Safety Precautions

- · 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 from
- · 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 result in loosening.
- *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 quality 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 required.
- Failure of this product depending on its content may generate smoke of about one cigarette. Take this into consideration when the application of the machine is clean room related.
- · Please be careful when using 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; http://industrial.panasonic.com/ww/products/motors-compressors/fa-motors

Contact to :



Certificate division

ISO14001 Certificate division

ISO 14001

Panasonic Corporation, Automotive & Industrial Systems Company, Smart Factory Solutions 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 January 2016.



MINAS A6 family **MINAS** E series

Servo Motor & Driver < MINAS A₆ family, MINAS Ш series>





2016

<16.1®>

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

[·] Printed colors may be slightly different from the actual products

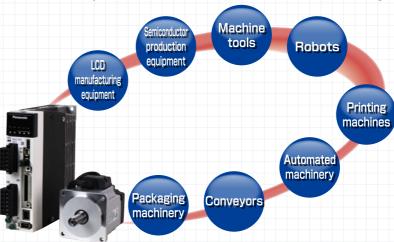
Specifications and design of the products are subject to change without notice for the product improvement



MINAS AS

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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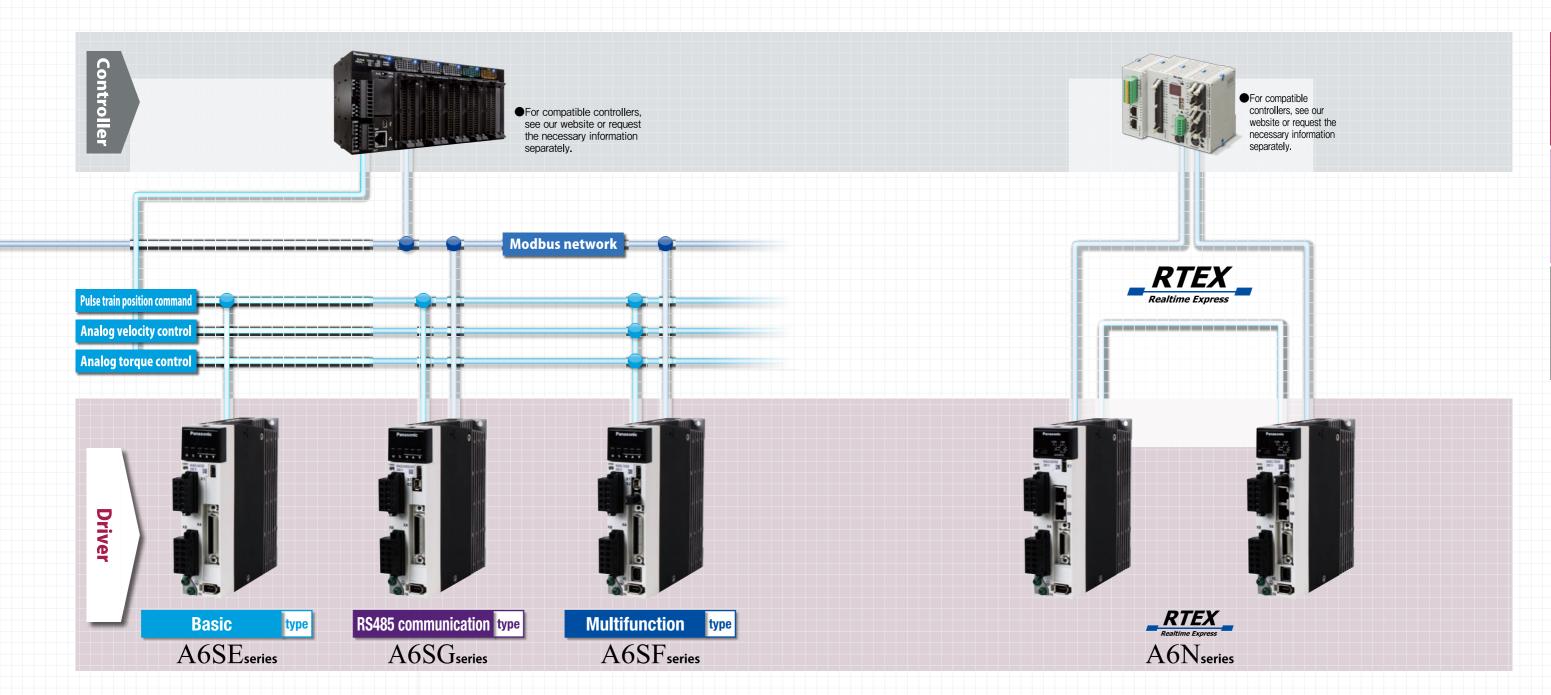
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1 MINAS A6 Family

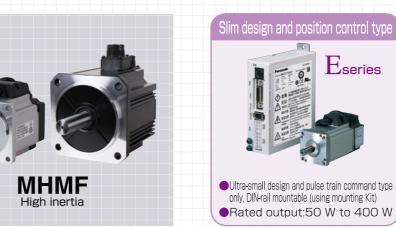
Servomotors that flexibly and effectively fit into

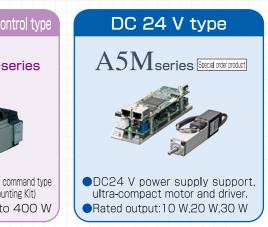
various system configurations









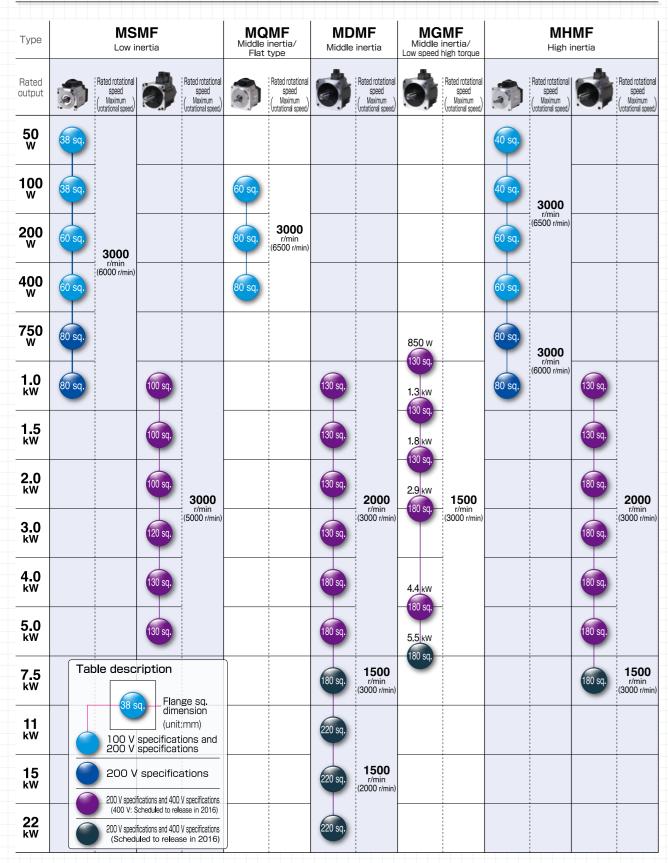


It is MINAS A6 Family lineup that meets the

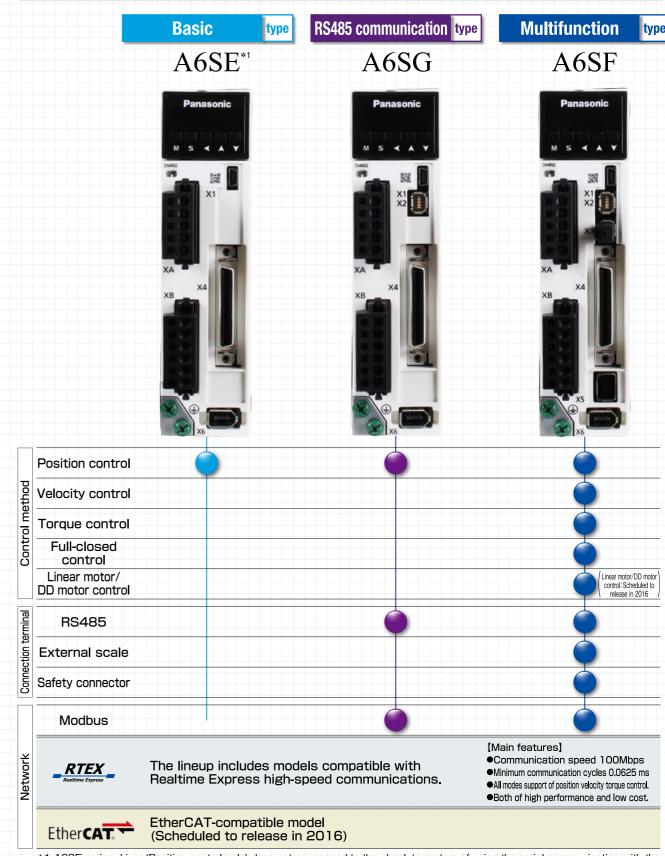
manufacturing industry needs. 1



■Motor line-up



■Driver line-up



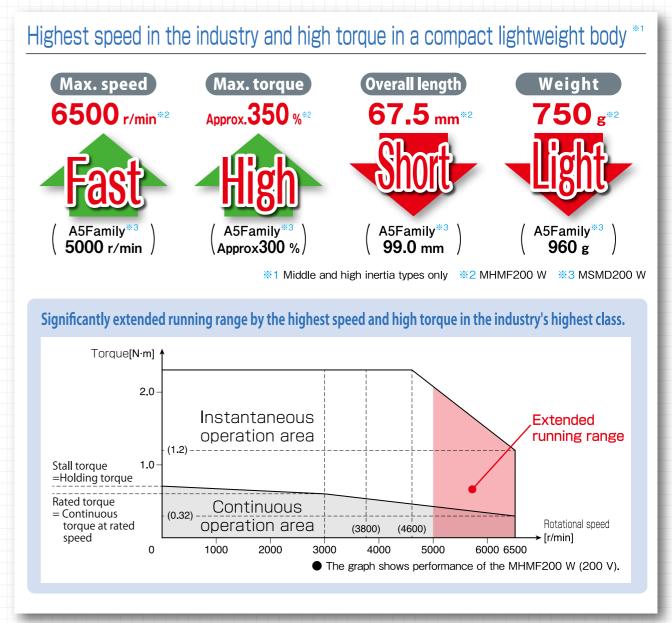
^{*1} A6SE series driver (Position control only) does not correspond to the absolute system of using the serial communication with the host device. It supports incremental system only.

5 MINAS A6 Family MINAS A6 Family

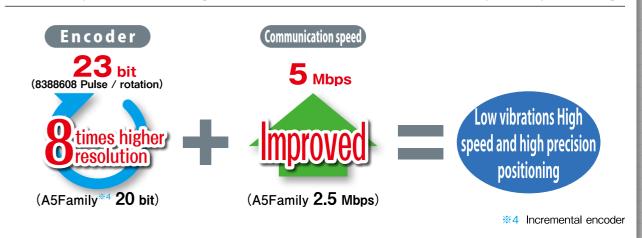
Small, light, powerful and speedy











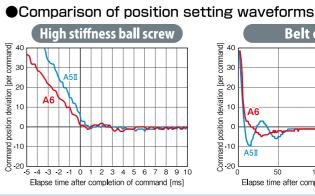
Swifter, smarter and easier to use

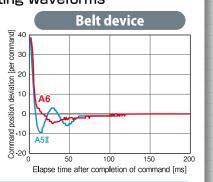




High-speed response, high-precision positioning for quick and accurate movement

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.

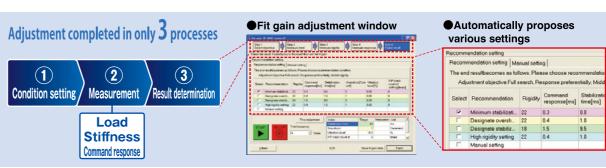
*1 Comparison with conventional product A5II family







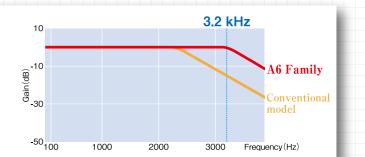
The above is a measure based on our test environment.



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.

Comparison with conventional product A5II family



3.2 kHz

Support

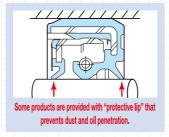
Reduced maintenance work and trouble.

Lineup of motors protected by high dust-proof, high heat-resistant oil seal (With protective lip)

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 o	il seal		With oil seal(wi	ith protective lip)
00	MSMF	0			No s	setting
80 mm or less	MHMF,MQMF	0	Made of nitrile rubber (NBR)	0	Made of	Not mounting-compatible with A5 family products
100 mm or more	All Type	0	Tubber (Mbri)	0	fluororubber	Mounting-compatible with A5 family products

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. 165.



What is IP?

An international standard that specifies the degree of dustproof and waterproof performance. (IP: Ingress Protection)

- Protected against solid objects over 50 mm in diameter. Protected against solid objects over 12.5 mm in diameter.
- 3 Protected against solid objects over 2.5 mm in diameter.
- 4 Protected against solid objects over 1.0 mm in diameter.
- Dust-proof type: Protected against dust penetration. Continues normal operation even if penetrated by a small quantity of dust.
- 6 Dust-tight type: Totally protected against dust penetration.

IP- 6 7

- Protected against vertically falling drops of water or condensation 2 Protected against falling drops of water, if the case is inclined no more than 15' off vertical
- Protected against sprays of water from any direction, ever
 - 4 Protected against water splashed from any direction.
 - 5 Protected against direct low pressure water jets from any direction. Limited penetration permitted
 - 6 Protected against direct high pressure water jets from any direction. Limited penetration permitted
 - otected against water penetration when immersed in water for the specified period of time and under the specified pressure
 - 8 Protected against water penetration when immersed in water for long, continuous periods of time.

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.

Parameter initialization

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

Other driver functions

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)

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.)

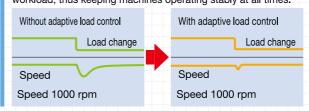
Manual/Auto damping filter

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.

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.



Regenerative energy discharge

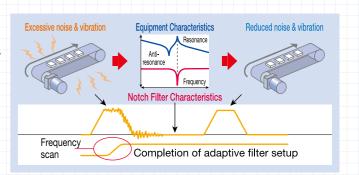
A regenerative resistor is used to discharge regenerative energy, which is the energy generated when stopping a load with a large moment of inertia or when using this unit in vertical operation. This energy is returned to the driver from the motor.

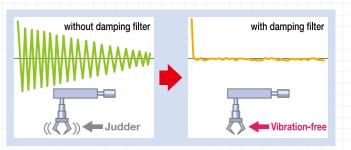
- Frame A. and frame B model drivers do not contain a regenerative resistor. Optional regenerative resisters are recommended.
- Frame C to frame F model drivers contain one regenerative resistor; however, adding an optional regenerative resistor provides additional regeneration capability.

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.

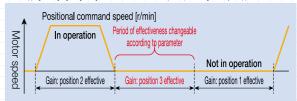
A6 family Input 4 Mpps input 8 Mpps





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.

11 MINAS A6 Family MINAS A6 Family 12

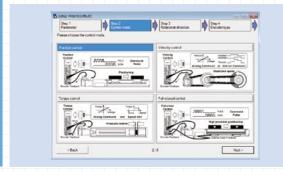
Multifunctional software for quick adjustment support

PNATERM 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-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.



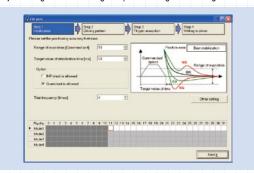
The fit gain function for setting Two-degree-of-freedom control.

- 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.



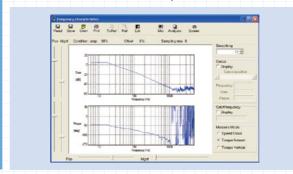


Please download from our web site and use after install to the PC.

http://industrial.panasonic.com/ww/products/motors-compressors/fa-motors

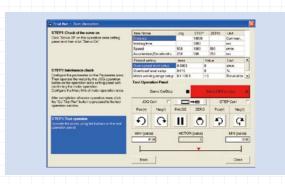
Frequency characteristics measurement function

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.



rial run

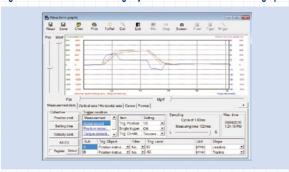
This function supports positioning with the Z-phase search and software limit.



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
	OS	Windows® Vista SP1(32 bit), Windows® 7(32 bit,64 bit),
		Windows® 8(32 bit , 64 bit) Japanese, English, Chinese (Simplified) ver ,
	Serial communication	USB port, COM port (Communication speeds: 24000115200 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	24bit 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.

13 MINAS A6 Family MINAS A6 Family

Compliance with MINA international standards

CE CSUUS CUL US PROVED SIDE











		Driver	Motor
	EMC Directives	EN55011	
		EN61000-6-2	-
		EN61000-6-4	-
		EN61800-3	
	Low-Voltage Directives	EN61800-5-1	EN60034-1
EU Directives	Low-voltage 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	
		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	_

IEC: International Electrotechnical Commission

EN: 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

This products is not an object of china compulsory

- When export this product, follow statutory provisions of the destination country.
- A6SE and A6SG 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)

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.

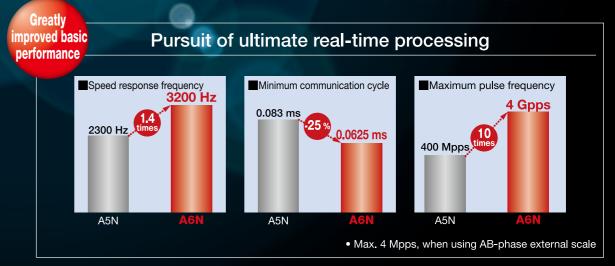
Features non-software-based independent redundant circuitry for motor power isolation. Independent redundant circuitry for motor power isolation. This obviates the need for magnetic contactors to isolate the required motor in order to accommodate low-voltage machinery commands.(The final safety compliance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

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.

Ultra-high-speed network driver Realtime Express (RTEX)





Multifunctional capabilities to match various needs

Supports all positions, speeds and torque modes (w/ built-in positioning function).

©High-precision position latch and comparison

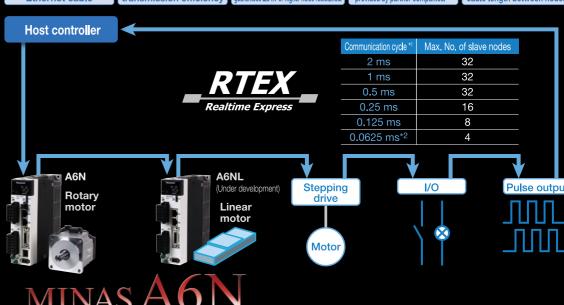
OCommunication cycle can be set to any time between 2 ms and 62.5 μs.

Simple network

OSatisfies both high performance and low cost requirements. **O**Synchronization established by communication IC

©Easier development of compatible equipment

System configuration example



• Realtime Express and RTEX are registered trademarks of Panasonic Corporation. Realtime Express is a high-speed synchronous motion network we developed.*1 Communication cycle and connections to slave devices other than servomotors should be made according to controller specifications.*2 Commands are updated every 0.125 ms when the communication cycle is 0.0625 ms.

Motor Line-up

MO	tor Line-	up							
	M	otor	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 · Semicon- ductor production
Low inertia	MSMF	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	(4500)				stiffness and high repetitive application	equipment etc
	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	· SMT machines · Inserter machines
Mic	(Flat type)	80 mm sq. or less	0.1 0.2	3000 (6500)	0	IP67	Connector	machines with belt driven	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 2.9 4.4	1500 (3000)	0	IP67	Connector	Middle capacity Suitable for low speed and high torque application	· Conveyors · Robots · Textile machines etc
			0.05 0.1 0.2 0.4	3000 (6500) 3000	0	IP65	Leadwire	· Small capacity	
		80 mm sq. or less	0.75 1.0	(6000)				· Suitable for low stiff-	· Conveyors · Robots
High inertia	MHMF		0.05 0.1 0.2 0.4 0.75 1.0	3000 (6500) 3000	0	IP67	Connector	ness machines with belt driven	etc
iia		80 mm sq. or less 130 mm sq. or more	1.0 1.5 2.0 3.0 4.0 5.0	(6000) 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) Except for output shaft, and 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.
- When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.



Model Designation

* For combination of elements of model number, refer to Index P.272.

 $\ensuremath{\, \bigcirc \,}$ Motor specifications: 80 mm sq. or less MSMF 50 W to 1000 W

Connector Lead JN wire

•

•

•

•

Servo Motor

(2) Motor rated output

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

B 2 •

C 1 • C 2 •

D 2 •

•

•

•

S 2 T 1

T 2

U 2 V 1

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) IVIOL	or 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	29	2.9 kW
08	750 W	30	3.0 kW
09	0.85 kW, 1000 W	40	4.0 kW
09	(130 mm sq.) (80 mm sq.)	44	4.4 kW
10	1.0 kW	50	5.0 kW
13	1.3 kW		

4 Voltage specifications

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

6 Design order

Symbol	Specifications
1	Standard

When using a rotary encoder as an incre-

② Series

Symbol Series name

A6 series

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

Absolute 23-bit 8388608

7 Motor specifications: 100 mm sq. or more 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 MHMF 50 W to 1000 W MQMF 100 W to 400 W

		Sh	naft	Holding	g brake		Oil sea	I	Motor encorder terminal *1		
Symbol		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

M A D L N 1 5 S E * * * **Special specifications** <u>2</u> 3 4 5 6 7

1) Frame symbol

Symbol	Frame	Symbol I	rame
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 series

3 Safety Function

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	Α	100 A
3	22 A	В	120 A
1	24 /		

(5) Supply voltage specifications

ூ Su p	ppry voltage specification
Symbol	Specifications
1	Single phase 100 V
3	3-phase 200 V
5	Single/3-phase 200 V

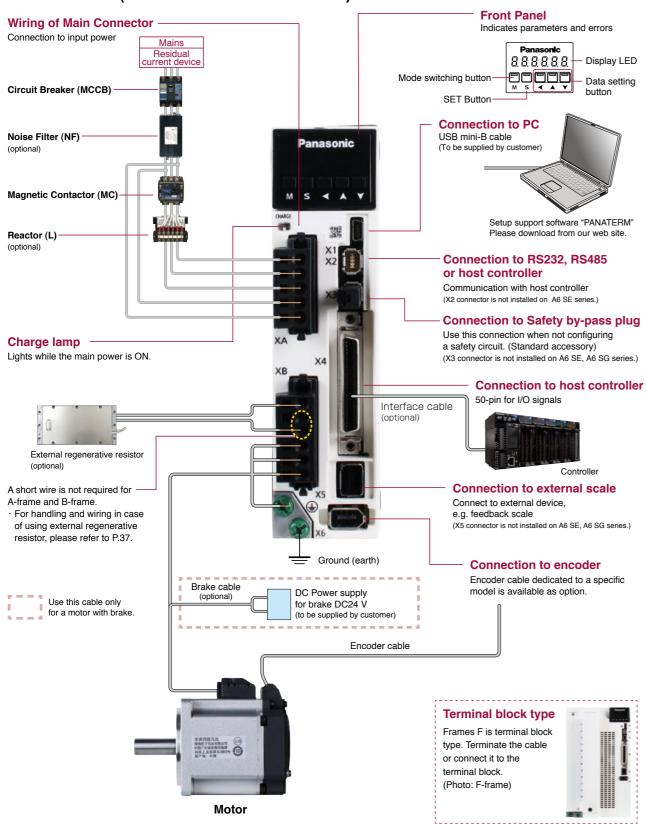
6 I/f specifications 7 Classification of type

(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)
N	E	without the safety function
(RTEX)	F	with the safety function
B (EtherCAT)	(Sch	neduled to release in 2016)

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MINAS A6 Family Overall Wiring

<A6 SF Series (Driver: A-frame Motor: 200 W)>

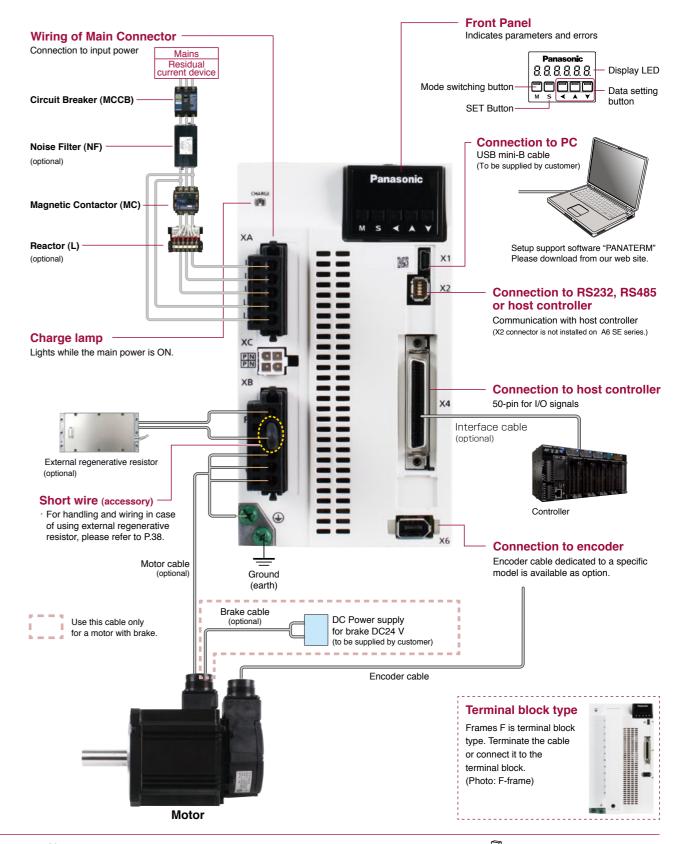


<Caution>

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.

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

<A6 SG Series/ A6 SE Series (Driver: D-frame Motor: 1.0 kW)>



<Note>

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



MINAS A6 Family

Driver and List of Applicable Peripheral Equipments

Driver	Applicable motor	Voltage (V) *1	Rated output (kW)	Required Power at the (rated load) (kVA)	Circuit breaker (rated (current)	Noise filter (Single phase) 3-phase	Surge absorber /Single phase 3-phase	Ferite 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												
MADI	MSMF MQMF MHMF	phase, 100	0.1	approx. 0.4		DV0P4170	DV0P4190								
MADL	MSMF MHMF	Single/	0.05			DV0P4170	DV0P4190								
	MSMF MQMF MHMF	3-phase 200	0.1, 0.2	approx. 0.5	10	DV0PM20042	DV0P1450		20 A (3P+1a)	0.75 mm²/ AWG18 600 VAC or more			0	0.75 mm ² /	0.28 mm ² to 0.75 mm ² /
	MSMF	Single phase, 100	0.2			DV0P4170	DV0P4190							AWG18 600 VAC or more	AWG22 to AWG18 100 VAC
MBDL	MQMF MHMF	Single/ 3-phase 200	0.4	approx.		DV0P4170 DV0PM20042	DV0P4190 DV0P1450				Ω				or more
	MSMF MQMF MHMF	Single phase, 100	phase, 0.4 0.9 0.9			DV0P4190	DV0P1460			onnection		onnection t			
MCDL	MSMF MHMF	Single/ 3-phase 200	0.75	approx.	15	DV0PM20042	DV0P4190 DV0P1450				Connection to exclusive connector		Connection to exclusive connector		
	MGMF		0.85				DV0P4190 DV0P1450				e conr		e con	2.0 mm²/ AWG14 600 VAC or more	
	MSMF		1.0 (80 mm sq.)	approx.		DV0P4220					nector	0.75 mm ² /	nector		
	MSMF MDMF MHMF		1.0									AWG18 600 VAC or more			
MDDL	MHMF	Single/ 3-phase 200	1.0 (80 mm sq.)		20				30 A (3P+1a)	2.0 mm ² /					
	MSMF		1.0	annray						AWG14 600 VAC or more					
	MGMF		1.3	approx. 2.3											
	MSMF MDMF MHMF		1.5												0.75 mm ² /
	MGMF		1.8												AWG18
MEDL	MSMF MDMF MHMF	3-phase 200	2.0	approx. 3.8	30	DV0PM20043	DV0P1450		60 A (3P+1a)						100 VAC or more
	MSMF MDMF MHMF		3.0	approx. 4.5				DV0P1460	(5. 114)						
	MDMF MHMF MGMF MSMF MDME 3-P		2.9					RJ8035			11 mm or smaller		11 mm or smaller		
MFDL		3-phase 200	4.0	approx.	50	DV0P3410	DV0P1450	(Recommended component *4	100 A	3.5 mm²/ AWG12 600 VAC	φ _{5.3}		φ _{5.3}	3.5 mm²/ AWG12 600 VAC	
	MGMF		4.4	7.5					(3P+1a)	or more	Terminal block		Terminal block	or more	
	MSMF MDMF MHMF		5.0								M5		M5		

^{*1} Select peripheral equipments for single/3phase common specification according to the power source.

Related page

Noise filter	P.236 "Composition of Peripheral Equipm	ents"
Surge absorber	P.237 "Composition of Peripheral Equipm	ents"
Ferite core	P.238 "Composition of Peripheral Equipm	ents"
Motor/brake connector	P.169 "Specifications of Motor connector"	

About circuit breaker and magnetic contactor

To comply to EC Directives, install a circuit breaker between the power and the noise filter without fail, and the circuit breaker should conform to IEC Standards and UL recognized (Listed and marked).

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	Terminal cover fastening 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])

	Grou	und screw		nnector to ontroller (X4)
Driver frame	Nominal size	Fastening torque (N·m) Note)1	Nominal size	Fastening torque (N·m) Note)1
A to E	M4	0.7 to 0.8	M2.6	0.3 to 0.35
F	M5	1.4 to 1.6	IVI∠.0	0.3 10 0.35

Note)1 < Caution>

- · 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.

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^{*2} For the ground screw, use the same crimp terminal as that for the main circuit terminal block.

^{*3} The diameter of the ground cable must be equal to, or larger than that of the motor cable.

^{*4} Use thses products to suit an international standard.

A6 Family Table of Part Numbers and Options

80 mm sq. or less 50 W to 1000 W MSMF, MQMF, MHMF: Leadwire type IP65

			Moto	or			Driver					Optional	l parts						■ Options									
						A6 SF series	A6 SG series		Power	Encoder Ca	able Note)3	· ·	Cable Not	ite)3						Title	Part No.	Page						
					Rating/	Multi fanction	RS485 communication		capacity	23-bit A	bsolute								Interface Cable		DV0P4360	182						
M	otor series	Power	Output	Part No.	Spec.	type /Pulse, analog,\	A6 SE series	Frame	/ at /	Use in the	Use in the		without with Cable Regend		External Regenerative	Reactor	Noise Filter			DV0P4120	182							
		supply	(W)	Note)1	Dimensions (page)	(full-closed)	Basic		\ load / (kVA)	absolute system	Incremental system	Brake		rake	Note)3	Resistor	Single phase 3-phase	Single phase 3-phase			DV0P4121	182						
							(Pulse signal input)			_	(without battery box)								Interface Conv	ersion Cable	DV0P4130	182						
				MONESATIA	- 4	MADITOLOF	Note)2, Note)4			Notejs											DV0P4131	182						
			50	MSMF5AZL1 ☐ 2	51	MADLT01SF	MADLN01S♦	A-frame	Approx.							DV0P4280	DV0P227				DV0P4132	182						
		Single phase	100	MSMF011L1 ☐ 2	53	MADLT11SF	MADLN11S♦		0.4									DV0P4170	Connector Kit for Power	A-frame Single row type	DV0PM20032	185						
		100 V	200	MSMF021L1 ☐ 2	55	MBDLT21SF	MBDLN21S♦	B-frame	Approx. 0.5							DV0P4283	D) (ODOOO		0	to D-frame Double row type	DV0PM20033	185						
			400	MSMF041L1 ☐ 2	57	MCDLT31SF	MCDLN31S♦	C-frame	Approx.							DV0P4282	DV0P228	DV0PM20042	Connector Kit for Motor	A-frame to	DV0PM20034	186						
<u>ا</u>	MSMF		50	MSMF5AZL1 ☐ 2	52	MADLT05SF	MADLN05S♦			MEEOA		MEEGA	MEEOA	MEECA	MEECA		MEEOA								Connection	D-frame		
w ine	(Leadwire) type		100	MSMF012L1 ☐ 2	54	MADLT05SF	MADLN05S♦	A-frame	Approx.		MFECA 0 * * 0EAD		MFMCA **0EED		MFMCB * * 0GET		DV0P227	DV0P4170	Connector Kit f Motor/Encoder	Connection	DV0P4290	186						
tia	3000 r/min IP65	Single	200	MSMF022L1 ☐ 2	56	MADLT15SF	MADLN15S♦		0.0	(For fixed)	(For fixed)						DV0P220	DV0PM20042		RS485, RS232	DV0PM20024	183						
		phase/				MBDLT25SF	MBDLN25S♦ B-frame Approx. 0.9 MCDLN35S♦ C-frame Approx. 1.3									Safety	DV0PM20025	183										
		3-phase 200 V	400	MSMF042L1 □ 2	58				Annrox							DV0P4283			Connector Kit	Interface	DV0P4350	184						
			750	MSMF082L1 ☐ 2	//SMF082L1							DV0PM20042	External Scale Encoder		DV0PM20026	184												
			1000	MSMF092L1 ☐ 2	60	MDDLT45SF	MDDLN45S♦	D-frame								DV0P4284	DV0P228	DV0P4220	Pottony for Abo		DV0PM20010 DV0P2990	184						
				MOME011L1 □ 2					Approx							D) (2D) 200	DV0P222		Battery for Abs	Absolute Encoder								
		Single	100	MQMF011L1 4	67	MADLT11SF	MADLN11S♦	A-frame	0.4	-						DV0P4280	DV0P227	DV0P4170	Note)5	For A-frame,	DV0P4430	194						
ĭ		phase	MQMF011L1					DV0P4283		2101 1110	Mounting	B-frame	DV0PM20100	195														
iddle ir	MQMF	re) 100 V	400	MQMF041L1 ☐ 2	71	MCDLT31SF	MCDLN31S♦	C-frame	Approx.	MEEOA	MEEOA					DV0P4282	DV0P228	DV0PM20042	Bracket	For C-frame, D-frame	DV0PM20101	195						
nertia	(Leadwire)		400	MQMF041L1 4		MADI TOTOE	_		0.9	MFECA 0**0EAE	DEAE 0**0EAD	0 * * 0 EAD		MFMCA * * 0EED		MFMCB **0GET	D) (0D (00 (Encoder	with Battery Box	MFECA0**0EAE	E 171					
Fa:	3000 r/min) nin	100	MQMF012L1 ☐ 4	68	MADLT05SF	MADLN05S♦	A-frame	Approx.	(For fixed)			(For fixed)	0.4	· *ULLD		* *UGLI		DV0P227		Cable	Note)5 without	MFECA0 * * 0EAD	D 171				
t type	IP65		200	MQMF022L1 ☐ 2 MQMF022L1 ☐ 4	70	MADLT15SF	MADLN15S♦		0.5							DV0P220			Battery Box									
(D		3-phase 200 V	400	MQMF042L1 ☐ 2	72	MDDI TOFOE	MBDLN25S♦	В.	Approx.							DV0P4283	DV0P228	DV0PM20042	Motor Cable	without Brake	MFMCA0 * * 0EEI							
			400	MQMF042L1 ☐ 4	12	MDDL1200F	MIDDLIN235	D-trame	0.9								DV0P220		Brake Cable	50.005.111	MFMCB0 * * 0GE							
			50	MHMF5AZL1 \square 2 MHMF5AZL1 \square 4	73	MADLT01SF	MADLN01S♦		Approx.							D) /2D / 222	D) (0 D 0 0 0 -			50 Ω 25 W	DV0P4280	197						
		Single	100	MHMF011L1 2 2 MHMF011L1 4	75	MADLT11SF	MADLN11S♦	A-frame	0.4							DV0P4280	DV0P227	DV0P4170	External	100 Ω 25 W	DV0P4281	197						
		phase 100 V	200	MHMF021L1 2	77	MBDLT21SF	MBDLN21S♦	B-frame	Approx.							DV0P4283			regenerative resistor	25 Ω 50 W	DV0P4282	197						
		100 V		MHMF021L1 4 MHMF041L1 2					0.0								DV0P228			50 Ω 50 W	DV0P4283	197						
	MHMF		400	MHMF041L1 ☐ 4	79	MCDLT31SF	MCDLN31S♦	C-frame	0.9							DV0P4282		DV0PM20042		30 Ω 100 W	DV0P4284	197						
High	/Leadwire\		50	MHMF5AZL1 2 MHMF5AZL1 4	74	MADLT05SF	MADLN05S♦			MFECA	MFECA		ИFMCA		MFMCB	DV0P4281	D) (6D5 ==				DV0P220	196						
inert	(type /		100	MHMF012L1 ☐ 2 MHMF012L1 ☐ 4	76	MADLT05SF	MADLN05S♦	A-frame	Approx.	0 * * 0EAE (For fixed)	0 * * 0EAD (For fixed)		**0EED		* * 0GET		DV0P227 DV0P220	DV0P4170	Reactor		DV0P222	196						
tia	3000 r/min IP65	e) 50 100	MHMF022L1 2	78	MADLT15SF	MADLN15S♦			,,								DV0PM20042			DV0P227	196							
				MHMF022L1	80	MBDLT25SF		B-frame	Approx.							DV0P4283	D. I.S. T.				DV0P228	196						
				MHMF042L1 ☐ 4 MHMF082L1 ☐ 2					Annrox								DV0P228		Naiss Fill		DV0P4170	236						
			750	MHMF082L1 4	81	MCDLT35SF	MCDLN35S♦	C-frame	1.3								D VUF 220	DV0PM20042	Noise Filter		DV0PM20042	236						
			1000	MHMF092L1 ☐ 2 MHMF092L1 ☐ 4	82	MDDLT55SF	MDDLN55S♦	D-frame	Approx.							DV0P4284	DV0P228	DV0P4220			DV0P4220	236						
									2.3								DV0P222		Surge Absorbe	r	DV0P4190	237						
Note Note		-		notor specifications. driver specifications.		_								ote that a ba encoder ca		t supplied to	gether with	n 23-bit			DV0P1450	237						
	,	•		cable length (03/3 m	•	•	•	m/MI	EC A OO						•	attery box). nber "DV0P2	2000" cona	ratoly	Ferite Core		DV0P1460	238						

Note)3 **: 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.

DV0P227, DV0P228 DV0P4170, DV0PM20042

DV0P4190, DV0P1450

DV0P4220

DV0P1460

Reactor

Noise Filter

Ferite Core

Surge Absorber

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A6 Family Table of Part Numbers and Options

80 mm sq. or less 50 W to 1000 W MSMF, MQMF: Connector type IP67

		Moto	r			Driver					Optional p	arts					■ Options		
					A6 SF series	A6 SG series		_	Encoder Ca	able Note)3	Motor Ca	ble Note)3					Interface Cable	Title	Part No. DV0P4360
					Multi fanction	RS485		Power	22 hit A	bsolute			_				interface Cabi	.	DV0P4360 DV0P4120
	_			Rating/	type	communication		/ at	23-DIL A	DSOIULE			Brake	External	Reactor	Noise Filter			DV0P4121
otor series	Power	Output (W)	Part No. Note)1	Spec. Dimensions	(Pulse, analog, full-closed	A6 SE series	Frame	rated	Use in the	Use in the	without	with	Cable	Regenerative	Single phase	Single phase	Interface Conv	ersion Cable	DV0P4130
	Supply	(**)	Note) i	(page)	(iuii-cioseu /	Basic		\ load /	absolute system	Incremental system	Brake	Brake	Note)3	Resistor	3-phase	3-phase			DV0P4131 DV0P4132
				([0.50]		(Pulse signal input)		(KVA)	(with battery box)	(without battery box)					,	,	Connector Kit	A frame Single row	DV0P4132 DV0PM20032
						Note)2, Note)5			Note)6								for Power	to type	
				51													Supply Input Connection	D-frame Double row type	DV0PM20033
		50	MSMF5AZL1 ☐ 1	100	MADLT01SF	MADLN01S♦											Connector Kit	A-frame to	
							A-frame	Approx.						DV0P4280	DV0P227		for Motor Connection	D-frame	DV0PM20034
	Single	100	MSMF011L1 ☐ 1	53 100	MADLT11SF	MADLN11S♦										DV0P4170	Connector	MSMF	DV0PM20035
	phase			100					-								Kit for Motor/ Encoder Con-	MQMF	DV0PM24582
	100 V	200	MSMF021L1 ☐ 1	55	MBDLT21SF	MBDLN21S♦	R.frame	Approx.	MFECA	MFECA		MCA ONJD	MFMCB	DV0P4283			nection	IVIQIVII	D V 01 1V124302
		200		100	Wibbereror	WBBENETO V	D mame	0.5	0 * * 0MJE	0 * * 0MJD /For movable.\	/For m	novable,\	0 * * 0PJT /For movable,\	2101 1200	DV0P228		Connector Kit f	or Brake Connection	
				57				Approx.	For movable, direction of motor shaft	direction of motor shaft		ction of or shaft	direction of motor shaft	D) / D / D / D		D) (0D) (000 (0		RS485, RS232 Safety	DV0PM20024 DV0PM20025
		400	MSMF041L1 ☐ 1	101	MCDLT31SF	MCDLN31S♦	G-frame	0.9			MF	MCA		DV0P4282		DV0PM20042	Connector Kit	Interface	DV0P4350
MSMF									MFECA 0**0MKE	MFECA 0 * * 0MKD	-	: 0NKD	MFMCB 0 * * 0PKT					External Scale	DV0PM20026
onnector\		50	MSMF5AZL1 ☐ 1	52 100	MADLT05SF	MADLN05S♦			For movable, opposite direction	/ For movable, \	opposite	novable, e direction	/ For movable,	\				Encoder	DV0PM20010
type				100					of motor shaft	opposite direction of motor shaft	\ of mot	tor shaft /	opposite direction of motor shaft	DV0P4281			Battery for Abs		DV0P2990
00 r/min		100	MSMF012L1 ☐ 1	54	MADLT05SF	MADLN05S♦	Λ.	Approx.	MFECA	MFECA	MF	MCA	MFMCB	21020.	DV0P227		Note)6	r Absolute Encoder	DV0P4430
IP67		100	MOMEO12L1 1	100	WIADLIUSSE	MIADLINUSS	A-frame	0.5	0 * * 0TJE	0 * * 0 T J D		ORJD	0 * * 0SJT		DV0P220	DV0P4170	Mounting	For A-frame,B-frame	DV0PM20100
11 07				56					For fixed, \ direction of \ motor shaft/	For fixed, direction of motor shaft	direc	fixed, ction of	For fixed, direction of motor shaft			DV0PM20042	Bracket	For C-frame, D-frame	DV0PM20101
	Single	200	MSMF022L1 ☐ 1	56 100	MADLT15SF	MADLN15S♦			,,		·	or shaft/				2 7 01 111200 12	Encoder	For movable, direction of motor shaft	MFECA0 * * 0MJI
	phase/			100					MFECA 0**0TKE	MFECA 0**0TKD		MCA ORKD	MFMCB 0**0SKT				Cable	For movable, opposite direction of motor shaft	MFECA0 * * 0MK
	3-phase 200 V	400	MSMF042L1 ☐ 1	58	MBDLT25SF	MBDLN25S♦	B-frame	Approx.	For fixed, opposite direction	For fixed, opposite direction	/ For	fixed, e direction	For fixed, opposite direction	DV0P4283			(with Battery Box)	For fixed, direction of	MFECA0 * * 0TJE
	200 V			101		552.1266 \$		0.9	of motor shaft	of motor shaft	\ of mot	tor shaft /	of motor shaft	7 2 7 3 1 1 2 3 3	DV0P228		Note)6	motor shaft For fixed, opposite	
				59			_	Approx.]		No	ote)4			DV0P220			direction of motor shaft	
		750	MSMF082L1 ☐ 1	101	MCDLT35SF	MCDLN35S♦	C-frame	1.3								DV0PM20042	Encodor	For movable, direction of motor shaft	MFECA0 * * 0MJI
								Approx	-						DV0P228		Encoder Cable	For movable, opposite direction of motor shaft	MFECA0 * * 0MK
		1000	MSMF092L1 ☐ 1	60 101	MDDLT45SF	MDDLN45S♦	D-frame	Approx.						DV0P4284		DV0P4220	(without	For fixed, direction of motor shaft	MFECA0 * * 0TJE
				101								1			DV0P222		(Battery Box)	For fixed, opposite	MFECA0 * * 0TKI
		100	MQMF011L1 🗌 1	67	MADLT11SF	MADI NI116	Λ.	Approx.						DV0P4280	DVADAAZ			direction of motor shaft For movable, direction	MFMCA0 * * 0NJ
		100	MQMF011L1 3	104	WADLITISE	MADLN11S♦	A-trame	0.4	MFECA	MFECA	MFMCA	MFMCA		DV0F4260	DVUFZZI			of motor shaft For movable, opposite	
	Single		MOMEORILATIA						- 0 * * 0MJE /For movable,\	0 * * 0MJD /For movable,\	0 * * 0UFD /For movable,\	0 * * 0VFE /For movable,\				DV0P4170	Motor Cable	direction of motor shaft	MFMCA0 * * 0NK
	phase	200	MQMF021L1 ☐ 1 MQMF021L1 ☐ 3	69 104	MBDLT21SF	MBDLN21S♦	B-frame	Approx.	direction of motor shaft	direction of motor shaft	direction of motor shaft	direction of motor shaft		DV0P4283			(For MSMF type)	For fixed, direction of motor shaft	MFMCA0 * * 0RJ
	100 V		NIQNIFUZILI 🗆 3	104				0.0	MFECA	MFECA	MFMCA	MFMCA			DV0P228			For fixed, opposite direction of motor shaft	MFMCA0**0RK
/IQMF		400	MQMF041L1 ☐ 1	71	MODITO	MODINGIOA		Approx.	0 * * 0MKE	0 * * 0MKD	0 * * 0UGD	0 * * 0 V G [)	D) (0D (000	D 701 220	D) (0D) (000 (0		For movable, direction of motor shaft	MFMCA0**0UF
onnector		400	MQMF041L1 ☐ 3	105	MCDLT31SF	MCDLN31S♦	G-frame	0.9	For movable, opposite direction	For movable, opposite direction	For movable, opposite direction		n)	DV0P4282		DV0PM20042	Motor Cable	For movable, opposite	MFMCA0**0UG
type									of motor shaft /	of motor shaft	of motor shaft	of motor shaft	_				(For MQMF type)	direction of motor shaft For fixed, direction of	
000 r/min		100	MQMF012L1 1	68	MADLT05SF	MADLN05S♦			MFECA 0**0TJE	MFECA 0**0TJD	MFMCA 0**0WFD	MFMCA 0**0XFD		DV0P4281			(without Brake)	motor shaft For fixed, opposite	MFMCA0 * * 0WF
IP67	Cinalo		MQMF012L1 ☐ 3	104			۸.	Approx.	/ For fixed, \	/ For fixed, \	/ For fixed, \	/ For fixed, \			DV0P227			direction of motor shaft	MFMCA0 * * 0WG
	Single phase/		MQMF022L1 ☐ 1	70			A-frame	0.5	direction of motor shaft/	direction of motor shaft/	direction of motor shaft	direction of motor shaft			DV0P220	DV0P4170		For movable, direction of motor shaft	MFMCA0**0VF
	3-phase	200	MQMF022L1 3	104	MADLT15SF	MADLN15S♦			MFECA	MFECA	MFMCA	MFMCA				DV0PM20042	Motor Cable	For movable, opposite direction of motor shaft	MFMCA0**0VG
	200 V								0 * * 0TKE	0 * * 0TKD For fixed,	0 * * 0WGD	0 * * 0XG[)	DV0P4283		D V 0 F W 20042	(For MQMF type) (with Brake)	For fixed, direction of	MFMCA0**0XF
		400	MQMF042L1 ☐ 1	72	MBDLT25SF	MBDLN25S♦	B	Approx.	opposite direction of motor shaft	opposite direction of motor shaft	opposite direction of motor shaft				DV0P228		(With Blake)	motor shaft For fixed, opposite	MFMCA0 * * 0XG
		400	MQMF042L1 ☐ 3	105	WIDDLIZSSI	WIDDLIN255	D-irame	0.9	,	, ,	, , , , , ,	,			DV0P220			direction of motor shaft For movable, direction	
									1		「Movable・F	For application	n where the c	ahle is moval	nle	٦		of motor shaft	MFMCB0 * * 0PJ
	•		otor specifications.	•	•	,							on where the c		J.C.		Brake Cable	For movable, opposite direction of motor shaft	MFMCB0 * * 0PK
	•		river specifications.	•	•	•							Opposite dire		r chaft · Ca	hle direction	Brake Cable	For fixed, direction of motor shaft	MFMCB0 * * 0SJ
	•		able length (03/3 m		•	, .					[Direction o	i motor snah	Opposite uiiti	J. 111010	ı sılalı. Ud	מופטנוטוו]		For fixed, opposite	MEMCBO * * OSK
			utput shaft cannot			•												direction of motor shaft 50 Ω 25 W	DV0P4280
			river (dedicated for	•	,	t support the abs	solute	system	specification								External	100 Ω 25 W	DV0P4281
only in	cremental	systen	n can be used in co	mbinatior	n.												regenerative	25 Ω 50 W	DV0P4282
Б.	note that	a hatte	ry is not supplied to	naether w	ith 23-hit aheali	ita ancodar cahl	(with	hattor	(hoy)								resistor	50 Ω 50 W	DV0P4283
6 Please	note that	u built	ny io not bappiloa te	geniei w	אוווז בט-טוג מטטטונ	ite encoder cabit	o (vviti	Dallei	y DOA).								10010101	30 Ω 100 W	2 7 01 1200

25 MINAS A6 Family MINAS A6 Family 26

A6 Family **Table of Part Numbers** and Options

80 mm sq. or less 50 W to 1000 W

MHMF: Connector type IP67

Part			Moto	or			Driver					Optiona	al pari	ts					■ Options		
Part						A6 SE carias	A6 SG series			Encoder C	able Note)3	Motor	Cable	e Note)3							Part No.
Part												illotoi	- J	110.070					Interface Cabl	9	
					Rating/	_			' '	23-bit A	Absolute				Brake	Evtornal					
March Marc	otor series	Power	Output	Part No.	Spec.		A6 SE series	Frame		Use in the	Use in the		_		_ 1.1		Reactor	Noise Filter	Interface Conv	version Cable	
Part	otor series	supply	(W)	Note)1	Dimensions			Fiaille					t	WILII		_			l intoriaco com	oroion oubio	
Maniformal 1 1 1 1 1 1 1 1 1					(page)				(kVA)			Вгаке		Вгаке			3-phase	3-phase			DV0P4132
MARCHANI 1							' ' '			, , ,	(without dattery dox)								Connector Kit	A-frame Single row	DV0PM20032
## 10 MARCHALL 72 MARCHALL 72 MARCHALL 72 MARCHALL 73 MARCHALL 74 MARCHALL							Note)2, Note)4			Note									lor Power	to	
MATHORITIES 100 MATH												MFMCA	4	MFMCA						D-frame type	DV0PM20033
Maintangerial 100			50	MHMF5AZL1 🗌 1	73	MADI TO 1 SE	MADI NO18													A-frame to	
Mark			30	MHMF5AZL1 ☐ 3	109	WIADLIVISI	WADLINGTS					common-us	e,	common-use,							DV0PM20034
MADLETISE MADLETISM MADLET								۸.	Approx.							DV0D4000	DVADAAZ		l 	MHMF 200 W to 1.0 kW	DV0PM24582
March 1 1 1 75								A-frame	0.4			MFMCA	4	MFMCA		DV0P4280	DV0P227		Kit for Motor/		D 101 WE 100E
Marker M				MHMF011I 1 □ 1	75							0**7U0	GD (MHMF 50 W, 100 W	DV0PM24581
Marker M			100			MADLT11SF	MADLN11S♦					common-us	ie,	common-use,						or Brake Connection	DV0PM20040
Minimary												opposite direct of motor sh	aft /					DV0P4170	Connector Rit	1	
Bingle Flower Flo													_	145140:	-					,	DV0PM20025
Price Pric												_							Connector Kit	Interface	
Method 1		Single										/For movabl	e,\	/For movable,\							DV0PM20026
MINAPORTILITIES MINAPORTICITIES MINAPORTIC		•	200	MHMF021L1 🗌 1	77	MDDI TO4 CE	MDDI NOTCA	D.				direction o motor shat	ft)	direction of motor shaft		DV0D4000			<u> </u>		DV0PM20010
		100 V	200	MHMF021L1 3	110	MIDDLIZISF	MIDDLINZIS	D-trame	0.5			MEMO	,	MEMCA		DV0P4263					DV0P2990
Method M																				r Absolute Encoder	DV0P4430
Math												/ For movabl	e, \ /	For movable, \					l - '	For A-frame, B-frame	DV0PM20100
MMMF04LL 1 70 MMMF04LL 1 70 MMDLT3SF MCDLN3SS Cree Approx Processes Proces												of motor sha	aft /	of motor shaft			DV0P228		Bracket	For C-frame, D-frame	DV0PM2010
MMMF04L1 1 70 MCDLT31SF MCDLN31S C+ame 0.9 MCDLN31S MCDLN31S C+ame 0.9 M										MFECA	MFECA			MFMCA							MFECA0**(
### #FO41L 1 79 MCDLT31SF MCDLN31S C Same 4 pprox 4 p										0 * * 0MJE	0 * * 0MJD										
MHMF				MHMF041I 1 □ 1	70				Approx			direction o	f	direction of							MFECA0**(
MFCA 0			400	_		MCDLT31SF	MCDLN31S♦	C-frame	0.9	\ motor shaft /	\ motor shaft /					DV0P4282		DV0PM20042			MFECA0**0
Part	AL IN A E									MFECA	MFECA								Note)5	For fixed, opposite	MEECA0**
February												/ For fixed,	\ /	For fixed,							
Memory M	onnector									opposite direction	opposite direction	of motor sha	aft /	of motor shaft							MFECA0 * * 0
MMMF6AZ1 3 74 MADLT05SF MADLN05S	type /									·	j` '	MEMCA	Δ	MEMCA	-						MFECA0 * * 0
MHMF02L1 3 109	000 r/min		E0.	MHMF5AZL1 ☐ 1	74	MADITOECE	MADI NOECA			-		0**7UI	FD (0**7VFD							MEECVU* *U
MHMF012L1	IP67		50	MHMF5AZL1 ☐ 3	109	MADLIUSSF	MADLINUSS			/ For fixed, \	For fixed, direction of	common-us	e,	common-use,					Battery Box		
MHMF02L1 1 76 MADLT0SSF MADLN0SS Advantage Approx.											motor shaft/					D) (0D (00 (MFECA0 * * 0
100 MHMF012L1 1 76 MHMF02L1 1 78 MADLT1SSF MADLN1SS District shart Di								1		MFECA	MFECA	MFMCA	4	MFMCA		DV0P4281					MFMCA0**(
MMMF02L1 3 109 MADLTISSF MADLNISS				MHMF012L1 □ 1	76			Λ,	Approx.								DV0P227		Motor Cable		MEMCAON
Single phase 200 V MHMF02L1 1 1 1 1 1 1 1 1 1			100			MADLT05SF	MADLN05S	A-trame	0.5	opposite direction	opposite direction		e,	common-use,			DV0P220		(For MHMF	direction of motor shaft	
Single phase/ 3-phase 200 V				_						,	, , , , , ,							DV0P4170	(without Brake)	motor shaft	MFMCA0 * * (
Single phase/ 3-phase 200 V								1							-			DV0PM20042		For fixed, opposite	MFMCA0**(
Single phase 200 V MHMF02L1 3 110 MADLT15SF MADLN15SQ Brane 200 V MHMF042L1 3 110 MBDLT2SSF MBDLN2SSQ Brane 200 V MHMF042L1 3 110 MBDLT2SSF MBDLN2SSQ Brane 200 V MHMF042L1 3 110 MBDLT2SSF MBDLN2SSQ Brane 200 V MHMF042L1 3 111 MCDLT3SSF MCDLN3SSQ Crame 200 MHMF042L1 3 111 MCDLT3SSF MCDLN3SSQ Cr		0: :	000	MHMF022L1 ☐ 1	78	MARITITA	MARIALIS A							-							
Phase 200 V 400 MHMF042L1 1 80 MHMF042L1 1 80 MHMF042L1 3 110 MBDLN25SF MBDLN25			200	_		MADLT15SF	MADLN15S♦					/For movabl	e,\	/For movable,\					Matau O-51	of motor shaft	WIFWICAU**(
MFMCA 0 ** 0/400 MHMF042L1 1 80 MHMF04		•										direction o	f	direction of					/For MHMF \		MFMCA0**
## Approx. App													.	MEMO					200 W to 1.0 kW	For fixed, direction of	MFMCA0**(
Model For Manual Model		200 V	400			MRDI T25SE	MRDI N259△	B-fromo	Approx.							DV0P4383			(with Brake)		
MHMF082L1			700	MHMF042L1 ☐ 3	110	WIDDLIESSI	MIDDEINZOO	-iraine	0.9			/ For movabl	e, \ /	For movable, \			DVCDCCC			direction of motor shaft	MFMCA0**
MHMF082L1												of motor sha							Motor Cable		MFMCA0**
750 MHMF082L1												MEMCA	Δ	MEMCA			DV0P220		/For MHMF \	of motor shaft	IVII IVIO710 · · ·
MHMF082L1			750			MCDLT35SF	MCDLN35S	C-frame				0 * * 0W	FD (0**0XFD				DV0PM20042	1 '		MFMCA0**
Motor Shaft/ MFMCA MFM				MHMF082L1 ☐ 3	111				1.3			For fixed, direction o	f)						(without brake)	direction of motor shaft	IVII IVIOAUTTI
MHMF092L1 ☐ 1												\motor shaf	ft/		-				Motor Cable		MEMCA0 * * 7
1000 MHMF092L1				MUMEOOOL 4 T 4	00												DVVDSSS		/For MHMF \	of motor shaft	IVII IVI∪⊓U↑ ♣ I
Opposite direction of motor shaft Opposite direction of motor shaft			1000			MDDLT55SF	MDDLN55S♦	D-frame	Approx.			/ For fixed,	\ /	For fixed, \		DV0P4284		DV0P4220			MEMC AO * * 7
□ : Represents the motor specifications. (refer to "Model designation" P.18.) □ : Represents the motor specifications (refer to "Model designation" P.18.) □ : Represents the driver specifications (refer to "Model designation" P.18.) □ : Represents the driver specifications (refer to "Model designation" P.18.) □ : Represents the driver specifications (refer to "Model designation" P.18.) □ : Represents the motor specifications (refer to "Model designation" P.18.) □ : Represents the driver specifications (refer to "Model designation" P.18.) □ : Represents the driver specifications (refer to "Model designation" P.18.)				IVI⊓IVIFU92L1 ∐ 3	111				2.0			opposite direc	ction c	opposite direction			DV0P222		(with brake)		IVII IVIOAU * *
Sepresents the driver specifications (refer to "Model designation" P.18.) Fixed For application where the cable is fixed regenerative 25 Ω 50 W DV0P4282													- ' '	- '							
Sepresents the driver specifications (refer to "Model designation" P.18.)	□ : R	epresent	s the n	notor specifications	. (refer to	"Model designa	tion" P.18.)					Movable	e : Fo	r application wh	ere the cab	ble is movat	ole.	7			
		-				_													_		

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

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.

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

	Motor Cable		se, direction	MFMCA0 * * 7UFD	175
M20042	(For MHMF 50 W, 100 W) (without Brake)	of motor shaft Movable/fixed common-use, opposite direction of motor shaft		MFMCA0 * * 7UGD	175
	Motor Cable /For MHMF \	Movable/fixed common-use, direction of motor shaft		MFMCA0**7VFD	178
P4220	(with Brake)		ced se, opposite motor shaft	MFMCA0**7VGD	178
		50 Ω 25 W		DV0P4280	197
7	External	100 Ω 25	W	DV0P4281	197
	regenerative	25 Ω 50	W	DV0P4282	197
	resistor	50 Ω 50	W	DV0P4283	197
ection		30 Ω 100	W	DV0P4284	197
	Reactor), DV0P222 7, DV0P228	196
	Noise Filter		DV0P4170, DV0PM20042 DV0P4220		
	Surge Absorbe	r	DV0P419	0, DV0P1450	237
	Ferite Core		DV0P146	238	

A6 Family Table of Part Numbers and Options

100 mm sq. or more 0.85 kW to 5.0 kW IP67 motor Encorder connector (Large size JL10) type

Mode Park	Dank N
Modern Service Part	Part No.
Miles Power Powe	
Mode Park	
	PM20032
Fig	PM20033
Part	PM20044
Mask	PM20034
Mark September Mark Sept	PM20046
Second Continue	
Part	PM20045
Part	PM24587
Prof. Prof	1.0 kW to 2.0 kW 1.0 kW to 2.0 kW
MSMF5QL1 6 66 MFDLBSSF	0.85 kW to 1.8 kW
Second S	1.0 kW, 1.5 kW PM24588
	3.0 kW to 5.0 kW
MOMF Phase Phas	3.0 kW to 5.0 kW 2.9 kW, 4.4 kW
MDMF Section	2.0 kW to 5.0 kW
MDMF Large size Large siz	1.0 kW to 2.0 kW
Large size Jul 10 type 2000 r/min IP67 200 V MDMF202L1 6 MDMF202L1 8 91 MEDLT83SF MEDLN83S	1.0 kW to 2.0 kW 0.85 kW to 1.8 kW
Single phase/ MGMF Sare phase/ MGMF092L1 8 95 MDLT45SF MDLN45S MFDLN3S MFDLN	1.0 kW, 1.5 kW
Post	3.0 kW to 5.0 kW
Figure F	3.0 kW to 5.0 kW 2.9 kW, 4.4 kW
Month Mont	2.0 kW to 5.0 kW
Single phase/ 3-phase 200 V 1800 MGMF132L1 6 MGMF092L1 8 95 MDDLT45SF MDDLN45S DV0P4284 MGMF092L1 8 96 MDDLT55SF MDDLN5SS DV0P4284 DV	
Single phase/ 3-phase 200 V 1300 MGMF132L1 6 MGMF092L1 8 MDDLT45SF MDDLN45S DV0P4284 MGMF092L1 8 MDDLT5SF MDDLN5SS MFECA MMMIning MGMF182L1 6 MGMF182L1 8 MG	
MGMF Large size JL10 type / Low speed/ Low s	PM20026
MGMF Large size JL10 type / Low speed/ Low s	PM20010
Large size JL10 type / Low speed/\ Low spe	P2990
JL10 type / Low speed/\ 1800 MGMF182L1 □ 6 MGMF182L1 □ 8 97 MEDLN83S E-frame Approx. 3.8 0**0EPD O***0EPD O***2FCD 0**2FCD O***2FCD DV0P4285 DV0P42043 Mounting Bracket D-frame Dv0P4	P4430
/Low speed/\ MGMF182L1 \square 8 S.8 Bracket	PM20101
High torque type 3-phase 2900 MGMF292L1 G 6 MGMF292L1 G 8 98 MFDLTB3SF MFDLNB3S	CAO**0EPE
1500 r/min 200 V MGMF292L1 8 DV0P4285 DV0P4285	
IP67 MGMF442L1 □ 6 MFDLTP3CF MFDLNP3C MFDLNP	CAO**0ESE
MGMF442L1 8 Encoder One-touch lock type MFFC	CA0**0EPD
Single 1000 MHMF102L1 6 83 MDDLT45SF MDDLN45SQ Approx. Approx. Approx. Approx. Approx. Approx. 1 8 O* * 25LID 0 * 25LID 0 * * 25L	
phase/ MHMF102L1 \(\sigma \) 8 \\ \(\sigma \) \(\lambda \) \(\sigma \) \(\sigm	CA0**0ESD
3-phase MFMCD MFMCA DV0P4284 DV0P4220 One-touch lock type MFMC	
200 V 1500 MHMF152L1 0 8 84 MDDLT55SF MDDLN55S	CD0 * * 2ECD
MEMOR MEMOR (without Brake) Screwed type MEMOR	CE0 * *2ECD
Targe size 0 * *2EUD 0 * *	
JL10 type 2000 MIMME2021 1 8 85 MEDLN83S E-frame 3.8	CA0 * *3ECT
2000 r/min MFECA MFECA MFECA MFMCE MFMCE MFMCE MFMCE	CA0 * * 2FUD CA0 * * 2FCD
IP67 3-phase One-touch lock type MEMC	
Approx MHMF31721 1 6	CE0**2FCD
MHMF402I 1 0 6 One-touch lock type MFMC	
MHMF402L1 🗌 8 87 MFDL1B3SF MFDLNB3S First Approx. Screwed type MFMC	CA0**3FCT
MHMF502L1 \(\sqrt{8} \) resistor \(\lambda \text{0 } \Omega 130 \text{ W} \) DV0P4	
Note)1	
Note)2 \Diamond : Represents the driver specifications. (refer to "Model designation" P.18.) DV0P224, DV0P DV0P228, DV0P	
Note)3 **: Represents the cable length (03/3 m, 05/5 m, 10/10 m, 20/20 m). Example: 3 m/MFECA0030EPE DV0P4220, DV0	
lote)4 Because A6SE series driver (dedicated for position control) does not support the absolute system specification, Note)6 For other possible combinations, refer to P.197. Note)7 For other possible combinations, refer to P.197.	0D4 450

only incremental system can be used in combination.

Note)7 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.

