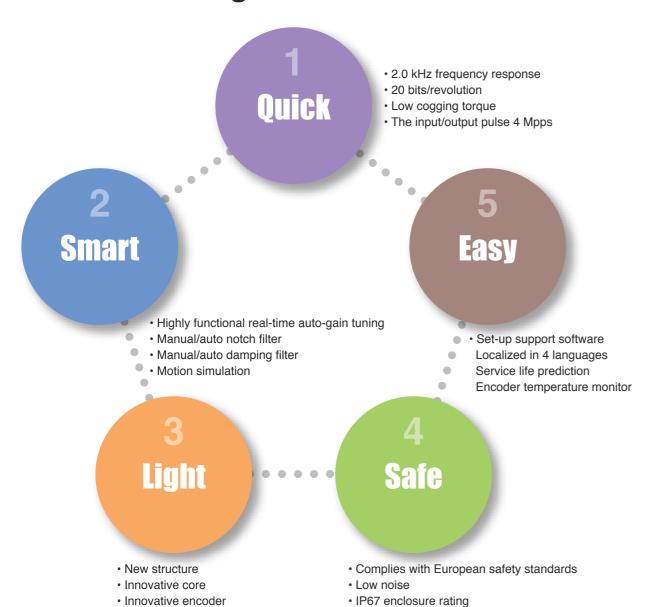


A small step for axis.
Large step ahead for system motion.

Series



# Five industry-leading advantages supported by a variety of new technologies and new features.

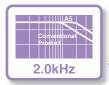


## Contents

Motor Line-up/ Driver and Motor Combination	1
Model Designation	
Peripheral equipments configuration	12
List of recommended peripheral equipments	14
Table of Part Numbers and Options	10
Driver	
Common Specifications of Driver	
A5 series (Standard type)	18
A5E series (Positioning type)	2
Wiring example of main circuit	
Wiring to the Connector XA, XB, XC, XD	2
Safety function	
Wiring to the Connector X3	2
Control circuit wiring diagram	
Wiring to the Connector X4	2
Wiring to the Connector X5	2
Wiring to the Connector X6	
Dimensions of Driver	3
Motor	
Specifications of Motor	
Motor specifications, ratings and Dimensions	3
Describes motor specifications	
OPTION	
	10
OPTION	10
OPTION  Conformance to EC Directives / UL Standards	10
OPTION  Conformance to EC Directives / UL Standards	
OPTION  Conformance to EC Directives / UL Standards  Cable part number designation  Specifications of motor connector.	10 10 11 11
OPTION  Conformance to EC Directives / UL Standards	
OPTION  Conformance to EC Directives / UL Standards  Cable part number designation  Specifications of motor connector.  Junction Cable for Encoder  Junction Cable for Motor.	
OPTION  Conformance to EC Directives / UL Standards  Cable part number designation  Specifications of motor connector.  Junction Cable for Encoder  Junction Cable for Motor.  Junction Cable for Brake	
OPTION  Conformance to EC Directives / UL Standards  Cable part number designation  Specifications of motor connector.  Junction Cable for Encoder  Junction Cable for Motor.  Junction Cable for Brake  Connector kit.	
OPTION  Conformance to EC Directives / UL Standards  Cable part number designation  Specifications of motor connector.  Junction Cable for Encoder  Junction Cable for Motor.  Junction Cable for Brake  Connector kit.  Battery for absolute encoder.	
OPTION  Conformance to EC Directives / UL Standards  Cable part number designation  Specifications of motor connector.  Junction Cable for Encoder  Junction Cable for Motor.  Junction Cable for Brake  Connector kit.  Battery for absolute encoder.  Mounting bracket	
OPTION  Conformance to EC Directives / UL Standards  Cable part number designation  Specifications of motor connector.  Junction Cable for Encoder  Junction Cable for Motor.  Junction Cable for Brake  Connector kit.  Battery for absolute encoder.  Mounting bracket  Reactor	
OPTION  Conformance to EC Directives / UL Standards  Cable part number designation  Specifications of motor connector.  Junction Cable for Encoder  Junction Cable for Motor.  Junction Cable for Brake  Connector kit.  Battery for absolute encoder.  Mounting bracket  Reactor  External regenerative resister.	
OPTION  Conformance to EC Directives / UL Standards  Cable part number designation  Specifications of motor connector.  Junction Cable for Encoder  Junction Cable for Motor.  Junction Cable for Brake  Connector kit.  Battery for absolute encoder.  Mounting bracket  Reactor  External regenerative resister.  Surge absorber for motor brake  List of manufactures for peripheral equipments	
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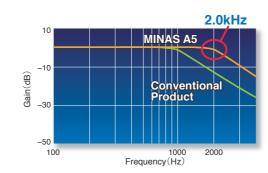


#### 2.0 kHz frequency response

Example application Semiconductor production equipment, packaging, etc.

# Achieves the industry's fastest frequency response of 2.0 kHz.

Operation speed up by new developed LSI and high responsible control. By the industry's fastest speed and positioning response, a highly advanced system can be created. What's more, the shorter response delay will realize an to extremely lower vibration.





#### 20 bits/revolution, 1.04 million pulses

Example application Machine tools, textile machinery, etc.

# Ensures smoother operation and reduced vibration at stopping.

#### Ensures accurate positioning in a short time.

New proprietary signal processing technology achieves 1.04 million pulses with a 20-bit encoder.

Conventional A4 Series 131,072 p/r 130,000 pulses





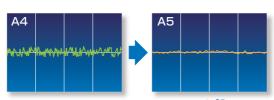
#### Low cogging torque (Excluding MSMD, MHMD type)

**Example application** Semiconductor production equipment, textile machinery, etc.

# For the industry's most stable speed and lowest cogging

We've achieved the industry's lowest cogging by minimizing the pulse width by a new design incorporating a 10-pole rotor for the motor and a magnetic field parsing technique.

Positioning and stability are greatly improved by the minimal torque variation. This results to improved speed stability and positioning of motor rotation.



Vibration reduced to only 1/8



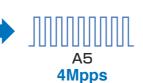
#### The input/output pulse 4 Mpps

**Example application** Semiconductor production equipment, machine tools, etc.

# Accommodates the industry's leading positioning resolution commands (with pulse train commands).

The command input and feedback output operate at the high speed of 4 Mpps. Accommodates high-resolution and high-speed operation, including standard full closed operation.





# 2 Smart



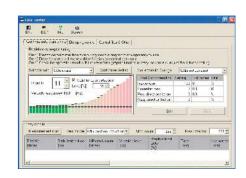
#### **Highly Functional Real-time Auto-Gain Tuning**

**Example application** Semiconductor production equipment, food processing machinery, etc.

# Incorporates the industry's quickest high-performance real-time auto-gain tuning featuring simple setup.

After installation, tuning is completed automatically in several operations. When the response is adjusted, **simple tuning** is supported with a change to one parameter value. Use of the gain adjustment mode in the setup support software contributes to optimum adjustment. **The built-in auto vibration suppression function reduces equipment damage.** Appropriate modes are provided for various machines such as **vertical axis machines and high friction machines with belts**.

This makes it possible to perform simple optimal adjustments simply by selecting the mode and stiffness.



# Nocth filters

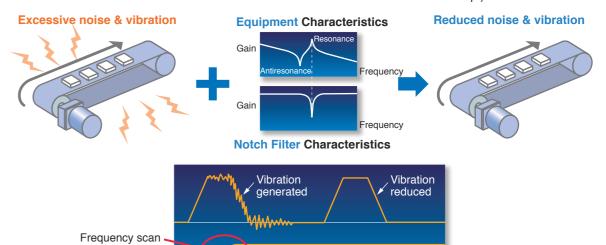
#### Manual/Auto Notch Filters

**Example application** Semiconductor production equipment, food processing machinery, etc.

#### 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

during operation. The A5 Series features an industry-largest total of four notch filters with setup frequencies of 50 to 5,000 Hz. This approach enables depth adjustment within this frequency range. (Two of the filters share the auto set-up.)



Completion of adaptive





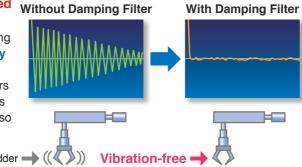
#### Manual/Auto Damping Filter

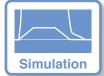
**Example application** 

Chip mounters, food processing machinery, robots, general production machinery, etc.

# Equipped with a damping filter featuring simplified automatic setup. Without Damping Filter

The setup software features automatic setup of the damping filter. This filter removes the natural vibration frequency component from the command input, greatly reducing vibration of the axis when stopping. The number of filters has been increased to four from the conventional two filters (two for simultaneous use). The adaptive frequency has also been significantly expanded from 1 to 200 Hz.



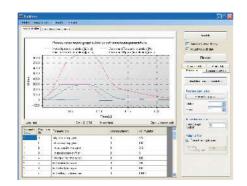


#### **Motion Simulation**

**Example application** General production machinery, etc.

# Equipped with a simplified machine simulation function.

The setup software uses frequency response data acquired from the actual machine. In addition, it features a machine simulation function for performing simulated operation. This allows you to easily confirm the effects of gain and various filters without adjusting the actual equipment.



3 Light



#### New Structure/ Innovative Core/ Innovative Encoder (Excluding MSMD, MHMD type)

**Example application** Robots, chip mounters, general production machinery, etc.



nnovative encode

# Featuring significantly reduced weight and a more compact motor

We've developed new designs for both compact motors and large motors. The new design used for the core has succeeded in compact. The addition of an innovative compact encoder has contributed to a 10% to 25% (1 to 6 kg) reduction in motor weight in the 1 kW and larger class when compared with conventional motors.



	[Examples for MSM or MDM]									
1		A4 Series	A5 Series	Weight Reduction						
4	MSM 1kW	4.5kg	3.5kg	<b>▲</b> 1kg						
	MSM 2kW	6.5kg	5.3kg	▲1.2kg						
	MDM 1kW	6.8kg	5.2kg	▲1.6kg						
	MDM 2kW	10.6kg	8.0kg	▲2.6kg						

4 Safe



#### Complies with European Safety Standards. (A5E series doesn't correspond to the safety standard.)

Example application Semiconductor and LCD production equipment, etc.

## Complies with the latest European safety standards.

Features non-software-based (hardware-based?) 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.)



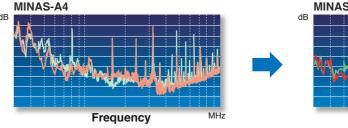
#### Low noise

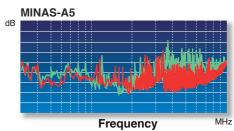
Example application

Semiconductor and LCD production equipment, etc. general production machinery for export to the European market

#### **Complies with the European EMC Directive**

By incorporating the latest circuit technology, A5 series achieves a further noise reduction of 3dB compared with the conventional A4 Series, which also features noise suppression. (The A4 Series also conforms to the EMC Directive.)





# IP67

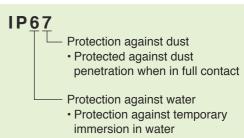
#### IP67 Enclosure Rating (Excluding MSMD, MHMD type)

**Example application** Machine tools, robots, printing machines, etc.

# IP67 enclosure rating for increased environmental resistance

Our improved motor seals and direct-mount connectors in the motor power supply and encoder input-output areas contribute to this unit's IP67 enclosure rating.





IP65: MSMD, MHMD series









#### **PANATERM Set-up Support Software**

Introducing the new PANATERM Set-up Support Software, now with many added features.

#### Localized in 4 languages

Choose either **English**, **Japanese**, **Chinese**, **or Korean**\*-language display.

\* The Korean-language version is scheduled for release in December.

#### **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.

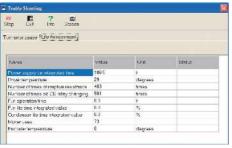
#### **Encoder Temperature Monitor**

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 (provided with 20-bit encoder only).

#### **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, the trial run function supports positioning with a Z-phase search and software limit as well as a non-rotating contributing factor display function.

• Service Life Prediction function (Screen shown for reference only.)



• The Data Logging function handles a variety of data types.

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# Other Functions

#### Command Control Mode (Excluding A5E Series)

- Command control mode is available for Position,
   Speed (including eight internal gears) and Torque.
- Using parameter settings, you can set up one optional command control mode or two command control modes by switching.
- With a suitable application utility, you can choose an optional command control mode.

#### Full closed Control (Excluding A5E Series)

You can use the AB-phase linear scale (for general all-purpose products) or the serial scale (for products with Panasonic1s exclusive format) for supported scales (see table below).

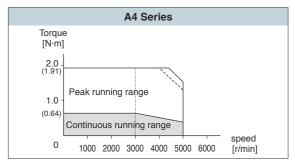
#### SEMI F47

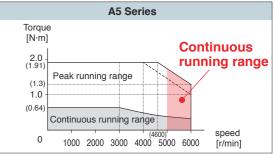
- Includes a function in compliance with the SEMI F47 standard for voltage sag immunity under no load or light load.
- Ideal for the semiconductor and LCD industries.
   Notes:
- 1) Excluding the single-phase 100-V type.
- Please verify the actual compliance of your machine with the F47 standard for voltage sag immunity.

#### 6,000-rpm capability

The MSME motor (under 750 W) can accommodate a maximum speed of 6,000 r/min.

