	Electronics Ind.	(Screwed type)

Part No.	DV0P4320	100 mm og or moro	MSMF	otor) Encoder JL10 3.0 kW to 5.0 kW, 2.0 kW to 5.0 kW,	MDMF	3.0 kW to 5.0 kW	Without brake	1
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#### Components

Title	Part No.	Number	Manufacturer	Note
Connector (Driver side)	3E206-0100 KV	1	Sumitomo 3M	For Connector V6 (6 pine)
Shell kit	3E306-3200-008	1	(or equivalent)	For Connector X6 (6-pins)
Encoder connector	N/MS3106B20-29S	1	Japan Aviation	For Encoder cable
Cable clamp	N/MS3057-12A	1	Electronics Ind.	(Screwed type)
Motor connector	N/MS3106B22-22S	1	Japan Aviation	For Motor cable
Cable clamp	N/MS3057-12A	1	Electronics Ind.	(Screwed type)

Part No.	DV0P4340 100 mm sq. or mor Applicable mode	$\square$ MSME 30 kW to 50 kW MIDME 30 kW to 50 kW	With brake	,
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#### Components

Title	Part No.	Number	Manufacturer	Note
Connector (Driver side)	3E206-0100 KV	1	Sumitomo 3M	For Connector X6 (6-pins)
Shell kit	3E306-3200-008	1	(or equivalent)	For Connector A6 (6-pins)
Encoder connector	N/MS3106B20-29S	1	Japan Aviation	For Encoder cable
Cable clamp	N/MS3057-12A	1	Electronics Ind.	(Screwed type)
Motor connector	N/MS3106B24-11S	1	Japan Aviation	For Motor cable
Cable clamp	N/MS3057-16A	1	Electronics Ind.	(Screwed type)

#### <Remarks>

• For crimp tool etc., necessary to produce a cable, access the web site of the manufacturer or consult with the manufacturer for details. For inquiries of manufacturer, refer to P.308 "List of Peripheral Equipments".

A6B Series
Special Order Product

A6N Series

Series

Imformation

**A6N Series** 

A6B Series
Special Order Product

Series

Imformation

Part No.	DV0PM20040	80 mm sq. or less Applicable model	MSMF 50 W to 1000 W * (Connector type IP67)
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#### Components

\* MSMF092L1 1

Title	Part No.	Number	Manufacturer	Note
Connector	JN4FT02SJM-R	1	Japan Aviation	For broke cable
Socket contact	ST-TMH-S-C1B-3500	2	Electronics Ind.	For brake cable

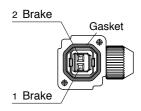
#### · Pin disposition of connector for brake cable

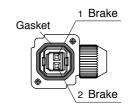
[Direction of motor shaft]

[Opposite direction of motor shaft]

Connector Kit for Motor/Brake Connection

\* When IP65 or IP67 are necessary, the customer must give appropriate processing.





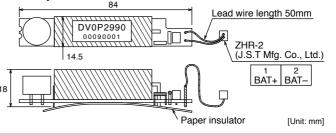
#### <Remarks>

Secure the gasket in place without removing it from the connector. Otherwise, the degree of protection of IP67 will not be guaranteed.

#### **Battery for Absolute Encoder**

Part No. DV0P2990

· Lithium battery: 3.6 V 2000 mAh

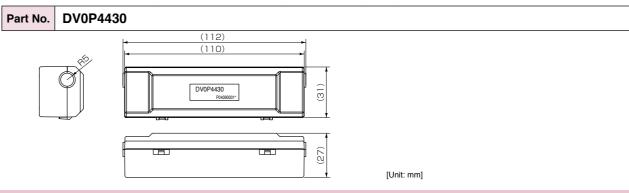


#### <Caution>

This battery is categorized as hazardous substance, and you may be required to present an application of hazardous substance when you transport by air (both passenger and cargo airlines).

#### **Battery Box for Absolute Encoder \***

\* Battery is not included. Please buy the absolute encoder battery "DV0P2990" separately.



#### When waking a cable for 23-bit absolute encoder by yourself

When you make your own cable for 23-bit absolute encoder, connect the optional battery for absolute encoder, DV0P2990 as per the wiring diagram below. Connector of the battery for absolute encoder shall be provided by customer as well.

#### <Caution>

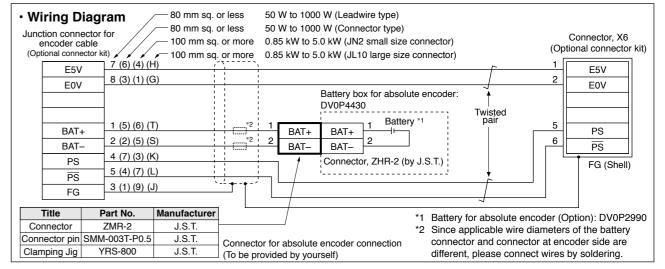
industrial.panasonic.com/ac/e/

Install and fix the battery securely. If the installation and fixing of the battery is not appropriate, it may cause the wire breakdown or damage of the battery.

Refer to the instruction manual of the battery for handling the battery.

#### Installation Place of Battery

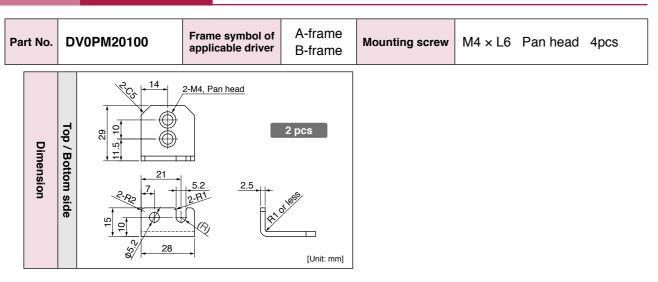
- 1) Indoors, where the products are not subjected to rain or direct sun beam.
- 2) Where the products are not subjected to corrosive atmospheres such as hydrogen sulfide, sulfurous acid, chlorine, ammonia, chloric gas, sulfuric gas, acid, alkaline and salt and so on, and are free from splash of inflammable gas, grinding oil, oil mist, iron powder or chips and etc.
- 3) Well-ventilated and humid and dust-free place.
- 4) Vibration-free place



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**A6 Series** 

**Options** 



**Mounting Bracket** 

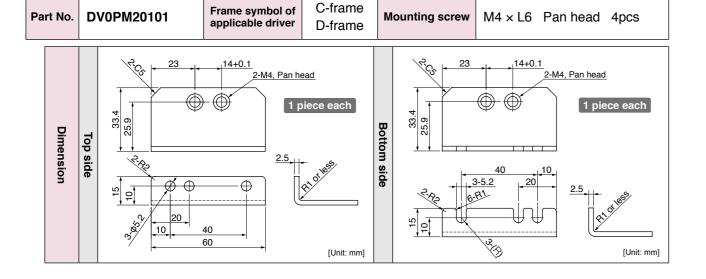


Fig.1 Fig.2 Α (Mounting pitch) · Wiring of the reactor <3-Phase> · Wiring of the reactor <Single phase> Servo Power supply side Servo driver Power side supply Center-to-center distance F: Center-to-center on outer circular arc distance on slotted hole

[Unit: mm]

	Part No.	Α	В	С	D	E(Max)	F	G	н	ı	Inductance (mH)	Rated current (A)
	DV0P220	65±1	125±1	(93)	136мах	155	70+3/-0	85±2	4-7φ×12	M4	6.81	3
	DV0P221	60±1	150±1	(113)	155мах	130	60+3/-0	75±2	4-7φ×12	M4	4.02	5
Fig.1	DV0P222	60±1	150±1	(113)	155мах	140	70+3/-0	85±2	4-7φ×12	M4	2	8
rig. i	DV0P223	60±1	150±1	(113)	155мах	150	79+3/-0	95±2	4-7φ×12	M4	1.39	11
	DV0P224	60±1	150±1	(113)	160мах	155	84+3/-0	100±2	4-7φ×12	M5	0.848	16
	DV0P225	60±1	150±1	(113)	160мах	170	100+3/-0	115±2	4-7φ×12	M5	0.557	25
	DV0P227	55±0.7	80±1	66.5±1	110мах	90	41±2	55±2	4-5φ×10	M4	4.02	5
Fig.2	DV0P228	55±0.7	80±1	66.5±1	110мах	95	46±2	60±2	4-5φ×10	M4	2	8
	DV0PM20047	55±0.7	80±1	66.5±1	110мах	105	56±2	70±2	4-5φ×10	M4	1.39	11

<sup>\*</sup> For application, refer to P.23 to P.32 and P.179 to P.182 "Table of Part Numbers and Options".

#### Harmonic restraint

Harmonic restraint measures are not common to all countries. Therefore, prepare the measures that meet the requirements of the destination country.

When installing a product for Japan, refer to the instruction manual available on our website.

[Panasonic Corporation, Motor Business Unit web site]

industrial.panasonic.com/ac/e/

#### <Remarks>

Reactor

When using a reactor, be sure to install one reactor to one servo driver.

Part No.

DV0P4280

DV0P4281

DV0P4282

DV0P4283

DV0P4284

DV0P4285

Manufacturer's

part No.

RF70M

RF70M

RF180B

RF180B

RF240

RH450F

Manufacturer: Iwaki Musen Kenkyusho

**Specifications** 

Weight

kg

0.1

0.1

0.4

0.2

0.5

1.2

cable core

outside

diameter

mm

φ1.27

AWG18

stranded

wire

Rated power

with fan

1 m/s<sup>\*2</sup>

W

25

25

50

50

100

130

(reference)\*1

Free air

W

10

10

17

17

40

52

Activation

temperature of

built-in thermal protector

140±5 °C

**B-contact** 

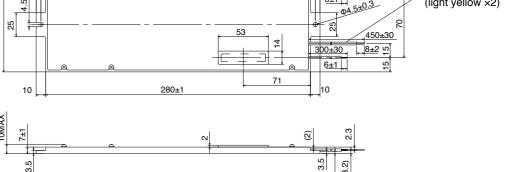
Open/Close capacity

1 A 125 VAC 6000 times

0.5 A 250 VAC 10000 times

(resistance load)

#### **DV0P4284**



#### \*1 Power with which the driver can be used without activating the built-in thermal protector.

Resistance

Ω

50

100

25

50

30

20

A built-in thermal fuse and a thermal protector are provided for safety.

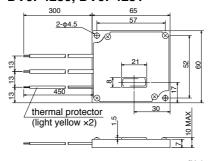
The circuit should be so designed that the power supply will be turned off as the thermal protector operates. The built-in thermal fuse blows depending on changes in heat dissipation condition, operating temperature limit, power supply voltage or load.

Mount the regenerative resistor on a machine operating under aggressive regenerating condition (high power supply voltage, large load inertia, shorter deceleration time, etc.) and make sure that the surface temperature will not exceed 100 °C.

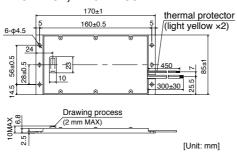
\*2 If the wind speed is 1m / s by the fan.

	Power supply							
Frame	Single phase, 100 V	Single phase, 200 V 3-phase, 200 V						
А	DV0P4280	DV0P4281 (100 W or less) DV0P4283 (200 W)						
В	DV0P4283	DV0P4283						
С	DV0P4282	DV0F4263						
D		DV0P4284						
E		DV0P4284 × 2 in parallel or DV0P4285						
F	_	DV0P4285 × 2 in parallel						
G		DV0P4285 × 3 in parallel						
Н		DV0P4285 × 6 in parallel						

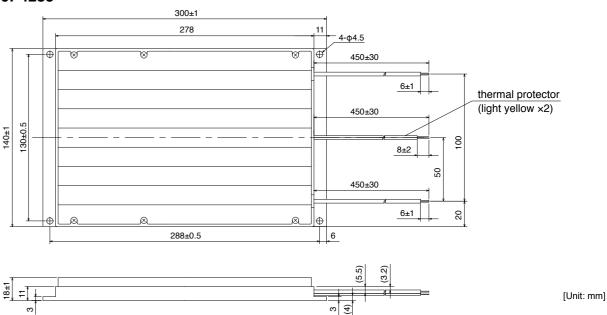
#### DV0P4280, DV0P4281



DV0P4282, DV0P4283



#### DV0P4285



#### <Caution when using external regenerative resistor>

#### Regenerative resistor gets very hot.

Configure a circuit so that a power supply shuts down when built-in thermal protector of the regenerative resistor works. Because it is automatic reset thermal protector, please apply a self-holding circuit to the outside in order to maintain safety in case of sudden activation. During the failure of the driver, the surface temperature of the regenerative resistor may exceed the operating temperature before thermal protector starts to work.

Built-in thermal fuse of regenerative resistor is intended to prevent from ignition during the failure of the driver and not intended to suppress the surface temperature of the resistor.

- Be attached the regenerative resistance to non-combustible material such as metal.
- Built-in thermal fuse of regenerative resistor is intended to prevent from ignition during the failure of the driver and not intended to suppress the surface temperature of the resistor.
- Do not install the regenerative resistor near flammable materials.

Tel No. / Home Page

http://panasonic.net/es/

http://panasonic.net/id/

http://www.iwakimusen.co.jp/

http://www.koanet.co.jp/en/index.htm

http://www.semitec.co.jp/english2/

http://www.chemi-con.co.jp/e/index.html

+81-44-833-4311

+81-42-336-5300

+81-3-5436-7711

+81-3-3621-2703

Peripheral components

Circuit breaker

Surge absorber

Switch, Relay

Regenerative

Surge absorber

for holding brake

resistor

#### **■** Recommended components

	Motor	Part No.	Manufacturer				
	50 W to 1000 W	TND15G271K	NIPPON CHEMI-CON CORPORATION				
MSMF	1.0 kW to 3.0 kW	Z15D151	SEMITEC Corporation				
	4.0 kW, 5.0 kW	TNR9G820K	NIPPON CHEMI-CON CORPORATION				
MQMF	100W to 400 W	TND150071V	NIPPON CHEMI-CON				
	50 W to 1000 W	TND15G271K	CORPORATION				
MHMF	1.0 kW, 1.5 kW	TNR9G820K	NIPPON CHEMI-CON CORPORATION				
	2.0 kW to 4.0 kW	Z15D151	SEMITEC Corporation				
	5.0 kW	NVD07SCD082	KOA Corporation				
MDME	1.0 kW to 3.0 kW	TNR9G820K	NIPPON CHEMI-CON CORPORATION				
MDMF	4.0 kW	SEMITEC Corporation					
	5.0 kW	NVD07SCD082	KOA Corporation				
MOME	0.85 kW to 1.8 kW	TNR9G820K	NIPPON CHEMI-CON CORPORATION				
MGMF	2.4 kW, 2.9 kW	Z15D151	SEMITEC Corporation				
	4.4 kW	NVD07SCD082	KOA Corporation				

Surge Absorber for Motor Brake/ Daisy Chain

#### Daisy Chain (Excluding A6SE, A6NE, A6BE Series)

Part No.	DV0PM24610
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#### Components

Title	Part No.	Manufacturer	Note
Connector	CIF-PCNS08KK-072R	J.S.T Mfg. Co., Ltd.	For Connector X2 (2-pins)
Cable	3-core cable with shield	_	Core diameter AWG24

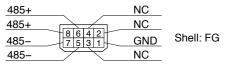
<Remarks>

Cable ②

· Do not connect anything to NC.

the shell (housing) of the connector.

#### • Pin disposition of connector, connector X2



(Viewed from cable)

#### · Table for wiring

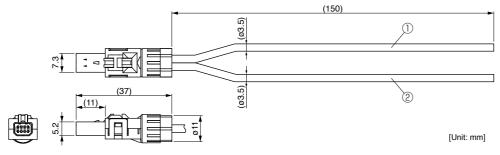
#### Cable (1)

Pin No.	Signal name	Core color
8	485+	Red
7	485-	Yellow
1	GND	White

Pin No.	Signal name	Core color
6	485+	Red
5	485-	Yellow
1	GND	White

• The braided wire of the cable is connected to

#### Dimensions



#### **List of Peripheral Equipments**

Panasonic Corporation

**Eco Solutions Company** Panasonic Corporation

**KOA** Corporation

SEMITEC Corporation

Manufacturer

Automotive & Industrial Systems Company

NIPPON CHEMI-CON CORPORATION

Iwaki Musen Kenkyusho Co., Ltd.

Panasonic Corporation Electromechanical Control Business Division
industrial.panasonic.com/ac/e/

Schaffner EMC, Inc.

Noise filter

TDK Corporation	+81-3-5201-7229 http://www.global.tdk.com/	Ferrite core
Okaya Electric Industries Co. Ltd.	+81-3-4544-7040 http://www.okayaelec.co.jp/english/index.html	Surge absorber Noise filter
Japan Aviation Electronics Industry, Ltd.	+81-3-3780-2717 http://www.jae.co.jp/e-top/index.html	
Japan Molex Inc.	+81-462-65-2313 http://www.molex.co.jp	
J.S.T. Mfg. Co., Ltd.	+81-45-543-1271 http://www.jst-mfg.com/index_e.php	Connector
Sumitomo 3M	+81-3-5716-7290 http:/solutions.3m.com/wps/portal/3M/ja_JP/ WW2/Country/	
Tyco Electronics Japan G.K.	+81-44-844-8052 http://www.te.com/ja/home.html	
DYDEN CORPORATION	+81-3-5805-5880 http://www.dyden.co.jp/english/index.htm	Cable
DR. JOHANNES HEIDENHAIN GmbH	+81-3-3234-7781 http://www.heidenhain.de/de_EN/company/contact/	
Fagor Automation S.Coop.	+34-943-719-200 http://www.fagorautomation.com	
Magnescale Co., Ltd.	+81-463-92-7971 http://www.mgscale.com/mgs/language/english/	External scale
Mitutoyo Corporation	+81-44-813-8234 http://www.mitutoyo.co.jp/eng/	External scale
Nidec Sankyo Corporation	+81-3-5740-3006 http://www.nidec-sankyo.co.jp/	
Renishaw plc	+44 1453 524524 www.renishaw.com	

+81-3-5712-3650

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http://www.schaffner.jp/

\* The above list is for reference only. We may change the manufacturer without notice.

..317 ...317

# Communication sycle 0.0625 ms Ultra-high-speed network driver

Merits of RTEX..

INDEX

Table of parts numbers.....

Driver common specifications.....

Interface connector Kit .....

Dimensions of driver

Interface cable

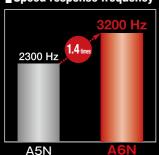


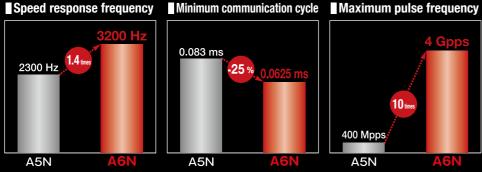
#### Realtime Express(RTEX)



#### Pursuit of ultimate real-time processing

**Pursuit of ultimate** real-time processing





■Max.4 Mpps,when using AB-phase external scale

#### **Multifunctional capabilities to match various needs**

- O Supports all positions, speeds and torque modes (w/built-in positioning function)
- O High-precision position latch and comparison O Communication cycle can be set to any time between 2 ms and 62.5 µs.

#### Simple network

- O Satisfies both high performance and low cost
- O Synchronization established by communication IC © Easier development of compatible equipment
- Easy setup with setup support software "PANATERM".

*	<b>F</b> ~*	on:	iono	othe	r th	on	for	Inte	rfoc	0	aak	J۵	an	4 0	nn	ooto	Sr l	∕i+ f	or	nto	rfo	00	000	~ r	202	to	ם ס	0

• Realtime Express and RTEX are registered trademarks of Panasonic Corporation.

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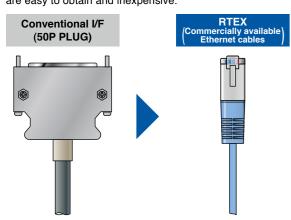


#### **Merits of RTEX**

●The "Conventional I/F" used in this document means a pulse train and analog I/F.

#### Wire-saving

Wire-saving reduces various troubles relating to wires. The cables used are widely available Ethernet cables, which are easy to obtain and inexpensive.

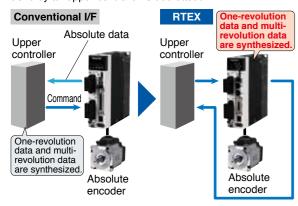


# Maximum length of the node-to-node cable is 100 m. Flexibility increases in the layout of an upper controller and servo motors. The RTEXs can also support large-scale systems. RTEX Max. 100 m Upper controller

# Up to 32 axes can be controlled. In comparison with conventional I/Fs, the number of axes increases that can be controlled by next upper controllers. Conventional I/F Up to 32 axes Upper controller \* If devices other than servo motors are also connected, up to 32 nodes can be connected as entire slaves including the servo motors. Actual number of controllable axes depends on the specification of an upper controller.

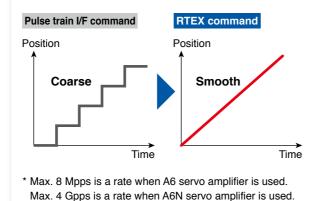
#### Absolute system can easily be built.

Conventional I/F requires an additional wire to transmit absolute data, while the RTEX doesn't. Each servo motor synthesizes one-revolution data and multi-revolution data to produce an actual position, so that the amount of work to be done by an upper controller is decreased.



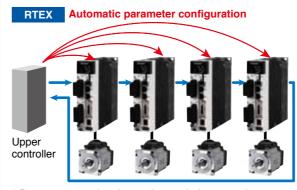
#### High resolution command is enabled

The position command rate of max. 8 Mpps\* in a pulse train I/F is improved to 4 Gpps\* in the RTEX. Vibrations are reduced due to a smooth command sent to a servo motor using the advantage of the high-resolution encoder.



#### Configurable parameter settings

Upper controllers can configure servo parameters. This enables parameters to be configured automatically instead by human at installation.



\* Parameters can be changed even during operation

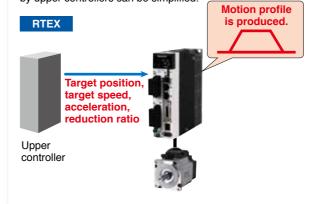
#### Real time monitoring is enabled.

Upper controllers can monitor various information, such as position, speed, and torque, etc. in real time. Since alarm codes can also be read out, analysis can be performed promptly at trouble occurrence.



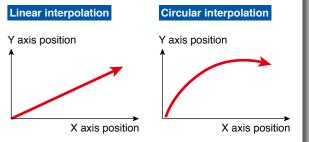
#### Profile position mode is supported

Profile position mode is supported for PTP control as well as cyclic position, speed, and torque. The processing done by upper controllers can be simplified.



#### High synchronization capability among axes

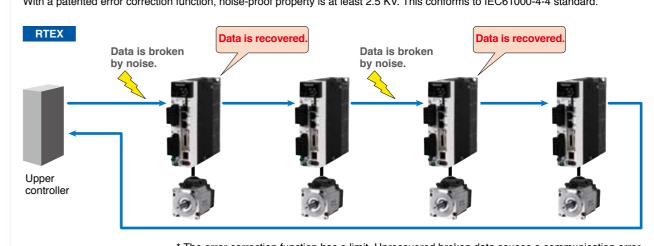
Upper controllers synchronize with entire servo motor axes at high accuracy. With the synchronization capability higher than that of conventional I/F, the RTEX is best suitable for machine tools, robots, gantry systems, and others.



\* Interpolation depends on the specification of upper controllers. This is not the function of individual servo motor.

#### **High noise-proof property**

With a patented error correction function, noise-proof property is at least 2.5 KV. This conforms to IEC61000-4-4 standard.



 $^{\star}$  The error correction function has a limit. Unrecovered broken data causes a communication error.

#### MINAS AON series

#### **Appearance/ System configuration**

#### **Servo Motor**

MINAS AON series

#### Special specifications

**Model Designation** 

U Type	1		
--------	---	--	--

#### 2 Series Symbol Symbol Series name

MSM	Low inertia	(50 W to 5.0 kW)
MQM	Middle inertia	(100 W to 400 W)
MDM	Middle inertia	(1.0 kW to 5.0 kW)
MGM	Middle inertia	(0.85 kW to 4.4 kW)
MHM	High inertia	(50 W to 5.0 kW)

#### **3 Motor rated output**

Symbol	Rated output	Symbol	Rated output
5A	50 W	15	1.5 kW
01	100 W	18	1.8 kW
02	200 W	20	2.0 kW
04	400 W	24	2.4 kW
80	750 W	29	2.9 kW
09	0.85 kW, 1000 W	30	3.0 kW
09	(130 mm sq.) (80 mm sq.)	40	4.0 kW
10	1.0 kW	44	4.4 kW
13	1.3 kW	50	5.0 kW

#### (4) Voltage specifications (6) Design order

Symbol	Specifications			
1	100 V			
2	200 V			
Z	100 V/ 200 V common (50 W only)			

J = 001 <b>3</b> 11 01 001								
Symbol	Specifications							
1	Standard							

When using a rotary encoder as an incremental system (not using multi-turn data), do

not connect a battery for absolute encoder.

Tiotally chooder specimoanons										
Symbol	Format	Pulse counts	Resolution	Wires						
L	Absolute	23-bit	8388608	7						

#### 7 Motor specifications: 100 mm sq. to 220 mm sq. MSMF. MHMF. MDMF. MGMF

		Sh	aft	Holding	g brake	Oil	seal	Encorde	r terminal
Syn	nbol	Round	Key- way	without	with	with	With protective lip	Connector JN2 (Small size)	Connector JL10 (Large size)*2
С	5	•		•		•		•	
С	6	•		•		•			•
С	7	•		•			•	•	
С	8	•		•			•		•
D	5	•			•	•		•	
D	6	•			•	•			•
D	7	•			•		•	•	
D	8	•			•		•		•
G	5		•	•		•		•	
G	6		•	•		•			•
G	7		•	•			•	•	
G	8		•	•			•		•
Н	5		•		•	•		•	
Н	6		•		•	•			•
Н	7		•		•		•	•	
Н	8		•		•		•		•

#### 7 Motor specifications: 80 mm sq. or less MSMF 50 W to 1000 W

\* For combination of elements of model number, refer to Index P.402.

Symbol		Sh	aft	Holding brake (		Oils	Oil seal		Motor encorder terminal *1		
Syn	nboi	Round	Key-way, center tap	without	with	without	with	Connector JN	Lead wire		
Α	1	•		•		•		•			
Α	2	•		•		•			•		
В	1	•			•	•		•			
В	2	•			•	•			•		
С	1	•		•			•	•			
С	2	•		•			•		•		
D	1	•			•		•	•			
D	2	•			•		•		•		
S	1		•	•		•		•			
S	2		•	•		•			•		
T	1		•		•	•		•			
T	2		•		•	•			•		
U	1		•	•			•	•			
U	2		•	•			•		•		
٧	1		•		•		•	•			
٧	2		•		•		•		•		

#### 7 Motor specifications: 80 mm sq. or less MHMF 50 W to 1000 W MQMF 100 W to 400 W

		Sh	aft	Holding	g brake		Oil sea	I	Motor e termi	
Syn	nbol	Round	Key-way, center tap	without	with	without	with	With protective lip	Connector JN	Lead wire
Α	1	•		•		•			•	
Α	2	•		•		•				•
В	1	•			•	•			•	
В	2	•			•	•				•
С	1	•		•			•		•	
С	2	•		•			•			•
С	3	•		•				•	•	
С	4	•		•				•		•
D	1	•			•		•		•	
D	2	•			•		•			•
D	3	•			•			•	•	
D	4	•			•			•		•
S	1		•	•		•			•	
S	2		•	•		•				•
T	1		•		•	•			•	
T	2		•		•	•				•
U	1		•	•			•		•	
U	2		•	•			•			•
U	3		•	•				•	•	
U	4		•	•				•		•
V	1		•		•		•		•	
٧	2		•		•		•			•
٧	3		•		•			•	•	
٧	4		•		•			•		•

<sup>\*1</sup> Connector type: IP67, Lead wire type: IP65

#### **Servo Driver**

#### M A D L N 1 5 N E \*\*\* 2 3 4 5 6 7

#### 4 Max. current rating

Symbol	Frame	Symbol	Frame	S
MAD	A-Frame	MDD	D-Frame	
MBD	B-Frame	MED	E-Frame	
MCD	C-Frame	MFD	F-Frame	

#### 2 Series

Symbol	Series name
L	A6 family

#### 3 Safety Function \*3

1) Frame symbol

Symbol	Specifications
N	without the safety function
Т	with the safety function

Symbol	Current rating		Symbol	Current rating
0	6 A		5	40 A
1	8 A		8	60 A
2	12 A		9	80 A
3	22 A		Α	100 A
4	24 A		В	120 A
4	24 A	I	Ь	120 A

#### **5** Supply voltage specifications

	Symbol	Specifications						
	1	Single phase 100 V						
	3	3-phase 200 V						
	Single/3-phase 200 V							

#### **(6)** I/f specifications **(7)** Classification of type \*3

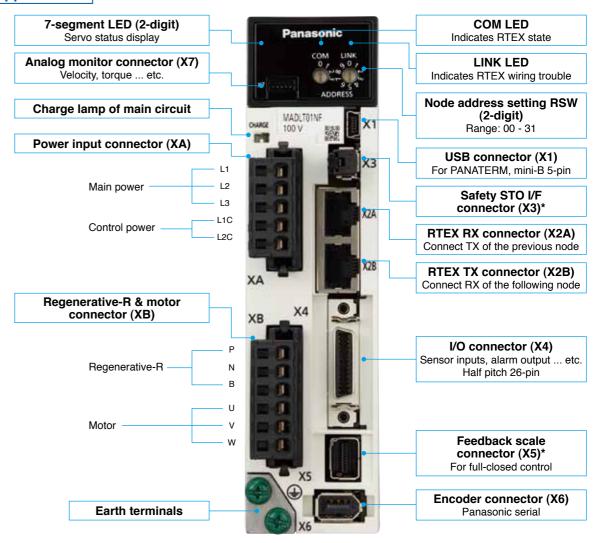
Special specifications

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Symbol (specification)	Symbol	Specification
	E	Standard for rotary motor
	F	Multifunction for rotary motor
N	L	Standard for linear/ DD motor
(RTEX)		<b>Special Order Product</b>
	М	Multifunction for linear/ DD motor
		Special Order Product

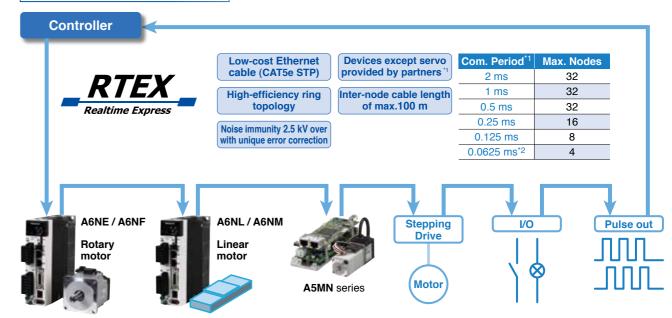
<sup>\*3</sup> Standard type (with a part number ending in E or L) has no safety function. Multi-function type (with a part number ending in F or M) has a safety function

#### **Appearance**



\* The photo is A6NF series. There are no X3 and X5 connectors in the A6NE series.





<sup>\*1:</sup> The communication period and connection of slave devices depend on the controller specification.

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<sup>\*2</sup> Connector on the motor side encoder. (Also applicable to screwed type.)

<sup>\*2:</sup> For communication period 0.0625 ms, command update period is 0.125 ms only.

#### ● 80 mm sq. or less 50 W to 1000 W MSMF, MQMF, MHMF Leadwire type IP65

	M	otor			Driver		Power
Motor series		Power supply	Output (W)	Part No.	A6N series Part No.	Dimension Frame	capacity (at rated load)
			50	MSMF5AZL1 ☐ 2	MADL☆01N☆		. 0.4104
		Single phase	100	MSMF011L1 ☐ 2	MADL☆11N☆	A-frame	Approx. 0.4 KV
		100 V	200	MSMF021L1 ☐ 2	MBDL☆21N☆	B-frame	Approx. 0.5KV/
MSMF			400	MSMF041L1 ☐ 2	MCDL☆31N☆	C-frame	Approx. 0.9 KV
(Leadwire type)			50	MSMF5AZL1 ☐ 2	MADL A OFNIA		
3000 r/min	(A) 15		100	MSMF012L1 ☐ 2	MADL☆05N☆	A-frame	Approx. 0.5 KV
Low inertia		Single phase/	200	MSMF022L1 ☐ 2	MADL☆15N☆		
		3-phase 200 V	400	MSMF042L1 ☐ 2	MBDL☆25N☆	B-frame	Approx. 0.9 KV
		200 V	750	MSMF082L1 ☐ 2	MCDL☆35N☆	C-frame	Approx. 1.3 KV
			1000	MSMF092L1 ☐ 2	MDDL☆45N☆	D-frame	Approx. 1.8 KV
MONE		Cinale abose	100	MQMF011L1 🗆 🗆	MADL☆11N☆	A-frame	Approx. 0.4 KV
MQMF		Single phase 100 V Single phase/ 3-phase 200 V	200	MQMF021L1 🔲	MBDL☆21N☆	B-frame	Approx. 0.5KV
(Leadwire type) 3000 r/min			400	MQMF041L1 🔲	MCDL☆31N☆	C-frame	Approx. 0.9 KV
Middle inertia			100	MQMF012L1 □□	MADL☆05N☆	A-frame	Approx. 0.5 KV
Flat type			200	MQMF022L1 □□	MADL☆15N☆	A-II allie	Approx. U.5 KV
r lat type			400	MQMF042L1 □□	MBDL☆25N☆	B-frame	Approx. 0.9 KV
			50	MHMF5AZL1 □□	MADL☆01N☆	A-frame	Approx. 0.4 KVA
		Single phase	100	MHMF011L1 🔲	MADL☆11N☆	A-II allie	Арргох. <b>0.4 К.V</b>
		100 V	200	MHMF021L1 🗆 🗆	MBDL☆21N☆	B-frame	Approx. 0.5KV
MHMF			400	MHMF041L1 □□	MCDL☆31N☆	C-frame	Approx. 0.9 KV
(Leadwire type)	-0-		50	MHMF5AZL1 □□	MADL☆05N☆		
3000 r/min		Oire also also as a	100	MHMF012L1 🗌 🗌	MADLMOSINA	A-frame	Approx. 0.5 KV
High inertia		Single phase/ 3-phase	200	MHMF022L1 🔲	MADL☆15N☆		
		200 V	400	MHMF042L1 🔲	MBDL☆25N☆	B-frame	Approx. 0.9 KV
			750	MHMF082L1 □□	MCDL☆35N☆	C-frame	Approx. 1.3 KV
			1000	MHMF092L1 □□	MDDL☆55N☆	D-frame	Approx. 2.3 KV

#### ● 80 mm sq. or less 50 W to 1000 W MSMF, MQMF, MHMF Connector type IP67

	Me	otor			Driver		Power
Motor series		Power supply	Output (W)	Part No.	A6N series Part No.	Dimension Frame	capacity (at rated load)
			50	MSMF5AZL1 ☐ 1	MADL☆01N☆	A frama	Approx. 0.4 KVA
		Single phase	100	MSMF011L1 ☐ 1	MADL☆11N☆	A-frame	Approx. U.4 KVA
		100 V	200	MSMF021L1 ☐ 1	MBDL☆21N☆	B-frame	Approx. 0.5KVA
MSMF	شم		400	MSMF041L1 ☐ 1	MCDL☆31N☆	C-frame	Approx. 0.9 KVA
(Connector type)	3		50	MSMF5AZL1 ☐ 1	MADI -A-OENI-A-		
3000 r/min			100	MSMF012L1 ☐ 1	MADL☆05N☆	A-frame	Approx. 0.5 KVA
Low inertia		Single phase/	200	MSMF022L1 ☐ 1	MADL☆15N☆		
		3-phase 200 V	400	MSMF042L1 ☐ 1	MBDL☆25N☆	B-frame	Approx. 0.9 KVA
		200 •	750	MSMF082L1 ☐ 1	MCDL☆35N☆	C-frame	Approx. 1.3 KVA
			1000	MSMF092L1 ☐ 1	MDDL☆45N☆	D-frame	Approx. 1.8 KVA
МОМЕ		0: 1 1	100	MQMF011L1 🔲	MADL☆11N☆	A-frame	Approx. 0.4 KVA
MQMF		Single phase 100 V	200	MQMF021L1 🔲	MBDL☆21N☆	B-frame	Approx. 0.5KVA
(Connector type) 3000 r/min			400	MQMF041L1 🔲	MCDL☆31N☆	C-frame	Approx. 0.9 KVA
Middle inertia		Single phase/ 3-phase 200 V	100	MQMF012L1 🔲	MADL☆05N☆	A frama	Approx. 0.5 KVA
Flat type			200	MQMF022L1 🔲	MADL☆15N☆	A-frame	AVA C.U. xorqqA
i iai type			400	MQMF042L1 □□	MBDL☆25N☆	B-frame	Approx. 0.9 KVA
			50	MHMF5AZL1 □□	MADL☆01N☆	A-frame	. 0.410.44
		Single phase	100	MHMF011L1 🔲	MADL☆11N☆	A-II allie	Approx. 0.4 KVA
		100 V	200	MHMF021L1 🔲	MBDL☆21N☆	B-frame	Approx. 0.5KVA
MHMF			400	MHMF041L1 🔲 🗌	MCDL☆31N☆	C-frame	Approx. 0.9 KVA
(Connector type)	1		50	MHMF5AZL1 □□	MADL☆05N☆		
3000 r/min			100	MHMF012L1 □□	MADEXOSIVX	A-frame	Approx. 0.5 KVA
High inertia		Single phase/	200	MHMF022L1 🗆 🗆	MADL☆15N☆		
		3-phase 200 V	400	MHMF042L1 🔲	MBDL☆25N☆	B-frame	Approx. 0.9 KVA
		200 .	750	MHMF082L1 🗆 🗆	MCDL☆35N☆	C-frame	Approx. 1.3 KVA
			1000	MHMF092L1 🗆 🗆	MDDL☆55N☆	D-frame	Approx. 2.3 KVA

 $<sup>\</sup>square \updownarrow$ : For more information, Please refer to "Model Designation" in P.313.

#### ● 100 mm sq. or more 0.85 kW to 5.0 kW MSMF, MDMF, MGMF, MHMF Encorder connector (Large size JL10) type IP67

	Me	otor			Driver	Power	
Motor :	Power supply		Part No.		Dimension Frame	capacity (at rated load)	
MSMF	A Total	Single phase/	1000	MSMF102L1 □□	MDDL☆55N☆	D-frame	Approx. 2.3 KVA
(Large size JL10 type)		3-phase 200 V	1500	MSMF152L1 □□	MIDDLASSINA	D-IIaille	Applox. 2.3 KVA
3000 r/min	9		2000	MSMF202L1 □□	MEDL☆83N☆	E-frame	Approx. 3.8 KVA
Low inertia		3-phase	3000	MSMF302L1 □□	MFDL☆A3N☆		Approx. 4.5 KVA
IP67		200 V	4000	MSMF402L1 □□	MFDL☆B3N☆	F-frame	Approx. 7.5 KVA
IP07	AO		5000	MSMF502L1 □□	MILDEMBOINM		Approx. 7.3 KVA
MDMF		Single phase/	1000	MDMF102L1 □□	MDDL☆45N☆	D-frame	Approx. 1.8 KVA
(Large size JL10 type)		3-phase 200 V	1500	MDMF152L1 □□	MDDL☆55N☆	D-IIaille	Approx. 2.3 KVA
2000 r/min		3-phase 200 V	2000	MDMF202L1 □□	MEDL☆83N☆	E-frame	Approx. 3.8 KVA
Middle inertia			3000	MDMF302L1 □□	MFDL☆A3N☆	F-frame	Approx. 4.5 KVA
IP67			4000	MDMF402L1 □□	MFDL☆B3N☆		Approx. 7.5 KVA
IF07			5000	MDMF502L1 □□			Applox. 7.3 KVA
MGMF		Single phase/ 3-phase 200 V	850	MGMF092L1 □□	MDDL☆45N☆	D-frame	Approx. 1.8 KVA
(Large size JL10 type)			1300	MGMF132L1 □□	MDDL☆55N☆	D-Irame	Approx. 2.3 KVA
Low speed/			1800	MGMF182L1 □□	MEDL☆83N☆	E-frame	Approx. 3.8 KVA
[High torque type] 1500 r/min		3-phase	2400	MGMF242L1 □□	MEDL☆93N☆	E-II allie	Approx. 4.5 KVA
Middle inertia		200 V	2900	MGMF292L1 □□	MEDL A DONLA	Г <b>б</b> иана а	A 7 F I/\/A
IP67			4400	MGMF442L1 □□	MFDL☆B3N☆	F-frame	Approx. 7.5 KVA
MHMF		Single phase/	1000	MHMF102L1 □□	MDDL☆45N☆	D frame -	Approx. 1.8 KVA
		3-phase 200 V	1500	MHMF152L1 □□	MDDL☆55N☆	D-frame	Approx. 2.3 KVA
(Large size JL10 type)	95		2000	MHMF202L1 □□	MEDL☆83N☆	E-frame	Approx. 3.8 KVA
2000 r/min		3-phase	3000	MHMF302L1 □□	MFDL☆A3N☆		Approx. 4.5 KVA
High inertia		200 V	4000	MHMF402L1 🔲	MFDL☆B3N☆	F-frame	Annew 7 E 1/1/A
IP67			5000	MHMF502L1 🔲	NIFULXB3NX		Approx. 7.5 KVA

 $<sup>\</sup>square \updownarrow$ : For more information, Please refer to "Model Designation" in P.313.