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DV0P4190, DV0P1450

DV0P1460

Surge Absorber

Ferite Core

A6 Family Table of Part Numbers and Options

100 mm sq. or more 0.85 kW to 5.0 kW IP67 motor Encorder connector (Small size JN2) type

		Moto	r			Driver					Optiona	parts				■ Options		
								-	Encoder C	able Note)3	Motor C	able Note)3	,5			lataria a Oak	Title	Part No. Pa
					A6 SF series	A6 SG series		Power	INO /C-	, , , , , , , , , , , , , , , , , , ,		JL10				Interface Cable	е	DV0P4360 18 DV0P4120 18
				Rating/	Multi fanction type	RS485 communication		capacity	,	nall size) h lock type)		ich lock type	1					DV0P4121 18
Motor series	Power	Output	Part No.	Spec.	/Pulse, analog,\	A6 SE series	Frame	/ at rated	23-hit A	Absolute	\ JL04 s	crewed type	External	Reactor	Noise Filter	Interface Conv	version Cable	DV0P4130 18 DV0P4131 18
	supply	(W)	Note)1	Dimensions (page)	(full-closed)	Basic		\ load / (kVA)	Use in the	Use in the			Regenerative Resistor	(Single phase / 3-phase)				DV0P4132 18
				(1000)		(Pulse signal input)		(1.17)	absolute system	Incremental system	without Brake	with Brak						DV0PM20032 18
						Note)2, Note)4				(without battery box			-			for Power Supply Input	D-frame	DV0PM20033 18
	Single	4000	MSMF102L1 ☐ 5	61	MDDITESOE	MDDINESOA			Note)7					DVODOGO / DVODOGO		Connection	E-frame	DV0PM20044 18
	phase/	1000	MSMF102L1 7	102	MDDLT55SF	MDDLN55S♦	D-frame	Approx.			MFMCD 0 * * 2EU	MFM0 0 * * 2F		DV0P228 / DV0P222	DV0P4220	Connector Kit for Motor	A-frame to D-frame	DV0PM20034 18
	3-phase 200 V	1500	MSMF152L1 ☐ 5 MSMF152L1 ☐ 7	62 102	MDDLT55SF	MDDLN55S♦		2.3				-	_	DV0PM20047 / DV0P222		Connection	E-frame	DV0PM20046 18
MSMF Small size		2000	MSMF202L1 ☐ 5	63	MEDLT83SF	MEDI NOSCA	г.	Approx.			MFMCD 0**2EC	MFM0 0 * * 2F	DVADAGOE	DV0P223	DV0PM20043	Connector Kit for Regenera-	E-frame	DV0PM20045 18
		2000	MSMF202L1 ☐ 7	102	MEDLIOSSE	MEDLN83S♦	E-frame	3.8	MFECA	MFECA	0 4 4 2 2 0	5 0 4 4 21	Note)6	DV0F223	D V U F IVI 20043	tive Resistor		DV0PM24583
JN2 type	3-phase	3000	MSMF302L1 ☐ 5 MSMF302L1 ☐ 7	64 102	MFDLTA3SF	MFDLNA3S♦		Approx. 4.5	0 * * 0ETE	0 * * 0ETD	MFMCA	MFMC	CA	DV0P224				MSMF 1.0 kW to 2.0 kW MDMF 1.0 kW to 2.0 kW 18
IP67	200 V	4000	MSMF402L1 ☐ 5	65	MFDLTB3SF	MFDLNB3S	F-frame				0 * * 3EU	T 0**3F	DV0P4285		DV0P3410		without Brake	MGMF 0.85 kW to 1.8 kW MHMF 1.0 kW, 1.5 kW
		4000	MSMF402L1 7	102	WII DET BOOT	WII BENDOO	1 -mame	Approx. 7.5			MFMCA	MFMC	A ×2 in paralle	DV0P225	2 701 0 710			DV0PM24584
		5000	MSMF502L1 7	66 102	MFDLTB3SF	MFDLNB3S					0 * * 3EC	T 0**3F	-CT			Connector		MSMF 3.0 kW to 5.0 kW MDMF 3.0 kW to 5.0 kW
	Single	1000	MDMF102L1	89 113	MDDLT45SF	MDDLN45S♦		Approx.			MFMCD	MFMC	:Δ	DV0P228 / DV0P222		Kit for Motor/		MGMF 2.9 kW, 4.4 kW MHMF 2.0 kW to 5.0 kW
	phase/ 3-phase	4500	MDMF102L1	90			D-frame				0**2EU		DV0D4004	DV0DM00047 / DV0D000	DV0P4220	Encoder Con- nection		DV0PM24585 MSMF 1.0 kW to 2.0 kW
MDMF	200 V	1500	MDMF152L1 ☐ 7	113	MDDLT55SF	MDDLN55S♦		2.3			MFMCD	MFMC	CA .	DV0PM20047 / DV0P222		4		MDMF 1.0 kW to 2.0 kW MGMF 0.85 kW to 1.8 kW MHMF 1.0 kW, 1.5 kW
Small size		2000	MDMF202L1 ☐ 5 MDMF202L1 ☐ 7	91 113	MEDLT83SF	MEDLN83S♦	E-frame	Approx. 3.8	MFECA	MFECA	0**2EC		DIVIDAGE	DV0P223	DV0PM20043		with Brake	DV0PM24586
JN2 type			MDMF302L1 5	92				Approx.	0**0ETE	0 * * 0ETD			,					MSMF 3.0 kW to 5.0 kW MDMF 3.0 kW to 5.0 kW 19
2000 r/mii IP67	3-pnase	3000	MDMF302L1 ☐ 7	113	MFDLTA3SF	MFDLNA3S		4.5	MFMCA 0**3EU	MFM0 T 0**3	IIT	DV0P224	-			MGMF 2.9 kW, 4.4 kW MHMF 2.0 kW to 5.0 kW		
<	200 V	4000	MDMF402L1 ☐ 5 MDMF402L1 ☐ 7	93 113	MFDLTB3SF	MFDLNB3S♦	F-frame	Approx.					DV0P4285	DV0P3410		RS485, RS232 Safety	DV0PM20024 18 DV0PM20025 18	
Middle		5000	MDMF502L1 ☐ 5	94	MFDLTB3SF	MFDLNB3S♦		7.5			MFMCA 0**3EC	MFM0 T 0 * * 3F	. А	DV0P225		Connector Kit		DV0P4350 18
e in	0: 1	3000	MDMF502L1 \square 7 MGMF092L1 \square 5	113	WII DET DOOI	IVII DEINDOO					0 1 1020						External Scale Encoder	DV0PM20026 18 DV0PM20010 18
ertia	Single phase/	850	MGMF092L1 7	95 114	MDDLT45SF	MDDLN45S♦	D.	Approx. 1.8		MFMCD	MFMC		DV0P228 / DV0P221	DV0P4220	Battery for Abs		DV0P2990 19	
MGMF	3-phase	1300	MGMF132L1 5	96	MDDLT55SF	MDDLN55S♦	D-frame	Approx.			0 * * 2EU	0	FUD DV0P4284	DV0PM20047 / DV0P222	DV0P4220	Battery Box fo Note)7	r Absolute Encoder	DV0P4430 19
Small size JN2 type	,		MGMF132L1 ☐ 7 MGMF182L1 ☐ 5	114 97	145D1 Tabob		_				MFMCD	MFMC		D. /oDeec	D) (2D) (200 (2	Mounting	D-frame	DV0PM20101 19
/Low speed	Λ	1800	MGMF182L1 🗌 7	114	MEDLT83SF	MEDLN83S♦	E-frame	3.8	MFECA 0 * * 0ETE	MFECA 0**0ETD	0**2EC	D 0**2F	CD DV0P4285	DV0P223	DV0PM20043	Bracket Encoder		
High torque type	3-phase	2900	MGMF292L1 ☐ 5	98	MFDLTB3SF	MFDLNB3S♦			O A A OLIL	0 * * 0 L 1 D	MFMCA	MFMC		DV0P224		Cable /with		MFECA0 * * 0ETE 17
1500 r/mii	200 V		MGMF292L1 ☐ 7	114		•	F-frame	Approx.			0 * * 3EU	T 0**3F	DV0P4285		DV0P3410	(Battery Box)		
IP67		4400	MGMF442L1 ☐ 5 MGMF442L1 ☐ 7	99 114	MFDLTB3SF	MFDLNB3S		7.5			MFMCA	MFMC		DV0P225		Note)7 Encoder	One-touch lock type	
											0 * * 3EC					Cable /without \		MFECA0 * * 0ETD 17
	Single	1000	MHMF102L1 ☐ 5 MHMF102L1 ☐ 7	83 112	MDDLT45SF	MDDLN45S♦		Approx. 1.8			MFMCD 0**2EU	MFM0 0 * * 2F		DV0P228 / DV0P222		(Battery Box)	One touch leads to	MEMODO & AOCUD 47
	phase/ 3-phase						D-frame	App				-	DV0P4284		DV0P4220		Screwed type	MFMCD0 * * 2EUD 17 MFMCD0 * * 2ECD 17
	200 V	1500	MHMF152L1 ☐ 5 MHMF152L1 ☐ 7	84 112	MDDLT55SF	MDDLN55S♦		Approx. 2.3			MFMCD 0**2EC	MFM0 0 * * 2F		DV0PM20047 / DV0P222		Motor Cable		MFMCE0 * *2EUD 17
MHMF											MFMCE	MFMC				(without Brake)		MFMCE0 * * 2ECD 17
Small size		005	MHMF202L1 ☐ 5	85	MEDITATION	LIEBULIA - A	_	Approx.	MFECA	MFECA	0**2EU			B. (abs	D) (0D) (5		Screwed type	MFMCA0**3ECT 17
∃ JINZ type		2000	MHMF202L1 7	112	MEDLT83SF	MEDLN83S♦	E-frame	3.8	0 * * 0ETE		MFMCE	MFMC	Note)6	DV0P223	DV0PM20043		One-touch lock type Screwed type	MFMCA0 * *2FUD 17 MFMCA0 * *2FCD 17
2000 r/mii IP67	1 3-phase										0**2EC	O 0**2F	CD			Motor Cable	One-touch lock type	MFMCE0**2FUD 17
11 07	200 V	3000	MHMF302L1 ☐ 5 MHMF302L1 ☐ 7	86 112	MFDLTA3SF	MFDLNA3S		Approx. 4.5			MFMCA	MFMC	CA	DV0P224		(with Brake)	Screwed type One-touch lock type	MFMCE0 * * 2FCD 18 • MFMCA0 * * 3FUT 18
		4000	MHMF402L1 5	87	MEDITROCE	MEDI NIDOO ^	- -	1.5			0**3EU				DVoDo440		Screwed type	MFMCA0 * *3FCT 18
		4000	MHMF402L1 ☐ 7	112	MFDLTB3SF	MFDLNB3S♦	F-frame	Approx. 7.5			MFMCA	MFMC	×2 in paralle	DV0P225	DV0P3410	External regenerative	30 Ω 100 W	DV0P4284 19
		5000	MHMF502L1 ☐ 5 MHMF502L1 ☐ 7	88 112	MFDLTB3SF	MFDLNB3S♦		7.5			0**3EC	T 0**3F	-CT			resistor	20 Ω 130 W	DV0P4285
Note)1 :	Represen	ts the n	notor specifications		"Model designa	tion" P.18.)				1	Note)5 L	se of JL10	type motor cables	enable one-touch lock	connections.	Reactor	DV0P22	2, DV0P223 4, DV0P225 19
,			river specifications	•	-	,	_						• • •	04V type cables can al	so be used.			8, DV0PM20047 20, DV0PM20043
,			able length (03/3 m Iriver (dedicated for			, .					•		ssible combination	ns, refer to P.197. ot supplied together wi	h 23-hit	Noise Filter	DV0P34	10
			n can be used in co	-		a support the ab	Joiule	oyol c iii	specification!	,			coder cable (with b		20-DIL	Surge Absorbe	DV0P41 DV0P14	90, DV0P1450 23 60 23
- ,		,												mber "DV0P2990" sep	arataly	I GING COIR	D V U P 14	23

31 MINAS A6 Family

A6 SF series (Multifanction type) Driver Specifications A6 SF series (Multifanction type) Position, Speed, Torque, Full-closed type

					+10 % +10 %						
		100 V	Mair	n circuit	Single phase 100 V $^{+10}_{-15}$ % to 120 V $^{+10}_{-15}$ % 50 Hz / 60 Hz						
		100 V	Contr	ol circuit	Single phase 100 V ^{+10 %} to 120 V ^{+10 %} 50 Hz / 60 Hz						
	Input I		Main	A-frame to D-frame	Single/3-phase 200 V +10 % to 240 V +10 % 50 Hz / 60 Hz						
	7		circuit	E-frame, F-frame	Single/3-phase 200 V +10 % to 240 V +10 % 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 % to 240 V +10 % 50 Hz / 60 Hz						
	temperature			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						
	Vibration				5.88 m/s² or less, 10 Hz to 60 Hz						
	Control method				IGBT PWM Sinusoidal wave drive						
	Encoder feedback				23-bit (8388608 resolution) absolute encoder, 7-wire serial * When using the product as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder. Instead, set the parameter Pr0.15 to [1] (default).						
Basic Specifications	External scale		efeedbad	ck	A/B phase, initialization signal defferential input. Manufacturers that support serial communication scale: Fagor Automation S.Coop., Magnescale Co., Ltd., Mitutoyo Corporation Nidec Sankyo Corporation, Renishaw plc						
cification		Control si	Input		General purpose 10 inputs The function of general-purpose input is selected by parameters.						
Snc	Pa	Control si	griai	Output	General purpose 6 outputs The function of general-purpose output is selected by parameters.						
	Parallel I/O	Analog oi	anal	Input	3 inputs (16-bit A/D : 1 input, 12-bit A/D : 2 inputs)						
	0	Analog sig	yriai	Output	2 outputs (Analog monitor: 2 output)						
	connector	Dulae eigr	a o l	Input	2 inputs (Photo-coupler input, Line receiver input) Both open collector and line driver interface can be connected. High speed line driver interface can be connected.						
		Pulse signal Output USB Communication function		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 (EXA/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 Safety function		RS485	1: n communication (max 31)							
				A dedicated connector is provided for Functional Safety.							
	Fro	nt panel			(1) 5 keys (2) LED (6-digit)						
	Re	generation			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.)						
	Dy	namic brak	е		A-frame to F-frame: Built-in						
	Control mode				Switching among the following 7 mode is enabled, (1) Position control (2) Speed control (3) Toque control (4) Position/Speed control (5) Position/Torque control (6) Speed/Torque control (7) Full-closed control						

^{*1} Air containing water vapor will become saturated with water vapor as the temperature falls, causing dew.

Со	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
Со	ntrol outpo	ut		 (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 in	nput		(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 o	utput		(1) In-position output (2) Position command ON/OFF output
		Max. command	pulse frequency	500 kpps (Optocoupler interface), 8 Mpps (When using line receiver input multiplied by 4
Pos		Input pulse si	gnal format	Differential input. Selectable by parameter. ([1]Positive/Negative pulse [2]A/B quadrature [3]Pulse/Direction)
Position control	Pulse input	Electronic gea (Division/Mult command pul	iplication of	Applicable scaling ratio: 1/1000 times to 8000 times Any value of 1 - 2 ³⁰ can be set for both numerator (which corresponds to encode resolution) and denominator (which corresponds to command pulse resolution permotor revolution), but the combination has to be within the range shown above.
<u>2</u>		Smoothing filt	ter	Primary delay filter or FIR type filter is adaptable to the command input
	Analog		ommand input	Individual torque limit for both positive and negative direction is enabled.
	input	Torque feed f	orward input	Analog voltage can be used as torque feed forward input.
	Two-degi	ee-of-freedom	control	Available
	Anti-vibra	tion control		Available
L	Load var	ation suppress	ion function	Available
	Control ir	nput		(1) Internal command velocity selection input(2) Speed zero clamp input(3) Velocity command sign input(4) Control mode switch input
	Control o	utput		(1) Speed coincidence output (2) Velocity command ON/OFF output
Speed	Analog	Velocity comr	mand input	Velocity command input with analog voltage is possible. Scale setting and command polarity vary depending on parameters. (6 V/Rated rotational speed: Defaul
ed	input	Torque limit c	ommand input	Individual torque limit for both positive and negative direction is enabled.
8		Torque feed f	orward input	Analog voltage can be used as torque feed forward input.
contro	Internal v	nternal velocity 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.
	Speed ze	ero clamp		Internal velocity command can be clamped to 0 with speed zero clamp input.
		ee-of-freedom	control	Available
헉	Control ir	•		Speed zero clamp input, torque command sign input, control mode switch input.
que	Control o	utput		(1) Speed coincidence output (2) Speed in-limit output
Torque contro	Analog input			Torque command input with analog voltage is possible. Scale setting and command polarity vary depending on parameters. (3 V/rated torque Default)
으	Speed lin	nit function		Speed limit value with parameter is enabled.
	Control ir	nput		 (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
	Control o	utnut		(1) In-position output (2) Position command ON/OFF output
	CONTROLO		pulse frequency	500 kpps (Optocoupler interface), 8 Mpps (When using line receiver input multiplied by
		Input pulse si		Differential input. Selectable by parameter. ([1]Positive/Negative pulse [2]A/B quadrature [3]Pulse/Direction)
Full-closed control	Pulse input	Electronic gea (Division/Mult command pul	iplication of	Applicable scaling ratio: 1/1000 times to 8000 times Any value of 1 - 2 ³⁰ can be set for both numerator (which corresponds to encode resolution) and denominator (which corresponds to command pulse resolution p motor revolution), but the combination has to be within the range shown above.
d C		Smoothing fill	ter	Primary delay filter or FIR type filter is adaptable to the command input
	Analog	Torque limit c	ommand input	Individual torque limit for both positive and negative direction is enabled.
o,	input	Torque feed f	orward input	Analog voltage can be used as torque feed forward input.
	division/n	ange of externa nultiplication		1/40 times to 1280 times Although ratio of the encoder pulse (numerator) and external scale pulse (denominator) can be arbitrarily set in the range of 1 to 2^{23} for the numerator and in the range of 1 to 2^{23} for the denominator, this product should be used within the aforementioned range.
	Two-degree-of-freedom control		control	Available
	Anti-vibration control			Available
	Auto tuni	ng		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.
Š	Division of	of encoder feed	back pulse	Set up of any value is enabled (encoder pulses count is the max.).
Common			Hard error	Over-voltage, under-voltage, over-speed, over-load, over-heat, over-current and encoder error etc.
I	i retective randucti		Soft error	Excess position deviation, command pulse division error, EEPROM error etc.
			00.0	

33 MINAS A6 Family MINAS A6 Family 34

A6 Family

A6 SG series (RS485 communication type)
A6 SE series (Besic type)
Position control only type

	100 V	Maii	n circuit	Single phase 100 V $^{+1}_{-1}$	0 % 5 % to	120 V +10 % -15 %	50 Hz / 60 Hz		
	100 V	Conti	rol circuit	Single phase 100 V ⁺¹ -1	0 % 5 % to	120 V +10 % -15 %	50 Hz / 60 Hz		
Input		Main	A-frame to D-frame	Single/3-phase 200 V +1 -1	0 % 5 % to	240 V +10 % -15 %	50 Hz / 60 Hz		
Input power	circui		E-frame to F-frame	Single/3-phase 200 V +1 -1	0 % 5 % to	240 V +10 % -15 %	50 Hz / 60 Hz		
	A-fı		A-frame to D-frame	Single phase 200 V $^{+1}_{-1}$	0 % 5 % to	240 V +10 % -15 %	50 Hz / 60 Hz		
	circuit E-frame to F-frame			Single phase 200 V +1 -1	0 % 5 % to	240 V +10 % -15 %	50 Hz / 60 Hz		
		temp	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)					
Env	vironment	hu	midity	Both operating and storage : 20 % to	85 %RI	H (free from co	ondensation*1)		
	Altitude			Lower than 1000 m					
	Vibration Control method		oration	5.88 m/s ² or less, 10 Hz to 60 Hz					
Co				IGBT PWM Sinusoidal wave drive					
	Encoder feedback			23-bit (8388608 resolution) absolute * When using the product as an inconnect a battery for absolute enco	rementa	al system (not			
	O a matural ad		Input	General purpose 10 inputs The function of general-purpose input is selected by parameters.					
Parallel I/O	Control si	gnai	Output	General purpose 6 outputs The function of general-purpose input is selected by parameters.					
I/O cc	A		Input	None					
connec	Analog sig	gnai	Output	2 outputs (Analog monitor: 2 output)					
ð	ি Input			2 inputs (Photo-coupler input, Line receiver input)					
	Pulse signal Output USB Communication function RS232 RS485		Output	4 outputs (Line driver: 3 output, open collector: 1 output)					
			USB	USB interface to connect to compute	rs for pa	rameter settin	g or status monitoring.		
			RS232	1:1 communication		* RS485, RS	S232 connector is not installed		
			RS485	1: n communication (max 31)		on A6 SE series.			
Fro	Front panel			(1) 5 keys (2) LED (6-digit)					
Re	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.)					
Dyı	namic brak	е		Built-in					
Co	ntrol mode			(1) Position control (2) Internal veloc	ity comn	nand (3) Posit	tion/Internal velocity command		

^{*1} Air containing water vapor will become saturated with water vapor as the temperature falls, causing dew.

		Control inp	ut	(1) servo-ON input (2) Alarm clear input (3) Gain switch input (4) Positive direction drive inhibit input ect.
		Control out	put	In-Position output etc.
		Max. command pulse frequency Input pulse signal format Pulse		500 kpps (Optocoupler interface) 8 Mpps (Line receiver interface)
0000	Position control			Differential input. Selectable by parameter. ([1]Positive/Negative pulse [2]A/B quadrature [3]Pulse/Direction)
	control	input	Electronic gear (Division/Multiplica- tion of command pulse)	Applicable scaling ratio: 1/1000 times to 8000 times Any value of 1 - 2 ³⁰ 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
근		Control input Control output		Internal command speed selections 1-3, speed-zero clamp, etc.
Function				At speed etc.
0	Speed	Internal vel	ocity command	Switching the internal 8 speed is enabled by command input.
	control	Soft-start/d	own 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	l clamp	Internal velocity command can be clamped to 0 with speed zero clamp input.
		Two-degree-of-freedom control		Available
		Auto tuning		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.
0	Com	Division of encoder feedback pulse Protective function Hard error		Set up of any value is enabled (encoder pulses count is the max.).
	Common			Over-voltage, under-voltage, over-speed, over-load, over-heat, over-current and encoder error etc.
		- anotion	Soft error	Excess position deviation, command pulse division error, EEPROM error etc.
		Alarm data trace back		Tracing back of alarm data is available

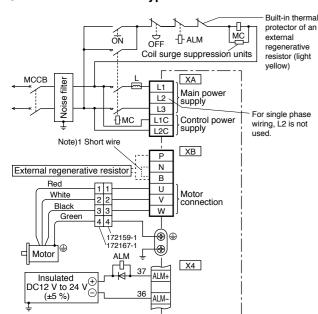
35 MINAS A6 Family MINAS A6 Family 36 Wiring Diagram

A6 F

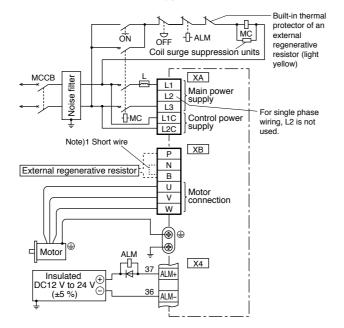
In Case of Single phase, C-frame, D-frame, 100 V / 200 V type

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

● In Case of Leadwire type

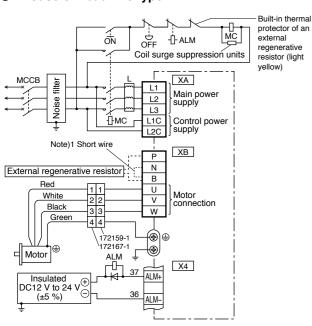


■ In Case of Connector type

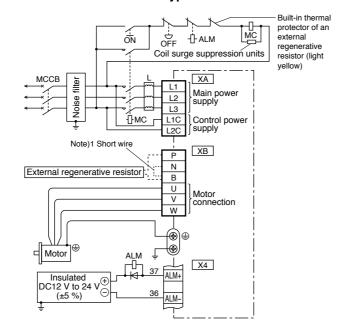


In Case of 3-phase, A-frame, B-frame, 200 V type

● In Case of Leadwire type



● In Case of Connector type

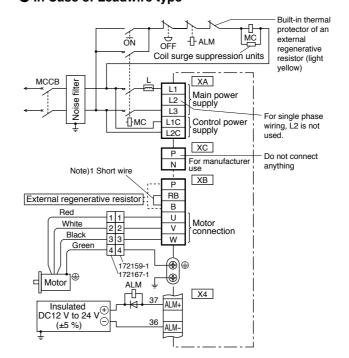


Note)1

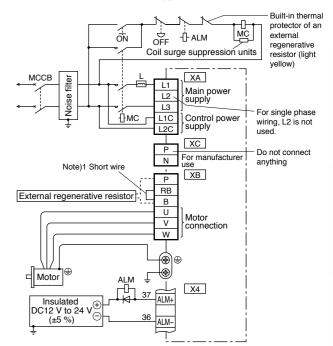
Frame No.	Chart wire	Built-in regenerative resistor	Connection of the connector XB					
	Short wire (Accessory)		In case of using an external regenerative resistor	In case of not using an external regenerative resistor				
A-frame B-frame	without	without	 Connect an external regenerative resistor between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

* Refer to P.169, P.170, Specifications of Motor connector.

● In Case of Leadwire type

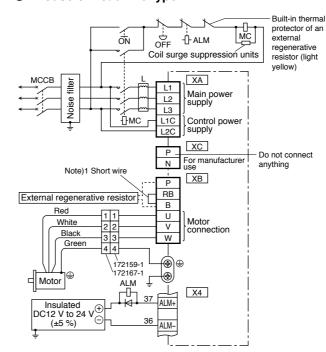


● In Case of Connector type

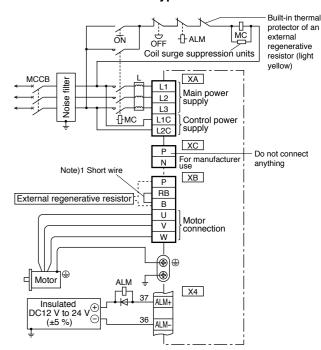


In Case of 3-phase, C-frame, D-frame, 200 V type

■ In Case of Leadwire type



In Case of Connector type



Note)1

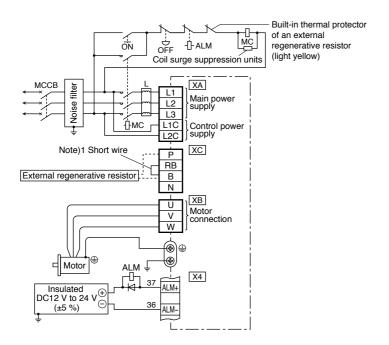
Fromo	Short wire	Built-in	Connection of the connector XB					
Frame No.	(Accessory)	regenerative resistor	In case of using an external regenerative resistor	In case of not using an external regenerative resistor				
C-frame D-frame	with	with	 Remove the short wire accessory from between RB-B. Connect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

^{*} Refer to P.169, P.170, Specifications of Motor connector.

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Wiring Diagram

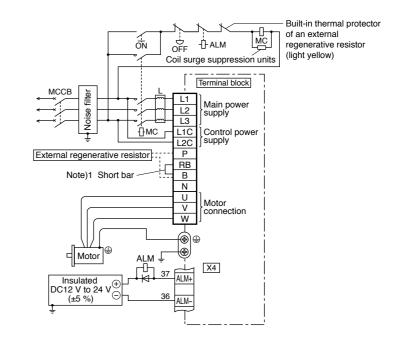
In Case of 3-phase, E-frame, 200 V type



Note)1

Fromo	Short wire	Built-in	Connection of the 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

Fromo	Short bar	Built-in	Connection of	terminal block
Frame No.	(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.170, Specifications of Motor connector.

^{*} Refer to P.170, Specifications of Motor connector.

Wiring to the Connector, X4

Safety Function

* Excluding A6 SE, A6 SG Series

Wiring to the Connector, X3

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.

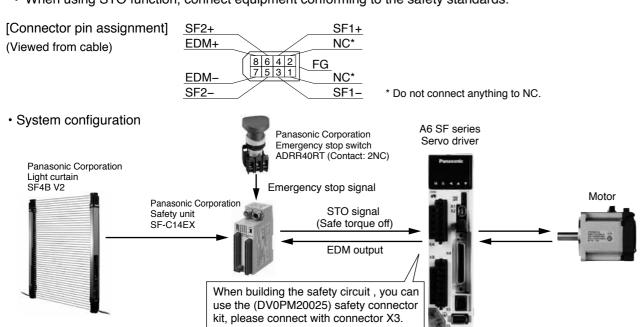
Outline Description of Safe Torque Off (STO)

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.

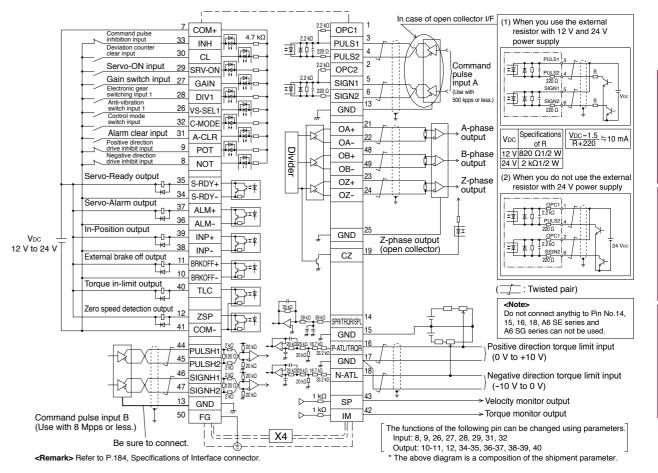
Safety Precautions

- · 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
- 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
- When using STO function, connect equipment conforming to the safety standards.



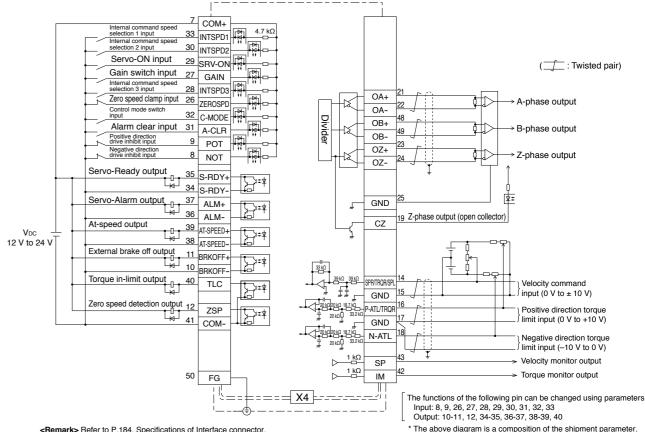
Panasonic Corporation Automotive & Industrial Systems Company http://panasonic.net/id/

Wiring Example of Position Control Mode



Wiring Example of Velocity Control Mode

* Excluding A6 SE, A6 SG Series



<Remark> Refer to P.184, Specifications of Interface connector

MINAS A6 Family 42

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A6 Family

Imformation

A6 Family

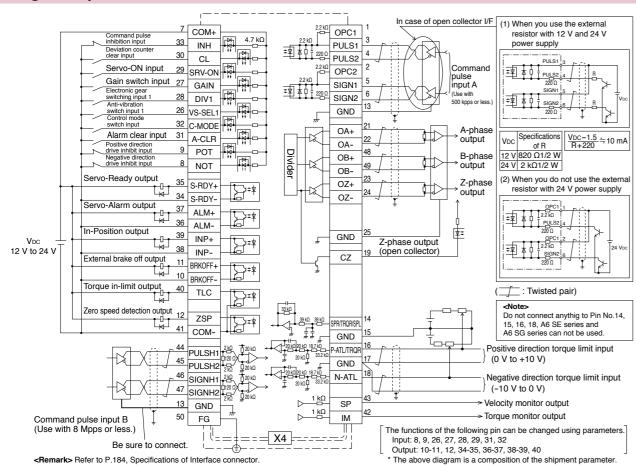
Wiring to the Connector, X4

Wiring Example of Full-closed Control Mode

<Remark> Refer to P.184, Specifications of Interface connector.

* Excluding A6 SE, A6 SG Series

The above diagram is a composition of the shipment paramete

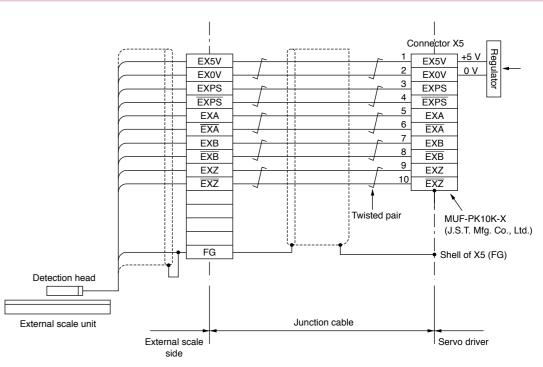


Applicable External Scale

Applicable External Scale	Manufacturer	Model No.	Resolution [µm]	Maximum speed (m/s)*1
Parallel type (AB-phase)	General	_		eed after 4 × on : 4 Mpps
	Nidec Sankyo Corporation	PSLH	0.1	6
		SL700-PL101RP/RHP	0.1	10
Serial type		SL710-PL101RP/RHP	0.1	10
(Incremental)	Magnescale Co., Ltd.	SR75	0.01 to 1	3.3
		SR85	0.01 to 1	3.3
		BF1	0.001/0.01	0.4/1.8
		LIC2197P/LIC2199P	0.05/0.1	10
	HEIDENHAIN	LIC4193P/LIC4195P LIC4197P/LIC4199P	0.001 /0.005 /0.01	10
	Managarata	SR77	0.01 to 1	3.3
	Magnescale Co., Ltd.	SR87	0.01 to 1	3.3
	Mitutous Companyation	AT573A	0.05	2.5
Serial type	Mitutoyo Corporation	ST778A(L)	0.1	5
(Absolute)			0.001	0.4
	Renishaw plc	RESOLUTE	0.05	20
			0.1	40
		SAP / SVAP / GAP	0.05	2.5
	FAGOR AUTOMATION	LAP	0.1	2
	FAGOR AUTOMATION	SAP10/SVAP10/GAP10	0.01	3
		LAP10	0.01	2

^{*1} The maximum speed is a characteristic of the driver. It is limited by the configration of the machine and the system.

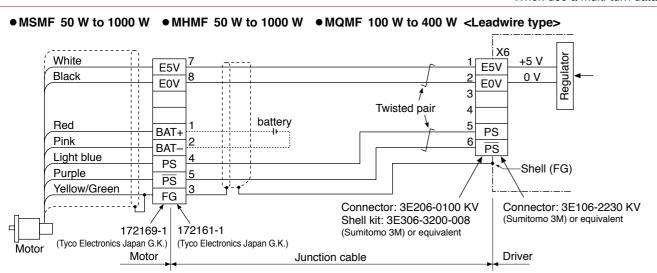
Wiring Diagram of X5

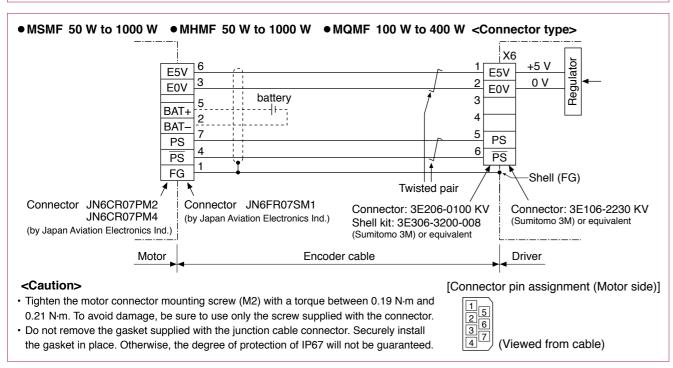


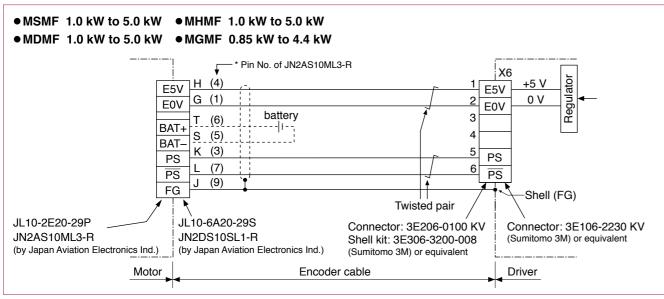
^{*} For more information about the external scale product, please contact the manufacturer.

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

* When use a multi-turn data.



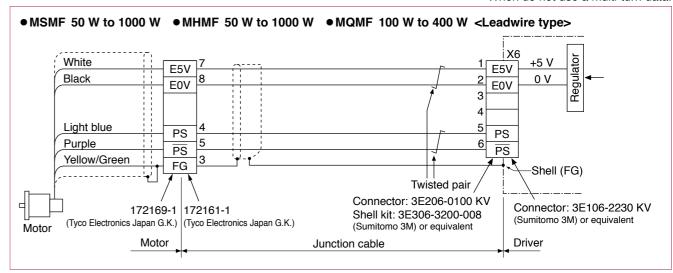


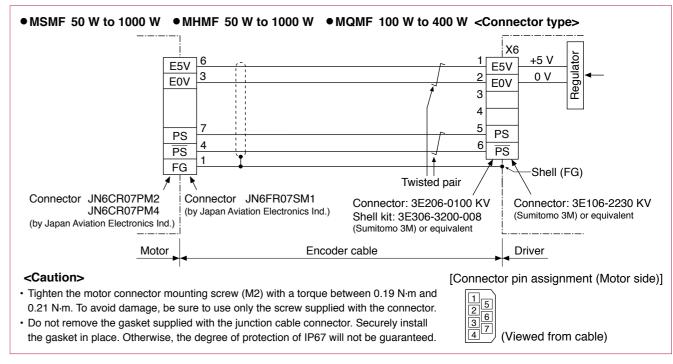


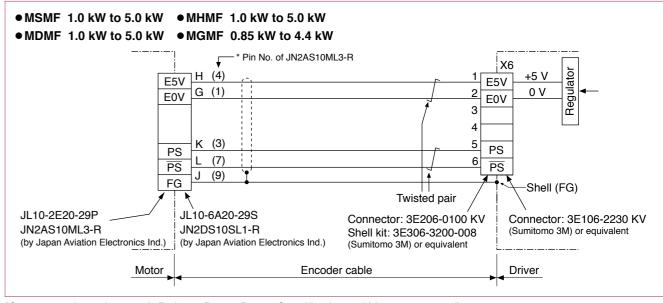
[Connector pin assignment] Refer to P.169, P.170 "Specifications of Motor connector".

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

* When do not use a multi-turn data.







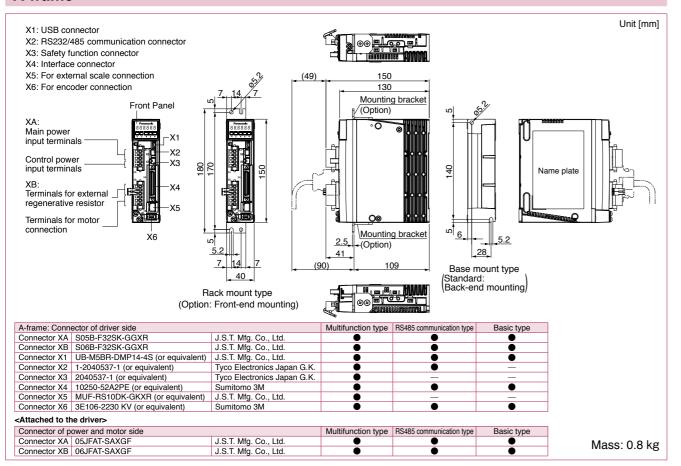
[Connector pin assignment] Refer to P.169, P.170 "Specifications of Motor connector".

A6 Family

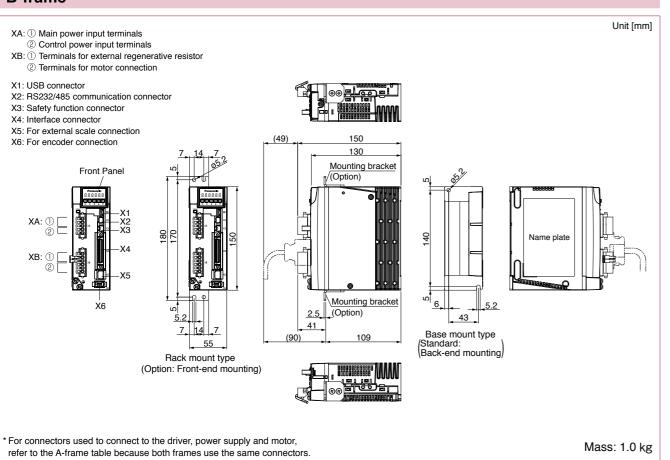
Imformation

* All dimensions shown in this catalog are for the A6 SF series, but outer dimensions are the same as the A6 SE series. For appearance, refer to P. 19 and P. 20.

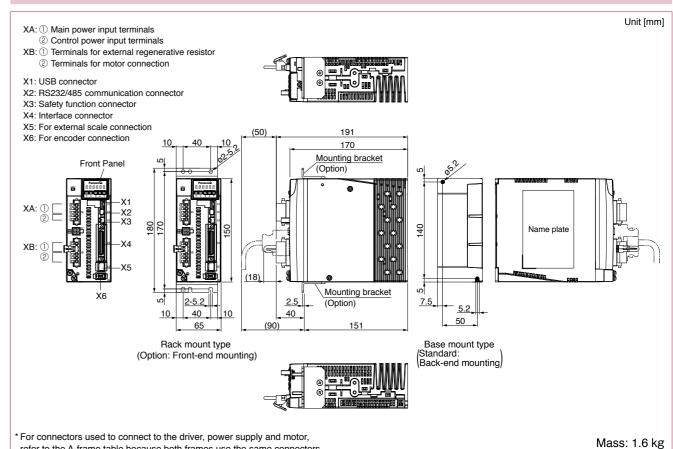
A-frame



B-frame

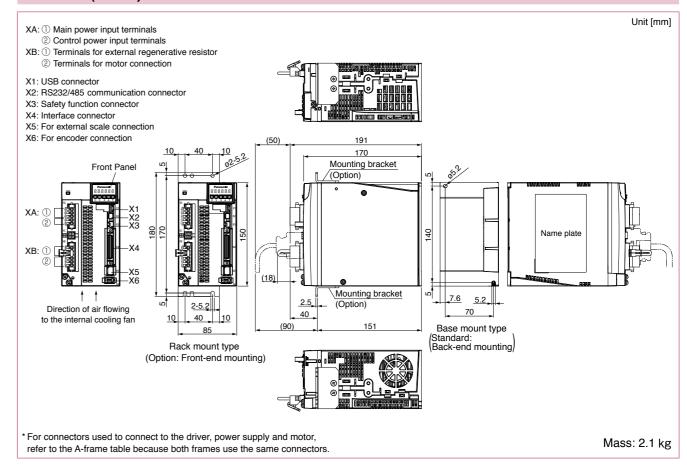


C-frame



D-frame (200 V)

refer to the A-frame table because both frames use the same connectors.



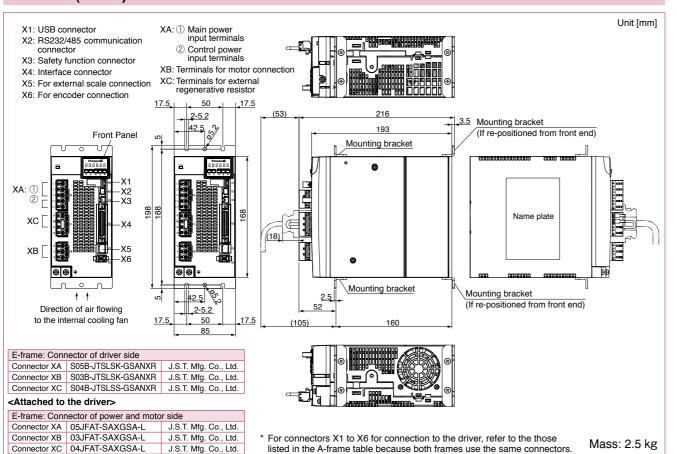
47 MINAS A6 Family MINAS A6 Family 48

Dimensions of Driver

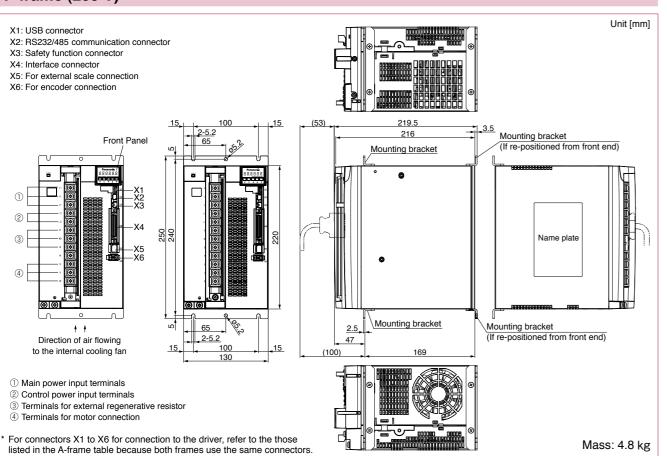
A6 Family

* All dimensions shown in this catalog are for the A6 SF series, but outer dimensions are the same as the A6 SE series. For appearance, refer to P.19 and P.20.

E-frame (200 V)



F-frame (200 V)



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

ō

E

9



MSMF Low inertia

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

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



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 IP67: Connector 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: 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



MGMF (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: Connector type



MHMF High inertia

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

MHMF 50 W to 5.0 kW P.73

MDMF

1.0 kW to 5.0 kW P.89

MGMF0.85 kW to 4.4 kW P.95

Dimensions

MSMF (50 W to 1000 W) Connector typeP.100

MSMF (1.0 kW to 5.0 kW) Small size connectorP.102

MQMF (100 W to 400 W) Leadwire type with protective lip/ with oil seal

MQMF (100 W to 400 W) Connector typeP.104

MHMF (750 W, 1000 W) Leadwire type with oil seal.....F

MHMF (50 W to 1000 W)
Leadwire type
with protective lip/ with oil seal
......P.107

MHMF (50 W to 1000 W)
Connector typeP.109

MHMF (1.0 kW to 5.0 kW) Small size connectorP.112

MDMF (1.0 kW to 5.0 kW) Small size connectorP.113

MGMF (0.85 kW to 4.4 kW) Small size connectorP.114

Motor Specification Description

Environmental Conditions... P.165
Notes on [Motor specification]
page........... P.165
Permissible Load at
Output Shaft.......... P.166
Built-in Holding Brake............ P.167

				AC100 V
Motor model *1			IP65	MSMF5AZL1
		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)	0.16
Momentary Ma	ax. peal	k torqı	ue (N·m)	0.48
Rated current (A(rms))				1.1
Max. current (A(o-p))				4.7
Regenerative brake Without			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)	6000
Moment of ine	rtia		Without brake	0.026
of rotor (×10 ⁻⁴ kg·m ²)			With brake	0.029
Recommended moment of inertia ratio of the load and the rotor Note)3				30 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.167) /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.166)

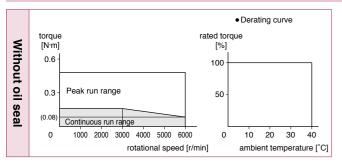
_	During assembly During operation	Radial load P-direction (N)	147
		Thrust load A-direction (N)	88.0
uoo		Thrust load B-direction (N)	117.6
Dur		Radial load P-direction (N)	68.6
ope		Thrust load A, B-direction (N)	58.8

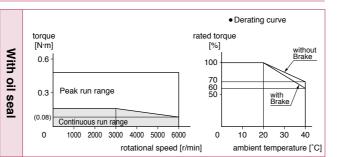
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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.

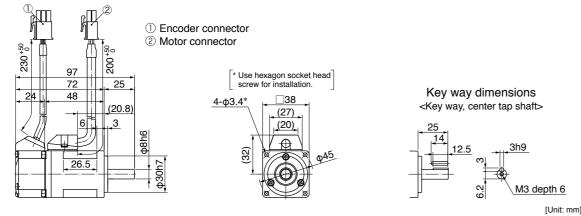
Torque characteristics (at AC100 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





Dimensions

Mass: 0.32 kg <without Brake>



For connector type IP67 motors, refer to P.100.

• For the dimensions with brake, refer to the right page

<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

				AC200 V
Motor model *1			IP65	MSMF5AZL1□□
		Multi	function type	MADLT05SF
Applicable	Model No	RS48	5 communication type *2	MADLN05SG
driver	140.	Basic	type *2	MADLN05SE
	Frame	e sym	bol	A-frame
Power supply	capacity	/	(kVA)	0.5
Rated output			(W)	50
Rated torque			(N·m)	0.16
Continuous sta	all torqu	е	(N·m)	0.16
Momentary Ma	ax. peal	c torqu	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	es/min) I	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 ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)			With brake	0.029
Recommended moment of inertia ratio of the load and the rotor Note)3			30 times or less	
Rotary encode	r specif	icatio	ns ^{*3}	23-bit Absolute
	Res	solutio	n per single turn	8388608

[Low inertia]

• Brake specifications (For details, refer to P.167) /This brake will be released when it is energized.' Do not use this for braking the motor in motion.

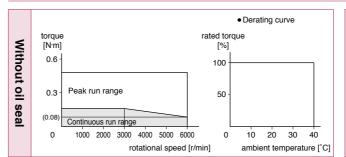
Static friction torque (N·m)	0.294 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.30
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

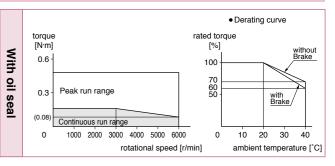
• Permissible load (For details, refer to P.166)

During assembly During operation	Radial load P-direction (N)	147
	Thrust load A-direction (N)	0.88
	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.165.
- 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.

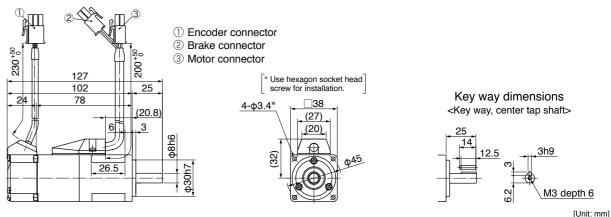
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





Dimensions

Mass: 0.53 kg <with brake>



For connector type IP67 motors, refer to P.100.

• For the dimensions without brake, refer to the left page

<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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Imformation

				AC100 V
Motor model *1			IP65	MSMF011L1
		Multif	function type	MADLT11SF
Applicable	Model No.	RS485	communication type *2	MADLN11SG
driver	140.	Basic	type *2	MADLN11SE
	Frame	syml	bol	A-frame
Power supply	capacity	/	(kVA)	0.4
Rated output			(W)	100
Rated torque			(N·m)	0.32
Continuous sta	all torqu	е	(N·m)	0.32
Momentary Ma	ax. peak	torqu	ıe (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) I	Note)1	DV0P4280	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	0.048
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)			With brake	0.051
Recommended moment of inertial ratio of the load and the rotor				30 times or less
Rotary encoder specifications *3			ns ^{∗3}	23-bit Absolute
Resolution			n per single turn	8388608

• Brake specifications (For details, refer to P.167) /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.166)

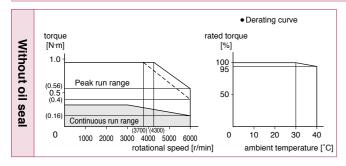
	Radial load P-direction (N)	147
During assembly	Thrust load A-direction (N)	88.0
accombiy	Thrust load B-direction (N)	117.6
During operation	Radial load P-direction (N)	68.6
	Thrust load A, B-direction (N)	58.8

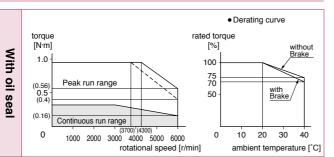
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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.

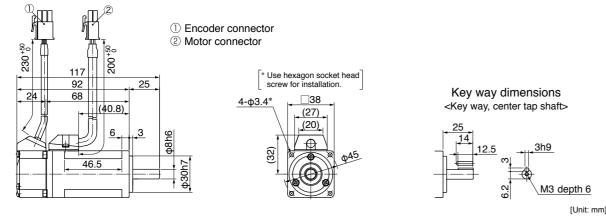
Torque characteristics (at AC100 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





Dimensions

Mass: 0.47 kg <without brake>



For connector type IP67 motors, refer to P.100.

• For the dimensions with brake, refer to the right page

<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.

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

Specifications

				AC200 V
Motor model *1			IP65	MSMF012L1□□
		Multi	function type	MADLT05SF
Applicable	Model No	RS48	5 communication type *2	MADLN05SG
driver	110.	Basic type *2		MADLN05SE
	Frame	e sym	bol	A-frame
Power supply	capacity	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 torqu	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 (times/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 inertia			Without brake	0.048
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)			With brake	0.051
Recommended moment of inertia ratio of the load and the rotor Note)3			30 times or less	
Rotary encoder specifications *3			ns ^{*3}	23-bit Absolute
	Res	solutio	n per single turn	8388608

• Brake specifications (For details, refer to P.167) 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.166)

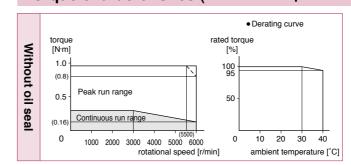
During assembly During operation	Radial load P-direction (N)	147
	Thrust load A-direction (N)	0.88
	Thrust load B-direction (N)	117.6
	Radial load P-direction (N)	68.6
	Thrust load A, B-direction (N)	58.8

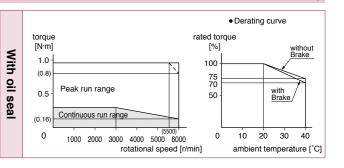
- For details of Note)1 to Note)4, refer to P.165.
- Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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.

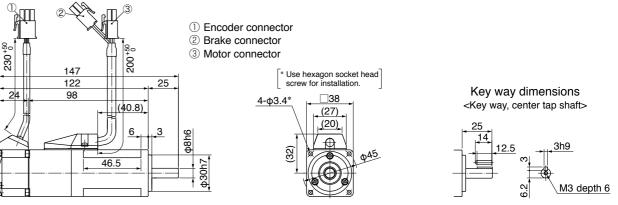
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





Dimensions

Mass: 0.68 kg <with brake>



For connector type IP67 motors, refer to P.100.

• For the dimensions without brake, refer to the left page

<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.

53 MINAS A6 Family

Imformation

[Unit: mm]

Specifications

				AC100 V
Motor model *1			IP65	MSMF021L1
		Multi	function type	MBDLT21SF
Applicable	Model No.	RS48	5 communication type *	MBDLN21SG
driver	140.	Basic	type *2	MBDLN21SE
	Fram	e sym	bol	B-frame
Power supply	capacit	у	(kVA)	0.5
Rated output			(W)	200
Rated torque			(N·m)	0.64
Continuous sta	all torqu	ie	(N·m)	0.64
Momentary Ma	ax. pea	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. rotational speed		(r/min)	6000	
Moment of inertia W			Without brake	0.14
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake	0.17	
Recommended moment of inertia ratio of the load and the rotor Note)3			30 times or less	
Rotary encoder specifications *3			ns ^{*3}	23-bit Absolute
	Re	solutio	on per single turn	8388608

• Brake specifications (For details, refer to P.167) /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.166)

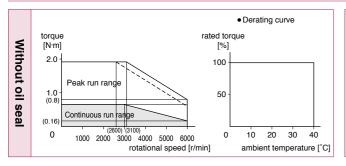
	Radial load P-direction (N)	392
During assembly	Thrust load A-direction (N)	147
assembly	Thrust load B-direction (N)	196
During	Radial load P-direction (N)	245
operation	Thrust load A, B-direction (N)	98.0

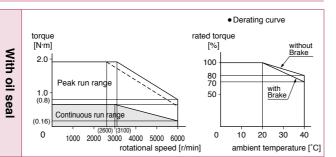
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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.

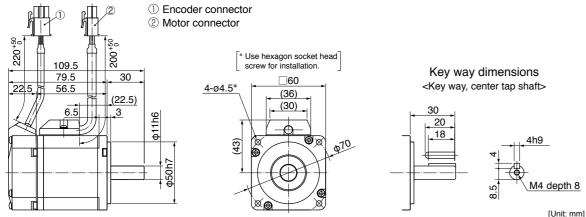
Torque characteristics (at AC100 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





Dimensions

Mass: 0.82 kg <without brake>



For connector type IP67 motors, refer to P.100.

• For the dimensions with brake, refer to the right page

Reduce the moment of inertia ratio if high speed response operation is required. <Cautions> 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 200 W

					AC200 V
Motor model *1	IP65			MSMF022L1□□	
		Multif	function type		MADLT15SF
Applicable	Model No	RS48	RS485 communication type *2		MADLN15SG
driver	110.	Basic	type *2		MADLN15SE
	Fram	e syml	bol		A-frame
Power supply	capacit	у	(kVA)	0.5
Rated output				(W)	200
Rated torque			(N·m)	0.64
Continuous sta	all torqu	ie	(N·m)	0.64
Momentary Ma	ax. pea	k torqu	ue (N·m)	1.91
Rated current			(A(ı	rms))	1.5
Max. current			(A(o-p))	6.5
Regenerative brake			Without option	n	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 ⁻⁴ kg·m ²)			With brake		0.17
Recommended moment of inertia ratio of the load and the rotor Note)3			Note)3	30 times or less	
Rotary encode	r speci	23-bit Absolute			
	Resolution per single turn			8388608	

[Low inertia] 60 mm sq.

• Brake specifications (For details, refer to P.167) /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.166)

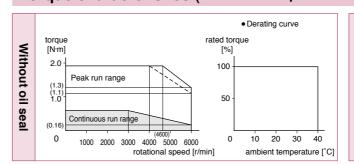
During assembly During operation	Radial load P-direction (N)	392
	Thrust load A-direction (N)	147
	Thrust load B-direction (N)	196
	Radial load P-direction (N)	245
	Thrust load A, B-direction (N)	98.0

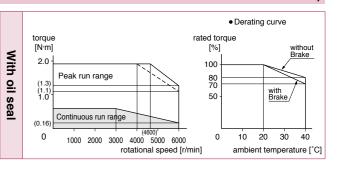
- For details of Note)1 to Note)4, refer to P.165.
- Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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.

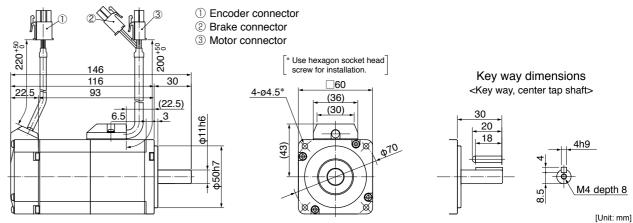
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





Dimensions

<with brake>



For connector type IP67 motors, refer to P.100.

• For the dimensions without brake, refer to the left page

<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.

55 MINAS A6 Family

Imformation

Mass: 1.3 kg

				AC100 V
Motor model*1			IP65	MSMF041L1□□
		Multi	function type	MCDLT31SF
Applicable	Model No	RS48	5 communication type *2	MCDLN31SG
driver		Basic	type *2	MCDLN31SE
	Fram	e sym	bol	C-frame
Power supply	capacit	y	(kVA)	0.9
Rated output			(W)	400
Rated torque			(N·m)	1.27
Continuous sta	all torqu	1.27		
Momentary Ma	ax. pea	3.82		
Rated current (A(rms))			4.6	
Max. current (A(o-p))			19.5	
Regenerative brake		Without option	No limit Note)2	
frequency (time	es/min)	Note)1	DV0P4282	No limit Note)2
Rated rotation	al spee	d	(r/min)	3000
Max. rotationa	l speed		(r/min)	6000
Moment of inertia			Without brake	0.27
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)			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*3	23-bit Absolute
	Re	8388608		

• Brake specifications (For details, refer to P.167) /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.166)

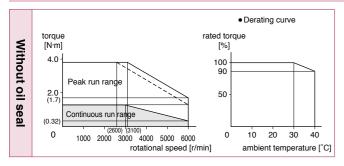
	Radial load P-direction (N)	392
During assembly	Thrust load A-direction (N)	147
documbiy	Thrust load B-direction (N)	196
During operation	Radial load P-direction (N)	245
	Thrust load A, B-direction (N)	98.0

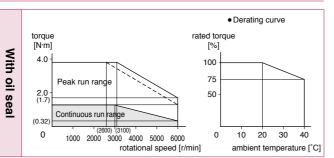
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.48.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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.

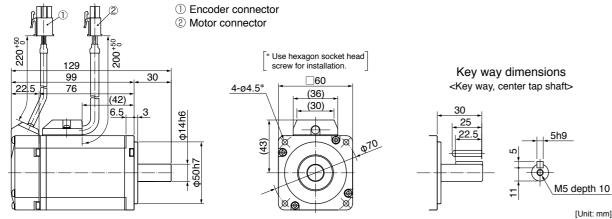
Torque characteristics (at AC100 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





Dimensions

Mass: 1.2 kg <without brake>



For connector type IP67 motors, refer to P.101.

57 MINAS A6 Family

• For the dimensions with brake, refer to the right page

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.

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

Specifications

					AC200 V
Motor model *1	IP65			MSMF042L1□□	
		Multif	function type		MBDLT25SF
Applicable	Model No	RS48	5 communication ty	pe *2	MBDLN25SG
driver	110.	Basic type *2		MBDLN25SE	
	Frame	e syml	bol		B-frame
Power supply	capacity	/	(k	VA)	0.9
Rated output				(W)	400
Rated torque			(N	l·m)	1.27
Continuous sta	all torqu	е	(N	l·m)	1.27
Momentary Ma	ax. peal	torqu	ue (N	l·m)	3.82
Rated current (A(ri				าร))	2.4
Max. current			(A(o	-p))	10.2
Regenerative brake			Without option	l	No limit Note)2
frequency (times/min) Note)1		DV0P4283		No limit Note)2	
Rated rotation	al spee	d	(r/n	nin)	3000
Max. rotationa	l speed		(r/n	nin)	6000
Moment of inertia			Without brake		0.27
of rotor (×10 ⁻⁴ kg·m ²)			With brake		0.30
Recommended moment of inertia ratio of the load and the rotor Note)3				30 times or less	
Rotary encode	Rotary encoder specifications *3				23-bit Absolute
	Resolution per single turn				8388608

 Brake specifications (For details, refer to P.167) 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.166)

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.165.
- 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".

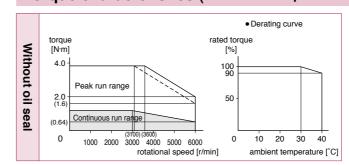
Detail of model designation, refer to P.18.

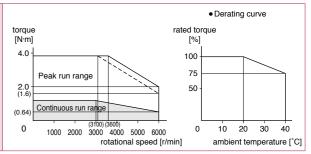
*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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

∀ith

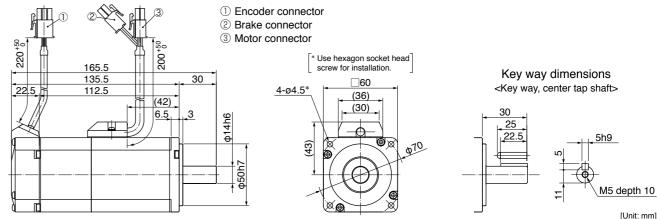
<u>⊆</u>





Dimensions

<with brake>



For connector type IP67 motors, refer to P.101.

• For the dimensions without brake, refer to the left page

<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.

Imformation

Mass: 1.7 kg

MINAS A6 Family 58

Specifications

					AC200 V
Motor model*1			IP65		MSMF082L1□□
		Multi	function type		MCDLT35SF
Applicable	Model No	RS48	5 communication typ	e *2	MCDLN35SG
driver	110.	Basic	type *2		MCDLN35SE
	Frame	e sym	bol		C-frame
Power supply	capacity	/	(kV	(A)	1.3
Rated output			()	N)	750
Rated torque			(N·ı	m)	2.39
Continuous sta	all torqu	е	(N·ı	m)	2.39
Momentary Ma	ax. peal	c torqu	ue (N·ı	m)	7.16
Rated current (A(rms))			4.1		
Max. current (A(o-p))		17.4			
Regenerative brake frequency (times/min) Note)1		Without option		No limit Note)2	
		Note)1	DV0P4283		No limit Note)2
Rated rotation	al spee	d	(r/mi	in)	3000
Max. rotational speed			(r/mi	in)	6000
Moment of inertia of rotor (×10 ⁻⁴ kg·m²)		Without brake		0.96	
		With brake		1.06	
Recommended moment of inertia ratio of the load and the rotor Note)3			e)3	20 times or less	
Rotary encoder specifications *3			ns ^{*3}		23-bit Absolute
Resolution			n per single turn		8388608

• Brake specifications (For details, refer to P.167) /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.166)

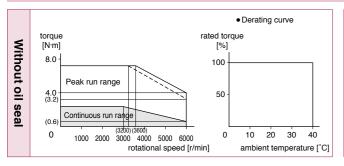
During assembly During operation	Radial load P-direction (N)	686
	Thrust load A-direction (N)	294
	Thrust load B-direction (N)	392
	Radial load P-direction (N)	392
	Thrust load A, B-direction (N)	147

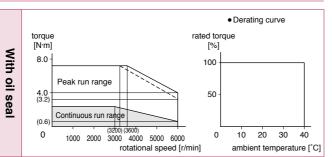
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.48.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.18.

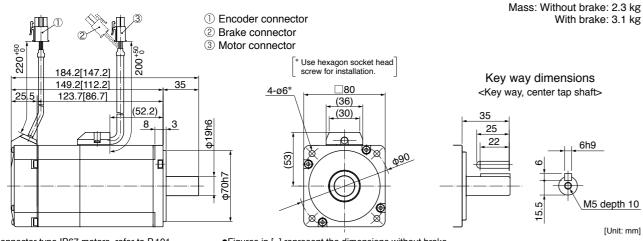
*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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





Dimensions



For connector type IP67 motors, refer to P.101. •Figures in [] represent the dimensions without brake. <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	MSMF092L1□□
		Multi	function type	MDDLT45SF
Applicable	Model No	RS48	5 communication type *2	MDDLN45SG
driver	140.	Basic type *2		MDDLN45SE
	Frame	sym	bol	D-frame
Power supply	capacity	/	(kVA)	1.8
Rated output			(W)	1000
Rated torque			(N·m)	3.18
Continuous sta	all torqu	е	(N·m)	3.18
Momentary Max. peak torque (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 (times/min) Note)1		DV0P4284	No limit Note)2	
Rated rotational speed			(r/min)	3000
Max. rotational speed			(r/min)	6000
Moment of inertia			Without brake	1.26
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)			With brake	1.36
Recommended moment of inertia ratio of the load and the rotor Note)3				15 times or less
Rotary encode	r specif	icatio	ns ^{*3}	23-bit Absolute
	Res	solutio	on per single turn	8388608

 Brake specifications (For details, refer to P.167) 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.166)

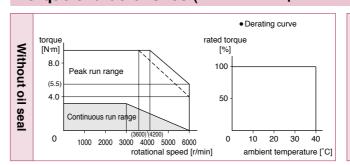
During assembly During operation	Radial load P-direction (N)	686
	Thrust load A-direction (N)	294
	Thrust load B-direction (N)	392
	Radial load P-direction (N)	392
	Thrust load A, B-direction (N)	147

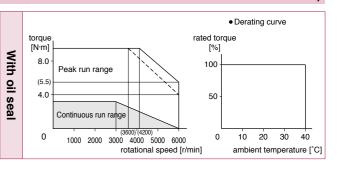
- For details of Note)1 to Note)4, refer to P.165.
- Dimensions of Driver, refer to P.48.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.18.

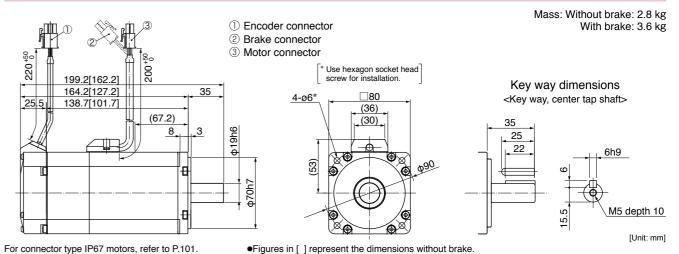
*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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





Dimensions



<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.

59 MINAS A6 Family

Imformation

Brake specifications (For details, refer to P.167) 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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

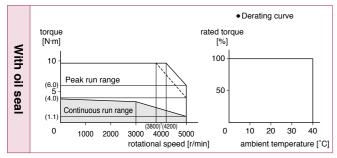
	During assembly During operation	Radial load P-direction (N)	980
		Thrust load A-direction (N)	588
		Thrust load B-direction (N)	686
		Radial load P-direction (N)	490
		Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.48.
- specifications.
- *2 Basic type and RS485 communication type are "Position control type".

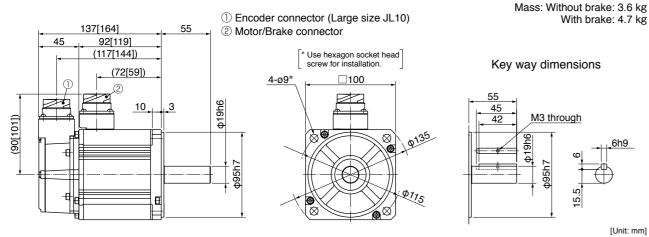
Detail of model designation, refer to P.18.

*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



Encoder connector (Small size JN2), refer to P.102. • Figures in [] represent the dimensions with brake.

<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 type *2	MDDLN55SG
driver	110.	Basic	type *2	MDDLN55SE
	Frame	sym	bol	D-frame
Power supply	capacity	/	(kVA)	2.3
Rated output			(W)	1500
Rated torque			(N·m)	4.77
Continuous sta	all torqu	е	(N·m)	5.72
Momentary Max. peak torque (N·m)				14.3
Rated current (A			(A(rms))	8.2
Max. current (A(o-p)				35
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	l speed		(r/min)	5000
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 inertia ratio of the load and the rotor Note)3				15 times or less
Rotary encode	r specif	icatio	ns ^{*3}	23-bit Absolute
	Res	solutio	n per single turn	8388608

200 V MSMF 1.5 kW Low inertia 100 mm sq.

• Brake specifications (For details, refer to P.167) 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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

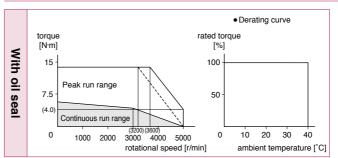
During assembly During operation	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.165.
- · 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".

