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.

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 A6 family **MINAS** E series

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

AC Servo Motor & Driver

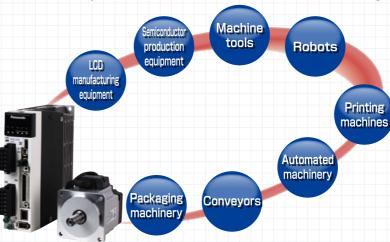


2016

<16.1®>



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

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



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۹6	Family Line-up · · · · · · · · · · · · · · · · · · ·	з
Иo	otor Features ······	7
	ver Features · · · · · · · · · · · · · · · · · · ·	
	otective Features ·····	
Otl	ner Driver Functions·····	12
3e	tup Support Software · · · · · · · ·	13
	npliance with International Standards · · · ·	
۹6	N series Features·····	16
Иo	tor Line-up · · · · · · · · · · · · · · · · · · ·	17
Иo	del Designation · · · · · · · · · · · · · · · · · · ·	18
Οv	erall Wiring · · · · · · · · · · · · · · · · · · ·	19
	plicable Peripheral Equipments · · · ·	
	ole of Part Numbers and Options · ·	
	Driver Specifications · · · · · · ·	.33
	A6SF series·····	.33
Driver	A6SG series and A6SE series ·	.35
	Wiring Diagram · · · · · · · · · · · · · · · · · · ·	٠37
	Wiring to the connector	
	XA, XB, XC, and Terminal Block. \cdots	. 37
	Safety Function · · · · · · · · · · · · · · · · · · ·	٠41
	Wiring to the Connector X3 \cdot	٠41
	Control Circuit Diagram · · · · · ·	.42
	Wiring to the Connector X4 \cdot	
	Wiring to the Connector X5 \cdot	٠44
	Wiring to the Connector X6 \cdot	
	Dimensions of Driver · · · · · ·	٠47
ᡖ	Motor Specifications · · · · · · · ·	٠50
히	Special Order Product · · · · ·	
≥	Motor Specifications Description	165
L		
	Cable part No. Designation · · ·	
	Specifications of Motor connector	
	Encoder Cable · · · · · · · · · ·	
		175
	Brake Cable · · · · · · · · · · · · · · · · · · ·	
တ္က	Interface Cable · · · · · · · · ·	182
힏	Connector Kit · · · · · · · · · · · · · · · · · · ·	
Options	Battery for Absolute Encoder	
٦	Mounting Bracket · · · · · · · ·	
		196
	External Regenerative Resistor · ·	
	Surge Absorber for Motor Brake · · ·	199

The A6 family also shows its versatility when high productivity.

Manufacturers · · · · · 200

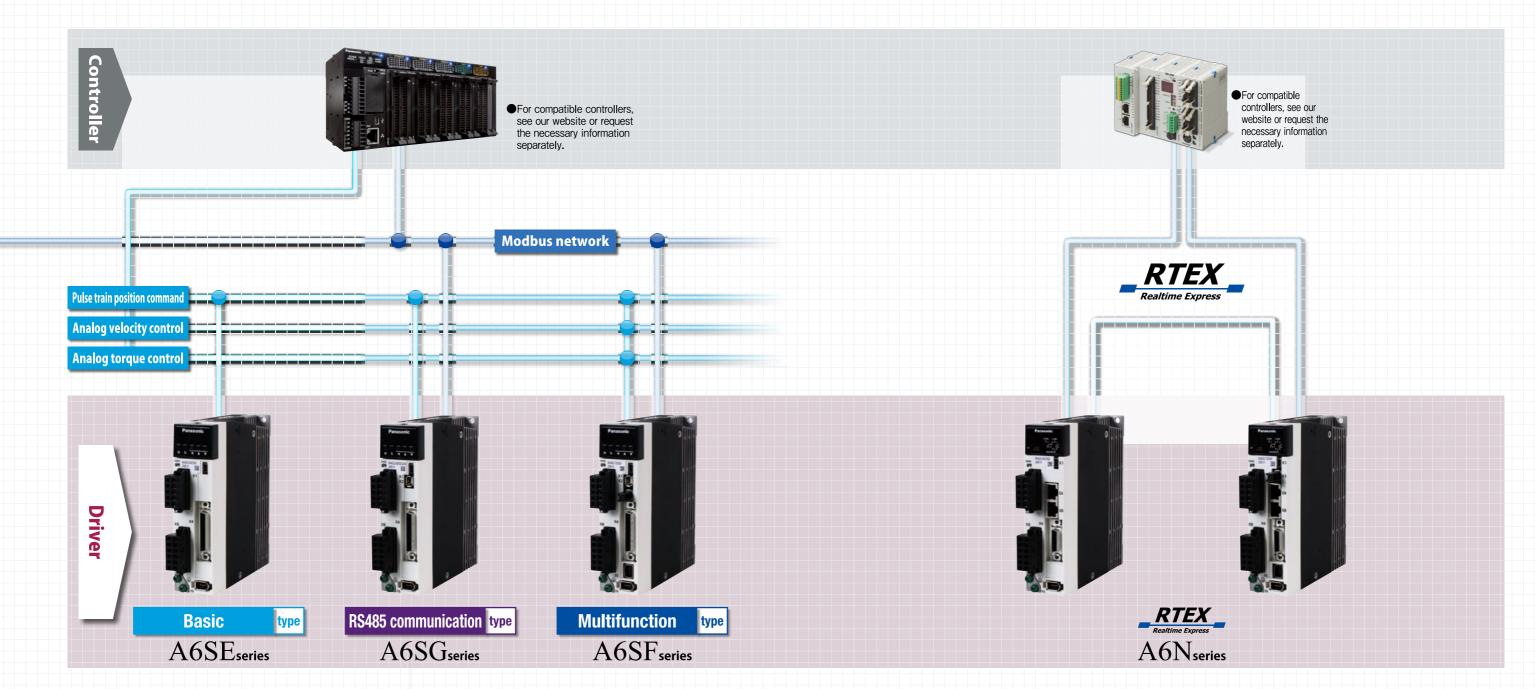
List of Peripheral Equipment

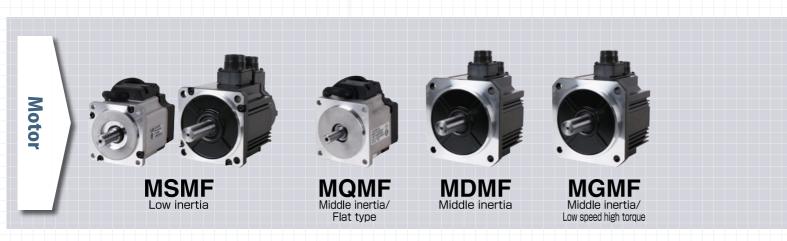
formation	٠.	٠.	٠.	٠.	٠.	٠.,		٠.	٠.	٠.	٠.	232
Index ···				٠.				٠.			٠.	272
Sales Of	fic	Р	οf	0	W.	ers	0.5	15				284

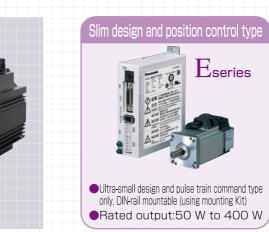
Servomotors that flexibly and effectively fit into

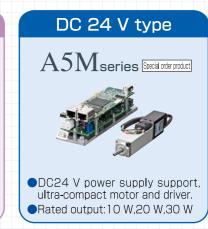
various system configurations







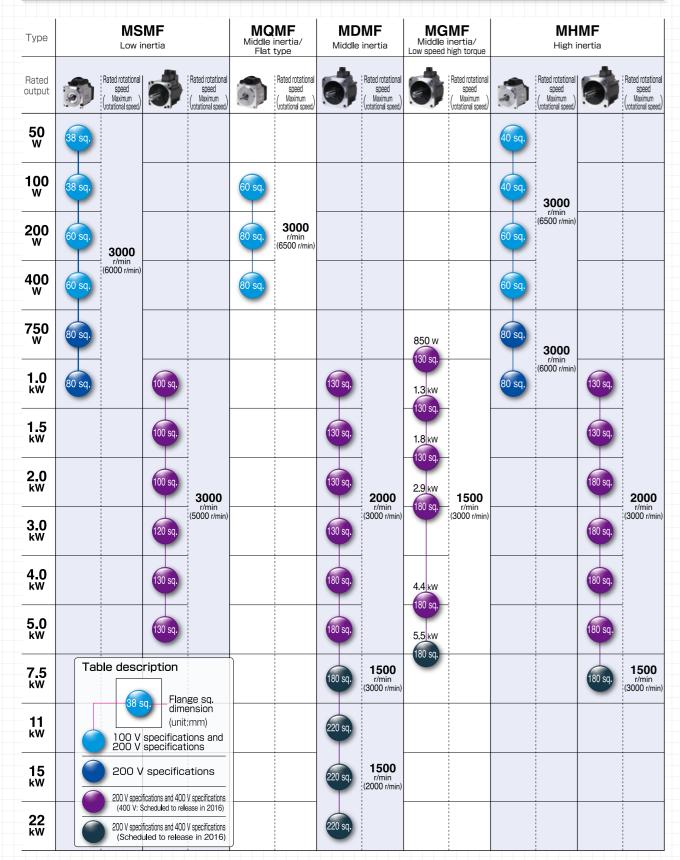




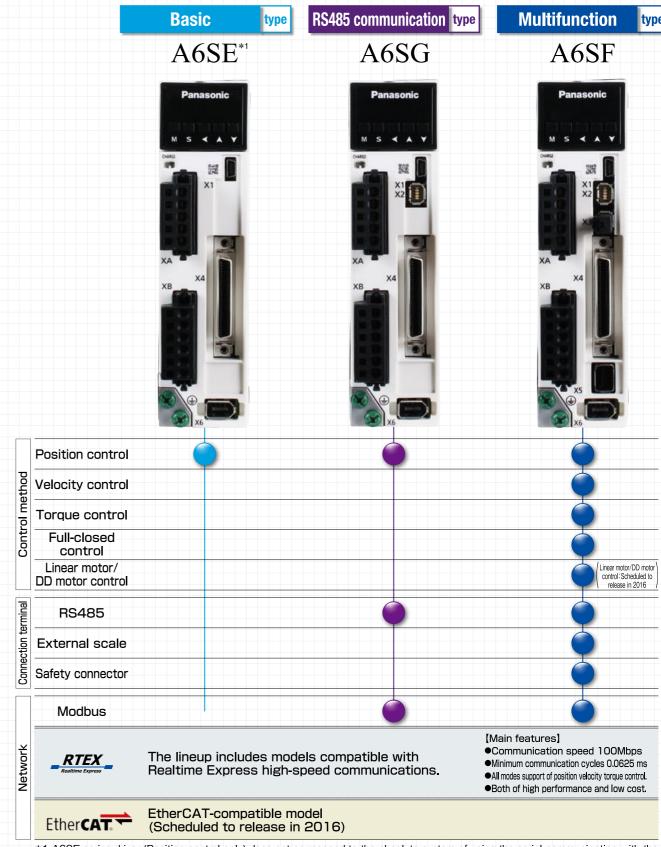
manufacturing industry needs. M

It is MINAS A6 Family lineup that meets the

Motor line-up



Driver line-up

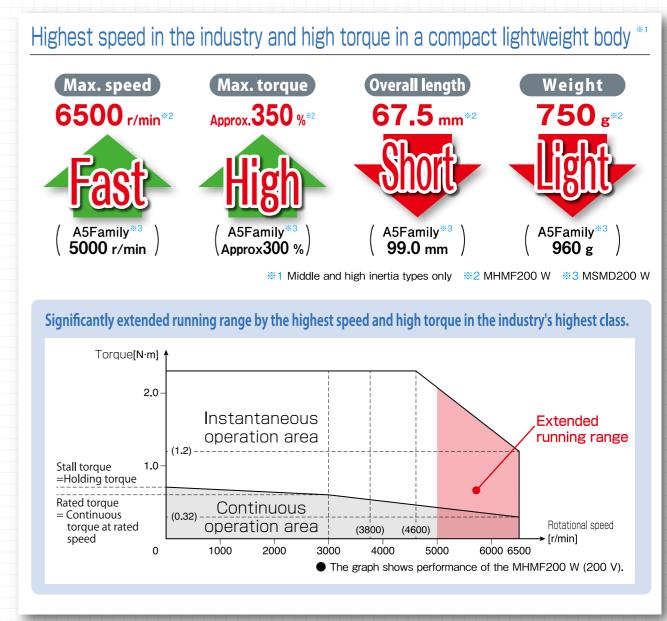


^{*1} A6SE series driver (Position control only) does not correspond to the absolute system of using the serial communication with the host device. It supports incremental system only.

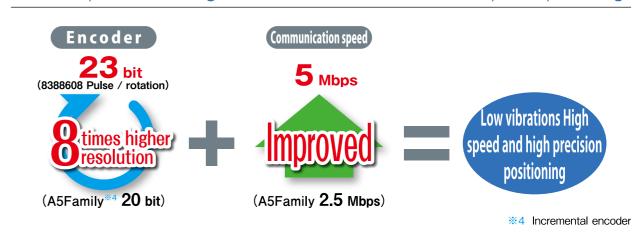
Small, light, powerful and speedy







Enhanced position detecting resolution enables smoother and more precise positioning.



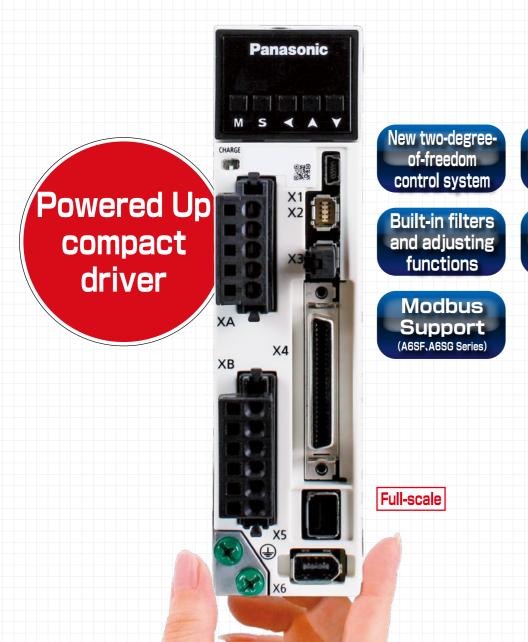
Swifter, smarter and easier to use

Frequency response

3.2 kHz

PANATERM

Support



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.

Comparison of position setting waveforms High stiffness ball screw

Belt device

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

Trace of ●A5II Family

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.

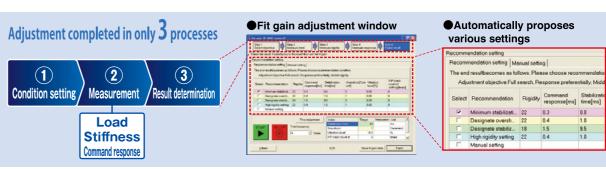
*1 Comparison with conventional product A5II family

Settling time (Measured on low stiffness resonant mechanism) A6 Family **6** ms

settling time



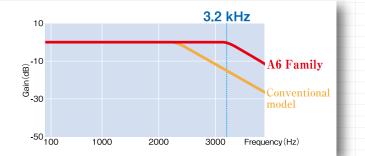
The above is a measure based on our test environment.



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



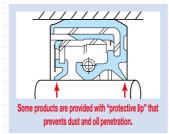
Reduced maintenance work and trouble.

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(with protective lip)					
MSMF ©				No 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 (NDIT)	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.)

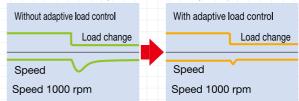
Manual/Auto damping filter

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

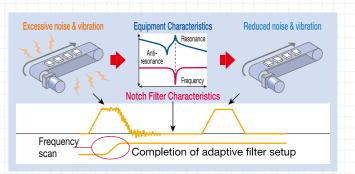
A regenerative resistor is used to discharge regenerative energy, which is the energy generated when stopping a load with a large moment of inertia or when using this unit in vertical operation. This energy is returned to the driver from the motor.

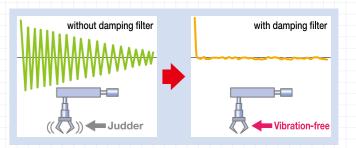
- Frame A. and frame B model drivers do not contain a regenerative resistor. Optional regenerative resisters are recommended.
- Frame C to frame F model drivers contain one regenerative resistor; however, adding an optional regenerative resistor provides additional regeneration capability.

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.







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.

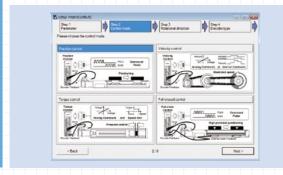
Multifunctional software for quick adjustment support

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.



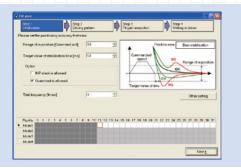
The fit gain function for setting Two-degree-of-freedom control.

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



Fit gain

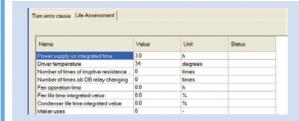
This function automatically searches the best suitable stiffness setting and mode and adjusts the gain once the target in-position range and setting time are set.



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.



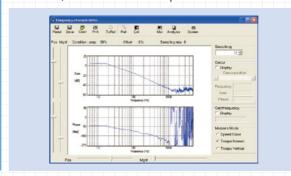


Please download from our web site and use after install to the PC.

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

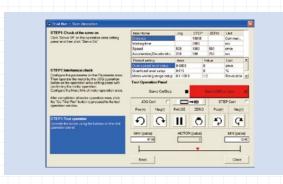
Frequency characteristics measurement function

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

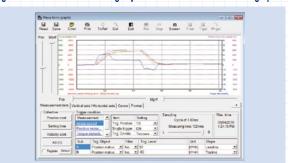
This function supports positioning with the Z-phase search and software limit.



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.

Compliance with MINAS international standards









		Driver	Motor
	EMC Directives	EN55011	
		EN61000-6-2	
		EN61000-6-4	_
		EN61800-3	
	Low-Voltage Directives	EN61800-5-1	EN60034-1
EU Directives	Low-voitage Directives	EN50178	EN60034-5
		ISO13849-1(PL e , Cat.3)	
		EN61508(SIL3)	
	Machinery Directives	EN62061(SILCL 3)	
	Functional safety *1	EN61800-5-2(SIL3、STO)	_
		IEC61326-3-1	
		IEC60240-1	
III Ctandondo		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

- 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)

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.

Low noise, compliant with EMC directives

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

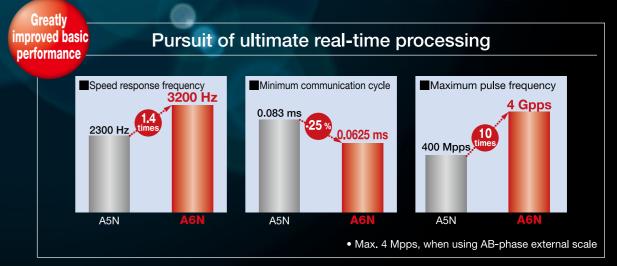
Compliance with EU safety standards.

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.)

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

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).

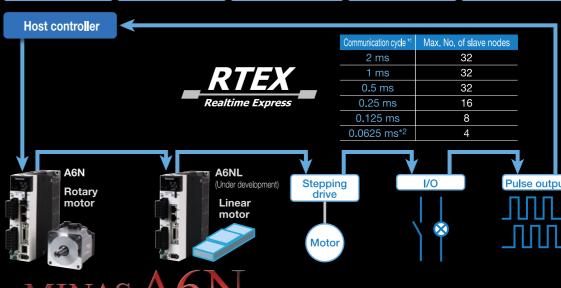
©High-precision position latch and comparison ©Communication cycle can be set to any time between 2 ms and 62.5 μs.

Simple network OSatisfies both high performance and low cost requirements.

OSynchronization 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

Rated rotational Rotary

speed

(Max. speed)

(r/min)

3000

(6000)

3000

(6000)

3000

(5000)

3000

(4500)

3000

(6500)

3000

(6500)

2000

(3000)

1500

(3000)

3000 (6500)

3000

(6000)

3000

(6500)

3000

(6000)

2000

(3000)

 \bigcirc

 \bigcirc

 \bigcirc

 \bigcirc

 \bigcirc

Rated output

(kW)

0.05 0.1

0.2 0.4

0.75 1.0

0.05 0.1

0.2 0.4

0.75 1.0

1.0 1.5

2.0 3.0

0.1 0.2

0.4

0.1 0.2

0.4

1.0 1.5

0.85 1.3

1.8 2.9

4.4

0.05 0.1

0.2 0.4

0.75 1.0

0.05 0.1

0.2 0.4

0.75 1.0

1.0 1.5

2.0 3.0

5.0

4.0

3.0

5.0

2.0

4.0

5.0

4.0

encoder Enclosure

IP65

IP67

IP67

IP65

IP67

23-bit

absolute

 \bigcirc

Motor

lead-out

configuration

I eadwire

Connector

Connector

Leadwire

Connector

IP67 Connector

IP67 Connector

IP65 Leadwire

IP67 Connector

IP67 Connector

Features

Small capacity

plications

Suitable for high

speed application

Suitable for all ap-

Middle capacity

Suitable for the

machines directly

coupled with ball screw and high

stiffness and high

Small capacity

Middle capacity

Middle capacity

Suitable for low

speed and high

Small capacity

Middle capacity

Suitable for low

of inertia

stiffness machines

with belt driven, and

large load moment

Suitable for low stiff-

ness machines with

torque application

belt driven

Suitable for low stiff-

ness machines with

driven

Flat type and suit-

machines with belt

able for low stiffness

repetitive application

Applications

Bonder

ductor

Semicon-

production

equipment

Packing

SMT

Food

SMT

machines

machines

Belt drive

machines

unloading

Conveyors

Robots

tool

etc

Machine

Conveyors

Robots

Textile

etc

machines

Conveyors

Conveyors

LCD man-

ufacturing

equipment

etc

Robots

Robots

robot

Inserter

machines

machines LCD

production

equipment

machines

Motor Line-up

MSMF

MQMF

(Flat type)

MDMF

MGME

MHMF

Middle inertia

80 mm sq. or less

130 mm sq. or mor

Low inertia

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

Servo Motor

M S	M F	5 A	Z	L	1	A 1	*	Special specifications
1	2	3	4	(5)	6	7		

ш тур	e	
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)

MINAS A6 Family

Model Designation

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

Symbol		Sh	aft	Holding	g brake	Oil	seal	Motor encorder terminal *1		
		Round	Key-way, center tap	without	with	without	with	Connector JN	Lead wire	
Α	1	•		•		•		•		
Α	2	•		•		•			•	
В	1	•			•	•		•		
В	2	•			•	•			•	
С	1	•		•			•	•		
С	2	•		•			•		•	
D	1	•			•		•	•		
D	2	•			•		•		•	
S	1		•	•		•		•		
S	2		•	•		•			•	
Т	1		•		•	•		•		
Т	2		•		•	•			•	
U	1		•	•			•	•		
U	2		•	•			•		•	
V	1		•		•		•	•		
٧	2		•		•		•		•	

3 Motor rated output

4 Voltage specifications

_			
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
00	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		

6 Design order

Symbol	Specifications	Symbol
1	100 V	1
2	200 V	<note></note>
Z	100 V/ 200 V common (50 W only)	When us

Specifications Standard

② Series

Symbol Series name

A6 series

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

5 Rotary encoder specifications

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

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

		Sh	aft	Holding	g brake	Oil	seal	Encorder terminal		
Symbol		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		•		•		•		•	

Α	2	•		•		•				•
В	1	•			•	•			•	
В	2	•			•	•				•
С	1	•		•			•		•	
С	2	•		•			•			•
С	3	•		•				•	•	
С	4	•		•				•		•
D	1	•			•		•		•	
D	2	•			•		•			•
D	3	•			•			•	•	
D	4	•			•			•		•
S	1		•	•		•			•	
S	2		•	•		•				•
T	1		•		•	•			•	
Т	2		•		•	•				•
U	1		•	•			•		•	
U	2		•	•			•			•
- 11	2							•		

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

*1 Connector type: IP67, Lead wire type: IP65

•

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

Servo Driver

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

U 4

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

© oak	pry voltage opcomoduo	•••		
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

Symbol (specification)	Symbol	Specification
	E	Basic type (Pulse train only)
S (Analog/Pulse)	F	Multi fanction type (Pulse, analog, full-closed)
	G	RS485 communication type (Pulse train only)
N	Е	without the safety function
(RTEX)	F	with the safety function
B (EtherCAT)	(Sch	neduled to release in 2016)

- (*1) Except for output shaft, and connector.
- * For possible combinations of motors and drivers, see P. 23 to P. 32.

80 mm sq. or less

130 mm sq. or more

- · 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.

17 MINAS A6 Family

High inertia

MQMF 100 W to 400 W

With protective JN Lead wire

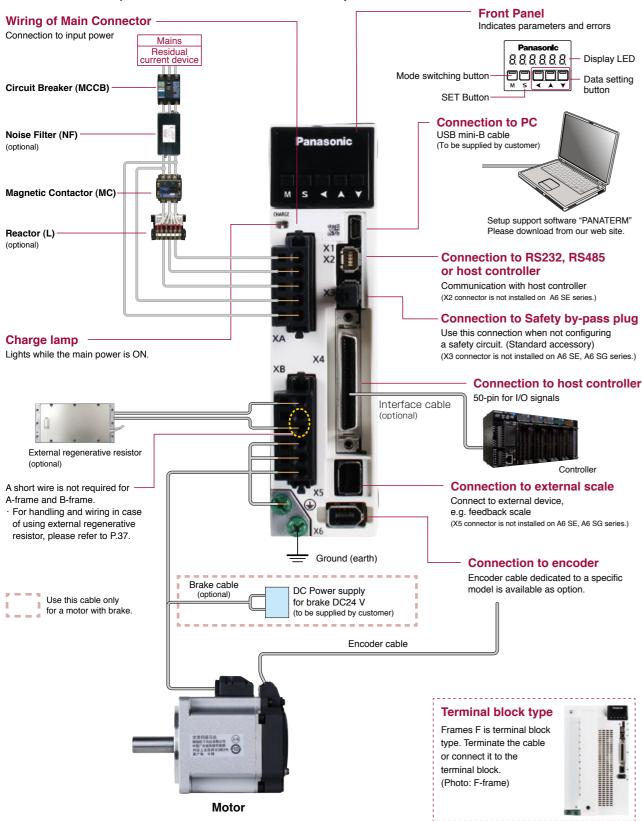
lip

Motor encorder terminal *1

Overall Wiring

MINAS A6 Family

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

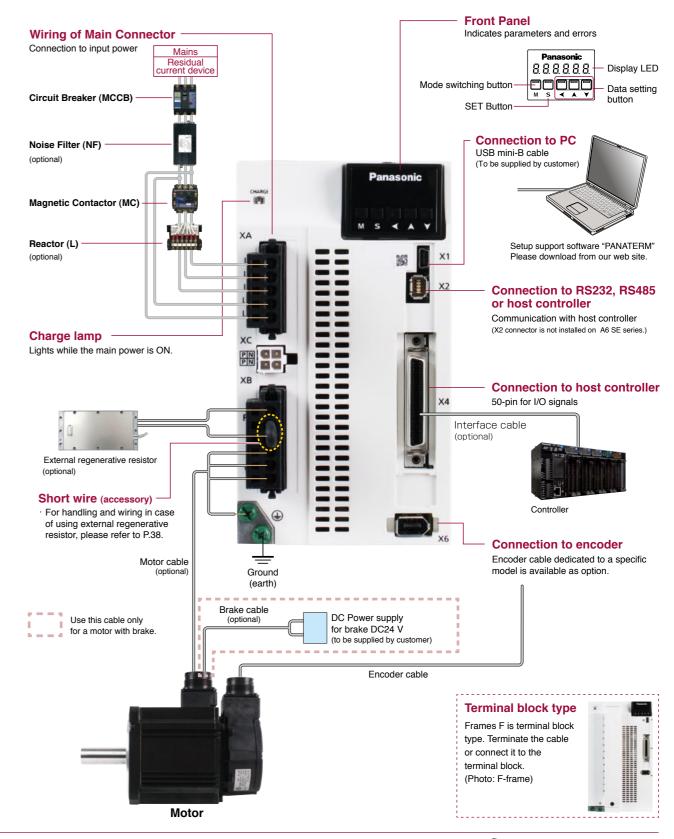


<Caution>

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.

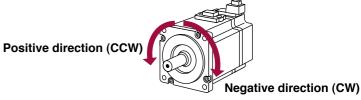
Example) Steel screw (M5) into steel section: 2.7 N·m to 3.3 N·m.

<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												
MADL	MSMF MQMF MHMF	MF 0.1 0.1	DV0P4190												
WIADL	MSMF MHMF	Single/	0.05			DV0P4170	DV0P4190						Connection to exclusive connector		
	MSMF MQMF MHMF	3-phase 200	0.1, 0.2	approx. 0.5	10	DV0PM20042	DV0P1450					Connection to exclusive connector		0.75 mm²/	0.28 mm ² to 0.75 mm ² /
MDDI	MSMF	Single phase, 100	0.2			DV0P4170	DV0P4190		20 A (3P+1a)					AWG18 600 VAC or more	to AWG18 100 VAC
MBDL	MQMF MHMF	Single/ 3-phase 200	0.4	approx. 0.9		DV0P4170 DV0PM20042	DV0P4190 DV0P1450				Connection to exclusive				or more
MCDL	MSMF MQMF MHMF	Single phase, 100	0.4	approx. 0.9	15	DV0PM20042	DV0P4190 DV0P14	DV0P1460							
MODE	MSMF MHMF	Single/ 3-phase 200	0.75	approx.	15	DVOFIVIZOU4Z	DV0P4190 DV0P1450								
	MGMF		0.85								conn		conn		
	MSMF	1.0 (80 mm sq.) 1.0									ector	0.75 mm²/ AWG18	ector		
	MDMF MHMF		1.0						600 VAC or more						
MDDL	MHMF	Single/ 3-phase 200	1.0 (80 mm sq.)		20	DV0P4220	DV0P4190 DV0P1450		30 A (3P+1a)	2.0 mm²/	00 VAC			2.0 mm²/ AWG14 600 VAC or more	0.75 mm²/
	MSMF		1.0							AWG14					
	MGMF		1.3	approx. 2.3						or more					
	MSMF MDMF MHMF		1.5												
	MGMF		1.8												AWG18 100 VAC
MEDL	MSMF MDMF MHMF	3-phase 200	2.0	approx. 3.8	30	DV0PM20043	DV0P1450		60 A (3P+1a)						or more
	MSMF MDMF MHMF		3.0	approx. 4.5				DV0P1460	,		11 mm or		11 mm or		
	MGMF		2.9					RJ8035 (Recommended) component			smaller		smaller		
MFDL	MSMF MDMF MHMF	3-phase 200	4.0	approx.	50	DV0P3410	DV0P1450	*4	100 A	3.5 mm²/ AWG12 600 VAC or more	φ _{5.3} Terminal		φ _{5.3}	3.5 mm²/ AWG12 600 VAC or more	
	MGMF		4.4	7.5					(3P+1a)	or more	block		block	or more	
	MSMF MDMF MHMF		5.0									15	M5		

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

Related page

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		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	IVIZ.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.

^{*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	parts					■ Options			
					A6 SF series	A6 SG series		Power	Encoder C	able Note)3		able Note)3						Title	Part No.	Page
				Rating/	Multi fanction	RS485 communication		capacity	23-bit A	Absolute							Interface Cable)	DV0P4360	182
Motor series	Power	Output	Part No.	Spec.	type /Pulse, analog,\	A6 SE series	Frame	/ at rated	Use in the	Use in the	without	with	Brake Cable	External Regenerative	Reactor	Noise Filter			DV0P4120	182
	supply	(W)	Note)1	Dimensions (page)	\ full-closed /	Basic		\ load / (kVA)	absolute system	Incremental system	without Brake	Brake	Note)3	Resistor	Single phase 3-phase	Single phase 3-phase			DV0P4121	182
						(Pulse signal input) Note)2, Note)4)		(with battery box) Note)5	(without battery box)							Interface Conv	ersion Cable	DV0P4130	182
		50	MSMF5AZL1 ☐ 2	51	MADLT01SF	MADLN01S			,										DV0P4131	182
	Cinalo	100	MSMF011L1 2	53	MADLT11SF	MADLN11S♦	A-frame	Approx. 0.4						DV0P4280	DV0P227	DV0P4170	Connector Kit	Cingle row	DV0P4132	182
	Single phase							Approx.								DV0P4170	for Power	A-frame Single row type	DV0PM20032	185
	100 V	200	MSMF021L1 ☐ 2	55	MBDLT21SF	MBDLN21S♦	B-frame	0.5						DV0P4283	DV0P228		COMMICCION	D-frame Double row type	DV0PM20033	185
MSMF		400	MSMF041L1 ☐ 2	57	MCDLT31SF	MCDLN31S♦	C-frame	Approx. 0.9						DV0P4282		DV0PM20042	Connector Kit for Motor	A-frame to D-frame	DV0PM20034	186
\Leadwire\		50	MSMF5AZL1 ☐ 2	52	MADLT05SF	MADLN05S♦			MFECA	MFECA		F1404	MEMOR	DV0D4004			Connection Connector Kit		DV0D4000	100
type /		100	MSMF012L1 ☐ 2	54	MADLT05SF	MADLN05S♦	A-frame	Approx.	0 * * 0EAE (For fixed)	0 * * 0EAD (For fixed)		FMCA *0EED	MFMCB 0**0GET	DV0P4281	DV0P227	DV0P4170	Motor/Encoder		DV0P4290	186
∄ 3000 r/min IP65	Single	200	MSMF022L1 ☐ 2	56	MADLT15SF	MADLN15S♦	_		(i oi lixeu)	(i oi lixea)					DV0P220	DV0PM20042		RS485, RS232	DV0PM20024	183
	phase/	400	MSMF042L1 ☐ 2	58	MBDLT25SF	MBDLN25S♦	B-frame	Approx.						DV0P4283			Connector Kit	Safety	DV0PM20025	183
	3-phase 200 V		_					Annroy						DV01 4200		DV0PM20042	Connector Kit	Interface External Scale	DV0P4350 DV0PM20026	184
		750	MSMF082L1 ☐ 2	59	MCDLT35SF	MCDLN35S♦	C-frame	1.3								DV0PM20042		Encoder	DV0PM20010	184
		1000	MSMF092L1 ☐ 2	60	MDDLT45SF	MDDLN45S♦	D-frame	Approx.						DV0P4284	DV0P228 DV0P222	DV0P4220	Battery for Abs		DV0P2990	194
		400	MQMF011L1 🗌 2	07	MADITMOE	MARINAGA		Approx.						D1/0D 4000			Battery Box for	Absolute Encoder	DV0P4430	194
	Single	100	MQMF011L1 ☐ 4	67	MADLT11SF	MADLN11S♦	A-frame	0.4						DV0P4280	DV0P227	DV0P4170	Note)5	For A-frame,	DV0PM20100	195
Mid	phase 100 V	200	MQMF021L1 \square 2 MQMF021L1 \square 4	69	MBDLT21SF	MBDLN21S♦	B-frame	Approx. 0.5						DV0P4283	DV0P228		Mounting Bracket	B-frame For C-frame,		
MQMF	100 V	400	MQMF041L1 2 MQMF041L1 4	71	MCDLT31SF	MCDLN31S♦	C-frame	Approx.	MFECA	MFECA				DV0P4282	DV0P228	DV0PM20042		D-frame with	DV0PM20101	195
Leadwire type		100	MQMF012L1 ☐ 2	68	MADLT05SF	MADLN05S♦		0.0	0 * * 0EAE	0**0EAD		FMCA *0EED	MFMCB 0**0GET	DV0P4281			Encoder	Battery Box Note)5	MFECA0 * * 0EAE	171
☐ 3000 r/min ☐ IP65	Single	100	MQMF012L1 4	00	WADLIUSSE	WADLINUSS	A-frame	Approx.	(For fixed)	(For fixed)				DV0F4261	DV0F221	D) (2D = 2	Cable	without	MFECA0 * * 0EAD) 171
type IP65	phase/ 3-phase	200	MQMF022L1 ☐ 2 MQMF022L1 ☐ 4	70	MADLT15SF	MADLN15S♦									DV0P220		Motor Cable	Battery Box without Brake	MFMCA0**0EED	
	200 V	400	MQMF042L1 2	72	MBDLT25SF	MBDLN25S♦	B-frame	Approx.						DV0P4283		D 101 111200 12	Brake Cable	manout Brano	MFMCB0 * * 0GET	
			MQMF042L1 ☐ 4 MHMF5AZL1 ☐ 2					0.5							DV0P220			50 Ω 25 W	DV0P4280	197
		50	MHMF5AZL1 ☐ 4	73	MADLT01SF	MADLN01S♦	A-frame	Approx.						DV0P4280	DV0P227			100 Ω 25 W	DV0P4281	197
	Single phase	100	MHMF011L1	75	MADLT11SF	MADLN11S♦		0.4								DV0P4170	External regenerative	25 Ω 50 W	DV0P4282	197
	100 V	200	MHMF021L1	77	MBDLT21SF	MBDLN21S♦	B-frame	Approx. 0.5						DV0P4283			resistor	50 Ω 50 W	DV0P4283	197
		400	MHMF041L1 2 2 MHMF041L1 4	79	MCDLT31SF	MCDLN31S♦	C-frame	Approx.						DV0P4282	DV0P228	DV0PM20042		30 Ω 100 W	DV0P4284	197
MHMF <u>∓</u>		50	MHMF5AZL1 🗌 2	74	MADLT05SF	MADLN05S♦		0.0											DV0P220	196
Leadwire type			MHMF5AZL1 4 MHMF012L1 2	76		-	.	Approx.	MFECA 0**0EAE	MFECA 0**0EAD		FMCA *0EED	MFMCB 0**0GET	DV0P4281	DV0P227		Decetes		DV0P222	196
3000 r/min		100	MHMF012L1 4 MHMF022L1 2		MADLT05SF	MADLN05S♦	A-frame	0.5	(For fixed)	(For fixed)	0*	*UEED	0 * * 0GE1		DV0P220	DV0P4170 DV0PM20042	Reactor		DV0P227	196
IP65	Single phase/	200	MHMF022L1 4	78	MADLT15SF	MADLN15S♦										DV0PW20042			DV0P228	196
	3-phase 200 V	400	MHMF042L1 ☐ 2 MHMF042L1 ☐ 4	80	MBDLT25SF	MBDLN25S♦	B-frame	Approx. 0.9						DV0P4283	DV0P228				DV0P4170	236
	200 V	750	MHMF082L1 ☐ 2 MHMF082L1 ☐ 4	81	MCDLT35SF	MCDLN35S♦	C-frame	Approx.							DV0P220	DV0PM20042	Noise Filter		DV0PM20042	236
	1							Approx.						DV0P4284	DV0P228	DV0D4000			DV0P4220	236
		1000	MHMF092L1	00	MDDLTECOL	MDDI NECO ^					1									
		1000	MHMF092L1 ☐ 2 MHMF092L1 ☐ 4	82	MDDLT55SF	MDDLN55S♦	D-frame	2.3						D V 0 F 4 2 0 4	DV0P222	DV0P4220	Surge Absorba	r	DV0P4190	237
	-	ts the r		. (refer to	"Model designa	tion" P.18.)	D-frame						nat a battery is r	not supplied to			Surge Absorbe	r	DV0P4190 DV0P1450	237

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

Surge Absorber Ferite Core

196

236

237

238

MINAS A6 Family 26

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	al parts	S					■ Options		
					A6 SF series	A6 SG series			Encoder Ca	able Note)3	Motor (Cable	Note)3						Title	Part No. P
					Multi fanction	RS485		Power					11010/0					Interface Cabl	9	DV0P4360 1 DV0P4120 1
				Rating/	type	communication		capacity	23-bit A	bsolute				Brake	External	D	Naine Filter			DV0P4121 1
Motor series		Output	Part No.	Spec.	/Pulse, analog,\	A6 SE series	Frame	rated	Use in the	Use in the	without		with	Cable	Regenerative	Reactor	Noise Filter	Interface Conv	ersion Cable	DV0P4130 1
	supply	(W)	Note)1	Dimensions (page)	\ full-closed /	Basic		\ load /	absolute system	Incremental system	without Brake	١	Brake	Note)3	Resistor	Single phase 3-phase	Single phase 3-phase			DV0P4131 1
				(page)		(Pulse signal input)		(KVA)	I	(without battery box						, ,	. ,	Connector Kit	Single row	DV0P4132 1 DV0PM20032 1
						Note)2, Note)5			Note)6									for Power	to type	
				51														Supply Input Connection	D-frame Double row type	DV0PM20033 1
		50	MSMF5AZL1 ☐ 1	100	MADLT01SF	MADLN01S♦		Approx										Connector Kit	A-frame to	DV0DM00004 4
				E2			A-frame	Approx. 0.4							DV0P4280	DV0P227		for Motor Connection	D-frame	DV0PM20034 1
	Single	100	MSMF011L1 ☐ 1	53 100	MADLT11SF	MADLN11S♦											DV0P4170	Connector	MSMF	DV0PM20035 1
	phase								-			MFMC	.,					Kit for Motor/ Encoder Con-	MQMF	DV0PM24582 1
	100 V	200	MSMF021L1 ☐ 1	55 100	MBDLT21SF	MBDLN21S♦	B-frame	Approx.	MFECA	MFECA		* * 0N		MFMCB	DV0P4283			nection	or Brake Connection	DV0PM20040 1
				100					0 * * 0MJE For movable,\	0 * * 0MJD /For movable,\	d	or movabl direction o	of	0 * * 0PJT /For movable,\		DV0P228		Connector Kit i	RS485, RS232	DV0PM20040 1
		400	MSMF041L1 ☐ 1	57	MCDLT31SF	MCDLN31S♦	C-frame	Approx.	direction of motor shaft	direction of motor shaft		motor sha		direction of motor shaft	DV0P4282		DV0PM20042		Safety	DV0PM20025 1
MONTE				101				0.5	MFECA	MFECA		MFMC/ * * 0NI		MFMCB				Connector Kit	Interface External Scale	DV0P4350 1 DV0PM20026 1
MSMF		50	MSMF5AZL1 □ 1	52	MADLT05SF	MADLN05S♦			0 * * 0MKE / For movable, \	0 * * 0MKD / For movable, \	/ Fo	or movable	ole, \	0 * * 0PKT For movable,					Encoder	DV0PM20010 1
Connector type)			100					opposite direction of motor shaft	opposite direction of motor shaft		f motor sh		opposite direction of motor shaft	DV0P4281			Battery for Abs		DV0P2990 1
를 3000 r/min	'	100	MSMF012L1 ☐ 1	54	MADLT05SF	MADLN05S♦	۸ ،	Approx.	MFECA	MFECA	N	MFMC	;A	MFMCB	D V 01 4201	DV0P227		Note)6	r Absolute Encoder	DV0P4430 1
IP67		100	WOWN OTZET T	100	WADEI	WIADLINGSS	A-frame	0.5	0 * * 0TJE / For fixed, \	0 * * 0TJD / For fixed, \	-	* * 0R	-	0 * * 0SJT / For fixed. \		DV0P220	DV0P4170	Mounting	For A-frame,B-frame	
	Single	000	MCMEOCOL 4 - 4	56	MADITAGOE	MADINATO			direction of motor shaft	direction of motor shaft/	(d	direction of motor sha	of	direction of motor shaft			DV0PM20042	Bracket	For C-frame, D-frame For movable, direction	
	Single phase/	200	MSMF022L1 ☐ 1	100	MADLT15SF	MADLN15S♦			MFECA	MFECA	N	MFMC	;A	MFMCB				Encoder	of motor shaft For movable, opposite	MFECA0 * * 0MJE 1
	3-phase			58				Approx.	0 * * 0TKE	0 * * 0TKD		* * 0RI For fixed,		0 * * 0SKT For fixed,				Cable /with \	direction of motor shaft	MFECA0 * * 0MKE 1
	200 V	400	MSMF042L1 ☐ 1	101	MBDLT25SF	MBDLN25S♦	B-frame	0.9	opposite direction of motor shaft	opposite direction of motor shaft	oppo	osite direct	ection	opposite direction of motor shaft	DV0P4283	DV0P228		(Battery Box)	For fixed, direction of motor shaft	MFECA0 * * 0TJE 1
				50					_			Note)4	4			DV0P220		Note)6	For fixed, opposite direction of motor shaft	MFECA0 * * 0TKE 1
		750	MSMF082L1 ☐ 1	59 101	MCDLT35SF	MCDLN35S♦	C-frame	Approx.								D V 01 220	DV0PM20042		For movable, direction of motor shaft	MFECA0 * * 0MJD 1
									-							DV0P228		Encoder Cable	For movable, opposite direction of motor shaft	MFECA0 * * 0MKD 1
		1000	MSMF092L1 ☐ 1	60 101	MDDLT45SF	MDDLN45S♦	D-frame	Approx.							DV0P4284	DV0P228	DV0P4220	(without Battery Box)	For fixed, direction of motor shaft	MFECA0 * * 0TJD 1
				101												DVUFZZZ		(Battery Box)	For fixed, opposite direction of motor shaft	MFECA0 * * 0TKD 1
		100	MQMF011L1 1	67	MADLT11SF	MADLN11S♦	A-frame	Approx.	MEEOA	MEEOA	MEMOA		MEMOA		DV0P4280	DV0P227			For movable, direction of motor shaft	MFMCA0 * * 0NJD 1
			MQMF011L1 🗌 3	104				0.4	MFECA 0**0MJE	MFECA 0**0MJD	MFMCA 0**0UF		MFMCA **0VFD				DV0P4170	Motor Coblo	For movable, opposite direction of motor shaft	MFMCA0 * * 0NKD 1
	Single	200	MQMF021L1 ☐ 1	69	MBDLT21SF	MBDLN21S♦	D.	Approx.	For movable, direction of	For movable, direction of	For movable direction of	f	For movable, direction of		DV0P4283		210	Motor Cable (For MSMF type)	For fixed, direction of	MFMCA0 * * 0RJD 1
≦	phase 100 V	200	MQMF021L1 ☐ 3	104	WIDDLIZIOF	WIDDLINZ 13	B-frame	0.5	\ motor shaft /	\ motor shaft /	\ motor shaft		motor shaft /		DV0F4203				motor shaft For fixed, opposite	MFMCA0 * * 0RKD 1
Middle MQMF			MQMF041L1 🗌 1	71				Approx.	MFECA 0**0MKE	MFECA 0 * * 0MKD	MFMCA 0 * * 0UG		MFMCA **0VGD			DV0P228			For movable, direction	MFMCA0 * * 0UFD 1
	١	400	MQMF041L1 3	105	MCDLT31SF	MCDLN31S♦	C-frame	0.9	For movable, opposite direction	For movable, opposite direction	For movable opposite directi	e, \ / F	For movable,		DV0P4282		DV0PM20042	Motor Cable	of motor shaft For movable, opposite	MFMCA0 * * 0UGD 1
Connector type]								of motor shaft	of motor shaft	\ of motor shaf	. .	of motor shaft	_				(For MQMF type)	direction of motor shaft For fixed, direction of	
3000 r/min		100	MQMF012L1 1	68	MADLT05SF	MADLN05S♦			MFECA 0**0TJE	MFECA 0**0TJD	MFMCA 0**0WF		MFMCA)**0XFD		DV0P4281			(without Brake)	motor shaft For fixed, opposite	MFMCA0 * * 0WFD 1
3000 r/min	Single		MQMF012L1 3	104			A-frame	Approx.	For fixed, direction of	For fixed, direction of	For fixed, \direction of	\ /	For fixed, \ direction of			DV0P227			direction of motor shaft For movable, direction	MFMCA0 * * 0WGD 1
o e	phase/	200	MQMF022L1 ☐ 1	70	MADLT15SF	MADLN15S♦	7 1 11 4110	0.5	\motor shaft/	\motor shaft/	\motor shaft/	t/ \	\motor shaft/			DV0P220	DV0P4170		of motor shaft	MFMCA0 * * 0VFD 1
	3-phase	200	MQMF022L1 ☐ 3	104	WADEI 1991	WADENTSS			MFECA 0**0TKE	MFECA 0**0TKD	MFMCA 0**0WG		MFMCA * * 0XGD		D) / D / D / D		DV0PM20042	Motor Cable (For MQMF type)	For movable, opposite direction of motor shaft	MFMCA0**0VGD 1
	200 V		MQMF042L1 ☐ 1	72				Annroy	For fixed, opposite direction	For fixed, opposite direction	For fixed, opposite directi	\ /	For fixed,		DV0P4283	DV0P228		(with Brake)	For fixed, direction of motor shaft	MFMCA0**0XFD 1
		400	MQMF042L1 3	105	MBDLT25SF	MBDLN25S♦	B-frame	Approx.	of motor shaft	of motor shaft	\ of motor shaf	aft / \ c	of motor shaft			DV0P220			For fixed, opposite direction of motor shaft	MFMCA0 * * 0XGD 1
			_								[Marrahla		!:4:		hla :		<u> </u>		For movable, direction of motor shaft	MFMCB0 * * 0PJT 1
,	•		notor specifications.	•	•	,								where the ca		ule.		Protes O-51-	For movable, opposite direction of motor shaft	MFMCB0 * * 0PKT 1
•	•		river specifications.	•	•	,			2014:5					where the ca		r shaft · Ca	able direction	Brake Cable	For fixed, direction of motor shaft	MFMCB0 * * 0SJT 1
,	•		able length (03/3 m			, .					LDIIGCIIOII	01 1110	ow shall	Phonic and		. Jilait . Oc	iolo un conort		For fixed, opposite direction of motor shaft	MFMCB0 * * 0SKT 1
,			output shaft cannot l Iriver (dedicated for			•													50 Ω 25 W	DV0P4280 1
,			n can be used in co	•	,	auppoit tile ab	Joiule	Systell	i opecilication,	,								External	100 Ω 25 W	DV0P4281 1
•		•	ery is not supplied to			ite encoder cabl	e (with	batten	/ box).									regenerative resistor	25 Ω 50 W 50 Ω 50 W	DV0P4282 1 DV0P4283 1
			part number "DV0P	_		and the second second	_ (,,-										30 Ω 100 W	DV0P4284 1
	,	,		1	. ,													Popotor	DV0P220), DV0P222

MFECA0**0MJE

MFECA0 * * 0MKE 172 MFECA0 * * 0TJE 172 MFECA0 * * 0TKE 172

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172

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

80 mm sq. or less 50 W to 1000 W

MHMF: Connector type IP67

		Moto	or			Driver				Optiona	al parts						■ Options		
					A6 CE corios			Encoder C	Cable Note)3		Cable N	lote)3						Title	Part No.
					A6 SF series Multi fanction	A6 SG series RS485	Pow	/er	,	Wotor	Cable 14	voie)5					Interface Cable	е	DV0P4360
				Rating/	type	communication	capa	·	Absolute				Duales	Futernal					DV0P4120 DV0P4121
Motor series	Power	Output	Part No.	Spec.	/Pulse, analog,\	A6 SE series Fran	ne rate		Use in the		_		Brake Cable	External Regenerative	Reactor	Noise Filter	Interface Conv	version Cable	DV0P4130
Motor series	supply	(W)	Note)1	Dimensions	full-closed /	Basic	\ loa	d / absolute	Incremental	without Brake		with Brake	Note)3	Resistor	Single phase 3-phase	Single phase 3-phase			DV0P4131
				(page)		(Pulse signal input)	(kV	A) system (with battery box)	system (without battery box)	Diake	-	DIARE	•		\ 3-priase	\ 3-priase			DV0P4132
						Note)2, Note)4		Note)5	(without battery box)								Connector Kit for Power	A-frame Single row	DV0PM20032
						, ,,		,									Supply Input	to Double row	DV0PM20033
										MFMCA		MFMCA					Connection	D-frame type	D V 0 P IVI 20033
		50	MHMF5AZL1 ☐ 1 MHMF5AZL1 ☐ 3	73 109	MADLT01SF	MADLN01S♦				0 * * 7UI /Movable/fixe		* * 7VFD ovable/fixed\					Connector Kit for Motor	A-frame to	DV0PM20034
			INITINIFOAZLI 🗆 3	109						common-us direction o	f dir	mmon-use, irection of					Connection	D-frame	2 101 1112000 1
						A-fra	Appr 0.4			\ motor shaf		notor shaft /		DV0P4280	DV0P227		Connector Kit for Motor/	MHMF 200 W to 1.0 kW	DV0PM24582
							0.			MFMCA 0 * * 7U0		MFMCA *7VGD						MHMF 50 W, 100 W	DV0PM24581
		100	MHMF011L1 1	75 109	MADLT11SF	MADLN11S♦				/ Movable/fixe common-us	ed \ / Mov	ovable/fixed mmon-use,					nection		
			MHMF011L1 🗌 3	109						opposite direction of motor sh	ction oppos	site direction motor shaft				DV0P4170	Connector Kit f	for Brake Connection RS485, RS232	DV0PM20040 DV0PM20024
								_		<u> </u>						DV0F4170		Safety	DV0PM20024
										MFMCA		MFMCA					Connector Kit		DV0P4350
	Single									0 * * 0Uf	e,\ /For	* * 0VFD or movable,\						External Scale	DV0PM20026
	phase	200	MHMF021L1 🗌 1	77	MBDLT21SF	MDDI NO1CA D	Appr			direction o	ft dir	irection of notor shaft		DV0P4283				Encoder	DV0PM20010
	100 V	200	MHMF021L1 🗌 3	110	MIDDLIZISF	MBDLN21S♦ B-fra	0.	5		MFMCA	A M	/FMCA		DV0P4263				solute Encoder	DV0P2990
										0**000	GD 0*	*0VGD					Note)5	r Absolute Encoder	DV0P4430
										For movabl opposite direct	ction oppos	or movable, osite direction					Mounting	For A-frame,B-frame	DV0PM20100
								_		\ of motor sha		motor shaft			DV0P228		Bracket	For C-frame, D-frame	
								MFECA	MFECA	MFMCA 0**0W		MFMCA * * 0XFD					Encoder	For movable, direction of motor shaft	MFECA0 * * 0MJ
								0 * * 0MJE /For movable,\	0 * * 0MJD /For movable,\	/ For fixed,	\ / Fo	For fixed, \					Cable	For movable, opposite	MFECA0 * * 0Mł
		400	MHMF041L1 🗌 1	79	MCDLT31SF	MCDLN31S♦ C-fra	Appr		direction of motor shaft	direction o motor shat	ft) air	irection of notor shaft		DV0P4282		DV0PM20042	(with	direction of motor shaft For fixed, direction of	MEECAON NOT I
		100	MHMF041L1 ☐ 3	110	WIODETOTO	WODE TO TO V	o.9	MFECA	MFECA	MFMCA	A M	/IFMCA		D V 01 4202		D V OI IVIZOU-IZ	(Battery Box) Note)5	motor shaft	MFECA0 * * 0TJI
_ MHMF								0**0MKE		0 * * 0W(/ For fixed,		* 0XGD For fixed,					14010/0	For fixed, opposite direction of motor shaft	MFECA0 * * 0TK
्रेट्ट (Connector)								For movable, opposite direction	/ For movable, /	opposite direction of motor shall	ction loppos	site direction motor shaft						For movable, direction of motor shaft	MFECA0 * * 0MJ
ਤੁੰ (type /								of motor shaft	of motor shaft	MEMO		4ENACA	_				Encoder	For movable, opposite	MFECA0 * * 0MH
The 1 stype / 3000 r/min			MHMF5AZL1 ☐ 1	74				MFECA	MFECA	MFMCA 0**7UI		MFMCA **7VFD					Cable /without \	direction of motor shaft For fixed, direction of	
IP67		50	MHMF5AZL1 3	109	MADLT05SF	MADLN05S♦		0 * * 0TJE / For fixed, \	0 * * 0TJD / For fixed, \	Movable/fixe	ed\ /Mov	ovable/fixed mmon-use,					(Battery Box)	motor shaft	MFECA0 * * 0TJI
			_					direction of motor shaft/	direction of motor shaft/	direction o	f dir	irection of notor shaft						For fixed, opposite direction of motor shaft	MFECA0 * * 0TK
								MFECA	MFECA	MFMCA		MFMCA		DV0P4281				For movable, direction	MFMCA0**0UF
			MHMF012L1 ☐ 1	76		Λ	Appr		0 * * 0TKD	0**7U0	GD 0*	*7VGD			DV0P227		Motor Cable	of motor shaft For movable, opposite	MFMCA0**0U0
		100	MHMF012L1 3	109	MADLT05SF	MADLN05S	o.	 opposite direction 	opposite direction of motor shaft	Movable/fixe	e, com	wable/fixed mmon-use,			DV0P220	D) (0D 4470	(For MHMF 200 W to 1.0 kW)	direction of motor shaft For fixed, direction of	
										opposite direct of motor sh	aft oppos	motor shaft				DV0P4170	(without Brake)	motor shaft	MFMCA0 * * 0W
										MEMO		4ENACA			1	DV0PM20042		For fixed, opposite direction of motor shaft	MFMCA0 * * 0W0
	Single	200	MHMF022L1 ☐ 1	78	MADLT15SF	MADLN15S♦				MFMCA 0**0UI		MFMCA **0VFD						For movable, direction	MFMCA0**0VF
	phase/	200	MHMF022L1 ☐ 3	110	WADEI 1551	WADLINTSS				/For movabl direction o	e,\ /For	or movable,\ irection of					Motor Cable	of motor shaft For movable, opposite	
	3-phase							_		motor shat	ft / \ mo	notor shaft /				-	(For MHMF 200 W to 1.0 kW)	direction of motor shaft	MFMCA0 * * 0VG
	200 V		MHMF042L1 ☐ 1	00						MFMCA	A M	/IFMCA					(with Brake)	For fixed, direction of motor shaft	MFMCA0**0XF
		400	MHMF042L1 3	80 110	MBDLT25SF	MBDLN25S♦ B-fra	Appr 0.9	ox. 9		0 * * 0U(* 0VGD or movable,		DV0P4283				For fixed, opposite direction of motor shaft	MFMCA0**0XG
			WII IIVII 042LI 🗆 3	110				-		opposite direct	ction oppos	site direction motor shaft			DV0P228		<u> </u>	Movable/fixed	
															DV0P220		Motor Cable /For MHMF \	common-use, direction of motor shaft	MFMCA0 * * 7UF
		750	MHMF082L1 ☐ 1	81	MCDLT35SF	MODI NOTO	Appr	ox.		MFMCA 0**0W		MFMCA * * 0XFD			D 101 220	DVODMOOOAO	(50 W, 100 W)	Movable/fixed	
		750	MHMF082L1 ☐ 3	111	MICDLISSSF	MCDLN35S♦ C-fra	1.5	3		/ For fixed,	\ / Fo	For fixed, \				DV0PM20042	(without Brake)	common-use, opposite direction of motor shaft	MFMCA0 * * 7U0
										direction o motor shaf	ft) air	irection of notor shaft					Motor Cable	Movable/fixed	MEMOAO + + 7\/F
			MUNICOCK 4 77 4							MFMCA		MFMCA			DV0P228		/For MHMF \	common-use, direction of motor shaft	MFMCAU* * 7VF
		1000	MHMF092L1 1	82 111	MDDLT55SF	MDDLN55S♦ D-fra	Appr	ox. 3		0 * * 0W(\ / Fo	For fixed, \		DV0P4284		DV0P4220	(50 W, 100 W)	Movable/fixed common-use, opposite	MEMCΔ0 * * 7\/0
			MHMF092L1 ☐ 3	'''			2.				ction oppos	site direction motor shaft			DV0P222		(with Brake)	direction of motor shaft	
		1	I						1		- 1						' <u> </u>	50 Ω 25 W	DV0P4280
,			notor specifications.	•	•	,								able is moval	ble.]	External	100 Ω 25 W 25 Ω 50 W	DV0P4281 DV0P4282
Note)2 🔷 : F	Represen	ts the d	Iriver specifications.	(refer to	"Model designate	tion" P.18.)				Fixed	: For ap	pplication v	where the ca	able is fixed.			regenerative resistor	25 Ω 50 W 50 Ω 50 W	DV0P4282 DV0P4283

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 : Cab

		a 001.011 01	motor oriant		
		For movabl of motor sh	.,	MFECA0 * * 0MJD	172
	Encoder Cable	For movabl direction of	e, opposite motor shaft	MFECA0 * * 0MKD	172
	(without Battery Box)	For fixed, d motor shaft		MFECA0**0TJD	172
	, ,	For fixed, o direction of	pposite motor shaft	MFECA0 * * 0TKD	172
		For movabl of motor sh	aft	MFMCA0 * * 0UFD	176
	Motor Cable /For MHMF		motor shaft	MFMCA0 * * 0UGD	176
DV0P4170	(without Brake)	For fixed, d motor shaft		MFMCA0 * * 0WFD	176
DV0PM20042			motor shaft	MFMCA0 * * 0WGD	176
		For movabl of motor sh	aft	MFMCA0 * * 0VFD	178
	Motor Cable		motor shaft	MFMCA0 * * 0VGD	178
	(200 W to 1.0 kW) (with Brake)	For fixed, d motor shaft		MFMCA0 * * 0XFD	178
			motor shaft	MFMCA0 * * 0XGD	178
	Motor Cable (For MHMF \	Movable/fix common-us of motor sh	se, direction	MFMCA0**7UFD	175
DV0PM20042	(50 W, 100 W) (without Brake)		ed se, opposite motor shaft	MFMCA0**7UGD	175
	Motor Cable	Movable/fix common-us of motor sh	se, direction	MFMCA0**7VFD	178
DV0P4220	(50 W, 100 W) (with Brake)		ed se, opposite motor shaft	MFMCA0**7VGD	178
		50 Ω 25 \		DV0P4280	197
٦	External	100 Ω 25	W	DV0P4281	197
	regenerative	25 Ω 50 \	W	DV0P4282	197
bla dina di d	resistor	50 Ω 50 \	W	DV0P4283	197
ble direction		30 Ω 100	W	DV0P4284	197
	Reactor), DV0P222 7, DV0P228	196
	Noise Filter			70, DV0PM20042	236
	Surge Absorbe	r		90, 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

		Moto	r			Driver					Optional	parts				■ Options	Tiala	Deat N	n.
				Rating/	A6 SF series Multi fanction type	A6 SG series RS485 communication		Power capacity	JL10 (La	h lock type ewed type	(One-tou	ble Note)3,5 UL10 ch lock type rewed type				Interface Cabl		Part No. DV0P4360 DV0P4120 DV0P4121 DV0P4130	182 182 182 182
Motor series	Power supply	Output (W)	Part No. Note)1	Spec. Dimensions (page)	(Pulse, analog, full-closed	A6 SE series Basic (Pulse signal input) Note)2, Note)4	Frame	1	23-bit A Use in the absolute system	Use in the Incremental system (without battery box)	without Brake	with Brake	Regenerative Resistor	Reactor (Single phase / 3-phase)	Noise Filter	Connector Kit for Power Supply Input	A-frame to Double row type	DV0P4131 DV0P4132 DV0PM20032	18 18 18
	Single	1000	MSMF102L1 6	61	MDDLT55SF	MDDLN55S♦			Note)/		MFMCD	MFMCA		DV0P228 / DV0P222		Connection Connector Kit	E-frame A-frame to	DV0PM20044	18
	phase/ 3-phase	1500	MSMF102L1	62	MDDLT55SF		D-frame	Approx. 2.3			0 * * 2EU		D) (0D (00 (DV0PM20047 / DV0P222	DV0P4220	for Motor Connection	D-frame E-frame	DV0PM20034 DV0PM20046	18
MSMF Large size JL10 type		2000	MSMF152L1 ☐ 8 MSMF202L1 ☐ 6 MSMF202L1 ☐ 8	63	MEDLT83SF		E-frame	Approx.	MFECA 0**0EPE	MFECA 0**0EPD	MFMCD 0**2ECE	MFMCA 0 * * 2FC	DV0P4285 Note)6	DV0P223	DV0PM20043	Connector Kit for Regenera- tive Resistor	E-frame	DV0PM20045	18
3000 r/mir		3000	MSMF302L1 6 MSMF302L1 8	64	MFDLTA3SF	MFDLNA3S♦		Approx.	MFECA	MFECA	MFMCA	MFMCA		DV0P224		uvo ricolotor		DV0PM24587 MSMF 1.0 kW to 2.0 kV	
IP67	200 V	4000	MSMF402L1 6 MSMF402L1 8	65	MFDLTB3SF	MFDLNB3S	F-frame		0**0ESE	0 * * 0ESD	0 * *3EU	-	_ DV0P4285		DV0P3410		without Brake	MDMF 1.0 kW to 2.0 kV MGMF 0.85 kW to 1.8 kV MHMF 1.0 kW, 1.5 kW	W
		5000	MSMF502L1 6 MSMF502L1 8	66	MFDLTB3SF	MFDLNB3S♦		7.5			MFMCA 0 * * 3ECT	MFMCA 0 * * 3FC	•	DV0P225			Williout Brake	DV0PM24588 MSMF 3.0 kW to 5.0 kV MDMF 3.0 kW to 5.0 kV	
	Single phase/	1000	MDMF102L1 ☐ 6 MDMF102L1 ☐ 8	89	MDDLT45SF	MDDLN45S♦	D-frame	Approx. 1.8			MFMCD	MFMCA	D) (0D 400 4	DV0P228 / DV0P222	DV0P4220	Connector Kit for Motor/ Encoder Con-		MGMF 2.9 kW, 4.4 kW MHMF 2.0 kW to 5.0 kV DV0PM24589	V
MDMF	3-phase 200 V	1500	MDMF152L1 ☐ 6 MDMF152L1 ☐ 8	90	MDDLT55SF	MDDLN55S♦	D-liame	Approx. 2.3	MFECA	MFECA	0**2EUI ———— MFMCD	0 * * 2FU MFMCA	-	DV0PM20047 / DV0P222		nection		MSMF 1.0 kW to 2.0 kV MDMF 1.0 kW to 2.0 kV MGMF 0.85 kW to 1.8 kV	พ 18 พ
Large size		2000	MDMF202L1 ☐ 6 MDMF202L1 ☐ 8	91	MEDLT83SF	MEDLN83S♦	E-frame	Approx. 3.8	0 * * 0EPE	0**0EPD	0 * * 2EC		DVADAGE	DV0P223	DV0PM20043		with Brake	MHMF 1.0 kW, 1.5 kW DV0PM24590 MSMF 3.0 kW to 5.0 kV	
2000 r/mir IP67	3-phase	3000	MDMF302L1 ☐ 6 MDMF302L1 ☐ 8	92	MFDLTA3SF	MFDLNA3S		Approx. 4.5	MFECA 0**0ESE	MFECA 0**0ESD	MFMCA 0**3EU	MFMCA	т	DV0P224				MDMF 3.0 kW to 5.0 kV MDMF 3.0 kW to 5.0 kV MGMF 2.9 kW, 4.4 kW MHMF 2.0 kW to 5.0 kV	N 19
Middle	200 V	4000	MDMF402L1	93	MFDLTB3SF	MFDLNB3S♦	F-frame	Approx.			MFMCA	MFMCA	DV0P4285 ×2 in parallel	DV0P225	DV0P3410		RS485, RS232 Safety	DV0PM20024 DV0PM20025	18 18
dle ine		5000	MDMF502L1	94	MFDLTB3SF	MFDLNB3S♦		7.5			0**3EC	0**3FC	Т			Connector Kit	Interface External Scale	DV0P4350 DV0PM20026	18 18
ertia	Single phase/ 3-phase	850	MGMF092L1	95	MDDLT45SF	MDDLN45S♦	D-frame	Approx. 1.8 Approx.			MFMCD 0**2EUI	MFMCA 0 * * 2FU		DV0P228 / DV0P221	DV0P4220	Battery for Abs		DV0PM20010 DV0P2990	18 19
MGMF Large size JL10 type	200 V	1300	MGMF132L1 8 MGMF182L1 6	96	MDDLT55SF	MDDLN55S♦	_	2.3	MFECA 0**0EPE	MFECA 0**0EPD	MFMCD	MFMCA	_	DV0PM20047 / DV0P222		Battery Box fo Note)7 Mounting	r Absolute Encoder	DV0P4430	19
Low speed		1800	MGMF182L1 ☐ 8 MGMF292L1 ☐ 6	97	MEDLT83SF		E-frame	3.8	MFECA	MFECA	0**2ECI	0 * * 2FC	270200	DV0P223	DV0PM20043	Bracket Encoder	D-frame	DV0PM20101	19
type 1500 r/mir	3-phase	2900	MGMF292L1 ☐ 8	98	MFDLTB3SF	MFDLNB3S	F-frame	Approx.		0**0ESD	0 * * 3EU	0**3FU	T DV0P4285	DV0P224	DV0P3410	Cable (with (Battery Box)	Screwed type	MFECA0 * * 0EPE	+
IP67		4400	MGMF442L1 ☐ 6 MGMF442L1 ☐ 8	99	MFDLTB3SF	MFDLNB3S					MFMCA 0 * * 3ECT		т	DV0P225		Note)7 Encoder Cable		e MFECA0**0EPD	
	Single phase/	1000	MHMF102L1 ☐ 6 MHMF102L1 ☐ 8	83	MDDLT45SF	MDDLN45S♦	_	Approx. 1.8			MFMCD 0**2EUI	MFMCA 0 * * 2FU	D	DV0P228 / DV0P222	DV0D 1000	(without (Battery Box)	Screwed type	MFECA0 * * 0ESD	
	3-phase 200 V	1500	MHMF152L1 ☐ 6 MHMF152L1 ☐ 8	84	MDDLT55SF	MDDLN55S♦	D-frame	Approx. 2.3			MFMCD 0**2ECE	MFMCA 0 * * 2FC		DV0PM20047 / DV0P222	DV0P4220	Motor Cable	Screwed type	MFMCD0 * * 2EUI MFMCD0 * * 2EUI MFMCE0 * * 2EUI	D 17
MHMF Large size JL10 type		2000	MHMF202L1 ☐ 6 MHMF202L1 ☐ 8	85	MEDLT83SF	MEDLN83S♦	E-frame	Approx.	MFECA 0**0EPE MFECA	MFECA 0**0EPD ———— MFECA	MFMCE 0 * * 2EUI MFMCE	MFMCE 0 * * 2FU MFMCE	D DV0P4285	DV0P223	DV0PM20043	(without Brake)	Screwed type One-touch lock typ Screwed type One-touch lock typ	MFMCE0 * * 2ECI MFMCA0 * * 3EUI MFMCA0 * * 3ECI MFMCA0 * * 2FUI	D 17 Γ 17 Γ 17 Ο 17
IP67	3-phase 200 V	3000	MHMF302L1 6	86	MFDLTA3SF	MFDLNA3S		Approx.	0**0ESE		0**2ECI	0 * * 2FC		DV0P224		Motor Cable (with Brake)	Screwed type One-touch lock typ Screwed type	MFMCA0 * * 2FCE MFMCE0 * * 2FUE MFMCE0 * * 2FCE) 17
		4000	MHMF302L1		MFDLTB3SF		F-frame	4.5			0 * * 3EU		T DV0P4285	3.0.224	DV0P3410	(2.3.10)		MFMCA0 * *3FUT	Γ 18
		5000	MHMF502L1 6 MHMF502L1 8	88	MFDLTB3SF	MFDLNB3S		Approx. 7.5			MFMCA 0**3EC	MFMCA 0 * * 3FC		DV0P225		External regenerative resistor	30 Ω 100 W 20 Ω 130 W	DV0P4284 DV0P4285	19
lote)2 \diamondsuit : lote)3 **:	Represen Represen	s the d	notor specifications river specifications. able length (03/3 m	(refer to n, 05/5 m,	"Model designat 10/10 m, 20/20	tion" P.18.) m). Example. 3					to Jl	uch lock con .04V type ca	nections. Conve bles can also be			Reactor	DV0P22 DV0P22	22, DV0P223 24, DV0P225 28, DV0PM20047 220, DV0PM20043	19
te)4 Becau	ise A6SE	series c	Iriver (dedicated for	position	control) does no	t support the abs	solute	system	specification	,	,			s, refer to P.197.		Noise Filter	DV0P34	10	

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.

237

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					Optional	oarts				■ Options		
									Encoder Ca	able Note)3	Motor Ca	ble Note)3,5					Title	Part No.
	_		B	Rating/	A6 SF series Multi fanction type	A6 SG series RS485 communication		Power capacity	JN2 (Sm (One-touch	nall size)	(One-tou	L10 ch lock type rewed type				Interface Cabl		DV0P4360 DV0P4120 DV0P4121 DV0P4130
tor series	Power	Output (W)	Part No. Note)1	Spec. Dimensions (page)	(Pulse, analog, full-closed	A6 SE series Basic (Pulse signal input)	Frame	rated load (kVA)	23-bit A Use in the absolute	Use in the Incremental	without	with	External Regenerative Resistor	Reactor (Single phase / 3-phase)	Noise Filter		A-frame Single row	DV0P4131 DV0P4132
						Note)2, Note)4			system (with battery box) Note)7	system (without battery box)	Brake	Brake				Connector Kit for Power Supply Input Connection	to Double row type E-frame	
	Single phase/	1000	MSMF102L1 ☐ 5 MSMF102L1 ☐ 7	61 102	MDDLT55SF	MDDLN55S♦		Approx.			MFMCD	MFMCA		DV0P228 / DV0P222		Connector Kit	A-frame to	DV0PM20034
	3-phase 200 V	1500	MSMF152L1 ☐ 5 MSMF152L1 ☐ 7	62 102	MDDLT55SF	MDDLN55S♦	D-frame	2.3			0 * * 2EUD		-	DV0PM20047 / DV0P222	DV0P4220	for Motor Connection	D-frame E-frame	DV0PM20046
MSMF Small size JN2 type		2000	MSMF202L1 ☐ 5 MSMF202L1 ☐ 7	63 102	MEDLT83SF	MEDLN83S♦	E-frame	Approx.	MFECA	MFECA	MFMCD 0**2ECD	MFMCA 0 * * 2FC	DVADAGE	DV0P223	DV0PM20043	Connector Kit for Regenera- tive Resistor	E-frame	DV0PM20045
3000 r/min	3-phase	3000	MSMF302L1 ☐ 5 MSMF302L1 ☐ 7	64 102	MFDLTA3SF	MFDLNA3S		Approx.	0 * * 0ETE	0 * * 0ETD	MFMCA	MFMCA		DV0P224				DV0PM24583 MSMF 1.0 kW to 2.0 MDMF 1.0 kW to 2.0
IP67	200 V	4000	MSMF402L1 ☐ 5 MSMF402L1 ☐ 7	65 102	MFDLTB3SF	MFDLNB3S	F-frame	Approx.			0 * * 3EUT	0 * * 3FU	DV0P4285 ×2 in parallel		DV0P3410		without Brake	MGMF 0.85 kW to 1.8 MHMF 1.0 kW, 1.5 kV
		5000	MSMF502L1 ☐ 5 MSMF502L1 ☐ 7	66 102	MFDLTB3SF	MFDLNB3S		7.5			MFMCA 0 * *3ECT	MFMCA 0**3FC		DV0P225				DV0PM24584 MSMF 3.0 kW to 5.0 MDMF 3.0 kW to 5.0
	Single phase/	1000	MDMF102L1 5 MDMF102L1 7	89 113	MDDLT45SF	MDDLN45S♦	D.	Approx.			MFMCD	MFMCA	D) /OD /OO /	DV0P228 / DV0P222	DV0B4000	Connector Kit for Motor/ Encoder Con-		MGMF 2.9 kW, 4.4 k MHMF 2.0 kW to 5.0 DV0PM24585
MDMF	3-phase 200 V	1500	MDMF152L1 ☐ 5 MDMF152L1 ☐ 7	90 113	MDDLT55SF	MDDLN55S♦	D-frame	Approx. 2.3			0**2EUD		-	DV0PM20047 / DV0P222	DV0P4220	nection		MSMF 1.0 kW to 2.0 MDMF 1.0 kW to 2.0 MGMF 0.85 kW to 1.8
Small size JN2 type		2000	MDMF202L1 ☐ 5 MDMF202L1 ☐ 7	91 113	MEDLT83SF	MEDLN83S♦	E-frame	Approx.	MFECA	MFECA	MFMCD 0**2ECD	MFMCA 0 * * 2FC	DMODAGE	DV0P223	DV0PM20043		with Brake	MHMF 1.0 kW, 1.5 k DV0PM24586 MSMF 3.0 kW to 5.0
000 r/min	3-phase	3000	MDMF302L1 ☐ 5 MDMF302L1 ☐ 7	92 113	MFDLTA3SF	MFDLNA3S♦		Approx. 4.5	0 * * 0ETE	0 * * 0ETD	MFMCA	MFMCA		DV0P224				MDMF 3.0 kW to 5. MGMF 2.9 kW, 4.4 MHMF 2.0 kW to 5.
IP67	200 V	4000	MDMF402L1 ☐ 5 MDMF402L1 ☐ 7	93 113	MFDLTB3SF	MFDLNB3S♦	F-frame	Approx.			0 * * 3EUT	0 * * 3FU MFMCA	DV0P4285 ×2 in parallel	DVoDoor	DV0P3410		RS485, RS232 Safety	DV0PM20024 DV0PM20025
		5000	MDMF502L1 ☐ 5 MDMF502L1 ☐ 7	94 113	MFDLTB3SF	MFDLNB3S♦		7.5			0 * * 3ECT	0 * * 3FC	т	DV0P225		Connector Kit	Interface External Scale	DV0P4350 DV0PM20026
	Single phase/	850	MGMF092L1 ☐ 5 MGMF092L1 ☐ 7	95 114	MDDLT45SF	MDDLN45S♦	Г.	Approx. 1.8			MFMCD	MFMCA		DV0P228 / DV0P221	DV0P4220	Battery for Abs	Encoder solute Encoder	DV0PM20010 DV0P2990
MGMF mall size	3-phase 200 V	1300	MGMF132L1 ☐ 5 MGMF132L1 ☐ 7	96 114	MDDLT55SF	MDDLN55S♦	D-frame	Approx. 2.3			0 * * 2EUD ————— MFMCD	0 * * 2FU ———— MFMCA	-	DV0PM20047 / DV0P222	DV0F4220	Note)7	r Absolute Encoder	DV0P4430
N2 type w speed/\		1800	MGMF182L1 ☐ 5 MGMF182L1 ☐ 7	-	MEDLT83SF	MEDLN83S♦	E-frame	Approx. 3.8	MFECA	MFECA	0 * * 2ECD			DV0P223	DV0PM20043	Mounting Bracket Encoder	D-frame	DV0PM20101
ah torayel	3-phase 200 V	2900	MGMF292L1 ☐ 5 MGMF292L1 ☐ 7	98 114	MFDLTB3SF	MFDLNB3S♦	F-frame	Approx. 7.5	0 * * 0ETE	U**UEID	MFMCA 0 * * 3EUT	MFMCA 0**3FU	T DV0P4285	DV0P224	DV0P3410	Cable (with (Battery Box)		MFECA0 * * 0
IP67		4400	MGMF442L1 ☐ 5 MGMF442L1 ☐ 7	99 114	MFDLTB3SF	MFDLNB3S♦		7.5			MFMCA 0 * *3ECT	MFMCA 0 * * 3FC		DV0P225		Note)7 Encoder Cable	One-touch lock type	MFECA0 * * 0E
	Single phase/	1000	MHMF102L1	83 112	MDDLT45SF	MDDLN45S♦	D :	Approx.			MFMCD 0 * * 2EUD	MFMCA 0**2FU	D	DV0P228 / DV0P222	DV0D4000	(without (Battery Box)	One-touch lock type	
	3-phase 200 V	1500	MHMF152L1 ☐ 5 MHMF152L1 ☐ 7	84 112	MDDLT55SF	MDDLN55S♦	D-frame	Approx.			MFMCD 0**2ECD	MFMCA		DV0PM20047 / DV0P222	DV0P4220	Motor Cable (without Brake)	Screwed type One-touch lock type	
MHMF mall size N2 type		2000	MHMF202L1 ☐ 5 MHMF202L1 ☐ 7	85 112	MEDLT83SF	MEDLN83S♦	E-frame	Approx.	MFECA 0**0ETE	MFECA 0**0ETD	MFMCE 0 * * 2EUD MFMCE	MFMCE	D DV0P4285	DV0P223	DV0PM20043	(without blake)	One-touch lock type Screwed type One-touch lock type	MFMCA0 * *3 MFMCA0 * *2
00 r/min IP67	3-phase 200 V	3000	MHMF302L1 5	86	MFDLTA3SF	MFDLNA3S♦		Approx.	J. FULIL	3. POLID	0**2ECD	0**2FC	D	DV0P224		Motor Cable (with Brake)	One-touch lock type Screwed type	MFMCE0**2
	200 V	4000	MHMF302L1 ☐ 7 MHMF402L1 ☐ 5	112 87	MFDLTB3SF		F-frame	4.5			MFMCA 0 * *3EUT	MFMCA 0 * * 3FU	T DV0P4285	DVUFZZ4	DV0P3410	Freto :!	One-touch lock type Screwed type	MFMCA0 * *3 MFMCA0 * *3
		5000	MHMF402L1	112 88 112	MFDLTB3SF	MFDLNB3S	-name	Approx. 7.5			MFMCA 0 * * 3ECT	MFMCA 0**3FC		DV0P225	21010410	External regenerative resistor	30 Ω 100 W 20 Ω 130 W	DV0P4284 DV0P4285
♦ : R	epresent	s the d	MHMF502L1 ☐ 7 notor specifications river specifications able length (03/3 m	. (refer to . (refer to	"Model designa "Model designa	tion" P.18.) tion" P.18.)	m/MF	ECA003	BOETE		Co	nventional s		enable one-touch lock 4V type cables can al s, refer to P.197.		Reactor Noise Filter	DV0P22 DV0P22 DV0P42	2, DV0P223 4, DV0P225 8, DV0PM2004 20, DV0PM2004
Becaus	e A6SE s	series d	river (dedicated for n can be used in co	position	control) does no	, .					Note)7 PI	ease note th		t supplied together wit	h 23-bit	Surge Absorbe	DV0P34 er DV0P41 DV0P14	90, DV0P1450

Please buy the battery part number "DV0P2990" separately.