#### ● 100 mm sq. or more 0.85 kW to 5.0 kW MSMF, MDMF, MGMF, MHMF Encorder connector (Small size JN2) type IP67

Elicorder collin							
	M	otor			Driver		Power
Motor series		Power supply	Output (W)	Part No.	A6N series Part No.	Dimension Frame	capacity (at rated load)
MSMF	All n	Single phase/	1000	MSMF102L1 □□	MDDL☆55N☆	D-frame	Approx. 2.3 KVA
(Small size JN2 type)		3-phase 200 V	1500	MSMF152L1 □□	MIDDEX 33IN X	D-IIaille	Applox. 2.3 KVA
3000 r/min	9		2000	MSMF202L1 □□	MEDL☆83N☆	E-frame	Approx. 3.8 KVA
Low inertia		3-phase	3000	MSMF302L1 □□	MFDL☆A3N☆		Approx. 4.5 KVA
IP67		200 V	4000	MSMF402L1 □□	MFDL☆B3N☆	F-frame	Approx. 7.5 KVA
IP07	AO		5000	MSMF502L1 □□	MILDEXBOINX		Approx. 7.5 KVA
MDMF		Single phase/	1000	MDMF102L1 □□	MDDL☆45N☆	D-frame	Approx. 1.8 KVA
		3-phase 200 V	1500	MDMF152L1 □□	MDDL☆55N☆	D-IIailie	Approx. 2.3 KVA
(Small size JN2 type) 2000 r/min		3-phase 200 V	2000	MDMF202L1 🔲	MEDL☆83N☆	E-frame	Approx. 3.8 KVA
Middle inertia			3000	MDMF302L1 □□	MFDL☆A3N☆	F-frame	Approx. 4.5 KVA
			4000	MDMF402L1 🔲	MFDL☆B3N☆		Annes: 7 E K\/A
IP67			5000	MDMF502L1 □□			Approx. 7.5 KVA
MGMF		Single phase/	850	MGMF092L1 □□	MDDL☆45N☆	D-frame	Approx. 1.8 KVA
(Small size JN2 type)		3-phase 200 V	1300	MGMF132L1 □□	MDDL☆55N☆	D-Irame	Approx. 2.3 KVA
Low speed/			1800	MGMF182L1 □□	MEDL☆83N☆	E-frame	Approx. 3.8 KVA
[High torque type]		3-phase	2400	MGMF242L1 □□	MEDL☆93N☆	E-Irame	Approx. 4.5 KVA
1500 r/min Middle inertia		200 V	2900	MGMF292L1 □□	MEDI A DONI A		. 7510/4
IP67			4400	MGMF442L1 □□	MFDL☆B3N☆	F-frame	Approx. 7.5 KVA
MUNAT	<b>18</b> .	Single phase/	1000	MHMF102L1 □□	MDDL☆45N☆	D (	Approx. 1.8 KVA
MHMF		3-phase 200 V	1500	MHMF152L1 □□	MDDL☆55N☆	D-frame	Approx. 2.3 KVA
(Small size JN2 type) 2000 r/min	0		2000	MHMF202L1 □□	MEDL☆83N☆	E-frame	Approx. 3.8 KVA
		3-phase	3000	MHMF302L1 □□	MFDL☆A3N☆		Approx. 4.5 KVA
High inertia		200 V	4000	MHMF402L1 □□	MEDI -A-DON A	F-frame	Annew 7 E 1/1/A
IP67	•		5000	MHMF502L1 □□	MFDL☆B3N☆		Approx. 7.5 KVA

 $<sup>\</sup>square \updownarrow$ : For more information, Please refer to "Model Designation" in P.313.

<sup>\*1:</sup> Encorder connector (Large size JL10)



\*2: Encorder connector (Small size JN2)



				•	t i i i uli-ciose type				
		100 V	Mair	n circuit	Single phase 100 V $^{+10}_{-15}$ % to 120 V $^{+10}_{-15}$ % 50 Hz / 60 Hz				
			Control circuit		Single phase $100 \text{ V}_{-15 \text{ \%}}^{+10 \text{ \%}}$ to 120 V $_{-15 \text{ \%}}^{+10 \text{ \%}}$ 50 Hz / 60 Hz				
	Input power		Main	A-frame to D-frame	Single/3-phase 200 V $^{+10}_{-15}$ % to 240 V $^{+10}_{-15}$ % 50 Hz / 60 Hz				
	power	200 V	circuit	E-frame, F-frame	Single/3-phase 200 V $^{+10~\%}_{-15~\%}$ to 240 V $^{+10~\%}_{-15~\%}$ 50 Hz / 60 Hz				
		200 V	Control	A-frame to D-frame	Single phase 200 V $^{+10~\%}_{-15~\%}$ to 240 V $^{+10~\%}_{-15~\%}$ 50 Hz / 60 Hz				
			circuit	E-frame, F-frame	Single phase 200 V $^{+10}_{-15}$ % to 240 V $^{+10}_{-15}$ % 50 Hz / 60 Hz				
			temp	erature	Ambient temperature: 0 °C to 55 °C (free from freezing) Storage temperature: -20 °C to 65 °C (Max.temperature guarantee: 80 °C for 72 hours free from condensation 1)				
	En	vironment	hu	midity	Both operating and storage : 20 % to 85 %RH (free from condensation 1)				
			Al	titude	Lower than 1000 m				
			Vib	ration	5.88 m/s <sup>2</sup> or less, 10 Hz to 60 Hz				
	Co	ntrol metho	od		IGBT PWM Sinusoidal wave drive				
	Encoder feedback				23-bit (8388608 resolution) absolute encoder, 7-wire serial  * When using it as an incremental system (not using multiturn data), do not connect the battery for absolute encoder. Parameter Pr. 0.15 must be set to "1" (factory settings).				
Basic S	External scale feedback			ck	A/B phase, homing signal differential input. Serial communication is also supported.  Manufacturers that support serial communication scale:  Fagor Automation S.Coop., HEIDENHAIN, Magnescale Co., Ltd., Mitutoyo Corporation  Nidec Sankyo Corporation, Renishaw plc				
pecific	Interface	Control si	anal	Input	Each 8 input can be assigned by the parameter.				
Specifications		Control Si	griai	Output	Each 3 output can be assigned by the parameter.				
S	connector	Analog si	gnal	Output	2 outputs for analog monitors 1 and 2				
	ctor	Pulse sign	nal	Output	Line driver output for encoder pulses (A/B phase signal) or external scale pulses.				
	0			ne Express TEX)	Communication for transmission of a real-time operation command, the parameter setting, or the status monitoring.				
	Cor	nmunication	ι	JSB	USB interface to connect to computers (setup support software PANATERM) for parameter setting or status monitoring.				
	Sat	ety termina	al		Terminal to support safety function.				
	Front panel				<ul><li>(1) 7 segment LED (double digits) (2) Network status LED(LINK,COM)</li><li>(3) Rotary switch for node address setting</li><li>(4) Analog monitor output(Analog monitors 1 and 2)</li></ul>				
	Regeneration  Dynamic brake  Control mode				Size A and B: Without built-in regenerative resistor (use external resistor) Size C to F: Built-in regenerative resistor (External regenerative resistor is also available)				
					A to F frame: built-in				
					<ul> <li>(1) Semi-closed control Position control: Profile position control (PP), Cyclic position control (CP) Velocity control: Cyclic velocity control (CV) Torque control: Cyclic torque control (CT)</li> <li>(2) Full-closed control Position control: Plofile position control (PP), Cyclic position control (CP)</li> <li>• The two modes, [1] and [2] above are switched by parameters.</li> <li>• Switch PP/CP/CV/CT mode according to the RTEX communication command.</li> </ul>				

			Positive direction drive inhibit input, Negative direction drive inhibit, Latch signal,				
	Control input		Near home position, etc				
	Control output		Positioning completion etc.				
	Position	Input mode	Command type by RTEX command				
	command input	Smoothing filter	Either a primary delay filter or a FIR type filter can be selected against command input.				
ק	Damping control		Available (Up to 3 frequency settings,out of 4 settings in total,can be used simultaneously.)				
Position control	Model type damping filter		Available (2 filter available used simultaneously)				
S.	Feed forward fund	ction	Available (speed/torque)				
8	Load variation su	ppression control	Available				
Ĭ	Gain 3 switching	function	Available				
<u>o</u>	Quadrant gritch in	hibit function	Available				
	Two-degree-of-freedom control mode		Available				
	Motor operatable setup function		Available				
	External scale position	on information monitor	Available				
	Other available functions		Friction torque compensation, Torque limit switching function, Torque saturation protection				
	Other available it	ITICLIOTIS	function, Single-turn absolute function, Continuous rotating absolute encoder function				
	Control input		Positive direction drive inhibit input, Negative direction drive inhibit, Latch signal, etc				
	Control output		At speed etc.				
	Position	Input mode	Command type by RTEX command				
	command input						
3pe	Soft start/slowdown function		0 s to 10 s / 1000 r/min Acceleration and deceleration can be set separately.				
Speed			S-curve acceleration/deceleration is also available.				
8	Feed forward fund		Available (torque)				
contro	Load variation sup	•	Available				
으	Two-degree-of-free		Available (standard type)				
	External scale position information		Available				
	monitor		Friction torque compensation, Torque limit switching function, Torque saturation protection				
	Other available fu	inctions	function, Single-turn absolute function, Continuous rotating absolute encoder function				
	Control input		Positive direction drive inhibit input, Negative direction drive inhibit, Latch signal, etc				
ㅋ	Control output		At speed etc.				
Torque control	Position		·				
e	command input Input mode		Command type by RTEX command				
lg	Speed limit functi	on	Speed limit value can be set by parameter. (Switchd by RTEX command.)				
control	External scale position information monitor		Available				
	Other available fu	inctions	Single-turn absolute function Continuous rotating absolute encoder function				
			Positive direction drive inhibit input, Negative direction drive inhibit, Latch signal, Near				
	Control input		home position , etc				
	Control output		Positioning completion etc.				
	Position	Input mode	Command type by RTEX command				
	command input	Smoothing filter	Either a primary delay filter or a FIR type filter can be selected against command input.				
			1/40 times to 125200 times				
끄	Setting range of e		Although the ratio of the encoder pulse (numerator) and external scale pulse (denominator				
1 =	division/multiplica	tion.	can be set anywhere between the range of 1 to 2 <sup>23</sup> for the numerator and 1 to 2 <sup>23</sup> for the				
Full-closed control	5		denominator, Please use within the range indicated above.				
ěd	Damping control		Available(Up to 3 frequency settings,out of 4 settings in total,can be used simultaneously.)				
8	Feed forward fund		Available (speed/torque)				
Ť.	Load variation su	•	Available				
으	Gain 3 switching		Available				
	•	uppression function	Available				
	Quadrant gritch in		Available				
		edom control mode	Available (standard type)				
1	Motor operatable setup function		Available				
	•	•					
	External scale position	on information monitor	Available				
	•	on information monitor	Friction torque compensation, Torque limit switching function, Torque saturation protection function				
	External scale position Other available fu	on information monitor	Friction torque compensation, Torque limit switching function, Torque saturation protection function Applicable scaling ratio: 1/1000 to 8000				
	External scale position	on information monitor	Friction torque compensation, Torque limit switching function, Torque saturation protection function Applicable scaling ratio: 1/1000 to 8000 Although any value of 1 to 2 <sup>30</sup> (numerator) and any value of 1 to 2 <sup>30</sup> (denominator) can be				
	External scale position Other available fu	on information monitor	Friction torque compensation, Torque limit switching function, Torque saturation protection function. Applicable scaling ratio: 1/1000 to 8000  Although any value of 1 to 2 <sup>30</sup> (numerator) and any value of 1 to 2 <sup>30</sup> (denominator) can be used, resulting value should be within the range shown above.				
	External scale position Other available fu	on information monitor	Friction torque compensation, Torque limit switching function, Torque saturation protection function. Applicable scaling ratio: 1/1000 to 8000  Although any value of 1 to 2 <sup>30</sup> (numerator) and any value of 1 to 2 <sup>30</sup> (denominator) can be used, resulting value should be within the range shown above.  Identifies the load inertia real-time and automatically sets up the gain that meets the				
C	External scale position Other available full Electronic gear randauto tuning	on information monitor	Friction torque compensation, Torque limit switching function, Torque saturation protection function. Applicable scaling ratio: 1/1000 to 8000  Although any value of 1 to 2 <sup>30</sup> (numerator) and any value of 1 to 2 <sup>30</sup> (denominator) can be used, resulting value should be within the range shown above.  Identifies the load inertia real-time and automatically sets up the gain that meets the stiffness setting when the motor is running with upper and internal operation commands.				
Com	External scale position Other available fur Electronic gear range Auto tuning Notch filter	on information monitor inctions itio setting	Friction torque compensation, Torque limit switching function, Torque saturation protection function. Applicable scaling ratio: 1/1000 to 8000. Although any value of 1 to 2 <sup>30</sup> (numerator) and any value of 1 to 2 <sup>30</sup> (denominator) can be used, resulting value should be within the range shown above. Identifies the load inertia real-time and automatically sets up the gain that meets the stiffness setting when the motor is running with upper and internal operation commands. Available (5 filters available)				
Commo	External scale position Other available fur Electronic gear range Auto tuning Notch filter Gain switching fur	on information monitor inctions itio setting	Friction torque compensation, Torque limit switching function, Torque saturation protection function. Applicable scaling ratio: 1/1000 to 8000  Although any value of 1 to 2 <sup>30</sup> (numerator) and any value of 1 to 2 <sup>30</sup> (denominator) can be used, resulting value should be within the range shown above.  Identifies the load inertia real-time and automatically sets up the gain that meets the stiffness setting when the motor is running with upper and internal operation commands. Available (5 filters available)				
Common	External scale position Other available fur Electronic gear range Auto tuning Notch filter Gain switching fur 2-step torque filter	on information monitor inctions attion setting inction rection	Friction torque compensation, Torque limit switching function, Torque saturation protection function Applicable scaling ratio: 1/1000 to 8000  Although any value of 1 to 2 <sup>30</sup> (numerator) and any value of 1 to 2 <sup>30</sup> (denominator) can be used, resulting value should be within the range shown above.  Identifies the load inertia real-time and automatically sets up the gain that meets the stiffness setting when the motor is running with upper and internal operation commands. Available (5 filters available)  Available  Available				
Common	External scale position Other available fur Electronic gear range Auto tuning Notch filter Gain switching fur 2-step torque filter	on information monitor inctions itio setting	Friction torque compensation, Torque limit switching function, Torque saturation protection function.  Applicable scaling ratio: 1/1000 to 8000  Although any value of 1 to 2 <sup>30</sup> (numerator) and any value of 1 to 2 <sup>30</sup> (denominator) can be used, resulting value should be within the range shown above.  Identifies the load inertia real-time and automatically sets up the gain that meets the stiffness setting when the motor is running with upper and internal operation commands.  Available (5 filters available)  Available  Available  Available				
Common	External scale position Other available fur Electronic gear range Auto tuning Notch filter Gain switching fur 2-step torque filter	on information monitor inctions into setting inction i	Friction torque compensation, Torque limit switching function, Torque saturation protection function.  Applicable scaling ratio: 1/1000 to 8000  Although any value of 1 to 2 <sup>30</sup> (numerator) and any value of 1 to 2 <sup>30</sup> (denominator) can be used, resulting value should be within the range shown above.  Identifies the load inertia real-time and automatically sets up the gain that meets the stiffness setting when the motor is running with upper and internal operation commands.  Available (5 filters available)  Available  Available  Over-voltage, under-voltage, over-speed, over-load, over-heat, over-current,				
Common	External scale position Other available for Electronic gear range Auto tuning Notch filter Gain switching for 2-step torque filte Position comparise Protective function	on information monitor inctions utio setting  nction r son output function	Friction torque compensation, Torque limit switching function, Torque saturation protection function Applicable scaling ratio: 1/1000 to 8000  Although any value of 1 to 2 <sup>30</sup> (numerator) and any value of 1 to 2 <sup>30</sup> (denominator) can be used, resulting value should be within the range shown above.  Identifies the load inertia real-time and automatically sets up the gain that meets the stiffness setting when the motor is running with upper and internal operation commands.  Available (5 filters available)  Available  Available  Over-voltage, under-voltage, over-speed, over-load, over-heat, over-current, encoder error, excess position deviation, EEPROM error etc.				
Common	External scale position Other available full Electronic gear rand Auto tuning Notch filter Gain switching full 2-step torque filte Position comparis	on information monitor inctions utio setting  nction r son output function n ack function	Friction torque compensation, Torque limit switching function, Torque saturation protection function.  Applicable scaling ratio: 1/1000 to 8000  Although any value of 1 to 2 <sup>30</sup> (numerator) and any value of 1 to 2 <sup>30</sup> (denominator) can be used, resulting value should be within the range shown above.  Identifies the load inertia real-time and automatically sets up the gain that meets the stiffness setting when the motor is running with upper and internal operation commands.  Available (5 filters available)  Available  Available  Over-voltage, under-voltage, over-speed, over-load, over-heat, over-current,				

Position, Speed, Torque, Full-close type

<sup>\*1</sup> Air containing water vapor will become saturated with water vapor as the temperature falls, causing dew.

<b>A</b> 6	N	Series	Driver	Specifica	tions A6NE series (Besic type) Position, Speed, Torque type				
					<del></del>				
		100 V	Main circuit		Single phase 100 V <sup>+10</sup> % to 120 V <sup>+10</sup> % 50 Hz / 60 Hz				
		100 V	Contr	ol circuit	Single phase 100 V $^{+10}_{-15}$ % to 120 V $^{+10}_{-15}$ % 50 Hz / 60 Hz				
-	Input		Main	A-frame to D-frame	Single/3-phase 200 V $^{+10}_{-15}$ % to 240 V $^{+10}_{-15}$ % 50 Hz / 60 Hz				
	Input power	000.14	circuit	E-frame, F-frame	Single/3-phase 200 V $^{+10}_{-15}$ % to 240 V $^{+10}_{-15}$ % 50 Hz / 60 Hz				
		200 V	Control	A-frame to D-frame	Single phase 200 V $^{+10}_{-15}$ % to 240 V $^{+10}_{-15}$ % 50 Hz / 60 Hz				
			circuit	E-frame, F-frame	Single phase 200 V <sup>+10</sup> % to 240 V <sup>+10</sup> % 50 Hz / 60 Hz				
	temperature			perature	Ambient temperature: 0 °C to 55 °C (free from freezing) Storage temperature: -20 °C to 65 °C (Max.temperature guarantee: 80 °C for 72 hours free from condensation*1)				
	Environment		hu	midity	Both operating and storage: 20 % to 85 %RH (free from condensation 1)				
			Al	titude	Lower than 1000 m				
	Vibration				5.88 m/s <sup>2</sup> or less, 10 Hz to 60 Hz				
	Control method			IGBT PWM Sinusoidal wave drive					
က	Encoder feedback			23-bit (8388608 resolution) absolute encoder, 7-wire serial  * When using it as an incremental system (not using multiturn data), do not connect the battery for absolute encoder. Parameter Pr. 0.15 must be set to "1" (factory settings).					
Specifications	Interface Control sig		Input		Each 8 input can be assigned by the parameter.				
ations			Output		Each 3 output can be assigned by the parameter.				
-	connector	Analog signal		Output	2 outputs for analog monitors 1 and 2				
	Pulse signal Output				Line driver output for encoder pulses (A/B phase signal).				
	Communication		Realtime Express (RTEX)		Communication for transmission of a real-time operation command, the parameter setting, or the status monitoring.				
			USB		USB interface to connect to computers (setup support software PANATERM) for parameter setting or status monitoring.				
	Front panel				(1) 7 segment LED (double digits) (2) Network status LED(LINK,COM) (3) Rotary switch for node address setting (4) Analog monitor output(Analog monitors 1 and 2)				
	Regeneration				Size A and B: Without built-in regenerative resistor (use external resistor) Size C to F: Built-in regenerative resistor (External regenerative resistor is also available)				
	Dyr	namic brak	e		A to F frame: built-in				
	Control mode				(1) Semi-closed control     Position control: Profile position control (PP), Cyclic position control (CP)     Velocity control: Cyclic velocity control (CV)     Torque control: Cyclic torque control (CT)     Switch PP/CP/CV/CT mode according to the RTEX communication command.				

<sup>\*1</sup> Air containing water vapor will become saturated with water vapor as the temperature falls, causing dew.

	Control input		Positive direction drive inhibit input, Negative direction drive inhibit, Latch signal, Near home position, etc					
	Control output		Positioning completion etc.					
	Da a'ii' a a	Input mode	Command type by RTEX command					
	Position command input	Smoothing filter	Either a primary delay filter or a FIR type filter can be selected against command input.					
Position	Damping control		Available(Up to 3 frequency settings,out of 4 settings in total,can be used simultaneously.)					
itio	Model type damping filter		Available(2 filter available used simultaneously)					
	Feed forward fur	nction	Available (speed/torque)					
contro	Load variation su	opression control	Available					
2	Gain 3 switching	function	Available					
	Quadrant gritch	nhibit function	Available					
	Two-degree-of-free	edom control mode	Available					
	Motor operatable	e setup function	Available					
	Other available functions		Friction torque compensation, Torque limit switching function, Torque saturation protection function, Single-turn absolute function, Continuous rotating absolute encoder function					
	Control input		Positive direction drive inhibit input, Negative direction drive inhibit, Latch signal, etc.					
	Control output		At speed etc.					
	Position command input	Input mode	Command type by RTEX command					
Speed contro	Soft start/slowdown function		0 s to 10 s / 1000 r/min Acceleration and deceleration can be set separately. S-curve acceleration/deceleration is also available.					
d control	Feed forward function		Available (torque)					
ntro	Load variation suppression control		Available					
-	Two-degree-of-freedom control mode		Available (standard type)					
	Other available functions		Friction torque compensation, Torque limit switching function, Torque saturation protection function, Single-turn absolute function, Continuous rotating absolute encoder function					
	Control input		Positive direction drive inhibit input, Negative direction drive inhibit, Latch signal, etc					
Tor	Control output		At speed etc.					
Torque co	Position command input	Input mode	Command type by RTEX command					
control	Speed limit funct	ion	Speed limit value can be set by parameter. (Switchd by RTEX command.)					
-	Other available f	unctions	Single-turn absolute function Continuous rotating absolute encoder function					
	Electronic gear r	atio setting	Applicable scaling ratio: 1/1000 to 8000 Although any value of 1 to 2 <sup>30</sup> (numerator) and any value of 1 to 2 <sup>30</sup> (denominator) can be used, resulting value should be within the range shown above.					
	Auto tuning		Identifies the load inertia real-time and automatically sets up the gain that meets the stiffness setting when the motor is running with upper and internal operation commands.					
Co	Notch filter		Available (5 filters available)					
Common	Gain switching for	unction	Available					
S	2-step torque filt	er	Available					
	Position comparis	on output function	Available					
	Protective function	on	Over-voltage, under-voltage, over-speed, over-load, over-heat, over-current, encoder error, excess position deviation, EEPROM error etc.					
	Alarm data trace l	oack function	Tracing back of alarm data is available					
	Deterioration dia	gnosis function	Available					

CIF-HS08SS-071-TB (or equivalent) J.S.T. Mfg. Co., Ltd.

Sumitomo 3M

Connector X2A MOD-WRJ88LY1G-TP+ (or equivalent) HTK Connector X2B MOD-WRJ88LY1G-TP+ (or equivalent) HTK

DF02R026NA2 (or equivalent)

3E106-223KAV (or equivalent)

Connector X5 MUF-RS10SK-GKX-TB (or equivalent) J.S.T. Mfg. Co., Ltd.

\* All dimensions shown in this catalog are for the A6NF series, but outer dimensions are the same as the A6NE series.

A6N Series

#### A-frame X1: USB connector X3: Safety function connector X2A : RTEX RX connector X2B: RTEX TX connector X4: I/O connector X5 : Feedback scale connector 130 X6: Encoder connector Mounting bracke X7: For analog monitor signal connection (Option) Front Panel -X3

~X2B XB: Mounting bracket For mounting Ground screw X6 (Option) XA: ①Main power input terminals \_\_\_6 ②Control power input terminals XB: ①Terminals for external regenerative resistor Base mount type ②Terminals for motor connection /Standard: Rack mount type Back-end mounting (Option: Front-end mounting) A-frame: Connector of driver side Connector XA S05B-F32SK-GGXR (or equivalent) S06B-F32SK-GGXR (or equivalent)
UB-M5BR-S14-4S (or equivalent)
J.S.T. Mfg. Co., Ltd.
J.S.T. Mfg. Co., Ltd. Connector XB

#### B-frame

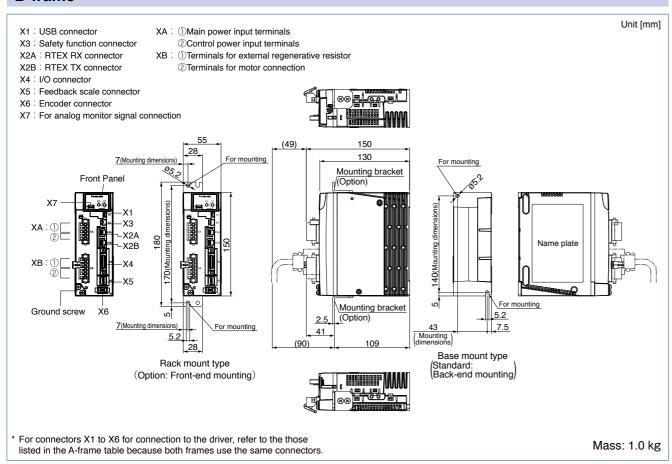
Connector X1

Connector X3

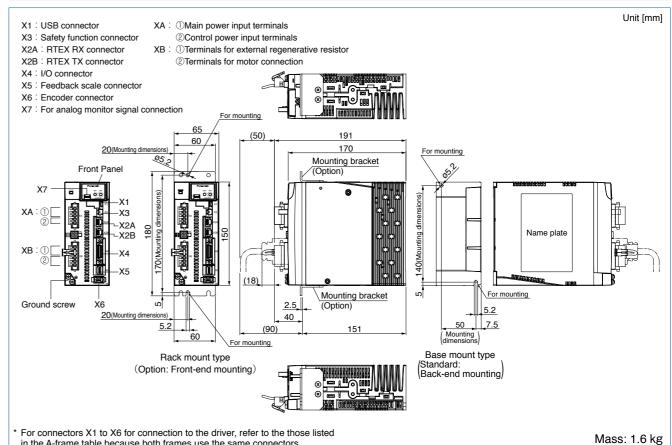
Connector X4

Connector X6

Connector X7 53398-8605 (5pin)



#### C-frame



#### **D-frame (200 V)**

in the A-frame table because both frames use the same connectors.

Mass: 0.8 kg

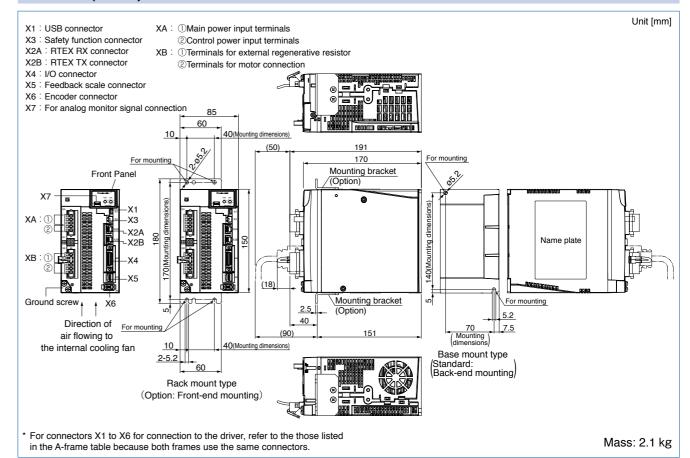
Attached to the driver>

Connector of power and motor side

Connector XA 05JFAT-SAXGGKK-A J.S.T. Mfg. Co., Ltd.

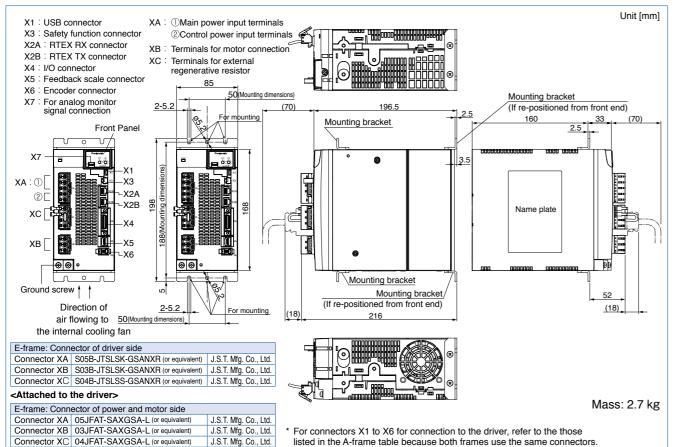
Connector XB 06JFAT-SAXGGKK-A J.S.T. Mfg. Co., Ltd.

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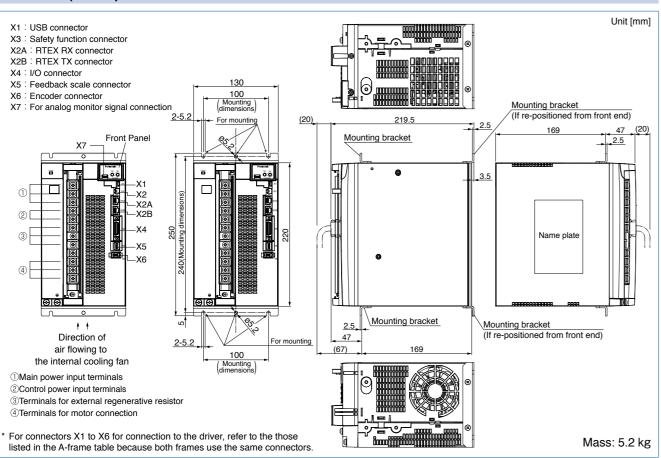


All dimensions shown in this catalog are for the A6NF series, but outer dimensions are the same as the A6NE series.

#### E-frame (200 V)



#### F-frame (200 V)

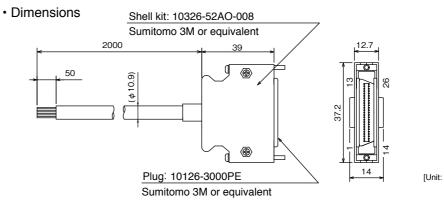


#### Refer to pages 23-32 for other options than the interface cable and interface connector kit.

#### **Cable for Interface**

Interface Cable / Connector Kit

Part No. DV0P0800 Cable length 2 m, core wire AWG 26 is connected.



#### · Table for wiring

Pin No.	信号名	color	Pin No.	信号名	color	Pin No.	信号名	color
1*	BRK-OFF+	Orange (Red1)	10*	HOME	Pink (Black1)	19	OB-/OCMP2-	Pink (Red2)
2*	BRK-OFF-	Orange (Black1)	11*	EXT2	Orange (Red2)	20	OB+/OCMP2+	Pink (Black2)
3*	ALM+	Gray (Red1)	12*	EXT3	Orange (Black2)	21	OCMP3+	Orange (Red3)
4*	ALM-	Gray (Black1)	13*	SI-MON4	Gray (Red2)	22	OCMP3-	Gray (Red3)
5*	SI-MON5	White (Red1)	14	BTP-I	Gray (Black2)	23	_	Gray (Black3)
6	I-COM	White (Black1)	15	BTN-I	White (Red2)	24	_	White (Red3)
7*	POT	Yellow (Red1)	16	GND	White (Black2)	25*	EX-OUT1+	White (Black3)
8*	NOT	Yellow (Black1)	17	OA+/OCMP1+	Yellow (Red2)	26*	EX-OUT1-	Orange (Black3)
9*	SI-MON1	Pink (Red1)	18	OA-/OCMP1-	Yellow (Black2)			

The signals allocated to the pin No. with " \* " in the table are factory default.

#### <Remarks>

Color designation of the cable e.g.) Pin-1 Cable color: Orange (Red1): One red dot on the cable

The braided wire of this cable is not connected to the shell (housing) of the connector. When connecting the shield to FG or GND on the driver side, please use the interface connector Kit DV0P0770.

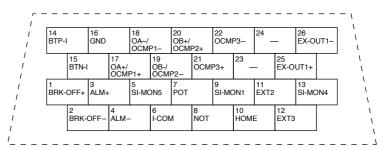
#### **Connector Kit for Interface**

Part No. DV0P0770	
-------------------	--

#### Components

Title	Part No.	Number	Manufacturer	Note
Connector	10126-3000PE	1	Sumitomo 3M	For CN X4
Connector cover	10326-52A0-008	1	(or equivalent)	(26-pins)

• Pin disposition: Connector X4 (26 pins) (viewed from the soldering side)



#### <Remarks>

- 1. Check the stamped pin-No. on the connector body while making a wiring.
- 2. For the symbols representing the signal names or the functions of the signals in the figure above, refer to the

# Servo driver with EtherCAT open network





Response frequency 3200 Hz & communication rate 100 Mbps enable fast and highly accurate operation.

Configurable even for motors with a maximum rotating speed 6500 r/min.\*

\* MHMF and MQMF types with a maximum wattage 400 W



New algorithm "Two-degree-of-freedom control method" is used to improve machining accuracy and productivity.



Easy and speedy set-up with set-up support software "PANATERM" Easily Optional wireless LAN dongle (available separately) enables wireless connection with PCs, smart phones, and tablet terminals.

- Fully-featured EtherCAT application (7 control modes, 32 origin-return modes, 2 synchronous modes, and an asynchronous mode.) 

  Capable of system upgrade with various slaves. 

  Capable of establishing PC-based systems without needing dedicated hardware. ● Planed to pass official EtherCAT Conformance Test. ● Under development of A6BF with safety I/F corresponding to international standard, and A6BL/A6BM supporting linear motors \*2: IEC61800-5-2 STO, IEC61508 SIL3
  - The EtherCAT is a registered trademark of patented technology licensed from Beckhoff Autmation GmbH in Germany.

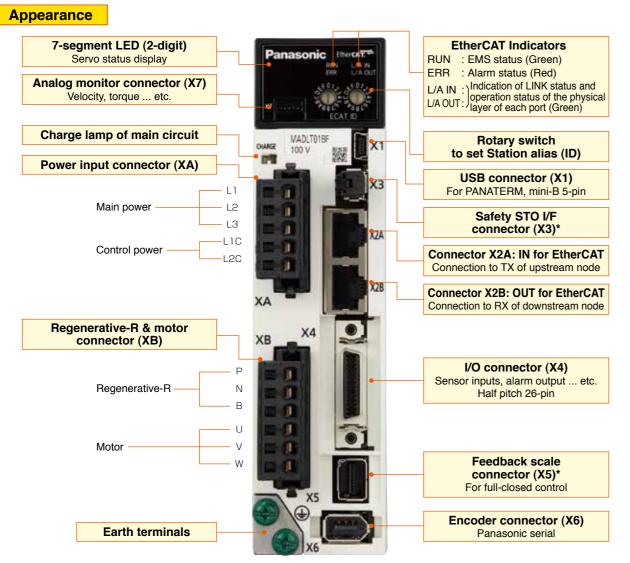
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Special Order Product For more information, please visit our website or request to our distributors separately.

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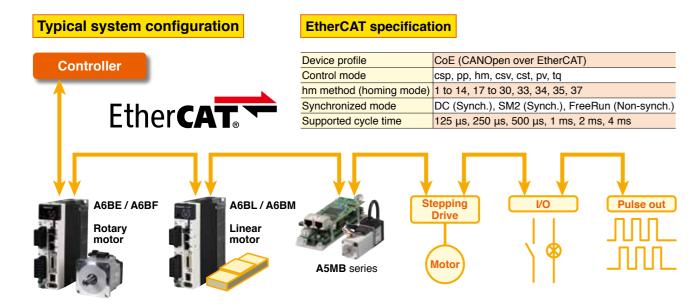
Connector XB 06JFAT-SAXGGKK-A J.S.T. Mfg. Co., Ltd.

#### Appearance/ System configuration



<sup>\*</sup> The photo is A6BF series. There are no X3 and X5 connectors in the A6BE series.

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● For supported motors, refer to A6 series Pages 23–32. For options, refer to A6N series Page 324 For more information, refer to specification sheets because "Signal names" and "Pin configuration" of connectors vary. A-frame X1: USB connector Unit [mm] X3 : Safety function connector X2A : Connector X2A: IN for EtherCAT X2B : Connector X2B: OUT for EtherCAT X4: I/O connector X5 : Feedback scale connecto For mounting X6: Encoder connector Mounting bracke X7: For analog monitor signal connection X7 XB: Mounting bracket For mounting (Option) ①Main power input terminals (2)Control power input terminals XB (1) Terminals for external regenerative resistor Base mount type ②Terminals for motor connection Rack mount type (Option: Front-end mounting) A-frame: Connector of driver side S05B-F32SK-GGXR (or equivalent) Connector XA Connector XB S06B-F32SK-GGXR (or equivalent) J.S.T. Mfg. Co., Ltd. UB-M5BR-S14-4S (or equivalent) J.S.T. Mfg. Co., Ltd Connector X1 Mass: 0.8 kg Connector X3 CIF-HS08SS-071-TB (or equivalent) Connector X2A MOD-WRJ88LY1G-TP+ (or equivalent) HTK Connector X2B MOD-WRJ88LY1G-TP+ (or equivalent) <a href="#">Attached to the driver></a> Connector X4 DE02B026NA2 (or equivalent) MUF-RS10SK-GKX-TB (or equivalent) J.S.T. Mfg. Co., Ltd. Connector of power and motor side Connector X5 Connector XA 05JFAT-SAXGGKK-A J.S.T. Mfg. Co., Ltd. 3E106-223KAV (or equivalent) Connector X6 Sumitomo 3M

#### **B-frame**

Connector X7

53398-8605 (5pin)

are the same as the A6BE series.

Unit [mm] X1: USB connector XA: 

Main power input terminals X3 : Safety function connector Control power input terminals X2A : Connector X2A: IN for EtherCAT XB: ①Terminals for external regenerative resistor X2B : Connector X2B: OUT for EtherCAT ②Terminals for motor connection X4: I/O connector X5 : Feedback scale connector X6 : Encoder connector X7: For analog monitor signal connection 130 Mounting bracket Front Panel (Option) \For mounting Mounting bracket Ground screw (Option) 2.5 7(Mounting dim 7.5 For mounting 41 5.2 Base mount type Standard: Back-end mounting Rack mount type (Option: Front-end mounting) For connectors X1 to X6 for connection to the driver, refer to the those listed

Panasonic Corporation Electromechanical Control Business Division

in the A-frame table because both frames use the same connectors

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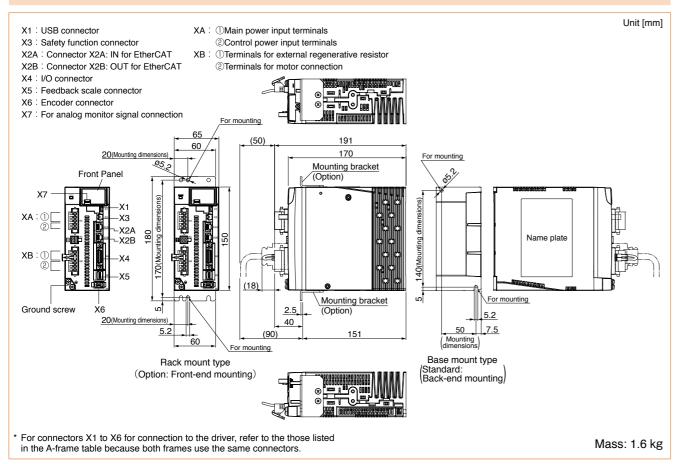
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Mass: 1.0 kg

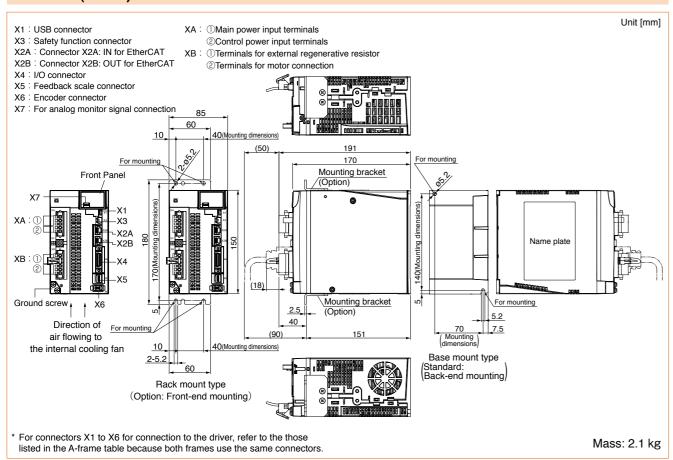
Panasonic Corporation Electromechanical Control Business Division industrial.panasonic.com/ac/e/

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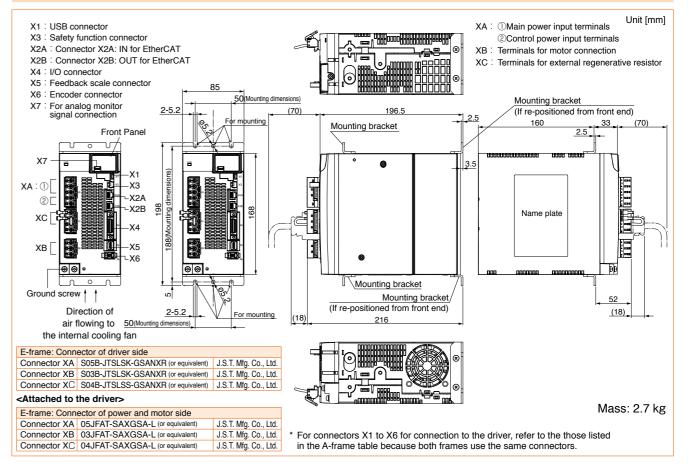
#### C-frame



#### **D-frame (200 V)**

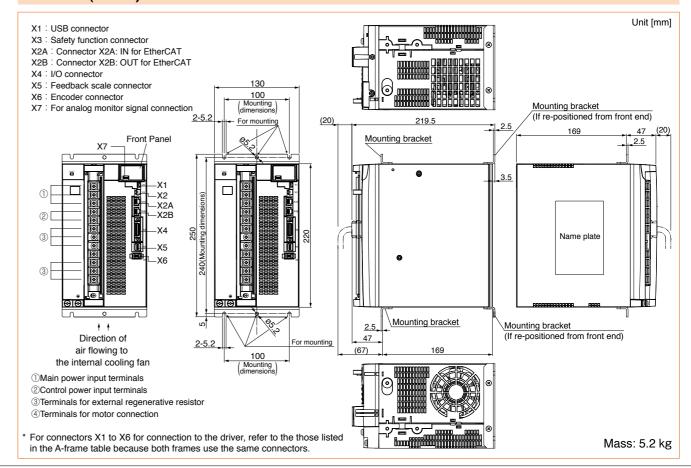


#### E-frame (200 V)



#### F-frame (200 V)

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..339

## Compact Servo Only for Position Control.

Ultra compact position control type

### MINAS E Series



#### **Best Fit to Small Drives**

- Further evolution in down-sizing, by 47 % in size. (Note)
- Exclusively designed for position control.