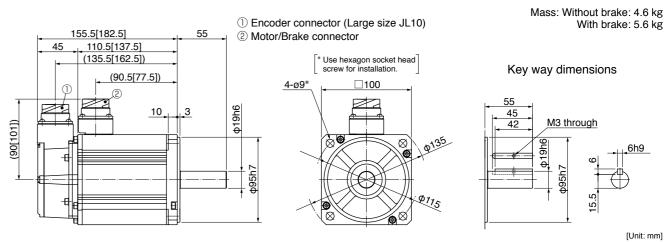
Detail of model designation, refer to P.18.

*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



Encoder connector (Small size JN2), refer to P.102. • Figures in [] represent the dimensions with brake.

<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	MSMF202L1
		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)	6.37
Continuous sta	all torqu	ie	(N·m)	7.64
Momentary Ma	ax. pea	k torqı	ie (N·m)	19.1
Rated current			(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 ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)			With brake	4.41
Recommended moment of inertratio of the load and the rotor				15 times or less
Rotary encoder specification			ns ^{*3}	23-bit Absolute
Resolution			n per single turn	8388608

• Brake specifications (For details, refer to P.167) /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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

	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

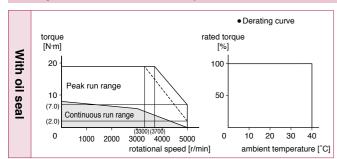
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.49.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.18.

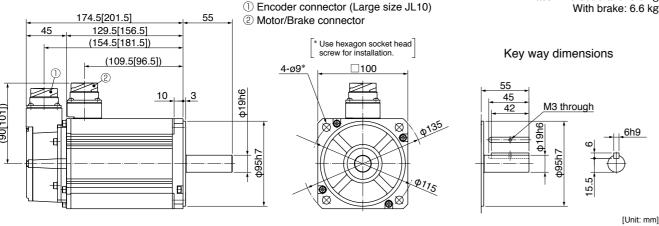
*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Mass: Without brake: 5.6 kg

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



Dimensions



Encoder connector (Small size JN2), refer to P.102. • Figures in [] represent the dimensions with brake.

<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	MSMF302L1□□
			function type	MFDLTA3SF
Applicable	Model No	RS48	5 communication type *	MFDLNA3SG
driver	110.	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)	9.55
Continuous sta	all torqu	ie	(N·m)	11.0
Momentary Ma	ax. pea	k torqı	ue (N·m)	28.6
Rated current			(A(rms))	18.1
Max. current		77		
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)	3000
Max. rotationa	l speed		(r/min)	5000
Moment of ine	rtia		Without brake	7.04
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)			With brake	7.38
Recommended moment of inertia ratio of the load and the rotor				15 times or less
Rotary encoder specifications *3			23-bit Absolute	
Resolution per single			n per single turn	8388608

• Brake specifications (For details, refer to P.167) /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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

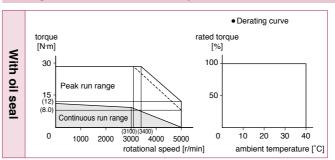
During assembly During operation	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.165.
- 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".

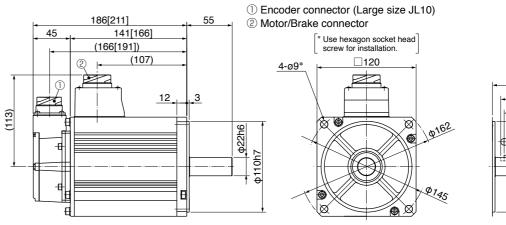
Detail of model designation, refer to P.18.

*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



Encoder connector (Small size JN2), refer to P.102. • Figures in [] represent the dimensions with brake.

<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. **Imformation**

Mass: Without brake: 8.7 kg

With brake: 9.9 kg

M3 through

Key way dimensions

45

[Unit: mm]

63 MINAS A6 Family

				AC200 V
Motor model *1			IP67	MSMF402L1□□
		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)	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
		DV0P4285×2	No limit Note)2	
Rated rotational speed		d	(r/min)	3000
Max. rotational speed			(r/min)	4500
Moment of inertia			Without brake	14.4
of rotor (×10 ⁻⁴ kg·m ²)			With brake	15.6
Recommended moment of ratio of the load and the rote				15 times or less
Rotary encode	er speci	ficatio	ns ^{*3}	23-bit Absolute
Resolutio			n per single turn	8388608

• Brake specifications (For details, refer to P.167) /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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

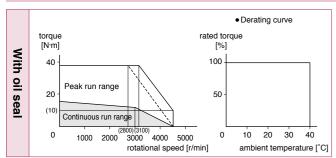
	During assembly During operation	Radial load P-direction (N)	980
		Thrust load A-direction (N)	588
		Thrust load B-direction (N)	686
		Radial load P-direction (N)	784
		Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.165.
- · 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".

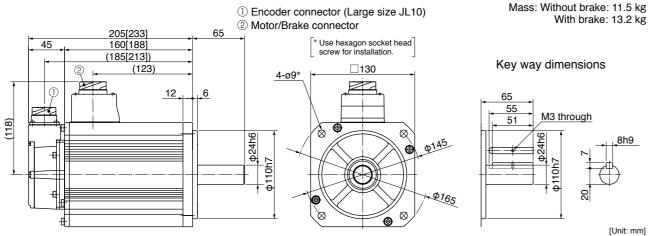
Detail of model designation, refer to P.18.

*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



Encoder connector (Small size JN2), refer to P.102. • Figures in [] represent the dimensions with brake.

<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	MSMF502L1□□
		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)	15.9
Continuous sta	all torqu	ie	(N·m)	19.1
Momentary Ma	ax. pea	k torqı	ue (N·m)	47.7
Rated current (A(rms)			(A(rms))	24.0
Max. current (A(o-p))				102
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)	4500
Moment of inertia		Without brake	19.0	
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)			With brake	20.2
Recommended moment of inertial ratio of the load and the rotor				15 times or less
Rotary encoder specifications *3			ns*3	23-bit Absolute
	Re	solutio	n per single turn	8388608

200 V **MSMF** 5.0 kW [Low inertia]

• Brake specifications (For details, refer to P.167) /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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

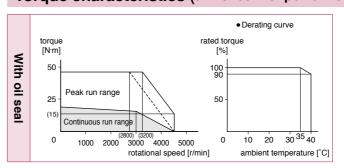
During assembly During operation	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	784
	Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.165.
- 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".

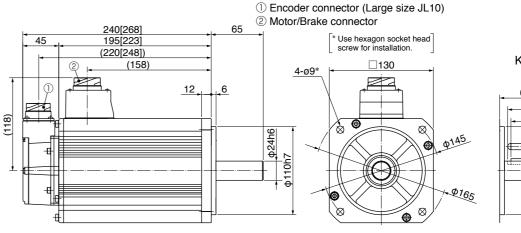
Detail of model designation, refer to P.18.

*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



Encoder connector (Small size JN2), refer to P.102. • Figures in [] represent the dimensions with brake.

<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.

65 MINAS A6 Family

Mass: Without brake: 14.5 kg With brake: 16.1 kg

Key way dimensions

[Unit: mm]

MINAS A6 Family 66

Specifications

				AC100 V
Motor model *1			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 Ma	ax. pea	k torqı	ue (N·m)	1.11
Rated current			(A(rms))	1.6
Max. current			(A(o-p))	7.9
Regenerative I	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	0.15
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)			With brake	0.18
Recommended moment of inertia ratio of the load and the rotor Note)3			20 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.167) /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.166)

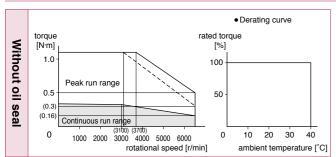
	During assembly During operation	Radial load P-direction (N)	147
		Thrust load A-direction (N)	88
		Thrust load B-direction (N)	117.6
		Radial load P-direction (N)	68.6
		Thrust load A, B-direction (N)	58.8

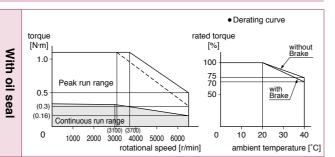
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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

Mass: 0.54 kg (0.57 kg with oil seal) <without brake> Encoder connector ② Motor connector * Use hexagon socket head a: 81.2[84.7] screw for installation. Key way dimensions b: 56.2[59.7] <Key way, center tap shaft> c: 39.7[43.2] (30.8)d: (14[17.5]) (2.1) Figures in [] represent with oil seal **Ф**70

For motors with protective lip, refer to P.103. For connector type IP67 motors, refer to P.104. • For the dimensions with brake, refer to the right page

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

<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.

Specifications

					AC200 V
Motor model *1	IP65				MQMF012L1□□
		Multi	Multifunction type		MADLT05SF
Applicable	Model No	RS48	5 communication typ	e *2	MADLN05SG
driver	110.	Basic	Basic type ^{*2}		MADLN05SE
	Frame	sym	bol		A-frame
Power supply	capacity	1	(kV	(A)	0.5
Rated output			(\	N)	100
Rated torque			ı·N)	m)	0.32
Continuous sta	all torqu	е	ı·N)	m)	0.33
Momentary Ma	ax. peak	torqu	ıe (N⋅ı	m)	1.11
Rated current			(A(rms	s))	1.1
Max. current			(A(o-p	0))	5.5
Regenerative brake		Without option		No limit Note)2	
frequency (time	es/min) N	Note)1	DV0P4281		No limit Note)2
Rated rotation	al speed	t	(r/mi	in)	3000
Max. rotationa	l speed		(r/mi	in)	6500
Moment of ine	rtia		Without brake		0.15
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)			With brake		0.18
Recommended moment of inertia ratio of the load and the rotor Note)3				e)3	20 times or less
Rotary encode	r specif	icatio	ns ^{∗3}		23-bit Absolute
	Res	olutio	n per single turn		8388608

 Brake specifications (For details, refer to P.167) 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.166)

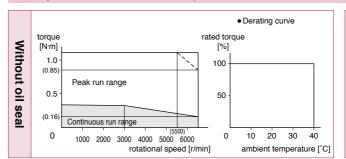
During assembly During operation	Radial load P-direction (N)	147
	Thrust load A-direction (N)	88
	Thrust load B-direction (N)	117.6
	Radial load P-direction (N)	68.6
	Thrust load A, B-direction (N)	58.8

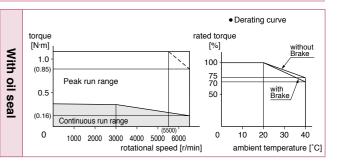
- For details of Note)1 to Note)4, refer to P.165.
- Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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

Mass: 0.79 kg (0.82 kg with oil seal) <with brake> ① Encoder connector ② Brake connector ③ Motor connector Use hexagon socket head 102.5[106] screw for installation. Key way dimensions Figures in [] represent 77.5[81] □60 <Key way, center tap shaft> 61[64.5] with oil seal. (30.8)(2.1)

For motors with protective lip, refer to P.103. For connector type IP67 motors, refer to P.104. •For the dimensions without brake, refer to the left page.

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

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 MINAS A6 Family MINAS A6 Family 68

Specifications

					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	e sym	bol		B-frame
Power supply	capacit	y	(kVA	۹)	0.5
Rated output			(V	V)	200
Rated torque			(N·n	n)	0.64
Continuous sta	all torqu	е	(N·n	n)	0.76
Momentary Ma	ax. peal	k torqı	ue (N·n	n)	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	s/min)	Note)1	te)1 DV0P4283		No limit Note)2
Rated rotation	al spee	d	(r/mir	1)	3000
Max. rotationa	l speed		(r/mir	1)	6500
Moment of ine	rtia		Without brake		0.50
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake		0.59	
Recommended moment of inertia ratio of the load and the rotor Note)3)3	20 times or less	
Rotary encoder specifications *3			ns ^{*3}		23-bit Absolute
	Re	solutio	tion per single turn		8388608

• Brake specifications (For details, refer to P.167) /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.166)

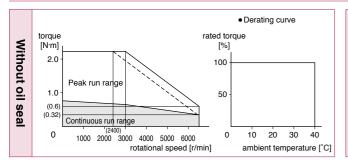
	During assembly During operation	Radial load P-direction (N)	392
		Thrust load A-direction (N)	147
		Thrust load B-direction (N)	196
		Radial load P-direction (N)	245
		Thrust load A, B-direction (N)	98

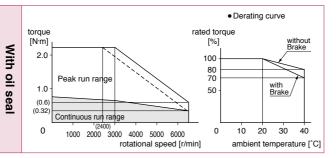
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type"

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.>)





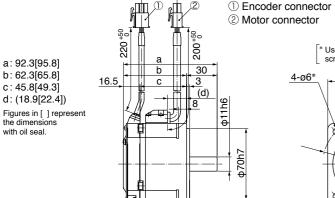
Dimensions

<without brake>

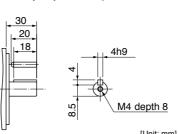
Mass: 1.1 kg (1.2 kg with oil seal)

Key way dimensions

<Key way, center tap shaft>



Use hexagon socket head (30.8)**Φ9**0



For motors with protective lip, refer to P.103. For connector type IP67 motors, refer to P.104. • For the dimensions with brake, refer to the right page.

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

<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.

Specifications

					AC200 V
Motor model *1		IP65			MQMF022L1
		Multif	function type		MADLT15SF
Applicable	Model No	RS485	5 communication typ	e *2	MADLN15SG
driver	140.	Basic type *2			MADLN15SE
	Fram	e syml	bol		A-frame
Power supply	capacit	y	(kV	'A)	0.5
Rated output			(\	W)	200
Rated torque			ı·N)	m)	0.64
Continuous sta	all torqu	е	1·N)	m)	0.76
Momentary Ma	ax. peal	k torqu	ue (N⋅r	m)	2.23
Rated current			(A(rms	s))	1.4
Max. current			(A(o-p	p))	6.9
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/mi	in)	3000
Max. rotationa	l speed		(r/mi	in)	6500
Moment of ine	rtia		Without brake		0.50
of rotor (×10 ⁻⁴ kg·m ²)			With brake		0.59
Recommended moment of inertia ratio of the load and the rotor Note			te)3	20 times or less	
Rotary encode	r speci	ficatio	ns ^{∗3}		23-bit Absolute
	Re	solutio	n per single turn		8388608

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

• Brake specifications (For details, refer to P.167) This brake will be released when it is energized. Do not use this for braking the motor in motion.

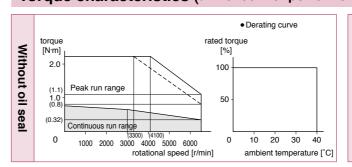
Static friction torque (N·m)	1.6 or more
Engaging time (ms)	70 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

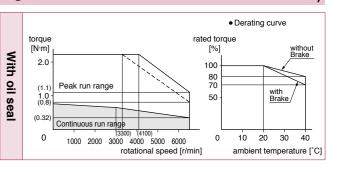
• Permissible load (For details, refer to P.166)

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.165.
- 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

<with brake>

 Encoder connector ② Brake connector 3 Motor connector Use hexagon socket head Figures in [] represent 85.9[89.4] 30 the dimensions with oil seal (30.8)(18.9[22.4]) (2.1)

Mass: 1.5 kg (1.6 kg with oil seal)

Key way dimensions <Key way, center tap shaft>

20 18 4h9

For motors with protective lip, refer to P.103. For connector type IP67 motors, refer to P.104. • For the dimensions without brake, refer to the left page.

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

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.

A6 Family

Specifications

					AC100 V
Motor model*1	Motor model 1 IP65		MQMF041L1		
		Multi	function type		MCDLT31SF
Applicable	Applicable Model RS485		S485 communication type *2		MCDLN31SG
driver		Basic	type *2		MCDLN31SE
	Fram	e sym	bol		C-frame
Power supply	capacit	y	(k\	VA)	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 torqı	ue (N	·m)	4.46
Rated current			(A(rm	ıs))	4.1
Max. current			(A(o-	p))	20.3
Regenerative	brake		Without option		No limit Note)2
frequency (time	s/min)	Note)1	DV0P4282		No limit Note)2
Rated rotation	al spee	d	(r/m	nin)	3000
Max. rotationa	l speed		(r/m	nin)	6500
Moment of ine	rtia		Without brake		0.98
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			ote)3	20 times or less	
Rotary encode	r speci	ficatio	ns *3		23-bit Absolute
	Re	solutio	lution per single turn		8388608

Brake specifications (For details, refer to P.167) (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.166)

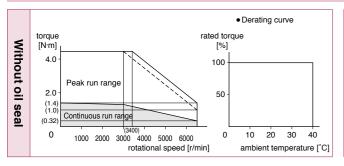
	During assembly During operation	Radial load P-direction (N)	392
		Thrust load A-direction (N)	147
		Thrust load B-direction (N)	196
		Radial load P-direction (N)	245
		Thrust load A, B-direction (N)	98

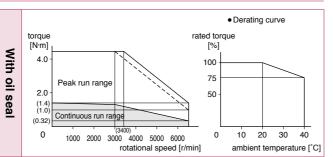
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.48.
- *1 in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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.

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

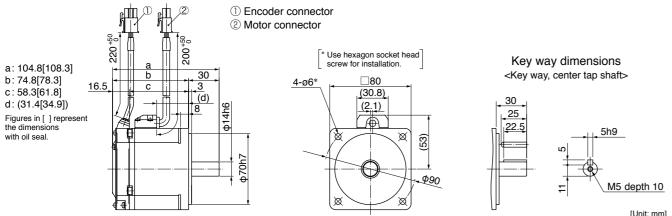




Dimensions

<without brake>

Mass: 1.5 kg (1.6 kg with oil seal)



For motors with protective lip, refer to P.103. For connector type IP67 motors, refer to P.105. • For the dimensions with brake, refer to the right page.

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 later than the contact us of the contact us of the contact us or a dealer for the later than the contact us of the contact us or a dealer for the contact us of the contact

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□□
		Multif	function type		MBDLT25SF
Applicable	Model No	RS48	RS485 communication type *2		MBDLN25SG
driver	110.	Basic	type *2		MBDLN25SE
	Fram	e syml	bol		B-frame
Power supply	capacit	у	(l	κVA)	0.9
Rated output				(W)	400
Rated torque			1)	N·m)	1.27
Continuous sta	all torqu	ie	1)	N·m)	1.40
Momentary Ma	ax. pea	k torqu	ue (f	N·m)	4.46
Rated current	nt (A(rms))		2.1		
Max. current	current (A(o-p))		10.4		
Regenerative	brake		Without option	n	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)	0.98
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	r speci	ficatio	ns*3		23-bit Absolute
	Re	solutio	n per single tur	'n	8388608

Brake specifications (For details, refer to P.167)
 (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.166)

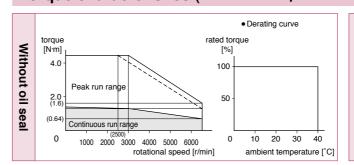
	Radial load P-direction (N)	392
During assembly	Thrust load A-direction (N)	147
assembly	Thrust load B-direction (N)	196
During operation	Radial load P-direction (N)	245
	Thrust load A, B-direction (N)	98

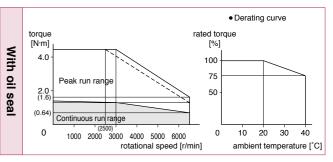
- For details of Note)1 to Note)4, refer to P.165.
- Dimensions of Driver, refer to P.47.
- *1 in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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.>)

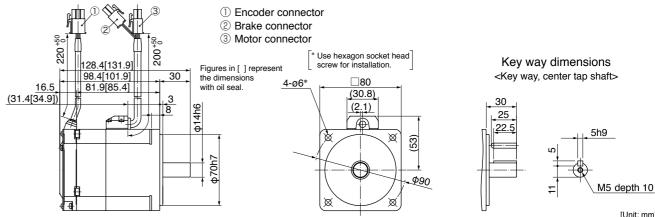




Mass: 2.0 kg (2.1 kg with oil seal)

Dimensions

<with brake>



For motors with protective lip, refer to P.103. For connector type IP67 motors, refer to P.105. • For the dimensions without brake, refer to the left page.

<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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				AC100 V
Motor model *1	IP65			MHMF5AZL1
			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	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	0.038
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)			With brake	0.042
Recommended moment of inertia ratio of the load and the rotor Note)3				30 times or less
Rotary encode	er speci	ficatio	ns*3	23-bit Absolute
	Re	solutio	on per single turn	8388608

/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.166)

	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)	49

- For details of Note)1 to Note)4, refer to P.165.
- *1 \square in the motor part number represents the motor specifications.

Detail of model designation, refer to P.18.

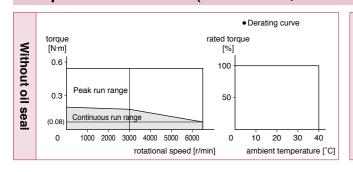
*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

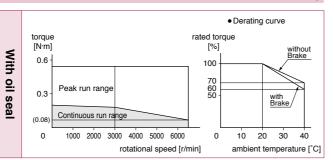
• Brake specifications (For details, refer to P.167)

	THIUST IDAG D-GITECTION (IN)	117.0
During	Radial load P-direction (N)	68.6
operation	Thrust load A, B-direction (N)	49

- · Dimensions of Driver, refer to P.47.
- *2 Basic type and RS485 communication type are
- "Position control type".

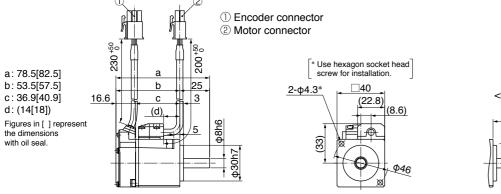
Torque characteristics (at AC100 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





Dimensions

Mass: 0.29 kg (0.31 kg with oil seal) <without brake>



Key way dimensions <Key way, center tap shaft>

For motors with protective lip, refer to P.107. For connector type IP67 motors, refer to P.109. • For the dimensions with brake, refer to the right page

<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	MHMF5AZL1
		Multi	function type	MADLT05SF
Applicable	Model No	RS48	5 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)	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 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)	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 ratio of the load and the rote			30 times or less	
Rotary encode	er speci	ficatio	ns ^{*3}	23-bit Absolute
Resolution		n per single turn	8388608	

Brake specifications (For details, refer to P.167) 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.166)

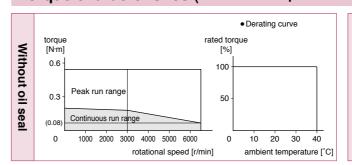
During assembly	Radial load P-direction (N)	147
	Thrust load A-direction (N)	88
	Thrust load B-direction (N)	117.6
During	Radial load P-direction (N)	68.6
operation	Thrust load A, B-direction (N)	49

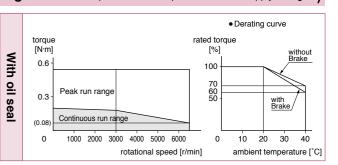
- For details of Note)1 to Note)4, refer to P.165.
- Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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.

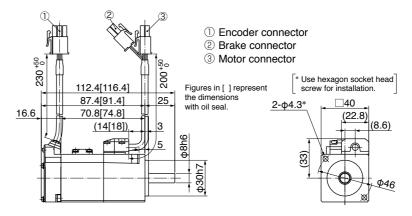
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)

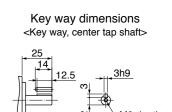




Dimensions

Mass: 0.51 kg (0.53 kg with oil seal) <with brake>





For motors with protective lip, refer to P.107. For connector type IP67 motors, refer to P.109. •For the dimensions without brake, refer to the left page.

<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.

				AC100 V
Motor model *1	tor model ⁻¹ IP65			MHMF011L1
			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 Ma	ax. pea	k torqı	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	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 ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)			With brake	0.074
Recommended moment of inertia ratio of the load and the rotor Note)3			30 times or less	
Rotary encode	er speci	ficatio	ns ^{*3}	23-bit Absolute
Resolution			on per single turn	8388608

• Brake specifications (For details, refer to P.167) /This brake will be released when it is energized.\

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.166)

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

- · 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

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.

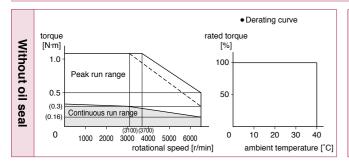
Do not use this for braking the motor in motion.

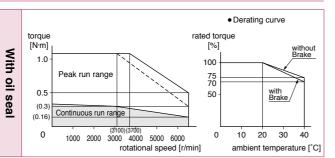
Static friction torque (N·m)	0.38 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.30
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

The state of the first	. T C NI. I.	\ d L = A L = L	- \ 4	- D405
 ⊢∩r ∩⊖t² 	ails of Note	117 TO KINT	OLA POTOR	ひとりんり

- "Position control type".

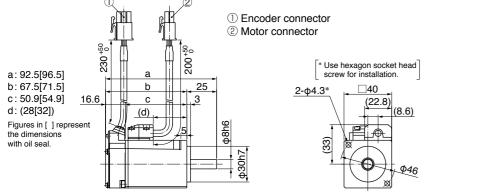
Torque characteristics (at AC100 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)

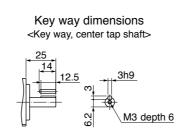




Dimensions

Mass: 0.40 kg (0.42 kg with oil seal) <without brake>





For motors with protective lip, refer to P.107. For connector type IP67 motors, refer to P.109. • For the dimensions with brake, refer to the right page

<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	MHMF012L1□□
		Multi	function type	MADLT05SF
Applicable	Model No.	RS48	5 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	ie	(N·m)	0.33
Momentary Ma	ax. pea	k torqı	ue (N·m)	1.11
Rated current			(A(rms))	1.1
Max. current		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 brake	0.071
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)			With brake	0.074
Recommended moment of ir ratio of the load and the roto				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.167) This brake will be released when it is energized. Do not use this for braking the motor in motion.

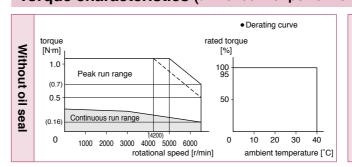
Static friction torque (N·m)	0.38 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.30
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

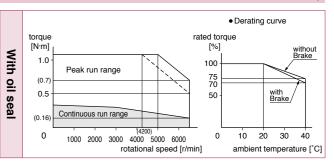
• Permissible load (For details, refer to P.166)

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.165.
- 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.

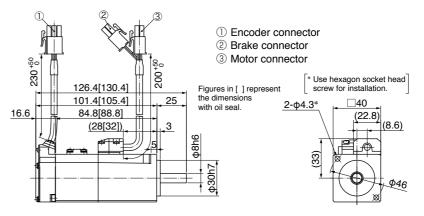
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)

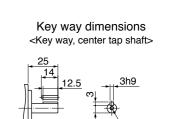




Dimensions

Mass: 0.62 kg (0.64 kg with oil seal) <with brake>





For motors with protective lip, refer to P.107. For connector type IP67 motors, refer to P.109. • For the dimensions without brake, refer to the left page.

<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.

75 MINAS A6 Family

				AC100 V
Motor model *1			IP65	MHMF021L1
		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	у	(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 torqu	ue (N·m)	2.23
Rated current (A(rms))			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/min)	3000
Max. rotationa	l speed		(r/min)	6500
Moment of ine	rtia		Without brake	0.29
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake	0.31	
Recommended moment of inertia ratio of the load and the rotor Note)3				30 times or less
Rotary encode	er speci	ficatio	ns*³	23-bit Absolute
Resolution per single turn			n per single turn	8388608

• Brake specifications (For details, refer to P.167) /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.166)

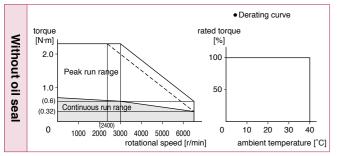
	During assembly During operation	Radial load P-direction (N)	392
		Thrust load A-direction (N)	147
		Thrust load B-direction (N)	196
		Radial load P-direction (N)	245
		Thrust load A, B-direction (N)	98

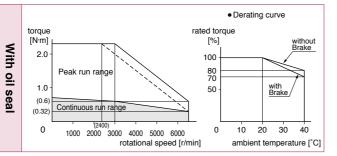
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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

Mass: 0.75 kg (0.78 kg with oil seal) <without brake> Encoder connector ② Motor connector * Use hexagon socket head a: 97.5[101] screw for installation Key way dimensions b: 67.5[71] □60 16.5 <Key way, center tap shaft> c:51[54.5] (30.8)d: (25.3[28.8]) (2.1)Figures in [] represent with oil seal

For motors with protective lip, refer to P.107. For connector type IP67 motors, refer to P.110. • For the dimensions with brake, refer to the right page

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

<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.

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

Specifications

					AC200 V
Motor model *1		IP65			MHMF022L1
		Multi	function type		MADLT15SF
Applicable	Model No	RS48	5 communication t	type *2	MADLN15SG
driver	110.	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 stall torque (N·m)				0.76	
Momentary Max. peak torque (N·m)				2.23	
Rated current (A(rms))				1.4	
Max. current			(A(o-p))	6.9
Regenerative brake			Without optio	n	No limit Note)2
frequency (time	s/min) I	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		0.29
of rotor (×10 ⁻⁴ kg·m ²)			With brake		0.31
Recommended moment of inertia ratio of the load and the rotor Note)3				30 times or less	
Rotary encoder specifications *3					23-bit Absolute
	Res	solutio	n per single tu	rn	8388608

• Brake specifications (For details, refer to P.167) This brake will be released when it is energized. Do not use this for braking the motor in motion.

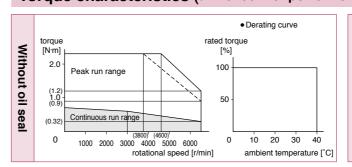
Static friction torque (N·m)	1.6 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

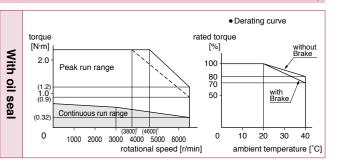
• Permissible load (For details, refer to P.166)

	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

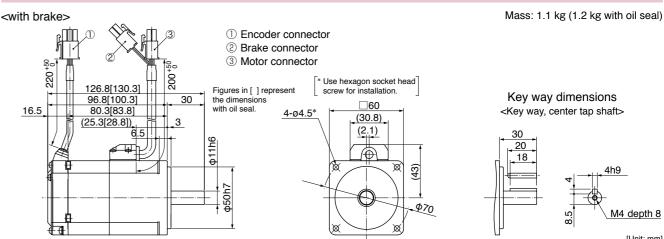
- For details of Note)1 to Note)4, refer to P.165.
- Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- *3 When using 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



For motors with protective lip, refer to P.107. For connector type IP67 motors, refer to P.110. ● For the dimensions without brake, refer to the left page.

<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.

				AC100 V
Motor model*1			IP65	MHMF041L1
		Multifunction type		MCDLT31SF
Applicable	Model No	RS48	communication type *	MCDLN31SG
driver		Basic	type *2	MCDLN31SE
	Frame	e sym	bol	C-frame
Power supply	capacity	/	(kVA)	0.9
Rated output			(W)	400
Rated torque			(N·m)	1.27
Continuous stall torque (N·m)			1.40	
Momentary Max. peak torque (N·m)			4.46	
Rated current (A(rms))			4.1	
Max. current (A(o-p))			20.3	
Regenerative brake V		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	0.56
of rotor (×10 ⁻⁴ kg·m ²)		With brake	0.58	
Recommended moment of inertia ratio of the load and the rotor Note)3			30 times or less	
Rotary encode	er specif	icatio	ns ^{*3}	23-bit Absolute
	Res	solutio	n per single turn	8388608

• Brake specifications (For details, refer to P.167) /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.166)

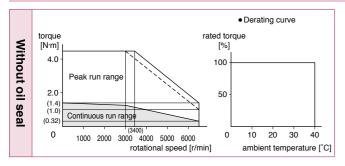
	During assembly During operation	Radial load P-direction (N)	392
		Thrust load A-direction (N)	147
		Thrust load B-direction (N)	196
		Radial load P-direction (N)	245
		Thrust load A, B-direction (N)	98

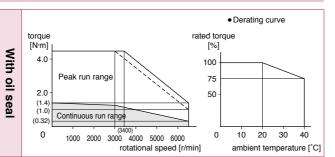
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.48.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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.>)





Dimensions

Mass: 1.1 kg (1.2 kg with oil seal) <without brake> ① Encoder connector 2 Motor connector * Use hexagon socket head a: 114.5[118] Key way dimensions b: 84.5[88] <Key way, center tap shaft> c: 68[71.5] 4-ø4.5* (30.8)d: (42.3[45.8]) (2.1)Figures in [] represent the dimension with oil seal.

For motors with protective lip, refer to P.108. For connector type IP67 motors, refer to P.110. • For the dimensions with brake, refer to the right page.

<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	MHMF042L1
		Multi	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	y	(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 torqı	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	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	0.56
of rotor ($\times 10^{-4}$	kg·m²)		With brake	0.58
Recommended moment of ine ratio of the load and the rotor				30 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.167) This brake will be released when it is energized. Do not use this for braking the motor in motion.

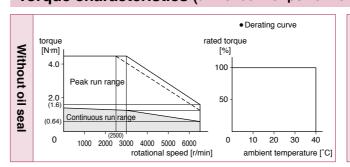
Static friction torque (N·m)	1.6 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

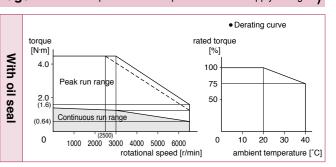
• Permissible load (For details, refer to P.166)

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

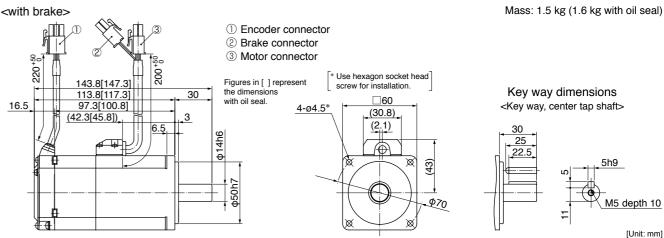
- For details of Note)1 to Note)4, refer to P.165.
- Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- *3 When using 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



For motors with protective lip, refer to P.108. For connector type IP67 motors, refer to P.110. •For the dimensions without brake, refer to the left page.

<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.

A6 Family

Specifications

					AC200 V
Motor model*1			IP65		MHMF082L1□□
		Multi	function type		MCDLT35SF
Applicable	Model No.	HS485 communication type 2		MCDLN35SG	
driver		Basic type *2			MCDLN35SE
	Fram	e sym	bol		C-frame
Power supply	capacit	y	(k\	/A)	1.3
Rated output			(W)	750
Rated torque (N·m)			2.39		
Continuous stall torque (N·m)			2.86		
Momentary Ma	ax. peal	k torqı	ue (N·	m)	8.36
Rated current			(A(rm	s))	3.8
Max. current			(A(o-	p))	18.8
Regenerative	brake		Without option		No limit Note)2
frequency (time	es/min)	Note)1	ote)1 DV0P4283		No limit Note)2
Rated rotation	al spee	d	(r/m	in)	3000
Max. rotationa	l speed		(r/m	in)	6000
Moment of ine	rtia		Without brake		1.56
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake		1.66	
Recommended moment of inertia ratio of the load and the rotor Note)3			te)3	20 times or less	
Rotary encoder specifications *3			ns*3		23-bit Absolute
	Re	solutio	on per single turn		8388608

Brake specifications (For details, refer to P.167) (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.166)

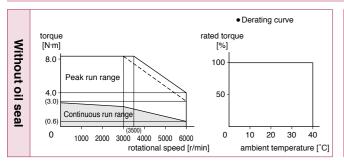
	Radial load P-direction (N)	686
During assembly	Thrust load A-direction (N)	294
docorribiy	Thrust load B-direction (N)	392
During	Radial load P-direction (N)	392
operation	Thrust load A, B-direction (N)	147

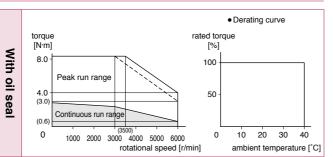
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.48.
- *1 in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.18.

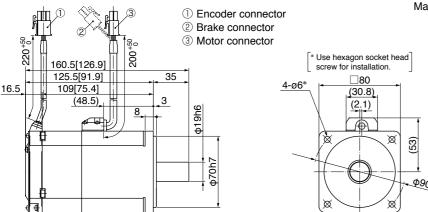
*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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





Dimensions



Mass: Without brake: 2.2 kg (2.3 kg with oil seal) With brake: 2.9 kg (3.0 kg with oil seal)

> 6h9 w M5 depth 10

Key way dimensions

<Key way, center tap shaft>

•Figures in [] represent the dimensions without brake.

[Unit: mm]

For motors with oil seal, refer to P.106. For motors with protective lip, refer to P.108. For connector type IP67 motors, refer to P.111.

<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	MHMF092L1
		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 stall torque (N·m)				3.34
Momentary Max. peak torque (N·m)				11.1
Rated current			(A(rms))	5.7
Max. current			(A(o-p))	28.2
Regenerative brake frequency (times/min) Note)1		Without option	No limit Note)2	
		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 (×10 ⁻⁴	kg·m²)		With brake	2.13
Recommended moment of ine ratio of the load and the rotor				20 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.167) (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.166)

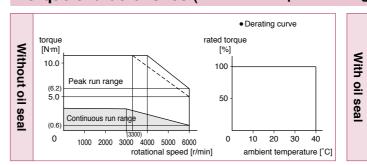
During assembly During operation	Radial load P-direction (N)	686
	Thrust load A-direction (N)	294
	Thrust load B-direction (N)	392
	Radial load P-direction (N)	392
	Thrust load A, B-direction (N)	147

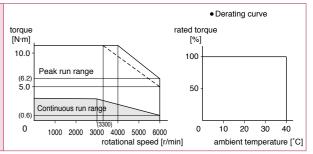
- For details of Note)1 to Note)4, refer to P.165.
- Dimensions of Driver, refer to P.48.
- *1 in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.18.

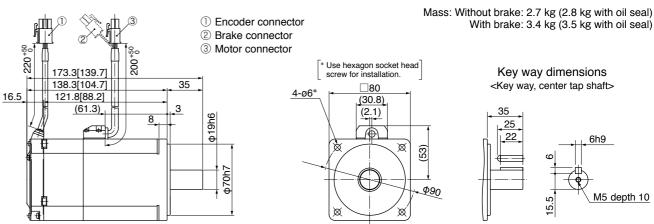
*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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





Dimensions



•Figures in [] represent the dimensions without brake.

[Unit: mm]

For motors with oil seal, refer to P.106. For motors with protective lip, refer to P.108. For connector type IP67 motors, refer to P.111.

<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.

П

Imformation

ambient temperature (°

				AC200 V
Motor model ^{*1}			IP67	MHMF102L1
		Multi	function type	MDDLT45SF
Applicable	Model No	RS48	5 communication type *	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 stall torque (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	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	22.9
of rotor (×10 ⁻⁴ kg·m ²)			With brake	24.1
Recommended moment of inertia ratio of the load and the rotor Note)3			5 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.167) /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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

	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.165.
- · 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.

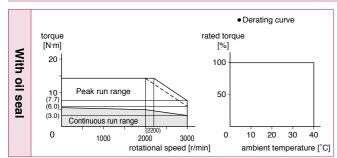
*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Mass: Without brake: 6.1 kg

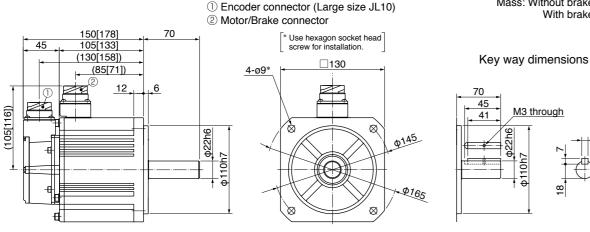
With brake: 7.6 kg

[Unit: mm]

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



Dimensions



Encoder connector (Small size JN2), refer to P.112. • Figures in [] represent the dimensions with brake.

<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				MHMF152L1
		Multif	function type		MDDLT55SF
Applicable	Model No	RS485 communication type *2		ı type *2	MDDLN55SG
driver	140.	Basic type *2			MDDLN55SE
	Frame	e sym	bol		D-frame
Power supply	capacity	/		(kVA)	2.3
Rated output				(W)	1500
Rated torque				(N·m)	7.16
Continuous sta	all torqu	е		(N·m)	7.52
Momentary Max. peak torque (N-n				(N·m)	21.5
Rated current			(A	(rms))	8.0
Max. current			(A	(o-p))	34
Regenerative brake			Without opti	on	No limit Note)2
frequency (time	s/min) I	Note)1	DV0P4284		No limit Note)2
Rated rotation	al spee	d	(r/min)	2000
Max. rotationa	speed		(r/min)	3000
Moment of ine	rtia		Without bra	ke	33.4
of rotor (×10 ⁻⁴	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 specif	icatio	ns *3		23-bit Absolute
	Res	solutio	n per single t	urn	8388608

• Brake specifications (For details, refer to P.167) 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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

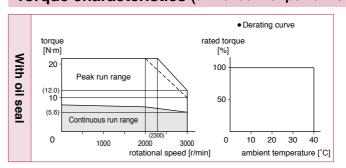
During assembly During operation	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.165.
- 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".

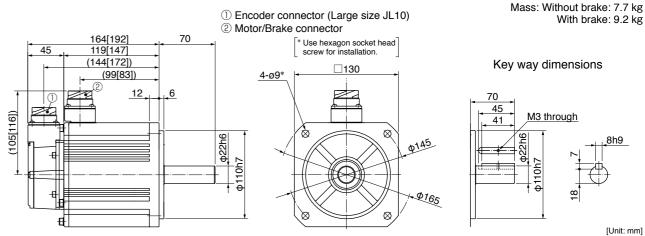
Detail of model designation, refer to P.18.

*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



Encoder connector (Small size JN2), refer to P.112. • Figures in [] represent the dimensions with brake.

<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.

				AC200 V
Motor model *1			IP67	MHMF202L1
		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)	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 (times/min) Note)1		Note)1	DV0P4285	No limit Note)2
Rated rotation	al spee	d	(r/min)	2000
Max. rotationa	l speed		(r/min)	3000
Moment of inertia			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 Note)3			5 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.167) /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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

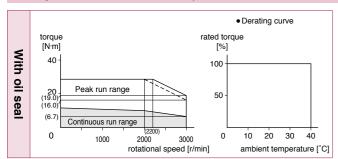
	Radial load P-direction (N)	1666
During assembly	Thrust load A-direction (N)	784
accombiy	Thrust load B-direction (N)	980
During	Radial load P-direction (N)	784
operation	Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.165.
- · 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".

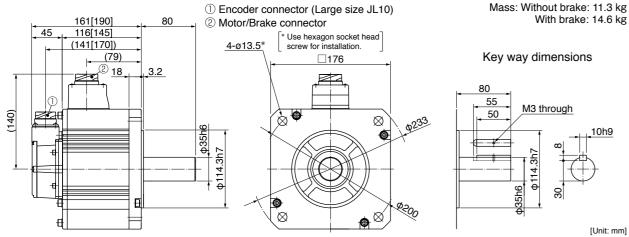
Detail of model designation, refer to P.18.

*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



Encoder connector (Small size JN2), refer to P.112. • Figures in [] represent the dimensions with brake.

<a>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			MHMF302L1□□
		Multi	function type		MFDLTA3SF
Applicable	Model No	RS48	5 communication	n 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)	14.3
Continuous stall torque (N·m)				17.2	
Momentary Max. peak torque (N·m)				43.0	
Rated current (A(rms))				17.0	
Max. current (A(o-p))				72	
Regenerative brake			Without opti	ion	No limit Note)2
frequency (times/min) Note)1		lote)1	DV0P4285×2		No limit Note)2
Rated rotation	al speed	t	(r/min)	2000
Max. rotationa	speed		(r/min)	3000
Moment of ine	rtia		Without bra	ke	85.3
of rotor (×10 ⁻⁴ kg·m ²)		With brake		90.7	
Recommended moment of inertia ratio of the load and the rotor Note)3					5 times or less
Rotary encode	r specif	icatio	ns*3		23-bit Absolute
Resolution per			n per single t	urn	8388608

• Brake specifications (For details, refer to P.167) 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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

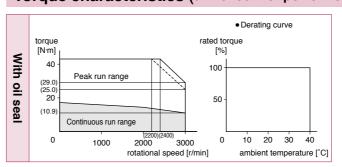
During assembly During operation	Radial load P-direction (N)	1666
	Thrust load A-direction (N)	784
	Thrust load B-direction (N)	980
	Radial load P-direction (N)	784
	Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.165.
- 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".

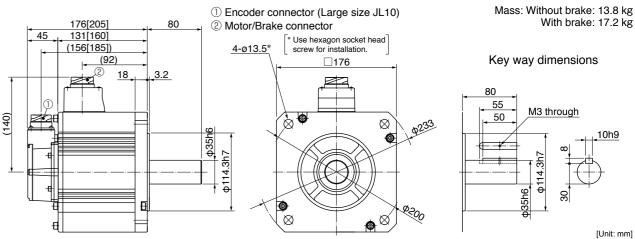
Detail of model designation, refer to P.18.

*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



Encoder connector (Small size JN2), refer to P.112. • Figures in [] represent the dimensions with brake.

<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.

				AC200 V
Motor model*1			IP67	MHMF402L1□□
		Multifunction type		MFDLTB3SF
Applicable	Model No.	RS48	5 communication type *2	MFDLNB3SG
driver		Basic	type *2	MFDLNB3SE
	Fram	e sym	bol	F-frame
Power supply capacity (kVA)				7.5
Rated output			(W)	4000
Rated torque (N·m)				19.1
Continuous stall torque (N·m)				22.0
Momentary Max. peak torque (N·m)				57.3
Rated current (A(rms))				20
Max. current (A(o-p))				85
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)	2000
Max. rotationa	l speed		(r/min)	3000
Moment of inertia			Without brake	104
of rotor (×10 ⁻⁴	of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake	110
Recommended moment of inertia ratio of the load and the rotor Note)3				5 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.167) /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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

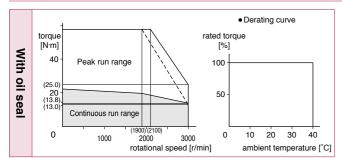
During assembly	Radial load P-direction (N)	1666
	Thrust load A-direction (N)	784
	Thrust load B-direction (N)	980
During operation	Radial load P-direction (N)	784
	Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.165.
- · 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".

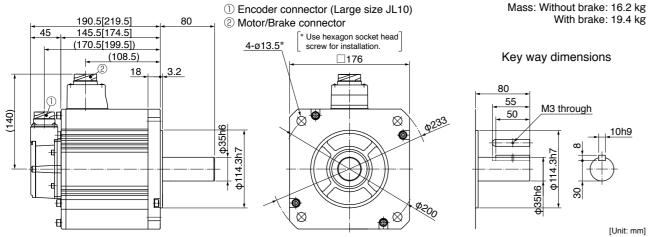
Detail of model designation, refer to P.18.

*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



Encoder connector (Small size JN2), refer to P.112. • Figures in [] represent the dimensions with brake.

<a>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		MHMF502L1
		Multif	function type		MFDLTB3SF
Applicable	Model No	RS485	5 communication	n type *2	MFDLNB3SG
driver	140.	Basic	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 stall torque (N·m)				26.3	
Momentary Max. peak torque (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 inertia			Without brake		146
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)			With brake		151
Recommended moment of inertia ratio of the load and the rotor Note)3				5 times or less	
Rotary encode	r speci	ficatio	ns*3		23-bit Absolute
	Resolution per single turn			8388608	

200 V MHMF 5.0 kW High inertia 176 mm sq.

• Brake specifications (For details, refer to P.167) /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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

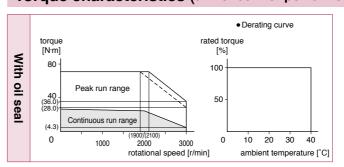
During assembly During operation	Radial load P-direction (N)	1666
	Thrust load A-direction (N)	784
	Thrust load B-direction (N)	980
	Radial load P-direction (N)	784
	Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.165.
- 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".

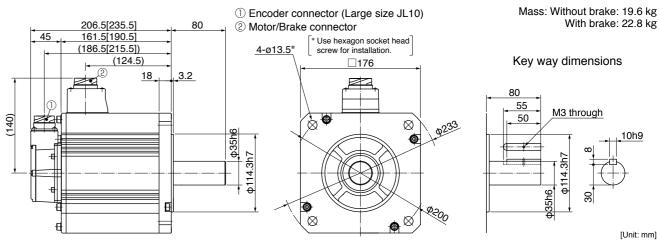
Detail of model designation, refer to P.18.

*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



Encoder connector (Small size JN2), refer to P.112. • Figures in [] represent the dimensions with brake.

<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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MINAS A6 Family 88

				AC200 V
Motor model *1			IP67	MDMF102L1□□
		Multi	function type	MDDLT45SF
Applicable	Model No.	RS485 communication type *2		MDDLN45SG
driver	110.	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	torqu	ue (N·m)	14.3
Rated current (A(rms))			5.2	
Max. current (A(o-p))			22	
Regenerative brake With		Without option	No limit Note)2	
frequency (time	es/min) I	Note)1	DV0P4284	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	6.18
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake	7.40	
Recommended moment of inertia ratio of the load and the rotor				10 times or less
Rotary encode	er specif	icatio	ns ^{*3}	23-bit Absolute
Resolution per single turn			n per single turn	8388608

• Brake specifications (For details, refer to P.167) /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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

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
	assembly	During assembly Thrust load A-direction (N) Thrust load B-direction (N) During Radial load P-direction (N)

- For details of Note)1 to Note)4, refer to P.165.
- · 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.

Mass: Without brake: 4.6 kg

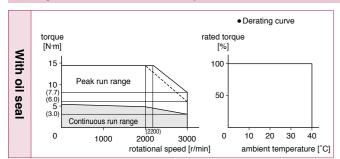
Key way dimensions

M3 through

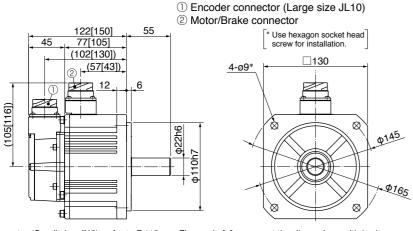
With brake: 6.1 kg

[Unit: mm]

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



Dimensions



Encoder connector (Small size JN2), refer to P.113. • Figures in [] represent the dimensions with brake.

<a>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
		Multif	function type		MDDLT55SF
Applicable	Model No	RS48	RS485 communication type *2		MDDLN55SG
driver	140.	Basic	Basic type *2		MDDLN55SE
	Frame	sym	bol		D-frame
Power supply	capacity	/	(I	κVA)	2.3
Rated output				(W)	1500
Rated torque			1)	N·m)	7.16
Continuous sta	all torqu	е	1)	N·m)	7.52
Momentary Ma	ax. peak	torqu	ıe (1	N·m)	21.5
Rated current (A(rms))				ms))	8.0
Max. current			(A(d	o-p))	34
Regenerative I	orake		Without option		No limit Note)2
frequency (time	s/min) I	Note)1	DV0P4284		No limit Note)2
Rated rotation	al speed	d	(r/	min)	2000
Max. rotationa	speed		(r/	min)	3000
Moment of ine	rtia		Without brake	9	9.16
of rotor (×10 ⁻⁴ kg·m ²)			With brake		10.4
Recommended moment of inertia ratio of the load and the rotor Note)3					10 times or less
Rotary encoder specifications *3					23-bit Absolute
	Res	solutio	n per single tur	'n	8388608

 Brake specifications (For details, refer to P.167) 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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

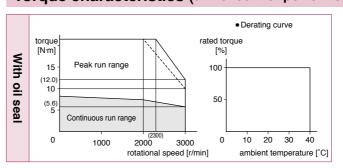
	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
assembly	Thrust load B-direction (N)	686
During operation	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.165.
- 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".

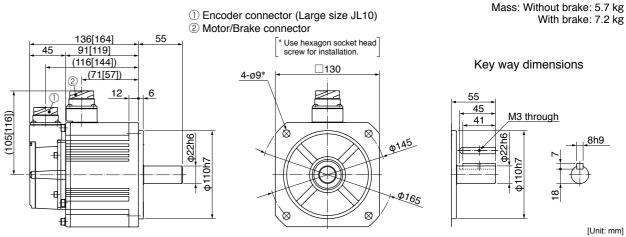
Detail of model designation, refer to P.18.

*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



Encoder connector (Small size JN2), refer to P.113. • Figures in [] represent the dimensions with brake.

<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.

				AC200 V
Motor model *1			IP67	MDMF202L1□□
		Multi	function type	MEDLT83SF
Applicable	Model No	RS485 communication type *2		MEDLN83SG
driver	110.	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 sta	all torqu	е	(N·m)	10.0
Momentary Ma	ax. peak	torqı	ue (N·m)	28.6
Rated current			(A(rms))	9.9
Max. current			(A(o-p))	42
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	d	(r/min)	2000
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	12.1
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)			With brake	13.3
Recommended moment of inertia ratio of the load and the rotor Note)3			10 times or less	
Rotary encode	er specif	icatio	ns ^{*3}	23-bit Absolute
	Res	solutio	on per single turn	8388608

• Brake specifications (For details, refer to P.167) /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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

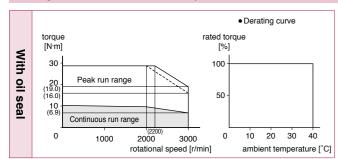
		Radial load P-direction (N)	980
	During assembly	Thrust load A-direction (N)	588
	assembly	Thrust load B-direction (N)	686
	During operation	Radial load P-direction (N)	490
		Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.165.
- · 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".

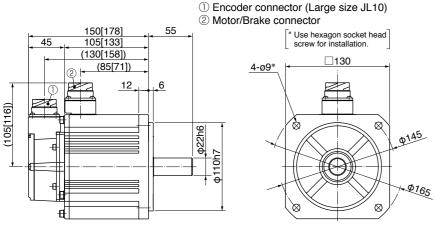
Detail of model designation, refer to P.18.

*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 dimensions

Mass: Without brake: 6.9 kg

With brake: 8.4 kg

M3 through [Unit: mm]

Encoder connector (Small size JN2), refer to P.113. • Figures in [] represent the dimensions with brake.

<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□□
		Multif	function type		MFDLTA3SF
Applicable	Model No	RS485	RS485 communication type *2		MFDLNA3SG
driver	140.	Basic	Basic type ^{*2}		MFDLNA3SE
	Frame	e sym	bol		F-frame
Power supply	capacity	y	(k	(AV	4.5
Rated output				(W)	3000
Rated torque			(1)	√m)	14.3
Continuous sta	all torqu	е	1)	√m)	15.0
Momentary Max. peak torque (N·m)					43.0
Rated current (A(rms))				16.4	
Max. current (A(o-p))				70	
Regenerative I	brake		Without option	ı	No limit Note)2
frequency (time	es/min)	Note)1	DV0P4285×2		No limit Note)2
Rated rotation	al spee	d	(r/r	min)	2000
Max. rotationa	l speed		(r/ı	min)	3000
Moment of ine	rtia		Without brake)	18.6
of rotor (×10 ⁻⁴ kg·m ²)			With brake		19.6
Recommended moment of inertia ratio of the load and the rotor Note)3					10 times or less
Rotary encode	r speci	ficatio	ns*3		23-bit Absolute
	Res	solutio	n per single tur	n	8388608

 Brake specifications (For details, refer to P.167) 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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

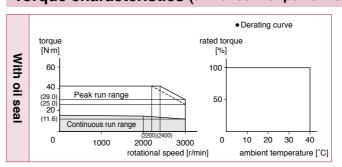
. .	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
accombiy	Thrust load B-direction (N)	686
During operation	Radial load P-direction (N)	784
	Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.165.
- 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".

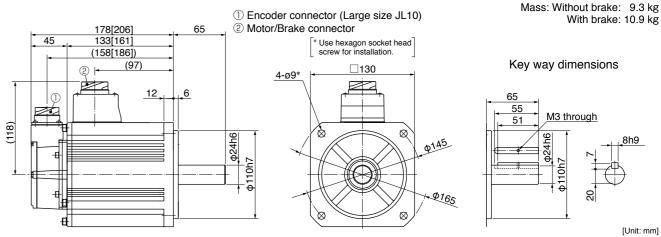
Detail of model designation, refer to P.18.

*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



Encoder connector (Small size JN2), refer to P.113. • Figures in [] represent the dimensions with brake.

<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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[Unit: mm]

				AC200 V
Motor model *1			IP67	MDMF402L1
		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	y	(kVA)	7.5
Rated output			(W)	4000
Rated torque			(N·m)	19.1
Continuous sta	all torqu	е	(N·m)	22.0
Momentary Ma	ax. peal	k torqı	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
Recommended moment of inertia ratio of the load and the rotor Note)3			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.167) /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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

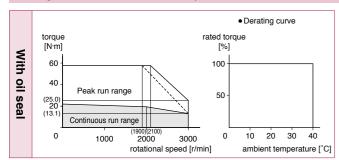
	During assembly During operation	Radial load P-direction (N)	1666
		Thrust load A-direction (N)	784
		Thrust load B-direction (N)	980
		Radial load P-direction (N)	784
		Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.165.
- · 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".

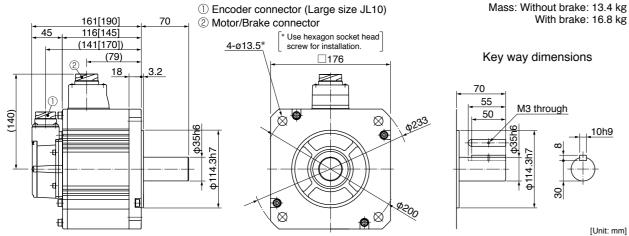
Detail of model designation, refer to P.18.

*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



Encoder connector (Small size JN2), refer to P.113. • Figures in [] represent the dimensions with brake.

<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			MDMF502L1
		Multif	function type		MFDLTB3SF
Applicable	Model No.	RS485	communication typ	e *2	MFDLNB3SG
driver	110.	Basic	type *2		MFDLNB3SE
	Fram	e syml	bol		F-frame
Power supply	capacit	у	(kV	/A)	7.5
Rated output			()	W)	5000
Rated torque			(N·	m)	23.9
Continuous sta	all torqu	ie	(N·ı	m)	26.3
Momentary Ma	ax. pea	k torqu	ıe (N·ı	m)	71.6
Rated current			(A(rm:	s))	23.3
Max. current			(A(o-)	p))	99
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/mi	in)	2000
Max. rotationa	l speed		(r/mi	in)	3000
Moment of ine	rtia		Without brake		58.2
of rotor (×10 ⁻⁴ kg·m ²)			With brake		63.0
Recommended moment of inertia ratio of the load and the rotor Note)3					10 times or less
Rotary encoder specifications *3					23-bit Absolute
	Re	solutio	n per single turn		8388608

• Brake specifications (For details, refer to P.167) 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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

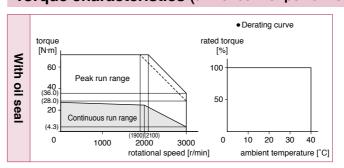
	Radial load P-direction (N)	1666
During assembly	Thrust load A-direction (N)	784
assembly	Thrust load B-direction (N)	980
During	Radial load P-direction (N)	784
operation	Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.165.
- 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".

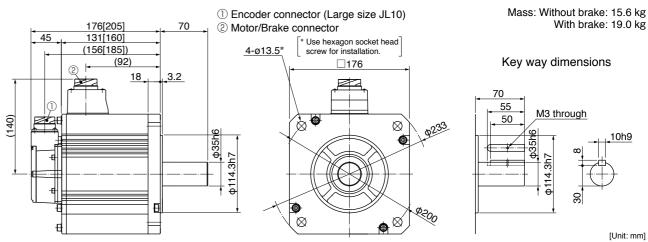
Detail of model designation, refer to P.18.

*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



Encoder connector (Small size JN2), refer to P.113. • Figures in [] represent the dimensions with brake.

<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.

					AC200 V
Motor model*1			IP67		MGMF092L1□□
		Multi	function typ	е	MDDLT45SF
Applicable	Model No	RS48	35 communication type *2		MDDLN45SG
driver		Basic	c type *2		MDDLN45SE
	Frame	sym	bol		D-frame
Power supply	capacity			(kVA)	1.8
Rated output				(W)	850
Rated torque				(N·m)	5.41
Continuous sta	all torque	Э		(N·m)	5.41
Momentary Ma	ax. peak	torqu	ne	(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) N	lote)1	DV0P4284		No limit Note)2
Rated rotation	al speed	i		(r/min)	1500
Max. rotationa	l 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 iner ratio of the load and the rotor				Note)3	10 times or less
Rotary encode	er specifi	catio	ns *3		23-bit Absolute
Resolution per single tur			e turn	8388608	

Brake specifications (For details, refer to P.167) (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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

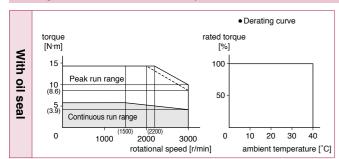
	During assembly During operation	Radial load P-direction (N)	980
		Thrust load A-direction (N)	588
		Thrust load B-direction (N)	686
		Radial load P-direction (N)	686
		Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.48.
- *1 \(\subseteq \) in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

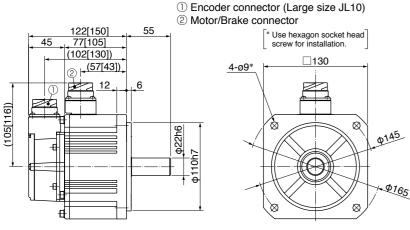
Detail of model designation, refer to P.18.

*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.>)

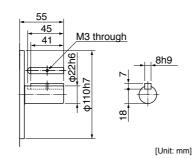


Dimensions



Mass: Without brake: 4.6 kg With brake: 6.1 kg

Key way dimensions



Encoder connector (Small size JN2), refer to P.114. • Figures in [] represent the dimensions with brake.

<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

MGMF 1.3 kW

				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
	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 torqı	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 (×10 ⁻⁴ kg·m ²) W			With brake	10.4
Recommende ratio of the loa				10 times or less
Rotary encode	er speci	ficatio	ns ^{*3}	23-bit Absolute
	Re	solutio	n per single turn	8388608

Middle inertia

.130 mm sq.

Low speed/High torque type

Brake specifications (For details, refer to P.167)
 (This brake will be released when it is energized. Do not use this for braking the motor in motion.)

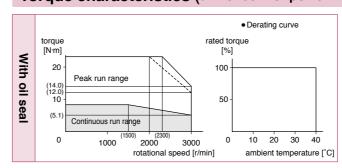
Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

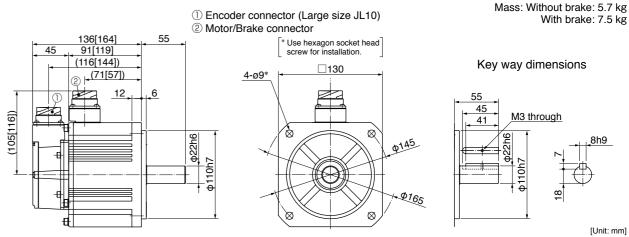
	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
document	Thrust load B-direction (N)	686
During operation	Radial load P-direction (N)	686
	Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.165.
- · 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.

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



Dimensions



Encoder connector (Small size JN2), refer to P.114. • Figures in [] represent the dimensions with brake.

<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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MINAS A6 Family 96

					AC200 V
Motor model*1			IP67		MGMF182L1□□
		Multi	function t	type	MEDLT83SF
Applicable	Model No	RS48	RS485 communication type ^{*2}		MEDLN83SG
driver		Basic	type *2		MEDLN83SE
	Frame	e sym	bol		E-frame
Power supply	capacity	y		(kVA)	3.8
Rated output				(W)	1800
Rated torque				(N·m)	11.5
Continuous sta	all torqu	е		(N·m)	11.5
Momentary Ma	ax. peal	k torqı	ıe	(N·m)	28.7
Rated current				(A(rms))	11.8
Max. current				(A(o-p))	42
Regenerative I	brake		Without option		No limit Note)2
frequency (time	s/min)	Note)1	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 ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake		13.3	
Recommended moment of inertia ratio of the load and the rotor Note)3			Note)3	10 times or less	
Rotary encode	r speci	ficatio	ons*3		23-bit Absolute
	Res	solutio	ition per single turn		8388608

• Brake specifications (For details, refer to P.167) /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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

	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.165.
- · 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.

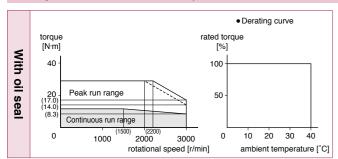
Mass: Without brake: 6.9 kg

M3 through

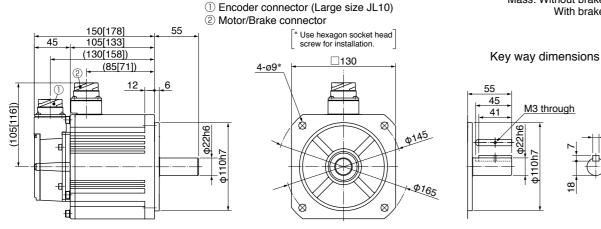
With brake: 8.4 kg

[Unit: mm]

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



Dimensions



Encoder connector (Small size JN2), refer to P.114. • Figures in [] represent the dimensions with brake.

<a>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

MGMF 2.9 kW

					AC200 V
Motor model *1			IP67		MGMF292L1
		Multifunction type		MFDLTB3SF	
Applicable	Model No	RS48	5 communication	type *2	MFDLNB3SG
driver	140.	Basic	type *2		MFDLNB3SE
	Frame	e sym	bol		F-frame
Power supply	capacity	/	(kVA)	7.5
Rated output				(W)	2900
Rated torque			(N·m)	18.5
Continuous sta	all torqu	е	(N·m)	18.5
Momentary Max. peak torqu		ue (N·m)	45.2	
Rated current		(A(ı	ms))	19.3	
Max. current		(A(o-p))	67	
Regenerative brake		Without option	n	No limit Note)2	
frequency (time	s/min) I	Note)1	DV0P4285×2	2	No limit Note)2
Rated rotation	al spee	d	(r	/min)	1500
Max. rotationa	speed		(r	/min)	3000
Moment of ine	rtia		Without brak	е	46.9
of rotor ($\times 10^{-4}$	kg·m²)		With brake		52.3
Recommended ratio of the load				Note)3	10 times or less
Rotary encode	r specif	icatio	ns*3		23-bit Absolute
	Res	solutio	n per single tu	rn	8388608

Middle inertia

.176 mm sq.

Low speed/High torque type

• Brake specifications (For details, refer to P.167) 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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

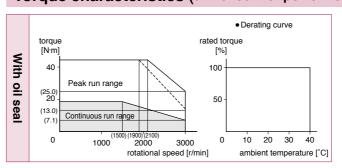
During assembly	Radial load P-direction (N)	1666
	Thrust load A-direction (N)	784
	Thrust load B-direction (N)	980
During operation	Radial load P-direction (N)	1176
	Thrust load A, B-direction (N)	490

- For details of Note)1 to Note)4, refer to P.165.
- 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".

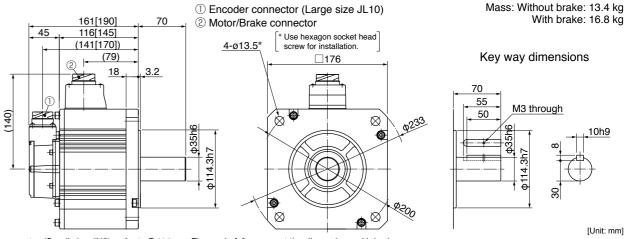
Detail of model designation, refer to P.18.

*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



Encoder connector (Small size JN2), refer to P.114. • Figures in [] represent the dimensions with brake.

<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.

				AC200 V
Motor model *1			IP67	MGMF442L1□□
	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	y	(kVA)	7.5
Rated output			(W)	4400
Rated torque			(N·m)	28.0
Continuous stall torque (N·m)		28.0		
Momentary Max. peak torque (N·m)		70.0		
Rated current (A(rms))		27.2		
Max. current (A(o-p))		96		
Regenerative brake Without option		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	58.2
of rotor ($\times 10^{-4}$	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	er speci	ficatio	ns*3	23-bit Absolute
Resolution per single turn		8388608		

• Brake specifications (For details, refer to P.167) (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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

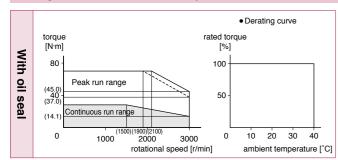
	Radial load P-direction (N)	1666
During assembly	Thrust load A-direction (N)	784
assembly	Thrust load B-direction (N)	980
During	Radial load P-direction (N)	1470
operation	Thrust load A, B-direction (N)	490

- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.49.
- *1 \square in the motor part number represents the motor
- *2 Basic type and RS485 communication type are "Position control type".