[Comparison of new and conventional 200 W]





#### **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.

Table 1

Applicable Linear Scale	Manufacturer	Model No.	Resolution [µs]	Maximum Speed (m/s)*
Parallel Type (AB-phase)	General	_	Maximum s 4 × multiplica	speed after ation: 4 Mpps
		SR75	0.01	3.3
Serial Type	Sony Manufacturing Systems Corporation	SR85	0.01	3.3
(Incremental)		SL700/PL101-RP	0.1	10
		SL710/PL101-RP	0.1	10
		AT573A	0.05	2
0 1 1 7	Mitutoyo Corporation	ST771A(L)	0.5	5
Serial Type (Absolute)		ST773A(L)	0.1	4
(16001410)	Sony Manufacturing Systems Corporation	SR77	0.01	3.3
	Sony Manufacturing Systems Corporation	SR87	0.01	3.3

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

#### 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. We recommend that you connect an optional regenerative resistor.
- Frame C to Frame F model drivers contain one regenerative resistor; however, adding an optional regenerative resistor provides additional regeneration capability.

#### 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 over-travel inhibition, and during power shutdown and tripping of the circuit breaker.
- The desired action sequence can be set up to accommodate your machine requirements.

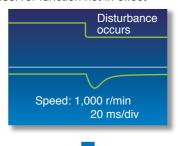
#### Parameter Initialization

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

#### Disturbance Observer

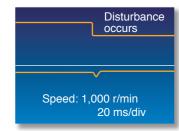
By using a disturbance observer to add an estimated disturbance torque value to the torque canceling command, this function diminishes the impact of the disturbance torque, reduces vibration, and offsets any speed decline.

Disturbance observer function not in effect





Disturbance observer function in effect



#### Torque Feed Forward

The Torque Feed Forward function performs a comparison with feedback and calculates the amount of torque to add to the necessary torque command in the command for actuation.

#### Friction Torque Compensation

This function reduces the effect of machine-related friction and improves responsiveness. Two kinds of friction compensation can be set up: unbalanced load compensation, which compensates with a constant operational offset torque; and kinetic friction, which changes direction in response to the direction of movement.

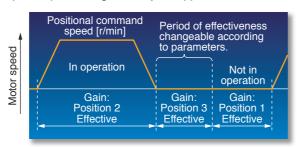
#### 3-Step Gain

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 diffent tunings for normal running, stopping for faster positioning and at stopping.

The right gaing 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).

When you have significant load inertia changes, it can adjust unbalanced speed and position gain turning conbination.

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

You can use the I/Os to set up torque limits. These can be used for applications such as simplified pressure, tension control, and sensor-less homing.

#### Applicable overseas safety standards









		Driver	Motor
	<b>EMC Directives</b>	EN55011 EN61000-6-2 IEC61800-3	_
	Low-Voltage Directives	EN61800-5-1	EN60034-1 EN60034-5
EC Directives	Functional safety	EN954-1(CAT3) ISO13849-1(PL-D) EN61508(SIL2) EN62061(SIL2) EN61800-5-2(STO) IEC61326-3-1	_
UL Standards		UL508C (E164620)	UL1004-1 (E327868: Small type) UL1004 (E166557: Large type)
CSA Standards		C22.2 No.14	C22.2 No.100

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

MEMO

<sup>\*</sup> When export this product, follow statutory provisions of the destination country.

<sup>\*</sup> A5E series doesn't correspond to the functional safety standard.

# **Motor Line-up/ Driver and Motor Combination**

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

	Line up							
Low inertia					Middle	inertia	High i	inertia
		MSMD (Small type)	MSME (Small type)	MSME (Large type)	MDME	MGME (Low speed/ (High torque type)	MHMD	MHME
Motor								
Rated o	output (kW)	0.05 0.1 0.2 0.4 0.75	0.05 0.1 0.2 0.4 0.75	1.0 1.5 2.0 3.0 4.0 5.0	1.0 1.5 2.0 3.0 4.0 5.0	0.9 2.0 3.0	0.2 0.4 0.75	1.0     1.5       2.0     3.0       4.0     5.0
	otational Max. speed)	3000 (5000) For 750W 3000 (4500)	3000 (6000)	3000 (5000) For 4.0kW and 5.0kW 3000 (4500)	2000 (3000)	1000 (2000)	3000 (5000) For 750W 3000 (4500)	2000 (3000)
Rotary	20-bit incremental	0	0	0	0	0	0	0
encoder	17-bit absolute	0	0	0	0	0	0	0
Enclosu	ıre	IP65 (*)	IP67 (*)	IP67 (*)	IP67 (*)	IP67 (*)	IP65 (*)	IP67 (*)
Features		Leadwire type     Small capacity     Suitable for     high speed     application     Suitable for all     applications		Middle capacity     Suitable for the machines directly coupled with ball screw and high stiffness and high repetitive application	Middle capacity     Suitable for low stiffness machines with belt driven	Middle capacity     Flat type and suitable for machines with space limitation	Leadwire type     Small capacity     Suitable for low stiffness machines with belt driven	Middle capacity     Suitable for low stiffness machines with belt driven, and large load moment of inertia
Applicat		Bonder     Semiconductor     equipment     Packing machinetc	nes	• SMT machines • Food machines • LCD production equipment	Conveyors     Robots     Machine tool etc	Conveyors     Robots     Textile     machines     etc	Conveyors     Robots	Conveyors     Robots     LCD     manufacturing     equipment     etc

<sup>(\*)</sup> Except for output shaft, and connector.

#### **Driver and Motor Combination**

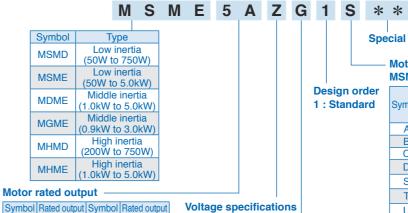
	Driver					Motor				
Frame	Part No.	MSMD	MSME	I	MSME	MDME	MGME		MHMD	МНМЕ
	MADHT1105	MSMD5AZ***	MSME5AZ***							
	MADHT1107	MSMD011 ***	MSME011 ***		Motor (S	cheduled to be i	released.)			
<b>A</b> -Frame	MADHT1505	MSMD5AZ***	MSME5AZ***		• MDME	7.5kW, 11kW, 15	kW			
	MADHIIOUS	MSMD012***	MSME012***		• MHME	7.5kW				
	MADHT1507	MSMD022***	MSME022***			4.5kW, 6.0kW			MHMD022***	
D.c.	MBDHT2110	MSMD021***	MSME021***			1.5kW, 2.5kW, 4.			MHMD021 ***	
<b>B</b> -Frame	MBDHT2510	MSMD042***	MSME042***			vith Gear Reduce	-		MHMD042***	
0 =	MCDHT3120	MSMD041 ***	MSME041 ***		100V	V, 200W, 400W, 7	'50W		MHMD041 ***	
C-Frame	MCDHT3520	MSMD082***	MSME082***						MHMD082***	
	MDDHT3530				MDME102***				MHME102***	
	MDDHT2412					MDME104***				MHME104***
D.	MDDHT5540			MSMI	E102***	MDME152***	MGME092	***		MHME152***
D-Frame	MDDH 13540			MSM	E152***					
	MDDUT2420			MSMI	E104***	MDME154***	MGME094	***		MHME154***
	MDDHT3420			MSM	E154***					
E-Frame	MEDHT7364			MSMI	E202***	MDME202***				MHME202***
E-Frame	MEDHT4430			MSMI	E204***	MDME204***				MHME204***
	MFDHTA390			MSMI	E302***	MDME302***	MGME202	***		MHME302***
	MFDHT5440			MSMI	E304***	MDME304***	MGME204	***		MHME304***
	MFDHTB3A2			MSMI	ME402 *** MDME402 *** MGME302		***		MHME402***	
F-Frame	WIFDH I B3A2			MSMI	E502***	MDME502***				MHME502***
	MEDUTAAGA			MSMI	E404***	MDME404***	MGME304	***		MHME404***
	MFDHTA464			MSMI	E504***	MDME504***				MHME504***

<sup>\*</sup> A5E series (dedicated for position control) drivers are also used in combination with motors show above.

# MINAS A5

## **Model Designation**

#### Servo Motor



	-		
Symbol	Rated output	Symbol	Rated output
5A	50W	10	1.0kW
01	100W	15	1.5kW
02	200W	20	2.0kW
04	400W	30	3.0kW
80	750W	40	4.0kW
09	0.9kW	50	5.0kW

# **Rotary encoder specifications**

Symbol	Format	Pulse counts	Resolution	Wires
G	Incremental	20-bit	1,048,576	5
S	Absolute	17-bit	131,072	7

Symbol Specifications

Z

100V 200V

400V 100V/200V common (50W only)

M S M E 0 1 1 G 3 1 N



1 : Standard

	S	haft	Holding	g brake	Oil	seal
Symbol	Round	Key-way, center tap	without	with	without	with
Α						
В						
С						
D						
S						
Т						
U						
V						

#### MSME(1.0kW to 5.0kW), MDME, MGME, MHME

,	•		**				
Symbol	S	haft	Holding	brake	Oil seal		
	Round	Key-way	without	with	without	with	
С							
D							
G							
Н							

## Motor with reduction gear

# **Motor rated output** Sy

Symbol	Тур	е		Symbol	Rated output
MSME	Low in	w inertia		01	100W
INIOINE	(50W to	750W)		02	200W
				04	400W
				08	750W

#### **Voltage specifications**

Symbol	Specifications
1	100V
2	200V

#### **Rotary encoder specifications**

Symbol	Format	Pulse counts	Resolution	Wires		0	K
G	Incremental	20-bit	1,048,576	5		3	
S	Absolute	17-bit	131,072	7		4	
0. 00.	n be used in in	0.0					
Ser	vo Driver						
Ser	vo Driver		A D H				

#### Gear ratio, gear type

Cumbal	Gear	Mo	otor ou	itput (	W)	Gear
Symbol	reduction ratio	100	200	400	750	type
1N	1/5					
2N	1/9					For high
3N	1/15					accuracy
4N	1/25					

#### **Motor structure**

Symbol	Shaft	Holding	brake
Syllibol	Key-way	without	with
3			
4			

Positioning type	M	Α	D	Н	Т	1	5	0	5	E	* *		Special s	pecifications		
				vice N	lax						Only posit	tion control	Current detector			
Frame symbol Frame	) L ]		nt ra	ting Currer	nt ratin	ıa							Symbol	Current ratin		

Symbol	Frame
MADH	Frame A
MBDH	Frame B
MCDH	Frame C
MDDH	Frame D
MEDH	Frame E
MFDH	Frame F

Symbol	Current rating
T1	10A
T2	15A
T3	30A
T4	35A
T5	50A
T7	75A
TA	100A
TB	150A

# Supply voltage

specifica	tions
Symbol	Specifications
1	Single phase, 100V
3	3-phase, 200V
4	3-phase, 400V
5	Single/3-phase, 200V

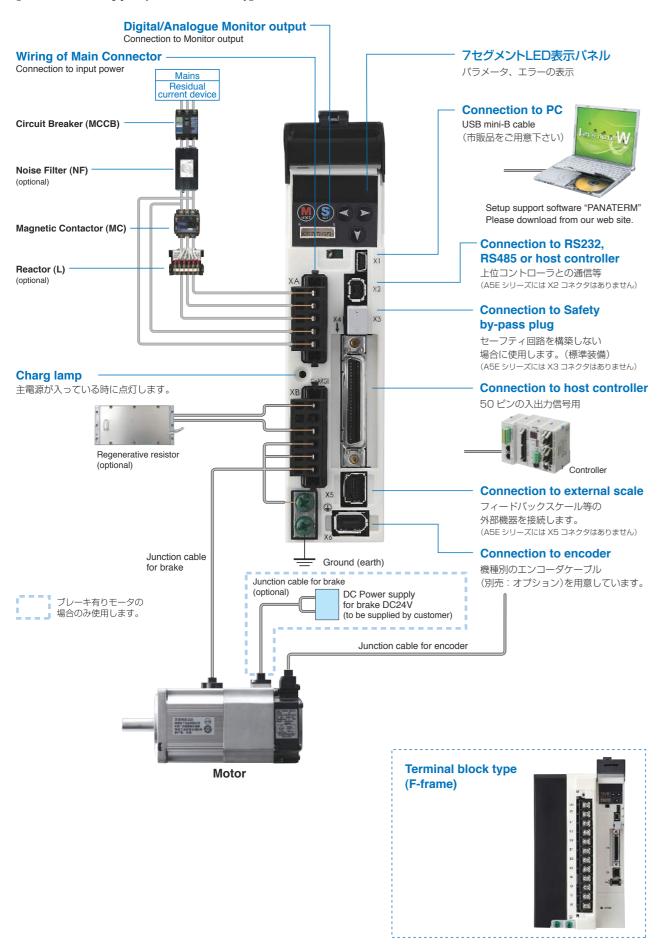
Syllibol	Current rating	
05	5A	
07	7.5A	
10	10A	
12	12A	
20	20A	
30	30A	
40	40A	
64	64A	
90	90A	
A2	120A	

**Special specifications** 

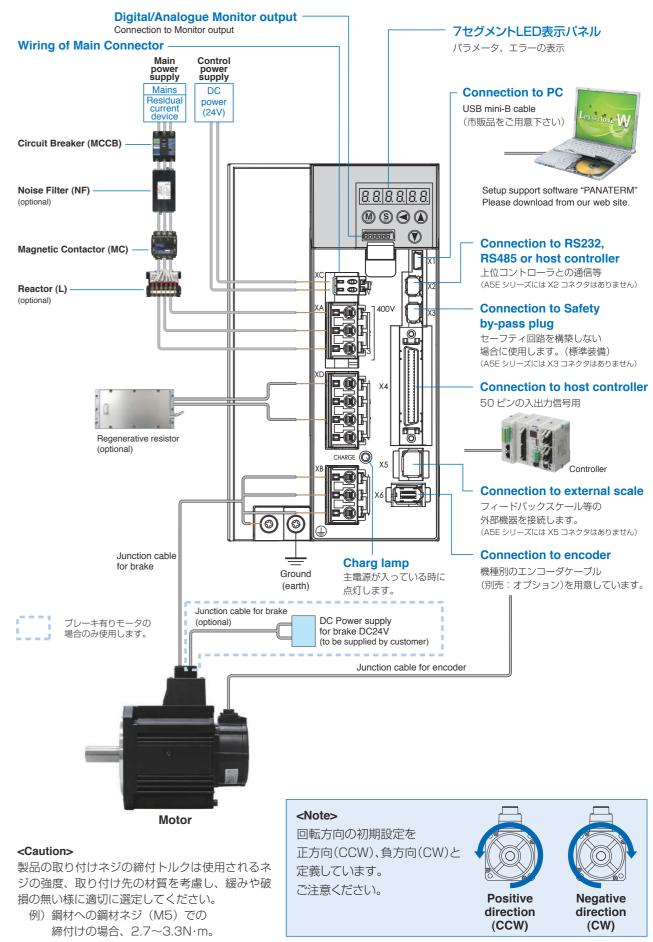
<sup>\*</sup> S: can be used in incremental.