(Note) Compared to MUDS043A1

#### **Easy to Handle, Easy to Use**

- DIN-rail mounting unit (option) improves handling/installation.
- User-friendly Console makes the setup easy.
- High functionality Real-Time Auto-Gain Tuning enables adjustment-free operation.



#### **High-Speed Positioning with Resonance Suppression Filters**

- Built-In notch filter suppresses resonance of the machine.
- Built-in adaptive filter detect resonance frequency and suppress vibration.

#### **Smoother operation for Low Stiffness Machine**

Damping control function suppresses vibration during acceleration/deceleration

Panasonic Corporation Electromechanical Control Business Division

Contents

Driver and List of Applicable Peripheral Equipments.....

Driver Specifications ..... Standard Wiring Example of Main Circuit.....

Control Circuit Standard Wiring Example .....

Specifications/Model designation/Torque Characteristics.....

Setup Support Software..... Cable part No. Designation....

Communication Cable.....

External Regenerative Resistor.....

Surge Absorber for Motor Brake .....

List of Peripheral Components.....

Motors with Gear Reducer.....

Model Designation...

Encorder Wiring Diagram.

Dimensions of Motor....

Brake Cable ..

Interface Cable..

DIN Rail Mounting Unit .....

**A6N Series** 

#### Lasy to Handle, Easy to Use

#### High-functionality Real-Time Auto-Gain Tuning (Note 1

- Offers real automatic gain tuning for low and high stiffness machines with a combination of an adaptive filter.
- Supports the vertical axis application where the load torque is different in rotational direction.

#### **DIN-rail mounting unit (option)**

- DIN-rail mounting unit allows parallel mounting with small control devices such as PLC.
- Easy to mount and easy to dismount.

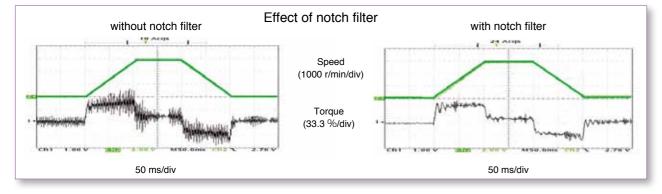
#### Further Reduction of Vibration

#### Adaptive filter (Note1)

- Makes the notch filter frequency automatically follow the machine resonance frequency in real-time auto-gain tuning.
- Suppression of "Judder" noise of the machine, which is caused by variation of the machines or resonance frequency due to aging, can be expected.

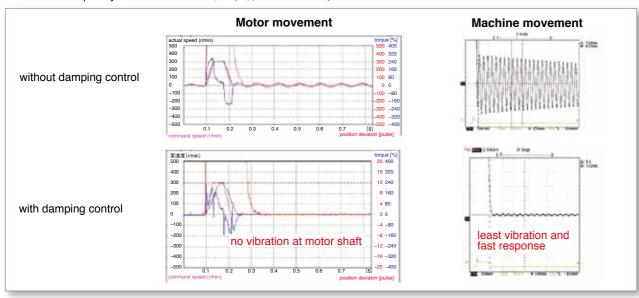
#### Notch filter (Note1)

- 1-channel notch filter is equipped in the driver independent from adaptive filter.
- Each of 2 filters can set up frequency and notch width, and frequency in 1Hz unit. Suppression of "Judder" noise of the machine which has multiple resonance points can be expected.



#### Damping control (Note1)

You can suppress vibration occurring at both starting and stopping in low stiffness machine, by manually setting up vibration frequency in 0.1 Hz unit. Note) Only applies to manual adjustment



(Note1) Select at positioning action mode

· At high speed positioning mode (Pr02=0) Select either one of notch filter damping control or high-functionality real-time auto- gain tuning. Not possible to use them all at the same time. Adaptive filter cannot be used

· At high-functionality positioning mode (Pr02=1) All of notch filter, damping control, high-functionality real-time auto-gain tuning and adaptive filter can be used at the same time

#### 3. Further Flexibility and Multiplicity

#### Console (Option)

- You can set up parameters, copy and make a JOG run.
- Convenient for maintenance at site.
- Refer to P.357, Options.

#### **Command control modes**

- Offers 2 command modes, "Position control" and "Internal velocity control".
- You can make a 4-speed running at preset values with parameter at internal velocity control mode.

#### Inrush current suppressing function

- Inrush suppressing resistor, which prevent the circuit breaker shutdown of the power supply caused by inrush current at power-on, is equipped in this driver.
- Prevents unintentional shutdown of the power supply circuit breaker in multi axis application and does not give load to the power line.

#### Regeneration discharging function

- Discharges the regenerative energy with external resistor, where energy is generated while stopping the load with large moment of inertia, or use in up-down operation, and is returned to the driver from the motor.
- No regenerative resistor is installed in the driver.
- It is highly recommended to install an external regenerative resistor (option).

#### **Built-in dynamic brake**

- You can select the dynamic brake action which short the servo motor windings of U, V and W, at Servo-OFF, CW/ CCW over- travel inhibition, power shutdown and trip.
- You can select the action sequence depending on the machine requirement.

#### **Setup support software** (Option)

With the setup support software, "PANATERM" via RS232 / RS485 communication port, you can monitor the running status of the driver and set up parameters. Note) Refer to P.352 for setup support software.

#### Key-way shaft and tapped shaft end

- Easy pulley attachment and easy maintenance
- Attache screw to the tapped shaft to prevent key or pulley from being pulled out.

#### Wave-form graphic function

- With the setup support software, "PANATERM", you can monitor the "Command speed", "Actual speed", "Torque", "Position deviation" and "Positioning complete signal".
- Helps you to analyze the machine and shorten the setup

Note) Refer to P.352 for setup support software.

#### Frequency analyzing function

- You can confirm the response frequency characteristics of total machine mechanism including the servo motor with the setup support software, "PANATERM".
- Helps you to analyze the machine and shorten the setup

Note) Refer to P.352 for setup support software.

#### **Torque limit switching function**

- You can select 2 preset torque limit value from external input.
- Use this function for tension control or press-hold control.

#### Conformity to CE and UL Standards







Subject		Standard conformed			
Motor	IEC60034-1	IEC60034-5 UL1004 CSA22.2 No.100	Conforms to Low-Voltage		
	EN50178	UL508C CSA22.2 No.14	Directives		
	EN55011	Radio Disturbance Characteristics of Industrial, Scientific and Medical (ISM) Radio-Frequency Equipment			
	EN61000-6-2	Immunity for Industrial Environments	Conforms to references		
Matau	EC61000-4-2	Electrostatic Discharge Immunity Test			
Motor and driver	IEC61000-4-3	Radio Frequency Electromagnetic Field Immunity Test			
unven	IEC61000-4-4	Electric High-Speed Transition Phenomenon/Burst Immunity Test	by EMC Directives		
	IEC61000-4-5	Lightening Surge Immunity Test			
	IEC61000-4-6	000-4-6 High Frequency Conduction Immunity Test			
	IEC61000-4-11	Instantaneous Outage Immunity Test			

IEC : International Electrotechnical Commission

: Europaischen Normen EMC : Electromagnetic Compatibility

CSA: Canadian Standards Association

Pursuant to at the directive 2004/108/EC, article 9(2)

Panasonic Testing Centre

Panasonic Service Europe,

a division of Panasonic Marketing Europe GmbH Winsbergring 15,22525 Hamburg, F.R. Germany

\* When exporting this product, follow statutory provisions of the destination country

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#### MINAS E series

#### **Motor Line-up**

		. Rated output		Rotary e	encoder	Brake	Gear	UL/			
	Motor series	(kW)	speed ( Max. (speed) (r/min)	2500 P/r incremental	17bit absolute/ incremental	Holding	High precision	CSA	Enclosure	Features	Applications
	MUMA										
Ultra low inertia		0.05 to 0.4 0.05 0.1 0.2 0.4	3000 (5000)	0	_	0	0	0	IP65 Except shaft throughhole and connector	Small capacity Ultra low inertia	SMT machines Inserters High repetitive positioning application



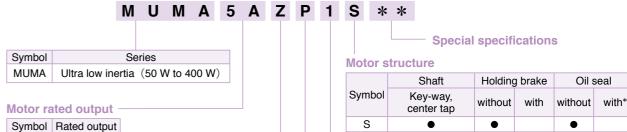
#### Servo Motor

5A

01

02

04



\* Motor with oil seal is manufactured by order.

#### Design order

Т

Symbol	Specifications
1	Standard

**Rotary encoder specifications** 

50 W

100 W

200 W

400 W

Symbol	Format	Pulse counts	Resolution	Wires
Р	Incremental	2500 P/r	10000	5

Symbol

2

Z

**Voltage specifications** 

Specifications

100 V

200 V

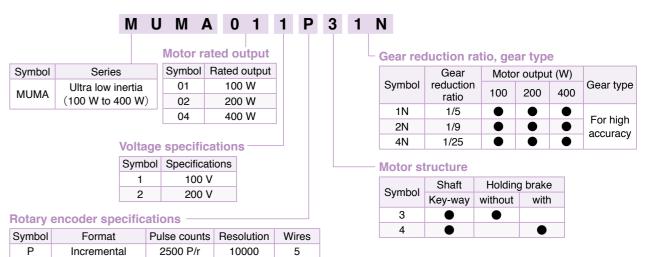
100 V/200 V common

(50 W only)

See P.343 for motor specifications

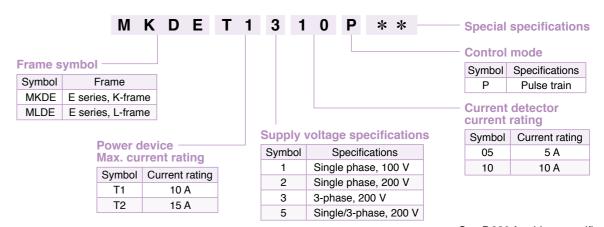
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#### Motor with gear reducer



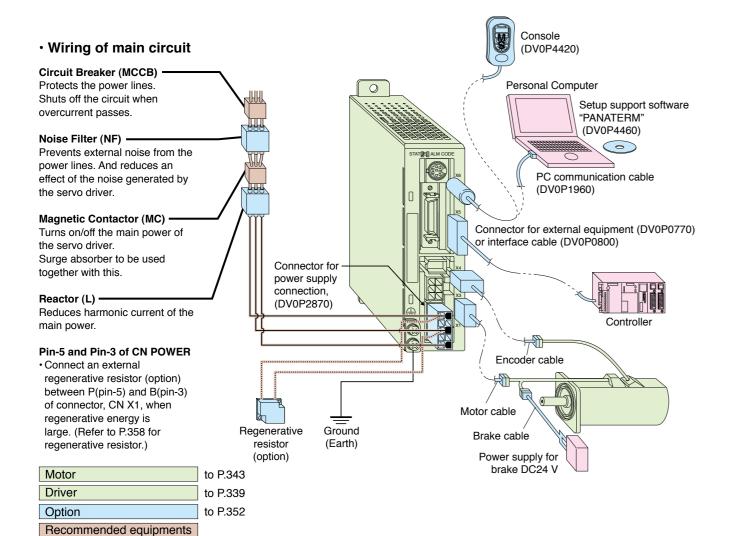
See P.348 for motor with gear reducer specifications

#### Servo Driver



See P.339 for driver specifications

**A6N Series** 



#### List of recommended peripheral equipments

_	Мо	tor	Power			Magnetic	
Power supply	Series	Output	(at rated) output	Circuit Breaker (Rated current)	Noise Filter	Contactor (Contact Composition)	Wire diameter (L1, L2, L3, U, V and W)
Single		50 W	0.3 kVA	(5 A)		40.4	
phase, 100 V		100 W	0.4 kVA	(3 A)		10 A (3P+1a)	
		200 W	0.5 kVA	(10 A)		(6	
	MUMA	50 W	0.3 kVA	(5 A)		15 A (3P+1a)	
Single		100 W	U.S KVA				0.75 mm <sup>2</sup> to 0.85 mm <sup>2</sup> AWG18
phase, 200 V		200 W	0.5 kVA		DV0P4160		
		400 W	0.9 kVA	(10 A)			AWGIO
		50 W	0.017/4				
3-phase 200 V		100 W	0.3 kVA	(5 A)		10 A (3P+1a)	
		200 W	0.5 kVA	1			
		400 W	0.9 kVA	(10 A)			

- \* Select the single and 3-phase common specifications corresponding to the power supplies.
- To conform to EC Directives, install a circuit breaker which conforms to IEC and UL Standards (Listed, ® marked) between noise filter and power supply.
- For details of the noise filters, refer to 370.

#### <Remarks>

 Use a copper conductor cables with temperature rating of 60 °C or higher for main power connector and ground terminal wiring.

Use a cable for ground with diameter of 2.0 mm<sup>2</sup> (AWG14) or larger.

#### Carrying page

(	Part No.	Carrying page			
Console			DV0P4420	357	
Setup Support		Japanese			
Software, PANATERM		English	DV0P4460	352	
RS232 Community for Connection			DV0P1960	357	
nterface Cable			DV0P0800	357	
Connector Kit fo	r Inter	ace	DV0P0770	356	
Connector Kit fo	r Moto	r and Encoder	DV0P3670	355	
Connector Kit fo	r Drive	r Power Supply	DV0P2870	355	
Encoder Cable		MFECA0 * *	MFECA0 * * 0EAM		
Motor Cable		MFMCA0 * *	0AEB	354	
Brake Cable		MFMCB0 * *	0GET	354	
Cable Set (3 m)	(Note 3)	DV0P37300		354	
Cable Set (5 m)	(Note 3)	DV0P39200	354		
OIN Rail Mount	Unit	DV0P3811	358		
External Regenerative	100 V	50 Ω 10 W	DV0P2890	358	
Resistor	200 V	100 Ω 10 W	DV0P2891	330	
		100 V	DV0P227		
Reactor		100 V	DV0P228	359	
		200 V	DV0P220		
Noise Filter			DV0P4160	370	
		ngle phase 0 V, 200 V	DV0P4190	370	
		ohase 200 V	DV0P1450		
errite core			DV0P1460	370	

(Note 3) Cable set (3 m) contains,

- 1) Interface cable: DV0P0800
- 2) Encoder cable (3 m): MFECA0030EAM
- 3) Motor cable (3 m) : MFMCA0030AEB
- 4) Connector kit for driver power supply connection: DV0P2870 Cable set (5 m) contains,

  Output

  Description: DV0P2870 Cable set (5 m) contains,
- 1) Interface cable: DV0P0800
- 2) Encoder cable (5 m): MFECA0050EAM
- 3) Motor cable (5 m) : MFMCA0050AEB
- 4) Connector kit for driver power supply connection : DV0P2870

#### ■ Table of Part Numbers and Options

			2500P/r, Inc	remental				Opt	otion				
Power supply	Output (W)	Motor Note) 1	Rating/Spec. (page)	Driver	Dimensions (Frame (symbol)	Encoder Cable Note) 2	Motor Cable	В	Brake Cable Note) 2	External Regenerative Resistor	Reactor	Noise Filter	
Single	50	MUMA5AZP1 □	343	MKDET1105P	342 (K)					DV0P227			
phase	phase 100 I	MUMA011P1 $\square$	343	MKDET1110P	342 (K)					DV0P2890	DVUFZZI		
100 V	200	MUMA021P1 🗌	343	MLDET2110P	342 (L)						DV0P228		
	Single 100	MUMA5AZP1 🗌	345	MKDET1505P	342 (K)	MEEO A O. H. d. O. F. A. M.							
_		MUMA012P1	345	MKDET1505P	342 (K)							DVODATCO	
phase 200 V	200	MUMA022P1	345	MLDET2210P	342 (L)		FECA0**0EAM MFMCA0**0AEB						
	400	MUMA042P1	345	MLDET2510P	342 (L)	MIFECAU * * UEAIN		MFMCB0 * * 0GET	MCB0 * * 0GET			DV0P4160	
	50	MUMA5AZP1	345	MKDET1505P	342 (K)					DV0P2891	DV0P220		
	100	MUMA012P1	345	MKDET1505P	342 (K)								
3-phase 200 V	200	MUMA022P1	345	MKDET1310P	342 (K)								
200 V	400	MLDET2510P	040 (1)										
	400	MUMA042P1 □	345	MLDET2310P	342 (L)								

Note) 1 Motor model number suffix:  $\square$ 

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Parts customer to prepare

MINAS E series

- S: Key way with center tap, without brake
- T: Kew way with center tap, with brake

Panasonic Corporation Electromechanical Control Business Division

Note) 2 \*\* represents cable length. For details, refer to P.353.

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Single phase, 100 V

	ਰ				10 //					
	nput power	Sing	le phase, 200 V		Single phase, 200 V to 240 V +10 % 50 Hz/60 Hz					
	ver	3-ph	ase, 200 V		3-phase, 200 V to 240 V +10 % 50 Hz/60 Hz					
	ū	Tem	perature		Operating: 0 °C to 55 °C, Storage: –20 °C to 65 °C (Max.temperature guarantee 80 °C for 72 hours <nomal temperature="">)</nomal>					
	Environment	Hun	nidity		Both operating and storage : 90 %RH or less (free from condensation)					
	nme	Altit			1000 m or lower					
	₽	Vibration			5.88 m/s <sup>2</sup> or less, 10 Hz to 60 Hz (No continuous use at resonance frequency)					
Ras	With	stand	voltage		Should be 1500 VAC (Sensed current: 20 mA) for 1 minute between Primary and Ground.					
S	Cont	rol m	ethod		IGBT PWM Sinusoidal wave drive					
ecif	Enco	Encoder feedback			2500 P/r (10000 resolution) incremental encoder					
Basic Specifications	တ္ လ	Inpu	t		7 inputs (1) Servo-ON, (2) Alarm clear and other inputs vary depending on the control mode.					
ons	Control signal	Output			4 outputs (1) Servo alarm, (2) Alarm, (3) Release signal of external brake and other outputs vary depending on the control mode					
ĺ	σπ	Input			2 inputs Supports both line driver I/F and open collector I/F.					
	Pulse signal	Output			4 outputs Feed out the encoder pulse (A, B and Z-phase) in line driver.  Z-phase pulse is also feed out in open collector.					
İ	Com	nmunication function RS232			1 : 1 communication to a host with RS232 interface is enabled.					
	Disp	lay LE	ED .		(1) Status LED (STATUS), (2) Alarm code LED (ALM-CODE)					
Ì	Rege	enera	tion		No built-in regenerative resistor (external resistor only)					
	Dyna	amic b	orake		Built-in					
-	Control		ode		3 modes of (1) High-speed position control, (2) Internal velocity control and (3) High-functionality positioning control are selectable with parameter.					
		Control input			(1) CW over-travel inhibition, (2) CCW over-travel inhibition, (3) Deviation counter clear, (4) Gain switching, (5) Electronic gear switching					
	_	Control output			(1) Positioning complete (In-position)					
	ositio	Max. command pulse frequency		pulse	Line driver : 500 kpps, Open collector : 200 kpps					
	Position control	Pulse	Type of input pu	ılse train	Differential input. Selectable with parameter, ((1) CW/CCW, (2) A and B-phase, (3) Command and Direction)					
	<u>0</u>	input	Electronic gear (Division/Multiplie of command pu		Setup of electronic gear ratio Setup range of (1-10000) × 2 <sup>(0-17)</sup> /(1-10000)					
			Smoothing filter	•	Primary delay filter or FIR type filter is selectable to the command input.					
	Intern	Con	trol input		(1) CW over-travel inhibition, (2) CCW over-travel inhibition, (3) Selection 1 of internal command speed, (4) Selection 2 of internal command speed, (5) Speed zero clamp					
	B)	Con	trol output		(1) Speed arrival (at-speed)					
	Speed	Inte	rnal speed comm	nand	Internal 4-speed is selectable with control input.					
ַ	d contro	Soft	-start/down funct	ion	Individual setup of acceleration and deceleration are enabled, with 0 s to 10 s/1000 r/min. Sigmoid acceleration/deceleration is also enabled.					
Functions	<u>o</u>	Zero	-speed clamp		0-clamp of internal speed command with speed zero clamp input is enabled.					
ons		Auto-gain tuning	Real-time		Estimates the load inertia in real-time in actual operation and sets up the gain automatically corresponding to the machine stiffness. Useable at (1) High-response position control, (2) Internal speed control and (3) High-functionality position control.					
		n tuning	Normal mode		Estimates the load inertia with an action command inside of the driver, and sets up the gain automatically corresponding to setup of the machine stiffness. Useable at (1) High-response position control, (2) Internal speed control and (3) High-functionality position control.					
		Mas inpu	king of unnecess	sary	Masking of the following input signal is enabled. (1) Over-travel inhibition, (2) Speed zero clamp, (3) Torque limit switching					
	Comr	Divis	sion of encoder f	eedback	1 P/r to 2500 P/r (encoder pulses count is the max.).					

Single phase, 100 V to 115 V  $^{+10}_{-15}\%$ 

#### **Standard Wiring Example of Main Circuit**

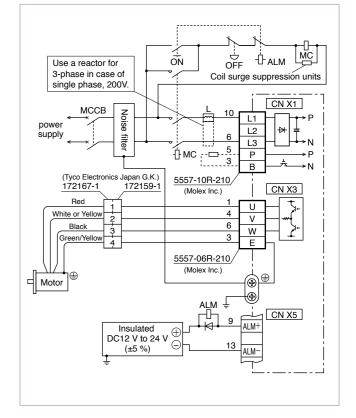
Standard Wiring Example of Main Circuit/

#### 3-Phase, 200 V

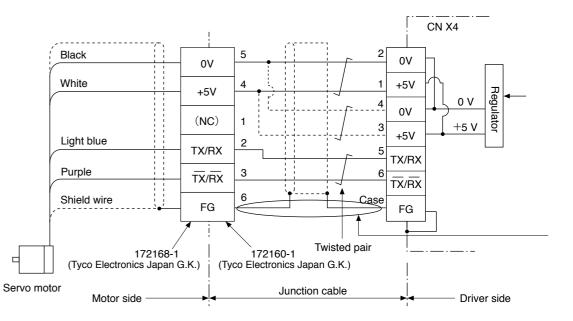
**Encorder Wiring Diagram** 

#### HALM MC Coil surge suppression units CN X1 . Һмс ,-----5557-10R-210/ CN X3 Black 5557-06R-210 Motor CN X5 Insulated DC12 V to 24 V (±5 %) ALM-

#### ■ Single Phase, 100 V / 200 V



#### **Encorder Wiring Diagram**



#### When you make your own junction cable for encoder (Refer to P.355, P.356 "Options" for connector.)

- 1) Refer the wiring diagram.
- 2) Use the twisted pair wire with shield, with core diameter of 0.18 mm2 (AWG24) or larger, with higher bending resistance.
- 3) Use the twisted pair wire for the corresponding signal and power supply.
- 4) Shielding
- Connect the shield of the driver to the case of CN X4. Connect the shield of the motor to Pin-6.

Hardware error

Software error

Traceability of alarm data

Damping control function

Manual

Console

Setup support software PANATERM (Supporting OS: Windows98, Windows ME, Windows2000, and WindowsXP)

Traceable up to past 14 alarms including the present one.

Manual setup with parameter

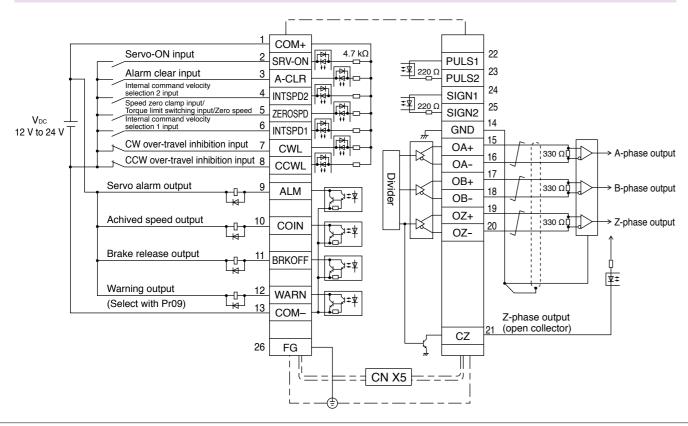
Over-voltage, under-voltage, over-speed over-load, over-heat, over-current and encoder error etc.

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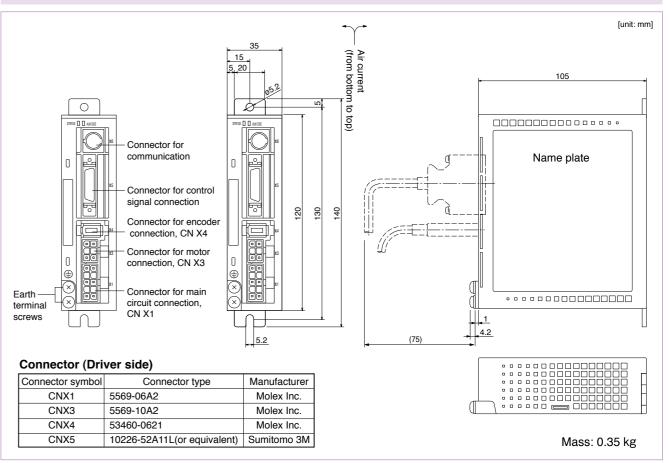
Excess position deviation, command pulse division error, EEPROM error etc.

**Control Circuit Standard Wiring Example** 

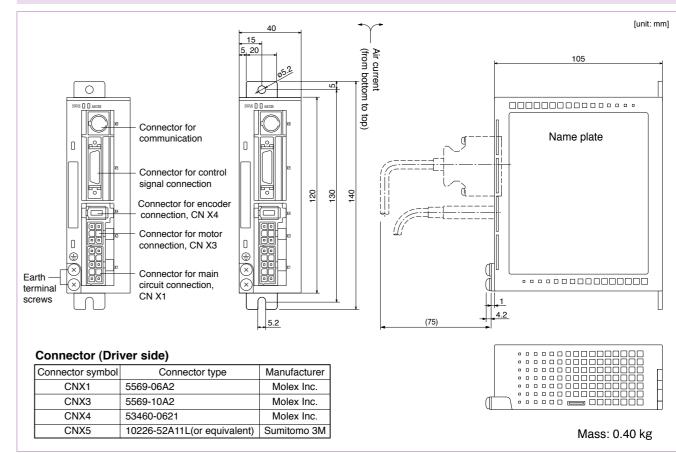
#### **CN X 5 Wiring Example at Internal Velocity Control Mode**



#### Frame K



#### Frame L



Motor model

Applicable driver

Rated output (W)

Rated torque (N·m)

Rated current (Arms)

Max. current (Ao-p)

Regenerative brake

Moment of inertia

frequency

(times/min)

of rotor (×10<sup>-4</sup> kg·m<sup>2</sup>)

Power supply capacity (kVA)

Momentary Max. peak torque (N·m)

Note)1

Recommended moment of inertia ratio

Rated rotational speed (r/min)

Max. rotational speed (r/min)

of the load and the rotor

Rotary encoder specifications

Protective enclosure rating

Static friction torque (N m)

Engaging time (ms)

Releasing time (ms)

Releasing voltage

Exciting voltage

Permissible load

During

During

operation

assembly

Exciting current (DC) (A)

Environment

MUMA

Model No

Frame symbol

Without option

DV0P2890

Without brake

Note)3

Resolution per single turn

Ambient temperature

Ambient humidity

Installation location

Vibration resistance

Note)4

Radial load P-direction (N)

Thrust load A-direction (N)

Thrust load B-direction (N)

Radial load P-direction (N)

Thrust load A-direction (N)

Thrust load B-direction (N)

Altitude

Mass (kg), ( ) represents holding brake type

**AC100 V** 

011P1

MKDET1110P

0.4

100

0.32

0.95

1.6

6.9

No limit Note)2

No limit Note)2

3000

5000

0.032

0.036

30 times or less

2500 P/r

Incremental

10000

IP65 (except rotating portion of output shaft and lead wire end)

0  $^{\circ}$ C to 40  $^{\circ}$ C (free from freezing), Storage : –20  $^{\circ}$ C to 65  $^{\circ}$ C

(Max.temperature guarantee 80 °C for 72 hours <nomal humidity>)

85 %RH or lower (free from condensing)

Indoors (no direct sunlight), free from corrosive gas, inflammable gas, oil mist and dust

1000 m or lower 49 m/s<sup>2</sup> or less

0.5 (0.7)

DC 1 V or more

DV 24 V ±10 %

021P1

MLDET2110P

Frame L

0.5

200

0.64

1.91

2.5

11.7

0.10

0.13

0.96 (1.36)

1.27

50

15 (100)

0.36

392

147

196

245

98

Frame K

5AZP1

MKDET1105P

0.3

50

0.16

0.48

1.0

4.3

0.021

0.026

0.4 (0.6)

Brake specifications (This brake will be released when it is energized. Do not use this for braking the motor in motion.)

0.29

25

20 (30)

0.26

147

88

117

68

58

58

Mod	lel De	signa	tion						
e.g.)	M	U	M	Α	5	Α	Z	Р	1
									Desid

Symbol Series Ultra low inertia MUMA (50 W to 200 W)

e.g.

Motor rated output Symbol Rated output 5A 50 W 01 100 W 02 200 W

Voltage specifications Symbol Specifications 100 V 100/200 V Z (50 W only)

sign order 1 : Standard

S

#### Motor structure

S

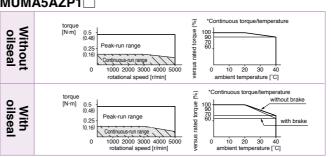
	Shaft	Holding	brake	Oil s	eal
ymbol	Key-way, center tap	without	with	without	with
S	•	•		•	
Т	•		•	•	

#### Rotary encoder specifications

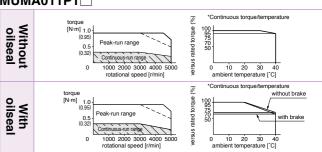
Symbol	Format	Pulse counts	Resolution	Wires
Р	Incremental	2500 P/r	10000	5

#### Torque Characteristics [at AC100 V of power voltage (Dotted line represents the torque at 10 % less supply voltage.)]

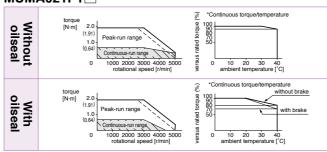
#### MUMA5AZP1

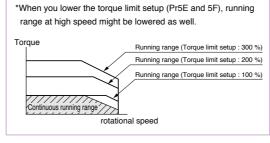


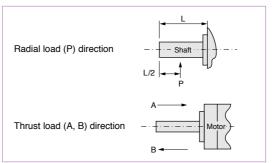
#### MUMA011P1



#### MUMA021P1







- Note) 1. Regenerative brake frequency represents the frequency of the motor's stops from the rated speed with deceleration without load
  - If the load is connected, frequency will be defined as 1/(m+1), where m =(load moment of inertia) / (rotor moment of inertia).
  - When the motor speed exceeds the rated speed, regenerative brake frequency is in inverse proportion to the square of (running speed/rated
  - Power supply voltage is AC115 V (at 100 V of the main voltage).
  - If the supply voltage fluctuates, frequency is in inverse proportion to the square of (Running supply voltage/115) relative to the value in the table. · When regeneration occurs continuosly such cases as running speed
  - frequently changes or vertical feeding, consult us or a dealer. 2. If the effective torque is within the rated torque, there is no limit in regenera-
  - tive brake 3. Consult us or a dealer if the load moment of inertia exceeds the specified
  - 4. Specified releasing time is obtained with the use of surge absorber for brake (Z15D151 by SEMITEC Corporation or equivalent).
  - ( ) represents the actually measured value using a diode (200 V, 1 A or equivalent)

#### Panasonic Corporation Electromechanical Control Business Division industrial.panasonic.com/ac/e/

For motor dimensions, refer to P.347, and for the diver, refer to P.342.

			AC	200 V			
Motor model	MUMA	5AZP1□	012P1	022P1□	042P1□		
					MLDET2310P		
Applicable driver	Model No.	MKDE	T1505P	MKDET2210P	MLDET2510P		
	Frame symbol	Fra	ame K	Frame K Frame L	Frame L		
Power supply capac	eity (kVA)	0.3	0.3	0.5	0.9		
Rated output (W)		50	100	200	400		
Rated torque (N · m	)	0.16	0.32	0.64	1.3		
Momentary Max. pe	ak torque (N · m)	0.48	0.95	1.91	3.8		
Rated current (Arms	s)	1.0	1.0	1.6	2.5		
Max. current (Ao-p)		4.3	4.3	7.5	11.7		
Regenerative brake frequency (times/m	Without Option		No limi	t Note)2			
Note	·	No limit Note)2					
Rated rotational spe	ed (r/min)	3000					
Max. rotational spec	ed (r/min)	5000					
Moment of inertia of rotor	Without brake	0.021	0.032	0.10	0.17		
or rotor (×10 <sup>-4</sup> kg·m²)	With brake	0.026	0.036	0.13	0.20		
Recommended mor of the load and the		30 times or less					
D		2500 P/r					
Rotary encoder spe	cifications		Incremental				
Res	solution per single turn	10000					
Protective enclosure	rating	IP65 (except rotating portion of output shaft and lead wire end)					
Am	bient temperature	0 °C to 40 °C (free from freezing), Storage : –20 °C to 65 °C (Max.temperature guarantee 80 °C for 72 hours <nomal humidity="">)</nomal>					
	bient humidity		85 %RH or lower (free from condensing)				
Environment	tallation location	Indoors (no direct	t sunlight), free from corr	osive gas, inflammable ga	s, oil mist and dust		

Brake specifications (This brake will	be released when it is energized. Do not use t	his for braking the motor in motion.)					
Static friction torque (N · m)	0.29	1.27					
Engaging time (ms)	25	50					
Releasing time (ms) Note)4	20 (30)	15 (100)					
Exciting current (DC) (A)	0.26	0.36					
Releasing voltage	DC 1 V or more						
Exciting voltage	DV 24 V ±10 %						

0.5 (0.7)

0.4 (0.6)

1000 m or lower 49 m/s<sup>2</sup> or less

0.96 (1.36)

1.5 (1.9)

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Permissible load									
	Radial load P-direction (N)	147	392						
During assembly	Thrust load A-direction (N)	88	147						
,	Thrust load B-direction (N)	117	196						
	Radial load P-direction (N)	68	245						
During operation	Thrust load A-direction (N)	58	98						
	Thrust load B-direction (N)	58	98						

For motor dimensions, refer to P.347, and for the driver, refer to P.342.

Altitude

Mass (kg), ( ) represents holding brake type

Vibration resistance

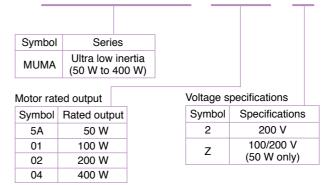
Note) Driver for 50 W and 100 W has a common power supply of single phase and 3-phase 200 V.

Driver for 200 W, the upper row is the power supply of 3-phase 200 V, and lower is the power supply of single-phase 200 V.

Driver for 400 W, the upper row is the power supply of 3-phase 200 V, and lower is the common power supply of single-phase and 3-phase 200 V.

#### **Model Designation**

#### S 5



Design order 1 : Standard

#### Motor structure

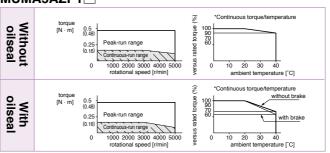
Symbol	Shaft	Holding	brake	Oil seal		
	Key-way, center tap	without	with	without	with	
S	•	•		•		
T	•		•	•		

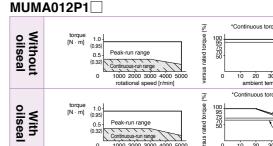
Rotary encoder specifications

ymbol	Format	Pulse counts	Resolution	Wires
Р	Incremental	2500 P/r	10000	5

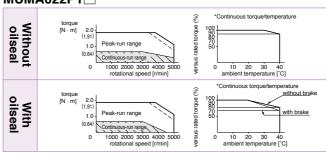
#### Torque Characteristics [at AC200 V of power voltage (Dotted line represents the torque at 10 % less supply voltage.)]

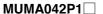
#### MUMA5AZP1

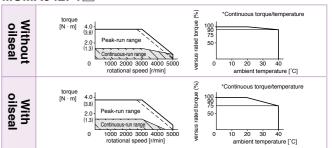


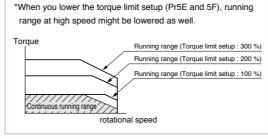


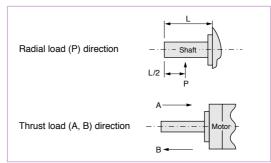
#### MUMA022P1











- Note) 1. Regenerative brake frequency represents the frequency of the motor's stops from the rated speed with deceleration without load
  - If the load is connected, frequency will be defined as 1/(m+1), where m =(load moment of inertia) / (rotor moment of inertia).
  - When the motor speed exceeds the rated speed, regenerative brake frequency is in inverse proportion to the square of (running speed/rated
  - Power supply voltage is AC240 V (at 200 V of the main voltage).
  - If the supply voltage fluctuates, frequency is in inverse proportion to the square of (Running supply voltage/240) relative to the value in the table. · When regeneration occurs continuosly such cases as running speed
  - frequently changes or vertical feeding, consult us or a dealer. 2. If the effective torque is within the rated torque, there is no limit in regenera-
  - tive brake 3. Consult us or a dealer if the load moment of inertia exceeds the specified

  - 4. Specified releasing time is obtained with the use of surge absorber for brake (Z15D151 by SEMITEC Corporation or equivalent). ( ) represents the actually measured value using a diode (200 V, 1 A or
  - equivalent)

Type of

reducer

For High

# Encoder connector Motor connector (Key way dimensions) \* Dimensions are subject to change without notice. Contact us or a dealer for the latest information

						[Unit: mm]
				MUMA series	(Ultra low inertia)	
Motor outpo	ut		50 W	100 W	200 W	400 W
Motor mode	el	MUMA	5A□P1□	01□P1□	02□P1□	04□P1□
Rotary ence	oder spec	ifications	2500 P/r Incremental	2500 P/r Incremental	2500 P/r Incremental	2500 P/r Incremental
LL		Without brake	75.5	92.5	96	123.5
LL		129	156.5			
	LR		24	24	30	30
	S		8	8	11	14
	LA		48	48	70	70
	LB		22	22	50	50
	LC		42	42	60	60
	LE		2	2	3	3
	LF		7	7	7	7
	LH		34	34	43	43
	LZ		3.4	3.4	4.5	4.5
	LW		14	14	20	25
	LK		12.5	12.5	18	22.5
	ΚW		3h9	3h9	4h9	5h9
Key way	КН		3	3	4	5
	RH		6.2	6.2	8.5	11
	TP		M3 × 6 (depth)	M3 × 6 (depth)	M4 × 8 (depth)	M5 × 10 (depth)
Mana (kg)		Without brake	0.40	0.50	0.96	1.5
Mass (kg)		With brake	0.60	0.70	1.36	1.9
Connector/	Plug spec	ifications		refer to Options	, P.355, P.356.	

#### <Cautions>

Reduce the moment of inertia ratio if high speed response operation is required.

Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

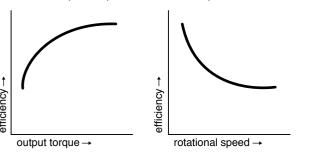
# MINAS E Series Motors with Gear Reducer

#### **Motor Types with Gear Reducer**

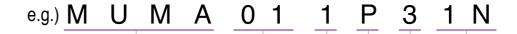
Motor Types/ Model No. Designation Specifications

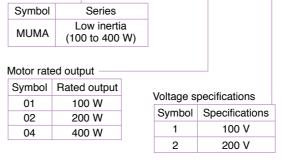
Reduction ratio	Мо	Motor output (W)									
	100	200	400	reducer							
1/5	•	•	•								
1/9	•	•	•	For high precision							
1/25	•	•	•	precision							

Efficiency of the gear reducer shows the following inclination in relation to output torque and rotational speed.