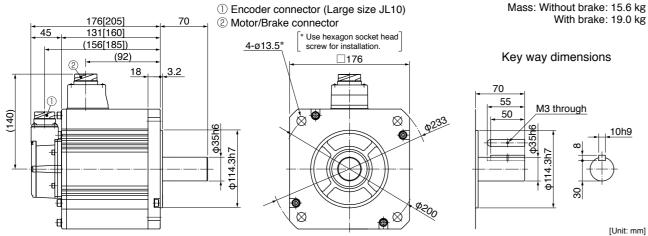
Detail of model designation, refer to P.18.

*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



Encoder connector (Small size JN2), refer to P.114. • Figures in [] represent the dimensions with brake.

<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.

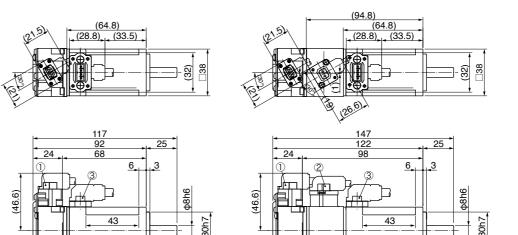
● MSMF5AZL1 □ □ [Unit: mm] <without brake> <with brake> ① Encoder connector 2 Brake connector 3 Motor connector

MSMF 50 W to 200 W

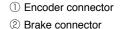
Connector type (IP67)

● MSMF01 L1 U

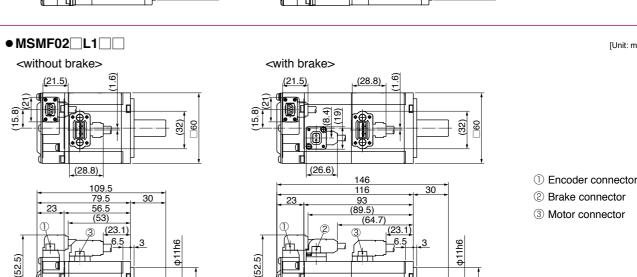
<without brake>



<with brake>



3 Motor connector



99 MINAS A6 Family MINAS A6 Family 100

[Unit: mm]

[Unit: mm]

^{*} For motor specifications and mounting dimensions (on flange face), refer to P.51 to P.56.

Dimensions

(42.6)

30

● MSMF042L1 □ □

<without brake>

● MSMF082L1 □ □

<without brake>

■ MSMF092L1 □ □

<without brake>

(52.5)

MSMF 400 W to 1000 W Connector type (IP67)

<with brake>

<with brake>

(26.6)

<with brake>

(26.6)

[Unit: mm]

[Unit: mm]

[Unit: mm]

① Encoder connector

① Encoder connector ② Brake connector (3) Motor connector

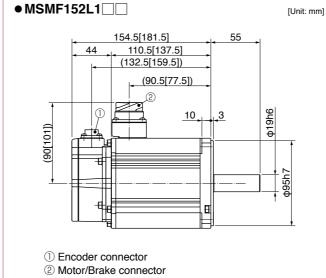
① Encoder connector ② Brake connector ③ Motor connector

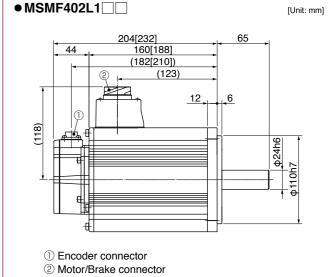
② Brake connector ③ Motor connector

MSMF 1.0 kW to 5.0 kW Small size connector (JN2)

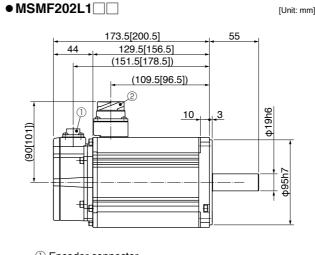
● MSMF102L1 □ □ 92[119] (114[141]) (72[59]) (1) Encoder connector ② Motor/Brake connector • Figures in [] represent the dimensions with brake.

● MSMF302L1 □ □ [Unit: mm] 141[166] (163[188]) (107) 12 (1) Encoder connector ② Motor/Brake connector • Figures in [] represent the dimensions with brake.

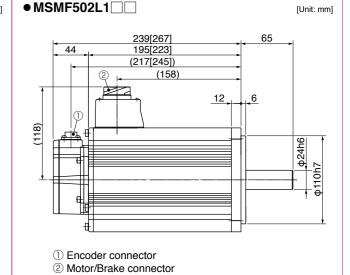




• Figures in [] represent the dimensions with brake.



• Figures in [] represent the dimensions with brake.



• Figures in [] represent the dimensions with brake.

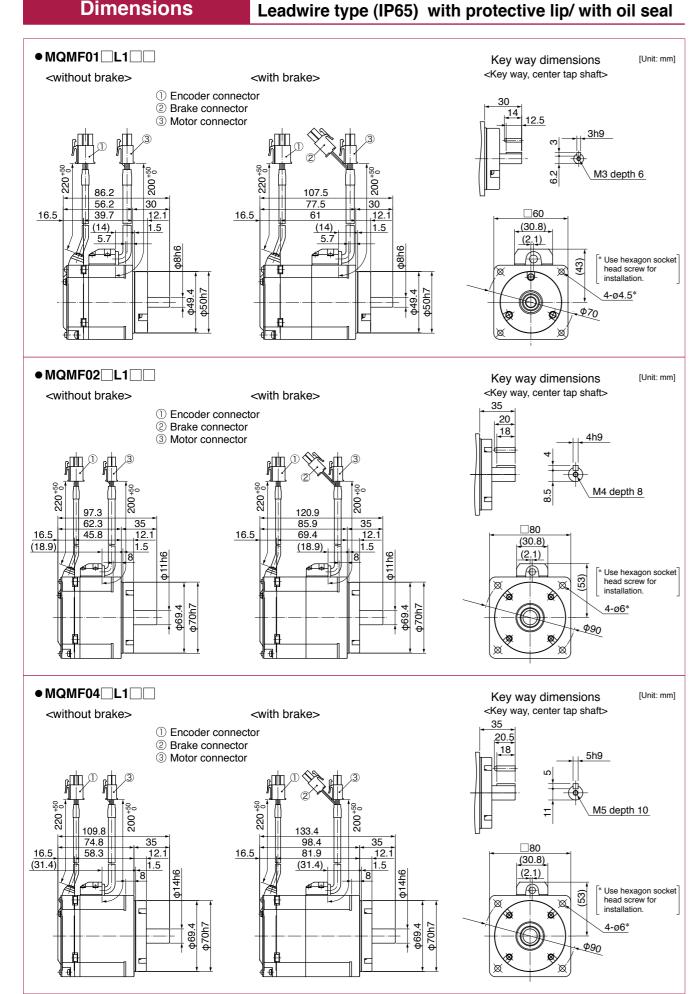


• Figures in [] represent the dimensions with brake.

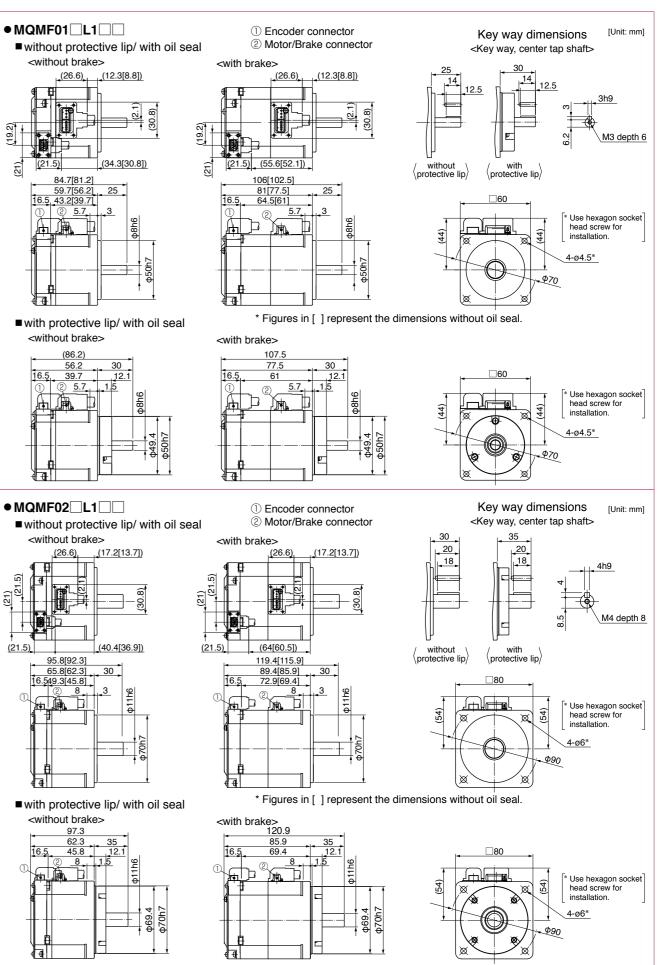
* For motor specifications and mounting dimensions (on flange face), refer to P.57 to P.60.

^{*} For motor specifications and mounting dimensions (on flange face), refer to P.61 to P.66.

Dimensions



MQMF 100 W to 400 W



^{*} For motors specifications, refer to P.67 to P.70.

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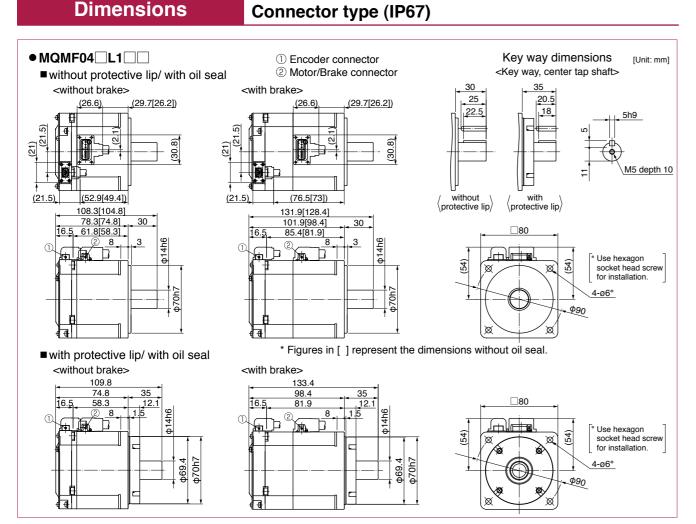
^{*} For motors specifications, refer to P.67 to P.72.

MHMF 750 W, 1000 W

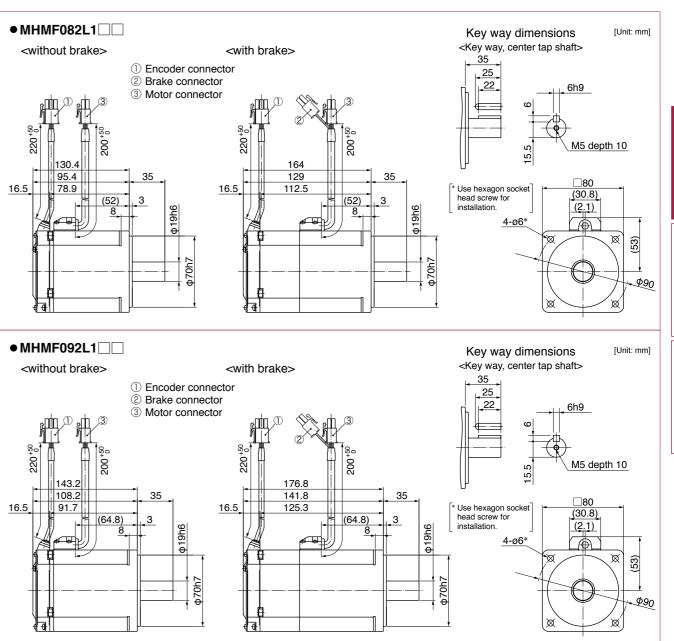
Leadwire type (IP65) with oil seal

A6 Family

Dimensions



MQMF 400 W

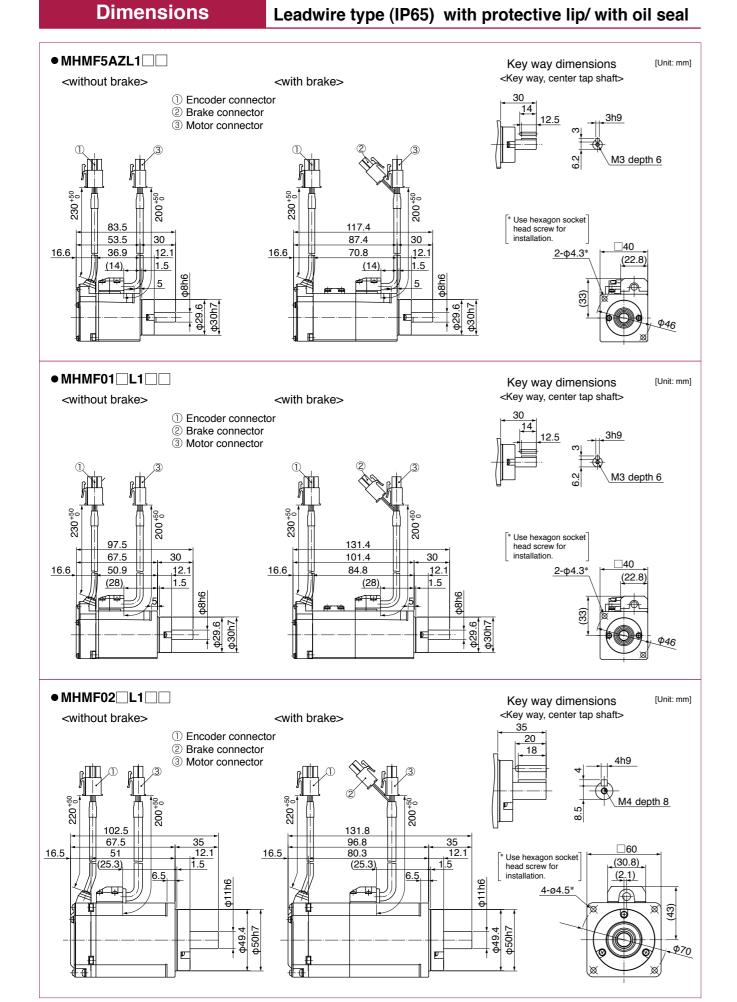


^{*} For motors specifications, refer to P.81, P.82.

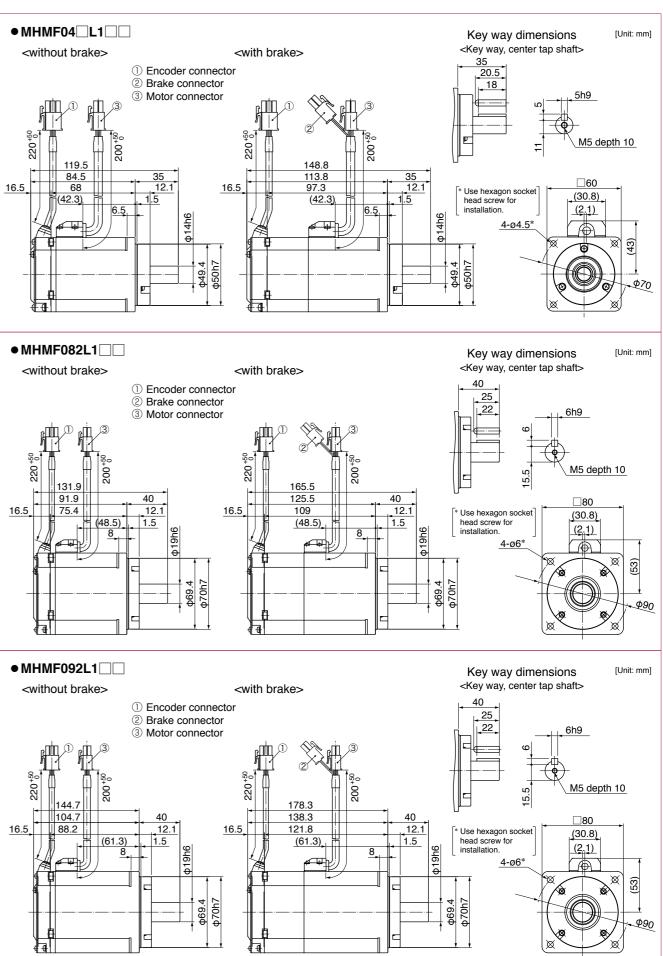
^{*} For motors specifications, refer to P.71, P.72.

MHMF 400 W to 1000 W





^{*} For motors specifications, refer to P.73 to P.78.



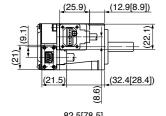
^{*} For motors specifications, refer to P.79 to P.82.

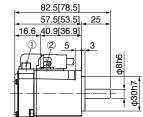
MHMF 200 W, 400 W Connector type (IP67)

Imformation

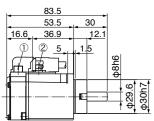
Dimensions

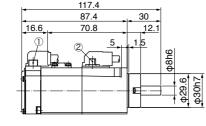






■ with protective lip/ with oil seal <without brake>





MHMF 50 W, 100 W

Connector type (IP67)

① Encoder connector

<with brake>

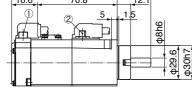
<with brake>

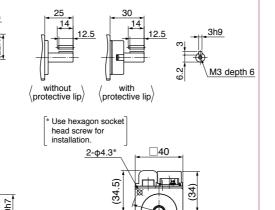
② Motor/Brake connector

116.4[112.4]

91.4[87.4]

74.8[70.8]

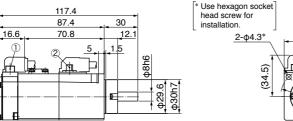




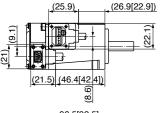
Key way dimensions

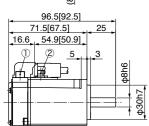
<Key way, center tap shaft>

* Figures in [] represent the dimensions without oil seal.

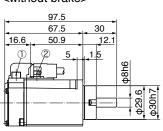


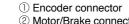


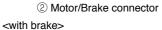


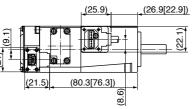


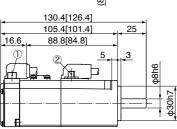
■ with protective lip/ with oil seal <without brake>

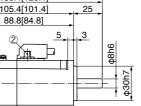


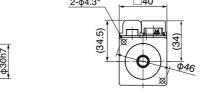












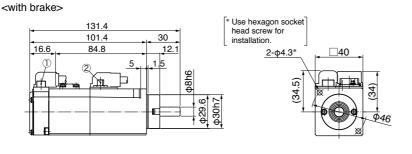
with protective lip

Key way dimensions

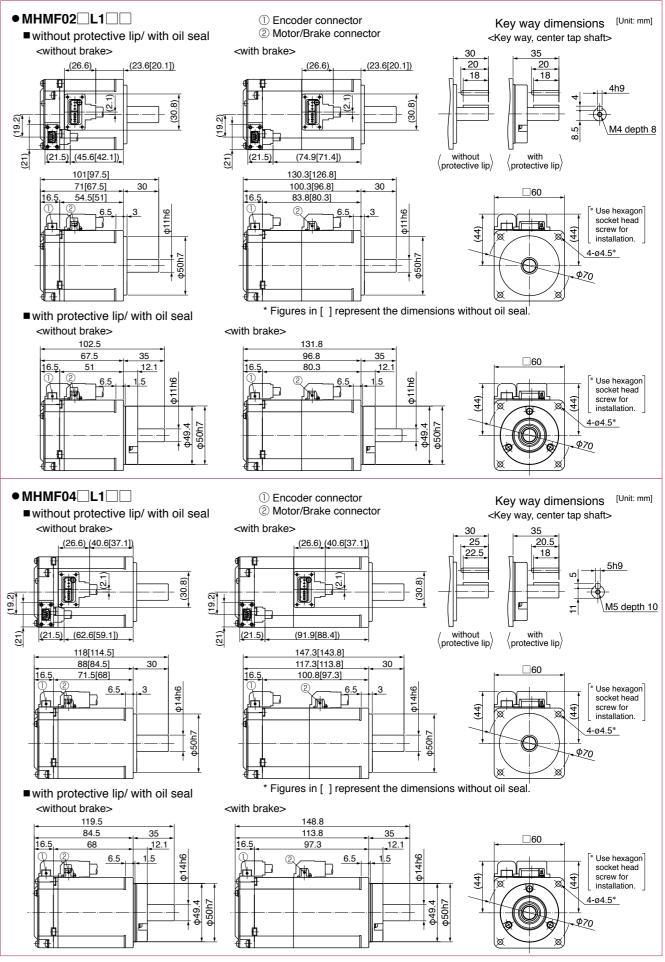
<Key way, center tap shaft>

M3 depth 6

* Figures in [] represent the dimensions without oil seal.



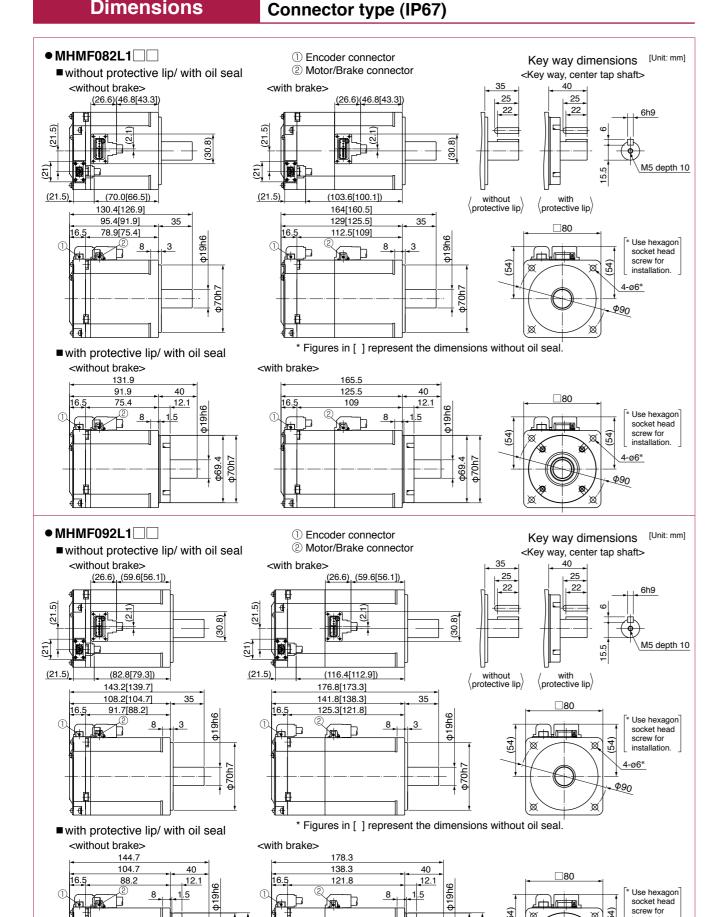
without



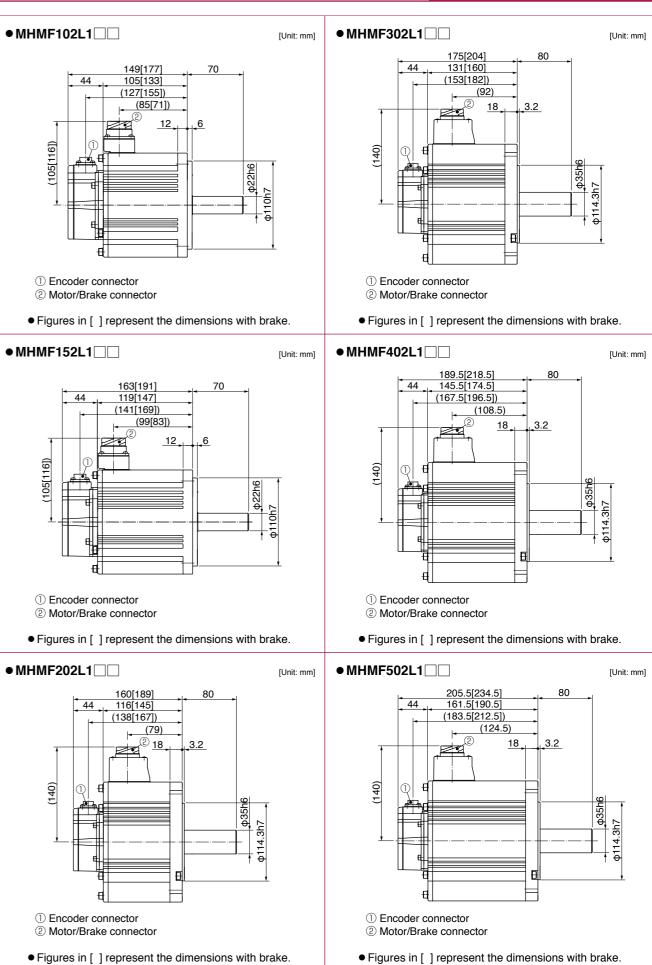
^{*} For motors specifications, refer to P.77 to P.80.

^{*} For motors specifications, refer to P.73 to P.76.

Imformation



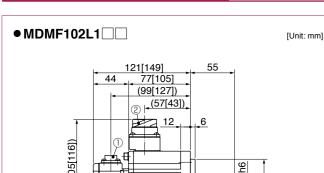
MHMF 750 W, 1000 W



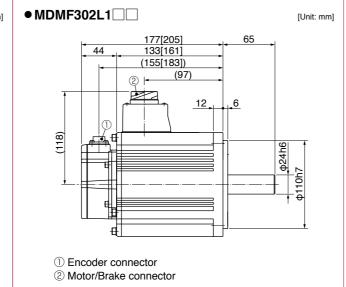
^{*} For motor specifications and mounting dimensions (on flange face), refer to P.83 to P.88.

^{*} For motors specifications, refer to P.81, P.82.

MGMF 0.85 kW to 4.4 kW Small size connector (JN2)



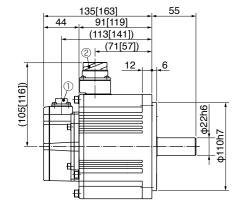
- (1) Encoder connector
- ② Motor/Brake connector
- Figures in [] represent the dimensions with brake.



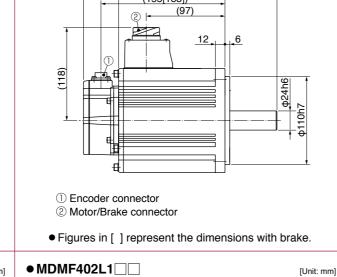
MDMF 1.0 kW to 5.0 kW

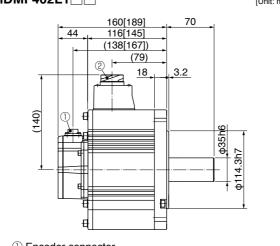
Small size connector (JN2)

● MDMF152L1 □ □ [Unit: mm]



- ① Encoder connector
- ② Motor/Brake connector
- Figures in [] represent the dimensions with brake.





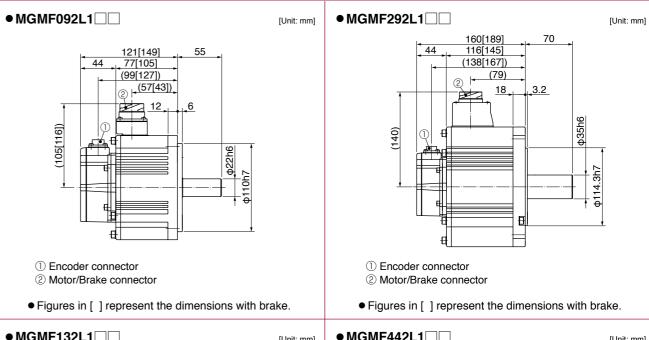
- ① Encoder connector
- ② Motor/Brake connector
- Figures in [] represent the dimensions with brake.

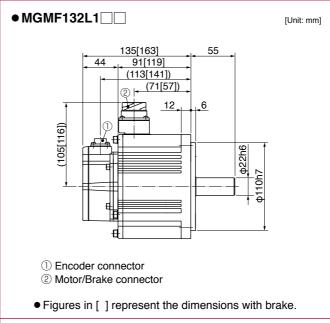
● MDMF202L1 □ □ [Unit: mm] (127[155]) (85[71]) (105[116])

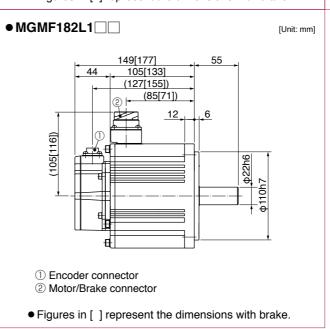
① Encoder connector ② Motor/Brake connector

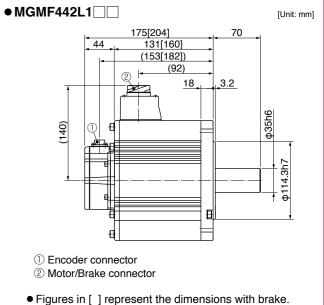
• Figures in [] represent the dimensions with brake.

● MDMF502L1 □ □ [Unit: mm] 175[204] 131[160] (153[182]) ① Encoder connector ② Motor/Brake connector • Figures in [] represent the dimensions with brake.









113 MINAS A6 Family MINAS A6 Family 114

^{*} For motor specifications and mounting dimensions (on flange face), refer to P.89 to P.94.

^{*} For motor specifications and mounting dimensions (on flange face), refer P.95 to P.99.

Line-up IP67 motor: 1.0 kW to 5.0 kW

· 23-bit absolute encoder (8388608 pulse).

• 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).

Model Designation

Imformation

Servo Motor

M S M F 5 A 2 L 1 A 1 *

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 series

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	29	2.9 kW
08	750 W	30	3.0 kW
09	0.85 kW, 1000 W	40	4.0 kW
09	(130 mm sq.) (80 mm sq.)	44	4.4 kW
10	1.0 kW	50	5.0 kW
13	1.3 kW		

4 Voltage specifications

_	• 1
Symbol	Specifications
2	200 V
Z	100 V/200 V common (50 W only)

5 Rotary encoder specifications

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

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

6 Design order

Symbol	Specifications	
1	Standard	

7 Motor specifications: 80 mm sq. or less Leadwire type IP65 MSMF 50 W to 1000 W

		Shaft		Holding	g brake	Oil seal		
Syn	nbol	Round	Round Key-way, center tap		with	without	with	
Α	2	•		•		•		
В	2	•			•	•		
С	2	•		•			•	
D	2	•			•		•	
S	2		•	•		•		
Т	2		•		•	•		
U	2		•	•			•	
٧	2		•		•		•	

7 Motor specifications: 80 mm sq. or less Leadwire type IP65 MHMF 50 W to 1000 W, MQMF 100 W to 400 W

		Shaft		Holding	g brake	Oil seal			
Syn	nbol	Round	Round Key-way, center tap		without with		without with		
Α	2	•		•		•			
В	2	•			•	•			
С	2	•		•			•		
С	4	•		•				•	
D	2	•			•		•		
D	4	•			•			•	
S	2		•	•		•			
Т	2		•		•	•			
U	2		•	•			•		
U	4		•	•				•	
٧	2		•		•		•		
V	4		•		•			•	

7 Motor specifications: 100 mm sq. or more Encoder connector : JL10 IP67 MSMF, MHMF, MDMF, MGMF

		Shaft		Holding	g brake	Oil seal		
Syn	nbol	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		•		•		•	

^{*} Encoder connector JL10: Also applicable to screwed type

Motor Lineup

ō

80

ō

9

Features



MSMF Low inertia

Max. speed : 6000 r/min Rated speed: 3000 r/min Rated output: 50 W to 1000 W Enclosure: IP65: Leadwire type



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

Enclosure: IP65: Leadwire type



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



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

Motor Specification Description

Environmental Conditions... P.165 Notes on [Motor specification]P.165 Permissible Load at Built-in Holding Brake P.167

Special Order Product **Motor Contents**

. P.136

...P.159

...P.160

.....P.161

MSMF (200 V) 50 W to 5.0 kW...

MQMF (200 V)

MHMF (200 V)

MDMF (200 V)

MGMF (200 V)

Dimensions

Leadwire type with oil seal ...

Leadwire type

Leadwire type

with oil seal

Leadwire type

MQMF (100 W to 400 W)

MQMF (100 W to 400 W)

MHMF (50 W, 1000 W)

MHMF (50 W to 1000 W)

with protective lip/ with oil seal

with protective lip/ with oil seal

1.0 kW to 5.0 kW P.148

0.85 kW to 4.4 kW P.154

50 W to 5.0 kW..

100 W to 400 W.....

<Cautions> Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

Servo Driver

I	VI	Α	D	L	N	1	5	S	E	* * *	Special specifications
		1		2	3	4	(5)	6	7		

① Frame symbol

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 series

3 Safety Function

_	•
Symbol	Specifications
N	without the safety function
T	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	Α	100 A
3	22 A	В	120 A
4	24 A		

5 Supply voltage specifications

© out	spry romago opocimoa
Symbol	Specifications
3	3-phase 200 V
5	Single/3-phase 200 V

6 I/f specifications 7 Classification of type

S (Analog/Pulse) S (Analog/Pulse) B (Analog/Pulse) R (Analog/Pulse) G (Pulse, analog, full-closed) G (Pulse train only) R S485 communication type (Pulse train only) N E without the safety function F with the safety function B (Scheduled to release in 2016)	(specification)	Symbol	Specification
(Analog/Pulse) G (Pulse, analog, full-closed) G (Pulse train only) N E without the safety function (RTEX) B (Scheduled to release in 2016)		Е	
N E without the safety function (RTEX) F with the safety function B (Scheduled to release in 2016)	-	F	
(RTEX) F with the safety function B (Scheduled to release in 2016)		G	, , ,
B (Scheduled to release in 2016)	N	Е	without the safety function
B (Scheduled to release in 2016)	(RTEX)	F	with the safety function
	B (EtherCAT)	(Sch	neduled to release in 2016)

	Options	
_	Optiono	

		-		2	.02				
			DV0P4120	182					
			DV0P4121	182					
	Interface Conv	ersion Ca	ble	DV0P4130	182				
				DV0P4131	182		Ab		
				DV0P4132	182		Family		
	Connector Kit for Power	A-frame	Single row type	DV0PM20032	185		Į		
	Supply Input Connection	to D-frame	Double row type	DV0PM20033	185				
2	Connector Kit for Motor Connection A-frame to D-frame			DV0PM20034	186		п		
	Connector Kit t Motor/Encoder		DV0P4290	186		Series			
		RS485, F	RS232	DV0PM20024	183		es		
		Safety		DV0PM20025	183				
	Connector Kit	Interface		DV0P4350	184	Ī			
		External Scale Encoder		DV0PM20026	184		Imtormation		
4				DV0PM20010	184				
	Battery for Absolute Encoder			DV0P2990	194		allo		
	Battery Box for Note)5	Absolute	Encoder	DV0P4430	194		_		
-1	<u> </u>			_	L				

Part No.

DV0P4360

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	Encoder	DV0PM20010	184		
for Abs	olute Encoder	DV0P2990	194		
Box for	Absolute Encoder	DV0P4430	194		
ıg	For A-frame, B-frame	DV0PM20100	195		_
	For C-frame, D-frame	DV0PM20101	195		
r	with Battery Box Note)5	MFECA0**0EAE	171		
	without Battery Box	MFECA0**0EAD	171		
able	without Brake	MFMCA0 * * 0EED	175		
able	_	MFMCB0 * * 0GET	181		

ne oabie		WII WIODO: TOOLT	101	
	50 Ω 25 W	DV0P4280	197	
ernal enerative	100 Ω 25 W	DV0P4281	197	
	25 Ω 50 W	DV0P4282	197	
stor	50 Ω 50 W	DV0P4283	197	
	30 Ω 100 W	DV0P4284	197	

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DV0P220 DV0P222 Reactor DV0P227

DV0P228 DV0P4170 Noise Filter DV0PM20042

DV0P4220 DV0P4190

Surge Absorber DV0P1450 DV0P1460 Ferite Core

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

			Mot	or			Driver						Optional p	parts					■ Options														
						A6 SF series	A6 SG series		1_	Encoder C	able Note)3		Motor Ca	able Note)3						Tit													
					Rating/	Multi fanction	RS485 communication		Power						_				Interface Cabl	е													
	Motor series	Power supply	Output (W)	Part No. Note)1	Spec. Dimensions (page)	type (Pulse, analog, full-closed	A6 SE series Basic (Pulse signal input Note)2, Note)4	Frame	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 Con	vers													
			50	MSMF5AZL1 ☐ 2M	121	MADLT05SF	MADLN05S♦									D. Va.D. va.a. v			Connector Kit														
			100	MSMF012L1 ☐ 2M	122	MADLT05SF	MADLN05S♦	A-frame	Approx. 0.5	0.5 MFECA	O.5 MFECA 0 * * 0EAE (For fixed) O.9 MFECA 0 * * 0EAE (For fixed)	0.5 MFECA MFECA 0 * * 0EAD (For fixed) MFECA (For fixed) (For fixed)	0.5 MFECA 0 * * 0EAE Approx. (For fixed)	MFECA 0 * * 0EAE 0 * * 0EAD (For fixed) (For fixed)	MFECA MFECA 0 * * 0EAE 0.x. (For fixed) (For fixed)	MFECA MFECA 0 * * 0EAD (For fixed) (For fixed)													DV0P4281	DV0P227 DV0P220	DV0P4170	Supply Input	to D
[MSMF (Leadwire type) 3000 r/min	Single phase/	200	MSMF022L1 □ 2M	123	MADLT15SF	MADLN15S♦		Approx. 0 * * 0EAE (For fixed)										-MCA	MFMCB			DV0PM20042	Connector Kit for Motor Connection Connector Kit	D.								
Š	3000 r/min IP65	3-phase 200 V	400	MSMF042L1 ☐ 2M	124	MBDLT25SF	MBDLN25S♦	B-frame		Approx. (For fixed)							Approx. (For fixed)	Approx. (For fixed)	Approx. (For fixed)			0**	k0EED	0 * * 0GET	DV0P4283	DV0P228		Motor/Encode					
			750	MSMF082L1 □ 2M	125	MCDLT35SF	MCDLN35S♦	C-frame										DV0P220	DV0PM20042	Connector Kit	Sa												
			1000	MSMF092L1 □ 2M	126	MDDLT45SF	MDDLN45S♦	D-frame	Approx.							DV0P4284	DV0P228 DV0P222	DV0P4220		Ex													
	MQMF Deption (Leadwire) type	Cinalo	100	MQMF012L1 ☐ 2M MQMF012L1 ☐ 4M	133	MADLT05SF	MADLN05S♦	Δ.	0.5 MFECA 0 * * 0EAE (For fixed)							DV0P4281	DV0P227		Battery for Ab	solu													
		Single phase/	200	MQMF022L1 ☐ 2M MQMF022L1 ☐ 4M		MADLT15SF	MADLN15S♦	A-frame		0.5 MFECA MFE 0 * * 0 EAE	0**0EAE 0**	MFECA 0 * * 0EAD (For fixed)			FMCA ¢0EED	MFMCB 0**0GET	DV0P4283	DV0P220	DV0P4170 DV0PM20042	Note)5 Mounting	Fo B-												
1000	IP65	200 V	400	MQMF042L1 ☐ 2M MQMF042L1 ☐ 4M	135	MBDLT25SF	MBDLN25S♦	B-frame			pprox. 0.9						DV0P4283	DV0P228 DV0P220		Bracket	Fo D- wi												
			50	MHMF5AZL1 ☐ 2M MHMF5AZL1 ☐ 4M		MADLT05SF	MADLN05S♦												Encoder Cable	Ba N Wi													
			100	MHMF012L1 ☐ 2M MHMF012L1 ☐ 4M	137	MADLT05SF	MADLN05S♦	A-frame	Approx.							DV0P4281	DV0P227 DV0P220	DV0P4170	Motor Cable	Wit													
	MHMF			MHMF022L1 ☐ 2M						MFECA 0 * * 0EAE Approx. (For fixed)								DV0PM20042	Brake Cable														
ď	Leadwire type	Single phase/	200	MHMF022L1 4M	138	MADLT15SF	MADLN15S♦				MFECA		MF	MCA	MFMCB					10													
	3000 r/min	3-phase 200 V		MHMF042L1 ☐ 2M MHMF042L1 ☐ 4M	139	MBDLT25SF	MBDLN25S♦	B-frame			0 * * 0EAD (For fixed)		0 * *	k0EED	0 * * 0GET	DV0P4283			External regenerative														
	IP65								0.9							DV0P228 DV0P220		resistor	50														
			750	MHMF082L1 ☐ 2M MHMF082L1 ☐ 4M	140	MCDLT35SF	MCDLN35S♦	C-frame	Approx.	Approx. 1.3	Approx.							5 7 51 220	DV0PM20042		30												
			1000	MHMF092L1 ☐ 2M MHMF092L1 ☐ 4M	141	MDDLT55SF	MDDLN55S♦	D-frame	Approx. 2.3							DV0P4284	DV0P228 DV0P222	DV0P4220	Reactor														

Note)1 : Represents the motor specifications. (refer to "Model designation" P.116.)

Note)2 \diamondsuit : Represents the driver specifications. (refer to "Model designation" P.116.)

Note)3 **: 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.

MINAS A6 Family 118 117 MINAS A6 Family

DV0P4130 182 DV0P4131 182 DV0P4132 182 frame Single row type DV0PM20032 185

DV0P3410

DV0P1460

Noise Filter

Ferite Core

Surge Absorber

DV0P228, DV0PM20047

DV0P4190, DV0P1450

DV0P4220, DV0PM20043

Imformation

Table of Part Numbers and Options: Special Order Product 100 mm sq. or more 0.85 kW to 5.0 kW

			Moto	or			Driver					Optiona	al parts					■ Options										
										Encoder Ca	ble Note)3,5	Motor C	Cable No	ote)3,5					Title	Part No. DV0P4360	Page							
		Power	Output	Part No.	Rating/ Spec.	A6 SF series Multi fanction type /Pulse, analog,\	A6 SG series RS485 communication		Power capacity	•	rge size) n lock type ewed type		JL10 buch lock screwed		External			Interface Cable	DV0P4120 DV0P4121 Interface Conversion Cable DV0P4130		182 182 182 182							
М	otor series	supply	(W)	Note)1	Dimensions (page)	(full-closed)	A6 SE series Basic	Frame	rated load / (kVA)	23-bit A Use in the absolute	Use in the Incremental	without	,	with	Regenerative Resistor	Reactor (Single phase / 3-phase)	Noise Filter		0: 1	DV0P4131 DV0P4132	182 182							
							(Pulse signal input) Note)2, Note)4			system	system (without battery box)	Brake		Brake				for Power	A-frame Single row type To Double row type		185 185							
		0: 1		MCME100L1						Note)7								Connection	E-frame	DV0PM20044	185							
		Single phase/	1000	MSMF102L1 \square 6M MSMF102L1 \square 8M	127	MDDLT55SF	MDDLN55S♦	D.	Approx.			MFMCD		MFMCA		DV0P228 / DV0P222	DV0D4000	Connector Kit	A-frame to D-frame	DV0PM20034	186							
		3-phase 200 V	1500	MSMF152L1 6M	128	MDDLT55SF	MDDLN55S♦	D-frame	2.3			0**2EU	JD 0* — —	*2FUD	DV0P4284	DV0PM20047 / DV0P222	DV0P4220	for Motor Connection	E-frame	DV0PM20046	186							
Low	MSMF Large size	200 V	2000	MSMF152L1	129	MEDLT83SF	MEDLN83S♦	E-frame	Approx.	MFECA 0**0EPE	MFECA 0**0EPD	MFMCD 0**2EC		MFMCA * * 2FCD	DV0P4285 Note)6	DV0P223	DV0PM20043	Connector Kit for Regenerative Resistor	E-frame	DV0PM20045	185							
inertia	JL10 type 3000 r/min	3-phase	3000	MSMF302L1 6M MSMF302L1 8M	130	MFDLTA3SF	MFDLNA3S		Approx.	MFECA 0**0ESE	MFECA 0**0ESD	MFMCA		MFMCA	. 1010/0	DV0P224		LIVO I IODIOIOI		DV0PM24587 MSMF 1.0 kW to 2.0 kW MDMF 1.0 kW to 2.0 kW								
	IP67	200 V	4000	MSMF402L1 ☐ 6M MSMF402L1 ☐ 8M	131	MFDLTB3SF	MFDLNB3S♦	F-frame	Approx.	0 # # OLOL	0 4 4 0 2 0 2	0 * * 3EU ————————————————————————————————————	-	**3FUT MFMCA	DV0P4285 ×2 in parallel	DV0P225	DV0P3410		without Brake	MGMF 0.85 kW to 1.8 kV MHMF 1.0 kW, 1.5 kW	W							
			5000	MSMF502L1 6M MSMF502L1 8M	132	MFDLTB3SF	MFDLNB3S♦		7.5			0 * * 3EC		**3FCT		D VUF 220		Connector		DV0PM24588 MSMF 3.0 kW to 5.0 kW MDMF 3.0 kW to 5.0 kW MGMF 2.9 kW, 4.4 kW	/ V 190							
		Single phase/	1000	MDMF102L1 GM MDMF102L1 8M	148	MDDLT45SF	MDDLN45S♦	D-frame	Approx.			MFMCD 0**2EU		MFMCA * * 2FUD	DV0P4284	DV0P228 / DV0P222	DV0P4220	Kit for Motor/ Encoder Con-		MHMF 2.0 kW to 5.0 kW DV0PM24589								
	MDMF	3-phase 200 V	1500	MDMF152L1 6M MDMF152L1 8M	149	MDDLT55SF	MDDLN55S♦		2.3	MFECA 0**0EPE	MFECA MFECA	MFECA	MFMCD	- -	MFMCA		DV0PM20047 / DV0P222		nection		MSMF 1.0 kW to 2.0 kW MDMF 1.0 kW to 2.0 kW MGMF 0.85 kW to 1.8 kW MHMF 1.0 kW, 1.5 kW	พ 189 พ						
	Large size JL10 type		2000	MDMF202L1 6M MDMF202L1 8M	150	MEDLT83SF	MEDLN83S♦	E-frame	3.6		0**0EPD	0 * * 2EC	D 0*	*2FCD	DV0P4285 Note)6	DV0P223	DV0PM20043		with Brake	DV0PM24590 MSMF 3.0 kW to 5.0 kW	N							
	2000 r/min IP67	3-phase 200 V	3000	MDMF302L1	151	MFDLTA3SF	MFDLNA3S		Approx. MFECA 0**0ESE	4.5 0 * * OE	5 WII LOA	IVII LOA IVII L	A E IVII LOA	MFECA 0**0ESD	MFMCA 0 * *3EU		MFMCA **3FUT	DV0P4285	DV0P224				MDMF 3.0 kW to 5.0 kW MGMF 2.9 kW, 4.4 kW MHMF 2.0 kW to 5.0 kW	N				
≦			4000	MDMF402L1 \square 8M	152	MFDLTB3SF	MFDLNB3S	F-frame	Approx.			MFMCA	_ _	MFMCA	x2 in parallel	DV0P225	DV0P3410		RS485, RS232 Safety	DV0PM20024 DV0PM20025	183 183							
Middle			5000	MDMF502L1 ☐ 6M MDMF502L1 ☐ 8M	153	MFDLTB3SF	MFDLNB3S♦		7.5			0**3EC		* *3FCT		DV01 223		Connector Kit	Interface	DV0P4350	184							
inerti		Single	850	MGMF092L1 6M MGMF092L1 8M	154	MDDLT45SF	MDDLN45S♦		Approx.		MFMCD) M	/FMCA		DV0P228 / DV0P221			External Scale Encoder	DV0PM20026 DV0PM20010	184 184								
മ	MGMF	phase/ 3-phase 200 V	1300	MGMF132L1 6M MGMF132L1 8M	155	MDDLT55SF	MDDLN55S♦	D-frame	Approx.	Approx.		0 * * 2EU	JD 0*	* 2FUD	DV0P4284	DV0PM20047 / DV0P222	DV0P4220		olute Encoder Absolute Encoder	DV0P2990 DV0P4430	194 194							
	Large size JL10 type		1800	MGMF182L1 6M MGMF182L1 8M	156	MEDLT83SF	MEDLN83S♦	E-frame	Approx	MFECA 0**0EPE	MFECA 0**0EPD	MFMCD 0 * * 2EC		MFMCA * * 2FCD	DV0P4285	DV0P223	DV0PM20043	Note)7 Mounting Bracket	D-frame	DV0PM20101	195							
	Low speed/ High torque type	3-phase	2900	MGMF292L1 6M MGMF292L1 8M	157	MFDLTB3SF	MFDLNB3S♦			MFECA								CA MFECA DESE 0**0ESD	MFMCA 0**3EU		MFMCA **3FUT	D. / - D. /	DV0P224		Encoder Cable	One-touch lock type	MFECA0 * * 0EPE	173
	1500 r/min IP67	200 V	4400	MGMF442L1 ☐ 6M	158	MFDLTB3SF	MFDLNB3S♦	F-frame	Approx. 7.5			MFMCA	_	MFMCA	DV0P4285 ×2 in parallel	DV0P225	DV0P3410	(with (Battery Box) Note)7	Screwed type	MFECA0 * * 0ESE								
		Single	1000	MGMF442L1 ☐ 8M MHMF102L1 ☐ 6M	142	MDDLT45SF	MDDLN45S♦		Approx.			0 * * 3EC) M	**3FCT MFMCA		DV0P228 / DV0P222		Encoder Cable /without	One-touch lock type Screwed type	MFECA0 * * 0EPD MFECA0 * * 0ESD								
		phase/ 3-phase		MHMF102L1 ☐ 8M MHMF152L1 ☐ 6M				D-frame	1.8 Approx.			0**2EU ———— MFMCD	-	* 2FUD MFMCA	DV0P4284		DV0P4220	Battery Box		MFMCD0 * * 2EUE	_							
		200 V	1500	MHMF152L1 ☐ 8M	143	MDDLT55SF	MDDLN55S♦		2.3			0**2EC	OD 0*	*2FCD		DV0PM20047 / DV0P222		Motor Cable (without Brake)		MFMCD0 * * 2ECC MFMCE0 * * 2EUC MFMCE0 * * 2ECC	D 177							
High	MHMF Large size JL10 type		2000	MHMF202L1 ☐ 6M	144	MEDLT83SF	MEDLN83S	E-frame	Approx.	, ibb. ov:	MFECA 0**0EPD	MFMCE 0**2EU		MFMCE * * 2FUD	DV0P4285	DV0P223	DV0PM20043	,		MFMCA0 * *3EUT MFMCA0 * *3ECT	Γ 177							
inertia	2000 r/min IP67	3-phase	_550	MHMF202L1 ☐ 8M	177			nanik	3.8	MFECA 0**0ESE	MFECA 0**0ESD	MFMCE 0**2EC		MFMCE * * 2FCD	Note)6	2 701 220	2 7 31 19120040		One-touch lock type Screwed type	MFMCA0 * * 2FUD MFMCA0 * * 2FCD	179 179							
	11 07	1	3000	MHMF302L1 ☐ 6M MHMF302L1 ☐ 8M	145	MFDLTA3SF	MFDLNA3S		Approx. 4.5			MFMCA		MFMCA		DV0P224		Motor Cable (with Brake)	Screwed type	MFMCE0 * *2FUD MFMCE0 * *2FUD	180							
			4000	MHMF402L1 ☐ 6M MHMF402L1 ☐ 8M	146	MFDLTB3SF	MFDLNB3S♦	F-frame	Approx.			0 * * 3EU ————————————————————————————————————	- -	**3FUT MFMCA	DV0P4285 ×2 in parallel	DV0P225	DV0P3410	External	Screwed type	MFMCA0 * *3FUT MFMCA0 * *3FCT								
			5000	MHMF502L1 ☐ 6M MHMF502L1 ☐ 8M	147	MFDLTB3SF	MFDLNB3S		7.5			0 * *3EC	OT 0*	* * 3FCT				regenerative resistor	30 Ω 100 W 20 Ω 130 W	DV0P4284 DV0P4285	197							
Not		•		notor specifications. Iriver specifications.	•	•	,									s and motor cables er tional screwed type N		Reactor		2, DV0P223 4, DV0P225	196							

Note)3 **: Represents the cable length (03/3 m, 05/5 m, 10/10 m, 20/20 m). Example. 3 m/MFECA0030EPE

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.

touch lock connections. Conventional screwed type N/MS and JL04V type cables can also be used.

Note)6 For other possible combinations, refer to P.197.

Note)7 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.

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Specifications

				AC200 V		
Motor model*1		MSMF5AZL1□□M				
		Multi	function type	MADLT05SF		
Applicable	Model No	RS48	5 communication type *	MADLN05SG		
driver		Basic	type *2	MADLN05SE		
	Fram	e sym	bol	A-frame		
Power supply	capacit	/	(kVA)	0.5		
Rated output			(W)	50		
Rated torque			(N·m)	0.16		
Continuous sta	all torqu	е	(N·m)	0.16		
Momentary Ma	ax. peal	c torqu	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	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	0.026		
of rotor ($\times 10^{-4}$	kg·m²)		With brake	0.029		
Recommender ratio of the loa		30 times or less				
Rotary encode	er speci	icatio	ns*³	23-bit Absolute		
	Re	solutio	n per single turn	8388608		

• Brake specifications (For details, refer to P.167) /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.166)

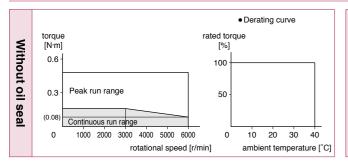
During assembly	Radial load P-direction (N)	147
	Thrust load A-direction (N)	88.0
accombiy	Thrust load B-direction (N)	117.6
During	Radial load P-direction (N)	68.6
operation	Thrust load A, B-direction (N)	58.8

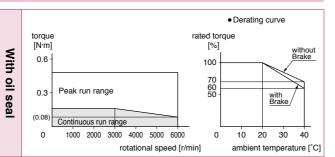
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.47.
- *1 in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.116.

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

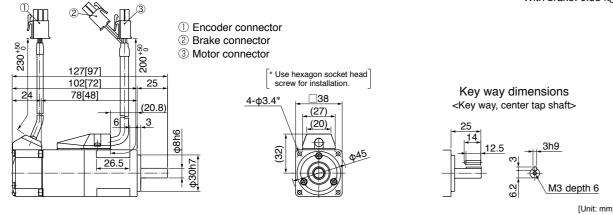
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





Dimensions

Mass: Without brake: 0.32 kg With brake: 0.53 kg



• Figures in [] represent the dimensions without brake.

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

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 Product

				AC200 V
Motor model *1			IP65	MSMF012L1□□M
		Multi	function type	MADLT05SF
Applicable	Model No.	RS485 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	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 ($\times 10^{-4}$	kg·m²)		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	n per single turn	8388608

Brake specifications (For details, refer to P.167) /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.166)

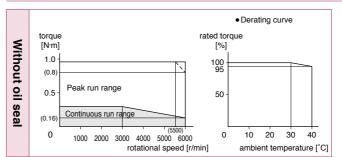
	Radial load P-direction (N)	147
During assembly	Thrust load A-direction (N)	88.0
dooonibiy	Thrust load B-direction (N)	117.6
During	Radial load P-direction (N)	68.6
operation	Thrust load A, B-direction (N)	58.8

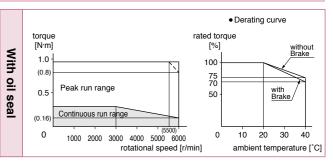
- For details of Note)1 to Note)4, refer to P.165.
- Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.116.

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

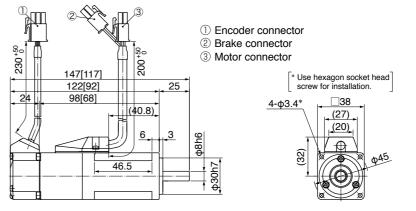
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





Dimensions

Mass: Without brake: 0.47 kg With brake: 0.68 kg



<Key way, center tap shaft>

Key way dimensions

[Unit: mm]

• Figures in [] represent the dimensions without brake.

<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

121 MINAS A6 Family

Specifications

					AC200 V		
Motor model *1			MSMF022L1 M				
		Multif	function ty	rpe	MADLT15SF		
Applicable	Model No.	RS48	5 communic	ation type *2	MADLN15SG		
driver		Basic	c type *2		MADLN15SE		
	Frame	syml	bol		A-frame		
Power supply	capacity			(kVA)	0.5		
Rated output				(W)	200		
Rated torque				(N·m)	0.64		
Continuous sta	all torque	9		(N·m)	0.64		
Momentary Ma	ax. peak	torqu	ne	(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) N	lote)1	DV0P42	283	No limit Note)2		
Rated rotation	al speed	l		(r/min)	3000		
Max. rotationa	l speed			(r/min)	6000		
Moment of ine	rtia		Without	brake	0.14		
of rotor ($\times 10^{-4}$	kg·m²)		With bra	ıke	0.17		
Recommender ratio of the loa				Note)3	30 times or less		
Rotary encode	er specifi	catio	ns *3		23-bit Absolute		
	Res	olutio	on per sing	gle turn	8388608		

• Brake specifications (For details, refer to P.167) /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.166)

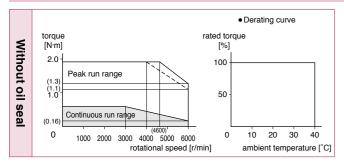
	During assembly	Radial load P-direction (N)	392
		Thrust load A-direction (N)	147
		Thrust load B-direction (N)	196
	During operation	Radial load P-direction (N)	245
		Thrust load A, B-direction (N)	98.0

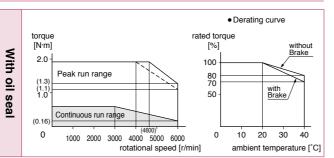
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.116.

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

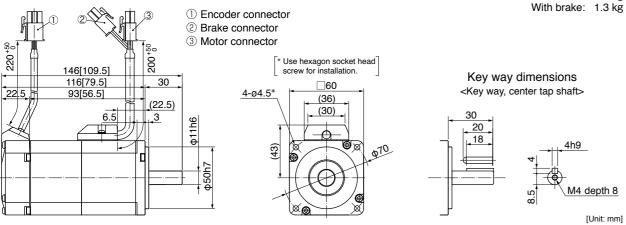
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





Mass: Without brake: 0.82 kg

Dimensions



• Figures in [] represent the dimensions without brake

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

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 Product

200 V | MSMF 400 W

Specifications

				AC200 V
Motor model *1	IP65			MSMF042L1□□M
	Multifur		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	y	(kVA)	0.9
Rated output			(W)	400
Rated torque			(N·m)	1.27
Continuous sta	all torqu	е	(N·m)	1.27
Momentary Ma	ax. peal	k torqı	ue (N·m)	3.82
Rated current Max. current Regenerative brake			(A(rms))	2.4
			(A(o-p))	10.2
			Without option	No limit Note)2
frequency (times/min) Note)1		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	0.27
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake	0.30	
Recommended moment of it ratio of the load and the roto				30 times or less
Rotary encode	r speci	ficatio	ns ^{*3}	23-bit Absolute
	Res	solutio	n per single turn	8388608

Brake specifications (For details, refer to P.167) This brake will be released when it is energized. Do not use this for braking the motor in motion.

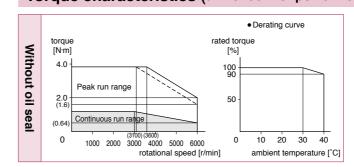
Static friction torque (N·m)	1.27 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

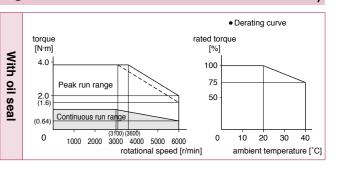
• Permissible load (For details, refer to P.166)

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

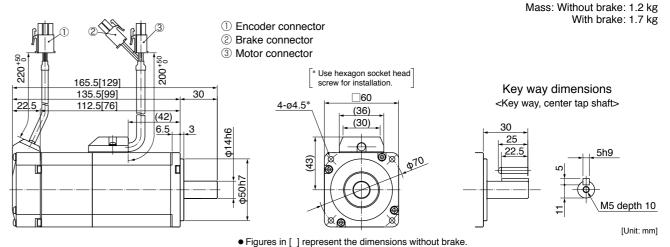
- For details of Note)1 to Note)4, refer to P.165.
- Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.116.
- *3 When using 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



<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	Notor model 1 IP65			MSMF082L1□□M	
		Multi	function t	уре	MCDLT35SF
Applicable	Model No	RS48	5 communi	cation type *2	MCDLN35SG
driver		Basic	type *2		MCDLN35SE
	Frame	e sym	bol		C-frame
Power supply	capacity	/		(kVA)	1.3
Rated output				(W)	750
Rated torque				(N·m)	2.39
Continuous sta	all torqu	е	e (N·m)		2.39
Momentary Ma	ax. peal	c torqu	torque (N·m)		7.16
Rated current		(A(rms))			4.1
Max. current				(A(o-p))	17.4
Regenerative brake frequency (times/min) Note)1		Without option		No limit Note)2	
		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		0.96
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)			With brake		1.06
Recommender ratio of the loa				Note)3	20 times or less
Rotary encode	er specif	icatio	ns ^{⁺3}		23-bit Absolute
	Res	solutio	n per sin	gle turn	8388608

• Brake specifications (For details, refer to P.167) /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.166)

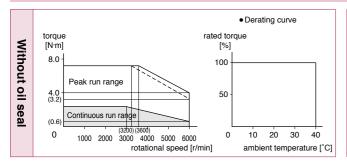
	Radial load P-direction (N)	686
During assembly	Thrust load A-direction (N)	294
docorribiy	Thrust load B-direction (N)	392
During	Radial load P-direction (N)	392
operation	Thrust load A, B-direction (N)	147

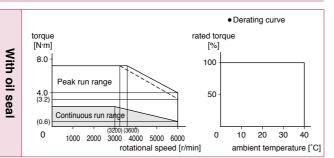
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.48.
- *1 in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.116.

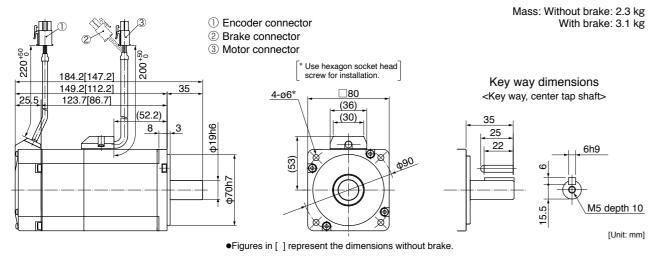
*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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





Dimensions



<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 Product

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

Specifications

					AC200 V
Motor model *1		IP65			MSMF092L1□□M
		Multifunction type			MDDLT45SF
Applicable	Model No	RS48	5 communication ty	/pe *2	MDDLN45SG
driver	140.	Basic	Basic type *2		MDDLN45SE
	Frame	e sym	bol	D-frame	
Power supply	capacity	у	(k	(AV	1.8
Rated output				(W)	1000
Rated torque			1)	l·m)	3.18
Continuous sta	all torqu	е	1)	l·m)	3.18
Momentary Ma	ax. peal	k torqu	ue (N	l·m)	9.55
Rated current		(A(rr	ns))	5.7	
Max. current			(A(c	-p))	24.2
Regenerative I	brake		Without option	1	No limit Note)2
frequency (time	es/min)	Note)1	DV0P4284		No limit Note)2
Rated rotation	al spee	d	(r/r	nin)	3000
Max. rotationa	l speed		(r/r	nin)	6000
Moment of ine	rtia		Without brake		1.26
of rotor (x10 ⁻⁴ kg·m²) Recommended moment of irratio of the load and the roto			With brake		1.36
				lote)3	15 times or less
Rotary encode	r speci	fication	ns ^{*3}		23-bit Absolute
	Res	solutio	n per single turn		8388608

 Brake specifications (For details, refer to P.167) 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.166)

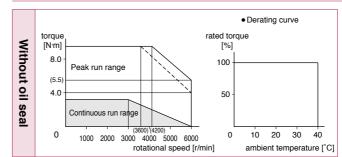
	Radial load P-direction (N)	686
During assembly	Thrust load A-direction (N)	294
	Thrust load B-direction (N)	392
During	Radial load P-direction (N)	392
operation	Thrust load A, B-direction (N)	147

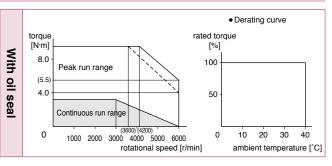
- For details of Note)1 to Note)4, refer to P.165.
- Dimensions of Driver, refer to P.48.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.116.

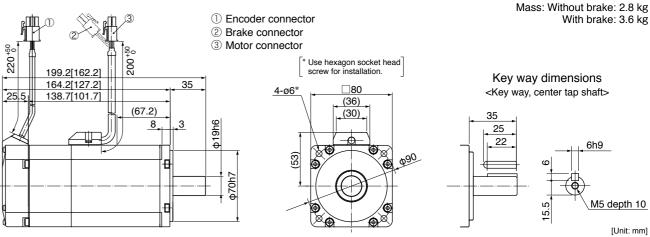
*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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





Dimensions



•Figures in [] represent the dimensions without brake

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

125 MINAS A6 Family

					AC200 V
Motor model*1	Motor model 1 IP67				MSMF102L1□□M
		Multi	function ty	/ре	MDDLT55SF
Applicable	Model No	RS485 communication type *2		cation type *2	MDDLN55SG
driver		Basic	c type *2		MDDLN55SE
	Frame	sym	bol		D-frame
Power supply	capacity	/		(kVA)	2.3
Rated output				(W)	1000
Rated torque				(N·m)	3.18
Continuous st	all torqu	е		(N·m)	3.82
Momentary Ma	ax. peak	torqı	ne	(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) 1	Note)1	DV0P4284		No limit Note)2
Rated rotation	al speed	d		(r/min)	3000
Max. rotationa	l speed			(r/min)	5000
Moment of ine	ertia		Without brake		2.15
of rotor (×10 ⁻⁴	kg·m²)		With bra	ake	2.47
Recommended moment of inertia ratio of the load and the rotor			Note)3	15 times or less	
Rotary encode	er specif	icatio	ns *3		23-bit Absolute
	Res	solutio	on per sin	gle turn	8388608

• Brake specifications (For details, refer to P.167) /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)	8.0 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.81±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

		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

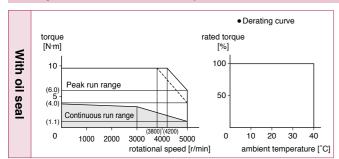
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.48.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.116.

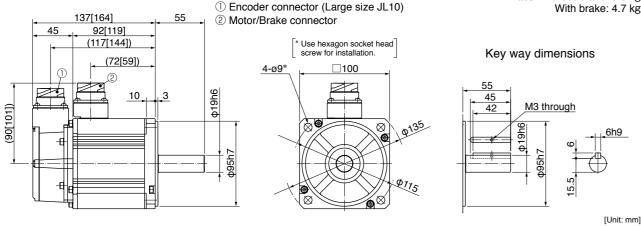
*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Mass: Without brake: 3.6 kg

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



Dimensions



• Figures in [] represent the dimensions with brake.

<a>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 Product

200 V **MSMF** 1.5 kW

Specifications

				AC200 V
Motor model *1			IP67	MSMF152L1□□M
		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	/	(kVA)	2.3
Rated output			(W)	1500
Rated torque			(N·m)	4.77
Continuous sta	all torqu	е	(N·m)	5.72
Momentary Ma	ax. peal	torqu	ue (N·m)	14.3
Rated current			(A(rms))	8.2
Max. current			(A(o-p))	35
Regenerative brake			Without option	No limit Note)2
frequency (times/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	3.10
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake	3.45	
Recommended moment of ratio of the load and the rote				15 times or less
Rotary encode	r specif	icatio	ns ^{*3}	23-bit Absolute
	Res	solutio	on per single turn	8388608

 Brake specifications (For details, refer to P.167) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

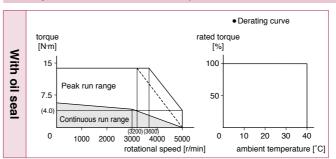
Static friction torque (N·m)	8.0 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.81±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

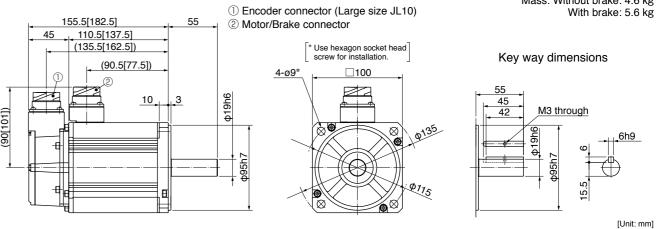
	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
docombry	Thrust load B-direction (N)	686
During	Radial load P-direction (N)	490
operation		196

- For details of Note)1 to Note)4, refer to P.165.
- 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.116.
- *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



• Figures in [] represent the dimensions with brake.