# MINAS A 5 Overall Wiring

#### [Connector type (A to E-frame)]



#### [Connector type (D, E-frame 400V)]





## **Driver and List of Applicable Peripheral Equipments**

Driver	Applicable motor	Voltage	Rated output	Required Power at the	Circuit breaker ( rated (current)	Surge absorber	Noise filter for signal	Magnetic contactor (定格通電電流) /開放熱電流	Cable diameter ( main circuit)	Cable diameter (control) circuit	Connection
	MSMD	Single phase,	50W to 100W	approx.		DV0P4190				, ,	
MADH	MSME MHMD	Single/3-phase, 200V	50W to 200W	approx.		DV0P4190 DV0P1450					
	MSMD	Single phase, 100V	200W	approx. 0.5kVA	10A	DV0P4190			0.75mm <sup>2</sup> / AWG18		
MBDH	MSME MHMD	Single/3-phase, 200V	400W	approx. 0.9kVA		DV0P4190 DV0P1450		20A	to 2.0mm <sup>2</sup> / AWG14		
MCDH	MSMD MSME	Single phase, 100V	400W	approx. 0.9kVA		DV0P4190				0.7521	
WICEIT	MHMD	Single/3-phase, 200V	750W	approx. 1.3kVA						0.75mm²/ AWG18	
	MDME MHME		1.0kW	approx. 1.8kVA	15A						Connec
	MGME	0: 1.6	900W	approx. 1.8kVA		DV0P4190					tion to
	MSME	Single/3-phase, 200V	1.0kW	approx. 1.8kVA	20A	DV0P1450		30A			exclu
MDDH	MHME MDME MSME		1.5kW	approx. 2.3kVA							Connection to exclusive connector
	MSME MDME MHME		1.0kW	approx. 1.8kVA					2.0mm²/ AWG14	0.52/	ector
	MGME	3-phase, 400V	0.9kW		10A	DV0PM20050		20A		0.5mm²/ AWG	
	MSME MDME MHME		1.5kW	approx. 2.3kVA						20~24	
MEDII	MDME MSME MHME	3-phase, 200V	2.0kW	approx. 3.3kVA	30A	DV0P1450	DV0P1460	60A		0.75mm²/ AWG18	
MEDH	MSME MDME MHME	3-phase, 400V	2.0kW	approx. 3.3kVA	15A	DV0PM20050		30A		0.5mm <sup>2</sup> / AWG 20~24	
	MGME		2.0kW	approx. 3.8kVA							
	MDME MHME MSME MGME	3-phase.	3.0kW	approx. 4.5kVA				60A	3.5mm²/ AWG12		
	MDME MHME MSME	200V	4.0kW	approx. 6kVA	50A	DV0P1450		4004			
	MDME MHME MSME		5.0kW	approx. 7.5kVA				100A	5.3mm²/ AWG10	0.75mm²/	11mm or smaller \$\phi_5.3\$
MFDH	MGME		2.0kW	approx. 3.8kVA						AWG18	Terminal block
	MSME MDME MGME MHME	3-phase,	3.0kW	approx. 4.5kVA					3.5mm²/		M5
	MSME MDME MHME	400V	4.0kW	approx. 6.8kVA	30A	DV0PM20050		60A	AWG12		
	MSME MDME MHME		5.0kW	approx. 7.5kVA							

- Select peripheral equipments for single/3phase common specification according to the power source.
- 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 (4) marked).

Suitable for use on a circuit capable of delivering not more than 5,000 rms 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.

#### <Remarks>

- 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.

The screws of protective earth terminals for Frame A to D are M4 (Fastening torque: 0.7 to 0.8N·m) and M5 (Fastening torque: 1.4 to 1.6N·m) for Frame E, F.

Fastening torque of earth screws.

Tighten the terminal block screw on frame F with a torque between 1.0 and 2.0 N·m. Application of overtorque (more than 2.0 N·m) will cause damage to terminal block. Maximum allowable torque to the screw securing terminal block cover is 0.19 to 0.21 N·m.

- · The cable diameter of an earth cable.
  - Use an earth cable with the same diameter or larger as that of the main circuit cable.
- If the diameter of the main circuit cable is 1.6mm<sup>2</sup> or less, use an earth cable with a diameter of 2.0mm<sup>2</sup> (AWG14).
- Use the attached exclusive connector for A to E-frame, and maintain the peeled off length of 8 to
- Tighten the screws of the connector, Connector X4 for the host controller with the torque of 0.3 to 0.35

Larger torque than 0.35N·m may damage the connector at the driver side.

#### <Caution>

Do not turn on power without tightening all terminal block screws properly, otherwise, loose contacts may generate heat (smoking, firing).