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

		100 V	Mair	n circuit	Single phase $100 \text{ V} {+10 \% \atop -15 \%}$ to $120 \text{ V} {+10 \% \atop -15 \%}$ 50 Hz / 60 Hz					
		100 1	Contr	rol circuit	Single phase $\begin{array}{ccc} 100 \text{ V} & +10 \% \\ -15 \% & to 120 \text{ V} & +10 \% \\ -15 \% & & 50 \text{ Hz} / 60 \text{ Hz} \end{array}$					
	Input		Main	A-frame to D-frame	Single/3-phase 200 V $^{+10}_{-15}$ % to 240 V $^{+10}_{-15}$ % 50 Hz / 60 Hz					
	Input power	200 V	circuit	E-frame, F-frame	Single/3-phase 200 V $^{+10}_{-15}$ % to 240 V $^{+10}_{-15}$ % 50 Hz / 60 Hz					
		200 V	Control	A-frame to D-frame	Single phase $200 \text{ V}^{+10 \text{ \%}}_{-15 \text{ \%}}$ to $240 \text{ V}^{+10 \text{ \%}}_{-15 \text{ \%}}$ 50 Hz / 60 Hz					
			circuit	E-frame, F-frame	Single phase 200 V ⁺¹⁰ % to 240 V ⁺¹⁰ % 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)					
	Εn	vironment	hu	midity	Both operating and storage : 20 % to 85 %RH (free from condensation*1)					
			Al	titude	Lower than 1000 m					
			Vib	oration	5.88 m/s ² or less, 10 Hz to 60 Hz					
	Coi	ntrol metho	d		IGBT PWM Sinusoidal wave drive					
	End	coder feedb	ack		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	Ext	ernal scale	feedba	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					
ecification		Control si	anal	Input	General purpose 10 inputs The function of general-purpose input is selected by parameters.					
Snc	Pa	Control si	giiai	Output	General purpose 6 outputs The function of general-purpose output is selected by parameters.					
	ralle	A I		Input	3 inputs (16-bit A/D : 1 input, 12-bit A/D : 2 inputs)					
) 	Analog sig	gnai	Output	2 outputs (Analog monitor: 2 output)					
	Parallel I/O connector	Duloo sigr	no!	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 sigr	iai	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.					
		mmunicatio ction	n	RS232	1:1 communication					
	1011	01.011		RS485	1: n communication (max 31)					
	Saf	ety function	n		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.)					
	Dyr	namic brak	е		A-frame to F-frame: Built-in					
		ntrol 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>o</u>		Smoothing filt	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.
	input	Torque feed f	orward input	Analog voltage can be used as torque feed forward input.
	Two-degi	ree-of-freedom	control	Available
	Anti-vibra	ation control		Available
L	Load vari	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.
		Torque feed f	orward input	Analog voltage can be used as torque feed forward input.
contro	Internal v	elocity comma	nd	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.
	_	ero clamp		Internal velocity command can be clamped to 0 with speed zero clamp input.
		ee-of-freedom	control	Available
렃	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 comm	and 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
	Control o		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.
8		Smoothing filt		Primary delay filter or FIR type filter is adaptable to the command input
띾	Analog	-	ommand input	Individual torque limit for both positive and negative direction is enabled.
2	input	Torque feed for	orward input	Analog voltage can be used as torque feed forward input.
		ange of externa nultiplication	I scale	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.
		ree-of-freedom	control	Available
	Anti-vibra	ation 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		e function	Hard error	Over-voltage, under-voltage, over-speed, over-load, over-heat, over-current and encoder error etc.
	1	'	0 "	France position deviation command unles division armore FERROM armore at-
			Soft error	Excess position deviation, command pulse division error, EEPROM error etc.

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

	100 V	Mai	n circuit	Single phase 100 V +10) % 5 % to	120 V +10 % -15 %	50 Hz / 60 Hz		
	100 V	Cont	rol circuit	Single phase 100 V +10) % 5 % to	120 V +10 % -15 %	50 Hz / 60 Hz		
Input		Main	A-frame to D-frame	Single/3-phase 200 V +10) % 5 % to	240 V +10 % -15 %	50 Hz / 60 Hz		
input power		circuit	E-frame to F-frame	Single/3-phase 200 V +10) % 5 % to	240 V ^{+10 %} -15 %	50 Hz / 60 Hz		
	200 V	Control	A-frame to D-frame	Single phase 200 V +10) % 5 % to	240 V ^{+10 %} -15 %	50 Hz / 60 Hz		
		circuit	E-frame to F-frame	Single phase 200 V +10) % 5 % to	240 V ⁺¹⁰ % -15 %	50 Hz / 60 Hz		
		temp	perature	Ambient temperature: 0 °C to 55 °C (f Storage temperature: -20 °C to 65 °C (Max.temperature guarantee: 80 °C fo		-	condensation ^{*1})		
E	nvironment	hu	midity	Both operating and storage : 20 % to	85 %RI	H (free from co	ondensation*1)		
		Al	titude	Lower than 1000 m					
		Vik	oration	5.88 m/s ² or less, 10 Hz to 60 Hz					
Basic	ontrol metho	od		IGBT PWM Sinusoidal wave drive					
Spe	ncoder feedl	oack		23-bit (8388608 resolution) absolute 6 * When using the product as an incommect a battery for absolute encode	ementa	al system (not			
	0.001.001.00		Input	General purpose 10 inputs The function of general-purpose input	is sele	cted by param	eters.		
Parallel I/O	Control si	gnai	Output	General purpose 6 outputs The function of general-purpose input	is sele	cted by param	eters.		
00	Amalagasi		Input	None					
connector	Analog si	gnai	Output	2 outputs (Analog monitor: 2 output)					
Ö	Pulse sign	aal	Input	2 inputs (Photo-coupler input, Line red	eiver ir	nput)			
	i dise sigi		Output	4 outputs (Line driver: 3 output, open	collect	or: 1 output)			
			USB	USB interface to connect to computer	s for pa	rameter settin	g or status monitoring.		
_	communication	on	RS232	1:1 communication			S232 connector is not installed		
			RS485	1: n communication (max 31)		on A6 SE s	series.		
F	ront panel			(1) 5 keys (2) LED (6-digit)					
R	legeneration			A-frame, B,-frame: no built-in regener C-frame to F-frame: Built-in regeneral			* *		
D	ynamic brak	е		Built-in					
С	ontrol mode			(1) Position control (2) Internal veloci	ty comr	nand (3) Posi	tion/Internal velocity command		

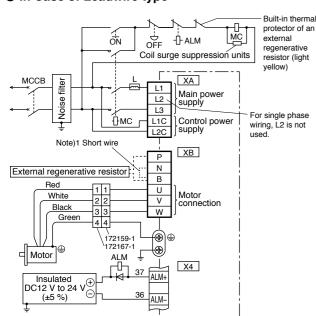
^{*1} Air containing water vapor will become saturated with water vapor as the temperature falls, causing dew.

		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	500 kpps (Optocoupler interface) 8 Mpps (Line receiver interface)
	Position control	Dulas	Input pulse signal format	Differential input. Selectable by parameter. ([1]Positive/Negative pulse [2]A/B quadrature [3]Pulse/Direction)
	control	Pulse input	Electronic gear (Division/Multiplica- tion of command pulse)	Applicable scaling ratio: 1/1000 times to 8000 times Any value of 1 - 2 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	on control	Available
		Two-degree	e-of-freedom control	Available
Ē		Control inp	ut	Internal command speed selections 1-3, speed-zero clamp, etc.
Function		Control out	put	At speed etc.
	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	i clamp	Internal velocity command can be clamped to 0 with speed zero clamp input.
		Two-degree	e-of-freedom control	Available
		Auto tuning	ı	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.
	Com	Division of pulse	encoder feedback	Set up of any value is enabled (encoder pulses count is the max.).
	Common	Protective function	Hard error	Over-voltage, under-voltage, over-speed, over-load, over-heat, over-current and encoder error etc.
		TUTION	Soft error	Excess position deviation, command pulse division error, EEPROM error etc.
		Alarm data	trace back	Tracing back of alarm data is available

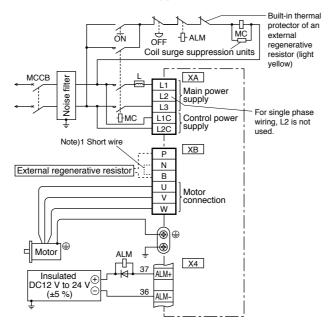
Wiring Diagram

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

● In Case of Leadwire type

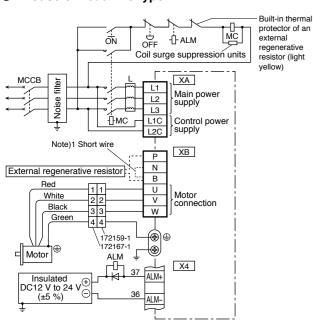


● In Case of Connector type

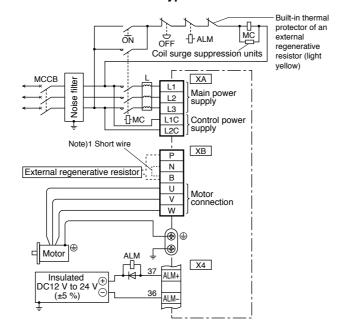


In Case of 3-phase, A-frame, B-frame, 200 V type

● In Case of Leadwire type



● In Case of Connector type



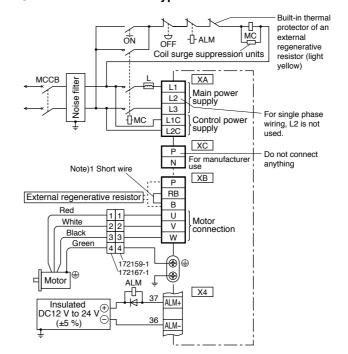
Note)1

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

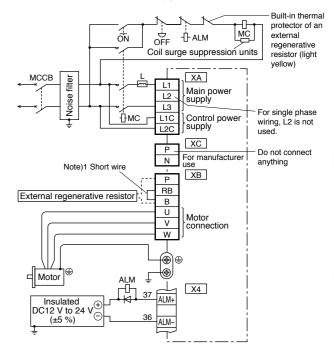
^{*} Refer to P.169, P.170, Specifications of Motor connector.

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

In Case of Leadwire type

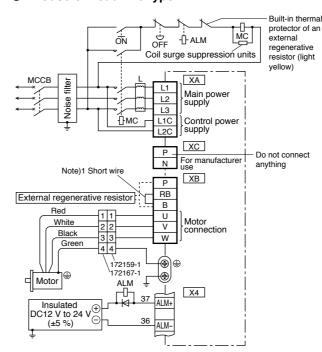


In Case of Connector type

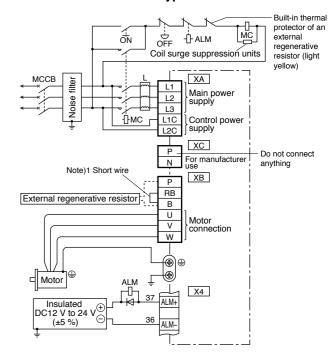


In Case of 3-phase, C-frame, D-frame, 200 V type

■ In Case of Leadwire type



■ In Case of Connector type



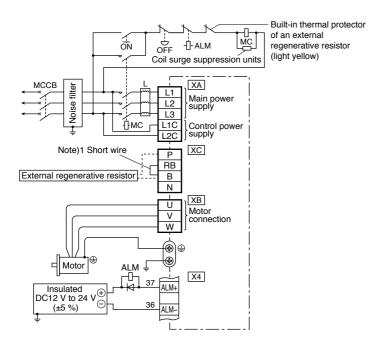
Note)1

Note) i							
F	Short wire	Built-in regenerative resistor	Connection of the connector XB				
Frame No.	(Accessory)		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.

Wiring Diagram

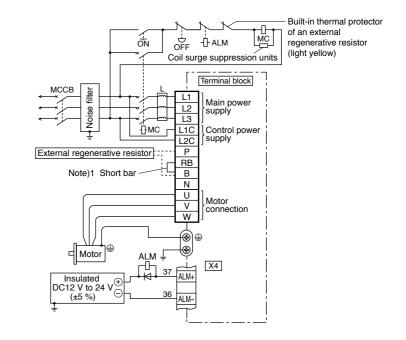
In Case of 3-phase, E-frame, 200 V type



Note)1

Frame	Short wire	Built-in regenerative resistor	Connection of the connector XC		
No.	Short wire (Accessory)		In case of using an external regenerative resistor	In case of not using an external regenerative resistor	
E-frame	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

	Chart har	Built-in	Connection of terminal block		
No.	No. Short bar regene (Accessory) resis		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

* 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.

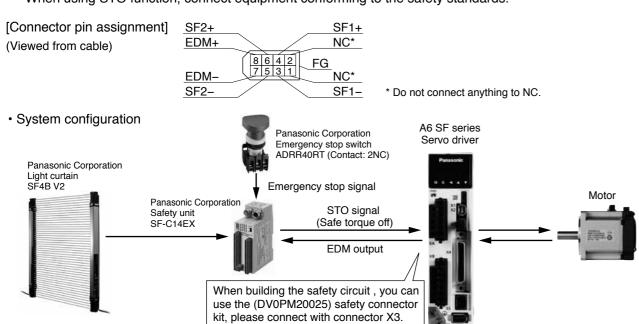
Outline Description of Safe Torque Off (STO)

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.

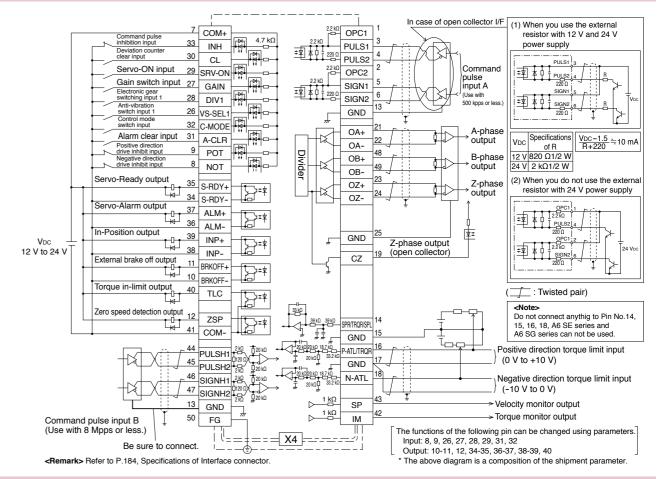
Safety Precautions

- · 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.



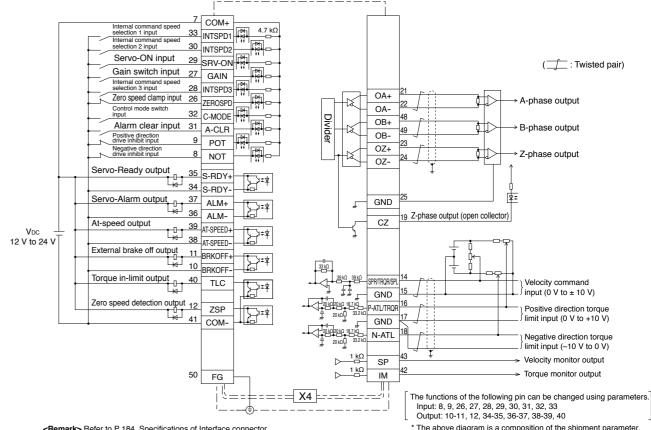
Panasonic Corporation Automotive & Industrial Systems Company http://panasonic.net/id/

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

* The above diagram is a composition of the shipment parameter

41 MINAS A6 Family

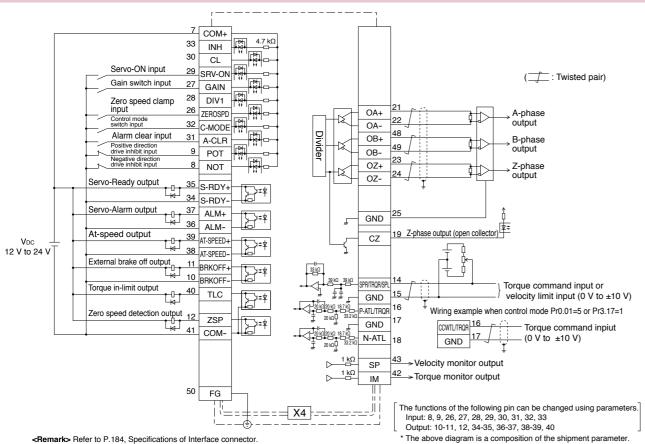
MINAS A6 Family 42

A6 Family

Imformation

A6 Family

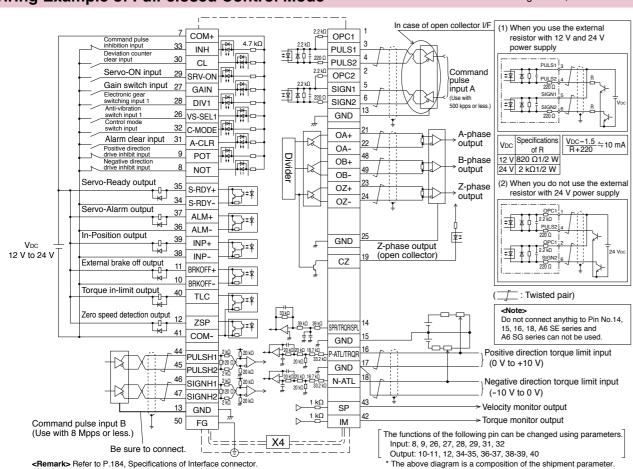
* Excluding A6 SE, A6 SG Series



Wiring to the Connector, X4

Wiring Example of Full-closed Control Mode

* Excluding A6 SE, A6 SG Series

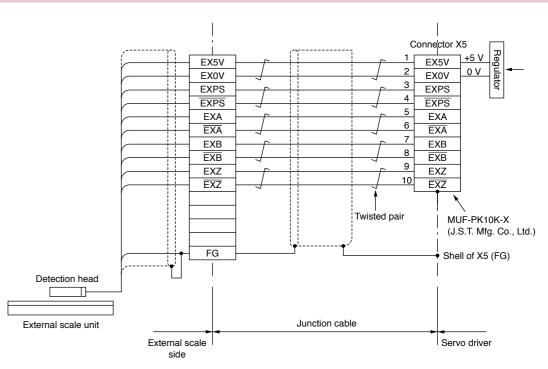


Applicable External Scale

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	HAIN LIC4193P/LIC4195P LIC4197P/LIC4199P		10
	Magnagada Ca I td	SR77	0.01 to 1	3.3
	Magnescale Co., Ltd.	SR87	0.01 to 1	3.3
	Mitutovo Corporation	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
	I AGON AUTOWATION	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.

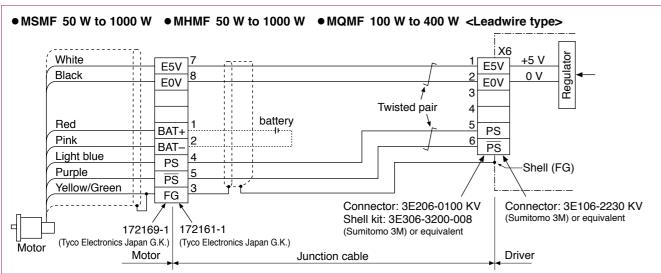
Wiring Diagram of X5

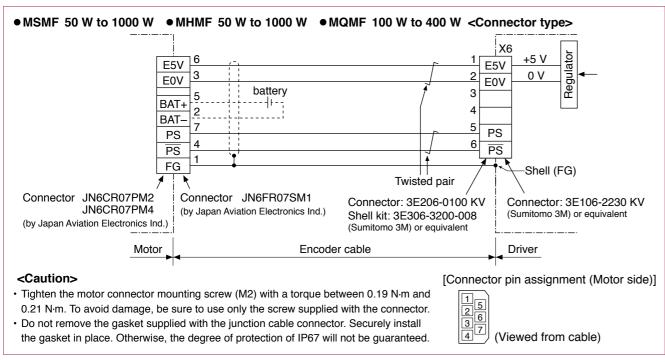


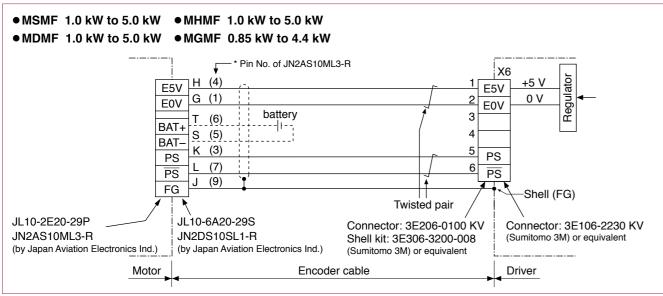
^{*} For more information about the external scale product, please contact the manufacturer.

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

* When use a multi-turn data.



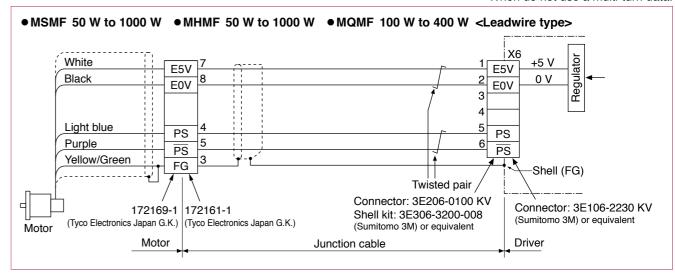


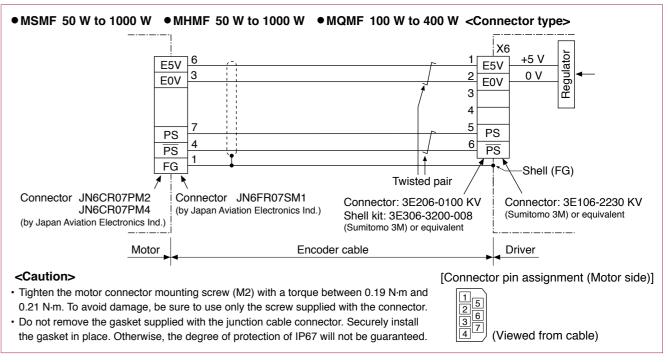


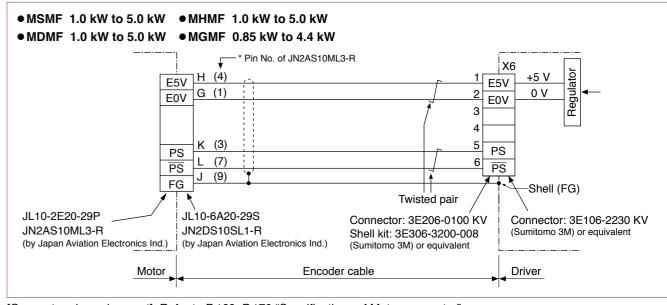
[Connector pin assignment] Refer to P.169, P.170 "Specifications of Motor connector".

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

* When do not use a multi-turn data.





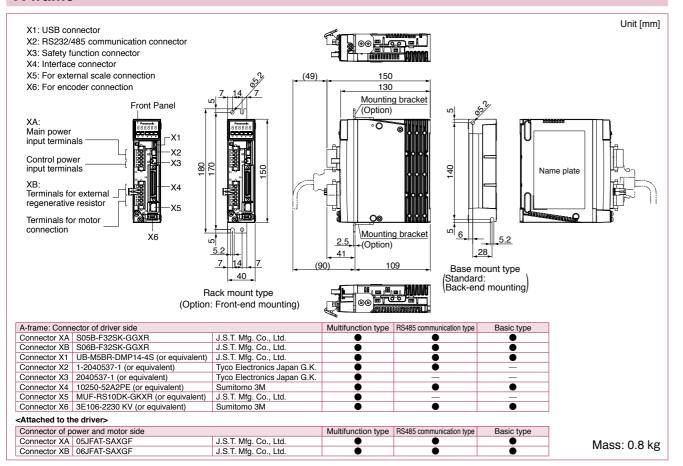


[Connector pin assignment] Refer to P.169, P.170 "Specifications of Motor connector".

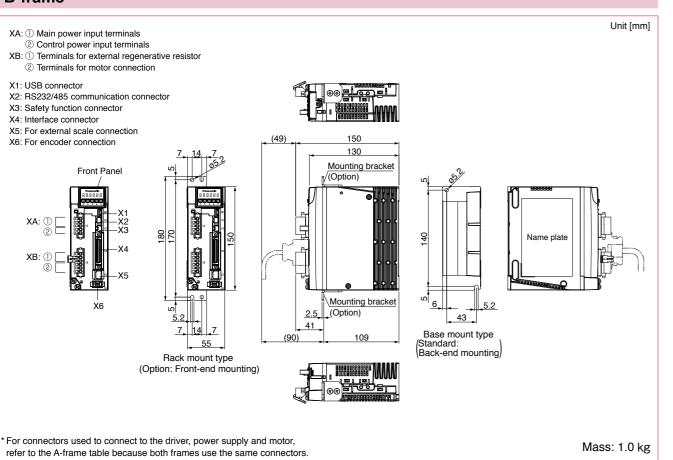
A6 Family

* 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.

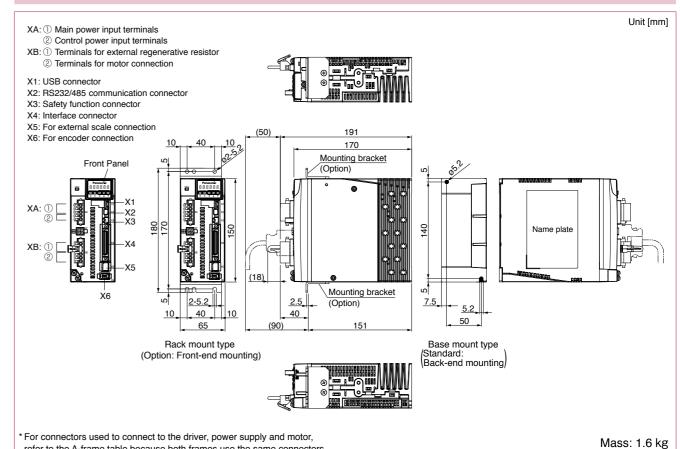
A-frame



B-frame

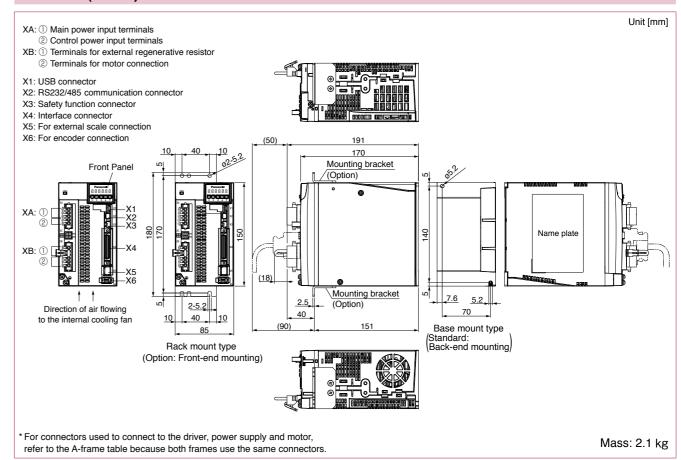


C-frame



D-frame (200 V)

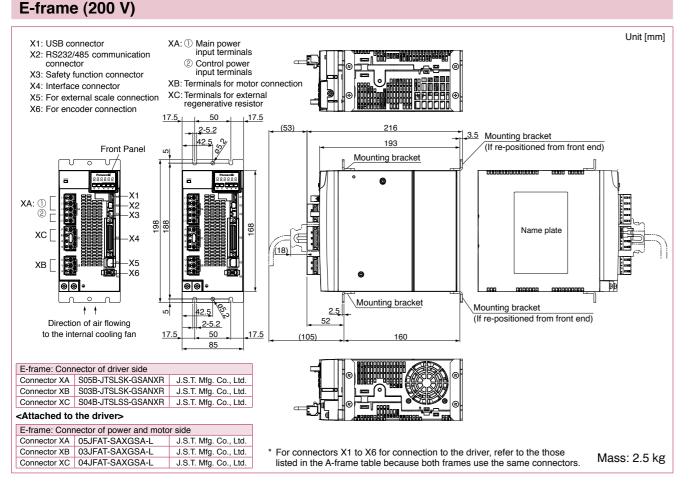
refer to the A-frame table because both frames use the same connectors.



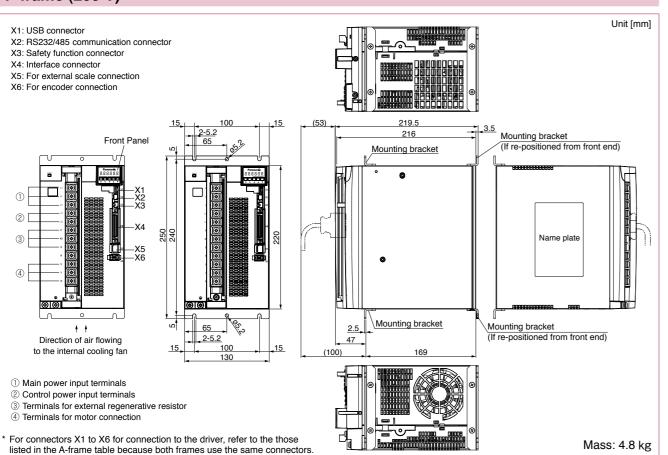
Dimensions of Driver

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.



F-frame (200 V)



Features/Lineup

Features

- · 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:

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



High inertia Max. speed :

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

IP65: Leadwire type IP67: Connector type



Low inertia

Max. speed : 5000 r/min 4500 r/min (4.0 kW,5.0 kW)

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



MDMF Middle inertia

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



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 **Motor Contents**

//SMF 50 W to 5.0 kW	P.51
IQMF 100 W to 400 W	P.67

MHMF

50 W to 5.0 kW P.73

MDMF 1.0 kW to 5.0 kW P.89

MGMF 0.85 kW to 4.4 kW P.95

Dimensions

MSMF (50 W to 1000 W)	
Connector type	2.100

MSMF (1.0 kW to 5.0 kW) ...P.102 Small size connector...

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

MQMF (100 W to 400 W) ...P.104 Connector type.....

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

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

MHMF (50 W to 1000 W) Connector type

MHMF (1.0 kW to 5.0 kW) Small size connector P.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.... Permissible Load at Output Shaft..... .. P.166 Built-in Holding Brake P.167

A6 Family

				AC100 V
Motor model *1	Motor model *1 IP65			MSMF5AZL1
		Multi	function type	MADLT01SF
Applicable	Model No.	RS48	5 communication type *2	MADLN01SG
driver		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. pea	k torqı	ue (N·m)	0.48
Rated current			(A(rms))	1.1
Max. current			(A(o-p))	4.7
Regenerative	brake		Without option	No limit Note)2
frequency (time	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 ratio of the load and the rot				30 times or less
Rotary encode	er speci	ficatio	ns*3	23-bit Absolute
	Re	solutio	on per single turn	8388608

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

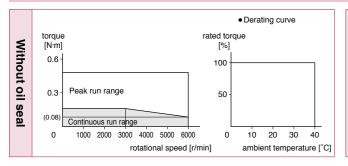
	Radial load P-direction (N)	147
During assembly	Thrust load A-direction (N)	88.0
accombiy	Thrust load B-direction (N)	117.6
During	Radial load P-direction (N)	68.6
operation	Thrust load A, B-direction (N)	58.8

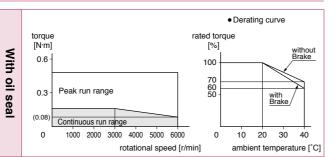
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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.

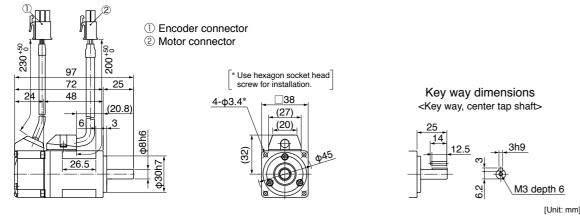
Torque characteristics (at AC100 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





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
		Multif	function type		MADLT05SF
Applicable	Model No	RS48	RS485 communication type *2		MADLN05SG
driver	110.	Basic	type *2		MADLN05SE
	Frame	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	e (N·m)		0.16
Momentary Ma	ax. peal	torque (N·m)		(N·m)	0.48
Rated current			(A(rms))	1.1
Max. current			(A)	(o-p))	4.7
Regenerative brake		Without option		No limit Note)2	
frequency (time	s/min) 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 inertia			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	Rotary encoder specifications *3				23-bit Absolute
	Res	solutio	n per single tu	ırn	8388608

[Low inertia]

38 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.

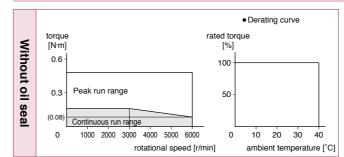
Static friction torque (N·m)	0.294 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.30
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

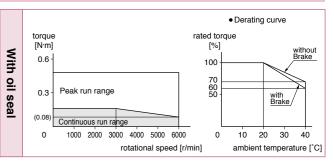
• Permissible load (For details, refer to P.166)

During assembly During operation	Radial load P-direction (N)	147
	Thrust load A-direction (N)	88.0
	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.

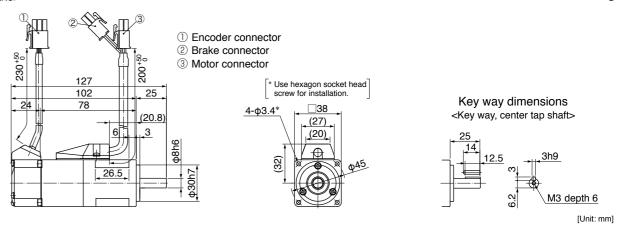
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





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.

A6 Family

Specifications

				AC100 V
Motor model *1			IP65	MSMF011L1
		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)	0.32
Momentary Ma	ax. pea	k torqı	ue (N·m)	0.95
Rated current		(A(rms))	1.6	
Max. current			(A(o-p))	6.9
Regenerative	brake		Without option	No limit Note)2
frequency (time	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	0.048
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				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)	0.294 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)

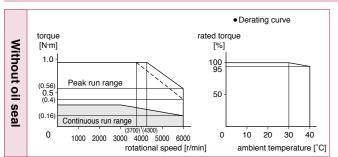
	During assembly During operation	Radial load P-direction (N)	147
		Thrust load A-direction (N)	88.0
		Thrust load B-direction (N)	117.6
		Radial load P-direction (N)	68.6
		Thrust load A, B-direction (N)	58.8

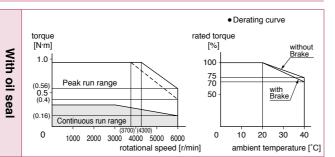
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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.

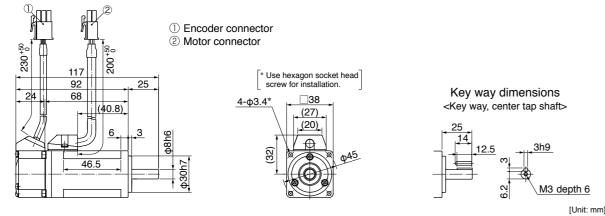
Torque characteristics (at AC100 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





Dimensions

Mass: 0.47 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.

Specifications

				AC200 V
Motor model *1			IP65	MSMF012L1
		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)	0.32
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 (times/min) Note)1		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 ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake	0.051	
Recommended moment of inertial ratio of the load and the rotor				30 times or less
Rotary 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)	0.294 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)

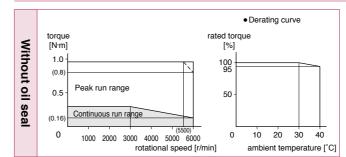
During assembly During operation	Radial load P-direction (N)	147
	Thrust load A-direction (N)	0.88
	Thrust load B-direction (N)	117.6
	Radial load P-direction (N)	68.6
	Thrust load A, B-direction (N)	58.8

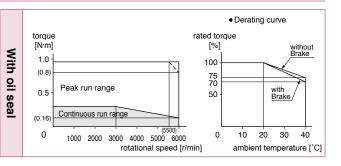
- For details of Note)1 to Note)4, refer to P.165.
- Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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.

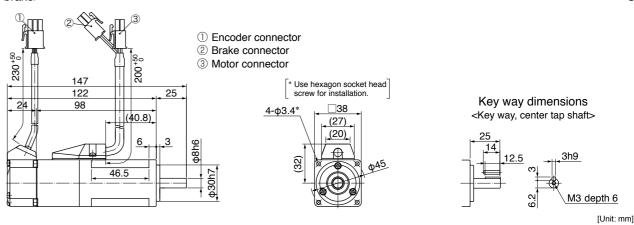
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





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.

				AC100 V
Motor model ^{*1}			IP65	MSMF021L1
		Multi	function type	MBDLT21SF
Applicable	Model No.	RS48	5 communication type *2	MBDLN21SG
driver		Basic	type *2	MBDLN21SE
	Fram	e sym	bol	B-frame
Power supply	capacit	y	(kVA)	0.5
Rated output			(W)	200
Rated torque			(N·m)	0.64
Continuous sta	all torqu	ie	(N·m)	0.64
Momentary Ma	ax. pea	k torqı	ue (N·m)	1.91
Rated current (A(rms)			(A(rms))	2.5
Max. current (A(o-p)		(A(o-p))	10.6	
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)	6000
Moment of inertia			Without brake	0.14
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake	0.17	
Recommended moment of iner ratio of the load and the rotor				30 times or less
Rotary encode	er speci	ficatio	ns*3	23-bit Absolute
Resolution per single tu			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)

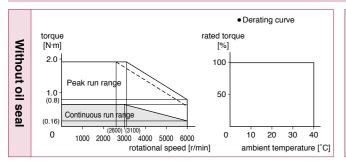
	During assembly During operation	Radial load P-direction (N)	392
		Thrust load A-direction (N)	147
		Thrust load B-direction (N)	196
		Radial load P-direction (N)	245
		Thrust load A, B-direction (N)	98.0

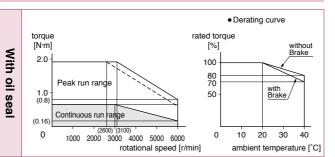
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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.

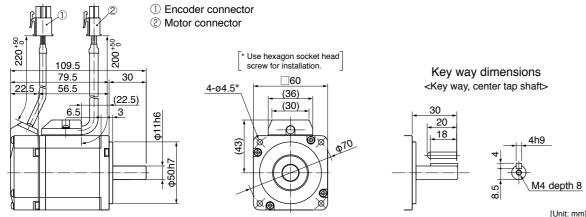
Torque characteristics (at AC100 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





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.

200 V MSMF 200 W Low inertia 60 mm sq.

Specifications

					AC200 V
Motor model *1		IP65			MSMF022L1
		Multi	function type		MADLT15SF
Applicable	Model No	RS48	5 communication ty	pe *2	MADLN15SG
driver	110.	Basic	Basic type *2		MADLN15SE
	Frame	sym	bol		A-frame
Power supply	capacity	,	(k'	VA)	0.5
Rated output			((W)	200
Rated torque			(N	·m)	0.64
Continuous sta	all torqu	е	(N	·m)	0.64
Momentary Ma	ax. peak	torqu	ue (N	·m)	1.91
Rated current	urrent			າຣ))	1.5
Max. current		(A(o	-p))	6.5	
Regenerative I	brake		Without option		No limit Note)2
frequency (time	es/min) N	lote)1	DV0P4283		No limit Note)2
Rated rotation	al speed	t	(r/n	nin)	3000
Max. rotationa	l speed		(r/n	nin)	6000
Moment of ine	rtia		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			ote)3	30 times or less	
Rotary encode	r specif	icatio	ns*3		23-bit Absolute
	Res	olutio	n per single turr	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)	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)

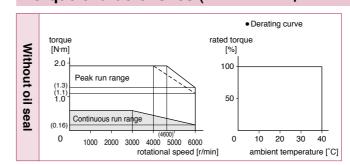
During assembly During operation	Radial load P-direction (N)	392
	Thrust load A-direction (N)	147
	Thrust load B-direction (N)	196
	Radial load P-direction (N)	245
	Thrust load A, B-direction (N)	98.0

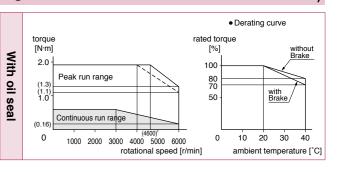
- For details of Note)1 to Note)4, refer to P.165.
- Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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.

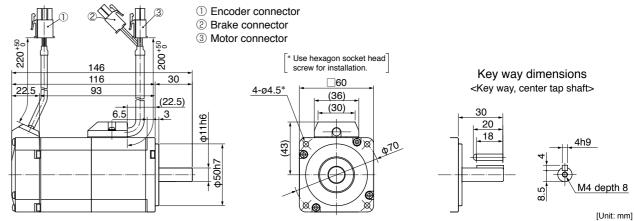
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





Dimensions

Mass: 1.3 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.

				AC100 V
Motor model*1			IP65	MSMF041L1□□
		Multifunction 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 Max. peak torque (N·m)				3.82
Rated current (A(rms))				4.6
Max. current (A(o-p))			(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 ine	rtia		Without brake	0.27
of rotor (×10 ⁻⁴ kg·m ²)			With brake	0.30
Recommender ratio of the loa		30 times or less		
Rotary encoder specifications *3			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)	1.27 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)

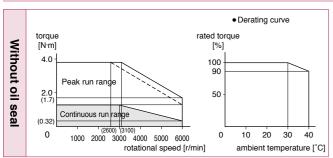
	Radial load P-direction (N)	392
During assembly	Thrust load A-direction (N)	147
documbry	Thrust load B-direction (N)	196
During operation	Radial load P-direction (N)	245
	Thrust load A, B-direction (N)	98.0

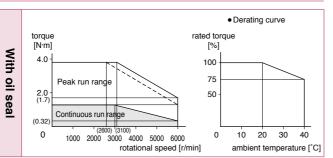
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.48.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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.

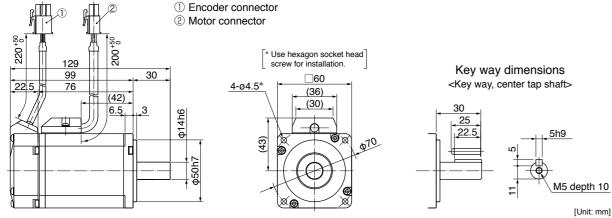
Torque characteristics (at AC100 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





Dimensions

Mass: 1.2 kg <without brake>



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

• 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. 200 V MSMF 400 W Low inertia 60 mm sq.

Specifications

					AC200 V
Motor model *1		IP65			MSMF042L1□□
		Multif	function type		MBDLT25SF
Applicable	Model No.	RS48	communication typ	oe *²	MBDLN25SG
driver	110.	Basic	type *2		MBDLN25SE
	Fram	e syml	bol		B-frame
Power supply	capacit	у	(k\	/A)	0.9
Rated output			(W)	400
Rated torque			(N-	m)	1.27
Continuous sta	all torqu	ie	(N·	m)	1.27
Momentary Max. peak torque (N·m)				3.82	
Rated current			(A(rm	s))	2.4
Max. current			(A(o-	p))	10.2
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)	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				te)3	30 times or less
Rotary encode	r speci	ficatio	ns ^{∗3}		23-bit Absolute
	Re	solutio	n per single turn		8388608

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

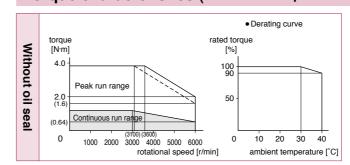
During assembly During operation	Radial load P-direction (N)	392
	Thrust load A-direction (N)	147
	Thrust load B-direction (N)	196
	Radial load P-direction (N)	245
	Thrust load A, B-direction (N)	98.0

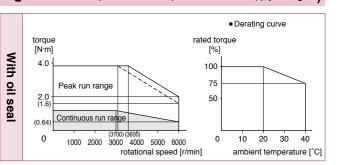
- For details of Note)1 to Note)4, refer to P.165.
- Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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.

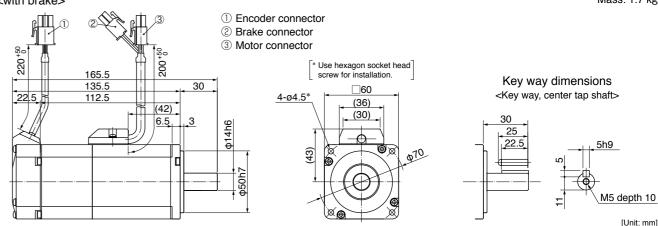
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





Dimensions

<with brake>



For connector type IP67 motors, refer to P.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.

57 MINAS A6 Family

Mass: 1.7 kg

Specifications

				AC200 V
Motor model *1			IP65	MSMF082L1
			function type	MCDLT35SF
Applicable	Model No.	RS48	5 communication type *2	MCDLN35SG
driver	140.	Basic	type *2	MCDLN35SE
	Fram	e sym	bol	C-frame
Power supply	capacit	у	(kVA)	1.3
Rated output			(W)	750
Rated torque			(N·m)	2.39
Continuous sta	all torqu	ie	(N·m)	2.39
Momentary Ma	ax. pea	k torqı	ue (N·m)	7.16
Rated current (A(rms))			(A(rms))	4.1
Max. current (A(o-p))			17.4	
Regenerative brake W			Without option	No limit Note)2
frequency (time	es/min)	Note)1	DV0P4283	No limit Note)2
Rated rotation	al spee	d	(r/min)	3000
Max. rotationa	l speed		(r/min)	6000
Moment of ine	rtia		Without brake	0.96
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake	1.06	
Recommended moment of inertia ratio of the load and the rotor Note)3				20 times or less
Rotary 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)	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)

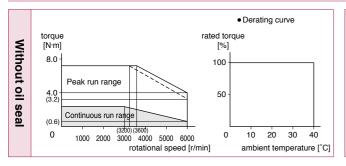
	During assembly During operation	Radial load P-direction (N)	686
		Thrust load A-direction (N)	294
		Thrust load B-direction (N)	392
		Radial load P-direction (N)	392
		Thrust load A, B-direction (N)	147

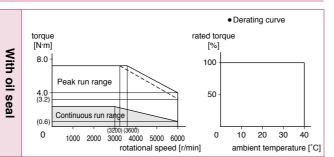
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.48.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.18.

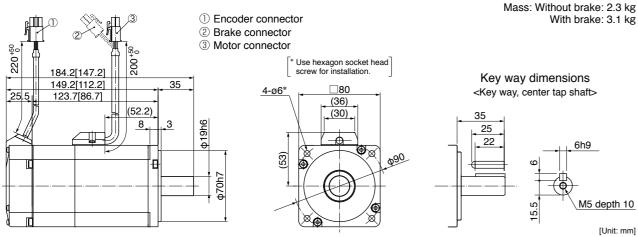
*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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

Specifications

					AC200 V
Motor model *1	IP65			MSMF092L1	
		Multif	function type		MDDLT45SF
Applicable	Model No.	RS48	5 communication ty	pe *2	MDDLN45SG
driver	110.	Basic type *2		MDDLN45SE	
	Frame	e syml	bol		D-frame
Power supply	capacity	y	(k'	VA)	1.8
Rated output				(W)	1000
Rated torque			(N	ŀm)	3.18
Continuous sta	all torqu	е	(N	l·m)	3.18
Momentary Ma	ax. peal	k torqu	ue (N	ŀm)	9.55
Rated current (A(าร))	5.7
Max. current			(A(o	-p))	24.2
Regenerative brake			Without option	ı	No limit Note)2
frequency (times/min) Note)1		DV0P4284		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		1.26
of rotor (×10 ⁻⁴ kg·m ²)			With brake		1.36
Recommended moment of inertia ratio of the load and the rotor Note)3				ote)3	15 times or less
Rotary encoder specifications *3					23-bit Absolute
	Res	solutio	n per single turr	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)	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)

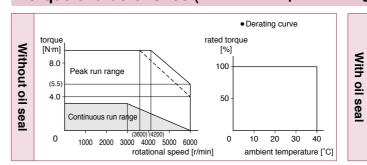
During assembly During operation	Radial load P-direction (N)	686
	Thrust load A-direction (N)	294
	Thrust load B-direction (N)	392
	Radial load P-direction (N)	392
	Thrust load A, B-direction (N)	147

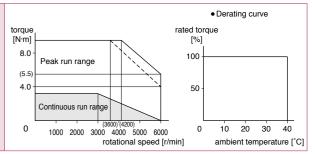
- For details of Note)1 to Note)4, refer to P.165.
- Dimensions of Driver, refer to P.48.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.18.

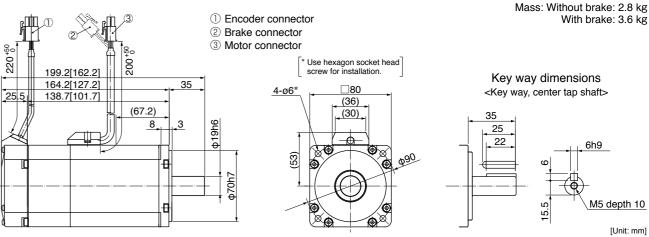
*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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





Dimensions



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. **Imformation**

Specifications

				AC200 V
Motor model ^{*1}			IP67	MSMF102L1□□
		Multifunction type		MDDLT55SF
Applicable	Model No	RS48	5 communication type *2	MDDLN55SG
driver		Basic	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 sta	all torque	е	(N·m)	3.82
Momentary Ma	ax. peak	torqu	ue (N·m)	9.55
Rated current			(A(rms))	6.6
Max. current			(A(o-p))	28
Regenerative	brake		Without option	No limit Note)2
frequency (time	es/min) N	lote)1	DV0P4284	No limit Note)2
Rated rotation	al speed	t	(r/min)	3000
Max. rotationa	l speed		(r/min)	5000
Moment of ine	rtia		Without brake	2.15
of rotor (×10 ⁻⁴ kg·m ²)			With brake	2.47
Recommended moment of inertia ratio of the load and the rotor				15 times or less
Rotary encode	er specif	icatio	ns ^{*3}	23-bit Absolute
	Res	olutic	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

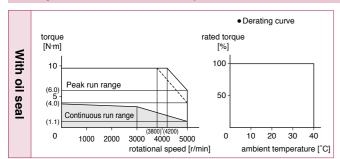
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.48.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.18.

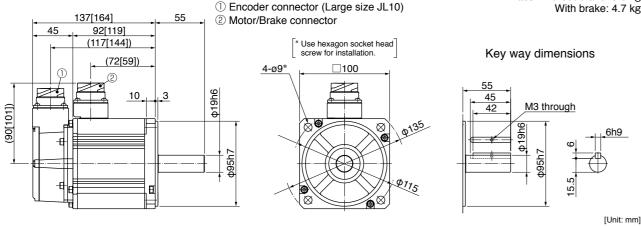
*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Mass: Without brake: 3.6 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		MSMF152L1□□
		Multifunction type			MDDLT55SF
Applicable	Model No	RS485 communication type *2 Basic type *2		n type *2	MDDLN55SG
driver	140.				MDDLN55SE
	Frame	e 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	c torqu	ıe	(N·m)	14.3
Rated current			(A	(rms))	8.2
Max. current			(/	۹(o-p))	35
Regenerative I	brake		Without op	tion	No limit Note)2
frequency (time	es/min) I	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 bra	ake	3.10
of rotor (×10 ⁻⁴ kg·m ²)			With brake		3.45
Recommended moment of inertial 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]

• 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)

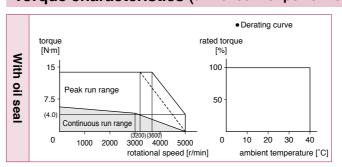
During assembly During operation	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196

- 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".

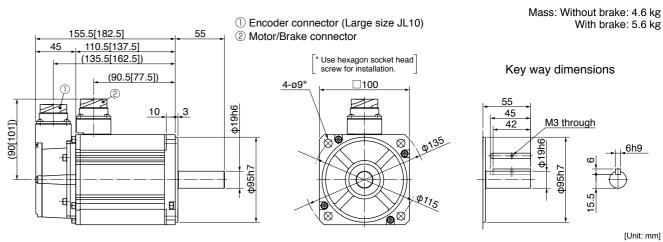
Detail of model designation, refer to P.18.

*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.

					AC200 V
Motor model*1			IP67		MSMF202L1□□
		Multi	function type		MEDLT83SF
Applicable	Model No	HS485 communication type 2		e *2	MEDLN83SG
driver	110.	Basic	type *2		MEDLN83SE
	Fram	e sym	bol		E-frame
Power supply	capacit	у	(kV	A)	3.8
Rated output			(V	V)	2000
Rated torque			(N·r	n)	6.37
Continuous st	all torqu	ie	(N·r	n)	7.64
Momentary M	ax. pea	k torqı	ıe (N·r	n)	19.1
Rated current			(A(rms	s))	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/mi	n)	3000
Max. rotational speed		(r/mi	n)	5000	
Moment of inertia of rotor (×10 ⁻⁴ kg·m²)		Without brake		4.06	
		With brake		4.41	
Recommended moment of in ratio of the load and the rotor				e)3	15 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)	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)

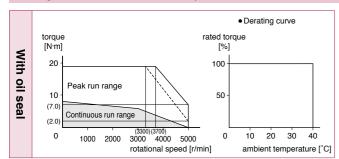
	During assembly During operation	Radial load P-direction (N)	980
		Thrust load A-direction (N)	588
		Thrust load B-direction (N)	686
		Radial load P-direction (N)	490
		Thrust load A, B-direction (N)	196

- 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".

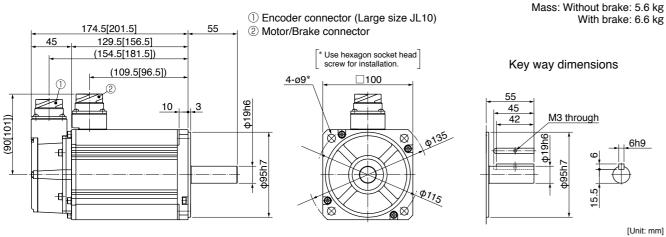
Detail of model designation, refer to P.18.

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

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			(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/min)	3000
Max. rotationa	l speed		(r/min)	5000
Moment of ine	rtia		Without brake	7.04
of rotor ($\times 10^{-4}$	kg·m²)		With brake	7.38
Recommended moment of inertia ratio of the load and the rotor				15 times or less
Rotary encode	r speci	ficatio	ns*3	23-bit Absolute
Resolution per single turn				8388608

200 V MSMF 3.0 kW Low inertia 120 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)	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)

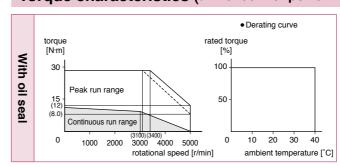
	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
assembly	Thrust load B-direction (N)	686
During operation	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196

- 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".

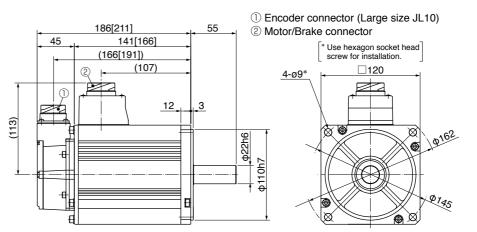
Detail of model designation, refer to P.18.

*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



45 M3 through

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.

63 MINAS A6 Family

Imformation

Mass: Without brake: 8.7 kg With brake: 9.9 kg

Key way dimensions

[Unit: mm]

Specifications

				AC200 V
Motor model *1			IP67	MSMF402L1□□
		Multi	function type	MFDLTB3SF
Applicable	Model No	RS48	5 communication type	MFDLNB3SG
driver		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	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			(A(o-p)	83
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 ine	rtia		Without brake	14.4
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake	15.6	
Recommended moment of inertia ratio of the load and the rotor				15 times or less
Rotary encode	er speci	ficatio	ns ^{*3}	23-bit Absolute
	Re	solutio	n per single turn	8388608

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

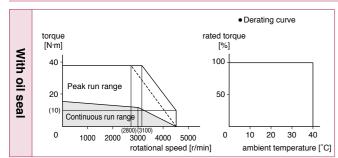
	During assembly During operation	Radial load P-direction (N)	980
		Thrust load A-direction (N)	588
		Thrust load B-direction (N)	686
		Radial load P-direction (N)	784
		Thrust load A, B-direction (N)	343

- 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".

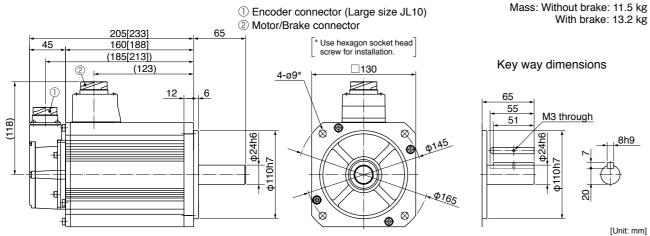
Detail of model designation, refer to P.18.

*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□□
		Multifunction type			MFDLTB3SF
Applicable	Model No	RS48	communication type	e *2	MFDLNB3SG
driver	110.	Basic	Basic type *2		MFDLNB3SE
	Fram	e syml	bol		F-frame
Power supply	capacit	y	(kV	(A)	7.5
Rated output			(V	N)	5000
Rated torque			(N·r	m)	15.9
Continuous sta	all torqu	ie	(N·r	m)	19.1
Momentary Ma	ax. peal	k torqu	ıe (N·r	m)	47.7
Rated current			(A(rms	s))	24.0
Max. current			(A(o-p	0))	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/mi	in)	3000
Max. rotationa	l speed		(r/mi	in)	4500
Moment of inertia			Without brake		19.0
of rotor (×10 ⁻⁴ kg·m ²)			With brake		20.2
Recommended moment of inertia ratio of the load and the rotor Note)3				e)3	15 times or less
Rotary encode	Rotary encoder specifications *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)

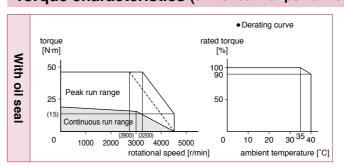
During assembly During operation	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	784
	Thrust load A, B-direction (N)	343

- 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".

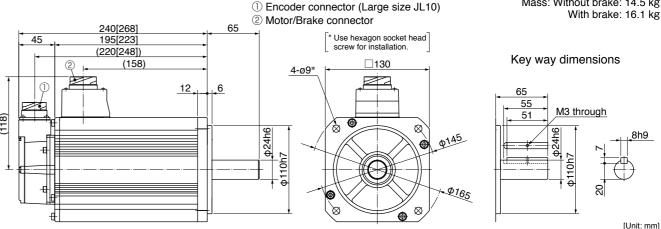
Detail of model designation, refer to P.18.

*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.

Mass: Without brake: 14.5 kg

[Unit: mm]

				AC100 V
Motor model *1			IP65	MQMF011L1
		Multi	function type	MADLT11SF
Applicable	Model No	RS48	5 communication type *2	MADLN11SG
driver		Basic	type *2	MADLN11SE
	Fram	e sym	bol	A-frame
Power supply	capacit	y	(kVA)	0.4
Rated output			(W)	100
Rated torque			(N·m)	0.32
Continuous sta	all torqu	ie	(N·m)	0.33
Momentary Ma	ax. pea	k torqu	ue (N·m)	1.11
Rated current			(A(rms))	1.6
Max. current (A(o-p)			(A(o-p))	7.9
Regenerative brake W			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
	Resolution per single tu			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)

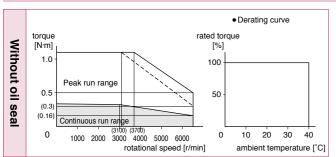
	During assembly During operation	Radial load P-direction (N)	147
		Thrust load A-direction (N)	88
		Thrust load B-direction (N)	117.6
		Radial load P-direction (N)	68.6
		Thrust load A, B-direction (N)	58.8

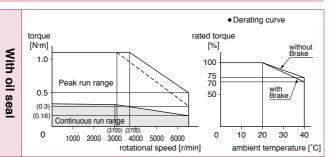
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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

Specifications

					AC200 V
Motor model *1	IP65			MQMF012L1□□	
		Multifunction type		MADLT05SF	
Applicable	Model No	RS485	5 communication	type *2	MADLN05SG
driver	140.	Basic	asic 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)	0.33
Momentary Ma	ax. peal	c torqu	ie (N·m)	1.11
Rated current			(A(I	rms))	1.1
Max. current			(A(o-p))	5.5
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)	6500
Moment of inertia			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	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)	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

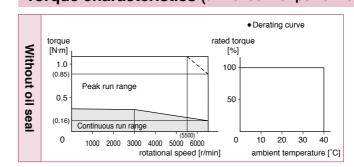
• Permissible load (For details, refer to P.166)

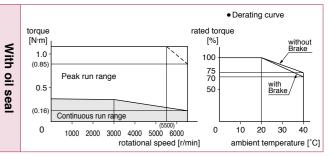
During assembly During operation	Radial load P-direction (N)	147
	Thrust load A-direction (N)	88
	Thrust load B-direction (N)	117.6
	Radial load P-direction (N)	68.6
	Thrust load A, B-direction (N)	58.8

- 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.>)

<u>e.</u>





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.

Specifications

				AC100 V
Motor model *1	IP65			MQMF021L1
Applicable driver			function type	MBDLT21SF
	Model No.	RS485 communication type *2		MBDLN21SG
		Basic type *2		MBDLN21SE
	Fram	e sym	bol	B-frame
Power supply capacity (kVA)			0.5	
Rated output (W)			(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))	2.1
Max. current			(A(o-p))	10.4
Regenerative brake frequency (times/min) Note)1		Without option	No limit Note)2	
		DV0P4283	No limit Note)2	
Rated rotational speed			(r/min)	3000
Max. rotational speed			(r/min)	6500
Moment of inertia of rotor (×10 ⁻⁴ kg·m²)		Without brake	0.50	
			With brake	0.59
Recommended moment of inertia ratio of the load and the rotor Note)3				20 times or less
Rotary encoder specifications '3 Resolution per single turn			ns *3	23-bit Absolute
			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)

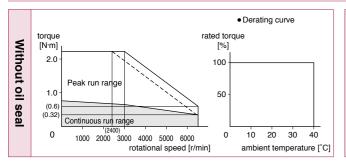
	During assembly	Radial load P-direction (N)	392
		Thrust load A-direction (N)	147
		Thrust load B-direction (N)	196
	During operation	Radial load P-direction (N)	245
		Thrust load A, B-direction (N)	98

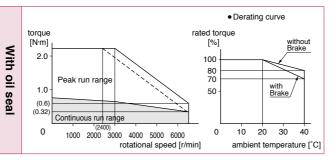
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type"

Detail of model designation, refer to P.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.>)

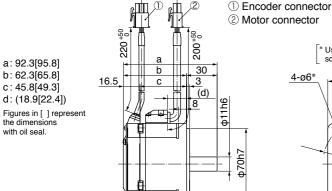


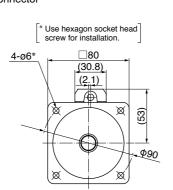


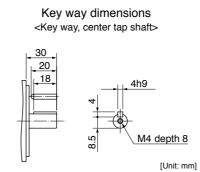
Dimensions

<without brake>

Mass: 1.1 kg (1.2 kg with oil seal)







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.

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

Specifications

					AC200 V
Motor model *1	IP65				MQMF022L1□□
Applicable driver	Multif		function type		MADLT15SF
	NO.	RS485	5 communication typ	e *2	MADLN15SG
		Basic type *2		MADLN15SE	
	Frame symbol			A-frame	
Power supply	capacit	y	(kV	/A)	0.5
Rated output			()	W)	200
Rated torque (N·m)				m)	0.64
Continuous stall torque (N·m)				m)	0.76
Momentary Max. peak torque (N·m)				m)	2.23
Rated current			(A(rm	s))	1.4
Max. current			(A(o-	p))	6.9
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. rotationa	l speed		(r/mi	in)	6500
Moment of inertia of rotor (×10 ⁻⁴ kg·m²)		Without brake		0.50	
		With brake		0.59	
Recommended moment of inertia ratio of the load and the rotor Note)3				20 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)	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)

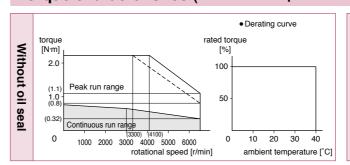
During assembly During operation	Radial load P-direction (N)	392
	Thrust load A-direction (N)	147
	Thrust load B-direction (N)	196
	Radial load P-direction (N)	245
	Thrust load A, B-direction (N)	98

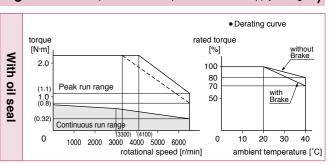
- For details of Note)1 to Note)4, refer to P.165.
- Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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.

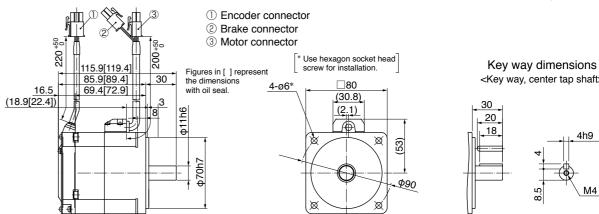
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





Dimensions

<with brake>



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.

69 MINAS A6 Family

Mass: 1.5 kg (1.6 kg with oil seal)

<Key way, center tap shaft>

4h9

Specifications						
		AC100 V				
Motor model ^{*1}			IP65	MQMF041L1□□		
		Multi	function type	MCDLT31SF		
Applicable	Model No.	RS48	5 communication type *2	MCDLN31SG		
driver	140.	Basic	type *2	MCDLN31SE		
	Frame	e sym	bol	C-frame		
Power supply	capacity	у	(kVA)	0.9		
Rated output			(W)	400		
Rated torque			(N·m)	1.27		
Continuous stall torque (N·m)				1.40		
Momentary Max. peak torque (N·m)				4.46		
Rated current (A(rms))			4.1			
Max. current (A(o-p))			20.3			
Regenerative brake frequency (times/min) Note)1		Without option	No limit Note)2			
		DV0P4282	No limit Note)2			
Rated rotational speed (r/min)			3000			
Max. rotational speed (r/min)			6500			
Moment of ine	rtia		Without brake	0.98		
of rotor (×10 ⁻⁴	kg·m²)		With brake	1.06		
Recommende ratio of the loa		20 times or less				

• 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 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

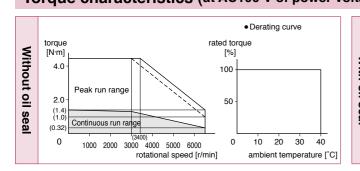
Detail of model designation, refer to P.18.

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

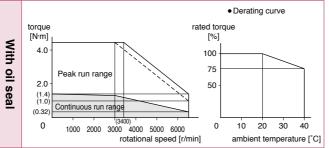
Torque characteristics (at AC100 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)

23-bit Absolute

8388608



Resolution per single turn

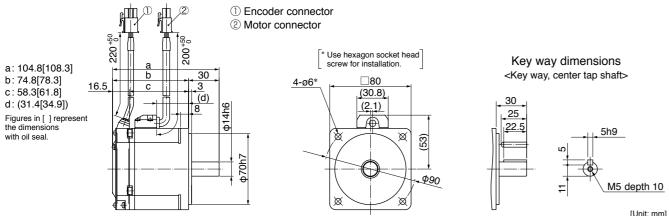


Dimensions

Rotary encoder specifications *3

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

Middle inertia 200 V **MQMF** 400 W Flat type 80 mm sq.

Specifications

					AC200 V
Motor model *1		IP65			MQMF042L1
		Multi	function type		MBDLT25SF
Applicable	Model No	RS485 communication type *2		MBDLN25SG	
driver	140.	Basic type *2			MBDLN25SE
	Frame	e sym	bol		B-frame
Power supply	capacit	y	(k	(AV	0.9
Rated output				(W)	400
Rated torque			(1)	√m)	1.27
Continuous sta	all torqu	е	1)	√m)	1.40
Momentary Max. peak torque (N·r					4.46
Rated current				ns))	2.1
Max. current (A(o-				p-p))	10.4
Regenerative brake			Without option	า	No limit Note)2
frequency (times/min) Note)1		DV0P4283		No limit Note)2	
Rated rotational speed			(r/r	min)	3000
Max. rotationa	l speed		(r/r	min)	6500
Moment of inertia			Without brake	;	0.98
of rotor (×10 ⁻⁴ kg·m ²)			With brake		1.06
Recommended moment of inertia ratio of the load and the rotor				lote)3	20 times or less
Rotary encoder specifications '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.

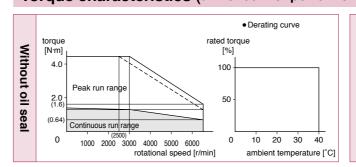
Static friction torque (N·m)	1.6 or more
Engaging time (ms)	70 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

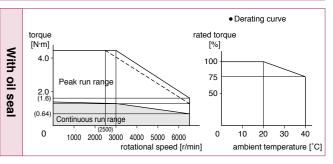
• Permissible load (For details, refer to P.166)

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.

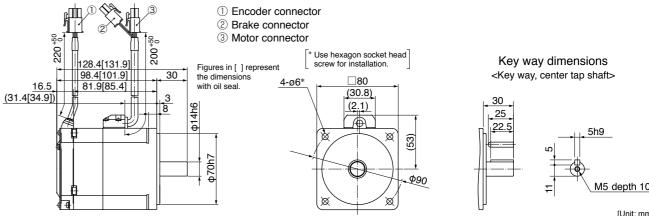
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





Dimensions

<with brake>



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.

Mass: 2.0 kg (2.1 kg with oil seal)

				AC100 V
Motor model *1			IP65	MHMF5AZL1
		Multi	function type	MADLT01SF
Applicable	Model No.	RS48	5 communication type *2	MADLN01SG
driver	140.	Basic	c type ^{⁺2}	MADLN01SE
	Fram	e sym	bol	A-frame
Power supply	capacit	/	(kVA)	0.4
Rated output			(W)	50
Rated torque			(N·m)	0.16
Continuous sta	all torqu	е	(N·m)	0.18
Momentary Max. peak torque (N·m)				0.56
Rated current (A			(A(rms))	1.1
Max. current (A(o-			(A(o-p))	5.5
Regenerative brake		Without option	No limit Note)2	
frequency (times/min) Note)1		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 inert ratio of the load and the rotor				30 times or less
Rotary encode	r 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.

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)

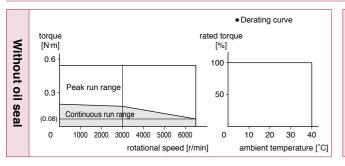
During assembly During operation	Radial load P-direction (N)	147
	Thrust load A-direction (N)	88
	Thrust load B-direction (N)	117.6
	Radial load P-direction (N)	68.6
	Thrust load A, B-direction (N)	49

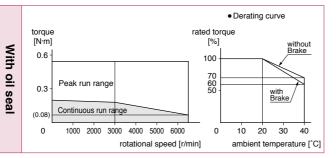
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.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.>)

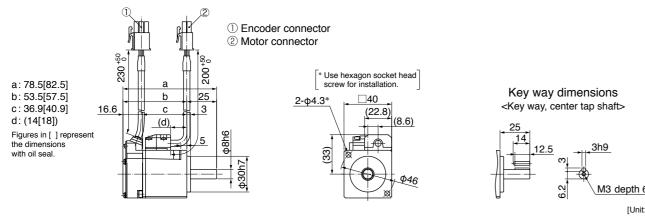




Dimensions

73 MINAS A6 Family

Mass: 0.29 kg (0.31 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	MHMF5AZL1
		Multi	function type	MADLT05SF
Applicable	Model No.	RS48	5 communication type *	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 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)	6500
Moment of inertia			Without brake	0.038
of rotor (×10 ⁻⁴ kg·m ²)			With brake	0.042
Recommender ratio of the loa				30 times or less
Rotary encode	r speci	ficatio	ns*3	23-bit Absolute
Resolution per			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

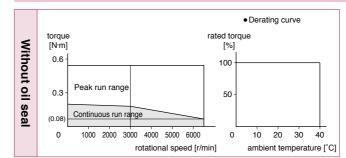
• Permissible load (For details, refer to P.166)

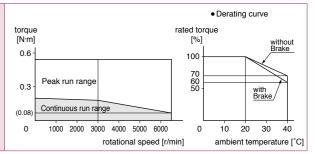
During assembly During operation	Radial load P-direction (N)	147
	Thrust load A-direction (N)	88
	Thrust load B-direction (N)	117.6
	Radial load P-direction (N)	68.6
	Thrust load A, B-direction (N)	49

- 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.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.>)

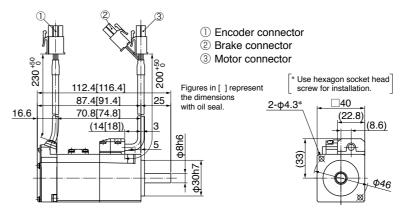
<u>⊆</u>.





Dimensions

<with brake>



Key way dimensions <Key way, center tap shaft>

MINAS A6 Family 74

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.