<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

Imformation

Mass: Without brake: 4.6 kg

Please contact us for more information

Specifications

					AC200 V
Motor model *1 IP6			IP67		MSMF202L1□□M
		Multi	function type		MEDLT83SF
Applicable	Model No	RS48	5 communication	on type *2	MEDLN83SG
driver	140.	Basic	c 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	е	e (N·m)		7.64
Momentary Max. peak torqu		rque (N·m)		19.1	
Rated current			(<i>F</i>	A(rms))	11.3
Max. current			(,	A(o-p))	48
Regenerative brake			Without op	tion	No limit Note)2
frequency (time	requency (times/min) Note)1		DV0P4285	i	No limit Note)2
Rated rotation	nal speed			(r/min)	3000
Max. rotationa	l speed			(r/min)	5000
Moment of ine	rtia		Without bra	ake	4.06
of rotor ($\times 10^{-4}$	$kg \cdot m^2$)	With brake			4.41
Recommended moment of ine ratio of the load and the rotor				Note)3	15 times or less
Rotary encode	er speci	ficatio	ns *3		23-bit Absolute
Resolution			tion per single turn		8388608

• Brake specifications (For details, refer to P.167) /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.

[Low inertia]

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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

	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.165.
- · 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.116.

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

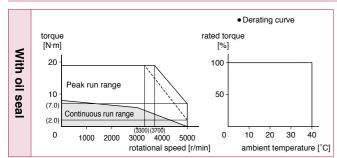
Mass: Without brake: 5.6 kg

Key way dimensions

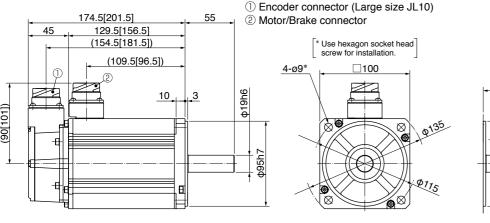
With brake: 6.6 kg

[Unit: mm]

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



Dimensions



• Figures in [] represent the dimensions with brake.

<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 Product

200 V MSMF 3.0 kW

Specifications

					AC200 V
Motor model *1	IP67			MSMF302L1□□M	
		Multifunction type		MFDLTA3SF	
Applicable	Model No.	RS48	5 communication type	e *2	MFDLNA3SG
driver	140.	Basic	asic type *2		MFDLNA3SE
	Frame	e sym	bol		F-frame
Power supply	capacity	у	(kV/	A)	4.5
Rated output			(V	V)	3000
Rated torque			(N·r	n)	9.55
Continuous sta	all torqu	е	(N·r	n)	11.0
Momentary Ma	ax. peal	k torqu	ue (N·r	n)	28.6
Rated current			(A(rms	5))	18.1
Max. current			(A(o-p)))	77
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)	3000
Max. rotationa	l speed		(r/mi	n)	5000
Moment of ine	rtia		Without brake		7.04
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake		7.38	
	ommended moment of inertia			e)3	15 times or less
Rotary encode	r speci	ficatio	ns ^{*3}		23-bit Absolute
	Res	solutio	on per single turn		8388608

• Brake specifications (For details, refer to P.167) /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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

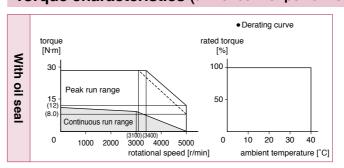
• Permissible load (For details, refer to P.166)

	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		

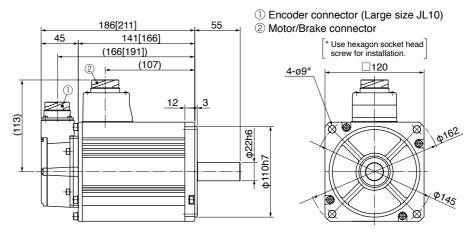
- For details of Note)1 to Note)4, refer to P.165.
- Dimensions of Driver, refer to P.49.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.116.
- *3 When using 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



• Figures in [] represent the dimensions with brake.

<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

Mass: Without brake: 8.7 kg

With brake: 9.9 kg

Key way dimensions

45 M3 through

[Unit: mm]

MINAS A6 Family 130

Please contact us for more information

Specifications

					AC200 V
Motor model*1	IP67			MSMF402L1□□M	
		Multi	function t	уре	MFDLTB3SF
Applicable	Model No	RS48	5 communi	cation 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)	4000
Rated torque				(N·m)	12.7
Continuous sta	all torqu	ie		(N·m)	15.2
Momentary Ma	ax. pea	k torqı	ue	(N·m)	38.2
Rated current				(A(rms))	19.6
Max. current	lax. current			(A(o-p))	83
Regenerative brake			Without	option	No limit Note)2
frequency (time	quency (times/min) Note)		DV0P4	285×2	No limit Note)2
Rated rotation	ated rotational speed			(r/min)	3000
Max. rotationa	l speed		(r/min)		4500
Moment of ine	rtia		Without	brake	14.4
of rotor ($\times 10^{-4}$	of rotor (×10 ⁻⁴ kg·m ²)		With bra	ake	15.6
Recommended moment of ratio of the load and the ro				Note)3	15 times or less
Rotary encode	er speci	ficatio	ns*3		23-bit Absolute
	Re	solutic	tion per single turn		8388608

• Brake specifications (For details, refer to P.167) /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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

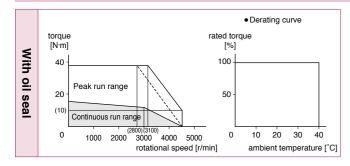
	During assembly	Radial load P-direction (N)	980
		Thrust load A-direction (N)	588
		Thrust load B-direction (N)	686
	During operation	Radial load P-direction (N)	784
		Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.165.
- · 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".

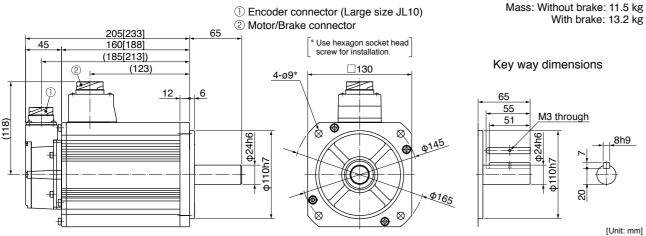
Detail of model designation, refer to P.116.

*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



• Figures in [] represent the dimensions with brake.

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 Product

JU V	MOME	5.0 KW	_130 mm sq

Specifications

				AC200 V
Motor model *1			IP67	MSMF502L1□□M
		Multifunction 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	y	(kVA)	7.5
Rated output			(W)	5000
Rated torque			(N·m)	15.9
Continuous sta	all torqu	е	(N·m)	19.1
Momentary Ma	ax. peal	k torque (N·m)		47.7
Rated current			(A(rms))	24.0
Max. current			(A(o-p))	102
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)	3000
Max. rotationa	l speed		(r/min)	4500
Moment of ine	rtia		Without brake	19.0
of rotor (×10 ⁻⁴ kg·m²) Recommended moment of iratio of the load and the roto			With brake	20.2
				15 times or less
Rotary encode	r speci	ficatio	ns ^{*3}	23-bit Absolute
	Re	solutio	n per single turn	8388608

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• Brake specifications (For details, refer to P.167) 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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

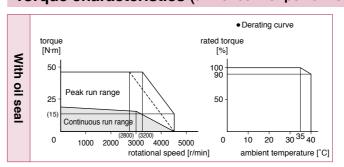
	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
accombiy	Thrust load B-direction (N)	686
During	Radial load P-direction (N)	784
operation	Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.165.
- 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".

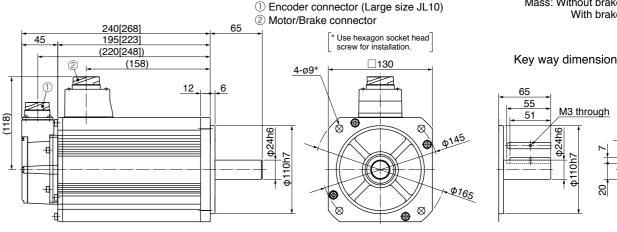
Detail of model designation, refer to P.116.

*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



Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan

• Figures in [] represent the dimensions with brake

<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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Mass: Without brake: 14.5 kg

[Unit: mm]

With brake: 16.1 kg

Key way dimensions

Specifications

				AC200 V
Motor model*1			IP65	MQMF012L1□□M
		Multi	function type	MADLT05SF
Applicable	Model No.	RS48	5 communication type *2	MADLN05SG
driver		Basic	type *2	MADLN05SE
	Frame	sym	bol	A-frame
Power supply	capacity	/	(kVA)	0.5
Rated output			(W)	100
Rated torque			(N·m)	0.32
Continuous sta	all torqu	e (N·m)		0.33
Momentary Ma	ax. peal	torqı	ue (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	es/min) I	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	0.15
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake	0.18	
Recommended moment of inertia ratio of the load and the rotor				20 times or less
Rotary encode	er specit	icatio	ns ^{*3}	23-bit Absolute
Resolution			on per single turn	8388608

• Brake specifications (For details, refer to P.167) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

Flat type 60 mm sq.

· Please contact us for more information.

Middle inertia

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.166)

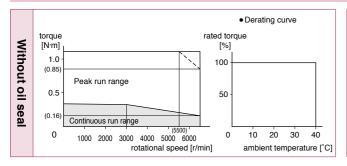
	Radial load P-direction (N)	147
During assembly	Thrust load A-direction (N)	88
docombry	Thrust load B-direction (N)	117.6
During	Radial load P-direction (N)	68.6
operation	Thrust load A, B-direction (N)	58.8

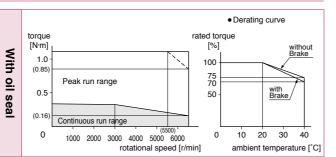
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.116.

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

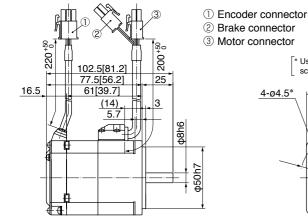
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)

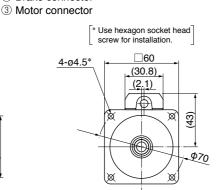




Dimensions

Mass: Without brake: 0.54 kg (0.57 kg with oil seal) With brake: 0.79 kg (0.82 kg with oil seal)





Key way dimensions <Key way, center tap shaft>

[Unit: mm]

For motors with oil seal, refer to P.159. For motors with protective lip, refer to P.160. • Figures in [] represent the dimensions without brake

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

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 Product

				AC200 V
Motor model *1			IP65	MQMF022L1 M
		Multifunction 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. pea	k torqı	ue (N·m)	2.23
Rated current			(A(rms))	1.4
Max. current			(A(o-p))	6.9
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)	6500
Moment of ine	rtia		Without brake	0.50
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake	0.59	
Recommended moment of it ratio of the load and the roto				20 times or less
Rotary encode	er speci	ficatio	ns ^{*3}	23-bit Absolute
Resolution p			on per single turn	8388608

• Brake specifications (For details, refer to P.167) 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

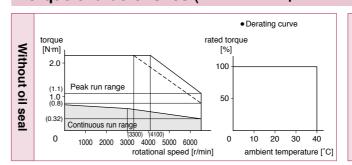
• Permissible load (For details, refer to P.166)

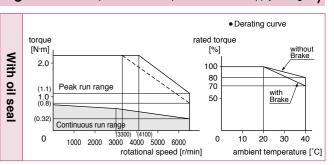
	Radial load P-direction (N)	392
During assembly	Thrust load A-direction (N)	147
accombiy	Thrust load B-direction (N)	196
During	Radial load P-direction (N)	245
operation	Thrust load A, B-direction (N)	98

- For details of Note)1 to Note)4, refer to P.165.
- 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.116.
- *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.>)

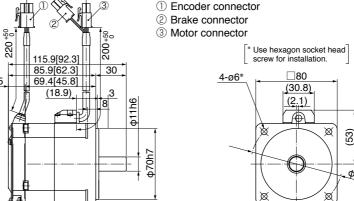
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Dimensions

Mass: Without brake: 1.1 kg (1.2 kg with oil seal) With brake: 1.5 kg (1.6 kg with oil seal)



Key way dimensions <Key way, center tap shaft> 20 _18 4h9

[Unit: mm]

For motors with oil seal, refer to P.159. For motors with protective lip, refer to P.160. • Figures in [] represent the dimensions without brake.

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

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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A6 Family

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Please contact us for more information

Specifications

					AC200 V
Motor model *1			IP65		MQMF042L1□□M
		Multi	function ty	pe	MBDLT25SF
Applicable	Model No	RS48	5 communic	ation type *2	MBDLN25SG
driver	140.	Basic	c type *2		MBDLN25SE
	Frame	e sym	bol		B-frame
Power supply	capacity	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 torqı	rque (N·m)		4.46
Rated current		(A(rms))		2.1	
Max. current	ax. current			(A(o-p))	10.4
Regenerative	Regenerative brake		Without	option	No limit Note)2
frequency (times/min)		Note)1	DV0P42	.83	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 ⁻⁴ kg·m ²)		With brake		1.06	
Recommended moment of iner ratio of the load and the rotor				Note)3	20 times or less
Rotary encode	er specifications '3 23-bit Absolute		ns *3		23-bit Absolute
	Res	solutio	on per single turn		8388608

• Brake specifications (For details, refer to P.167) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

Flat type 80 mm sq.

· Please contact us for more information.

Middle inertia

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.166)

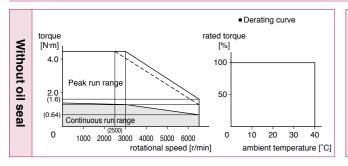
During assembly During operation	Radial load P-direction (N)	392
	Thrust load A-direction (N)	147
	Thrust load B-direction (N)	196
	Radial load P-direction (N)	245
	Thrust load A, B-direction (N)	98

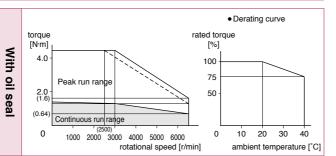
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.116.

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

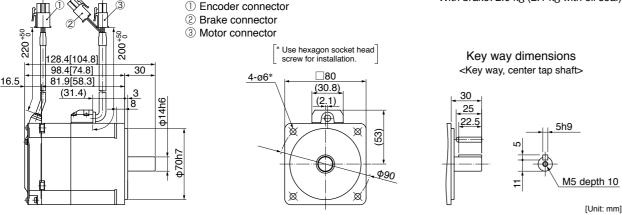
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





Dimensions

Mass: Without brake: 1.5 kg (1.6 kg with oil seal) With brake: 2.0 kg (2.1 kg with oil seal)



For motors with oil seal, refer to P.159. For motors with protective lip, refer to P.160. • Figures in [] represent the dimensions without brake

<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 Product

200 V **MHMF** 50 W 40 mm sq.

Specifications

					AC200 V
Motor model *1	IP65			MHMF5AZL1 M	
		Multifunction type		MADLT05SF	
Applicable	Model No.	RS48	RS485 communication type *2		MADLN05SG
driver	140.	Basic	type *2		MADLN05SE
	Frame	e sym	bol		A-frame
Power supply	capacit	y	(k\	/A)	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(rm	s))	1.1
Max. current	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/m	in)	3000
Max. rotationa	l speed		(r/m	in)	6500
Moment of ine	rtia		Without brake		0.038
of rotor (×10 ⁻⁴ kg·m ²)			With brake		0.042
Recommended moment of inertia ratio of the load and the rotor Note)3					30 times or less
Rotary encode	Rotary encoder specifications *3				23-bit Absolute
	Resolution per single turn				8388608

• Brake specifications (For details, refer to P.167) /This brake will be released when it is energized. Do not use this for braking the motor in motion.

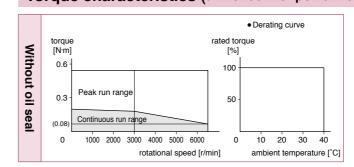
Static friction torque (N·m)	0.38 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.30
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

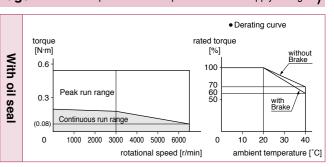
• Permissible load (For details, refer to P.166)

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.165.
- 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.116.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

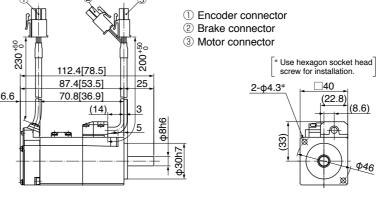
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)

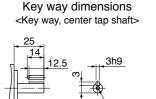




Dimensions

Mass: Without brake: 0.29 kg (0.31 kg with oil seal) With brake: 0.51 kg (0.53 kg with oil seal)





[Unit: mm]

For motors with oil seal, refer to P.161. For motors with protective lip, refer to P.163. • Figures in [] represent the dimensions without brake.

<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

135 MINAS A6 Family

Specifications

					AC200 V
Motor model*1		IP65			MHMF012L1□□M
		Multi	function ty	/pe	MADLT05SF
Applicable	Model No.	RS48	5 communio	cation type *2	MADLN05SG
driver		Basic	c type *2		MADLN05SE
	Frame	sym	bol		A-frame
Power supply	capacity	,		(kVA)	0.5
Rated output				(W)	100
Rated torque				(N·m)	0.32
Continuous sta	all torque	Э		(N·m)	0.33
Momentary Ma	ax. peak	torqu	ue	(N·m)	1.11
Rated current				(A(rms))	1.1
Max. current (A(o-p))			(A(o-p))	5.5	
Regenerative	brake		Without	option	No limit Note)2
frequency (time	es/min) N	lote)1	DV0P4281		No limit Note)2
Rated rotation	al speed	t		(r/min)	3000
Max. rotationa	l speed			(r/min)	6500
Moment of ine	rtia		Without	brake	0.071
of rotor (×10 ⁻⁴ kg·m²)		With brake		0.074	
Recommended moment of inertia ratio of the load and the rotor Note)3			Note)3	30 times or less	
Rotary encoder specifications *3				23-bit Absolute	
	Resolution per single turn				8388608

• Brake specifications (For details, refer to P.167) /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.166)

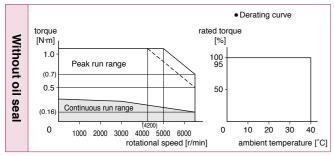
	During assembly During operation	Radial load P-direction (N)	147
		Thrust load A-direction (N)	88
		Thrust load B-direction (N)	117.6
		Radial load P-direction (N)	68.6
		Thrust load A, B-direction (N)	58.8

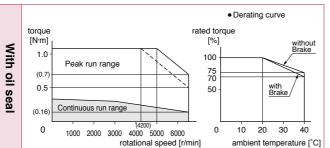
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.116.

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

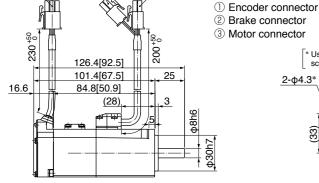
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)

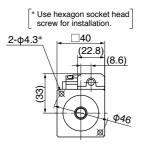


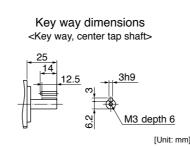


Dimensions

Mass: Without brake: 0.40 kg (0.42 kg with oil seal) With brake: 0.62 kg (0.64 kg with oil seal)







For motors with oil seal, refer to P.161. For motors with protective lip, refer to P.163. • Figures in [] represent the dimensions without brake.

<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 Product

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

Specifications

					AC200 V
Motor model *1	IP65			MHMF022L1□□M	
		Multifunction type			MADLT15SF
Applicable	Model No.	RS48	5 communication typ	e *2	MADLN15SG
driver	140.	Basic	asic type *2		MADLN15SE
	Frame	e sym	bol		A-frame
Power supply	capacity	/	(kV	/A)	0.5
Rated output			(1	W)	200
Rated torque			(N·	m)	0.64
Continuous sta	all torqu	е	(N·	m)	0.76
Momentary Ma	ax. peal	c torqu	ue (N·	m)	2.23
Rated current			(A(rm	s))	1.4
Max. current	rent (A(o-p))				6.9
Regenerative	brake		Without option		No limit Note)2
frequency (times/min) Note)1		DV0P4283		No limit Note)2	
Rated rotation	al spee	d	(r/m	in)	3000
Max. rotationa	l speed		(r/m	in)	6500
Moment of ine	rtia		Without brake		0.29
of rotor (×10 ⁻⁴ kg·m ²)			With brake		0.31
Recommended moment of inertia ratio of the load and the rotor Note)3					30 times or less
Rotary encode	r speci	icatio	ns*3		23-bit Absolute
	Res	solutio	n per single turn		8388608

• Brake specifications (For details, refer to P.167) 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.166)

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

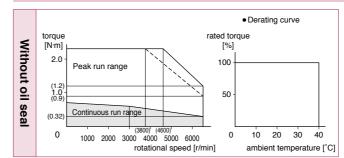
- For details of Note)1 to Note)4, refer to P.165.
- Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

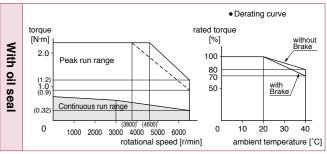
Detail of model designation, refer to P.116.

*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.>)

A COOO 1/





Dimensions

Mass: Without brake: 0.75 kg (0.78 kg with oil seal) With brake: 1.1 kg (1.2 kg with oil seal) ① Encoder connector ② Brake connector ③ Motor connector Use hexagon socket head 126.8[97.5] screw for installation Key way dimensions 96.8[67.5] □60 <Key way, center tap shaft> 16.5 (30.8) (2.1)M4 depth 8 [Unit: mm]

For motors with oil seal, refer to P.161. For motors with protective lip, refer to P.163. • Figures in [] represent the dimensions without brake.

<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

137 MINAS A6 Family

					AC200 V
Motor model*1		IP65			MHMF042L1 M
		Multi	function ty	ре	MBDLT25SF
Applicable	Model No	RS48	5 communica	ation type *2	MBDLN25SG
driver		Basio	type *2		MBDLN25SE
	Frame	sym	bol		B-frame
Power supply	capacity			(kVA)	0.9
Rated output				(W)	400
Rated torque				(N·m)	1.27
Continuous st	all torque	9		(N·m)	1.40
Momentary M	ax. peak	torqı	ne	(N·m)	4.46
Rated current (A(rms))		ated current (A(rm		(A(rms))	2.1
Max. current (A		(A(o-p))	10.4		
Regenerative	brake		Without option		No limit Note)2
frequency (time	es/min) N	lote)1	DV0P4283		No limit Note)2
Rated rotation	al speed	l		(r/min)	3000
Max. rotationa	l speed			(r/min)	6500
Moment of ine	ertia		Without	brake	0.56
of rotor (×10 ⁻⁴	kg·m²)		With bra	ke	0.58
Recommended moment of inertia ratio of the load and the rotor Note)3			Note)3	30 times or less	
Rotary encode	er specifi	catio	ns ^{*3}		23-bit Absolute
	Res	olutic	n per sing	le turn	8388608

• Brake specifications (For details, refer to P.167) /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.166)

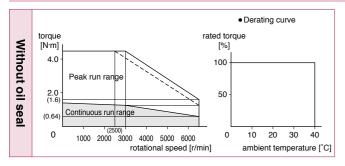
During assembly During operation	Radial load P-direction (N)	392
	Thrust load A-direction (N)	147
	Thrust load B-direction (N)	196
	Radial load P-direction (N)	245
	Thrust load A, B-direction (N)	98

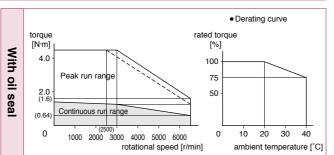
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.116.

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

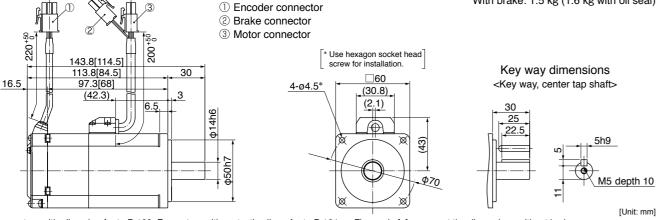
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





Dimensions

Mass: Without brake: 1.1 kg (1.2 kg with oil seal) With brake: 1.5 kg (1.6 kg with oil seal)



For motors with oil seal, refer to P.162. For motors with protective lip, refer to P.164. • Figures in [] represent the dimensions without brake

<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 Product

[High inertia] 200 V MHMF 750 W 80 mm sq.

Please contact us for more information

Specifications

					AC200 V
Motor model *1	IP65				MHMF082L1 M
		Multi	function type		MCDLT35SF
Applicable	Model No	RS48	5 communication t	ype *2	MCDLN35SG
driver	140.	Basic	type *2		MCDLN35SE
	Frame	e sym	bol		C-frame
Power supply	capacity	y	(H	(VA)	1.3
Rated output				(W)	750
Rated torque			1)	√m)	2.39
Continuous sta	all torqu	е	1)	N·m)	2.86
Momentary Max. peak torque (N·m)				8.36	
Rated current			(A(rı	ms))	3.8
Max. current			(A(c	p-p))	18.8
Regenerative brake		Without option	n	No limit Note)2	
frequency (times/min) Note)1		Note)1	DV0P4283		No limit Note)2
Rated rotation	al spee	d	(r/i	min)	3000
Max. rotational speed			(r/	min)	6000
Moment of inertia of rotor (×10 ⁻⁴ kg·m²)			Without brake)	1.56
			With brake		1.66
Recommended moment of inertia ratio of the load and the rotor Note)3				20 times or less	
Rotary encode	Rotary encoder specifications *3				23-bit Absolute
	Res	solutio	n per single tur	n	8388608

Brake specifications (For details, refer to P.167) 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.166)

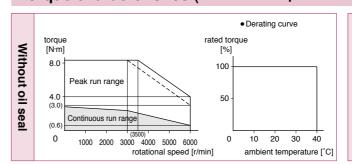
	Radial load P-direction (N)	686
During assembly	Thrust load A-direction (N)	294
assembly	Thrust load B-direction (N)	392
During operation	Radial load P-direction (N)	392
	Thrust load A, B-direction (N)	147

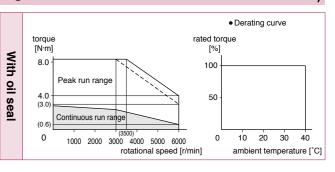
- For details of Note)1 to Note)4, refer to P.165.
- Dimensions of Driver, refer to P.48.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.116.

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

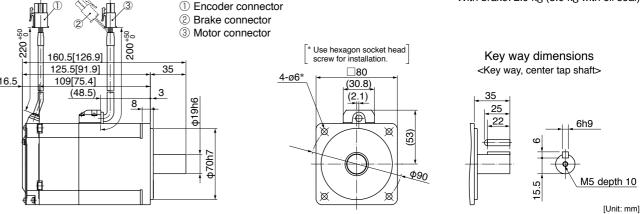
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





Dimensions

Mass: Without brake: 2.2 kg (2.3 kg with oil seal) With brake: 2.9 kg (3.0 kg with oil seal)



For motors with oil seal, refer to P.162. For motors with protective lip, refer to P.164. • Figures in [] represent the dimensions without brake.

<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

139 MINAS A6 Family

Specifications

				AC200 V
Motor model *1			IP65	MHMF092L1□□M
		Multi	function type	MDDLT55SF
Applicable	Model RS485 communication type *2		communication type	MDDLN55SG
driver		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	3.34
Momentary Max. peak torque (N·m)			11.1	
Rated current (A(rms))			5.7	
Max. current (A(o-p))			28.2	
Regenerative brake frequency (times/min) Note)1		Without option	No limit Note)2	
		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
Recommended moment of inertia ratio of the load and the rotor Note)3			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.167) /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.

[High inertia]

80 mm sq.

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.166)

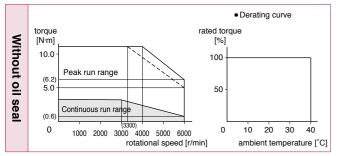
During assembly During operation	Radial load P-direction (N)	686
	Thrust load A-direction (N)	294
	Thrust load B-direction (N)	392
	Radial load P-direction (N)	392
	Thrust load A, B-direction (N)	147

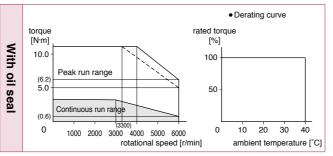
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.48.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.116.

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

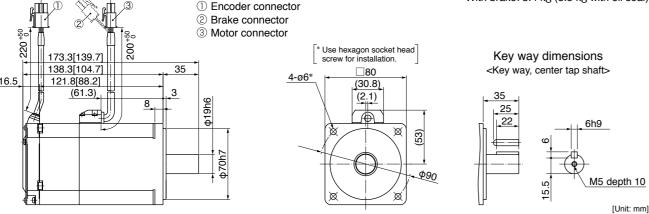
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





Dimensions

Mass: Without brake: 2.7 kg (2.8 kg with oil seal) With brake: 3.4 kg (3.5 kg with oil seal)



For motors with oil seal, refer to P.162. For motors with protective lip, refer to P.164. • Figures in [] represent the dimensions without brake

<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 Product

Please contact us for more information

Specifications

					AC200 V
Motor model *1	IP67				MHMF102L1□□M
		Multi	function type		MDDLT45SF
Applicable	Model No	RS48	5 communication ty	pe *2	MDDLN45SG
driver	140.	Basic type *2		MDDLN45SE	
	Frame	e sym	bol		D-frame
Power supply	capacity	y	(k¹	VA)	1.8
Rated output			((W)	1000
Rated torque			(N	·m)	4.77
Continuous sta	all torqu	е	(N	·m)	5.25
Momentary Max. peak torque (N·m)				14.3	
Rated current			(A(rm	ıs))	5.2
Max. current			(A(o-	-p))	22
Regenerative brake		Without option		No limit Note)2	
frequency (times/min) Note)1		DV0P4284		No limit Note)2	
Rated rotation	al spee	d	(r/m	nin)	2000
Max. rotational speed			(r/m	nin)	3000
Moment of inertia of rotor (×10 ⁻⁴ kg·m²)		Without brake		22.9	
		With brake		24.1	
Recommended moment of inertia ratio of the load and the rotor Note)3			5 times or less		
Rotary encoder specifications *3				23-bit Absolute	
	Resolution per single turn			1	8388608

 Brake specifications (For details, refer to P.167) This brake will be released when it is energized. Do not use this for braking the motor in motion.

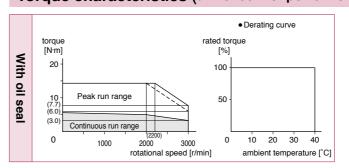
Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

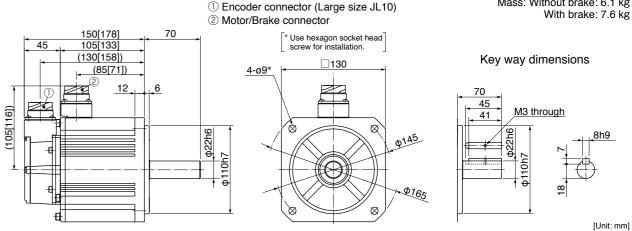
During assembly During operation	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.165.
- · 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.116.
- *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



• Figures in [] represent the dimensions with brake.

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

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

141 MINAS A6 Family

MINAS A6 Family 142

Imformation

Mass: Without brake: 6.1 kg

Specifications

					AC200 V
Motor model*1	or model ^{*1} IP67		MHMF152L1□□M		
		Multifu		/ре	MDDLT55SF
Applicable	Model No.	RS48	RS485 communication type *2		MDDLN55SG
driver	110.	Basic	c type *2		MDDLN55SE
	Frame	sym	bol		D-frame
Power supply	capacity	/		(kVA)	2.3
Rated output				(W)	1500
Rated torque				(N·m)	7.16
Continuous sta	all torqu	е		(N·m)	7.52
Momentary Ma	ax. peak	torqu	ne	(N·m)	21.5
Rated current				(A(rms))	8.0
Max. current				(A(o-p))	34
Regenerative	Regenerative brake		Without	option	No limit Note)2
frequency (time	es/min) 1	Note)1	DV0P42	284	No limit Note)2
Rated rotation	al speed	t		(r/min)	2000
Max. rotationa	l speed			(r/min)	3000
Moment of ine	rtia		Without	brake	33.4
of rotor ($\times 10^{-4}$	kg·m²)		With bra	ake	34.6
Recommended moment of inertia ratio of the load and the rotor		Note)3	5 times or less		
Rotary encoder specifications *3				23-bit Absolute	
Resolution			on per sing	gle turn	8388608

• Praka enacifications (For details, refer to D167)

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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

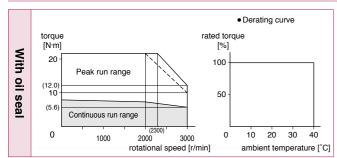
• Permissible load (For details, refer to P.166)

	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

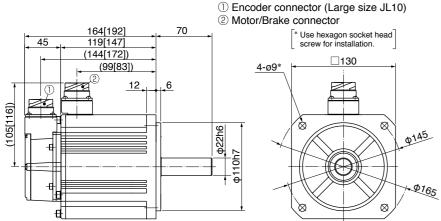
- For details of Note)1 to Note)4, refer to P.165.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect

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



Dimensions



• Figures in [] represent the dimensions with brake.

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.

This brake will be released when it is Do not use this for braking the motor i	
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±10 %

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

- · Dimensions of Driver, refer to P.48.

- Detail of model designation, refer to P.116.
- a battery for absolute encoder.

Mass: Without brake: 7.7 kg

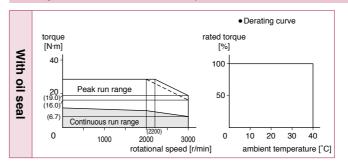
Key way dimensions

M3 through

With brake: 9.2 kg

[Unit: mm]

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



Specifications

Special Order Product

				AC200 V
Motor model *1			IP67	MHMF202L1□□M
		Multi	function type	MEDLT83SF
Applicable	Model No	RS48	5 communication type *2	MEDLN83SG
driver	110.	Basic	type *2	MEDLN83SE
	Frame	e sym	bol	E-frame
Power supply	capacity			3.8
Rated output			(W)	2000
Rated torque			(N·m)	9.55
Continuous sta	all torqu	е	(N·m)	11.5
Momentary Ma	ax. peal	c 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) I	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 ($\times 10^{-4}$	kg·m²)		With brake	61.0
Recommender ratio of the loa				5 times or less
Rotary encode	r specif	icatio	ns ^{*3}	23-bit Absolute
	Res	solutio	on per single turn	8388608

• Brake specifications (For details, refer to P.167) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

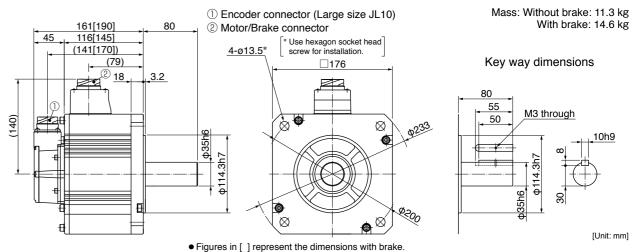
Static friction torque (N·m)	25.0 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.29±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

	Radial load P-direction (N)	ction (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	Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.165.
- 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.116.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Dimensions



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

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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Imformation

Please contact us for more information

Specifications

					AC200 V	
Motor model*1			IP67		MHMF302L1 M	
		Multi	function type		MFDLTA3SF	
Applicable	Model No	RS48	S485 communication type *2		MFDLNA3SG	
driver		Basic	type *2		MFDLNA3SE	
	Fram	e sym	bol		F-frame	
Power supply	capacit	y	(kV	(A)	4.5	
Rated output			()	N)	3000	
Rated torque			(N·ı	m)	14.3	
Continuous sta	all torqu	ie	(N·	m)	17.2	
Momentary M	ax. pea	k torqı	ıe (N·ı	m)	43.0	
Rated current		(A(rms))		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/m	in)	2000	
Max. rotationa	l speed		(r/m	in)	3000	
Moment of ine	rtia		Without brake		85.3	
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake		90.7		
Recommended moment of inertia ratio of the load and the rotor Note)3			e)3	5 times or less		
Rotary encoder specifications *3			ns ^{*3}		23-bit Absolute	
	Re	solutio	n per single turn		8388608	

• Brake specifications (For details, refer to P.167) /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)	25.0 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.29±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

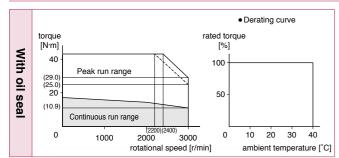
	Radial load P-direction (N)	1666
During assembly	Thrust load A-direction (N)	784
accombiy	Thrust load B-direction (N)	980
During	Radial load P-direction (N)	784
operation	Thrust load A, B-direction (N	343

- For details of Note)1 to Note)4, refer to P.165.
- · 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".

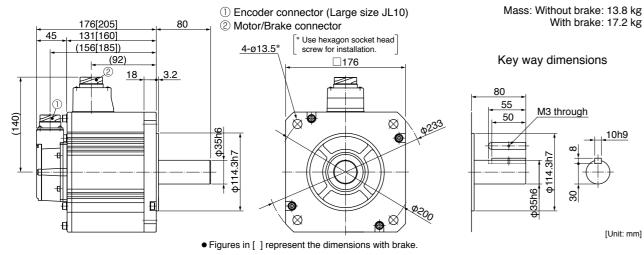
Detail of model designation, refer to P.116.

*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



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

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	MHMF402L1 M
		Multi	function type	MFDLTB3SF
Applicable	icable Model RS485		5 communication type *2	MFDLNB3SG
driver	140.	Basic	c 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 torqı	ue (N·m)	57.3
Rated current	ed current		(A(rms))	20
Max. current		(A(o-		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	104
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake	110	
Recommended moment of inertia ratio of the load and the rotor				5 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.167) 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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

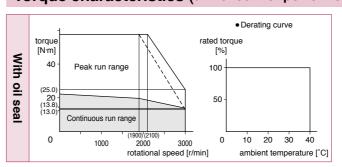
		1666
During assembly	Thrust load A-direction (N)	784
accombiy	Thrust load B-direction (N)	980
During	Radial load P-direction (N)	784
operation	Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.165.
- 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".

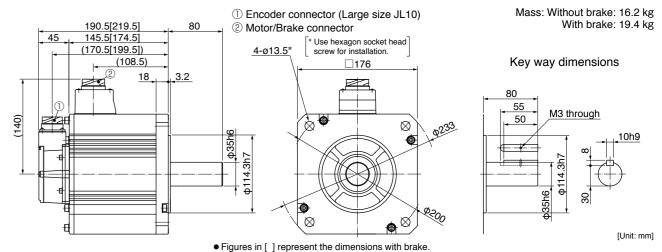
Detail of model designation, refer to P.116.

*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



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

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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Imformation

Specifications

· Please contact us for more information.

				AC200 V
Motor model*1			IP67	MHMF502L1□□M
		Multi	unction type	MFDLTB3SF
Applicable	Model No	RS48	communication type *2	MFDLNB3SG
driver	110.	Basic	type *2	MFDLNB3SE
	Frame	sym	ool	F-frame
Power supply	capacity	/	(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. peak	torqu	ie (N·m)	71.6
Rated current			(A(rms))	23.3
Max. current	Max. current (A(o-p)			99
Regenerative I	brake		Without option	No limit Note)2
frequency (time	s/min) N	Note)1	DV0P4285×2	No limit Note)2
Rated rotation	al speed	t	(r/min)	2000
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	146
of rotor (×10 ⁻⁴ kg·m ²)		With brake	151	
Recommended moment of inertia ratio of the load and the rotor Note)3			5 times or less	
Rotary encode	r specif	icatio	າຣ ^{*3}	23-bit Absolute
	Res	8388608		

• Brake specifications (For details, refer to P.167) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

[High inertia]

176 mm sq.

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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

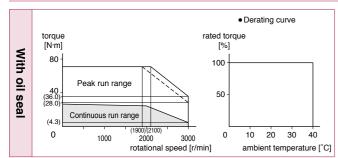
	Radial load P-direction (N)	(N) 1666
During assembly	Thrust load A-direction (N)	784
		980
During	Radial load P-direction (N)	784
operation	Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.165.
- · 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".

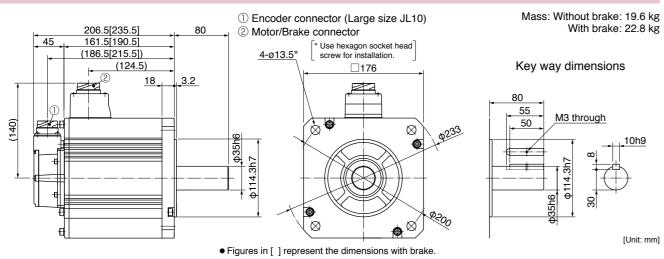
Detail of model designation, refer to P.116.

*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



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 Product

Please contact us for more information

Specifications

				AC200 V
Motor model *1			IP67	MDMF102L1
		Multi	function type	MDDLT45SF
Applicable	Model No	RS48	5 communication type *2	MDDLN45SG
driver	INO.	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	е	(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 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/min)	2000
Max. rotationa	l 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 inertia ratio of the load and the rotor				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.167) This brake will be released when it is energized. Do not use this for braking the motor in motion.

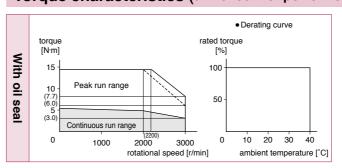
Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

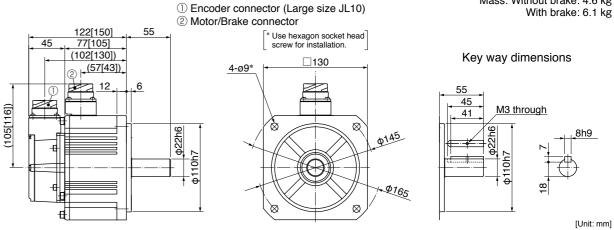
		980
During assembly During operation	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.165.
- 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.116.
- *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



• Figures in [] represent the dimensions with brake.

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

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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Imformation

Mass: Without brake: 4.6 kg

Please contact us for more information

Specifications

					AC200 V
Motor model*1			IP67		MDMF152L1 M
		Multif	function ty	уре	MDDLT55SF
Applicable	Model No.	RS485	5 communio	cation type *2	MDDLN55SG
driver		Basic	type *2		MDDLN55SE
	Frame	syml	bol		D-frame
Power supply	capacity			(kVA)	2.3
Rated output				(W)	1500
Rated torque				(N·m)	7.16
Continuous st	all torque)		(N·m)	7.52
Momentary Max. peak torque (N				(N·m)	21.5
Rated current				(A(rms))	8.0
Max. current	ax. current			(A(o-p))	34
Regenerative	brake		Without option		No limit Note)2
frequency (times/min) Note)1		ote)1	DV0P4284		No limit Note)2
Rated rotation	al speed			(r/min)	2000
Max. rotationa	l speed		(r/min)		3000
Moment of ine	ertia		Without	brake	9.16
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake		10.4	
Recommende ratio of the loa				Note)3	10 times or less
Rotary encoder specifications *3				23-bit Absolute	
	Reso	gle turn	8388608		

• Brake specifications (For details, refer to P.167) /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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

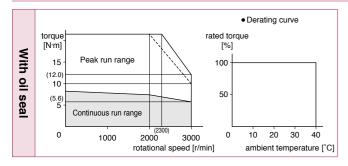
		Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588	
	assembly	Thrust load B-direction (N)	686
	During operation	Radial load P-direction (N)	490
		Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.165.
- · 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".

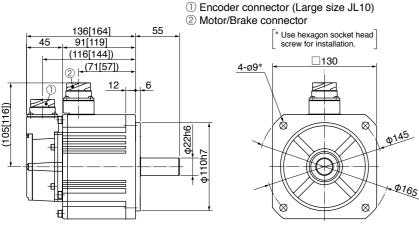
Detail of model designation, refer to P.116.

*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.>)

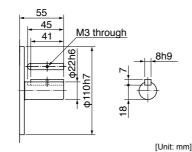


Dimensions



Mass: Without brake: 5.7 kg With brake: 7.2 kg

Key way dimensions



• Figures in [] represent the dimensions with brake.

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

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 Product

200 V MDMF 2.0 kW

130 mm sq.

[Middle inertia]

Specifications

					AC200 V
Motor model *1			IP67		MDMF202L1 M
		Multif	function type		MEDLT83SF
Applicable	Model No.	RS48	RS485 communication type *2		MEDLN83SG
driver	110.	Basic	type *2		MEDLN83SE
	Frame	e sym	bol		E-frame
Power supply	capacity	y	(k	(AV	3.8
Rated output				(W)	2000
Rated torque			1)	√m)	9.55
Continuous sta	all torqu	е	1)	√m)	10.0
Momentary Max. peak torque (N·m)				28.6	
Rated current	rated current		(A(rr	ns))	9.9
Max. current			(A(c)-p))	42
Regenerative I	brake		Without option	ı	No limit Note)2
frequency (time	es/min) I	Note)1	DV0P4285		No limit Note)2
Rated rotation	al spee	d	(r/r	min)	2000
Max. rotationa	l speed		(r/r	min)	3000
Moment of ine	rtia		Without brake	!	12.1
of rotor (×10 ⁻⁴ kg·m²) With brake				13.3	
Recommended moment of inertia ratio of the load and the rotor Note)3			10 times or less		
Rotary encoder specifications *3					23-bit Absolute

• Brake specifications (For details, refer to P.167) 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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

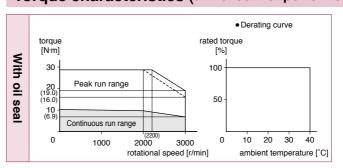
Permissible load (For details, refer to P.166)

<u>.</u>	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)	490
	Thrust load A, B-direction (N)	196

- or details of Note)1 to Note)4, refer to P.165.
- Dimensions of Driver, refer to P.49.
- ☐☐ in the motor part number represents the motor specifications.
- Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.116.
- When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

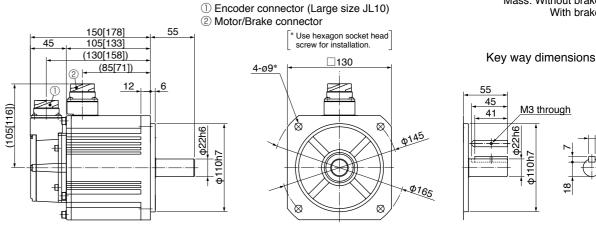
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)

8388608



Resolution per single turn

Dimensions



• Figures in [] represent the dimensions with brake.

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

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.

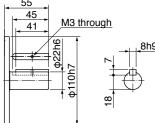
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan

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Imformation

Mass: Without brake: 6.9 kg

With brake: 8.4 kg



[Unit: mm]

Please contact us for more information

Specifications

					AC200 V	
Motor model *1	Motor model 1 IP67			MDMF302L1□□M		
		Multi	function type		MFDLTA3SF	
Applicable	Model No	RS48	5 communicatio	n type *2	MFDLNA3SG	
driver	140.	Basic	c 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 st	all torqu	е	(N·m) 15.0		15.0	
Momentary M	ax. peal	k torqu	ne	(N·m)	43.0	
Rated current			(<i>F</i>	A(rms))	16.4	
Max. current			(,	A(o-p))	70	
Regenerative	Regenerative brake			tion	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	Moment of inertia			ake	18.6	
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake		19.6		
Recommended moment of in ratio of the load and the rotor				Note)3	10 times or less	
Rotary encode	er speci	ficatio	ns *3		23-bit Absolute	
Resolution			on per single	turn	8388608	

• Brake specifications (For details, refer to P.167) /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.

[Middle inertia]

130 mm sq.

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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

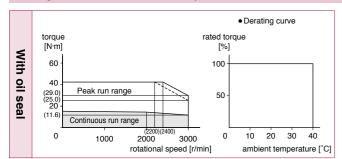
	During assembly	Radial load P-direction (N)	980
		Thrust load A-direction (N)	588
		Thrust load B-direction (N)	686
	During operation	Radial load P-direction (N)	784
		Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.165.
- · 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".

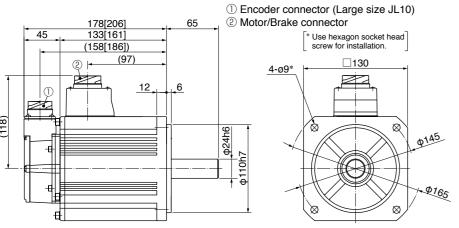
Detail of model designation, refer to P.116.

*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.>)



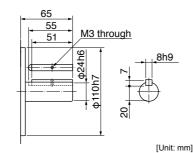
Dimensions



With brake: 10.9 kg

Mass: Without brake: 9.3 kg

Key way dimensions



• Figures in [] represent the dimensions with brake.

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

200 V MDMF 4.0 kW

Specifications

				AC200 V
Motor model *1	IP67			MDMF402L1□□M
		Multif	function type	MFDLTB3SF
Applicable	Model No.	RS485	5 communication type *2	MFDLNB3SG
driver	140.	Basic	type *2	MFDLNB3SE
	Frame	e sym	bol	F-frame
Power supply	capacit	y	(kVA)	7.5
Rated output			(W)	4000
Rated torque			(N·m)	19.1
Continuous sta	all torqu	е	(N·m)	22.0
Momentary Ma	ax. peal	k torqu	ue (N·m)	57.3
Rated current Max. current			(A(rms))	20.0
			(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 (×10 ⁻⁴ kg·m ²)		With brake	52.3	
Recommended moment of i ratio of the load and the rote				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.167) This brake will be released when it is energized. Do not use this for braking the motor in motion.

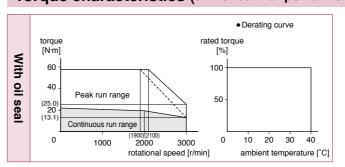
Static friction torque (N·m)	25.0 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.29±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

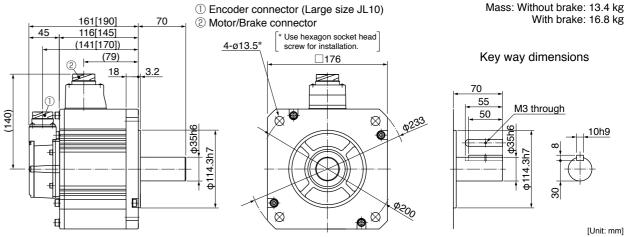
	Radial load P-direction (N)	1666
During assembly	Thrust load A-direction (N)	784
accombiy	Thrust load B-direction (N)	980
During operation	Radial load P-direction (N)	784
	Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.165.
- 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.116.
- *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



• Figures in [] represent the dimensions with brake. <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

151 MINAS A6 Family

Imformation

Please contact us for more information

Specifications

					AC200 V	
Motor model ¹¹ IP67		MDMF502L1 M				
		Multi	function t	уре	MFDLTB3SF	
Applicable	Model No	RS48	5 communi	cation type *2	MFDLNB3SG	
driver		Basic	type *2		MFDLNB3SE	
	Frame	sym	bol		F-frame	
Power supply	capacity	/		(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. peak	torqu	ıe	(N·m)	71.6	
Rated current	Rated current			(A(rms))	23.3	
Max. current				(A(o-p))	99	
Regenerative brake		Withou	t option	No limit Note)2		
frequency (time	requency (times/min)		DV0P4	285×2	No limit Note)2	
Rated rotational speed				(r/min)	2000	
Max. rotationa	Max. rotational speed			(r/min)	3000	
Moment of ine	rtia		Withou	t brake	58.2	
of rotor (×10 ⁻⁴ kg·m ²)		With br	ake	63.0		
Recommended moment of in ratio of the load and the roto				Note)3	10 times or less	
Rotary encode	er specif	icatio	ns *3		23-bit Absolute	
	Res	solutio	n per single turn		8388608	

• Brake specifications (For details, refer to P.167) /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.

[Middle inertia]

176 mm sq.

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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

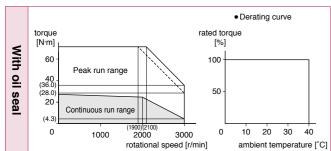
	During assembly	Radial load P-direction (N)	1666
		Thrust load A-direction (N)	784
		Thrust load B-direction (N)	980
	During	Radial load P-direction (N)	784
	operation	Thrust load A, B-direction (N)	343

- For details of Note)1 to Note)4, refer to P.165.
- · 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".

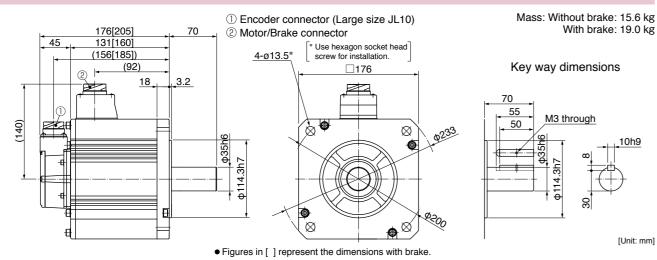
Detail of model designation, refer to P.116.

*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



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

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 Product

200 V | **MGMF** 0.85 kW

Specifications

				AC200 V
Motor model *1			IP67	MGMF092L1□□M
		Multi	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	capacit	y	(kVA)	1.8
Rated output			(W)	850
Rated torque			(N·m)	5.41
Continuous sta	all torqu	е	(N·m)	5.41
Momentary Ma	ax. peal	k torqu	ue (N·m)	14.3
Rated current Max. current			(A(rms))	5.9
			(A(o-p))	22
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/min)	1500
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	6.18
of rotor (×10 ⁻⁴ kg·m ²)		With brake	7.40	
Recommended moment of i ratio of the load and the roto				10 times or less
Rotary encoder specification			ns*3	23-bit Absolute
	Re	solutio	n per single turn	8388608

Brake specifications (For details, refer to P.167) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

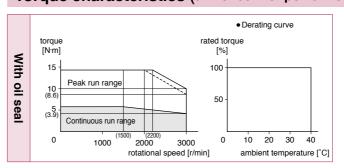
Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

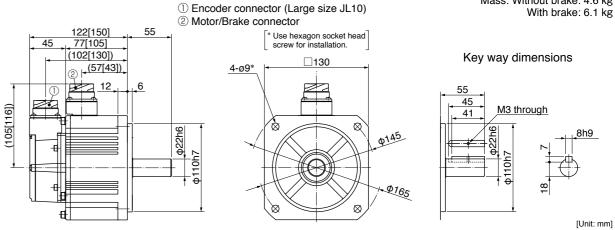
During assembly During operation	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	686
	Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.165.
- 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.116.
- *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



• Figures in [] represent the dimensions with brake.

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

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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Imformation

Mass: Without brake: 4.6 kg

Please contact us for more information

Specifications

					AC200 V
Motor model *1		IP67			MGMF132L1□□M
		Multi	function ty	ре	MDDLT55SF
Applicable	Model No	RS48	5 communic	ation type *2	MDDLN55SG
driver		Basic	type *2		MDDLN55SE
	Frame	sym	bol		D-frame
Power supply	capacity	/		(kVA)	2.3
Rated output				(W)	1300
Rated torque				(N·m)	8.28
Continuous sta	all torqu	е		(N·m)	8.28
Momentary Ma	ax. peak	torqı	ıe	(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) 1	Note)1	DV0P42	84	No limit Note)2
Rated rotation	al speed	b		(r/min)	1500
Max. rotationa	l speed			(r/min)	3000
Moment of ine	rtia		Without	brake	9.16
of rotor (×10 ⁻⁴ kg·m ²)		With bra	ke	10.4	
Recommended moment of inertia ratio of the load and the rotor Note)3			Note)3	10 times or less	
Rotary encode	er specif	icatio	ns ^{∗3}		23-bit Absolute
Resolutio			on per single turn		8388608

• Brake specifications (For details, refer to P.167) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

Middle inertia
Low speed/High torque type

· Please contact us for more information

L130 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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

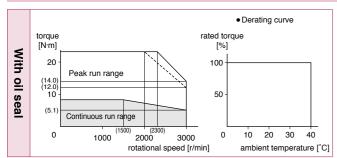
		Radial load P-direction (N)	980
	During assembly During operation	Thrust load A-direction (N)	588
		Thrust load B-direction (N)	686
		Radial load P-direction (N)	686
		Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.165.
- · 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".

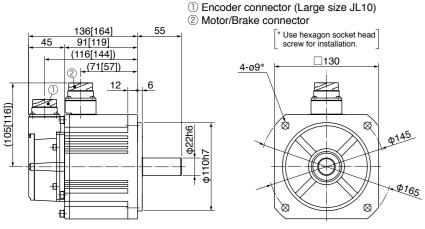
Detail of model designation, refer to P.116.

*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.>)

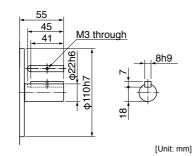


Dimensions



Mass: Without brake: 5.7 kg With brake: 7.5 kg

Key way dimensions



• Figures in [] represent the dimensions with brake.

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

200 V MGMF 1.8 kW

Specifications

				AC200 V
Motor model *1			IP67	MGMF182L1 M
		Multi	function type	MEDLT83SF
Applicable	Model No	RS48	5 communication type *2	MEDLN83SG
driver	140.	Basic	type *2	MEDLN83SE
	Frame	e sym	bol	E-frame
Power supply	capacit	y	(kVA)	3.8
Rated output			(W)	1800
Rated torque			(N·m)	11.5
Continuous sta	all torqu	е	(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 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)	1500
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	12.1
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake	13.3	
Recommended moment of inertia ratio of the load and the rotor Note):				10 times or less
Rotary encode	r speci	ficatio	ns ^{*3}	23-bit Absolute
Resolutio			n per single turn	8388608

Brake specifications (For details, refer to P.167) 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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

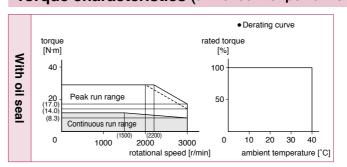
	During assembly During operation	Radial load P-direction (N)	980
		Thrust load A-direction (N)	588
		Thrust load B-direction (N)	686
		Radial load P-direction (N)	686
		Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.165.
- 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".

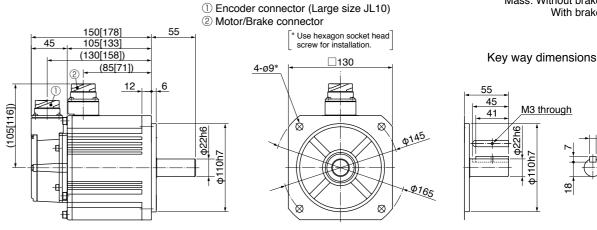
Detail of model designation, refer to P.116.

*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



• Figures in [] represent the dimensions with brake.

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

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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[Unit: mm]

Mass: Without brake: 6.9 kg

With brake: 8.4 kg

Please contact us for more information

Specifications

		AC200 V		
Motor model*1	lotor model *1 IP67			MGMF292L1□□M
		Multifunction type		MFDLTB3SF
Applicable	Model No	RS485 communication type *2		MFDLNB3SG
driver	101	Basic	type *2	MFDLNB3SE
	Frame	sym	bol	F-frame
Power supply	capacity	,	(kVA)	7.5
Rated output			(W)	2900
Rated torque			(N·m)	18.5
Continuous st	all torque	Э	(N·m)	18.5
Momentary Ma	ax. peak	torqu	ue (N·m)	45.2
Rated current			(A(rms))	19.3
Max. current			(A(o-p))	67
Regenerative	brake		Without option	No limit Note)2
frequency (time	es/min) N	lote)1	DV0P4285×2	No limit Note)2
Rated rotation	al speed	i	(r/min)	1500
Max. rotationa	l speed		(r/min)	3000
Moment of ine	ertia		Without brake	46.9
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake	52.3	
Recommended moment of inertia ratio of the load and the rotor Note)3				10 times or less
Rotary encoder specifications *3			23-bit Absolute	
	Resolution per single turn			8388608

• Brake specifications (For details, refer to P.167) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

Middle inertia
Low speed/High torque type

· Please contact us for more information

L176 mm sq.

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±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.166)

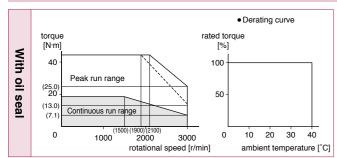
		Radial load P-direction (N)	1666
	During assembly	Thrust load A-direction (N)	784
as	accombiy	Thrust load B-direction (N)	980
	During	Radial load P-direction (N)	1176
operation	Thrust load A, B-direction (N)	490	

- For details of Note)1 to Note)4, refer to P.165.
- · 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".

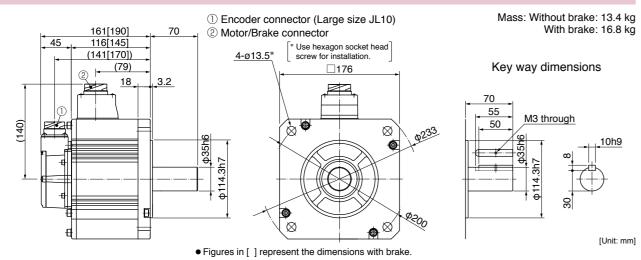
Detail of model designation, refer to P.116.

*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



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

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.

176 mm sq.

Specifications

Special Order Product

				AC200 V
Motor model *1	IP67			MGMF442L1□□M
		Multifunction type		MFDLTB3SF
Applicable	Model No	RS48	5 communication type *2	MFDLNB3SG
driver	110.	Basic	type *2	MFDLNB3SE
	Frame	sym	bol	F-frame
Power supply	capacity	/	(kVA)	7.5
Rated output			(W)	4400
Rated torque			(N·m)	28.0
Continuous sta	all torqu	е	(N·m)	28.0
Momentary Ma	ax. peal	torqu	ue (N·m)	70.0
Rated current			(A(rms))	27.2
Max. current			(A(o-p))	96
Regenerative I	brake		Without option	No limit Note)2
frequency (time	es/min) I	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 ⁻⁴ kg·m ²)			With brake	63.0
Recommended ratio of the load		10 times or less		
Rotary encode	y encoder specifications *3			23-bit Absolute
	Res	solutio	n per single turn	8388608

 Brake specifications (For details, refer to P.167) /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±10 %		
Releasing voltage (DC) (V)	2 or more		
Exciting voltage (DC) (V)	24±2.4		

• Permissible load (For details, refer to P.166)

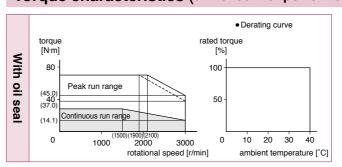
	Radial load P-direction (N)	1666
During assembly	Thrust load A-direction (N)	784
accombiy	Thrust load B-direction (N)	980
During	Radial load P-direction (N)	1470
operation	Thrust load A, B-direction (N)	490

- For details of Note)1 to Note)4, refer to P.165.
- 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".

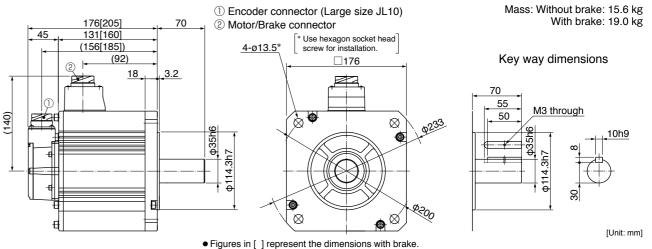
Detail of model designation, refer to P.116.

*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



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

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.

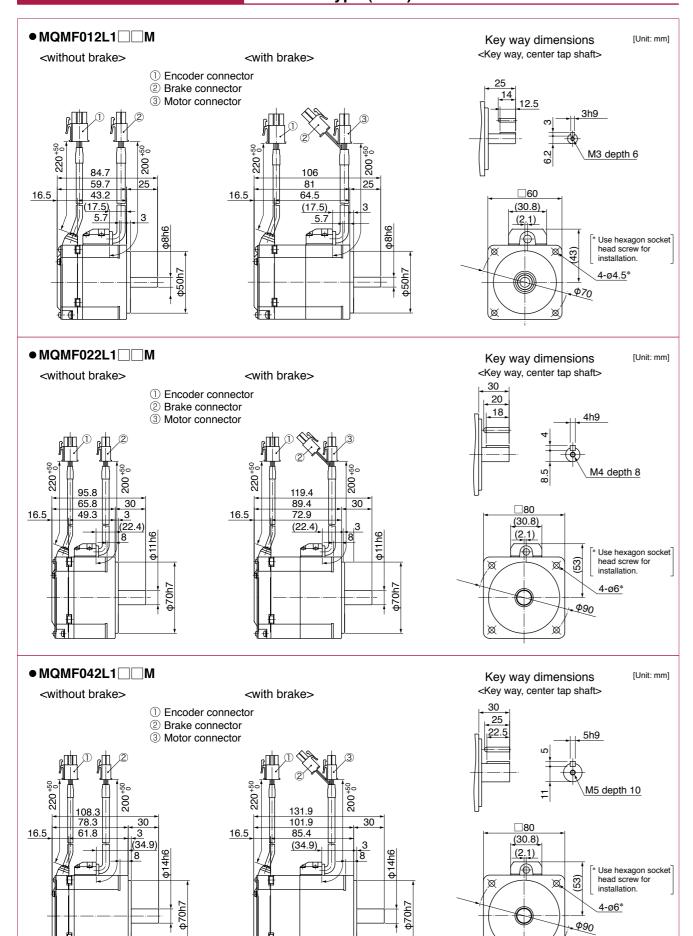
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan

157 MINAS A6 Family

Dimensions

MQMF 100 W to 400 W Leadwire type (IP65) with oil seal

Imformation



^{*} For motors specifications, refer to P.133 to P.135.