		Motor					Driver						Optio	nal parts				<ul> <li>Options</li> </ul>		
			0	Dout No.	Rating/	Dout No.	Part No.		Power	Encod	ler cable		cable		D		Mata	Title	構成品名	Part No.
Mc	tor series	Power supply	Output (W)	Part No. Note) 1	Spec.	Part No. (Standard type)	(Positioning	Frame	capacity (atrated load)	20-bit Incrementa	17-bit al Absolute	without brake	with brake	cable	Regenerative resistor	Reactor	Noise filter	Interface cable		DV0P4360
			ì	ŕ	(page)	` ,	type)				Note) 2	Note) 2	Note) 2	Note) 2				Interface Conn		DV0P4350
			50 100	MSMD5AZ_1 * MSMD011_1 *		MADHT1105 MADHT1107	MADHT1105E MADHT1107E	A-frame	Approx. 0.4kVA Approx. 0.4kVA						DV0P4280	DV0P227	DV0P4170		A to Single D-frame row type	DV0PM20032
	MSMD	Single phase 100V	200	MSMD021 1 *	_	MBDHT2110	MBDHT2110E	B-frame							DV0P4283	D) (ODOOO		Connector for Power	(100V/) Double	DV0PM20033
			400	MSMD041□1 *	72	MCDHT3120	MCDHT3120E			MEEGA	MEECA	MEMOA		MEMOR	DV0P4282	DV0P228	DV0PM20042	Supply Input	\200V   row type E-frame (200V)	'
	(Leadwire) type		50	MSMD5AZ_1 *		MADHT1505	MADHT1505E		Approx. 0.5kVA			MFMCA 0**0EED	_	MFMCB 0**0GET	DV0P4281			Connection	D-frame (400V)	
	3000r/min	Single phase/ 3-phase	100	MSMD012 1 *	_	MADHT1505	MADHT1505E	A-frame							210201	DV0P220			E-frame (400V)	
	00001/111111	200V	200 400	MSMD022_1 * MSMD042_1 *		MADHT1507 MBDHT2510	MADHT1507E MBDHT2510E	R framo	Approx. 0.5kVA						DV0P4283		DV0PM20042	Connector for Control Power	D, E-frame	
			750	MSMD042_1 *	_	MCDHT3520	MCDHT3520F	C-frame	Approx. 1 3kVA						D V 01 4200	DV0P221		Supply Input	(400V)	DV0PM2005
			50	MSME5AZ_1 *		MADHT1105	MADHT1105E	Δ (	Approx. 0.4kVA						DV0D4000	DVODOOZ		Connection	A to D-frame	DV0PM2003
		Single phase 100V	100	MSME011 1 *		MADHT1107	MADH11107E		Approx. U.4KVA						DV0P4280		DV0P4170	Connector for Motor	E-frame (200V)	
		Origic priase 100 v	200	MSME021 1 *		MBDHT2110	MBDHT2110E								DV0P4283 DV0P4282	DV0P228	D1/0D1/000/0	Connection	D-frame (400V)	
-	MSME		400	MSME041 1 * MSME5AZ 1 *		MCDHT3120 MADHT1505	MCDHT3120E MADHT1505E	C-frame		MFECA	MFECA	MFMCA		MFMCB			DV0PM20042	Connector for	E-frame	DV0PM2004
•	3000r/min		50 100	MSME012_1 *		MADHT1505 MADHT1505	MADHT1505E MADHT1505E	Δ <sub>-frame</sub>	Approx. 0.5kVA	0**0MJE	0**0MJE	0**0NJD	_	0**0PJT	DV0P4281	DV0P220		Regenerative Resistor	D-frame (400V)	DV0PM2005
		Single phase/ 3-phase	200	MSME022 1 *		MADHT1507	MADHT1503E	A-lialle	Approx. 0.5kVA								DV0PM20042			DV0P4290
-		200V	400	MSME042_1 *		MBDHT2510	MBDHT2510E	B-frame							DV0P4283	DV0P221				DV0P4380
			750	MSME082_1 *		MCDHT3520	MCDHT3520E	C-frame	Approx. 1.3kVA							DVUPZZI		Connector Kit		DV0PM2003 DV0PM2003
		Single phase/ 3-phase	1000	MSME102 1 *		MDDHT5540	MDDHT5540E	D-frame	Approx. 1.8kVA			MEMCD	MFMCA		DV0P4284	DV0P222	DV0P4220	Motor/Encoder	Connection	DV0PM2003 DV0PM2003
		200V	1500	MSME152_1 * MSME202_1 *		MDDHT5540 MEDHT7364	WIDDITTOOTOL		Approx. Z.OKV/				0**2FCD							DV0PM2003
			2000 3000	MSME302 1 *		MFDHTA390	MEDHT7364E MFDHTA390E	E-Irame	Approx. 4.5kVA						DV0F4200	DV0P223	DV0PM20043			DV0PM2003
		3-phase 200V	4000	MSME402 1 *		MFDHTB3A2	MFDHTB3A2E	F-frame	Approx. 6kVA				MFMCA		DV0P4285		DV0P3410	Connector Kit 1 Motor/Brake C		DV0PM2004
	MSME		5000	MSME502_1 *	50	MFDHTB3A2	MFDHTB3A2E		Approx. 7.5kVA	MFECA	MFECA	0**3ECT	03FC1		x 2 in parallel	_		WOOD/DIAKE O	RS485, RS232	DV0PM2002
	3000r/min		1000	MSME104□1*		MDDHT3420	MDDHT3420E	D-frame	Approx. 1.8kVA	0**0ETD	0**0ETE		MFMCE	_	DV0PM20048				Safety	DV0PM2002
			1500	MSME154_1 *		MDDHT3420	MDDH13420E		Approx. 2.3kVA				0**2FCD					Connector	External Scale	DV0PM2002
		3-phase 400V	2000 3000	MSME204 1 * MSME304 1 *		MEDHT4430 MFDHT5440	MEDHT4430E MFDHT5440E	E-frame	Approx. 3.3kVA Approx. 4.5kVA						DV0PM20049	_	_		Encoder Analog Monitor	DV0PM2001
			4000	MSME404 1 *		MFDHTA464	MFDHTA464E	F-frame					MFMCA		DV0PM20049				Signal	DV0PM2003
			5000	MSME504_1 *		MFDHTA464	MFDHTA464E	i iiuiiio	Approx. 7.5kVA			0**3ECT	0**3FCT		× 2 in parallel			Battery For Ab	solute Encoder	DV0P2990
		Single phase/ 3-phase	1000	MDME102_1*		MDDHT3530	MDDHT3530E	D-frame	Approx. 1.8kVA			MEMCD	MEMOA		DV0P4284	DV/nP222	DV0P4220	Battery Box	A framo	DV0P4430 DV0PM2002
		200V	1500	MDME152_1 *		MDDHT5540	MDDHT5540E		Approx. 2.3kVA				MFMCA 0**2FCD					Mounting	A-frame B-frame	DV0PM2002
			2000	MDME202 1 *		MEDHT7364	MEDHT7364E	E-frame							DV0P4285		DV0PM20043	bracket	C-frame	DV0PM20029
		3-phase 200V	3000 4000	MDME302_1 * MDME402_1 *	_	MFDHTA390 MFDHTB3A2	MFDHTA390E MFDHTB3A2E	F-framo	Approx. 4.5kVA Approx. 6kVA				MFMCA		DV0P4285	DV0P224 DV0P225	DV0P3410		D-frame	DV0PM2003
	MDME		5000	MDME502 1 *		MFDHTB3A2	MFDHTB3A2E	I -IIaille	Approx. 7.5kVA	MEECA	MFECA	0**3ECT	0**3FCT		x 2 in parallel	_	D V 01 3410		without	MFECA0**0E
	2000r/min			MDME104_1*		MDDHT2412	MDDHT2412E	D frama	A 4 Old/A		0**0ETE	MEMOD	MEMOE	_	DV0PM20048			Junction Cable	Buttery Box	MFECA0**0N MFECA0**0E
:			1500	MDME154□1 *		MDDHT3420	MDDHT3420E	D-Irame	Approx. 2.3kVA				MFMCE 0**2FCD					for Encoder		MFECA0**0E
		3-phase 400V	2000	MDME204 1 *		MEDH 14430	MEDH 14430E	E-frame	Approx. 3.3KVA						DV0PM20049	_	_		with Buttery Box	MFECA0**0N
		'	3000 4000	MDME304_1 * MDME404_1 *		MFDHT5440 MFDHTA464	MFDHT5440E MFDHTA464E	E fromo	Approx. 4.5kVA Approx. 6.8kVA			MFMCA	MFMCA		DV0PM20049				Buttery Box	MFECA0**0E
			5000	MDME504 1 *		MFDHTA464	MFDHTA464E	I -IIaille	Approx. 7.5kVA			0**3ECT	0**3FCT		× 2 in parallel					MFMCA0**0E
		Single phase/ 3-phase 200V	900	MGME092_1 *	_	MDDHT5540	MDDHT5540E	D-frame				MFMCD0**2ECD	MFMCA0**2FCD	)	DV0P4284	DV0P222	DV0P4220		without Brake	MFMCD0**2E
		3-phase 200V	2000	MGME202□1 *	58	MFDHTA390	MFDHTA390E	F-frame	Approx. 3.8kVA						DV0P4285	DV0P223	DV0P3410	Junction Cable	•	MFMCE0**2E
	MGME	3-priase 200 v	3000	MGME302□1 *		MFDHTB3A2	MFDHTB3A2E		Approx. 4.5kVA	MFECA	MFECA	0**3ECT		_	× 2 in parallel	DV0P224	D V 01 3410	for Motor		MFMCA0**3E
	1000r/min	0 mhana 400V	900	MGME094_1 * MGME204_1 *		MDDHT3420	MDDHT3420E	D-frame		0^^0E1L	0 0 TOE 1E	MFMCD0**2ECD		-	DV0PM20048	-			with Brake	MFMCA0**2F
		3-phase 400V	2000 3000	MGME304_1 *		MFDHT5440 MFDHTA464	MFDHT5440E MFDHTA464E	F-frame	Approx. 3.8kVA Approx. 4.5kVA			0**3ECT	MFMCA 0**3FCT		DV0PM20049 × 2 in parallel	_	_		Willi Diake	MFMCA0**3F
	MHMD	0	200	MHMD021 1 *		MBDHT2110	MBDHT2110E	B-frame							DV0P4283	D) /oDooo	DV0P4170	Junation Cobla	for Proko	MFMCB0**00
		Single phase 100V	400	MHMD041 1 *		MCDHT3120	MCDHT3120E			145504	145504	1451404		MEMOR	DV0P4282	DV0P228	DV0PM20042	Junction Cable		MFMCB0**0F
	(Leadwire) type	Single phase/ 3-phase	200	MHMD022_1 *		MADHT1507	MADHT1507E					MFMCA 0**0EED	_	MFMCB 0**0GET		DV0P220			50Ω 25W	DV0P4280
	3000r/min	200V	400	MHMD042 1 *		MBDHT2510	MBDHT2510E								DV0P4283	DV0P221	DV0PM20042		100Ω 25W 25Ω 50W	DV0P4281 DV0P4282
ŀ	00001/111111	0:	750 1000	MHMD082_1 * MHME102_1 *		MCDHT3520 MDDHT3530	MCDHT3520E MDDHT3530E	C-frame				MEMOD	NATNAOA					External	50Ω 50W	DV0P4283
		Single phase/ 3-phase 200V	1500	MHME152 1 *		MDDHT5540	MDDHT5540E	D-frame	Approx. 1.8kVA Approx. 2.3kVA			MFMCD 0**2ECD	0**2FCD		DV0P4284	DV0P222	DV0P4220	Regenerative Resistor	30Ω 100W	DV0P4284
			2000	MHME202 1 *		MEDHT7364	MEDHT7364E	E-frame					MFMCE0**2FCD	)	DV0P4285	DV0P223	DV0PM20043	1 100.010	20Ω 130W	DV0P4285
		3-phase 200V	3000	MHME302□1 *	63	MFDHTA390	MFDHTA390E		Approx. 4.5kVA							DV0P224			120Ω 35W 80Ω 65W	DV0PM2004 DV0PM2004
	84: 184-	3-p11a58 200 V	4000	MHME402 1 *		MFDHTB3A2	MFDHTB3A2E	F-frame	Approx. 6kVA				MFMCA 0**3FCT		DV0P4285 × 2 in parallel	DV0P225	DV0P3410		DV0P220, DV0	
	MHME		5000	MHME502 1 *		MFDHTB3A2	MFDHTB3A2E		Approx. 7.5kVA		MFECA			_	p	_		Reactor	DV0P223, DV0	P224, DV0P2
	2000r/min		1000 1500	MHME104_1 * MHME154_1 *		MDDHT2412 MDDHT3420	MDDHT2412E MDDHT3420E	D-frame	Approx. 1.8kVA Approx. 2.3kVA	UUE IL	0**0ETE	MFMCD 0**2ECD	MFMCE		DV0PM20048				DV0P227, DV0 DV0P4170, DV	
			2000	MHME204 1 *		MEDHT4430	MEDHT4430E	E-frame				MFMCE0**2ECD	0**2FCD		DV0PM20048	-		Noise Filter	DV0P4220, DV	
		3-phase 400V	3000	MHME304 1 *		MFDHT5440	MFDHT5440E		Approx. 4.5kVA							-	_		DV0P3410	D\/0D4100
			4000	MHME404 1 *		MFDHTA464	MFDHTA464E	F-frame				MFMCA 0**3ECT			DV0PM20049 × 2 in parallel			Surge	Single phase 3-phase (200V)	
			5000	MHME504□1 *	103	MFDHTA464	MFDHTA464E		Approx. 7.5kVA			0 0001	0 0101		^ = III paraliel			absorber	3-phase (200V)	

	100V	Main	circuit	+10%		
			Circuit	Single phase, 100 to 120V15% 50/60Hz		
	100 0	Control circuit		Single phase, 100 to 120V $^{+10\%}_{-15\%}$ 50/60Hz		
		Main	A to D-frame	Single/3-phase, 200 to 240V +10% 50/60Hz		
Input power	200V	circuit	E to F-frame	3-phase, 200 to 230V +10% 50/60Hz		
ower	200 V	Control	A to D-frame	Single phase, 200 to 240V +10% 50/60Hz		
		circuit	E to F-frame	Single phase, 200 to 230V +10% 50/60Hz		
	400V	Main circuit	D to F-frame	Single phase, 380 to 480V +10% 50/60Hz		
		Control circuit	D to F-frame	DC 24V ± 15%		
Wit	hstand vo	ltage		Primary to earth: withstand 1500 VAC, 1 min,(sensed current: 20 mA)		
		tempe	erature	Ambient temperature: 0°C to 55°C (free from freezing) Storage temperature: -20°C to 65°C (Max.temperature guarantee: 80°C for 72 hours)		
Enι	/ironment	onment humidity		Both operating and storage : 20 to 85%RH or less (free from condensation)		
		Altitude		Lower than 1000m		
		Vibration		5.88m/s <sup>2</sup> or less, 10 to 60Hz (No continuous use at resonance frequency)		
Co	ntrol meth	nod		IGBT PWM Sinusoidal wave drive		
End	Encoder feedback			17-bit (131072 resolution) absolute encoder, 7-wire serial 20-bit (1048576 resolution) incremental encoder, 5-wire serial		
Fee	Feedback scale feedback			A/B phase, initialization signal defferential input.  Manufacturers that support serial communication scale:  Mitsutoyo Corp.  Sony Manufacturing Systems Corp.		
	Input Control		put	General purpose 10 inputs The function of general-purpose input is selected by parameters.		
sigi	nal	Output		General purpose 6 outputs The function of general-purpose input is selected by parameters.		
	alog	Input		3 inputs (16Bit A/D : 1 input, 12Bit A/D : 2 inputs)		
sigi	igital nal	Output		3 outputs (Analog monitor: 2 output, Digital monitor: 1 output)		
Pul	Input		put	2 inputs (Photo-coupler input, Line receiver input) Photocoupler input is compatible with both line driver I/F and open collector I/F. Line receiver input is compatible with line driver I/F.		
sig	nal	Output		4 outputs (Line driver: 3 output, open collector: 1 output) Feed out the encoder pulse (A, B and Z-phase) or feedback scale pulse (EXA, EXB and EXZ-phase) in line driver. Z-phase and EXZ-phase pulse is also fed out in open collector.		
		U	SB	Connection with PC etc.		
Com funct	nmunication tion	RS	232	1 : 1 communication to a host with RS23 interface is enabled.		
idilo	,,,,,,	RS	485	1 : n communication up to 15 axes to a host with RS485 interface is enabled.		
Sat	Safety function			Used for IEC61800-5-2: STO.		
Fro	Front panel			(1) 5 keys (MODE, SET, UP, DOWN, SHIFT) (2) LED (6-digit) (3) Analog monitor output (2ch) (4) Digital monitor output (1ch)		
Re	Regeneration			A, B-frame: no built-in regenerative resistor (external resistor only) C to F-frame: Built-in regenerative resistor (external resistor is also enabled.)		
Dyr	namic bra	ke		Built-in		
Co	Control mode			Switching among the following 7 mode is enabled, (1) Position control (2) Velocity control (3) Toque control (4) Position/Velocity control (5) Position/Torque control (6) Velocity/Torque control (7) Full-closed control		

		Control input  Control output		<ul><li>(1) Deviation counter clear (2) Command pulse inhibition</li><li>(3) Command dividing gradual increase switching</li><li>(4) Damping control switching etc.</li></ul>		
				Positioning complete (In-position) etc.		
		Max. command		Exclusive interface for Photo-coupler: 500kpps		
			pulse frequency	Exclusive interface for line driver : 4Mpps		
	Position control	Pulse	Input pulse signal format	Differential input. Selectable with parameter. ((1) Positive and Negative direction, (2) A and B-phase, (3) Command and direction)		
		input	Electronic gear (Division/ Multiplication of command pulse)	Process command pulse frequency $\times$ electronic gear ratio $\left(\frac{1 \text{ to } 2^{30}}{1 \text{ to } 2^{30}}\right)$ as positional command input. Use electronic gear ratio in the range 1/1000 to 1000 times.		
			Smoothing filter	Primary delay filter or FIR type filter is adaptable to the command input		
		Analog input	Torque limit command input	Individual torque limit for both positive and negative direction is enabled. (3V/rated torque)		
		Instantaneous Speed Observer		Available		
		Damping	Control	Available		
		Control input		<ul><li>(1) Selection of internal velocity setup 1 (2) Selection of internal velocity setup 2</li><li>(3) Selection of internal velocity setup 3 (4) Speed zero clamp etc.</li></ul>		
		Control ou	tput	Speed arrival etc.		
			Velocity command	Speed command input can be provided by means of analog voltage.		
	Vel	Analog input	Input Torque limit	Parameters are used for scale setting and command polarity.  Individual torque limit for both positive and negative direction is enabled. (3V/rated)		
	ocit	IIIput	command input	torque)		
Ì	Velocity control	Internal velocity command		Switching the internal 8speed is enabled by command input.		
		Soft-start/down function		Individual setup of acceleration and deceleration is enabled, with 0 to 10s/1000r/min. Sigmoid acceleration/deceleration is also enabled.		
		Zero-spee		0-clamp of internal velocity command with speed zero clamp input is enabled.		
		Instantaneous Speed Observer		Available		
F un		Velocity Control filter		Available		
Function	Torque control	Control input		Speed zero clamp, Torque command sign input etc.		
<b></b>		Control ou		Speed arrival etc.		
	cont	Analog input	Torque command input	Speed command input can be provided by means of analog voltage.  Parameters are used for scale setting and command polarity.		
	<u>o</u>	Speed limit function		Speed limit value with parameter t is enabled.		
		Control input		<ul><li>(1) Deviation counter clear (2) Command pulse inhibition</li><li>(3) Command dividing gradual increase switching (4) Damping control switching etc.</li></ul>		
		Control output		Full-closed positioning complete etc.		
			Max. command pulse frequency	Exclusive interface for Photo-coupler: 500kpps Exclusive interface for line driver: 4Mpps		
	Fu⊩	Pulse	Input pulse signal format	Differential input. Selectable with parameter. ((1) Positive and Negative direction, (2) A and B-phase, (3) Command and direction)		
	()	input	Electronic gear (Division/ Multiplication of command pulse)	Process command pulse frequency $\times$ electronic gear ratio $\left(\frac{1 \text{ to } 2^{90}}{1 \text{ to } 2^{90}}\right)$ as positional command input. Use electronic gear ratio in the range 1/1000 to 1000 times.		
	trol		Smoothing filter	Primary delay filter or FIR type filter is adaptable to the command input		
		Analog input	Torque limit command input	Individual torque limit for both positive and negative direction is enabled. (3V/rated torque)		
		Setup range of division/ multiplication of feedback scale		1/40 to 160 times  The ratio of encoder pulse (numerator) to external scale pulse (denominator) can be set to 1 to $2^{20}$ (numerator) to 1 to $2^{20}$ (denominator), but should be set to a ratio within the range shown above.		
	0	Auto tunin	g	The load inertia is identified in real time by the driving state of the motor operating according to the command given by the controlling device and set up support software "PANATERM".  The gain is set automatically in accordance with the rigidity setting.		
	Common	Division o pulse	f encoder feedback	Set up of any value is enabled (encoder pulses count is the max.).		
	non	Protective	Hard error	Over-voltage, under-voltage, over-speed, over-load, over-heat, over-current and encoder error etc.		
		function	Soft error	Excess position deviation, command pulse division error, EEPROM error etc.		
		Traceability of alarm data		The alarm data history can be referred to.		