Mass: 0.51 kg (0.53 kg with oil seal)

				AC100 V
Motor model*1			IP65	MHMF011L1
		Multif	unction type	MADLT11SF
Applicable	Model No	RS48	communication type *2	MADLN11SG
driver	. 10.	Basic	type *2	MADLN11SE
	Frame	syml	ool	A-frame
Power supply	capacity		(kVA)	0.4
Rated output			(W)	100
Rated torque			(N·m)	0.32
Continuous sta	all torque)	(N·m)	0.33
Momentary Ma	ax. peak	torqu	ie (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) No	ote)1	DV0P4280	No limit Note)2
Rated rotation	al speed		(r/min)	3000
Max. rotationa	l speed		(r/min)	6500
Moment of ine	rtia		Without brake	0.071
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)			With brake	0.074
Recommended moment of ratio of the load and the rote			30 times or less	
Rotary encode	er specific	catio	ns ^{∗3}	23-bit Absolute
	Reso	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)	0.38 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)

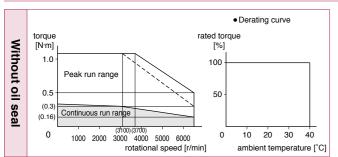
	Radial load P-direction (N)	147
During assemble	Thrust load A-direction (N)	88
accombi	Thrust load B-direction (N)	117.6
During	Radial load P-direction (N)	68.6
operation	Thrust load A, B-direction (N)	58.8

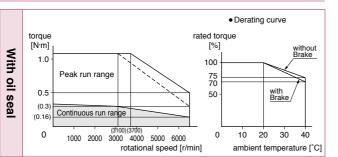
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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.

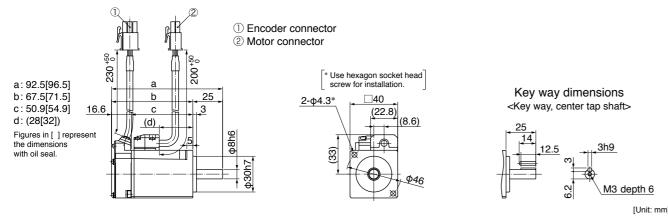
Torque characteristics (at AC100 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





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
	Frame	e sym	bol	A-frame
Power supply	capacit	y	(kVA)	0.5
Rated output			(W)	100
Rated torque			(N·m)	0.32
Continuous sta	all torqu	е	(N·m)	0.33
Momentary Ma	ax. peal	k torqu	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)	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 inert ratio of the load and the rotor				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.

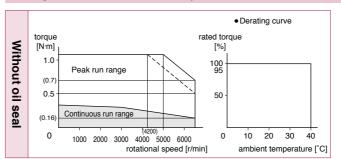
Static friction torque (N·m)	0.38 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.30
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

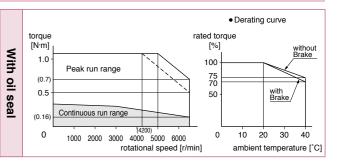
• Permissible load (For details, refer to P.166)

During assembly 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.

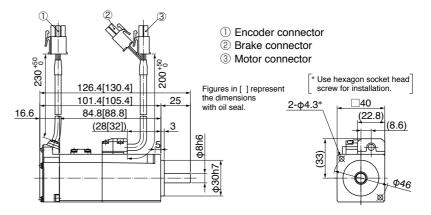
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





Dimensions

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

Specifications

					AC100 V
Motor model *1			IP65		MHMF021L1
		Multifunction type		MBDLT21SF	
Applicable	Model No	" RS485 communication type "		MBDLN21SG	
driver		Basic	type *2		MBDLN21SE
	Frame	e sym	bol		B-frame
Power supply	capacit	y	(kV	A)	0.5
Rated output			(V	V)	200
Rated torque			(N·r	n)	0.64
Continuous sta	all torqu	е	(N·r	n)	0.76
Momentary Ma	ax. peal	k torqu	ıe (N·r	n)	2.23
Rated current			(A(rms	s))	2.1
Max. current			(A(o-p)))	10.4
Regenerative I	brake		Without option		No limit Note)2
frequency (time	s/min)	Note)1	DV0P4283		No limit Note)2
Rated rotation	al spee	d	(r/mi	n)	3000
Max. rotationa	l speed		(r/mi	n)	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			e)3	30 times or less	
Rotary encode	r speci	ficatio	ns *3		23-bit Absolute
Resolutio			tion 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)	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.
- *1 \square 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.

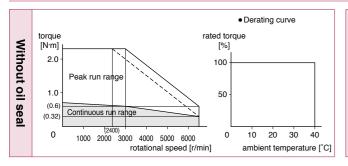
*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

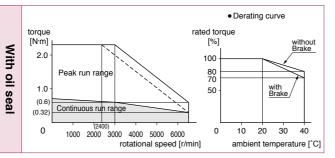
• Brake specifications (For details, refer to P.167)

· Dimensions of Driver, refer to P.47.

"Position control type".

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

<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			MHMF022L1
		Multi	Multifunction type		MADLT15SF
Applicable	Model No	RS48	5 communication type	, *2	MADLN15SG
driver	140.	Basic	type *2		MADLN15SE
	Fram	e sym	bol		A-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	((1.4
Max. current	rrent (A(o-p))))	6.9
Regenerative I	brake		Without option		No limit Note)2
frequency (time	es/min)	Note)1	DV0P4283		No limit Note)2
Rated rotation	al spee	d	(r/mir	n)	3000
Max. rotationa	l speed		(r/mir	n)	6500
Moment of ine	rtia		Without brake		0.29
of rotor (×10 ⁻⁴	kg·m²)		With brake		0.31
Recommended moment of inertial ratio of the load and the rotor				9)3	30 times or less
Rotary encode	r speci	ficatio	ns ^{*3}		23-bit Absolute
	Re	solutio	n per single turn		8388608

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

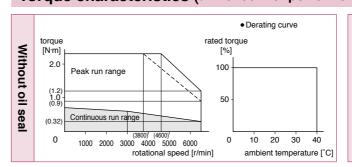
During assembly During operation	Radial load P-direction (N)	392
	Thrust load A-direction (N)	147
	Thrust load B-direction (N)	196
	Radial load P-direction (N)	245
	Thrust load A, B-direction (N)	98

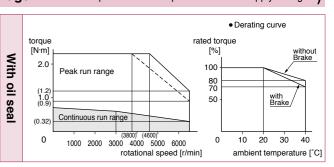
- For details of Note)1 to Note)4, refer to P.165.
- Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.18.

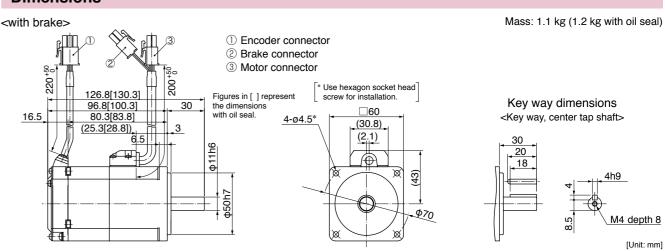
*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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.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.

77 MINAS A6 Family

				AC100 V
Motor model *1			IP65	MHMF041L1
		Multif	function type	MCDLT31SF
Applicable	Model I	RS48	communication type *2	MCDLN31SG
driver	I	Basic type *2		MCDLN31SE
	Frame	syml	bol	C-frame
Power supply	capacity		(kVA)	0.9
Rated output			(W)	400
Rated torque			(N·m)	1.27
Continuous sta	all torque	;	(N·m)	1.40
Momentary Ma	ax. peak	torqu	ie (N·m)	4.46
Rated current (A(rr			(A(rms))	4.1
Max. current (A(o-p))		20.3		
Regenerative brake frequency (times/min) Note)1		Without option	No limit Note)2	
		ote)1	DV0P4282	No limit Note)2
Rated rotation	al speed		(r/min)	3000
Max. rotationa	l speed		(r/min)	6500
Moment of ine	rtia		Without brake	0.56
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)			With brake	0.58
Recommended moment of inertia ratio of the load and the rotor				30 times or less
Rotary encode	er specific	catio	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)	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)

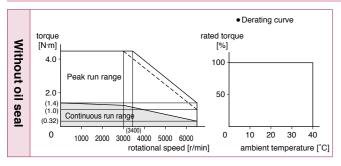
	During assembly During operation	Radial load P-direction (N)	392
		Thrust load A-direction (N)	147
		Thrust load B-direction (N)	196
		Radial load P-direction (N)	245
		Thrust load A, B-direction (N)	98

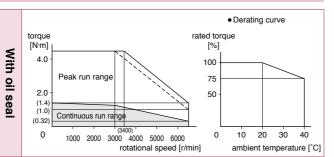
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.48.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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.

200 V MHMF 400 W High inertia 60 mm sq.

Specifications

				AC200 V
Motor model *1			IP65	MHMF042L1
		Multi	function type	MBDLT25SF
Applicable	Model No	RS48	5 communication type *2	MBDLN25SG
driver	110.	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)	1.40
Momentary Ma	ax. peal	k torqu	ue (N·m)	4.46
Rated current			(A(rms))	2.1
Max. current			(A(o-p))	10.4
Regenerative brake			Without option	No limit Note)2
frequency (times/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 inertia			Without brake	0.56
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake	0.58	
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	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)

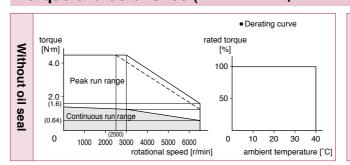
During assembly During operation	Radial load P-direction (N)	392
	Thrust load A-direction (N)	147
	Thrust load B-direction (N)	196
	Radial load P-direction (N)	245
	Thrust load A, B-direction (N)	98

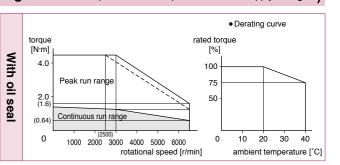
- For details of Note)1 to Note)4, refer to P.165.
- Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.18.

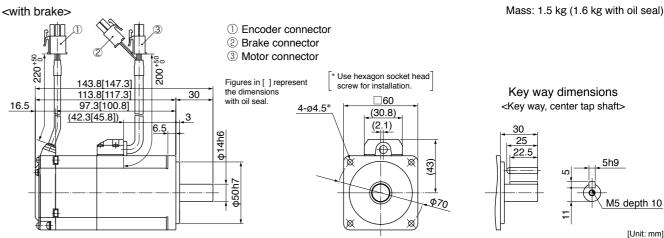
*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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.

79 MINAS A6 Family

Specifications

					AC200 V
Motor model *1			IP65		MHMF082L1
		Multi	function t	уре	MCDLT35SF
Applicable	Model No	Model RS485 communication type *2		cation type *2	MCDLN35SG
driver		Basic type *2			MCDLN35SE
	Frame	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		(N·m)	2.86
Momentary Ma	ax. peal	torqı	ue	(N·m)	8.36
Rated current (A			(A(rms))	3.8	
Max. current (A(o-			(A(o-p))	18.8	
Regenerative brake Witho		Without	option	No limit Note)2	
frequency (time	es/min) I	Note)1	DV0P4283		No limit Note)2
Rated rotation	al spee	d	<u> </u>	(r/min)	3000
Max. rotationa	l speed			(r/min)	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			Note)3	20 times or less	
Rotary encoder specification			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.

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

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

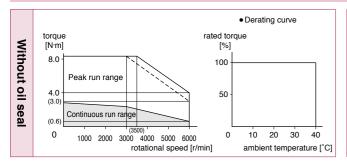
Detail of model designation, refer to P.18.

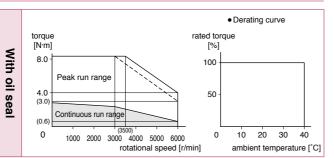
*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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

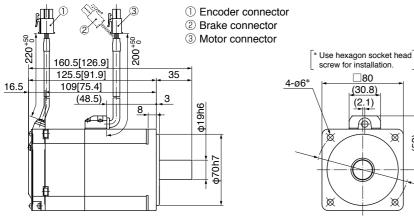
- · Dimensions of Driver, refer to P.48.
- "Position control type".

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

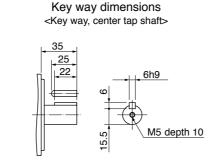




Dimensions



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



•Figures in [] represent the dimensions without brake.

(30.8)

(2.1)

(53)

[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 sta	all torqu	ie	(N·m)	3.34
Momentary Ma	ax. pea	k torqı	ue (N·m)	11.1
Rated current			(A(rms))	5.7
Max. current			(A(o-p))	28.2
Regenerative brake		Without option	No limit Note)2	
frequency (time	es/min)	Note)1	DV0P4284	No limit Note)2
Rated rotation	al spee	d	(r/min)	3000
Max. rotationa	l speed		(r/min)	6000
Moment of ine	rtia		Without brake	2.03
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake	2.13	
Recommended moment of ir ratio of the load and the roto				20 times or less
Rotary encode	r speci	ficatio	ns *3	23-bit Absolute
	Re	solutio	n per single turn	8388608

200 V MHMF 1000 W High inertia 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.

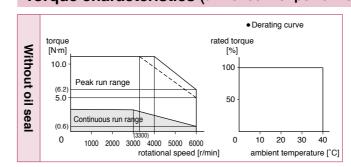
Static friction torque (N·m)	3.8 or more
Engaging time (ms)	70 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.42
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

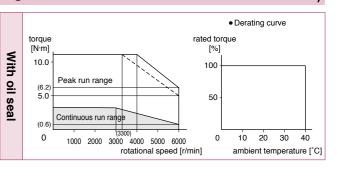
• Permissible load (For details, refer to P.166)

	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

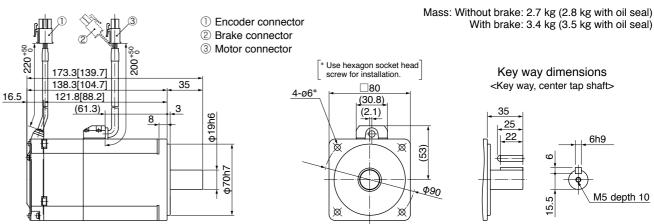
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.48.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.18.
- *3 When using 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.

Specifications

				AC200 V
Motor model *1			IP67	MHMF102L1□□
			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	у	(kVA)	1.8
Rated output			(W)	1000
Rated torque			(N·m)	4.77
Continuous sta	all torqu	ie	(N·m)	5.25
Momentary Ma	ax. pea	k torqı	ue (N·m)	14.3
Rated current			(A(rms))	5.2
Max. current			(A(o-p))	22
Regenerative I	Regenerative brake		Without option	No limit Note)2
frequency (times/min) Note)		Note)1	DV0P4284	No limit Note)2
Rated rotation	rotational speed		(r/min)	2000
Max. rotationa	onal speed		(r/min)	3000
Moment of ine	rtia		Without brake	22.9
of rotor ($\times 10^{-4}$	kg·m²)		With brake	24.1
Recommended momer ratio of the load and the				5 times or less
Rotary encode	r 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.

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".

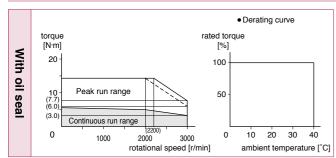
Detail of model designation, refer to P.18.

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

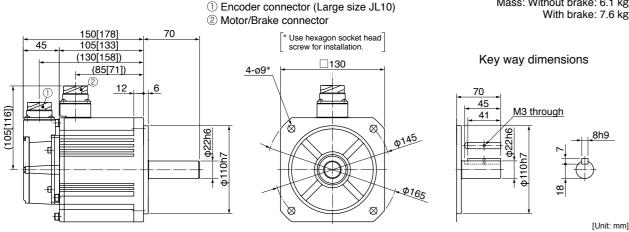
Mass: Without brake: 6.1 kg

[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.	RS48	5 communication ty	pe *2	MDDLN55SG
driver	110.	Basic	type *2		MDDLN55SE
	Frame	e syml	bol		D-frame
Power supply	capacity	y	(k	VA)	2.3
Rated output				(W)	1500
Rated torque			(N	l·m)	7.16
Continuous sta	all torqu	е	(N	l·m)	7.52
Momentary Ma	ax. peal	k torqu	ue (N	l·m)	21.5
Rated current	(, (, ,)				8.0
Max. current					34
Regenerative I	orake		Without option	1	No limit Note)2
frequency (time	s/min)	Note)1	DV0P4284		No limit Note)2
Rated rotation	al spee	d	(r/n	nin)	2000
Max. rotationa	l speed		(r/n	nin)	3000
Moment of ine	rtia		Without brake		33.4
of rotor (×10 ⁻⁴ kg·m ²)			With brake		34.6
Recommended moment of inertia ratio of the load and the rotor Note					5 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)	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)

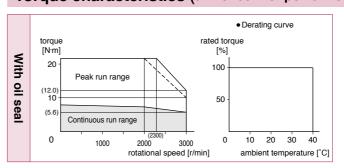
During assembly During operation	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196

- 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".

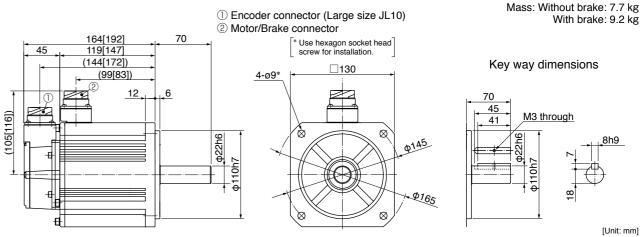
Detail of model designation, refer to P.18.

*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.

83 MINAS A6 Family

MINAS A6 Family 84

Specifications

				AC200 V
Motor model *1			IP67	MHMF202L1□□
			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	y	(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 torqı	ue (N·m)	28.6
Rated current			(A(rms))	12.5
Max. current			(A(o-p))	53
Regenerative I	Regenerative brake		Without option	No limit Note)2
frequency (times/min) Note		Note)1	DV0P4285	No limit Note)2
Rated rotation	ated rotational speed		(r/min)	2000
Max. rotationa	l speed		(r/min)	3000
Moment of ine	nertia		Without brake	55.7
of rotor ($\times 10^{-4}$	kg·m²)		With brake	61.0
Recommended mon ratio of the load and				5 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)	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)

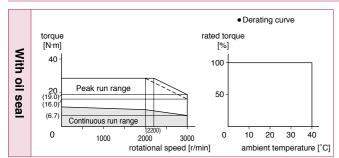
	During assembly During operation	Radial load P-direction (N)	1666
		Thrust load A-direction (N)	784
		Thrust load B-direction (N)	980
		Radial load P-direction (N)	784
		Thrust load A, B-direction (N)	343

- 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".

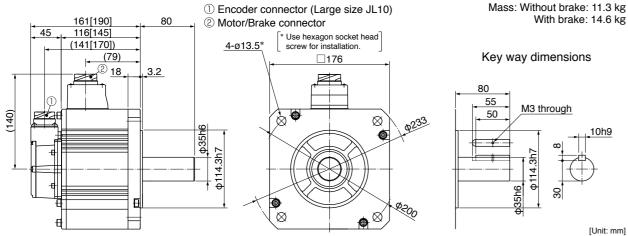
Detail of model designation, refer to P.18.

*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.

<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	RS485 communication type *2		MFDLNA3SG
driver	140.	Basic	sic type *2		MFDLNA3SE
	Frame	e sym	bol		F-frame
Power supply	capacity	/		(kVA)	4.5
Rated output				(W)	3000
Rated torque				(N·m)	14.3
Continuous sta	all torqu	е		(N·m)	17.2
Momentary Ma	ax. peal	c torqu	ue	(N·m)	43.0
Rated current			(A	(rms))	17.0
Max. current			(/	A(o-p))	72
Regenerative I	orake		Without opt	ion	No limit Note)2
frequency (time	s/min) I	Note)1	DV0P4285×2		No limit Note)2
Rated rotation	al spee	d		(r/min)	2000
Max. rotationa	speed			(r/min)	3000
Moment of ine	rtia		Without bra	ıke	85.3
of rotor (×10 ⁻⁴ kg·m ²)			With brake		90.7
Recommended ratio of the load			Note)3	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)

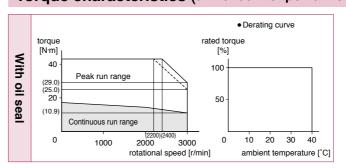
During assembly During operation	Radial load P-direction (N)	1666
	Thrust load A-direction (N)	784
	Thrust load B-direction (N)	980
	Radial load P-direction (N)	784
	Thrust load A, B-direction (N)	343

- 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".

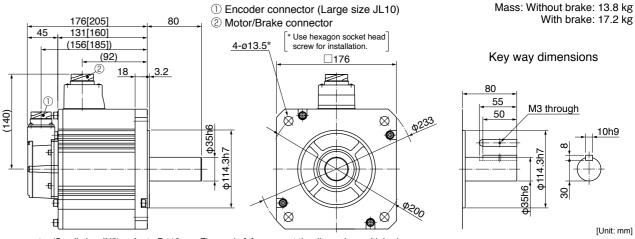
Detail of model designation, refer to P.18.

*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.

85 MINAS A6 Family

				AC200 V
Motor model*1	Motor model ¹¹ IP67			MHMF402L1
		Multi	function type	MFDLTB3SF
Applicable	Model No	RS48	5 communication type *2	MFDLNB3SG
driver		Basic	type *2	MFDLNB3SE
	Fram	e sym	bol	F-frame
Power supply	capacit	у	(kVA)	7.5
Rated output			(W)	4000
Rated torque			(N·m)	19.1
Continuous sta	all torqu	ie	(N·m)	22.0
Momentary Ma	ax. peal	k torqı	ue (N·m)	57.3
Rated current			(A(rms))	20
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	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 Note)3				5 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)	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)

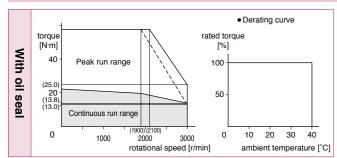
		Radial load P-direction (N)	1666
During assembly	Thrust load A-direction (N)	784	
	docombry	Thrust load B-direction (N)	980
	During operation	Radial load P-direction (N)	784
		Thrust load A, B-direction (N)	343

- 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".

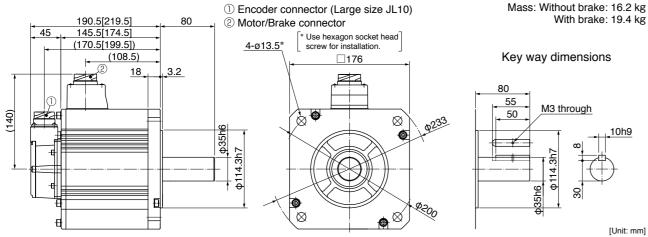
Detail of model designation, refer to P.18.

*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□□
		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	у	(kVA)	7.5
Rated output			(W)	5000
Rated torque			(N·m)	23.9
Continuous sta	all torqu	ie	(N·m)	26.3
Momentary Ma	ax. pea	k torqu	ue (N·m)	71.6
Rated current			(A(rms))	23.3
Max. current			(A(o-p))	99
Regenerative	brake		Without option	No limit Note)2
frequency (time	es/min)	Note)1	DV0P4285×2	No limit Note)2
Rated rotation	al spee	d	(r/min)	2000
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	146
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake	151	
Recommender ratio of the loa				5 times or less
Rotary encode	r speci	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)	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)

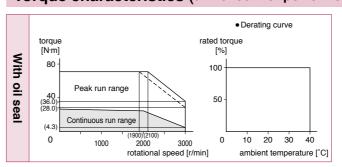
	Radial load P-direction (N)	1666
During assembly	Thrust load A-direction (N)	784
document	Thrust load B-direction (N)	980
During operation	Radial load P-direction (N)	784
	Thrust load A, B-direction (N)	343

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

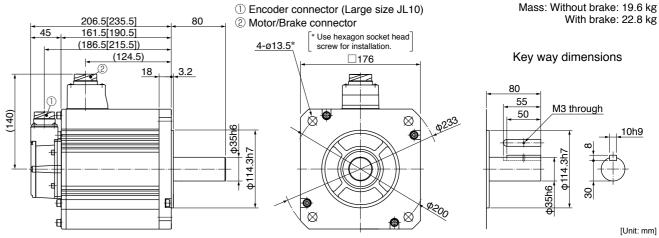
Detail of model designation, refer to P.18.

*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			MDMF102L1
		Multi	function t	уре	MDDLT45SF
Applicable	Model No	RS48	5 communi	cation type *2	MDDLN45SG
driver		Basic	c 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. peal	k torqu	ue	(N·m)	14.3
Rated current				(A(rms))	5.2
Max. current				(A(o-p))	22
Regenerative	brake		Without option		No limit Note)2
frequency (time	es/min)	Note)1	DV0P4284		No limit Note)2
Rated rotation	al spee	d		(r/min)	2000
Max. rotationa	l speed			(r/min)	3000
Moment of ine	rtia		Without brake		6.18
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)			With brake		7.40
Recommended moment of inertia ratio of the load and the rotor				Note)3	10 times or less
Rotary encoder specification			ns *3		23-bit Absolute
	Re	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.

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)

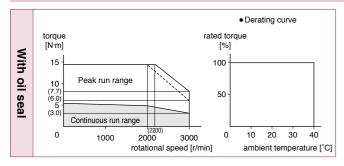
		Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588	
	During operation	Thrust load B-direction (N)	686
		Radial load P-direction (N)	490
		Thrust load A, B-direction (N)	196

- 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".

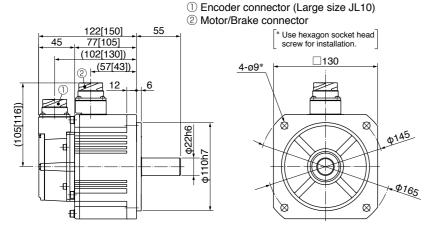
Detail of model designation, refer to P.18.

*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.>)

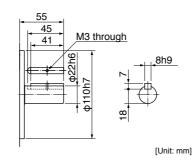


Dimensions



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

Key way 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
		Multifunction type		MDDLT55SF	
Applicable	Model No	RS485	RS485 communication type *2		MDDLN55SG
driver	140.	Basic	c type *2		MDDLN55SE
	Frame	e sym	bol		D-frame
Power supply	capacity	y		(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. peal	k torqu	ue	(N·m)	21.5
Rated current			(/	A(rms))	8.0
Max. current			(,	A(o-p))	34
Regenerative I	orake		Without op	tion	No limit Note)2
frequency (time	s/min)	Note)1	DV0P4284		No limit Note)2
Rated rotation	al spee	d		(r/min)	2000
Max. rotationa	l speed			(r/min)	3000
Moment of ine	rtia		Without brake		9.16
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)			With brake		10.4
Recommended moment of i ratio of the load and the roto				Note)3	10 times or less
Rotary encoder specification			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.

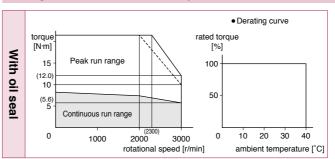
Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

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

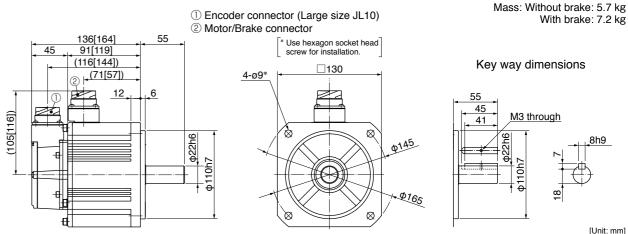
	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
assembly	Thrust load B-direction (N)	686
During operation	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196

- 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.

89 MINAS A6 Family

With brake: 7.2 kg

[Unit: mm]

				AC200 V
Motor model *1			IP67	MDMF202L1□□
			function type	MEDLT83SF
Applicable	Model No	RS48	5 communication type	MEDLN83SG
driver	140.	Basic	type *2	MEDLN83SE
	Fram	e sym	bol	E-frame
Power supply	capacit	y	(kVA	A) 3.8
Rated output			(W	/) 2000
Rated torque			(N·m	1) 9.55
Continuous sta	all torqu	ie	(N·m	10.0
Momentary Ma	ax. pea	k torqu	ıe (N⋅m	1) 28.6
Rated current			(A(rms)) 9.9
Max. current			(A(o-p)) 42
Regenerative	brake		Without option	No limit Note)2
frequency (times/min) Note)1		DV0P4285	No limit Note)2	
Rated rotation	Rated rotational speed		(r/mir	1) 2000
Max. rotationa	l speed		(r/mir	1) 3000
Moment of ine	rtia		Without brake	12.1
of rotor (×10 ⁻⁴ kg·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 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)	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)

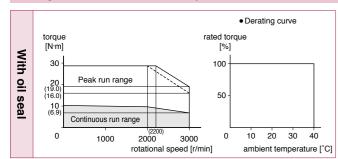
	During assembly During operation	Radial load P-direction (N)	980
		Thrust load A-direction (N)	588
		Thrust load B-direction (N)	686
		Radial load P-direction (N)	490
		Thrust load A, B-direction (N)	196

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

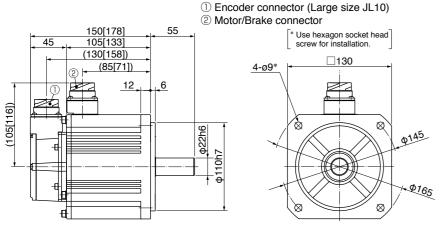
Detail of model designation, refer to P.18.

*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.>)

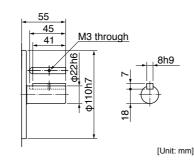


Dimensions



Mass: Without brake: 6.9 kg With brake: 8.4 kg

Key way 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				MDMF302L1
		Multi	function type		MFDLTA3SF
Applicable	Model No	RS48	5 communication typ	oe *²	MFDLNA3SG
driver			asic type *2		MFDLNA3SE
	Frame	e sym	bol		F-frame
Power supply	capacity	/	(k\	VA)	4.5
Rated output			(W)	3000
Rated torque			(N	·m)	14.3
Continuous sta	all torqu	е	(N	·m)	15.0
Momentary Ma	ax. peal	c torqu	ue (N	·m)	43.0
Rated current			(A(rm	ıs))	16.4
Max. current			(A(o-	p))	70
Regenerative I	orake		Without option		No limit Note)2
frequency (time	s/min) I	Note)1	DV0P4285×2		No limit Note)2
Rated rotation	al spee	d	(r/m	າin)	2000
Max. rotationa	speed		(r/m	ıin)	3000
Moment of ine	rtia		Without brake		18.6
of rotor (×10 ⁻⁴ kg·m ²)			With brake		19.6
Recommended ratio of the load			ote)3	10 times or less	
Rotary encode	r specif	icatio	ns*³		23-bit Absolute
	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)	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)

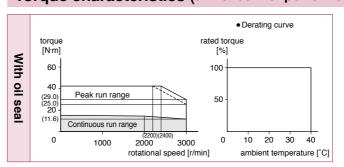
During assembly During operation	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	784
	Thrust load A, B-direction (N)	343

- 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".

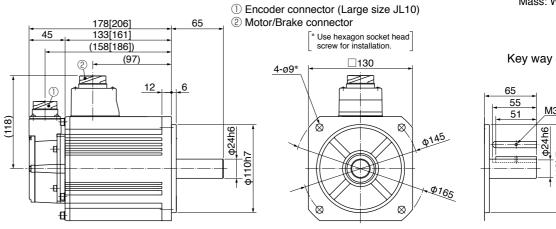
Detail of model designation, refer to P.18.

*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.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.

91 MINAS A6 Family

Mass: Without brake: 9.3 kg With brake: 10.9 kg

Key way dimensions

M3 through

[Unit: mm]

				AC200 V
Motor model*1			IP67	MDMF402L1
		Multif	unction type	MFDLTB3SF
Applicable	Model No	RS485	communication type *2	MFDLNB3SG
driver	1	Basic	type ^{*2}	MFDLNB3SE
	Frame	syml	ool	F-frame
Power supply	capacity		(kVA)	7.5
Rated output			(W)	4000
Rated torque			(N·m)	19.1
Continuous sta	all torque)	(N·m)	22.0
Momentary Ma	ax. peak	torqu	e (N·m)	57.3
Rated current (A((A(rms))	20.0
Max. current			(A(o-p))	85
Regenerative I	brake		Without option	No limit Note)2
frequency (time	s/min) N	ote)1	DV0P4285×2	No limit Note)2
Rated rotation	al speed		(r/min)	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 ine ratio of the load and the rotor				10 times or less
Rotary encode	r specific	cation	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)	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)

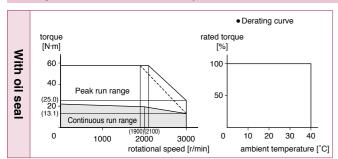
	During assembly	Radial load P-direction (N)	1666
		Thrust load A-direction (N)	784
		Thrust load B-direction (N)	980
	During	Radial load P-direction (N)	784
	operation	Thrust load A, B-direction (N)	343

- 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".

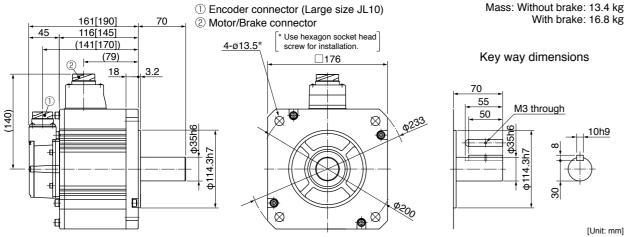
Detail of model designation, refer to P.18.

*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.

<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	MDMF502L1
		Multi	function type	MFDLTB3SF
Applicable	Model No.	RS485 communication type *2		MFDLNB3SG
driver	140.	Basic	type *2	MFDLNB3SE
	Fram	e sym	bol	F-frame
Power supply	capacit	у	(kVA)	7.5
Rated output			(W)	5000
Rated torque			(N·m)	23.9
Continuous sta	all torqu	ie	(N·m)	26.3
Momentary Ma	ax. pea	k torqı	ue (N·m)	71.6
Rated current			(A(rms))	23.3
Max. current			(A(o-p))	99
Regenerative I	brake		Without option	No limit Note)2
frequency (time	es/min)	Note)1	DV0P4285×2	No limit Note)2
Rated rotation	al spee	d	(r/min)	2000
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	58.2
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)			With brake	63.0
Recommended moment of ine ratio of the load and the rotor				10 times or less
Rotary encoder specifications *3			ns ^{*3}	23-bit Absolute
Resolution per single turn				8388608

200 V MDMF 5.0 kW Middle inertia 176 mm sq.

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

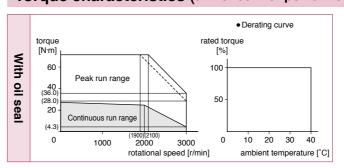
	Radial load P-direction (N)	1666
During assembly	Thrust load A-direction (N)	784
document	Thrust load B-direction (N)	980
During	Radial load P-direction (N)	784
operation	Thrust load A, B-direction (N)	343

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

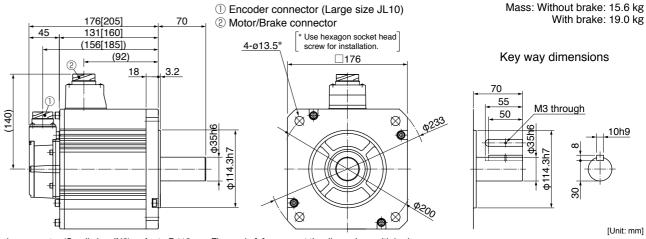
Detail of model designation, refer to P.18.

*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.

93 MINAS A6 Family

MINAS A6 Family 94

					AC200 V
Motor model*1		IP67			MGMF092L1□□
		Multi	function t	уре	MDDLT45SF
Applicable	Model No	RS48	5 commun	ication type *2	MDDLN45SG
driver		Basic	c type ^{*2}		MDDLN45SE
	Frame	e sym	bol		D-frame
Power supply	capacity	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	ne	(N·m)	14.3
Rated current				(A(rms))	5.9
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)	1500
Max. rotationa	l speed			(r/min)	3000
Moment of ine	rtia		Withou	t brake	6.18
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake		7.40	
Recommended moment of in- ratio of the load and the rotor				Note)3	10 times or less
Rotary encoder specification			ns ^{⁺3}		23-bit Absolute
			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.

Low speed/High torque type

Middle inertia

130 mm sq.

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

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

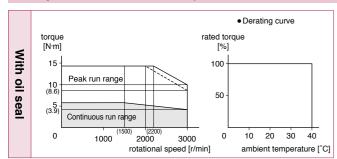
	During assembly During operation	Radial load P-direction (N)	980
		Thrust load A-direction (N)	588
		Thrust load B-direction (N)	686
		Radial load P-direction (N)	686
		Thrust load A, B-direction (N)	196

- 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".

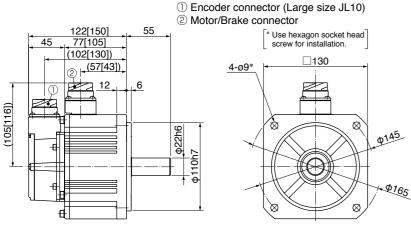
Detail of model designation, refer to P.18.

*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.>)

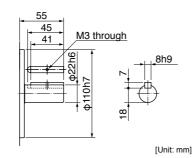


Dimensions



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.

<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	MGMF132L1□□
		Multi	function type	MDDLT55SF
Applicable	Model No	RS485 communication type *2		MDDLN55SG
driver	140.	Basic	c type *2	MDDLN55SE
	Fram	e sym	bol	D-frame
Power supply	capacit	y	(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 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	9.16
of rotor (×10 ⁻⁴	kg·m²)		With brake	10.4
Recommended moment of ir ratio of the load and the roto				10 times or less
Rotary encode	r speci	ficatio	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.

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)

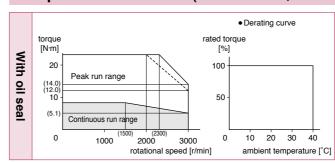
During assembly	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
dooonibiy	Thrust load B-direction (N)	686
During	Radial load P-direction (N)	686
operation	Thrust load A, B-direction (N)	196

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

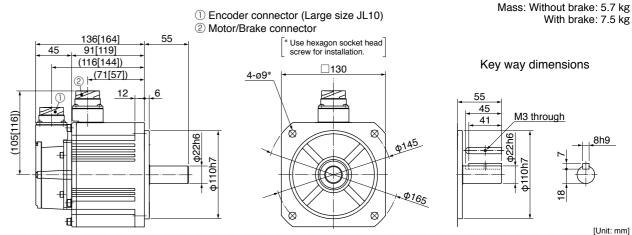
Detail of model designation, refer to P.18.

*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.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.

95 MINAS A6 Family

Imformation

With brake: 7.5 kg

[Unit: mm]

.176 mm sq.

Specifications

				AC200 V
Motor model ^{*1}			IP67	MGMF182L1□□
		Multi	function type	MEDLT83SF
Applicable	Model No	RS48	5 communication type *2	MEDLN83SG
driver		Basic	type *2	MEDLN83SE
	Fram	e sym	bol	E-frame
Power supply	capacit	y	(kVA)	3.8
Rated output			(W)	1800
Rated torque			(N·m)	11.5
Continuous sta	all torqu	ie	(N·m)	11.5
Momentary Ma	ax. pea	k torqı	ue (N·m)	28.7
Rated current			(A(rms))	11.8
Max. current			(A(o-p))	42
Regenerative	brake		Without option	No limit Note)2
frequency (time	es/min)	Note)1	DV0P4285×2	No limit Note)2
Rated rotation	al spee	d	(r/min)	1500
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	12.1
of rotor (×10 ⁻⁴ kg·m ²)		With brake	13.3	
Recommended moment of inertia ratio of the load and the rotor				10 times or less
Rotary encode	Rotary encoder specification Resolutio			23-bit Absolute
				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.

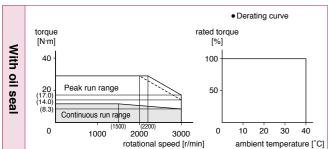
Mass: Without brake: 6.9 kg

M3 through

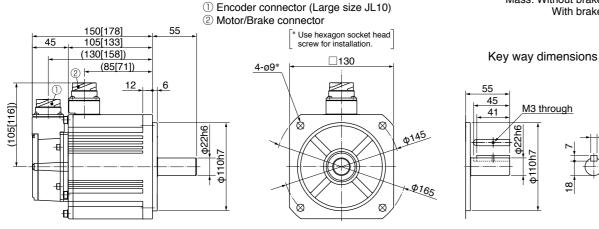
With brake: 8.4 kg

[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

				AC200 V
Motor model *1			IP67	MGMF292L1□□
		Multi	function type	MFDLTB3SF
Applicable	Model No.	RS48	5 communication type	MFDLNB3SG
driver	140.	Basic	type *2	MFDLNB3SE
	Fram	e sym	bol	F-frame
Power supply	capacit	y	(kVA)	7.5
Rated output			(W)	2900
Rated torque			(N·m)	18.5
Continuous sta	all torqu	е	(N·m)	18.5
Momentary Ma	ax. pea	k torqı	ue (N·m)	45.2
Rated current			(A(rms))	19.3
Max. current			(A(o-p))	67
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	46.9
of rotor (×10 ⁻⁴	kg·m²)		With brake	52.3
Recommender ratio of the loa				10 times or less
Rotary encode	Rotary encoder specifications *3			23-bit Absolute
Resolution per s			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)

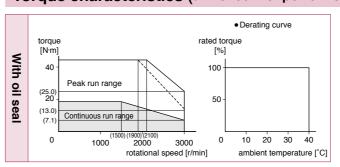
During assembly During operation	Radial load P-direction (N)	1666
	Thrust load A-direction (N)	784
	Thrust load B-direction (N)	980
	Radial load P-direction (N)	1176
	Thrust load A, B-direction (N)	490

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

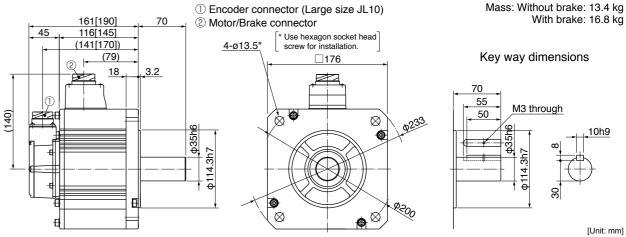
Detail of model designation, refer to P.18.

*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 sta	all torqu	ie	(N·m)	28.0			
Momentary Ma	ax. pea	k torqı	ue (N·m)	70.0			
Rated current			(A(rms))	27.2			
Max. current			(A(o-p))	96			
Regenerative	brake		Without option	No limit Note)2			
frequency (time	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 i ratio of the load and the roto			10 times or less			
Rotary encode	er speci	ficatio	ns ^{*3}	23-bit Absolute			
	Re	solutio	n per single turn	8388608			

Brake specifications (For details, refer to P.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)

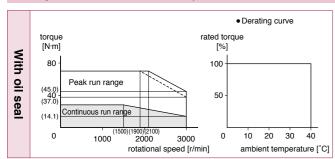
	Radial load P-direction (N)	1666
During assembly	Thrust load A-direction (N)	784
assembly	Thrust load B-direction (N)	980
During	Radial load P-direction (N)	1470
operation	Thrust load A, B-direction (N)	490

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

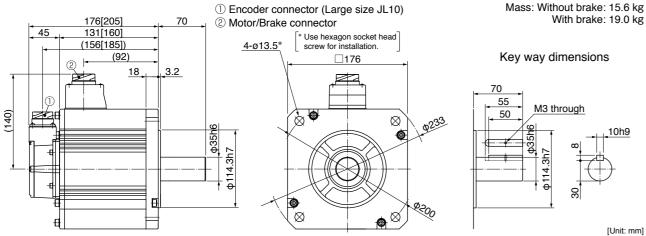
Detail of model designation, refer to P.18.

*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



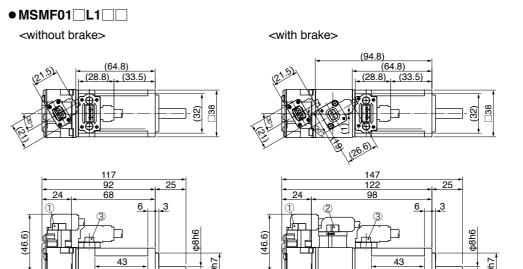
Encoder connector (Small size JN2), refer to P.114. • Figures in [] represent the dimensions with brake.

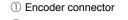
<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.

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.

MSMF 50 W to 200 W Connector type (IP67)

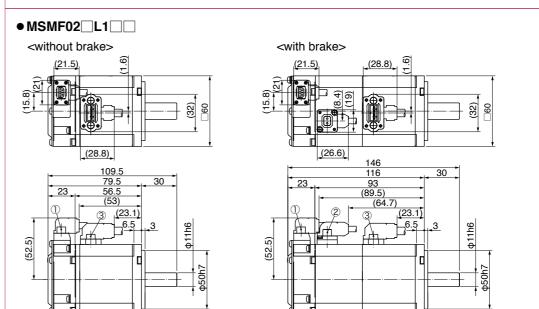




- ② Brake connector
- 3 Motor connector

① Encoder connector

② Brake connector③ Motor connector



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

Amria (cn. m. lat

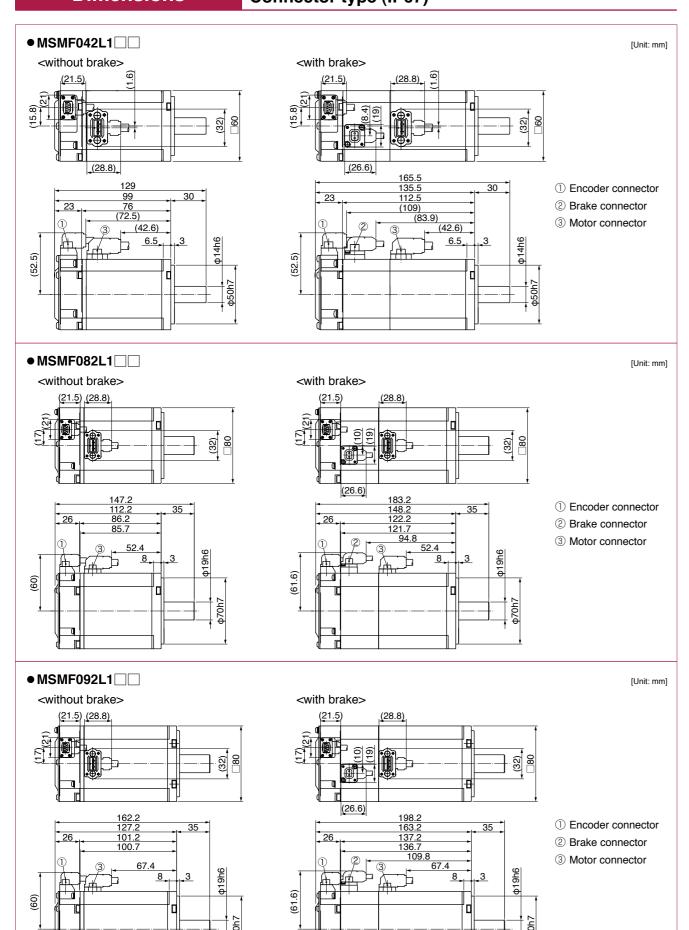
beries

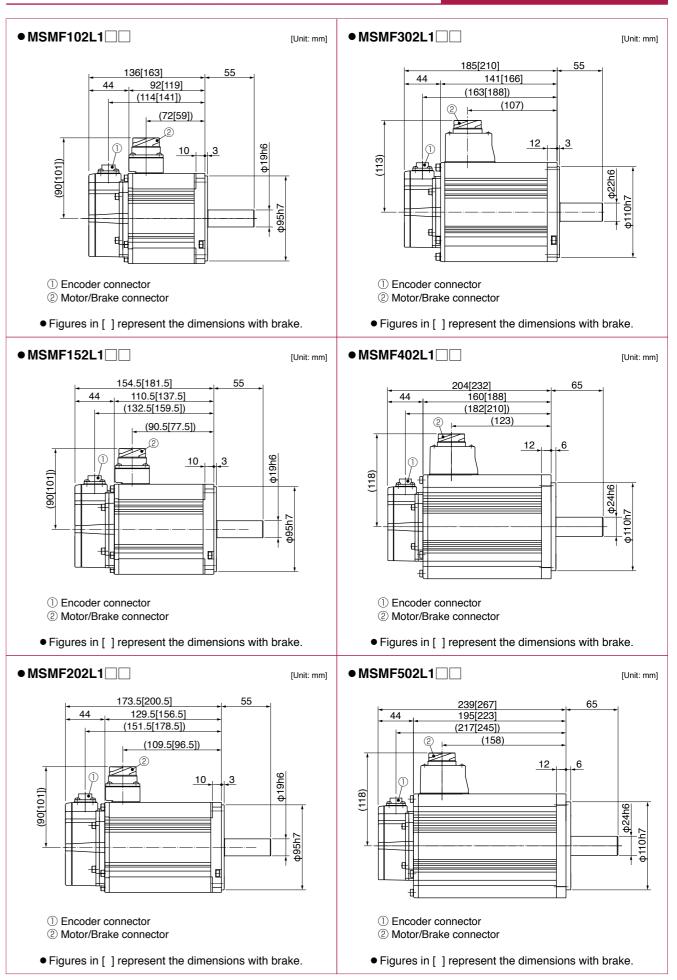
[Unit: mm]

[Unit: mm]

Dimensions

MSMF 400 W to 1000 W Connector type (IP67) MSMF 1.0 kW to 5.0 kW Small size connector (JN2)

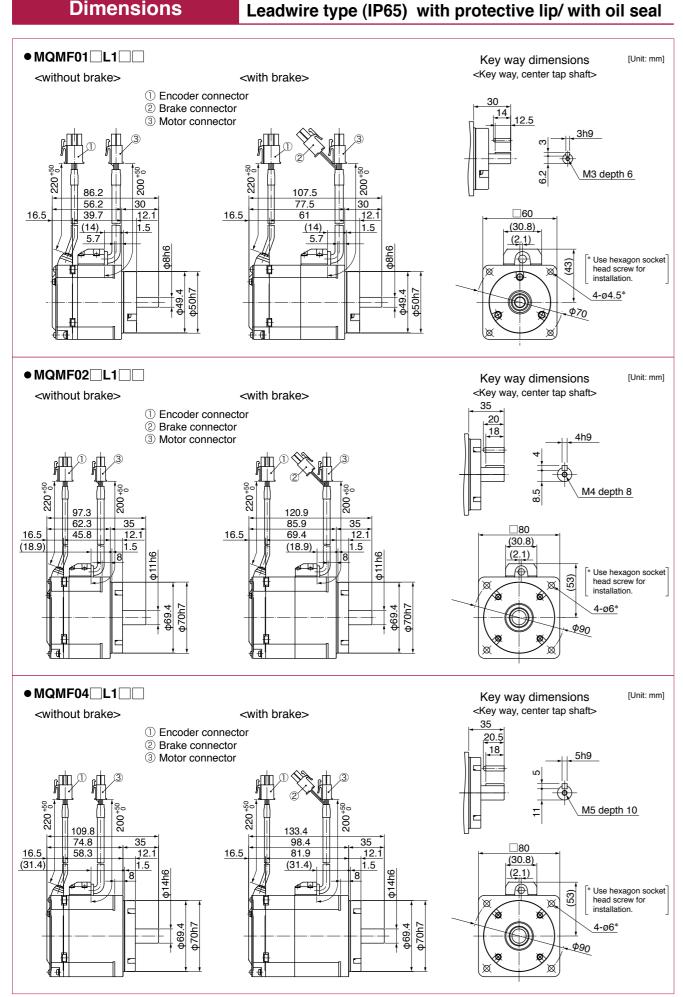




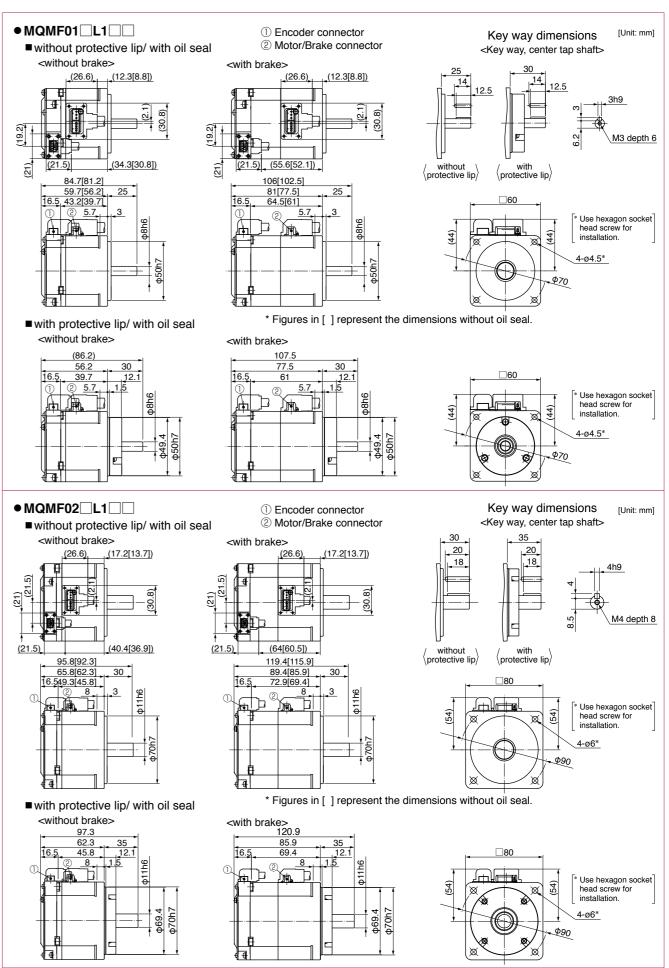
^{*} For motor specifications and mounting dimensions (on flange face), refer to P.61 to P.66.

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

MQMF 100 W to 400 W



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



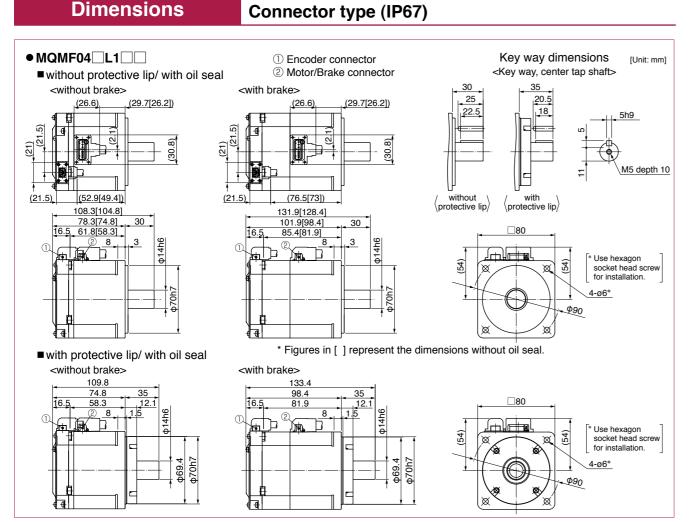
^{*} For motors specifications, refer to P.67 to P.70.

MHMF 750 W, 1000 W

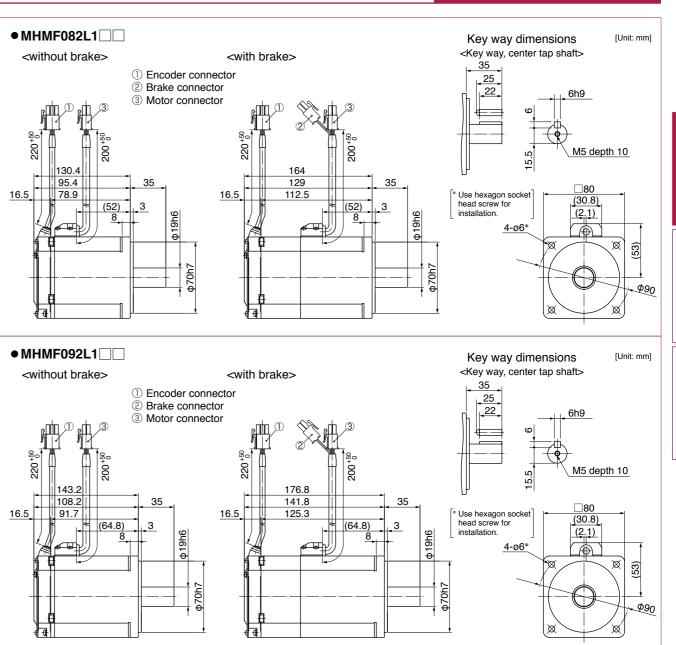
Leadwire type (IP65) with oil seal

A6 Family

Dimensions

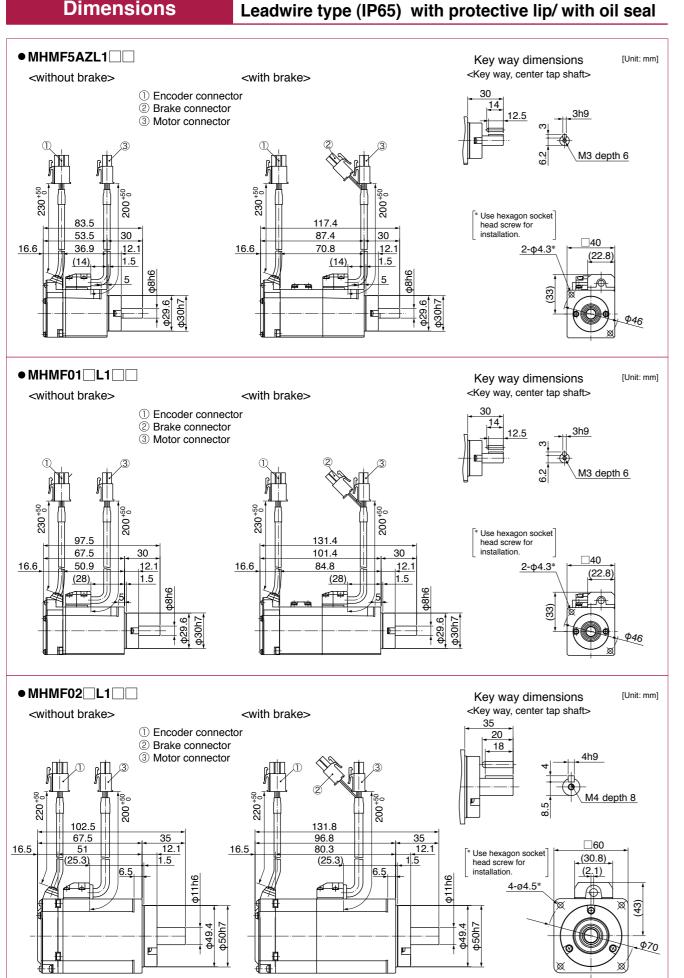


MQMF 400 W

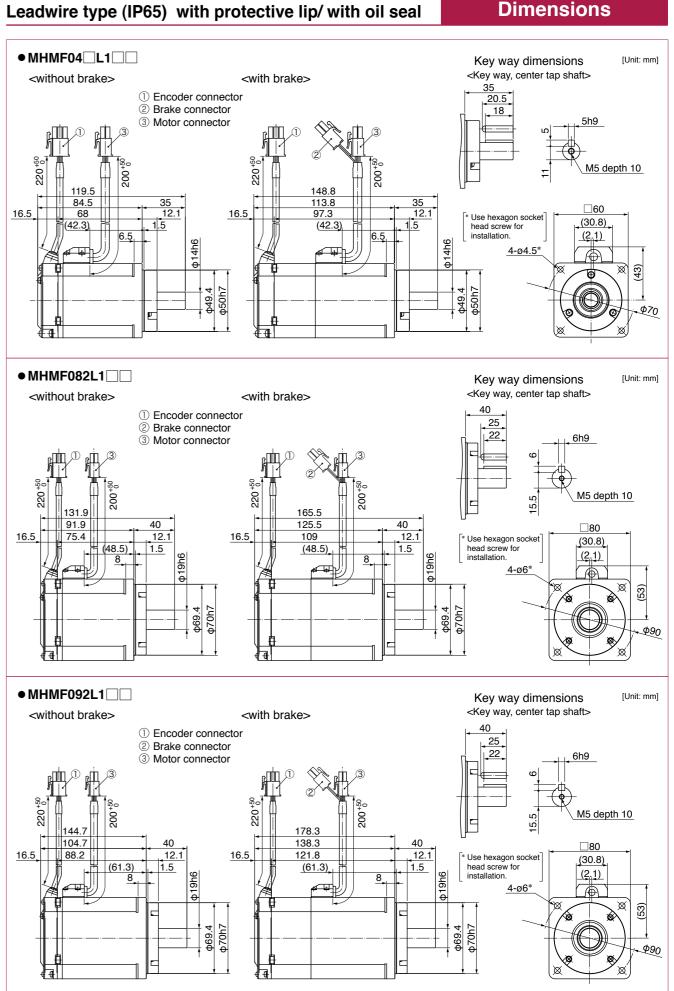


^{*} For motors specifications, refer to P.81, P.82.

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



MHMF 50 W to 200 W



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

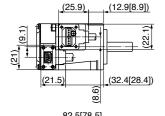
^{*} For motors specifications, refer to P.73 to P.78.

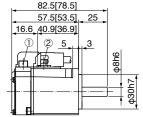
MHMF 200 W, 400 W Connector type (IP67)

Imformation

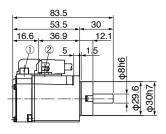
Dimensions





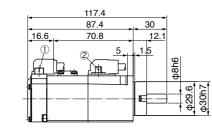


<without brake>



■ without protective lip/ with oil seal

■ with protective lip/ with oil seal



MHMF 50 W, 100 W

Connector type (IP67)

① Encoder connector

<with brake>

<with brake>

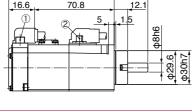
<with brake>

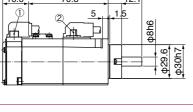
② Motor/Brake connector

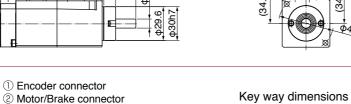
116.4[112.4]

91.4[87.4]

74.8[70.8]







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

head screw for

* Use hexagon socket

2-ф4.3*

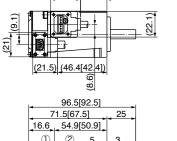
<Key way, center tap shaft>

2-φ4.3°

Key way dimensions

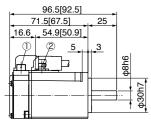
<Key way, center tap shaft>

M3 depth 6

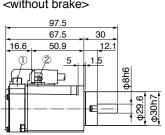


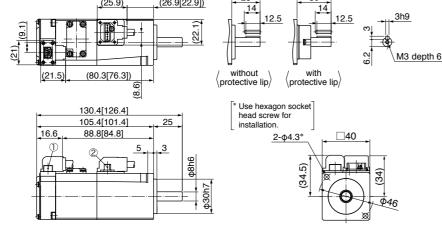
● MHMF01 □ L1 □ □

<without brake>

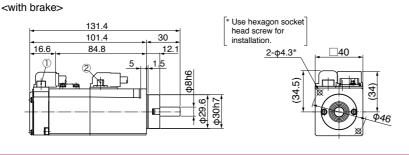


■ with protective lip/ with oil seal <without brake>

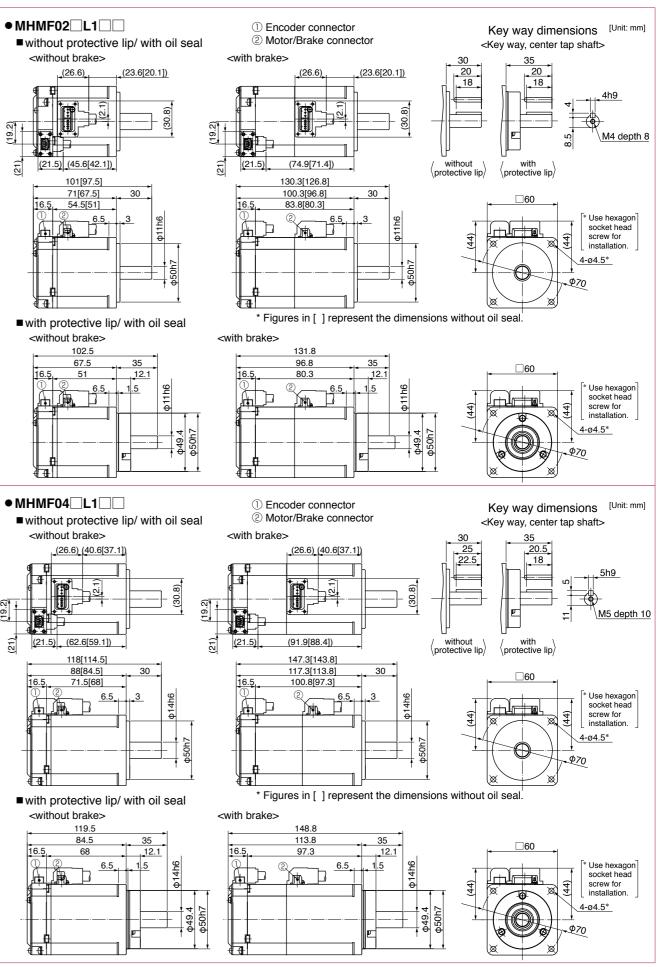




* Figures in [] represent the dimensions without oil seal.



* For motors specifications, refer to P.73 to P.76.

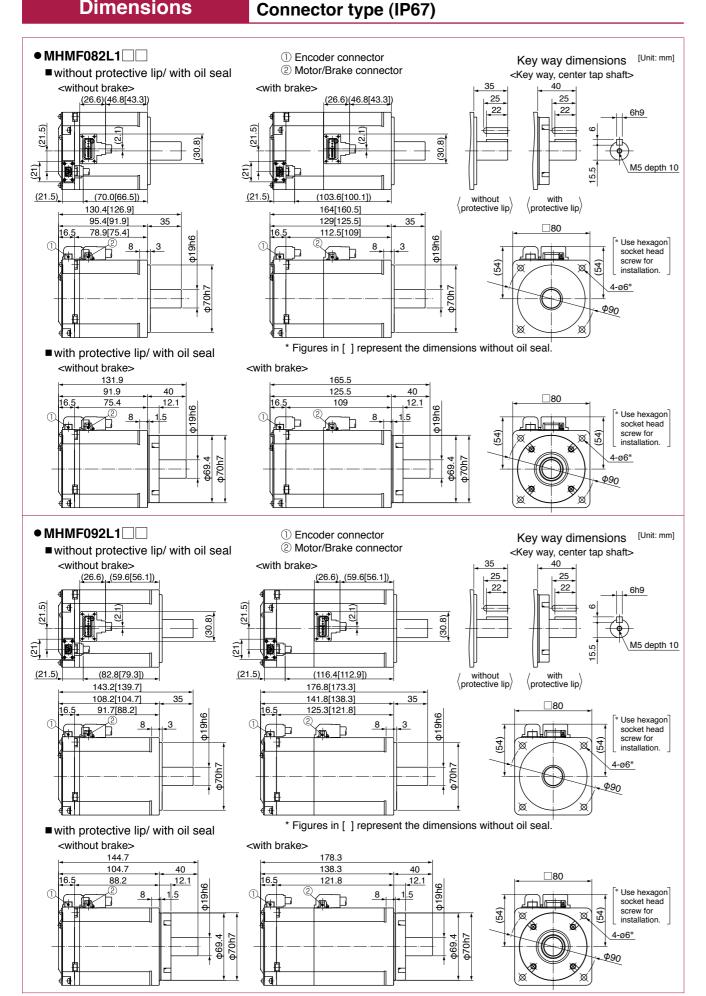


^{*} For motors specifications, refer to P.77 to P.80.

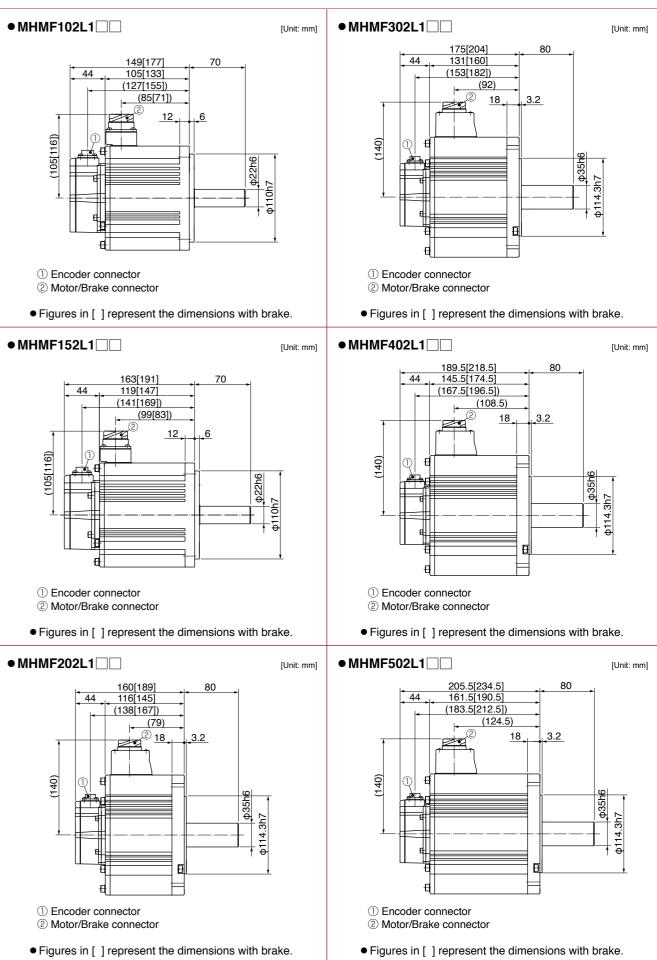
MHMF 1.0 kW to 5.0 kW Small size connector (JN2)

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)

(113[141])

(105[116])

① Encoder connector

② Motor/Brake connector

② | (71[57])

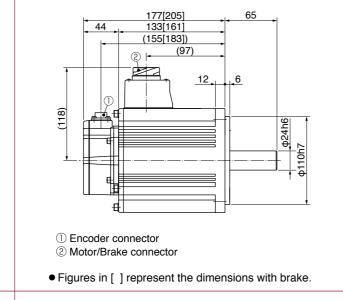
- (1) Encoder connector ② Motor/Brake connector
- Figures in [] represent the dimensions with brake.
- MDMF302L1 □ □ [Unit: mm] [Unit: mm] 177[205] 133[161] (155[183]) (97)(1) Encoder connector

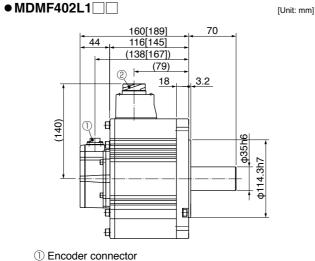
MDMF 1.0 kW to 5.0 kW

Small size connector (JN2)

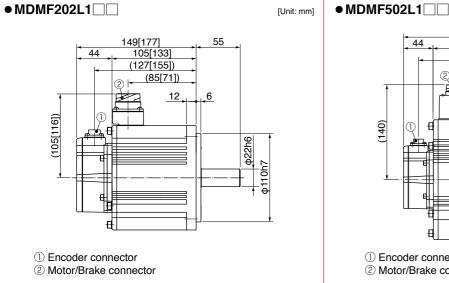
● MDMF152L1 □ □ [Unit: mm] (113[141]) (71[57])

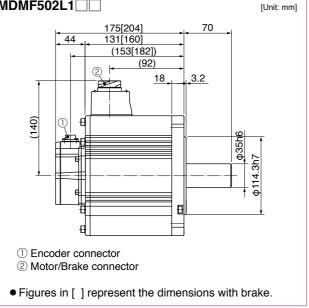
- ① Encoder connector
- ② Motor/Brake connector
- Figures in [] represent the dimensions with brake.





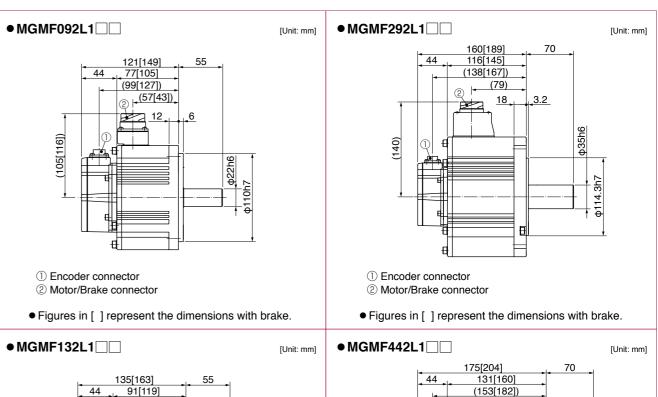
- ② Motor/Brake connector
- Figures in [] represent the dimensions with brake.

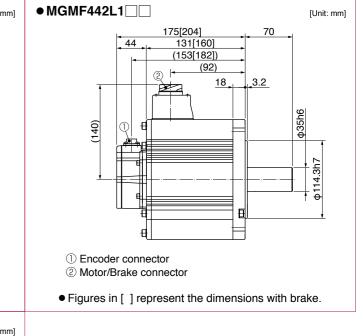


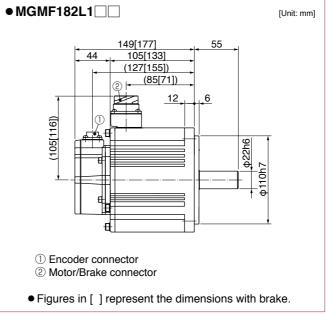


^{*} For motor specifications and mounting dimensions (on flange face), refer to P.89 to P.94.

• Figures in [] represent the dimensions with brake.







• 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 P.95 to P.99.

Model Designation

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
Alotos				

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

Symbol		Shaft		Holding	g brake	Oil seal	
		Round Key-way, center tap		without	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

		Sha		ft Holding brake		Oil seal		
Syn	nbol	Round	Key-way, center tap	without	with	without	with	With protective lip
Α	2	•		•		•		
В	2	•			•	•		
С	2	•		•			•	
С	4	•		•				•
D	2	•			•		•	
D	4	•			•			•
S	2		•	•		•		
Т	2		•		•	•		
U	2		•	•			•	
U	4		•	•				•
V	2		•		•		•	
V	4		•		•			•

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

Shaft				Holding	g brake	Oil seal				
Symbol		Round	Key-way	without	with	with	With protective lip			
С	6	•		•		•				
С	8	•		•			•			
D	6	•			•	•				
D	8	•			•		•			
G	6		•	•		•				
G	8		•	•			•			
Н	6		•		•	•				
Н	8		•		•		•			
					_					

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

.P.121

. P.136

...P.159

...P.160

....P.161

Special Order Product **Motor Contents**

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

MQMF (200 V)

MHMF (200 V)

50 W to 5.0 kW...

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

100 W to 400 W....

Line-up IP67 motor: 1.0 kW to 5.0 kW

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

Motor Lineup

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115 MINAS A6 Family

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

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



Max. speed

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

50 W to 1000 W Enclosure:

IP65: Leadwire type



MSMF Low inertia

Max. speed : 5000 r/min 4500 r/min (4.0 kW,5.0 kW)

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



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 BrakeP.167

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

Servo Driver

	M	Α	D	L	N	1	5	S	E	* * *	Special specifications
-		1		2	3	4	<u>(5)</u>	<u>6</u>	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

© cappi) romage opecimen									
Symbol	Specifications								
3	3-phase 200 V								
5	Single/3-phase 200 V								

6 Vf specifications 7 Classification of type

Symbol (specification)	Symbol	Specification
	Е	Basic type (Pulse train only)
S (Analog/Pulse)	F	Multi fanction type (Pulse, analog, full-closed)
	G	RS485 communication type (Pulse train only)
N	Е	without the safety function
(RTEX)	F	with the safety function
B (EtherCAT)	(Sch	neduled to release in 2016)

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

				Mot	or			Driver					Opi	ptional pa	rts					■ Options	
							A6 SF series	A6 SG series		Power	Encoder C	able Note)3	Me	Motor Cab	le Note)3					Interface Cabl	
			_			Rating/	Multi fanction type	RS485 communication		capacity	23-bit /	Absolute				Brake	External	Reactor	Noise Filter		
	Moto	or series	Power supply	(W) Note)1 Dime	Part No. Spec. Note) 1 Dimensions (page)	(Pulse, analog, full-closed	A6 SE series Basic (Pulse signal input Note)2, Note)4	Frame		Use in the absolute system (with battery box) Note)5	Use in the Incremental system (without battery box		rithout with Brake Brake	Cable Note)3	Regenerative Resistor		Single phase 3-phase	Interface Conv			
				50	MSMF5AZL1 □ 2M	121	MADLT05SF	MADLN05S♦												Connector Kit	
				100	MSMF012L1 □ 2M	122	MADLT05SF	MADLN05S♦	A-frame	Approx.						DV0P4281	DV0P227 DV0P220	DV0P4170	for Power Supply Input Connection		
7	- } /L	MSMF _eadwire	Single phase/	200	MSMF022L1 ☐ 2M	123	MADLT15SF	MADLN15S♦			MFECA	MFECA		MFMCA		MFMCB		_	DV0PM20042	Connector Kit for Motor Connection	
	j \ Σ 1. 30	typo /	3-phase 200 V	400	MSMF042L1 ☐ 2M	104	MBDLT25SF	MBDLN25S♦	D.	Approx.	0 * * 0EAE (For fixed)	0 * * 0EAD (For fixed)		0**(0 * * 0GET	DV0D4000			Connector Kit Motor/Encode	
2	ט כ	IP65	200 V	400	WSWF042L1 ZW	124	WIDDLI 200F	MIDDLINZSS	B-frame	0.9							DV0P4283	DV0P228			
				750	MSMF082L1 □ 2M	125	MCDLT35SF	MCDLN35S♦	C-frame	Approx.							DV0P220	DV0PM20042	Connector Kit		
				1000	MSMF092L1 ☐ 2M	126	MDDLT45SF	MDDLN45S♦	D-frame	Approx.							DV0P4284	DV0P228 DV0P222	DV0P4220		
T T T T T T T T T T T T T T T T T T T	Z.			100	MQMF012L1 2M	133	MADLT05SF	MADLN05S♦									DV0P4281			Battery for Abs	
	5 /ı	MQMF _eadwire\	Single		MQMF012L1 ☐ 4M				A-frame	Approx.	MFECA 0 * * 0EAE (For fixed)	* * 0EAE 0 * * 0EAD	*0EAE 0**0EAD		MFMCA 0 * * 0EED				DV0P227		Battery Box fo Note)5
		type	phase/ 3-phase 200 V	200	MQMF022L1 ☐ 2M MQMF022L1 ☐ 4M	134	MADLT15SF	MADLN15S♦									MFMCB 0**0GET	DV0P4283	DV0P220	DV0P4170 DV0PM20042	Mounting Bracket
י ומי יאסט	at type	IP65	200 1	400	MQMF042L1 ☐ 2M MQMF042L1 ☐ 4M	135	MBDLT25SF	MBDLN25S♦	B-frame	Approx.								DV0P228 DV0P220		Diacket	
				50	MHMF5AZL1 ☐ 2M MHMF5AZL1 ☐ 4M	136	MADLT05SF	MADLN05S♦												Encoder Cable	
				100	MHMF012L1 ☐ 2M	137	MADLT05SF	MADLN05S♦	A-frame	Approx.							DV0P4281	DV0P227		Motor Cable	
				100	MHMF012L1 ☐ 4M	107	WADLIGGG	WIADLINOSS	A-iranie	0.5								DV0P220	DV0P4170	Brake Cable	
9	표 글 /L	MHMF eadwire type	Single phase/	200	MHMF022L1 ☐ 2M MHMF022L1 ☐ 4M	138	MADLT15SF	MADLN15S♦			MFECA	MFECA		MFM	ICA	MFMCB			DV0PM20042		
gh inertia	30	000 r/min IP65	3-phase 200 V		MHMF042L1 ☐ 2M MHMF042L1 ☐ 4M	139	MBDLT25SF	MBDLN25S♦	B-frame	Approx.	0 * * 0EAE (For fixed)	0 * * 0EAD (For fixed)		0**(DEED	0**0GET	DV0P4283	DV0P228		External regenerative resistor	
				750	MHMF082L1 ☐ 2M MHMF082L1 ☐ 4M	140	MCDLT35SF	MCDLN35S♦	C-frame	Approv							DV0P220	DV0PM20042			
				1000	MHMF092L1 ☐ 2M MHMF092L1 ☐ 4M	141	MDDLT55SF	MDDLN55S♦	D-frame	Approx.							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.