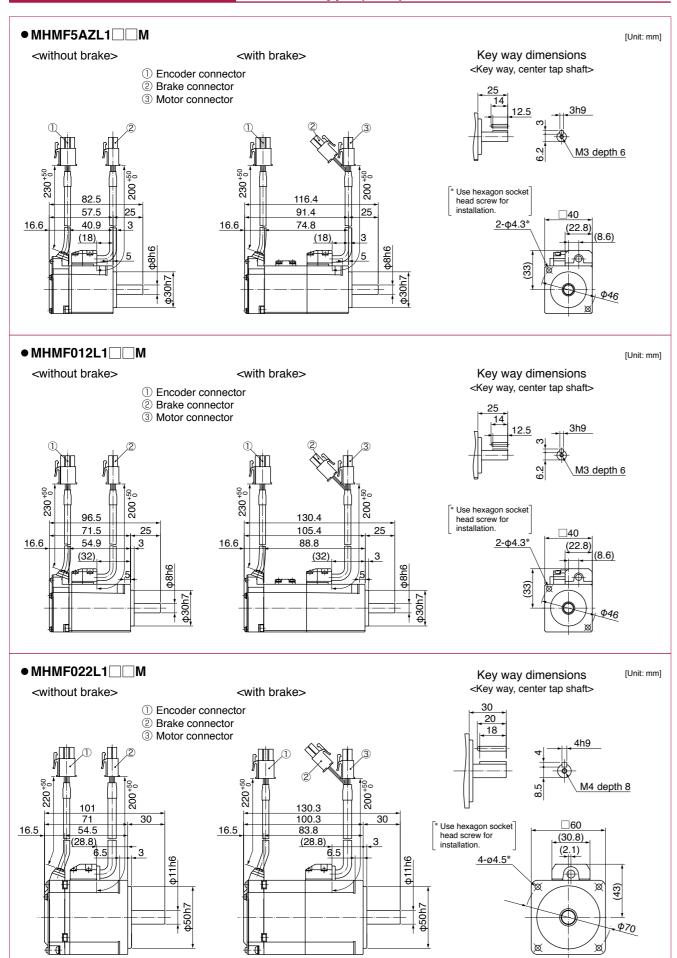
opecial order i roduct		Ab Faililly
MQMF 100 W to 400 Leadwire type (IP65) with) W n protective lip/ with oil seal	Dimensions
● MQMF012L1 □ M		Key way dimensions [Unit: mm]
<pre><without brake=""></without></pre>	<with brake=""></with>	
② Brake conr ③ Motor conr	nector	30 14 12.5
J 3		m 3h9
\$\frac{1}{2} \frac{1}{2} \frac	\$0	M3 depth 6
050 86.2 86.2	950 020 107.5	ω (Mo doptino
16.5 56.2 30 12.1 12.1 1.5	77.5 30 16.5 61 12.1 (14) 1.5	(30.8)
	/ /// 5.7	(2.1)
0089	98h6	* Use hexagon socket head screw for installation
ф49.4 Ф50h7	4049.4 4049.4 4050h7	installation. 4-04.5*
440	4050h	970
 1		
● MQMF022L1□□M		Key way dimensions [Unit: mm]
<without brake=""></without>	<with brake=""></with>	<key center="" shaft="" tap="" way,=""></key>
① Encoder co ② Brake conr ③ Motor conr	nector	20 18 149
and Danks	ector	4
\$0 M 180	\$0 M 180	M4 depth 8
97.3 02 97.3 02	9000 120.9 120.9	∞ ∞
16.5 45.8 12.1 (18.9) 15.1	85.9 35 16.5 69.4 12.1 (18.9) 1.5	□80 <u>(30.8)</u>
18 94 1	88 941	(2.1)
		* Use hexagon socket head screw for installation.
4 70h7	φ70h7	4-ø6*
1 9 9		№ № №
WWII II	441	
● MQMF042L1 □ □ M <without brake=""></without>	<with brake=""></with>	Key way dimensions [Unit: mm]
① Encoder co	onnector	35 20.5
② Brake conr ③ Motor conr		18 5h9
		٥
\$\frac{1}{2} \\ \frac{1}{2} \\ \frac	\$\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	M5 depth 10
74.8 35	98.4 35	ٰٰٰٰٰ الله ' □80
16.5 58.3 12.1 (31.4) 1.5	16.5 81.9 12.1 (31.4) 1.5	(30.8)
8 9 4 1 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	8 94410	* Use hexagon socket
	4 5	nead screw for installation. 4-ø6*
φ 70h7	φ φ φ φ φ φ φ φ φ φ φ φ φ φ φ φ φ φ φ	290

^{*} For motors specifications, refer to P.133 to P.135.

Special Order Product

Dimensions

MHMF 50 W to 200 W Leadwire type (IP65) with oil seal

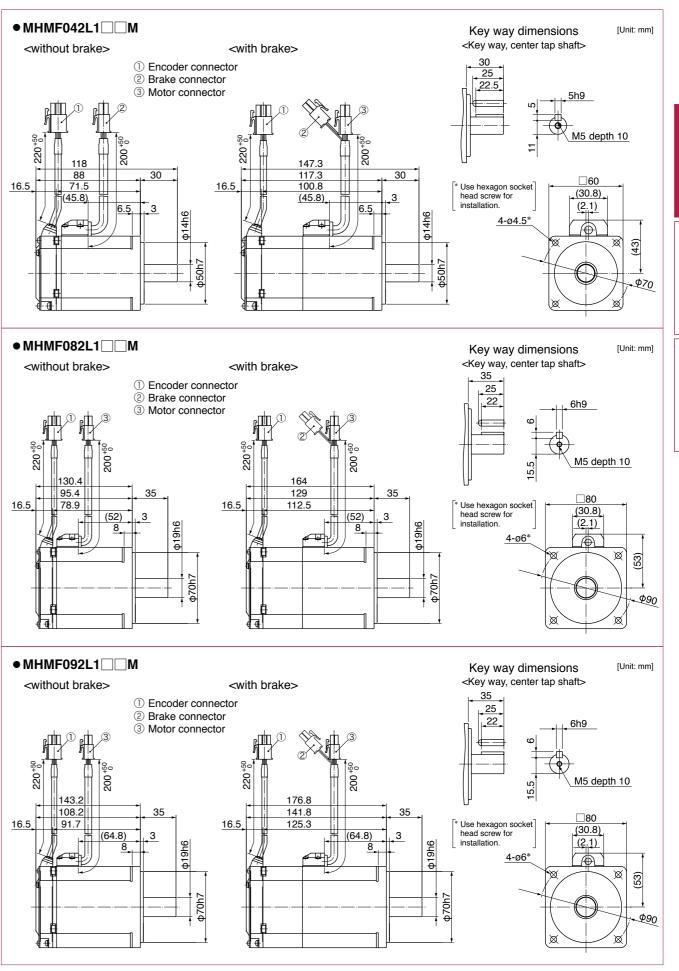


^{*} For motors specifications, refer to P.136 to P.138.

MHMF 400 W to 1000 W Leadwire type (IP65) with oil seal

Special Order Product

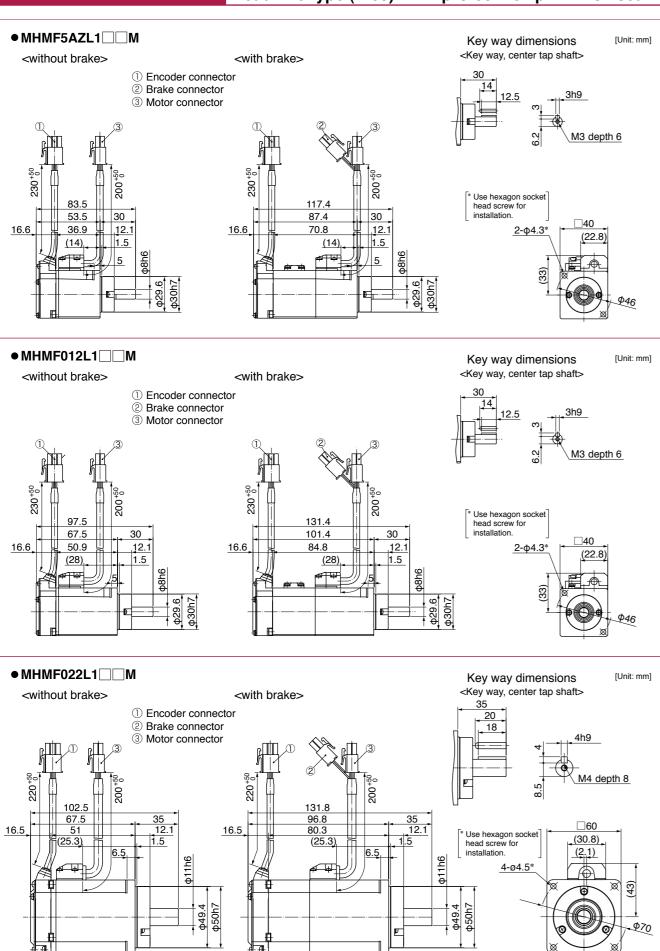
Dimensions



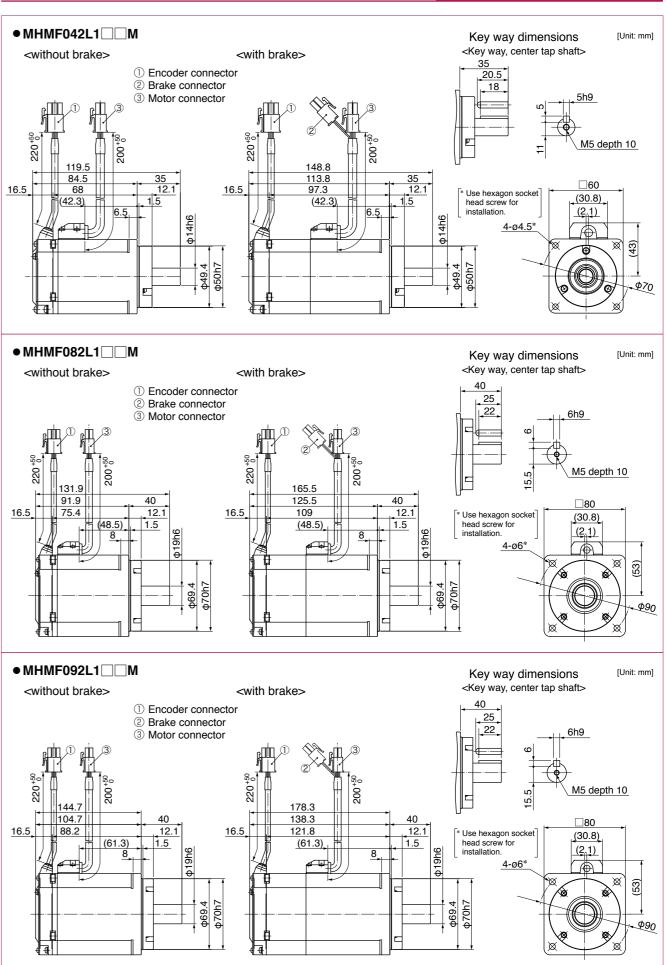
^{*} For motors specifications, refer to P.139 to P.141.

161 MINAS A6 Family MINAS A6 Family

Dimensions



^{*} For motors specifications, refer to P.136 to P.138.



^{*} For motors specifications, refer to P.139 to P.141.

Special Order Product

MHMF 400 W to 1000 W

Leadwire type (IP65) with protective lip/ with oil seal

163 MINAS A6 Family MINAS A6 Family

A6 Family

Motor Specification Description

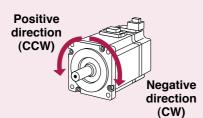
Environmental Conditions

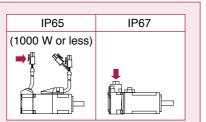
Item		Conditions
Ambient temperature *1		0 °C to 40 °C (free from freezing)
Ambient humidity		20 % to 85 % RH (free from condensation)
Storage temperature *2		-20 °C to 65 °C (Max.temperature guarantee: 80 °C for 72 hours free from condensation '5)
Storage hur	nidity	20 % to 85 % RH (free from condensation ^{*5})
Vibration Motor only		Lower than 49 m/s ² (5 G) at running, 24.5 m/s ² (2.5 G) at stall
Impact Motor only		Lower than 98 m/s ² (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.





Notes on [Motor specification] page

Note) 1. [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]

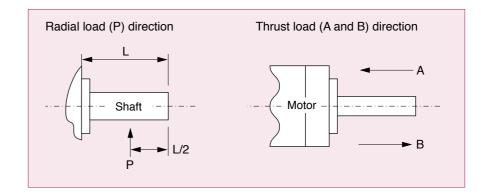
Regenerative brake frequency represents the frequency of the motor's stops from the rated speed with deceleration without load.

- 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.

MINAS A6 Family

MINAS A6 Family

A6 Family

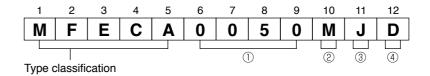
Options

Specifications of Built-in Holding Brake

Motor series	Motor output	Static friction torque N·m	Rotor inertia × 10 ⁻⁴ 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 angular acceleration rad/s ²		
	50 W,100 W	0.294 or more	0.002	35 or less	20 or less	0.30	1	39.2	4.9			
MSMF	200 W,400 W	1.27 or more	0.018	50 or less	15 or less	0.36	1 or more	137	44.1			
(80 mm sq.) or less	750 W	2.45 or more					24±1.2	196	147	30000		
(0. 1000)	1000 W	3.80 or more	0.075	70 or less	20 or less	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	0.170	80 or less	10 01 1000	±10 %	2 or more	000	900	10000		
(100 mm sq.) or more	4.0 kW	16.2 or more	4.40	440	50	0.90	24±2.4	1470	2160	10000		
	5.0 kW	22.0 or more	1.12	110 or less	50 or less	±10 %		1545	2000			
MQMF	100 W	0.39 or more	0.018	15 or less		0.30	1 or more	105	44.1			
(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	20 or less	0.30	_	39.2	4.9	30000		
MHMF (80 mm sq.)	200 W, 400 W	1.6 or more	0.018	50 or less		0.36	0.36 1 or more 24±2.4	105	44.1			
\ or less /	750 W, 1000 W	3.8 or more	0.075	70 or less		0.42		185	80			
	1.0 kW, 1.5 kW	13.7 or more	1.12	100 or less	50 or less	0.79 ±10 %	0	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		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	±10 %		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 ±10 %		1470	2160	10000		
MDMF	3.0 kW	22.0 or more	1.12	110 or less	30 of less	0.90 ±10 %	2 or more	1545	2000	10000		
or more	4.0 kW	25.0 or more	4.7	80 or less	25 or less	1.29	24±2.4	1000	3000	5440		
	5.0 kW	44.1 or more	4.1	150 or less	30 or less	±10 %		1800	3100	5108		
	0.85 kW, 1.3 kW, 1.8 kW	13.7 or more	1.12	100 or less	50 or less	0.79 ±10 %	2 or more	1470	2160	10000		
MGMF (100 mm sq.) or more	2.9 kW	25.0 or more	4.7	80 or less	25 or less 1.29	24±2.4	1800	3000	5440			
(or more /	4.4 kW	44.1 or more	3.93	150 or less	30 or less	±10 %	2712.4	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

MFECA: Encoder cable

O Cable longin				
0030	3 m			
0050	5 m			
0100	10 m			
0200	20 m			

Cable part No. Designation

② Cable type

Е	PVC cable with shield by Oki Electric Cable Co., 0.20 mm ² × 4P(8-wire), 3P(6-wire)
М	Hitachi Cable, Ltd. Highly bendable type
Т	Hitachi Cable, Ltd., Standard bendable type

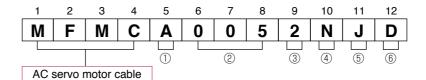
3 Cable end (Encoder side)

		,	
-	Α	Tyco Electronics Japan G.K. connector	
	J	Japan Aviation Electronics Industry, Ltd.	connector (Direction of motor shaft)
ı	K	Japan Aviation Electronics Industry, Ltd.	connector (Opposite direction of motor shaft)
I	Р	Japan Aviation Electronics Industry, Ltd.	plug connector
;	S	"S" shaped cannonplug	
-	Т	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 ④ Cable type

Α	Standard	
В	Special	
÷	Design order	

(2) Cable length

E Cable length			
003	3 m		
005	5 m		
010	10 m		
020	20 m		

③ Sectional area of

cable core			
0	0.75 mm ²		
1	1.25 mm ²		
2	2.0 mm ²		
3	3.5 mm ²		

ROBO-TOP⊚ is a trade mark of DYDEN CORPORATION

	71
Е	ROBO-TOP _® 4-wire by DYDEN CORPORATION
F	ROBO-TOP _® 6-wire by DYDEN CORPORATION
G	ROBO-TOP _® 2-wire by DYDEN CORPORATION
N	4-wire by Hitachi Cable, Ltd. (Highly bendable type)
R	2-wire by Hitachi Cable, Ltd. (Highly bendable type)
Р	4-wire by Hitachi Cable, Ltd. (Standard 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 connector

6 Cable end at driver side

D	Rod terminal
Т	Clamp terminal

Connector

for encoder

Connector

Connector

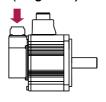
for motor

for brake

50 W to 1000 W 80 mm sq. or less

Connector for encoder

IP67 motor Connector for encoder (Large size)



IP67 motor Connector for encoder (Small size)

· Connector for motor/brake

Motor output

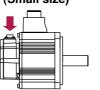
1.0 kW to 2.0 kW

3.0 kW to 5.0 kW

1.0 kW to 2.0 kW

3.0 kW to 5.0 kW

Table for motor connector and brake connector



<Large size Encoder connector>



JL10-2A20-29P

23-bit Absolute

PIN No.

С

D

G

Н

М

Ν

200 V

without Brake with Brake

В

В

С

D

C

D

Application

NC

NC

NC

NC

NC

NC

F0V

E5V

FG(SHIELD) PS

NC

NC

NC

NC

BAT-

BAT+

Motor

MGMF

MHMF

23-bit Absolute		
PIN No.	Application	
1	E0V	
2	NC	
3	PS	
4	E5V	
5	BAT-*	
6	BAT+*	
7	PS	
8	NC	
9	FG(SHIELD)	
10	NC	

1	E0V
2	NC
3	PS
4	E5V
5	BAT-*
6	BAT+*
7	PS
8	NC
9	FG(SHIELD)
10	NC

<Small size Encoder connector>

JN2AS10ML3-R

<Remarks>

Motor output

0.85 kW to 1.8 kW

2.9 kW to 4.4 kW

1.0 kW to 1.5 kW

2.0 kW to 5.0 kW

Do not connect anything to NC.

* When using the motor as an incremental system. BAT+ and BAT- can be left unconnected.

200 V

without Brake with Brake

* Electromagnetic brake

is a nonpolar device

C

D

C

Imformation

0.85 kW to 5.0 kW 100 mm sq. or more

Connector: Made by Japan Aviation Electronics Industry, Ltd. (The figures below show connectors for the motor.)

[Connector for motor]



• 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]

3 2 1

6 5 4

9 8 7

172169-1

23-bit Absolute

Connector pin diagram is

viewed from the direction

of the arrow.

Specifications of Motor connector

<Remarks> Do not connect anything to NC.

NC

* When using the motor as an incremental system BAT+ and BAT- can be left unconnected.

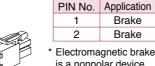
4 3 172167

	PIN No.	Application
'	1	U-phase
3	2	V-phase
7-1	3	W-phase
	4	Ground

* Connector pin diagram is viewed from the direction of the arrow

[Connector for Brake]

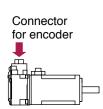




is a nonpolar device.

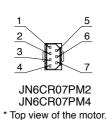
* Connector pin diagram is viewed from the direction

• 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

for motor





Tightening torque of the screw (M2) 0.19 N·m to 0.21 N·m

without Brake

- * 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>



PIN No. Application U-phase V-phase W-phase PΕ Ground 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



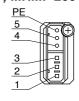




JN11AH06NN2

Top view of the motor.

<MQMF, MHMF 200 W to 1000 W>



JN11AH06NN1 Top view of the motor.

PIN No. Application PIN No. Application U-phase U-phase 2 V-phase V-phase W-phase 3 W-phase 3 NC 4 Brake 4 5 NC 5 Brake PΕ Ground PΕ Ground

Tightening torque of the screw (M2) 0.085 N·m to 0.095 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

<Remarks> Do not connect anything to NC.

Connector for

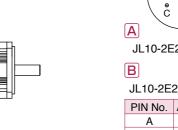
motor/brake

Motor

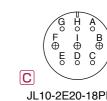
part No.

MSMF

MDMF



	A JL10-2E	8 20-4PE-B
B JL10-2E22-22PE-B		
	PIN No.	Application
	Α	U-phase
	В	V-phase
	С	W-phase
	D	Ground



.II 10-2F20-18PF-B

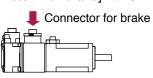
3L10-2L20-101 L-D		
PIN No.	Application	
G	with Brake : Brake	
G	without Brake: NC	
Н	with Brake : Brake	
Н	without Brake: NC	
Α	NC	
F	U-phase	
I	V-phase	
В	W-phase	
Е	Ground	
D	Ground	
С	NC	

		D	
3		JL10)-2E24-11PE
		PIN No.	Applicati
ke		۸	with Brake : [
		A	

Α	with Brake	:Brake
А	without Brake	e: NC
В	with Brake	:Brake
Б	without Brake: NC	
С	NC	
D	U-phase	
E	V-phase	
F	W-phase	
G	Ground	
Н	Ground	
ı	NC	

<Remarks> Do not connect anything to NC.

[Motor with brake] < MSMF>





* Top view of the motor

PIN No. Application Brake 2 Brake

Tightening torque of the screw (M2)

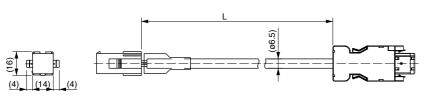
- 0.19 N·m to 0.21 N·m * Electromagnetic brake is a nonpolar device.
- * Be sure to use only the screw supplied with the connector, to avoid damage
- Secure the gasket in place without removing it from the connector.

169 MINAS A6 Family MINAS A6 Family 170 Part No.

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
Connector (Driver side)	3E206-0100 KV	Sumitomo 3M
Shell kit	3E306-3200-008	(or equivalent)
Connector (Motor side)	172161-1	Tyco Electronics Japan
Connector pin	170365-1	G.K.
Cable	0.20 mm ² x3P (6-wire)	Oki Electric Cable Co., Ltd.

	L (m)	Part No.(ex.)
	3	MFECA0030EAD
	5	MFECA0050EAD
	10	MFECA0100EAD
	20	MFECA0200EAD
<u>ہ</u>		

L (m)

5

10

20

Part No.(ex.)
MFECA0030EAE

MFECA0050EAE

MFECA0100EAE

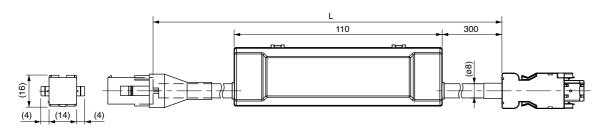
MFECA0200EAE

Part No.	MFECA0 * * 0EAE	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 V	solute encoder When used in absolute system (with battery box) *		

* Battery is not included. Please buy the absolute encoder battery "DV0P2990" separately.

[Unit: mm]

[Unit: mm]

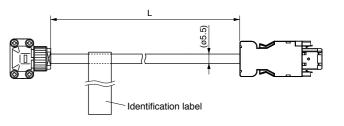


Title	Part No.	Manufacturer
Connector (Driver side)	3E206-0100 KV	Sumitomo 3M
Shell kit	3E306-3200-008	(or equivalent)
Connector (Motor side)	nector (Motor side) 172161-1	
Connector pin	170365-1	G.K.
Cable	0.20 mm ² ×4P (8-wire)	Oki Electric Cable Co., Ltd.

	Part No.	MFECA0 * * 0MJD (Highly bendable type, Direction of motor shaft)	80 mm sq.	MSMF 50 W to 1000 W
		MFECA0 * * 0MKD (Highly bendable type, Opposite direction of motor shaft)	or less	MQMF 100 W to 400 W
		MFECA0 * * 0TJD (Standard bendable type, Direction of motor shaft)	Applicable model	MHMF 50 W to 1000 W
		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



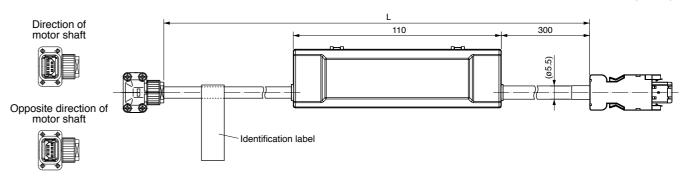


Title Part No.		Manufacturer	L (m)	Part No.(ex.)
Connector (Driver side)	3E206-0100 KV	3E206-0100 KV Sumitomo 3M		MFECA0030MJD
Shell kit	3E306-3200-008 (or equivalent)		5	MFECA0050MJD
Connector (Motor side) JN6FR07SM1		Japan Aviation	10	MFECA0100MJD
Connector pin	LY10-C1-A1-10000	Electronics Ind.	20	MFECA0200MJD
Cable	AWG24 4-wire, AWG22 2-wire (ø5.5)	Hitachi Cable, Ltd.		<u> </u>

	MFECA0 * * 0MJE (Highly bendable type, Direction of motor shaft)	OU IIIII SU.	MSMF 50 W to 1000 W
Part No.	MFECA0 * * 0MKE (Highly bendable type, Opposite direction of motor shaft)		MQMF 100 W to 400 W
Part No.	MFECA0 * * 0TJE (Standard bendable type, Direction of motor shaft)	Applicable model	WII 11VIII 00 VV 10 1000 VV
	$\textbf{MFECA0} \ \textbf{** 0TKE} \ \text{(Standard bendable type, Opposite direction of motor shaft)}$		(Connector type)
Specifications	23-bit absolute encoder When used in absolute system (with battery box) *		

* 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)	JN6FR07SM1	Japan Aviation
Connector pin	LY10-C1-A1-10000	Electronics Ind.
Cable	AWG24 4-wire、AWG22 2-wire (φ5.5)	Hitachi Cable, Ltd.

L (m)	Part No.(ex.)
3	MFECA0030MJE
5	MFECA0050MJE
10	MFECA0100MJE
20	MFECA0200MJE

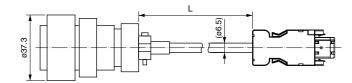
171 MINAS A6 Family 172

[Unit: mm]

Encoder Cable

* It doesn't correspond to IP65 and IP67.

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) Large one-touch lock type>			

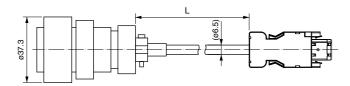


[Unit:	mı

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 ² ×3P (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 V <large screwed="" type=""></large>	Vhen used in ind	cremental system (without battery box)



[Unit: mm]

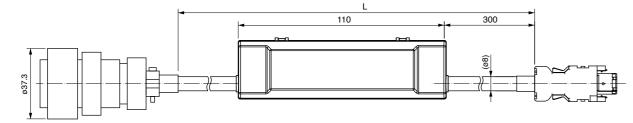
Title	Part No.	Manufacturer
Connector (Driver side)	3E206-0100 KV	Sumitomo 3M
Shell kit	3E306-3200-008	(or equivalent)
Connector (Motor side)	N/MS3106B20-29S	Japan Aviation
Cable clamp	N/MS3057-12A	Electronics Ind.
Cable	0.2 mm ² x3P (6-wire)	Oki Electric Cable Co., Ltd.

L (m)	Part No.(ex.)
3	MFECA0030ESD
5	MFECA0050ESD
10	MFECA0100ESD
20	MFECA0200ESD

	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) *				solute system (with battery box) *
Specific	эрсинсацина	<large lock="" one-touch="" p="" type<=""></large>	9>	

 * Battery is not included. Please buy the absolute encoder battery "DV0P2990" separately.

[Unit: mm]



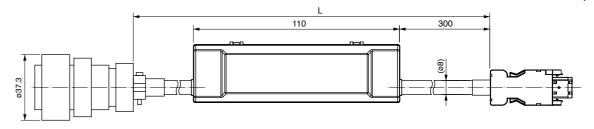
Title	Part No.	Manufacturer
Connector (Driver side)	3E206-0100 KV	Sumitomo 3M
Shell kit	3E306-3200-008	(or equivalent)
Connector (Motor side)	JL10-6A20-29S-EB	Japan Aviation
Cable clamp	JL04-2022CK(09)-R	Electronics Ind.
Cable	0.2 mm ² ×3P (6-wire)	Oki Electric Cable Co., Ltd.

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>	/hen used in ab	solute system (with battery box) *

* Battery is not included. Please buy the absolute encoder battery "DV0P2990" separately.

FI I	Init:	

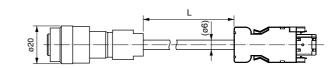


Title	Part No.	Manufacturer	L (m)	Part No.(ex.)
Connector (Driver side)	3E206-0100 KV	Sumitomo 3M	3	MFECA0030ESE
Shell kit	3E306-3200-008	(or equivalent)	5	MFECA0050ESE
Connector (Motor side)	N/MS3106B20-29S	Japan Aviation	10	MFECA0100ESE
Cable clamp	N/MS3057-12A	Electronics Ind.	20	MFECA0200ESE
Cable	0.2 mm ² ×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)			

[Unit: mm]

Imformation

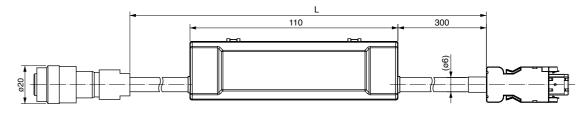


Title	Part No.	Manufacturer	L (m)	Part No.(ex.)
Connector (Driver side)	3E206-0100 KV	Sumitomo 3M	3	MFECA0030ETD
Shell kit	3E306-3200-008	(or equivalent)	5	MFECA0050ETD
Connector (Motor side)	JN2DS10SL1-R	Japan Aviation	10	MFECA0100ETD
Connector pin	JN1-22-22S-PKG100	Electronics Ind.	20	MFECA0200ETD
Cable	0.2 mm ² ×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.

[Unit: n



Title	Part No.	Manufacturer	L (m)
Connector (Driver side)	3E206-0100 KV	Sumitomo 3M	3
Shell kit	3E306-3200-008	(or equivalent)	5
Connector (Motor side)	JN2DS10SL1-R	Japan Aviation	10
Connector pin	JN1-22-22S-PKG100	Electronics Ind.	20
Cable	0.2 mm ² x3P (6-wire)	Oki Electric Cable Co. Ltd.	

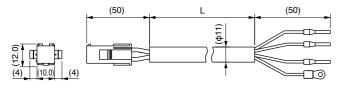
L (m)	Part No.(ex.)
3	MFECA0030ETE
5	MFECA0050ETE
10	MFECA0100ETE
20	MFECA0200ETE

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Motor Cable (without Brake)

* It doesn't correspond to IP65 and IP67.

MSMF 50 W to 1000 W, MQMF 100 W to 400 W 80 mm sq. or less Part No. MFMCA0 * * 0EED MHMF 50 W to 1000 W Applicable model (Leadwire type)



Title	Part No.	Manufacturer
Connector	r 172159-1 Tyco Electronics	
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 ² 4-wire	DYDEN CORPORATION

	L (m)	Part No.(ex.)
	3	MFMCA0030EED
	5	MFMCA0050EED
	10	MFMCA0100EED
	20	MFMCA0200EED
ı 🗌		

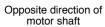
	MFMCA0 * * 0NJD (Highly bendable type, Direction of motor shaft)	90 mm om	MSMF
Part No.	MFMCA0 * * 0RJD (Standard bendable type, Direction of motor shaft)	80 mm sq. or less	(Conn
Part No.	MFMCA0 * * 0NKD (Highly bendable type, Opposite direction of motor shaft)	Applicable model	MSMF
	MFMCA0 * * 0RKD (Standard bendable type, Opposite direction of motor shaft)		(Conn

1F 50 W to 1000 W nector type) 1F 200 W to 1000 W nector type)

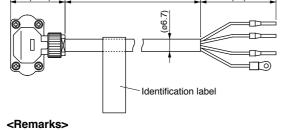
[Unit: mm]

[Unit: mm]







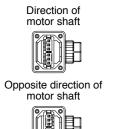


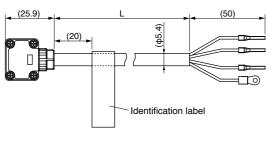
Motor cable for opposite direction of motor shaft cannot be used with a motor 50 W and 100 W.

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.

L (m)	Part No.(ex.)
3	MFMCA0030NJD
5	MFMCA0050NJD
10	MFMCA0100NJD
20	MFMCA0200NJD

Part No.	MFMCA0 * * 7UFD	(Movable/fixed common-use, direction of motor shaft	80 mm sq. or less	MHMF 50 W, 100 W
Part No.	MFMCA0 * * 7UGD	(Movable/fixed common-use, opposite directionof motor shaft)	Applicable model	(Connector type)
	Direction of	(25.9)	(50)	[Unit: mm]





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	

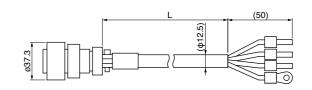
L (m)	Part No.(ex.)
3	MFMCA0037UFD
5	MFMCA0057UFD
10	MFMCA0107UFD
20	MFMCA0207UFD

Direction of motor shaft Opposite direction of motor shaft

(26.6)	L .	(50)
(20)	(8/9)	
	Identification	label

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 COLTD		

			MOME	1.0 kW to 2.0 kW,	MDME	1.0 kW to 2.0 kW
		100 === == == ==			INIDINIE	1.0 KVV 10 2.0 KVV
Part No. MFMC	MFMCDO * * 2EUD	Addiicadie modei		1.0 kW, 1.5 kW,	MGMF	0.85 kW to 1.8 kW
			<one-to< td=""><td>ouch lock type></td><td></td><td></td></one-to<>	ouch lock type>		



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
Nylon insulated round terminal	N2-M4	J.S.T Mfg. Co., Ltd.	20	MFMCD0202EUD
Cable	ROBO-TOP 600V 2.0mm ² 4-wire	DYDEN CORPORATION		-

Part No.	MFMCDO * * 2ECD	100 mm sq. or more Applicable model	MHMF	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 ² 4-wire	DYDEN CORPORATION		

175 MINAS A6 Family MINAS A6 Family 176

[Unit: mm]

Imformation

[Unit: mm]

[Unit: mm]

Part No. MFMCEO * * 2ECD

Motor Cable (with Brake)

* It doesn't correspond to IP65 and IP67.

A6 Family

Options

Part No. MFMCEO * * 2EUD Applicable model

MHMF 2.0 kW <One-touch lock type>

MHMF 2.0 kW <Screwed type>

		(50)	[Unit. mm]
042.2)((412.5)	

Motor Cable (without Brake)

* It doesn't correspond to IP65 and IP67.

Title	Part No.	Manufacturer
Connector	JL10-6A22-22SE-EB	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 DP6/2501 2.0 mm ² 4-wire	DYDEN CORPORATION

100 mm sq. or more

Applicable model

	L (m)	Part No.(ex.)
	3	MFMCE0032EUD
	5	MFMCE0052EUD
	10	MFMCE0102EUD
	20	MFMCE0202EUD
N		

[Unit: mm]

[Unit: mm]

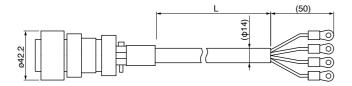
[Unit: mm]

•	L (<u>6:</u>	(50)
940.5	Φ12	

	L	(50)
	12.5)	
92	<u> </u>	
2 1 1 1		

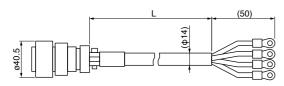
Title	Part No.	Manufacturer	L (m)	Part No.(ex.)
Connector	JL04V-6A22-22SE-EB-R	Japan Aviation	3	MFMCE0032ECD
Cable clamp	JL04-2022CK(14)-R	Electronics Ind.	5	MFMCE0052ECD
Rod terminal	NTUB-2	J.S.T Mfg. Co., Ltd.	10	MFMCE0102ECD
Nylon insulated round terminal	N2-M4	J.S.T Mfg. Co., Ltd.	20	MFMCE0202ECD
Cable	ROBO-TOP 600V 2.0 mm ² 4-wire	DYDEN CORPORATION		

Part No.	MFMCAO * * 3EUT	100 mm sq. or more Applicable model	MHMF	3.0 kW to 5.0 kW, 3.0 kW to 5.0 kW, buch lock type>	3.0 kW to 5.0 kW 2.9 kW to 4.4 kW



Title	Part No.	Manufacturer	L (m)	Part No.(ex.)
Connector	JL10-6A22-11SE-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 ² 4-wire	DYDEN CORPORATION	20	MFMCA0203EUT

Part No. MFMCAO * * 3ECT 100 mm sq. or more Applicable model MSMF 3.0 kW to 5.0 kW, MHMF	



Title	Part No.	Manufacturer	L (n
Connector	JL04V-6A22-22SE-EB-R	Japan Aviation	3
Cable clamp	JL04-2022CK(14)-R	Electronics Ind.	5
Nylon insulated round terminal	N5.5-5	J.S.T Mfg. Co., Ltd.	10
Cable	ROBO-TOP 600V 3.5 mm ² 4-wire	DYDEN CORPORATION	20

L (m)	Part No.(ex.)	
3	MFMCA0033ECT	
5	MFMCA0053ECT	
10 MFMCA0103EC		
20	MFMCA0203ECT	

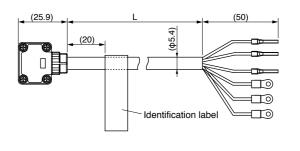
80 mm sq. (Movable/fixed common-use, MFMCA0 * * 7VFD MHMF 50 W, 100 W direction of motor shaft or less Part No. **Applicable** /Movable/fixed common-use, (Connector type) MFMCA0 * * 7VGD opposite directionof motor shaft model

[Unit: mm]



Opposite direction of motor shaft



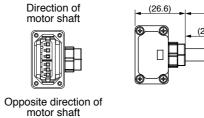


Title	Part No.	Manufacturer	L (m)	Part No.(ex.)
Connector	JN11FH06SN2	Japan Aviation	3	MFMCA0037VFD
Cable clamp	JN11S10K4A1	Electronics Ind.	5	MFMCA0057VFD
Rod terminal	AI0.75-8GY	PHOENIX CONTACT	10	MFMCA0107VFD
Nylon insulated round terminal	N1.25-M4	J.S.T Mfg. Co., Ltd.	20	MFMCA0207VFD
Cable	AWG22 6-wire (65 4 mm)	NIKKO ELECTRIC WIRE COLLTD		-

MFMCA0 * * 0XFD (Standard bendable type, Direction of motor shaft) MFMCA0 * * 0XGD (Standard bendable type, Opposite direction of motor shaft)	Part No.	Standard bendable type, Direction of motor shart)	80 mm sq. or less Applicable model	M M (C
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MQMF 100 W to 400 W MHMF 200 W to 1000 W (Connector type)

[Unit: mm]



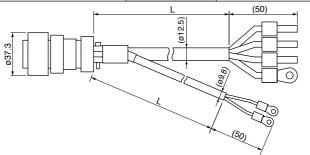


(26.6)	L ,	(50)
(20)	Identification I	

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

	L (m) Part No.(ex.)			
3 MFMCA		3	MFMCA0030VFD	
		5 MFMCA0050VFD		
10 MFMCA01		10	MFMCA0100VFD	
20		20	MFMCA0200VFD	
\neg				

MSMF 1.0 kW to 2.0 kW, MDMF 1.0 kW to 2.0 kW MHMF 1.0 kW to 1.5 kW, MGMF 0.85 kW to 1.8 kW <One-touch lock type>



			/
Title		Part No.	Manufacturer
Connector		JL10-6A20-18SE-EB	Japan Aviation
Cable clar	np	JL042022CK(14)-R	Electronics Ind.
Rod terminal		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. I Wilg. Co., Ltd.
Cable		ROBO-TOP 600V 2.0 mm ² 4-wire ROBO-TOP 600V 0.75 mm ² 2-wire	DYDEN CORPORATION

	L (m)	Part No.(ex.)
3		MFMCA0032FUD
	5	MFMCA0052FUD
	10	MFMCA0102FUD
	20	MFMCA0202FUD
1		

[Unit: mm]

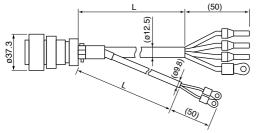
[Unit: mm]

[Unit: mm]

MFMCA0 * * 2FCD Part No.

100 mm sq. or more Applicable model

MSMF 1.0 kW to 2.0 kW, MDMF 1.0 kW to 2.0 kW MHMF 1.0 kW to 1.5 kW, MGMF 0.85 kW to 1.8 kW <Screwed type>



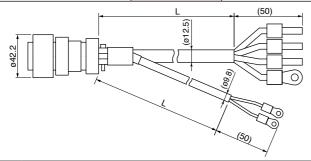
Title		Part No.	Manufacturer
Connector		JL04V-6A20-18SE-EB-R	Japan Aviation
Cable clan	пр	JL04-2022CK(14)-R	Electronics Ind.
Rod terminal		NTUB-2	J.S.T Mfg. Co., Ltd.
Nylon insulated	Earth	N2-M4	J.S.T Mfg. Co., Ltd.
round terminal	Brake	N1.25-M4	3.3.1 Wilg. Co., Ltd.
Cable		ROBO-TOP 600V 2.0 mm ² 4-wire ROBO-TOP 600V 0.75 mm ² 2-wire	DYDEN CORPORATION

L (m)	Part No.(ex.)	
3	MFMCA0032FCD	
5	MFMCA0052FCD	
10	MFMCA0102FCD	
20	MFMCA0202FCD	

MFMCE0 * * 2FUD

100 mm sq. or more Applicable model

MHMF 2.0 kW <One-touch lock type>



Title		Part No.	Manufacturer
Connecto	r	JL10-6A24-11SE-EB	Japan Aviation
Cable clan	np	JL04-2428CK(17)-R	Electronics Ind.
Rod terminal		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 DP6/2501 2.0 mm ² 4-wire ROBO-TOP DP6/2501 0.75 mm ² 2-wire	DYDEN CORPORATION

L (m)	Part No.(ex.)
3	MFMCE0032FUD
5	MFMCE0052FUD
10	MFMCE0102FUD
20	MFMCE0202FUD

			7		
Title		Part No.	Manufacturer	L (m)	Part No
Connecto	or	JL04V-6A24-11SE-EB-R	Japan Aviation	3	MFMCE00
Cable clan	np	JL04-2428CK(17)-R	Electronics Ind.	5	MFMCE00
Rod termir	nal	NTUB-2	J.S.T Mfg. Co., Ltd.	10	MFMCE01
Nylon insulated	Earth	N2-M4	J.S.T Mfg. Co., Ltd.	20	MFMCE02
round terminal	Brake	N1.25-M4	3.3.1 Wilg. Co., Ltd.		
Cable		ROBO-TOP 600V 2.0 mm ² 4-wire ROBO-TOP 600V 0.75 mm ² 2-wire	DYDEN CORPORATION		

r	L (m)	Part No.(ex.)
1	3	MFMCE0032FCD
i.	5	MFMCE0052FCD
₋td.	10	MFMCE0102FCD
_td.	20	MFMCE0202FCD
-tu.		

MSMF 3.0 kW to 5.0 kW, MDMF 3.0 kW to 5.0 kW 100 mm sq. or more Part No. MFMCA0 * * 3FUT MHMF 3.0 kW to 5.0 kW, MGMF 2.9 kW, 4.4 kW Applicable model <One-touch lock type> [Unit: mm]

-	L	(50)
	(014)	
042.2		
	1	
	*	(50)
		/

Title		Part No.	Manufacturer	L (m)	Part No.(ex.)
Connecto	Connector JL10-6A24-11SE-EB Japan Aviation		3	MFMCA0033FUT	
Cable clar	np	JL04-2428CK(17)-R Electronics Ind.		5	MFMCA0053FUT
Nylon insulated	Earth	N5.5-5	LC T Mfa Co. Ltd	10	MFMCA0103FUT
round terminal	Brake	N1.25-M4	J.S.T Mfg. Co., Ltd.	20	MFMCA0203FUT
Cable ROBO-TOP DP6/2501 3.5 mm ² 4-wire ROBO-TOP DP6/2501 0.75 mm ² 2-wire		DYDEN CORPORATION			

MSMF 3.0 kW to 5.0 kW, MDMF 3.0 kW to 5.0 kW 100 mm sq. or more MFMCA0 * * 3FCT MHMF 3.0 kW to 5.0 kW, MGMF 2.9 kW, 4.4 kW Part No. **Applicable model** <Screwed type>

This product does not correspond to IP67.

			,
Title		Part No.	Manufacturer
Connector		JL04V-6A24-11SE-EB-R	Japan Aviation
Cable clamp		JL04-2428CK(17)-R	Electronics Ind.
Nylon insulated Earth		N5.5-5	J.S.T Mfg. Co., Ltd.
round terminal	Brake	N1.25-M4	J.S.1 Wilg. Co., Ltd.
Cable		ROBO-TOP 600V 3.5 mm ² 4-wire ROBO-TOP 600V 0.75 mm ² 2-wire	DYDEN CORPORATION

L (m)	Part No.(ex.)
3	MFMCA0033FCT
5	MFMCA0053FCT
10	MFMCA0103FCT
20	MFMCA0203FCT

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Imformation

Interface Cable Options

Brake Cable * It doesn't correspond to IP65 and IP67.

MSMF 50 W to 1000 W, MQMF 100 W to 400 W 80 mm sq. or less MFMCB0 * * 0GET MHMF 50 W to 1000 W Part No. Applicable model (Leadwire type)

[Unit: mm]	

[Unit: mm]

Title	Part No.	Manufacturer
Connector	172157-1	Tyco Electronics Japan
Connector pin	170366-1, 170362-1	G.K.
Nylon insulated round terminal	N1.25-M4	J.S.T Mfg. Co., Ltd.
Cable	ROBO-TOP 600V 0.75 mm ² 2-wire	DYDEN CORPORATION

	L (m)	Part No.(ex.)
	3	MFMCB0030GET
	5	MFMCB0050GET
	10	MFMCB0100GET
1	20	MFMCB0200GET

	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)
	MFMCB0 * * 0SKT (Standard bendable type, Opposite direction of motor shaft)		

10

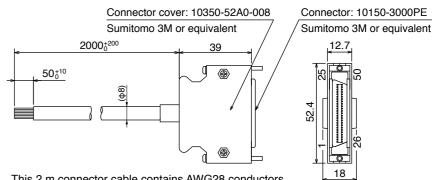
Opposite direction of motor shaft	Identification label

Direction of motor shaft

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

Cable for Interface

Part No. DV0P4360



This 2 m connector cable contains AWG28 conductors.

[Unit: mm]

A6 Family

· Table for wiring

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	Gray (Black4)	50	Gray (Black5)

<Remarks>

Color designation of the cable e.g.) Pin-1 Cable color: Orange (Red1): One red dot on the cable The shield of this cable is connected to the connector shell but not to the terminal.

Interface Conversion Cable

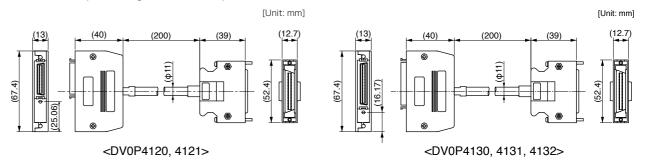
Part No. DV0P4120, 4121, 4130, 4131, 4132

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

* For details of wiring, contact our sales department.

Converts 36-pin configuration to 50-pin.



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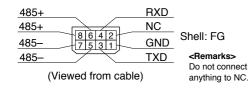
Connector Kit for Communication Cable (for RS485, RS232) (Excluding A6 SE Series)

Part No. DV0PM20024

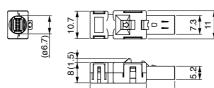
Components

Title	Part No.	Manufacturer	Note
Connector	2040008-1	Tyco Electronics Japan G.K.	For Connector X2 (8-pins)

• Pin disposition of connector, connector X2



Dimensions



[Unit: mm]

[Unit: mm]

[Unit: mm]

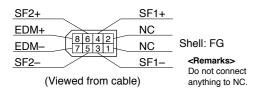
Connector Kit for Safety (Excluding A6 SE, A6 SG Series)

Part No. DV0PM20025

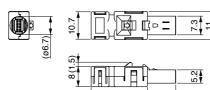
Components

Title	Part No.	Manufacturer	Note
Connector	2013595-1	Tyco Electronics Japan G.K.	For Connector X3 (8-pins)

• Pin disposition of connector, connector X3



Dimensions



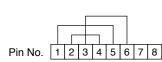
Safety bypass plug (Excluding A6 SE, A6 SG Series)

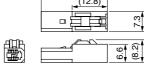
Part No. DV0PM20094

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.200 "List of Peripheral Equipments".

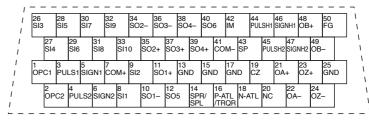
Connector Kit for Interface

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.

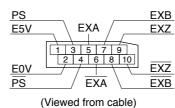
Connector Kit for External Scale (Excluding A6 SE, A6 SG Series)

Part No. DV0PM20026

· Components

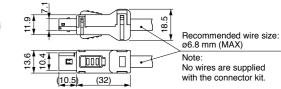
Title Part No.		Manufacturer	Note	
Connector	MUF-PK10K-X	J.S.T Mfg. Co., Ltd.	For Connector X5 (10-pins)	

• Pin disposition of connector, connector X5





[Unit: mm]



Connector Kit for Encoder

Part No. DV0PM20010

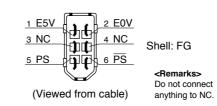
Components

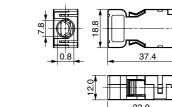
Title	Part No.	Manufacturer	Note
Connector (Driver side)	3E206-0100 KV	Sumitomo 3M	For Connector X6
Shell kit	3E306-3200-008	(or equivalent)	FOI COIIIIeCIOI X6

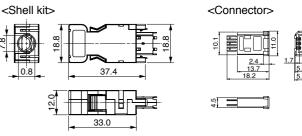
• Pin disposition of connector, connector X6

Dimensions

[Unit: mm]







<Remarks>

Connector X1: use with commercially available cable.

· Configuration of connector X1: USB mini-B



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Connector Kit for Motor/Encoder Connection

Part No. DV0PM20032 (For A-frame to D-frame: Single row type)

• Please refer to the Dimensions of driver P.47 for connector XA.

Components

Title	Part No.	Number	Manufacturer	Note	
Connector	05JFAT-SAXGF	1	J.S.T Mfg. Co., Ltd.	For Connector XA	
Handle lever	J-FAT-OT	2		FOI COIIIIeCIOI XA	

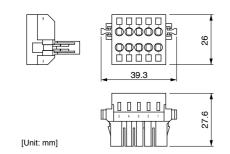
Connector Kit

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
	MADL*01** MADL*11** MADL*05** MADL*15** MBDL*21** MBDL*25** MCDL*31** MCDL*35**	MADL*01** Single phase 100 V MADL*11** Single phase 100 V MADL*05** Single phase/3-phase 200 V MADL*15** Single phase/3-phase 200 V MBDL*21** Single phase/3-phase 100 V MBDL*25** Single phase/3-phase 200 V MCDL*31** Single phase/3-phase 200 V MCDL*35** Single phase/3-phase 200 V MDDL*45** Single phase/3-phase 200 V MDDL*55** Single phase/3-phase 200 V

Part No. DV0PM20044 (For E-frame)

Components

Title	Part No.	Number	Manufacturer	Note
Connector	05JFAT-SAXGSA-L	1	LC T Mfg. 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)
	D V OI IVIZOUTO	(1 OI = 11 a1110)

Components

Title	Part No.	Number	Manufacturer	Note
Connector	04JFAT-SAXGSA-L	1	10 TM** 0 144	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.200 "List of Peripheral Equipments".

Connector Kit for Motor Connection (Driver side)

Part No	DV0PM20034	(For A-frame to D-frame)
Part NO.	DVUPIVIZUU34	(FUI A-IIAIIIE (U D-IIAIIIE)

Components

• Please refer to the Dimensions of driver P.47 for connector XB

Title	Part No.	Number	Manufacturer	Note
Connector	06JFAT-SAXGF	1	LS T Mfa 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.

· Components

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 XB

Connector Kit for Motor/Encoder Connection

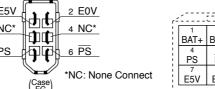
* When IP65 or IP67 are necessary, the customer must give appropriate processing.

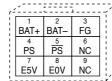
Part No.	DV0P4290	80 mm sq. or less Applicable model	MSMF 50 W to 1000 W *, MQMF 100 W to 400 W MHMF 50 W to 1000 W * (Leadwire type IP65)
			(Leadwire type ii 03)

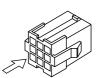
Components

Components				
Title	Part No.	Number	Manufacturer	Note
Connector (Driver side)	3E206-0100 KV	1	Sumitomo 3M (or equivalent)	For Connector X6 (6-pins)
Shell kit	3E306-3200-008	1		
Connector	172161-1	1	Tyco Electronics Japan G.K.	For Encoder cable (9-pins)
Connector pin	170365-1	9		
Connector	172159-1	1	Tyco Electronics Japan G.K.	For Motor cable (4-pins)
Connector pin	170366-1	4		

· Pin disposition of connector, · Pin disposition of connector connector X6 for encoder cable









for motor cable

Pin disposition of connector



MINAS A6 Family 186

* MSMF092L1 2, MHMF092L1 1

* When you connect the battery for absolute encoder, refer to P.194, "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.200 "List of Peripheral Equipments".

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MHMF 50 W, 100 W (Connector type IP67)

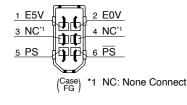
Options

80 mm sq. or less DV0PM20035 Part No. MSMF 50 W to 1000 W * (Connector type IP67) Applicable model

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 (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



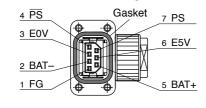
• Pin disposition of connector • Pin disposition of connector for encoder cable

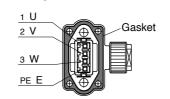
· Pin disposition of connector for motor cable

* MSMF092L1 1

[Direction of motor shaft]

Connector Kit for Motor/Encoder Connection



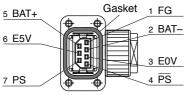


[Opposite direction of motor shaft]

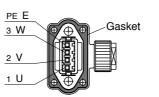
<Remarks>

Secure the gasket in place without removing it from the connector.

Otherwise, the degree of protection of IP67 will not be guaranteed.



* 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.200 "List of Peripheral Equipments".

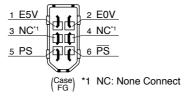
Components

Part No.

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	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)

connector X6

DV0PM24581



• Pin disposition of connector • Pin disposition of connector for encoder cable

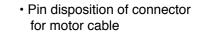
3 E0V

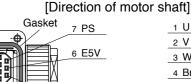
2 BAT-

1 FG

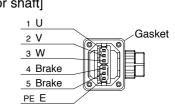
80 mm sq. or less

Applicable model





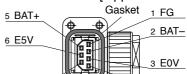
5 BAT+



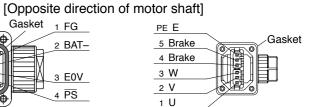
<Remarks>

Secure the gasket in place without removing it from the connector.

Otherwise, the degree of protection of IP67 will not be guaranteed.



* Pins 2 and 5 are left unused (NC) when used in incremental system.



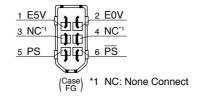
* 4-pin and 5-pin are not used in case of no brake.

Part No.		MQMF 100 W to 400 W, (Connector type IP67)	MHMF 200 W to 1000 W
	Applicable illouel	(Connector type IP67)	

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)

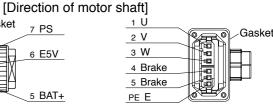
connector X6



• Pin disposition of connector • Pin disposition of connector for encoder cable

· Pin disposition of connector for motor cable

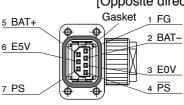
Gasket 4 PS 7 PS 3 E0V 6 E5V 2 BAT-5 BAT+



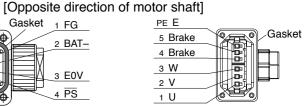
<Remarks>

Secure the gasket in place without removing it from the connector.

Otherwise, the degree of protection of IP67 will not be guaranteed.



* 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.

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Series

Imformation

Gasket

Connector Kit for Motor/Encoder Connection

* When IP65 or IP67 are necessary, the customer must give appropriate processing.

Without

brake

* MSMF102L1 ____, MHMF102L1 ____

* MSMF102L1 ____, MHMF102L1 ____

* MSMF102L1 , MHMF102L1 .

(IP67 motor) Encoder JN2 <Small size connector> 100 mm sq. or more Part No. DV0PM24583 MSMF 1.0 kW * to 2.0 kW, MDMF 1.0 kW to 2.0 kW Applicable model MHMF 1.0 kW *, 1.5 kW, MGMF 0.85 kW to 1.8 kW * MSMF102L1 , MHMF102L1 .

Components

Title	le Part No.		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	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	1	Electronics Ind.	(One-touch lock type)	

Part No.	DV0PM24585	100 mm sq. or more Applicable model	\parallel MSMF 1.0 kW * to 2.0 kW. MDMF 1.0 kW to 2.0 kW \parallel .	With brake
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Components

Title	Part No.	Number	Manufacturer	Note	
Connector (Driver side)	3E206-0100 KV	1	Sumitomo 3M	For Commenter VC (Coming)	
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.	DV0PM24587	100 mm sq. or more Applicable model		Without brake
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Components

Title	Title Part No.		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	JL10-6A20-29S	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	(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>	With brake
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Components

Title	Part No.	Number	Manufacturer	Note	
Connector (Driver side)	3E206-0100 KV	1	Sumitomo 3M	For Commenter VC (Coming)	
Shell kit	3E306-3200-008	1	(or equivalent)	For Connector X6 (6-pins)	
Encoder connector	JL10-6A20-29S	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.200 "List of Peripheral Equipments".

Part No.	DV0PM24584	100 mm sq. or more Applicable model	MSMF	notor) Encoder JN2 < 3.0 kW to 5.0 kW, 2.0 kW to 5.0 kW,	MDMF	e connector> 3.0 kW to 5.0 kW 2.9 kW, 4.4 kW	Without brake
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Components

Title	Part No.	Number	Manufacturer	Note	
Connector (Driver side)	3E206-0100 KV	1 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.		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	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	JL04-2428-CK(17)-R	1	Electronics Ind.	(One-touch lock type)	

Part No. DV0PM24588	100 mm sq. or more Applicable model		Without brake
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Components

Title	Part No.	Number	Manufacturer	Note	
Connector (Driver side)	3E206-0100 KV	1	Sumitomo 3M	For Open set at V6 (0 mins)	
Shell kit	3E306-3200-008	1	(or equivalent)	For Connector X6 (6-pins)	
Encoder connector	JL10-6A20-29S	1	Japan Aviation	For Encoder cable	
Cable clamp	JL04-2022-CK(14)-R	1	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.	MSN	DV0PM24590 100 mm sq. or more Applicable model	notor) Encoder JL10 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)		
Encoder connector	JL10-6A20-29S	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.200 "List of Peripheral Equipments".

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Connector Kit for Motor/Encoder Connection

* When IP65 or IP67 are necessary, the customer must give appropriate processing.

Without

brake

* MSMF102L1 ..., MHMF102L1 ...

* MSMF102L1 ____, MHMF102L1 ____

(IP67 motor) Encoder JN2 <Small size connector> 100 mm sq. or more DV0PM20036 MSMF 1.0 kW * to 2.0 kW, MDMF 1.0 kW to 2.0 kW Part No. Applicable model MHMF 1.0 kW *, 1.5 kW, MGMF 0.85 kW to 1.8 kW * 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)		
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-6A20-4SE-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 more Applicable model	I MSME 1.0 kW $^{\circ}$ to 2.0 kW. MDME 1.0 kW to 2.0 kW $^{\circ}$.	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)		
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	MISIME 10 KW "TO 20 KW MIDIME 10 KW TO 20 KW	Nithout 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	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	MSMF	notor) Encoder JL10 < 1.0 kW * to 2.0 kW, 1.0 kW *, 1.5 kW,	MDMF		With brake
_					* M	SMF102L1 \square , MHMF10	02L1 🗆 🗆

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	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.200 "List of Peripheral Equipments".

Part No.	DV0PM20037	100 mm sq. or more Applicable model	MSMF 3.0 KW to 5.0 KW, MDMF 3.0 KW to 5.0 KW	/ithou
			MHMF 2.0 kW to 5.0 kW, MGMF 2.9 kW, 4.4 kW	

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	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)	

Part 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 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-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 sq. or more Applicable model		Without brake
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Components

Title	Title Part No.		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	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 App	o mm sq. or more MSMI	motor) Encoder JL10 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 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/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.200 "List of Peripheral Equipments".

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Imformation

Battery for Absolute Encoder

Connector Kit for Motor/Brake Connection

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 coble
Socket contact	ST-TMH-S-C1B-3500	2	Electronics Ind.	For brake cable

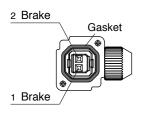
· Pin disposition of connector for brake cable

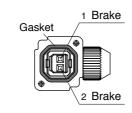
[Direction of motor shaft]

[Opposite direction of motor shaft]

Connector Kit for Motor/Brake Connection

* When IP65 or IP67 are necessary, the customer must give appropriate processing.





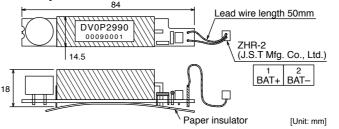
<Remarks>

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

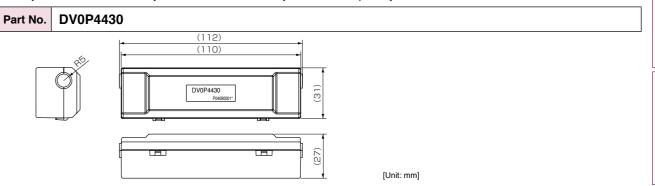


<Caution>

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.

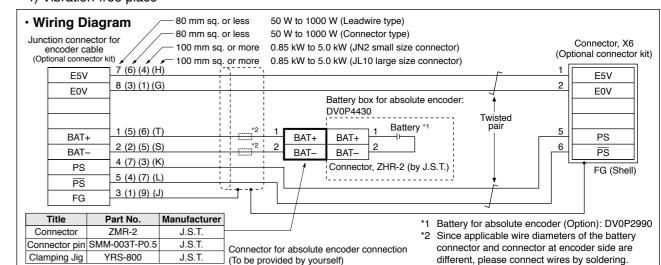
<Caution>

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

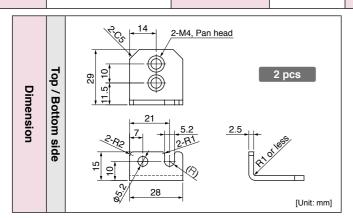


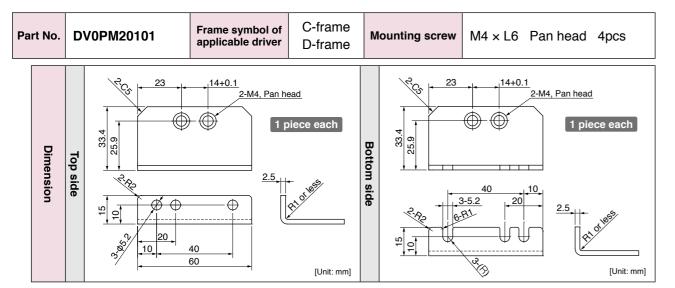
Part No.

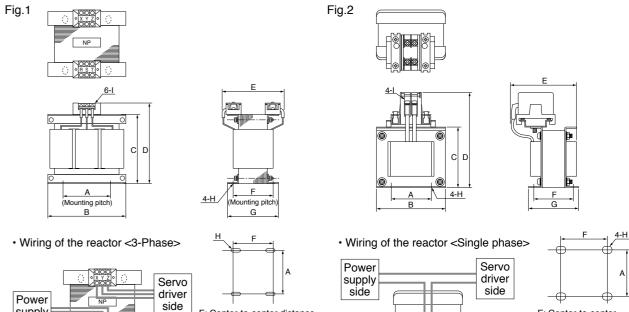
A-frame B-frame

Mounting Bracket

Mounting screw M4 × L6 Pan head 4pcs







Imformation

F: Center-to-center 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	l
Eig 1	DV0P222	60±1	150±1	(113)	155мах	140	70+3/-0	85±2	4-7φ×12	M4	2	8	
Fig.1	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	

^{*} For application, refer to P.23 to P.32 and P.117 to P.120 "Table of Part Numbers and Options".

: Center-to-center distance

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]

http://industrial.panasonic.com/ww/products/motors-compressors/fa-motors

<Remarks>

Reactor

When using a reactor, be sure to install one reactor to one servo driver.

195 MINAS A6 Family

External Regenerative Resistor

			Spec	ification	s			
Part No.	Manufacturer's	Resistance	cable core	Woight	Rated power (reference) ^{*1}		Activation temperature of	
Pait NO.	part No. diameter From air with fa		with fan 1 m/s ²	built-in thermal protector				
		Ω	mm	kg	W	W		
DV0P4280	RF70M	50		0.1	10	25		
DV0P4281	RF70M	100		0.1	10	25	140±5 °C B-contact	
DV0P4282	RF180B	25	φ1.27 / AWG18 \	0.4	17	50	Open/Close capacity	
DV0P4283	RF180B	50	stranded	0.2	17	50	(resistance load)	
DV0P4284	RF240	30	1 1110 /	0.5	40	100	1 A 125 VAC 6000 times 0.5 A 250 VAC 10000 times	
DV0P4285	RH450F	20		1.2	52	130		

Manufacturer : Iwaki Musen Kenkyusho

*1 Power with which the driver can be used without activating the built-in thermal protector.

A built-in thermal fuse and a thermal protector are provided for safety.

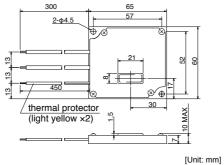
The circuit should be so designed that the power supply will be turned off as the thermal protector operates. The built-in thermal fuse blows depending on changes in heat dissipation condition, operating temperature limit, power supply voltage or load.

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.

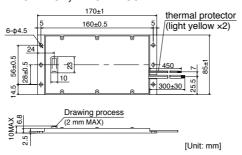
*2 If the wind speed is 1m / s by the fan.

	Powe	er 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	DV0D4292			
С	DV0P4282	DV0P4283			
D		DV0P4284			
E		DV0P4284 × 2 in parallel or DV0P4285			
F	_	DV0P4285 × 2 in parallel			
G		DV0P4285 × 3 in parallel			
Н		DV0P4285 × 6 in parallel			

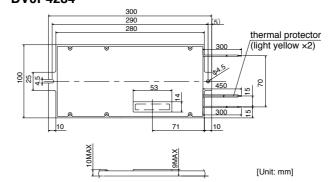
DV0P4280, DV0P4281



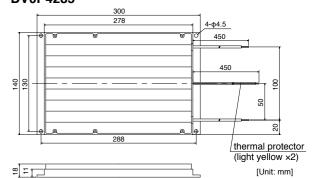
DV0P4282, DV0P4283



DV0P4284



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.