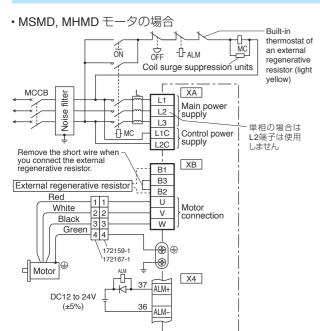
	Input power	4001/	Main circuit		Single phase, 100 to 120V +10% 50/60Hz -15%		
		100V	Control circuit		Single phase, 100 to 120V +10% 50/60Hz		
		200V	Main	A to D-frame	Single/3-phase, 200 to 240V +10% 50/60Hz		
			circuit	E to F-frame	3-phase, 200 to 230V +10% 50/60Hz		
			Control	A to D-frame	Single phase, 200 to 240V +10% 50/60Hz -15%		
			circuit	E to F-frame	Single phase, 200 to 230V +10% 50/60Hz		
		400V	Main circuit	D to F-frame	Single phase, 380 to 480V +10% 50/60Hz		
		1001	Control circuit	D to F-frame	DC 24V ± 15%		
	Wit	Vithstand voltage			Primary to earth: withstand 1500 VAC, 1 min,(sensed current: 20 mA)		
	Environment		temperature		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)		
			humidity		Both operating and storage : 20 to 85%RH or less (free from condensation)		
_			Altitude		Lower than 1000m		
Basic			Vibr	ation	5.88m/s² or less, 10 to 60Hz (No continuous use at resonance frequency)		
Spec	Control method				IGBT PWM Sinusoidal wave drive		
Specifications	Encoder feedback				17-bit (131072 resolution) absolute encoder, 7-wire serial 20-bit (1048576 resolution) incremental encoder, 5-wire serial		
S	Control signal		Input		General purpose 10 inputs The function of general-purpose input is selected by parameters.		
			Output		General purpose 6 outputs The function of general-purpose input is selected by parameters.		
		alog	Input		3 inputs (16Bit A/D : 1 input, 12Bit A/D : 2 inputs)		
	/Digital signal		Output		3 outputs (Analog monitor: 2 output, Digital monitor: 1 output)		
	Pulse signal		Input		2 inputs (Photo-coupler input, Line receiver input) Photocoupler input is compatible with both line driver I/F and open collector I/F. Line receiver input is compatible with line driver I/F.		
			Output		4 outputs (Line driver: 3 output, open collector: 1 output) Feed out the encoder pulse (A, B and Z-phase) or feedback scale pulse (EXA, EXB and EXZ-phase) in line driver. Z-phase and EXZ-phase pulse is also fed out in open collector.		
	Com funct	munication ion	U	SB	Connection with PC etc.		
	Saf	Safety function			Used for IEC61800-5-2: STO.		
	Fro	Front panel			(1) 5 keys (MODE, SET, UP, DOWN, SHIFT) (2) LED (6-digit) (3) Analog monitor output (2ch) (4) Digital monitor output (1ch)		
	Reg	Regeneration			A, B-frame: no built-in regenerative resistor (external resistor only) C to F-frame: Built-in regenerative resistor (external resistor is also enabled.)		
	Dyr	namic bra	ıke		Built-in		
	Cor	ntrol mod	е		Position control		

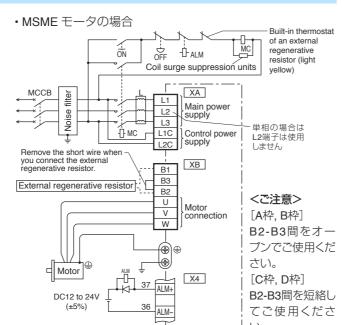
		Control input		<ul><li>(1) Deviation counter clear (2) Command pulse inhibition</li><li>(3) Command dividing gradual increase switching</li><li>(4) Damping control switching etc.</li></ul>		
		Control output		Positioning complete (In-position) etc.		
	P		Max. command pulse frequency	Exclusive interface for Photo-coupler: 500kpps Exclusive interface for line driver : 4Mpps		
	Position control	Pulse input	Pulsa	Pulse	Input pulse signal format	Differential input. Selectable with parameter. ((1) Positive and Negative direction, (2) A and B-phase, (3) Command and direction)
COTILIO	ontrol		Electronic gear (Division/ Multiplication of command pulse)	Process command pulse frequency $\times$ electronic gear ratio $\left(\frac{1 \text{ to } 2^{30}}{1 \text{ to } 2^{30}}\right)$ as positional command input. Use electronic gear ratio in the range 1/1000 to 1000 times.		
Fun			Smoothing filter	Primary delay filter or FIR type filter is adaptable to the command input		
Function		Instantaneous Speed Observer		Available		
		Damping Control		Available		
		Auto tuning		The load inertia is identified in real time by the driving state of the motor operating according to the command given by the controlling device and set up support software "PANATERM".  The gain is set automatically in accordance with the rigidity setting.		
	Common	Division of encoder feedback pulse		Set up of any value is enabled (encoder pulses count is the max.).		
	mon	Protective function	Hard error	Over-voltage, under-voltage, over-speed, over-load, over-heat, over-current and encoder error etc.		
		IUIICUOII	Soft error	Excess position deviation, command pulse division error, EEPROM error etc.		
		Traceability of alarm data		The alarm data history can be referred to.		

of an external

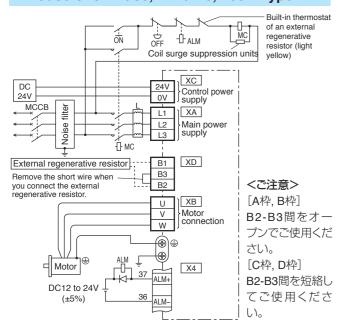
(light yellow)

#### In Case of Single Phase, A to D-frame, 100 V / 200 V type and 3-Phase, A to D-frame, 200 V type





## In Case of 3-Phase, D-frame, 400 V type



 When the motors of <MSME (50 W to 750 W)> are used, they are connected as shown below. Connector: Made by Japan Aviation Electronics Industry, Ltd.

<Brake>

JN4AT02PJM-R

PIN No. Application

2 Brake

Tightening torque of the screw(M2)

0.19 to 0.21 N·m

Brake

1

#### <Motor>

# 2 1 4 3

· When the motors of <MSMD, MHMD>

Connector: Made by Tyco Electronics AMP

are used, they are connected as shown below.

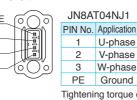
172	167-1		
IN No.	Application		P
1	U-phase		L
2	V-phase	2	
3	W-phase		
4	Ground		

<Brake>

172165-1 PIN No. Application Brake 2 Brake

**Specifications of Motor connector** (The figures show connectors for the motor.)

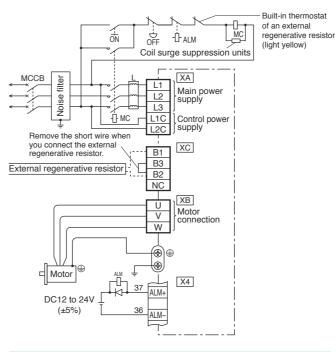
<Motor>



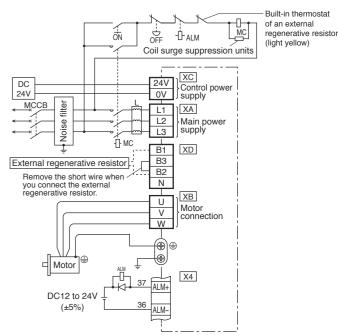
Tightening torque of the screw (M2) 0.085 to 0.095 N·m (screwed to plastic)

\* Be sure to use only the screw supplied with the connector,

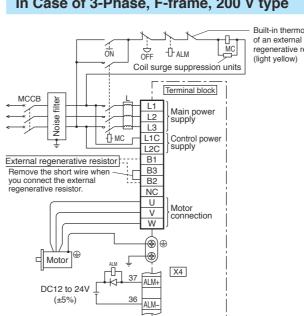
#### In Case of 3-Phase, E-frame, 200 V type



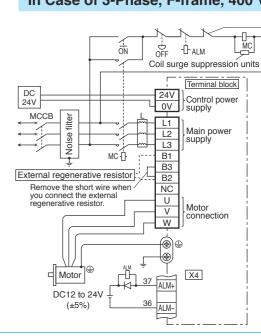
In Case of 3-Phase, E-frame, 400 V type



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



#### In Case of 3-Phase, F-frame, 400 V type



• When the motors of <MSME (1.0 kW to 5.0 kW), MDME, MGME, MHME> are used, they are connected as shown below. Connector: Made by Japan Aviation Electronics Industry, Ltd.

PIN I

G

Н

Α

В

D

\* For detail of Applicable model, refer to P.111 "Specifications of Motor connector".





JL04V-2E20-4PE-B-R JL04HV-2E22-22PE-B-R

PIN No.	Application				
Α	U-phase				
В	V-phase				
С	W-phase				
D	Ground				

#### <with Brake>

GO	H A
(FO	OI OB
align*	ß ĉ
II 04\/-2E	20-18PF-F

O O O O	
JL04V-2E20-18PE-B-R	

No.	Application	
	Brake	A B
	Brake	/
	NC	DO OE
	U-phase	\ G H
	V-phase	
	W-phase	JL04V-2E24-
	Ground	
	Ground	

	PIN No.	Application
A B C	Α	Brake
/ 0 0 0	В	Brake
DO OE OF	С	NC
G H I	D	U-phase
	Е	V-phase
V-2E24-11PE-B-R	F	W-phase
	G	Ground
	Н	Ground
	I	NC

<Remarks> Do not connect anything to NC.

# 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).

上位コントローラを接続して、セーフティ機能をコントロールするセーフティ回路を構築することができます。

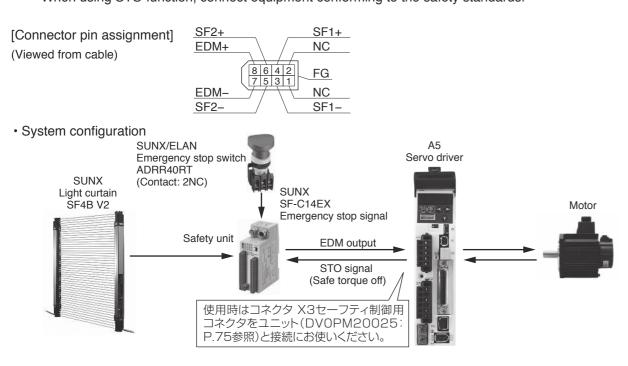
セーフティ回路を構築しない場合は、付属のセーフティバイパスプラグをご使用ください。

When STO function operates, the servo driver turns off the servo ready output signal (S-RDY) and enters

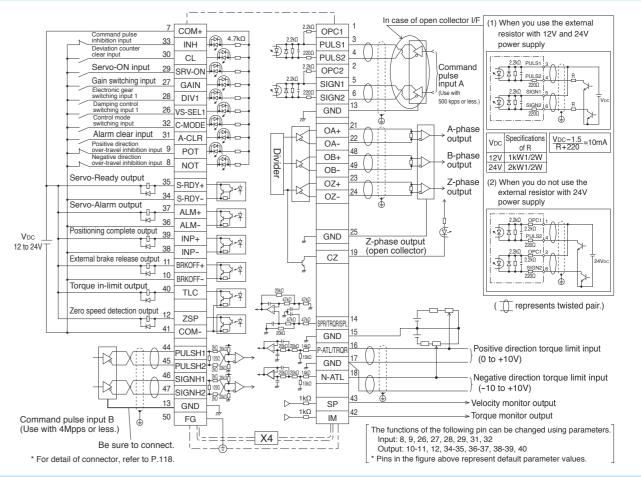
This is an alarm condition and the 7-seg LED on the front panel displays the error code number.