_	■ Options	Title		Part No.	Page
	Interface Cable			DV0P4360	182
				DV0P4120	182
				DV0P4121	182
	Interface Conv	ersion Cal	ble	DV0P4130	182
				DV0P4131	182
				DV0P4132	182
	Connector Kit for Power	A-frame	Single row type	DV0PM20032	185
	Supply Input Connection	to D-frame	Double row type	DV0PM20033	185
2	Connector Kit for Motor Connection	A-frame D-frame	to	DV0PM20034	186
	Connector Kit f Motor/Encoder		on	DV0P4290	186
		RS485, F		DV0PM20024	183
		Safety		DV0PM20025	183
2	Connector Kit	Interface		DV0P4350	184
		External	Scale	DV0PM20026	184
4		Encoder		DV0PM20010	184
	Battery for Abs	olute Enc	DV0P2990	194	
	Battery Box for Note)5	Absolute	DV0P4430	194	
2	Mounting	For A-fra B-frame		DV0PM20100	195
	Bracket	For C-fra D-frame	ıme,	DV0PM20101	195
$\frac{1}{2}$	Encoder	with Battery E Note)5	Box	MFECA0**0EAE	171
	Cable	without Battery E	Box	MFECA0 * * 0EAD	171
	Motor Cable	without E	Brake	MFMCA0 * * 0EED	175
	Brake Cable			MFMCB0 * * 0GET	181
2		50 Ω 25	W	DV0P4280	197
	External	100 Ω 25	5 W	DV0P4281	197
	regenerative resistor	25 Ω 50	W	DV0P4282	197
\dashv	resistor	50 Ω 50	W	DV0P4283	197
2		30 Ω 100	W	DV0P4284	197
1				DV0P220	196
	Dogetor			DV0P222	196
_	Reactor			DV0P227	196
				DV0P228	196
				DV0P4170	236
	Noise Filter			DV0PM20042	236
				DV0P4220	236
	Curao Abasel-	r		DV0P4190	237
	Surge Absorbe	ı		DV0P1450	237

Imformation

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

			Mot	or			Driver					Optional p	arts				■ Options	
										Encoder Ca	able Note)3,5	Motor Cab	le Note)3,5				Interface Cab	T
		_			Rating/	A6 SF series Multi fanction type	A6 SG series RS485 communication		Power capacity	One-touc	h lock type		n lock type				Interface Con	
N	lotor series	Power supply	Output (W)	Part No. Note)1	Spec. Dimensions	(Pulse, analog, full-closed	A6 SE series Basic	Frame	rated load	23-bit A	Absolute Use in the			External Regenerative	Reactor (Single phase / 3-phase)	Noise Filter	interides con	
					(page)		(Pulse signal input) Note)2, Note)4)	(kVA)	absolute system	Incremental system (without battery box)	without Brake	with Brake	Resistor			Connector Kit for Power Supply Input Connection	t
		Single phase/	1000	MSMF102L1 6M MSMF102L1 8M	127	MDDLT55SF	MDDLN55S♦		Approx.			MFMCD	MFMCA	D) (0D (00 (DV0P228 / DV0P222	D1/0D 4000	Connector Kit	\dagger
	MONE	3-phase 200 V	1500	MSMF152L1 ☐ 6M MSMF152L1 ☐ 8M	128	MDDLT55SF	MDDLN55S♦	D-frame	2.3			0**2EUD	0 * * 2FUD	DV0P4284	DV0PM20047 / DV0P222	DV0P4220	for Motor Connection	_
Low ii	MSMF Large size JL10 type		2000	MSMF202L1 ☐ 6M MSMF202L1 ☐ 8M	129	MEDLT83SF	MEDLN83S♦	E-frame	Approx.	MFECA 0**0EPE	MFECA 0**0EPD	MFMCD 0 * *2ECD	MFMCA 0**2FCD	DV0P4285 Note)6	DV0P223	DV0PM20043	Connector Kit for Regenerative Resistor	
Low inertia	3000 r/min	3-phase	3000	MSMF302L1 ☐ 6M MSMF302L1 ☐ 8M	130	MFDLTA3SF	MFDLNA3S		Approx.	MFECA 0**0ESE	MFECA 0 * * 0ESD	MFMCA	MFMCA		DV0P224			T
	IP67	200 V	4000	MSMF402L1 ☐ 6M MSMF402L1 ☐ 8M	131	MFDLTB3SF	MFDLNB3S♦	F-frame	Approx.	00202	00202	0**3EUT ————————————————————————————————————	0 * * 3FUT ————— MFMCA	DV0P4285 ×2 in parallel	DV0P225	DV0P3410		,
			5000	MSMF502L1 6M MSMF502L1 8M	132	MFDLTB3SF	MFDLNB3S♦		7.5			0 * * 3ECT	0 * * 3FCT		DVOFZZS		Connector	
		Single phase/	1000	MDMF102L1 6M MDMF102L1 8M	148	MDDLT45SF	MDDLN45S♦	D-frame	Approx.			MFMCD 0**2EUD	MFMCA 0**2FUD	DV0P4284	DV0P228 / DV0P222	DV0P4220	Kit for Motor/ Encoder Con-	
	MDMF	3-phase 200 V	1500	MDMF152L1 ☐ 6M MDMF152L1 ☐ 8M	149	MDDLT55SF	MDDLN55S♦		Approx. 2.3	MFECA	MFECA	MFMCD	MFMCA		DV0PM20047 / DV0P222		nection	
	Large size JL10 type		2000	MDMF202L1 6M MDMF202L1 8M	150	MEDLT83SF	MEDLN83S♦	E-frame	Approx.	0**0EPE	0 * * 0EPD	0 * * 2ECD	0 * * 2FCD	DV0P4285 Note)6	DV0P223	DV0PM20043		'
	2000 r/min IP67	3-phase 200 V	3000	MDMF302L1	151	MFDLTA3SF	MFDLNA3S♦		Approx. 4.5	IVII LO/ (MFECA 0**0ESD	MFMCA 0**3EUT	MFMCA 0**3FUT	D) (0D (005	DV0P224			
Middle		200 V	4000	MDMF402L1	152	MFDLTB3SF	MFDLNB3S♦	F-frame	Approx.			MFMCA	MFMCA	DV0P4285 ×2 in parallel	DV0P225	DV0P3410		
de inertia		Single	5000	MDMF502L1 8M MGMF092L1 6M	153	MFDLTB3SF	MFDLNB3S♦		Approx.			0**3ECT	0**3FCT				Connector Kit	
rtia	MGMF	phase/ 3-phase	850	MGMF092L1	154	MDDLT45SF	MDDLN45S	D-frame	1.8	MFECA MFECA 0**0EPD	* * 0EPE 0 * * 0EPD	MFMCD 0**2EUD	MFMCA 0**2FUD	DV0P4284	DV0P228 / DV0P221	DV0P4220	Battery for Ab	
	Large size	200 V	1300	MGMF132L1	155	MDDLT55SF	MDDLN55S		2.3			MFMCD	MFMCA	D) (0D (000	DV0PM20047 / DV0P222	D. (2D. 1222)	Battery Box fo Note)7 Mounting	T.
	/Low speed/\		1800	MGMF182L1 ☐ 8M MGMF292L1 ☐ 6M	156	MEDLT83SF	MEDLN83S♦	E-frame	3.8			0**2E0	0 * * 2FCD MFMCA	DV0P4285	DV0P223	DV0PM20043	Bracket Encoder	-
	type / 1500 r/min	3-phase 200 V	2900	MGMF292L1 ☐ 8M	157	MFDLTB3SF	MFDLNB3S♦	F-frame	Approx.		0 * * 0ESD	0 * * 3EUT	0 * * 3FUT	DV0P4285	DV0P224	DV0P3410	Cable (with (Battery Box)	,
	IP67		4400	MGMF442L1 ☐ 6M MGMF442L1 ☐ 8M	158	MFDLTB3SF	MFDLNB3S		7.5			MFMCA 0**3ECT	MFMCA 0**3FCT	×2 in parallel	DV0P225		Note)7 Encoder	-
		Single phase/	1000	MHMF102L1 ☐ 6M MHMF102L1 ☐ 8M	142	MDDLT45SF	MDDLN45S♦		Approx.			MFMCD 0**2EUD	MFMCA 0**2FUD		DV0P228 / DV0P222		Cable (without Battery Box)	
		3-phase 200 V	1500	MHMF152L1 ☐ 6M MHMF152L1 ☐ 8M	143	MDDLT55SF	MDDLN55S♦	D-frame	Approx.			MFMCD 0 * * 2ECD	MFMCA 0**2FCD	DV0P4284	DV0PM20047 / DV0P222	DV0P4220	Motor Cable	
I	MHMF									MFECA	MFECA	MFMCE 0 * * 2EUD	MFMCE 0**2FUD				(without Brake)
High ine	Large size JL10 type		2000	MHMF202L1 ☐ 6M MHMF202L1 ☐ 8M	144	MEDLT83SF	MEDLN83S♦	E-frame	Approx.	0**0EPE		MFMCE	MFMCE	DV0P4285 Note)6	DV0P223	DV0PM20043		-
rtia	2000 r/min IP67	3-phase		MHMF302L1 ☐ 6M					Approx.	MFECA 0**0ESE	MFECA 0**0ESD	0**2ECD	0 * * 2FCD				Motor Cable	:
		200 V	3000	MHMF302L1 8M MHMF402L1 6M	145	MFDLTA3SF	MFDLNA3S	_	4.5			MFMCA 0 * *3EUT	MFMCA 0**3FUT	DV0P4285	DV0P224	DVcDss	(with Brake)	;
			4000	MHMF402L1	146	MFDLTB3SF		F-frame	Approx.			MFMCA	MFMCA	×2 in parallel	DV0P225	DV0P3410	External	+
	te)1 🗌 : F		5000	MHMF502L1 8M	147	MFDLTB3SF	MFDLNB3S♦					0 * *3ECT	0 * * 3FCT		es and motor cables er		regenerative resistor	

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/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.

	■ Options							
		Title		Part No.	Page			
	Interface Cable)		DV0P4360	182			
				DV0P4120	182			
	Interface Com	oroion Cal	blo	DV0P4121	182			
	Interface Conv	ersion Cal	uie	DV0P4130 DV0P4131	182 182			
				DV0P4131 DV0P4132	182			
		A-frame	Single row		_			
	Connector Kit for Power	to	type	DV0PM20032	185			
	Supply Input	D-frame	Double row type	DV0PM20033	185			
4	Connection	E-frame	31.	DV0PM20044	185			
	Connector Kit	A-frame	to	DV0PM20034	186			
	for Motor	D-frame		D V 0 F W 20034	100			
	Connection	E-frame		DV0PM20046	186			
3	Connector Kit for Regenerative Resistor	E-frame		DV0PM20045	185			
		without B	rake	DV0PM24587 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 DV0PM24588	189			
	Connector Kit for Motor/			MSMF 3.0 kW to 5.0 kW MDMF 3.0 kW to 5.0 kW MGMF 2.9 kW, 4.4 kW MHMF 2.0 kW to 5.0 kW	190			
	Encoder Con- nection	with Brak	Δ	DV0PM24589 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	189			
3		WILLI DIAN	C	DV0PM24590 MSMF 3.0 kW to 5.0 kW MDMF 3.0 kW to 5.0 kW MGMF 2.9 kW, 4.4 kW MHMF 2.0 kW to 5.0 kW	190			
		RS485, F	RS232	DV0PM20024	183			
		Safety		DV0PM20025	183			
	Connector Kit	Interface		DV0P4350	184			
\dashv		External		DV0PM20026	184			
	D (A)	Encoder		DV0PM20010	184			
	Battery for Abs			DV0P2990 DV0P4430	194 194			
3	Note)7 Mounting Bracket	D-frame		DV0PM20101	195			
┨	Encoder	One-touc	h lock type	MFECA0 * * 0EPE	173			
	Cable (with (Battery Box) Note)7	Screwed		MFECA0**0ESE	174			
	Encoder	One-touc	h lock type	MFECA0 * * 0EPD	173			
	(without (Battery Box)	Screwed	type	MFECA0 * * 0ESD	173			
	\ ,	One-touc	h lock type	MFMCD0**2EUD	176			
		Screwed		MFMCD0**2ECD	176			
	Motor Cable		h lock type	MFMCE0**2EUD	177			
	(without Brake)	Screwed	type	MFMCE0**2ECD	177			
			h lock type	MFMCA0 * *3EUT	177			
3		Screwed		MFMCA0 * *3ECT	177			
			h lock type		179			
		Screwed		MFMCA0 * * 2FCD	179			
1	Motor Cable		h lock type		180			
	(with Brake)	Screwed		MFMCE0 * *2FCD	180			
			h lock type	MFMCA0 * *3FUT MFMCA0 * *3FCT	180 180			
	External regenerative resistor	30 Ω 100 20 Ω 130	W	DV0P4284 DV0P4285	197			
	Reactor		DV0P224	2, DV0P223 1, DV0P225 8, DV0PM20047	196			
	Noise Filter			0, DV0PM20043	236			
	Surge Absorbe	r			237			
	Ferite Core			DV0P4190, DV0P1450 DV0P1460				

119 MINAS A6 Family

Please contact us for more information

Specifications

					AC200 V
Motor model*1			IP65		MSMF5AZL1□□M
		Multi	function type		MADLT05SF
Applicable	Model No.	RS485 communication type *2			MADLN05SG
driver		Basic	type *2		MADLN05SE
	Frame	sym	bol		A-frame
Power supply	capacity			(kVA)	0.5
Rated output				(W)	50
Rated torque				(N·m)	0.16
Continuous sta	all torque	Э		(N·m)	0.16
Momentary M	ax. peak	torqı	ıe	(N·m)	0.48
Rated current			(A(rms))	1.1
Max. current	Max. current			(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 speed	i	1)	r/min)	3000
Max. rotationa	ıl speed		1)	r/min)	6000
Moment of inertia			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 encoder specifications *3			ns *3		23-bit Absolute
Resolution pe			n per single tu	ırn	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.

38 mm sq.

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)

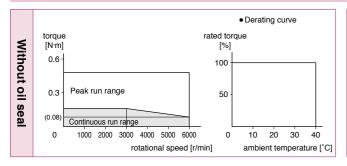
	Radial load P-direction (N)	147
During assembly	Thrust load A-direction (N)	88.0
documbry	Thrust load B-direction (N)	117.6
During operation	Radial load P-direction (N)	68.6
	Thrust load A, B-direction (N)	58.8

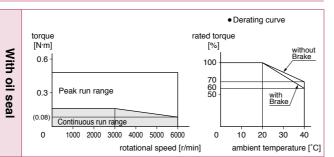
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.47.
- *1 \(\subseteq \) in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.116.

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

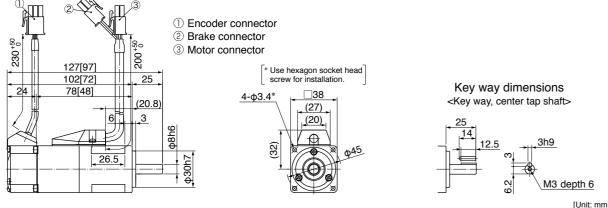
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





Dimensions

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



• Figures in [] represent the dimensions without brake.

<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

Specifications

				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
	Frame	e sym	bol	A-frame
Power supply	capacit	y	(kVA)	0.5
Rated output			(W)	100
Rated torque			(N·m)	0.32
Continuous sta	all torqu	е	(N·m)	0.32
Momentary Ma	ax. peal	k 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 (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 inertia			Without brake	0.048
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)			With brake	0.051
Recommender ratio of the loa		30 times or less		
Rotary encode	Rotary encoder specifications *3			23-bit Absolute
	Re	solutio	n per single turn	8388608

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

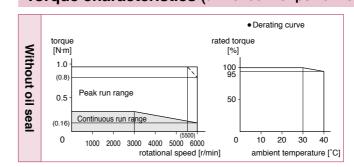
Static friction torque (N·m)	0.294 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.30
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

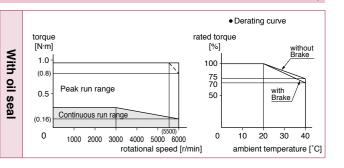
• Permissible load (For details, refer to P.166)

During assembly During operation	Radial load P-direction (N)	147
	Thrust load A-direction (N)	88.0
	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 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.

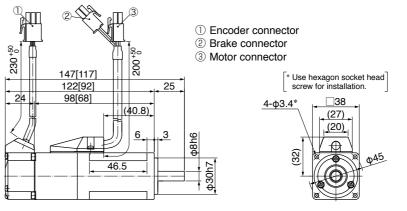
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





Dimensions

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



Key way, center tap shaft>
25
14
12.5
3h9
7

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 122

Please contact us for more information

Specifications

					AC200 V
Motor model *1			IP65		MSMF022L1 M
		Multifunction type			MADLT15SF
Applicable	Model No.	RS485 communication type *2		ation type *2	MADLN15SG
driver		Basio	c type ^{⁺2}		MADLN15SE
	Frame	sym	bol		A-frame
Power supply	capacity	,		(kVA)	0.5
Rated output				(W)	200
Rated torque				(N·m)	0.64
Continuous sta	all torque	Э		(N·m)	0.64
Momentary Ma	ax. peak	torqu	ue	(N·m)	1.91
Rated current				(A(rms))	1.5
Max. current		(A(o-p))		6.5	
Regenerative	brake		Without option		No limit Note)2
frequency (time	es/min) N	lote)1	DV0P4283		No limit Note)2
Rated rotation	al speed	i		(r/min)	3000
Max. rotational speed		(r/min)		6000	
Moment of inertia			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			Note)3	30 times or less	
Rotary encoder specification			ns ⁺³		23-bit Absolute
Resolution			on per singl	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.

· 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)

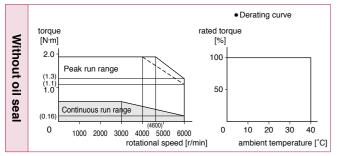
	During assembly During operation	Radial load P-direction (N)	392
		Thrust load A-direction (N)	147
		Thrust load B-direction (N)	196
		Radial load P-direction (N)	245
		Thrust load A, B-direction (N)	98.0

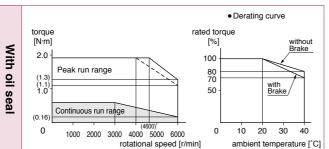
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.47.
- *1 in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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.

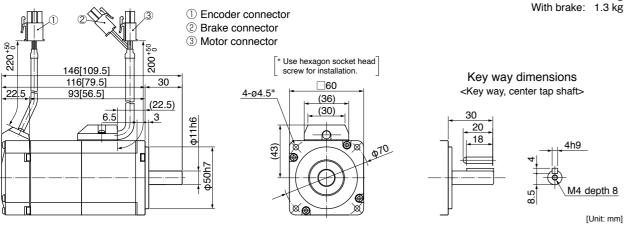
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





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

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

Specifications

				AC200 V
Motor model *1	IP65			MSMF042L1□□M
		Multi	function type	MBDLT25SF
Applicable	Model No	RS48	communication type	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 torqu	ıe (N⋅m	3.82
Rated current			(A(rms)	2.4
Max. current			(A(o-p)	10.2
Regenerative brake		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 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
	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)	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)

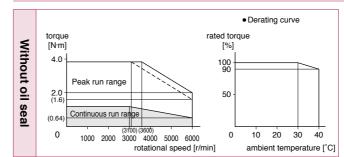
During assembly During operation	Radial load P-direction (N)	392
	Thrust load A-direction (N)	147
	Thrust load B-direction (N)	196
	Radial load P-direction (N)	245
	Thrust load A, B-direction (N)	98.0

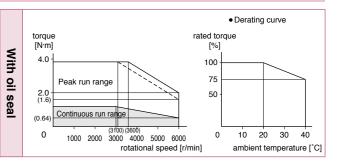
- For details of Note)1 to Note)4, refer to P.165.
- Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.116.

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

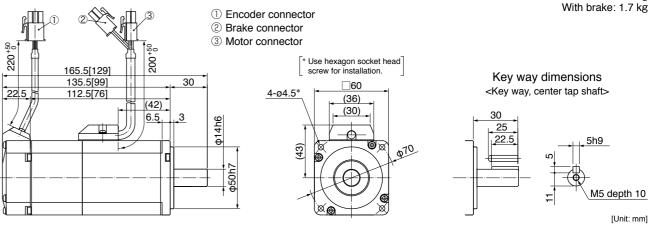
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





Mass: Without brake: 1.2 kg

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

123 MINAS A6 Family

				AC200 V
Motor model*1			IP65	MSMF082L1□□M
		Multi	function type	MCDLT35SF
Applicable	Model No	RS48	communication type *2	MCDLN35SG
driver		Basic	type *2	MCDLN35SE
	Fram	e sym	bol	C-frame
Power supply	capacit	y	(kVA)	1.3
Rated output			(W)	750
Rated torque			(N·m)	2.39
Continuous sta	all torqu	е	(N·m)	2.39
Momentary Ma	ax. peal	k torqu	ıe (N·m)	7.16
Rated current			(A(rms))	4.1
Max. current			(A(o-p))	17.4
Regenerative	brake		Without option	No limit Note)2
frequency (time	es/min)	Note)1	DV0P4283	No limit Note)2
Rated rotation	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
Recommended moment of iner ratio of the load and the rotor				20 times or less
Rotary encode	er speci	ficatio	ns ^{*3}	23-bit Absolute
	Re	solutio	n per single turn	8388608

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

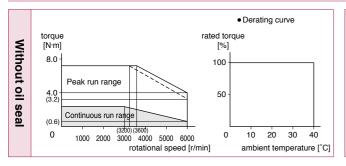
During assembly	Radial load P-direction (N)	686
	Thrust load A-direction (N)	294
docombry	Thrust load B-direction (N)	392
During operation	Radial load P-direction (N)	392
	Thrust load A, B-direction (N)	147

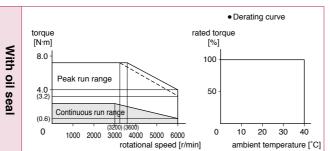
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.48.
- *1 in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.116.

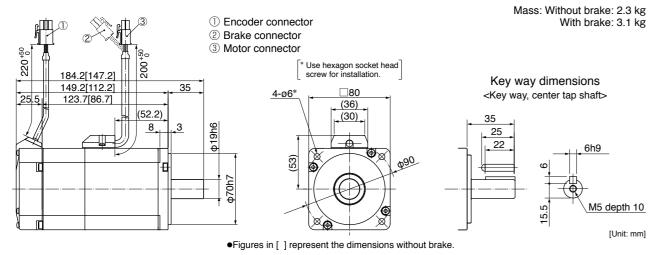
*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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

A6 Family

Motor Specifications

Please contact us for more information

Specifications

					AC200 V
Motor model *1	IP65			MSMF092L1□□M	
		Multifunction type			MDDLT45SF
Applicable	Model No	RS48	5 communication	n type *2	MDDLN45SG
driver	140.	Basic	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			ıe	(N·m)	9.55
Rated current			(A	(rms))	5.7
Max. current			(A	(o-p))	24.2
Regenerative brake			Without option		No limit Note)2
frequency (time	es/min) I	Note)1	DV0P4284		No limit Note)2
Rated rotation	al speed	d		(r/min)	3000
Max. rotationa	l speed			(r/min)	6000
Moment of ine	rtia		Without bra	ke	1.26
of rotor (×10 ⁻⁴ kg·m ²)		With brake		1.36	
Recommender ratio of the loa			Note)3	15 times or less	
Rotary encode	r specif	icatio	ns*3		23-bit Absolute
	Reso			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)	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)

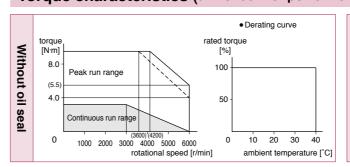
During assembly	Radial load P-direction (N)	686
	Thrust load A-direction (N)	294
	Thrust load B-direction (N)	392
During	Radial load P-direction (N)	392
operation	Thrust load A, B-direction (N)	147

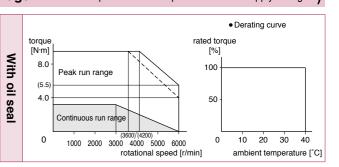
- For details of Note)1 to Note)4, refer to P.165.
- Dimensions of Driver, refer to P.48.
- *1 \square in the motor part number represents the motor specifications.

Imformation

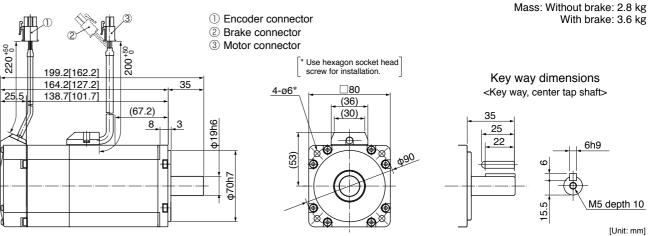
- *2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.116.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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

Specifications

					AC200 V
Motor model *1			IP67		MSMF102L1□□M
		Multi	function type		MDDLT55SF
Applicable	Model No	RS48	5 communication ty	/pe *2	MDDLN55SG
driver	110.	Basic	type *2		MDDLN55SE
	Frame	e sym	bol		D-frame
Power supply	capacit	y	(k	VA)	2.3
Rated output				(W)	1000
Rated torque			(N	l·m)	3.18
Continuous sta	all torqu	е	(N	l·m)	3.82
Momentary Ma	ax. peal	k torqu	ıe (N	l·m)	9.55
Rated current			(A(rms))		6.6
Max. current			(A(o	-p))	28
Regenerative	brake		Without option		No limit Note)2
frequency (time	es/min)	Note)1	DV0P4284		No limit Note)2
Rated rotation	al spee	d	(r/n	nin)	3000
Max. rotationa	l speed		(r/n	nin)	5000
Moment of ine	rtia		Without brake		2.15
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake		2.47	
Recommended moment of inertia ratio of the load and the rotor Note)3			ote)3	15 times or less	
Rotary encoder specifications *3				23-bit Absolute	
	Res	solutio	on per single turr	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.

· 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)

	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

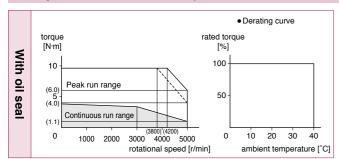
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.48.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.116.

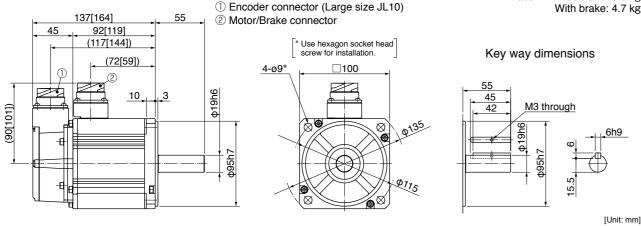
*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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.

<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

Please contact us for more information

Specifications

					AC200 V
Motor model *1	IP67			MSMF152L1□□M	
		Multifunction type			MDDLT55SF
Applicable	Model No	RS48	5 communicatio	n type *2	MDDLN55SG
driver	140.	Basic	Basic type *2		MDDLN55SE
	Frame	e 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			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 (time	s/min)	Note)1	DV0P4284		No limit Note)2
Rated rotation	al spee	d		(r/min)	3000
Max. rotationa	speed			(r/min)	5000
Moment of ine	rtia		Without bra	ıke	3.10
of rotor ($\times 10^{-4}$	kg·m²)		With brake		3.45
Recommended ratio of the load			Note)3	15 times or less	
Rotary encoder specifications *3				23-bit Absolute	
	Res	Resolution po			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.

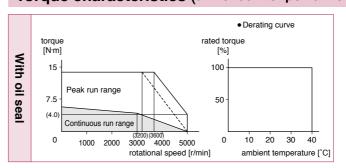
Static friction torque (N·m)	8.0 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.81±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

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

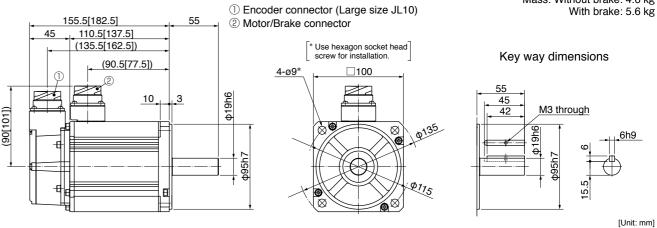
During assembly During operation	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196

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

127 MINAS A6 Family

Imformation

Mass: Without brake: 4.6 kg

					AC200 V
Motor model *1			IP67		MSMF202L1□□M
		Multi	function type		MEDLT83SF
Applicable	Model No	RS48	RS485 communication type *2		MEDLN83SG
driver		Basic	type ^{*2}		MEDLN83SE
	Frame	sym	bol		E-frame
Power supply	capacity	′		(kVA)	3.8
Rated output				(W)	2000
Rated torque				(N·m)	6.37
Continuous sta	all torqu	е		(N·m)	7.64
Momentary Ma	ax. peak	torqu	ıe	(N·m)	19.1
Rated current (A(rms))		11.3			
Max. current	Max. current (A(o-p)		(A(o-p))	48	
Regenerative	brake		Without	option	No limit Note)2
frequency (time	es/min) N	Note)1	DV0P4285		No limit Note)2
Rated rotation	al speed	t		(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 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	olutio	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.

[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)

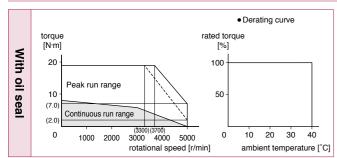
	During assembly During operation	Radial load P-direction (N)	980
		Thrust load A-direction (N)	588
		Thrust load B-direction (N)	686
		Radial load P-direction (N)	490
		Thrust load A, B-direction (N)	196

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

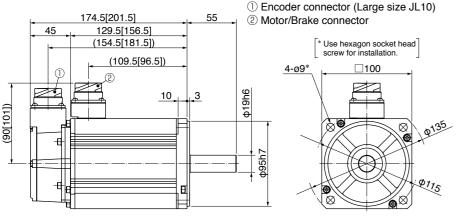
Detail of model designation, refer to P.116.

*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.>)



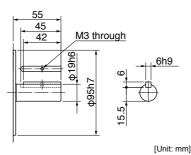
Dimensions



Key way dimensions

Mass: Without brake: 5.6 kg

With brake: 6.6 kg



• 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 **MSMF** 3.0 kW

Please contact us for more information

Specifications

				AC200 V
Motor model *1			IP67	MSMF302L1□□M
		Multi	function type	MFDLTA3SF
Applicable	Model No	RS48	5 communication type	² MFDLNA3SG
driver	140.	Basic	type *2	MFDLNA3SE
	Frame	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. peal	k torqı	ue (N⋅m	28.6
Rated current			(A(rms)	18.1
Max. current	Max. current (A			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 iner ratio of the load and the rotor				15 times or less
Rotary encode	r speci	ficatio	ns*3	23-bit Absolute
Resolution pe			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.

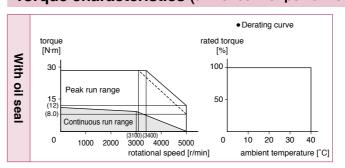
Static friction torque (N·m)	12.0 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.81±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

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

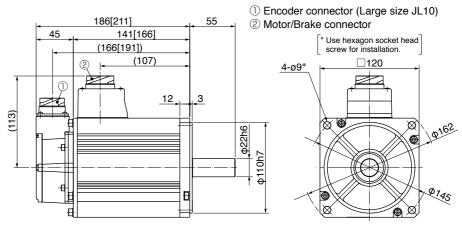
During assembly During operation	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196

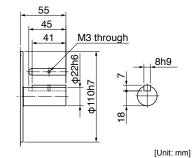
- For details of Note)1 to Note)4, refer to P.165.
- Dimensions of Driver, refer to P.49.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
- Detail of model designation, refer to P.116.
- *3 When using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





Key way dimensions

Mass: Without brake: 8.7 kg

With brake: 9.9 kg

• 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

129 MINAS A6 Family

Please contact us for more information

Specifications

				AC200 V	
Motor model *1			IP67	MSMF402L1□□M	
		Multi	unction type	MFDLTB3SF	
Applicable	Model No	RS48	communication type *2	MFDLNB3SG	
driver		Basic	type *2	MFDLNB3SE	
	Frame	e sym	ool	F-frame	
Power supply	capacit	y	(kVA)	7.5	
Rated output			(W)	4000	
Rated torque			(N·m)	12.7	
Continuous sta	all torqu	е	(N·m)	15.2	
Momentary Ma	ax. peal	k torqu	ie (N·m)	38.2	
Rated current (A(rms))		19.6			
Max. current	x. current (A(o-p))		x. current (A(o-p))		83
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	14.4	
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake	15.6		
Recommended moment of inertia ratio of the load and the rotor				15 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.

· Please contact us for more information.

[Low inertia]

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)

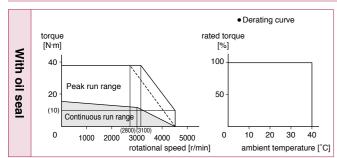
	During assembly During operation	Radial load P-direction (N)	980
		Thrust load A-direction (N)	588
		Thrust load B-direction (N)	686
		Radial load P-direction (N)	784
		Thrust load A, B-direction (N)	343

- 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".

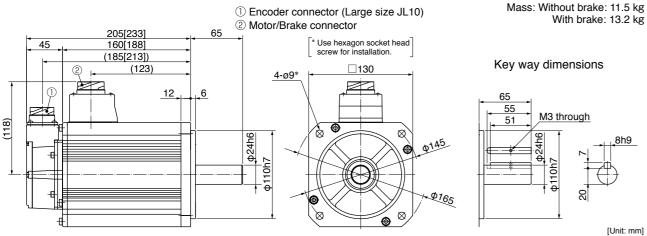
Detail of model designation, refer to P.116.

*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

Specifications

				AC200 V
Motor model *1	IP67			MSMF502L1□□M
		Multi	function type	MFDLTB3SF
Applicable	Model No	RS48	5 communication type *2	MFDLNB3SG
driver	140.	Basic	c type *2	MFDLNB3SE
	Frame	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 Max. peak torque (N·m)			ue (N·m)	47.7
Rated current			(A(rms))	24.0
Max. current			(A(o-p))	102
Regenerative brake frequency (times/min) Note)1		Without option	No limit Note)2	
		DV0P4285×2	No limit Note)2	
Rated rotation	al spee	d	(r/min)	3000
Max. rotational 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 inertia ratio of the load and the rotor Note)3			15 times or less	
Rotary encoder specifications			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)	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)

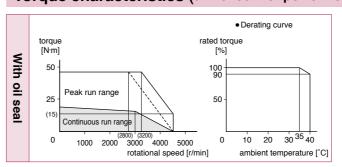
During assembly During operation	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	784
	Thrust load A, B-direction (N)	343

- 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".

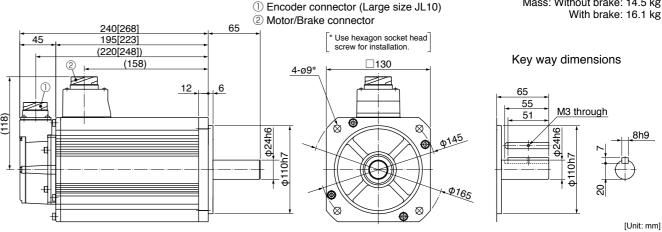
Detail of model designation, refer to P.116.

*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

131 MINAS A6 Family

MINAS A6 Family 132

[Unit: mm]

Mass: Without brake: 14.5 kg

					AC200 V
Motor model *1		IP65			MQMF012L1 M
		Multi	function t	уре	MADLT05SF
Applicable	Model No	RS48	5 communi	cation 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	е		(N·m)	0.33
Momentary Ma	ax. peak	torqu	ıe	(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) 1	Note)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		Withou	t brake	0.15
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake		0.18	
Recommended moment of inertial ratio of the load and the rotor				Note)3	20 times or less
Rotary encoder specificatio			ns*3		23-bit Absolute
Resolution			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.

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)

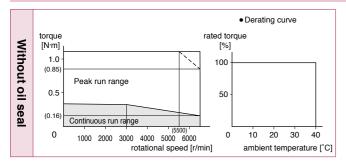
During assembly During operation	Radial load P-direction (N)	147
	Thrust load A-direction (N)	88
	Thrust load B-direction (N)	117.6
	Radial load P-direction (N)	68.6
	Thrust load A, B-direction (N)	58.8

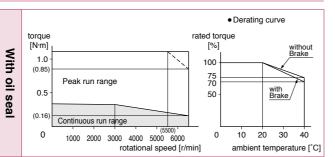
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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.

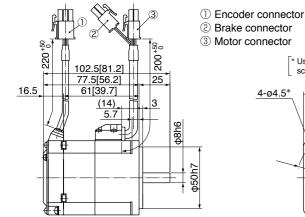
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)

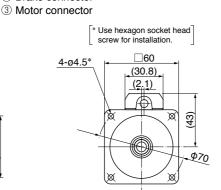




Dimensions

Mass: Without brake: 0.54 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. Special Order Product

Please contact us for more information

Specifications

				AC200 V
Motor model *1			IP65	MQMF022L1□□M
		Multi	function type	MADLT15SF
Applicable	Model No	RS48	5 communication type	MADLN15SG
driver	140.	Basic	type *2	MADLN15SE
	Fram	e sym	bol	A-frame
Power supply	capacit	y	(kVA	0.5
Rated output			(W	200
Rated torque			(N·m	0.64
Continuous sta	all torqu	е	(N·m	0.76
Momentary Ma	ax. peal	k torqu	ue (N⋅m	2.23
Rated current			(A(rms)	1.4
Max. current			(A(o-p)	6.9
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/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 i ratio of the load and the roto				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.

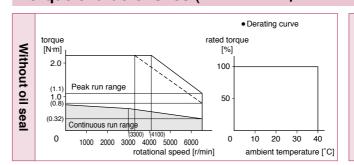
Static friction torque (N·m)	1.6 or more
Engaging time (ms)	70 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

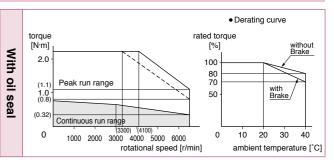
• Permissible load (For details, refer to P.166)

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.

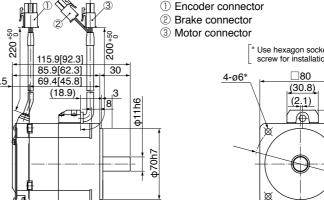
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)

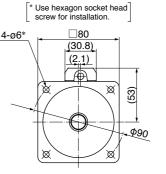


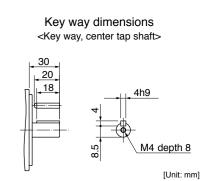


Dimensions

Mass: Without brake: 1.1 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.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

133 MINAS A6 Family

· Please contact us for more information.

Please contact us for more information

Specifications

				AC200 V
Motor model *1			IP65	MQMF042L1□□M
		Multi	function type	MBDLT25SF
Applicable	Model No	RS48	communication type *2	MBDLN25SG
driver		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	е	(N·m)	1.40
Momentary Ma	ax. peal	k torqu	ıe (N·m)	4.46
Rated current (A(rms))		2.1		
Max. current			(A(o-p))	10.4
Regenerative	brake		Without option	No limit Note)2
frequency (time	es/min)	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				20 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.

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)

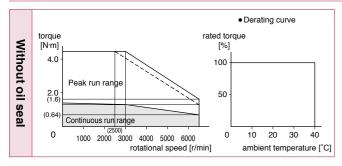
	During assembly During operation	Radial load P-direction (N)	392
		Thrust load A-direction (N)	147
		Thrust load B-direction (N)	196
		Radial load P-direction (N)	245
		Thrust load A, B-direction (N)	98

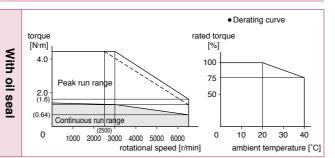
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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.

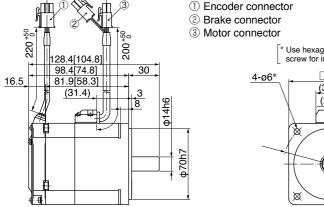
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)



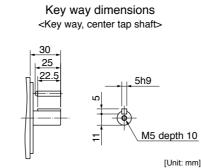


Dimensions

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



Use hexagon socket head (30.8)



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	
		Multi	function type		MADLT05SF
Applicable	Model No	RS48	RS485 communication type *2		MADLN05SG
driver	140.	Basic type *2			MADLN05SE
	Fram	e sym	bol		A-frame
Power supply	capacit	у	(k	VA)	0.5
Rated output				(W)	50
Rated torque			(1)	l·m)	0.16
Continuous sta	all torqu	ie	(1)	l·m)	0.18
Momentary Ma	ax. peal	k torqı	ue (N	l·m)	0.56
Rated current			(A(rr	ns))	1.1
Max. current			(A(o	-p))	5.5
Regenerative I	brake		Without option	ı	No limit Note)2
frequency (times/min) Note)1		Note)1	DV0P4281		No limit Note)2
Rated rotation	al spee	d	(r/r	nin)	3000
Max. rotationa	l speed		(r/r	nin)	6500
Moment of inertia		Without brake		0.038	
of rotor (×10 ⁻⁴ kg·m ²)		With brake		0.042	
Recommended moment of iner ratio of the load and the rotor				ote)3	30 times or less
Rotary encode	r speci	ficatio	ns*3		23-bit Absolute
	Re	solutio	n per single turi	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.

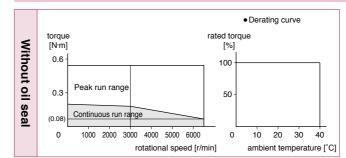
Static friction torque (N·m)	0.38 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.30
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±2.4

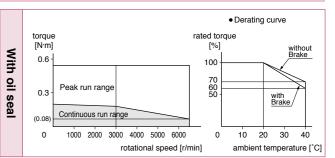
• Permissible load (For details, refer to P.166)

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

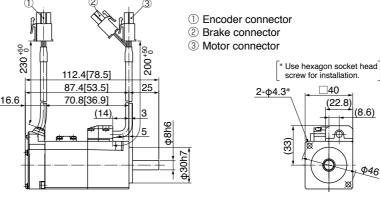
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)

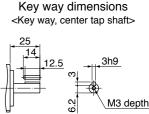




Dimensions

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 t	уре	MADLT05SF
Applicable	Model No	RS48	RS485 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	е		(N·m)	0.33
Momentary Ma	ax. peak	torqı	ıe	(N·m)	1.11
Rated current (A(rms))		(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 speed	d		(r/min)	3000
Max. rotational 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 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)	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)

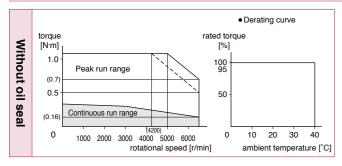
During assembly During operation	Radial load P-direction (N)	147
	Thrust load A-direction (N)	88
	Thrust load B-direction (N)	117.6
	Radial load P-direction (N)	68.6
	Thrust load A, B-direction (N)	58.8

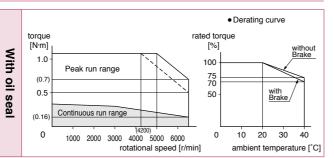
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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.

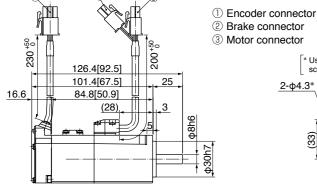
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)

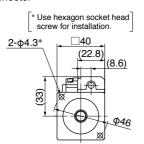




Dimensions

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





Key way dimensions <Key way, center tap shaft> [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. Special Order Product

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

Please contact us for more information

Specifications

				AC200 V
Motor model *1			IP65	MHMF022L1 M
		Multifunction type		MADLT15SF
Applicable	Model No.	RS48	5 communication type *2	MADLN15SG
driver	140.	Basic	type *2	MADLN15SE
	Frame	e sym	bol	A-frame
Power supply	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. peal	k torqu	ue (N·m)	2.23
Rated current			(A(rms))	1.4
Max. current			(A(o-p))	6.9
Regenerative brake With		Without option	No limit Note)2	
frequency (times/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 (×10 ⁻⁴ kg·m ²)			With brake	0.31
Recommended moment of inertia ratio of the load and the rotor				30 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.

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)

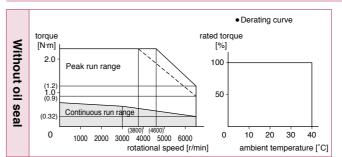
During assembly During operation	Radial load P-direction (N)	392
	Thrust load A-direction (N)	147
	Thrust load B-direction (N)	196
	Radial load P-direction (N)	245
	Thrust load A, B-direction (N)	98

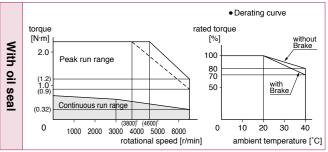
- For details of Note)1 to Note)4, refer to P.165.
- Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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

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> (30.8) (2.1)M4 depth 8

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

[Unit: mm]

Imformation

Mass: Without brake: 0.75 kg (0.78 kg with oil seal) With brake: 1.1 kg (1.2 kg with oil seal)

Specifications

					AC200 V
Motor model*1	IP65				MHMF042L1□□M
		Multi	function ty	γpe	MBDLT25SF
Applicable	Model No.	RS485 communication type *2		ation type *2	MBDLN25SG
driver		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	е		(N·m)	1.40
Momentary Ma	ax. peal	k torqu	ıe	(N·m)	4.46
Rated current (A(rms))			2.1		
Max. current (A(o-p))			10.4		
Regenerative brake		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)	6500
Moment of ine	rtia		Without brake		0.56
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)			With brake		0.58
Recommended moment of inertia ratio of the load and the rotor Note)3			Note)3	30 times or less	
Rotary encoder specifications *3			ns *3		23-bit Absolute
Resolution per single turn			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)	1.6 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)

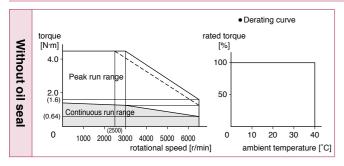
	Radial load P-direction (N)	392
During assembly	Thrust load A-direction (N)	147
documbry	Thrust load B-direction (N)	196
During operation	Radial load P-direction (N)	245
	Thrust load A, B-direction (N)	98

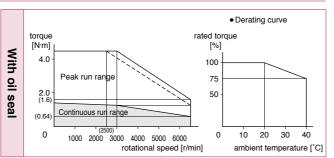
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.47.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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.

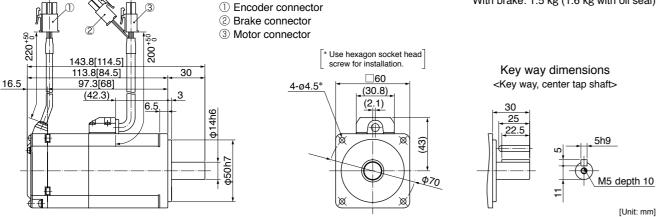
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





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.

Specifications

					AC200 V
Motor model *1	IP65			MHMF082L1□□M	
		Multi	function type		MCDLT35SF
Applicable	Model No	RS485 communication type *2		MCDLN35SG	
driver	140.	Basic	type *2		MCDLN35SE
	Frame	e sym	bol		C-frame
Power supply	capacit	y	(kV	/A)	1.3
Rated output			(1	W)	750
Rated torque			(N·	m)	2.39
Continuous sta	all torqu	е	(N·	m)	2.86
Momentary Ma	ax. peal	k torqu	ıe (N·	m)	8.36
Rated current (A(rms))			s))	3.8	
Max. current (A(o-p)			p))	18.8	
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)	6000
Moment of inertia			Without brake		1.56
of rotor (×10 ⁻⁴ kg·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 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)	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)

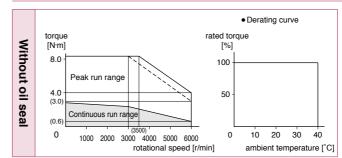
During assembly During operation	Radial load P-direction (N)	686
	Thrust load A-direction (N)	294
	Thrust load B-direction (N)	392
	Radial load P-direction (N)	392
	Thrust load A, B-direction (N)	147

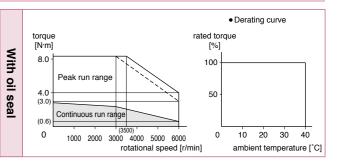
- For details of Note)1 to Note)4, refer to P.165.
- Dimensions of Driver, refer to P.48.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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.

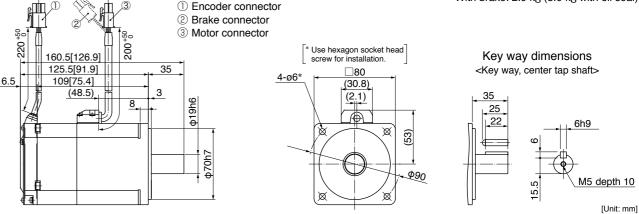
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





Dimensions

Mass: Without brake: 2.2 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

· Please contact us for more information.

Specifications

					AC200 V
Motor model *1	IP65			MHMF092L1 M	
Applicable driver		Multifunction type			MDDLT55SF
	Model No.	RS485 communication type *2		n type *2	MDDLN55SG
		Basic 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 stall torque (N·m)				3.34	
Momentary Max. peak torque (N·m)					11.1
Rated current			(A(rms))		5.7
Max. current			(A	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 bra	ıke	2.03
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake		2.13	
Recommended moment of inertia ratio of the load and the rotor Note)3			20 times or less		
Rotary encoder specification			ns*3		23-bit Absolute
	Res	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)	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)

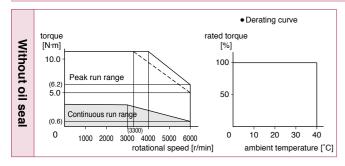
During assembly	Radial load P-direction (N)	686
	Thrust load A-direction (N)	294
	Thrust load B-direction (N)	392
During operation	Radial load P-direction (N)	392
	Thrust load A, B-direction (N)	147

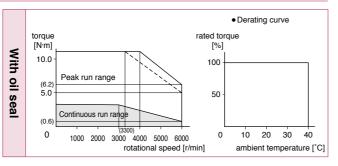
- For details of Note)1 to Note)4, refer to P.165.
- · Dimensions of Driver, refer to P.48.
- *1 \square in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".

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.

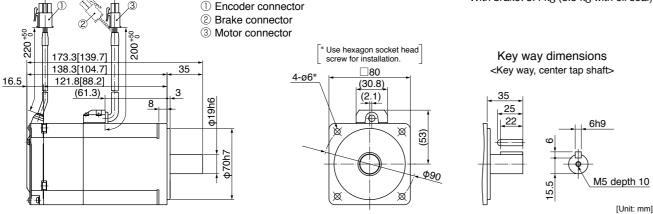
Torque characteristics (at AC200 V of power voltage < Dotted line represents the torque at 10 % less supply voltage.>)





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

[High inertia] 200 V MHMF 1.0 kW 130 mm sq.

Please contact us for more information

Specifications

					AC200 V
Motor model *1	IP67				MHMF102L1 M
Applicable driver		Multi	ultifunction type		MDDLT45SF
	Model No.	RS485 communication type *2		type *2	MDDLN45SG
		Basic type *2			MDDLN45SE
	Frame	sym	bol	D-frame	
Power supply capacity (kVA)	1.8
Rated output (W				(W)	1000
Rated torque (N·m)					4.77
Continuous stall torque (N·m)					5.25
Momentary Ma	ax. peak	torqu	ie (N·m)	14.3
Rated current			(A(r	ms))	5.2
Max. current			(A(o-p))	22
Regenerative brake			Without optio	n	No limit Note)2
frequency (times/min) Note)1		Note)1	DV0P4284		No limit Note)2
Rated rotational speed			(r/	min)	2000
Max. rotational speed			(r/	min)	3000
Moment of inertia of rotor (×10 ⁻⁴ kg·m²)			Without brake	е	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			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.

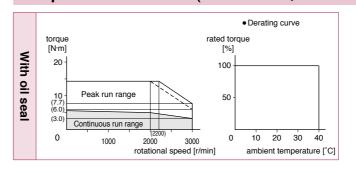
Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

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

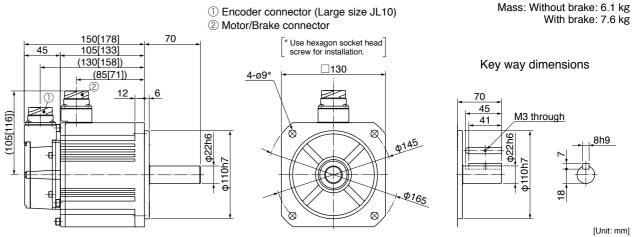
During assembly	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
During operation	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196

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

Specifications

					AC200 V
Motor model *1		IP67			MHMF152L1□□M
		Multi	Multifunction type		MDDLT55SF
Applicable	Model No	RS48	RS485 communication type *2		MDDLN55SG
driver		Basic	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	ıe	(N·m)	21.5
Rated current				(A(rms))	8.0
Max. current				(A(o-p))	34
Regenerative	brake		Without option		No limit Note)2
frequency (time	es/min) 1	Note)1	DV0P4284		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 ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)			With brake		34.6
Recommended moment of inertia ratio of the load and the rotor Note)3				5 times or less	
Rotary encode	er specif	icatio	ns ^{*3}		23-bit Absolute
	Res	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.

· 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)

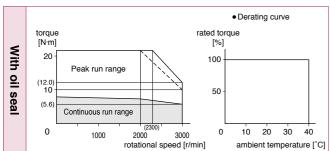
	During assembly During operation	Radial load P-direction (N)	980
		Thrust load A-direction (N)	588
		Thrust load B-direction (N)	686
		Radial load P-direction (N)	490
		Thrust load A, B-direction (N)	196

- 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".

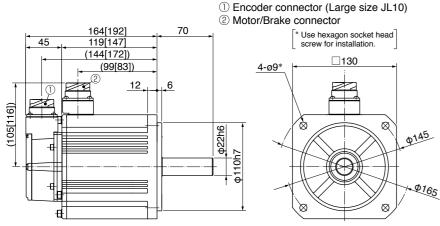
Detail of model designation, refer to P.116.

*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



Key way dimensions

Mass: Without brake: 7.7 kg

With brake: 9.2 kg

M3 through [Unit: mm]

• 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

[High inertia] 200 V MHMF 2.0 kW 176 mm sq.

Please contact us for more information

Specifications

				AC200 V
Motor model *1	IP67			MHMF202L1 M
		Multi	function type	MEDLT83SF
Applicable	Model No	RS48	5 communication type *2	MEDLN83SG
driver	INO.	Basic	type *2	MEDLN83SE
	Fram	e sym	bol	E-frame
Power supply	capacit	у	(kVA)	3.8
Rated output			(W)	2000
Rated torque			(N·m)	9.55
Continuous sta	all torqu	е	(N·m)	11.5
Momentary Ma	ax. peal	k torqı	ue (N·m)	28.6
Rated current			(A(rms))	12.5
Max. current	ax. current (A(o-p))			53
Regenerative	brake		Without option	No limit Note)2
frequency (time	es/min)	Note)1	DV0P4285	No limit Note)2
Rated rotation	al spee	d	(r/min)	2000
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	55.7
of rotor ($\times 10^{-4}$	kg·m²)		With brake	61.0
Recommended moment of it ratio of the load and the roto				5 times or less
Rotary encode	r speci	ficatio	ns*3	23-bit Absolute
	Re	solutio	n per single turn	8388608

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

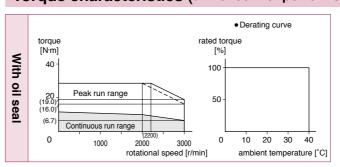
During assembly During operation	Radial load P-direction (N)	1666
	Thrust load A-direction (N)	784
	Thrust load B-direction (N)	980
	Radial load P-direction (N)	784
	Thrust load A, B-direction (N)	343

- 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".

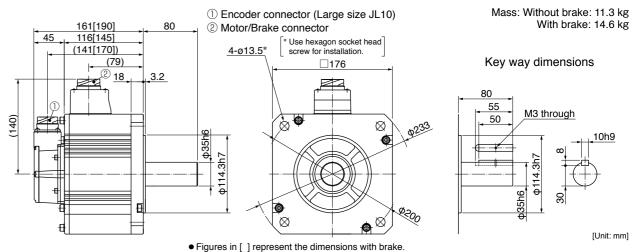
Detail of model designation, refer to P.116.

*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

143 MINAS A6 Family

MINAS A6 Family 144

Specifications

					AC200 V
Motor model*1			IP67		MHMF302L1 M
		Multi	function type		MFDLTA3SF
Applicable	Model No.	RS48	5 communication	type *2	MFDLNA3SG
driver	INO.	Basic	type *2		MFDLNA3SE
	Fram	e sym	bol		F-frame
Power supply	capacit	у		(kVA)	4.5
Rated output				(W)	3000
Rated torque				(N·m)	14.3
Continuous st	all torqu	ie		(N·m)	17.2
Momentary M	ax. pea	k torqı	ıe	(N·m)	43.0
Rated current			(A)	(rms))	17.0
Max. current (A(o-p))			(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/min)	2000
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake		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			Note)3	5 times or less	
Rotary encode	er speci	ficatio	ns *3		23-bit Absolute
	Re	solutio	n per single to	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.

· 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)

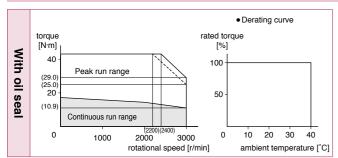
	During assembly During operation	Radial load P-direction (N)	1666
		Thrust load A-direction (N)	784
		Thrust load B-direction (N)	980
		Radial load P-direction (N)	784
		Thrust load A, B-direction (N)	343

- 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.116.

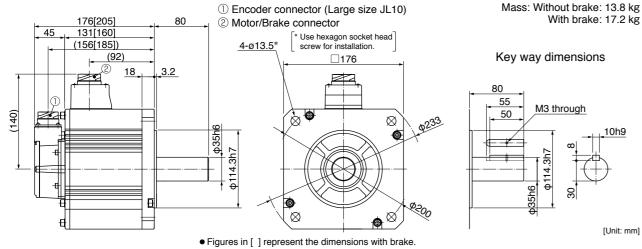
*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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



Dimensions

145 MINAS A6 Family



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 MHMF 4.0 kW

Specifications

					AC200 V
Motor model *1	IP67			MHMF402L1 M	
		Multif	function type		MFDLTB3SF
Applicable	Model No	RS48	5 communication	type *2	MFDLNB3SG
driver	110.	Basic	Basic type ⁺²		MFDLNB3SE
	Fram	e syml	bol		F-frame
Power supply	capacit	y	(kVA)	7.5
Rated output				(W)	4000
Rated torque			(N·m)	19.1
Continuous stall torque (N·m)				N·m)	22.0
Momentary Max. peak torque (N·m)				57.3	
Rated current (A(r				ms))	20
Max. current (A(o-p)				o-p))	85
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		104
of rotor (×10 ⁻⁴ kg·m ²)			With brake		110
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				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.

Imformation

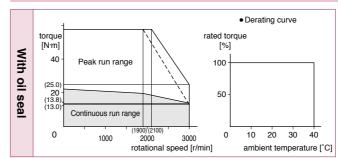
MINAS A6 Family 146

*2 Basic type and RS485 communication type are "Position control type".

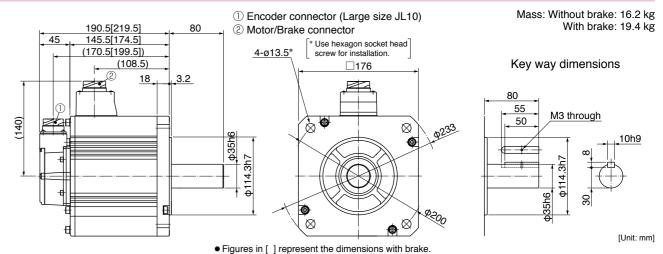
Detail of model designation, refer to P.116.

*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	MHMF502L1□□M
		Multi	function type	MFDLTB3SF
Applicable	Model No.	RS48	5 communication type *2	MFDLNB3SG
driver	140.	Basic	type *2	MFDLNB3SE
	Fram	e sym	bol	F-frame
Power supply	capacit	у	(kVA)	7.5
Rated output			(W)	5000
Rated torque			(N·m)	23.9
Continuous sta	all torqu	ie	(N·m)	26.3
Momentary Ma	ax. pea	k torqı	ue (N·m)	71.6
Rated current			(A(rms))	23.3
Max. current			(A(o-p))	99
Regenerative	brake		Without option	No limit Note)2
frequency (time	es/min)	Note)1	DV0P4285×2	No limit Note)2
Rated rotation	al spee	d	(r/min)	2000
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	146
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake	151	
Recommended moment of ir ratio of the load and the roto				5 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)	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)

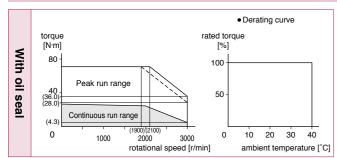
	During assembly During operation	Radial load P-direction (N)	1666
		Thrust load A-direction (N)	784
		Thrust load B-direction (N)	980
		Radial load P-direction (N)	784
		Thrust load A, B-direction (N)	343

- 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.116.

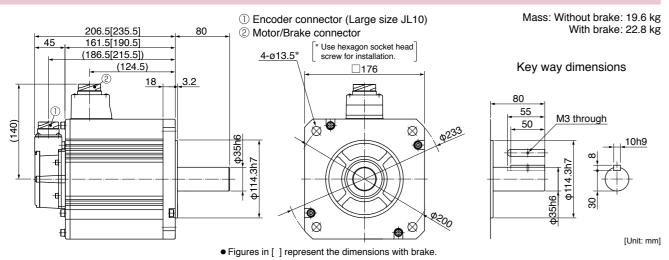
*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

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



Dimensions

147 MINAS A6 Family



<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 MDMF 1.0 kW

[Middle inertia] 130 mm sq.

A6 Family **Motor Specifications**

Please contact us for more information

Specifications

				AC200 V
Motor model *1			IP67	MDMF102L1 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	у	(kVA)	1.8
Rated output			(W)	1000
Rated torque			(N·m)	4.77
Continuous sta	all torqu	ie	(N·m)	5.25
Momentary Ma	ax. pea	k torqı	ue (N·m)	14.3
Rated current			(A(rms))	5.2
Max. current	Max. current		(A(o-p))	22
Regenerative brake		Without option	No limit Note)2	
frequency (time	es/min)	Note)1	DV0P4284	No limit Note)2
Rated rotation	al spee	d	(r/min)	2000
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	6.18
of rotor ($\times 10^{-4}$	kg·m²)		With brake	7.40
Recommended moment of in 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)

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.

Imformation

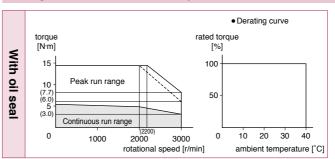
MINAS A6 Family 148

*2 Basic type and RS485 communication type are "Position control type".

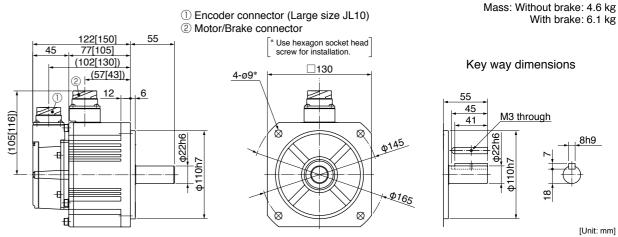
Detail of model designation, refer to P.116.

*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

Specifications

				AC200 V
Motor model *1			IP67	MDMF152L1 M
		Multi	function type	MDDLT55SF
Applicable	Model No	RS48	communication type *2	MDDLN55SG
driver		Basic	type *2	MDDLN55SE
	Fram	e sym	bol	D-frame
Power supply	capacit	y	(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. peal	k torqu	ıe (N·m)	21.5
Rated current			(A(rms))	8.0
Max. current			(A(o-p))	34
Regenerative	brake		Without option	No limit Note)2
frequency (time	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	9.16
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake	10.4	
Recommended moment of inertination of the load and the rotor				10 times or less
Rotary encode	er speci	ficatio	ns ^{*3}	23-bit Absolute
	Re	solutio	n per single turn	8388608

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

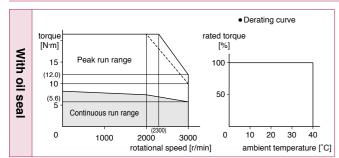
	During assembly During operation	Radial load P-direction (N)	980
		Thrust load A-direction (N)	588
		Thrust load B-direction (N)	686
		Radial load P-direction (N)	490
		Thrust load A, B-direction (N)	196

- 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".

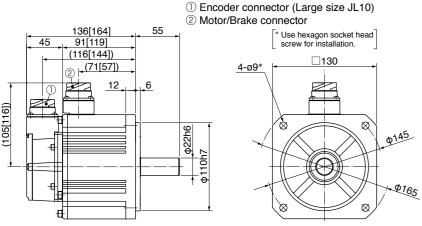
Detail of model designation, refer to P.116.

*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.>)



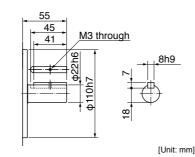
Dimensions



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

Please contact us for more information

Specifications

					AC200 V
Motor model *1	IP67			MDMF202L1□□M	
		Multif	function type		MEDLT83SF
Applicable	Model No	RS48	communication ty	/pe *2	MEDLN83SG
driver	140.	Basic	type *2		MEDLN83SE
	Fram	e sym	bol		E-frame
Power supply	capacit	y	(k	VA)	3.8
Rated output				(W)	2000
Rated torque			(N	l·m)	9.55
Continuous sta	all torqu	е	(1)	l·m)	10.0
Momentary Ma	ax. peal	k torqu	ie (V	l·m)	28.6
Rated current			(A(rr	ns))	9.9
Max. current			(A(o	-p))	42
Regenerative brake		Without option	1	No limit Note)2	
frequency (times/min) Note)1		DV0P4285		No limit Note)2	
Rated rotation	al spee	d	(r/r	nin)	2000
Max. rotationa	l speed		(r/r	nin)	3000
Moment of inertia		Without brake		12.1	
of rotor (×10 ⁻⁴ kg·m ²)		With brake		13.3	
Recommended moment of inertial ratio of the load and the rotor				ote)3	10 times or less
Rotary encode	r speci	ficatio	ns ^{⁺3}		23-bit Absolute
	Re	solutio	n per single turi	n	8388608

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

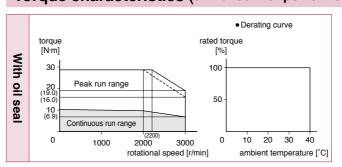
Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

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

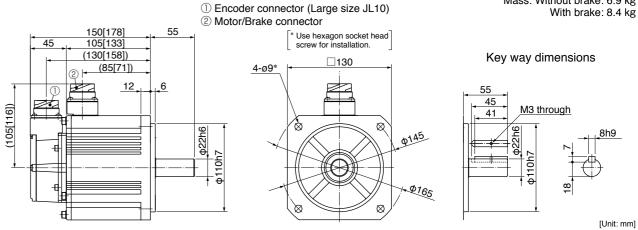
During assembly During operation	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196

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

149 MINAS A6 Family

Mass: Without brake: 6.9 kg

Specifications

				AC200 V
Motor model*1	el ^{*1} IP67			MDMF302L1□□M
		Multi	function type	MFDLTA3SF
Applicable	Model No.	RS485 communication type *2		MFDLNA3SG
driver		Basic	type *2	MFDLNA3SE
	Fram	e sym	bol	F-frame
Power supply	capacit	y	(kVA)	4.5
Rated output			(W)	3000
Rated torque			(N·m)	14.3
Continuous sta	all torqu	е	(N·m)	15.0
Momentary Ma	ax. peal	k torqı	ue (N·m)	43.0
Rated current			(A(rms))	16.4
Max. current		(A(o-p))		70
Regenerative	brake		Without option	No limit Note)2
frequency (time	s/min)	Note)1	DV0P4285×2	No limit Note)2
Rated rotation	al spee	d	(r/min)	2000
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	18.6
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)			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
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)

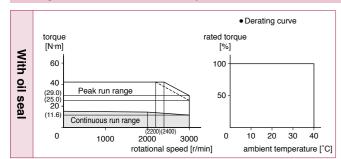
	During assembly	Radial load P-direction (N)	980
		Thrust load A-direction (N)	588
assembly	Thrust load B-direction (N)	686	
	During operation	Radial load P-direction (N)	784
		Thrust load A, B-direction (N)	343

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

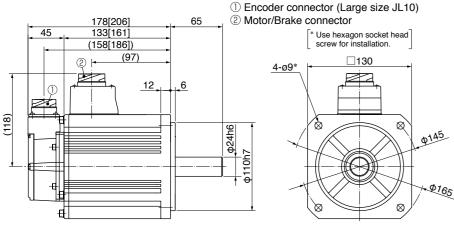
Detail of model designation, refer to P.116.

*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.>)

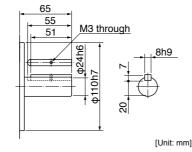


Dimensions



Mass: Without brake: 9.3 kg With brake: 10.9 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.

Specifications

Special Order Product

				AC200 V
Motor model *1			IP67	MDMF402L1□□M
		Multi	function type	MFDLTB3SF
Applicable	Model No.	RS48	5 communication type *2	MFDLNB3SG
driver	140.	Basic	type *2	MFDLNB3SE
	Fram	e sym	bol	F-frame
Power supply	capacit	у	(kVA)	7.5
Rated output			(W)	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 (A		(A(rms))	20.0	
Max. current ((A(o-p))	85
Regenerative	brake		Without option	No limit Note)2
frequency (times/min) Note)1		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				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)

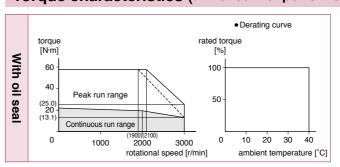
During assembly During operation	Radial load P-direction (N)	1666
	Thrust load A-direction (N)	784
	Thrust load B-direction (N)	980
	Radial load P-direction (N)	784
	Thrust load A, B-direction (N)	343

- 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".

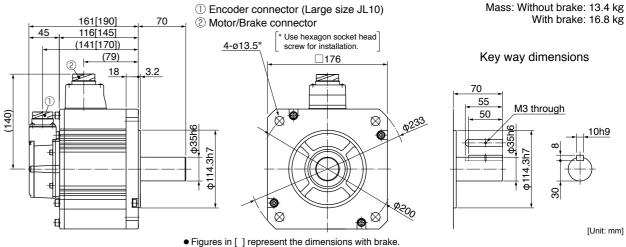
Detail of model designation, refer to P.116.

*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

151 MINAS A6 Family

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Please contact us for more information

Specifications

					AC200 V
Motor model *1			IP67		MDMF502L1□□M
		Multi	function type		MFDLTB3SF
Applicable	Model No	RS48	5 communication	n type ⁺²	MFDLNB3SG
driver		Basic	type *2		MFDLNB3SE
	Fram	e sym	bol		F-frame
Power supply	capacit	у		(kVA)	7.5
Rated output				(W)	5000
Rated torque				(N·m)	23.9
Continuous sta	all torqu	ie		(N·m)	26.3
Momentary Ma	ax. pea	k torqı	ie	(N·m)	71.6
Rated current		(A	(rms))	23.3	
Max. current	urrent		(A	(o-p))	99
Regenerative	brake		Without option		No limit Note)2
frequency (times/min) Note)1		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 bra	ke	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 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.

176 mm sq.

2	
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)

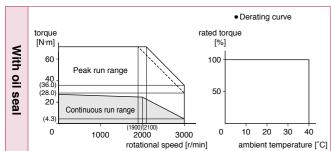
	Radial load P-direction (N)	1666
During assembly	Thrust load A-direction (N)	784
accombi	Thrust load B-direction (N)	980
During	Radial load P-direction (N)	784
operation	Thrust load A, B-direction (N)	343

- 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".

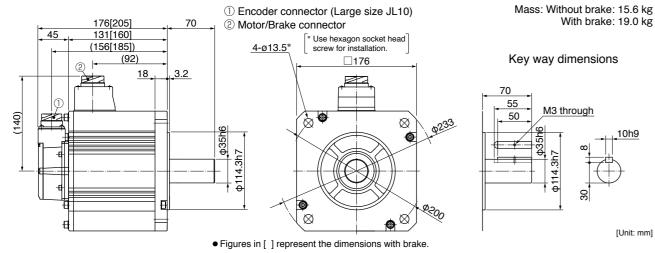
Detail of model designation, refer to P.116.

*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.

· Please contact us for more information.

Specifications	

Special Order Product

				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 torqı	ue (N·m)	14.3
Rated current	Rated current		(A(rms))	5.9
Max. current		(A(o-p))	22	
Regenerative brake frequency (times/min) Note)1		Without option	No limit Note)2	
		Note)1	DV0P4284	No limit Note)2
Rated rotation	al spee	d	(r/min)	1500
Max. rotationa	l speed		(r/min)	3000
Moment of ine	rtia		Without brake	6.18
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)		With brake	7.40	
Recommended moment of ine ratio of the load and the rotor				10 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.

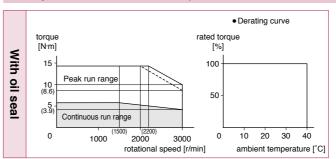
Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

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

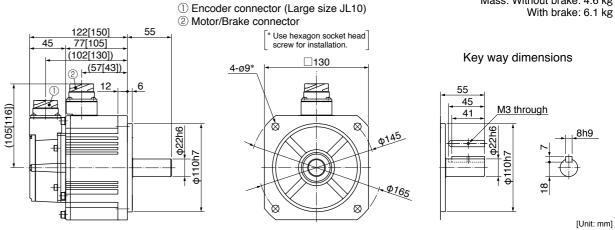
During assembly	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
accombiy	Thrust load B-direction (N)	686
During operation	Radial load P-direction (N)	686
	Thrust load A, B-direction (N)	196

- For details of Note)1 to Note)4, refer to P.165.
- Dimensions of Driver, refer to P.48.
- *1 \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

153 MINAS A6 Family

Imformation

Mass: Without brake: 4.6 kg

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Please contact us for more information

Specifications

		AC200 V		
Motor model*1	del ^{*1} IP67		IP67	MGMF132L1□□M
		Multi	function type	MDDLT55SF
Applicable	Model No	RS48	5 communication type *2	MDDLN55SG
driver		Basic	type *2	MDDLN55SE
	Frame	e sym	bol	D-frame
Power supply	capacity	/	(kVA)	2.3
Rated output			(W)	1300
Rated torque	Rated torque (N·m)		(N·m)	8.28
Continuous sta	all torqu	е	(N·m)	8.28
Momentary Max. peak torque (N·m)		23.3		
Rated current			(A(rms))	9.3
Max. current			(A(o-p))	37
Regenerative			Without option	No limit Note)2
frequency (time			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·m²) Recommended moment of iratio of the load and the roto		With brake	10.4	
			10 times or less	
Rotary encode	er specif	icatio	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.

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)

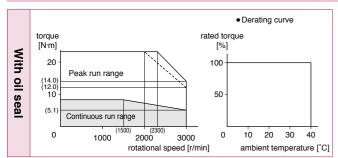
	During assembly During operation	Radial load P-direction (N)	980
		Thrust load A-direction (N)	588
		Thrust load B-direction (N)	686
		Radial load P-direction (N)	686
		Thrust load A, B-direction (N)	196

- 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".