#### Model No. Designation





Rotary en	coder specifications			
Symbol	Format	Pulse counts	Pulse counts	Wire
Р	Incremental	2500 P/r	10000	5

		4N	1	/25	•	)	•	•
	str	ucture						
	ol	Sha	aft	Holo	ling l	bra	ke	
,	OI	Kov-v	vav	witho	ut	١.	with	

100 200 400

Motor types with gear reducer

Symbol Reduction

Motor

#### **Specifications of Motor with Gear Reducer**

	Motor series	MUMA						
	Backlash	3 minutes or smaller (initial value) at output shaft of the reducer						
	Composition of gear	Planetary gear						
	Gear efficiency	65 % to 85 %						
Gear reducer	Rotational direction at output shaft (of reducer)	Same direction as the motor output shaft						
	Composition of gear	Planetary gear						
	Mounting method	Flange mounting						
	Permissible moment of inertia of the load	10 times or smaller than rater moment of inactic of the mater						
	(conversion to the motor shaft)	10 times or smaller than rotor moment of inertia of the motor						
	Protective structure	IP44 (at gear reducer)						
	Ambient temperature	0 °C to 40 °C						
<b>_</b>	Ambient humidity	85 %RH (free from condensation) or less						
Environment	Vibration resistance	49 m/s <sup>2</sup> or less (at motor frame)						
	Impact resistance	98 m/s² or less						

**A6N Series** 

A6B Series
Special Order Product

#### **Table of Motor with Gear Reducer Specifications**

	Motor					М	JMA with g	ear reduc	er				
Model	Output	Reduction	Output	Rated	Max.	Rated		/motor + redu			ass		Permissible thrust load
		ratio	•	speed	speed	torque	torque	w/o brake	w/ brake	w/o brake	w/ brake	radial load	
	(W)		(W)	(r/min)	(r/min)	(N·m)	(N·m)	J ( × 10	⁻⁴kg·m²)	(k	g)	(N)	(N)
MUMA01 P 1N		1/5	75	600	1000	1.18	3.72	0.072	0.076	1.05	1.25	490	245
MUMA01□P□2N	100	1/9	80	333	555	2.25	6.86	0.0663	0.0703	1.05	1.25	588	294
MUMA01□P□4N		1/25	80	120	200	6.27	19.0	0.0645	0.0685	2.20	2.40	1670	833
MUMA02 P 1N		1/5	170	600	1000	2.65	8.04	0.218	0.248	1.68	2.08	490	245
MUMA02□P□2N	200	1/9	132	333	555	3.72	11.3	0.368	0.398	2.66	3.06	1180	588
MUMA02 P 4N		1/25	140	120	200	11.1	33.3	0.388	0.418	2.66	3.06	1670	833
MUMA042P□1N		1/5	340	600	1000	5.39	16.2	0.533	0.563	3.2	3.6	980	490
MUMA042P□2N	400	1/9	332	333	555	9.51	28.5	0.438	0.468	3.2	3.6	1180	588
MUMA042P□4N		1/25	332	120	200	26.4	79.2	0.470	0.500	4.7	5.1	2060	1030

For dimensions, refer to P.351.

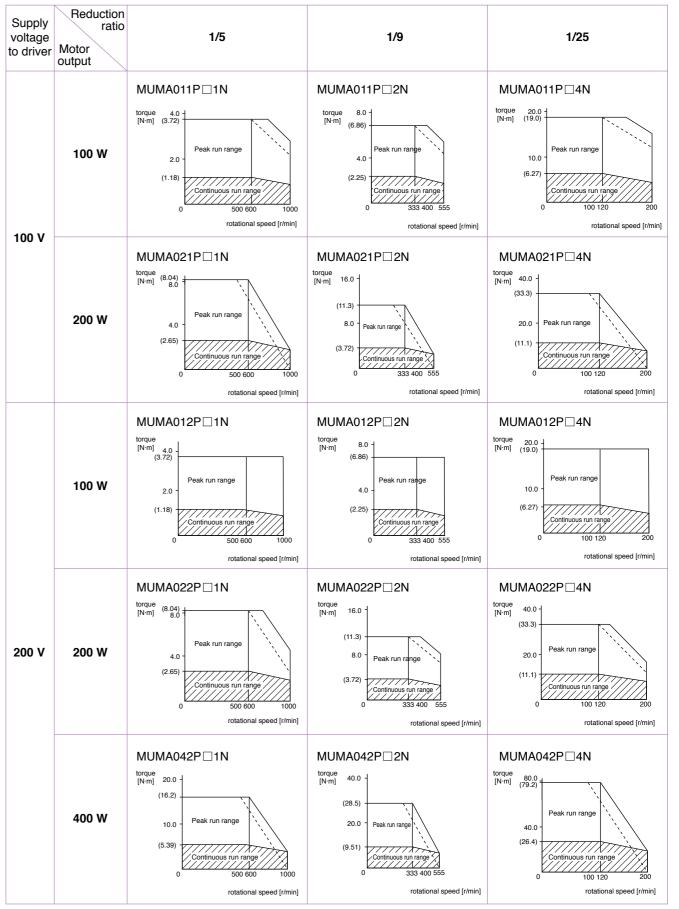
#### The Combination of the Driver and the Motor with Gear Reducer

Combination w	ith driver	10	0 V	200 V					
Encoder	Motor	Part No. of motor	Single phase, 100 V	Part No. of motor	3-phase, 200 V	Single phase, 200 V			
Encodei	output	with gear reducer	Part No. of driver	with gear reducer	Part No. of driver	Part No. of driver			
	100 W	MUMA011P□□N	MKDET1110P	MUMA012P□□N	MKDET1505P	MKDET1505P			
2500 P/r	200 W	MUMA021P□□N	MLDET2110P	MUMA022P□□N	MKDET1310P	MLDET2210P			
Incremental	400 W			MUMAGAODITA	MLDET2510P	MLDET2510P			
	400 00	_	_	MUMA042P□□N	MLDET2310P	WILDL 12310P			

For dimensions, refer to P.342.

#### **Torque Characteristics**

#### For High Precision (MUMA Series 100 W to 400 W)



Dotted line represents the torque at 10 % less supply voltage.

**Options** 

11 21-224-250

19 展示建業報金公司分 S ##3--13+9-F から ウィーナフィヴーナフィック報告報

八郎(他女会与在外) 内部(他女会与在外)

27-125-

TOTAL PERSON

「娘」、一つのゲイ・小説を出て、単心上からです。 大学・選手をおして選挙等のサード同性が考しまり起記を開いたことます。 たた、大学によるし、全様になって、一片を上の、

入出力! 入水力と バルス 春節 フラン フルクローズ!

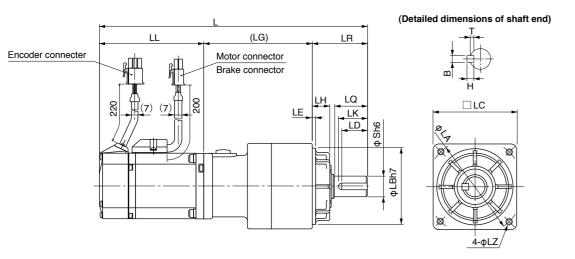
Parameter

・人間接送度 - 54代-2日素送の完了

グイナマックプレー \*460

#### **MUMA series with Gear Reducer**

[Unit: mm]



#### 2500 P/r Encoder

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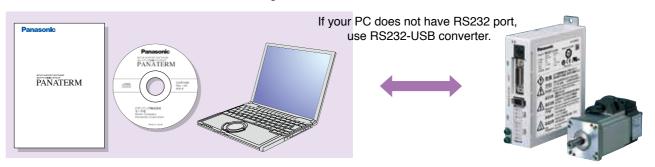
Model	Motor output	Reduction ratio	L	LL	LR	LQ	LC	LB	LA	s	LH	LZ	LK	(LG)	LE	Key way B×H×LD	Т						
MUMA01 P 1N		1/5	192	92.5																			
WOWAOT I IIV		173	223.5	124	32	32 20	52	50	60	12	10	M5	18	67.5		4×4×16	2.5						
MUMA01 P2N	100 W	1/9	192	92.5	32	20	52	30	00	12	10	(Depth: 12)	10	07.5		4,44,10	2.5						
WOWAUTE	100 W	179	223.5	124																			
MUMA01 P 4N		1/25	234.5	92.5	50	20	30 78	70	70 90	19	17	M6	26	92	3	6×6×22	3.5						
WOWAUT_F_4N		1/25	266	124	50	30		70		0 19	1/	(Depth: 20)	26	92	3	0X0X22	3.5						
MUMA02 P 1N		1/5	200.5	96	32	20		00	00 00	00 00	00 00	00 00	52	50	60	12	10	M5	18	72.5		4×4×16	2.5
WUWAU2_P_ IN		1/5	233.5	129	32		32	52 50	00	12	. 10	(Depth: 12)	10	12.5		4×4×16	2.5						
MUMA02 P 2N	200 W	200 W 1/9	235.5	96										00.5									
IVIOIVIAU2_F_2IN	200 W	179	268.5	129								M6		89.5									
MUMA02 P 4N		1/25	246	96										400	1								
WUWAUZ_P_4N		1/25	279	129		00	78							100		0.0.00							
MUMAO40D TAN		4 / 5	263	123.5	50	30	/8	70	90	19	17	(Depth: 20)	26			6×6×22	3.5						
MUMA042P□1N		1/5	296	156.5																			
MUMA O 4 O D TON		4.40	263	123.5										89.5									
MUMA042P□2N	400 W	1/9	296	156.5																			
MUMA042P□4N		1 105	288.5	123.5	Ī.,			98 90		٠		M8			_		+						
		1/25	321.5	156.5	61	40	98		115	115 24		24 18		(Depth: 20)	35	104	5	8×7×30	4				

Upper column: without brake Lower column : with brake

#### Setup Support Software "PANATERM" for MINAS series AC Servo Motor & Driver

Part No. DV0P4460 (Japanese/English version)

The PANATERM assists users in setting parameters, monitoring control conditions, setup support, and analyzing mechanical operation data on the PC screen, when installed in a commercially available personal computer, and connected to the MINAS A4 series, E series through the RS232 serial interface.



#### **Basic Function**

#### Parameter setup

**Setup Support Software** 

- · After a parameter is defined on the screen, it will be sent to the driver immediately.
- Once you register parameters you frequently use, they can be easily set up on the screen.

#### **Monitoring Control Conditions**

#### Monitor

- · Control conditions: Control mode, velocity, torque, error and warning
- Driver input signal
- · Load conditions: Total count of command/feedback pulses, Load ratio, Regenerative resistor load ratio

#### Alarm

- · Displays the numbers and contents of the current alarm and up to 14 error events in the past.
- · Clears the numbers and contents of the current alarm and up to 14 error events in the past.

#### Setup

#### Auto tuning

· Gain adjustment and inertia ratio measurement

#### Graphic waveform display

• The graphic display shows command velocity, actual velocity, torque, and error waveforms.

#### Absolute encoder setup

- · Clears absolute encoder at the origin.
- · Displays single revolution/multi-revolution data.
- · Displays absolute encoder status.

#### **Analysis of Mechanical Operation Data**

#### Frequency analysis

· Measures frequency characteristics of the machine, and displays Bode diagram.

#### ■ Can not use with A5, A6 family.

Monitor

Graphic waveform display

industrial.panasonic.com/ac/e/

[Personal computer] • CPU : Pentium 100MHz or more • Memory : 16 MB or more (32 MB recommended)

- Hard disk capacity (vacancy of 25 MB or more recommended) OS: Windows® 98, Windows® Me, Windows® 2000, Windows® XP (US version)
- Communication speed of serial communication port : 2400 bps or more (The software may not operate normally using USB-to-Serial adapter.) [Display] • Resolution : 640\*480 (VGA) or more (desirably 1024\*768) • Number of colors : 256 colors or more

[CD-ROM drive] · CD-ROM drive operable on the above-mentioned personal computer

Panasonic Corporation Electromechanical Control Business Division

CHAR-

**Encoder Cable** 

C

Α

Type classification

0

0

Α

Cable end

(Encoder side)

0030

0050

0100

0200

3 m

5 m

10 m

20 m

Cable end (Driver side)

M Connector (MUMA)

E PVC cable with shield by Oki Electric Cable Co., 0.20 mm<sup>2</sup> x 3P

A Tyco Electronics Japan G.K. connector

5

0

Cable length

MFECA: Encoder cable

Ε

[Unit: mm]

#### Cable Set (3 m)

Cable

#### Part No. DV0P37300

- 1) Interface cable: DV0P0800
- 2) Encoder cable (3 m): MFECA0030EAM
- 3) Motor cable (3 m): MFMCA0030AEB
- 4) Connector kit for driver power supply connection : DV0P2870

#### Cable Set (5 m)

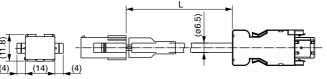
#### Part No. DV0P39200

- 1) Interface cable: DV0P0800
- 2) Encoder cable (5 m): MFECA0050EAM
- 3) Motor cable (5 m): MFMCA0050AEB
- 4) Connector kit for driver power supply connection :

**Options** 

#### **Encoder Cable**

#### Part No. MFECA0 \* \* 0EAM

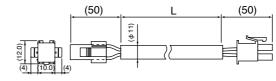


Title	Part No.	Manufacturer	L (m)	Part No.
Connector (Driver side)	3E206-0100KV	Sumitomo 3M	3	MFECA0030EAM
Shell kit	3E306-3200-008	or equivalent	5	MFECA0050EAM
Connector	172160-1	Tugo Flootronico	10	MFECA0100EAM
Connector Pin	170365-1	Tyco Electronics	20	MFECA0200EAM
Cable	0.20 mm <sup>2</sup> × 3P	Oki Electric Cable Co., Ltd.		

#### Motor Cable (ROBO-TOP® 105 °C 600 V . DP)

 $\mathsf{ROBO}\text{-}\mathsf{TOP}_{\scriptscriptstyle{\circledR}}$  is a trade mark of DYDEN CORPORATION



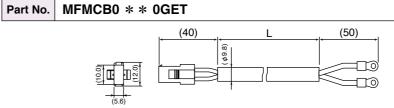


Title Part No.		Manufacturer	L (m)
Connector	172159-1	Tugo Flootronico	3
Connector Pin	170362-1, 170366-1	Tyco Electronics	5
Connector	5557-06R-210	Molex Inc	10
Connector Pin	5556T	Molex IIIC	20
Cable	ROBO-TOP 600 V 0.75 mm <sup>2</sup>	Daiden Co.,Ltd.	

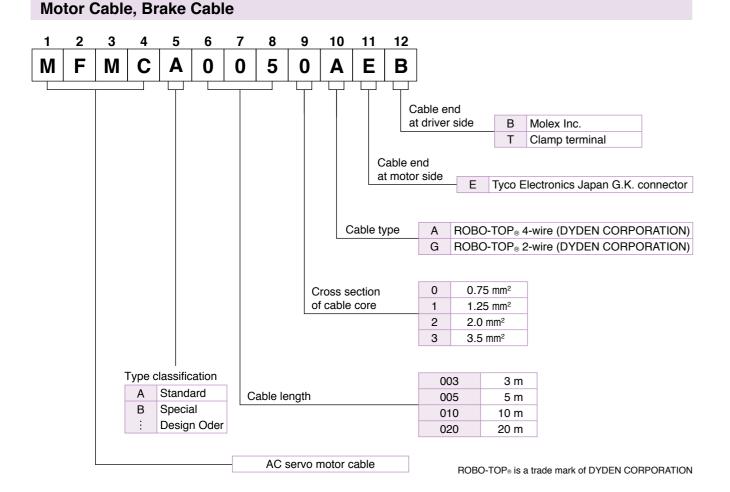
L (m)	Part No.
3	MFMCA0030AEB
5	MFMCA0050AEB
10	MFMCA0100AEB
20	MFMCA0200AEB

#### Brake Cable (ROBO-TOP® 105 °C 600V . DP)

 $\mathsf{ROBO}\text{-}\mathsf{TOP}_{\scriptscriptstyle{\circledR}}$  is a trade mark of DYDEN CORPORATION



Title	Part No.	Manufacturer	L (m)	Part No.
Connector	172157-1	Type Fleetrenies	3	MFMCB0030GET
Connector Pin	170362-1, 170366-1	Tyco Electronics	5	MFMCB0050GET
Nylon insulated round terminal	N1.25-M4	J.S.T Mfg. Co., Ltd.	10	MFMCB0100GET
Cable	ROBO-TOP 600 V 0.75 mm <sup>2</sup>	Daiden Co.,Ltd.	20	MFMCB0200GET



#### **Connector Kit for Power Supply Connection**

**Options** 

Part No. DV0P2870

Parts composition

Title	Part No.	Number	Manufacturer	Note
Connector (10 pins)	5557-10R-210	1	Molex Inc.	For connector, CN X1
Connector pin	5556PBTL	6	iviolex iric.	(10 pins)

#### Pin configuration of connector CN X1

2	,,	3				_/
1	10	9	8	7	6	1:
!	L1	(NC)	L2	(NC)	L3	H
1	5	4	3	2	1	1 :
	Р	(NC)	В	(NC)	E	H,



#### Recommended manual crimping tool (to be prepared by customer)

Part No.	Cable material
57026-5000	UL1007
57027-5000	UL1015

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#### <Cautions>

- 1. The above pin disposition is shown when viewed from the terminal inserting direction. Make a correct wiring by checking the stamped pin numbers on the connector itself.
- 2. Refer to P.340 for wiring and connection.
- 3. Do not connect anything to pins marked "NC".

#### Connector Kit for Motor/Encoder Connection

Part No. DV0P3670 (Incremental 2500 pulse, 5-wire)

This option is required when you make your own encoder cable and motor cable. (Brake cable is required for brake.)

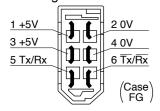
#### Parts composition

Title	Part No.	Number	Manufacturer	Note
Connector (Driver side)	3E206-0100 KV	1	Sumitomo 3M	For connector, CN X4
Shell kit	3E306-3200-008	1	or equivalent	(6 pins)
Connector (6 pins)	172160-1	1	Tyco Electronics	For junction to encoder cable
Connector pin	170365-1	6	Tyco Electronics	(6 pins)
Connector (4 pins)	172159-1	1	Tyco Electronics	For junction to motor power cable
Connector pin	170366-1	4	Tyco Electronics	(4 pins)
Connector (6 pins)	5557-06R-210	1	Molex Inc.	For connector, CN X3
Connector pin	5556PBTL	4	IVIOLEX ITIC.	(6 pins)

#### <Remarks>

We may use parts equivalent to the above for shell and connector cover.

#### Pin configuration of connector CN X4 plug



#### Recommended manual crimping tool (to be prepared by customer)

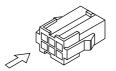
Title	Part No.	Manufacturer	Cable material	
For encoder cable junction	755330-1	Type Floatronice		
For motor power cable junction	755331-1	Tyco Electronics	_	
For Connector CN X3	57026-5000	Molex Inc.	UL1007	
For Connector CN X3	57027-5000	WOIEX ITIC.	UL1015	

#### <Remarks>

- 1. The above pin configuration is shown when viewed from the pin-soldering direction. Make a correct wiring by checking the stamped pin numbers on the connector itself.
- 2. Connect the shield of the wire to the case (FG) without fail.
- 3. For wiring and connection, refer to P.340.

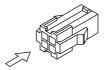
#### Pin configuration of encoder cable junction

ز.	, ,			
Г	1	2	3	1
-	10	_		1
ŀ	NC	TX/RX	TX/RX	1
-	4	5	6	-
-	+5V	0V	FG	Ι.
-				1.7



#### Pin configuration of motor power cable junction





#### Pin configuration of mating connector to CN X3 connector

, i		1
6	5	4
W	(NC)	V
3	2	1
E	(NC)	U



#### <Cautions>

- 1. The above pin configuration is shown when viewed from the terminal inserting direction. Make a correct wiring by checking the stamped pin numbers on the connector itself.
- 2. Refer to P.340 for wiring and connection.

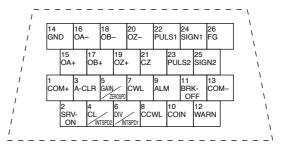
#### Connector Kit for Interface

Part No.	DV0P0770

#### Parts composition

Title	Part No.	Number	Manufacturer	Note
Connector	10126-3000PE	1	Sumitomo 3M	For connector, CN X5
Connector cover	10326-52A0-008	1	or equivalent	(26 pins)

#### Pin configuration of connector CN X5 (26 pins) (viewed from the soldering side)



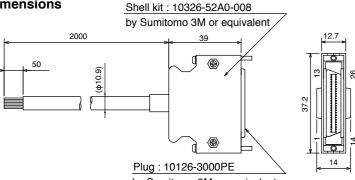
#### <Cautions>

- 1. Make a correct wiring by checking the stamped pin numbers on the connector itself.
- 2. Refer to P.341 for symbols and functions of the above signals.

#### **Interface Cable**

Part No. DV0P0800 Cable of 2 m is connected.

#### Dimensions



#### Wiring table

by Sumitomo 3M or equivalent

_	•							
Pin No.	Title of signal	Color or cable	Pin No.	Title of signal	Color or cable	Pin No.	Title of signal	Color or cable
1	COM+	Orange (Red 1)	10	COIN	Pink (Black 1)	19	OZ+	Pink (Red 2)
2	SRV-ON	Orange (Black 1)	11	BRK-OFF	Orange (Red 2)	20	OZ-	Pink (Black 2)
3	A-CLR	Gray (Red 1)	12	WARN	Orange (Black 2)	21	CZ	Orange (Red 3)
4	CL/INTSPD2	Gray (Black 1)	13	COM-	Gray (Red 2)	22	PULS1	Gray (Red 3)
5	GAIN/ZEROSPD	White (Red 1)	14	GND	Gray (Black 2)	23	PULS2	Gray (Black 3)
6	DIV/INTSPD1	White (Black 1)	15	OA+	White (Red 2)	24	SIGN1	White (Red 3)
7	CWL	Yellow (Red 1)	16	OA-	White (Black 2)	25	SIGN2	White (Black 3)
8	CCWL	Yellow (Black 1)	17	OB+	Yellow (Red 2)	26	FG	Orange (Black 3)
9	ALM	Pink (Red 1)	18	OB-	Yellow (Black 2)			

e. g. of Pin No. designation: Pin No. 1 ..... Wire color is orange, and one red dot.

Pin No. 12 ... Wire color is orange, and two black dot.

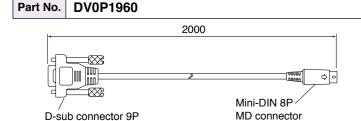
#### <Remarks>

Pin No.26 (FG) is connected to the shell (housing) of the connector, but the braided wire of this cable is not connected to the shell (housing) of the connector. When connecting the shield to FG or GND on the driver side, please use the interface connector Kit DV0P0770.

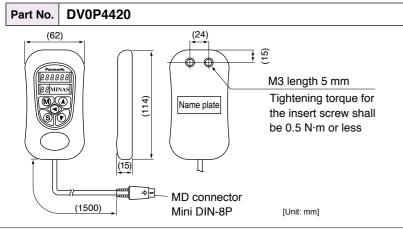
[Unit: mm]

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#### Communication Cable (For Connection with PC)



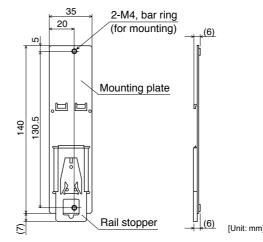
#### Console



#### **DIN Rail Mounting Unit**

Part No. DV0P3811

#### Dimensions



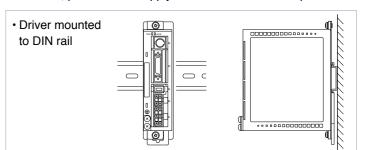
**DIN Rail Mounting Unit/ External Regenerative Resistor** 

#### <Notes>

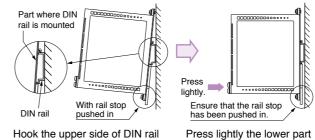
2 mounting screws (M4 X L8, Pan head) are attached. Rail stopper can be extended to max. 10 mm.

#### <Cautions>

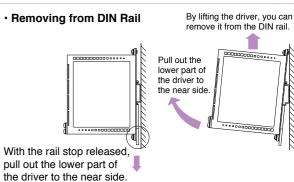
Please read carefully operation manual before using this product. In addition, please do not apply excessive stress to the product.







Press lightly the lower part of the main body of driver.



#### **External Regenerative Resistor**

mounting part on the DIN rail.

	Manufacturer's Part No.	Specifications				
Part No.		Resistance	Rated power	Activation temperature of built-in fuse	Note (Input Power of drive)	
		Ω	W	°C		
DV0P2890	45M03	50	10	<b>137</b> <sup>+3</sup> <sub>-2</sub>	Single phase, 100 V	
DV0P2891	45M03	100	10	<b>137</b> <sup>+3</sup> <sub>-2</sub>	Single/3-phase, 200 V	

#### Dimensions

Manufactured by Iwaki Musen Kenkyuusho Co., Ltd.

## Mating terminal 5556PBTL (or 5556PBT)

#### <Caution of when using external regeneration resistor>

Since it becomes high temperature, external regeneration resistor must be installed according to the contents shown below.

- · Attach to incombustibles, such as metal.
- · Install in the place which cannot touch directly by covering with incombustibles etc.
- · Do not install near the combustibles.

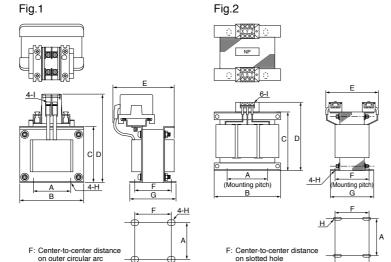
Although the thermal cutoff is built in external regeneration resistor, the skin temperature of regeneration resistor may become high exceeding the operating temperature of thermal cutoff by the time the thermal cutoff operates in driver failure. The thermal cutoff is for preventing ignition of the regeneration resistor in driver failure, and is not for controlling the skin temperature of resistor.

#### <Remarks>

Thermal fuse is installed for safety.

The thermal fuse may blow due to heat dissipating condition, working temperature, supply voltage or load fluctuation. Make it sure that the surface temperature of the resistor may not exceed 100 °C at the worst running conditions with the machine, which brings large regeneration (such case as high supply voltage, load inertia is large or deceleration time is short) Please carry out air cooling if needed.

Frame symbol of driver	Power supply specifications	Rated output	Part No.	Fig.	
	Single phase, 100 V	50 W to 100 W	DV0P227	1	
MKDE	Single phase, 200 V	50 W to 100 W	DV0P220	2	
	3-phase, 200 V	50 W to 200 W	DV0F220		
	Single phase, 100 V	200 W	DV0P228	1	
MLDE	Single phase, 200 V	200 W to 400 W	DV0P220	2	
	3-phase, 200 V	400 W			



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	Part No.	А	В	С	D	E(Max)	F	G	н	ı	Inductance (mH)	Rated current (A)
Fig. 1	DV0P227	55±0.7	80±1	66.5±1	110 Max	90	41±2	55±2	4-5φ×10	M4	4.02	5
Fig.1	DV0P228	55±0.7	80±1	66.5±1	110 Max	95	46±2	60±2	4-5φ×10	M4	2	8
Fig.2	DV0P220	65±1	125±1	(93)	136 Max	155	70+3/-0	85±2	4-7φ×12	M4	6.81	3

#### **Harmonic restraint**

Harmonic restraint measures are not common to all countries. Therefore, prepare the measures that meet the requirements of the destination country.

When installing a product for Japan, refer to the instruction manual available on our website.

[Panasonic Corporation, Motor Business Unit web site]

industrial.panasonic.com/ac/e/

#### <Remarks>

When using a reactor, be sure to install one reactor to one servo driver.

# **■** Recommended components

#### **Surge Absorber for Motor Brake**

Motor	Surge absorber for motor brake		
Motor	Part No. (Manufacturer's)	Manufacturer	
MUMA 50 W to 400 W	Z15D151	SEMITEC Corporation	

# **List of Peripheral Components**

**List of Peripheral Components** 

Manufacturer	Tel No. / Home Page	Peripheral components
Panasonic Corporation Eco Solutions Company	http://panasonic.net/es/	Circuit breaker
Panasonic Corporation Automotive & Industrial Systems Company	http://panasonic.net/id/	Surge absorber Switch, Relay
Iwaki Musen Kenkyusho Co., Ltd.	+81-44-833-4311 http://www.iwakimusen.co.jp/	Regenerative resistor
SEMITEC Corporation	+81-3-3621-2703 http://www.semitec.co.jp/english2/	Surge absorber for motor brake
TDK Corporation	+81-3-5201-7229 http://www.global.tdk.com/	Ferrite core
Okaya Electric Industries Co. Ltd.	+81-3-4544-7040 http://www.okayaelec.co.jp/english/index.html	Surge absorber Noise filter
Sumitomo 3M	+81-3-5716-7290 http:/solutions.3m.com/wps/portal/3M/ja_JP/ WW2/Country/	
Tyco Electronics Japan G.K.	+81-44-844-8052 http://www.te.com/ja/home.html	Connector
Japan Molex Inc.	+81-462-65-2313 http://www.molex.co.jp	
DYDEN CORPORATION	+81-3-5805-5880 http://www.dyden.co.jp/english/index.htm	Cable

<sup>\*</sup> The above list is for reference only. We may change the manufacturer without notice.

MEMO

# Information

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#### **EU Directives**

The EU Directives apply to all such electronic products as those having specific functions and have been exported to EU and directly sold to general consumers. Those products are required to conform to the EU unified standards and to furnish the CE marking on the products.

However, our AC servos meet the relevant EU Directives for Low Voltage Equipment so that the machine or equipment comprising our AC servos can meet EU Directives.

#### **EMC Directives**

MINAS Servo System conforms to relevant standard under EMC Directives setting up certain model (condition) with certain locating distance and wiring of the servo motor and the driver. And actual working condition often differs from this model condition especially in wiring and grounding. Therefore, in order for the machine to conform to the EMC Directives, especially for noise emission and noise terminal voltage, it is necessary to examine the machine incorporating our servos.

# **Conformity to UL Standards**

Observe the following conditions of (1) and (2) to make the system conform to UL508C (E164620).

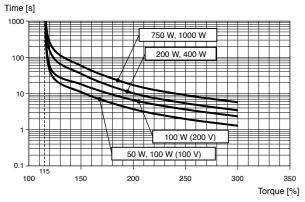
- (1) Use the driver in an environment of Pollution Degree 2 or 1 prescribed in IEC60664-1. (e.g. Install in the control box with IP54 enclosure.)
- (2) Make sure to install a circuit breaker or fuse which are UL recognized (Listed (1) marked) between the power supply and the noise filter.
  - For rated current of circuit breaker and fuse, refer to P.21 "Driver and List of Applicable Peripheral Equipments".
  - Use a copper cable with temperature rating of 75 °C or higher.
- (3) Over-load protection level

Over-load protective function will be activated when the effective current exceeds 115 % or more than the rated current based on the time characteristics (see the graph). Confirm that the effective current of the driver does not exceed the rated current.

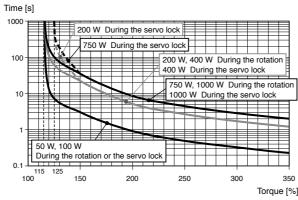
Set up the peak permissible current with Pr0.13 (Setup of 1st torque limit) and Pr5.22 (Setup 2nd torque limit).

#### Overload protection time characteristics

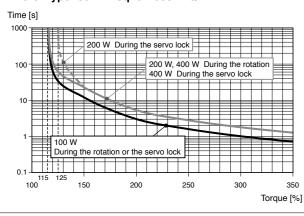
#### · Motor type: 80 mm sq. or less MSMF

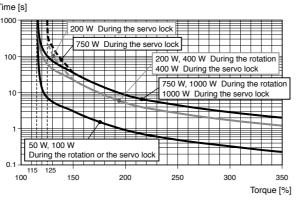


#### · Motor type: 80 mm sq. or less MHMF



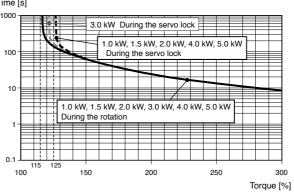
#### · Motor type: 80 mm sq. or less MQMF



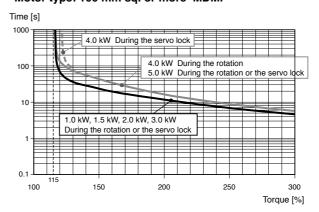


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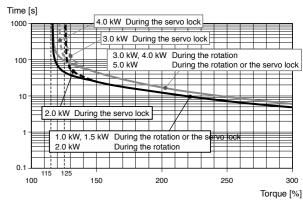
#### Motor type: 100 mm sq. or more MSMF



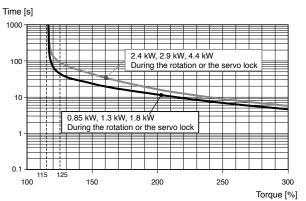
#### · Motor type: 100 mm sq. or more MDMF



#### · Motor type: 100 mm sq. or more MHMF



#### · Motor type: 100 mm sq. or more MGMF



# **Conformed Standards**

		Driver		Motor
	EMC Directives	EN55011 EN61000-6-2 EN61000-6-4 EN61800-3		-
EU Directives	Low-Voltage Directives	EN61800-5-1 EN50178		EN60034-1 EN60034-5
	Machinery Directives Functional safety 11	EN62061(SILCL 3)	EN61508(SIL3) EC61326-3-1	_
UL Standards		UL508C (E164620)		UL1004-1, UL1004-6 (E327868)
CSA Standards Radio Waves Act (South Korea) (KC) '2		C22.2 No.14		C22.2 No.100-4
		KN11 KN61000-4-2,3,4,5,6,8,11		-

: International Electrotechnical Commission

: Europaischen Normen **EMC**: Electromagnetic Compatibility UL : Underwriters Laboratories

CSA: Canadian Standards Association

Pursuant to the directive 2004/108/EC, article 9(2)

Panasonic Testing Centre

Panasonic Service Europe, a division of Panasonic Marketing Europe GmbH

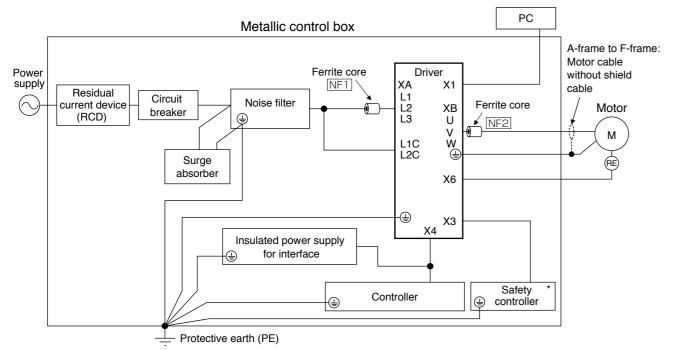
Winsbergring 15, 22525 Hamburg, F.R. Germany

When export this product, follow statutory provisions of the destination

- \*1 A6SE, A6SG, A6NE, A6BE series doesn't correspond to the functional safety standard.
- \*2 Information related to the Korea Radio Law This servo driver is a Class A commercial broadcasting radio wave generator not designed for home use. The user and dealer should be aware of this fact.

A 급 기기 (업무용 방송통신기자재) 이 기기는 업무용(A 급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

(대상기종: Servo Driver)



For NF1 to NF2, refer to the Table "Ferrite core" (P.368).

\* A6SE, A6SG, A6NE, A6BE is not provided with X3 terminal.

#### <Caution>

Use options correctly after reading Operating Instructions of the options to better understand the precautions. Take care not to apply excessive stress to each optional part.

# **Power Supply**

100 V type	Single phase, 100 V <sup>+10</sup> / <sub>-15</sub> % to 120 V <sup>+10</sup> / <sub>-15</sub> %	50 Hz/60 Hz
(A-frame to C-frame) 200 V type	16 %	50 H=/00 H=
(A-frame to D-frame)	Single/3-phase, 200 V <sup>+10</sup> / <sub>-15</sub> % to 240 V <sup>+10</sup> / <sub>-15</sub> %	50 Hz/60 Hz
200 V type (E-frame, F-frame)	3-phase, 200 V $^{+10}_{-15}\%$ to 240 V $^{+10}_{-15}\%$	50 Hz/60 Hz

- (1) This product is designed to be used in over-voltage category (installation category) II of EN 61800-5-1:2007.
- (2) Use an insulated power supply of DC12 V to 24 V which has CE marking or complies with EN60950.

#### **Circuit Breaker**

Install a circuit breaker which complies with IEC Standards and UL recognized (Listed and marked) between power supply and noise filter.

The short-circuit protection circuit on the product is not for protection of branch circuit.

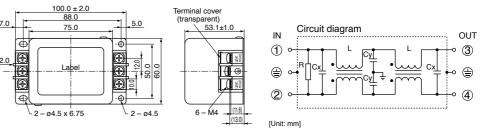
The branch circuit should be protected in accordance with NEC and the applicable local regulations in your area.

#### **Noise Filter**

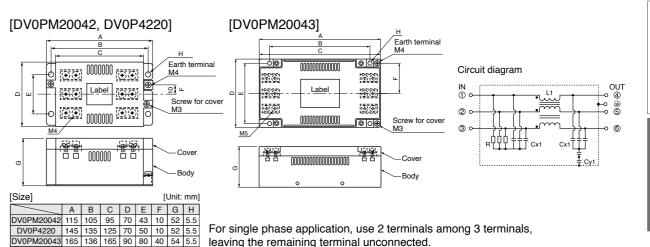
When you install one noise filter at the power supply for multi-axes application, contact the manufacturer of the noise filter. If noise margin is required, connect 2 filters in series to emphasize effectiveness.

# Options

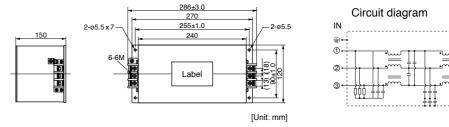
Option part No.	Voltage specifications for driver	Manufacturer's part No.	Applicable driver (frame)	Manufacturer
DV0P4170	Single phase 100 V, 200 V	SUP-EK5-ER-6	A-frame and B-frame	Okaya Electric Ind.
100.0 ± 2.0	Terminal cover			



Option part No.	Voltage specifications for driver	Manufacturer's part No.	Applicable driver (frame)	Manufacturer
	3-phase 200 V		A-frame and B-frame	
DV0PM20042	Single phase 100 V, 200 V 3-phase 200 V	3SUP-HU10-ER-6	C-frame	Okaya Electric Ind.
DV0P4220	Single/3-phase 200 V	3SUP-HU30-ER-6	D-frame	
DV0PM20043	3-phase 200 V	3SUP-HU50-ER-6	E-frame	



Option part No.	Voltage specifications for driver	Manufacturer's part No.	Applicable driver (frame)	Manufacturer
DV0P3410	3-phase 200 V	3SUP-HL50-ER-6B	F-frame	Okaya Electric Ind.



#### <Remarks>

- · Select a noise filter of capacity that exceeds the capacity of the power source (also check for load condition).
- For detailed specification of the filter, contact the manufacturer.

A6B Series
Special Order Product

A6 Series

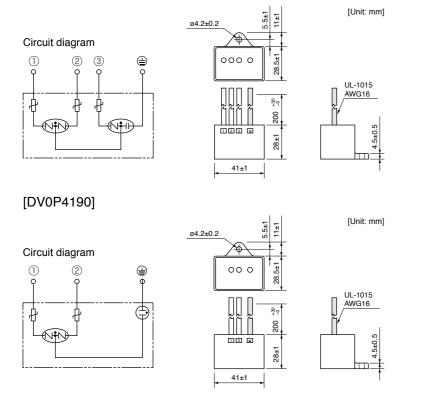
A6N Series

# **Surge Absorber**

Provide a surge absorber for the primary side of noise filter.

Option part No.	Voltage specifications for driver	Manufacturer's part No.	Manufacturer
DV0P1450	3-phase 200 V	R·A·V-781BXZ-4	Okaya Electric Ind.
DV0P4190	Single phase 100 V, 200 V	R·A·V-781BWZ-4	Okaya Electric iriu.

#### [DV0P1450]



#### <Remarks>

Remove this surge absorber when you perform dielectric test on the machine, or surge absorber might be damaged.

#### Ferrite core

Install ferrite core to power cable and motor cable.

Symbol*1	Cable Name	Option part No.	Manufacturer's part No.	Manufacturer	Qty.
NF1	Power cable	DV0D4.460	70 AT2025 1220	TDV Corp	4
NF2	Motor cable	DV0P1460	ZCAT3035-1330	TDK Corp.	4

<sup>\*1</sup> For symbols, refer to the Block Diagram "Installation Environment" (P.365).

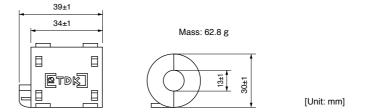
#### <Remarks>

To connect the ferrite core to the connector XB connection cable, adjust the sheath length at the tip of the cable, as required.

#### <Caution>

Fix the ferrite core in order to prevent excessive stress to the cables.

Fig.1: DV0P1460



# **Residual Current Device**

Install a type B Residual current device (RCD) at primary side of the power supply.

Type B: Residual current device which detects a direct-current ingredient.

#### Grounding

- (1) Connect the protective earth terminal ( ) of the driver and the protective earth terminal (PE) of the control box without fail to prevent electrical shocks.
- (2) Do not make a joint connection to the protective earth terminals ((4)). 2 terminals are provided for protective earth.

#### <Note>

For driver and applicable peripheral equipments, refer to P.21 "Driver and List of Applicable Peripheral Equipments".