#### Safety precautions

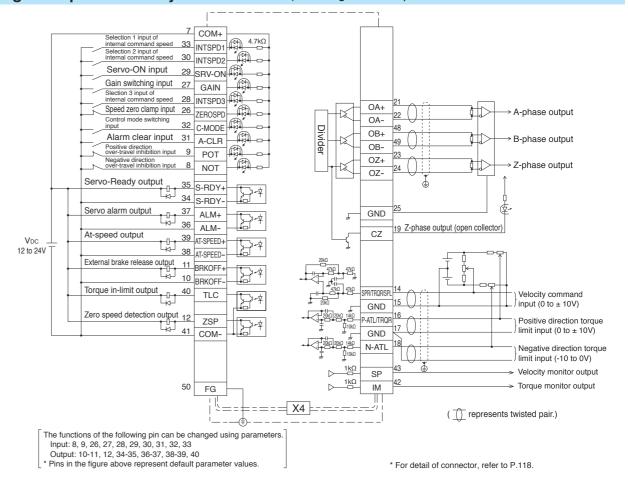
- · When using the STO function, be sure to perform equipment risk assessment to ensure that the system conforms to the safety requirements.
- · Even while the STO function is working, the following potential safety hazards exist. Check safety in risk assessment.
- The motor may move when eternal force (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 (hereafter EDM) output signal is not a safety signal. Do not use it for an application
- 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.



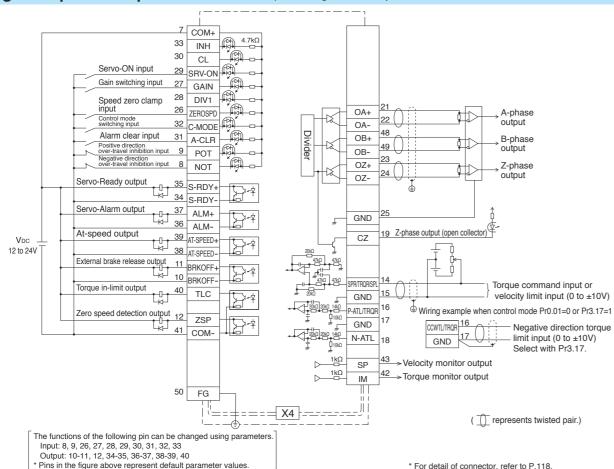
#### **Wiring Example of Position Control Mode**



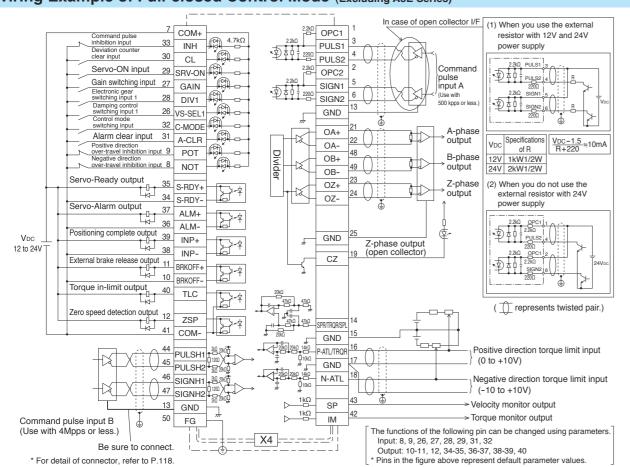
#### Wiring Example of Velocity Control Mode (Excluding A5E Series)



#### Wiring Example of Torque Control Mode (Excluding A5E Series)



## Wiring Example of Full-closed Control Mode (Excluding A5E Series)

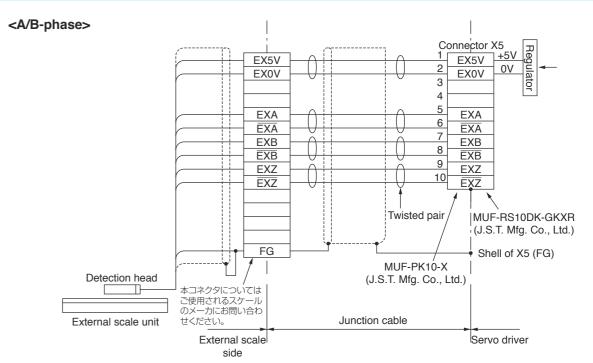


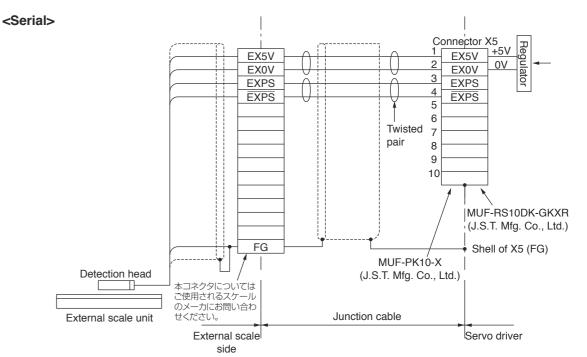
#### Applicable external scale

The manufacturers applicable external scales for this product are as follows.

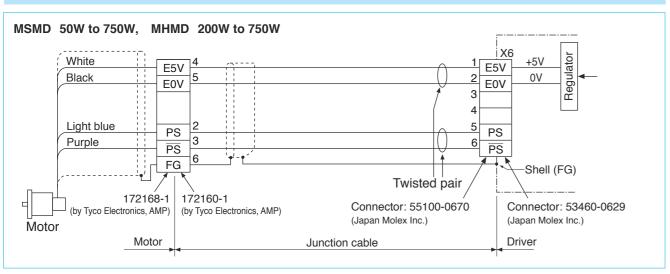
- · Mitutoyo Corp.
  - ST771A(L), ST773A(L), AT573A
- · Sony Manufacturing Systems Corp. SR75, SR85, SR77, SR87, SL700 · PL101-RP, SL710 · PL101-RP
- \* For the details of the external scale product, contact each company.

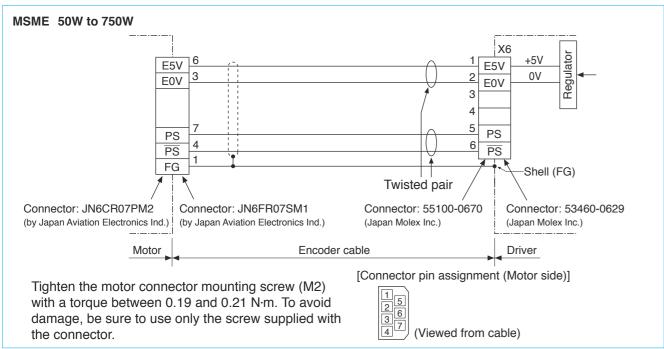
# Wiring Diagram of X5

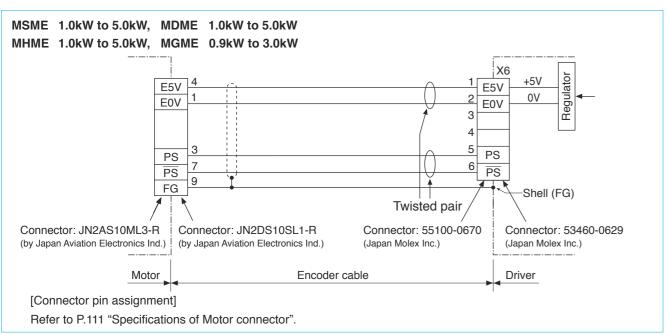




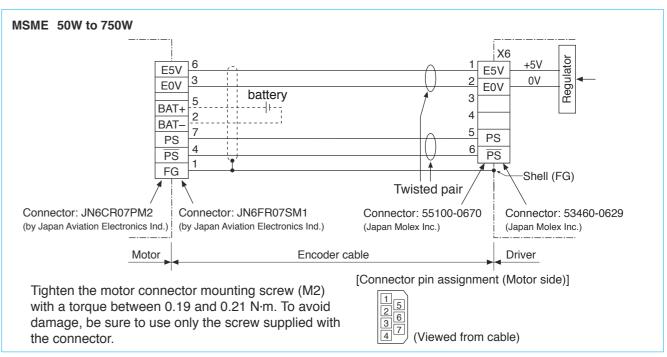
#### In case of 20-bit incremental encoder

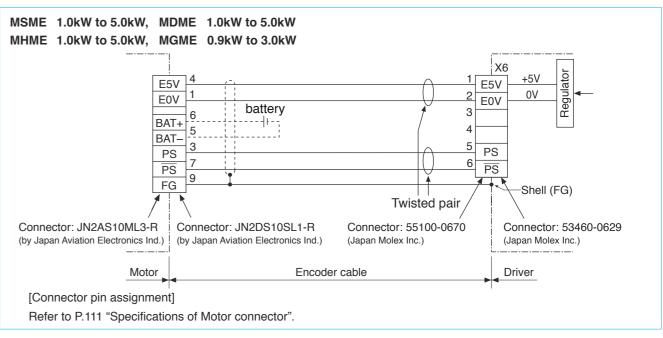


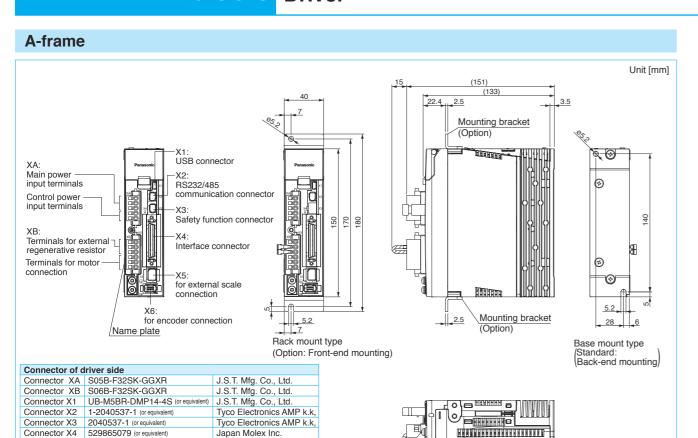




#### In case of 17-bit absolute encoder MSMD 50W to 750W, MHMD 200W to 750W X6 White E5V E5V Black 0V 2 E0V E0V Twisted pair battery Red BAT+ PS Pink PS BAT-Light blue PS -Shell (FG) Purple PS Yellow/Green FG Connector: 55100-0670 Connector: 53460-0629 (Japan Molex Inc.) (Japan Molex Inc.) 172169-1 172161-1 (by Tyco Electronics, AMP) (by Tyco Electronics, AMP) Motor Motor Junction cable Driver







#### **B-frame**

Connector X6 53460-0629 (or equivalent)

Connector X7 530140610 (or equivalent)

Connector XA 05JFAT-SAXGF

Connector XB 06JFAT-SAXGF

Connector X5 MUF-RS10DK-GKXR (or equivalent) J.S.T. Mfg. Co., Ltd.

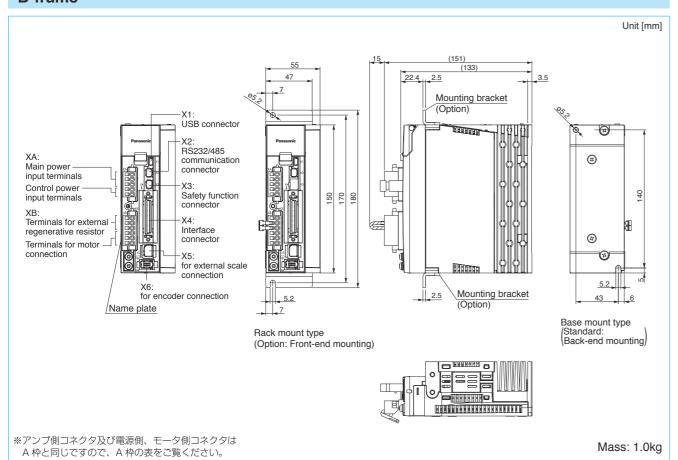
Connector of power and motor side (アンプ本体に同梱)

Japan Molex Inc.

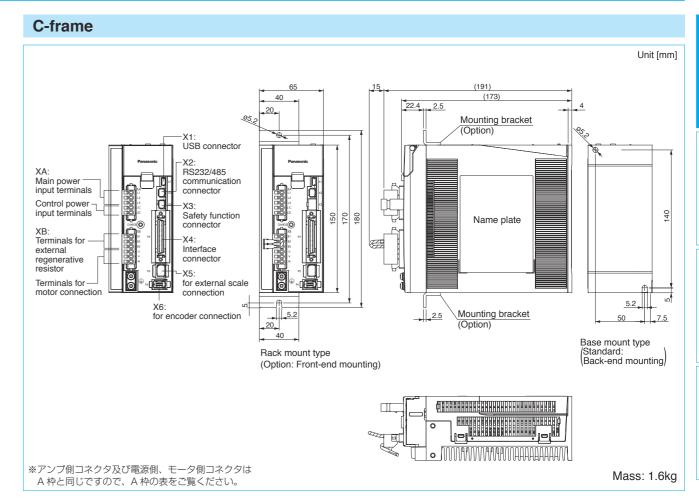
Japan Molex Inc.