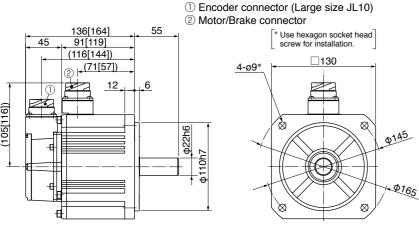
Detail of model designation, refer to P.116.

*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.>)

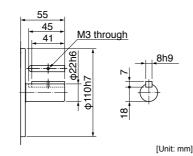


Dimensions



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
		Multif	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	capacity	у	(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 torqu	ue (N⋅m) 28.7
Rated current			(A(rms)) 11.8
Max. current		(A(o-p)) 42	
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) 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 inertiratio of the load and the rotor				10 times or less
Rotary encoder specification		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.

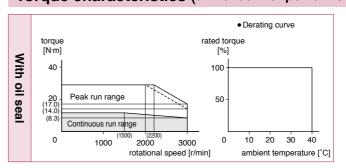
Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79±10 %
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

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

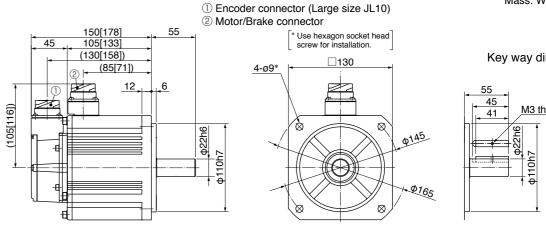
During assembly	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
accombiy	Thrust load B-direction (N)	686
During operation	Radial load P-direction (N)	686
	Thrust load A, B-direction (N)	196

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

Mass: Without brake: 6.9 kg

With brake: 8.4 kg

Key way dimensions

MINAS A6 Family 156

[Unit: mm]

200 V | **MGMF** 2.9 kW

Middle inertia
Low speed/High torque type L176 mm sq.

· Please contact us for more information

Specifications

				AC200 V
Motor model *1			IP67	MGMF292L1□□M
			function type	MFDLTB3SF
Applicable	Model No	RS48	communication type *2	MFDLNB3SG
driver		Basic	type *2	MFDLNB3SE
	Fram	e sym	bol	F-frame
Power supply	capacit	у	(kVA)	7.5
Rated output			(W)	2900
Rated torque			(N·m)	18.5
Continuous sta	all torqu	ie	(N·m)	18.5
Momentary Ma	ax. pea	k torqu	ıe (N·m)	45.2
Rated current			(A(rms))	19.3
Max. current			(A(o-p))	67
Regenerative	Regenerative brake frequency (times/min) Note)1		Without option	No limit Note)2
frequency (time			DV0P4285×2	No limit Note)2
Rated rotation	al spee	d	(r/min)	1500
Max. rotationa	rotational speed		(r/min)	3000
Moment of ine	rtia		Without brake	46.9
of rotor (×10 ⁻⁴ kg·m²) Recommended moment of iratio of the load and the roto			With brake	52.3
			10 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)	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)

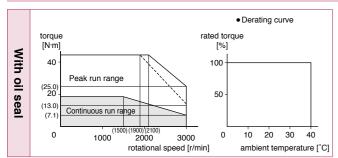
		Radial load P-direction (N)	1666
	During assembly	Thrust load A-direction (N)	784
۵	accombiy	Thrust load B-direction (N)	980
	During operation	Radial load P-direction (N)	1176
		Thrust load A, B-direction (N)	490

- 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".

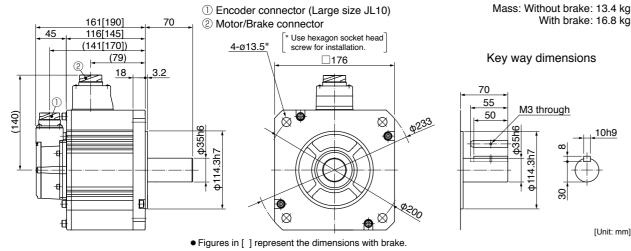
Detail of model designation, refer to P.116.

*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** 4.4 kW

Middle inertia Low speed/High torque type 176 mm sq.

A6 Family

Motor Specifications

Please contact us for more information

Specifications

		AC200 V		
Motor model *1			IP67	MGMF442L1□□M
		Multi	function type	MFDLTB3SF
Applicable	Model No.	RS48	5 communication type *2	MFDLNB3SG
driver	140.	Basic	type *2	MFDLNB3SE
	Fram	e sym	bol	F-frame
Power supply	capacit	y	(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	k torqu	ue (N·m)	70.0
Rated current			(A(rms))	27.2
Max. current	(A(o-p))		(A(o-p))	96
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	58.2
of rotor ($\times 10^{-4} \text{ kg} \cdot \text{m}^2$)			With brake	63.0
Recommended moment of in ratio of the load and the rotor				10 times or less
Rotary encode	r 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.

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)

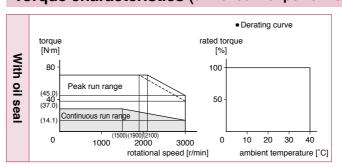
During assembly	Radial load P-direction (N)	1666
	Thrust load A-direction (N)	784
accombiy	Thrust load B-direction (N)	980
During operation	Radial load P-direction (N)	1470
	Thrust load A, B-direction (N)	490

- 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".

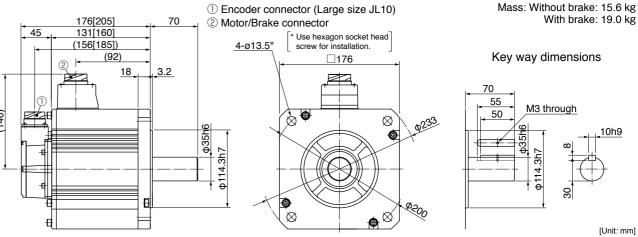
Detail of model designation, refer to P.116.

*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



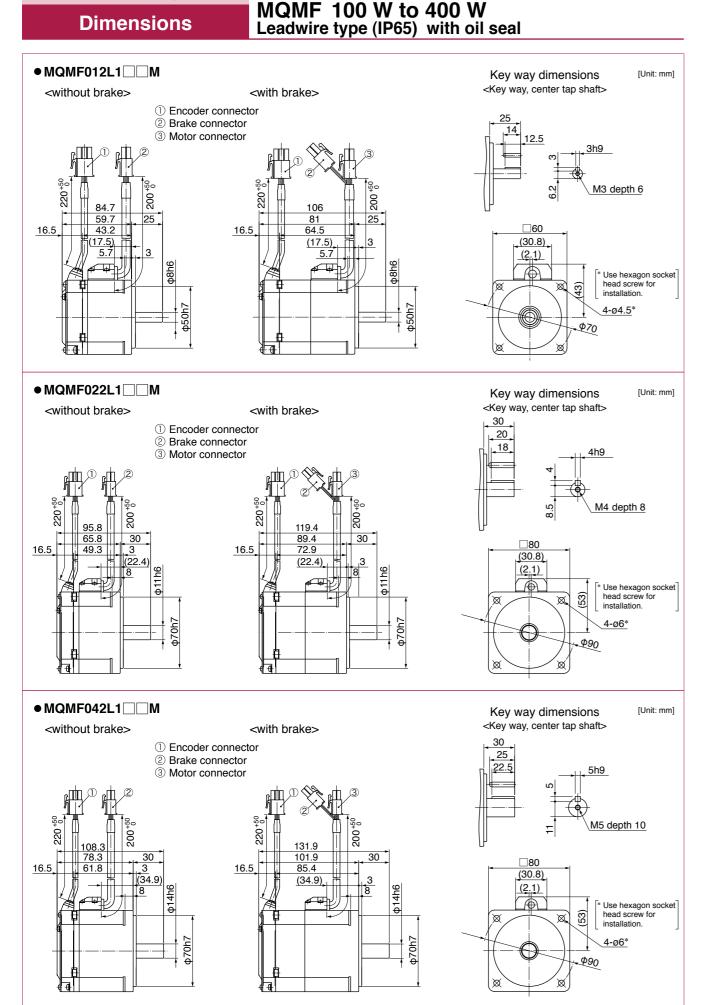
• Figures in [] represent the dimensions with brake. Reduce the moment of inertia ratio if high speed response operation is required. <Cautions>

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

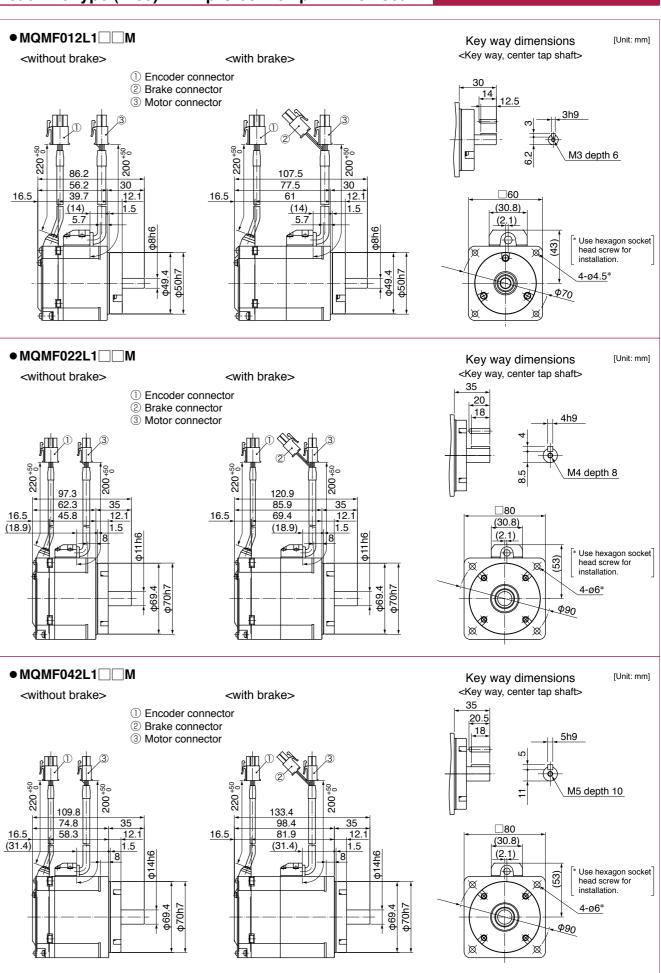
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

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

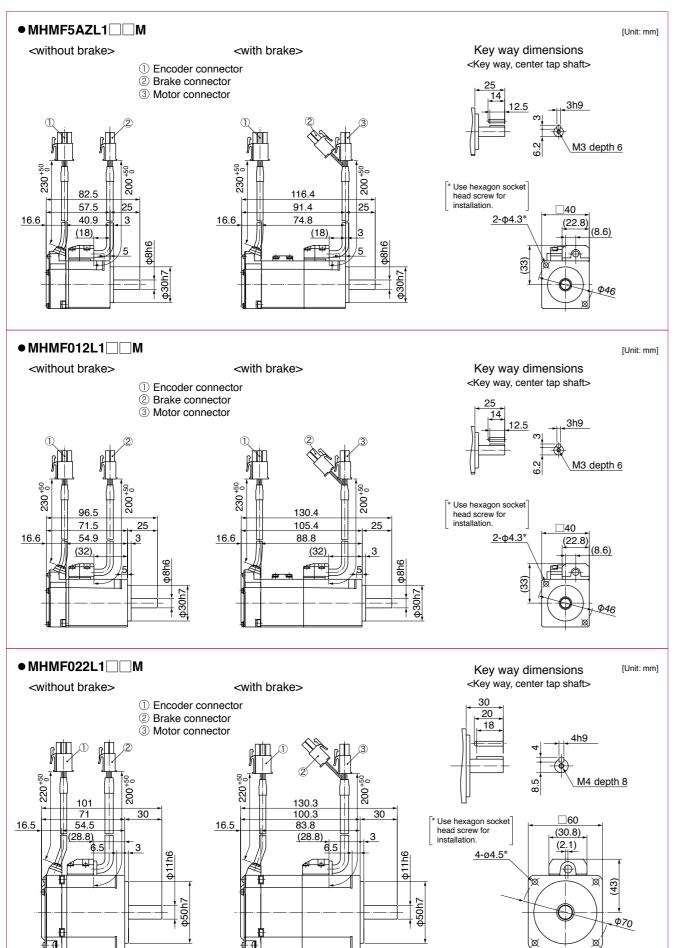
157 MINAS A6 Family



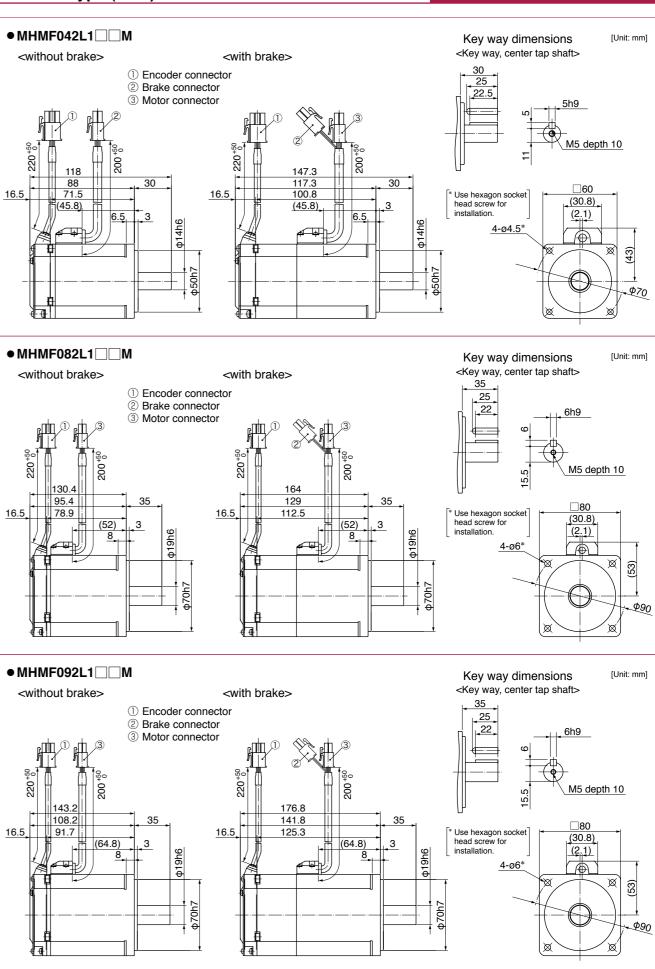
^{*} For motors specifications, refer to P.133 to P.135.



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



^{*} 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 oil seal

161 MINAS A6 Family MINAS A6 Family

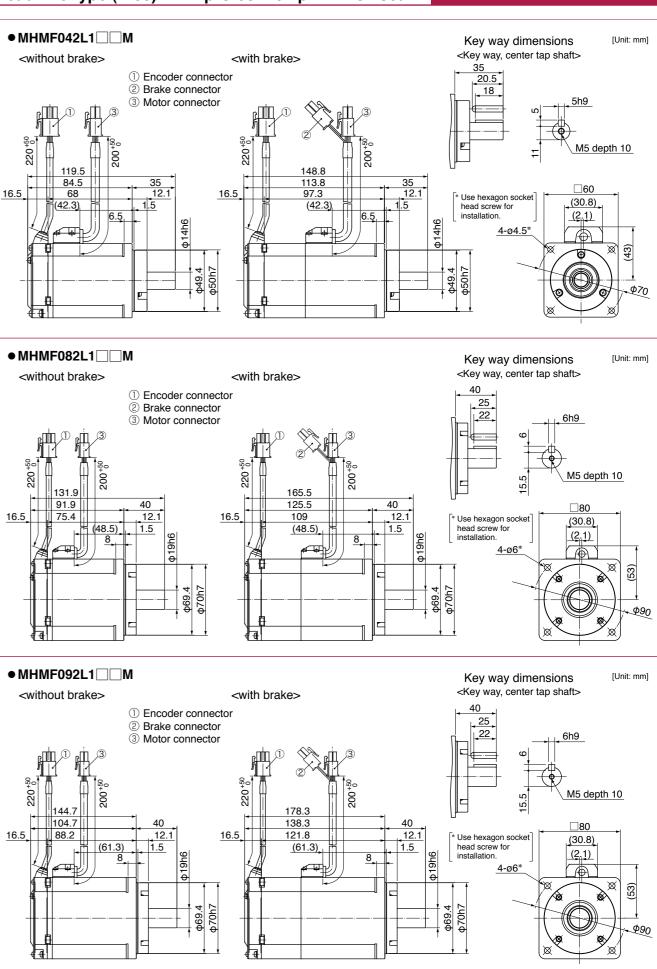
MHMF 50 W to 200 W

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

Special Order Product

Dimensions

● MHMF5AZL1 □ □ M [Unit: mm] Key way dimensions <Key way, center tap shaft> <without brake> <with brake> ① Encoder connector ② Brake connector 3 Motor connector * Use hexagon socket head screw for 87.4 36.9 70.8 (14)● MHMF012L1 □ □ M Key way dimensions [Unit: mm] <without brake> <Key way, center tap shaft> <with brake> ① Encoder connector ② Brake connector (3) Motor connector M3 depth 6 * Use hexagon socket 67.5 101.4 84.8 50.9 12.1 12.1 $(28)_{,}$ (28)● MHMF022L1 □ □ M Key way dimensions [Unit: mm] <Key way, center tap shaft> <without brake> <with brake> ① Encoder connector ② Brake connector 18 3 Motor connector □60 16.5 * Use hexagon socket head screw for (30.8) (2.1)



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

163 MINAS A6 Family MINAS A6 Family 164

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

A6 Family

Motor Specification Description

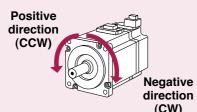
Environmental Conditions

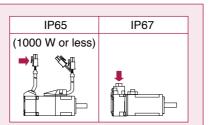
Item		Conditions	
Ambient temperature *1		0 °C to 40 °C (free from freezing)	
Ambient humidity		20 % to 85 % RH (free from condensation)	
Storage tem	nperature *2	-20 °C to 65 °C (Max.temperature guarantee: 80 °C for 72 hours free from condensation *5)	
Storage humidity		20 % to 85 % RH (free from condensation*5)	
Vibration	Motor only	Lower than 49 m/s 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]

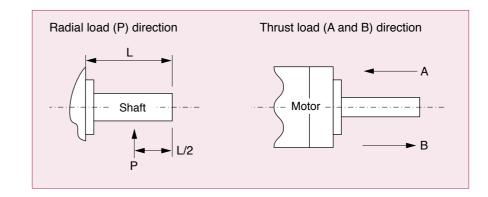
Regenerative brake frequency represents the frequency of the motor's stops from the rated speed with deceleration without load.

- 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

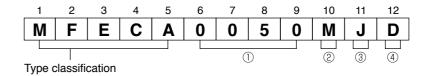
Options

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	total work	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
	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				0.90 ±10 %	24±2.4	1470	2160	. 10000
	5.0 kW	22.0 or more	1.12	110 or less	50 or less			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		0.30	1 or more 24±2.4	39.2	4.9	30000
MHMF (80 mm sq.) or less	200 W, 400 W	1.6 or more	0.018	50 or less	20 or less	0.36		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 %	_	1470	2160	10000
MHMF (100 mm sq.) or more	2.0 kW, 3.0 kW, 4.0 kW	25.0 or more	4.7	80 or less	25 or less	1.29	2 or more 24±2.4	1800	3000	5440
	5.0 kW	44.1 or more	4.1	150 or less	30 or less	±10 %		1800	3100	5108
	1.0 kW, 1.5 kW, 2.0 kW	13.7 or more	1.12	100 or less	EO or loss	0.79 ±10 %		1470	2160	10000
MDMF (100 mm sq.) or more	3.0 kW	22.0 or more	1.12	110 or less	0.90 ±10 %	2 or more	1545	2000	10000	
	4.0 kW	25.0 or more	4.7	80 or less	25 or less	1.29	24±2.4	1800	3000	5440
	5.0 kW	44.1 or more	4.1	150 or less	30 or less	±10 %		1000	3100	5108
MGMF	0.85 kW, 1.3 kW, 1.8 kW	13.7 or more	1.12	100 or less	50 or less	0.79 ±10 %	2 or more	1470	2160	10000
(100 mm sq.) or more	2.9 kW	25.0 or more	4.7	80 or less	25 or less	1.29	24±2.4	1800	3000	5440
(or more /	4.4 kW	44.1 or more	3.93	150 or less	30 or less	±10 %		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

Ε	PVC cable with shie	eld 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

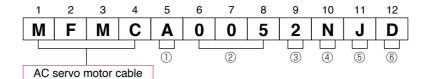
3 Cable end (Encoder side)

	,	
Α	Tyco Electronics Japan G.K. connector	
J	Japan Aviation Electronics Industry, Ltd.	connector (Direction of motor shaft)
K	Japan Aviation Electronics Industry, Ltd.	connector (Opposite direction of motor shaft)
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)

<u> </u>			
D	Connector (Without battery box)		
Е	Connector (With battery box)		

Motor Cable, Brake Cable



① Type classification ④ Cable type

Α	Standard	
В	Special	
i	Design order	

(2) Cable length

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

3 Sectional area of cable core

0.75 mm ²	
1.25 mm ²	
2.0 mm ²	
3.5 mm ²	

ROBO-TOP⊚ is a trade mark of DYDEN CORPORATION

	71	
Ε	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)	
Х	6-wire for A6 series small motor* (Standard bendable type)	

* 80 mm sq. or less

Imformation

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 brake

Connector

for motor

50 W to 1000 W 80 mm sq. or less

• When the motors of <MSMF, MQMF, MHMF (Leadwire type)> are used, they are connected as shown below. Connector: Tyco Electronics Japan G.K. (The figures below show connectors for the motor.)

3

BAT+*

BAT-*

FG(SHIELD)

PS

PS

NC

E5V

E0V

NC



172169-1 23-bit Absolute



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

<Remarks> Do not connect anything to NC.

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

[Connector for motor]

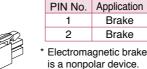
_		\neg	,		
	2	1			
	4	3			^
	172167-1				
		1	abla		J

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

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

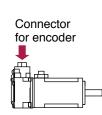
[Connector for Brake]

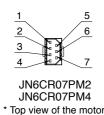




- * Connector pin diagram is viewed from the direction

• 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.)







PΕ

PIN No. Application

U-phase

V-phase

W-phase

Ground

- Tightening torque of the screw (M2) 0.19 N·m to 0.21 N·m FG(SHIELD)
 - * 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>

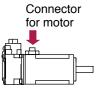


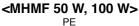
JN8AT04NJ1

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.

* Top view of the motor.

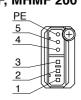






JN11AH06NN2 Top view of the motor.

<MQMF, MHMF 200 W to 1000 W>



JN11AH06NN1 Top view of the motor.

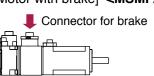
without Brake with Brake PIN No. Application PIN No. Application U-phase U-phase 2 V-phase V-phase W-phase W-phase 3 3 NC 4 Brake NC 5 Brake PΕ Ground PΕ Ground

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.

[Motor with brake] < MSMF>





* Top view of the motor

2 Brake

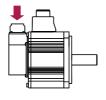
Tightening torque of the screw (M2) PIN No. Application 0.19 N·m to 0.21 N·m Brake

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

0.85 kW to 5.0 kW 100 mm sq. or more

- When the motors of <MSMF, MDMF, MGMF, MHMF> are used, they are connected as shown below. Connector: Made by Japan Aviation Electronics Industry, Ltd. (The figures below show connectors for the motor.)
- Connector for encoder

IP67 motor Connector for encoder (Large size)



IP67 motor Connector for encoder (Small size)



<Large size Encoder connector>



JL10-2A20-29P

23-bit Absolute

20 011710001010			
PIN No.	Application		
Α	NC		
B C	NC		
С	NC		
D	NC		
E F	NC		
	NC		
G	E0V		
Н	E5V		
J	FG(SHIELD)		
K	PS		
L	PS		
М	NC		
N	NC		
Р	NC		
R	NC		
S	BAT-*		
	D.4.T. #		
T	BAT+*		

<Small size Encoder connector>



JN2AS10ML3-R

23-bit Absolute

25-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		
•			

<Remarks>

Do not connect anything to NC.

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

· Connector for motor/brake

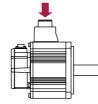
Table for motor connector and brake connector

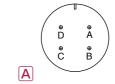
Motor	Mataraut	200 V		
part No.	Motor output	without Brake	with Brake	
MSMF	1.0 kW to 2.0 kW	Α	С	
	3.0 kW to 5.0 kW	В	D	
MDMF	1.0 kW to 2.0 kW	Α	С	
	3.0 kW to 5.0 kW	В	D	

	Motor	Motor cutout	200 V		
	part No.	Motor output	without Brake	with Brake	
	140145	0.85 kW to 1.8 kW	Α	С	
	MGMF	2.9 kW to 4.4 kW	В	D	
		1.0 kW to 1.5 kW	Α	С	
	MHMF	2.0 kW to 5.0 kW	В	D	

* Electromagnetic brake is a nonpolar device

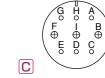






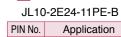
JL10-2E20-4PE-B B

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



JL10-2E20-18PE-B

PIN No.	Application		
G	with Brake	: Brake	
G	without Brak	e: NC	
н	with Brake	: Brake	
п	without Brak	e: NC	
Α	A NC		
F	U-ph	ase	
- 1	V-ph	ase	
В	W-ph	ase	
E Ground		und	
D	D Ground C NC		
С			



PIN No.	Applicat	tion
Α	with Brake :	Brake
А	without Brake:	NC
В	with Brake :	Brake
В	without Brake:	NC
C NC		
D	U-pha:	se
Е	V-phas	se
F	W-phase	
G	Groun	ıd
Н	Ground	
1	NC	

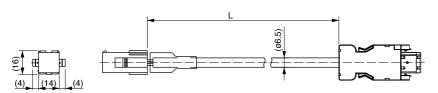
<Remarks> Do not connect anything to NC

Part No.

80 mm sq. or less Applicable model MSMF 50 W to 1000 W, MQMF 100 W to 400 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 ×3P (6-wire)	Oki Electric Cable Co., Ltd.

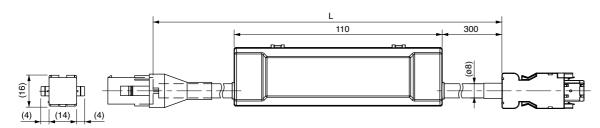
_				
L (m)	Part No.(ex.)			
3	MFECA0030EAD			
5	MFECA0050EAD			
10	MFECA0100EAD			
20	MFECA0200EAD			

Part No.	MFECA0 * * 0EAE	80 mm sq. or less Applicable model	MSMF 50 W to 1000 W, MHMF 50 W to 1000 W (Leadwire type)	MQMF	100 W to 400 W
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]

[Unit: mm]



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 ×4P (8-wire)	Oki Electric Cable Co., Ltd.

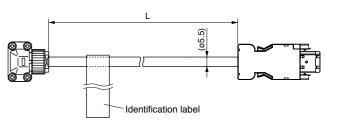
Part No.(ex.)
MFECA0030EAE
MFECA0050EAE
MFECA0100EAE
MFECA0200EAE

Part No.

| MFECA0 ** 0MJD (Highly bendable type, Direction of motor shaft) | MFECA0 ** 0MKD (Highly bendable type, Opposite direction of motor shaft) | MFECA0 ** 0TJD (Standard bendable type, Direction of motor shaft) | MFECA0 ** 0TKD (Standard bendable type, Opposite direction of motor shaft) | MSMF 50 W to 1000 W | MQMF 100 W to 400 W | MHMF 50 W to 1000 W | MHMF 50 W

Direction of motor shaft



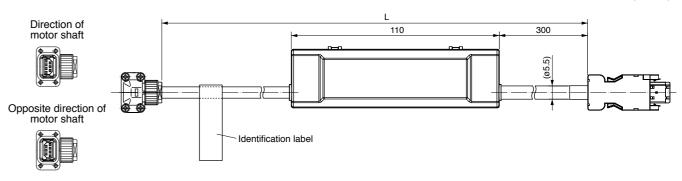


Title	Part No.	Manufacturer	L (m)	Part No.(ex.)
Connector (Driver side)	3E206-0100 KV	Sumitomo 3M	3	MFECA0030MJD
Shell kit	3E306-3200-008	(or equivalent)	5	MFECA0050MJD
Connector (Motor side) JN6FR07SM1 Ja		Japan Aviation	10	MFECA0100MJD
Connector pin	LY10-C1-A1-10000	Electronics Ind.	20	MFECA0200MJD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

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

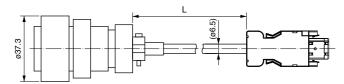
L (m)	Part No.(ex.)
3	MFECA0030MJE
5	MFECA0050MJE
10	MFECA0100MJE
20	MFECA0200MJE

[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 lock="" one-touch="" type=""></large>		

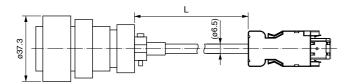


[Unit: mm]

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 x3P (6-wire)	Oki Electric Cable Co., Ltd.	

	L (m)	Part No.(ex.)		
	3	MFECA0030EPD		
	5	MFECA0050EPD		
	10	MFECA0100EPD		
	20	MFECA0200EPD		
1				

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]

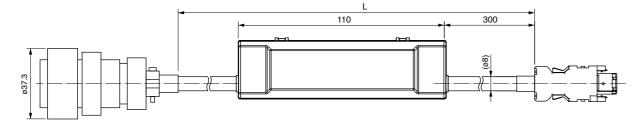
Title	Part No.	Manufacturer
Connector (Driver side)	3E206-0100 KV	Sumitomo 3M
Shell kit	3E306-3200-008	(or equivalent)
Connector (Motor side)	N/MS3106B20-29S	Japan Aviation
Cable clamp	N/MS3057-12A	Electronics Ind.
Cable	0.2 mm ² x3P (6-wire)	Oki Electric Cable Co., Ltd.

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) *		
opeomoations	<large lock="" one-touch="" td="" type<=""><th>e></th><td></td></large>	e>	

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

[Unit: mm]



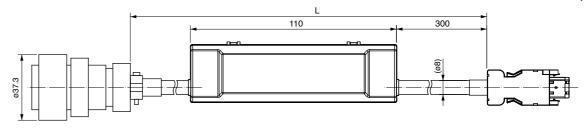
Title	Part No.	Manufacturer
Connector (Driver side)	r (Driver side) 3E206-0100 KV Sumitomo 3M	
Shell kit	3E306-3200-008	(or equivalent)
Connector (Motor side)	or side) JL10-6A20-29S-EB Japan Aviation	
Cable clamp	JL04-2022CK(09)-R	Electronics Ind.
Cable	0.2 mm ² ×3P (6-wire)	Oki Electric Cable Co., Ltd.

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>	Vhen used in ab	solute system (with battery box) *

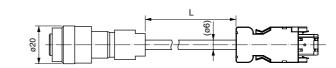
* Battery is not included. Please buy the absolute encoder battery "DV0P2990" separately.

П	Init:	m



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 x4P (8-wire)	Oki Electric Cable Co., Ltd.		

[Unit: mm]



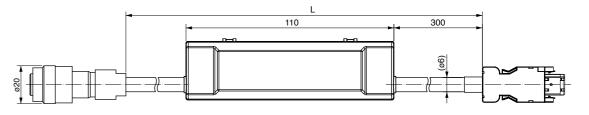
Title	Part No.	Manufacturer	L (m)	Part No.(ex.)
Connector (Driver side)	3E206-0100 KV	Sumitomo 3M	3	MFECA0030ETD
Shell kit	3E306-3200-008	(or equivalent)	5	MFECA0050ETD
Connector (Motor side)	JN2DS10SL1-R	Japan Aviation	10	MFECA0100ETD
Connector pin	JN1-22-22S-PKG100	Electronics Ind.	20	MFECA0200ETD
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 V <small lock="" one-touch="" th="" type<=""><th></th><th>solute system (with battery box) *</th></small>		solute system (with battery box) *

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

[Unit: n

MINAS A6 Family 174



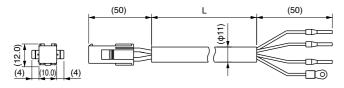
Title	Part No.	Manufacturer	L (m)	Р
Connector (Driver side)	3E206-0100 KV	Sumitomo 3M	3	MF
Shell kit	3E306-3200-008	(or equivalent)	5	MF
Connector (Motor side)	JN2DS10SL1-R	Japan Aviation	10	MF
Connector pin	JN1-22-22S-PKG100	Electronics Ind.	20	MF
Cable	0.2 mm ² ×3P (6-wire)	Oki Electric Cable Co., Ltd.		

L (m)	Part No.(ex.)	
3	MFECA0030ETE	
5	MFECA0050ETE	
10	MFECA0100ETE	
20	MFECA0200ETE	

Motor Cable (without Brake)

* It doesn't correspond to IP65 and IP67.

MQMF 100 W to 400 W MSMF 50 W to 1000 W, 80 mm sq. or less MFMCA0 * * 0EED MHMF 50 W to 1000 W Part No. Applicable model (Leadwire type)



Title	Part No.	Manufacturer		
Connector	172159-1	Tyco Electronics Japan		
Cable clamp	170366-1	G.K.		
Rod terminal	AI0.75-8GY	PHOENIX CONTACT		
Nylon insulated round terminal	N1.25-M4	J.S.T Mfg. Co., Ltd.		
Cable	ROBO-TOP 600V 0.75 mm ² 4-wire	DYDEN CORPORATION		

	L (m)	Part No.(ex.)
	3	MFMCA0030EED
	5	MFMCA0050EED
	10	MFMCA0100EED
	20	MFMCA0200EED
ı I		

	MFMCA0 * * 0NJD (Highly bendable type, Direction of motor shaft)		MSI
Part No.	MFMCA0 * * 0RJD (Standard bendable type, Direction of motor shaft)	80 mm sq. or less	(Co
Part No.	MFMCA0 * * ONKD (Highly bendable type, Opposite direction of motor shaft)	Applicable model	MSN
	MFMCA0 * * ORKD (Standard bendable type, Opposite direction of motor shaft)	IIIOUGI	(Co

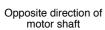
(28.8)

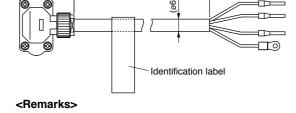
SMF 50 W to 1000 W onnector type) SMF 200 W to 1000 W onnector type)

[Unit: mm]

[Unit: mm]





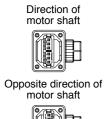


Motor cable for opposite direction of motor shaft cannot be used with a motor 50 W and 100 W.

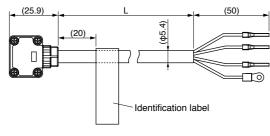
Title	Title Part No.	
Connector	JN8FT04SJ1	Japan Aviation
Cable clamp	ST-TMH-S-C1B-3500	Electronics Ind.
Rod terminal	AI0.75-8GY	PHOENIX CONTACT
Nylon insulated round terminal	N1.25-M4	J.S.T Mfg. Co., Ltd.
Cable	AWG18 4-wire (φ6.7 mm)	Hitachi Cable, Ltd.

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]



175 MINAS A6 Family



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 =10 Opposite direction of motor shaft 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 CO.,LTD		

Part No.	MFMCDO * * 2EUD	ADDITCADLE IIIOUEL	MHMF	1.0 kW to 2.0 kW, 1.0 kW, 1.5 kW, ouch lock type>		1.0 kW to 2.0 kW 0.85 kW to 1.8 kW
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Title	Title Part No. Manufactu		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
----------	-----------------	--	------	--	--	---------------------------------------

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		

[Unit: mm]

Imformation

[Unit: mm]

[Unit: mm]

Part No.(ex.)

Part No. MFMCEO * * 2ECD

Motor Cable (with Brake)

* It doesn't correspond to IP65 and IP67.

Options

A6 Family

* It doesn't correspond to IP65 and IP67.

Motor Cable (without Brake)

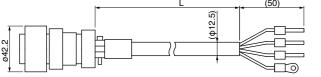
MHMF 2.0 kW <Screwed type>

Part No. MFMCEO * * 2EUD

100 mm sq. or more Applicable model

MHMF 2.0 kW <One-touch lock type>

[Unit: mm]



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		

(50)

Title	Part No.	Manufacturer	
Connector	JL04V-6A22-22SE-EB-R	Japan Aviation	
Cable clamp	JL04-2022CK(14)-R	Electronics Ind.	
Rod terminal	NTUB-2	J.S.T Mfg. Co., Ltd.	
Nylon insulated round terminal	N2-M4	J.S.T Mfg. Co., Ltd.	
Cable	ROBO-TOP 600V 2.0 mm ² 4-wire	DYDEN CORPORATION	

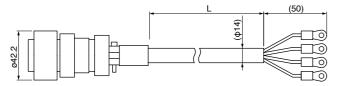
L (m)	Part No.(ex.)
3	MFMCE0032ECD
5	MFMCE0052ECD
10	MFMCE0102ECD
20	MFMCE0202ECD

[Unit: mm]

[Unit: mm]

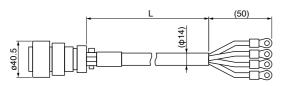
[Unit: mm]

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
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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, MDMF 3.0 kW to 5.0 kW, MGMF 3.0 kW to 5.0 kW, MDMF 3.0 kW to 5.0 kW, MGMF	F	



Title	Part No.	Manufacturer	
Connector	JL04V-6A22-22SE-EB-R	Japan Aviation	
Cable clamp	JL04-2022CK(14)-R	Electronics Ind.	Г
Nylon insulated round terminal	N5.5-5	J.S.T Mfg. Co., Ltd.	
Cable	ROBO-TOP 600V 3.5 mm ² 4-wire	DYDEN CORPORATION	

L (m)		Part No.(ex.)
	3	MFMCA0033ECT
	5	MFMCA0053ECT
	10	MFMCA0103ECT
	20	MFMCA0203ECT

Part No.

MFMCA0 * * 7VFD (Movable/fixed common-use, direction of motor shaft)

MFMCA0 * * 7VGD (Movable/fixed common-use, or less Applicable model)

MFMCA0 * * 7VGD (Movable/fixed common-use, opposite direction of motor shaft)

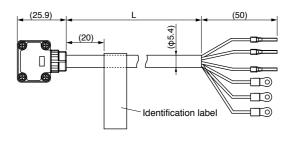
MHMF 50 W, 100 W (Connector type)

[Unit: mm]



Opposite direction of motor shaft



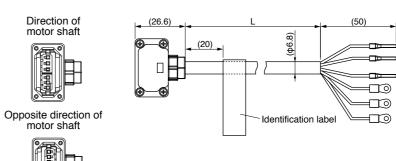


Title	Part No.	Manufacturer	L (m)	Part No.(ex.)
Connector	JN11FH06SN2	Japan Aviation	3	MFMCA0037VFD
Cable clamp	JN11S10K4A1	Electronics Ind.	5	MFMCA0057VFD
Rod terminal	AI0.75-8GY	PHOENIX CONTACT	10	MFMCA0107VFD
Nylon insulated round terminal	N1.25-M4	J.S.T Mfg. Co., Ltd.	20	MFMCA0207VFD
Cable	AWG22 6-wire (φ5 4 mm)	NIKKO ELECTRIC WIRE COLLTD		

Part No.	MFMCA0 * * 0VFD (Highly bendable type, Direction of motor shaft)	00 mm om	
	MFMCA0 * * 0VGD (Highly bendable type, Opposite direction of motor shaft)	80 mm sq. or less Applicable model	MQMF MHMF
	MFMCA0 * * 0XFD (Standard bendable type, Direction of motor shaft)		(Conr
	MFMCA0 * * 0XGD (Standard bendable type, Opposite direction of motor shaft)	Illouei	(

MQMF 100 W to 400 W MHMF 200 W to 1000 W (Connector type)

[Unit: mm]



Title	Part No.	Manufacturer
Connector	JN11FH06SN1	Japan Aviation
Cable clamp	JN11S35H3A1	Electronics Ind.
Rod terminal	AI0.75-8GY	PHOENIX CONTACT
Nylon insulated round terminal	N1.25-M4	J.S.T Mfg. Co., Ltd.
Cable	AWG18 6-wire (φ6.8 mm)	NIKKO ELECTRIC WIRE CO.,LTD

L (m)	Part No.(ex.)			
3	MFMCA0030VFD			
5	MFMCA0050VFD			
10	MFMCA0100VFD			
20	MFMCA0200VFD			

Family

Imformation

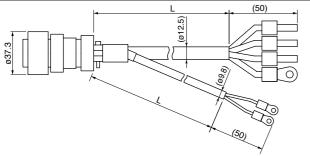
Motor Cable (with Brake)

* It doesn't correspond to IP65 and IP67.

Part No. MFMCA0 * * 2FUD

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 <One-touch lock type>



			/
Title		Part No.	Manufacturer
Connecto	r	JL10-6A20-18SE-EB	Japan Aviation
Cable clamp		JL042022CK(14)-R	Electronics Ind.
Rod termir	nal	NTUB-2	J.S.T Mfg. Co., Ltd.
Nylon insulated	Earth	N2-M4	J.S.T Mfg. Co., Ltd.
round terminal	Brake	N1.25-M4	J.S. 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
ı		

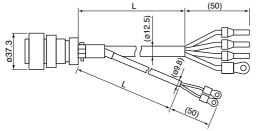
[Unit: mm]

[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>



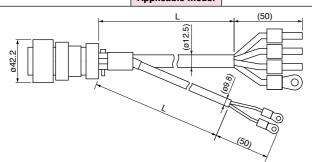
		4/	
Title		Part No.	Manufacturer
Connecto	r	JL04V-6A20-18SE-EB-R	Japan Aviation
Cable clan	np	JL04-2022CK(14)-R	Electronics Ind.
Rod termir	nal	NTUB-2	J.S.T Mfg. Co., Ltd.
Nylon insulated	Earth	N2-M4	J.S.T Mfg. Co., Ltd.
round terminal	Brake	N1.25-M4	3.3.1 Wilg. Co., Etc.
Cable		ROBO-TOP 600V 2.0 mm ² 4-wire ROBO-TOP 600V 0.75 mm ² 2-wire	DYDEN CORPORATION
		NOBO-TOF 600 V 0.75 IIIII 2-WILE	

L (m)	Part No.(ex.)
3	MFMCA0032FCD
5	MFMCA0052FCD
10	MFMCA0102FCD
20	MFMCA0202FCD

MFMCE0 * * 2FUD

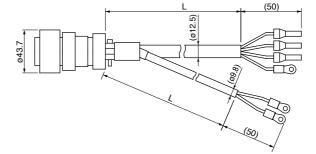
100 mm sq. or more Applicable model

MHMF 2.0 kW <One-touch lock type>



Title		Part No.	Manufacturer
Connector		JL10-6A24-11SE-EB	Japan Aviation
Cable clamp		JL04-2428CK(17)-R	Electronics Ind.
Rod termin	nal	NTUB-2	J.S.T Mfg. Co., Ltd.
Nylon insulated	Earth	N2-M4	J.S.T Mfg. Co., Ltd.
round terminal	Brake	N1.25-M4	J.S. 1 Wilg. Co., Ltd.
Cable		ROBO-TOP 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			

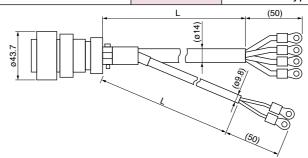


·						
Title		Part No.	Manufacturer	L (m)	Part No.(ex.)	
Connector		JL04V-6A24-11SE-EB-R	Japan Aviation	3	MFMCE0032FCD	
Cable clamp		JL04-2428CK(17)-R	Electronics Ind.	5	MFMCE0052FCD	
Rod terminal		NTUB-2	J.S.T Mfg. Co., Ltd.	10	MFMCE0102FCD	
Nylon insulated Earth		N2-M4	LS T Mfg. Co. Ltd	20	MFMCE0202FCD	
round terminal Brake		N1.25-M4	J.S.T Mfg. Co., Ltd.			
Cable		ROBO-TOP 600V 2.0 mm ² 4-wire ROBO-TOP 600V 0.75 mm ² 2-wire	DYDEN CORPORATION			

Part No.	MFMCA0 * * 3FUT	100 mm sq. or more Applicable model	MHMF	3.0 kW to 5.0 kW, 3.0 kW to 5.0 kW, such lock type>	
	-	L	(50)	→	[Unit: mm]

Title		Part No.	Manufacturer	L (m)	Part No.(ex.)
Connector		JL10-6A24-11SE-EB	Japan Aviation	3	MFMCA0033FUT
Cable clamp		JL04-2428CK(17)-R	Electronics Ind.	5	MFMCA0053FUT
Nylon insulated	Earth	N5.5-5	LC T Mfa Co. Ltd	10	MFMCA0103FUT
round terminal	Brake	N1.25-M4	J.S.T Mfg. Co., Ltd.		MFMCA0203FUT
Cable		ROBO-TOP DP6/2501 3.5 mm ² 4-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 Connector Cable clamp		Part No.	Manufacturer
		JL04V-6A24-11SE-EB-R	Japan Aviation
		JL04-2428CK(17)-R	Electronics Ind.
Nylon insulated	Earth	N5.5-5	LC T Mfc Co Ltd
round terminal	Brake	N1.25-M4	J.S.T Mfg. 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	

179 MINAS A6 Family MINAS A6 Family 180

[Unit: mm]

Direction of motor shaft

Part No.

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 Applicable model (Leadwire type)

[Unit: mm]

[Unit: mm]

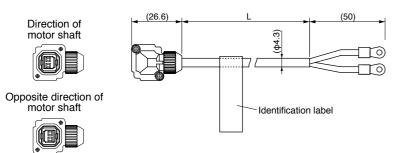
Part No.(ex.) MFMCB0030GET MFMCB0050GET

MFMCB0100GET

MFMCB0200GET

Title	Part No.	Manufacturer	L (m)
Connector	172157-1	Tyco Electronics Japan	3
Connector pin	170366-1, 170362-1	G.K.	5
Nylon insulated round terminal	N1.25-M4	J.S.T Mfg. Co., Ltd.	10
Cable	ROBO-TOP 600V 0.75 mm ² 2-wire	DYDEN CORPORATION	20

	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)		



Title	Part No.	Manufacturer	L (m)	Part No.(ex.)
Connector	JN4FT02SJMR	Japan Aviation	3	MFMCB0030PJT
Connector pin	ST-TMH-S-C1B-3500	Electronics Ind.	5	MFMCB0050PJT
Nylon insulated round terminal	N1.25-M4	J.S.T Mfg. Co., Ltd.	10	MFMCB0100PJT
Cable	AWG22 2-wire (φ4.3)	Hitachi Cable, Ltd.	20	MFMCB0200PJT

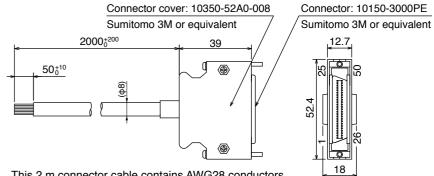
Interface Cable

Options

A6 Family

Cable for Interface

Part No. DV0P4360



This 2 m connector cable contains AWG28 conductors.

[Unit: mm]

· Table for wiring

	9								
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

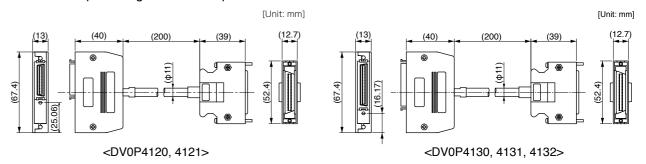
Part No. DV0P4120, 4121, 4130, 4131, 4132

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.



Imformation

[Unit: mm]

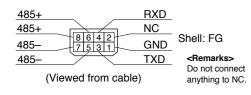
Connector Kit for Communication Cable (for RS485, RS232) (Excluding A6 SE Series)

Part No. DV0PM20024

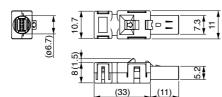
Components

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



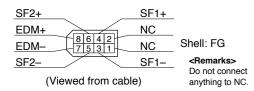
Connector Kit for Safety (Excluding A6 SE, A6 SG Series)

Part No. DV0PM20025

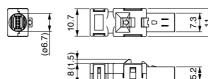
Components

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	

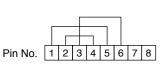
 Internal wiring (Wiring of the following has been applied inside the plug.)

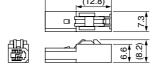
· Dimensions (Resin color : black)

[Unit: mm]

[Unit: mm]

[Unit: mm]





<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".

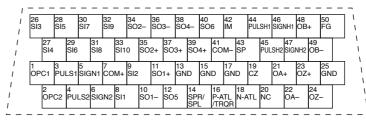
Connector Kit for Interface

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.

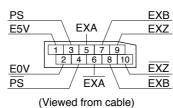
Connector Kit for External Scale (Excluding A6 SE, A6 SG Series)

Part No. DV0PM20026

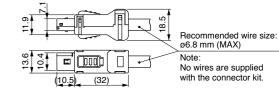
· Components

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



Dimensions



Connector Kit for Encoder

Part No. DV0PM20010

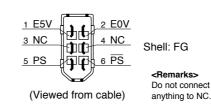
Components

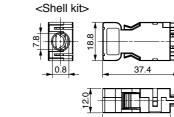
Title	Part No.	Manufacturer	Note	
Connector (Driver side)	3E206-0100 KV	Sumitomo 3M	For Connector X6	
Shell kit	3E306-3200-008	(or equivalent)	For Connector X6	

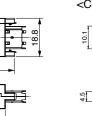
Pin disposition of connector, connector X6

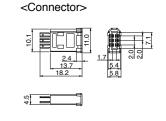
Dimensions

[Unit: mm]









<Remarks>

Connector X1: use with commercially available cable.

· Configuration of connector X1: USB mini-B



Connector Kit for Motor/Encoder Connection

Connector Kit for Power Supply Input

Part No. DV0PM20032 (For A-frame to D-frame: Single row type)

Components

• Please refer to the Dimensions of driver P.47 for connector XA.

Title	Part No.	Number	Manufacturer	Note
Connector	05JFAT-SAXGF	1	LC T Mfa Co. Ltd	For Connector XA
Handle lever	J-FAT-OT	2	J.S.T Mfg. Co., Ltd.	FOI COIIIIECTOI XA

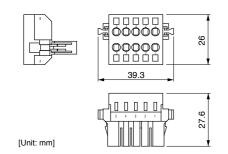
Connector Kit

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 Mfa Co. Ltd	For Connector XA
Handle lever	J-FAT-OT	2	J.S.T Mfg. Co., Ltd.	For Connector XA

Dimensions



* When connection multiple axes in series, make sure the sum of the current value does not exceed the rated current (11.25 A) of DV0PM20033.

Remarks · 🔆

When using drivers MDDL * 55 * * in single-phase power supply, do not use DV0PM20033.

Driver part No.	Power supply	Rated input current
MADL*01**	Single phase 100 V	1.7 A
MADL*11**	Single phase 100 V	2.0 A
MADL*05**	Single phase/3-phase 200 V	1.6 A/0.9 A
MADL*15**	Single phase/3-phase 200 V	2.0 A/1.1 A
MBDL * 21 * *	Single phase 100 V	4.5 A
MBDL * 25 * *	Single phase/3-phase 200 V	3.7 A/2.1 A
MCDL * 31 * *	Single phase 100 V	7.0 A
MCDL * 35 * *	Single phase/3-phase 200 V	6.4 A/3.4 A
MDDL*45**	Single phase/3-phase 200 V	7.9 A/4.6 A
MDDL*55**	Single phase/3-phase 200 V	13.6 A/7.2 A

Part No. DV0PM20044 (For E-frame)

Components

Title	Part No.	Number	Manufacturer	Note
Connector	05JFAT-SAXGSA-L	1	LC T 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 F-frame)
Part No.	DVUPIVI20043	(FOI E-ITAILIE)

Components

Title	Part No.	Number	Manufacturer	Note
Connector	04JFAT-SAXGSA-L	1	LC T Mfa Co. Ltd	200 V: For Connector XC
Handle lever	J-FAT-OT-L	2	J.S.T Mfg. Co., Ltd.	* Jumper wire is included.

<Remarks>

• For crimp tool etc., necessary to produce a cable, access the web site of the manufacturer or consult with the manufacturer for details. For inquiries of manufacturer, refer to P.200 "List of Peripheral Equipments".

Connector Kit for Motor Connection (Driver side)

Part No. DV0PM20034 (For A-frame to D-frame

Components

• Please refer to the Dimensions of driver P.47 for connector XB

Title	Part No.	Number	Manufacturer	Note
Connector	06JFAT-SAXGF	1	LC T 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 AB

Connector Kit for Motor/Encoder Connection

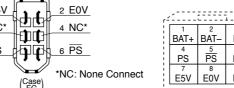
* When IP65 or IP67 are necessary, the customer must give appropriate processing.

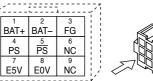
Part No.	DV0P4290	80 mm sq. or less Applicable model	MSMF 50 W to 1000 W *, MQMF 100 W to 400 W MHMF 50 W to 1000 W *
		Applicable filodel	(Leadwire type IP65)

Components

Part No.	Number	Manufacturer	Note
3E206-0100 KV	3E206-0100 KV 1 Sumitomo 3M	Far Canada VC (Caina)	
3E306-3200-008	1	(or equivalent)	For Connector X6 (6-pins)
172161-1 1 Tyco Electronics Japan 170365-1 9 G.K.	Tyco Electronics Japan	For Encoder cable	
	G.K.	(9-pins)	
172159-1	1	Tyco Electronics Japan	For Motor cable
170366-1 4 G.K.	(4-pins)		
	3E206-0100 KV 3E306-3200-008 172161-1 170365-1 172159-1	3E206-0100 KV 1 3E306-3200-008 1 172161-1 1 170365-1 9 172159-1 1	3E206-0100 KV 1 Sumitomo 3M 3E306-3200-008 1 (or equivalent) 172161-1 1 Tyco Electronics Japan 170365-1 9 G.K. 172159-1 1 Tyco Electronics Japan

· Pin disposition of connector, · Pin disposition of connector connector X6 for encoder cable









for motor cable

Pin disposition of connector

* 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>

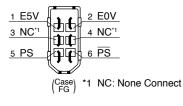
• For crimp tool etc., necessary to produce a cable, access the web site of the manufacturer or consult with the manufacturer for details. For inquiries of manufacturer, refer to P.200 "List of Peripheral Equipments".

Part No.	DV0PM20035	80 mm sq. or less Applicable model	MSMF	50 W to 1000 W * (Connector type IP67)

Components

Title	Part No.	Number	Manufacturer	Note
Connector (Driver side)	3E206-0100 KV	1	Sumitomo 3M	For Connector 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	JN8FT04SJ1	1	Japan Aviation	For Motor cable
Socket contact	ST-TMH-S-C1B-3500	4	Electronics Ind.	(4-pins)

• Pin disposition of connector • Pin disposition of connector connector X6



for encoder cable

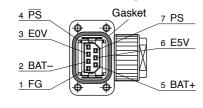
5 BAT+

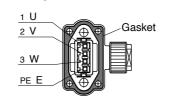
6 E5V

· Pin disposition of connector for motor cable

* MSMF092L1 1

[Direction of motor shaft]





[Opposite direction of motor shaft]

Gasket 1 FG

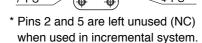
2 BAT-

3 E0V

<Remarks>

Secure the gasket in place without removing it from the connector.

Otherwise, the degree of protection of IP67 will not be guaranteed.



3 W

<Remarks>

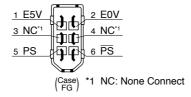
· For crimp tool etc., necessary to produce a cable, access the web site of the manufacturer or consult with the manufacturer for details. For inquiries of manufacturer, refer to P.200 "List of Peripheral Equipments".

80 mm sq. or less DV0PM24581 MHMF 50 W, 100 W (Connector type IP67) Part No. Applicable model

Components

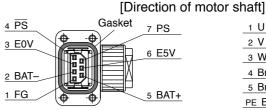
Title	Part No.	Number	Manufacturer	Note
Connector (Driver side)	3E206-0100 KV	1	Sumitomo 3M	For Connector X6 (6-pins)
Shell kit	3E306-3200-008	1	(or equivalent)	For Connector A6 (6-pins)
Encoder connector	JN6FR07SM1	1	Japan Aviation	For Encoder cable
Socket contact	LY10-C1-A1-10000	7	Electronics Ind.	(7-pins)
Motor connector	JN11FH06SN2	1	Japan Aviation	For Motor cable
Socket contact	JN11S10K4A1	6	Electronics Ind.	(6-pins)

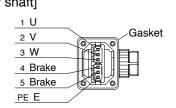
connector X6



• Pin disposition of connector • Pin disposition of connector for encoder cable

· Pin disposition of connector for motor cable

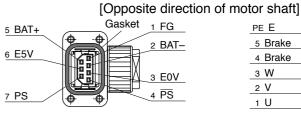




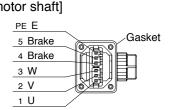
<Remarks>

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.



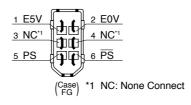
* 4-pin and 5-pin are not used in case of no brake.

Oort No	DV0PM24582	80 mm sq. or less	MQMF 100 W to 400 W,	MHMF 200 W to 1000 W	
art No.	DV0PW24562	Applicable model	(Connector type IP67)		

· Components

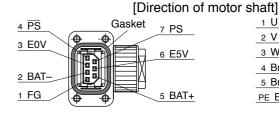
Title	Part No.	Number	Manufacturer	Note
Connector (Driver side)	3E206-0100 KV	1	Sumitomo 3M	For Connector V6 (6 pine)
Shell kit	3E306-3200-008	1	(or equivalent)	For Connector X6 (6-pins)
Encoder connector	JN6FR07SM1	1	Japan Aviation	For Encoder cable
Socket contact	LY10-C1-A1-10000	7	Electronics Ind.	(7-pins)
Motor connector	JN11FL06SN1	1	Japan Aviation	For Motor cable
Socket contact	JN11S35H3A1	6	Electronics Ind.	(6-pins)

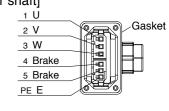
connector X6



• Pin disposition of connector • Pin disposition of connector for encoder cable

· Pin disposition of connector for motor cable

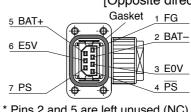




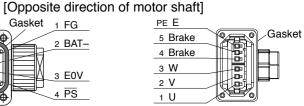
<Remarks>

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.

Connector Kit for Motor/Encoder Connection

* When IP65 or IP67 are necessary, the customer must give appropriate processing.

Part No. DV0PM24583 100 mm sq. or more Applicable model (IP67 motor) E MSMF 1.0 kV MHMF 1.0 kV

(IP67 motor) Encoder JN2 <Small size connector>
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
Without brake

Components

* MSMF102L1 , MHMF102L1 .

* MSMF102L1 ..., MHMF102L1 ...

 Comp 	onents
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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	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)

(IP67 motor) Encoder JN2 <Small size connector>
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

With brake

Without

brake

Components

Title	Part No.	Number	Manufacturer	Note
Connector (Driver side)	3E206-0100 KV	1	Sumitomo 3M	For Connector VC (C nine)
Shell kit	3E306-3200-008	1	(or equivalent)	For Connector X6 (6-pins)
Encoder connector	JN2DS10SL1-R	1	Japan Aviation	For Encoder cable
Connector pin	JN1-22-22S-PKG100	5	Electronics Ind.	(One-touch lock type)
Motor connector	JL10-6A20-18SE-EB	1	Japan Aviation	For Motor cable
Cable clamp	JL04-2022-CK(14)-R	1	Electronics Ind.	(One-touch lock type)

(IP67 motor) Encoder JL10 <Large size connector>
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

* MSMF102L1 ____, MHMF102L1 ____

* MSMF102L1 , MHMF102L1 .

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	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
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(IP67 motor) Encoder JL10 <Large size connector>
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
With

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 Corniector Ao (o-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 on or more	MSMF	notor) Encoder JN2 < 3.0 kW to 5.0 kW, 2.0 kW to 5.0 kW,	MDMF		Witho brak
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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	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,	MDMF	3.0 kW to 5.0 kW	With brake
			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 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	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. DV0PM245	100 mm sq. or more Applicable model	TO 5.U KVV I.	١.	thout ake	1
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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 At (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.	DV0PM24590 100 mm sq. or mor Applicable mode	INSIDE SUKVITOSUKVI MIDIME SUKVITOSUKVI I	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	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".

189 MINAS A6 Family

Connector Kit for Motor/Encoder Connection

* When IP65 or IP67 are necessary, the customer must give appropriate processing.

* MSMF102L1 ____, MHMF102L1 ____

* MSMF102L1 ____, MHMF102L1 ____

* MSMF102L1 , MHMF102L1 .

Components

Title	Part No.	Number	Manufacturer	Note
Connector (Driver side)	3E206-0100 KV	1	Sumitomo 3M	For Connector V6 (6 pine)
Shell kit	3E306-3200-008	1	(or equivalent)	For Connector X6 (6-pins)
Encoder connector	JN2DS10SL1-R	1	Japan Aviation	For Encoder cable
Connector pin	JN1-22-22S-PKG100	5	Electronics Ind.	(One-touch lock type)
Motor connector	JL04V-6A20-4SE-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	\parallel MSMF 1.0 kW $^{\circ}$ 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 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	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	MSME 10 KW * to 20 KW MDME 10 KW to 20 KW	Vithout orake
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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.	70P4330 100 mm sq. or mo	MSME 10 kW fo 20 kW MDME 10 kW to 20 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	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 (IP67 motor) Encoder JN2 <small 2.0="" 3.0="" 5.0="" kw="" kw,="" mdmf="" mgmf<="" mhmf="" msmf="" size="" th="" to=""><th>3.0 kW to 5.0 kW</th><th></th></small>	3.0 kW to 5.0 kW	
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Components

Title Part No.		Number	Manufacturer	Note	
Connector (Driver side)	3E206-0100 KV	Odinitorilo olvi		For Connector X6 (6-pins)	
Shell kit	3E306-3200-008				
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 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-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 r Applicable m	. MSME 30 KW TO 50 KW MIDIME 30 KW TO 50 KW 1.	Without brake	1
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Components

Title Part No.		Number	Manufacturer	Note	
Connector (Driver side)	3E206-0100 KV	1	Sumitomo 3M	For Connector 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/MS3106B22-22S	1	Japan Aviation	For Motor cable	
Cable clamp	N/MS3057-12A	1	Electronics Ind.	(Screwed type)	

Part No.	DV0P4340	100 mm sq. or more Applicable model	MSMF	otor) Encoder JL10 3.0 kW to 5.0 kW, 2.0 kW to 5.0 kW,	MDMF	3.0 kW to 5.0 kW	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 At (6-pins)
Encoder connector	N/MS3106B20-29S	1	Japan Aviation	For Encoder cable
Cable clamp	N/MS3057-12A	1	Electronics Ind.	(Screwed type)
Motor connector	N/MS3106B24-11S	1	Japan Aviation	For Motor cable
Cable clamp	N/MS3057-16A	1	Electronics Ind.	(Screwed type)

<Remarks>

• For crimp tool etc., necessary to produce a cable, access the web site of the manufacturer or consult with the manufacturer for details. For inquiries of manufacturer, refer to P.200 "List of Peripheral Equipments".

191 MINAS A6 Family 192

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

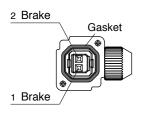
· Pin disposition of connector for brake cable

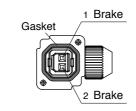
[Direction of motor shaft]

[Opposite direction of motor shaft]

Connector Kit for Motor/Brake Connection

* When IP65 or IP67 are necessary, the customer must give appropriate processing.





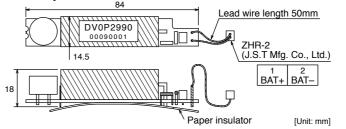
<Remarks>

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

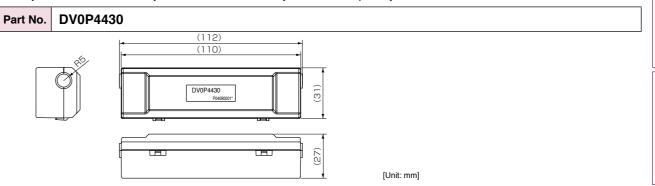


<Caution>

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.

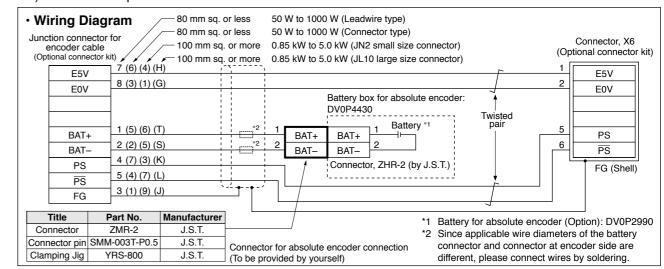
<Caution>

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



193 MINAS A6 Family MINAS A6 Family 194 A-frame

Mounting screw M4 × L6 Pan head 4pcs

Frame symbol of

Part No.	D'	V0PM20101	Frame symbol of applicable driver	C-frame D-frame	M	ounting screw	M4 × L6	Pan head 4pcs
Dimension	Top side	G / 4 ▶ 4	25	iece each	Bottom side	4.58 4.50 4.50 5.50	3-5.2 20	1 piece each 2.5 [Unit: mm]

distance on slotted hole

												[Unit: mm]
	Part No.	Α	В	С	D	E(Max)	F	G	Н	I	Inductance (mH)	Rated current (A)
	DV0P220	65±1	125±1	(93)	136мах	155	70+3/-0	85±2	4-7φ×12	M4	6.81	3
	DV0P221	60±1	150±1	(113)	155мах	130	60+3/-0	75±2	4-7φ×12	M4	4.02	5
Fig.1	DV0P222	60±1	150±1	(113)	155мах	140	70+3/-0	85±2	4-7φ×12	M4	2	8
rig. i	DV0P223	60±1	150±1	(113)	155мах	150	79+3/-0	95±2	4-7φ×12	M4	1.39	11
	DV0P224	60±1	150±1	(113)	160мах	155	84+3/-0	100±2	4-7φ×12	M5	0.848	16
	DV0P225	60±1	150±1	(113)	160мах	170	100+3/-0	115±2	4-7φ×12	M5	0.557	25
	DV0P227	55±0.7	80±1	66.5±1	110мах	90	41±2	55±2	4-5φ×10	M4	4.02	5
Fig.2	DV0P228	55±0.7	80±1	66.5±1	110мах	95	46±2	60±2	4-5φ×10	M4	2	8
	DV0PM20047	55±0.7	80±1	66.5±1	110мах	105	56±2	70±2	4-5Φ×10	M4	1.39	11

^{*} For application, refer to P.23 to P.32 and P.117 to P.120 "Table of Part Numbers and Options".

Harmonic restraint

Harmonic restraint measures are not common to all countries. Therefore, prepare the measures that meet the requirements of the destination country.

When installing a product for Japan, refer to the instruction manual available on our website.

[Panasonic Corporation, Motor Business Unit web site]

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.

thermal protector [Unit: mm]

A6 Family

External Regenerative Resistor

			Spec								
Part No.	Manufacturer's	Resistance	cable core	Weight	Rated power (reference)*1		Activation temperature of				
Fait NO.	part No.	nesistance	diameter	Weight	Free air	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	1 '	φ1.27 / AWG18 \	0.4	17	50	Open/Close capacity		
DV0P4283	RF180B	50	stranded	0.2	17	50	(resistance load)				
DV0P4284	RF240	30	wire /	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.

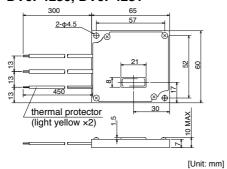
The circuit should be so designed that the power supply will be turned off as the thermal protector operates. The built-in thermal fuse blows depending on changes in heat dissipation condition, operating temperature limit, power supply voltage or load.

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.

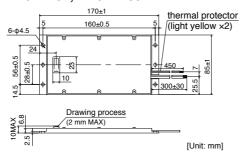
*2 If the wind speed is 1m / s by the fan.

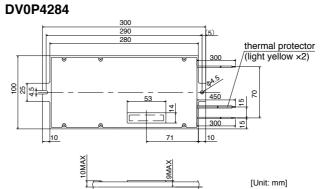
	Powe	er supply			
Frame	Single phase, 100 V	Single phase, 200 V 3-phase, 200 V			
А	DV0P4280	DV0P4281 (100 W or less) DV0P4283 (200 W)			
В	DV0P4283	DV0P4283			
С	DV0P4282	DV0F4263			
D		DV0P4284			
E		DV0P4284 × 2 in parallel or DV0P4285			
F	_	DV0P4285 × 2 in parallel			
G		DV0P4285 × 3 in parallel			
Н		DV0P4285 × 6 in parallel			

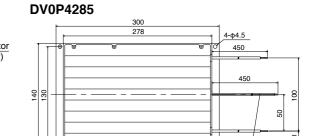
DV0P4280, DV0P4281



DV0P4282, DV0P4283







<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.

197 MINAS A6 Family MINAS A6 Family 198

List of Peripheral Equipments

A6 Family

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

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	
lwaki Musen Kenkyusho Co., Ltd.	+81-44-833-4311 http://www.iwakimusen.co.jp/	Regenerative resistor	
KOA Corporation	+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	Surge absorber for holding brake	
SEMITEC Corporation	+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.)	+81-4-2934-4151 http://www.nisshin-electric.com/	Ferite core for signal lines	
TDK Corporation	+81-3-5201-7229 http://www.global.tdk.com/		
Okaya Electric Industries Co. Ltd.	+81-3-4544-7040 http://www.okayaelec.co.jp/english/index.html	Surge absorber Noise filter	
Japan Aviation Electronics Industry, Ltd.	+81-3-3780-2717 http://www.jae.co.jp/e-top/index.html		
Japan Molex Inc.	+81-462-65-2313 http://www.molex.co.jp		
J.S.T. Mfg. Co., Ltd.	+81-45-543-1271 http://www.jst-mfg.com/index_e.php	Connector	
Sumitomo 3M	+81-3-5716-7290 http:/solutions.3m.com/wps/portal/3M/ja_JP/ WW2/Country/		
Tyco Electronics Japan G.K.	+81-44-844-8052 http://www.te.com/ja/home.html		
DYDEN CORPORATION	+81-3-5805-5880 http://www.dyden.co.jp/english/index.htm	Cable	
DR. JOHANNES HEIDENHAIN GmbH	+81-3-3234-7781 http://www.heidenhain.de/de_EN/company/contact/		
Fagor Automation S.Coop.	+34-943-719-200 http://www.fagorautomation.com		
Magnescale Co., Ltd.	+81-463-92-7971 http://www.mgscale.com/mgs/language/english/	Futawal and	
Mitutoyo Corporation	+81-44-813-8234 http://www.mitutoyo.co.jp/eng/	External scale	
Nidec Sankyo Corporation	+81-3-5740-3006 http://www.nidec-sankyo.co.jp/		
Renishaw plc	+44 1453 524524 www.renishaw.com		
Schaffner EMC, Inc.	+81-3-5712-3650 http://www.schaffner.jp/	Noise filter	
TDK-Lambda Corporation	+81-3-5201-7140 http://www.tdk-lambda.com/	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.

4

Smoother operation for Low Stiffness Machine

Damping control function suppresses vibration during acceleration/deceleration

Features	201
Motor Line-up	205
Model Designation	206
Overall Wiring	207
Oriver and List of Applicable Peripheral Equipments	207
Oriver	209
Driver Specifications	209
Standard Wiring Example of Main Circuit	210
Encorder Wiring Diagram	210
Control Circuit Standard Wiring Example	211
Dimensions of Driver	212
Motor	213
Specifications/Model designation/Torque Characteristics	
Dimensions of Moter	
Motors with Gear Reducer	218
Options	222
Setup Support Software	
Cable part No. Designation	223
Cable Set	224
Encoder Cable	224
Motor Cable	224
Brake Cable	224
Connector Kit	225
Interface Cable	227
Communication Cable	227
Console	227
DIN Rail Mounting Unit	228
External Regenerative Resistor	228
Reactor	229
Surge Absorber for Motor Brake	229

List of Peripheral Components..

Contents

201 MINAS E Series 202

Features

Lasy to Handle, Easy to Use

High-functionality Real-Time Auto-Gain Tuning (Note 1)

- Offers real automatic gain tuning for low and high stiffness machines with a combination of an adaptive filter.
- Supports the vertical axis application where the load torque is different in rotational direction.

DIN-rail mounting unit (option)

- DIN-rail mounting unit allows parallel mounting with small control devices such as PLC.
- Easy to mount and easy to dismount.

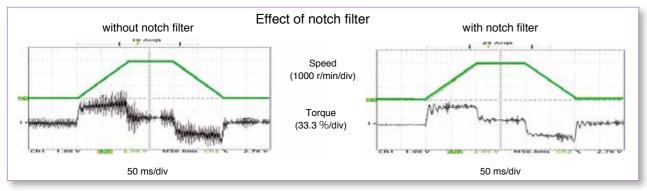
?. Further Reduction of Vibration

Adaptive filter (Note1)

- Makes the notch filter frequency automatically follow the machine resonance frequency in real-time auto-gain tuning.
- Suppression of "Judder" noise of the machine, which is caused by variation of the machines or resonance frequency due to aging, can be expected.

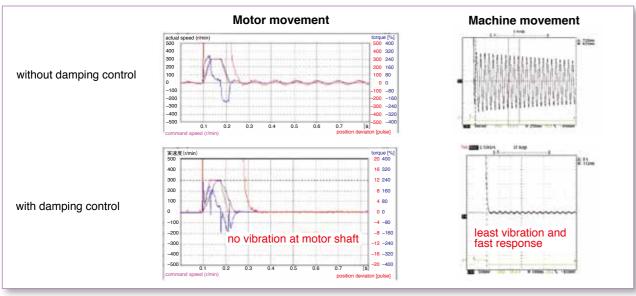
Notch filter (Note1)

- 1-channel notch filter is equipped in the driver independent from adaptive filter.
- Each of 2 filters can set up frequency and notch width, and frequency in 1Hz unit. Suppression of "Judder" noise of the machine which has multiple resonance points can be expected.



Damping control (Note1)

You can suppress vibration occurring at both starting and stopping in low stiffness machine, by manually setting up vibration frequency in 0.1 Hz unit. Note) Only applies to manual adjustment



(Note1) Select at positioning action mode

- At high speed positioning mode (Pr02=0) Select either one of notch filter, damping control or high-functionality real-time auto- gain tuning.
 Not possible to use them all at the same time.
 Adaptive filter cannot be used
- At high-functionality positioning mode (Pr02=1) All of notch filter, damping control, high-functionality real-time auto-gain tuning and adaptive filter can be used at the same time.

3. Further Flexibility and Multiplicity

Console (Option)

- You can set up parameters, copy and make a JOG run.
- Convenient for maintenance at site.
- Refer to P.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	Conforms to Low-Voltage			
	EN50178	UL508C CSA22.2 No.14	Directives		
	EN55011				
	EN61000-6-2				
Matau	EC61000-4-2	l			
Motor and driver	IEC61000-4-3	Radio Frequency Electromagnetic Field Immunity Test	Conforms to references by EMC		
unven	IEC61000-4-4	EC61000-4-4 Electric High-Speed Transition Phenomenon/Burst Immunity Test			
	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

UL : Underwriters Laboratories

CSA: Canadian Standards Association

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

Panasonic Testing Centre
Panasonic Service Europe,
a division of Panasonic Marketing

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

Oil seal

MINAS E series

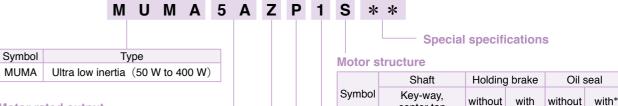
Motor Line-up

			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	Rated output
5A	50 W
01	100 W
02	200 W
04	400 W

Voltage specifications Symbol Specifications

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

S

Т

1 Standard

center tap

* Motor with oil seal is manufactured by order.