List of Peripheral Equipments

Imformation

■ 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	TND4500741/	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	
	1.0 kW to 3.0 kW	TNR9G820K	NIPPON CHEMI-CON CORPORATION	
MDMF	4.0 kW	Z15D151	SEMITEC Corporation	
	5.0 kW	NVD07SCD082	KOA Corporation	
	0.85 kW to 1.8 kW	TNR9G820K	NIPPON CHEMI-CON CORPORATION	
MGMF	2.9 kW	Z15D151	SEMITEC Corporation	
	4.4 kW	NVD07SCD082	KOA Corporation	

Surge Absorber for Motor Brake

Automotive & Industrial Systems Company Iwaki Musen Kenkyusho Co., Ltd. #81-44-833-4311 http://www.iwakimusen.co.jp/ #81-42-336-5300 http://www.koanet.co.jp/en/index.htm NIPPON CHEMI-CON CORPORATION SEMITEC Corporation #81-3-5436-7711 http://www.chemi-con.co.jp/e/index.html SEMITEC Corporation #81-3-3621-2703 http://www.semitec.co.jp/english2/ #81-184-53-2307 http://www.kk-corp.co.jp/ MICROMETALS (Nisshin Electric Co., Ltd.) #81-3-5201-7229 http://www.global.tdk.com/ Okaya Electric Industries Co. Ltd. Japan Aviation Electronics Industry, Ltd. Japan Moley Inc. #81-3-3780-2717 http://www.jae.co.jp/e-top/index.html #81-3-3780-2717 http://www.jae.co.jp/e-top/index.html	Manufacturer	Tel No. / Home Page	Peripheral components
Automotive & Industrial Systems Company Iwaki Musen Kenkyusho Co., Ltd. #81-44-833-4311 http://www.iwakimusen.co.jp/ #81-42-336-5300 http://www.koanet.co.jp/en/index.htm NIPPON CHEMI-CON CORPORATION *81-3-5436-7711 http://www.chemi-con.co.jp/e/index.html SEMITEC Corporation #81-3-3621-2703 http://www.semitec.co.jp/english2/ #81-184-53-2307 http://www.kk-corp.co.jp/ MICROMETALS (Nisshin Electric Co., Ltd.) *7DK Corporation *81-3-5201-7229 http://www.nisshin-electric.com/ *81-3-4544-7040 http://www.global.tdk.com/ Okaya Electric Industries Co. Ltd. *81-3-3780-2717 http://www.jae.co.jp/e-top/index.html #81-3-3780-2717 http://www.jae.co.jp/e-top/index.html	•	http://panasonic.net/es/	Circuit breaker
http://www.iwakimusen.co.jp/ resistor KOA Corporation H81-42-336-5300 http://www.koanet.co.jp/en/index.htm H81-3-5436-7711 http://www.chemi-con.co.jp/e/index.html SEMITEC Corporation KK-CORP.CO.JP MICROMETALS (Nisshin Electric Co., Ltd.) TDK Corporation Corporation All -3-3-201-7229 http://www.nisshin-electric.com/ H81-3-3-5201-7229 http://www.global.tdk.com/ All -3-3-4544-7040 http://www.okayaelec.co.jp/english/index.html Japan Aviation Electronics Industry, Ltd. Japan Moley Inc. H81-3-3780-2717 http://www.jae.co.jp/e-top/index.html H81-462-65-2313	·	http://panasonic.net/id/	Surge absorber Switch, Relay
NIPPON CHEMI-CON CORPORATION Http://www.koanet.co.jp/en/index.htm +81-3-5436-7711 http://www.chemi-con.co.jp/e/index.html SEMITEC Corporation KK-CORP.CO.JP MICROMETALS (Nisshin Electric Co., Ltd.) TDK Corporation Ckaya Electric Industries Co. Ltd. Japan Aviation Electronics Industry, Ltd. Http://www.jae.co.jp/e-top/index.html +81-3-5436-7711 http://www.koemitec.co.jp/english2/ +81-3-5201-7203 http://www.nisshin-electric.com/ +81-3-5201-7229 http://www.global.tdk.com/ +81-3-4544-7040 http://www.okayaelec.co.jp/english/index.html +81-3-3780-2717 http://www.jae.co.jp/e-top/index.html	Iwaki Musen Kenkyusho Co., Ltd.	101 11 000 1011	
NIPPON CHEMI-CON CORPORATION http://www.chemi-con.co.jp/e/index.html +81-3-3621-2703 http://www.semitec.co.jp/english2/ KK-CORP.CO.JP #81-184-53-2307 http://www.kk-corp.co.jp/ MICROMETALS (Nisshin Electric Co., Ltd.) TDK Corporation Okaya Electric Industries Co. Ltd. Japan Aviation Electronics Industry, Ltd. Http://www.jae.co.jp/e-top/index.html +81-3-62-65-2313 http://www.chemi-con.co.jp/e/index.html for holding brak #81-3-3621-2703 http://www.semitec.co.jp/english2/ #81-3-2307 http://www.nisshin-electric.com/ #81-3-5201-7229 http://www.global.tdk.com/ #81-3-4544-7040 http://www.okayaelec.co.jp/english/index.html #81-3-3780-2717 http://www.jae.co.jp/e-top/index.html	KOA Corporation		
KK-CORP.CO.JP Http://www.semitec.co.jp/english2/ +81-184-53-2307 http://www.kk-corp.co.jp/ MICROMETALS (Nisshin Electric Co., Ltd.) TDK Corporation Http://www.nisshin-electric.com/ +81-3-5201-7229 http://www.global.tdk.com/ Http://www.global.tdk.com/ Http://www.okayaelec.co.jp/english/index.html Http://www.okayaelec.co.jp/english/index.html Http://www.jae.co.jp/e-top/index.html Http://www.jae.co.jp/e-top/index.html Http://www.jae.co.jp/e-top/index.html	NIPPON CHEMI-CON CORPORATION		Surge absorber for holding brake
MICROMETALS (Nisshin Electric Co., Ltd.) TDK Corporation Okaya Electric Industries Co. Ltd. Japan Aviation Electronics Industry, Ltd. http://www.jae.co.jp/e-top/index.html +81-3-62-65-2313 http://www.kk-corp.co.jp/ http://www.kk-corp.co.jp/ http://www.kk-corp.co.jp/ http://www.kk-corp.co.jp/ http://www.kk-corp.co.jp/ http://www.nisshin-electric.com/ +81-3-5201-7229 http://www.global.tdk.com/ -81-3-4544-7040 http://www.okayaelec.co.jp/english/index.html +81-3-3780-2717 http://www.jae.co.jp/e-top/index.html	SEMITEC Corporation		
(Nisshin Electric Co., Ltd.) TDK Corporation Okaya Electric Industries Co. Ltd. Japan Aviation Electronics Industry, Ltd. http://www.jae.co.jp/e-top/index.html +81-3-452-2313 for signal lines for signal lines Surge absorber Noise filter	KK-CORP.CO.JP		
Okaya Electric Industries Co. Ltd. Japan Aviation Electronics Industry, Ltd. Http://www.global.tdk.com/ +81-3-4544-7040 http://www.okayaelec.co.jp/english/index.html Http://www.okayaelec.co.jp/english/index.html Http://www.jae.co.jp/e-top/index.html Http://www.jae.co.jp/e-top/index.html Http://www.jae.co.jp/e-top/index.html			
Okaya Electric Industries Co. Ltd. http://www.okayaelec.co.jp/english/index.html Noise filter +81-3-3780-2717 http://www.jae.co.jp/e-top/index.html +81-462-65-2313	TDK Corporation		
Japan Aviation Electronics Industry, Ltd. http://www.jae.co.jp/e-top/index.html +81-462-65-2313	Okaya Electric Industries Co. Ltd.		Surge absorber Noise filter
Janan Moley Inc	Japan Aviation Electronics Industry, Ltd.		
http://www.molex.co.jp	Japan Molex Inc.		
J.S.T. Mfg. Co., Ltd. +81-45-543-1271 http://www.jst-mfg.com/index_e.php Connector	J.S.T. Mfg. Co., Ltd.		Connector
Sumitomo 3M +81-3-5716-7290 http://solutions.3m.com/wps/portal/3M/ja_JP/ WW2/Country/	Sumitomo 3M	http:/solutions.3m.com/wps/portal/3M/ja_JP/	
Tyco Electronics Japan G.K. +81-44-844-8052 http://www.te.com/ja/home.html	Tyco Electronics Japan G.K.		
DYDEN CORPORATION +81-3-5805-5880 http://www.dyden.co.jp/english/index.htm Cable	DYDEN CORPORATION		Cable
DR. JOHANNES HEIDENHAIN GmbH +81-3-3234-7781 http://www.heidenhain.de/de_EN/company/contact/	DR. JOHANNES HEIDENHAIN GmbH	5 5=5 5 .	
Fagor Automation S.Coop. +34-943-719-200 http://www.fagorautomation.com	Fagor Automation S.Coop.		
Magnescale Co., Ltd. +81-463-92-7971 http://www.mgscale.com/mgs/language/english/	Magnescale Co., Ltd.		
Mitutoyo Corporation +81-44-813-8234 http://www.mitutoyo.co.jp/eng/	Mitutoyo Corporation		External scale
Nidec Sankyo Corporation +81-3-5740-3006 http://www.nidec-sankyo.co.jp/	Nidec Sankyo Corporation	+81-3-5740-3006	
Renishaw plc +44 1453 524524 www.renishaw.com	Renishaw plc		
Schaffner EMC, Inc. +81-3-5712-3650 http://www.schaffner.jp/	Schaffner EMC, Inc.		Nicion City
TDK-Lambda Corporation +81-3-5201-7140 http://www.tdk-lambda.com/	TDK-Lambda Corporation	+81-3-5201-7140	Noise filter

^{*} The above list is for reference only. We may change the manufacturer without notice.

199 MINAS A6 Family MINAS A6 Family 200

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

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List of Peripheral Components.

Contents

201 MINAS E Series MINAS E Series 202

Features

Lasy to Handle, Easy to Use

High-functionality Real-Time Auto-Gain Tuning (Note 1)

MINAS E Series

- 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.

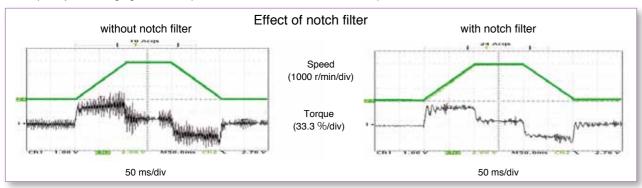
?. Further Reduction of Vibration

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.

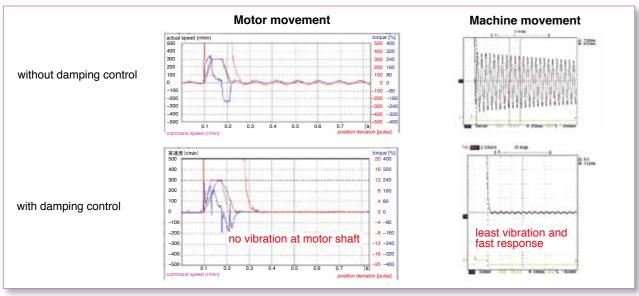
Notch filter (Note1)

- 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.227, 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.222 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 time.

Note) Refer to P.222 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 time

Note) Refer to P.222 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					
	EN61000-6-2	000-6-2 Immunity for Industrial Environments				
	EC61000-4-2	Electrostatic Discharge Immunity Test	l			
Motor and	IEC61000-4-3	Radio Frequency Electromagnetic Field Immunity Test	Conforms to references			
IEC61000-4-4 IEC61000-4-5 IEC61000-4-6	IEC61000-4-4	Electric High-Speed Transition Phenomenon/Burst Immunity Test	by EMC Directives			
	IEC61000-4-5	Lightening Surge Immunity Test				
	IEC61000-4-6	High Frequency Conduction Immunity Test				
	IEC61000-4-11	Instantaneous Outage Immunity Test				

IEC : International Electrotechnical Commission

EN : Europaischen Normen

EMC : Electromagnetic Compatibility

CSA: Canadian Standards Association

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

Panasonic Testing Centre

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

203 MINAS E Series MINAS E Series

MINAS E series

Motor Line-up

			Rated rotational	Rotary e	encoder	Brake	Gear					
	Motor series	Rated output (kW)	speed (Max. (speed) (r/min)	2500 P/r incremental	17bit absolute/ incremental	Holding	High precision	UL/ 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	



Model Designation

Servo Motor



Motor rated output

Symbol

Symbol

Symbol	Rated output
5A	50 W
01	100 W
02	200 W
04	400 W

Voltage specifications Symbol Specifications 100 V

2500 P/r

2 200 V 100 V/200 V common Z (50 W only)

Symbol Specifications

1 Standard

Design order

S

Т

10000

Pulse counts Resolution Wires

5

See P.213 for motor specifications

without with

•

Oil seal

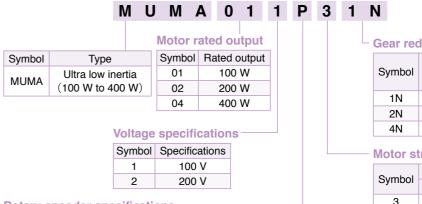
without with*

Motor with gear reducer

Rotary encoder specifications

Format

Incremental



Potary anadar englifications

Holary	encoder specific	Calions					
Symbol	Format	Pulse counts	Resolution	Wires			
Р	Incremental	2500 P/r	10000	5			

└ Gear reduction ration, gear type

	Gear	Moto	r outpu	t (W)		
Symbol	nbol reduction ratio	100	200	400	Gear type	
1N	1/5	•	•	•	Fau biada	
2N	1/9	•	•	•	For high accuracy	
4N	1/25	•	•	•	accuracy	

Motor structure

Key-way,

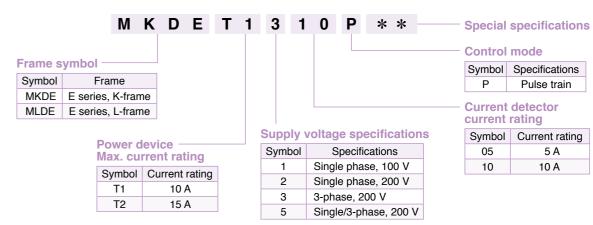
center tap

* Motor with oil seal is manufactured by order.

Cymbol	Shaft	Holding	g brake
Symbol	Key-way	without	with
3	•	•	
4	•		•

See P.218 for motor with gear reducer specifications

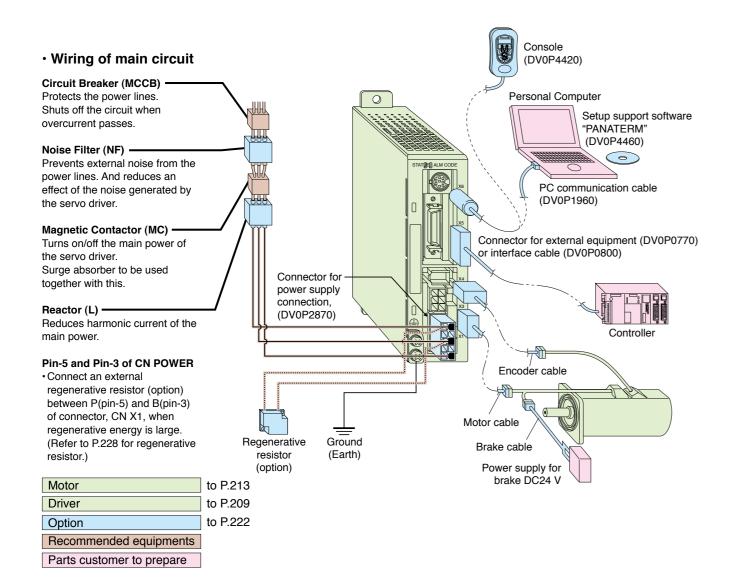
Servo Driver



See P.209 for driver specifications

205 MINAS E Series

Overall Wiring/ Driver and List of Applicable Peripheral Equipments



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 W	0.4 kVA	(5 A)	10 A (3P+1a)				
100 V		200 W	0.5 kVA	(10 A)		(or rra)	_		
Single	MUMA	50 W	0.3 kVA	(5 A)		15 A DV0P4160 (3P+1a)			
		100 W	U.S KVA		DV0P4160		0.7521. 0.052		
phase, 200 V		200 W	0.5 kVA				0.75 mm ² to 0.85 mm ² AWG18		
		400 W	0.9 kVA	(10 A)			AWGIO		
		50 W	0.01970	(5 A)		10 A			
3-phase		100 W	0.3 kVA						
200 V		200 W	0.5 kVA			(3P+1a)			
		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, (9) marked) between noise filter and power supply.
- For details of the noise filters, refer to P.240.

<Remarks>

· Use a copper conductor cables with temperature rating of 60 °C or higher for main power connector and ground

Use a cable for ground with diameter of 2.0 mm² (AWG14) or larger.

Carrying page							
	Part No.	Carrying page					
Console				DV0P4420	227		
Setup Support Software, PANATERM			Japanese English	DV0P4460	222		
RS232 Commu (for Connection			Cable	DV0P1960	227		
Interface Cable	9			DV0P0800	227		
Connector Kit f	for E	xter	nal Equipment	DV0P0770	226		
Connector Kit f	for N	/lotor	and Encoder	DV0P3670	225		
Connector Kit f	for D)rive	Power Supply	DV0P2870	225		
Encoder Cable			MFECA0 * *	224			
Motor Cable			MFMCA0 * *	0AEB	224		
Brake Cable			MFMCB0 * *	224			
Cable Set (3 m	ı) ^{(Not}	te 3)	DV0P37300	224			
Cable Set (5 m	ı) ^{(Not}	te 3)	DV0P39200	224			
DIN Rail Moun	t Un	it	DV0P3811		228		
External	10	0 V	50 Ω 10 W	DV0P2890	228		
Regenerative Resistor	20	0 V	100 Ω 10 W	DV0P2891	220		
			100 V	DV0P227			
Reactor				DV0P228	229		
			200 V	DV0P220			
Noise Filter				DV0P4160	240		
			gle phase 0 V, 200 V	DV0P4190	240		
		3-p	hase 200 V	DV0P1450			
Ferite core for	DV0P1460	240					

(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,
- 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

MINAS E Series

			2500P/r, Inc	remental					Option			
Power supply	Output (W)	Motor Note) 1	Rating/Spec. (page)	Driver	Dimensions (Frame (symbol)	Encoder Cable Note) 2	Motor Cable Note) 2		Brake Cable Note) 2	External Regenerative Resistor	Reactor	Noise Filter
Single	50	MUMA5AZP1 □	213	MKDET1105P	212 (K)						DV0P227	
phase	100	MUMA011P1 🗌	213	MKDET1110P	212 (K)	MEE OAO II II OE AM				DV0P2890	DVUFZZI	
100 V	200	MUMA021P1 🗌	213	MLDET2110P	212 (L)					DV0P228		
	50	MUMA5AZP1	215	MKDET1505P	212 (K)				MFMCB0 * *0GET	T DV0P2891		
Single	100	MUMA012P1	215	MKDET1505P	212 (K)						DV0P220	DV0P4160
phase 200 V	200	MUMA022P1	215	MLDET2210P	212 (L)		MEECAO * * OFAM MEMCAO * * OAFD					
	400	MUMA042P1	215	MLDET2510P	212 (L)	MFECA0 * * 0EAM	0 * * 0EAM MFMCA0 * * 0AEB					
	50	MUMA5AZP1	215	MKDET1505P	212 (K)							
	100	MUMA012P1	215	MKDET1505P	212 (K)							
3-phase 200 V	200	MUMA022P1	215	MKDET1310P	212 (K)							
250 V	400	MUMAO40D4	015	MLDET2510P	010 (1)							
	400	MUMA042P1	215	MLDET2310P	212 (L)							

- Note) 1 Motor model number suffix:
 - S: Key way with center tap, without brake
 - T: Kew way with center tap, with brake
- Note) 2 ** represents cable length. For details, refer to P.223.

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amily

Standard Wiring	Example of Main Circuit/
Encorder Wiring	Diagram

E Series

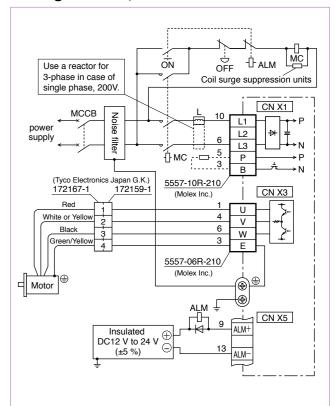
Wiring Diagram

Standard Wiring Example of Main Circuit

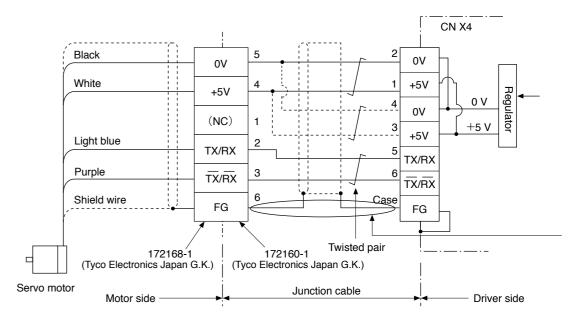
3-Phase, 200 V

HALM ME Coil surge suppression units CN X1 . Вмс -- □--<u>\$</u>-(Tyco Electronics Japan G.K.) 172167-1 172159-1 5557-10R-210/ CN X3 (Molex Inc.) Red White or Yellow 2 Black 5557-06R-210/ (Molex Inc.) 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.225, P.226 "Options" for connector.)

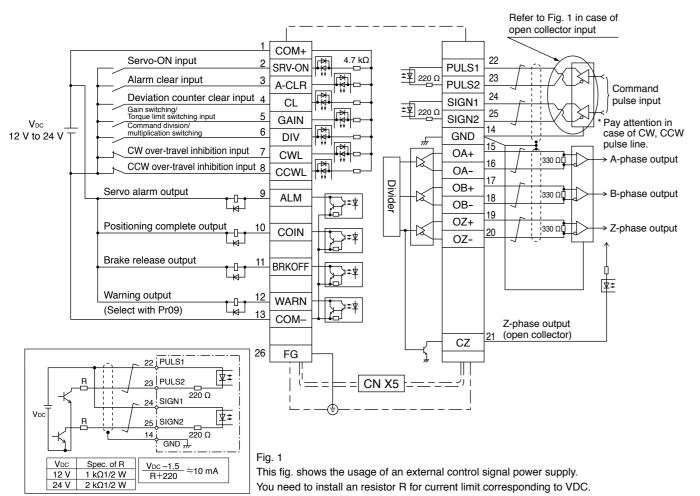
- 1) Refer the wiring diagram.
- 2) Use the twisted pair wire with shield, with core diameter of 0.18 mm² (AWG24) or larger, with higher bending resistance.
- 3) Use the twisted pair wire for the corresponding signal and power supply.
- 4) Shielding

Connect the shield of the driver to the case of CN X4. Connect the shield of the motor to Pin-6.

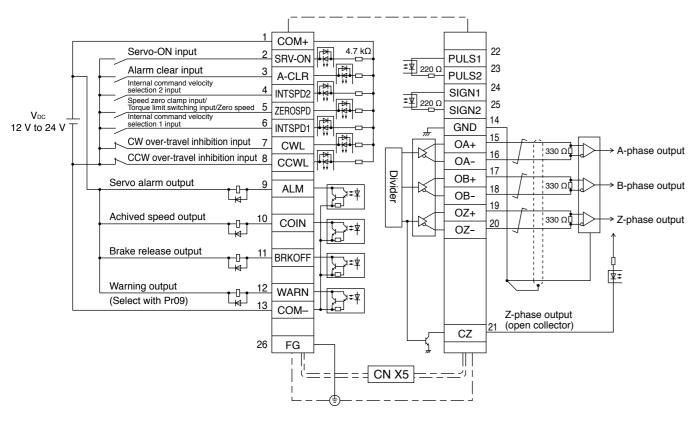
				±10 %	
= 5	<u> </u>	Single phase, 100 V		Single phase, 100 V to 115 V +10 % 50 Hz/60 Hz	
iibar bowei	PON L	Single phase, 200 V		Single phase, 200 V to 240 V +10 % 50 Hz/60 Hz	
ď	Ď	3-phase, 200 V		3-phase, 200 V to 240 V ⁺¹⁰ % 50 Hz/60 Hz	
9	TI S	Temperature		Operating: 0 °C to 55 °C, Storage: -20 °C to 65 °C (Max.temperature guarantee 80 °C for 72 hours <nomal temperature="">)</nomal>	
	≦.]	Humidity		Both operating and storage : 90 %RH or less (free from condensation)	
<u> </u>	A P	Altitude		1000 m or lower	
	3	Vibration		5.88 m/s² or less, 10 Hz to 60 Hz (No continuous use at resonance frequency)	
٧	Viths	stand voltage		Should be 1500 VAC (Sensed current: 20 mA) for 1 minute between Primary and Ground.	
C	Control method		ethod	IGBT PWM Sinusoidal wave drive	
S C E signa	Encoder feedback		eedback	2500 P/r (10000 resolution) incremental encoder	
<u>s</u>	တ္က လ	Input		7 inputs (1) Servo-ON, (2) Alarm clear and other inputs vary depending on the control mode.	
signal	ontrol	Output		4 outputs (1) Servo alarm, (2) Alarm, (3) Release signal of external brake and other outputs vary depending on the control mod	
ဟ	T	Input		2 inputs Supports both line driver I/F and open collector I/F.	
signal	ulse	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.	
С	Comi	munic	cation function RS232	1 : 1 communication to a host with RS232 interface is enabled.	
D	Displ	ay LE	ED .	(1) Status LED (STATUS), (2) Alarm code LED (ALM-CODE)	
В	Rege	nerat	tion	No built-in regenerative resistor (external resistor only)	
D	Dyna	mic b	rake	Built-in	
С	Conti	ontrol mode		3 modes of (1) High-speed position control, (2) Internal velocity control and (3) High-functionality positioning control are selectable with parameter.	
		Cont	trol input	(1) CW over-travel inhibition, (2) CCW over-travel inhibition, (3) Deviation counter clear, (4) Gain switching, (5) Electronic gear switching	
		Conf	trol output	(1) Positioning complete (In-position)	
	Positio		Max. command pulse frequency	Line driver : 500 kpps, Open collector : 200 kpps	
	Position control	Pulse input	Type of input pulse train	Differential input. Selectable with parameter, ((1) CW/CCW, (2) A and B-phase, (3) Command and Direction)	
			Electronic gear (Division/Multiplication) of command pulse	Setup of electronic gear ratio Setup range of (1-10000) × 2 ⁽⁰⁻¹⁷⁾ /(1-10000)	
			Smoothing filter	Primary delay filter or FIR type filter is selectable to the command input.	
=	nter	Control 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	
<u>a</u>	<u> </u>	Conf	trol output	(1) Speed arrival (at-speed)	
a d	n e	Inter	nal speed command	Internal 4-speed is selectable with control input.	
ווופווומו אספפט כסווווסו	d Cont	Soft-start/down function		Individual setup of acceleration and deceleration are enabled, with 0 s to 10 s/1000 r/min. Sigmoid acceleration/deceleration is also enabled.	
5	<u> </u>	Zero	-speed clamp	0-clamp of internal speed command with speed zero clamp input is enabled.	
		Auto-ga	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.	
		Auto-gain 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.	
		Masking of unnecessary input		Masking of the following input signal is enabled. (1) Over-travel inhibition, (2) Speed zero clamp, (3) Torque limit switching	
	Comm	Division of encoder feedback pulse		1 P/r to 2500 P/r (encoder pulses count is the max.).	
=	2	Protective function	Hardware error	Over-voltage, under-voltage, over-speed over-load, over-heat, over-current and encoder error etc.	
		ctive	Software error	Excess position deviation, command pulse division error, EEPROM error etc.	
		Trac	eability of alarm data	Traceable up to past 14 alarms including the present one.	
		Damping control function		Manual setup with parameter	
		Manual Setup support software		Console	
		Setup support software		PANATERM (Supporting OS: Windows98, Windows ME, Windows2000, and WindowsXP)	

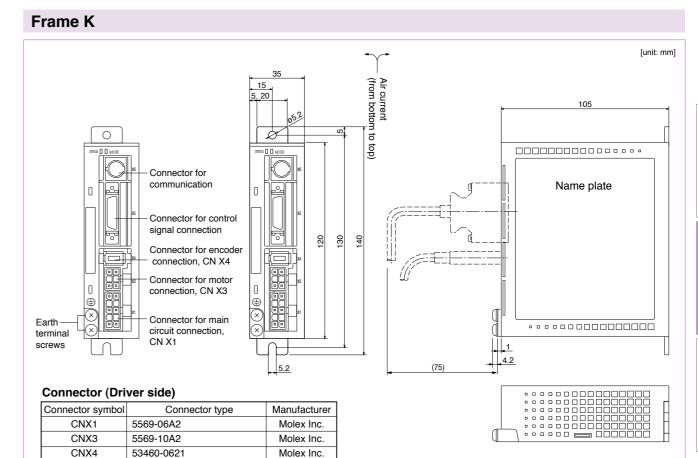
209 MINAS E Series

Control Circuit Standard Wiring Example



CN X 5 Wiring Example at Internal Velocity Control Mode

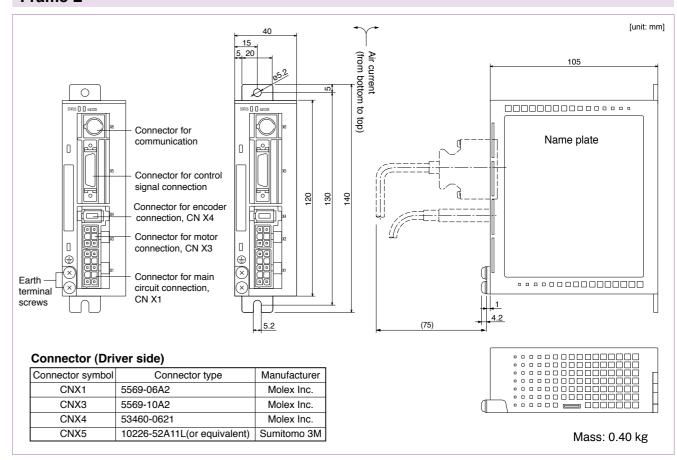




Frame L

CNX5

10226-52A11L(or equivalent) | Sumitomo 3M



211 MINAS E Series 212

Mass: 0.35 kg

100 V **MUMA** 50 W to 200 W

AC100 V 5AZP1 021P1 **MUMA** 011P1 Motor model Model No. MKDET1105P MKDET1110P MLDET2110P Applicable driver Frame symbol Frame K Frame L Power supply capacity (kVA) 0.5 0.3 0.4 Rated output (W) 50 100 200 Rated torque (N·m) 0.16 0.32 0.64 Momentary Max. peak torque (N·m) 0.95 1.91 0.48 Rated current (Arms) 2.5 1.0 1.6 Max. current (Ao-p) 4.3 6.9 11.7 Regenerative brake Without option No limit Note)2 frequency DV0P2890 No limit Note)2 Rated rotational speed (r/min) 3000 Max. rotational speed (r/min) 5000 Moment of inertia Without brake 0.021 0.032 0.10 of rotor (×10⁻⁴ kg·m²) 0.026 0.036 0.13 Recommended moment of inertia ratio 30 times or less of the load and the rotor Note)3 2500 P/r Rotary encoder specifications Incremental 10000 Resolution per single turn Protective enclosure rating IP65 (except rotating portion of output shaft and lead wire end) 0 °C to 40 °C (free from freezing), Storage : –20 °C to 65 °C Ambient temperature (Max.temperature guarantee 80 °C for 72 hours <nomal humidity>) 85 %RH or lower (free from condensing) Ambient humidity Environment Indoors (no direct sunlight), free from corrosive gas, inflammable gas, oil mist and dust Installation location 1000 m or lower Altitude 49 m/s2 or less Vibration resistance Mass (kg), () represents holding brake type 0.4 (0.6) 0.5 (0.7) 0.96 (1.36)

Brake specifications (This brake will be released when it is energized. Do not use this for braking the motor in motion.)				
Static friction torque (N m)	0.29	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 %			

Permissible load			
During assembly	Radial load P-direction (N)	147	392
	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
- F	Thrust load B-direction (N)	58	98

For motor dimensions, refer to P.217, and for the diver, refer to P.212.

Model Designation

Design order Symbol Type 1 : Standard Ultra low inertia MUMA (50 W to 200 W)

Motor rated output Symbol Rated output 5A 50 W 01 100 W

200 W

Voltage specifications Symbol Specifications 100 V 100/200 V Z (50 W only)

notor structure					
	Shaft	Holding	brake	Oil s	eal
Symbol	Key-way, center tap	without	with	without	with
S	•	•		•	
Т	•		•	•	

Rotary encoder specifications

MUMA011P1

iolary chicoder opcomoditions					
Symbol	Format	Pulse counts	Resolution	Wires	
Р	Incremental	2500 P/r	10000	5	

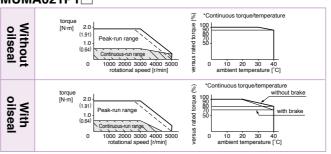
Torque Characteristics [at AC100 V of power voltage (Dotted line represents the torque at 10 % less supply voltage.)]

MUMA5AZP1

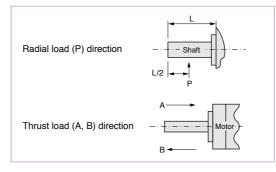
Without oilseal

MUMA021P1

02



*When you lower the torque limit setup (Pr5E and 5F), running range at high speed might be lowered as well. Running range (Torque limit setup: 300 %) Running range (Torque limit setup: 200 %) Running range (Torque limit setup : 100 %



- 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 regenerative 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)

213 MINAS E Series MINAS E Series 214 **Motor Specifications**

200 V **MUMA** 50 W to 400 W

Low inertia

AC200 V 5AZP1 012P1 022P1 042P1 MUMA Motor model MKDET1310P MLDET2310P Model No MKDET1505P MKDET2210P MLDET2510P Applicable driver Frame K Frame symbol Frame K Frame L Frame L 0.3 0.3 0.5 0.9 Power supply capacity (kVA) 100 50 200 400 Rated output (W) 0.16 0.32 0.64 1.3 Rated torque (N · m) 0.48 0.95 1.91 3.8 Momentary Max. peak torque (N · m) 1.0 1.0 1.6 25 Rated current (Arms) 4.3 7.5 Max. current (Ao-p) 4.3 11.7 Regenerative brake Without option No limit Note)2 frequency (times/min) DV0P2891 No limit Note)2 Note)1 Rated rotational speed (r/min) 3000 Max. rotational speed (r/min) 5000 Moment of inertia Without brake 0.021 0.032 0.10 0.17 of rotor With brake 0.026 0.036 0.13 0.20 (×10⁻⁴ kg·m²) Recommended moment of inertia ratio 30 times or less of the load and the rotor Note)3 2500 P/r Rotary encoder specifications Incremental Resolution per single turn 10000 Protective enclosure rating 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 Ambient temperature (Max.temperature guarantee 80 °C for 72 hours <nomal humidity>) Ambient humidity 85 %RH or lower (free from condensing) Environment Installation location Indoors (no direct sunlight), free from corrosive gas, inflammable gas, oil mist and dust Altitude 1000 m or lower Vibration resistance 49 m/s2 or less Mass (kg), () represents holding brake type 0.4 (0.6) 0.5 (0.7) 0.96 (1.36) 1.5 (1.9)

Brake specifications (This brake will be released when it is energized. Do not use this for braking the motor in motion.)									
Static friction torque (N · m)	0.29	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 %							

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				
ope.auon	Thrust load B-direction (N)	58	98				

For motor dimensions, refer to P.217, and for the driver, refer to P.212.

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

M S Design order Symbol Type 1 : Standard Ultra low inertia MUMA (50 W to 400 W)

Motor rated output Symbol Rated output 5A 50 W 01 100 W 02 200 W 04 400 W

Voltage specifications Symbol Specifications 2 200 V 100/200 V Z (50 W only)

Motor structure

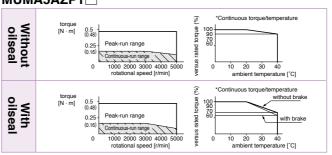
	Shaft	Holding	brake	Oil s	eal
Symbol	Key-way, center tap	without	with	without	with
S	•	•		•	
T	•		•	•	

Rotary encoder specifications

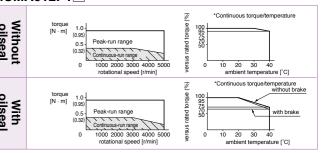
Symbol	Format	Pulse counts	Resolution	Wires
Р	Incremental	2500 P/r	10000	5

Torque Characteristics [at AC200 V of power voltage (Dotted line represents the torque at 10 % less supply voltage.)]

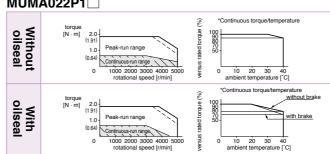
MUMA5AZP1



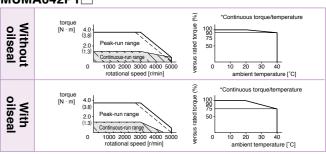
MUMA012P1



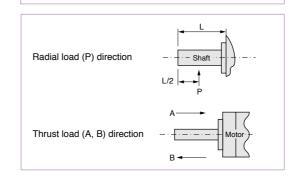
MUMA022P1



MUMA042P1



*When you lower the torque limit setup (Pr5E and 5F), running range at high speed might be lowered as well. Running range (Torque limit setup: 300 %) Running range (Torque limit setup: 200 %) Running range (Torque limit setup : 100 %



- 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 regenerative 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)

215 MINAS E Series MINAS E Series 216

Type of

reducer

For High

400

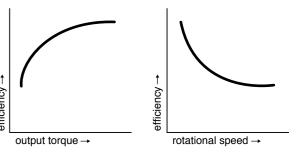
MINAS E Series

Motors with Gear Reducer

Motor Types with Gear Reducer

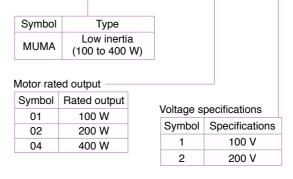
Reduction	Мо	Type of		
ratio	100	200	400	reducer
1/5	•	•	•	
1/9	•	•	•	For high precision
1/25	•	•	•	precision

Efficiency of the gear reducer shows the following inclination in relation to output torque and rotational speed.



Model No. Designation

e.g.) M U M A



	Symbol	
	Symbol	K
Vire	3	

Rotary encoder specifications Symbol Format Pulse counts Pulse counts 2500 P/r 10000

Motor structure Holding brake

Motor types with gear reducer

Reduction

ratio

1/5

1/9

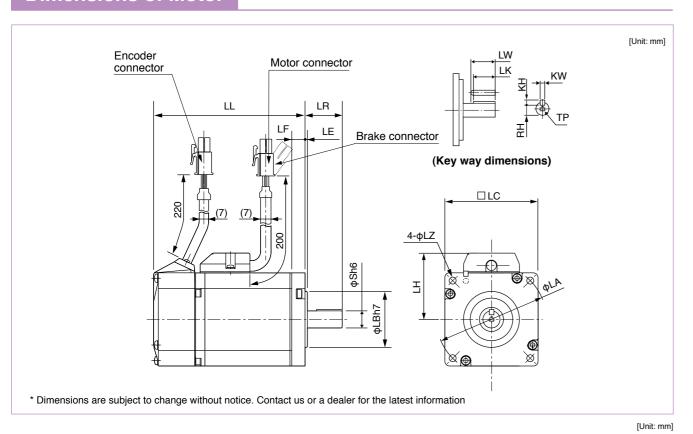
1/25

2N

4N

Specifications of Motor with Gear Reducer

	Motor type	MUMA				
	Backlash	3 minutes or smaller (initial value) at output shaft of the reducer				
	Composition of gear	Planetary gear				
	Gear efficiency	65 % to 85 %				
	Rotational direction at output shaft (of reducer)	Same direction as the motor output shaft				
Gear	Composition of gear	Planetary gear				
reducer	Mounting method	Flange mounting				
	Permissible moment of inertia of the load	10 times or smaller than reter moment of inertia of the motor				
	(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				
	Ambient humidity	85 %RH (free from condensation) or less				
Environment	Vibration resistance	49 m/s ² or less (at motor frame)				
	Impact resistance	98 m/s² or less				



MUMA series (Ultra low inertia)

refer to Options, P.225, P.226.

200 W

02 P1

400 W

04□P1□

100 W

01 🗆 P1 🗀

MUMA 50 W to 400 W

Rotary encoder specifications		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		With brake	107	124	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	KH		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

<Cautions>

Connector/Plug specifications

Motor output

Motor model

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.

50 W

5A 🗆 P1 🗆

MUMA

217 MINAS E Series

Motors with Gear Reducer

Table of Motor Specifications/ The Combination of the Driver and the Motor

Table of Motor with Gear Reducer Specifications

	Motor					М	JMA with g	ear reduc	er				
Model	Output	Reduction	Output	Rated			Peak max.	Moment of inertia (motor + reducer/converted) to motor shaft				Permissible radial load	Permissible thrust load
		ratio		speed	speed	torque	torque	w/o brake	w/ brake	w/o brake	w/ brake	raulai luau	liliusi loau
	(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.221.

The Combination of the Driver and the Motor with Gear Reducer

Combination w	bination with driver 100 V			200 V					
Encoder	Motor	Part No. of motor	Part No. of motor Single phase, 100 V Part		3-phase, 200 V	Single phase, 200 V			
Encoder	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			MUMA042P N	MLDET2510P	MLDET2510P			
	400 00	_	_	IVIUIVIAU42PUUN	MLDET2310P	WILDE 125 TUP			

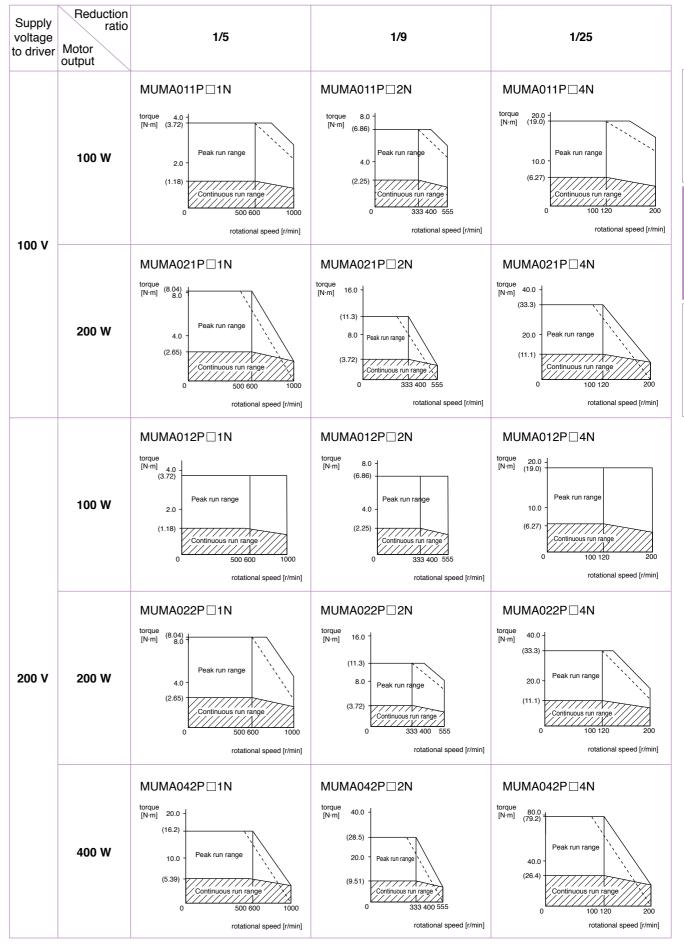
For dimensions, refer to P.212.

Torque Characteristics

E Series

Motors with Gear Reducer

For High Precision (MUMA Series 100 W to 400 W)



Dotted line represents the torque at 10 % less supply voltage.

219 MINAS E Series 220

Setup Support Software

MUMA series with Gear Reducer

(Detailed dimensions of shaft end) (LG) LR Encoder connecter (AMP) Motor connector (AMP) Brake connector (AMP) \Box LC LK

Motor Dimensions

2500 P/r Encoder

																[U	nit: mm]	
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 92.5														
WOWAUTET ETT		173	223.5	124	24 32	20	52	50	60	12	10	M5	18	67.5		4×4×16	2.5	
MUMA01□P□2N	100 W	1/9	192		32	20	52	50	60	12	10	(Depth: 12)	10	67.5		4x4x10	2.5	
WOWAUTEEZN	100 W	179	223.5	124														
MUMA01□P□4N		1/25	234.5	92.5	5 50	30	78	70	90	19	17	M6	26	92		6×6×22	3.5	
WOWAUT_F_4N		1/25	266	124		50	30	/6	70	90	19	17	(Depth: 20)	20	92	3	0X0X22	3.5
MUMA02 P 1N		1/5	200.5	96	32	20	52	50	60	12	2 10	M5	18	72.5		4×4×16	2.5	
WOWAUZ_P_TN		1/5	233.5	129		32	2 20	20	32	32 30	60	12	10	(Depth: 12)	10	12.5		4x4x10
MUMA02 P 2N	000 14/	1/9	235.5	96								47 M6		89.5				
WOWAUZ_F_ZN	200 W	179	268.5	129										89.5				
MUMA02 P 4N		1/25	246	96										400	1			
WOWAUZ_F_4N		1/25	279	129	50	30	78	70	90	19			26	100		6600	2.5	
MUMA042P□1N		1/5	263	123.5	50	30	/6	70	90	19	17	(Depth: 20)	20			6×6×22	3.5	
WOWAU42F IN		1/5	296	156.5										00.5				
MUMA042P□2N	400 14/	1/9	263	123.5										89.5				
WUWAU42P_ZN	400 W	179	296	156.5														
MUMA O A O D TAN		1/05	288.5	123.5	0.4	40	00	00		0.4		M8		104	_			
MUMA042P□4N		1/25	321.5	156.5	61	40	98	90	115	24	18	(Depth: 20)	35	104	5	8×7×30	4	

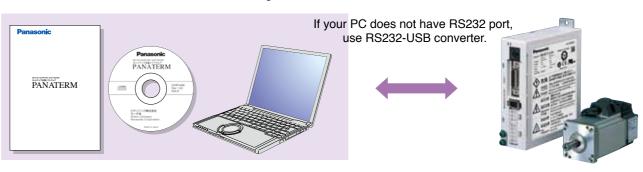
Upper column: without brake Lower column : with brake

[Unit: mm]

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

- 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

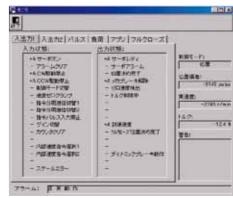
Frequency analysis

• Measures frequency characteristics of the machine, and displays Bode diagram.

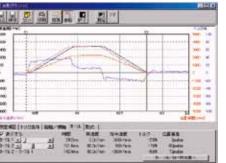
■ Can not use with A5, A6 family.

日本の人の知ら一十一日刊であ、U.G.I. (計画の日本) イダンモラン・フテム 日本の大学 リステン・ II RIGENISTIO 2 MINUS-TRACTOR D ROBBERSON 4 MINNODOWNERS 15 ##3+-F3+9-F 16 34-F3+9-F3+50#EB

Parameter



Monitor



Graphic waveform display

[Personal computer] • CPU : Pentium 100MHz or more • Memory : 16 MB or more (32 MB recommended)

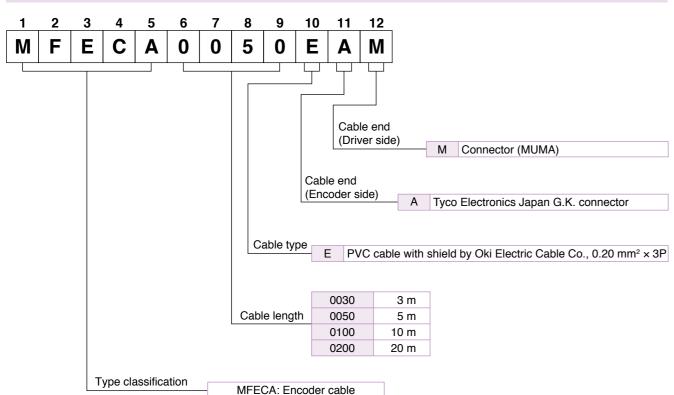
- · Hard disk capacity (vacancy of 25 MB or more recommended) · OS: Windows® 98, Windows® Me, Windows® 2000, Windows® XP (US version)
- Communication speed of serial communication port : 2400 bps or more (The software may not operate normally using USB-to-Serial adapter.)

[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

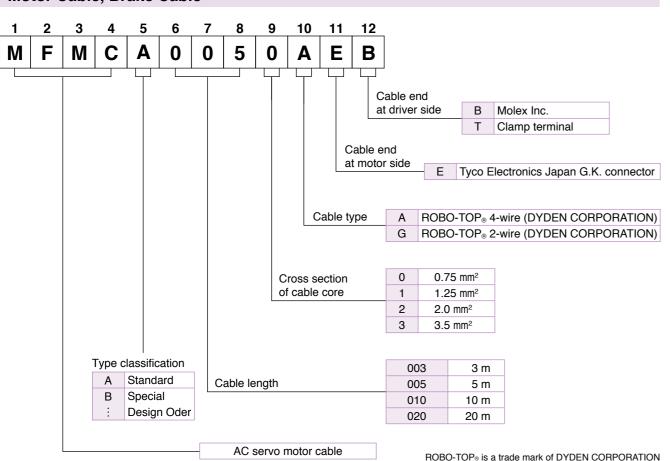
Cable

Encoder Cable



Cable part No. Designation

Motor Cable, Brake Cable



Cable Set (3 m)

Part No. DV0P37300

- 1) Interface cable: DV0P0800
- 2) Encoder cable (3 m): MFECA0030EAM
- 3) Motor cable (3 m): MFMCA0030AEB
- Connector kit for driver power supply connection : DV0P2870

Cable Set (5 m)

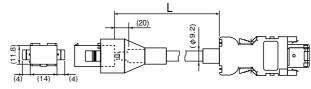
Part No. DV0P39200

- 1) Interface cable: DV0P0800
- 2) Encoder cable (5 m): MFECA0050EAM
- 3) Motor cable (5 m): MFMCA0050AEB
- 4) Connector kit for driver power supply connection : DV0P2870

Encoder Cable

Part No. MFECA0 * * 0EAM

[Unit: mm]



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	Type Fleetrenies	10	MFECA0100EAM
Connector Pin	170365-1	Tyco Electronics	20	MFECA0200EAM
Cable	0.20 mm ² × 3P	Oki Electric Cable Co., Ltd.		

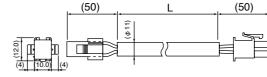
Motor Cable (ROBO-TOP_® 105 °C 600 V . DP)

ROBO-TOP_® is a trade mark of DYDEN CORPORATION



[Unit: mm]

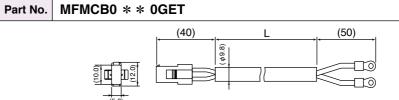
[Unit: mm]



Title	Part No.	Manufacturer	L (m)	Part No.
Connector	172159-1	Tugo Flootronico	3	MFMCA0030AEB
Connector Pin	170362-1, 170366-1	Tyco Electronics	5	MFMCA0050AEB
Connector	5557-06R-210	Molex Inc	10	MFMCA0100AEB
Connector Pin	5556T	IVIOLEX ITIC	20	MFMCA0200AEB
Cable	BOBO-TOP 600 V 0.75 mm ²	Daiden Co. Ltd		

Brake Cable (ROBO-TOP_® 105 °C 600V . DP)

 $\ensuremath{\mathsf{ROBO\text{-}TOP}}\xspace_{\circledcirc}$ is a trade mark of DYDEN CORPORATION



Title	Part No.	Manufacturer	L (m)	Part No.
Connector	172157-1	Tugo Floatronico	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 ²	Daiden Co.,Ltd.	20	MFMCB0200GET

223 MINAS E Series 224

Connector Kit for Power Supply Connection

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 IIIc.	(10 pins)

Pin configuration of connector CN X1

					-,-
10	9	8	7	6	Ĭ
L1	(NC)	L2	(NC)	L3	i
5	4	3	2	1	į.
Р	(NC)	В	(NC)	E	i



Connector Kit

Recommended manual crimping tool (to be prepared by customer)

Part No.	Cable material
57026-5000	UL1007
57027-5000	UL1015

<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.210 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.)

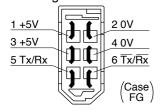
Parts composition

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	Tugo Floatronico	For junction to encoder cable
Connector pin	170365-1	6	Tyco Electronics	(6 pins)
Connector (4 pins)	172159-1	1	Tuga Flactronica	For junction to motor power cable
Connector pin	170366-1	4	Tyco Electronics	(4 pins)
Connector (6 pins)	5557-06R-210	1	Moley Inc	For connector, CN X3
Connector pin	5556PBTL	4	Molex Inc.	(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)

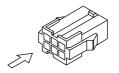
Title	Part No.	Manufacturer	Cable material
For encoder cable junction	755330-1	Type Floatronice	
For motor power cable junction	junction 755331-1 Tyco Electronics		_
For Connector CN X3	57026-5000	Molex Inc.	UL1007
For Connector CN A3	57027-5000	Willex IIIC.	UL1015

<Remarks>

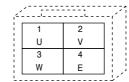
- 1. The above pin configuration is shown when viewed from the pin-soldering direction. Make a correct wiring by checking the stamped pin numbers on the connector itself.
- 2. Connect the shield of the wire to the case (FG) without fail.
- 3. For wiring and connection, refer to P.210.

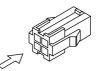
Pin configuration of encoder cable junction

<i>(</i> -]	
1	1	2	3	
i	NC	TX/RX	TX/RX	
1	4	5	6	
į	+5V	0V	FG	1

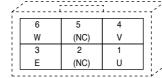


Pin configuration of motor power cable junction





Pin configuration of mating connector to CN X3 connector





<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.210 for wiring and connection.

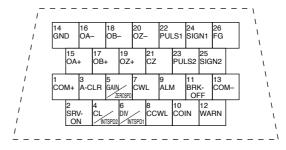
Connector Kit for External Peripheral Equipment

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.211 for symbols and functions of the above signals.

DIN Rail Mounting Unit/ External Regenerative Resistor

Part No. DV0P0800

Dimensions

Wiring table
Pin No. Title of signal

COM+

SRV-ON

A-CLR

CL/INTSPD2

GAIN/ZEROSPD

DIV/INTSPD1

CWL

CCWL

ALM

mformatio

DIN Rail Mounting Unit

Part No. DV0P3811

Dimensions

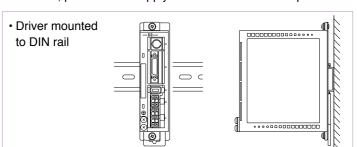
35 2-M4, bar ring (for mounting) Mounting plate Rail stopper (6)

<Notes>

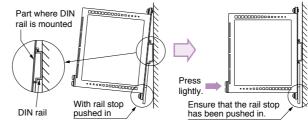
2 mounting screws (M4 X L8, Pan head) are attached. Rail stopper can be extended to max. 10 mm.

<Cautions>

Please read carefully operation manual before using this product. In addition, please do not apply excessive stress to the product.

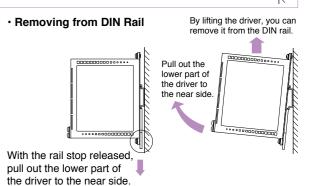


· How to Install



Press lightly the lower part of the main body of driver.

[Unit: mm



9

<Notes>

2

3

4

5

6

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.

COIN

BRK-OFF

WARN

COM-

GND

OA+

OA-

OB+

OB-

Interface Cable/

Shell kit: 10326-52A0-008

Plug: 10126-3000PE by Sumitomo 3M or equivalent

Orange (Red 1)

Orange (Black 1)

Gray (Red 1)

Gray (Black 1)

White (Red 1)

White (Black 1)

Yellow (Red 1)

Yellow (Black 1)

Pink (Red 1)

Color or cable Pin No. Title of signal

10

11

12

13

15

16

17

18

MD connector

by Sumitomo 3M or equivalent

Communication Cable/ Console

Color or cable

Pink (Black 1)

Orange (Red 2)

Orange (Black 2)

Gray (Red 2)

Gray (Black 2)

White (Red 2)

White (Black 2)

Yellow (Red 2)

Yellow (Black 2)

Pin No. Title of signal

19

20

21

22

23

24

25

26

OZ+

OZ-

CZ

PULS₁

PULS2

SIGN1

SIGN₂

FG

Cable of 2 m is connected.

Color or cable

Pink (Red 2)

Pink (Black 2)

Orange (Red 3)

Gray (Red 3)

Gray (Black 3)

White (Red 3)

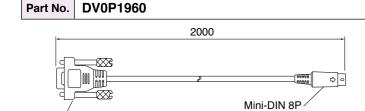
White (Black 3)

Orange (Black 3)

<Remarks>

The shield of this cable is not connected to a connector pin. To connect the shield to FG or GND at the driver side, use a connector kit for external device connection.

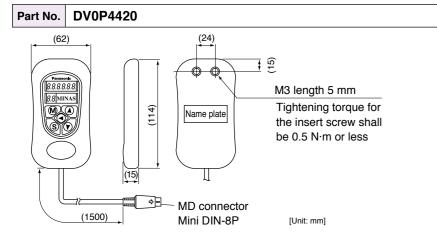
Communication Cable (For Connection with PC)



[Unit: mm]

Console

D-sub connector 9P



External Regenerative Resistor

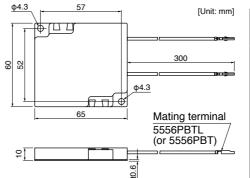
Hook the upper side of DIN rail

mounting part on the DIN rail.

Dimensions

		Specifications			
Part No.	Manufacturer's Part No.	Resistance	Rated power	Activation temperature of built-in fuse	Note (Input Power of drive)
		Ω	W	°C	
DV0P2890	45M03	50	10	137 ⁺³ ₋₂	Single phase, 100 V
DV0P2891	45M03	100	10	137 ⁺³ ₋₂	Single/3-phase, 200 V

Manufactured by Iwaki Musen Kenkyuusho Co., Ltd.



<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.

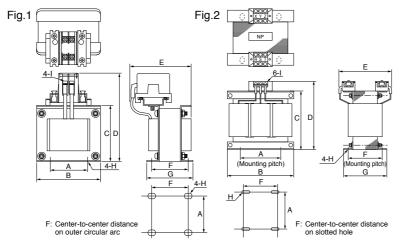
The thermal fuse may blow due to heat dissipating condition, working temperature, supply voltage or load fluctuation. Make it sure that the surface temperature of the resistor may not exceed 100 °C at the worst running conditions with the machine, which brings large regeneration (such case as high supply voltage, load inertia is large or deceleration time is short) Please carry out air cooling if needed.

227 MINAS E Series 228

List of Peripheral Components

Reactor

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	DV0P220	
	Single phase, 100 V	200 W	DV0P228	1
MLDE	Single phase, 200 V	·		2
	3-phase, 200 V	400 W		



Surge Absorber for Motor Brake

Unit: mm]

	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]

http://industrial.panasonic.com/ww/products/motors-compressors/fa-motors

Reactor/

<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

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/	Ferite core for signal lines
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

^{*} The above list is for reference only. We may change the manufacturer without notice.

229 MINAS E Series 230

MEMO

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During the rotation or the servo lock

Torque [%]

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).

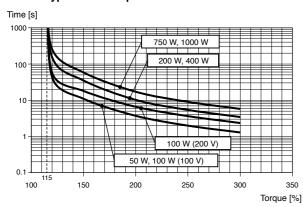
- (1) Use the driver in an environment of Pollution Degree 2 or 1 prescribed in IEC60664-1. (e.g. Install in the control box with IP54 enclosure.)
- (2) Make sure to install a circuit breaker or fuse which are UL recognized (Listed (h) marked) between the power supply and the noise filter.
 - For rated current of circuit breaker and fuse, refer to P.21 "Driver and List of Applicable Peripheral Equip-
 - 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.

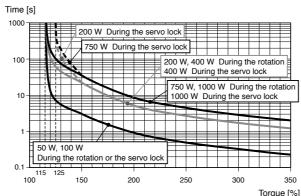
Set up the peak permissible current with Pr0.13 (Setup of 1st torque limit) and Pr5.22 (Setup 2nd torque

■ Overload protection time characteristics

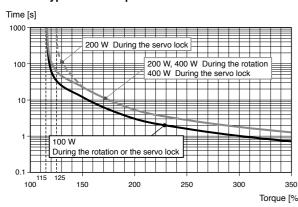
· Motor type: 80 mm sq. or less MSMF

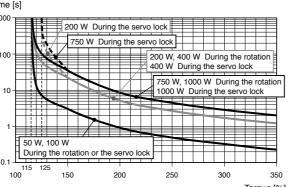


· Motor type: 80 mm sq. or less MHMF

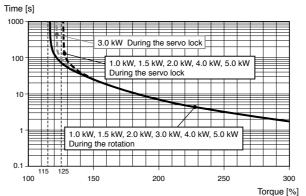


· Motor type: 80 mm sq. or less MQMF

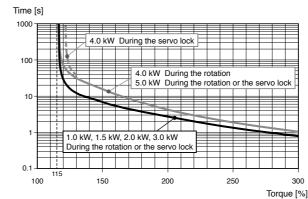




· Motor type: 100 mm sq. or more MSMF



· Motor type: 100 mm sq. or more MDMF

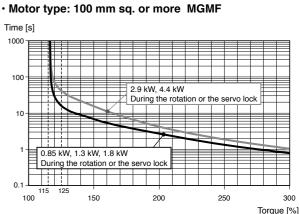


1.0 kW, 1.5 kW During the rotation or the servo lock

During the rotation

· Motor type: 100 mm sq. or more MHMF

Time [s]



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	ISO13849-1(PL e, Cat.3) EN61508(SIL3) EN62061(SILCL 3) EN61800-5-2(SIL3, STO) IEC61326-3-1 IEC60240-1	_
UL Standards		UL508C (E164620)	UL1004-1, UL1004-6 (E327868)
CSA Standards	S	C22.2 No.14	C22.2 No.100-4
Radio Waves A (South Korea)		KN11 KN61000-4-2,3,4,5,6,8,11	_

: International Electrotechnical Commission

FΝ : Europaischen Normen **EMC**: Electromagnetic Compatibility UI : 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 A6 SE, A6 SG 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.

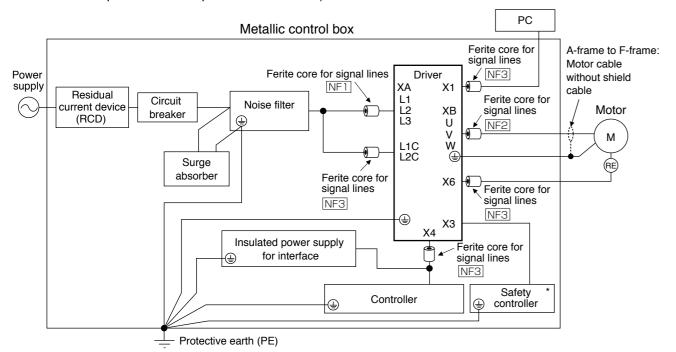
(대상기종: Servo Driver)

OUT

A6 Family

Installation Environment

Use the servo driver in the environment of Pollution Degree 1 or 2 prescribed in IEC-60664-1 (e.g. Install the driver in control panel with IP54 protection structure.)



For NF1 to NF3, refer to the Table "Ferite core for Signal Line" (P.238).

* A6 SE, A6 SG 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 (A-frame to C-frame)	Single phase, 100 V $^{+10}_{-15}\%$ to 120 V $^{+10}_{-15}\%$	50 Hz/60 Hz
200 V type (A-frame to D-frame)	Single/3-phase, 200 V $^{+10~\%}_{-15~\%}$ to 240 V $^{+10~\%}_{-15~\%}$	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)

 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.

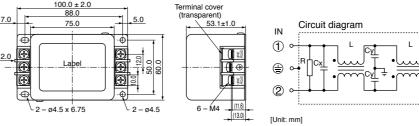
The branch circuit should be protected in accordance with NEC and the applicable local regulations in your area.

Noise Filter

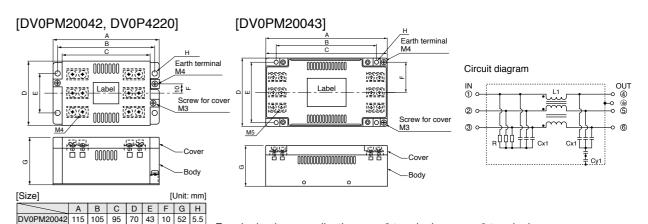
When you install one noise filter at the power supply for multi-axes application, contact the manufacturer of the noise filter. If noise margin is required, connect 2 filters in series to emphasize effectiveness.

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			

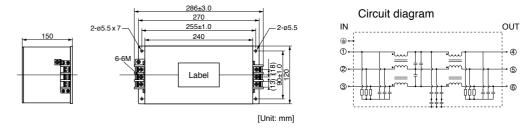


Option part No.	Voltage specifications for driver	Manufacturer's part No.	Applicable driver (frame)	Manufacturer
	3-phase 200 V		A-frame and B-frame	
DV0PM20042	Single phase 100 V, 200 V 3-phase 200 V	3SUP-HU10-ER-6	C-frame	Okaya Electric Ind.
DV0P4220	Single/3-phase 200 V	3SUP-HU30-ER-6	D-frame	
DV0PM20043	3-phase 200 V	3SUP-HU50-ER-6	E-frame	



For single phase application, use 2 terminals among 3 terminals, leaving the remaining terminal unconnected.

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>

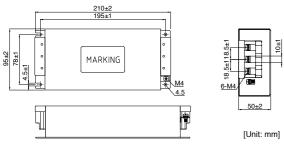
- Select a noise filter of capacity that exceeds the capacity of the power source (also check for load condition).
- · For detailed specification of the filter, contact the manufacturer.

Recommended components

Part No.	Voltage specifications for driver	Current rating (A)	Applicable driver (frame)	Manufacturer	
RTHN-5010	Single phase 100 V, 200 V 3-phase 200 V	10	A-frame to C-frame		
RTHN-5030		30	D-frame	TDK-Lambda Corp.	
RTHN-5050		50	E-frame and F-frame		

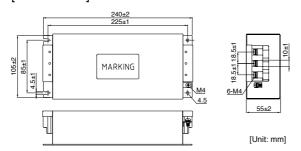
[RTHN-5010]

[RTHN-5050]

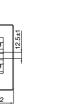


MARKING

[RTHN-5030]



<Remarks>

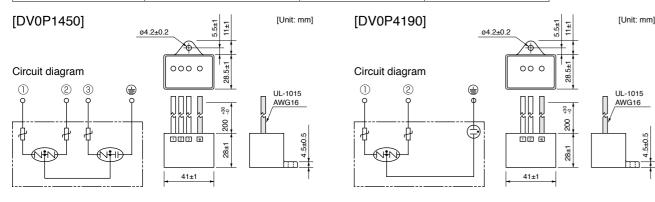


- Select a noise filter of capacity that exceeds the capacity of the power source (also check for load condition).
- · For detailed specification of the filter, contact the manufacturer.
- · When two or more servo drivers are used with a single noise filter at the common power source, consult with the noise filter manufacturer.

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	Okova Electric Ind	
DV0P4190	Single phase 100 V, 200 V	R·A·V-781BWZ-4	Okaya Electric Ind.	



<Remarks>

Remove this surge absorber when you perform dielectric test on the machine, or surge absorber might be damaged.

Ferite core for Signal Lines

Install ferite core for signal lines to all cables (power cable, motor cable, encoder cable and interface cable)

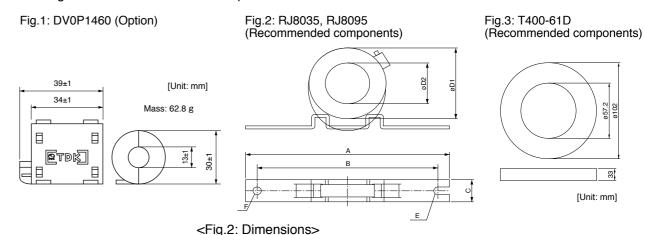
Symbol*1	Cable Name	100 V/200 V Driver frame symbol	Option part No.	Manufacturer's part No.	Manufacturer	Qty.
		A, B, C, D	DV0P1460	ZCAT3035-1330	TDK Corp.	4
NF1	Power cable	E, F	Recommended components	RJ8035	KK-CORP.CO.JP	1
NF2	Motor cable	A, B, C, D, E, F	DV0P1460	ZCAT3035-1330	TDK Corp.	4
NF3	24 V Power cableEncoder cableInterface cableUSB cableControl power cable	Common (to all frames)	DV0P1460	ZCAT3035-1330	TDK Corp.	4

^{*1} For symbols, refer to the Block Diagram "Installation Environment" (P.235).

To connect the ferite core to the connector XB connection cable, adjust the sheath length at the tip of the cable, as required.

<Caution>

Fix the signal line ferite core in order to prevent excessive stress to the cables.



Part No.	Current 100 kHz		Size [Unit: mm]							
rail No.	Current	(μH)	Α	В	С	D1	D2	Core thickness	Е	F
RJ8035	35 A	9.9±3	170	150	23	80	53	24	R3.5	7
RJ8095	95 A	7.9±3	200	180	34	130	107	35	R3.5	7

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 ((1)) 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 (). 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".

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					
Motor	IEC60034-1	IEC60034-5 UL1004 CSA22.2 No.100	Conforms to			
	EN50178	UL508C CSA22.2 No.14	Low- Voltage Directives			
	EN55011	Radio Disturbance Characteristics of Industrial, Scientific and Medical (ISM) Radio-Frequency Equipment				
	EN61000-6-2	Immunity for Industrial Environments	Conforms to references			
Motor	IEC61000-4-2	Electrostatic Discharge Immunity Test				
and driver	IEC61000-4-3	Radio Frequency Electromagnetic Field Immunity Test				
anver	IEC61000-4-4	Electric High-Speed Transition Phenomenon/Burst Immunity Test	by EMC Directives			
	IEC61000-4-5	Lightening Surge Immunity Test	1			
	IEC61000-4-6	High Frequency Conduction Immunity Test	1			
	IEC61000-4-11	Instantaneous Outage Immunity Test	7			

- IEC: International Electrotechnical Commission
- EN : Europaischen Normen **EMC: Electromagnetic Compatibility**
- UL : Underwriters Laboratories CSA: Canadian Standards Association

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

Panasonic Testing Centre

Panasonic Service Furone

a division of Panasonic Marketing Europe GmbH Winsbergring 15,22525 Hamburg, F.R. Germany

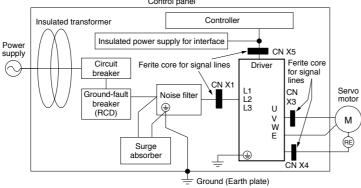
Composition of Peripheral Components

<Pre><Pre>cautions 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. Control pane

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, (n) marked), between the power supply and the noise filter.

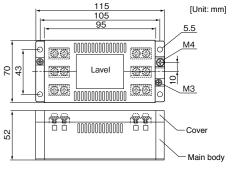
Noise Filter

When you install one noise filter in the power supply for multi axis application, consult with the manufacture of the filter.