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

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



30



31

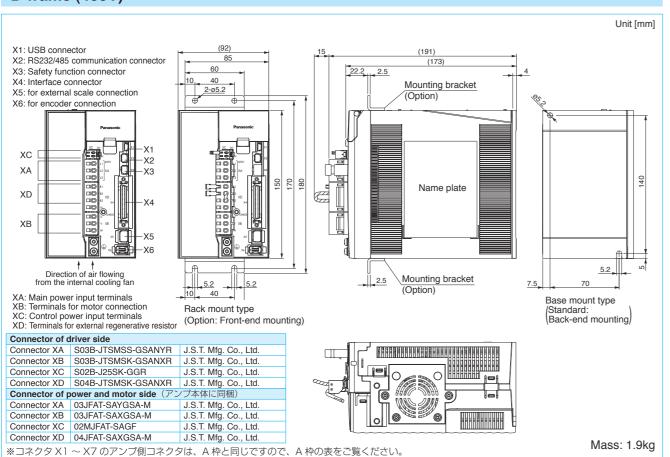
Mass: 0.8kg

#### **D-frame (200V)** Unit [mm] 22.2 ... 2.5 40 \_ Mounting bracket 2-ø5.2 Main power--X2 Control power -X3 Name plate Terminals for external regenerative -X5 Terminals for-5.2 Mounting bracket Direction of air flowing 40 (Option) from the internal cooling fan Base mount type (Standard: Back-end mounting) X1: USB connector Rack mount type X2: RS232/485 communication connector (Option: Front-end mounting) X3: Safety function connector X4: Interface connector X5: for external scale connection X6: for encoder connection

## D-frame (400V)

※アンプ側コネクタ及び電源側、モータ側コネクタは

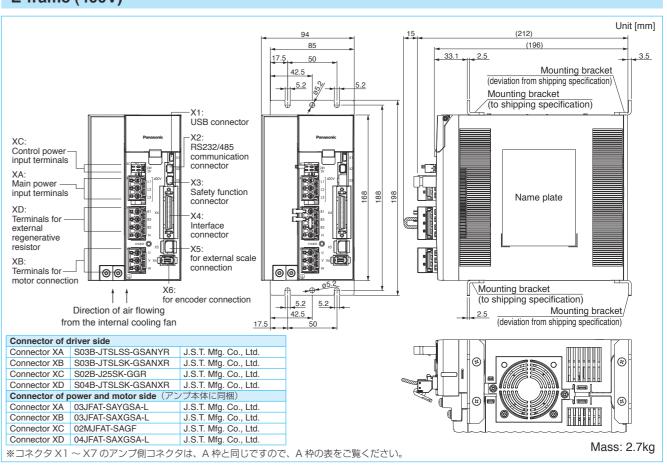
A 枠と同じですので、A 枠の表をご覧ください。



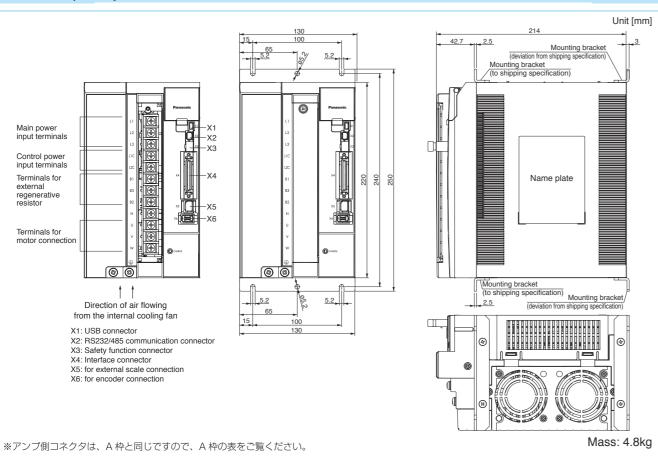
#### E-frame (200V) 33.1 2.5 3.5 Mounting bracket 42.5 (deviation from shipping specification 5.2 Mounting bracket (to shipping specification) USB connector -X2: RS232/485 XA: Main power – communication input terminals Control power input terminals Safety function Name plate connector Terminals for Interface external connector regenerative -X5: for external scale connection Terminals for – motor connection Mounting bracket (to shipping specification) 5.2 Mounting bracket/ 42.5 (deviation from shipping specification) Direction of air flowing from the internal cooling fan Connector of driver side Connector XA S05B-JTSLSK-GSANXR J.S.T. Mfg. Co., Ltd. Connector XB S03B-JTSLSK-GSANXR J.S.T. Mfg. Co., Ltd. Connector XC S04B-JTSLSS-GSANXR J.S.T. Mfg. Co., Ltd. Connector of power and motor side $(\mathcal{F}$ J.S.T. Mfg. Co., Ltd. J.S.T. Mfg. Co., Ltd. Connector XA 05JFAT-SAXGSA-L Connector XB 03JFAT-SAXGSA-L Connector XC 04JFAT-SAXGSA-L J.S.T. Mfg. Co., Ltd. Mass: 2.7kg \*コネクタ X1 $\sim$ X7 のアンプ側コネクタは、A 枠と同じですので、A 枠の表をご覧ください。

#### **E-frame (400V)**

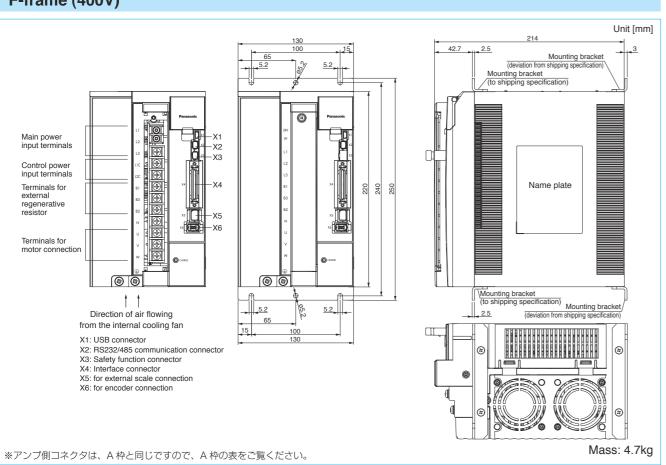
Mass: 1.8kg



#### F-frame (200V)



# F-frame (400V)



34

#### **Features**

- Line-up: 50W to 5.0kW
- Max speed: 6000r/min (MSME 50W to 750W)
- · Low inertia (MSME) to High inertia (MHME).
- Low cogging torque: Rated torque ratio 0.5% (typical value).
- 20-bit incremental encoder (1,048,576 pulse)
- 17-bit absolute encoder (131,072 pulse).
- Enclosure rating: IP67 (M\*ME), IP65 (M\*MD)
- Compact & Light weight

Middle capacity type





[MSME (50W to 750W)]

[MSME (1.0kW to 5.0kW)]

#### Motor (Scheduled to be released.)

- MDME 7.5kW, 11kW, 15kW
- MHME 7.5kW
- MGME 4.5kW, 6.0kW
- MFME 1.5kW, 2.5kW, 4.5kW
  - · Motor with Gear Reduce: 100W, 200W, 400W, 750W

#### **Environmental Conditions**

Item		Conditions	
Ambient te	mperature *1	0°C to 40°C (free from freezing)	
Ambient hu	umidity	20% to 85% RH (free from condensation)	
Storage temperature *2		-20°C to 65°C (Max.temperature guarantee: 80°C for 72 hours)	
Storage hu	ımidity	20% to 85% RH (free from condensation)	
Vibration	Motor only	Lower than 49m/s <sup>2</sup> (5G) at running, 24.5m/s <sup>2</sup> (2.5G) at stall	
Impact	Motor only	Lower than 98m/s² (10G)	
Enclosure	Leadwire type *3	IP65 (except rotating portion of output shaft and readwire end.)	
rating (Motor only)	Connector type*3*4	IP67 (except rotating portion of output shaft and connecting pin part of the motor connector and the encoder connector)	
Altitude		Lower than 1000m	

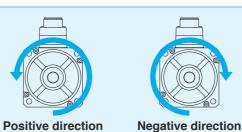
- \*1 Ambient temperature to be measured at 5cm away from the motor.
- \*2 Permissible temperature for short duration such as transportation.
- \*3 These motors conform to the test conditions specified in EN standards (EN60529, EN60034-5). Do not use these motors in application where water proof performance is required such as continuous wash-down operation.
- \*4 This condition is applied when the connector mounting screw in case of motor 750W or less are tightened to the recommended tightening torque (Refer to 1-16, 2-18, 2-00). Be sure to use mounting screw supplied with the connector.

#### <Note>

回転方向の初期設定を 正方向(CCW)、 負方向(CW)と 定義しています。 ご注意ください。



(CCW)



**Motor Contents** 

#### MSME (100V/200V)

50W to 750W ...... P.36 to 44

#### MSME (200V)

1.0kW to 5.0kW ..... P.45 to 50

#### MDME (200V)

1.0kW to 5.0kW .. .. P.51 to 56

#### MGME (200V)

0.9kW to 3.0kW ..... P.57 to 59

#### MHME (200V)

1.0kW to 5.0kW ..... P.60 to 65

# MSMD (100V/200V)

50W to 750W ...... P.66 to 74

## MHMD (100V/200V)

200W to 750W ...... P.76 to 80

#### MSME (400V)

1.0kW to 5.0kW ..... P.82 to 87

#### MDME (400V)

1.0kW to 5.0kW ..... P.88 to 93

#### MGME (400V)

0.9kW to 3.0kW ..... P.94 to 96

#### MHME (400V)

1.0kW to 5.0kW .... P.98 to 103

(CW)

		AC100V		
Motor model *1		5AZG1	5AZS1□	
	Model	A5 series	MADHT1105	
Applicable driver *2	No.	A5E series	MADH	Г1105Е
	Frame symbol		A-frame	
Power supply capacit	у	(kVA)	0.4	
Rated output		(W)	5	0
Rated torque		(N·m)	0.	16
Momentary Max. peal	k torqu	ie (N·m)	0.48	
Rated current		(A(rms))	1.1	
Max. current		(A(o-p))	4.7	
Regenerative brake	Without option		No limit Note)2	
frequency (times/min) Note)1	DV0P4280		No limit Note)2	
Rated rotational spee	d	(r/min)	3000	
Max. rotational speed		(r/min)	6000	
Moment of inertia	Without brake		0.025	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	With brake		0.027	
Recommended mome ratio of the load and the			30 times or less	
Rotary encoder speci	ficatior	Note)5	20-bit Incremental	17-bit Absolute
Resolut	ion per	r single turn	1,048,576	131,072

#### • Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

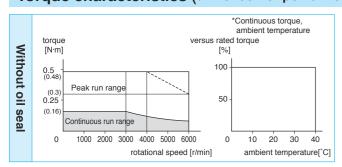
Static friction torque (N·m)	0.29 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.3
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

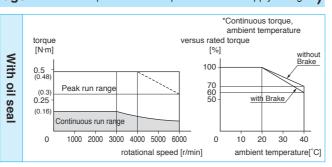
#### • Permissible load (For details, refer to P.104)

During assembl		Radial load P-direction (N)	147
	Ü	Thrust load A-direction (N)	88
	docombry	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 5, refer to P.104.
- · Dimensions of Driver, refer to P.30.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

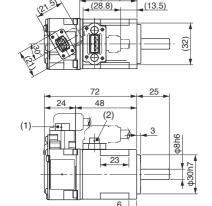
## Torque characteristics (at AC100V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)





#### **Dimensions**

Mass (kg)/ 0.32 <Without Brake>



- (1) Encoder connector (2) Motor connector

Key way dimensions

- For the dimensions of 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**

			AC2	200V
Motor model *1		MSME	5AZG1□	5AZS1
	Model	A5 series	MADH	T1505
Applicable driver *2	No.	A5E series	MADHT1505E	
	Fran	ne symbol	A-frame	
Power supply capacit	у	(kVA)	0	.5
Rated output		(W)	5	0
Rated torque		(N·m)	0.	16
Momentary Max. pea	k torqu	ie (N·m)	0.4	48
Rated current		(A(rms))	1.1	
Max. current		(A(o-p))	4.7	
Regenerative brake	With	out option	No limit Note)2	
frequency (times/min) Note)1	DV	OP4280	No limit Note)2	
Rated rotational spee	d	(r/min)	3000	
Max. rotational speed	l	(r/min)	6000	
Moment of inertia	With	out brake	0.025	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	th brake	0.027	
Recommended mome ratio of the load and t			30 times	s or less
Rotary encoder speci	fication	Note)5	20-bit Incremental	17-bit Absolute
Resolut	ion per	r single turn	1,048,576	131,072

• Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.) Do not use this for braking the motor in motion.