Design order Symbol Specifications

Rotary encoder specifications

Symbol	Format Pulse counts		Resolution	Wires
Р	Incremental	2500 P/r	10000	5

See P.213 for motor specifications

Motor output (W)

200

lacktriangle

•

400

100

•

•

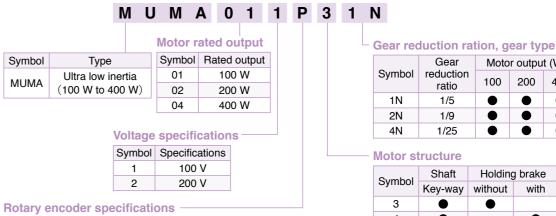
Gear type

For high

accuracy

•

Motor with gear reducer



Pulse counts Resolution Wires

10000

2500 P/r

Shaft Holding brake

Key-way without with 4

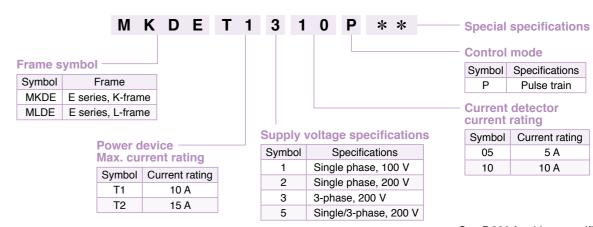
See P.218 for motor with gear reducer specifications

Servo Driver

Format

Incremental

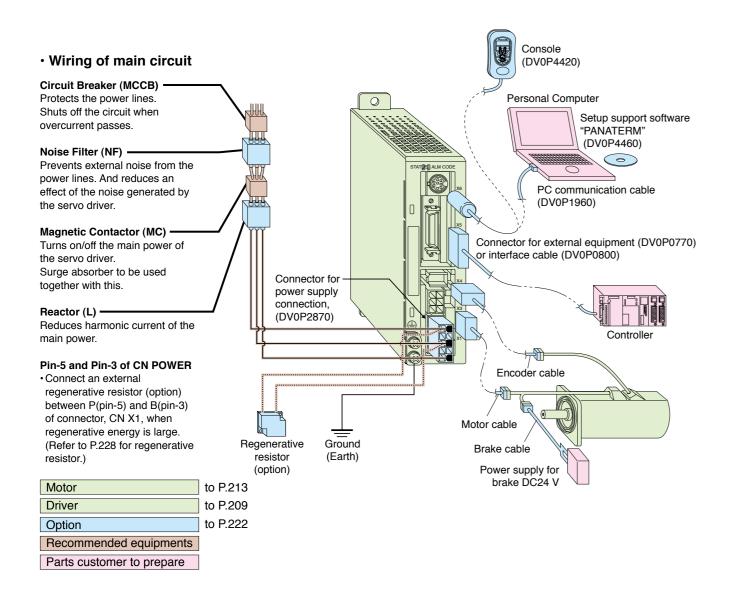
Symbol



See P.209 for driver specifications

205 MINAS E Series

Overall Wiring/ Driver and List of Applicable Peripheral Equipments



List of recommended peripheral equipments

_	Motor		Power			Magnetic									
Power supply	Series	Output	capacity (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 +ra)									
		50 W	0.3 kVA												
Single		100 W (5 A)	0.5 KVA	0.5 KVA	(5 A)	(5 A)	(5 A)	(5 A)	(5 A)	(5 A) 15 A		15 A	15 A	15 A	
phase, 200 V	MUMA	200 W	0.5 kVA				DV0P4160 (3F+1a) 1	1)V()P416() (3F+1a)	0.75 mm ² to 0.85 mm ² AWG18						
		400 W	0.9 kVA				AWais		AWGIO						
		50 W	0.011/4												
3-phase		100 W	0.3 kVA	(5 A)		10 A (3P+1a)									
200 V		200 W	0.5 kVA		(3P+1a)		(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, (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	Console							
Setup Support Software, PANATERM	Software,			DV0P4460	222			
RS232 Commu (for Connection				DV0P1960	227			
Interface Cable	9			DV0P0800	227			
Connector Kit f	for E	xter	nal Equipment	DV0P0770	226			
Connector Kit f	for N	1otor	and Encoder	DV0P3670	225			
Connector Kit f	for D)rive	Power Supply	DV0P2870	225			
Encoder Cable)		MFECA0 * *	0EAM	224			
Motor Cable			MFMCA0 * *	224				
Brake Cable			MFMCB0 * *	224				
Cable Set (3 m	ı) ^{(Not}	e 3)	DV0P37300	224				
Cable Set (5 m	ı) ^{(Not}	e 3)	DV0P39200	224				
DIN Rail Moun	t Un	it	DV0P3811	V0P3811				
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				
			hase 200 V	DV0P1450				
Ferite core for	Ferite core for Signal lines DV							

(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	External Regenerative Resistor	Reactor	Noise Filter												
Single	50	MUMA5AZP1 □	213	MKDET1105P	212 (K)						DV0P227													
phase	100	MUMA011P1 🗌	213	MKDET1110P	212 (K)					DV0P2890	DVUFZZI													
100 V	200	MUMA021P1 🗌	213	MLDET2110P	212 (L)	MFECA0 * * 0EAM MFI				DV0P228														
	50	MUMA5AZP1	215	MKDET1505P	212 (K)							7												
Single	100	MUMA012P1	215	MKDET1505P	212 (K)																			
phase 200 V	200	MUMA022P1	215	MLDET2210P	212 (L)		2 (L) MFECA0 * * 0EAM	MFECA0 * * 0EAM	MFECA0 * * 0EAM	MFECA0 * * 0EAM	MEEOAO # # OEAN	NATEO A O de de OTANA	MEECAO	MEECAO* *OEAM	MEECAO & & OEAM	MEECAO * *OEAM	MEECAO + + OEAM	MEECAO * * OEAM MEMO	MFMCA0**0AEB					D) (0D 4400
	400	MUMA042P1	215	MLDET2510P	212 (L)						FECAU * * UEAINI MIFINICAU * * UAED		MFMCB0 * * 0GET			DV0P4160								
	50	MUMA5AZP1	215	MKDET1505P	212 (K)						DV0P2891	DV0P220												
	100	MUMA012P1	215	MKDET1505P	212 (K)																			
3-phase 200 V	200	MUMA022P1	215	MKDET1310P	212 (K)		-																	
250 V	400	MI IMAGAGDA	015	MLDET2510P	040 (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.

207 MINAS E Series MINAS E Series 208

ш
S

E Series

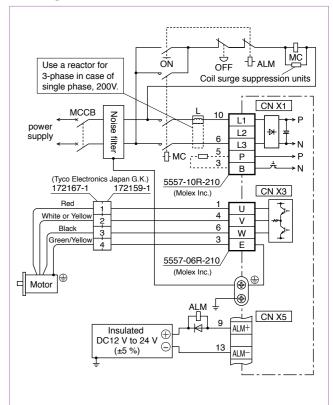
Wiring Diagram

Standard Wiring Example of Main Circuit

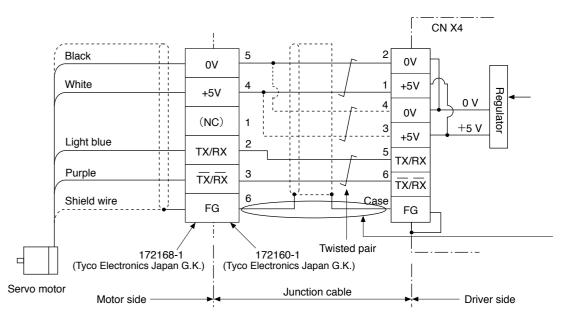
3-Phase, 200 V

ON OFF JALM MC OFF JALM MC Coil surge suppression units | ALM | State | State

■ 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.)

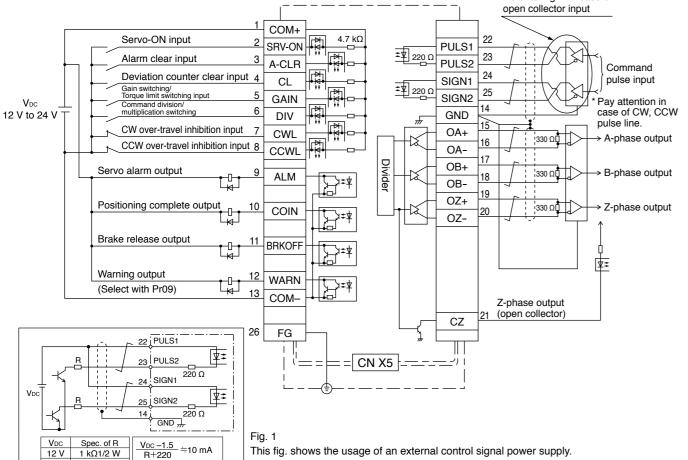
- 1) Refer the wiring diagram.
- 2) Use the twisted pair wire with shield, with core diameter of 0.18 mm² (AWG24) or larger, with higher bending resistance.
- 3) Use the twisted pair wire for the corresponding signal and power supply.
- 4) Shielding

Connect the shield of the driver to the case of CN X4. Connect the shield of the motor to Pin-6.

	0:	1 1 100 1/	0: 1 1 400 11 445 11 +10 % 50 11 400 11				
Inpu	Sin	gle phase, 100 V	Single phase, 100 V to 115 V +10 % 50 Hz/60 Hz				
Input power	Sin	gle phase, 200 V	Single phase, 200 V to 240 V ⁺¹⁰ / ₋₁₅ % 50 Hz/60 Hz				
Θr	3-р	hase, 200 V	3-phase, 200 V to 240 V +10 % 50 Hz/60 Hz				
g.	Ten	nperature	Operating: 0 °C to 55 °C, Storage: -20 °C to 65 °C (Max.temperature guarantee 80 °C for 72 hours <nomal temperature="">)</nomal>				
Environment	Hur	nidity	Both operating and storage : 90 %RH or less (free from condensation)				
ımer	Alti	tude	1000 m or lower				
₹	Vib	ration	5.88 m/s² or less, 10 Hz to 60 Hz (No continuous use at resonance frequency)				
Wit	hstand	d voltage	Should be 1500 VAC (Sensed current: 20 mA) for 1 minute between Primary and Ground.				
Cor	ntrol m	ethod	IGBT PWM Sinusoidal wave drive				
End	coder 1	eedback	2500 P/r (10000 resolution) incremental encoder				
န္း င	Inp	ut	7 inputs (1) Servo-ON, (2) Alarm clear and other inputs vary depending on the control mode.				
Control signal	Out	put	4 outputs (1) Servo alarm, (2) Alarm, (3) Release signal of external brake and other outputs vary depending on the control mod				
<u>v</u> . 7	Inp	ut	2 inputs Supports both line driver I/F and open collector I/F.				
Pulse signal	Out	put	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.				
Cor	mmun	cation function RS232	1 : 1 communication to a host with RS232 interface is enabled.				
Dis	play L	ED	(1) Status LED (STATUS), (2) Alarm code LED (ALM-CODE)				
Reg	genera	ition	No built-in regenerative resistor (external resistor only)				
Dyr	namic	brake	Built-in				
Cor	ntrol m	ode	3 modes of (1) High-speed position control, (2) Internal velocity control and (3) High-functionality positioning control are selectable with parameter.				
	Cor	ntrol input	(1) CW over-travel inhibition, (2) CCW over-travel inhibition, (3) Deviation counter clear, (4) Gain switching, (5) Electronic gear switching				
_	Cor	ntrol 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)				
_	tudu	(Division/Multiplication of command pulse	Setup of electronic gear ratio Setup range of (1-10000) $\times 2^{(0-17)}/(1-10000)$				
		Smoothing filter	Primary delay filter or FIR type filter is selectable to the command input.				
Inter	Cor	ntrol 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				
nal	Cor	ntrol output	(1) Speed arrival (at-speed)				
spee	Inte	rnal speed command	Internal 4-speed is selectable with control input.				
Internal speed control	Sof	t-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.				
<u>0</u>	Zer	o-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.				
	Ma	sking of unnecessary	Masking of the following input signal is enabled. (1) Over-travel inhibition, (2) Speed zero clamp, (3) Torque limit switching				
Common	Div	ision of encoder feedback	1 P/r to 2500 P/r (encoder pulses count is the max.).				
non	Protective	Hardware error	Over-voltage, under-voltage, over-speed over-load, over-heat, over-current and encoder error etc.				
	tion	Software error	Excess position deviation, command pulse division error, EEPROM error etc.				
	Tra	ceability of alarm data	Traceable up to past 14 alarms including the present one.				
	Dar	mping control function	Manual setup with parameter				
	Setup	Manual	Console				
	ı₫	Setup support software	PANATERM (Supporting OS : Windows98, Windows ME, Windows2000, and WindowsXP)				

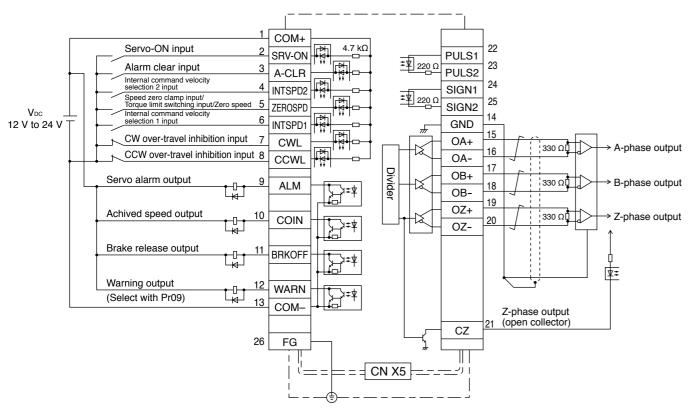
209 MINAS E Series

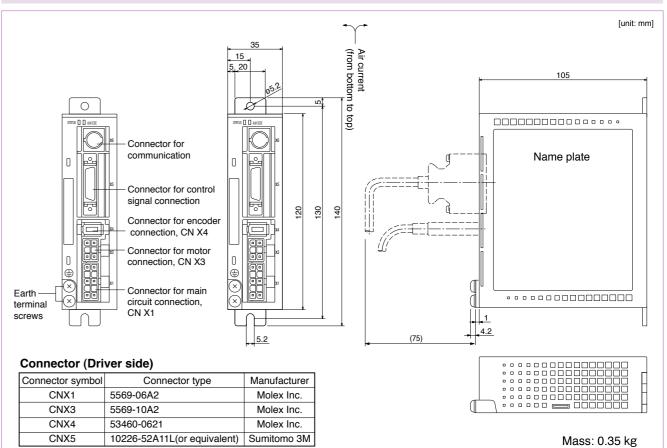
Control Circuit Standard Wiring Example



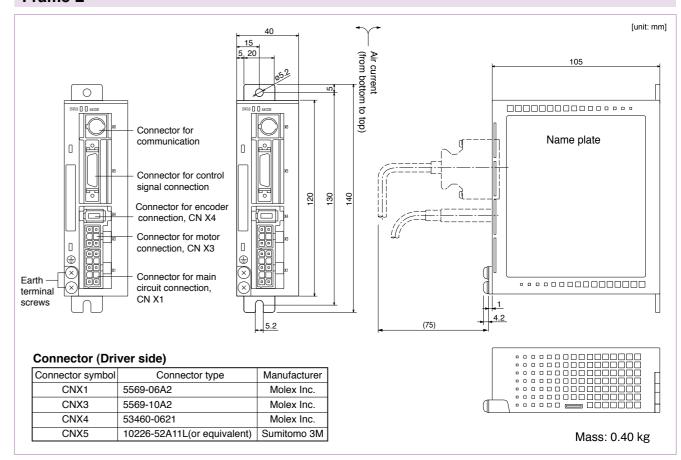
12 V 1 kΩ1/2 W R+220 - 10 mA Inis fig. shows the usage of an external control signal power supply. You need to install an resistor R for current limit corresponding to VDC.

CN X 5 Wiring Example at Internal Velocity Control Mode





Frame L



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					
5 .	Radial load P-direction (N)	147	392		
During assembly	Thrust load A-direction (N)	88	147		
	Thrust load B-direction (N)	117	196		
During operation	Radial load P-direction (N)	68	245		
	Thrust load A-direction (N)	58	98		
	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 Motor structure (50 W to 200 W)

Motor rated output Symbol Rated output 5A 50 W 01

02

100 W 200 W

Voltage specifications Symbol Specifications 100 V 100/200 V Z (50 W only)

otor otradiare								
	Shaft	Holding	brake	Oil s	eal			
Symbol	Key-way, center tap	without	with	without	with			
S	•	•		•				
Т	•		•	•				

Rotary encoder specifications

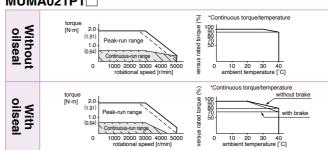
Symbol	Format	Pulse counts	Resolution	Wires
Р	Incremental	2500 P/r	10000	5

Torque Characteristics [at AC100 V of power voltage (Dotted line represents the torque at 10 % less supply voltage.)]

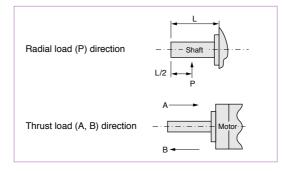
MUMA5AZP1

MUMA011P1 Without oilseal

MUMA021P1



*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 regenera-
 - tive brake
 - 3. Consult us or a dealer if the load moment of inertia exceeds the specified
 - 4. Specified releasing time is obtained with the use of surge absorber for brake (Z15D151 by SEMITEC Corporation or equivalent). () represents the actually measured value using a diode (200 V, 1 A or

equivalent)

213 MINAS E Series MINAS E Series 214 200 V **MUMA** 50 W to 400 W

Low inertia

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 %						

0.5 (0.7)

0.4 (0.6)

0 $^{\circ}$ C to 40 $^{\circ}$ C (free from freezing), Storage : –20 $^{\circ}$ C to 65 $^{\circ}$ C

(Max.temperature guarantee 80 °C for 72 hours <nomal humidity>)

85 %RH or lower (free from condensing)

Indoors (no direct sunlight), free from corrosive gas, inflammable gas, oil mist and dust

1000 m or lower

49 m/s2 or less

0.96 (1.36)

1.5 (1.9)

Permissible load							
	Radial load P-direction (N)	147	392				
During assembly	Thrust load A-direction (N)	88	147				
, ,	Thrust load B-direction (N)	117	196				
	Radial load P-direction (N)	68	245				
During operation	Thrust load A-direction (N)	58	98				
	Thrust load B-direction (N)	58	98				

For motor dimensions, refer to P.217, and for the driver, refer to P.212.

Ambient temperature

Ambient humidity

Altitude

Mass (kg), () represents holding brake type

Installation location

Vibration resistance

Environment

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 Motor structure (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)

	Shaft	Holding	brake	Oil s	eal
Symbol	Key-way, center tap	without	with	without	with
S	•	•		•	
T	•		•	•	

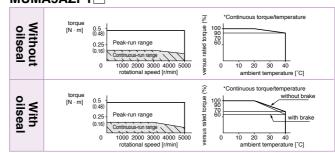
Rotary encoder specifications

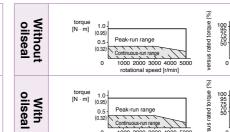
MUMA012P1

Symbol	Format	Pulse counts	Resolution	Wires
Р	Incremental	2500 P/r	10000	5

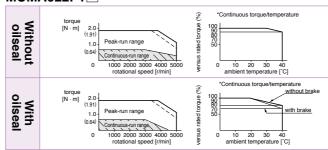
Torque Characteristics [at AC200 V of power voltage (Dotted line represents the torque at 10 % less supply voltage.)]

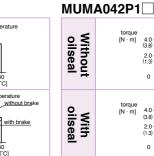
MUMA5AZP1

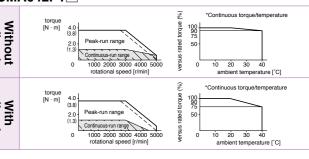




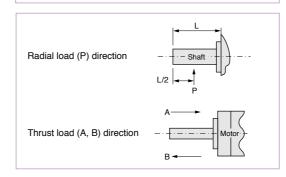
MUMA022P1







*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 Encoder

connector

Type of

For High

400

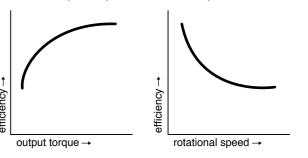
MINAS E Series

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 Type Low inertia MUMA (100 to 400 W) Motor rated output Symbol Rated output Voltage specifications 01 100 W Symbol Specifications 02 200 W 100 V 04 400 W 200 V

Rotary en	coder specifications			
Symbol	Format	Pulse counts	Pulse counts	Wire
Р	Incremental	2500 P/r	10000	5

Motor structure Holding brake with 4

Motor types with gear reducer

Reduction

ratio

1/9

1/25

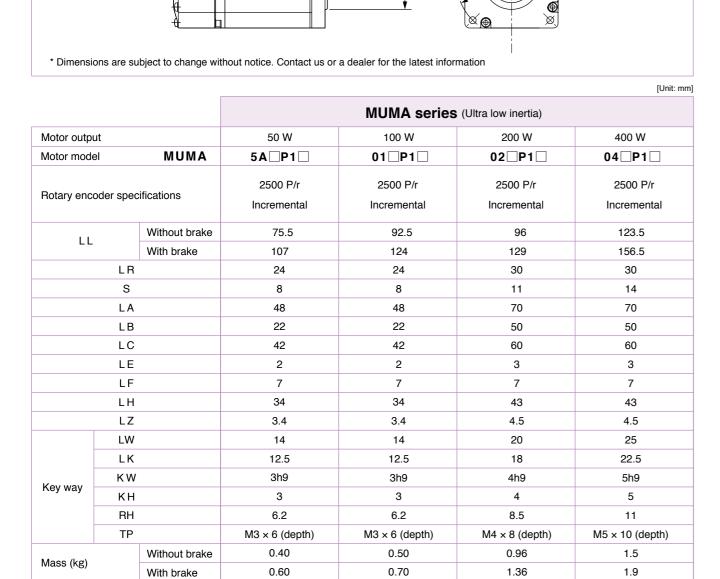
2N

4N

100

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 rotor moment of inertia of the mot			
	(conversion to the motor shaft)	to 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/s ² or less			



MUMA 50 W to 400 W

Brake connector

4-φLZ

refer to Options, P.225, P.226.

(Key way dimensions)

□LC

Motor connector

LR LE

LL

[Unit: mm]

<Cautions>

Connector/Plug specifications

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.

Motors with Gear Reducer

Table of Motor Specifications/ The Combination of the Driver and the Motor

Table of Motor with Gear Reducer Specifications

	Motor					M	JMA with g	ear reduc	er				
Model	Output	utput Reduction	Output	Rated	Max.		Peak max.	Moment of inertia (motor + reducer/converted to motor shaft		1			Permissible
		ratio	•	speed	speed	torque	torque	w/o brake	w/ brake	w/o brake	w/ brake	radial load	thrust load
	(W)		(W)	(r/min)	(r/min)	(N·m)	(N·m)	J (× 10	⁴kg·m²)	(k	g)	(N)	(N)
MUMA01 P 1N		1/5	75	600	1000	1.18	3.72	0.072	0.076	1.05	1.25	490	245
MUMA01□P□2N	100	1/9	80	333	555	2.25	6.86	0.0663	0.0703	1.05	1.25	588	294
MUMA01□P□4N		1/25	80	120	200	6.27	19.0	0.0645	0.0685	2.20	2.40	1670	833
MUMA02 P 1N		1/5	170	600	1000	2.65	8.04	0.218	0.248	1.68	2.08	490	245
MUMA02□P□2N	200	1/9	132	333	555	3.72	11.3	0.368	0.398	2.66	3.06	1180	588
MUMA02□P□4N		1/25	140	120	200	11.1	33.3	0.388	0.418	2.66	3.06	1670	833
MUMA042P□1N		1/5	340	600	1000	5.39	16.2	0.533	0.563	3.2	3.6	980	490
MUMA042P□2N	400	1/9	332	333	555	9.51	28.5	0.438	0.468	3.2	3.6	1180	588
MUMA042P□4N	1	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	ith driver	10	0 V	200 V			
Encoder	Motor	Part No. of motor	Single phase, 100 V	Part No. of motor	3-phase, 200 V	Single phase, 200 V	
Elicodei	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	400 W/			MUMA042P□□N	MLDET2510P	MLDET2510P	
	400 VV		_	IVIUIVIAU42PUUN	MLDET2310P	WILDL 123 TUP	

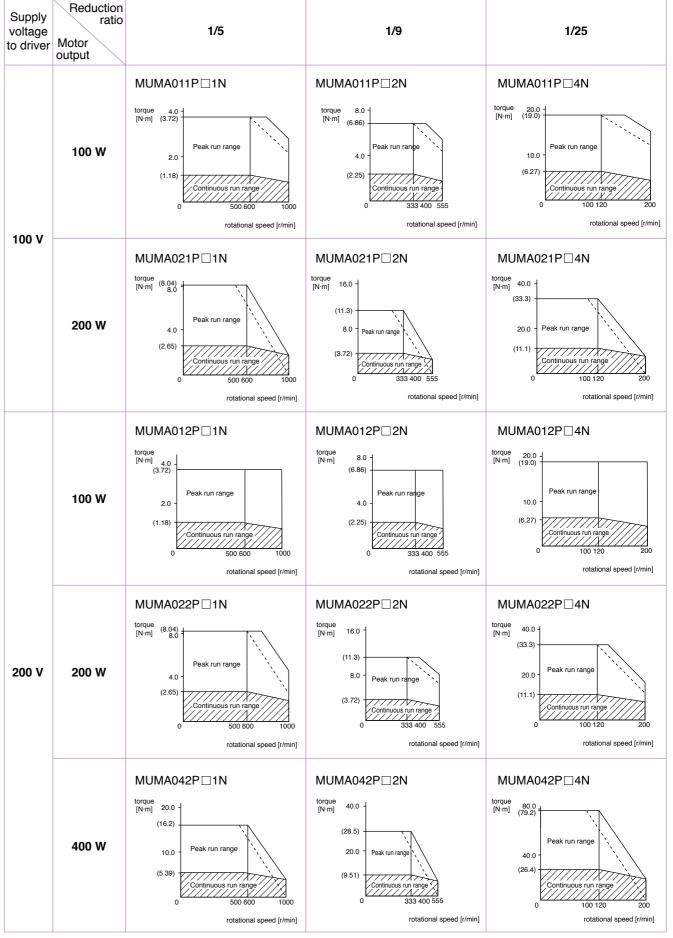
For dimensions, refer to P.212.

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

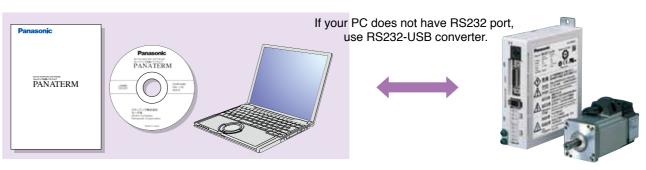
																[U	nit: mm]
Model	Motor output	Reduction ratio	L	LL	LR	LQ	LC	LB	LA	s	LH	LZ	LK	(LG)	LE	Key way B×H×LD	Т
MUMA01□P□1N	MI IMAO1 DD 1N	1/5	192	92.5													
WOWAUTET ETT		173	223.5	124	32	20	52	50	60	12	10	M5	18	67.5		4×4×16	2.5
MUMA01□P□2N	100 W	1/9	192	92.5	32	02 20 32	20 32		60	12	10	(Depth: 12)	10	67.5		424210	2.5
WOWAUTER	100 00	179	223.5	124													
MUMA01□P□4N		1/25	234.5	92.5	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	10	M5	18	72.5		4×4×16	2.5
WOWAUZ_P_TN		175	233.5		32 20	52	50	30	12	10	(Depth: 12)	10	12.5		4x4x10	2.5	
MUMA02 P 2N	000 144	1/9	235.5	96										89.5			
WOWAUZ_F_ZN	200 W	179	268.5	129										89.5			
MUMA02 P 4N		1/25	246	96										400			
WOWAUZ_F_4N		1/25	279	129	50	30	78	70	90	19	17	M6	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		175	296	156.5										00.5			
MUMA042P□2N	400 144	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	445	0.4	40	M8	0.5	404	_	0.7.00	
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]

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

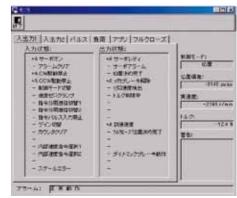
Frequency analysis

• Measures frequency characteristics of the machine, and displays Bode diagram.

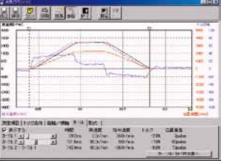
■ Can not use with A5, A6 family.

日本の人の知ら一十一日刊であ、U.G.L (計画の日本) イダンをラン・クチル 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#\$#

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.)

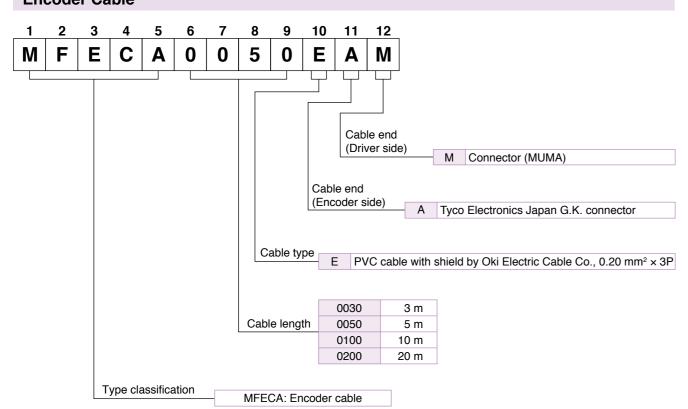
[Display] • Resolution : 640*480 (VGA) or more (desirably 1024*768) • Number of colors : 256 colors or more

[CD-ROM drive] · CD-ROM drive operable on the above-mentioned personal computer

221 MINAS E Series MINAS E Series 222

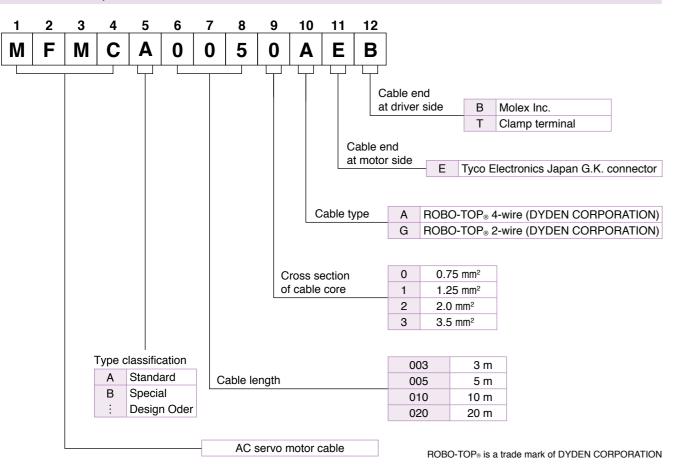
Cable

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
- 4) Connector kit for driver power supply connection : DV0P2870

Cable Set (5 m)

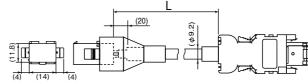
Part No. DV0P39200

- 1) Interface cable : DV0P0800
- 2) Encoder cable (5 m): MFECA0050EAM
- 3) Motor cable (5 m): MFMCA0050AEB
- 4) Connector kit for driver power supply connection : DV0P2870

Encoder Cable

Part No. MFECA0 * * 0EAM

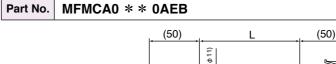
[Unit: mm]



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	Tues Flastronies	10	MFECA0100EAM
Connector Pin	170365-1	Tyco Electronics	20	MFECA0200EAM
Cable	0.20 mm ² x 3P	Oki Electric Cable Co. Ltd.		

Motor Cable (ROBO-TOP_® 105 °C 600 V . DP)

ROBO-TOP_® is a trade mark of DYDEN CORPORATION

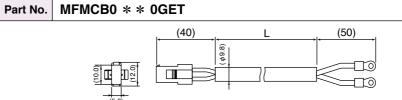


(4) (10.0) (4)		
Title	Part No.	Manufactur
Connector	172159-1	Tues Flootres
Connector Din	170000 1 170000 1	Tyco Electror

Title	Part No.	Manufacturer	L (m)	Part No.
Connector	172159-1 Tyco Electronics		3	MFMCA0030AEB
Connector Pin	170362-1, 170366-1	Tyco Electronics	5	MFMCA0050AEB
Connector	5557-06R-210	Molex Inc	10	MFMCA0100AEB
Connector Pin	5556T	Wolex IIIC	20	MFMCA0200AEB
Cable	ROBO-TOP 600 V 0.75 mm ²	Daiden Co.,Ltd.		

Brake Cable (ROBO-TOP_® 105 °C 600V . DP)

 $\ensuremath{\mathsf{ROBO\text{-}TOP}}\xspace_{\otimes}$ is a trade mark of DYDEN CORPORATION



Title	Part No.	Manufacturer	L (m)	Part No.
Connector	172157-1	Tyco Electronics		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	Cable ROBO-TOP 600 V 0.75 mm ²		20	MFMCB0200GET

223 MINAS E Series 224

[Unit: mm]

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
L1	(NC)	L2	(NC)	L3
5	4	3	2	1
Р	(NC)	В	(NC)	ΙE



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.)

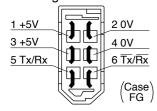
Parts composition

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	Tyco Electronics	For junction to encoder cable
Connector pin	170365-1	6	Tyco Electronics	(6 pins)
Connector (4 pins)	172159-1	1	Tugo Floatronico	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	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)

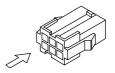
Title	Part No.	Manufacturer	Cable material	
For encoder cable junction	755330-1	Type Floatronice		
For motor power cable junction	755331-1	Tyco Electronics	_	
For Compostor CNI VO	57026-5000	Moley Inc	UL1007	
For Connector CN X3	57027-5000	Molex Inc.	UL1015	

<Remarks>

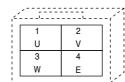
- 1. The above pin configuration is shown when viewed from the pin-soldering direction. Make a correct wiring by checking the stamped pin numbers on the connector itself.
- 2. Connect the shield of the wire to the case (FG) without fail.
- 3. For wiring and connection, refer to P.210.

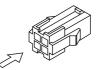
Pin configuration of encoder cable junction

1 2 _3	
	:
NC	XX
4 5 6	□ i
+5V 0V F0	ì



Pin configuration of motor power cable junction





Pin configuration of mating connector to CN X3 connector

, · 		1
6	5	4
W	(NC)	V
3	2	1
E	(NC)	U



<Cautions>

- 1. The above pin configuration is shown when viewed from the terminal inserting direction. Make a correct wiring by checking the stamped pin numbers on the connector itself.
- 2. Refer to P.210 for wiring and connection.

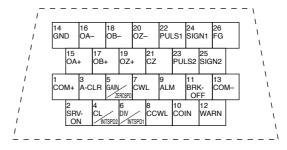
Connector Kit for External Peripheral Equipment

Part N	o. DV0P0770	

Parts composition

Title	Title Part No.		Manufacturer	Note	
Connector	10126-3000PE		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

Wiring table

Pin No.	Title of signal	Color or cable	Pin No.	Title of signal	Color or cable	Pin No.	Title of signal	Color or cable
1	COM+	Orange (Red 1)	10	COIN	Pink (Black 1)	19	OZ+	Pink (Red 2)
2	SRV-ON	Orange (Black 1)	11	BRK-OFF	Orange (Red 2)	20	OZ-	Pink (Black 2)
3	A-CLR	Gray (Red 1)	12	WARN	Orange (Black 2)	21	CZ	Orange (Red 3)
4	CL/INTSPD2	Gray (Black 1)	13	COM-	Gray (Red 2)	22	PULS1	Gray (Red 3)
5	GAIN/ZEROSPD	White (Red 1)	14	GND	Gray (Black 2)	23	PULS2	Gray (Black 3)
6	DIV/INTSPD1	White (Black 1)	15	OA+	White (Red 2)	24	SIGN1	White (Red 3)
7	CWL	Yellow (Red 1)	16	OA-	White (Black 2)	25	SIGN2	White (Black 3)
8	CCWL	Yellow (Black 1)	17	OB+	Yellow (Red 2)	26	FG	Orange (Black 3)
9	ALM	Pink (Red 1)	18	OB-	Yellow (Black 2)			

Interface Cable/

Communication Cable/ Console

<Notes>

e. g. of Pin No. designation: Pin No. 1 Wire color is orange, and one red dot.

by Sumitomo 3M or equivalent

Pin No. 12 ... Wire color is orange, and two black dot.

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)

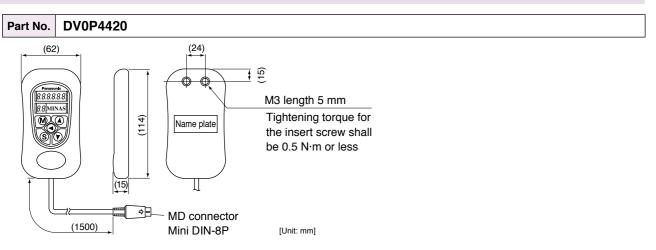
Part No. DV0P1960 2000 Mini-DIN 8P

[Unit: mm]

Console

227 MINAS E Series

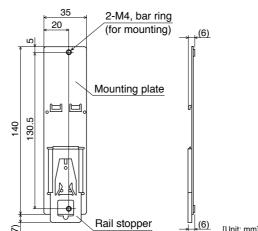
D-sub connector 9P



DIN Rail Mounting Unit

Part No. DV0P3811

Dimensions

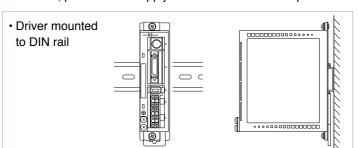


<Notes>

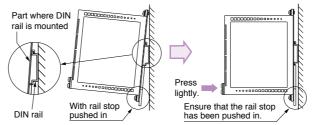
2 mounting screws (M4 X L8, Pan head) are attached. Rail stopper can be extended to max. 10 mm.

<Cautions>

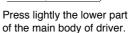
Please read carefully operation manual before using this product. In addition, please do not apply excessive stress to the product.

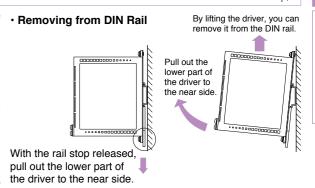


· How to Install



Hook the upper side of DIN rail mounting part on the DIN rail.



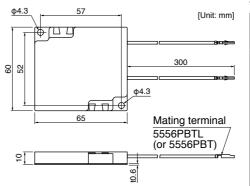


External Regenerative Resistor

	Specifications		cations		
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.

Dimensions



<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.

MD connector

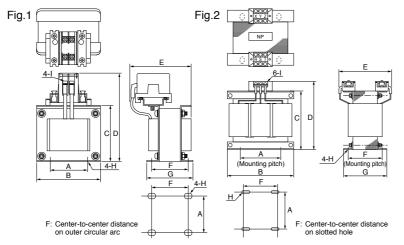
MINAS E Series 228

List of Peripheral Components

E Series

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	2
	Single phase, 100 V	200 W	DV0P228	1
MLDE	Single phase, 200 V	200 W to 400 W	DV0P220	2
	3-phase, 200 V	400 W		



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

Contents

A6 Family	233
EU Directives / Conformity to UL Standards / KC	233
Composition of Peripheral Equipments	235
E Series	239
Compliance to EU and EMC Directives	239
Composition of Peripheral Components	240
Conformity to UL Standards	240
Motor capacity selection software	241
AC Servo Motor Capacity Selection Software	241
Option Selection Software for AC Servo Motor	241
Guide to the International System of Units (SI)	242
Selecting Motor Capacity	244
Request Sheet for Motor Selection	250
Connection Between Driver and Controller	258
Connection Between A6 Family Driver and Controller	258
Replacing Old Model Servo Driver with MINAS A6 Series	263
Connection Between E Series Driver and Controller	267
Index	272
Sales Office	284

International Standards

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).

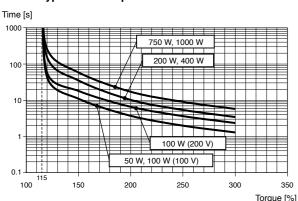
- (1) Use the driver in an environment of Pollution Degree 2 or 1 prescribed in IEC60664-1. (e.g. Install in the control box with IP54 enclosure.)
- (2) Make sure to install a circuit breaker or fuse which are UL recognized (Listed (h) marked) between the power supply and the noise filter.
 - For rated 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.

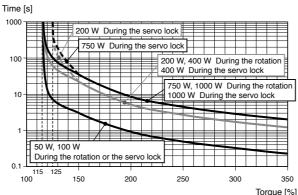
Set up the peak permissible current with Pr0.13 (Setup of 1st torque limit) and Pr5.22 (Setup 2nd torque

■ Overload protection time characteristics

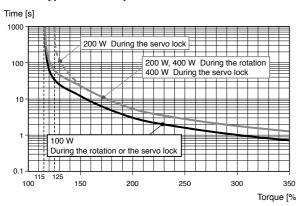
· Motor type: 80 mm sq. or less MSMF

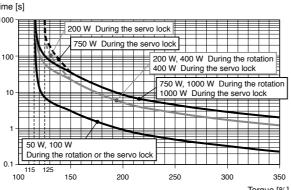


· Motor type: 80 mm sq. or less MHMF

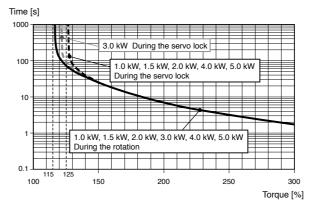


· Motor type: 80 mm sq. or less MQMF

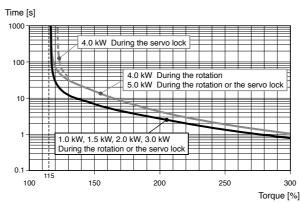




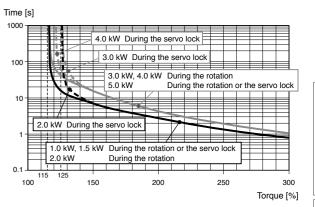
· Motor type: 100 mm sq. or more MSMF



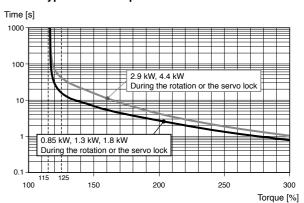
· Motor type: 100 mm sq. or more MDMF



· Motor type: 100 mm sq. or more MHMF



· Motor type: 100 mm sq. or more MGMF



Conformed Standards

		Driver	Motor
	EMC Directives	EN55011 EN61000-6-2 EN61000-6-4 EN61800-3	_
EU Directives	Low-Voltage Directives	EN61800-5-1 EN50178	EN60034-1 EN60034-5
	Machinery Directives Functional safety 11	ISO13849-1(PL e, Cat.3) EN61508(SIL3) EN62061(SILCL 3) EN61800-5-2(SIL3, STO) IEC61326-3-1 IEC60240-1	_
UL Standards CSA Standards Radio Waves Act (South Korea) (KC) '2		UL508C (E164620)	UL1004-1, UL1004-6 (E327868)
		C22.2 No.14	C22.2 No.100-4
		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

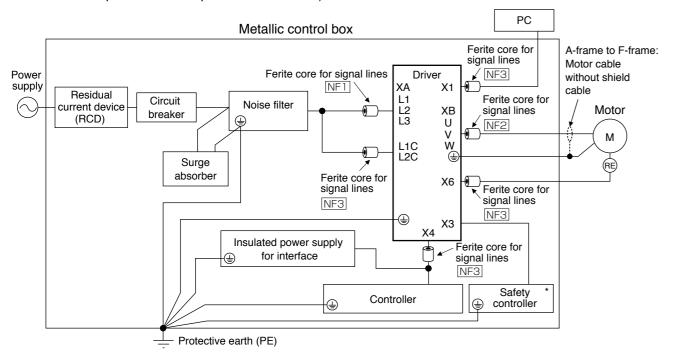
- *1 A6 SE, A6 SG series doesn't correspond to the functional safety standard
- *2 Information related to the Korea Radio Law This servo driver is a Class A commercial broadcasting radio wave generator not designed for home use. The user and dealer should be aware of this fact.

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)

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.

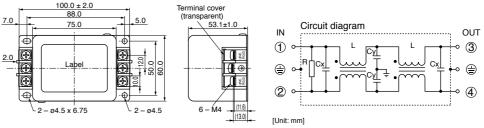
The branch circuit should be protected in accordance with NEC and the applicable local regulations in your area.

Noise Filter

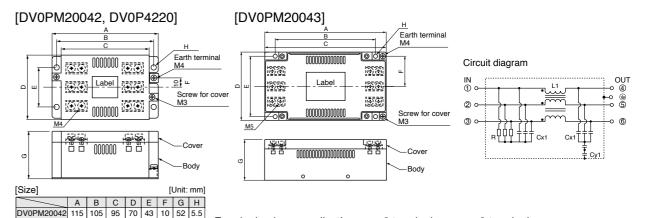
When you install one noise filter at the power supply for multi-axes application, contact the manufacturer of the noise filter. If noise margin is required, connect 2 filters in series to emphasize effectiveness.

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.
7.0 100.0 ± 2.0 88.0 75.0	Terminal cover (transparent) 53.1±1.0	Circuit diagram	OUT	

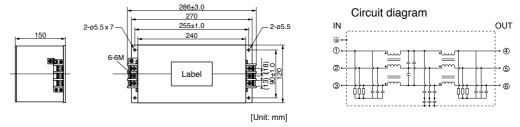


Option part No.	Voltage specifications for driver	Manufacturer's part No.	Applicable driver (frame)	Manufacturer
	3-phase 200 V		A-frame and B-frame	
DV0PM20042	Single phase 100 V, 200 V 3-phase 200 V	3SUP-HU10-ER-6	C-frame	Okaya Electric Ind.
DV0P4220	Single/3-phase 200 V	3SUP-HU30-ER-6	D-frame	
DV0PM20043	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.



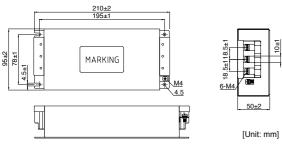
<Remarks>

- 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.

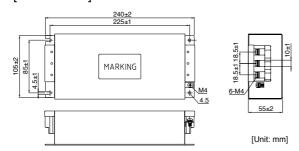
Recommended components

Part No.	Voltage specifications for driver	Current rating (A)	Applicable driver (frame)	Manufacturer
RTHN-5010		10	A-frame to C-frame	
RTHN-5030	Single phase 100 V, 200 V 3-phase 200 V	30	D-frame	TDK-Lambda Corp.
RTHN-5050	0-priase 200 v	50	E-frame and F-frame	

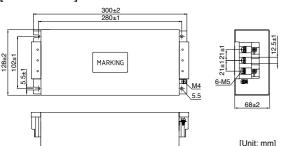
[RTHN-5010]



[RTHN-5030]



[RTHN-5050]



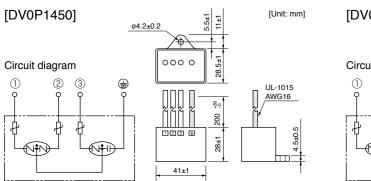
<Remarks>

- 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.



[DV0P4190]	ø4.2±0.2	11±1	[Unit: mm
Circuit diagram	000	28.5±1	UL-1015
		\$\frac{1}{500}\$	AWG16 2,5±0.5
	41±1		

<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)

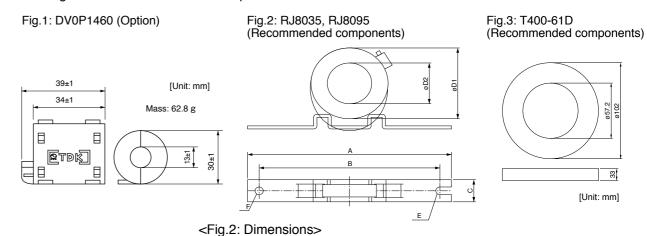
Symbol*1	Cable Name	100 V/200 V Driver frame symbol	Option part No.	Manufacturer's part No.	Manufacturer	Qty.
		A, B, C, D	DV0P1460	ZCAT3035-1330	TDK Corp.	4
NF1	Power cable	E, F	Recommended components	RJ8035	KK-CORP.CO.JP	1
NF2	Motor cable	A, B, C, D, E, F	DV0P1460	ZCAT3035-1330	TDK Corp.	4
NF3	 24 V Power cable Encoder cable Interface cable USB cable Control 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				Siz	e [Unit:	mm]		
railino.	Current	(μΗ)	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".

Part No.

A6 Family

Manufacturer

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	Okaya 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
DV0P1450	3-phase, 200 V	R·A·V-781BXZ-4	Okaya Electric		DV0P4190	Single phase, 100 V, 200 V
	ø4.2±	0.2	[Unit: mm]	•		ø4.2±
Circuit diagr	ram ③ ⊜	28.5±1			Circuit diagr	am 😩
		28±1 200.00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	MG16 AWG16			
		41±1	Ī			

DV0P4190	Single phase, 100 V, 200 V	R·A·V-781BWZ-4	Okaya Electric
	ø4.2±	0.2	[Unit: mm]
Circuit diagr	ram 😩	0 0 0 1 1 28.5 ±1	
		241 Sec. 1.50 Se	UL-1015 AWG16

<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".)

Option part No.	Part No.	Qty.	Manufacturer
DV0P1460	ZCAT3035-1330	4	TDK Corp.
39±1 34±1		ass : 62	[Unit: mm]

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.

Compliance to EU and EMC Directives

EU Directives

The EU Directives apply to all such electronic products as those having specific functions and have been exported to EU and directly sold to general consumers. Those products are required to conform to the EU unified standards and to furnish the CE marking on the products. MINAS AC Servos conforms to the EU Directives for Low Voltage Equipment so that the machine incorporating our servos has an easy access to the conformity to relevant EU Directives for the machine.

EMC Directives

MINAS Servo System conform to relevant standard under EMC Directives setting up certain model (condition) with certain locating distance and wiring of the servo motor and the driver. And actual working condition often differs from this model condition especially in wiring and grounding. Therefore, in order for the machine to conform to the EMC Directives, especially for noise emission and noise terminal voltage, it is necessary to examine the machine incorporating our servos.

Conformed Standards

Subject		Conformed Standard	IEC : International Electrotechnical Commission		
Motor	IEC60034-1	IEC60034-5 UL1004 CSA22.2 No.100	Conforms to	EN : Europaischen Normen	
	EN50178	UL508C CSA22.2 No.14	Low- Voltage Directives	EMC: Electromagnetic Compatibility UL : Underwriters Laboratories	
	EN55011	Radio Disturbance Characteristics of Industrial, Scientific and Medical (ISM) Radio-Frequency Equipment		CSA : Canadian Standards Association	
	EN61000-6-2	Immunity for Industrial Environments]	Pursuant to at the directive 2004/108/EC,article 9(2)	
Motor	IEC61000-4-2	Electrostatic Discharge Immunity Test	Conforms to	Fulsualit to at the directive 2004/100/EC, afficie 9(2)	
and	IEC61000-4-3	Radio Frequency Electromagnetic Field Immunity Test	references	Panasonic Testing Centre	
driver	IEC61000-4-4	Electric High-Speed Transition Phenomenon/Burst Immunity Test	by EMC Directives	Panasonic Service Europe, a division of Panasonic Marketing Europe GmbH	
	IEC61000-4-5	Lightening Surge Immunity Test	1	Winsbergring 15,22525 Hamburg,F.R.Germany	
	IEC61000-4-6	High Frequency Conduction Immunity Test			
	IEC61000-4-11	Instantaneous Outage Immunity Test	1		

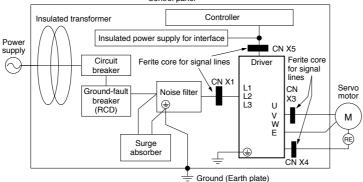
Composition of Peripheral Components

<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.

239 Information Information 240

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

1. Select components and specified values Select appropriate mechanical parameter items and fill them with parameter values derived from

the real machine. To simulate the target machine as practical as possible, use maximum number of parameters available.



2. Enter operation pattern

Input the planned operation pattern that will contain [speed and rotation standard] or [absolute position

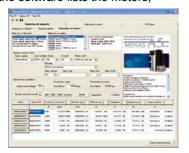
standard] with optional settings such as S-acceleration/de celeration.



3. Select the motor

When the data required in step 1 and 2 above have been input, the software lists the motors,

which will be appropriate to use with your machine. Select the motor that is best suitable for your machine application.



Details of motor

Once the motor is selected, specifications of the motor and driver, and details of reason for

determination are displayed and may be printed out.



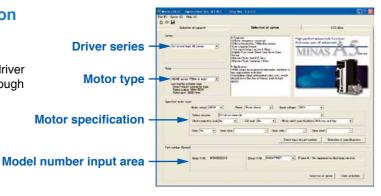
Option Selection Software for AC Servo Motor

We have prepared PC software to enable fast, easy, and correct option selection, a complicated job without the software.

Two procedures for option selection

1. Selection according to driver series and motor type

Suitable option can be selected by selecting driver series, motor type and motor specification through pulldown menu.



2. Entry of model number

If you know the model number based on the servo motor and driver currently used, enter the model number.

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

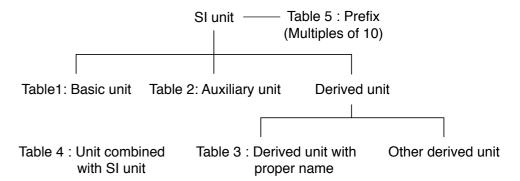


Table1: Basic unit

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

Table 4. Utili Cullibilieu Willi Si utili		
Quantity	Name	Symbol of unit
	minute	min
Time	hour	h
	day	d
	degree	٥
Plane angle	minute	1
	second	n n
Volume	liter	I, L
Weight	ton	t

Table 5: Prefix

Multiples powered	Prefix	
to unit	Name	Symbol
10 ¹⁸	exa	E
10 ¹⁵	peta	Р
10 ¹²	tera	Т
10 ⁹	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	а

241 Information Information 242

Major Compatible Unit

	Symbol of	Symbol of SI unit and	
Quantity	conventional unit	compatible unit	Conversion value
Length	μ (micron)	μ m	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	_	Same value
Mass	_	kg	Same value
Weight flow rate	kgf/s	_	Same value
Mass flow rate	_	kg/s	Same value
Specific weight	kgf/m ³	_	Same value
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
			= 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
	mH₂O, mAq	Pa	1 mH ₂ O = 9.80665 x 10 ³ Pa
	mmHg	Pa or mmHg (2)	1 mmHg = 133.322 Pa
	Torr	Pa	
Stress	kgf/mm ²	Pa or N/m ²	1 kgf/mm ² = 9.80665 x 10 ⁶ Pa
			=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
			= 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
			1 kgf/cm ² = 9.80665 x 10 ⁴ N/m ²
Energy, Work	kgf∙m	J (joule)	1 kgf·m = 9.80665 J
	erg	J	1 erg = 10 ⁻⁷ J
Work efficiency, Power	kgf·m/s	W (watt)	1 kgf·m/s = 9.80665 W
	PS	W	1 PS = 0.7355 kW
Viscosity	PP	Pa·s	1 P = 0.1 Pa·s
Kinetic viscosity	St	mm²/s	10 ⁻² St = 1 mm ² /s
Thermodynamic temperature	К	K (kelvin)	1 K = 1 K
Temperature interval	deg	K ⁽³⁾	1 deg = 1 K
Amount of heat	cal	J	1 cal = 4.18605 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·m ² ·°C) = 1.16279 W/ (m ² ·K)
Intensity of magnetic field	Oe	A/m	1 Oe = 10 ³ / (4π) 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

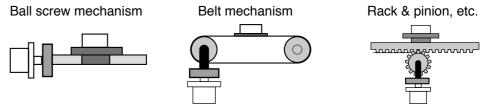
- (1) Applicable to liquid pressure. Also applicable to atmospheric pressure of meteorological data, when "bar" is used in international standard.
- (2) Applicable to scale or indication of blood pressure manometers.
- (3) "°C" can be substituted for "K".

Flow of Motor Selection

1. Definition of mechanism to be driven by motor.

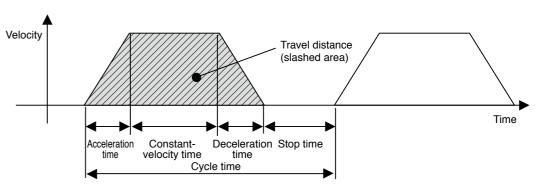
Define details of individual mechanical components (ball screw length, lead and pulley diameters, etc.)

<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

Ball screw 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

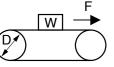
F: External force [N]

g: Acceleration of gravity 9.8[m/s²]

Belt mechanism

Traveling torque

 $\mathsf{Tf} = \frac{\mathsf{D}}{2\pi\,\eta}\,(\mu\mathsf{g}\mathsf{W}\!+\!\mathsf{F})$



W: Weight [kg]

P : Pulley diameter [m]

F: External force [N]

η: Mechanical efficiency μ: Coefficient of friction

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 =
$$\sqrt{\frac{Ta^2 \times ta + Tf^2 \times tb + Td^2 \times td}{tc}}$$

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 $\rho = 7.9 \times 10^3 \, [kg/m^3]$

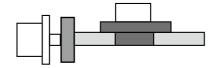
Aluminum $\rho = 2.8 \times 10^{3} \, [kg/m^{3}]$

Brass $\rho = 8.5 \times 10^3 \, [kg/m^3]$

To Drive Ball Screw Mechanism

1. Example of motor selection for driving ball screw mechanism

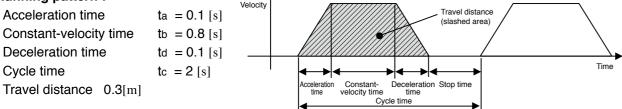
Workpiece weight	WA = 10 [kg]
Ball screw length	BL = 0.5 [m]
Ball screw diameter	BD = 0.02 [m]
Ball screw lead	BP = 0.02 [m]
Ball screw efficiency	$B\eta = 0.9$



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

$$\begin{aligned} JL &= JC \,+\, JB = JC \,+\, \frac{1}{8}BW \,\times\, BD^2 \,+\, \frac{WA \cdot BP^2}{4\pi^2} \\ &= 0.00001 \,+\, (1.24 \times 0.02^2) \,/\, 8 \,+\, 10 \,\times\, 0.02^2 \,/\, 4\pi^2 \\ &= 1.73 \,\times\, 10^{-4} \,[\,\mathrm{k}\,\mathrm{g} \cdot \mathrm{m}^2] \end{aligned}$$

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)

Vmax = 0.3 / 0.9 = 0.334 [m/s]

$$\frac{1}{2}$$
 × 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

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 = $T_a = 0.231 [N \cdot m] < 1.91 [N \cdot m]$ (Maximum torque of MSMF 200 W motor)

11. Verification of effective torque

Trms =
$$\sqrt{\frac{\text{Ta}^2 \times \text{ta} + \text{Tf}^2 \times \text{tb} + \text{Td}^2 \times \text{td}}{\text{tc}}}$$

= $\sqrt{\frac{0.231^2 \times 0.1 + 0.035^2 \times 0.8 + 0.161^2 \times 0.1}{2}}$
= 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)

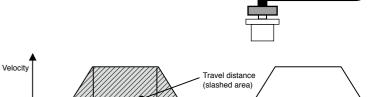
> Pulley diameter PD = 0.05[m]

Pulley weight WP= 0.5[kg] (Use manufacturer-specified catalog value, or calculation value.)

Mechanical efficiency $B\eta = 0.8$

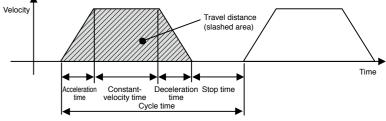
Coupling inertia Jc = 0 (Direct connection to motor shaft)

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

$$= JC + \frac{1}{4}WA \times PD^{2} + \frac{1}{8}WP \times PD^{2} \times 2$$

$$= 0 + \frac{1}{4} \times 2 \times 0.05^{2} + \frac{1}{8} \times 0.5 \times 0.05^{2} \times 2$$

$$= 0.00156 = 15.6 \times 10^{-4} [kg \cdot m^{2}]$$

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 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
$$T_f = \frac{PD}{2\,\eta} (\mu gWA + F) = \frac{0.05}{2\,\times\,0.8} \ (0.1\,\times\,9.8\,\times\,3 + 0)$$

$$= 0.061[\,N\cdot m\,]$$
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

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 V 11) Diameter of the ball screw mm 12) Total length of the ball

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:

mm

Request Sheet for Motor Selection

Request for motor selection II: Timing pulley + Ball screw drive

1. Driven mechanism and running data

1)	Travel distance of the work load per one cycle
1)	

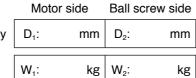
work	ℓ₁:



16) Weight of the pulley

15)	Diameter of the pulley

(or item 17) and 18))



(Fill in items 3) and 4) if required.)

17) Width of the pulley

L1:	mm

4) Deceleration time

3) Acceleration time

2) Cycle time

tu.		ro, material of the par
ts:	s	19) Weight of the belt

s 18) Material of the pulley

W _M :	kg

6) Max. velocity

5) Stopping time

V:	mm/s	
F:	N	

7) External force

8) work load

the	±	mm
load	W _A :	kg

Total weight of the work load 9) and the table

Positioning accuracy of

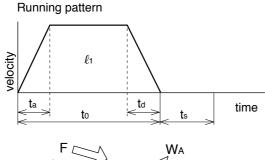
0)	Power supply voltage	

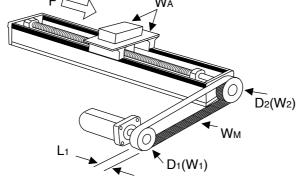
11) Diameter of the ball screw

12)	Total length of the ball screw	mm

13) Lead of the ball screw

Traveling direction	
4)	(horizontal, vertical etc.)





2. Other data (Fill the details on specific mechanism and its configurations in the following blank.)

٧

 mm

 $\mathsf{m}\mathsf{m}$

Company name :
Department/Section:
Name :
Address :
Tel:
Fax:
E-mail address:

Request Sheet for Motor Selection

Request for motor selection **II**: Belt drive

mm/s

Ν

mm

kg

V

kg

mm

kg

1. Driven mechanism and running data

1)	Travel distance of the work load per one cycle	ℓ₁:	mm
2)	Cycle time	to:	S

(Fill in items 3) and 4) if required.)

3)	Acceleration time	ta:
4)	Deceleration time	td:

ts:

F:

D₁:

 W_1 :

5) Stopping time

Max. velocity	V:
---------------	----

7) External force 8) Positioning accuracy of the

,	work load	
9)	Total weight of the work load	W _A :

10)	Power supply voltage	

Weight of the belt	V
--------------------	---

12) Diameter of the driving	ng pulley
-----------------------------	-----------

13)	Total	weight	of the	pulley
-----	-------	--------	--------	--------

g pattern
g patteri

velocity		ℓ 1		
	ta	t o	t _d t _s	time

WA

	 F
L ₁	
	D 1
	W 1

(or item 14) and 15))

14)	Width	of	the	pulley
-----	-------	----	-----	--------

15)	Material of the	pulle

16)	Traveling direction
16)	(horizontal vertical

(0)	ILCIII	14)	anu	13))	

Vidth of the pulley	L ₁ :
---------------------	------------------

6)	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:

pcs

Request Sheet for Motor Selection

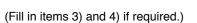
Request for motor selection IV: Timing pulley + Belt drive

1. Driven mechanism and running data

1)	load per one cycle	ℓ_1 :	mm
2)	Cycle time	to:	s

m	16)	Diameter of the pull

6)	Diameter of the pulley	D ₃ :	mm



3)	Acceleration time	ta:	s

td:

Stopping time	ts:

4) Deceleration time

6) Max. velocity	V:	mm

7) External force	F:	N
8) Positioning accuracy of the work load	±	mm

9)	Total weight of the work load	W _A : kg	5
10)	Power supply voltage	V	,

11) Maight of motor aids halt	١٨/ ٠	le ~
Weight of motor side belt	W _M :	Kg

		Motor side		Belt side	
12)	Diameter of the pulley	D ₁ :	mm	D ₂ :	mm
13)	Weight of the	W ₁ :	kg	W ₂ :	kg

(or item 14) and 15))

14) Width of the belt	L1:	mm
15) Material of the pulley		

Motor side Belt side

16) Diameter of the pulley	D ₃ :	mm	D ₄ :	m
17) Weight of the pulley	W ₃ :	kg	W ₄ :	k

r	item	18)	and	19))	
---	------	-----	-----	------	--

18) Width of the pulley	L2:

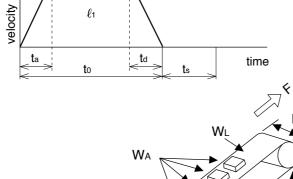
20) Weight of the belt

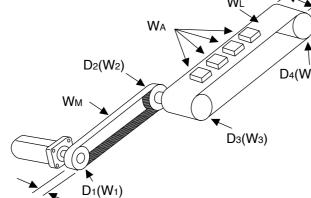
	\w\ .	
еу		

mm

21)	Traveling direction
۷١)	(horizontal, vertical etc.)

Running pattern





2. Other data (Fill the details on specific mechanism and its configurations in the following blank.)

Company name :
Department/Section:
Name :
Address:
Tel:
Fax:
E-mail address:

Request Sheet for Motor Selection

Request for motor selection V: Turntable drive

1. Driven mechanism and running data

1)	Travel distance of the work load per one cycle	d ₁ :	deg	14
2)	Cycle time	to:	S	
	(Fill in items 3) and 4) if requi	red.)		
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	± de	∍g

Weight of one work load		ad	W _A :		
n · ·					

9)	of gravity of the work	R ₁ :	mm
10)	Diameter of the table	D ₁ :	mm

 W_1 :

11)	Mass of the table	

12)	Diameter of the table
12)	support

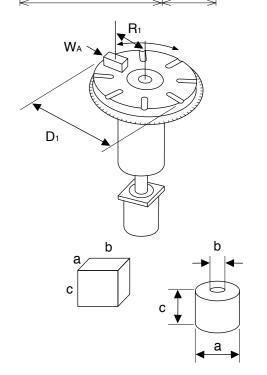
13)	Power	vlagus	voltage
,		CGPP.,	· Oitago

1 1)	Dimensions of t	h
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	rn			
velocity		d ₁			
	<ta>ta √</ta>	to	t d →	t s	time



2. Other data (Fill the details on specific mechanism and its configurations in the following blank.)

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

		9		
1)	Travel distance of the work load per one cycle	ℓ_1 : mm	Running pattern	
2)	Cycle time	to: s	/	
	(Fill in items 3) and 4) if required.)		lα l	
3)	Acceleration time	ta: s	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	ts
4)	Deceleration time	td: s	< >	 <
5)	Stopping time	ts: s		_
6)	Max. velocity	v: mm/s		F
7)	External pulling force	F: N		L1
8)	Positioning accuracy of the work load	± mm		D1(W1)
9)	Number of rollers	pcs		
0)	Power supply voltage	V	(or item 13) and 14))	
11)	Diameter of the roller	D ₁ : mm	13) Width of the roller	L ₁ : mm
2)	Mass of the roller	W· ka	14) Material of the roller	

Request Sheet for Motor Selection

Request for motor selection VI: Timing pulley + Turntable drive

1. Driven mechanism ar	nd running data
Travel distance of the work	

٠,	load per one cycle	u ₁ .	
2)	Cycle time	to:	S

u ₁ .	ueg	'
to:	s	1

16)	Diameter of the pulley

18) Width of the pulley

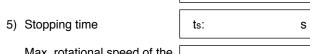
19) Material of the pulley

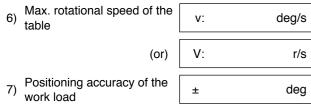
20) Weight of the belt

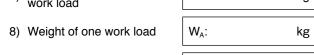
		Moto	or side	Turntable side	
)	Diameter of the pulley	D ₂ :	mm	D ₃ :	mm
)	Weight of the pulley	W ₂ :	kg	W ₃ :	kg

(Fill in items 3) and 4) if required.) (or item 18) and 19))

3) Acceleration time	ta:	s
4) Deceleration time	td:	s
-) 0 : 1		







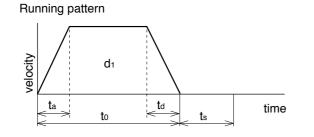
9)	Driving radius of the center of gravity of the work	R ₁ :	mm
10)	Diameter of the table	D ₁ :	mm

11)	Mass of the table	١
40)	Diameter of the table	Γ

-1	Diameter of the table
	support

13)	Power supply voltage	
,		

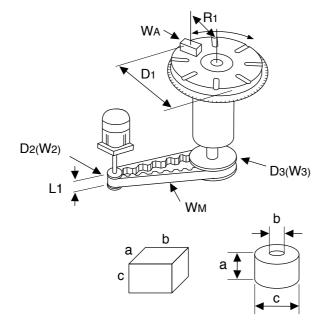
13)	Power supply volta	age					V
			(Prisr	n)		(Cylinder)	
14)	Dimension of the work load	a:		mm	a:	n	nm
		b:		mm	b:	n	nm
		c:		mm	c:	n	nm
15)	Number of work lo	ads				ŗ	ocs



 W_{M} :

 mm

kg



2. Other data (Fill the details on specific mechanism and its configurations in the following blank.)

kg

mm

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.)

0
Company name :
Department/Section :
Name :
Address :
Tel:
Fax:
E-mail address:

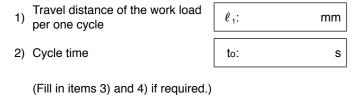
255 Information Information 256

Connection Between Driver and Controller

Request Sheet for Motor Selection

Request for motor selection III: Driving with Rack & Pinion

1. Driven mechanism and running data



3) Acceleration time

ta: 4) Deceleration time **t**d: 5) Stopping time ts:

V:

F:

 W_A :

D₃:

 W_3 :

6) Max. velocity

7) External force

Positioning accuracy of the 8) work load

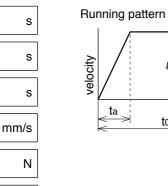
9) Total weight of the work load

10) Power supply voltage

11) Diameter of the pinion 12) Mass of the pinion

Traveling direction

(horizontal, vertical, etc.)



mm

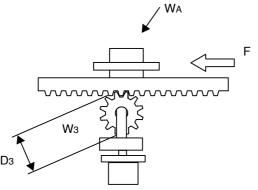
kg

٧

mm

kg

ta



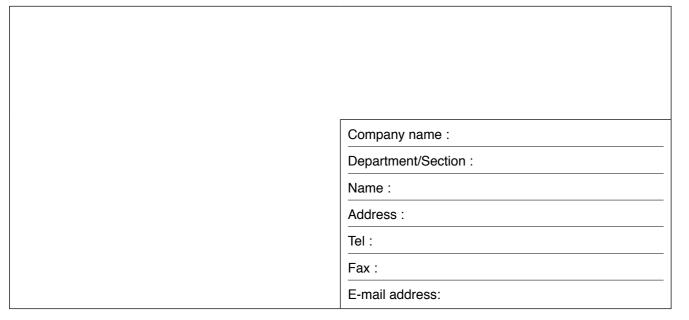
td

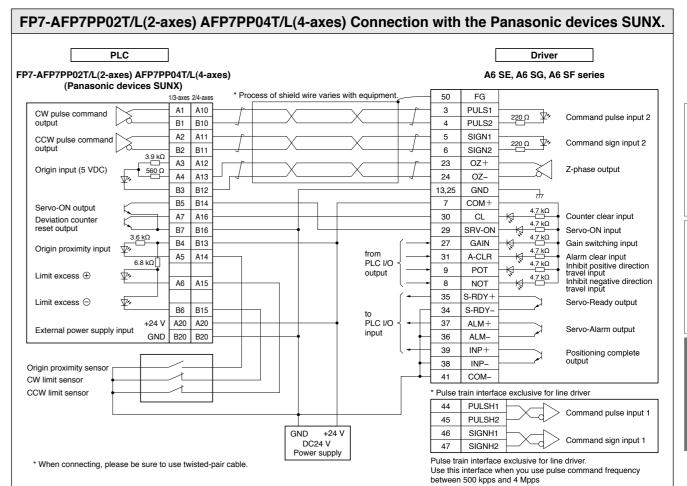
time

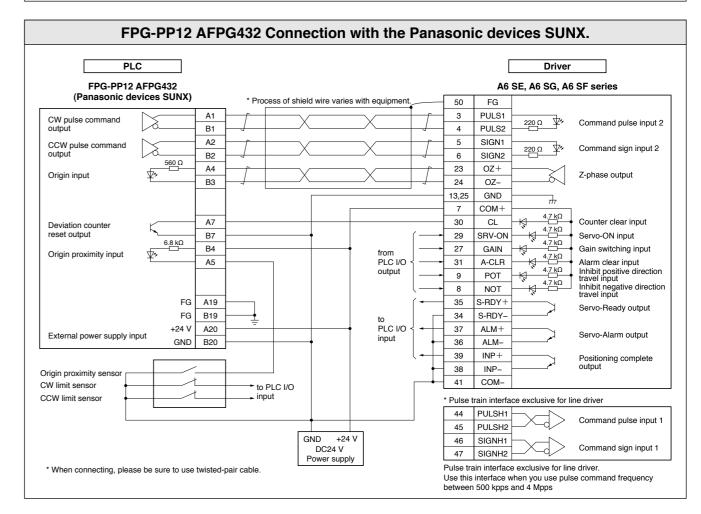
 ℓ_1

to

2. Other data (Fill the details on specific mechanism and its configurations in the following blank.)







Servo-Ready output

Servo-Alarm output

Positioning complete

Command pulse input 1

PLC I/O

input

35

34

37

36

39

38

45

46

S-RDY+

S-RDY-

ALM+

ALM-

INP+

INP-

PULSH1

PUI SH2 SIGNH1

47 SIGNH2

* Pulse train interface exclusive for line driver

Pulse train interface exclusive for line driver. Use this interface when

you use pulse command frequency between 500 kpps and 4 Mpps

1a

2a

За

4a

7.4 kΩ

7.4 kΩ

7.4 kΩ

* When connecting, please be sure to use twisted-pair cable

Contact point input COM

Negative direction limit input

Positive direction

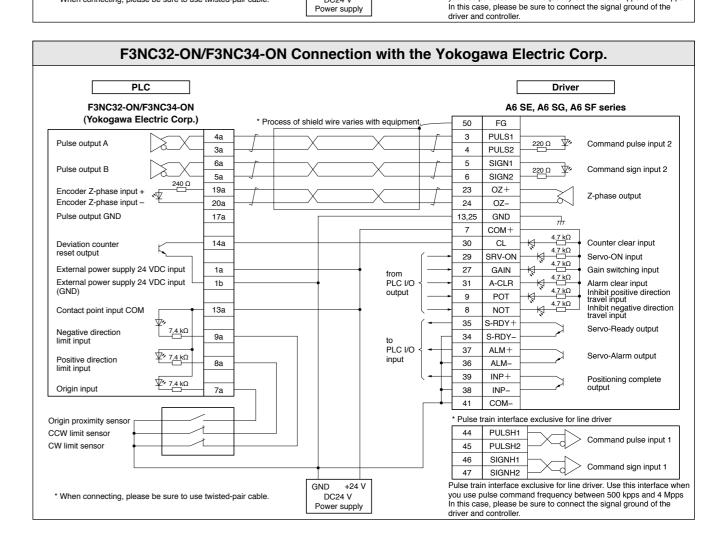
Origin proximity senso

Origin input

CCW limit senso

CW limit sensor

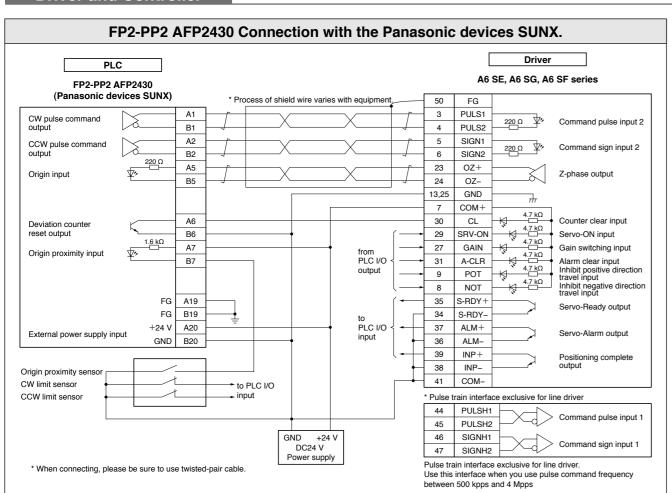
F3YP22-0P/F3YP24-0P/F3YP28-0P Connection with the Yokogawa Electric Corp.