Composition of Peripheral Components

Conformity to UL Standards

Option part No.	Part No.	Manufacturer
DV0P4160	3SUP-HU10-ER-6	Okava Electric Industries Co.



Surge Absorber

Install a surge absorber at primary side of the noise filter.

Option part No.	Driver voltage spec	Part No.	Manufacturer	Option part No.	Driver voltage spec	Part No.	Manufacturer
DV0P1450	3-phase, 200 V	R·A·V-781BXZ-4	Okaya Electric	DV0P4190	Single phase, 100 V, 200 V	R·A·V-781BWZ-4	Okaya Electric
	04.2±	0.2	[Unit: mm]		Ø4.2±	0.2	[Unit: mm]
Circuit diagr	am ③ ⊜	28.5±1		Circuit diagr	ram ⊜	0 0 0 28.5±1	
		28±1 2000-30	Olf-1012			28±1	35. AMG16 AMC16
		41±1				41±1	L h +

<Remarks>

Remove this surge absorber when you perform dielectric test on the machine, or surge absorber might be damaged.

Ferite core for Signal Lines

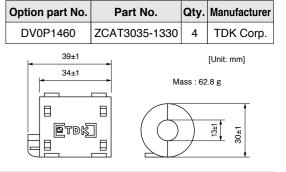
Install ferite core for signal lines to all cables (Power line, motor cable, encoder cable, interface cable)

<Caution>

- Please fix a line ferite 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

Please insert line ferite core between driver and motor wires (U, V, W but grounding).

(Please refer to P.239 "Composition of Peripheral Components".)



Grounding

- (1) Connect the protective earth terminal of the driver ((1) and protective earth terminal of the control panel (PE) without fail to prevent electrical shocks.
- (2) Do not co-clamp to the ground terminals ((\perp)). 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 (1) marked) between the power supply and the noise filter without fail.

AC Servo Motor Capacity Selection Software Option Selection Software for AC Servo Motor

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

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.



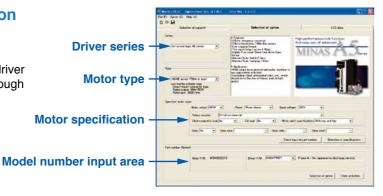
Option Selection Software for AC Servo Motor

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.

Result of selection

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.



Please download from our web site and use after install to the PC. http://industrial.panasonic.com/ww/products/motors-compressors/fa-motors

Organization of the System of Units

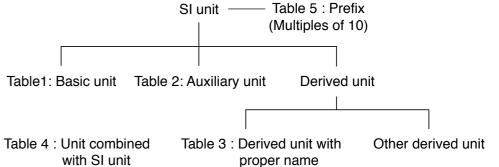


Table1: Basic unit

Quantity	Name of unit	Symbol of unit
Length	meter	m
Weight	kilogram	kg
Time	second	S
Current	ampere	Α
Thermodynamic temperature	kelvin	K
Amount of substance	mol	mol
Luminous intensity	candela	cd

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 ⁻¹
Force	newton	N	1 N = 1 kg·m/s ²
Pressure, Stress	pascal	Pa	1 Pa = 1 N/m ²
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 ⁻¹
Magnetic flux	weber	Wb	1 Wb = 1 V·s
Magnetic flux density, Magnetic induction	tesla	Т	1 T = 1 Wb/m ²
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 ²

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	Pr	efix
to unit	Name	Symbol
10 ¹⁸	exa	E
10 ¹⁵	peta	Р
10 ¹²	tera	Т
10°	giga	G
10 ⁶	mega	M
10 ³	kilo	k
10 ²	hecto	h
10	deca	da
10 ⁻¹	deci	d
10 ⁻²	centi	С
10 ⁻³	milli	m
10 ⁻⁶	micro	μ
10 ⁻⁹	nano	n
10 ⁻¹²	pico	р
10 ⁻¹⁵	femto	f
10 ⁻¹⁸	atto	a

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Major Compatible Unit

Quantity	Symbol of	Symbol of SI unit and	Conversion value
Quantity	conventional unit	compatible unit	Conversion value
Length	μ (micron)	μm	1 μ = 1 μm (micrometer)
Acceleration	Gal	m/s ²	1 Gal = 10 ⁻² m/s ²
	G	m/s ²	1 G = 9.80665 m/s ²
Frequency	c/s, c	Hz	1 c/s = Hz
Revolving speed, Number of revolutions	rpm	s ⁻¹ or min ⁻¹ , r/min	1 rpm = 1 min ⁻¹
Weight	kgf	_	1 -
Mass	_	kg	Same value
Weight flow rate	kgf/s	_	1,
Mass flow rate	_	kg/s	Same value
Specific weight	kgf/m ³	_	1
Density	_	kg/m³	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 ⁻⁵ N
Moment of force	kgf∙m	N∙m	1 kgf·m = 9.806 N·m
Pressure	kgf/cm ²	Pa, bar ⁽¹⁾ or kgf/cm ²	1 kgf/cm ² = 9.80665 x 10 ⁴ Pa
1.0004.0	1,6,,,,,,	r a, bar or ngrom	= 0.980665 bar
	at (Engineering atmospheric pressure)	Pa	1 at = 9.80665 x 10 ⁴ Pa
	atm (Atmospheric pressure)	Pa	1 atm = 1.01325 x 10 ⁵ Pa
	mH ₂ O, mAq	Pa	1 mH ₂ O = 9.80665 x 10 ³ Pa
	mmHg	Pa or mmHg ⁽²⁾	1 mmHg = 133.322 Pa
	Torr	Pa	1 1111111g 100.02E 1 u
Stress	kgf/mm²	Pa or N/m ²	1 kgf/mm ² = 9.80665 x 10 ⁶ Pa
Oll 633	1,6,7,1111	1 4 51 14111	=9.80665 x 10 ⁶ N/m ²
	kgf/cm ²	Pa or N/m ²	1 kgf/cm ² = 9.80665 x 10 ⁴ Pa
	Kgi/Giii	1 a 01 14/111	= 9.80665 x 10 ⁴ N/m ²
Elastic modulus	kgf/m²	Pa or N/m ²	1 kgf/m ² = 9.80665 Pa = 9.80665 N/m ²
Liastic modulus	Kgi/III	I a of Ivill	1 kgf/cm ² = 9.80665 x 10 ⁴ N/m ²
Energy, Work	kgf⋅m	J (joule)	1 kg·m = 9.80665 J
Energy, Work		J (Joule)	1 erg = 10 ⁻⁷ J
Work efficiency, Power	erg	W (watt)	1 kgf·m/s = 9.80665 W
Work efficiency, Fower	kgf·m/s PS	w (waii)	1 PS = 0.7355 kW
Viagositu	PP		1 P = 0.1 Pa·s
Viscosity		Pa·s	10 ⁻² St = 1 mm ² /s
Kinetic viscosity	St	mm²/s	
Thermodynamic temperature	K	K (kelvin) K ⁽³⁾	1 K = 1 K 1 deg = 1 K
Temperature interval	deg		1 cal = 4.18605 J
Amount of heat	cal	J	
Heat capacity	cal/°C	J/K ⁽³⁾	1 cal/°C = 4.18605 J/K
Specific heat, Specific heat capacity	cal/ (kgf·°C)	cal/ (kgf·K) ⁽³⁾	1 cal/ (kgf·°C) = 4.18605 J/ (kg·K)
Entropy	cal/K	J/K	1 cal/K = 4.18605 J/K
Specific entropy	cal/ (kgf⋅K)	J/(kg⋅K)	1 cal/ (kgf·K) = 4.18605 J/ (kg·K)
Internal energy (Enthalpy)	cal	J	1 cal = 4.18605 J
Specific internal energy (Specific enthalpy)	cal/kgf	J/kg	1 cal/kgf = 4.18605 J/kg
Heat flux	cal/h	W	1 kcal/h = 1.16279 W
Heat flux density	cal/ (h·m²)	W/m ²	1 kcal/ (h·m²) = 1.16279 W/m²
Thermal conductivity	cal/ (h·m·°C)	W/ (m·K) ⁽³⁾	1 kcal/ (h·m·°C) = 1.16279 W/ (m·K)
Coefficient of thermal conductivity	cal/ (h·m²·°C)	W/ (m ² ·K) ⁽³⁾	1 kcal/ (h·m²·°C) = 1.16279 W/ (m²·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 ⁻⁸ Wb
Magnetic flux density	Gs,G	T (tesla)	1 Gs = 10 ⁻⁴ T

Note

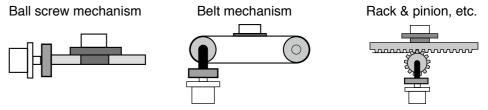
- (1) Applicable to liquid pressure. Also applicable to atmospheric pressure of meteorological data, when "bar" is used in international standard.
- (2) Applicable to scale or indication of blood pressure manometers.
- (3) "°C" can be substituted for "K".

Flow of Motor Selection

1. Definition of mechanism to be driven by motor.

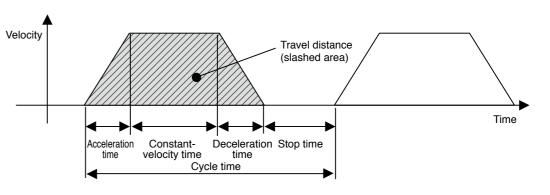
Define details of individual mechanical components (ball screw length, lead and pulley diameters, etc.)

<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 10⁻⁴ kg·m²".

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.

Description on the Items Related to Motor Selection

Description on the Items Related to Motor Selection

1. Torque

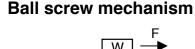
(1) Peak torque

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]

η: Mechanical efficiency μ: Coefficient of friction

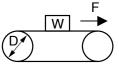
F: External force [N]

g: Acceleration of gravity 9.8[m/s²]

Belt mechanism

Traveling torque

$$Tf = \frac{D}{2\pi \eta} (\mu gW + F)$$



W: Weight [kg]

P : Pulley diameter [m]

η: Mechanical efficiency μ: Coefficient of friction

F: External force [N]

g: Acceleration of gravity 9.8[m/s2]

(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]

Tf: Traveling torque [N·m]

tb: Constant-velocity time [s]

(Run time + Stop time)

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

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 ρ [kg/m³] x Volume V[m³]

Density of each material

Iron $\rho = 7.9 \times 10^3 \, [kg/m^3]$

Aluminum $\rho = 2.8 \times 10^{3} \, [kg/m^{3}]$

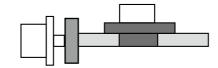
Brass $\rho = 8.5 \times 10^3 \, [kg/m^3]$

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To Drive Ball Screw Mechanism

1. Example of motor selection for driving ball screw mechanism

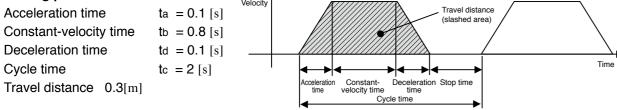
Workpiece weight WA = 10 [kg]Ball screw length BL = 0.5 [m]Ball screw diameter BD = 0.02 [m]Ball screw lead BP = 0.02 [m]Ball screw efficiency $B\eta = 0.9$



Travel distance 0.3[m]

Coupling inertia $Jc = 10 \times 10^{-6} [kg \cdot m^2]$ (Use manufacturer-specified catalog value, or calculation value.)

2. Running pattern :



3. Ball screw weight

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]

4. Load inertia

$$\begin{aligned} JL &= JC \,+\, JB = JC \,+\, \frac{1}{8}BW \,\times\, BD^2 \,+\, \frac{WA \cdot BP^2}{4\pi^2} \\ &= 0.00001 \,+\, (1.24 \times 0.02^2) \,/\, 8 \,+\, 10 \,\times\, 0.02^2 \,/\, 4\pi^2 \\ &= 1.73 \,\times\, 10^{-4} \,[\,\mathrm{kg} \cdot \mathrm{m}^2\,] \end{aligned}$$

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 =
$$1.73 \times 10^{-4}$$
 / 0.14×10^{-4} Therefore, the inertia ratio is "12.3" (less than "30") (In case of MSMF 100 W motor: JM = 0.048×10^{-4} Therefore, the inertia ratio is "36.0".)

7. 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 = 0.3 0.9 × Vmax = 0.3 Vmax = 0.3 / 0.9 = 0.334 [m/s]

8. Calculation of motor velocity (N [r/min]) Ball screw lead per resolution: Bp = 0.02 [m]

$$N = 0.334 / 0.02 = 16.7 [r/s]$$

= 16.7 × 60 = 1002 [r/min] < 3000 [r/min] (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
$$T_a = \frac{(\text{JL} + \text{JM}) \times 2\pi \text{N} [\text{r/s}]}{\text{Acceleration time [s]}} + \text{Traveling torque}$$

$$= \frac{(1.73 \times 10^{-4} + 0.14 \times 10^{-4}) \times 2\pi \times 16.7}{0.1} + 0.035$$

$$= 0.196 + 0.035 = 0.231 \ [\text{N·m}]$$

To Drive Ball Screw Mechanism **Example of Motor Selection**

Deceleration torque $Td = \frac{(JL + JM) \times 2\pi N[r/s]}{Deceleration time [s]}$ - Traveling torque $=\frac{(1.73\times10^{-4}+0.14\times10^{-4})\times2\pi\times16.7}{0.1}-0.035$ $= 0.196 - 0.035 = 0.161 [N \cdot m]$

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)

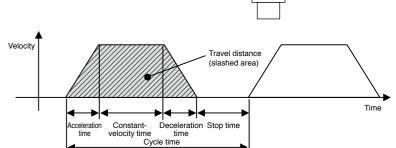
> Pulley diameter PD = 0.05[m]

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 Pulley inertia



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 × PD² + $\frac{1}{8}$ WP × PD² × 2
= 0 + $\frac{1}{4}$ × 2 × 0.05² + $\frac{1}{8}$ × 0.5 × 0.05² × 2
= 0.00156 = 15.6 × 10⁻⁴ [kg·m²]

4. Provisional motor selection

In case of MSMF 750 W motor : $JM = 0.96 \times 10^{-4} \, [kg \cdot m^2]$

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")

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

$$0.9 \times Vmax = 1$$

 $Vmax = 1 / 0.9 = 1.111[m/s]$

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
$$T_f = \frac{P_D}{2\,\eta} (\mu gWA + F) = \frac{0.05}{2\,\times\,0.8} \ (0.1\,\times\,9.8\,\times\,3 + 0)$$

$$= 0.061[\,N\cdot m\,]$$
Acceleration torque
$$T_a = \frac{(JL + JM)\,\times\,2\pi\,N[\,r/s\,]}{Acceleration\,time[\,s\,]} + Traveling\,torque$$

$$= \frac{(15.6\,\times\,10^{-4} + 0.87\,\times\,10^{-4})\,\times\,2\pi\,\times\,7.08}{0.1} + 0.061$$

$$= 0.751 + 0.061 = 0.812[\,N\cdot m\,]$$
Deceleration torque
$$T_d = \frac{(JL + JM)\,\times\,2\pi\,N[\,r/s\,]}{Deceleration\,time[\,s\,]} - Traveling\,torque$$

$$= \frac{(15.6\,\times\,10^{-4} + 0.87\,\times\,10^{-4})\,\times\,2\pi\,\times\,7.08}{0.1} - 0.061$$

$$= 0.751 - 0.061 = 0.69[\,N\cdot m\,]$$

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)

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

11) Diameter of the ball screw

12) Total length of the ball

13) Lead of the ball screw

1) Travel distance of the work load per one cycle mm 2) Cycle time to: Running pattern (Fill in items 3) and 4) if required.) 3) Acceleration time 4) Deceleration time time td: 5) Stopping time ts: V: 6) Max. velocity mm/s 7) External force F: Ν Positioning accuracy of the mm work load 9) Total weight of the work load and the table W_A: kg 10) Power supply voltage ٧

mm

mm

mm

14) Traveling direction (horizontal, vertical etc.)

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 II: Timing pulley + Ball screw drive

1. Driven mechanism and running data

1)	Travel distance of the work
	load per one cycle

2) Cycle time

4) Deceleration time

5) Stopping time

6) Max. velocity

7) External force

work load

9) and the table

10) Power supply voltage

13) Lead of the ball screw

Traveling direction (horizontal, vertical etc.)

11) Diameter of the ball screw

12) Total length of the ball screw

Positioning accuracy of the

Total weight of the work load

`	I ravel distance of the work	
)	load per one cycle	

ℓ_1 :	mm	15)

	15)	Diameter	of the	pulley
--	-----	----------	--------	--------

Weight of the pulley

	Motor side		Ball sc	rew side
pulley	D ₁ :	mm	D ₂ :	mm

kg W₂:

mm

kg

kg

(Fill in items 3) and 4) if required.)

3)	Acceleration time	ta:

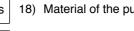
td:	s	

ts:

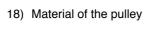
V:

F:

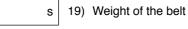
s	18)	Material of th



s 17) Width of the pulley





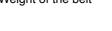


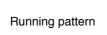
mm/s

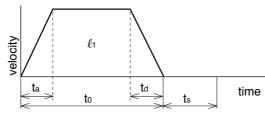
Ν

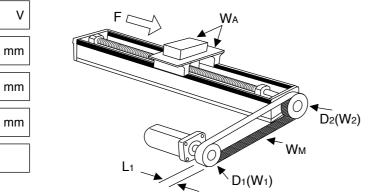
mm

kg









2. Other data (Fill the details on specific mechanism and its configurations in the following blank.)

Company name i
Company name :
Department/Section :
Name :
Address:
Tel:
Fax:
E-mail address:

Request Sheet for Motor Selection

Request for motor selection **II**: Belt drive

Ν

mm

kg

mm

kg

1. Driven mechanism and running data

1)	Travel distance of the work load per one cycle	ℓ₁: mi	m
2)	Cycle time	to:	s
	(Fill in items 3) and 4) if required.)		
3)	Acceleration time	ta:	s

٠)	Deceleration time	ta.

5) Stopping time	ts:	
6) Max. velocity	V:	m

_	
7) External force	F:

8)	Positioning accuracy of the	_
U)	work load	_

Total weight of the work load	W _A :

10)	Power supply voltage	,

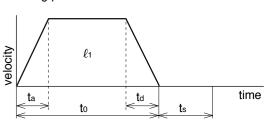
D₁:

11) Weight of the belt	W _M :

			Ξ
13)	Total weight of the pulley	W₁:	

12) Diameter of the driving pulley

Running pattern



	W _A \longrightarrow F
L ₁	
	D1
	W ₁

(or item 14)	and 15))
--------------	----------

4)	Width	of the	pulley
----	-------	--------	--------

Material of the pulley	

16)	Traveling direction	
10)	(horizontal, vertical etc.)	

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:

pcs

Request Sheet for Motor Selection

Request for motor selection IV: Timing pulley + Belt drive

1. Driven mechanism and running data

1) Trave load p	I distance of the work per one cycle	ℓ_1 :	mm
2) Cycle	time	to.	s

16)) Diameter	of the	pulle
-----	------------	--------	-------

	IVIOLO	i Side	DOIL	Side
16) Diameter of the pulley	D ₃ :	mm	D ₄ :	n
17) Weight of the pulley	W ₃ :	kg	W ₄ :	

(Fill in items 3) and 4) if required.)

3) Acceleration time	ta:	s
4) Deceleration time	td:	s

5) Stopping time ts.	5) Stopping time	ts:
	5) Stopping time	ts.

6) Max. velocity	V:	mm/s
7) External force	F:	N

8) Positioning accuracy of the work load	±	m
Total weight of the work	W.·	

oad load	VVA.	۱δ
10) Power supply voltage		٧

11) Weight of motor side belt	W _M :	kg
11) Weight of motor side beit	A A W.	ľδ

	Mote	or side	Ве	elt side
Diameter of the pulley	D ₁ :	mm	D ₂ :	mm
Weight of the pulley	W ₁ :	kg	W ₂ :	kg

(or item 14) and 15))

14) Width of the	L ₁ :	mm
' belt		
15) Material of the pulley		
pulley		

of the pulley	D ₃ :	mm	D ₄ :	mn
the pulley	W ₃ :	kg	W ₄ :	k

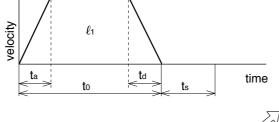
18)	Width of the pulley	L2:
ιυ,	Width of the pulley	L2.

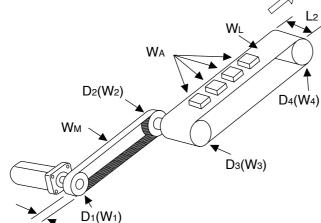
19)	Material of the pulley
-----	------------------------

19) Material of the pulley		
20) Weight of the belt	W _L :	kį

01)	Traveling direction
21)	(horizontal, vertical etc.)

Running pattern





2. Other data (Fill the details on specific mechanism and its configurations in the following blank.)

r	
	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)	Travel distance of the work load per one cycle	d ₁ :	deg	1
2)	Cycle time	to:	s	
	(Fill in items 3) and 4) if requi	ired.)		
3)	Acceleration time	ta:	s	1
4)	Deceleration time	td:	S	
5)	Stopping time	ts:	s	
6)	Max. rotational speed of the table	v:	deg/s	

(or)	V:	r/s
7) Positioning accuracy of the work load	±	deg

) Weight of one work load	W _A :

Driving radius of the center of gravity of the work	R ₁ :
_	

10)	Diameter of the table
11)	Mass of the table

12)	Diameter of the table
12)	cunnort

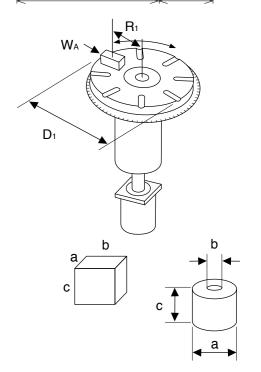
Power supply voltage
--

111	Dimensions of the
14)	work load

	Prism		Cylinder
a:	mm	a:	mm
b:	mm	b:	mm
c:	mm	c:	mm
			·

15) Number of work loads

Rur	nning patte	ern		
velocity		d ₁		
	≤ta >	t o	t _d	time



2. Other data (Fill the details on specific mechanism and its configurations in the following blank.)

kg

mm

mm

kg

 mm

Company name :
Department/Section :
Name :
Address :
Tel:
Fax :
E-mail address:

Request Sheet for Motor Selection

Request for motor selection VII: Roller feed drive

1. Driven mechanism and running data

		arring electer				
1)	Travel distance of the work load per one cycle	ℓ_1 :	nm	Running pattern		
2)	Cycle time	to:	s			
	(Fill in items 3) and 4) if required.)			λtiooley ℓ_1		
3)	Acceleration time	ta:	S	ta to	tin	ne
4)	Deceleration time	td:	s	×	* 	
5)	Stopping time	ts:	S		_	
6)	Max. velocity	v: mr	n/s		F	
7)	External pulling force	F:	N		L1	
8)	Positioning accuracy of the work load	± n	nm		D ₁ (W ₁)	
9)	Number of rollers	ţ	ocs			
0)	Power supply voltage		V	(or item 13) and 14))		
1)	Diameter of the roller	D ₁ : n	nm 1	3) Width of the roller	L ₁ :	mm
2)	Mass of the roller	w·	kø 1	Material of the roller		

Request for motor selection VI: Timing pulley + Turntable drive

Request Sheet for Motor Selection

. [Driven mecha	nism an	ıd rur	ning data			Motor	r side	Turnt	table sid
1)	Travel distance of load per one cycle		d ₁ :	deg	16)	Diameter of the pulley	D ₂ :	mm	D ₃ :	m
2)	Cycle time		to:	S	17)	Weight of the pulley	W ₂ :	kg	W ₃ :	
	(Fill in items 3) and	d 4) if requi	red.)			(or item 18) and 19))				
3)	Acceleration time		ta:	s	18)	Width of the pulley		L1:		m
4)	Deceleration time		t d:	s	19)	Material of the pulley				
5)	Stopping time		ts:	s	20)	Weight of the belt		W _M :		
6)	Max. rotational spetable	eed of the	v:	deg/s		Running pattern				
		(or)	V:	r/s						
7)	Positioning accura work load	cy of the	±	deg		d ₁		\		
8)	Weight of one work	k load	W _A :	kg		ta	t d €	ts	_	time
9)	Driving radius of the of gravity of the wo		R ₁ :	mm			,	x R1		
0)	Diameter of the tal	ole	D ₁ :	mm		١	NA _			
11)	Mass of the table		W ₁ :	kg		▼[D1 📗			
2)	Diameter of the tal	ole	T ₁ :	mm					L	
3)	Power supply volta	age		V		D2(W2)			•	
	5	(Prisr	m)	(Cylinder)	7	L1	<u> </u>			D3(W 3)
4)	Dimension of the work load	a:	mm	a: mm			\ N	/ M		b
		h:	mm	h: mm]		b		-	—

2. Other data (Fill the details on specific mechanism and its configurations in the following blank.)

mm

pcs

mm c:

·	,
	Company name :
	Department/Section:
	Name :
	Address :
	Tel:
	Fax:
	E-mail address:

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:

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15) Number of work loads

Information 256

A6 Family

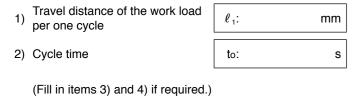
Series

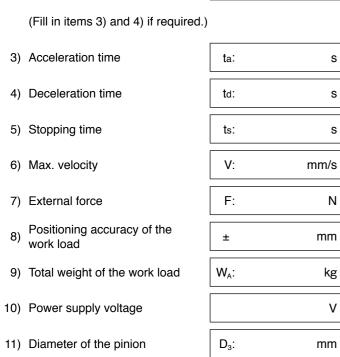
mformation

Request Sheet for Motor Selection

Request for motor selection III: Driving with Rack & Pinion

1. Driven mechanism and running data

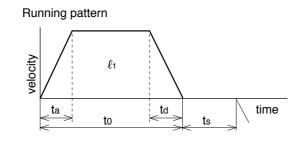


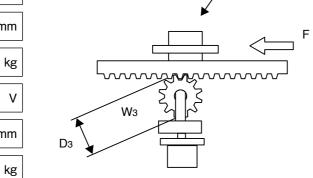


 W_3 :

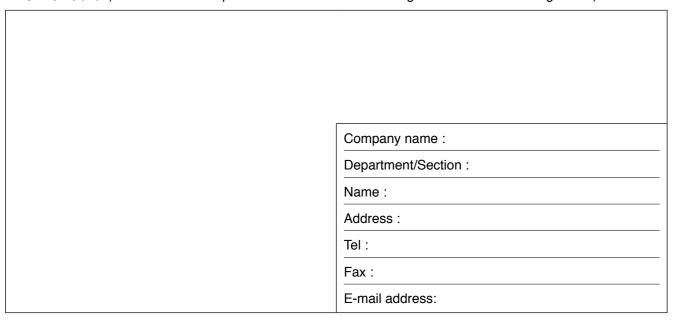
12) Mass of the pinion

Traveling direction (horizontal, vertical, etc.)



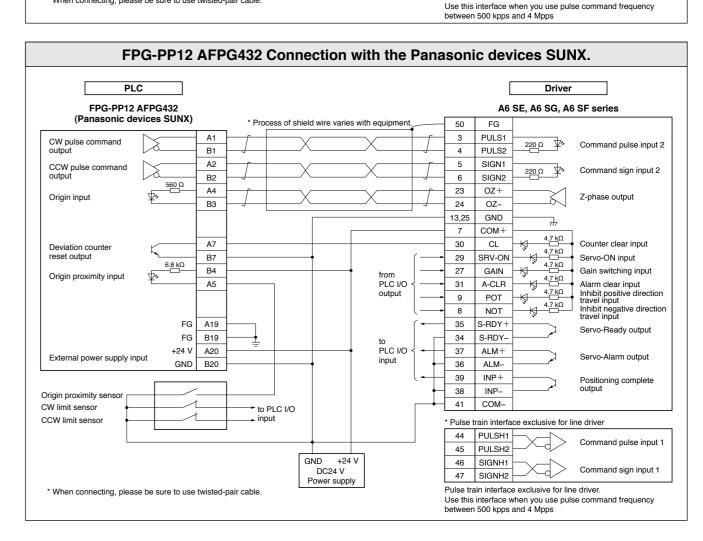


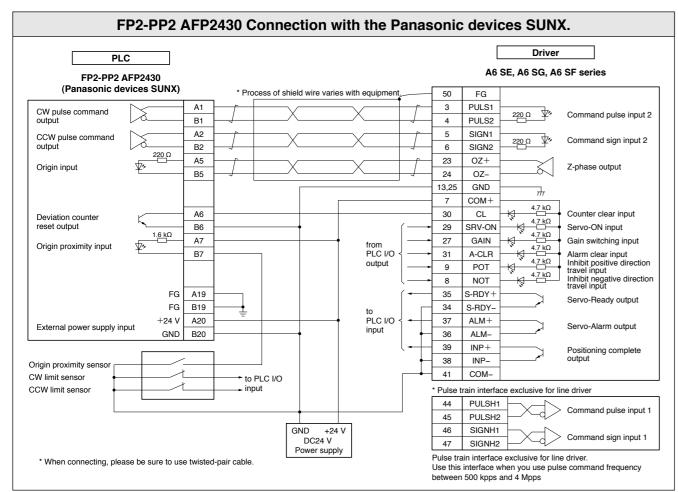
2. Other data (Fill the details on specific mechanism and its configurations in the following blank.)

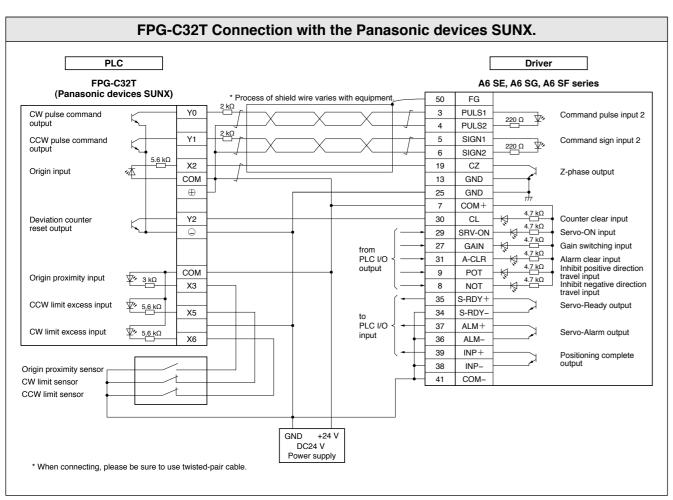


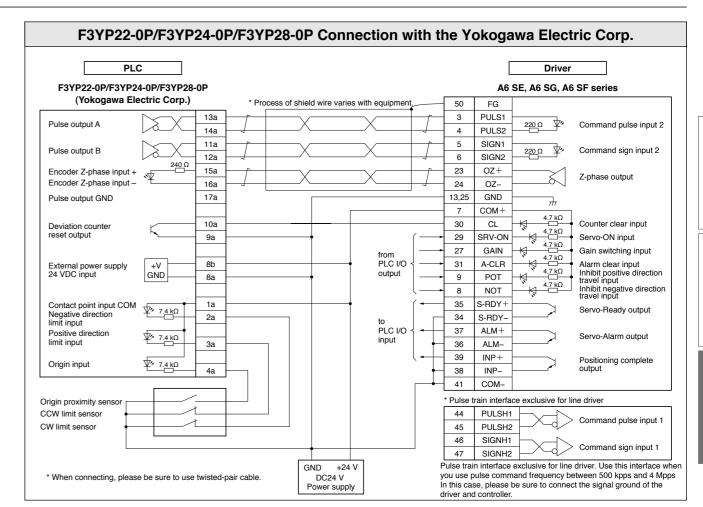
FP7-AFP7PP02T/L(2-axes) AFP7PP04T/L(4-axes) Connection with the Panasonic devices SUNX. PLC Driver FP7-AFP7PP02T/L(2-axes) AFP7PP04T/L(4-axes) A6 SE, A6 SG, A6 SF series (Panasonic devices SUNX) Process of shield wire varies with equipm PULS1 A1 A10 3 CW pulse command 220 Ω 💯 Command pulse input 2 B1 B10 PULS2 A2 A11 CCW pulse command output 5 SIGN1 220 Ω 🛂 ″ Command sign input 2 B2 B11 SIGN2 3.9 kΩ A3 A12 07+23 Origin input (5 VDC) Z-phase output A4 A13 24 OZ-B3 B12 13,25 GND B5 B14 COM+ Servo-ON output 4.7 kΩ A7 A16 30 CL Counter clear input Deviation counter reset output B7 B16 29 SRV-ON Servo-ON input 3.6 kΩ B4 B13 27 GAIN Origin proximity input 4.7 kΩ , from PLC I/O A5 A14 31 A-CLR Alarm clear input 6.8 kΩ Inhibit positive direction travel input Inhibit negative direction travel input РОТ 🤘 Limit excess (+) 4.7 κΩ A6 A15 8 NOT 35 S-RDY+ Limit excess ⊝ Servo-Ready output B6 B15 34 S-RDYto PLC I/O +24 V A20 A20 37 ALM+Servo-Alarm output External power supply input GND B20 B20 36 ALM-INP+ 39 Positioning complete 38 INP-Origin proximity senso 41 COM-CW limit sensor CCW limit sensor * Pulse train interface exclusive for line driver 44 PULSH1 Command pulse input PULSH2 45 GND +24 V 46 SIGNH1 Command sign input 1 DC24 V 47 SIGNH2 Pulse train interface exclusive for line driver.

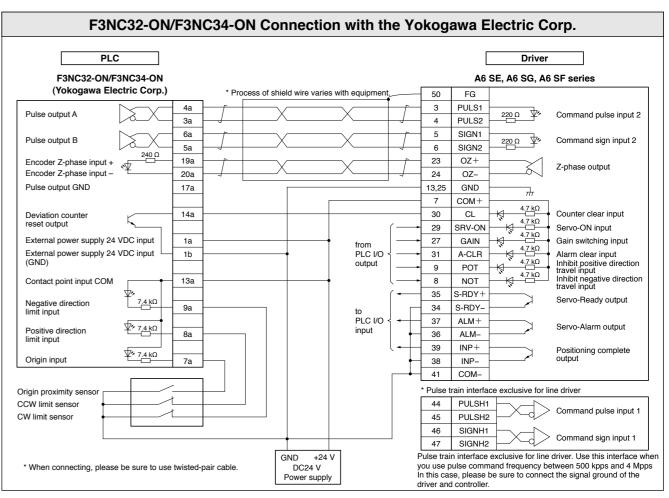
* When connecting, please be sure to use twisted-pair cable

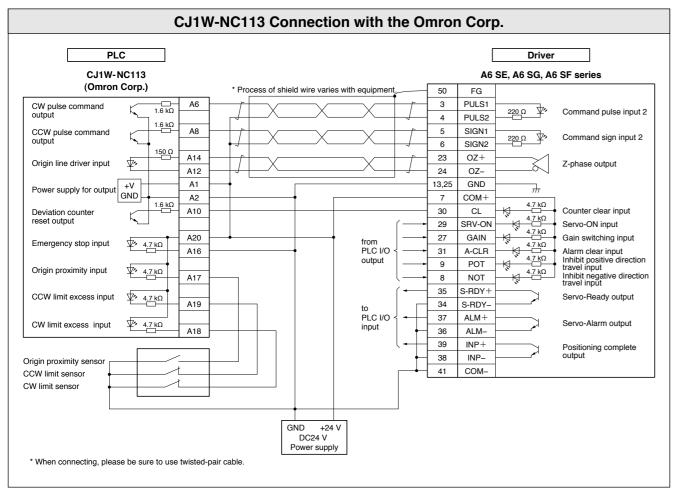


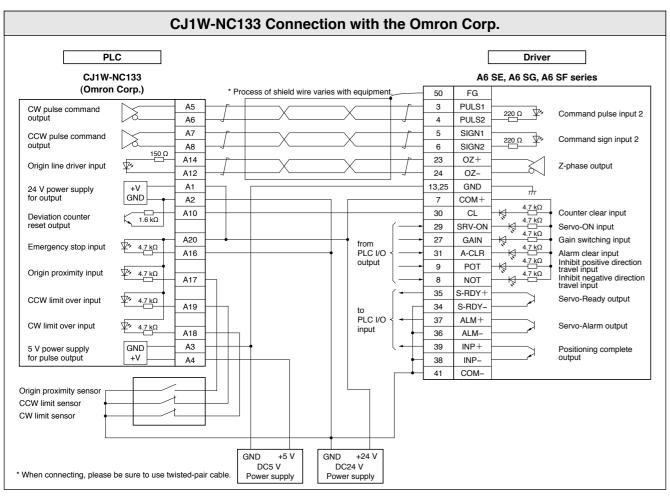


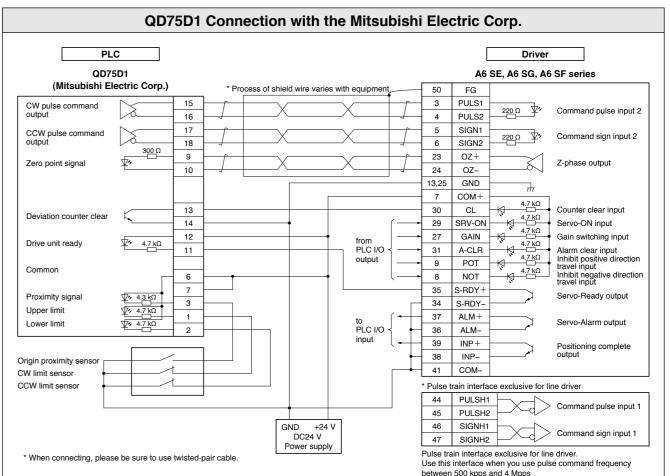


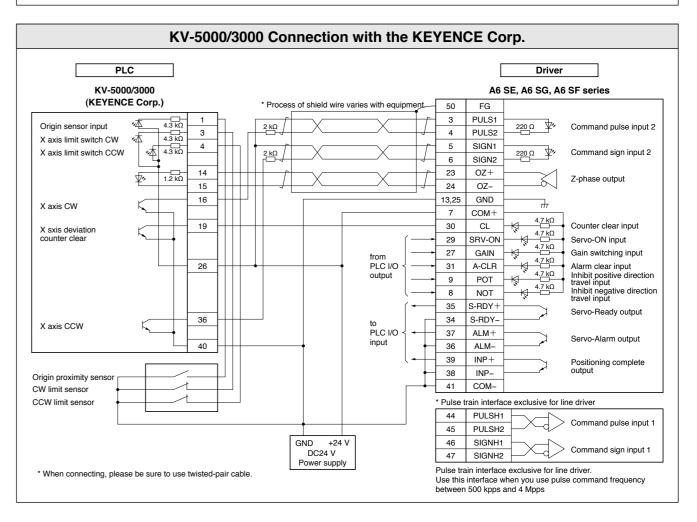








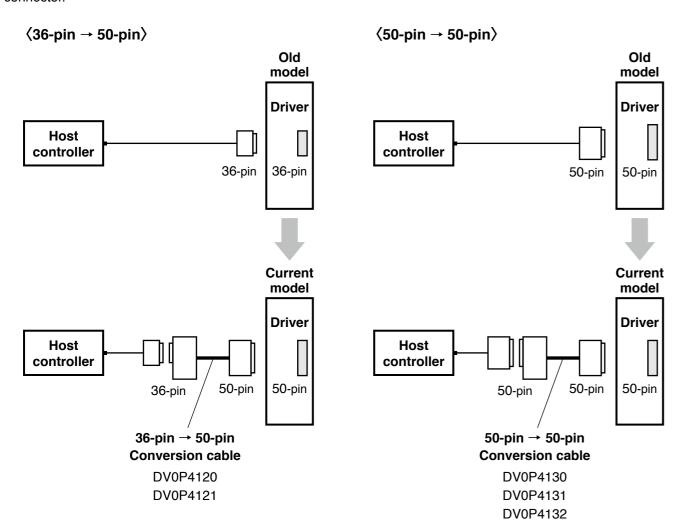




A6 Family Connection Between Driver and Controller

Replacing Old Model Servo Driver with MINAS A6 series

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.264
(36-pin)	Torque control	DV0P4121	F.204
	Position control	DV0P4130	P.265
V series (50-pin)	Velocity control	DV0P4131	F.203
	Torque control	DV0P4132	P.266

^{*} For external dimensions, refer to P.182.

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	

^{* &}quot;NC" is no connect.

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A6 Family Connection Between Driver and Controller

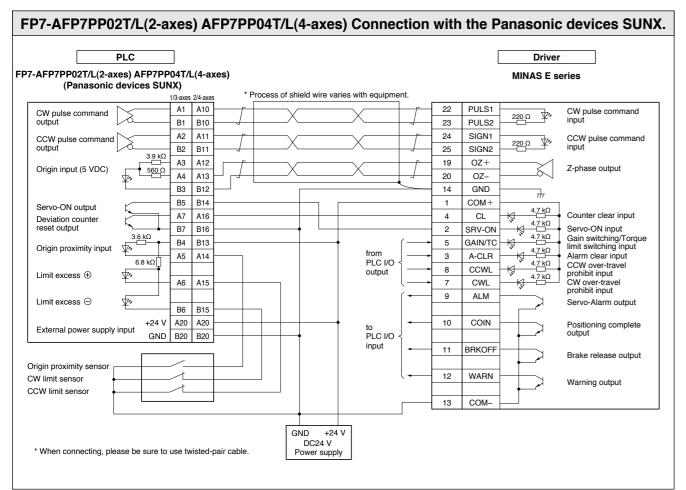
Replacing Old Model Servo Driver with MINAS A6 series

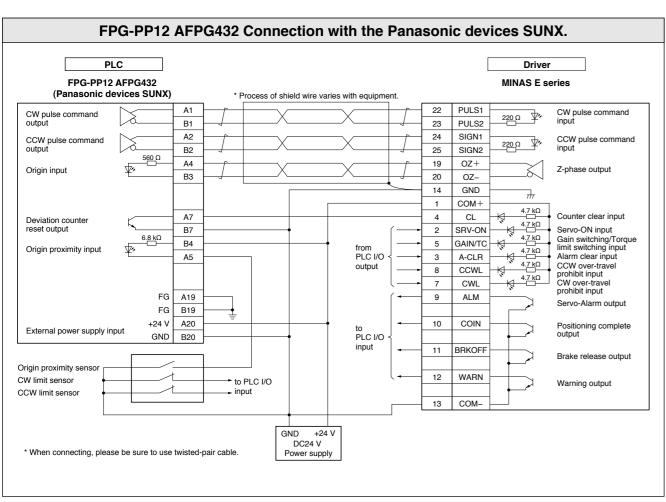
		DV0P4130			DV0P4131	
Pin No.	Pin				1	
on Old Model	No. on Current Model	Signal Name	Symbol	Pin No. on Current Model	Signal Name	Symbol
1	8	CW over-travel inhibit input	CWL	8	CW over-travel inhibit input	CWL
2	9	CCW over-travel inhibit input	CCWL	9	CCW over-travel inhibit input	CCWL
3	3	Command pulse 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		
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	·		NC		
35	35	Servo-Ready output	S-RDY+	35	Servo-Ready output	S-RDY+
36	NC	, .		NC	, ,	
37	37	Servo-Alarm output	ALM+	37	Servo-Alarm output	ALM+
38	NC	·		NC	·	
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-
	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-
	41	Power supply for control signal (–)	COM-	41	Power supply for control signal (–)	COM-
42	42	Torque monitor output	IM	42	Torque monitor output	IM
43	43	Speed monitor output	SP	43	Speed monitor output	SP
44	25	Signal ground	GND	25	Signal ground	GND
45	25	Signal ground	GND	25	Signal ground	GND
46	25	Signal ground	GND	25	Signal ground	GND
47	NC	- C.g. iai ground	GITE	NC	- S. S. M. G. Culled	G.1.D
48	48	B-phase output	OB+	48	B-phase output	OB+
49	49	B-phase output	OB-	49	B-phase output	OB-
50	50	Frame ground	FG	50	Frame ground	FG
50	30	i iaino giouna	, u	50	r ramo ground	1.0

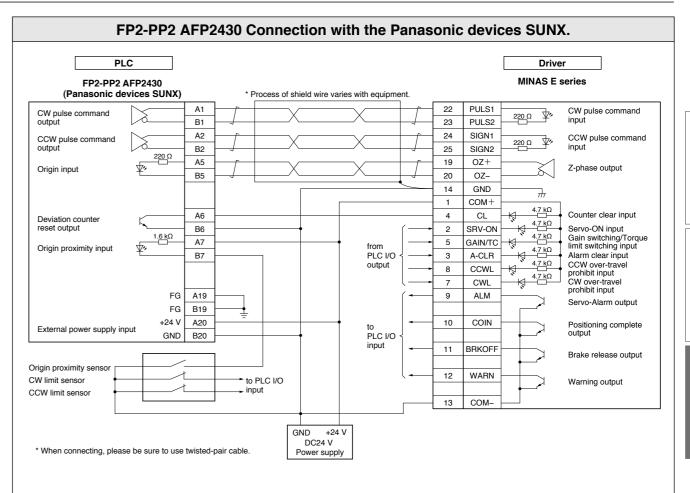
*	"NC"	is	no	connect.
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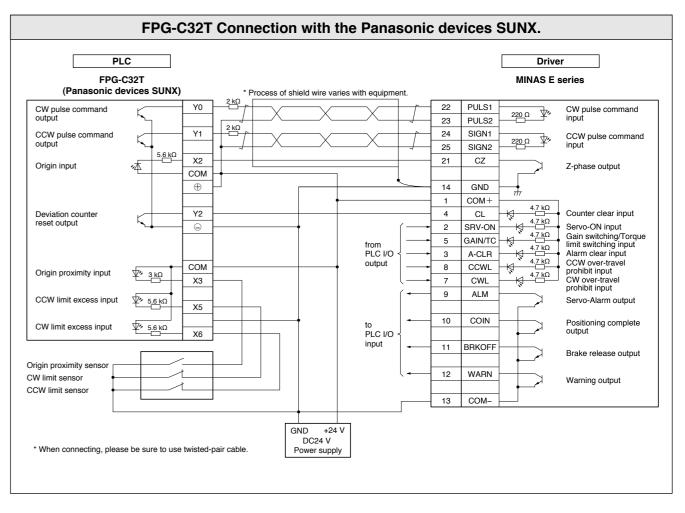
		DV0P4132					
Pin No. on Old Model	Pin No. on Current Model	Signal Name	Symbol				
1	8	CW over-travel inhibit input	CWL				
2	9	CCW over-travel inhibit input	CCWL				
3	NC						
4	NC						
5	NC						
6	NC						
7	7	Power supply for control signal (+)	COM+				
8	NC						
9	NC						
10	NC						
11	11	External brake release signal	BRK-OFF+				
12	12	Zero-speed detection output signal	ZSP				
13	13	Torque in-limit signal output	TLC				
14	NC						
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						
29	29	Servo-ON input	SRV-ON				
30	NC						
31	31	Alarm clear input	A-CLR				
32	32	Control mode switching input	C-MODE				
33	NC						
34	NC						
35	35	Servo-Ready output	S-RDY+				
36	NC	The state of the s					
37	37	Servo-Alarm output	ALM+				
38	NC		1 .=				
39	39	Speed arrival output	AT-SPEED+				
40	40	Torque in-limit signal output	TLC				
10	10	External brake release signal (–)	BRK-OFF-				
	34	Speed arrival output (–)	AT-SPEED-				
41	36	Servo-Alarm output (–)	ALM-				
41		Servo-Alarm output (–) Servo-Ready output (–)	S-RDY-				
	38 41						
40		Power supply for control signal (–)	COM-				
42	42	Torque monitor output	IM ep				
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				

^{* &}quot;NC" is no connect.

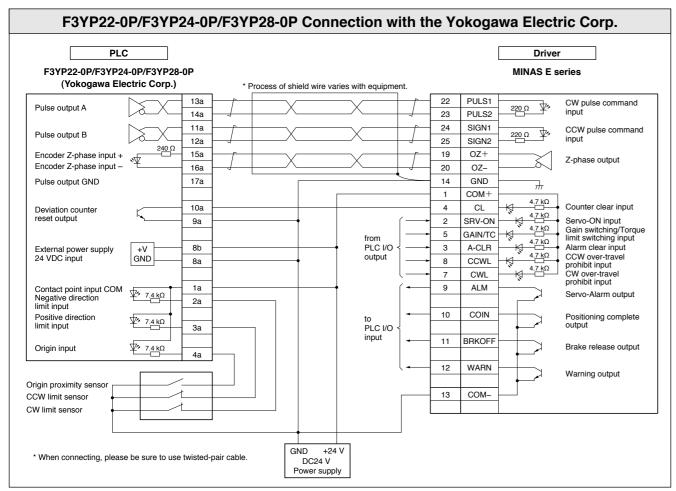


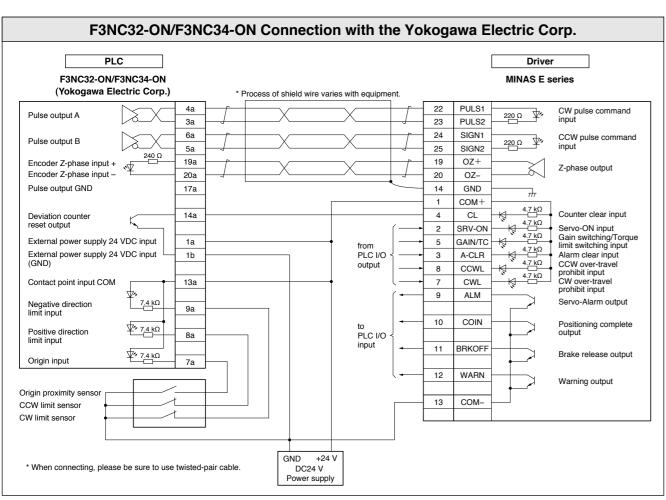


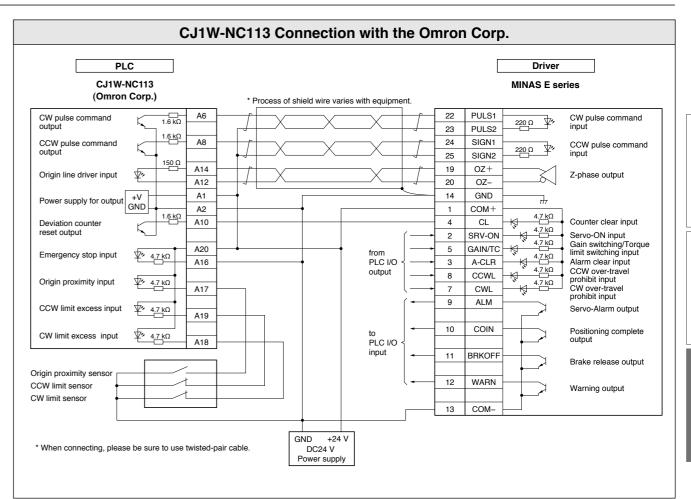


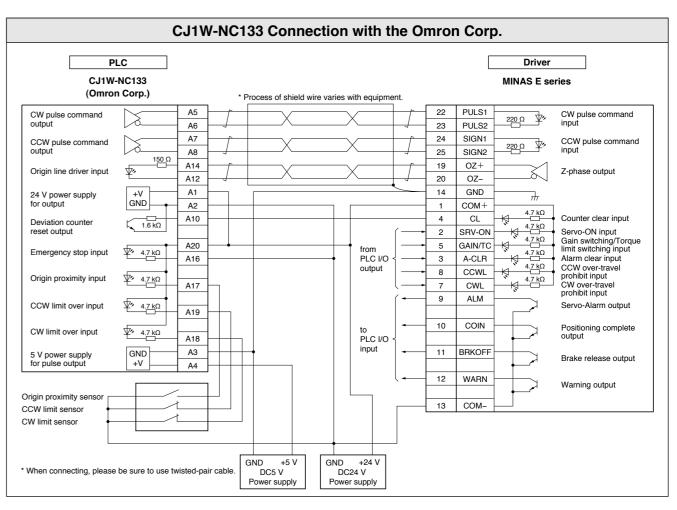


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Connection Between Driver and Controller

PL	c						Driver	
QD79 (Mitsubishi El		* Proce	ess of shield wire v	varies with equipme	nt.		MINAS E se	eries
CW pulse command putput	15			X	22		220 Ω 🕏	CW pulse command input
CCW pulse command output	17			X	24		220 Ω 🛂	CCW pulse command input
Zero point signal	300 Ω 9 10			X	19			Z-phase output
Deviation counter clear	13				14 1 4	COM+	4.7 kΩ	Counter clear input
Deviation counter clear Drive unit ready	14 12 12 11			from PLC I/O	5 3	GAIN/TC	4.7 kΩ 4.7 kΩ 4.7 kΩ 4.7 kΩ	Servo-ON input Gain switching/Torque limit switching input Alarm clear input
Common	6 7			output	8 7 9	CWL	4.7 kΩ	CCW over-travel prohibit input CW over-travel prohibit input
Proximity signal Upper limit Lower limit	3 Ψ, 4.7 kΩ Ψ, 4.7 kΩ 1			to	10	COIN		Servo-Alarm output Positioning complete output
	2			PLC I/O <	11	BRKOFF		Brake release output
gin proximity sensor / limit sensor W limit sensor					12	WARN		Warning output
					13	COM-		
When connecting, pleas	se be sure to use twiste	d-pair cable.	GND +2 DC24 V Power sup					

DV0P		
Part No.	Title	Page
DV0P0770 DV0P0800	Connector kit for external peripheral equipment	226 227
DV0P0800 DV0P1450	Interface cable Surge absorber (3-phase)	240
DV0P1460	Ferite core for signal lines	240
DV0F1960	Communication cable	227
DV0P220	Reactor	196,229
DV0P221	Reactor	196
DV0P222	Reactor	196
DV0P223	Reactor	196
DV0P224	Reactor	196
DV0P225	Reactor	196
DV0P227	Reactor	196,229
DV0P228	Reactor	196,229
DV0P2870	Connector kit for power supply connection	225
DV0P2890	External regenerative resistor	228
DV0P2891	External regenerative resistor	228
DV0P2990	Battery for absolute encoder	194
DV0P3410	Noise filter	236
DV0P3670	Connector kit for motor/encoder connection	225
DV0P37300	Cable set (3 m)	224
DV0P3811	DIN rail mounting unit	228
DV0P39200 DV0P4120	Cable set (5 m) Interface conversion cable	224 263
DV0P4120 DV0P4121	Interface conversion cable Interface conversion cable	263
DV0P4121	Interface conversion cable	263
DV0P4131	Interface conversion cable	263
DV0P4132	Interface conversion cable	263
DV0P4160	Noise filter	240
DV0P4170	Noise filter	236
DV0P4190	Surge absorber (Single phase)	240
DV0P4220	Noise Filter	236
DV0P4280	External regenerative resistor: 50 Ω 25 W	197
DV0P4281	External regenerative resistor: 100 Ω 25 W	197
DV0P4282	External regenerative resistor: 25 Ω 50 W	197
DV0P4283	External regenerative resistor: 50 Ω 50 W	197
DV0P4284	External regenerative resistor: 30 Ω100 W	197
DV0P4285	External regenerative resistor: 20 Ω130 W	197
DV0P4290	Connector kit for motor/encoder connection	186
DV0P4310	Connector kit for motor/encoder connection	191
DV0P4320	Connector kit for motor/encoder connection	192
DV0P4330 DV0P4340	Connector kit for motor/encoder connection Connector kit for motor/encoder connection	191
DV0P4340 DV0P4350	Interface connector	192 184
DV0P4350 DV0P4360	Interface collinector	182
DV0P4420	Console	227
DV0P4430	Battery box	194
	Setup support software "PANATERM" for	
DV0P4460	MINAS series AC servo motor & driver	222
DV0PM20010	Connector Kit: Encoder	184
DV0PM20024	Connector kit: RS485, 232	183
DV0PM20025	Connector kit: Safety	183
DV0PM20026	Connector kit: External scale	184
DV0PM20032	Connector for power supply input connection (A-frame to D-frame (Single row type))	185
	Connector for power supply input connection	
DV0PM20033	(A-frame to D-frame (Double row type))	185
DV0PM20034	Connector for motor connection	186
	(A-frame to D-frame)	
DV0PM20035	Connector kit for motor/encoder connection	187
DV0PM20036	Connector kit for motor/encoder connection	191
DV0PM20037	Connector kit for motor/encoder connection	192
DV0PM20038	Connector kit for motor/encoder connection	191
DV0PM20039 DV0PM20040	Connector kit for motor/encoder connection Connector kit for motor/brake connection	192 193
DV0PM20040 DV0PM20042	Noise filter	236
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	Company Name				TEL	
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Kingdom	[Distributors] Panasonic Electric Works Austria GmbH [Sales office] Panasonic Electric Works Polska sp.	Biedermannsdorf	Priory E e-mail Web site Josef M 2362 Bi e-mail Web site ul. Wok	Business Park, Bedford, MK44 3WH. uk.sales@lenze.com http://www.lenze.com/en-gb/about-lenze/ ladersperger Strasse 2, iedermannsdorf (Vienna), Austria https://www.panasonic-electric-works/ https://www.panasonic-electric-works/ pska 9a, 02-583 Warszawa https://www.panasonic-electric-works/	+44-1234-7532-20 e/lenze-in-united-kingdo +43(0)2236-26846 +43(0)2236-46133 .com/eu/93.htm .com/eu/index.htm +48(0)22338-11-33 +48(0)22213-95-01 .com/eu/93.htm	
Kingdom	Panasonic Electric Works Austria GmbH [Sales office] Panasonic Electric Works Polska sp. z.o.o.	Biedermannsdorf	Priory E e-mail Web site Josef M 2362 Bi e-mail Web site ul. Wok	Business Park, Bedford, MK44 3WH. uk.sales@lenze.com http://www.lenze.com/en-gb/about-lenze/ dadersperger Strasse 2, iedermannsdorf (Vienna), Austria https://www.panasonic-electric-works/ https://www.panasonic-electric-works/ bska 9a, 02-583 Warszawa	+44-1234-7532-20 e/lenze-in-united-kingdo +43(0)2236-26846 +43(0)2236-46133 .com/eu/j3.htm .com/eu/index.htm +48(0)22338-11-33 +48(0)22213-95-01 .com/eu/j3.htm .com/eu/index.htm	
Kingdom	Panasonic Electric Works Austria GmbH [Sales office] Panasonic Electric Works Polska sp. z.o.o. [Sales office]	Biedermannsdorf	Priory E e-mail Web site Josef M 2362 Bi e-mail Web site ul. Wold e-mail Web site De Rijn	Business Park, Bedford, MK44 3WH. uk.sales@lenze.com http://www.lenze.com/en-gb/about-lenze ladersperger Strasse 2, ledermannsdorf (Vienna), Austria https://www.panasonic-electric-works https://www.panasonic-electric-works bska 9a, 02-583 Warszawa https://www.panasonic-electric-works https://www.panasonic-electric-works https://www.panasonic-electric-works https://www.panasonic-electric-works	+44-1234-7532-20 e/lenze-in-united-kingdo +43(0)2236-26846 +43(0)2236-46133 .com/eu/93.htm .com/eu/index.htm +48(0)22338-11-33 +48(0)22213-95-01 .com/eu/93.htm .com/eu/index.htm +31(0)499372727	
Kingdom Austria	Panasonic Electric Works Austria GmbH [Sales office] Panasonic Electric Works Polska sp. z.o.o.	Biedermannsdorf	Priory E e-mail Web site Josef M 2362 Bi e-mail Web site ul. Wold e-mail	Business Park, Bedford, MK44 3WH. uk.sales@lenze.com http://www.lenze.com/en-gb/about-lenze ladersperger Strasse 2, ledermannsdorf (Vienna), Austria https://www.panasonic-electric-works https://www.panasonic-electric-works bska 9a, 02-583 Warszawa https://www.panasonic-electric-works https://www.panasonic-electric-works https://www.panasonic-electric-works https://www.panasonic-electric-works	+44-1234-7532-20 e/lenze-in-united-kingdo +43(0)2236-26846 +43(0)2236-46133 .com/eu/93.htm .com/eu/index.htm +48(0)22338-11-33 +48(0)22213-95-01 .com/eu/93.htm .com/eu/index.htm +31(0)499372727 +31(0)499372185	

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	Company Name	0	Address		TEL
Country	[Category]	City		Address	FAX
		_	., ,,		+420(0)541217001
O	Panasonic Electric Works Czech s.r.o.		Veveri	3163/111, 616 00 Brno, Czech	+420(0)541217101
Czech Republic	[Sales office]	Brno	e-mail	https://www.panasonic-electric-works.	com/eu/93.htm
			Web site	https://www.panasonic-electric-works.co	m/eu/index.htm
			Barajas	s Park, San Severo 20, 28042 Madrid,	+34-91-329-3875
Spain	Panasonic Electric Works Espana S.A.	Madrid	Spain		+34-91-329-2976
)	[Subsidiary]	Maaria	e-mail	https://www.panasonic-electric-works	com/eu/93.htm
			Web site	https://www.panasonic-electric-works	com/eu/322.htm
				icuresti, nr.63, Ciorogirla, Ilfov, RO-	+40-21-255-0543
Romania	C.I.T. Automatizari SRL	Bucuresti		5, ROMANIA	+40-21-255-0544
	[Distributors]		e-mail office@citautomatizari.ro		
			Web site	http://www.citautomatizari.ro	
			Neuma	ınn J. u. 1., 1117 Budapest, Hungary	+36(0)19998926
Hungary	Panasonic Electric Works Hungary	Budapest		I	+36(0)19998927
	[Sales office]		e-mail	https://www.panasonic-electric-works.	
			Web site	https://www.panasonic-electric-works.	
			Grunds Schwitz	strasse 8, 6343 Rotkreuz,	+33(0)417997050
Switzerland	Panasonic Electric Works Schweiz AG	Rotkreuz		T	+31(0)417997055
	[Sales office]		e-mail	https://www.panasonic-electric-works.	
			Web site	https://www.panasonic-electric-works.	
	Electroprivod Ltd.			417, litera 43, Polustrovskiy avenue, Petersburg, Russia	+7-812-703-09-81
Russia	[Distributors]	St.Petersburg		Ţ.	+7-812-493-27-26
			Web site	http://www.electroprivod.ru	
	BOSTEK TEKNOLOJI GELISTIRME VE ROBOT SIST.SAN.TIC.A.S [Distributors]		10042 SOK.NO:10 A.O.S.B CIGLI-IZMIR, TURKEY		+90 232 433 8515
		Izmir			+90 232 433 8881
			e-mail	sales@bostek.com.tr	
Turkey			Web site	1	.00.040.400.0000
			Des Sanayi Sitesi 104 Sokak A07 Blok No:02 Yukarı Dudullu Ümraniye İstanbul Turkey		+90-216-466-3683
	Savior Kontrol Otomasyon [Distributors]	Istanbul			+90-216-466-3685
	[Blothbatolo]		Web site		
	Panasonic Industrial Devices Sales		Top Floor, South Wing, ChinaChem Gloden		.050.0500.7000
	(Hong Kong) Co.,Ltd. (PIDSHK)	Hong kong	Plaza, 77 Mody Road, S.T.S. East, Kowloon, HongKong		+852-2529-7322
	[Sales office]				+852-2598-9743
China	Panasonic Industrial Devices Sales (China) Co.,Ltd. (PIDSCN)	Shanghai	Floor 6, China Insurance Building, 166 East Road LuJiaZui PuDong New District, Shanghai, China		+86-21-3855-2442
Onnia	[Sales office]	Oriangnai			+86-21-3855-2375
	Panasonic Industrial Devices Sales		8/F, Tower Three, Kerry Plaza, 1-1 Zhongxinsi Road, Futian District, Shenzhen, China 12th Floor, Ambience Commercial,		+86-755-8255-8791
	(China) Co.,Ltd. (PIDSCN) [Sales office]	Shenzhen			_
	[calco dilice]				+91-124-6670400
	Industrial Division,	Gurana	Behind	Ambience Mall,	
	Panasonic India Pvt Ltd.	Gurgaon, Haryana	Gurgao	on - 122002, Haryana, India	+91-124-6670338
	[Sales office]		Web site	http://industrial.panasonic.com/sa/pro compressors/fa-motors	ducts/motors-
			Sardar	Patel Ring Road, Near Bright School,	+91-79-39845300
	Lubi Electronics	Gandhinaga,	Nana Chiloda,		
	[Distributors]	Gujarat	Dist.: G	andhinagar - 382330, Gujarat, India	+91-79-39845599
India			Web site	http://www.lubielectronics.com	
	Luna Bearings	Mumbai,	59, Bibijan Street, 2nd Floor, Moiz Manzil,		+91-22-23455052
	[Distributors]	Maharashtra	Mumbai - 400003, Maharashtra, India		+91-22-23427773
			 	http://www.lunabearings.com	
				ot No.74, Shree Ganesh Complex, Gunta Compound, Danole Boad	+91-2522-661600
	Vashi Electricals Pvt. Ltd.	Mumbai,	Behind Gupta Compound, Dapole Road, Mankoli Naka,		101-2522 661620
	[Distributors]	Maharashtra	Bhiwan	di - 421305, Maharashtra, India	+91-2522-661620
			Web site	http://www.vashielectricals.com	

	Country	Company Name [Category]	City	Address	TEL
	Country				FAX
	V	Panasonic Industrial Devices Sales Korea Co., Ltd. (PIDSKR) [Sales office]	Seoul	6F DONG-IL Tower 38, Teheran-ro 114-gil, Gangnam-gu, Seoul, 135-851, Korea	+82-2-795-9600
	Korea				+82-2-2052-1053
	T-:	Panasonic Industrial Devices Sales Taiwan Co.,Ltd. [Sales office]	Taipei	12F, No.9, SongGao Rd., Taipei 110, Taiwan, R.O.C.	+886-2-2757-1900
	Taiwan				+886-2-2757-1977
		Panasonic Industrial Devices Sales Asia Pte.Ltd. [Sales office]	Singapore	No.3 Bedok South Road Singapore 469269	+65-6390-3718
					+65-9435-6844
	Singapore	Intermech Machinery Pte.Ltd. [Distributors]	Singapore	2 Woodlands Sector 1 #03-25, Woodlands	+65-6751-5088
				Spectrum 1 Singapore 738068	+65-6759-2122
				Web site http://www.intermech.com.sg	
ĺ	Malaysia	Panamech Machinery Sdn Bhd [Distributors]	Kuala Lumpur	No.14, Lorong Sanggul 1C, Bandar Puteri,	+60-3-5161-7876
				41200 Klang, Selangor Darul Ehsan	+60-3-5161-7136
				Web site http://panamech.com.my/	
		Panamech (PG) Sdn Bhd [Distributors]	Penang	Sri Relau Komplex, Unit 1-3-11, Persiaran Bukit Jambul 1, 11900 Penang	+60-4-643-8266
					+60-4-645-1639
۱				Web site http://panamech.com.my/	
•	Thailand	Premier Automation Center Co.,Ltd. [Distributors]	Bangkok	73 Soi Ladkrabang 30 Ladkrabang	+66-2181-2299
				Ladkrabang Bangkok 10520	+66-2181-2288
.				Web site http://www.premier-ac.co.th	site http://www.premier-ac.co.th
		Plenty Island (Thai) Co.,Ltd. [Distributors]	Bangkok	3 Soi Charoenrat 10, Charoenrat Road.,	+66-2291-9933
				Bangkhlo, Bangkhorlaem, Bangkok 10120	+66-2291-2065
				Web site http://www.plenty.co.th	http://www.plenty.co.th
	Indonesia	PT. Handal Yesindo Sejahtera [Distributors]	Surabaya	II Days Kuticari SA Surabaya Indonesia	+62-31-843-8844
				Jl. Raya Kutisari 8A, Surabaya, Indonesia	+62-31-841-4333
				/eb site http://www.handalyesindo.com	
		PT.Riasarana Electrindo [Distributors]	Jakarta	Jl. Prof. Dr. Latumenten Grogol Permai blok D No. 8-15 Jakarta 11460, Indonesia	+62-21-564-9178
					+62-21-566-7405
				Web site http://www.risacorps.com	•
	Philippines	ilippines Movaflex Designs Unlimited, Inc. [Distributors]	Manila	136 Calbayog Street, Mandaluyong City,	+63-2-881-3636
				Metro Manila, Philippines.	+63-2-998-3881
ı				Web site http://www.movaflex.com/	

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