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# Compliance to EU and EMC Directives

#### **EU Directives**

The EU Directives apply to all such electronic products as those having specific functions and have been exported to EU and directly sold to general consumers. Those products are required to conform to the EU unified standards and to furnish the CE marking on the products. MINAS AC Servos conforms to the EU Directives for Low Voltage Equipment so that the machine incorporating our servos has an easy access to the conformity to relevant EU Directives for the machine.

#### **EMC Directives**

MINAS Servo System conform to relevant standard under EMC Directives setting up certain model (condition) with certain locating distance and wiring of the servo motor and the driver. And actual working condition often differs from this model condition especially in wiring and grounding. Therefore, in order for the machine to conform to the EMC Directives, especially for noise emission and noise terminal voltage, it is necessary to examine the machine incorporating our servos.

#### **Conformed Standards**

Subject		Conformed Standard		IEC : International Electrotechnical Commission
Motor	IEC60034-1	IEC60034-5 UL1004 CSA22.2 No.100	Conforms to	EN : Europaischen Normen
	EN50178	UL508C CSA22.2 No.14	Low- Voltage Directives	EMC: Electromagnetic Compatibility UL: Underwriters Laboratories
EN55011 EN61000	EN55011	Radio Disturbance Characteristics of Industrial, Scientific and Medical (ISM) Radio-Frequency Equipment	CSA : Canadian Standards Association	
	EN61000-6-2	Immunity for Industrial Environments	Conforms to references by EMC Directives	Pursuant to at the directive 2004/108/EC,article 9(2) Panasonic Testing Centre Panasonic Service Europe, a division of Panasonic Marketing Europe GmbH Winsbergring 15,22525 Hamburg,F.R.Germany
Motor	IEC61000-4-2	Electrostatic Discharge Immunity Test		
and	IEC61000-4-3	Radio Frequency Electromagnetic Field Immunity Test		
	IEC61000-4-4	Electric High-Speed Transition Phenomenon/Burst Immunity Test		
	IEC61000-4-5	Lightening Surge Immunity Test	1	
	IEC61000-4-6	High Frequency Conduction Immunity Test	]	
	IEC61000-4-11	000-4-11 Instantaneous Outage Immunity Test		

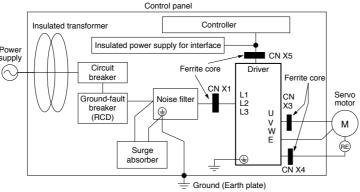
# Composition of Peripheral Components

#### <Pre><Precautions in using options>

Use options correctly after reading operation manuals of the options to better understand the precautions. Take care not to apply excessive stress to each optional part.

#### **Installation Environment**

Use Minas driver in environment of Pollution Degree 1 or 2 prescribed in IEC-60664-1 (e.g. Install the driver in control panel with IP54 protection structure.)



#### **Power Supply**

100 V system	Single phase, 100 V $^{+10~\%}_{-15~\%}$ to 115 V $^{+10~\%}_{-15~\%}$	50 Hz/60 Hz
200 V system	Single phase, 200 V $^{+10~\%}_{-15~\%}$ to 240 V $^{+10~\%}_{-15~\%}$	50 Hz/60 Hz
200 V system	3-phase, 200 V $^{+10~\%}_{-15~\%}$ to 240 V $^{+10~\%}_{-15~\%}$	50 Hz/60 Hz

- (1) Use the power supply under an environment of Overvoltage Category II specified in IEC60664-1.
- (2) For a interface power supply, use the insulated one with 12 VDC to 24 VDC which conforms to CE Marking or EN Standards (EN60950).

#### Circuit Breaker

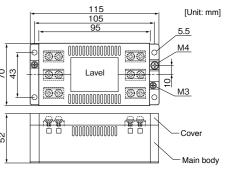
Connect a circuit breaker which conforms to IEC standards and is UL recognized (UL Listed, (IL) marked), between the power supply and the noise filter.

#### **Composition of Peripheral Components Conformity to UL Standards**

#### **Noise Filter**

When you install one noise filter in the power supply for multi axis application, consult with the manufacture of the filter.

Option part No.	Part No.	Manufacturer
DV0P4160	3SUP-HU10-ER-6	Okaya Electric Industries Co.



#### **Surge Absorber**

Install a surge absorber at primary side of the noise filter

Circuit diagram  Circuit diagram  Ooo O 149 80 000 000 000 000 000 000 000 000 000	Option part No.	Driver voltage spec	Part No.	Manufacturer	Option part No.	Driver voltage spec	Part No.	Manufacturer
Circuit diagram  ©4.2±0.2	DV0P1450	3-phase, 200 V	R·A·V-781BXZ-4	Okaya Electric	DV0P4190		R·A·V-781BWZ-4	Okaya Electric
① ② ③ ⊕ UL-1015 AWG16  ① ② ③ ⊕ UL-1015 AWG16  ☐ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	Circuit dia an		0.2	[Unit: mm]	Oine it die e		0.2	[Unit: mm
AWG16  AWG16  AWG16  AWG16  AWG16	J	③ ⊕		UI -1015	1 2			UI -1015
			123 🕏	AWG16		<b>\$</b>	12 🕏	AWG16

#### <Remarks>

Remove this surge absorber when you perform dielectric test on the machine, or surge absorber might be damaged.

#### Ferrite core

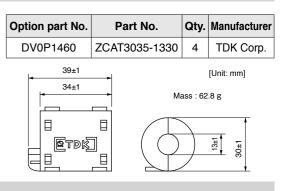
Install ferrite core to all cables (Power line, motor cable, encoder cable, interface cable)

#### <Caution>

- Please fix a ferrite core to avoid excessive stress to the cable.
- · When using multiple axes, noise generated from each driver might influence driver and peripheral equipment and result to malfunction.

Please insert a ferrite core between driver and motor wires (U, V, W but grounding).

(Please refer to P.369 "Composition of Peripheral Components".)



#### Grounding

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- (1) Connect the protective earth terminal of the driver ((\(\frac{1}{2}\)) and protective earth terminal of the control panel (PE) without fail to prevent electrical shocks.
- (2) Do not co-clamp to the ground terminals ((\(\begin{array}{l} = \)\)). Two ground terminals are provided.

#### **Ground-Fault Breaker**

Install a ground fault curcuit braker (RCD) to the primary side of the power supply.

Please use B-type (DC sensitive) ground fault circuit breakers defined in IEC60947-2, JISC8201-2-2.

# ■ Conformity to UL Standards

Observe the following conditions of (1) and (2) to make the system conform to UL508C (File No. E164620).

- (1) Use the driver in an environment of Pollution Degree 2 or 1 prescribed in IEC60664-1. (e.g. Install in the control box with IP54 enclosure.)
- (2) Install a circuit breaker or fuse which are UL recognized (LISTED ( marked) between the power supply and the noise filter without fail.

# **AC Servo Motor Capacity Selection Software**

We have prepared PC software "M-SELECT" for AC servo motor capacity selection. Consult our sales representative or authorized distributor.

#### Three-step selection

1. Select components and specified values Select appropriate mechanical parameter items and fill them with parameter values derived from

the real machine. To simulate the target machine as practical as possible, use maximum number of parameters available.



#### 2. Enter operation pattern

Input the planned operation pattern that will contain [speed and rotation standard] or [absolute position

standard] with optional settings such as S-acceleration/de celeration.



#### 3. Select the motor

When the data required in step 1 and 2 above have been input, the software lists the motors,

which will be appropriate to use with your machine. Select the motor that is best suitable for your machine application.



#### Details of motor

Once the motor is selected, specifications of the motor and driver, and details of reason for

determination are displayed and may be printed out.



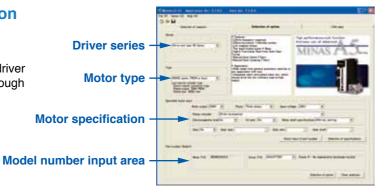
# **Option Selection Software for AC Servo Motor**

We have prepared PC software to enable fast, easy, and correct option selection, a complicated job without the software.

Two procedures for option selection

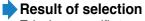
#### 1. Selection according to driver series and motor type

Suitable option can be selected by selecting driver series, motor type and motor specification through pulldown menu.



#### 2. Entry of model number

If you know the model number based on the servo motor and driver currently used, enter the model number.



Tab sheet specific to each of option model numbers is used for easier identification of the desired option.

When you are using the motor capacity selection software, simply press [Option Selection] tab and the screen as shown right will appear.



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Please download from our web site and use after install to the PC. https://industrial.panasonic.com/ww/products/motors-compressors/fa-motors/ac-servo-motors/minas-a5-panaterm

# SI unit — Table 5 : Prefix (Multiples of 10) Table 1: Basic unit Table 2: Auxiliary unit Derived unit Table 4: Unit combined Table 3: Derived unit with Other derived unit with SI unit proper name

# Table1: Basic unit

Table II Bacic and					
Quantity	Name of unit	Symbol of unit			
Length	meter	m			
Weight	kilogram	kg			
Time	second	S			
Current	ampere	A			
Thermodynamic temperature	kelvin	K			
Amount of substance	mol	mol			
Luminous intensity	candela	cd			

**Organization of the System of Units** 

**Table 2: Auxiliary unit** 

Quantity	Name of unit	Symbol of unit
Plane angle	radian	rad
Solid angle	steradian	sr

# Table 3: Major derived unit with proper name

Quantity	Name	Symbol of unit	Derivation from basic unit, auxiliary unit or other derived unit
Frequency	hertz	Hz	1 Hz = 1 s <sup>-1</sup>
Force	newton	N	1 N = 1 kg·m/s <sup>2</sup>
Pressure, Stress	pascal	Pa	1 Pa = 1 N/m <sup>2</sup>
Energy, Work, Amount of heat	joule	J	1 J = 1 N·m
Amount of work, Work efficiency, Power, Electric power	watt	W	1 W = 1 J/s
Electric charge, Amount of electricity	coulomb	С	1 C = 1 A·s
Electric potential, Potential difference, Voltage, Electromotive force	volt	V	1 V = 1 J/C
Electrostatic capacity, Capacitance	farad	F	1 F = 1 C/V
Electric resistance	ohm	Ω	1 Ω = 1 V/A
Electric conductance	siemens	S	1 S = 1 Ω <sup>-1</sup>
Magnetic flux	weber	Wb	1 Wb = 1 V⋅s
Magnetic flux density, Magnetic induction	tesla	Т	1 T = 1 Wb/m <sup>2</sup>
Inductance	henry	Н	1 H = 1 Wb/A
Degree centigrade (Celsius)	degree centigrade (Celsius) / degree	°C	t °C = (t+273.15) K
Luminous flux	lumen	lm	1 lm = 1 cd·sr
Illuminance	lux	lx	1 lx = 1 lm/m <sup>2</sup>

#### Table 4: Unit combined with SI unit

Quantity	Name	Symbol of unit
	minute	min
Time	hour	h
	day	d
	degree	۰
Plane angle	minute	'
	second	"
Volume	liter	I, L
Weight	ton	t

Table 5: Prefix

Multiples powered	Pre	efix
to unit	Name	Symbol
10 <sup>18</sup>	exa	E
10 <sup>15</sup>	peta	Р
10 <sup>12</sup>	tera	Т
10°	giga	G
10 <sup>6</sup>	mega	M
10 <sup>3</sup>	kilo	k
10 <sup>2</sup>	hecto	h
10	deca	da
10 <sup>-1</sup>	deci	d
10 <sup>-2</sup>	centi	С
10 <sup>-3</sup>	milli	m
10 <sup>-6</sup>	micro	μ
10 <sup>-9</sup>	nano	n
10 <sup>-12</sup>	pico	р
10 <sup>-15</sup>	femto	f
10 <sup>-18</sup>	atto	a

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			I
Quantity	Symbol of conventional unit	Symbol of SI unit and compatible unit	Conversion value
Length	μ (micron)	μ <b>m</b>	1 μ = 1 μm (micrometer)
Acceleration	Gal	m/s <sup>2</sup>	1 Gal = 10 <sup>-2</sup> m/s <sup>2</sup>
	G	m/s <sup>2</sup>	1 G = 9.80665 m/s <sup>2</sup>
Frequency	c/s, c	Hz	1 c/s = Hz
Revolving speed, Number of revolutions	rpm	s <sup>-1</sup> or min <sup>-1</sup> , r/min	1 rpm = 1 min <sup>-1</sup>
Weight	kgf	_	Same value
Mass	_	kg	Same value
Weight flow rate	kgf/s	-	Same value
Mass flow rate	_	kg/s	Same value
Specific weight	kgf/m³	-	Same value
Density	_	kg/m <sup>3</sup>	Same value
Specific volume	m³/kgf	m³/kg	Same value
Load	kgf	N	1 kgf = 9.80665 N
Force	kgf	N	1 kgf = 9.80665 N
	dyn	N	1 dyn = 10 <sup>-5</sup> N
Moment of force	kgf⋅m	N∙m	1 kgf·m = 9.806 N·m
Pressure	kgf/cm <sup>2</sup>	Pa, bar (1) or kgf/cm <sup>2</sup>	1 kgf/cm <sup>2</sup> = 9.80665 x 10 <sup>4</sup> Pa
	_		= 0.980665 bar
	at (Engineering atmospheric pressure)	Pa	1 at = 9.80665 x 10 <sup>4</sup> Pa
	atm (Atmospheric pressure)	Pa	1 atm = 1.01325 x 10 <sup>5</sup> Pa
	mH <sub>2</sub> O, mAq	Pa	1 mH <sub>2</sub> O = 9.80665 x 10 <sup>3</sup> Pa
	mmHg	Pa or mmHg <sup>(2)</sup>	1 mmHg = 133.322 Pa
	Torr	Pa	
Stress	kgf/mm <sup>2</sup>	Pa or N/m²	1 kgf/mm <sup>2</sup> = 9.80665 x 10 <sup>6</sup> Pa
055			=9.80665 x 10 <sup>6</sup> N/m <sup>2</sup>
	kgf/cm <sup>2</sup>	Pa or N/m <sup>2</sup>	1 kgf/cm <sup>2</sup> = 9.80665 x 10 <sup>4</sup> Pa
			= 9.80665 x 10 <sup>4</sup> N/m <sup>2</sup>
Elastic modulus	kgf/m²	Pa or N/m <sup>2</sup>	1 kgf/m <sup>2</sup> = 9.80665 Pa = 9.80665 N/m <sup>2</sup>
			1 kgf/cm <sup>2</sup> = 9.80665 x 10 <sup>4</sup> N/m <sup>2</sup>
Energy, Work	kgf⋅m	J (joule)	1 kgf·m = 9.80665 J
	erg	J	1 erg = 10 <sup>-7</sup> J
Work efficiency, Power	kgf·m/s	W (watt)	1 kgf·m/s = 9.80665 W
vvoik emoleray, r ewer	PS	W	1 PS = 0.7355 kW
Viscosity	PP	Pa·s	1 P = 0.1 Pa·s
Kinetic viscosity	St	mm²/s	10 <sup>-2</sup> St = 1 mm <sup>2</sup> /s
Thermodynamic temperature	K	K (kelvin)	1 K = 1 K
Temperature interval	_	K ((3)	1 deg = 1 K
Amount of heat	deg	J	1 cal = 4.18605 J
Heat capacity	cal cal/°C	J/K <sup>(3)</sup>	1 cal/°C = 4.18605 J/K
· ·		cal/ (kgf·K) <sup>(3)</sup>	1 cal/ $C = 4.18605 \text{ J/K}$ 1 cal/ (kgf·°C) = 4.18605 J/ (kg·K)
Specific heat, Specific heat capacity	cal/ (kgf·°C)		1 cal/ (kgr C) = 4.18605 J/ (kg·k) 1 cal/K = 4.18605 J/K
Entropy Specific entropy	cal/K	J/K	1 cal/ (kgf·K) = $4.18605 \text{ J/ (kg·K)}$
' ''	cal/ (kgf·K)	J/(kg·K)	1 cal = 4.18605 J
Internal energy (Enthalpy)	cal	J	
Specific internal energy (Specific enthalpy)	cal/kgf	J/kg W	1 cal/kgf = 4.18605 J/kg 1 kcal/h = 1.16279 W
Heat flux	cal/h		1 kcal/n = 1.162/9 W 1 kcal/ (h·m²) = 1.16279 W/m²
Heat flux density	cal/ (h·m²)	W/m²	
Thermal conductivity	cal/ (h·m·°C)	W/ (m·K) <sup>(3)</sup>	1 kcal/ (h·m·°C) = 1.16279 W/ (m·K)
Coefficient of thermal conductivity	cal/ (h·m²·°C)	W/ (m <sup>2</sup> ·K) <sup>(3)</sup>	1 kcal/ (h·m <sup>2</sup> ·°C) = 1.16279 W/ (m <sup>2</sup> ·K)
Intensity of magnetic field	Oe	A/m	1 Oe = $10^3 / (4\pi) \text{ A/m}$
Magnetic flux	Mx	Wb (weber)	1 Mx = 10 <sup>-8</sup> Wb
Magnetic flux density	Gs,G	T (tesla)	1 Gs = 10 <sup>-4</sup> T

- (1) Applicable to liquid pressure. Also applicable to atmospheric pressure of meteorological data, when "bar" is used in international standard.
- (2) Applicable to scale or indication of blood pressure manometers.
- (3) "°C" can be substituted for "K".

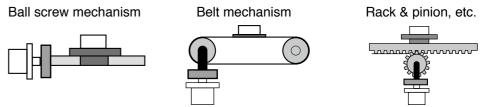
#### Flow of Motor Selection

Flow of Motor Selection

## 1. Definition of mechanism to be driven by motor.

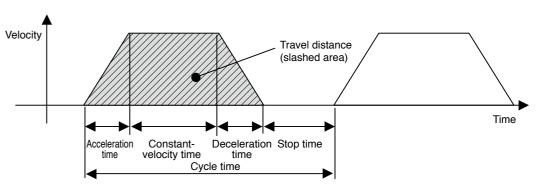
Define details of individual mechanical components (ball screw length, lead and pulley diameters, etc.)

#### <Typical mechanism>



#### 2. Definition of operating pattern.

Acceleration/deceleration time, Constant-velocity time, Stop time, Cycle time, Travel distance



Note) Selection of motor capacity significantly varies depending on the operating pattern. The motor capacity can be reduced if the acceleration/deceleration time and stop time are set as long as possible.

#### 3. Calculation of load inertia and inertia ratio.

Calculate load inertia for each mechanical component. (Refer to "General inertia calculation method" described later.)

Divide the calculated load inertia by the inertia of the selected motor to check the inertia ratio. For calculation of the inertia ratio, note that the catalog value of the motor inertia is expressed as " $\times$  10<sup>-4</sup> kg·m<sup>2</sup>".

#### 4. Calculation of motor velocity

Calculate the motor velocity from the moving distance, acceleration / deceleration time and constant-velocity time.

#### 5. Calculation of torque

Calculate the required motor torque from the load inertia, acceleration/deceleration time and constant-velocity time.

#### 6. Calculation of motor

Select a motor that meets the above 3 to 5 requirements.

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# **Description on the Items Related to Motor Selection**

#### 1. Torque

#### (1) Peak torque

Indicate the maximum torque that the motor requires during operation (mainly in acceleration and deceleration steps). The reference value is 80% or less of the maximum motor torque. If the torque is a negative value, a regenerative discharge resistor may be required.

#### (2) Traveling torque, Stop holding torque

Indicates the torque that the motor requires for a long time. The reference value is 80% or less of the rated motor torque. If the torque is a negative value, a regenerative discharge resistor may be required.

#### Traveling torque calculation formula for each mechanism



Traveling torque

 $\mathsf{Tf} = \frac{\mathsf{P}}{2\pi\,\eta}\;(\mu\mathsf{g}\mathsf{W}\!+\!\mathsf{F})$ 

W: Weight [kg] P:Lead[m]

 $\eta$ : Mechanical efficiency  $\mu$ : Coefficient of friction

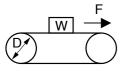
F: External force [N]

g: Acceleration of gravity 9.8[m/s<sup>2</sup>]

# **Belt mechanism**

Traveling torque

$$\mathsf{Tf} = \frac{\mathsf{D}}{2\pi\,\eta}\,(\mu\mathsf{g}\mathsf{W}\!+\!\mathsf{F})$$



W: Weight [kg]

 $\eta$ : Mechanical efficiency P: Pulley diameter [m]  $\mu$ : Coefficient of friction

F: External force [N]

g: Acceleration of gravity 9.8[m/s<sup>2</sup>]

#### (3) Effective torque

Indicates a root-mean-square value of the total torque required for running and stopping the motor per unit time. The reference value is approx. 80% or less of the rated motor torque.

Trms = 
$$\sqrt{\frac{Ta^2 x ta + Tf^2 x tb + Td^2 x td}{tc}}$$

Ta: Acceleration torque [N·m]

ta: Acceleration time [s]

tc: Cycle time [s]

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(Run time + Stop time)

Tf: Traveling torque [N·m] tb: Constant-velocity time [s]

Td: Deceleration torque [N·m] td: Deceleration time [s]

#### 2. Motor velocity

#### **Maximum velocity**

Maximum velocity of motor in operation: The reference value is the rated velocity or lower value. When the motor runs at the maximum velocity, you must pay attention to the motor torque and temperature rise. For actual calculation of motor velocity, see "Example of motor selection" described later.

#### 3. Inertia and inertia ratio

Inertia is like the force to retain the current moving condition.

Inertia ratio is calculated by dividing load inertia by rotor inertia.

Generally, for motors with 750 W or lower capacity, the inertia ratio should be "20" or less. For motors with 1000 W or higher capacity, the inertia ratio should be "10" or less.

If you need quicker response, a lower inertia ratio is required.

/ For example, when the motor takes several seconds in acceleration step, the inertia ratio can be further \increased.

#### General inertia calculation method

Shape	J calculation formula	Shape	J calculation formula
Disk	$J = \frac{1}{8} WD^{2} [kg \cdot m^{2}]$ $W : Weight [kg]$ $D : Outer diameter [m]$	Hollow cylinder	$J = \frac{1}{8} W(D^2 + d^2) [kg \cdot m^2]$ $W : Weight [kg]$ $D : Outer diameter [m]$ $d : Inner diameter [m]$
Prism	$J = \frac{1}{12} W (a^2 + b^2) [kg \cdot m^2]$ $W : Weight [kg]$ $a, b, c : Side length [m]$	Uniform rod	$J = \frac{1}{48} W (3D^2 + 4L^2) [kg \cdot m^2]$ $W : Weight [kg]$ $D : Outer diameter [m]$ $L : Length [m]$
Straight rod	$J = \frac{1}{3} WL^{2} [kg \cdot m^{2}]$ $W : Weight [kg]$ $L : Length [m]$	Separated rod	$J = \frac{1}{8} WD^2 + WS^2 [kg \cdot m^2]$ $W : Weight [kg]$ $D : Outer diameter [m]$ $S : Distance [m]$
Reduction gear	Inertia on shaft "a" $J = J_1 + (\frac{n_2}{n_1})^2 J_2[kg \cdot m^2]$ $n_1 : \text{A rotational speed of a shaft } [r/min]$ $n_2 : \text{A rotational speed of b shaft } [r/min]$		
Conveyor	$J = \frac{1}{4} W D^{2} [kg \cdot m^{2}]$ $W : \text{Workpiece weight on conveyor } [kg]$ $D : \text{Drum diameter } [m]$ * Excluding drum J	Ball screw	$J = J_B + \frac{W \cdot P^2}{4\pi^2} \text{ [kg·m²]}$ $W : \text{Weight [kg]}$ $P : \text{Lead}$ $JB : J \text{ of ball screw}$

If weight (W [kg]) is unknown, calculate it with the following formula:

Weight W[kg]=Density p [kg/m<sup>3</sup>] x Volume V[m<sup>3</sup>]

Density of each material

Iron  $\rho = 7.9 \times 10^3 \, [kg/m^3]$ 

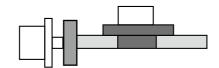
Aluminum  $\rho$  =2.8 x 10<sup>3</sup> [kg/m<sup>3</sup>]

Brass  $\rho$  =8.5 x 10<sup>3</sup> [kg/m<sup>3</sup>]

#### **To Drive Ball Screw Mechanism**

#### 1. Example of motor selection for driving ball screw mechanism

 $\begin{tabular}{llll} Workpiece weight & WA = 10 \ [kg] \\ Ball screw length & B L = 0.5 \ [m] \\ Ball screw diameter & BD = 0.02 \ [m] \\ Ball screw lead & BP = 0.02 \ [m] \\ Ball screw efficiency & B $\eta = 0.9$ \\ \end{tabular}$ 

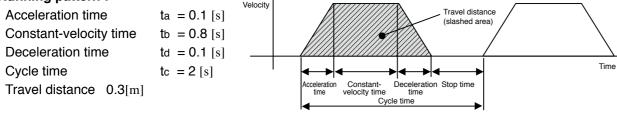


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Travel distance 0.3[m]

Coupling inertia  $Jc = 10 \text{ X } 10^{-6} \text{ [kg} \cdot \text{m}^2\text{]}$  (Use manufacturer-specified catalog value, or calculation value.)

#### 2. Running pattern :



BW = 
$$\rho \times \pi \times \left(\frac{BD}{2}\right)^2 \times BL = 7.9 \times 10^3 \times \pi \times \left(\frac{0.02}{2}\right)^2 \times 0.5$$
  
= 1.24 [kg]

$$JL = JC + JB = JC + \frac{1}{8}BW \times BD^{2} + \frac{WA \cdot BP^{2}}{4\pi^{2}}$$

$$= 0.00001 + (1.24 \times 0.02^{2}) / 8 + 10 \times 0.02^{2} / 4\pi^{2}$$

$$= 1.73 \times 10^{-4} [kg \cdot m^{2}]$$

5. Provisional motor selection

In case of MSMF 200 W motor :  $JM = 0.14 \times 10^{-4} \, [kg \cdot m^2]$ 

#### 6. Calculation of inertia ratio

JL / JM = 
$$1.73 \times 10^{-4}$$
 /  $0.14 \times 10^{-4}$  Therefore, the inertia ratio is "12.3" (less than "30") (In case of MSMF 100 W motor: JM =  $0.048 \times 10^{-4}$  Therefore, the inertia ratio is "36.0".)

#### 7. Calculation of maximum velocity (Vmax)

$$\frac{1}{2} \times \text{Acceleration time} \times \text{Vmax} + \text{Constant-velocity time} \times \text{Vmax} + \frac{1}{2} \times \text{Deceleration time} \times \text{Vmax} = \text{Travel distance}$$

$$\frac{1}{2} \times 0.1 \times \text{Vmax} + 0.8 \times \text{Vmax} + \frac{1}{2} \times 0.1 \times \text{Vmax} = 0.3$$

$$0.9 \times \text{Vmax} = 0.3$$

$$\text{Vmax} = 0.3 / 0.9 = 0.334 \text{ [m/s]}$$

## 8. Calculation of motor velocity (N [r/min]) Ball screw lead per resolution: Bp = 0.02 [m]

$$N = 0.334 \ / \ 0.02 = 16.7 \ [{\rm r/s}] \\ = 16.7 \times 60 = 1002 \ [{\rm r/min}] \ < 3000 \ [{\rm r/min}] \ \ ({\rm Rated\ velocity\ of\ MSMF\ 200\ W\ motor})$$

#### 9. Calculation of torque

Traveling torque 
$$T_f = \frac{BP}{2\pi B \, \eta} \ (\mu gWA + F) = \frac{0.02}{2\pi \ x \ 0.9} \ (0.1 \times 9.8 \times 10 + 0)$$

$$= 0.035 \ [\text{N·m}]$$
Acceleration torque 
$$T_a = \frac{(\text{JL} + \text{JM}) \times 2\pi \text{N}[\text{r/s}]}{\text{Acceleration time [s]}} + \text{Traveling torque}$$

$$= \frac{(1.73 \times 10^{-4} + 0.14 \times 10^{-4}) \times 2\pi \times 16.7}{0.1} + 0.035$$

$$= 0.196 + 0.035 = 0.231 \ [\text{N·m}]$$

# Deceleration torque $T_d = \frac{(JL + JM) \times 2\pi N[r/s]}{Deceleration time [s]} - Traveling torque$ $= \frac{(1.73 \times 10^{-4} + 0.14 \times 10^{-4}) \times 2\pi \times 16.7}{0.1} - 0.035$ = 0.196 - 0.035 = 0.161 [N·m]

#### 10. Verification of maximum torque

Acceleration torque =  $Ta = 0.231 [N \cdot m] < 1.91 [N \cdot m]$  (Maximum torque of MSMF 200 W motor)

#### 11. Verification of effective torque

Trms = 
$$\sqrt{\frac{Ta^2 \times ta + Tf^2 \times tb + Td^2 \times td}{tc}}$$
  
=  $\sqrt{\frac{0.231^2 \times 0.1 + 0.035^2 \times 0.8 + 0.161^2 \times 0.1}{2}}$   
= 0.067 [N·m] < 0.64 [N·m] (Rated torque of MSMF 200 W motor)

12. Judging from the inertia ratio calculated above, selection of 200 W motor is preferable, although the torque margin is significantly large.

#### **Example of Motor Selection**

#### Example of motor selection for timing belt mechanism

**1.Mechanism** Workpiece weight WA = 2[kg] (including belt)

To Drive Ball Screw Mechanism/ Example of Motor Selection

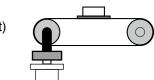
Pulley diameter PD = 0.05[m]

Pulley weight WP= 0.5[kg] (Use manufacturer-specified catalog value, or calculation value.)

Mechanical efficiency  $B_{\eta} = 0.8$ 

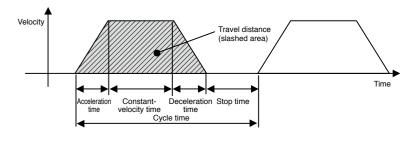
Coupling inertia Jc = 0 (Direct connection to motor shaft)

Belt mechanism inertia JB
Pulley inertia JP



#### 2. Running pattern

Acceleration time 
$$ta = 0.1[s]$$
Constant-velocity time  $tb = 0.8[s]$ 
Deceleration time  $td = 0.1[s]$ 
Cycle time  $tc = 2[s]$ 
Travel distance  $1[m]$ 



3. Load inertia JL = JC + JB + JP

= JC + 
$$\frac{1}{4}$$
WA × PD<sup>2</sup> +  $\frac{1}{8}$ WP × PD<sup>2</sup> × 2  
= 0 +  $\frac{1}{4}$  × 2 × 0.05<sup>2</sup> +  $\frac{1}{8}$  × 0.5 × 0.05<sup>2</sup> × 2  
= 0.00156 = 15.6 × 10<sup>-4</sup> [kg·m<sup>2</sup>]

4. Provisional motor selection

In case of MSMF 750 W motor :  $J_M = 0.96 \times 10^{-4} \, [kg \cdot m^2]$ 

5. Calculation of inertia ratio

JL / JM =  $15.6 \times 10^{-4}$  /  $0.96 \times 10^{-4}$  Therefore, the inertia ratio is "16.3" (less than "20")

# A6 Series

#### 6. Calculation of maximum velocity (Vmax)

$$\frac{1}{2}$$
 × Acceleration time× Vmax+ Constant-velocity time× Vmax+  $\frac{1}{2}$  × Deceleration time× Vmax=Travel distance  $\frac{1}{2}$  × 0.1 × Vmax + 0.8 × Vmax +  $\frac{1}{2}$  × 0.1 × Vmax = 1 0.9 × Vmax = 1 Vmax = 1 / 0.9 = 1.111 [m/s]

# 7. Calculation of motor velocity (N [r/min])

A single rotation of pulley : 
$$\pi \times PD = 0.157 [m]$$
  
N = 1.111 / 0.157 = 7.08[r/s]  
= 7.08 × 60 = 424.8[r/min] < 3000[r/min] (Rated velocity of MSMF 750 W motor)

#### 8. Calculation of torque

Traveling torque 
$$T_f = \frac{P_D}{2\, \eta} (\mu g W A + F) = \frac{0.05}{2 \times 0.8} \ (0.1 \times 9.8 \times 3 + 0)$$

$$= 0.061 [\, N \cdot m\,]$$
Acceleration torque 
$$T_a = \frac{(J L + J M) \times 2\pi N [\, r/s\,]}{\text{Acceleration time}[\, s\,]} + \text{Traveling torque}$$

$$= \frac{(15.6 \times 10^{-4} + 0.87 \times 10^{-4}) \times 2\pi \times 7.08}{0.1} + 0.061$$

$$= 0.751 + 0.061 = 0.812 [\, N \cdot m\,]$$
Deceleration torque 
$$T_d = \frac{(J L + J M) \times 2\pi N [\, r/s\,]}{\text{Deceleration time}[\, s\,]} - \text{Traveling torque}$$

$$= \frac{(15.6 \times 10^{-4} + 0.87 \times 10^{-4}) \times 2\pi \times 7.08}{0.1} - 0.061$$

$$= 0.751 - 0.061 = 0.69 [\, N \cdot m\,]$$

#### 9. Verification of maximum torque

Acceleration torque Ta =  $0.812[N \cdot m] < 7.1[N \cdot m]$  (Maximum torque of MSMF 750 W motor)

#### 10. Verification of effective torque

Trms = 
$$\sqrt{\frac{Ta^2 \times ta + Tf^2 \times tb + Td^2 \times td}{tc}}$$
  
=  $\sqrt{\frac{0.812^2 \times 0.1 + 0.061^2 \times 0.8 + 0.69^2 \times 0.1}{2}}$   
= 0.241 [N·m] < 2.4 [N·m] (Rated torque of MSMF 750 W motor)

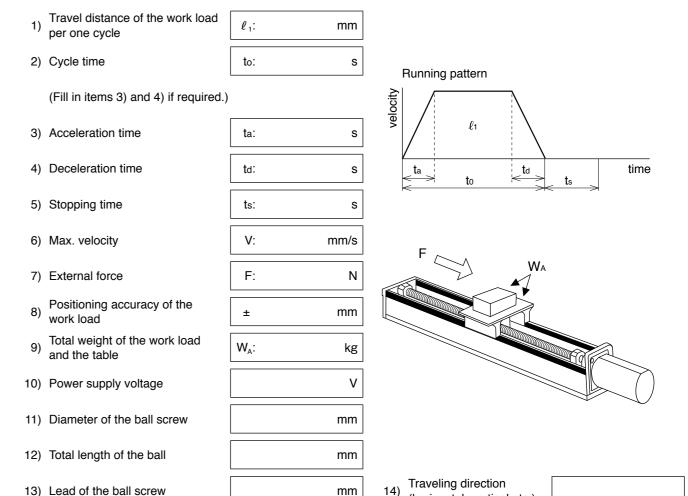
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#### 11. Judging from the above calculation result, selection of MSMF 750W motor is acceptable.

# **Request Sheet for Motor Selection**

# Request for motor selection I : Ball screw drive

# 1. Driven mechanism and running data



#### 2. Other data (Fill the details on specific mechanism and its configurations in the following blank.)



(horizontal, vertical etc.)

mm

# **Request Sheet for Motor Selection**

# Request for motor selection II: Timing pulley + Ball screw drive

# 1. Driven mechanism and running data

1)	Travel distance of the work
1)	load per one cycle

ℓ <sub>1</sub> :	mm	1

15) Diameter of the pulley
----------------------------

	Moto	r side	Ball sc	rew side
meter of the pulley	D <sub>1</sub> :	mm	D <sub>2</sub> :	mm

2) Cycle time	to:	s

(or ite	m 17	) and	18))
(01 16	,,,,	, and	10))

3)	Acceleration time	

(Fill in items 3) and 4) if required.)

ta:	S
td:	S

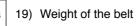
17)	Width	of the	pulley

17) Width of the pulley	L1:
18) Material of the pulley	

5) Stopping time

4) Deceleration time

ts:	S
V:	mm/s



W <sub>M</sub> :	kg

mm

kg W<sub>2</sub>:

6) Max. velocity

7) External force

F:	١

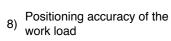
mm

kg

mm

mm

mm



Total weight of the work load	١٨/ ٠
and the table	VV <sub>A</sub> .

0)	Power	supply	voltage
,			U

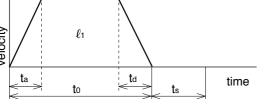
11)	Diameter of the ball screw

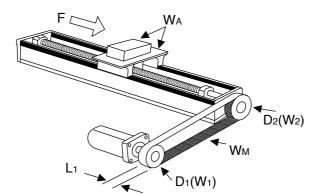
12) Total length of the ball screw	

13) I ead of the ball screw	

14)	Traveling direction
	(horizontal, vertical etc.)

# Running pattern





#### 2. Other data (Fill the details on specific mechanism and its configurations in the following blank.)

Comr	
Comp	pany name :
Depa	artment/Section:
Name	e :
Addre	ess:
Tel:	
Fax :	
F-ma	ail address:

# **Request Sheet for Motor Selection**

# Request for motor selection III: Belt drive

mm/s

Ν

mm

kg

٧

kg

 $\mathsf{mm}$ 

kg

# 1. Driven mechanism and running data

1)	Travel distance of the work load per one cycle	ℓ <sub>1</sub> :

ts:

 $W_1$ :

(Fill in items 3)	and 4	) if req	uired.)

3)	Acceleration	time	

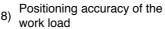
2) Cycle time

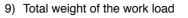
1)	Deceleration time		

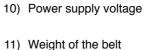
5)	Stopping time
$\circ$	Ctopping time

6) [	Мах.	velocity
------	------	----------

1)	External force	



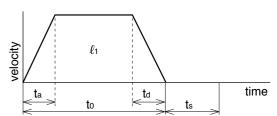


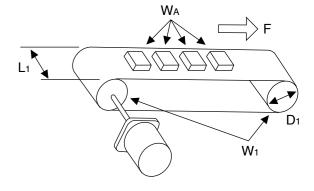


12)	Diameter	of the	driving	pulley

<ol><li>Total weight of the pulle</li></ol>
---

# Running pattern





(or itom 14) and 15))

14)	Width	of the	pulley

15)	Material of the pulley	

(0	Hem	14)	anu	13))

14)	Width	of the	pulley
-----	-------	--------	--------

15)	Material of the pulle	e)

16)	Traveling direction
16)	(horizontal, vertical etc.)

)ther da	ta (Fill the	e details on s	necific med	hanism ar	nd its cont	igurations	in the fol	lowing h	ılank )

Company name :
Department/Section :
Name :
Address:
Tel:
Fax :
E-mail address:

# **Request Sheet for Motor Selection**

# Request for motor selection IV : Timing pulley + Belt drive

# 1. Driven mechanism and running data

1)	Travel distance of the work
1)	load per one cycle

2) Cycle time

of the work ele	$\ell_1$ :	mm

mm	16) Diameter of the pulle
----	---------------------------

	16)	Diameter of the pulley	
_			Ī

16)	Diameter of the pulley	
-----	------------------------	--

	Motor side		Belt side	
of the pulley	D <sub>3</sub> :	mm	D <sub>4</sub> :	mm
the pulley	W <sub>o</sub> ·	kø	w.·	ke

(Fill in items 3) and 4) if required.)





7) External force	F:	1

8) Positioning accuracy of the work load	±	mm
9) Total weight of the work load	W <sub>A</sub> :	kg

10) Power supply voltage	,

11) Weight of motor side belt	W <sub>M</sub> :	k٤

	Moto	or side	Ве	lt side
12) Diameter of the pulley	D <sub>1</sub> :	mm	D <sub>2</sub> :	mm
Weight of the	W <sub>1</sub> :	kg	<b>W</b> <sub>2</sub> :	kg

(or item 14) and 15))

14) Width of the belt	L1:	mm
15) Material of the pulley		

(or item 18) and 19))		
8) Width of the nulley	12.	

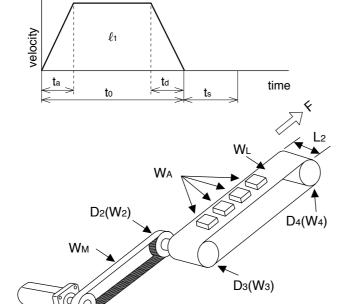
19)	Material of the pulley
-----	------------------------

20) Weight of the belt

W <sub>L</sub> :	kg

21)	Traveling direction
۷۱)	(horizontal, vertical etc.)

Traveling direction (horizontal, vertical etc.)	
Running pattern	



#### 2. Other data (Fill the details on specific mechanism and its configurations in the following blank.)

Company name :
Department/Section :
Name :
Address :
Tel:
Fax:
E-mail address:

# **Request Sheet for Motor Selection**

# Request for motor selection V: Turntable drive

## 1. Driven mechanism and running data

1. Birvon moonamom ana rammig aata				
1)	Travel distance of the work load per one cycle	d <sub>1</sub> :	deg	
2)	Cycle time	to:	S	
(Fill in items 3) and 4) if required.)				
3)	Acceleration time	ta:	S	
4)	Deceleration time	td:	S	
5)	Stopping time	ts:	s	

6) Max. rotational speed of the table	v:	de

(or)	V:	r/s
( )		

D<sub>1</sub>:

 $W_1$ :

T<sub>1</sub>:

٥١	Mojaht of one work load	

Positioning accuracy of the

()	Weight of one work load	ľ
	Driving radius of the center	

9)	of gravity of the work	

10)	Diameter of the table
11)	Mass of the table

12)	Diameter of the table
12)	support

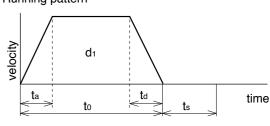
14)	Dimensions of
14)	work load

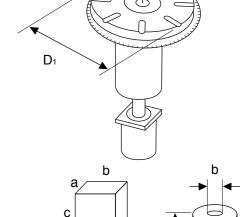
Prism			Cylinder	
a:	mm	a:	mm	
b:	mm	b:	mm	
c:	mm	c:	mm	
	_			

15) Number of work loads

a:	mm	a:	mm
<b>b</b> .		<b>b</b> .	
b:	mm	D.	mm
c:	mm	c:	mm
			200

Running pattern





# 2. Other data (Fill the details on specific mechanism and its configurations in the following blank.)

deg

kg

mm

mm

kg

mm

Company name :
Department/Section :
Name :
Address:
Tel:
Fax :
E-mail address:

Request for motor selection VII: Roller feed drive

# **Request Sheet for Motor Selection**

# Request for motor selection VI: Timing pulley + Turntable drive

# 1. Driven mechanism and running data

2) Cycle time	to:	s

to:	s

g		10)	Diameter	OI	ıne	pulle	У

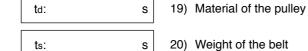
16)	Diameter of the pulley	

16)	Diameter of the pulley	D <sub>2</sub> :	mm	D <sub>3</sub> :	
17)	Weight of the pulley	W <sub>a</sub> :	kg	Wa:	

(or item 18) and 19))

3) Acceleration time	ta:	s
4) Deceleration time	ta:	s

(Fill in items 3) and 4) if required.)