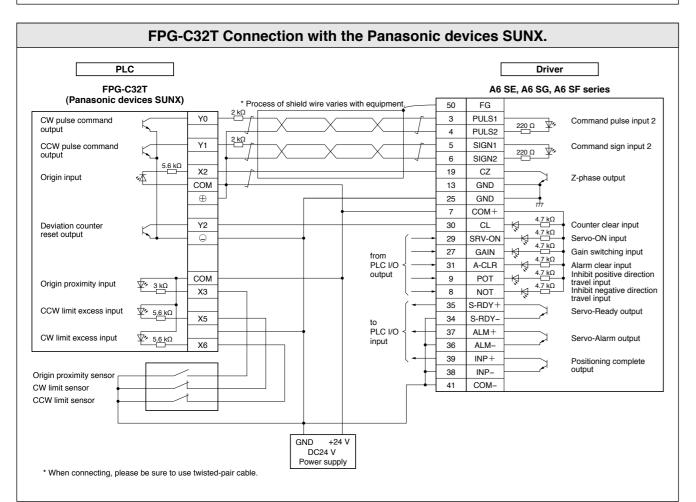


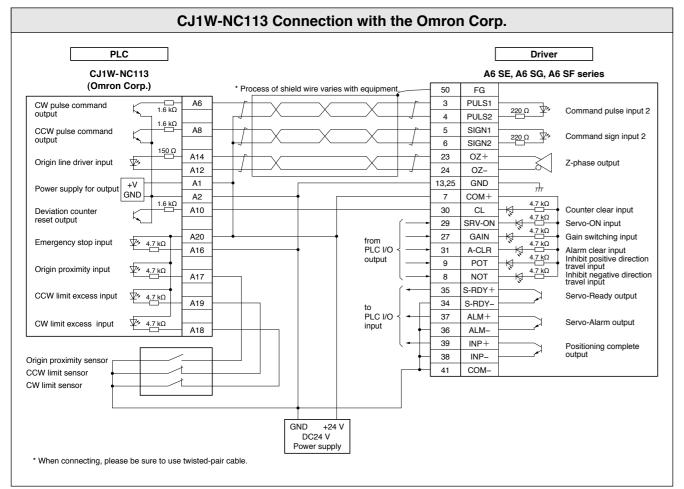
+24 V

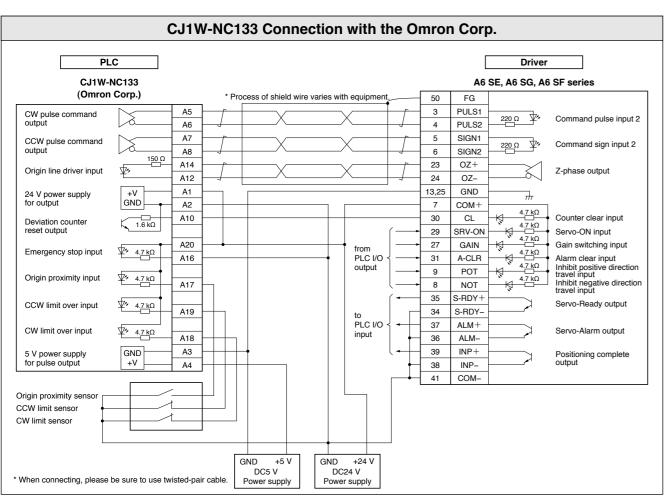
GND

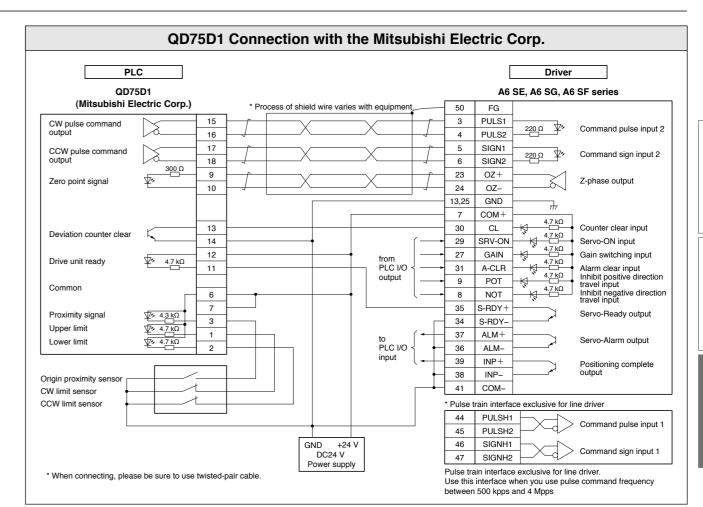
DC24 V

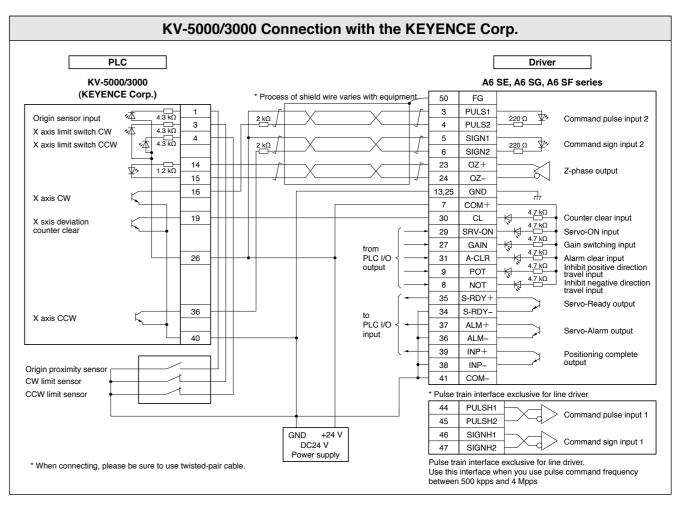








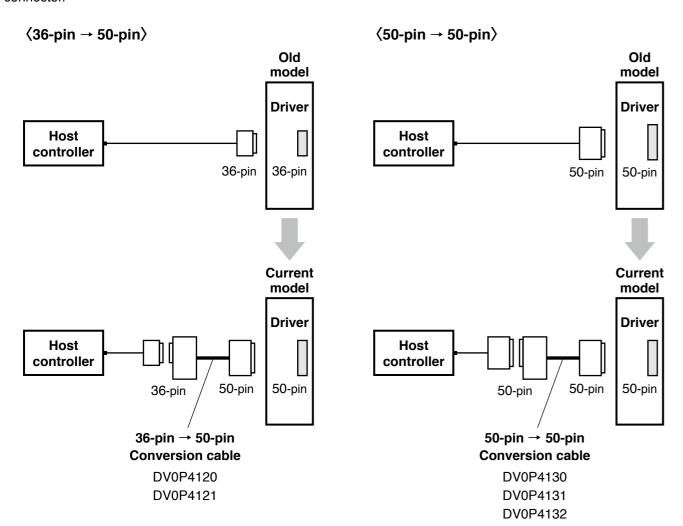




A6 Family Connection Between Driver and Controller

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	P.205
	Torque control	DV0P4132	P.266

^{*} For external dimensions, refer to P.182.

Conversion Wiring Table

	DV0P4120				DV0P4121			
Pin No. on Old Model	No. on 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.

263 Information Information

Replacing Old Model Servo Driver with MINAS A6 series

		DV0P4130 DV0P4131				
Pin No.	Pin			Pin		
on Old Model	No. on Current Model	Signal Name	Symbol	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
45	25	Signal ground	GND	25	Signal ground	GND
46	NC	olgital ground	GIND	NC	Oignai giounu	GIND
		R-phase output	OB+		R-phase output	OB+
48	48	B-phase output		48	B-phase output	
49	49	B-phase output	OB-	49	B-phase output	OB-
50	50	Frame ground	FG	50	Frame ground	FG

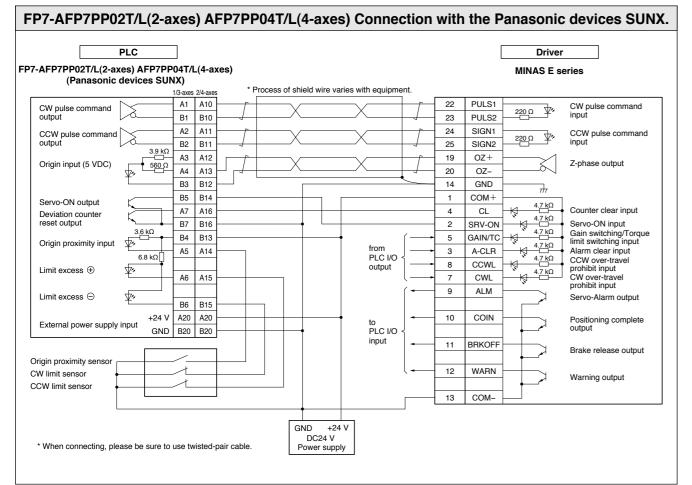
*	"NC"	is	no	connect.
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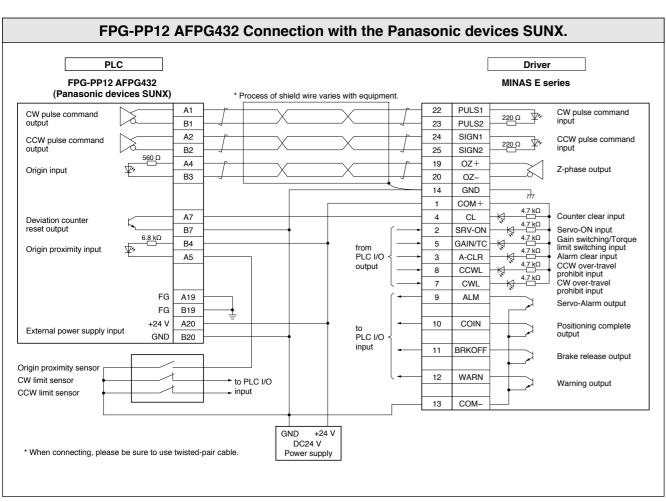
A6 Family

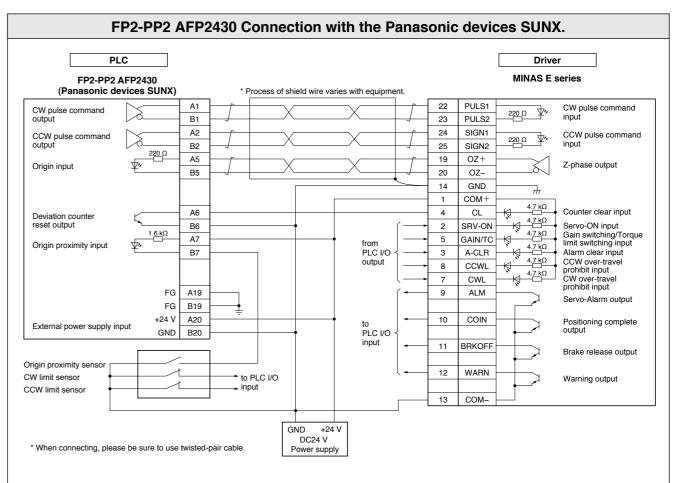
Connection Between Driver and Controller

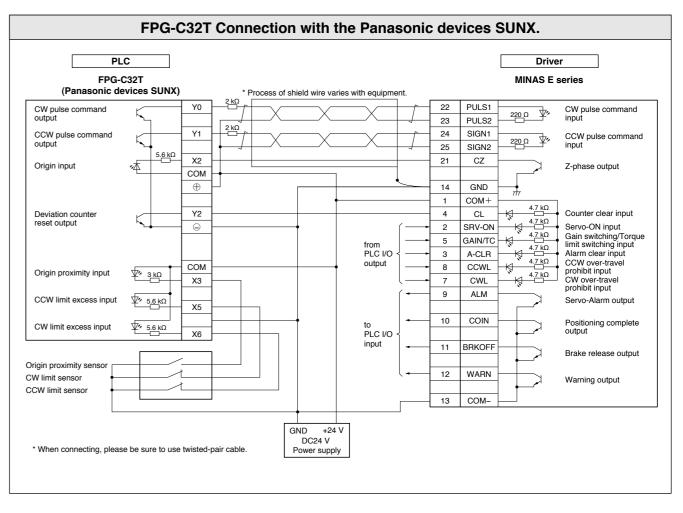
Pin No				
No. or N			DV0P4132	
2 9 CCW over-travel inhibit input CCWL 3 NC 4 NC 5 NC 6 NC 7 7 Power supply for control signal (+) COM+ 8 NC 9 NC 10 NC 11 11 External brake release signal BRK-OFF+ 12 12 Zero-speed detection output signal ZSP 13 13 Torque in-limit signal output TLC 14 NC 15 15 Signal ground GND 16 16 Torque command input TROR 17 17 Signal ground GND 18 18 CW direction torque limit input CWTL 19 19 2-phase output CZ 20 NC OZ- 21 21	on Old	No. on Current	Signal Name	Symbol
3	1	8	CW over-travel inhibit input	CWL
4 NC 5 NC 6 NC 7 7 8 NC 9 NC 10 NC 11 11 12 Zero-speed detection output signal 12 12 2ero-speed detection output signal ZSP 13 13 14 NC 15 15 15 Signal ground 16 16 16 Torque command input 17 17 Signal ground GND 18 18 CW direction torque limit input CWTL 20 NC 21 21 21 21 21 21 21 21 22 A-phase output 0A- 22 22 A-phase output OZ- 25 50 Frame ground FG 26	2	9	CCW over-travel inhibit input	CCWL
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 OZ- 23 23 23 23				
6 NC 7 7 Power supply for control signal (+) COM+ 8 NC Power supply for control signal (+) COM+ 9 NC NC Power supply for control signal (+) COM+ 10 NC NC Power supply for control signal (+) BRK-OFF+ 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 TLC TLC 14 NC GND TROR 15 15 Signal ground GND GND 16 16 Torque command input TROR GND 17 17 Signal ground GND GND 18 18 CW direction torque limit input CVTL CZ 20 NC CZ CZ CZ 21 21 A-phase output CX CZ				
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 Signal ground GND 16 16 Torque command input TRQR 17 17 Signal ground GND 18 18 CW direction torque limit input CWTL 20 NC 20 NC 21 21 A-phase output 22 22 A-phase output 23 23 Z-phase output 24 24 Z-phase output <td></td> <td></td> <td></td> <td></td>				
8 NC 9 NC 10 NC 11 11 12 12 2 zero-speed detection output signal ZSP 13 13 Torque in-limit signal output TLC 14 NC Interpretation of the property of the propert				0011
9 NC 10 NC 11 11 11 11 12 12 2 zero-speed detection output signal ZSP 13 13 Torque in-limit signal output TLC 14 NC ————————————————————————————————————			Power supply for control signal (+)	COM+
10	_			
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 Incompany Incompany 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 CWTL 20 NC Incompany CWTL 21 21 A-phase output OA- 22 22 A-phase output OZ- 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				
12 12 Zero-speed detection output signal ZSP 13 13 Torque in-limit signal output TLC 14 NC C GND 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 C C 20 NC C A-phase output OA- 22 22 A-phase output OZ- 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 SRV-ON 30 NC SRV-ON 3			Eutornal broke release signal	PDK OEE
13 13 Torque in-limit signal output TLC 14 NC GND 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 CZ 21 21 A-phase output OA- 22 22 A-phase output OZ- 23 23 Z-phase output OZ- 24 24 Z-phase output ZEROSPD 26 26 Speed zero clamp input ZEROSPD 27 27 Gain switching input GAIN 28 NC SERO-ON 30 NC SERV-ON 31 31 Alarm clear input A-CLR 32 32 Control mode switching input C-MODE 33 NC Servo-			-	
14 NC GND 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 CZ 21 21 A-phase output OA- 22 22 A-phase output OZ- 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 Servo-ON SRV-ON 30 NC SRV-ON 31 31 Alarm clear input A-CLR 32 32 32 Control mode switching input C-MODE 33 NC </td <td></td> <td></td> <td></td> <td></td>				
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 CZ 21 21 A-phase output OA- 22 22 A-phase output OZ- 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 Servo-ON SRV-ON 30 NC SRV-ON 31 31 Alarm clear input A-CLR 32 32 Control mode switching input C-MODE 33 NC Servo-Ready output S-RDY+ 36 NC <td></td> <td></td> <td>Torque III-IIIII signal output</td> <td>TEO</td>			Torque III-IIIII signal output	TEO
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 C C 21 21 A-phase output OA- 22 22 A-phase output OZ- 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 SRV-ON 30 NC SRV-ON 31 31 Alarm clear input A-CLR 32 32 Control mode switching input C-MODE 33 NC S-BOY-A S-RDY+ 36 NC S-RDY+ 36 NC S-RDY+			Signal ground	GND
17 17 Signal ground GND 18 18 CW direction torque limit input CWTL 19 19 Z-phase output CZ 20 NC C CZ 21 21 A-phase output OA- 22 22 A-phase output OZ- 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 SRV-ON 30 NC SRV-ON 31 31 Alarm clear input A-CLR 32 32 Control mode switching input C-MODE 33 NC S-RDY+ 36 NC S-RDY+ 36 NC S-RDY+ 37 37 Servo-Ready output AT-SPEED+				
19				
20	18	18	CW direction torque limit input	CWTL
21 21 A-phase output OA+ 22 22 A-phase output OZ+ 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 SRV-ON 30 NC SRV-ON 31 31 Alarm clear input A-CLR 32 32 Control mode switching input C-MODE 33 NC C-MODE 34 NC Servo-Ready output S-RDY+ 36 NC Servo-Ready output ALM+ 38 NC Servo-Alarm output ALM+ 39 39 Speed arrival output TLC 40 Torque in-limit signal output TLC 41 Speed arrival output (-) AT-SPEED- 41 Speed arrival output (19	19	Z-phase output	CZ
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 SRV-ON 30 NC SRV-ON 31 31 Alarm clear input A-CLR 32 32 Control mode switching input C-MODE 33 NC SA NC 34 NC NC S-RDY+ 36 NC S-RDY+ 37 37 Servo-Ready output ALM+ 38 NC NC NC 39 39 Speed arrival output AT-SPEED+ 40 40 Torque in-limit signal output TLC 34 Speed arrival output (-) AT-SPEED+ 41 Speed arrival output (-) A	20	NC		
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 SRV-ON 30 NC SRV-ON 31 31 Alarm clear input A-CLR 32 32 Control mode switching input C-MODE 33 NC C-MODE 34 NC S-RDY+ 35 35 Servo-Ready output S-RDY+ 36 NC ALM+ 37 37 Servo-Alarm output AT-SPEED+ 40 40 Torque in-limit signal output TLC 39 39 Speed arrival output (-) BRK-OFF- 34 Speed arrival output (-) AT-SPEED+ 41 36 Servo-Alarm output (-) ALM- 38 Servo-Ready output (-) S-RD	21	21	A-phase output	OA+
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 SRV-ON 29 29 Servo-ON input SRV-ON 30 NC C-MODE 31 31 Alarm clear input A-CLR 32 32 Control mode switching input C-MODE 33 NC C-MODE 34 NC S-RDY+ 35 35 Servo-Ready output S-RDY+ 36 NC NC 37 37 Servo-Alarm output ALM+ 38 NC NC 39 39 Speed arrival output TLC 40 Torque in-limit signal output TLC 34 Speed arrival output (-) AT-SPEED+ 41 Speed arrival output (-) ALM- 38 Servo-Ready outp	22	22	A-phase output	OA-
25 50 Frame ground FG 26 26 Speed zero clamp input ZEROSPD 27 27 Gain switching input GAIN 28 NC SRV-ON 29 29 Servo-ON input SRV-ON 30 NC A-CLR 31 31 Alarm clear input A-CLR 32 32 Control mode switching input C-MODE 33 NC C-MODE 34 NC S-RDY+ 36 NC Servo-Ready output S-RDY+ 36 NC ALM+ 38 NC ALM+ 39 39 Speed arrival output AT-SPEED+ 40 40 Torque in-limit signal output TLC BRK-OFF- 34 Speed arrival output (-) AT-SPEED+ 41 Speed arrival output (-) ALM- 38 Servo-Ready output (-) S-RDY- 41 Power supply for control signal (-) COM-	23	23	Z-phase output	OZ+
26 26 Speed zero clamp input ZEROSPD 27 27 Gain switching input GAIN 28 NC SRV-ON 29 29 Servo-ON input SRV-ON 30 NC CA-CLR 31 31 Alarm clear input A-CLR 32 32 Control mode switching input C-MODE 33 NC C-MODE 34 NC S-RDY+ 35 35 Servo-Ready output S-RDY+ 36 NC Servo-Alarm output ALM+ 38 NC AT-SPEED+ 40 40 Torque in-limit signal output TLC 34 Speed arrival output (-) BRK-OFF- 34 Speed arrival output (-) AT-SPEED- 41 36 Servo-Alarm output (-) ALM- 38 Servo-Ready output (-) S-RDY- 41 Power supply for control signal (-) COM- 42 42 Torque monitor output IM <td>24</td> <td>24</td> <td>Z-phase output</td> <td>OZ-</td>	24	24	Z-phase output	OZ-
27 27 Gain switching input GAIN 28 NC SRV-ON 29 29 Servo-ON input SRV-ON 30 NC A-CLR 31 31 Alarm clear input A-CLR 32 32 Control mode switching input C-MODE 33 NC Sasting input C-MODE 34 NC Servo-Ready output S-RDY+ 36 NC Servo-Alarm output ALM+ 38 NC AT-SPEED+ 40 40 Torque in-limit signal output TLC 34 Speed arrival output (-) BRK-OFF- 34 Speed arrival output (-) AT-SPEED- 41 Servo-Alarm output (-) ALM- 38 Servo-Ready output (-) S-RDY- 41 Power supply for control signal (-) COM- 42 42 Torque monitor output IM 43 Speed monitor output SP 44 25 Signal ground	25	50	Frame ground	FG
28 NC 29 29 Servo-ON input SRV-ON 30 NC	26	26	Speed zero clamp input	ZEROSPD
29 29 Servo-ON input SRV-ON 30 NC A-CLR 31 31 Alarm clear input A-CLR 32 32 Control mode switching input C-MODE 33 NC S-RDY+ 34 NC S-RDY+ 36 NC ALM+ 37 37 Servo-Alarm output ALM+ 38 NC AT-SPEED+ 40 40 Torque in-limit signal output TLC 34 Speed arrival output (-) BRK-OFF- 34 Speed arrival output (-) AT-SPEED- 41 Servo-Alarm output (-) ALM- 38 Servo-Ready output (-) S-RDY- 41 Power supply for control signal (-) COM- 42 42 Torque monitor output IM 43 Speed monitor output GND 44 25 Signal ground GND	27	27	Gain switching input	GAIN
30	28	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 37 37 Servo-Alarm output ALM+ 38 NC 39 39 Speed arrival output TLC 40 40 Torque in-limit signal output TLC 10 External brake release signal (-) BRK-OFF- 34 Speed arrival output (-) AT-SPEED- 41 Speed arrival output (-) ALM- 38 Servo-Alarm output (-) S-RDY- 41 Power supply for control signal (-) COM- 42 42 Torque monitor output IM 43 Speed monitor output SP 44 25 Signal ground GND	29	29	Servo-ON input	SRV-ON
32 32 Control mode switching input C-MODE 33 NC 34 NC 35 35 Servo-Ready output S-RDY+ 36 NC 37 37 Servo-Alarm output ALM+ 38 NC 39 39 Speed arrival output TLC 40 40 Torque in-limit signal output TLC 10 External brake release signal (-) BRK-OFF- 34 Speed arrival output (-) AT-SPEED- 36 Servo-Alarm output (-) ALM- 38 Servo-Ready output (-) S-RDY- 41 Power supply for control signal (-) COM- 42 42 Torque monitor output IM 43 Speed monitor output SP 44 25 Signal ground GND				
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34 NC 35 35 Servo-Ready output S-RDY+ 36 NC ALM+ 37 37 Servo-Alarm output ALM+ 38 NC AT-SPEED+ 40 40 Torque in-limit signal output TLC 41 10 External brake release signal (-) BRK-OFF- 34 Speed arrival output (-) AT-SPEED- 34 Speed arrival output (-) ALM- 38 Servo-Alarm output (-) S-RDY- 41 Power supply for control signal (-) COM- 42 42 Torque monitor output IM 43 Speed monitor output SP 44 25 Signal ground GND 45 25 Signal ground GND			Control mode switching input	C-MODE
35 35 Servo-Ready output S-RDY+ 36 NC				
36 NC 37 37 Servo-Alarm output ALM+ 38 NC AT-SPEED+ 40 40 Torque in-limit signal output TLC 41 10 External brake release signal (-) BRK-OFF- 34 Speed arrival output (-) AT-SPEED- 36 Servo-Alarm output (-) ALM- 38 Servo-Ready output (-) S-RDY- 41 Power supply for control signal (-) COM- 42 42 Torque monitor output IM 43 43 Speed monitor output SP 44 25 Signal ground GND 45 25 Signal ground GND				0.000
37 37 Servo-Alarm output ALM+ 38 NC 39 39 Speed arrival output AT-SPEED+ 40 40 Torque in-limit signal output TLC BRK-OFF- 34 Speed arrival output (-) AT-SPEED- ALM- 38 Servo-Alarm output (-) S-RDY- 41 Power supply for control signal (-) COM- 42 42 Torque monitor output IM 43 Speed monitor output SP Signal ground GND Signal ground GND GND			Servo-Ready output	S-RDY+
38 NC 39 39 Speed arrival output AT-SPEED+ 40 40 Torque in-limit signal output TLC 41 10 External brake release signal (-) BRK-OFF- 34 Speed arrival output (-) AT-SPEED- 36 Servo-Alarm output (-) S-RDY- 41 Power supply for control signal (-) COM- 41 Power supply for control signal (-) COM- 42 42 Torque monitor output IM 43 Speed monitor output SP 44 25 Signal ground GND 45 25 Signal ground GND			Come Alexen systems	A1 N4 .
39 39 Speed arrival output AT-SPEED+ 40 40 Torque in-limit signal output TLC 41 10 External brake release signal (-) BRK-OFF- 34 Speed arrival output (-) AT-SPEED- 36 Servo-Alarm output (-) ALM- 38 Servo-Ready output (-) S-RDY- 41 Power supply for control signal (-) COM- 42 42 Torque monitor output IM 43 43 Speed monitor output SP 44 25 Signal ground GND 45 25 Signal ground GND			Servo-Alarm output	ALIVI+
40 40 Torque in-limit signal output TLC 10 External brake release signal (-) BRK-OFF- 34 Speed arrival output (-) AT-SPEED- 36 Servo-Alarm output (-) ALM- 38 Servo-Ready output (-) S-RDY- 41 Power supply for control signal (-) COM- 42 42 Torque monitor output IM 43 43 Speed monitor output SP 44 25 Signal ground GND 45 25 Signal ground GND			Speed arrival output	AT-SPEED:
10			<u> </u>	
34 Speed arrival output (-) AT-SPEED- 36	70			
36 Servo-Alarm output (-) ALM- 38 Servo-Ready output (-) S-RDY- 41 Power supply for control signal (-) COM- 42 42 Torque monitor output IM 43 43 Speed monitor output SP 44 25 Signal ground GND 45 25 Signal ground GND				
38 Servo-Ready output (-) S-RDY- 41 Power supply for control signal (-) COM- 42 42 Torque monitor output IM 43 43 Speed monitor output SP 44 25 Signal ground GND 45 25 Signal ground GND	41			
41 Power supply for control signal (-) COM- 42 42 Torque monitor output IM 43 43 Speed monitor output SP 44 25 Signal ground GND 45 25 Signal ground GND				
42 42 Torque monitor output IM 43 43 Speed monitor output SP 44 25 Signal ground GND 45 25 Signal ground GND				COM-
43 43 Speed monitor output SP 44 25 Signal ground GND 45 25 Signal ground GND	42			
44 25 Signal ground GND 45 25 Signal ground GND				
45 25 Signal ground GND	44	25		GND
	45	25		GND
	46	25	Signal ground	GND
47 NC	47	NC		
48 48 B-phase output OB+	48	48	B-phase output	OB+
49 49 B-phase output OB-	49	49	B-phase output	OB-
50 50 Frame ground FG	50	50	Frame ground	FG

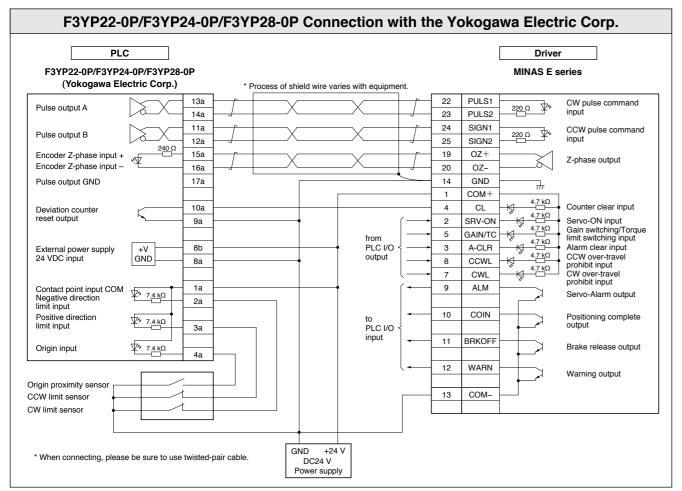
^{* &}quot;NC" is no connect.

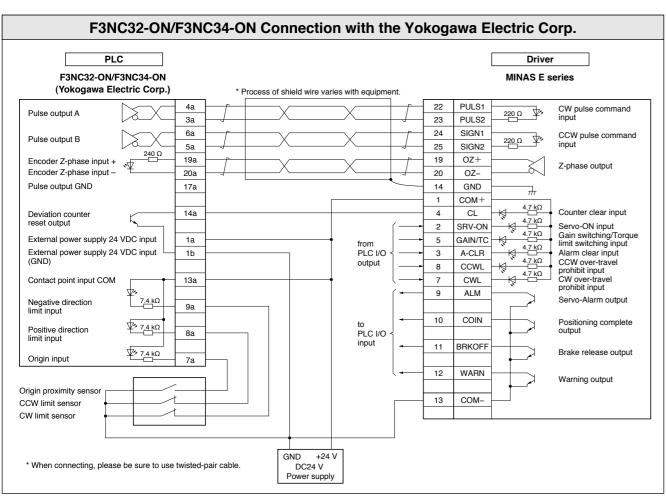


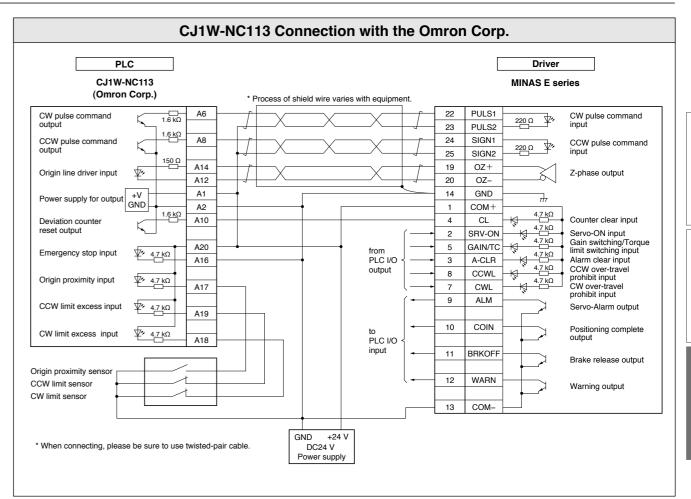


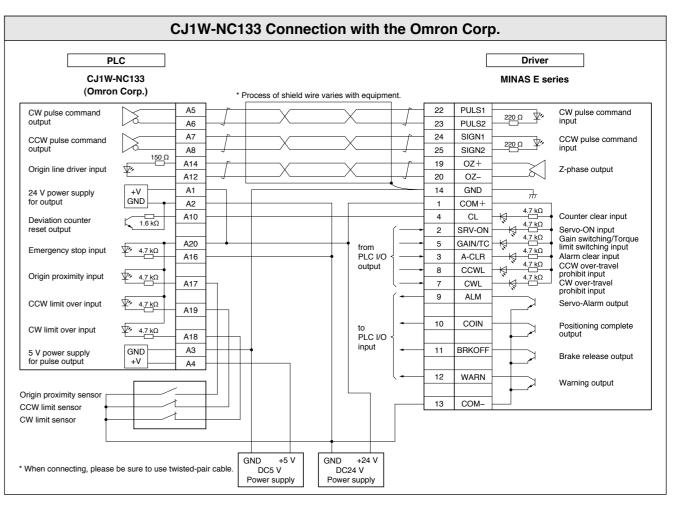












Connection Between Driver and Controller





PL	.C								Driver	
QD7: (Mitsubishi El			* Process	of shield wire	varies with equipme	ent.			MINAS E se	ries
CW pulse command output		15		X	X	1	22 23	PULS1 PULS2	220 Ω 💯	CW pulse command input
CCW pulse command output		17		X	X	1	24 25	SIGN1 SIGN2	220 Ω 🛂	CCW pulse command input
Zero point signal	300 Ω	9			\sim	<i></i>	19 20	OZ+ OZ-		Z-phase output
							14 1	GND COM+	1710	
Deviation counter clear		13				ſ 	4	CL SRV-ON	4.7 kΩ 4.7 kΩ	Counter clear input Servo-ON input
Drive unit ready	4.7 kΩ	12			from PLC I/O	\	5 3	GAIN/TC A-CLR	4.7 kΩ 4.7 kΩ	Gain switching/Torque limit switching input Alarm clear input
Common		6	•		output		8 7	CCWL	4.7 kΩ 4.7 kΩ	CCW over-travel prohibit input CW over-travel
Proximity signal	√⁄₂ 4.7 kΩ √⁄₂ 4.7 kΩ	7 3	 				9	ALM		prohibit input Servo-Alarm output
Upper limit Lower limit	Ψ% 4.7 kΩ	2		,	to PLC I/O	\ -	10	COIN		Positioning complete output
igin proximity sensor					input	-	11	BRKOFF		Brake release output
V limit sensor						-	12	WARN		Warning output
							13	COM-		
When connecting, pleas	se be sure to use t	wisted-pair o	able.	GND DC24	I .					

DV0P		
Part No.	Title	Page
DV0P0770	Connector kit for external peripheral equipment	226 227
DV0P0800 DV0P1450	Interface cable Surge absorber (3-phase)	240
DV0P1450	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 DV0P39200	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	Connector kit for motor/encoder connection Connector kit for motor/brake connection	192
		193
DV0PM20040	Noise filter	236
DV0PM20042	Noise filter	
DV0PM20042 DV0PM20043	Noise filter	236
DV0PM20042	Connector for power supply input connection	185
DV0PM20042 DV0PM20043 DV0PM20044		185
DV0PM20042 DV0PM20043	Connector for power supply input connection (E-frame) Connector for regenerative resistor (E-frame 200 V/400 V common	
DV0PM20042 DV0PM20043 DV0PM20044	Connector for power supply input connection (E-frame) Connector for regenerative resistor (E-frame 200 V/400 V common Connector for motor connection	185
DV0PM20042 DV0PM20043 DV0PM20044 DV0PM20045 DV0PM20046	Connector for power supply input connection (E-frame) Connector for regenerative resistor (E-frame 200 V/400 V common Connector for motor connection (E-frame 200 V/400 V common)	185 185 186
DV0PM20042 DV0PM20043 DV0PM20044 DV0PM20045	Connector for power supply input connection (E-frame) Connector for regenerative resistor (E-frame 200 V/400 V common Connector for motor connection	185 185

DV0P		
Part No.	Title	Page
DV0PM20100	Mounting bracket for A-frame and B-frame	195
DV0PM20101	Mounting bracket for C-frame and D-frame	195
DV0PM24581	Connector kit for motor/encoder connection	188
DV0PM24582	Connector kit for motor/encoder connection	188
DV0PM24583	Connector kit for motor/encoder connection	189
DV0PM24584	Connector kit for motor/encoder connection	190
DV0PM24585	Connector kit for motor/encoder connection	189
DV0PM24586	Connector kit for motor/encoder connection	190
DV0PM24587	Connector kit for motor/encoder connection	189
DV0PM24588	Connector kit for motor/encoder connection	190
DV0PM24589	Connector kit for motor/encoder connection	189
DV0PM24590	Connector kit for motor/encoder connection	190
		-

MADL		
Part No.	Title	Page
MADLN01SE	A6SE series driver: A-frame	35,36
MADLN05SE	A6SE series driver: A-frame	35,36
MADLN11SE	A6SE series driver: A-frame	35,36
MADLN15SE	A6SE series driver: A-frame	35,36
MADLN01SF	A6SF series driver: A-frame	33,34
MADLN05SF	A6SF series driver: A-frame	33,34
MADLN11SF	A6SF series driver: A-frame	33,34
MADLN15SF	A6SF series driver: A-frame	33,34
MADLN01SG	A6SG series driver: A-frame	35,36
MADLN05SG	A6SG series driver: A-frame	35,36
MADLN11SG	A6SG series driver: A-frame	35,36
MADLN15SG	A6SG series driver: A-frame	35,36

MBDL		
Part No.	Title	Page
MBDLN21SE	A6SE series driver: B-frame	35,36
MBDLN25SE	A6SE series driver: B-frame	35,36
MBDLT21SF	A6SF series driver: B-frame	33,34
MBDLT25SF	A6SF series driver: B-frame	33,34
MBDLT21SG	A6SG series driver: B-frame	35,36
MBDLT25SG	A6SG series driver: B-frame	35,36

MCDL		
Part No.	Title	Page
MCDLN31SE	A6SE series driver: C-frame	35,36
MCDLN35SE	A6SE series driver: C-frame	35,36
MCDLT31SF	A6SF series driver: C-frame	33,34
MCDLT35SF	A6SF series driver: C-frame	33,34
MCDLT31SG	A6SG series driver: C-frame	35,36
MCDLT35SG	A6SG series driver: C-frame	35,36

Title	Page
A6SE series driver: D-frame	35,36
A6SE series driver: D-frame	35,36
A6SF series driver: D-frame	33,34
A6SF series driver: D-frame	33,34
A6SG series driver: D-frame	35,36
A6SG series driver: D-frame	35,36
	A6SE series driver: D-frame A6SE series driver: D-frame A6SF series driver: D-frame A6SF series driver: D-frame A6SG series driver: D-frame

MDMF		
Part No.	Title	Page
MDMF102L1C5	MDMF 1.0 kW Absolute encoder	89
MDMF102L1C6	MDMF 1.0 kW Absolute encoder	89
MDMF102L1C6M	MDMF 1.0 kW Absolute encoder	148
MDMF102L1C7	MDMF 1.0 kW Absolute encoder	89
MDMF102L1C8	MDMF 1.0 kW Absolute encoder	89
MDMF102L1C8M	MDMF 1.0 kW Absolute encoder	148
MDMF102L1D5	MDMF 1.0 kW Absolute encoder	89
MDMF102L1D6	MDMF 1.0 kW Absolute encoder	89
MDMF102L1D6M	MDMF 1.0 kW Absolute encoder	148
MDMF102L1D7	MDMF 1.0 kW Absolute encoder	89
MDMF102L1D8	MDMF 1.0 kW Absolute encoder	89
MDMF102L1D8M	MDMF 1.0 kW Absolute encoder	148
MDMF102L1G5	MDMF 1.0 kW Absolute encoder	89
MDMF102L1G6	MDMF 1.0 kW Absolute encoder	89
MDMF102L1G6M	MDMF 1.0 kW Absolute encoder	148

Index (Alphabetical Order)

MDMF	Title	Domo
Part No. MDMF102L1G7	Title MDMF 1.0 kW Absolute encoder	Page 89
MDMF102L1G8	MDMF 1.0 kW Absolute encoder	89
MDMF102L1G8M	MDMF 1.0 kW Absolute encoder	148
MDMF102L1H5	MDMF 1.0 kW Absolute encoder	89
MDMF102L1H6	MDMF 1.0 kW Absolute encoder	89
MDMF102L1H6M MDMF102L1H7	MDMF 1.0 kW Absolute encoder MDMF 1.0 kW Absolute encoder	148 89
MDMF102L1H8	MDMF 1.0 kW Absolute encoder	89
MDMF102L1H8M	MDMF 1.0 kW Absolute encoder	148
MDMF152L1C5	MDMF 1.5 kW Absolute encoder	90
MDMF152L1C6	MDMF 1.5 kW Absolute encoder	90
MDMF152L1C6M MDMF152L1C7	MDMF 1.5 kW Absolute encoder MDMF 1.5 kW Absolute encoder	149 90
MDMF152L1C7	MDMF 1.5 kW Absolute encoder	90
MDMF152L1C8M	MDMF 1.5 kW Absolute encoder	149
MDMF152L1D5	MDMF 1.5 kW Absolute encoder	90
MDMF152L1D6	MDMF 1.5 kW Absolute encoder	90
MDMF152L1D6M	MDMF 1.5 kW Absolute encoder	149
MDMF152L1D7	MDMF 1.5 kW Absolute encoder MDMF 1.5 kW Absolute encoder	90
MDMF152L1D8 MDMF152L1D8M	MDMF 1.5 kW Absolute encoder	149
MDMF152L1G5	MDMF 1.5 kW Absolute encoder	90
MDMF152L1G6	MDMF 1.5 kW Absolute encoder	90
MDMF152L1G6M	MDMF 1.5 kW Absolute encoder	149
MDMF152L1G7	MDMF 1.5 kW Absolute encoder	90
MDMF152L1G8	MDMF 1.5 kW Absolute encoder	90
MDMF152L1G8M MDMF152L1H5	MDMF 1.5 kW Absolute encoder MDMF 1.5 kW Absolute encoder	149 90
MDMF152L1H6	MDMF 1.5 kW Absolute encoder	90
MDMF152L1H6M	MDMF 1.5 kW Absolute encoder	149
MDMF152L1H7	MDMF 1.5 kW Absolute encoder	90
MDMF152L1H8	MDMF 1.5 kW Absolute encoder	90
MDMF152L1H8M	MDMF 1.5 kW Absolute encoder	149
MDMF202L1C5 MDMF202L1C6	MDMF 2.0 kW Absolute encoder MDMF 2.0 kW Absolute encoder	91 91
MDMF202L1C6M	MDMF 2.0 kW Absolute encoder	150
MDMF202L1C7	MDMF 2.0 kW Absolute encoder	91
MDMF202L1C8	MDMF 2.0 kW Absolute encoder	91
MDMF202L1C8M	MDMF 2.0 kW Absolute encoder	150
MDMF202L1D5	MDMF 2.0 kW Absolute encoder MDMF 2.0 kW Absolute encoder	91
MDMF202L1D6 MDMF202L1D6M	MDMF 2.0 kW Absolute encoder	91 150
MDMF202L1D7	MDMF 2.0 kW Absolute encoder	91
MDMF202L1D8	MDMF 2.0 kW Absolute encoder	91
MDMF202L1D8M	MDMF 2.0 kW Absolute encoder	150
MDMF202L1G5	MDMF 2.0 kW Absolute encoder	91
MDMF202L1G6 MDMF202L1G6M	MDMF 2.0 kW Absolute encoder MDMF 2.0 kW Absolute encoder	91 150
MDMF202L1G6W	MDMF 2.0 kW Absolute encoder	91
MDMF202L1G8	MDMF 2.0 kW Absolute encoder	91
MDMF202L1G8M	MDMF 2.0 kW Absolute encoder	150
MDMF202L1H5	MDMF 2.0 kW Absolute encoder	91
MDMF202L1H6	MDMF 2.0 kW Absolute encoder	91
MDMF202L1H6M MDMF202L1H7	MDMF 2.0 kW Absolute encoder MDMF 2.0 kW Absolute encoder	150 91
MDMF202L1H8	MDMF 2.0 kW Absolute encoder	91
MDMF202L1H8M	MDMF 2.0 kW Absolute encoder	150
MDMF302L1C5	MDMF 3.0 kW Absolute encoder	92
MDMF302L1C6	MDMF 3.0 kW Absolute encoder	92
MDMF302L1C6M	MDMF 3.0 kW Absolute encoder	151
MDMF302L1C7 MDMF302L1C8	MDMF 3.0 kW Absolute encoder MDMF 3.0 kW Absolute encoder	92
MDMF302L1C8M	MDMF 3.0 kW Absolute encoder	151
MDMF302L1D5	MDMF 3.0 kW Absolute encoder	92
MDMF302L1D6	MDMF 3.0 kW Absolute encoder	92
MDMF302L1D6M	MDMF 3.0 kW Absolute encoder	151
MDMF302L1D7	MDMF 3.0 kW Absolute encoder	92
MDMF302L1D8 MDMF302L1D8M	MDMF 3.0 kW Absolute encoder MDMF 3.0 kW Absolute encoder	92 151
MDMF302L1D8M MDMF302L1G5	MDMF 3.0 kW Absolute encoder MDMF 3.0 kW Absolute encoder	92
MDMF302L1G6	MDMF 3.0 kW Absolute encoder	92
MDMF302L1G6M	MDMF 3.0 kW Absolute encoder	151

MDMF		
Part No.	Title	Page
MDMF302L1G7	MDMF 3.0 kW Absolute encoder	92
MDMF302L1G8	MDMF 3.0 kW Absolute encoder	92
MDMF302L1G8M	MDMF 3.0 kW Absolute encoder	151
MDMF302L1H5	MDMF 3.0 kW Absolute encoder	92
MDMF302L1H6	MDMF 3.0 kW Absolute encoder	92
MDMF302L1H6M	MDMF 3.0 kW Absolute encoder	151
MDMF302L1H7	MDMF 3.0 kW Absolute encoder	92
MDMF302L1H8	MDMF 3.0 kW Absolute encoder	92
MDMF302L1H8M	MDMF 3.0 kW Absolute encoder	151
MDMF402L1C5	MDMF 4.0 kW Absolute encoder	93
MDMF402L1C6	MDMF 4.0 kW Absolute encoder	93
MDMF402L1C6M	MDMF 4.0 kW Absolute encoder	152
MDMF402L1C7	MDMF 4.0 kW Absolute encoder	93
MDMF402L1C8	MDMF 4.0 kW Absolute encoder	93
MDMF402L1C8M	MDMF 4.0 kW Absolute encoder	152
MDMF402L1D5 MDMF402L1D6	MDMF 4.0 kW Absolute encoder MDMF 4.0 kW Absolute encoder	93
MDMF402L1D6 MDMF402L1D6M	MDMF 4.0 kW Absolute encoder	152
MDMF402L1D6M	MDMF 4.0 kW Absolute encoder	
MDMF402L1D7 MDMF402L1D8	MDMF 4.0 kW Absolute encoder	93
MDMF402L1D8M	MDMF 4.0 kW Absolute encoder	152
MDMF402L1G5	MDMF 4.0 kW Absolute encoder	93
MDMF402L1G6	MDMF 4.0 kW Absolute encoder	93
MDMF402L1G6M	MDMF 4.0 kW Absolute encoder	152
MDMF402L1G7	MDMF 4.0 kW Absolute encoder	93
MDMF402L1G8	MDMF 4.0 kW Absolute encoder	93
MDMF402L1G8M	MDMF 4.0 kW Absolute encoder	152
MDMF402L1H5	MDMF 4.0 kW Absolute encoder	93
MDMF402L1H6	MDMF 4.0 kW Absolute encoder	93
MDMF402L1H6M	MDMF 4.0 kW Absolute encoder	152
MDMF402L1H7	MDMF 4.0 kW Absolute encoder	93
MDMF402L1H8	MDMF 4.0 kW Absolute encoder	93
MDMF402L1H8M	MDMF 4.0 kW Absolute encoder	152
MDMF502L1C5	MDMF 5.0 kW Absolute encoder	94
MDMF502L1C6	MDMF 5.0 kW Absolute encoder	94
MDMF502L1C6M	MDMF 5.0 kW Absolute encoder	153
MDMF502L1C7	MDMF 5.0 kW Absolute encoder	94
MDMF502L1C8	MDMF 5.0 kW Absolute encoder	94
MDMF502L1C8M	MDMF 5.0 kW Absolute encoder	153
MDMF502L1D5	MDMF 5.0 kW Absolute encoder	94
MDMF502L1D6	MDMF 5.0 kW Absolute encoder	94
MDMF502L1D6M	MDMF 5.0 kW Absolute encoder	153
MDMF502L1D7	MDMF 5.0 kW Absolute encoder	94
MDMF502L1D8	MDMF 5.0 kW Absolute encoder	94
MDMF502L1D8M	MDMF 5.0 kW Absolute encoder	153
MDMF502L1G5	MDMF 5.0 kW Absolute encoder	94
MDMF502L1G6	MDMF 5.0 kW Absolute encoder	94
MDMF502L1G6M	MDMF 5.0 kW Absolute encoder	153
MDMF502L1G7	MDMF 5.0 kW Absolute encoder	94
MDMF502L1G8 MDMF502L1G8M	MDMF 5.0 kW Absolute encoder MDMF 5.0 kW Absolute encoder	94
MDMF502L1G8M	MDMF 5.0 kW Absolute encoder	153 94
MDMF502L1H6	MDMF 5.0 kW Absolute encoder	94
MDMF502L1H6M	MDMF 5.0 kW Absolute encoder	153
MDMF502L1H7	MDMF 5.0 kW Absolute encoder	94
MDMF502L1H8	MDMF 5.0 kW Absolute encoder	94
MDMF502L1H8M	MDMF 5.0 kW Absolute encoder	153
2122	2.2	

Title	Page
A6 SE series driver: E-frame	35,36
A6 SF series driver: E-frame	33,34
A6 SG series driver: E-frame	35,36
	A6 SE series driver: E-frame A6 SF series driver: E-frame

MFDL		
Part No.	Title	Page
MFDLNA3SE	A6 SE series driver: F-frame	35,36
MFDLNB3SE	A6 SE series driver: F-frame	35,36
MFDLNA3SF	A6 SF series driver: F-frame	33,34
MFDLNB3SF	A6 SF series driver: F-frame	33,34
MFDLNA3SG	A6 SG series driver: F-frame	35,36
MFDLNB3SG	A6 SG series driver: F-frame	35,36

MEEGA Part No.	Title	Page
MFECA0030EAD	Encoder cable (without battery box)	171
MFECA0030EAE	Encoder cable (with battery box)	171
MFECA0030EAL	Encoder cable (without battery box)	224
MFECA0030EAN	Encoder cable (without battery box)	173
MFECA0030EPE	Encoder cable (with battery box)	173
MFECA0030EFE	Encoder cable (without battery box)	173
MFECA0030ESE	`	173
	Encoder cable (with battery box)	
MFECA0030ETD	Encoder cable (without battery box)	174
MFECA0030ETE	Encoder cable (with battery box)	174
MFECA0030MJD	Encoder cable (without battery box)	172
MFECA0030MJE	Encoder cable (with battery box)	172
MFECA0030MKD	Encoder cable (without battery box)	172
MFECA0030MKE	Encoder cable (with battery box)	172
MFECA0030TJD	Encoder cable (without battery box)	172
MFECA0030TJE	Encoder cable (with battery box)	172
MFECA0030TKD	Encoder cable (without battery box)	172
MFECA0030TKE	Encoder cable (with battery box)	172
MFECA0050EAD	Encoder cable (without battery box)	171
MFECA0050EAE	Encoder cable (with battery box)	171
MFECA0050EAM	Encoder cable (without battery box)	224
MFECA0050EPD	Encoder cable (without battery box)	173
MFECA0050EPE	Encoder cable (without battery box)	173
MFECA0050ESD	Encoder cable (without battery box)	173
MFECA0050ESE	Encoder cable (with battery box)	174
MFECA0050ETD	Encoder cable (without battery box)	174
MFECA0050ETE	Encoder cable (with battery box)	174
MFECA0050MJD	Encoder cable (without battery box)	172
MFECA0050MJE	Encoder cable (with battery box)	172
MFECA0050MKD	Encoder cable (without battery box)	172
MFECA0050MKE	Encoder cable (with battery box)	172
MFECA0050TJD	Encoder cable (without battery box)	172
MFECA0050TJE	Encoder cable (with battery box)	172
MFECA0050TKD	Encoder cable (without battery box)	172
MFECA0050TKE	Encoder cable (with battery box)	172
MFECA0100EAD	Encoder cable (without battery box)	171
MFECA0100EAE	Encoder cable (with battery box)	171
MFECA0100EAM	Encoder cable (without battery box)	224
MFECA0100EPD	Encoder cable (without battery box)	173
MFECA0100EPE	Encoder cable (without battery box)	173
MFECA0100ESD	Encoder cable (without battery box)	173
MFECA0100ESE	Encoder cable (with battery box)	174
MFECA0100ETD	Encoder cable (without battery box)	174
MFECA0100ETE	Encoder cable (with battery box)	174
MFECA0100MJD	Encoder cable (with battery box)	172
MFECA0100MJE	Encoder cable (with battery box)	
MFECA0100MSD	Encoder cable (without battery box)	172
MFECA0100MKE	, ,	
MFECA0100MRL	Encoder cable (with battery box) Encoder cable (without battery box)	172
	Encoder cable (with battery box)	172
MFECA0100TJE	` , ,	172
MFECA0100TKD	Encoder cable (without battery box)	172
MFECA0100TKE	Encoder cable (with battery box)	172
MFECA0200EAD	Encoder cable (without battery box)	171
MFECA0200EAE	Encoder cable (with battery box)	171
MFECA0200EAM	Encoder cable (without battery box)	224
MFECA0200EPD	Encoder cable (without battery box)	173
MFECA0200EPE	Encoder cable (without battery box)	173
MFECA0200ESD	Encoder cable (without battery box)	173
MFECA0200ESE	Encoder cable (with battery box)	174
MFECA0200ETD	Encoder cable (without battery box)	174
MFECA0200ETE	Encoder cable (with battery box)	174
MFECA0200MJD	Encoder cable (without battery box)	172
MFECA0200MJE	Encoder cable (with battery box)	172
MFECA0200MKD	Encoder cable (without battery box)	172
MFECA0200MKE	Encoder cable (with battery box)	172
MFECA0200TJD	Encoder cable (without battery box)	172
MFECA0200TJE	Encoder cable (with battery box)	172
MFECA0200TKD	Encoder cable (without battery box)	172
IVII LUAUZUUTKU	Ziloodo: dabio (miliodi ballor) box)	

MFMCA Part No.	Title	Page
MFMCA0030AEB	Motor Cable	224
MFMCA0030ALB	Motor Cable (without Brake)	175
MFMCA0030EED	Motor Cable (without Brake)	175
MFMCA0030NSD	Motor Cable (without Brake)	175
MFMCA0030NRD	, ,	175
	Motor Cable (without Brake)	
MFMCA0030RKD	Motor Cable (without Brake)	175 176
MFMCA0030UFD	Motor Cable (without Brake)	
MFMCA0030UGD	Motor Cable (without Brake)	176
MFMCA0030VFD	Motor Cable (with Brake)	178
MFMCA0030VGD	Motor Cable (with Brake)	178
MFMCA0030WFD	Motor Cable (without Brake)	176
MFMCA0030WGD	Motor Cable (without Brake)	176
MFMCA0030XFD	Motor Cable (with Brake)	178
MFMCA0030XGD	Motor Cable (with Brake)	178
MFMCA0032FCD	Motor Cable (with Brake)	179
MFMCA0032FUD	Motor Cable (with Brake)	179
MFMCA0033ECT	Motor Cable (without Brake)	177
MFMCA0033EUT	Motor Cable (without Brake)	177
MFMCA0033FCT	Motor Cable (with Brake)	180
MFMCA0033FUT	Motor Cable (with Brake)	180
MFMCA0037UFD	Motor Cable (without Brake)	175
MFMCA0037UGD	Motor Cable (without Brake)	175
MFMCA0037VFD	Motor Cable (with Brake)	178
MFMCA0037VGD	Motor Cable (with Brake)	178
MFMCA0050AEB	Motor Cable	224
MFMCA0050EED	Motor Cable (without Brake)	175
MFMCA0050NJD	Motor Cable (without Brake)	175
MFMCA0050NKD	Motor Cable (without Brake)	175
MFMCA0050RJD	Motor Cable (without Brake)	175
MFMCA0050RKD	Motor Cable (without Brake)	175
MFMCA0050UFD	Motor Cable (without Brake)	176
MFMCA0050UGD	Motor Cable (without Brake)	176
MFMCA0050VFD	Motor Cable (with Brake)	178
MFMCA0050VGD	Motor Cable (with Brake)	178
MFMCA0050WFD	Motor Cable (without Brake)	176
MFMCA0050WGD	Motor Cable (without Brake)	176
MFMCA0050XFD	Motor Cable (with Brake)	178
MFMCA0050XGD	Motor Cable (with Brake)	178
MFMCA0052FCD	Motor Cable (with Brake)	179
MFMCA0052FUD	Motor Cable (with Brake)	179
MFMCA0053ECT	Motor Cable (without Brake)	177
MFMCA0053EUT	Motor Cable (without Brake)	177
MFMCA0053FCT	Motor Cable (with Brake)	180
MFMCA0053FUT	Motor Cable (with Brake)	180
MFMCA0057UFD	Motor Cable (without Brake)	175
MFMCA0057UGD	Motor Cable (without Brake)	175
MFMCA0057VFD	Motor Cable (with Brake)	178
MFMCA0057VID	Motor Cable (with Brake)	178
MFMCA0100AEB	Motor Cable	224
MFMCA0100AEB	Motor Cable (without Brake)	175
MFMCA0100EED	Motor Cable (without Brake)	175
MFMCA0100NJD	Motor Cable (without Brake) Motor Cable (without Brake)	
	, ,	175
MFMCA0100RJD	Motor Cable (without Brake)	175
MFMCA0100RKD	Motor Cable (without Brake)	175
MFMCA0100UFD	Motor Cable (without Brake)	176
MFMCA0100UGD	Motor Cable (without Brake)	176
MFMCA0100VFD	Motor Cable (with Brake)	178
MFMCA0100VGD	Motor Cable (with Brake)	178
MFMCA0100WFD	Motor Cable (without Brake)	176
MFMCA0100WGD	Motor Cable (without Brake)	176
MFMCA0100XFD	Motor Cable (with Brake)	178
MFMCA0100XGD	Motor Cable (with Brake)	178
MFMCA0102FCD	Motor Cable (with Brake)	179
MFMCA0102FUD	Motor Cable (with Brake)	179
MFMCA0103ECT	Motor Cable (without Brake)	177
MFMCA0103EUT	Motor Cable (without Brake)	177
	Motor Cable (with Brake)	180
MFMCA0103FCT	,	180
MFMCA0103FUT	Motor Cable (with Brake)	100
	Motor Cable (without Brake)	175
MFMCA0103FUT MFMCA0107UFD	Motor Cable (without Brake)	175
MFMCA0103FUT	,	

273 Information Information 274

Index

(Alphabetical Order)

MFMCA		
Part No.	Title	Page
MFMCA0200AEB	Motor Cable	224
MFMCA0200EED	Motor Cable (without Brake)	175
MFMCA0200NJD	Motor Cable (without Brake)	175
MFMCA0200NKD	Motor Cable (without Brake)	175
MFMCA0200RJD	Motor Cable (without Brake)	175
MFMCA0200RKD	Motor Cable (without Brake)	175
MFMCA0200UFD	Motor Cable (without Brake)	176
MFMCA0200UGD	Motor Cable (without Brake)	176
MFMCA0200VFD	Motor Cable (with Brake)	178
MFMCA0200VGD	Motor Cable (with Brake)	178
MFMCA0200WFD	Motor Cable (without Brake)	176
MFMCA0200WGD	Motor Cable (without Brake)	176
MFMCA0200XFD	Motor Cable (with Brake)	178
MFMCA0200XGD	Motor Cable (with Brake)	178
MFMCA0202FCD	Motor Cable (with Brake)	179
MFMCA0202FUD	Motor Cable (with Brake)	179
MFMCA0203ECT	Motor Cable (without Brake)	177
MFMCA0203EUT	Motor Cable (without Brake)	177
MFMCA0203FCT	Motor Cable (with Brake)	180
MFMCA0203FUT	Motor Cable (with Brake)	180
MFMCA0207UFD	Motor Cable (without Brake)	175
MFMCA0207UGD	Motor Cable (without Brake)	175
MFMCA0207VFD	Motor Cable (with Brake)	178
MFMCA0207VGD	Motor Cable (with Brake)	178

МЕМСВ		
Part No.	Title	Page
MFMCB0030GET	Brake cable	224
MFMCB0030PJT	Brake cable	181
MFMCB0030PKT	Brake cable	181
MFMCB0030SJT	Brake cable	181
MFMCB0030SKT	Brake cable	181
MFMCB0050GET	Brake cable	224
MFMCB0050PJT	Brake cable	181
MFMCB0050PKT	Brake cable	181
MFMCB0050SJT	Brake cable	181
MFMCB0050SKT	Brake cable	181
MFMCB0100GET	Brake cable	224
MFMCB0100PJT	Brake cable	181
MFMCB0100PKT	Brake cable	181
MFMCB0100SJT	Brake cable	181
MFMCB0100SKT	Brake cable	181
MFMCB0200GET	Brake cable	224
MFMCB0200PJT	Brake cable	181
MFMCB0200PKT	Brake cable	181
MFMCB0200SJT	Brake cable	181
MFMCB0200SKT	Brake cable	181

MFMCD		
Part No.	Title	Page
MFMCD0032ECD	Motor cable (without brake)	176
MFMCD0032EUD	Motor cable (without brake)	176
MFMCD0052ECD	Motor cable (without brake)	176
MFMCD0052EUD	Motor cable (without brake)	176
MFMCD0102ECD	Motor cable (without brake)	176
MFMCD0102EUD	Motor cable (without brake)	176
MFMCD0202ECD	Motor cable (without brake)	176
MFMCD0202EUD	Motor cable (without brake)	176

MFMCE		
Part No.	Title	Page
MFMCE0032ECD	Motor cable (without brake)	177
MFMCE0032EUD	Motor cable (without brake)	177
MFMCE0032FCD	Motor cable (with brake)	180
MFMCE0032FUD	Motor Cable (with Brake)	179
MFMCE0052ECD	Motor Cable (without Brake)	177
MFMCE0052EUD	Motor Cable (without Brake)	177
MFMCE0052FCD	Motor Cable (with Brake)	180
MFMCE0052FUD	Motor Cable (with Brake)	179
MFMCE0102ECD	Motor Cable (without Brake)	177
MFMCE0102EUD	Motor Cable (without Brake)	177
MFMCE0102FCD	Motor Cable (with Brake)	180

MFMCE		
Part No.	Title	Page
MFMCE0102FUD	Motor Cable (with Brake)	179
MFMCE0202ECD	Motor Cable (without Brake)	177
MFMCE0202EUD	Motor Cable (without Brake)	177
MFMCE0202FCD	Motor Cable (with Brake)	180
MFMCE0202FUD	Motor Cable (with Brake)	179

	nertia/Low speed high torque)	Domo
Part No.	Title MGMF 0.85 kW Absolute encoder	Page
MGMF092L1C5		95
MGMF092L1C6	MGMF 0.85 kW Absolute encoder	95
MGMF092L1C6M	MGMF 0.85 kW Absolute encoder	154
MGMF092L1C7	MGMF 0.85 kW Absolute encoder	95
MGMF092L1C8	MGMF 0.85 kW Absolute encoder MGMF 0.85 kW Absolute encoder	95
MGMF092L1C8M		154
MGMF092L1D5	MGMF 0.85 kW Absolute encoder	95
MGMF092L1D6	MGMF 0.85 kW Absolute encoder	95
MGMF092L1D6M	MGMF 0.85 kW Absolute encoder	154
MGMF092L1D7	MGMF 0.85 kW Absolute encoder	95
MGMF092L1D8	MGMF 0.85 kW Absolute encoder	95
MGMF092L1D8M	MGMF 0.85 kW Absolute encoder	154
MGMF092L1G5	MGMF 0.85 kW Absolute encoder	95
MGMF092L1G6	MGMF 0.85 kW Absolute encoder	95
MGMF092L1G6M	MGMF 0.85 kW Absolute encoder	154
MGMF092L1G7	MGMF 0.85 kW Absolute encoder	95
MGMF092L1G8	MGMF 0.85 kW Absolute encoder	95
MGMF092L1G8M	MGMF 0.85 kW Absolute encoder	154
MGMF092L1H5	MGMF 0.85 kW Absolute encoder	95
MGMF092L1H6	MGMF 0.85 kW Absolute encoder	95
MGMF092L1H6M	MGMF 0.85 kW Absolute encoder	154
MGMF092L1H7	MGMF 0.85 kW Absolute encoder	95
MGMF092L1H8	MGMF 0.85 kW Absolute encoder	95
MGMF092L1H8M	MGMF 0.85 kW Absolute encoder	154
MGMF132L1C5	MGMF 1.3 kW Absolute encoder	96
MGMF132L1C6	MGMF 1.3 kW Absolute encoder	96
MGMF132L1C6M	MGMF 1.3 kW Absolute encoder	155
MGMF132L1C7	MGMF 1.3 kW Absolute encoder	96
MGMF132L1C8	MGMF 1.3 kW Absolute encoder	96
MGMF132L1C8M	MGMF 1.3 kW Absolute encoder	155
MGMF132L1D5	MGMF 1.3 kW Absolute encoder	96
MGMF132L1D6	MGMF 1.3 kW Absolute encoder	96
MGMF132L1D6M	MGMF 1.3 kW Absolute encoder	155
MGMF132L1D7	MGMF 1.3 kW Absolute encoder	96
MGMF132L1D8	MGMF 1.3 kW Absolute encoder	96
MGMF132L1D8M	MGMF 1.3 kW Absolute encoder	155
MGMF132L1G5	MGMF 1.3 kW Absolute encoder	96
MGMF132L1G6	MGMF 1.3 kW Absolute encoder	96
MGMF132L1G6M	MGMF 1.3 kW Absolute encoder	155
MGMF132L1G7	MGMF 1.3 kW Absolute encoder	96
MGMF132L1G8	MGMF 1.3 kW Absolute encoder	96
MGMF132L1G8M	MGMF 1.3 kW Absolute encoder	155
MGMF132L1H5	MGMF 1.3 kW Absolute encoder	96
MGMF132L1H6	MGMF 1.3 kW Absolute encoder	96
MGMF132L1H6M	MGMF 1.3 kW Absolute encoder	155
MGMF132L1H7	MGMF 1.3 kW Absolute encoder	96
MGMF132L1H8	MGMF 1.3 kW Absolute encoder	96
MGMF132L1H8M	MGMF 1.3 kW Absolute encoder	155
MGMF182L1C5	MGMF 1.8 kW Absolute encoder	97
MGMF182L1C6	MGMF 1.8 kW Absolute encoder	97
MGMF182L1C6M	MGMF 1.8 kW Absolute encoder	156
MGMF182L1C7	MGMF 1.8 kW Absolute encoder	97
MGMF182L1C8	MGMF 1.8 kW Absolute encoder	97
MGMF182L1C8M	MGMF 1.8 kW Absolute encoder	156
MGMF182L1D5	MGMF 1.8 kW Absolute encoder	97
MGMF182L1D6	MGMF 1.8 kW Absolute encoder	97
	MGMF 1.8 kW Absolute encoder	
MGMF182L1D6M		156
MGMF182L1D7	MGMF 1.8 kW Absolute encoder	97
MGMF182L1D8	MGMF 1.8 kW Absolute encoder	97
MGMF182L1D8M	MGMF 1.8 kW Absolute encoder	156
MGMF182L1G5	MGMF 1.8 kW Absolute encoder	97
MGMF182L1G6	MGMF 1.8 kW Absolute encoder	97
MGMF182L1G6M	MGMF 1.8 kW Absolute encoder	156

Part No.	nertia/Low speed high torque) Title	Page
MGMF182L1G8	MGMF 1.8 kW Absolute encoder	97
MGMF182L1G8M	MGMF 1.8 kW Absolute encoder	156
MGMF182L1H5	MGMF 1.8 kW Absolute encoder	97
MGMF182L1H6	MGMF 1.8 kW Absolute encoder	97
MGMF182L1H6M	MGMF 1.8 kW Absolute encoder	156
MGMF182L1H7	MGMF 1.8 kW Absolute encoder	97
MGMF182L1H8	MGMF 1.8 kW Absolute encoder	97
MGMF182L1H8M	MGMF 1.8 kW Absolute encoder	156
MGMF292L1C5	MGMF 2.9 kW Absolute encoder	98
MGMF292L1C6	MGMF 2.9 kW Absolute encoder	98
MGMF292L1C6M	MGMF 2.9 kW Absolute encoder	157
MGMF292L1C7	MGMF 2.9 kW Absolute encoder	98
MGMF292L1C8	MGMF 2.9 kW Absolute encoder	98
MGMF292L1C8M	MGMF 2.9 kW Absolute encoder	157
MGMF292L1D5	MGMF 2.9 kW Absolute encoder	98
MGMF292L1D6	MGMF 2.9 kW Absolute encoder	98
MGMF292L1D6M	MGMF 2.9 kW Absolute encoder	157
MGMF292L1D7	MGMF 2.9 kW Absolute encoder	98
MGMF292L1D8	MGMF 2.9 kW Absolute encoder	98
MGMF292L1D8M	MGMF 2.9 kW Absolute encoder	157
MGMF292L1G5	MGMF 2.9 kW Absolute encoder	98
MGMF292L1G6	MGMF 2.9 kW Absolute encoder	98
MGMF292L1G6M	MGMF 2.9 kW Absolute encoder	157
MGMF292L1G7	MGMF 2.9 kW Absolute encoder	98
MGMF292L1G8	MGMF 2.9 kW Absolute encoder	98
MGMF292L1G8M	MGMF 2.9 kW Absolute encoder	157
MGMF292L1H5	MGMF 2.9 kW Absolute encoder	98
MGMF292L1H6	MGMF 2.9 kW Absolute encoder	98
MGMF292L1H6M	MGMF 2.9 kW Absolute encoder	157
MGMF292L1H7	MGMF 2.9 kW Absolute encoder	98
MGMF292L1H8	MGMF 2.9 kW Absolute encoder	98
MGMF292L1H8M	MGMF 2.9 kW Absolute encoder	157
MGMF442L1C5	MGMF 4.4 kW Absolute encoder	99
MGMF442L1C6	MGMF 4.4 kW Absolute encoder	99
MGMF442L1C6M	MGMF 4.4 kW Absolute encoder	158
MGMF442L1C6W	MGMF 4.4 kW Absolute encoder	99
MGMF442L1C7	MGMF 4.4 kW Absolute encoder	99
	MGMF 4.4 kW Absolute encoder	
MGMF442L1C8M		158
MGMF442L1D5	MGMF 4.4 kW Absolute encoder	99
MGMF442L1D6	MGMF 4.4 kW Absolute encoder	99
MGMF442L1D6M MGMF442L1D7	MGMF 4.4 kW Absolute encoder	158
	MGMF 4.4 kW Absolute encoder	99
MGMF442L1D8	MGMF 4.4 kW Absolute encoder	
MGMF442L1D8M	MGMF 4.4 kW Absolute encoder	158
MGMF442L1G5	MGMF 4.4 kW Absolute encoder	99
MGMF442L1G6	MGMF 4.4 kW Absolute encoder	99
MGMF442L1G6M	MGMF 4.4 kW Absolute encoder	158
MGMF442L1G7	MGMF 4.4 kW Absolute encoder	99
MGMF442L1G8	MGMF 4.4 kW Absolute encoder	99
MGMF442L1G8M	MGMF 4.4 kW Absolute encoder	158
MGMF442L1H5	MGMF 4.4 kW Absolute encoder	99
MGMF442L1H6	MGMF 4.4 kW Absolute encoder	99
MGMF442L1H6M	MGMF 4.4 kW Absolute encoder	158
MGMF442L1H7	MGMF 4.4 kW Absolute encoder	99
MGMF442L1H8	MGMF 4.4 kW Absolute encoder	99
MGMF442L1H8M	MGMF 4.4 kW Absolute encoder	158

Part No.	Title	Page
MHMF011L1A1	MHMF 100 W 100 V Absolute encoder	75
MHMF011L1A2	MHMF 100 W 100 V Absolute encoder	75
MHMF011L1B1	MHMF 100 W 100 V Absolute encoder	75
MHMF011L1B2	MHMF 100 W 100 V Absolute encoder	75
MHMF011L1C1	MHMF 100 W 100 V Absolute encoder	75
MHMF011L1C2	MHMF 100 W 100 V Absolute encoder	75
MHMF011L1C3	MHMF 100 W 100 V Absolute encoder	75
MHMF011L1C4	MHMF 100 W 100 V Absolute encoder	75
MHMF011L1D1	MHMF 100 W 100 V Absolute encoder	75
MHMF011L1D2	MHMF 100 W 100 V Absolute encoder	75
MHMF011L1D3	MHMF 100 W 100 V Absolute encoder	75
MHMF011L1D4	MHMF 100 W 100 V Absolute encoder	75
MHMF011L1S1	MHMF 100 W 100 V Absolute encoder	75

MHMF (High inertia)

MHMF (High ine Part No.	rtia)	Title	Page
MHMF011L1S2	MHMF 100 W	100 V Absolute encoder	75
MHMF011L1T1		100 V Absolute encoder	75
MHMF011L1T2	MHMF 100 W		75
MHMF011L1U1	MHMF 100 W	100 V Absolute encoder	75
MHMF011L1U2	MHMF 100 W	100 V Absolute encoder	75
MHMF011L1U3	MHMF 100 W		75
MHMF011L1U4		100 V Absolute encoder	75
MHMF011L1V1		100 V Absolute encoder	75
MHMF011L1V2 MHMF011L1V3	MHMF 100 W	100 V Absolute encoder 100 V Absolute encoder	75 75
MHMF011L1V4		100 V Absolute encoder	75
MHMF012L1A1		200 V Absolute encoder	76
MHMF012L1A2		200 V Absolute encoder	76
MHMF012L1A2M	MHMF 100 W	200 V Absolute encoder	137
MHMF012L1B1	MHMF 100 W	200 V Absolute encoder	76
MHMF012L1B2		200 V Absolute encoder	76
MHMF012L1B2M		200 V Absolute encoder	137
MHMF012L1C1		200 V Absolute encoder	76
MHMF012L1C2		200 V Absolute encoder	76
MHMF012L1C2M		200 V Absolute encoder	137
MHMF012L1C3 MHMF012L1C4		200 V Absolute encoder 200 V Absolute encoder	76 76
MHMF012L1C4M		200 V Absolute encoder	137
MHMF012L1D1		200 V Absolute encoder	76
MHMF012L1D2		200 V Absolute encoder	76
MHMF012L1D2M		200 V Absolute encoder	137
MHMF012L1D3		200 V Absolute encoder	76
MHMF012L1D4	MHMF 100 W	200 V Absolute encoder	76
MHMF012L1D4M	MHMF 100 W	200 V Absolute encoder	137
MHMF012L1S1	MHMF 100 W	200 V Absolute encoder	76
MHMF012L1S2		200 V Absolute encoder	76
MHMF012L1S2M		200 V Absolute encoder	137
MHMF012L1T1		200 V Absolute encoder	76
MHMF012L1T2		200 V Absolute encoder	76
MHMF012L1T2M MHMF012L1U1		200 V Absolute encoder 200 V Absolute encoder	137 76
MHMF012L1U2		200 V Absolute encoder	76
MHMF012L1U2M		200 V Absolute encoder	137
MHMF012L1U3		200 V Absolute encoder	76
MHMF012L1U4	MHMF 100 W	200 V Absolute encoder	76
MHMF012L1U4M	MHMF 100 W	200 V Absolute encoder	137
MHMF012L1V1	MHMF 100 W	200 V Absolute encoder	76
MHMF012L1V2		200 V Absolute encoder	76
MHMF012L1V2M		200 V Absolute encoder	137
MHMF012L1V3		200 V Absolute encoder	76
MHMF012L1V4		200 V Absolute encoder	76
MHMF012L1V4M MHMF021L1A1		200 V Absolute encoder 100 V Absolute encoder	137 77
MHMF021L1A2		100 V Absolute encoder	77
MHMF021L1B1		100 V Absolute encoder	77
MHMF021L1B2		100 V Absolute encoder	77
MHMF021L1C1		100 V Absolute encoder	77
MHMF021L1C2	MHMF 200 W	100 V Absolute encoder	77
MHMF021L1C3	MHMF 200 W	100 V Absolute encoder	77
MHMF021L1C4	MHMF 200 W	100 V Absolute encoder	77
MHMF021L1D1		100 V Absolute encoder	77
MHMF021L1D2		100 V Absolute encoder	77
MHMF021L1D3		100 V Absolute encoder	77
MHMF021L1D4		100 V Absolute encoder	77
MHMF021L1S1 MHMF021L1S2		100 V Absolute encoder 100 V Absolute encoder	77
MHMF021L132		100 V Absolute encoder	77
MHMF021L1T2		100 V Absolute encoder	77
MHMF021L1U1		100 V Absolute encoder	77
MHMF021L1U2		100 V Absolute encoder	77
MHMF021L1U3	MHMF 200 W	100 V Absolute encoder	77
MHMF021L1U4	MHMF 200 W	100 V Absolute encoder	77
MHMF021L1V1		100 V Absolute encoder	77
MHMF021L1V2		100 V Absolute encoder	77
MHMF021L1V3		100 V Absolute encoder	77
MHMF021L1V4		100 V Absolute encoder	77
MHMF022L1A1	VIDIVIE 200 W	200 V Absolute encoder	78

275 Information Information 276

Index

(Alphabetical Order)

MHMF (High ine	rtia)	Title	Dogo
Part No. MHMF022L1A2	MHME 200 W	200 V Absolute encoder	Page 78
MHMF022L1A2M		200 V Absolute encoder	138
MHMF022L1B1		200 V Absolute encoder	78
MHMF022L1B2	MHMF 200 W	200 V Absolute encoder	78
MHMF022L1B2M	MHMF 200 W	200 V Absolute encoder	138
MHMF022L1C1	MHMF 200 W	200 V Absolute encoder	78
MHMF022L1C2	MHMF 200 W	200 V Absolute encoder	78
MHMF022L1C2M		200 V Absolute encoder	138
MHMF022L1C3		200 V Absolute encoder	78
MHMF022L1C4		200 V Absolute encoder	78
MHMF022L1C4M		200 V Absolute encoder	138
MHMF022L1D1		200 V Absolute encoder 200 V Absolute encoder	78
MHMF022L1D2 MHMF022L1D2M		200 V Absolute encoder	78 138
MHMF022L1D3		200 V Absolute encoder	78
MHMF022L1D4		200 V Absolute encoder	78
MHMF022L1D4M	MHMF 200 W	200 V Absolute encoder	138
MHMF022L1S1	MHMF 200 W	200 V Absolute encoder	78
MHMF022L1S2	MHMF 200 W	200 V Absolute encoder	78
MHMF022L1S2M	MHMF 200 W	200 V Absolute encoder	138
MHMF022L1T1	MHMF 200 W	200 V Absolute encoder	78
MHMF022L1T2		200 V Absolute encoder	78
MHMF022L1T2M		200 V Absolute encoder	138
MHMF022L1U1		200 V Absolute encoder	78
MHMF022L1U2		200 V Absolute encoder	78
MHMF022L1U2M MHMF022L1U3		200 V Absolute encoder 200 V Absolute encoder	138 78
MHMF022L1U4		200 V Absolute encoder	78
MHMF022L1U4M		200 V Absolute encoder	138
MHMF022L1V1		200 V Absolute encoder	78
MHMF022L1V2	MHMF 200 W	200 V Absolute encoder	78
MHMF022L1V2M	MHMF 200 W	200 V Absolute encoder	138
MHMF022L1V3	MHMF 200 W	200 V Absolute encoder	78
MHMF022L1V4	MHMF 200 W	200 V Absolute encoder	78
MHMF022L1V4M		200 V Absolute encoder	138
MHMF041L1A1		100 V Absolute encoder	79
MHMF041L1A2		100 V Absolute encoder	79
MHMF041L1B1		100 V Absolute encoder	79
MHMF041L1B2 MHMF041L1C1		100 V Absolute encoder 100 V Absolute encoder	79 79
MHMF041L1C2		100 V Absolute encoder	79
MHMF041L1C3		100 V Absolute encoder	79
MHMF041L1C4	MHMF 400 W	100 V Absolute encoder	79
MHMF041L1D1	MHMF 400 W	100 V Absolute encoder	79
MHMF041L1D2	MHMF 400 W	100 V Absolute encoder	79
MHMF041L1D3	MHMF 400 W	100 V Absolute encoder	79
MHMF041L1D4		100 V Absolute encoder	79
MHMF041L1S1		100 V Absolute encoder	79
MHMF041L1S2		100 V Absolute encoder	79
MHMF041L1T1 MHMF041L1T2		100 V Absolute encoder 100 V Absolute encoder	79 79
MHMF041L112		100 V Absolute encoder	79
MHMF041L1U2		100 V Absolute encoder	79
MHMF041L1U3		100 V Absolute encoder	79
MHMF041L1U4	MHMF 400 W	100 V Absolute encoder	79
MHMF041L1V1	MHMF 400 W	100 V Absolute encoder	79
MHMF041L1V2	MHMF 400 W	100 V Absolute encoder	79
MHMF041L1V3	MHMF 400 W	100 V Absolute encoder	79
MHMF041L1V4	MHMF 400 W	100 V Absolute encoder	79
MHMF042L1A1		200 V Absolute encoder	80
MHMF042L1A2		200 V Absolute encoder	80
MHMF042L1A2M		200 V Absolute encoder	139
MHMF042L1B1 MHMF042L1B2		200 V Absolute encoder 200 V Absolute encoder	80
MHMF042L1B2M		200 V Absolute encoder	139
MHMF042L162M		200 V Absolute encoder	80
MHMF042L1C2		200 V Absolute encoder	80
MHMF042L1C2M		200 V Absolute encoder	139
MHMF042L1C3		200 V Absolute encoder	80
MHMF042L1C4	MHMF 400 W	200 V Absolute encoder	80
MHMF042L1C4M	MHMF 400 W	200 V Absolute encoder	139
MHMF042L1D1	MHMF 400 W	200 V Absolute encoder	80