5) Stopping time	ts:	s
May rotational speed of t	ho	

table		٧.	deg/3
	(or)	V:	r/s

7)	work load	±	deg
		I	

8) VV	eight of one work load	VV <sub>A</sub> :	кg
9) Dr	iving radius of the center gravity of the work	R <sub>1</sub> :	mm

3,		
<ol><li>Diameter of the table</li></ol>	D₁:	mm

11) Mass of the table	W <sub>1</sub> :	kg

12)	Diameter of the table support	T <sub>1</sub> :	mm
	• •		

13) Power supply voltage	V
<ol><li>Power supply voltage</li></ol>	V

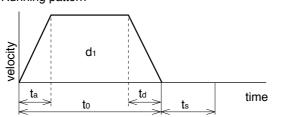
		(Prism)		(Cylinder)
Dimension of the work load	a:	mm	a:	mm
	b:	mm	b:	mm
	c:	mm	c:	mm
15) Number of work lo	ads			pcs

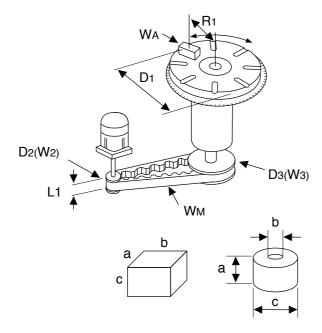
		Moto	or side	Turnta	able side
6)	Diameter of the pulley	D <sub>2</sub> :	mm	D <sub>3</sub> :	mm
7)	Weight of the pulley	W <sub>2</sub> :	kg	W <sub>3</sub> :	kg

18) Width of the pulley	L1:	mr
18) Width of the pulley	L1:	r

W <sub>M</sub> :	kg

# Running pattern





#### 2. Other data (Fill the details on specific mechanism and its configurations in the following blank.)

Company name :
Department/Section :
Name :
Address:
Tel:
Fax :
E-mail address:

# 1. Driven mechanism and running data

1)	Travel distance of the work load per one cycle	ℓ <sub>1</sub> : mm	Running pattern		
2)	Cycle time	to: s			
	(Fill in items 3) and 4) if required.)		lα (γelocity γelocity γelocit		
3)	Acceleration time	ta: s	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	ts time	- <del>2</del>
4)	Deceleration time	td: s	<		
5)	Stopping time	ts: s			
6)	Max. velocity	v: mm/s		F	
7)	External pulling force	F: N		Lı	
8)	Positioning accuracy of the work load	± mm		D <sub>1</sub> (W <sub>1</sub> )	
9)	Number of rollers	pcs			
10)	Power supply voltage	V	(or item 13) and 14))		
11)	Diameter of the roller	D <sub>1</sub> : mm	13) Width of the roller	L <sub>1</sub> :	mm
12)	Mass of the roller	W₁: kg	14) Material of the roller		

2. Other data (Fill the details on specific mechanism and its configurations in the following blank.)

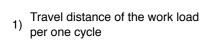
Company name :
Department/Section :
Name :
Address:
Tel:
Fax:
E-mail address:

# **Request Sheet for Motor Selection**

# Request for motor selection III: Driving with Rack & Pinion

Ν

#### 1. Driven mechanism and running data





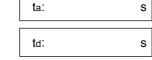
2) Cycle time

to: s

(Fill in items 3) and 4) if required.)

3) Acceleration time

4) Deceleration time



ts:

F:

5) Stopping time 6) Max. velocity

7) External force

work load

V:	mm/s

Positioning accuracy of the



9) Total weight of the work load

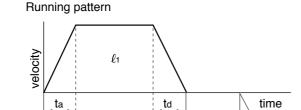


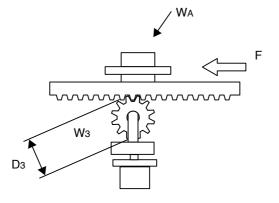
10) Power supply voltage 11) Diameter of the pinion



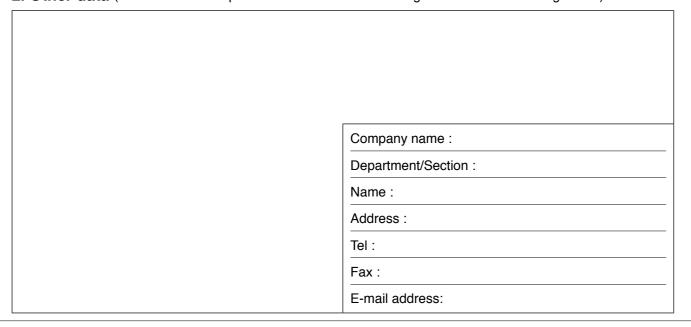
(horizontal, vertical, etc.)

 $W_3$ : 12) Mass of the pinion kg Traveling direction



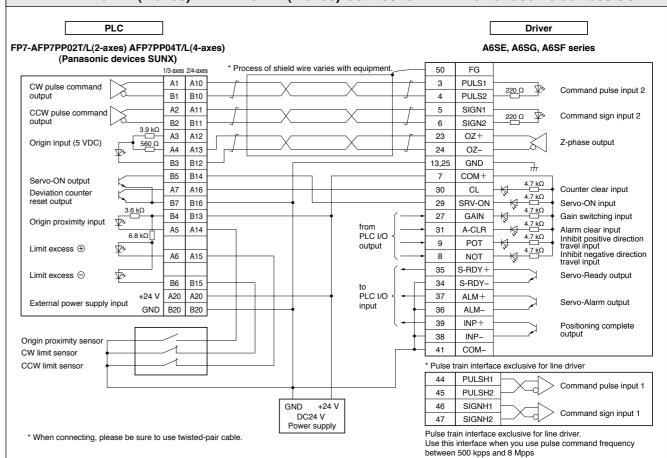


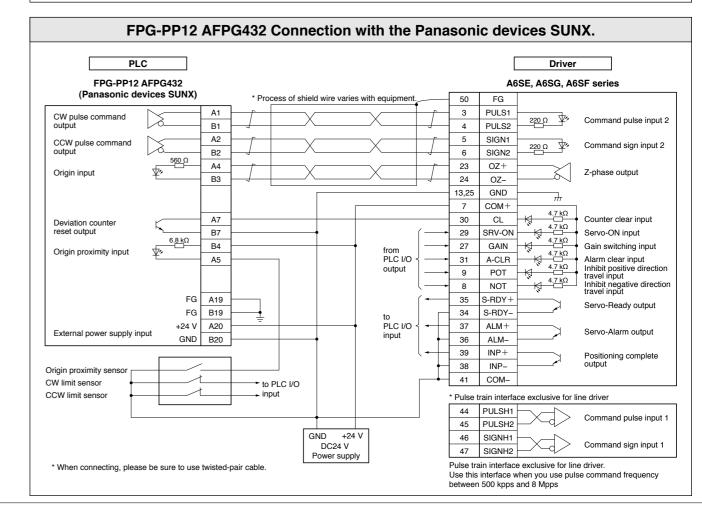
#### 2. Other data (Fill the details on specific mechanism and its configurations in the following blank.)

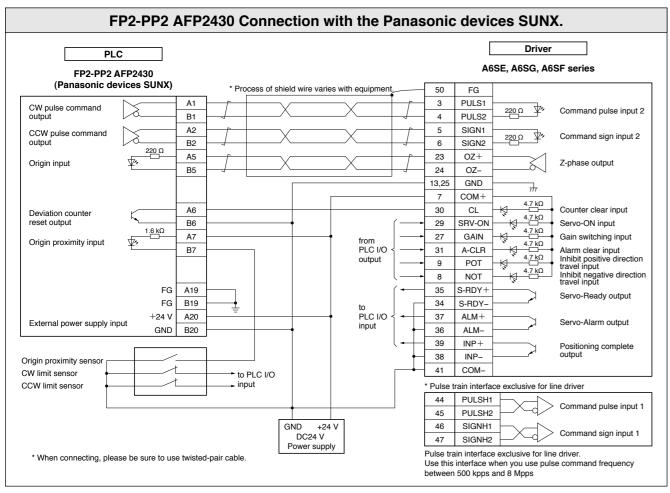


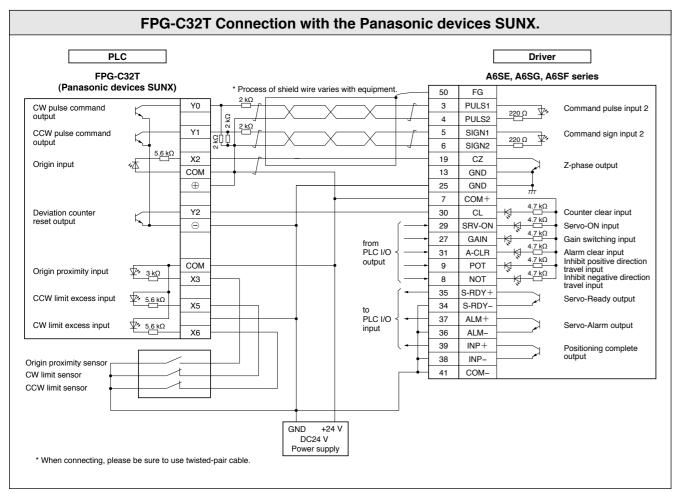
FP7-AFP7PP02T/L(2-axes) AFP7PP04T/L(4-axes) Connection with the Panasonic devices SUNX.

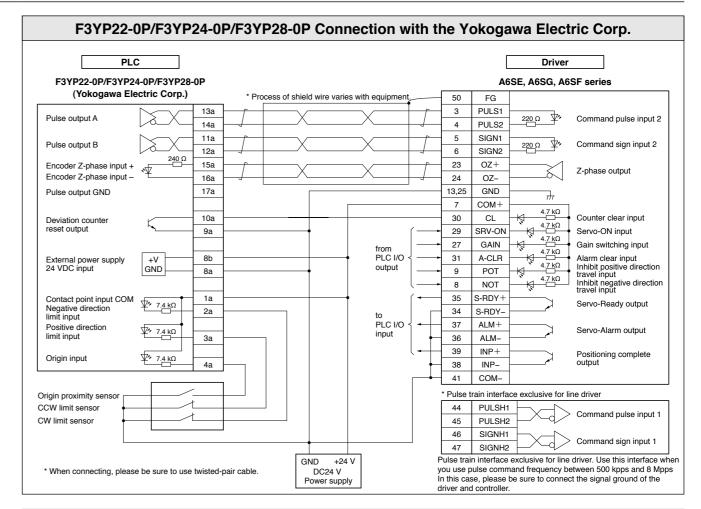
**Connection Between Driver and Controller** 

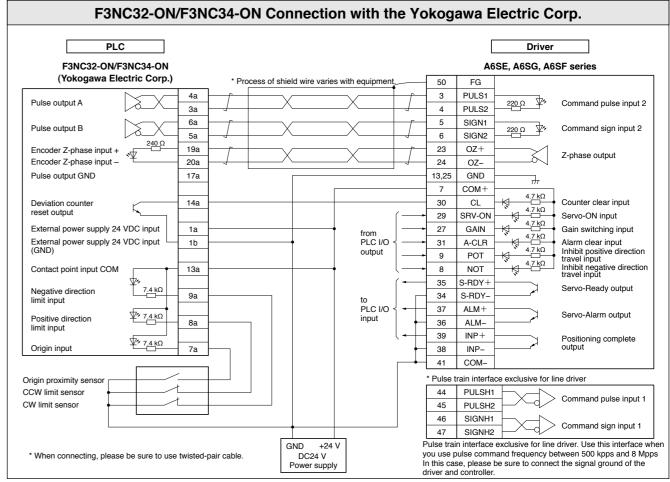




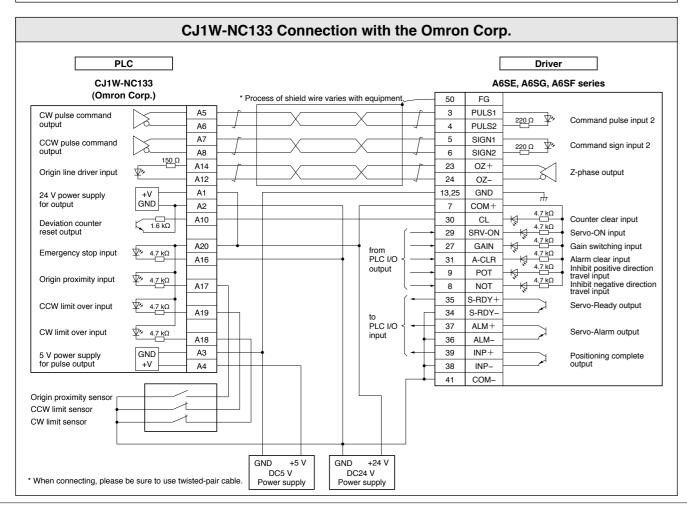


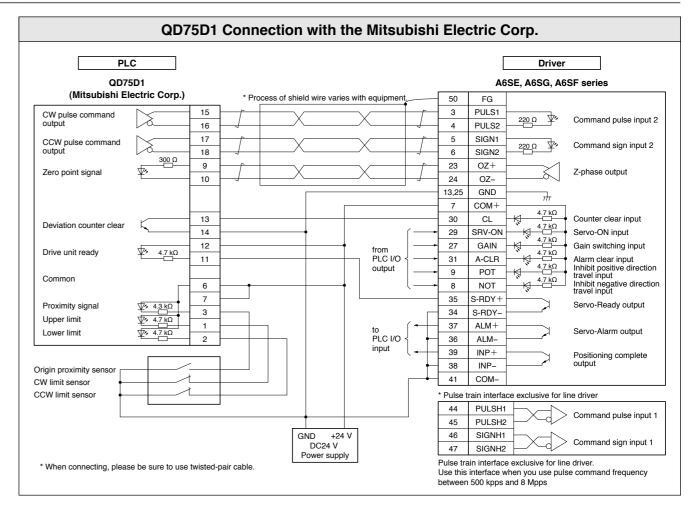


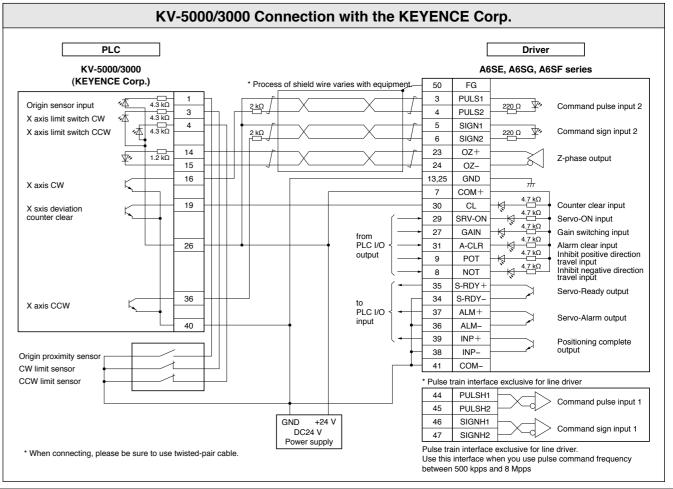




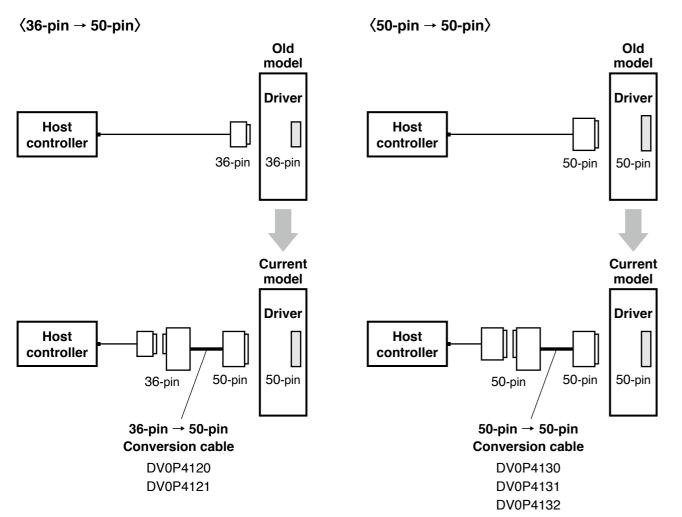
industrial.panasonic.com/ac/e/







For easier replacement of old driver (MINAS X/XX/V series) with A6 series, use the interface conversion connector.



When selecting the cable, refer to the table below because the part number of the cable is specific to the control mode of the old model.

Old model	Control mode	Conversion cable part No.	Conversion wiring table	
X series XX series	Position/velocity control	DV0P4120	P.394	
(36-pin)	Torque control	DV0P4121	7 F.394	
	Position control	DV0P4130	D 205	
V series (50-pin)	Velocity control	DV0P4131	P.395	
	Torque control	DV0P4132	P.396	

<sup>\*</sup> For external dimensions, refer to P.290.

# **Conversion Wiring Table**

		DV0P4120			DV0P4121			
Pin No. on Old Model	Pin No. on Current Model	Signal Name	Symbol	Pin No. on Current Model	Signal Name	Symbol		
1	23	Z-phase output	OZ+	23	Z-phase output	OZ+		
2	24	Z-phase output	OZ-	24	Z-phase output	OZ-		
3	13	Signal ground	GND	13	Signal ground	GND		
4	19	Z-phase output	CZ	19	Z-phase output	CZ		
5	4	Command pulse input 2	PULS2	4	Command pulse input 2	PULS2		
6	3	Command pulse input 2	PULS1	3	Command pulse input 2	PULS1		
7	6	Command pulse sign input 2	SIGN2	6	Command pulse sign input 2	SIGN2		
8	5	Command pulse sign input 2	SIGN1	5	Command pulse sign input 2	SIGN1		
9	33	Command pulse inhibition input	INH	33	Command pulse inhibition input	INH		
10	26	Speed zero clamp input	ZEROSPD	26	Speed zero clamp input	ZEROSPD		
11	7	Power supply for control signal (+)	COM+	7	Power supply for control signal (+)	COM+		
12	29	Servo-ON input	SRV-ON	29	Servo-ON input	SRV-ON		
13	30	Deviation counter clear input	CL	30	Deviation counter clear input	CL		
14	14	Speed command input	SPR	NC				
15	15	Signal ground	GND	15	Signal ground	GND		
16	43	Speed monitor output	SP	43	Speed monitor output	SP		
17	25	Signal ground	GND	25	Signal ground	GND		
18	50	Frame ground	FG	50	Frame ground	FG		
19	21	A-phase output	OA+	21	A-phase output	OA+		
20	22	A-phase output	OA-	22	A-phase output	OA-		
21	48	B-phase output	OB+	48	B-phase output	OB+		
22	49	B-phase output	OB-	49	B-phase output	OB-		
23	NC			NC				
24	NC			NC				
25	39	Positioning complete output Speed arrival output	COIN+ AT-SPEED+	39	Positioning complete output Speed arrival output	COIN+ AT-SPEED+		
26	37	Servo-Alarm output	ALM+	37	Servo-Alarm output	ALM+		
27	35	Servo-Ready output	S-RDY+	35	Servo-Ready output	S-RDY+		
	34	Positioning complete output (–) Speed arrival output (–)	COIN- AT-SPEED-	34	Positioning complete output (–) Speed arrival output (–)	COIN- AT-SPEED-		
28	36	Servo-Alarm output (-)	ALM-	36	Servo-Alarm output (–)	ALM-		
	38	Servo-Ready output (-)	S-RDY-	38	Servo-Ready output (-)	S-RDY-		
	41	Power supply for control signal (-)	COM-	41	Power supply for control signal (-)	COM-		
29	8	CW over-travel inhibit input	CWL	8	CW over-travel inhibit input	CWL		
30	9	CCW over-travel inhibit input	CCWL	9	CCW over-travel inhibit input	CCWL		
31	31	Alarm clear input	A-CLR	31	Alarm clear input	A-CLR		
32	32	Control mode switching input	C-MODE	32	Control mode switching input	C-MODE		
33	18	CW direction torque limit input	CWTL	18	CW direction torque limit input	CWTL		
34	16	CCW direction torque limit input	CCWTL	14	Torque command input	TRQR		
35	17	Signal ground	GND	17	Signal ground	GND		
36	42	Torque monitor output	IM	42	Torque monitor output	IM		

<sup>\* &</sup>quot;NC" is no connect.

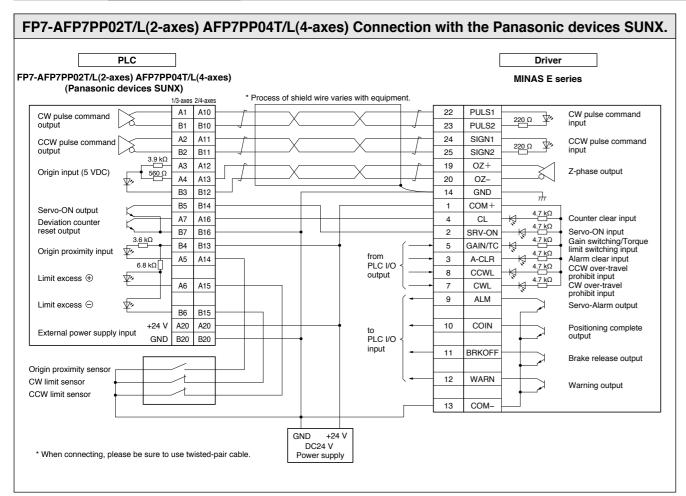
		DV0P4130 DV0P4131					
Pin No. on Old Model	Pin No. on Current Model	Signal Name	Symbol	Pin No. on Current Model	Signal Name	Symbol	
1	8	CW over-travel inhibit input	CWL	8	CW over-travel inhibit input	CWL	
2	9	CCW over-travel inhibit input	CCWL	9	CCW over-travel inhibit input	CCWL	
3	3	Command pulse input 2	PULS1	NC			
4	4	Command pulse input 2	PULS2	NC			
5	5	Command pulse sign input 2	SIGN1	NC			
6	6	Command pulse sign input 2	SIGN2	NC			
7	7	Power supply for control signal (+)	COM+	7	Power supply for control signal (+)	COM+	
8	NC			NC			
9	NC			NC			
10	NC			NC			
11	11	External brake release signal	BRK-OFF+	11	External brake release signal	BRK-OFF+	
12	12	Zero-speed detection output signal	ZSP	12	Zero-speed detection output signal	ZSP	
13	13	Torque in-limit signal output	TLC	13	Torque in-limit signal output	TLC	
14	NC			14	Speed command input	SPR	
15	15	Signal ground	GND	15	Signal ground	GND	
16	16	CCW direction torque limit input	CCWTL	16	CCW direction torque limit input	CCWTL	
17	17	Signal ground	GND	17	Signal ground	GND	
18	18	CW direction torque limit input	CWTL	18	CW direction torque limit input	CWTL	
19	19	Z-phase output	CZ	19	Z-phase output	CZ	
20	NC			NC			
21	21	A-phase output	OA+	21	A-phase output	OA+	
22	22	A-phase output	OA-	22	A-phase output	OA-	
23	23	Z-phase output	OZ+	23	Z-phase output	OZ+	
24	24	Z-phase output	OZ-	24	Z-phase output	OZ-	
25	50	Frame ground	FG	50	Frame ground	FG	
26	26	Speed zero clamp input	ZEROSPD	26	Speed zero clamp input	ZEROSPD	
27	27	Gain switching input	GAIN	27	Gain switching input	GAIN	
28	NC			33	Selection 1 input of internal command speed	INTSPD1	
29	29	Servo-ON input	SRV-ON	29	Servo-ON input	SRV-ON	
30	30	Deviation counter clear input	CL	NC		1	
31	31	Alarm clear input	A-CLR	31	Alarm clear input	A-CLR	
32	32	Control mode switching input	C-MODE	32	Control mode switching input	C-MODE	
33	33	Command pulse inhibition input	INH	NC			
34	NC	Our Park at the	0.000	NC	December 1911	0.000	
35	35	Servo-Ready output	S-RDY+	35	Servo-Ready output	S-RDY+	
36	NC			NC			
37	37 NC	Servo-Alarm output	ALM+	37	Servo-Alarm output	ALM+	
38	NC 20	Positioning complete sustaint	COIN	NC 20	Speed arrival output	AT ODEED	
39	39	Positioning complete output	COIN+	39	Speed arrival output	AT-SPEED+	
40	40	Torque in-limit signal output	TLC	40	Torque in-limit signal output	TLC	
	10	External brake release signal (–)	BRK-OFF-	10	External brake release signal (–)	BRK-OFF-	
A4	34	Positioning complete output (-)	COIN-	34	Speed arrival output (-)	AT-SPEED-	
41	36	Servo-Alarm output (–)	ALM-	36	Servo-Alarm output (-)	ALM-	
	38	Servo-Ready output (–)	S-RDY-	38	Servo-Ready output (–)	S-RDY-	
40	41	Power supply for control signal (–)	COM-	41	Power supply for control signal (–)	COM-	
42	42	Torque monitor output	IM SP	42	Torque monitor output	IM SP	
43	43	Speed monitor output		43	Speed monitor output		
44	25	Signal ground	GND	25	Signal ground	GND	
45	25	Signal ground	GND	25	Signal ground	GND	
46	25 NC	Signal ground	GND	25 NC	Signal ground	GND	
47	NC	D phase output	OB.	NC 40	D phase cutout	OR:	
40		B-phase output	OB+	48	B-phase output	OB+	
48 49	48 49	B-phase output	OB-	49	B-phase output	OB-	

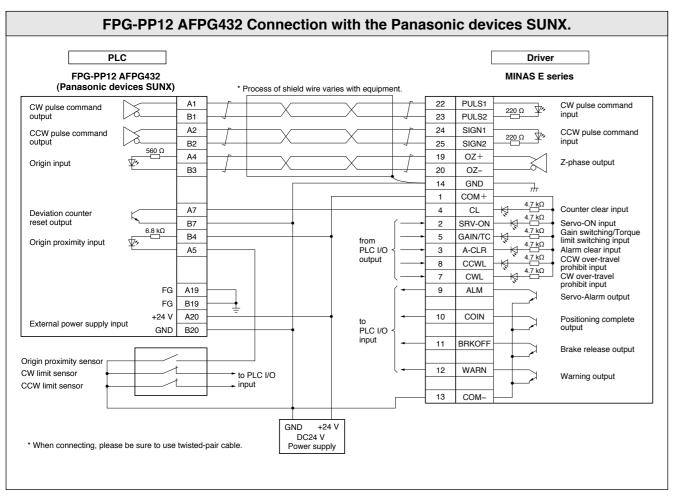
*	"NC"	is	no	connect.
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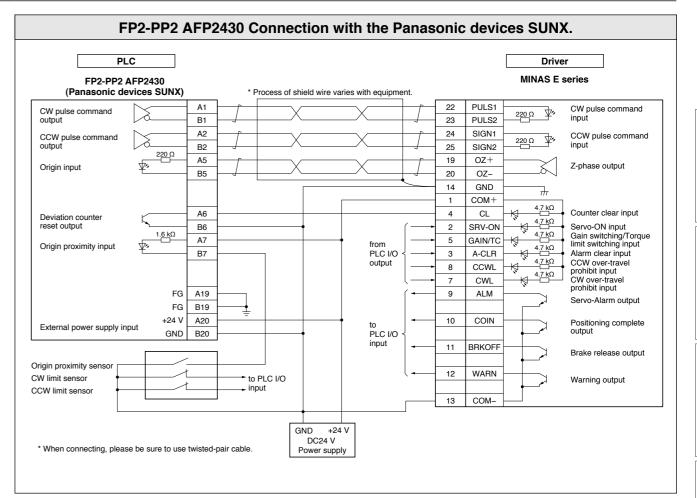
Pin No.	DV0P4132				
on Old Model	No. on Current Model	Signal Name	Symbol		
1	8	CW over-travel inhibit input	CWL		
2	9	CCW over-travel inhibit input	CCWL		
3	NC				
4	NC				
5	NC				
6	NC				
7	7	Power supply for control signal (+)	COM+		
8	NC				
9	NC				
10	NC				
11	11	External brake release signal	BRK-OFF+		
12	12	Zero-speed detection output signal	ZSP		
13	13	Torque in-limit signal output	TLC		
14	NC	O'control of	0.12		
15	15	Signal ground	GND		
16	16	Torque command input	TRQR		
17	17	Signal ground	GND		
18	18	CW direction torque limit input	CWTL		
19	19	Z-phase output	CZ		
20	NC				
21	21	A-phase output	OA+		
22	22	A-phase output	OA-		
23	23	Z-phase output	OZ+		
24	24	Z-phase output	OZ-		
25	50	Frame ground	FG		
26	26	Speed zero clamp input	ZEROSPD		
27	27	Gain switching input	GAIN		
28	NC	Carrie ON innet	ODV ON		
29	29	Servo-ON input	SRV-ON		
30	NC 01	Alorm cloor input	A CLD		
31	31	Alarm clear input	A-CLR		
32	32 NC	Control mode switching input	C-MODE		
34	NC				
35	35	Servo-Ready output	S-RDY+		
36	NC NC	Servo-neady output	3-ND1+		
37	37	Servo-Alarm output	ALM+		
38	NC	SS.70 / willin output	/ \LIVIT		
39	39	Speed arrival output	AT-SPEED+		
40	40	Torque in-limit signal output	TLC		
	10	External brake release signal (–)	BRK-OFF-		
	34	Speed arrival output (–)	AT-SPEED-		
41	36	Servo-Alarm output (–)	ALM-		
	38	Servo-Ready output (–)	S-RDY-		
	41	Power supply for control signal (–)	COM-		
42	42	Torque monitor output	IM		
43	43	Speed monitor output	SP		
44	25	Signal ground	GND		
45	25	Signal ground	GND		
46	25	Signal ground	GND		
47	NC	-			
48	48	B-phase output	OB+		
49	49	B-phase output	OB-		
50	50	Frame ground	FG		
* "NC" is	no coi	nnect			

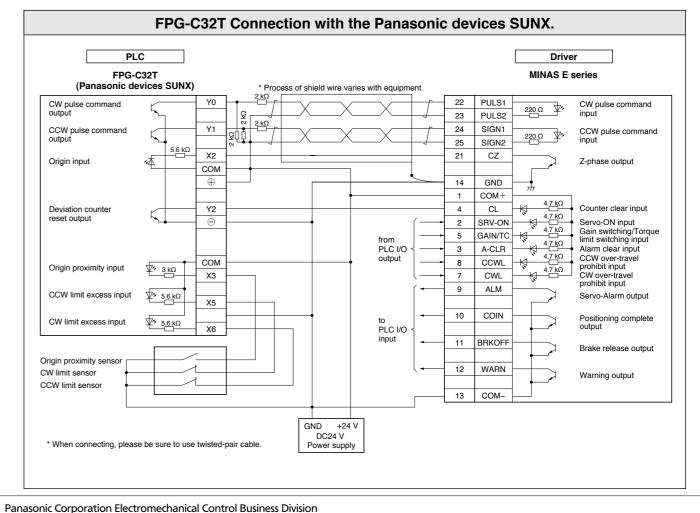
<sup>\* &</sup>quot;NC" is no connect.

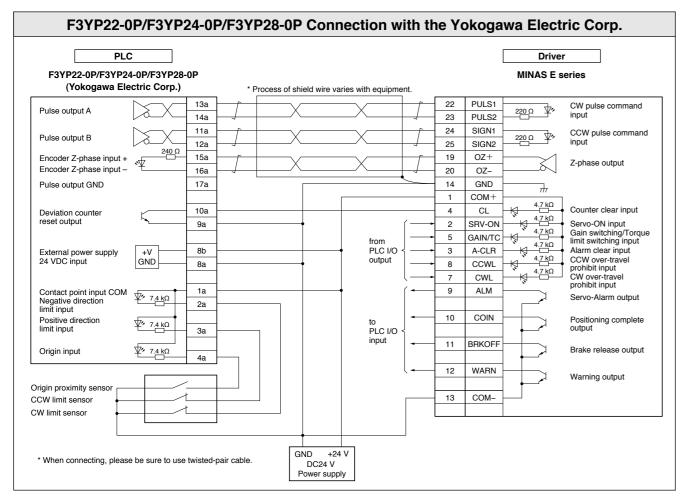
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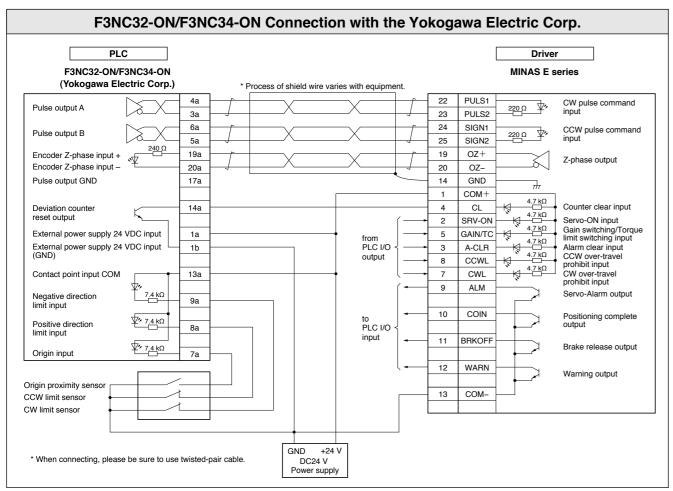




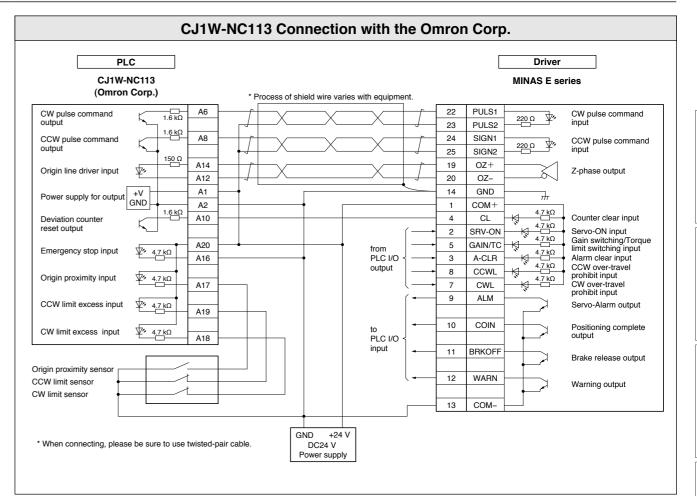


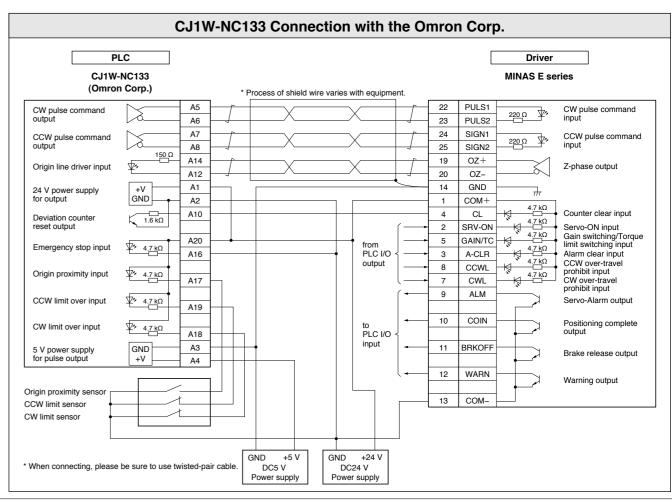






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MADLT05NF	A6NF series driver: A-frame	317,318
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MGMF132L1C5	MGMF 1.3 kW Motor	96
MGMF132L1C6	MGMF 1.3 kW Motor	96
MGMF132L1C6M	MGMF 1.3 kW Motor	217
MGMF132L1C7	MGMF 1.3 kW Motor	96
MGMF132L1C8	MGMF 1.3 kW Motor	96
MGMF132L1C8M	MGMF 1.3 kW Motor	217
MGMF132L1D5	MGMF 1.3 kW Motor	96
MGMF132L1D6	MGMF 1.3 kW Motor	96
MGMF132L1D6M	MGMF 1.3 kW Motor	217
MGMF132L1D7	MGMF 1.3 kW Motor	96
MGMF132L1D8	MGMF 1.3 kW Motor	96
MGMF132L1D8M	MGMF 1.3 kW Motor	217
MGMF132L1D6W	MGMF 1.3 kW Motor	96
MGMF132L1G6	MGMF 1.3 kW Motor	96
MGMF132L1G6 MGMF132L1G6M	MGMF 1.3 kW Motor	217
MGMF132L1G7	MGMF 1.3 kW Motor	96
MGMF132L1G8	MGMF 1.3 kW Motor	96
MGMF132L1G8M	MGMF 1.3 kW Motor	217
MGMF132L1H5	MGMF 1.3 kW Motor	96
MGMF132L1H6	MGMF 1.3 kW Motor	96
MGMF132L1H6M	MGMF 1.3 kW Motor	217
MGMF132L1H7	MGMF 1.3 kW Motor	96
MGMF132L1H8	MGMF 1.3 kW Motor	96
MGMF132L1H8M	MGMF 1.3 kW Motor	217
MGMF182L1C5	MGMF 1.8 kW Motor	97
MGMF182L1C6	MGMF 1.8 kW Motor	97
MGMF182L1C6M	MGMF 1.8 kW Motor	218
MGMF182L1C7	MGMF 1.8 kW Motor	97
MGMF182L1C8	MGMF 1.8 kW Motor	97
MGMF182L1C8M	MGMF 1.8 kW Motor	218
MGMF182L1D5	MGMF 1.8 kW Motor	97
MGMF182L1D6	MGMF 1.8 kW Motor	97
MGMF182L1D6M	MGMF 1.8 kW Motor	218
MGMF182L1D7	MGMF 1.8 kW Motor	97
MGMF182L1D8	MGMF 1.8 kW Motor	97
MGMF182L1D8M	MGMF 1.8 kW Motor	218
MGMF182L1G5	MGMF 1.8 kW Motor	97
MGMF182L1G5	MGMF 1.8 kW Motor	
	MGMF 1.8 kW Motor	97
MGMF182L1G6M		218
MGMF182L1G7	MGMF 1.8 kW Motor	97
MGMF182L1G8	MGMF 1.8 kW Motor	97
MGMF182L1G8M	MGMF 1.8 kW Motor	218
MGMF182L1H5	MGMF 1.8 kW Motor	97
MGMF182L1H6	MGMF 1.8 kW Motor	97
MGMF182L1H6M	MGMF 1.8 kW Motor	218
MGMF182L1H7	MGMF 1.8 kW Motor	97
MGMF182L1H8	MGMF 1.8 kW Motor	97
MGMF182L1H8M	MGMF 1.8 kW Motor	218
MGMF242L1C5	MGMF 2.4 kW Motor	98
MGMF242L1C6	MGMF 2.4 kW Motor	98
MGMF242L1C6M	MGMF 2.4 kW Motor	219
MGMF242L1C7	MGMF 2.4 kW Motor	98
MGMF242L1C8	MGMF 2.4 kW Motor	98
MGMF242L1C8M	MGMF 2.4 kW Motor	219
MGMF242L1D5	MGMF 2.4 kW Motor	98
MGMF242L1D6	MGMF 2.4 kW Motor	98
MGMF242L1D6M	MGMF 2.4 kW Motor	219
MGMF242L1D0W	MGMF 2.4 kW Motor	98
MGMF242L1D8	MGMF 2.4 kW Motor	98
MGMF242L1D8M	MGMF 2.4 kW Motor	219
MGMF242L1G5	MGMF 2.4 kW Motor	98

Part No.         Title         Page           MGMF242L1G6M         MGMF 2.4 kW Motor         219           MGMF242L1G8         MGMF 2.4 kW Motor         98           MGMF242L1G8         MGMF 2.4 kW Motor         219           MGMF242L1H5         MGMF 2.4 kW Motor         98           MGMF242L1H6         MGMF 2.4 kW Motor         98           MGMF242L1H6         MGMF 2.4 kW Motor         98           MGMF242L1H6         MGMF 2.4 kW Motor         98           MGMF242L1H8         MGMF 2.4 kW Motor         99           MGMF22L1C6         MGMF 2.9 kW Motor         99           MGMF292L1C6         MGMF 2.9 kW Motor         99           MGMF292L1C6         MGMF 2.9 kW Motor         99           MGMF292L1C8         MGMF 2.9 kW Motor         99           MGMF292L1C8         MGMF 2.9 kW Motor         99           MGMF292L1D6         MGMF 2.9 kW Motor         99           MGMF292L1D6         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         99     <	MGMF (Middle in	nertia/Low speed high torque)	
MGMF242L1G7         MGMF 2.4 kW Motor         98           MGMF242L1G8         MGMF 2.4 kW Motor         219           MGMF242L1H5         MGMF 2.4 kW Motor         219           MGMF242L1H6         MGMF 2.4 kW Motor         98           MGMF242L1H6         MGMF 2.4 kW Motor         219           MGMF242L1H7         MGMF 2.4 kW Motor         98           MGMF242L1H8         MGMF 2.4 kW Motor         98           MGMF242L1H8         MGMF 2.4 kW Motor         98           MGMF242L1H8M         MGMF 2.4 kW Motor         99           MGMF242L1H8M         MGMF 2.4 kW Motor         99           MGMF22L1C6         MGMF 2.9 kW Motor         99           MGMF222L1C6         MGMF 2.9 kW Motor         99           MGMF292L1C6         MGMF 2.9 kW Motor         99           MGMF292L1C8         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor <t< th=""><th>Part No.</th><th>Title</th><th>Page</th></t<>	Part No.	Title	Page
MGMF242L1G8         MGMF 2.4 kW Motor         219           MGMF242L1G8M         MGMF 2.4 kW Motor         219           MGMF242L1H6         MGMF 2.4 kW Motor         98           MGMF242L1H6         MGMF 2.4 kW Motor         98           MGMF242L1H6         MGMF 2.4 kW Motor         219           MGMF242L1H7         MGMF 2.4 kW Motor         98           MGMF242L1H8         MGMF 2.4 kW Motor         98           MGMF242L1H8         MGMF 2.4 kW Motor         99           MGMF292L1C5         MGMF 2.9 kW Motor         99           MGMF292L1C6         MGMF 2.9 kW Motor         99           MGMF292L1C6         MGMF 2.9 kW Motor         220           MGMF292L1C8         MGMF 2.9 kW Motor         99           MGMF292L1C8         MGMF 2.9 kW Motor         99           MGMF292L1C8         MGMF 2.9 kW Motor         99           MGMF292L1D6         MGMF 2.9 kW Motor         99           MGMF292L1D6         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         <	MGMF242L1G6M	MGMF 2.4 kW Motor	219
MGMF242L1G8M         MGMF 2.4 kW Motor         98           MGMF242L1H6         MGMF 2.4 kW Motor         98           MGMF242L1H6M         MGMF 2.4 kW Motor         219           MGMF242L1H7         MGMF 2.4 kW Motor         98           MGMF242L1H8         MGMF 2.4 kW Motor         98           MGMF242L1H8         MGMF 2.4 kW Motor         99           MGMF242L1B8         MGMF 2.9 kW Motor         99           MGMF292L1C5         MGMF 2.9 kW Motor         99           MGMF292L1C6M         MGMF 2.9 kW Motor         99           MGMF292L1C7         MGMF 2.9 kW Motor         99           MGMF292L1C8         MGMF 2.9 kW Motor         99           MGMF292L1DB         MGMF 2.9 kW Motor         99           MGMF292L1BM         MGMF 2.9 kW Motor         99           MGMF292L1GB         MGMF 2.9 kW Motor <t< td=""><td>MGMF242L1G7</td><td>MGMF 2.4 kW Motor</td><td>98</td></t<>	MGMF242L1G7	MGMF 2.4 kW Motor	98
MGMF242L1H5         MGMF 2.4 kW Motor         98           MGMF242L1H6M         MGMF 2.4 kW Motor         98           MGMF242L1H6M         MGMF 2.4 kW Motor         219           MGMF242L1H7         MGMF 2.4 kW Motor         98           MGMF242L1H8         MGMF 2.4 kW Motor         98           MGMF242L1H8M         MGMF 2.9 kW Motor         219           MGMF292L1C6         MGMF 2.9 kW Motor         99           MGMF292L1C6M         MGMF 2.9 kW Motor         99           MGMF292L1C7         MGMF 2.9 kW Motor         99           MGMF292L1C8         MGMF 2.9 kW Motor         99           MGMF292L1C8         MGMF 2.9 kW Motor         99           MGMF292L1C8M         MGMF 2.9 kW Motor         99           MGMF292L1DB         MGMF 2.9 kW Motor         99           MGMF292L1BB         MGMF 2.9 kW Motor         99           MGMF292L1BB         MGMF 2.9 kW Motor         99           MGMF292L1GB         MGMF 2.9 kW Motor	MGMF242L1G8	MGMF 2.4 kW Motor	98
MGMF242L1H6         MGMF 2.4 kW Motor         219           MGMF242L1H7         MGMF 2.4 kW Motor         98           MGMF242L1H7         MGMF 2.4 kW Motor         98           MGMF242L1H8         MGMF 2.4 kW Motor         219           MGMF242L1H8M         MGMF 2.9 kW Motor         219           MGMF292L1C5         MGMF 2.9 kW Motor         99           MGMF292L1C6         MGMF 2.9 kW Motor         99           MGMF292L1C6         MGMF 2.9 kW Motor         99           MGMF292L1C7         MGMF 2.9 kW Motor         99           MGMF292L1C8         MGMF 2.9 kW Motor         99           MGMF292L1C8         MGMF 2.9 kW Motor         99           MGMF292L1C8         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         99           MGMF292L1B8         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor <t< td=""><td>MGMF242L1G8M</td><td>MGMF 2.4 kW Motor</td><td>219</td></t<>	MGMF242L1G8M	MGMF 2.4 kW Motor	219
MGMF242L1H6M         MGMF 2.4 kW Motor         98           MGMF242L1H7         MGMF 2.4 kW Motor         98           MGMF242L1H8M         MGMF 2.4 kW Motor         219           MGMF242L1H8M         MGMF 2.4 kW Motor         219           MGMF292L1C5         MGMF 2.9 kW Motor         99           MGMF292L1C6M         MGMF 2.9 kW Motor         220           MGMF292L1C7         MGMF 2.9 kW Motor         99           MGMF292L1C8         MGMF 2.9 kW Motor         99           MGMF292L1C8M         MGMF 2.9 kW Motor         99           MGMF292L1C8M         MGMF 2.9 kW Motor         99           MGMF292L1D5         MGMF 2.9 kW Motor         99           MGMF292L1D6         MGMF 2.9 kW Motor         99           MGMF292L1D6         MGMF 2.9 kW Motor         99           MGMF292L1D7         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         99           MGMF292L1B6         MGMF 2.9 kW Motor         99           MGMF292L1B6         MGMF 2.9 kW Motor         99           MGMF292L1B6         MGMF 2.9 kW Motor	MGMF242L1H5	MGMF 2.4 kW Motor	98
MGMF242L1H7         MGMF 2.4 kW Motor         98           MGMF242L1H8M         MGMF 2.4 kW Motor         219           MGMF292L1C5         MGMF 2.9 kW Motor         99           MGMF292L1C6         MGMF 2.9 kW Motor         99           MGMF292L1C6         MGMF 2.9 kW Motor         99           MGMF292L1C6         MGMF 2.9 kW Motor         99           MGMF292L1C8         MGMF 2.9 kW Motor         99           MGMF292L1C8         MGMF 2.9 kW Motor         99           MGMF292L1C8         MGMF 2.9 kW Motor         99           MGMF292L1D5         MGMF 2.9 kW Motor         99           MGMF292L1D6         MGMF 2.9 kW Motor         99           MGMF292L1D7         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor	MGMF242L1H6	MGMF 2.4 kW Motor	98
MGMF242L1H8         MGMF 2.4 kW Motor         219           MGMF242L1H8M         MGMF 2.4 kW Motor         219           MGMF292L1C5         MGMF 2.9 kW Motor         99           MGMF292L1C6         MGMF 2.9 kW Motor         99           MGMF292L1C7         MGMF 2.9 kW Motor         99           MGMF292L1C8         MGMF 2.9 kW Motor         99           MGMF292L1C8M         MGMF 2.9 kW Motor         99           MGMF292L1D6         MGMF 2.9 kW Motor         99           MGMF292L1D6         MGMF 2.9 kW Motor         99           MGMF292L1D6         MGMF 2.9 kW Motor         99           MGMF292L1D7         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor <t< td=""><td>MGMF242L1H6M</td><td>MGMF 2.4 kW Motor</td><td>219</td></t<>	MGMF242L1H6M	MGMF 2.4 kW Motor	219
MGMF242L1H8M         MGMF 2.4 kW Motor         99           MGMF292L1C5         MGMF 2.9 kW Motor         99           MGMF292L1C6M         MGMF 2.9 kW Motor         99           MGMF292L1C6M         MGMF 2.9 kW Motor         99           MGMF292L1C7         MGMF 2.9 kW Motor         99           MGMF292L1C8         MGMF 2.9 kW Motor         99           MGMF292L1C8M         MGMF 2.9 kW Motor         99           MGMF292L1D5         MGMF 2.9 kW Motor         99           MGMF292L1D6         MGMF 2.9 kW Motor         99           MGMF292L1D6         MGMF 2.9 kW Motor         99           MGMF292L1D7         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1G8M         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         <	MGMF242L1H7	MGMF 2.4 kW Motor	98
MGMF292L1C5         MGMF 2.9 kW Motor         99           MGMF292L1C6         MGMF 2.9 kW Motor         99           MGMF292L1C6         MGMF 2.9 kW Motor         220           MGMF292L1C7         MGMF 2.9 kW Motor         99           MGMF292L1C8         MGMF 2.9 kW Motor         99           MGMF292L1C8M         MGMF 2.9 kW Motor         220           MGMF292L1D5         MGMF 2.9 kW Motor         99           MGMF292L1D6         MGMF 2.9 kW Motor         99           MGMF292L1D6         MGMF 2.9 kW Motor         99           MGMF292L1D7         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         99           MGMF292L1G5         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1B8         MGMF 2.9 kW Motor         99           MGMF292L1H6         MGMF 2.9 kW Motor <td< td=""><td>MGMF242L1H8</td><td>MGMF 2.4 kW Motor</td><td>98</td></td<>	MGMF242L1H8	MGMF 2.4 kW Motor	98
MGMF292L1C6         MGMF 2.9 kW Motor         220           MGMF292L1C6M         MGMF 2.9 kW Motor         220           MGMF292L1C8         MGMF 2.9 kW Motor         99           MGMF292L1C8M         MGMF 2.9 kW Motor         220           MGMF292L1C8M         MGMF 2.9 kW Motor         99           MGMF292L1D5         MGMF 2.9 kW Motor         99           MGMF292L1D6         MGMF 2.9 kW Motor         99           MGMF292L1D6M         MGMF 2.9 kW Motor         92           MGMF292L1D7         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         99           MGMF292L1G5         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor         90           MGMF292L1G7         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor	MGMF242L1H8M	MGMF 2.4 kW Motor	219
MGMF292L1C6M         MGMF 2.9 kW Motor         99           MGMF292L1C7         MGMF 2.9 kW Motor         99           MGMF292L1C8M         MGMF 2.9 kW Motor         99           MGMF292L1D8M         MGMF 2.9 kW Motor         99           MGMF292L1D6         MGMF 2.9 kW Motor         99           MGMF292L1D6         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1B         MGMF 2.9 kW Motor         99           MGMF292L1H6         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor	MGMF292L1C5	MGMF 2.9 kW Motor	99
MGMF292L1C7         MGMF 2.9 kW Motor         99           MGMF292L1C8         MGMF 2.9 kW Motor         99           MGMF292L1D5         MGMF 2.9 kW Motor         99           MGMF292L1D5         MGMF 2.9 kW Motor         99           MGMF292L1D6         MGMF 2.9 kW Motor         99           MGMF292L1D6         MGMF 2.9 kW Motor         220           MGMF292L1D7         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         99           MGMF292L1G5         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1H6         MGMF 2.9 kW Motor         99           MGMF292L1H6         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         9	MGMF292L1C6	MGMF 2.9 kW Motor	99
MGMF292L1C8         MGMF 2.9 kW Motor         220           MGMF292L1D5         MGMF 2.9 kW Motor         99           MGMF292L1D6         MGMF 2.9 kW Motor         99           MGMF292L1D6         MGMF 2.9 kW Motor         99           MGMF292L1D6         MGMF 2.9 kW Motor         220           MGMF292L1D6         MGMF 2.9 kW Motor         99           MGMF292L1D7         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         99           MGMF292L1G5         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1H6         MGMF 2.9 kW Motor         99           MGMF292L1H6         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF422L1C5         MGMF 4.4 kW Motor	MGMF292L1C6M	MGMF 2.9 kW Motor	220
MGMF292L1C8M         MGMF 2.9 kW Motor         99           MGMF292L1D5         MGMF 2.9 kW Motor         99           MGMF292L1D6         MGMF 2.9 kW Motor         99           MGMF292L1D6M         MGMF 2.9 kW Motor         99           MGMF292L1D7         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1H6         MGMF 2.9 kW Motor         99           MGMF292L1H6         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor	MGMF292L1C7	MGMF 2.9 kW Motor	99
MGMF292L1D5         MGMF 2.9 kW Motor         99           MGMF292L1D6         MGMF 2.9 kW Motor         220           MGMF292L1D6M         MGMF 2.9 kW Motor         99           MGMF292L1D7         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         99           MGMF292L1D8M         MGMF 2.9 kW Motor         220           MGMF292L1G5         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor         99           MGMF292L1G6M         MGMF 2.9 kW Motor         99           MGMF292L1G7         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1H6         MGMF 2.9 kW Motor         99           MGMF292L1H6         MGMF 2.9 kW Motor         99           MGMF292L1H6         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         <	MGMF292L1C8	MGMF 2.9 kW Motor	99
MGMF292L1D6         MGMF 2.9 kW Motor         220           MGMF292L1D6M         MGMF 2.9 kW Motor         220           MGMF292L1D7         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         99           MGMF292L1D8M         MGMF 2.9 kW Motor         99           MGMF292L1G5         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor         99           MGMF292L1G6M         MGMF 2.9 kW Motor         99           MGMF292L1G7         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1B8         MGMF 2.9 kW Motor         99           MGMF292L1H5         MGMF 2.9 kW Motor         99           MGMF292L1H6         MGMF 2.9 kW Motor         99           MGMF292L1H7         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF42L1C6         MGMF 4.4 kW Motor         100           MGMF442L1C6         MGMF 4.4 kW Motor         <	MGMF292L1C8M	MGMF 2.9 kW Motor	220
MGMF292L1D6M         MGMF 2.9 kW Motor         99           MGMF292L1D7         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         220           MGMF292L1D8M         MGMF 2.9 kW Motor         99           MGMF292L1G5         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor         220           MGMF292L1G6         MGMF 2.9 kW Motor         99           MGMF292L1G8M         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1B         MGMF 2.9 kW Motor         99           MGMF292L1H6         MGMF 2.9 kW Motor         99           MGMF292L1H6         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         90           MGMF42L1C6         MGMF 4.4 kW Motor         100           MGMF442L1C6         MGMF 4.4 kW Motor <t< td=""><td>MGMF292L1D5</td><td>MGMF 2.9 kW Motor</td><td>99</td></t<>	MGMF292L1D5	MGMF 2.9 kW Motor	99
MGMF292L1D7         MGMF 2.9 kW Motor         99           MGMF292L1D8         MGMF 2.9 kW Motor         220           MGMF292L1G5         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor         99           MGMF292L1G7         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1H5         MGMF 2.9 kW Motor         99           MGMF292L1H6         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF422L1C5         MGMF 4.4 kW Motor         100           MGMF442L1C6         MGMF 4.4 kW Motor         100           MGMF442L1C6         MGMF 4.4 kW Motor <td< td=""><td>MGMF292L1D6</td><td>MGMF 2.9 kW Motor</td><td>99</td></td<>	MGMF292L1D6	MGMF 2.9 kW Motor	99
MGMF292L1D8         MGMF 2.9 kW Motor         220           MGMF292L1G5         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor         220           MGMF292L1G6         MGMF 2.9 kW Motor         99           MGMF292L1G7         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1G8M         MGMF 2.9 kW Motor         99           MGMF292L1H5         MGMF 2.9 kW Motor         99           MGMF292L1H6         MGMF 2.9 kW Motor         99           MGMF292L1H6         MGMF 2.9 kW Motor         99           MGMF292L1H6         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF442L1C5         MGMF 4.4 kW Motor         100           MGMF442L1C6         MGMF 4.4 kW Motor         100           MGMF442L1C6         MGMF 4.4 kW Motor         <	MGMF292L1D6M	MGMF 2.9 kW Motor	220
MGMF292L1D8M         MGMF 2.9 kW Motor         99           MGMF292L1G5         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor         99           MGMF292L1G6M         MGMF 2.9 kW Motor         99           MGMF292L1G7         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1G8M         MGMF 2.9 kW Motor         99           MGMF292L1H5         MGMF 2.9 kW Motor         99           MGMF292L1H6         MGMF 2.9 kW Motor         99           MGMF292L1H6         MGMF 2.9 kW Motor         99           MGMF292L1H7         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF422L1C5         MGMF 4.4 kW Motor         100           MGMF442L1C5         MGMF 4.4 kW Motor         100           MGMF442L1C6         MGMF 4.4 kW Motor         100           MGMF442L1C8         MGMF 4.4 kW Motor         100           MGMF442L1D6         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor	MGMF292L1D7	MGMF 2.9 kW Motor	99
MGMF292L1G5         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor         99           MGMF292L1G6M         MGMF 2.9 kW Motor         220           MGMF292L1G7         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         220           MGMF292L1G8M         MGMF 2.9 kW Motor         99           MGMF292L1H5         MGMF 2.9 kW Motor         99           MGMF292L1H6         MGMF 2.9 kW Motor         99           MGMF292L1H7         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF442L1C5         MGMF 4.4 kW Motor         100           MGMF442L1C6         MGMF 4.4 kW Motor         100           MGMF442L1C6         MGMF 4.4 kW Motor         100           MGMF442L1C8         MGMF 4.4 kW Motor         100           MGMF442L1C8         MGMF 4.4 kW Motor         100           MGMF442L1D6         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor	MGMF292L1D8	MGMF 2.9 kW Motor	99
MGMF292L1G5         MGMF 2.9 kW Motor         99           MGMF292L1G6         MGMF 2.9 kW Motor         99           MGMF292L1G6M         MGMF 2.9 kW Motor         220           MGMF292L1G7         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         220           MGMF292L1G8M         MGMF 2.9 kW Motor         99           MGMF292L1H5         MGMF 2.9 kW Motor         99           MGMF292L1H6         MGMF 2.9 kW Motor         99           MGMF292L1H7         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF442L1C5         MGMF 4.4 kW Motor         100           MGMF442L1C6         MGMF 4.4 kW Motor         100           MGMF442L1C6         MGMF 4.4 kW Motor         100           MGMF442L1C8         MGMF 4.4 kW Motor         100           MGMF442L1C8         MGMF 4.4 kW Motor         100           MGMF442L1D6         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor			
MGMF292L1G6         MGMF 2.9 kW Motor         220           MGMF292L1G7         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         220           MGMF292L1H5         MGMF 2.9 kW Motor         99           MGMF292L1H6         MGMF 2.9 kW Motor         99           MGMF292L1H6         MGMF 2.9 kW Motor         99           MGMF292L1H7         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF292L1H8M         MGMF 2.9 kW Motor         99           MGMF442L1C5         MGMF 4.4 kW Motor         100           MGMF442L1C6         MGMF 4.4 kW Motor         100           MGMF442L1C6         MGMF 4.4 kW Motor         100           MGMF442L1C8         MGMF 4.4 kW Motor         100           MGMF442L1C8         MGMF 4.4 kW Motor         100           MGMF442L1D6         MGMF 4.4 kW Motor         100           MGMF442L1D6         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor	MGMF292L1G5		99
MGMF292L1G6M         MGMF 2.9 kW Motor         99           MGMF292L1G7         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1G8M         MGMF 2.9 kW Motor         220           MGMF292L1H5         MGMF 2.9 kW Motor         99           MGMF292L1H6         MGMF 2.9 kW Motor         99           MGMF292L1H6M         MGMF 2.9 kW Motor         99           MGMF292L1H7         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF292L1H8M         MGMF 2.9 kW Motor         99           MGMF442L1C5         MGMF 4.4 kW Motor         100           MGMF442L1C6         MGMF 4.4 kW Motor         100           MGMF442L1C6M         MGMF 4.4 kW Motor         100           MGMF442L1C8         MGMF 4.4 kW Motor         100           MGMF442L1C8         MGMF 4.4 kW Motor         100           MGMF442L1D5         MGMF 4.4 kW Motor         100           MGMF442L1D6         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor	MGMF292L1G6	MGMF 2.9 kW Motor	
MGMF292L1G7         MGMF 2.9 kW Motor         99           MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1G8M         MGMF 2.9 kW Motor         220           MGMF292L1H5         MGMF 2.9 kW Motor         99           MGMF292L1H6         MGMF 2.9 kW Motor         99           MGMF292L1H6M         MGMF 2.9 kW Motor         99           MGMF292L1H7         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF292L1H8M         MGMF 2.9 kW Motor         220           MGMF442L1C5         MGMF 4.4 kW Motor         100           MGMF442L1C6         MGMF 4.4 kW Motor         100           MGMF442L1C6M         MGMF 4.4 kW Motor         100           MGMF442L1C8         MGMF 4.4 kW Motor         100           MGMF442L1C8M         MGMF 4.4 kW Motor         100           MGMF442L1D5         MGMF 4.4 kW Motor         100           MGMF442L1D6         MGMF 4.4 kW Motor         100           MGMF442L1D6         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor <td></td> <td>MGMF 2.9 kW Motor</td> <td></td>		MGMF 2.9 kW Motor	
MGMF292L1G8         MGMF 2.9 kW Motor         99           MGMF292L1G8M         MGMF 2.9 kW Motor         220           MGMF292L1H5         MGMF 2.9 kW Motor         99           MGMF292L1H6         MGMF 2.9 kW Motor         220           MGMF292L1H6M         MGMF 2.9 kW Motor         99           MGMF292L1H7         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF292L1H8M         MGMF 2.9 kW Motor         220           MGMF442L1C5         MGMF 4.4 kW Motor         100           MGMF442L1C6         MGMF 4.4 kW Motor         100           MGMF442L1C6M         MGMF 4.4 kW Motor         221           MGMF442L1C7         MGMF 4.4 kW Motor         100           MGMF442L1C8         MGMF 4.4 kW Motor         100           MGMF442L1D5         MGMF 4.4 kW Motor         221           MGMF442L1D6         MGMF 4.4 kW Motor         100           MGMF442L1D6         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor         100           MGMF442L1G6         MGMF 4.4 kW Motor </td <td></td> <td></td> <td></td>			
MGMF292L1G8M         MGMF 2.9 kW Motor         99           MGMF292L1H5         MGMF 2.9 kW Motor         99           MGMF292L1H6         MGMF 2.9 kW Motor         99           MGMF292L1H6M         MGMF 2.9 kW Motor         220           MGMF292L1H7         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         220           MGMF292L1H8M         MGMF 2.9 kW Motor         220           MGMF442L1C5         MGMF 4.4 kW Motor         100           MGMF442L1C6         MGMF 4.4 kW Motor         100           MGMF442L1C6M         MGMF 4.4 kW Motor         221           MGMF442L1C7         MGMF 4.4 kW Motor         100           MGMF442L1C8         MGMF 4.4 kW Motor         100           MGMF442L1D5         MGMF 4.4 kW Motor         221           MGMF442L1D6         MGMF 4.4 kW Motor         100           MGMF442L1D6         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor         221           MGMF442L1D8         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor         100           MGMF442L1G6         MGMF 4.4 kW Motor         100           MGMF442L1G6         MGMF 4.4 kW Motor<	MGMF292L1G8		
MGMF292L1H5         MGMF 2.9 kW Motor         99           MGMF292L1H6         MGMF 2.9 kW Motor         99           MGMF292L1H6M         MGMF 2.9 kW Motor         220           MGMF292L1H7         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         220           MGMF292L1H8M         MGMF 2.9 kW Motor         100           MGMF442L1C5         MGMF 4.4 kW Motor         100           MGMF442L1C6         MGMF 4.4 kW Motor         100           MGMF442L1C7         MGMF 4.4 kW Motor         100           MGMF442L1C8         MGMF 4.4 kW Motor         100           MGMF442L1C8M         MGMF 4.4 kW Motor         221           MGMF442L1D5         MGMF 4.4 kW Motor         100           MGMF442L1D6         MGMF 4.4 kW Motor         100           MGMF442L1D6         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor         100           MGMF442L1G6         MGMF 4.4 kW Motor         100           MGMF442L1G6         MGMF 4.4 kW Motor<			
MGMF292L1H6         MGMF 2.9 kW Motor         99           MGMF292L1H6M         MGMF 2.9 kW Motor         220           MGMF292L1H7         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         220           MGMF292L1H8M         MGMF 2.9 kW Motor         100           MGMF442L1C5         MGMF 4.4 kW Motor         100           MGMF442L1C6         MGMF 4.4 kW Motor         100           MGMF442L1C6M         MGMF 4.4 kW Motor         100           MGMF442L1C7         MGMF 4.4 kW Motor         100           MGMF442L1C8         MGMF 4.4 kW Motor         100           MGMF442L1C8M         MGMF 4.4 kW Motor         221           MGMF442L1D5         MGMF 4.4 kW Motor         100           MGMF442L1D6         MGMF 4.4 kW Motor         100           MGMF442L1D6         MGMF 4.4 kW Motor         100           MGMF442L1D7         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor         100           MGMF442L1G6         MGMF 4.4 kW Moto	MGMF292L1H5	MGMF 2.9 kW Motor	
MGMF292L1H6M         MGMF 2.9 kW Motor         220           MGMF292L1H7         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         220           MGMF292L1H8M         MGMF 2.9 kW Motor         100           MGMF442L1C5         MGMF 4.4 kW Motor         100           MGMF442L1C6         MGMF 4.4 kW Motor         221           MGMF442L1C7         MGMF 4.4 kW Motor         100           MGMF442L1C8         MGMF 4.4 kW Motor         100           MGMF442L1C8         MGMF 4.4 kW Motor         100           MGMF442L1D5         MGMF 4.4 kW Motor         100           MGMF442L1D6         MGMF 4.4 kW Motor         100           MGMF442L1D6         MGMF 4.4 kW Motor         100           MGMF442L1D7         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor         100           MGMF442L1G6         MGMF 4.4 kW Motor         100           MGMF442L1G6         MGMF 4.4 kW Motor         100           MGMF442L1G6         MGMF 4.4 kW Motor         100           MGMF442L1G8         MGMF 4.4 kW Motor         100           MGMF442L1G8         MGMF 4.4 kW Motor			
MGMF292L1H7         MGMF 2.9 kW Motor         99           MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF292L1H8M         MGMF 2.9 kW Motor         220           MGMF442L1C5         MGMF 4.4 kW Motor         100           MGMF442L1C6         MGMF 4.4 kW Motor         100           MGMF442L1C6M         MGMF 4.4 kW Motor         100           MGMF442L1C7         MGMF 4.4 kW Motor         100           MGMF442L1C8         MGMF 4.4 kW Motor         100           MGMF442L1C8M         MGMF 4.4 kW Motor         221           MGMF442L1D5         MGMF 4.4 kW Motor         100           MGMF442L1D6         MGMF 4.4 kW Motor         100           MGMF442L1D6         MGMF 4.4 kW Motor         100           MGMF442L1D7         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor         100           MGMF442L1G5         MGMF 4.4 kW Motor         100           MGMF442L1G6         MGMF 4.4 kW Motor         100           MGMF442L1G8         MGMF 4.4 kW Motor         100           MGMF442L1G8         MGMF 4.4 kW Motor         100           MGMF442L1G8         MGMF 4.4 kW Motor			
MGMF292L1H8         MGMF 2.9 kW Motor         99           MGMF292L1H8M         MGMF 2.9 kW Motor         220           MGMF442L1C5         MGMF 4.4 kW Motor         100           MGMF442L1C6         MGMF 4.4 kW Motor         100           MGMF442L1C6M         MGMF 4.4 kW Motor         221           MGMF442L1C7         MGMF 4.4 kW Motor         100           MGMF442L1C8         MGMF 4.4 kW Motor         100           MGMF442L1C8M         MGMF 4.4 kW Motor         221           MGMF442L1D5         MGMF 4.4 kW Motor         100           MGMF442L1D6         MGMF 4.4 kW Motor         100           MGMF442L1D7         MGMF 4.4 kW Motor         221           MGMF442L1D8         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor         100           MGMF442L1G5         MGMF 4.4 kW Motor         100           MGMF442L1G6         MGMF 4.4 kW Motor         100           MGMF442L1G6         MGMF 4.4 kW Motor         100           MGMF442L1G8         MGMF 4.4 kW Moto			
MGMF292L1H8M         MGMF 2.9 kW Motor         220           MGMF442L1C5         MGMF 4.4 kW Motor         100           MGMF442L1C6         MGMF 4.4 kW Motor         100           MGMF442L1C6M         MGMF 4.4 kW Motor         221           MGMF442L1C7         MGMF 4.4 kW Motor         100           MGMF442L1C8         MGMF 4.4 kW Motor         100           MGMF442L1C8M         MGMF 4.4 kW Motor         221           MGMF442L1D5         MGMF 4.4 kW Motor         100           MGMF442L1D6         MGMF 4.4 kW Motor         100           MGMF442L1D6M         MGMF 4.4 kW Motor         221           MGMF442L1D7         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor         100           MGMF442L1G5         MGMF 4.4 kW Motor         100           MGMF442L1G6         MGMF 4.4 kW Motor         100           MGMF442L1G6M         MGMF 4.4 kW Motor         100           MGMF442L1G8         MGMF 4.4 kW M			
MGMF442L1C5         MGMF 4.4 kW Motor         100           MGMF442L1C6         MGMF 4.4 kW Motor         100           MGMF442L1C6M         MGMF 4.4 kW Motor         221           MGMF442L1C7         MGMF 4.4 kW Motor         100           MGMF442L1C8         MGMF 4.4 kW Motor         100           MGMF442L1C8M         MGMF 4.4 kW Motor         221           MGMF442L1D5         MGMF 4.4 kW Motor         100           MGMF442L1D6         MGMF 4.4 kW Motor         100           MGMF442L1D6M         MGMF 4.4 kW Motor         221           MGMF442L1D7         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor         100           MGMF442L1G5         MGMF 4.4 kW Motor         100           MGMF442L1G6         MGMF 4.4 kW Motor         100           MGMF442L1G6M         MGMF 4.4 kW Motor         100           MGMF442L1G7         MGMF 4.4 kW Motor         100           MGMF442L1G8         MGMF 4.4 kW Mo			
MGMF442L1C6         MGMF 4.4 kW Motor         100           MGMF442L1C6M         MGMF 4.4 kW Motor         221           MGMF442L1C7         MGMF 4.4 kW Motor         100           MGMF442L1C8         MGMF 4.4 kW Motor         100           MGMF442L1C8M         MGMF 4.4 kW Motor         221           MGMF442L1D5         MGMF 4.4 kW Motor         100           MGMF442L1D6         MGMF 4.4 kW Motor         100           MGMF442L1D6M         MGMF 4.4 kW Motor         221           MGMF442L1D7         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor         100           MGMF442L1D8M         MGMF 4.4 kW Motor         221           MGMF442L1G5         MGMF 4.4 kW Motor         100           MGMF442L1G6         MGMF 4.4 kW Motor         100           MGMF442L1G6M         MGMF 4.4 kW Motor         221           MGMF442L1G7         MGMF 4.4 kW Motor         100           MGMF442L1G8         MGMF 4.4 kW Motor         100           MGMF442L1G8         MGMF 4.4 kW Motor         100           MGMF442L1G8         MGMF 4.4 kW Motor         100			
MGMF442L1C6M         MGMF 4.4 kW Motor         221           MGMF442L1C7         MGMF 4.4 kW Motor         100           MGMF442L1C8         MGMF 4.4 kW Motor         100           MGMF442L1C8M         MGMF 4.4 kW Motor         221           MGMF442L1D5         MGMF 4.4 kW Motor         100           MGMF442L1D6         MGMF 4.4 kW Motor         100           MGMF442L1D6M         MGMF 4.4 kW Motor         221           MGMF442L1D7         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor         100           MGMF442L1D8M         MGMF 4.4 kW Motor         221           MGMF442L1G5         MGMF 4.4 kW Motor         100           MGMF442L1G6         MGMF 4.4 kW Motor         100           MGMF442L1G6M         MGMF 4.4 kW Motor         221           MGMF442L1G7         MGMF 4.4 kW Motor         100           MGMF442L1G8         MGMF 4.4 kW Motor         100			
MGMF442L1C7         MGMF 4.4 kW Motor         100           MGMF442L1C8         MGMF 4.4 kW Motor         100           MGMF442L1C8M         MGMF 4.4 kW Motor         221           MGMF442L1D5         MGMF 4.4 kW Motor         100           MGMF442L1D6         MGMF 4.4 kW Motor         100           MGMF442L1D6M         MGMF 4.4 kW Motor         221           MGMF442L1D7         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor         100           MGMF442L1D8M         MGMF 4.4 kW Motor         221           MGMF442L1G5         MGMF 4.4 kW Motor         100           MGMF442L1G6         MGMF 4.4 kW Motor         100           MGMF442L1G6M         MGMF 4.4 kW Motor         221           MGMF442L1G7         MGMF 4.4 kW Motor         100           MGMF442L1G8         MGMF 4.4 kW Motor         100			
MGMF442L1C8         MGMF 4.4 kW Motor         100           MGMF442L1C8M         MGMF 4.4 kW Motor         221           MGMF442L1D5         MGMF 4.4 kW Motor         100           MGMF442L1D6         MGMF 4.4 kW Motor         100           MGMF442L1D6M         MGMF 4.4 kW Motor         221           MGMF442L1D7         MGMF 4.4 kW Motor         100           MGMF442L1D8         MGMF 4.4 kW Motor         100           MGMF442L1D8M         MGMF 4.4 kW Motor         221           MGMF442L1G5         MGMF 4.4 kW Motor         100           MGMF442L1G6         MGMF 4.4 kW Motor         100           MGMF442L1G6M         MGMF 4.4 kW Motor         221           MGMF442L1G7         MGMF 4.4 kW Motor         100           MGMF442L1G8         MGMF 4.4 kW Motor         100           MGMF442L1G8         MGMF 4.4 kW Motor         100           MGMF442L1G8         MGMF 4.4 kW Motor         100           MGMF442L1G8M         MGMF 4.4 kW Motor         221			
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MGMF442L1D8         MGMF 4.4 kW Motor         100           MGMF442L1D8M         MGMF 4.4 kW Motor         221           MGMF442L1G5         MGMF 4.4 kW Motor         100           MGMF442L1G6         MGMF 4.4 kW Motor         100           MGMF442L1G6M         MGMF 4.4 kW Motor         221           MGMF442L1G7         MGMF 4.4 kW Motor         100           MGMF442L1G8         MGMF 4.4 kW Motor         100           MGMF442L1G8M         MGMF 4.4 kW Motor         221			
MGMF442L1D8M       MGMF 4.4 kW Motor       221         MGMF442L1G5       MGMF 4.4 kW Motor       100         MGMF442L1G6       MGMF 4.4 kW Motor       100         MGMF442L1G6M       MGMF 4.4 kW Motor       221         MGMF442L1G7       MGMF 4.4 kW Motor       100         MGMF442L1G8       MGMF 4.4 kW Motor       100         MGMF442L1G8M       MGMF 4.4 kW Motor       221			
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MGMF442L1G6         MGMF 4.4 kW Motor         100           MGMF442L1G6M         MGMF 4.4 kW Motor         221           MGMF442L1G7         MGMF 4.4 kW Motor         100           MGMF442L1G8         MGMF 4.4 kW Motor         100           MGMF442L1G8M         MGMF 4.4 kW Motor         221			
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MHMF042L1A2	MHMF 400 W 200 V Motor	80
MHMF042L1A2M	MHMF 400 W 200 V Motor	201
MHMF042L1B1	MHMF 400 W 200 V Motor	80
MHMF042L1B2	MHMF 400 W 200 V Motor	80
MHMF042L1B2M	MHMF 400 W 200 V Motor MHMF 400 W 200 V Motor	201
MHMF042L1C1	MHMF 400 W 200 V Motor	80
MHMF042L1C2		80
MHMF042L1C2M MHMF042L1C3	MHMF 400 W 200 V Motor MHMF 400 W 200 V Motor	201
VII IIVII U4/1 1(4)	I IVII IIVII 400 VV ZUU V IVIULUI	80

MHMF (High ine	<u> </u>	Decr
Part No.	Title	Page
MHMF042L1C4M	MHMF 400 W 200 V Motor	201
MHMF042L1D1	MHMF 400 W 200 V Motor	80
MHMF042L1D2	MHMF 400 W 200 V Motor	80
MHMF042L1D2M	MHMF 400 W 200 V Motor	201
MHMF042L1D3	MHMF 400 W 200 V Motor	80
MHMF042L1D4	MHMF 400 W 200 V Motor	80
MHMF042L1D4M	MHMF 400 W 200 V Motor	201
MHMF042L1S1	MHMF 400 W 200 V Motor	80
MHMF042L1S2	MHMF 400 W 200 V Motor	80
MHMF042L1S2M	MHMF 400 W 200 V Motor	201
MHMF042L1T1	MHMF 400 W 200 V Motor	80
MHMF042L1T2	MHMF 400 W 200 V Motor	80
MHMF042L1T2M	MHMF 400 W 200 V Motor	201
MHMF042L1U1	MHMF 400 W 200 V Motor	80
MHMF042L1U2	MHMF 400 W 200 V Motor	80
MHMF042L1U2M	MHMF 400 W 200 V Motor	201
MHMF042L1U3	MHMF 400 W 200 V Motor	80
MHMF042L1U4	MHMF 400 W 200 V Motor	80
MHMF042L1U4M	MHMF 400 W 200 V Motor	201
MHMF042L1V1	MHMF 400 W 200 V Motor	80
MHMF042L1V2	MHMF 400 W 200 V Motor	80
MHMF042L1V2M	MHMF 400 W 200 V Motor	201
MHMF042L1V3	MHMF 400 W 200 V Motor	80
MHMF042L1V4	MHMF 400 W 200 V Motor	80
MHMF042L1V4M	MHMF 400 W 200 V Motor	201
MHMF042L1V4M MHMF082L1A1	MHMF 750 W 200 V Motor	81
	MHMF 750 W 200 V Motor	
MHMF082L1A2		81
MHMF082L1A2M	MHMF 750 W 200 V Motor	202
MHMF082L1B1	MHMF 750 W 200 V Motor	81
MHMF082L1B2	MHMF 750 W 200 V Motor	81
MHMF082L1B2M	MHMF 750 W 200 V Motor	202
MHMF082L1C1	MHMF 750 W 200 V Motor	81
MHMF082L1C2	MHMF 750 W 200 V Motor	81
MHMF082L1C2M	MHMF 750 W 200 V Motor	202
MHMF082L1C3	MHMF 750 W 200 V Motor	81
MHMF082L1C4	MHMF 750 W 200 V Motor	81
MHMF082L1C4M	MHMF 750 W 200 V Motor	202
MHMF082L1D1	MHMF 750 W 200 V Motor	81
MHMF082L1D2	MHMF 750 W 200 V Motor	81
MHMF082L1D2M	MHMF 750 W 200 V Motor	202
MHMF082L1D3	MHMF 750 W 200 V Motor	81
MHMF082L1D4	MHMF 750 W 200 V Motor	81
MHMF082L1D4M	MHMF 750 W 200 V Motor	202
MHMF082L1S1	MHMF 750 W 200 V Motor	81
MHMF082L1S2	MHMF 750 W 200 V Motor	81
MHMF082L1S2M	MHMF 750 W 200 V Motor	202
MHMF082L1T1	MHMF 750 W 200 V Motor	81
MHMF082L1T2	MHMF 750 W 200 V Motor	81
MHMF082L1T2M	MHMF 750 W 200 V Motor	202
MHMF082L1U1	MHMF 750 W 200 V Motor	81
MHMF082L1U2	MHMF 750 W 200 V Motor	81
MHMF082L1U2M	MHMF 750 W 200 V Motor	202
MHMF082L1U2M	MHMF 750 W 200 V Motor	
		81
MHMF082L1U4	MHMF 750 W 200 V Motor	81
MHMF082L1U4M	MHMF 750 W 200 V Motor	202
MHMF082L1V1	MHMF 750 W 200 V Motor	81
MHMF082L1V2	MHMF 750 W 200 V Motor	81
MHMF082L1V2M	MHMF 750 W 200 V Motor	202
MHMF082L1V3	MHMF 750 W 200 V Motor	81
MHMF082L1V4	MHMF 750 W 200 V Motor	81
MHMF082L1V4M	MHMF 750 W 200 V Motor	202
MHMF092L1A1	MHMF 1000 W 200 V Motor	82
MHMF092L1A2	MHMF 1000 W 200 V Motor	82
MHMF092L1A2M	MHMF 1000 W 200 V Motor	203
MHMF092L1B1	MHMF 1000 W 200 V Motor	82
MHMF092L1B2	MHMF 1000 W 200 V Motor	82
MHMF092L1B2M	MHMF 1000 W 200 V Motor	203
MHMF092L1C1	MHMF 1000 W 200 V Motor	82
MHMF092L1C2	MHMF 1000 W 200 V Motor	82
MHMF092L1C2M	MHMF 1000 W 200 V Motor	203
MHMF092L1C3	MHMF 1000 W 200 V Motor	82