MHMF (High ine		
Part No.	Title	Page
MHMF042L1D2	MHMF 400 W 200 V Absolute encoder	80
MHMF042L1D2M	MHMF 400 W 200 V Absolute encoder	139
MHMF042L1D3	MHMF 400 W 200 V Absolute encoder	80
MHMF042L1D4	MHMF 400 W 200 V Absolute encoder	80
MHMF042L1D4M	MHMF 400 W 200 V Absolute encoder	139
MHMF042L1S1	MHMF 400 W 200 V Absolute encoder	80
MHMF042L1S2	MHMF 400 W 200 V Absolute encoder	80
MHMF042L1S2M MHMF042L1T1	MHMF 400 W 200 V Absolute encoder	139
MHMF042L111 MHMF042L1T2	MHMF 400 W 200 V Absolute encoder MHMF 400 W 200 V Absolute encoder	80
MHMF042L1T2M	MHMF 400 W 200 V Absolute encoder	139
MHMF042L112IVI	MHMF 400 W 200 V Absolute encoder	80
MHMF042L1U2	MHMF 400 W 200 V Absolute encoder	80
MHMF042L1U2M	MHMF 400 W 200 V Absolute encoder	139
MHMF042L1U3	MHMF 400 W 200 V Absolute encoder	80
MHMF042L1U4	MHMF 400 W 200 V Absolute encoder	80
MHMF042L1U4M	MHMF 400 W 200 V Absolute encoder	139
MHMF042L1V1	MHMF 400 W 200 V Absolute encoder	80
MHMF042L1V2	MHMF 400 W 200 V Absolute encoder	80
MHMF042L1V2M	MHMF 400 W 200 V Absolute encoder	139
MHMF042L1V3	MHMF 400 W 200 V Absolute encoder	80
ИНМF042L1V4	MHMF 400 W 200 V Absolute encoder	80
MHMF042L1V4M	MHMF 400 W 200 V Absolute encoder	139
ИНМF082L1A1	MHMF 750 W 200 V Absolute encoder	81
MHMF082L1A2	MHMF 750 W 200 V Absolute encoder	81
MHMF082L1A2M	MHMF 750 W 200 V Absolute encoder	140
MHMF082L1B1	MHMF 750 W 200 V Absolute encoder	81
MHMF082L1B2	MHMF 750 W 200 V Absolute encoder	81
MHMF082L1B2M	MHMF 750 W 200 V Absolute encoder	140
MHMF082L1C1	MHMF 750 W 200 V Absolute encoder	81
MHMF082L1C2	MHMF 750 W 200 V Absolute encoder	81
MHMF082L1C2M	MHMF 750 W 200 V Absolute encoder	140
MHMF082L1C3	MHMF 750 W 200 V Absolute encoder	81
MHMF082L1C4 MHMF082L1C4M	MHMF 750 W 200 V Absolute encoder MHMF 750 W 200 V Absolute encoder	140
MHMF082L1C4W	MHMF 750 W 200 V Absolute encoder	81
MHMF082L1D1	MHMF 750 W 200 V Absolute encoder	81
MHMF082L1D2M	MHMF 750 W 200 V Absolute encoder	140
MHMF082L1D3	MHMF 750 W 200 V Absolute encoder	81
MHMF082L1D4	MHMF 750 W 200 V Absolute encoder	81
MHMF082L1D4M	MHMF 750 W 200 V Absolute encoder	140
MHMF082L1S1	MHMF 750 W 200 V Absolute encoder	81
MHMF082L1S2	MHMF 750 W 200 V Absolute encoder	81
MHMF082L1S2M	MHMF 750 W 200 V Absolute encoder	140
MHMF082L1T1	MHMF 750 W 200 V Absolute encoder	81
MHMF082L1T2	MHMF 750 W 200 V Absolute encoder	81
MHMF082L1T2M	MHMF 750 W 200 V Absolute encoder	140
ИНМF082L1U1	MHMF 750 W 200 V Absolute encoder	81
ИНМF082L1U2	MHMF 750 W 200 V Absolute encoder	81
MHMF082L1U2M	MHMF 750 W 200 V Absolute encoder	140
MHMF082L1U3	MHMF 750 W 200 V Absolute encoder	81
MHMF082L1U4	MHMF 750 W 200 V Absolute encoder	81
MHMF082L1U4M	MHMF 750 W 200 V Absolute encoder	140
//HMF082L1V1	MHMF 750 W 200 V Absolute encoder	81
MHMF082L1V2	MHMF 750 W 200 V Absolute encoder	81
MHMF082L1V2M	MHMF 750 W 200 V Absolute encoder	140
MHMF082L1V3	MHMF 750 W 200 V Absolute encoder	81
MHMF082L1V4	MHMF 750 W 200 V Absolute encoder	81
MHMF082L1V4M	MHMF 750 W 200 V Absolute encoder	140
MHMF092L1A1	MHMF 1000 W 200 V Absolute encoder MHMF 1000 W 200 V Absolute encoder	82
MHMF092L1A2M		1.41
MHMF092L1A2M	MHMF 1000 W 200 V Absolute encoder MHMF 1000 W 200 V Absolute encoder	141
MHMF092L1B1		82
MHMF092L1B2	MHMF 1000 W 200 V Absolute encoder MHMF 1000 W 200 V Absolute encoder	1/1
MHMF092L1B2M MHMF092L1C1	MHMF 1000 W 200 V Absolute encoder MHMF 1000 W 200 V Absolute encoder	141
MHMF092L1C1	MHMF 1000 W 200 V Absolute encoder	82
MHMF092L1C2 MHMF092L1C2M	MHMF 1000 W 200 V Absolute encoder MHMF 1000 W 200 V Absolute encoder	141
MHMF092L1C3	MHMF 1000 W 200 V Absolute encoder	82
MHMF092L1C3	MHMF 1000 W 200 V Absolute encoder	82
MHMF092L1C4M	MHMF 1000 W 200 V Absolute encoder	141
3022101101		82

MHMF092L1D1 MHMF 1000 W 200 V Absolute encoder

MHMF (High ine Part No.	Title	Page
MHMF092L1D2	MHMF 1000 W 200 V Absolute encoder	82
MHMF092L1D2M	MHMF 1000 W 200 V Absolute encoder	141
MHMF092L1D3	MHMF 1000 W 200 V Absolute encoder	82
MHMF092L1D4	MHMF 1000 W 200 V Absolute encoder	82
MHMF092L1D4M	MHMF 1000 W 200 V Absolute encoder	141
MHMF092L1S1	MHMF 1000 W 200 V Absolute encoder	82
MHMF092L1S2	MHMF 1000 W 200 V Absolute encoder	82
MHMF092L1S2M	MHMF 1000 W 200 V Absolute encoder	141
MHMF092L1T1	MHMF 1000 W 200 V Absolute encoder	82
MHMF092L1T2	MHMF 1000 W 200 V Absolute encoder	82
MHMF092L1T2M	MHMF 1000 W 200 V Absolute encoder	141
MHMF092L112W		
	MHMF 1000 W 200 V Absolute encoder	82
MHMF092L1U2	MHMF 1000 W 200 V Absolute encoder	82
MHMF092L1U2M	MHMF 1000 W 200 V Absolute encoder	141
MHMF092L1U3	MHMF 1000 W 200 V Absolute encoder	82
MHMF092L1U4	MHMF 1000 W 200 V Absolute encoder	82
MHMF092L1U4M	MHMF 1000 W 200 V Absolute encoder	141
MHMF092L1V1	MHMF 1000 W 200 V Absolute encoder	82
MHMF092L1V2	MHMF 1000 W 200 V Absolute encoder	82
MHMF092L1V2M	MHMF 1000 W 200 V Absolute encoder	141
MHMF092L1V3	MHMF 1000 W 200 V Absolute encoder	82
MHMF092L1V4	MHMF 1000 W 200 V Absolute encoder	82
MHMF092L1V4M	MHMF 1000 W 200 V Absolute encoder	141
MHMF102L1C5	MHMF 1.0 kW Absolute encoder	83
MHMF102L1C6	MHMF 1.0 kW Absolute encoder	83
MHMF102L1C6M	MHMF 1.0 kW Absolute encoder	142
MHMF102L1C7	MHMF 1.0 kW Absolute encoder	83
MHMF102L1C8	MHMF 1.0 kW Absolute encoder	83
MHMF102L1C8M	MHMF 1.0 kW Absolute encoder	142
MHMF102L1D5	MHMF 1.0 kW Absolute encoder	83
MHMF102L1D6	MHMF 1.0 kW Absolute encoder	83
MHMF102L1D6M	MHMF 1.0 kW Absolute encoder	142
MHMF102L1D7	MHMF 1.0 kW Absolute encoder	83
MHMF102L1D8	MHMF 1.0 kW Absolute encoder	83
MHMF102L1D8M	MHMF 1.0 kW Absolute encoder	142
MHMF102L1G5	MHMF 1.0 kW Absolute encoder	83
MHMF102L1G6	MHMF 1.0 kW Absolute encoder	83
MHMF102L1G6M	MHMF 1.0 kW Absolute encoder	142
MHMF102L1G7	MHMF 1.0 kW Absolute encoder	83
MHMF102L1G8	MHMF 1.0 kW Absolute encoder	83
MHMF102L1G8M	MHMF 1.0 kW Absolute encoder	142
MHMF102L1H5	MHMF 1.0 kW Absolute encoder	83
MHMF102L1H6	MHMF 1.0 kW Absolute encoder	83
MHMF102L1H6M	MHMF 1.0 kW Absolute encoder	142
MHMF102L1H7	MHMF 1.0 kW Absolute encoder	83
MHMF102L1H8	MHMF 1.0 kW Absolute encoder	83
MHMF102L1H8M	MHMF 1.0 kW Absolute encoder	142
MHMF152L1C5	MHMF 1.5 kW Absolute encoder	84
MHMF152L1C6	MHMF 1.5 kW Absolute encoder	84
MHMF152L1C6M	MHMF 1.5 kW Absolute encoder	143
MHMF152L1C6W	MHMF 1.5 kW Absolute encoder	
		84
MHMF152L1C8	MHMF 1.5 kW Absolute encoder	84
MHMF152L1C8M	MHMF 1.5 kW Absolute encoder	143
MHMF152L1D5	MHMF 1.5 kW Absolute encoder	84
MHMF152L1D6	MHMF 1.5 kW Absolute encoder	84
MHMF152L1D6M	MHMF 1.5 kW Absolute encoder	143
MHMF152L1D7	MHMF 1.5 kW Absolute encoder	84
MHMF152L1D8	MHMF 1.5 kW Absolute encoder	84
MHMF152L1D8M	MHMF 1.5 kW Absolute encoder	143
MHMF152L1G5	MHMF 1.5 kW Absolute encoder	84
MHMF152L1G6	MHMF 1.5 kW Absolute encoder	84
MHMF152L1G6M	MHMF 1.5 kW Absolute encoder	143
MHMF152L1G0W	MHMF 1.5 kW Absolute encoder	
		84
MHMF152L1G8	MHMF 1.5 kW Absolute encoder	84
MHMF152L1G8M	MHMF 1.5 kW Absolute encoder	143
MHMF152L1H5	MHMF 1.5 kW Absolute encoder	84
MHMF152L1H6	MHMF 1.5 kW Absolute encoder	84
	MHMF 1.5 kW Absolute encoder	143
MHMF152L1H6M		
MHMF152L1H6M MHMF152L1H7	MHMF 1.5 kW Absolute encoder	84
	MHMF 1.5 kW Absolute encoder MHMF 1.5 kW Absolute encoder	84 84
MHMF152L1H7		

MHMF (High ine Part No.		Title	Page
MHMF202L1C6	MHMF 2.0 kW	Absolute encoder	85
MHMF202L1C6M	MHMF 2.0 kW	Absolute encoder	144
MHMF202L1C7	MHMF 2.0 kW	Absolute encoder	85
MHMF202L1C8	MHMF 2.0 kW	Absolute encoder	85
MHMF202L1C8M	MHMF 2.0 kW	Absolute encoder	144
MHMF202L1D5	MHMF 2.0 kW	Absolute encoder	85
MHMF202L1D6		Absolute encoder	85
MHMF202L1D6M		Absolute encoder	144
MHMF202L1D7		Absolute encoder	85
MHMF202L1D8	-	Absolute encoder	85
MHMF202L1D8M		Absolute encoder	144
MHMF202L1G5		Absolute encoder	85
MHMF202L1G6 MHMF202L1G6M		Absolute encoder Absolute encoder	85
MHMF202L1G6W	-	Absolute encoder	144 85
MHMF202L1G8		Absolute encoder	85
MHMF202L1G8M		Absolute encoder	144
MHMF202L1H5		Absolute encoder	85
MHMF202L1H6		Absolute encoder	85
MHMF202L1H6M		Absolute encoder	144
MHMF202L1H7		Absolute encoder	85
MHMF202L1H8		Absolute encoder	85
MHMF202L1H8M	MHMF 2.0 kW	Absolute encoder	144
MHMF302L1C5	MHMF 3.0 kW	Absolute encoder	86
MHMF302L1C6	MHMF 3.0 kW	Absolute encoder	86
MHMF302L1C6M	MHMF 3.0 kW	Absolute encoder	145
MHMF302L1C7	MHMF 3.0 kW	Absolute encoder	86
MHMF302L1C8	MHMF 3.0 kW	Absolute encoder	86
MHMF302L1C8M	MHMF 30 kW	Absolute encoder	145
MHMF302L1D5	MHMF 3.0 kW	Absolute encoder	86
MHMF302L1D6	MHMF 3.0 kW	Absolute encoder	86
MHMF302L1D6M		Absolute encoder	145
MHMF302L1D7		Absolute encoder	86
MHMF302L1D8		Absolute encoder	86
MHMF302L1D8M		Absolute encoder	145
MHMF302L1G5		Absolute encoder	86
MHMF302L1G6		Absolute encoder Absolute encoder	145
MHMF302L1G6M MHMF302L1G7		Absolute encoder	86
MHMF302L1G8		Absolute encoder	86
MHMF302L1G8M		Absolute encoder	145
MHMF302L1H5		Absolute encoder	86
MHMF302L1H6		Absolute encoder	86
MHMF302L1H6M		Absolute encoder	145
MHMF302L1H7		Absolute encoder	86
MHMF302L1H8		Absolute encoder	86
MHMF302L1H8M	MHMF 3.0 kW	Absolute encoder	145
MHMF402L1C5	MHMF 4.0 kW	Absolute encoder	87
MHMF402L1C6	MHMF 4.0 kW	Absolute encoder	87
MHMF402L1C6M	MHMF 4.0 kW	Absolute encoder	146
MHMF402L1C7	MHMF 4.0 kW	Absolute encoder	87
MHMF402L1C8	MHMF 4.0 kW	Absolute encoder	87
MHMF402L1C8M	MHMF 4.0 kW	Absolute encoder	146
MHMF402L1D5		Absolute encoder	87
MHMF402L1D6		Absolute encoder	87
MHMF402L1D6M		Absolute encoder	146
MHMF402L1D7		Absolute encoder	87
MHMF402L1D8		Absolute encoder	87
MHMF402L1D8M		Absolute encoder	146
MHMF402L1G5		Absolute encoder	87
MHMF402L1G6		Absolute encoder	87
MHMF402L1G6M MHMF402L1G7		Absolute encoder Absolute encoder	146 87
		Absolute encoder	
MHMF402L1G8 MHMF402L1G8M		Absolute encoder	146
MHMF402L1G8M		Absolute encoder Absolute encoder	87
MHMF402L1H6		Absolute encoder	87
MHMF402L1H6M		Absolute encoder	146
	.vv KVV		
	MHMF 4 O kW	Absolute encoder	87
MHMF402L1H7		Absolute encoder Absolute encoder	87
	MHMF 4.0 kW	Absolute encoder Absolute encoder Absolute encoder	87 87 146

(Alphabetical Order)

MHMF (High ine	rtia)	
Part No.	Title	Page
MHMF502L1C6	MHMF 5.0 kW Absolute encoder	88
MHMF502L1C6M	MHMF 5.0 kW Absolute encoder	147
MHMF502L1C7	MHMF 5.0 kW Absolute encoder	88
MHMF502L1C8	MHMF 5.0 kW Absolute encoder	88
MHMF502L1C8M	MHMF 50 kW Absolute encoder	147
MHMF502L1D5	MHMF 5.0 kW Absolute encoder	88
MHMF502L1D6	MHMF 5.0 kW Absolute encoder	88
MHMF502L1D6M	MHMF 5.0 kW Absolute encoder	147
MHMF502L1D7	MHMF 5.0 kW Absolute encoder	88
MHMF502L1D8	MHMF 5.0 kW Absolute encoder	88
MHMF502L1D8M	MHMF 5.0 kW Absolute encoder	147
MHMF502L1G5	MHMF 5.0 kW Absolute encoder	88
MHMF502L1G6	MHMF 5.0 kW Absolute encoder	88
MHMF502L1G6M	MHMF 5.0 kW Absolute encoder	147
MHMF502L1G7	MHMF 5.0 kW Absolute encoder	88
MHMF502L1G8	MHMF 5.0 kW Absolute encoder	88
MHMF502L1G8M	MHMF 5.0 kW Absolute encoder	147
MHMF502L1H5	MHMF 5.0 kW Absolute encoder	88
MHMF502L1H6	MHMF 5.0 kW Absolute encoder	88
MHMF502L1H6M	MHMF 5.0 kW Absolute encoder	147
MHMF502L1H7	MHMF 5.0 kW Absolute encoder	88
MHMF502L1H8	MHMF 5.0 kW Absolute encoder	88
MHMF502L1H8M	MHMF 5.0 kW Absolute encoder	147
MHMF5AZL1A1	MHMF 50 W 100 V/200 V common Absolute encoder	73,74
MHMF5AZL1A2	MHMF 50 W 100 V/200 V common Absolute encoder	73,74
MHMF5AZL1A2M	MHMF 50 W 100 V/200 V common Absolute encoder	136
MHMF5AZL1B1	MHMF 50 W 100 V/200 V common Absolute encoder	73,74
MHMF5AZL1B2	MHMF 50 W 100 V/200 V common Absolute encoder	73,74
MHMF5AZL1B2M	MHMF 50 W 100 V/200 V common Absolute encoder	136
MHMF5AZL1C1	MHMF 50 W 100 V/200 V common Absolute encoder	73,74
MHMF5AZL1C2	MHMF 50 W 100 V/200 V common Absolute encoder	73,74
MHMF5AZL1C2M	MHMF 50 W 100 V/200 V common Absolute encoder	136
MHMF5AZL1C3	MHMF 50 W 100 V/200 V common Absolute encoder	73,74
MHMF5AZL1C4	MHMF 50 W 100 V/200 V common Absolute encoder	73,74
MHMF5AZL1C4M	MHMF 50 W 100 V/200 V common Absolute encoder	136
MHMF5AZL1D1	MHMF 50 W 100 V/200 V common Absolute encoder	73,74
MHMF5AZL1D2	MHMF 50 W 100 V/200 V common Absolute encoder	73,74
MHMF5AZL1D2M	MHMF 50 W 100 V/200 V common Absolute encoder	136
MHMF5AZL1D3	MHMF 50 W 100 V/200 V common Absolute encoder	73,74
MHMF5AZL1D4	MHMF 50 W 100 V/200 V common Absolute encoder	73,74
MHMF5AZL1D4M	MHMF 50 W 100 V/200 V common Absolute encoder	136
MHMF5AZL1S1	MHMF 50 W 100 V/200 V common Absolute encoder	73,74
MHMF5AZL1S2	MHMF 50 W 100 V/200 V common Absolute encoder	73,74
MHMF5AZL1S2M	MHMF 50 W 100 V/200 V common Absolute encoder	136
MHMF5AZL1T1	MHMF 50 W 100 V/200 V common Absolute encoder	73,74
MHMF5AZL1T2	MHMF 50 W 100 V/200 V common Absolute encoder	73,74
MHMF5AZL1T2M	MHMF 50 W 100 V/200 V common Absolute encoder	136
MHMF5AZL1U1	MHMF 50 W 100 V/200 V common Absolute encoder	73,74
MHMF5AZL1U2	MHMF 50 W 100 V/200 V common Absolute encoder	73,74
MHMF5AZL1U2M	MHMF 50 W 100 V/200 V common Absolute encoder	136
MHMF5AZL1U3	MHMF 50 W 100 V/200 V common Absolute encoder	73,74
MHMF5AZL1U4	MHMF 50 W 100 V/200 V common Absolute encoder	73,74
MHMF5AZL1U4M	MHMF 50 W 100 V/200 V common Absolute encoder	136
MHMF5AZL1V1	MHMF 50 W 100 V/200 V common Absolute encoder	73,74
MHMF5AZL1V2	MHMF 50 W 100 V/200 V common Absolute encoder	73,74
MHMF5AZL1V2M	MHMF 50 W 100 V/200 V common Absolute encoder	136
MHMF5AZL1V3	MHMF 50 W 100 V/200 V common Absolute encoder	73,74
MHMF5AZL1V4	MHMF 50 W 100 V/200 V common Absolute encoder	73,74
MHMF5AZL1V4M	MHMF 50 W 100 V/200 V common Absolute encoder	136

MKDET			
Part No.	Title	Page	
MKDET1105P		207	
MKDET1110P	E series driver: K-frame		
MKDET1310P			
MKDET1505P			

MLDET		
Part No.	Title	Page
MLDET2110P		
MLDET2210P	E series driver: L-frame	207
MLDET2310P	E series driver: L-frame	209
MLDET2510P		

MOME (Middle in	noutin flat type)	
MQMF (Middle in Part No.	Title	Page
MQMF011L1A1	MQMF 100 W 100 V Absolute encoder	67
MQMF011L1A2	MQMF 100 W 100 V Absolute encoder	67
MQMF011L1B1	MQMF 100 W 100 V Absolute encoder	67
MQMF011L1B2	MQMF 100 W 100 V Absolute encoder	67
MQMF011L1C1	MQMF 100 W 100 V Absolute encoder	67
MQMF011L1C2	MQMF 100 W 100 V Absolute encoder	67
MQMF011L1C3	MQMF 100 W 100 V Absolute encoder	67
MQMF011L1C4	MQMF 100 W 100 V Absolute encoder	67
MQMF011L1D1	MQMF 100 W 100 V Absolute encoder	67
MQMF011L1D2	MQMF 100 W 100 V Absolute encoder	67
MQMF011L1D3	MQMF 100 W 100 V Absolute encoder	67
MQMF011L1D4	MQMF 100 W 100 V Absolute encoder	67
MQMF011L1S1	MQMF 100 W 100 V Absolute encoder	67
MQMF011L1S2	MQMF 100 W 100 V Absolute encoder	67
MQMF011L1T1	MQMF 100 W 100 V Absolute encoder	67
MQMF011L1T2	MQMF 100 W 100 V Absolute encoder	67
MQMF011L1U1	MQMF 100 W 100 V Absolute encoder	67
MQMF011L1U2	MQMF 100 W 100 V Absolute encoder	67
MQMF011L1U3	MQMF 100 W 100 V Absolute encoder	67
MQMF011L1U4	MQMF 100 W 100 V Absolute encoder MQMF 100 W 100 V Absolute encoder	67
MQMF011L1V1 MQMF011L1V2	MQMF 100 W 100 V Absolute encoder MQMF 100 W 100 V Absolute encoder	67
		67
MQMF011L1V3 MQMF011L1V4	MQMF 100 W 100 V Absolute encoder MQMF 100 W 100 V Absolute encoder	67
		-
MQMF012L1A1 MQMF012L1A2	MQMF 100 W 200 V Absolute encoder MQMF 100 W 200 V Absolute encoder	68
MQMF012L1A2M	MQMF 100 W 200 V Absolute encoder	133
MQMF012L1B1	MQMF 100 W 200 V Absolute encoder	68
MQMF012L1B2	MQMF 100 W 200 V Absolute encoder	68
MQMF012L1B2M	MQMF 100 W 200 V Absolute encoder	133
MQMF012L1C1	MQMF 100 W 200 V Absolute encoder	68
MQMF012L1C2	MQMF 100 W 200 V Absolute encoder	68
MQMF012L1C2M	MQMF 100 W 200 V Absolute encoder	133
MQMF012L1C3	MQMF 100 W 200 V Absolute encoder	68
MQMF012L1C4	MQMF 100 W 200 V Absolute encoder	68
MQMF012L1C4M	MQMF 100 W 200 V Absolute encoder	133
MQMF012L1D1	MQMF 100 W 200 V Absolute encoder	68
MQMF012L1D2	MQMF 100 W 200 V Absolute encoder	68
MQMF012L1D2M	MQMF 100 W 200 V Absolute encoder	133
MQMF012L1D3	MQMF 100 W 200 V Absolute encoder	68
MQMF012L1D4	MQMF 100 W 200 V Absolute encoder	68
MQMF012L1D4M	MQMF 100 W 200 V Absolute encoder	133
MQMF012L1S1	MQMF 100 W 200 V Absolute encoder	68
MQMF012L1S2	MQMF 100 W 200 V Absolute encoder	68
MQMF012L1S2M	MQMF 100 W 200 V Absolute encoder	133
MQMF012L1T1	MQMF 100 W 200 V Absolute encoder	68
MQMF012L1T2	MQMF 100 W 200 V Absolute encoder	68
MQMF012L1T2M	MQMF 100 W 200 V Absolute encoder	133
MQMF012L1U1	MQMF 100 W 200 V Absolute encoder	68
MQMF012L1U2	MQMF 100 W 200 V Absolute encoder	68
MQMF012L1U2M	MQMF 100 W 200 V Absolute encoder	133
MQMF012L1U3	MQMF 100 W 200 V Absolute encoder	68
MQMF012L1U4	MQMF 100 W 200 V Absolute encoder	68
MQMF012L1U4M	MQMF 100 W 200 V Absolute encoder	133
MQMF012L1V1	MQMF 100 W 200 V Absolute encoder	68
MQMF012L1V2	MQMF 100 W 200 V Absolute encoder	68
MQMF012L1V2M	MQMF 100 W 200 V Absolute encoder	133
MQMF012L1V3	MQMF 100 W 200 V Absolute encoder	68
MQMF012L1V4	MQMF 100 W 200 V Absolute encoder	68
MQMF012L1V4M	MQMF 100 W 200 V Absolute encoder	133
MQMF021L1A1	MQMF 200 W 100 V Absolute encoder	69
MQMF021L1A2	MQMF 200 W 100 V Absolute encoder	69
MQMF021L1B1	MQMF 200 W 100 V Absolute encoder	69
MQMF021L1B2	MQMF 200 W 100 V Absolute encoder	69
MQMF021L1C1	MQMF 200 W 100 V Absolute encoder	69

Part No.	nertia flat type) Title	Page
MQMF021L1C2	MQMF 200 W 100 V Absolute encoder	69
MQMF021L1C3	MQMF 200 W 100 V Absolute encoder	69
MQMF021L1C4	MQMF 200 W 100 V Absolute encoder	69
MQMF021L1D1	MQMF 200 W 100 V Absolute encoder	69
MQMF021L1D2	MQMF 200 W 100 V Absolute encoder	69
MQMF021L1D3	MQMF 200 W 100 V Absolute encoder	69
MQMF021L1D4	MQMF 200 W 100 V Absolute encoder	69
MQMF021L1S1	MQMF 200 W 100 V Absolute encoder	69
MQMF021L1S1	MQMF 200 W 100 V Absolute encoder	69
MQMF021L1T1	MQMF 200 W 100 V Absolute encoder	69
MQMF021L1T1	MQMF 200 W 100 V Absolute encoder	69
	MQMF 200 W 100 V Absolute encoder	
MQMF021L1U1		69
MQMF021L1U2	MQMF 200 W 100 V Absolute encoder	69
MQMF021L1U3	MQMF 200 W 100 V Absolute encoder	69
MQMF021L1U4	MQMF 200 W 100 V Absolute encoder	69
MQMF021L1V1	MQMF 200 W 100 V Absolute encoder	69
MQMF021L1V2	MQMF 200 W 100 V Absolute encoder	69
MQMF021L1V3	MQMF 200 W 100 V Absolute encoder	69
MQMF021L1V4	MQMF 200 W 100 V Absolute encoder	69
MQMF022L1A1	MQMF 200 W 200 V Absolute encoder	70
MQMF022L1A2	MQMF 200 W 200 V Absolute encoder	70
MQMF022L1A2M	MQMF 200 W 200 V Absolute encoder	134
MQMF022L1B1	MQMF 200 W 200 V Absolute encoder	70
MQMF022L1B2	MQMF 200 W 200 V Absolute encoder	70
MQMF022L1B2M	MQMF 200 W 200 V Absolute encoder	134
MQMF022L1C1	MQMF 200 W 200 V Absolute encoder	70
MQMF022L1C2	MQMF 200 W 200 V Absolute encoder	70
MQMF022L1C2M	MQMF 200 W 200 V Absolute encoder	134
MQMF022L1C3	MQMF 200 W 200 V Absolute encoder	70
MQMF022L1C4	MQMF 200 W 200 V Absolute encoder	70
MQMF022L1C4M	MQMF 200 W 200 V Absolute encoder	134
MQMF022L1D1	MQMF 200 W 200 V Absolute encoder	70
MQMF022L1D2	MQMF 200 W 200 V Absolute encoder	70
MQMF022L1D2M	MQMF 200 W 200 V Absolute encoder	134
MQMF022L1D3	MQMF 200 W 200 V Absolute encoder	70
MQMF022L1D3	MQMF 200 W 200 V Absolute encoder	70
MQMF022L1D4M	MQMF 200 W 200 V Absolute encoder	134
MQMF022L1S1	MQMF 200 W 200 V Absolute encoder	70
MQMF022L1S2	MQMF 200 W 200 V Absolute encoder	70
MQMF022L1S2M	MQMF 200 W 200 V Absolute encoder	134
MQMF022L1T1	MQMF 200 W 200 V Absolute encoder	70
MQMF022L1T2	MQMF 200 W 200 V Absolute encoder	70
MQMF022L1T2M	MQMF 200 W 200 V Absolute encoder	134
MQMF022L1U1	MQMF 200 W 200 V Absolute encoder	70
MQMF022L1U2	MQMF 200 W 200 V Absolute encoder	70
MQMF022L1U2M	MQMF 200 W 200 V Absolute encoder	134
MQMF022L1U3	MQMF 200 W 200 V Absolute encoder	70
MQMF022L1U4	MQMF 200 W 200 V Absolute encoder	70
MQMF022L1U4M	MQMF 200 W 200 V Absolute encoder	134
MQMF022L1V1	MQMF 200 W 200 V Absolute encoder	70
MQMF022L1V2	MQMF 200 W 200 V Absolute encoder	70
MQMF022L1V2M	MQMF 200 W 200 V Absolute encoder	134
MQMF022L1V3	MQMF 200 W 200 V Absolute encoder	70
MQMF022L1V4	MQMF 200 W 200 V Absolute encoder	70
MQMF022L1V4M	MQMF 200 W 200 V Absolute encoder	134
MQMF041L1A1	MQMF 400 W 100 V Absolute encoder	71
MQMF041L1A2	MQMF 400 W 100 V Absolute encoder	71
MQMF041L1B1	MQMF 400 W 100 V Absolute encoder	71
MQMF041L1B2	MQMF 400 W 100 V Absolute encoder	71
MQMF041L1C1	MQMF 400 W 100 V Absolute encoder	71
MQMF041L1C2	MQMF 400 W 100 V Absolute encoder	71
MQMF041L1C3	MQMF 400 W 100 V Absolute encoder	71
MQMF041L1C4	MQMF 400 W 100 V Absolute encoder	71
MQMF041L1D1	MQMF 400 W 100 V Absolute encoder	71
MQMF041L1D2	MQMF 400 W 100 V Absolute encoder	71
MQMF041L1D3	MQMF 400 W 100 V Absolute encoder	71
MQMF041L1D4	MQMF 400 W 100 V Absolute encoder	71
MOMEONALACA	MQMF 400 W 100 V Absolute encoder	71
MQMF041L151		
	MQMF 400 W 100 V Absolute encoder	71
MQMF041L1S1 MQMF041L1S2 MQMF041L1T1	MQMF 400 W 100 V Absolute encoder MQMF 400 W 100 V Absolute encoder	71 71

Minimax Mini						
MQMF041L1U2 MQMF 400 W 100 V Absolute encoder 71 MQMF041L1U3 MQMF 400 W 100 V Absolute encoder 71 MQMF041L1U4 MQMF 400 W 100 V Absolute encoder 71 MQMF041L1V1 MQMF 400 W 100 V Absolute encoder 71 MQMF041L1V2 MQMF 400 W 100 V Absolute encoder 71 MQMF041L1V3 MQMF 400 W 100 V Absolute encoder 71 MQMF041L1V4 MQMF 400 W 100 V Absolute encoder 71 MQMF042L1A2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1A2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1A2M MQMF 400 W 200 V Absolute encoder 72 MQMF042L1B1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1B2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1B2M MQMF 400 W 200 V Absolute encoder 72 MQMF042L1C2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1C2M MQMF 400 W 200 V Absolute encoder 72 MQMF042L1C2M MQMF 400 W 200 V Absolute encoder 72 MQMF042L1C2M MQMF 400 W 200 V Absolute encoder 72	MQMF (Middle inertia flat type)					
MQMF041L1U3 MQMF 400 W 100 V Absolute encoder 71 MQMF041L1U4 MQMF 400 W 100 V Absolute encoder 71 MQMF041L1V1 MQMF 400 W 100 V Absolute encoder 71 MQMF041L1V2 MQMF 400 W 100 V Absolute encoder 71 MQMF041L1V3 MQMF 400 W 100 V Absolute encoder 71 MQMF041L1V4 MQMF 400 W 100 V Absolute encoder 71 MQMF042L1A1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1A2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1A2M MQMF 400 W 200 V Absolute encoder 72 MQMF042L1B2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1B2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1B2M MQMF 400 W 200 V Absolute encoder 72 MQMF042L1C1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1C2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1C3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1C4M MQMF 400 W 200 V Absolute encoder 72 MQMF042L1C4M MQMF 400 W 200 V Absolute encoder 72		-	_			
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MQMF041L1V3 MQMF 400 W 100 V Absolute encoder 71 MQMF041L1V4 MQMF 400 W 100 V Absolute encoder 71 MQMF042L1A1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1A2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1B1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1B2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1B2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1B2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1C1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1C2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1C2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1C3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1C3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1C4M MQMF 400 W 200 V Absolute encoder 72 MQMF042L1D2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1D2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1D3 MQMF 400 W 200 V Absolute encoder 72 <td< td=""><td></td><td></td><td>_</td></td<>			_			
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MQMF042L1A1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1A2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1A2M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1B1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1B2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1B2M MQMF 400 W 200 V Absolute encoder 72 MQMF042L1C1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1C2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1C2M MQMF 400 W 200 V Absolute encoder 72 MQMF042L1C2M MQMF 400 W 200 V Absolute encoder 72 MQMF042L1C3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1C4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1C4M MQMF 400 W 200 V Absolute encoder 72 MQMF042L1C4M MQMF 400 W 200 V Absolute encoder 72 MQMF042L1D1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1D2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1D3 MQMF 400 W 200 V Absolute encoder 72			71			
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MQMF042L1A2M MQMF 400 W 200 V Absolute encoder 72 MQMF042L1B1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1B2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1B2M MQMF 400 W 200 V Absolute encoder 72 MQMF042L1C1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1C2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1C3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1C4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1C4M MQMF 400 W 200 V Absolute encoder 72 MQMF042L1C4M MQMF 400 W 200 V Absolute encoder 72 MQMF042L1D4M MQMF 400 W 200 V Absolute encoder 72 MQMF042L1D2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1D2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1D3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1D4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1D4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1D3 MQMF 400 W 200 V Absolute encoder 72	MQMF042L1A1	MQMF 400 W 200 V Absolute encoder	72			
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MQMF042L1D2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1D2M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1D3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1D4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1D4M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1S1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1S2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1S2M MQMF 400 W 200 V Absolute encoder 72 MQMF042L1T1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1T2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1T2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V1 MQMF 400 W 200 V Absolute encoder 72	MQMF042L1C4M	MQMF 400 W 200 V Absolute encoder	135			
MQMF042L1D2M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1D3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1D4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1D4M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1S1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1S2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1S2M MQMF 400 W 200 V Absolute encoder 72 MQMF042L1T1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1T2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1T2M MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V2 MQMF 400 W 200 V Absolute encoder 72	MQMF042L1D1	MQMF 400 W 200 V Absolute encoder	72			
MQMF042L1D3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1D4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1D4M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1S1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1S2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1S2M MQMF 400 W 200 V Absolute encoder 72 MQMF042L1T1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1T2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1T2M MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V2 MQMF 400 W 200 V Absolute encoder 72	MQMF042L1D2	MQMF 400 W 200 V Absolute encoder	72			
MQMF042L1D4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1D4M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1S1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1S2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1S2M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1T1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1T2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1T2M MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V2 MQMF 400 W 200 V Absolute encoder 72	MQMF042L1D2M	MQMF 400 W 200 V Absolute encoder	135			
MQMF042L1D4M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1S1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1S2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1S2M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1T1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1T2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1T2M MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V3 MQMF 400 W 200 V Absolute encoder 72	MQMF042L1D3	MQMF 400 W 200 V Absolute encoder	72			
MQMF042L1S1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1S2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1S2M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1T1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1T2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1T2M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1U1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U3M MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V3 MQMF 400 W 200 V Absolute encoder 72	MQMF042L1D4	MQMF 400 W 200 V Absolute encoder	72			
MQMF042L1S2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1S2M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1T1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1T2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1T2M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1U1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U3M MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V4 MQMF 400 W 200 V Absolute encoder 72	MQMF042L1D4M	MQMF 400 W 200 V Absolute encoder	135			
MQMF042L1S2M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1T1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1T2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1T2M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1U1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U3M MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V4 MQMF 400 W 200 V Absolute encoder 72	MQMF042L1S1	MQMF 400 W 200 V Absolute encoder	72			
MQMF042L1T1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1T2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1T2M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1U1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U3M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1U3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 135 MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V4 MQMF 400 W 200 V Absolute encoder 72	MQMF042L1S2	MQMF 400 W 200 V Absolute encoder	72			
MQMF042L1T2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1T2M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1U1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U2M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1U3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1V1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V4 MQMF 400 W 200 V Absolute encoder 72	MQMF042L1S2M	MQMF 400 W 200 V Absolute encoder	135			
MQMF042L1T2M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1U1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U2M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1U3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1V1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V2M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1V3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V4 MQMF 400 W 200 V Absolute encoder 72	MQMF042L1T1	MQMF 400 W 200 V Absolute encoder	72			
MQMF042L1U1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U2M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1U3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1V1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V2M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1V3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V4 MQMF 400 W 200 V Absolute encoder 72	MQMF042L1T2	MQMF 400 W 200 V Absolute encoder	72			
MQMF042L1U2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U2M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1U3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1V1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V2M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1V3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V4 MQMF 400 W 200 V Absolute encoder 72	MQMF042L1T2M	MQMF 400 W 200 V Absolute encoder	135			
MQMF042L1U2M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1U3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1V1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V2M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1V3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V4 MQMF 400 W 200 V Absolute encoder 72	MQMF042L1U1	MQMF 400 W 200 V Absolute encoder	72			
MQMF042L1U3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1V1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V2M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1V3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V4 MQMF 400 W 200 V Absolute encoder 72	MQMF042L1U2	MQMF 400 W 200 V Absolute encoder	72			
MQMF042L1U4 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1U4M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1V1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V2M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1V3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V4 MQMF 400 W 200 V Absolute encoder 72	MQMF042L1U2M	MQMF 400 W 200 V Absolute encoder	135			
MQMF042L1U4M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1V1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V2M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1V3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V4 MQMF 400 W 200 V Absolute encoder 72	MQMF042L1U3	MQMF 400 W 200 V Absolute encoder	72			
MQMF042L1V1 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V2M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1V3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V4 MQMF 400 W 200 V Absolute encoder 72	MQMF042L1U4	MQMF 400 W 200 V Absolute encoder	72			
MQMF042L1V2 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V2M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1V3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V4 MQMF 400 W 200 V Absolute encoder 72	MQMF042L1U4M	MQMF 400 W 200 V Absolute encoder	135			
MQMF042L1V2M MQMF 400 W 200 V Absolute encoder 135 MQMF042L1V3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V4 MQMF 400 W 200 V Absolute encoder 72	MQMF042L1V1	MQMF 400 W 200 V Absolute encoder	72			
MQMF042L1V3 MQMF 400 W 200 V Absolute encoder 72 MQMF042L1V4 MQMF 400 W 200 V Absolute encoder 72	MQMF042L1V2	MQMF 400 W 200 V Absolute encoder	72			
MQMF042L1V4 MQMF 400 W 200 V Absolute encoder 72	MQMF042L1V2M	MQMF 400 W 200 V Absolute encoder	135			
	MQMF042L1V3	MQMF 400 W 200 V Absolute encoder	72			
MQMF042L1V4M MQMF 400 W 200 V Absolute encoder 135	MQMF042L1V4	MQMF 400 W 200 V Absolute encoder	72			
	MQMF042L1V4M	MQMF 400 W 200 V Absolute encoder	135			

MSMF (Low inertia)					
Part No.	Title	Page			
MSMF011L1A1	MSMF 100 W 100 V Absolute encoder	53			
MSMF011L1A2	MSMF 100 W 100 V Absolute encoder	53			
MSMF011L1B1	MSMF 100 W 100 V Absolute encoder	53			
MSMF011L1B2	MSMF 100 W 100 V Absolute encoder	53			
MSMF011L1C1	MSMF 100 W 100 V Absolute encoder	53			
MSMF011L1C2	MSMF 100 W 100 V Absolute encoder	53			
MSMF011L1D1	MSMF 100 W 100 V Absolute encoder	53			
MSMF011L1D2	MSMF 100 W 100 V Absolute encoder	53			
MSMF011L1S1	MSMF 100 W 100 V Absolute encoder	53			
MSMF011L1S2	MSMF 100 W 100 V Absolute encoder	53			
MSMF011L1T1	MSMF 100 W 100 V Absolute encoder	53			
MSMF011L1T2	MSMF 100 W 100 V Absolute encoder	53			
MSMF011L1U1	MSMF 100 W 100 V Absolute encoder	53			
MSMF011L1U2	MSMF 100 W 100 V Absolute encoder	53			
MSMF011L1V1	MSMF 100 W 100 V Absolute encoder	53			
MSMF011L1V2	MSMF 100 W 100 V Absolute encoder	53			
MSMF012L1A1	MSMF 100 W 200 V Absolute encoder	54			
MSMF012L1A2	MSMF 100 W 200 V Absolute encoder	54			
MSMF012L1A2M	MSMF 100 W 200 V Absolute encoder	122			
MSMF012L1B1	MSMF 100 W 200 V Absolute encoder	54			
MSMF012L1B2	MSMF 100 W 200 V Absolute encoder	54			
MSMF012L1B2M	MSMF 100 W 200 V Absolute encoder	122			
MSMF012L1C1	MSMF 100 W 200 V Absolute encoder	54			
MSMF012L1C2	MSMF 100 W 200 V Absolute encoder	54			
MSMF012L1C2M	MSMF 100 W 200 V Absolute encoder	122			
MSMF012L1D1	MSMF 100 W 200 V Absolute encoder	54			

279 Information Information 280

Index

(Alphabetical Order)

MSMF (Low iner		D
Part No. MSMF012L1D2	Title MSMF 100 W 200 V Absolute encoder	Page 54
MSMF012L1D2M	MSMF 100 W 200 V Absolute encoder	122
MSMF012L1S1	MSMF 100 W 200 V Absolute encoder	54
MSMF012L1S2	MSMF 100 W 200 V Absolute encoder	54
MSMF012L1S2M	MSMF 100 W 200 V Absolute encoder	122
MSMF012L1T1	MSMF 100 W 200 V Absolute encoder	54
MSMF012L1T2	MSMF 100 W 200 V Absolute encoder	54
MSMF012L1T2M	MSMF 100 W 200 V Absolute encoder	122
MSMF012L1U1	MSMF 100 W 200 V Absolute encoder	54
MSMF012L1U2 MSMF012L1U2M	MSMF 100 W 200 V Absolute encoder MSMF 100 W 200 V Absolute encoder	122
MSMF012L102M	MSMF 100 W 200 V Absolute encoder	54
MSMF012L1V2	MSMF 100 W 200 V Absolute encoder	54
MSMF012L1V2M	MSMF 100 W 200 V Absolute encoder	122
MSMF021L1A1	MSMF 200 W 100 V Absolute encoder	55
MSMF021L1A2	MSMF 200 W 100 V Absolute encoder	55
MSMF021L1B1	MSMF 200 W 100 V Absolute encoder	55
MSMF021L1B2	MSMF 200 W 100 V Absolute encoder	55
MSMF021L1C1	MSMF 200 W 100 V Absolute encoder	55
MSMF021L1C2	MSMF 200 W 100 V Absolute encoder	55
MSMF021L1D1	MSMF 200 W 100 V Absolute encoder	55
MSMF021L1D2 MSMF021L1S1	MSMF 200 W 100 V Absolute encoder MSMF 200 W 100 V Absolute encoder	55 55
MSMF021L1S2	MSMF 200 W 100 V Absolute encoder	55
MSMF021L1T1	MSMF 200 W 100 V Absolute encoder	55
MSMF021L1T2	MSMF 200 W 100 V Absolute encoder	55
MSMF021L1U1	MSMF 200 W 100 V Absolute encoder	55
MSMF021L1U2	MSMF 200 W 100 V Absolute encoder	55
MSMF021L1V1	MSMF 200 W 100 V Absolute encoder	55
MSMF021L1V2	MSMF 200 W 100 V Absolute encoder	55
MSMF022L1A1	MSMF 200 W 200 V Absolute encoder	56
MSMF022L1A2	MSMF 200 W 200 V Absolute encoder	56
MSMF022L1A2M	MSMF 200 W 200 V Absolute encoder	123
MSMF022L1B1 MSMF022L1B2	MSMF 200 W 200 V Absolute encoder MSMF 200 W 200 V Absolute encoder	56
MSMF022L1B2M	MSMF 200 W 200 V Absolute encoder	123
MSMF022L1C1	MSMF 200 W 200 V Absolute encoder	56
MSMF022L1C2	MSMF 200 W 200 V Absolute encoder	56
MSMF022L1C2M	MSMF 200 W 200 V Absolute encoder	123
MSMF022L1D1	MSMF 200 W 200 V Absolute encoder	56
MSMF022L1D2	MSMF 200 W 200 V Absolute encoder	56
MSMF022L1D2M	MSMF 200 W 200 V Absolute encoder	123
MSMF022L1S1	MSMF 200 W 200 V Absolute encoder MSMF 200 W 200 V Absolute encoder	56
MSMF022L1S2 MSMF022L1S2M	MSMF 200 W 200 V Absolute encoder	123
MSMF022L1T1	MSMF 200 W 200 V Absolute encoder	56
MSMF022L1T2	MSMF 200 W 200 V Absolute encoder	56
MSMF022L1T2M	MSMF 200 W 200 V Absolute encoder	123
MSMF022L1U1	MSMF 200 W 200 V Absolute encoder	56
MSMF022L1U2	MSMF 200 W 200 V Absolute encoder	56
MSMF022L1U2M	MSMF 200 W 200 V Absolute encoder	123
MSMF022L1V1	MSMF 200 W 200 V Absolute encoder	56
MSMF022L1V2 MSMF022L1V2M	MSMF 200 W 200 V Absolute encoder MSMF 200 W 200 V Absolute encoder	56
MSMF041L1A1	MSMF 400 W 100 V Absolute encoder	123 57
MSMF041L1A2	MSMF 400 W 100 V Absolute encoder	57
MSMF041L1B1	MSMF 400 W 100 V Absolute encoder	57
MSMF041L1B2	MSMF 400 W 100 V Absolute encoder	57
MSMF041L1C1	MSMF 400 W 100 V Absolute encoder	57
MSMF041L1C2	MSMF 400 W 100 V Absolute encoder	57
MSMF041L1D1	MSMF 400 W 100 V Absolute encoder	57
MSMF041L1D2	MSMF 400 W 100 V Absolute encoder	57
MSMF041L1S1	MSMF 400 W 100 V Absolute encoder	57
MSMF041L1S2 MSMF041L1T1	MSMF 400 W 100 V Absolute encoder MSMF 400 W 100 V Absolute encoder	57
MSMF041L111 MSMF041L1T2	MSMF 400 W 100 V Absolute encoder MSMF 400 W 100 V Absolute encoder	57
MSMF041L1U1	MSMF 400 W 100 V Absolute encoder	57
MSMF041L1U2	MSMF 400 W 100 V Absolute encoder	57
MSMF041L1V1	MSMF 400 W 100 V Absolute encoder	57
MSMF041L1V2	MSMF 400 W 100 V Absolute encoder	57
MSMF042L1A1	MSMF 400 W 200 V Absolute encoder	58
MSMF042L1A2	MSMF 400 W 200 V Absolute encoder	58

MSMF (Low iner		
Part No.	Title	Page
MSMF042L1A2M	MSMF 400 W 200 V Absolute encoder	124
MSMF042L1B1	MSMF 400 W 200 V Absolute encoder	58
MSMF042L1B2	MSMF 400 W 200 V Absolute encoder	58
MSMF042L1B2M	MSMF 400 W 200 V Absolute encoder	124
MSMF042L1C1	MSMF 400 W 200 V Absolute encoder	58
MSMF042L1C2	MSMF 400 W 200 V Absolute encoder	58
MSMF042L1C2M	MSMF 400 W 200 V Absolute encoder	124
MSMF042L1D1	MSMF 400 W 200 V Absolute encoder	58
MSMF042L1D2	MSMF 400 W 200 V Absolute encoder	58
MSMF042L1D2M	MSMF 400 W 200 V Absolute encoder	124
MSMF042L1S1	MSMF 400 W 200 V Absolute encoder	58
MSMF042L1S2	MSMF 400 W 200 V Absolute encoder	58
MSMF042L1S2M	MSMF 400 W 200 V Absolute encoder	124
MSMF042L1T1	MSMF 400 W 200 V Absolute encoder	58
MSMF042L1T2	MSMF 400 W 200 V Absolute encoder	58
MSMF042L1T2M	MSMF 400 W 200 V Absolute encoder	124
MSMF042L1U1	MSMF 400 W 200 V Absolute encoder	58
MSMF042L1U2	MSMF 400 W 200 V Absolute encoder	58
MSMF042L1U2M	MSMF 400 W 200 V Absolute encoder	124
MSMF042L1V1	MSMF 400 W 200 V Absolute encoder	58
MSMF042L1V2	MSMF 400 W 200 V Absolute encoder	58
MSMF042L1V2M	MSMF 400 W 200 V Absolute encoder	124
MSMF082L1A1	MSMF 750 W 200 V Absolute encoder	59
MSMF082L1A2	MSMF 750 W 200 V Absolute encoder	59
MSMF082L1A2M	MSMF 750 W 200 V Absolute encoder	125
MSMF082L1B1	MSMF 750 W 200 V Absolute encoder	59
MSMF082L1B2	MSMF 750 W 200 V Absolute encoder	59
MSMF082L1B2M	MSMF 750 W 200 V Absolute encoder	125
MSMF082L1C1	MSMF 750 W 200 V Absolute encoder	59
MSMF082L1C2	MSMF 750 W 200 V Absolute encoder	59
MSMF082L1C2M	MSMF 750 W 200 V Absolute encoder	125
	MSMF 750 W 200 V Absolute encoder	
MSMF082L1D1	MSMF 750 W 200 V Absolute encoder	59
MSMF082L1D2	MSMF 750 W 200 V Absolute encoder	59
MSMF082L1D2M		125
MSMF082L1S1 MSMF082L1S2	MSMF 750 W 200 V Absolute encoder MSMF 750 W 200 V Absolute encoder	59
		59 125
MSMF082L1S2M	MSMF 750 W 200 V Absolute encoder	1-0
MSMF082L1T1	MSMF 750 W 200 V Absolute encoder	59
MSMF082L1T2	MSMF 750 W 200 V Absolute encoder	59
MSMF082L1T2M	MSMF 750 W 200 V Absolute encoder	125
MSMF082L1U1	MSMF 750 W 200 V Absolute encoder	59
MSMF082L1U2	MSMF 750 W 200 V Absolute encoder	59
MSMF082L1U2M	MSMF 750 W 200 V Absolute encoder	125
MSMF082L1V1	MSMF 750 W 200 V Absolute encoder	59
MSMF082L1V2	MSMF 750 W 200 V Absolute encoder	59
MSMF082L1V2M	MSMF 750 W 200 V Absolute encoder	125
MSMF092L1A1	MSMF 1000 W 200 V Absolute encoder	60
MSMF092L1A2	MSMF 1000 W 200 V Absolute encoder	60
MSMF092L1A2M	MSMF 1000 W 200 V Absolute encoder	126
MSMF092L1B1	MSMF 1000 W 200 V Absolute encoder	60
MSMF092L1B2	MSMF 1000 W 200 V Absolute encoder	60
MSMF092L1B2M	MSMF 1000 W 200 V Absolute encoder	126
MSMF092L1C1	MSMF 1000 W 200 V Absolute encoder	60
MSMF092L1C2	MSMF 1000 W 200 V Absolute encoder	60
MSMF092L1C2M	MSMF 1000 W 200 V Absolute encoder	126
MSMF092L1D1	MSMF 1000 W 200 V Absolute encoder	60
MSMF092L1D2	MSMF 1000 W 200 V Absolute encoder	60
MSMF092L1D2M	MSMF 1000 W 200 V Absolute encoder	126
MSMF092L1S1	MSMF 1000 W 200 V Absolute encoder	60
MSMF092L1S2	MSMF 1000 W 200 V Absolute encoder	60
MSMF092L1S2M	MSMF 1000 W 200 V Absolute encoder	126
MSMF092L1T1	MSMF 1000 W 200 V Absolute encoder	60
MSMF092L1T2	MSMF 1000 W 200 V Absolute encoder	60
MSMF092L1T2M	MSMF 1000 W 200 V Absolute encoder	126
MSMF092L1U1	MSMF 1000 W 200 V Absolute encoder	60
MSMF092L1U2	MSMF 1000 W 200 V Absolute encoder	106
MSMF092L1U2M	MSMF 1000 W 200 V Absolute encoder	126
MSMF092L1V1	MSMF 1000 W 200 V Absolute encoder	60
MSMF092L1V2	MSMF 1000 W 200 V Absolute encoder	60
MSMF092L1V2M	MSMF 1000 W 200 V Absolute encoder	126
MSMF102L1C5	MSMF 1.0 kW 200 V Absolute encoder	61

MSMF (Low iner Part No.	Title	Page
MSMF102L1C6M	MSMF 1.0 kW 200 V Absolute encoder	127
MSMF102L1C7	MSMF 1.0 kW 200 V Absolute encoder	61
MSMF102L1C8	MSMF 1.0 kW 200 V Absolute encoder	61
MSMF102L1C8M	MSMF 1.0 kW 200 V Absolute encoder	127
MSMF102L1D5	MSMF 1.0 kW 200 V Absolute encoder	61
MSMF102L1D6	MSMF 1.0 kW 200 V Absolute encoder	61
MSMF102L1D6M	MSMF 1.0 kW 200 V Absolute encoder	127
MSMF102L1D7	MSMF 1.0 kW 200 V Absolute encoder	61
MSMF102L1D8	MSMF 1.0 kW 200 V Absolute encoder	61
MSMF102L1D8M	MSMF 1.0 kW 200 V Absolute encoder	127
MSMF102L1G5	MSMF 1.0 kW 200 V Absolute encoder	61
MSMF102L1G6	MSMF 1.0 kW 200 V Absolute encoder	61
MSMF102L1G6M	MSMF 1.0 kW 200 V Absolute encoder	127
MSMF102L1G7	MSMF 1.0 kW 200 V Absolute encoder	61
MSMF102L1G8	MSMF 1.0 kW 200 V Absolute encoder	61
MSMF102L1G8M	MSMF 1.0 kW 200 V Absolute encoder	127
MSMF102L1H5	MSMF 1.0 kW 200 V Absolute encoder	61
MSMF102L1H6	MSMF 1.0 kW 200 V Absolute encoder	61
MSMF102L1H6M	MSMF 1.0 kW 200 V Absolute encoder	127
MSMF102L1H7	MSMF 1.0 kW 200 V Absolute encoder	61
MSMF102L1H8	MSMF 1.0 kW 200 V Absolute encoder	61
MSMF102L1H8M	MSMF 1.0 kW 200 V Absolute encoder	127
MSMF152L1C5	MSMF 1.5 kW 200 V Absolute encoder	62
MSMF152L1C6	MSMF 1.5 kW 200 V Absolute encoder	62
MSMF152L1C6M	MSMF 1.5 kW 200 V Absolute encoder	128
MSMF152L1C7	MSMF 1.5 kW 200 V Absolute encoder	62
MSMF152L1C8	MSMF 1.5 kW 200 V Absolute encoder	62
MSMF152L1C8M	MSMF 1.5 kW 200 V Absolute encoder	128
MSMF152L1D5	MSMF 1.5 kW 200 V Absolute encoder	62
MSMF152L1D6	MSMF 1.5 kW 200 V Absolute encoder	62
MSMF152L1D6M	MSMF 1.5 kW 200 V Absolute encoder	128
MSMF152L1D7	MSMF 1.5 kW 200 V Absolute encoder	62
MSMF152L1D8	MSMF 1.5 kW 200 V Absolute encoder	62
MSMF152L1D8M	MSMF 1.5 kW 200 V Absolute encoder	128
MSMF152L1G5	MSMF 1.5 kW 200 V Absolute encoder	62
MSMF152L1G6	MSMF 1.5 kW 200 V Absolute encoder	62
MSMF152L1G6M	MSMF 1.5 kW 200 V Absolute encoder	128
MSMF152L1G7	MSMF 1.5 kW 200 V Absolute encoder	62
MSMF152L1G8	MSMF 1.5 kW 200 V Absolute encoder	62
MSMF152L1G8M	MSMF 1.5 kW 200 V Absolute encoder	128
MSMF152L1H5	MSMF 1.5 kW 200 V Absolute encoder	62
MSMF152L1H6	MSMF 1.5 kW 200 V Absolute encoder	62
MSMF152L1H6M	MSMF 1.5 kW 200 V Absolute encoder	128
MSMF152L1H7	MSMF 1.5 kW 200 V Absolute encoder	62
MSMF152L1H8	MSMF 1.5 kW 200 V Absolute encoder	62
MSMF152L1H8M	MSMF 1.5 kW 200 V Absolute encoder	128
MSMF202L1C5	MSMF 2.0 kW 200 V Absolute encoder	63
MSMF202L1C6	MSMF 2.0 kW 200 V Absolute encoder	63
MSMF202L1C6M	MSMF 2.0 kW 200 V Absolute encoder	129
MSMF202L1C7	MSMF 2.0 kW 200 V Absolute encoder MSMF 2.0 kW 200 V Absolute encoder	63
MSMF202L1C8		63
MSMF202L1C8M	MSMF 2.0 kW 200 V Absolute encoder	129
MSMF202L1D5	MSMF 2.0 kW 200 V Absolute encoder	63
MSMF202L1D6	MSMF 2.0 kW 200 V Absolute encoder MSMF 2.0 kW 200 V Absolute encoder	63
MSMF202L1D6M MSMF202L1D7	MSMF 2.0 kW 200 V Absolute encoder	129
MSMF202L1D7 MSMF202L1D8	MSMF 2.0 kW 200 V Absolute encoder MSMF 2.0 kW 200 V Absolute encoder	63
MSMF202L1D8M	MSMF 2.0 kW 200 V Absolute encoder	129
MSMF202L1D8M MSMF202L1G5	MSMF 2.0 kW 200 V Absolute encoder	63
MSMF202L1G5	MSMF 2.0 kW 200 V Absolute encoder	63
MSMF202L1G6M	MSMF 2.0 kW 200 V Absolute encoder	129
MSMF202L1G6M	MSMF 2.0 kW 200 V Absolute encoder	
MSMF202L1G7 MSMF202L1G8	MSMF 2.0 kW 200 V Absolute encoder	63
MSMF202L1G8M	MSMF 2.0 kW 200 V Absolute encoder	129
	MSMF 2.0 kW 200 V Absolute encoder MSMF 2.0 kW 200 V Absolute encoder	
MSMF202L1H5 MSMF202L1H6	MSMF 2.0 kW 200 V Absolute encoder MSMF 2.0 kW 200 V Absolute encoder	63
		63
MSMF202L1H6M MSMF202L1H7	MSMF 2.0 kW 200 V Absolute encoder MSMF 2.0 kW 200 V Absolute encoder	129
MSMF202L1H7 MSMF202L1H8		63
	MSMF 2.0 kW 200 V Absolute encoder	63
	MSME 2.0 kW 200 V Absolute angoder	100
MSMF202L1H8M MSMF302L1C5	MSMF 2.0 kW 200 V Absolute encoder MSMF 3.0 kW 200 V Absolute encoder	129 64

MSMF (Low iner Part No.	Title	Page
MSMF302L1C6M	MSMF 3.0 kW 200 V Absolute encoder	130
MSMF302L1C7	MSMF 3.0 kW 200 V Absolute encoder	64
MSMF302L1C8	MSMF 3.0 kW 200 V Absolute encoder	64
MSMF302L1C8M	MSMF 3.0 kW 200 V Absolute encoder	130
MSMF302L1D5	MSMF 3.0 kW 200 V Absolute encoder	64
MSMF302L1D6	MSMF 3.0 kW 200 V Absolute encoder	64
MSMF302L1D6M	MSMF 3.0 kW 200 V Absolute encoder	130
MSMF302L1D7	MSMF 3.0 kW 200 V Absolute encoder	64
MSMF302L1D8	MSMF 3.0 kW 200 V Absolute encoder	64
MSMF302L1D8M	MSMF 3.0 kW 200 V Absolute encoder	130
MSMF302L1G5	MSMF 3.0 kW 200 V Absolute encoder	64
MSMF302L1G6	MSMF 3.0 kW 200 V Absolute encoder	64
MSMF302L1G6M	MSMF 3.0 kW 200 V Absolute encoder	130
MSMF302L1G7	MSMF 3.0 kW 200 V Absolute encoder	64
MSMF302L1G8	MSMF 3.0 kW 200 V Absolute encoder	64
MSMF302L1G8M	MSMF 3.0 kW 200 V Absolute encoder	130
MSMF302L1H5	MSMF 3.0 kW 200 V Absolute encoder	64
MSMF302L1H6	MSMF 3.0 kW 200 V Absolute encoder	64
MSMF302L1H6M	MSMF 3.0 kW 200 V Absolute encoder	
MSMF302L1H6W	MSMF 3.0 kW 200 V Absolute encoder	130
		64
MSMF302L1H8	MSMF 3.0 kW 200 V Absolute encoder	64
MSMF302L1H8M	MSMF 3.0 kW 200 V Absolute encoder	130
MSMF402L1C5	MSMF 4.0 kW 200 V Absolute encoder	65
MSMF402L1C6	MSMF 4.0 kW 200 V Absolute encoder	65
MSMF402L1C6M	MSMF 4.0 kW 200 V Absolute encoder	131
MSMF402L1C7	MSMF 4.0 kW 200 V Absolute encoder	65
MSMF402L1C8	MSMF 4.0 kW 200 V Absolute encoder	65
MSMF402L1C8M	MSMF 4.0 kW 200 V Absolute encoder	131
MSMF402L1D5	MSMF 4.0 kW 200 V Absolute encoder	65
MSMF402L1D6	MSMF 4.0 kW 200 V Absolute encoder	65
MSMF402L1D6M	MSMF 4.0 kW 200 V Absolute encoder	131
MSMF402L1D7	MSMF 4.0 kW 200 V Absolute encoder	65
MSMF402L1D8	MSMF 4.0 kW 200 V Absolute encoder	65
MSMF402L1D8M	MSMF 4.0 kW 200 V Absolute encoder	131
MSMF402L1G5	MSMF 4.0 kW 200 V Absolute encoder	65
MSMF402L1G6	MSMF 4.0 kW 200 V Absolute encoder	65
MSMF402L1G6M	MSMF 4.0 kW 200 V Absolute encoder	131
MSMF402L1G7	MSMF 4.0 kW 200 V Absolute encoder	65
MSMF402L1G8	MSMF 4.0 kW 200 V Absolute encoder	65
MSMF402L1G8M	MSMF 4.0 kW 200 V Absolute encoder	131
MSMF402L1H5	MSMF 4.0 kW 200 V Absolute encoder	65
MSMF402L1H6	MSMF 4.0 kW 200 V Absolute encoder	65
MSMF402L1H6M	MSMF 4.0 kW 200 V Absolute encoder	131
MSMF402L1H7	MSMF 4.0 kW 200 V Absolute encoder	65
MSMF402L1H8	MSMF 4.0 kW 200 V Absolute encoder	65
MSMF402L1H8M	MSMF 4.0 kW 200 V Absolute encoder	131
MSMF502L1C5	MSMF 5.0 kW 200 V Absolute encoder	66
MSMF502L1C6	MSMF 5.0 kW 200 V Absolute encoder	66
MSMF502L1C6M	MSMF 5.0 kW 200 V Absolute encoder	132
MSMF502L1C7	MSMF 5.0 kW 200 V Absolute encoder	66
MSMF502L1C8	MSMF 5.0 kW 200 V Absolute encoder	66
MSMF502L1C8M	MSMF 5.0 kW 200 V Absolute encoder	132
MSMF502L1D5	MSMF 5.0 kW 200 V Absolute encoder	66
MSMF502L1D6	MSMF 5.0 kW 200 V Absolute encoder	66
MSMF502L1D6M	MSMF 5.0 kW 200 V Absolute encoder	132
MSMF502L1D7	MSMF 5.0 kW 200 V Absolute encoder	66
MSMF502L1D7 MSMF502L1D8	MSMF 5.0 kW 200 V Absolute encoder	66
	MSMF 5.0 kW 200 V Absolute encoder	
MSMF502L1D8M MSMF502L1G5	MSMF 5.0 kW 200 V Absolute encoder MSMF 5.0 kW 200 V Absolute encoder	132
MSMF502L1G5		66
MSMF502L1G6	MSMF 5.0 kW 200 V Absolute encoder	66
MSMF502L1G6M	MSMF 5.0 kW 200 V Absolute encoder	132
MSMF502L1G7	MSMF 5.0 kW 200 V Absolute encoder	66
MSMF502L1G8	MSMF 5.0 kW 200 V Absolute encoder	66
MSMF502L1G8M	MSMF 5.0 kW 200 V Absolute encoder	132
MSMF502L1H5	MSMF 5.0 kW 200 V Absolute encoder	66
MSMF502L1H6	MSMF 5.0 kW 200 V Absolute encoder	66
MSMF502L1H6M	MSMF 5.0 kW 200 V Absolute encoder	132
MSMF502L1H7	MSMF 5.0 kW 200 V Absolute encoder	66
MSMF502L1H8	MSMF 5.0 kW 200 V Absolute encoder	66
MSMF502L1H8M	MSMF 5.0 kW 200 V Absolute encoder	132
MSMF5AZL1A1	MSMF 50 W 100 V/200 V common Absolute encoder	51,52
IVISIVIFSAZLTAT	The state of the s	,

Index

(Alphabetical Order)

MSMF (Low iner	tia)	
Part No.	Title	Page
MSMF5AZL1A2M	MSMF 50 W 100 V/200 V common Absolute encoder	121
MSMF5AZL1B1	MSMF 50 W 100 V/200 V common Absolute encoder	51,52
MSMF5AZL1B2	MSMF 50 W 100 V/200 V common Absolute encoder	51,52
MSMF5AZL1B2M	MSMF 50 W 100 V/200 V common Absolute encoder	121
MSMF5AZL1C1	MSMF 50 W 100 V/200 V common Absolute encoder	51,52
MSMF5AZL1C2	MSMF 50 W 100 V/200 V common Absolute encoder	51,52
MSMF5AZL1C2M	MSMF 50 W 100 V/200 V common Absolute encoder	121
MSMF5AZL1D1	MSMF 50 W 100 V/200 V common Absolute encoder	51,52
MSMF5AZL1D2	MSMF 50 W 100 V/200 V common Absolute encoder	51,52
MSMF5AZL1D2M	MSMF 50 W 100 V/200 V common Absolute encoder	121
MSMF5AZL1S1	MSMF 50 W 100 V/200 V common Absolute encoder	51,52
MSMF5AZL1S2	MSMF 50 W 100 V/200 V common Absolute encoder	51,52
MSMF5AZL1S2M	MSMF 50 W 100 V/200 V common Absolute encoder	121
MSMF5AZL1T1	MSMF 50 W 100 V/200 V common Absolute encoder	51,52
MSMF5AZL1T2	MSMF 50 W 100 V/200 V common Absolute encoder	51,52
MSMF5AZL1T2M	MSMF 50 W 100 V/200 V common Absolute encoder	121
MSMF5AZL1U1	MSMF 50 W 100 V/200 V common Absolute encoder	51,52
MSMF5AZL1U2	MSMF 50 W 100 V/200 V common Absolute encoder	51,52
MSMF5AZL1U2M	MSMF 50 W 100 V/200 V common Absolute encoder	121
MSMF5AZL1V1	MSMF 50 W 100 V/200 V common Absolute encoder	51,52
MSMF5AZL1V2	MSMF 50 W 100 V/200 V common Absolute encoder	51,52
MSMF5AZL1V2M	MSMF 50 W 100 V/200 V common Absolute encoder	121

MUMA (Low ine	MUMA (Low inertia MINAS E series Motor)					
Part No.	Title	Page				
MUMA011P1S	MUMA 100 W 100 V Incremental encoder	213,217				
MUMA011P1T	MUMA 100 W 100 V Incremental encoder	213,217				
MUMA012P1S	MUMA 100 W 200 V Incremental encoder	215,217				
MUMA012P1T	MUMA 100 W 200 V Incremental encoder	215,217				
MUMA021P1S	MUMA 200 W 100 V Incremental encoder	213,217				
MUMA021P1T	MUMA 200 W 100 V Incremental encoder	213,217				
MUMA022P1S	MUMA 200 W 200 V Incremental encoder	215,217				
MUMA022P1T	MUMA 200 W 200 V Incremental encoder	215,217				
MUMA042P1S	MUMA 400 W 200 V Incremental encoder	215,217				
MUMA042P1T	MUMA 400 W 200 V Incremental encoder	215,217				
MUMA5AZP1S	MUMA 50 W 100 V/200 V common Incremental encoder	213,215 217				
MUMA5AZP1T	MUMA 50 W 100 V/200 V common Incremental encoder	213,215 217				

Part No.	E series Motor with gear reducer) Title	Page
MUMA011P31N	10	218,22
MUMA011P32N	1	218,22
MUMA011P34N	MUMA with reduction gear 100 W 100 V	218,22
MUMA011P41N	Incremental encoder	218,22
MUMA011P42N	1	218,22
MUMA011P44N		218,22
MUMA012P31N		218,22
MUMA012P32N	1	218,22
MUMA012P34N	MUMA with reduction gear 100 W 200 V	218,22
MUMA012P41N	Incremental encoder	218,22
MUMA012P42N		218,22
MUMA012P44N	1	218,22
MUMA021P31N		218,22
MUMA021P32N		218,22
MUMA021P34N	MUMA with reduction gear 200 W 100 V	218,22
MUMA021P41N	Incremental encoder	218,22
MUMA021P42N	_	218,22
MUMA021P44N	1	218,22
MUMA022P31N		218,22
MUMA022P32N	1	218,22
MUMA022P34N	MUMA with reduction gear 200 W 200 V	218,22
MUMA022P41N	Incremental encoder	218,22
MUMA022P42N		218,22
MUMA022P44N	1	218,22
MUMA042P31N		218,22
MUMA042P32N	1	218,22
MUMA042P34N	MUMA with reduction gear 400 W 200 V	218,22
MUMA042P41N	Incremental encoder	218,22
MUMA042P42N	1	218,22
MUMA042P44N	1	218,22

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	[CA.SO OMOO]		e-mail Web site	https://www.panasonic-electric-works.	
					+33(0)417997050
	Panagania Electric Merica Colonicia A.C.		Grunds Schwitz	strasse 8, 6343 Rotkreuz, zerland	+31(0)417997055
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				117, litera 43, Polustrovskiy avenue,	+7-812-703-09-81
Russia	Electroprivod Ltd.	St.Petersburg		retersburg, Russia	+7-812-493-27-26
	[Distributors]		Web site	http://www.electroprivod.ru	<u> </u>
			10042	SOK.NO:10 A.O.S.B CIGLI-IZMIR,	+90 232 433 8515
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	ROBOT SIST.SAN.TIC.A.S [Distributors]	Izmir	e-mail	sales@bostek.com.tr	
Tourism	Distributors		Web site	http://www.bostek.com.tr/	
Turkey			Des Sa	nayi Sitesi 104 Sokak A07 Blok No:02	+90-216-466-3683
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	(Hong Kong) Co.,Ltd. (PIDSHK) [Sales office]	Hong kong	Plaza, 77 Mody Road, S.T.S. East, Kowloon, HongKong		+852-2598-9743
	Panasonic Industrial Devices Sales		<u> </u>	, China Insurance Building, 166	+86-21-3855-2442
China	(China) Co.,Ltd. (PIDSCN) [Sales office]	Shanghai	East Ro	pad LuJiaZui PuDong New District, nai, China	+86-21-3855-2375
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	(China) Co.,Ltd. (PIDSCN)	Shenzhen	8/F, Tower Three, Kerry Plaza, 1-1 Zhongxinsi Road, Futian District, Shenzhen, China		+60-755-6255-6791
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	Industrial Division		1	oor, Ambience Commercial, Ambience Mall,	+91-124-6670400
	Industrial Division, Panasonic India Pvt Ltd.	Gurgaon,	1	on - 122002, Haryana, India	+91-124-6670338
	[Sales office]	Haryana	Web site	http://industrial.panasonic.com/sa/pro compressors/fa-motors	ducts/motors-
	<u>-</u>		1	Patel Ring Road, Near Bright School,	+91-79-39845300
	Lubi Electronics [Distributors]	Gandhinaga, Gujarat	Nana C Dist.: G	iniloda, iandhinagar - 382330, Gujarat, India	+91-79-39845599
India	Communical	Jaujarat		http://www.lubielectronics.com	1
muia				ijan Street, 2nd Floor, Moiz Manzil,	+91-22-23455052
	Luna Bearings	Mumbai,	Mumbai - 400003, Maharashtra, India		+91-22-23427773
	[Distributors]	Maharashtra	Web site	http://www.lunabearings.com	
				ot No.74, Shree Ganesh Complex,	+91-2522-661600
	Vashi Electricals Pvt. Ltd.	Mumbai,	Behind Gupta Compound, Dapole Road, Mankoli Naka,		04 0500 004555
	[Distributors]	Mahayaahiya	1	di - 421305, Maharashtra, India	+91-2522-661620
			Web site	http://www.vashielectricals.com	

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	Korea	Korea Co., Ltd. (PIDSKR) [Sales office]		Gangnam-gu, Seoul, 135-851, Korea	+82-2-2052-1053	
	Taiman	Panasonic Industrial Devices Sales	Tainai	12F, No.9, SongGao Rd., Taipei 110, Taiwan,	+886-2-2757-1900	
	Taiwan	Taiwan Co.,Ltd. [Sales office]	Taipei	R.O.C.	+886-2-2757-1977	
		Panasonic Industrial Devices Sales Asia Pte.Ltd.	Cingonoro	No 2 Padak Couth Dood Cingapara 460260	+65-6390-3718	
		[Sales office]	Singapore	No.3 Bedok South Road Singapore 469269	+65-9435-6844	
				2 Woodlands Sector 1 #03-25, Woodlands	+65-6751-5088	
	Singapore	Intermech Machinery Pte.Ltd. [Distributors]	Singapore	Spectrum 1 Singapore 738068	+65-6759-2122	
		[=		Web site http://www.intermech.com.sg		
		Danamanh Marshinama Odo Dhd	IX	No.14, Lorong Sanggul 1C, Bandar Puteri,	+60-3-5161-7876	
		Panamech Machinery Sdn Bhd [Distributors]	Kuala Lumpur	41200 Klang, Selangor Darul Ehsan	+60-3-5161-7136	
	Malaysia			Web site http://panamech.com.my/		
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terr	Theiland	[Sistinguioro]		Web site http://www.premier-ac.co.th		
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		[Distributors]		Web site http://www.handalyesindo.com		
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		PT.Riasarana Electrindo [Distributors]	Jakarta	D No. 8-15 Jakarta 11460, Indonesia	+62-21-566-7405	
		[Distributions]		Web site http://www.risacorps.com		
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