Page   MIMMF   1000 W   200 V Motor   203   203 MIMMF092L1D2	MHMF (High inertia)			
MHMF092L1D2	Part No.	Title		
MHMF092L1D2				
MHMF092L1D2M   MHMF 1000 W 200 V Motor   82   MHMF092L1D4   MHMF 1000 W 200 V Motor   82   MHMF092L1D5   MHMF 1000 W 200 V Motor   82   MHMF092L1D4   MHMF 1000 W 200 V Motor   83   MHMF102L1D5   MHMF 1000 W 200 V Motor   83   MHMF102L1D5   MHMF 100 W 200 V Motor   83   MHMF102L1D5   MHMF 10 W 200 V Motor   83   MHMF102L1D5   MHMF 10 W 200 V Motor   83   MHMF102L1D6   MHMF 10 W 200 V Motor   83   MHMF102L1D6   MHMF 10 W 200 V Motor   83   MHMF102L1D8   MHMF 10 W 200 V Motor   83   MHMF102L1D8   MHMF102L1D8   MHMF10 W 200 V Motor   83   MHMF102L1D8   MHMF10 W 200 V Motor   84   MHMF152L1D8   MHMF15 W 200 V Motor   84				
MHMF092L1D3			_	
MHMF092L154  MHMF 1000 W 200 V Motor   82   MHMF092L152  MHMF 1000 W 200 V Motor   82   MHMF092L152  MHMF 1000 W 200 V Motor   82   MHMF092L152  MHMF 1000 W 200 V Motor   203   MHMF092L172  MHMF 1000 W 200 V Motor   82   MHMF092L102  MHMF 1000 W 200 V Motor   82   MHMF092L104  MHMF 1000 W 200 V Motor   83   MHMF102L105  MHMF 1000 W 200 V Motor   84   MHMF102L105  MHMF 1000 W 200 V Motor   84   MHMF102L105  MHMF1000 W 200 V Motor   85   MHMF102L105  MHMF100 W 200 V Motor   86   MHMF102L105  MHMF10 W 200 V Motor   87   MHMF102L105  MHMF10 W 200 V Motor   87   MHMF102L105  MHMF10 W 200 V Motor   88   MHMF102L105  MHMF10 W 200 V Motor   88   MHMF102L105  MHMF10 W 200 V Motor   89   MHMF102L105  MHMF102L105  MHMF10 W 200 V Motor   89   MHMF102L105  MHMF102L105  MHMF10 W 200 V Motor   89   MHMF102L105  MHMF102L105  MHMF10 W 200 V Motor				
MHMF092L1S1	MHMF092L1D4	MHMF 1000 W 200 V Motor	82	
MHMF092L1S2M   MHMF 1000 W 200 V Motor   82   MHMF092L1T1   MHMF 1000 W 200 V Motor   82   MHMF092L1T2   MHMF 1000 W 200 V Motor   82   MHMF092L1T2   MHMF 1000 W 200 V Motor   82   MHMF092L1T2   MHMF 1000 W 200 V Motor   82   MHMF092L1U1   MHMF 1000 W 200 V Motor   82   MHMF092L1U2   MHMF 1000 W 200 V Motor   82   MHMF092L1U3   MHMF 1000 W 200 V Motor   82   MHMF092L1U3   MHMF 1000 W 200 V Motor   82   MHMF092L1U4   MHMF 1000 W 200 V Motor   82   MHMF092L1U4   MHMF 1000 W 200 V Motor   82   MHMF092L1V2   MHMF 1000 W 200 V Motor   82   MHMF092L1V3   MHMF 1000 W 200 V Motor   82   MHMF092L1V3   MHMF 1000 W 200 V Motor   82   MHMF092L1V3   MHMF 1000 W 200 V Motor   83   MHMF102L1C5   MHMF 1.0 kW 200 V Motor   83   MHMF102L1C6   MHMF 1.0 kW 200 V Motor   84   MHMF102L1C6   MHMF 1.0 kW 200 V Motor   84   MHMF102L1C6   MHMF102L1C6   MHMF100 kW 200 V Motor   84   MHMF152L1C6   MHMF152L1C6   MHMF15 kW 200 V Motor   84	MHMF092L1D4M	MHMF 1000 W 200 V Motor	203	
MHMF092L171				
MHMF092L1T2				
MHMF092L1T2M   MHMF 1000 W 200 V Motor   203   MHMF092L1U1   MHMF 1000 W 200 V Motor   82   MHMF092L1U2   MHMF 1000 W 200 V Motor   82   MHMF092L1U2   MHMF 1000 W 200 V Motor   82   MHMF092L1U3   MHMF 1000 W 200 V Motor   82   MHMF092L1U3   MHMF 1000 W 200 V Motor   82   MHMF092L1U3   MHMF 1000 W 200 V Motor   82   MHMF092L1U4   MHMF 1000 W 200 V Motor   82   MHMF092L1U4   MHMF 1000 W 200 V Motor   82   MHMF092L1V1   MHMF 1000 W 200 V Motor   82   MHMF092L1V2   MHMF 1000 W 200 V Motor   82   MHMF092L1V2   MHMF 1000 W 200 V Motor   82   MHMF092L1V2   MHMF 1000 W 200 V Motor   82   MHMF092L1V3   MHMF 1000 W 200 V Motor   82   MHMF092L1V3   MHMF 1000 W 200 V Motor   82   MHMF092L1V3   MHMF 1000 W 200 V Motor   82   MHMF092L1V4   MHMF 1000 W 200 V Motor   83   MHMF102L1C5   MHMF 1000 W 200 V Motor   83   MHMF102L1C6   MHMF 1.0 kW 200 V Motor   83   MHMF102L1CB   MHMF1.0 kW 200 V Motor   84   MHMF152L1CB   MHMF1.5 kW 200 V Motor   84   MHMF152L1CB   MHMF1.5 kW 200 V Motor   84   MHMF152L1CB   MHMF1.5 kW 200				
MHMF092L1V1   MHMF 1000 W 200 V Motor   82   MHMF092L1U2   MHMF 1000 W 200 V Motor   82   MHMF092L1U2   MHMF 1000 W 200 V Motor   82   MHMF092L1U2   MHMF 1000 W 200 V Motor   82   MHMF092L1U4   MHMF 1000 W 200 V Motor   82   MHMF092L1V2   MHMF 1000 W 200 V Motor   82   MHMF092L1V3   MHMF 1000 W 200 V Motor   82   MHMF102L1C5   MHMF 1000 W 200 V Motor   83   MHMF102L1C6   MHMF 1.0 kW 200 V Motor   83   MHMF102L1C6   MHMF 1.0 kW 200 V Motor   83   MHMF102L1C6   MHMF 1.0 kW 200 V Motor   83   MHMF102L1C8   MHMF 1.0 kW 200 V Motor   84   MHMF102L1C8   MHMF 1.0 kW 200 V Motor   83   MHMF102L1C8   MHMF 1.0 kW 200 V Motor   84   MHMF102L1D8   MHMF1.0 kW 200 V Motor   84   MHMF102L1D8   MHMF1.0 kW 200 V Motor   85   MHMF102L1D6   MHMF1.0 kW 200 V Motor   86   MHMF102L1D6   MHMF1.0 kW 200 V Motor   86   MHMF102L1D6   MHMF1.0 kW 200 V Motor   86   MHMF102L1D8   MHMF1.0 kW 200 V Motor   87   MHMF102L1D8   MHMF1.0 kW 200 V Motor   88   MHMF102L1D8   MHMF1.0 kW 200 V Motor   88   MHMF102L1D8   MHMF1.0 kW 200 V Motor   88   MHMF102L1D8   MHMF1.0 kW 200 V Motor   89   MHMF102L1D8   MHMF1.0 kW 200 V Motor   89   MHMF102L1D8   MHMF1.0 kW 200 V Motor   80   MHMF152L1C6   MHMF1.0 kW 200 V Motor   80   MHMF152L1C6   MHMF1.5 kW 200 V Motor   8				
MHMF092L1U2   MHMF 1000 W 200 V Motor   82   MHMF092L1U2   MHMF 1000 W 200 V Motor   203   MHMF092L1U3   MHMF 1000 W 200 V Motor   82   MHMF092L1U4   MHMF 1000 W 200 V Motor   82   MHMF092L1U4   MHMF 1000 W 200 V Motor   82   MHMF092L1U4   MHMF 1000 W 200 V Motor   82   MHMF092L1V1   MHMF 1000 W 200 V Motor   82   MHMF092L1V2   MHMF 1000 W 200 V Motor   82   MHMF092L1V3   MHMF 1000 W 200 V Motor   82   MHMF092L1V3   MHMF 1000 W 200 V Motor   82   MHMF092L1V3   MHMF 1000 W 200 V Motor   82   MHMF102L1C5   MHMF 1000 W 200 V Motor   83   MHMF102L1C6   MHMF 1.0 kW 200 V Motor   83   MHMF102L1C6   MHMF 1.0 kW 200 V Motor   83   MHMF102L1C6   MHMF 1.0 kW 200 V Motor   83   MHMF102L1C8   MHMF 1.0 kW 200 V Motor   83   MHMF102L1D6   MHMF 1.0 kW 200 V Motor   83   MHMF102L1D8   MHMF 1.0 kW 200 V Motor   84   MHMF152L1D8   MHMF 1.0 kW 200 V Motor   84   MHMF152L1D8   MHMF 1.0 kW 200 V Motor   84   MHMF152L1D8   MHMF 1.5 kW 200 V Motor   84   MHMF152L1D8   MHMF 1.5 kW 200 V Motor   84   MHMF152L1D8   MHMF				
MHMF092L1U2M   MHMF1000 W 200 V Motor   203   MHMF092L1U3   MHMF1000 W 200 V Motor   82   MHMF092L1U4   MHMF1000 W 200 V Motor   82   MHMF092L1U4   MHMF1000 W 200 V Motor   82   MHMF092L1U4   MHMF1000 W 200 V Motor   82   MHMF092L1V2   MHMF1000 W 200 V Motor   82   MHMF102L1C5   MHMF1000 W 200 V Motor   82   MHMF102L1C5   MHMF1000 W 200 V Motor   83   MHMF102L1C6   MHMF1.0 kW 200 V Motor   83   MHMF102L1C6   MHMF1.0 kW 200 V Motor   83   MHMF102L1C8   MHMF1.0 kW 200 V Motor   83   MHMF102L1D5   MHMF1.0 kW 200 V Motor   83   MHMF102L1D8   MHMF1.0 kW 200 V Motor   84   MHMF102L1D8   MHMF1.0 kW 200 V Motor   85   MHMF102L1D8   MHMF1.0 kW 200 V Motor   86   MHMF152L1C8   MHMF1.5 kW 200 V Motor   86   MHMF152L1D8   MHMF				
MHMF092L1U2M   MHMF 1000 W 200 V Motor   82				
MHMF092L1U4	MHMF092L1U2M		_	
MHMF092L1V1	MHMF092L1U3	MHMF 1000 W 200 V Motor	82	
MHMF092L1V2	MHMF092L1U4		82	
MHMF092L1V2         MHMF 1000 W 200 V Motor         82           MHMF092L1V3         MHMF 1000 W 200 V Motor         82           MHMF092L1V4         MHMF 1000 W 200 V Motor         82           MHMF092L1V4M         MHMF 1000 W 200 V Motor         82           MHMF102L1C5         MHMF 1.0 kW 200 V Motor         83           MHMF102L1C6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1C6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1C8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D8         MHMF 1.0 kW 200 V Motor			203	
MHMF092L1V2M         MHMF 1000 W 200 V Motor         82           MHMF092L1V3         MHMF 1000 W 200 V Motor         82           MHMF092L1V4M         MHMF 1000 W 200 V Motor         82           MHMF902L1V4M         MHMF 1000 W 200 V Motor         203           MHMF102L1C5         MHMF 1.0 kW 200 V Motor         83           MHMF102L1C6M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1C6M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1C8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1C8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1C8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1DB         MHMF 1.0 kW 200 V Motor         83           MHMF102L1BM         MHMF 1.0 kW 200 V Motor         83           MHMF102L1GB         MHMF 1.0 kW 200 V Motor <td></td> <td></td> <td></td>				
MHMF092L1V3         MHMF 1000 W 200 V Motor         82           MHMF092L1V4M         MHMF 1000 W 200 V Motor         82           MHMF092L1V4M         MHMF 1000 W 200 V Motor         203           MHMF102L1C5         MHMF 1.0 kW 200 V Motor         83           MHMF102L1C6M         MHMF 1.0 kW 200 V Motor         204           MHMF102L1C7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1C8 M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1C8 M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D5 M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D5 M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D6 M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D7 M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D8 M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D8 M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6 M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8 M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8 M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8 M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H6 M         M				
MHMF092L1V4M         MHMF 1000 W 200 V Motor         203           MHMF102L1C5         MHMF 1.0 kW 200 V Motor         83           MHMF102L1C6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1C6         MHMF 1.0 kW 200 V Motor         204           MHMF102L1C6         MHMF 1.0 kW 200 V Motor         204           MHMF102L1C7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1C8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1C8         MHMF 1.0 kW 200 V Motor         204           MHMF102L1D5         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8         MHMF 1.0 kW 200 V Motor <td></td> <td></td> <td></td>				
MHMF092L1V4M         MHMF 100W 200 V Motor         83           MHMF102L1C5         MHMF 1.0 kW 200 V Motor         83           MHMF102L1C6M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1C6M         MHMF 1.0 kW 200 V Motor         204           MHMF102L1C7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1C8M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D5         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D6 MHMF 1.0 kW 200 V Motor         83           MHMF102L1D7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D8 MHMF 1.0 kW 200 V Motor         83           MHMF102L1D7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D8 MHMF 1.0 kW 200 V Motor         83           MHMF102L1D8 MHMF 1.0 kW 200 V Motor         83           MHMF102L1G5         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8M				
MHMF102L1C5         MHMF 1.0 kW 200 V Motor         83           MHMF102L1C6M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1C6M         MHMF 1.0 kW 200 V Motor         204           MHMF102L1C7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1C8 MHMF 1.0 kW 200 V Motor         83           MHMF102L1D5         MHMF 1.0 kW 200 V Motor         204           MHMF102L1D6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D7         MHMF 1.0 kW 200 V Motor         204           MHMF102L1D8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8         MHMF 1.0 kW 200 V Motor         83<				
MHMF102L1C6         MHMF 1.0 kW 200 V Motor         204           MHMF102L1C7         MHMF 1.0 kW 200 V Motor         204           MHMF102L1C8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1C8M         MHMF 1.0 kW 200 V Motor         204           MHMF102L1C8M         MHMF 1.0 kW 200 V Motor         204           MHMF102L1D5         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D6         MHMF 1.0 kW 200 V Motor         204           MHMF102L1D7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G5         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8         MHMF 1.0 kW 200 V Motor </td <td></td> <td></td> <td></td>				
MHMF102L1C7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1C8M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D5         MHMF 1.0 kW 200 V Motor         204           MHMF102L1D6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D6         MHMF 1.0 kW 200 V Motor         204           MHMF102L1D7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6         MHMF 1.0 kW 200 V Motor         204           MHMF102L1G6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H8         MHMF 1.0 kW 200 V Motor	MHMF102L1C6	MHMF 1.0 kW 200 V Motor	83	
MHMF102L1C8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1C8M         MHMF 1.0 kW 200 V Motor         204           MHMF102L1D5         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D7         MHMF 1.0 kW 200 V Motor         204           MHMF102L1D8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G5         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H8         MHMF 1.0 kW 200 V Motor	MHMF102L1C6M	MHMF 1.0 kW 200 V Motor	204	
MHMF102L1C8M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D5         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D6M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D6M         MHMF 1.0 kW 200 V Motor         204           MHMF102L1D7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D8M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D8M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1GB         MHMF 1.0 kW 200 V Motor         83           MHMF102L1HB         MHMF 1.0 kW 200 V Motor         83           MHMF102L1HB         MHMF 1.0 kW 200 V Motor         83           MHMF102L1HB         MHMF 1.0 kW 200 V Motor         83           MHMF152L1C6         MHMF 1.5 kW 200 V Motor </td <td>MHMF102L1C7</td> <td>MHMF 1.0 kW 200 V Motor</td> <td>83</td>	MHMF102L1C7	MHMF 1.0 kW 200 V Motor	83	
MHMF102L1D5         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D6         MHMF 1.0 kW 200 V Motor         204           MHMF102L1D7         MHMF 1.0 kW 200 V Motor         204           MHMF102L1D8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G5         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1HB         MHMF 1.0 kW 200 V Motor         83           MHMF152L1C6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C8         MHMF 1.5 kW 200 V Motor				
MHMF102L1D6         MHMF 1.0 kW 200 V Motor         204           MHMF102L1D6M         MHMF 1.0 kW 200 V Motor         204           MHMF102L1D7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D8M         MHMF 1.0 kW 200 V Motor         204           MHMF102L1G6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H8         MHMF 1.5 kW 200 V Motor         83           MHMF152L1C8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C8         MHMF 1.5 kW 200 V Motor<				
MHMF102L1D6M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1BM         MHMF 1.0 kW 200 V Motor         204           MHMF102L1G5         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6M         MHMF 1.0 kW 200 V Motor         204           MHMF102L1G7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1HB         MHMF 1.0 kW 200 V Motor         83           MHMF152L1CB         MHMF 1.5 kW 200 V Motor         84           MHMF152L1CB         MHMF 1.5 kW 200 V Motor         84           MHMF152L1CB         MHMF 1.5 kW 200 V Motor				
MHMF102L1D7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1D8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G5         MHMF 1.0 kW 200 V Motor         204           MHMF102L1G6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6M         MHMF 1.0 kW 200 V Motor         204           MHMF102L1G7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1HB         MHMF 1.0 kW 200 V Motor         83           MHMF152L1C5         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C8         MHMF 1.5 kW 200 V Motor				
MHMF102L1D8         MHMF 1.0 kW 200 V Motor         204           MHMF102L1D8M         MHMF 1.0 kW 200 V Motor         204           MHMF102L1G5         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6M         MHMF 1.0 kW 200 V Motor         204           MHMF102L1G7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8M         MHMF 1.0 kW 200 V Motor         204           MHMF102L1G8M         MHMF 1.0 kW 200 V Motor         204           MHMF102L1H6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H8         MHMF 1.0 kW 200 V Motor         83           MHMF152L1C5         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D6         MHMF 1.5 kW 200 V Motor				
MHMF102L1D8M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G5         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6         MHMF 1.0 kW 200 V Motor         204           MHMF102L1G6M         MHMF 1.0 kW 200 V Motor         204           MHMF102L1G7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8M         MHMF 1.0 kW 200 V Motor         204           MHMF102L1H6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H8         MHMF 1.0 kW 200 V Motor         83           MHMF152L1C5         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D6         MHMF 1.5 kW 200 V Motor <td></td> <td></td> <td></td>				
MHMF102L1G6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G6M         MHMF 1.0 kW 200 V Motor         204           MHMF102L1G7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8         MHMF 1.0 kW 200 V Motor         204           MHMF102L1G8M         MHMF 1.0 kW 200 V Motor         204           MHMF102L1H5         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H8         MHMF 1.0 kW 200 V Motor         83           MHMF152L1C6         MHMF 1.5 kW 200 V Motor         83           MHMF152L1C6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C7         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D7         MHMF 1.5 kW 200 V Motor <td></td> <td></td> <td></td>				
MHMF102L1G6M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8         MHMF 1.0 kW 200 V Motor         204           MHMF102L1G8M         MHMF 1.0 kW 200 V Motor         204           MHMF102L1H5         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H6M         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H8M         MHMF 1.0 kW 200 V Motor         83           MHMF152L1C5         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D7         MHMF 1.5 kW 200 V Motor <td>MHMF102L1G5</td> <td>MHMF 1.0 kW 200 V Motor</td> <td>83</td>	MHMF102L1G5	MHMF 1.0 kW 200 V Motor	83	
MHMF102L1G7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8M         MHMF 1.0 kW 200 V Motor         204           MHMF102L1H5         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H6M         MHMF 1.0 kW 200 V Motor         204           MHMF102L1H7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H8M         MHMF 1.0 kW 200 V Motor         84           MHMF152L1C5         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C7         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D7         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1B8         MHMF 1.5 kW 200 V Motor <td></td> <td></td> <td>83</td>			83	
MHMF102L1G8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1G8M         MHMF 1.0 kW 200 V Motor         204           MHMF102L1H5         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H6         MHMF 1.0 kW 200 V Motor         204           MHMF102L1H6M         MHMF 1.0 kW 200 V Motor         204           MHMF102L1H7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H8M         MHMF 1.0 kW 200 V Motor         204           MHMF152L1C5         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C6M         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C7         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G6         MHMF 1.5 kW 200 V Motor<				
MHMF102L1G8M         MHMF 1.0 kW 200 V Motor         204           MHMF102L1H5         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H6         MHMF 1.0 kW 200 V Motor         204           MHMF102L1H6M         MHMF 1.0 kW 200 V Motor         204           MHMF102L1H7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H8M         MHMF 1.0 kW 200 V Motor         204           MHMF15L1C5         MHMF 1.5 kW 200 V Motor         84           MHMF15L1C6         MHMF 1.5 kW 200 V Motor         84           MHMF15L1C6         MHMF 1.5 kW 200 V Motor         84           MHMF15L1C7         MHMF 1.5 kW 200 V Motor         84           MHMF15L1C8         MHMF 1.5 kW 200 V Motor         84           MHMF15L1C8         MHMF 1.5 kW 200 V Motor         84           MHMF15L1D6         MHMF 1.5 kW 200 V Motor         84           MHMF15L1D6         MHMF 1.5 kW 200 V Motor         84           MHMF15L1D7         MHMF 1.5 kW 200 V Motor         84           MHMF15L1D8         MHMF 1.5 kW 200 V Motor         84           MHMF15L1D8         MHMF 1.5 kW 200 V Motor         84           MHMF15L1G6         MHMF 1.5 kW 200 V Motor				
MHMF102L1H5         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H6M         MHMF 1.0 kW 200 V Motor         204           MHMF102L1H7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H8M         MHMF 1.0 kW 200 V Motor         204           MHMF152L1C5         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C6M         MHMF 1.5 kW 200 V Motor         205           MHMF152L1C7         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C8M         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D5         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D7         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1B8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G8         MHMF 1.5 kW 200 V Motor </td <td></td> <td></td> <td>_</td>			_	
MHMF102L1H6         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H6M         MHMF 1.0 kW 200 V Motor         204           MHMF102L1H7         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H8M         MHMF 1.0 kW 200 V Motor         204           MHMF152L1C5         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C6M         MHMF 1.5 kW 200 V Motor         205           MHMF152L1C7         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C8M         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D5         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D7         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G8         MHMF 1.5 kW 200 V Motor </td <td></td> <td></td> <td></td>				
MHMF102L1H6M         MHMF 1.0 kW         200 V Motor         204           MHMF102L1H7         MHMF 1.0 kW         200 V Motor         83           MHMF102L1H8         MHMF 1.0 kW         200 V Motor         204           MHMF102L1H8M         MHMF 1.0 kW         200 V Motor         204           MHMF152L1C5         MHMF 1.5 kW         200 V Motor         84           MHMF152L1C6         MHMF 1.5 kW         200 V Motor         205           MHMF152L1C6M         MHMF 1.5 kW         200 V Motor         84           MHMF152L1C7         MHMF 1.5 kW         200 V Motor         84           MHMF152L1C8         MHMF 1.5 kW         200 V Motor         84           MHMF152L1C8M         MHMF 1.5 kW         200 V Motor         84           MHMF152L1D5         MHMF 1.5 kW         200 V Motor         84           MHMF152L1D6         MHMF 1.5 kW         200 V Motor         84           MHMF152L1D7         MHMF 1.5 kW         200 V Motor         84           MHMF152L1D8         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G5         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G6         MHMF 1.5 kW         200 V Motor         84 <td< td=""><td></td><td></td><td>_</td></td<>			_	
MHMF102L1H8         MHMF 1.0 kW 200 V Motor         83           MHMF102L1H8M         MHMF 1.0 kW 200 V Motor         204           MHMF152L1C5         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C6M         MHMF 1.5 kW 200 V Motor         205           MHMF152L1C7         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C8M         MHMF 1.5 kW 200 V Motor         205           MHMF152L1D5         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D7         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G5         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G8         MHMF 1.5 kW 200 V Motor <td></td> <td></td> <td></td>				
MHMF102L1H8M         MHMF 1.0 kW         200 V Motor         204           MHMF152L1C5         MHMF 1.5 kW         200 V Motor         84           MHMF152L1C6         MHMF 1.5 kW         200 V Motor         84           MHMF152L1C6M         MHMF 1.5 kW         200 V Motor         205           MHMF152L1C7         MHMF 1.5 kW         200 V Motor         84           MHMF152L1C8         MHMF 1.5 kW         200 V Motor         205           MHMF152L1C8M         MHMF 1.5 kW         200 V Motor         205           MHMF152L1D5         MHMF 1.5 kW         200 V Motor         84           MHMF152L1D6         MHMF 1.5 kW         200 V Motor         205           MHMF152L1D6         MHMF 1.5 kW         200 V Motor         205           MHMF152L1D8         MHMF 1.5 kW         200 V Motor         84           MHMF152L1D8         MHMF 1.5 kW         200 V Motor         205           MHMF152L1G5         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G6         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G8         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G8         MHMF 1.5 kW         200 V Motor         84           <	MHMF102L1H7	MHMF 1.0 kW 200 V Motor	83	
MHMF152L1C5         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C6M         MHMF 1.5 kW 200 V Motor         205           MHMF152L1C7         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C8M         MHMF 1.5 kW 200 V Motor         205           MHMF152L1D5         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D6         MHMF 1.5 kW 200 V Motor         205           MHMF152L1D7         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G5         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G8         MHMF 1.5 kW 200 V Motor <td>MHMF102L1H8</td> <td>MHMF 1.0 kW 200 V Motor</td> <td>83</td>	MHMF102L1H8	MHMF 1.0 kW 200 V Motor	83	
MHMF152L1C6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C6M         MHMF 1.5 kW 200 V Motor         205           MHMF152L1C7         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C8M         MHMF 1.5 kW 200 V Motor         205           MHMF152L1D5         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D6M         MHMF 1.5 kW 200 V Motor         205           MHMF152L1D7         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D8M         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G8M         MHMF 1.5 kW 200 V Motor         205           MHMF152L1G8M         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G8M         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G8M         MHMF 1.5 kW 200 V Motor         84           MHMF152L1H6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1H6         MHMF 1.5 kW 200 V Mo				
MHMF152L1C6M         MHMF 1.5 kW         200 V Motor         205           MHMF152L1C7         MHMF 1.5 kW         200 V Motor         84           MHMF152L1C8         MHMF 1.5 kW         200 V Motor         205           MHMF152L1C8M         MHMF 1.5 kW         200 V Motor         205           MHMF152L1D5         MHMF 1.5 kW         200 V Motor         84           MHMF152L1D6         MHMF 1.5 kW         200 V Motor         205           MHMF152L1D6M         MHMF 1.5 kW         200 V Motor         84           MHMF152L1D7         MHMF 1.5 kW         200 V Motor         84           MHMF152L1D8         MHMF 1.5 kW         200 V Motor         84           MHMF152L1D8         MHMF 1.5 kW         200 V Motor         205           MHMF152L1G6         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G6         MHMF 1.5 kW         200 V Motor         205           MHMF152L1G8         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G8         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G8         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G8         MHMF 1.5 kW         200 V Motor         84 <t< td=""><td></td><td></td><td></td></t<>				
MHMF152L1C7         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1C8M         MHMF 1.5 kW 200 V Motor         205           MHMF152L1D5         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D6M         MHMF 1.5 kW 200 V Motor         205           MHMF152L1D7         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G5         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G7         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1H6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1H6         MHMF 1.5 kW 200 V Motor				
MHMF152L1C8         MHMF 1.5 kW         200 V Motor         84           MHMF152L1C8M         MHMF 1.5 kW         200 V Motor         205           MHMF152L1D5         MHMF 1.5 kW         200 V Motor         84           MHMF152L1D6         MHMF 1.5 kW         200 V Motor         84           MHMF152L1D6M         MHMF 1.5 kW         200 V Motor         205           MHMF152L1D7         MHMF 1.5 kW         200 V Motor         84           MHMF152L1D8         MHMF 1.5 kW         200 V Motor         84           MHMF152L1D8M         MHMF 1.5 kW         200 V Motor         205           MHMF152L1G5         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G6         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G6         MHMF 1.5 kW         200 V Motor         205           MHMF152L1G7         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G8         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G8         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G8         MHMF 1.5 kW         200 V Motor         84           MHMF152L1H6         MHMF 1.5 kW         200 V Motor         84				
MHMF152L1C8M         MHMF 1.5 kW         200 V Motor         205           MHMF152L1D5         MHMF 1.5 kW         200 V Motor         84           MHMF152L1D6         MHMF 1.5 kW         200 V Motor         84           MHMF152L1D6M         MHMF 1.5 kW         200 V Motor         205           MHMF152L1D7         MHMF 1.5 kW         200 V Motor         84           MHMF152L1D8         MHMF 1.5 kW         200 V Motor         84           MHMF152L1D8M         MHMF 1.5 kW         200 V Motor         205           MHMF152L1G5         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G6         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G6         MHMF 1.5 kW         200 V Motor         205           MHMF152L1G8         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G8         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G8         MHMF 1.5 kW         200 V Motor         84           MHMF152L1H6         MHMF 1.5 kW         200 V Motor         84           MHMF152L1H6         MHMF 1.5 kW         200 V Motor         84           MHMF152L1H6         MHMF 1.5 kW         200 V Motor         84			_	
MHMF152L1D5         MHMF 1.5 kW         200 V Motor         84           MHMF152L1D6         MHMF 1.5 kW         200 V Motor         84           MHMF152L1D6M         MHMF 1.5 kW         200 V Motor         205           MHMF152L1D7         MHMF 1.5 kW         200 V Motor         84           MHMF152L1D8         MHMF 1.5 kW         200 V Motor         205           MHMF152L1D8M         MHMF 1.5 kW         200 V Motor         205           MHMF152L1G5         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G6         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G8         MHMF 1.5 kW         200 V Motor         205           MHMF152L1G8         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G8         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G8         MHMF 1.5 kW         200 V Motor         84           MHMF152L1H5         MHMF 1.5 kW         200 V Motor         84           MHMF152L1H6         MHMF 1.5 kW         200 V Motor         84           MHMF152L1H6M         MHMF 1.5 kW         200 V Motor         84           MHMF152L1H7         MHMF 1.5 kW         200 V Motor         84				
MHMF152L1D6         MHMF 1.5 kW         200 V Motor         84           MHMF152L1D6M         MHMF 1.5 kW         200 V Motor         205           MHMF152L1D7         MHMF 1.5 kW         200 V Motor         84           MHMF152L1D8         MHMF 1.5 kW         200 V Motor         84           MHMF152L1D8M         MHMF 1.5 kW         200 V Motor         205           MHMF152L1G5         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G6         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G6M         MHMF 1.5 kW         200 V Motor         205           MHMF152L1G7         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G8         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G8         MHMF 1.5 kW         200 V Motor         84           MHMF152L1H5         MHMF 1.5 kW         200 V Motor         84           MHMF152L1H6         MHMF 1.5 kW         200 V Motor         84           MHMF152L1H6M         MHMF 1.5 kW         200 V Motor         205           MHMF152L1H7         MHMF 1.5 kW         200 V Motor         84				
MHMF152L1D7         MHMF 1.5 kW         200 V Motor         84           MHMF152L1D8         MHMF 1.5 kW         200 V Motor         84           MHMF152L1D8M         MHMF 1.5 kW         200 V Motor         205           MHMF152L1G5         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G6         MHMF 1.5 kW         200 V Motor         205           MHMF152L1G6M         MHMF 1.5 kW         200 V Motor         205           MHMF152L1G7         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G8         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G8M         MHMF 1.5 kW         200 V Motor         205           MHMF152L1H5         MHMF 1.5 kW         200 V Motor         84           MHMF152L1H6         MHMF 1.5 kW         200 V Motor         84           MHMF152L1H6M         MHMF 1.5 kW         200 V Motor         205           MHMF152L1H7         MHMF 1.5 kW         200 V Motor         84	MHMF152L1D6		84	
MHMF152L1D8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1D8M         MHMF 1.5 kW 200 V Motor         205           MHMF152L1G5         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G6M         MHMF 1.5 kW 200 V Motor         205           MHMF152L1G7         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G8M         MHMF 1.5 kW 200 V Motor         205           MHMF152L1H5         MHMF 1.5 kW 200 V Motor         205           MHMF152L1H6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1H6M         MHMF 1.5 kW 200 V Motor         205           MHMF152L1H7         MHMF 1.5 kW 200 V Motor         205           MHMF152L1H7         MHMF 1.5 kW 200 V Motor         84	MHMF152L1D6M		205	
MHMF152L1D8M         MHMF 1.5 kW         200 V Motor         205           MHMF152L1G5         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G6         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G6M         MHMF 1.5 kW         200 V Motor         205           MHMF152L1G7         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G8         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G8M         MHMF 1.5 kW         200 V Motor         205           MHMF152L1H5         MHMF 1.5 kW         200 V Motor         84           MHMF152L1H6         MHMF 1.5 kW         200 V Motor         84           MHMF152L1H6M         MHMF 1.5 kW         200 V Motor         205           MHMF152L1H7         MHMF 1.5 kW         200 V Motor         84				
MHMF152L1G5       MHMF 1.5 kW 200 V Motor       84         MHMF152L1G6       MHMF 1.5 kW 200 V Motor       84         MHMF152L1G6M       MHMF 1.5 kW 200 V Motor       205         MHMF152L1G7       MHMF 1.5 kW 200 V Motor       84         MHMF152L1G8       MHMF 1.5 kW 200 V Motor       84         MHMF152L1G8M       MHMF 1.5 kW 200 V Motor       205         MHMF152L1H5       MHMF 1.5 kW 200 V Motor       84         MHMF152L1H6       MHMF 1.5 kW 200 V Motor       84         MHMF152L1H6M       MHMF 1.5 kW 200 V Motor       205         MHMF152L1H7       MHMF 1.5 kW 200 V Motor       205         MHMF152L1H7       MHMF 1.5 kW 200 V Motor       84				
MHMF152L1G6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G6M         MHMF 1.5 kW 200 V Motor         205           MHMF152L1G7         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G8         MHMF 1.5 kW 200 V Motor         84           MHMF152L1G8M         MHMF 1.5 kW 200 V Motor         205           MHMF152L1H5         MHMF 1.5 kW 200 V Motor         84           MHMF152L1H6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1H6M         MHMF 1.5 kW 200 V Motor         205           MHMF152L1H7         MHMF 1.5 kW 200 V Motor         205           MHMF152L1H7         MHMF 1.5 kW 200 V Motor         84				
MHMF152L1G6M         MHMF 1.5 kW         200 V Motor         205           MHMF152L1G7         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G8         MHMF 1.5 kW         200 V Motor         84           MHMF152L1G8M         MHMF 1.5 kW         200 V Motor         205           MHMF152L1H5         MHMF 1.5 kW         200 V Motor         84           MHMF152L1H6         MHMF 1.5 kW         200 V Motor         84           MHMF152L1H6M         MHMF 1.5 kW         200 V Motor         205           MHMF152L1H7         MHMF 1.5 kW         200 V Motor         84				
MHMF152L1G7       MHMF 1.5 kW 200 V Motor       84         MHMF152L1G8       MHMF 1.5 kW 200 V Motor       84         MHMF152L1G8M       MHMF 1.5 kW 200 V Motor       205         MHMF152L1H5       MHMF 1.5 kW 200 V Motor       84         MHMF152L1H6       MHMF 1.5 kW 200 V Motor       84         MHMF152L1H6M       MHMF 1.5 kW 200 V Motor       205         MHMF152L1H7       MHMF 1.5 kW 200 V Motor       205         MHMF152L1H7       MHMF 1.5 kW 200 V Motor       84				
MHMF152L1G8       MHMF 1.5 kW 200 V Motor       84         MHMF152L1G8M       MHMF 1.5 kW 200 V Motor       205         MHMF152L1H5       MHMF 1.5 kW 200 V Motor       84         MHMF152L1H6       MHMF 1.5 kW 200 V Motor       84         MHMF152L1H6M       MHMF 1.5 kW 200 V Motor       205         MHMF152L1H7       MHMF 1.5 kW 200 V Motor       84				
MHMF152L1G8M         MHMF 1.5 kW 200 V Motor         205           MHMF152L1H5         MHMF 1.5 kW 200 V Motor         84           MHMF152L1H6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1H6M         MHMF 1.5 kW 200 V Motor         205           MHMF152L1H7         MHMF 1.5 kW 200 V Motor         84				
MHMF152L1H5         MHMF 1.5 kW 200 V Motor         84           MHMF152L1H6         MHMF 1.5 kW 200 V Motor         84           MHMF152L1H6M         MHMF 1.5 kW 200 V Motor         205           MHMF152L1H7         MHMF 1.5 kW 200 V Motor         84				
MHMF152L1H6M         MHMF 1.5 kW 200 V Motor         205           MHMF152L1H7         MHMF 1.5 kW 200 V Motor         84				
MHMF152L1H7 MHMF 1.5 kW 200 V Motor 84	MHMF152L1H6		84	
MHMF 1.5 KW 200 V Motor 84				
	MHMF152L1H8	WITIMIT 1.5 KW 200 V Motor	84	

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MHMF152L1H8M	MHMF 1.5 kW 200 V Motor	205
MHMF202L1C5	MHMF 2.0 kW 200 V Motor	85
MHMF202L1C6	MHMF 2.0 kW 200 V Motor	85
MHMF202L1C6M	MHMF 2.0 kW 200 V Motor	206
MHMF202L1C7	MHMF 2.0 kW 200 V Motor	85
MHMF202L1C8 MHMF202L1C8M	MHMF 2.0 kW 200 V Motor MHMF 2.0 kW 200 V Motor	85 206
MHMF202L1D5	MHMF 2.0 kW 200 V Motor	85
MHMF202L1D6	MHMF 2.0 kW 200 V Motor	85
MHMF202L1D6M	MHMF 2.0 kW 200 V Motor	206
MHMF202L1D7	MHMF 2.0 kW 200 V Motor	85
MHMF202L1D8	MHMF 2.0 kW 200 V Motor	85
MHMF202L1D8M	MHMF 2.0 kW 200 V Motor	206
MHMF202L1G5	MHMF 2.0 kW 200 V Motor	85
MHMF202L1G6 MHMF202L1G6M	MHMF 2.0 kW 200 V Motor MHMF 2.0 kW 200 V Motor	85 206
MHMF202L1G6W	MHMF 2.0 kW 200 V Motor	85
MHMF202L1G8	MHMF 2.0 kW 200 V Motor	85
MHMF202L1G8M	MHMF 2.0 kW 200 V Motor	206
MHMF202L1H5	MHMF 2.0 kW 200 V Motor	85
MHMF202L1H6	MHMF 2.0 kW 200 V Motor	85
MHMF202L1H6M	MHMF 2.0 kW 200 V Motor	206
MHMF202L1H7	MHMF 2.0 kW 200 V Motor	85
MHMF202L1H8	MHMF 2.0 kW 200 V Motor	85
MHMF202L1H8M MHMF302L1C5	MHMF 2.0 kW 200 V Motor MHMF 3.0 kW 200 V Motor	206 86
MHMF302L1C6	MHMF 3.0 kW 200 V Motor	86
MHMF302L1C6M	MHMF 3.0 kW 200 V Motor	207
MHMF302L1C7	MHMF 3.0 kW 200 V Motor	86
MHMF302L1C8	MHMF 3.0 kW 200 V Motor	86
MHMF302L1C8M	MHMF 3.0 kW 200 V Motor	207
MHMF302L1D5	MHMF 3.0 kW 200 V Motor	86
MHMF302L1D6	MHMF 3.0 kW 200 V Motor	86
MHMF302L1D6M MHMF302L1D7	MHMF 3.0 kW 200 V Motor MHMF 3.0 kW 200 V Motor	207 86
MHMF302L1D8	MHMF 3.0 kW 200 V Motor	86
MHMF302L1D8M	MHMF 3.0 kW 200 V Motor	207
MHMF302L1G5	MHMF 3.0 kW 200 V Motor	86
MHMF302L1G6	MHMF 3.0 kW 200 V Motor	86
MHMF302L1G6M	MHMF 3.0 kW 200 V Motor	207
MHMF302L1G7	MHMF 3.0 kW 200 V Motor	86
MHMF302L1G8 MHMF302L1G8M	MHMF 3.0 kW 200 V Motor MHMF 3.0 kW 200 V Motor	86 207
MHMF302L1H5	MHMF 3.0 kW 200 V Motor	86
MHMF302L1H6	MHMF 3.0 kW 200 V Motor	86
MHMF302L1H6M	MHMF 3.0 kW 200 V Motor	207
MHMF302L1H7	MHMF 3.0 kW 200 V Motor	86
MHMF302L1H8	MHMF 3.0 kW 200 V Motor	86
MHMF302L1H8M	MHMF 3.0 kW 200 V Motor	207
MHMF402L1C5	MHMF 4.0 kW 200 V Motor	87
MHMF402L1C6 MHMF402L1C6M	MHMF 4.0 kW 200 V Motor MHMF 4.0 kW 200 V Motor	208
MHMF402L1C6W	MHMF 4.0 kW 200 V Motor	87
MHMF402L1C8	MHMF 4.0 kW 200 V Motor	87
MHMF402L1C8M	MHMF 4.0 kW 200 V Motor	208
MHMF402L1D5	MHMF 4.0 kW 200 V Motor	87
MHMF402L1D6	MHMF 4.0 kW 200 V Motor	87
MHMF402L1D6M	MHMF 4.0 kW 200 V Motor	208
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# **Sales Office**

# [Panasonic Sales Office of Motors]

(February.01.2018)

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			Web site	https://panasonic-electric-works.com/ servomoteurs.htm	be/servosystemes-et-		
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A6N Series

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