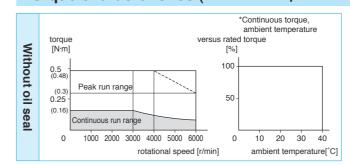
,	,
Static friction torque (N·m)	0.29 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.3
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

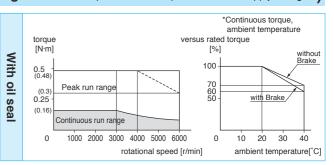
#### • Permissible load (For details, refer to P.104)

assembly Thrust load A-direction (N) 88 Thrust load B-direction (N) 117.6	<b>.</b> .	Radial load P-direction (N)	147
Thrust load B-direction (N) 117.6	During assembly	Thrust load A-direction (N)	88
De diel lee d D dive stiers (N)	accombiy	Thrust load B-direction (N)	117.6
During Radial load P-direction (N) 68.6	During	Radial load P-direction (N)	68.6
operation Thrust load A, B-direction (N) 58.8	operation	Thrust load A, B-direction (N)	58.8

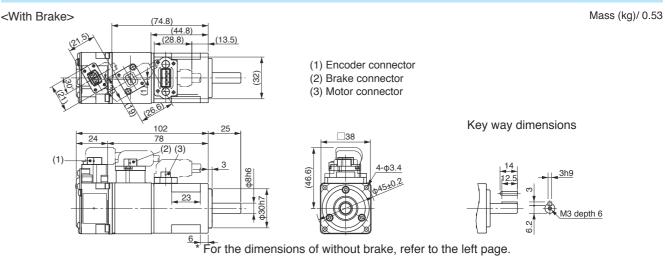
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.30.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

## Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)





#### **Dimensions**



AC100V				00V	
Motor model *1		MSME	011G1	011S1 <u></u>	
	Model	A5 series	MADH	T1107	
Applicable driver *2	No.	A5E series	MADH <sup>*</sup>	Г1107Е	
	Fran	ne symbol	A-frame		
Power supply capacit	у	(kVA)	0.	.4	
Rated output		(W)	10	00	
Rated torque		(N·m)	0.5	32	
Momentary Max. peal	k torqu	ıe (N⋅m)	0.9	95	
Rated current		(A(rms))	1.6		
Max. current		(A(o-p))	6.9		
Regenerative brake	With	Without option No limit No		t Note)2	
frequency (times/min) Note)1	DV0P4280		No limi	No limit Note)2	
Rated rotational spee	d	(r/min)	3000		
Max. rotational speed		(r/min)	6000		
Moment of inertia	With	out brake	0.051		
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	th brake	0.054		
Recommended moment of inertia ratio of the load and the rotor Note)3			30 times	s or less	
Rotary encoder speci	ficatior	Note)5	20-bit Incremental	17-bit Absolute	
Resolut	ion per	r single turn	1,048,576	131,072	

#### • Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

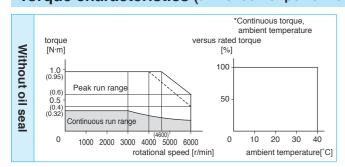
Static friction torque (N·m)	0.29 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.3
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

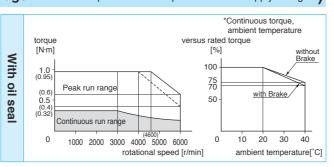
#### • Permissible load (For details, refer to P.104)

		Radial load P-direction (N)	147
During assembly  During operation		Thrust load A-direction (N)	88
	accombiy	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 5, refer to P.104.
- · Dimensions of Driver, refer to P.30.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

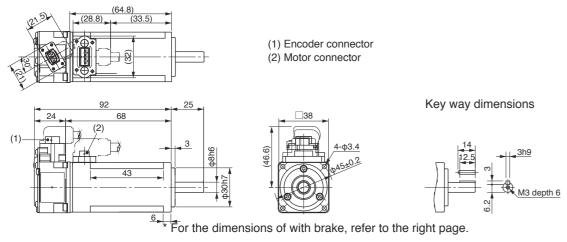
#### Torque characteristics (at AC100V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)





#### **Dimensions**

Mass (kg)/ 0.47 <Without Brake>



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

#### **Specifications**

				AC2	200V
Motor model *	1		MSME	012G1	012S1
		Model	A5 series	MADH	T1505
		No.	A5E series	MADHT1505E	
		Fran	ne symbol A-frame		ame
Power supply	capacit	у	(kVA)	0	.5
Rated output			(W)	10	00
Rated torque			(N·m)	0.5	32
Momentary Ma	ax. pea	k torqu	ıe (N·m)	0.9	95
Rated current			(A(rms))	1.	.1
Max. current			(A(o-p))	4.7	
Regenerative b	rake	With	out option	No limit Note)2	
frequency (times/n	nin) Note)1	DV	DV0P4280 No limit Note)2		it Note)2
Rated rotations	al spee	d	(r/min)	30	00
Max. rotational	l speed		(r/min)	60	00
Moment of ine	rtia	With	out brake	0.051	
of rotor (×10 <sup>-4</sup> k	⟨g·m²)	Wi	th brake	0.054	
Recommended ratio of the load				30 times	s or less
Rotary encode	r speci	fication	Note)5	20-bit Incremental	17-bit Absolute
I	Resolut		single turn	1,048,576	131,072

• Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.) Do not use this for braking the motor in motion.

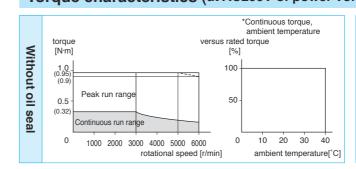
Static friction torque (N·m)	0.29 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.3
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

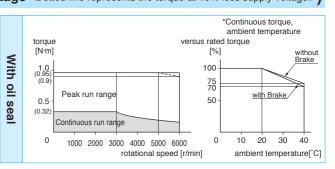
#### • Permissible load (For details, refer to P.104)

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

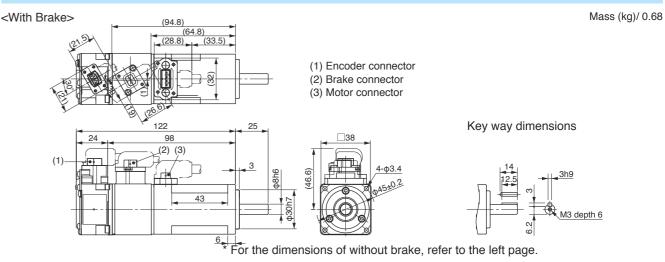
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.30.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

#### Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)





#### **Dimensions**



			AC1	00V	
Motor model *1		021G1	021S1		
	Model No.	A5 series	MBDH	T2110	
Applicable driver *2		A5E series	MBDHT2110E		
	Frame symbol		B-frame		
Power supply capacit	y	(kVA)	0.	.5	
Rated output		(W)	20	00	
Rated torque		(N·m)	0.0	64	
Momentary Max. peal	k torqu	ie (N·m)	1.9	91	
Rated current (A(rms)			2.5		
Max. current	(A(o-p))		10.6		
Regenerative brake	Without option		No limit Note)2		
frequency (times/min) Note)1	DV0P4283		No limi	No limit Note)2	
Rated rotational spee	d	(r/min)	3000		
Max. rotational speed		(r/min)	6000		
Moment of inertia	With	out brake	0.14		
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	With brake		0.16		
Recommended moment of inertia ratio of the load and the rotor Note)3		30 times or less			
Rotary encoder speci	fication	Note)5	20-bit Incremental	17-bit Absolute	
Resolut	ion per	single turn	1,048,576	131,072	

#### • Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

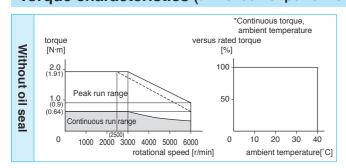
Static friction torque (N·m)	1.27 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

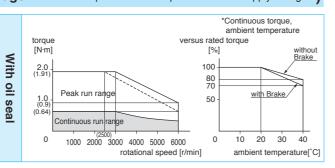
#### • Permissible load (For details, refer to P.104)

		Radial load P-direction (N)	392
	During assembly	Thrust load A-direction (N)	147
	docombry	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 5, refer to P.104.
- · Dimensions of Driver, refer to P.30.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

#### Torque characteristics (at AC100V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)

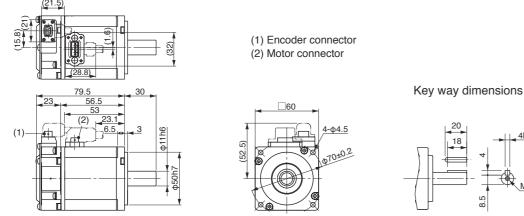




#### **Dimensions**

<Without Brake>

Mass (kg)/ 0.82



<sup>\*</sup> For the dimensions of 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**

			AC2	200V	
Motor model *1		MSME	022G1	022S1	
	Model	A5 series	MADH	T1507	
Applicable driver *2	No.	A5E series	MADH	Г1507Е	
	Fran	ne symbol	A-fra	ame	
Power supply capacit	у	(kVA)	0.	.5	
Rated output		(W)	200		
Rated torque		(N·m)	0.0	64	
Momentary Max. pea	k torqu	ıe (N·m)	1.9	91	
Rated current		(A(rms))	1.	.5	
Max. current		(A(o-p))	6.	6.5	
Regenerative brake	With	out option	No limi	t Note)2	
frequency (times/min) Note)1	DV	OP4283	No limit Note)2		
Rated rotational spee	d	(r/min)	30	00	
Max. rotational speed		(r/min)	60	00	
Moment of inertia	With	out brake	0.	14	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	th brake	0.	16	
Recommended mome ratio of the load and to			30 times	s or less	
Rotary encoder speci	ficatior	Note)5	20-bit Incremental	17-bit Absolute	
Resolut	ion per	single turn	1,048,576	131,072	

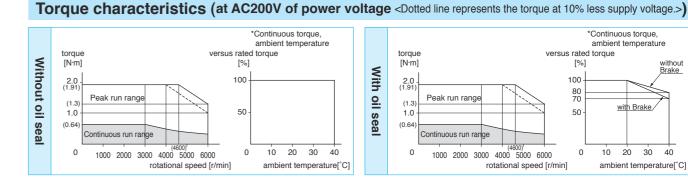
#### • Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.) Do not use this for braking the motor in motion.

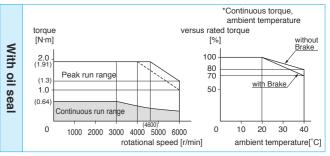
Static friction torque (N·m)	1.27 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

#### • Permissible load (For details, refer to P.104)

		Radial load P-direction (N)	392
During assembly During operation		Thrust load A-direction (N)	147
	2000111019	Thrust load B-direction (N)	196
	During	Radial load P-direction (N)	245
	peration	Thrust load A, B-direction (N)	98

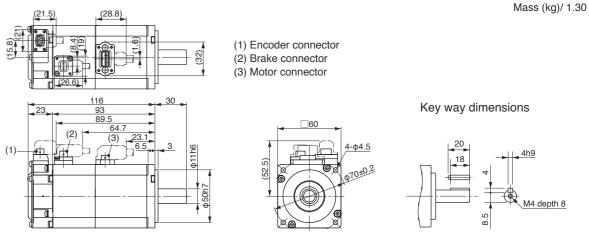
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.30.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.





#### **Dimensions**

<With Brake>



\* For the dimensions of without brake, refer to the left page.

			AC1	00V
Motor model *1 MSME			041G1	041S1
	Model	A5 series	MCDH	T3120
Applicable driver *2	No.	A5E series	MCDH.	Г3120E
	Fran	ne symbol	C-fra	ame
Power supply capacit	у	(kVA)	0.	.9
Rated output		(W)	40	00
Rated torque		(N·m)	1.	.3
Momentary Max. pea	k torqu	ie (N·m)	3.	.8
Rated current		(A(rms))	4.6	
Max. current		(A(o-p))	19.5	
Regenerative brake	Without option		No limit Note)2	
frequency (times/min) Note)1	DV	'0P4282	No limit Note)2	
Rated rotational spee	d	(r/min)	3000	
Max. rotational speed		(r/min)	6000	
Moment of inertia	With	out brake	0.26	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	th brake	0.28	
Recommended moment of inertia ratio of the load and the rotor Note)3			30 times	s or less
Rotary encoder speci	ficatior	Note)5	20-bit Incremental	17-bit Absolute
Resolut	ion per	r single turn	1,048,576	131,072

#### • Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

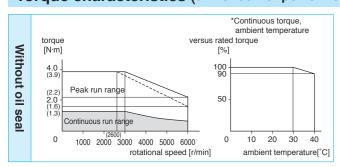
Static friction torque (N·m)	1.27 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

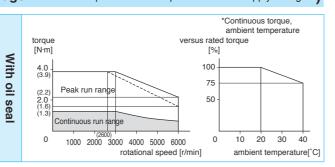
#### • Permissible load (For details, refer to P.104)

		Radial load P-direction (N)	392
	During assembly	Thrust load A-direction (N)	147
	docombry	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 5, refer to P.104.
- · Dimensions of Driver, refer to P.31.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

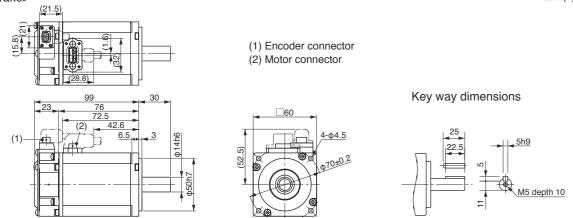
## Torque characteristics (at AC100V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)





#### **Dimensions**

Mass (kg)/ 1.2 <Without Brake>



\* For the dimensions of 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**

			AC2	00V
Motor model *1		MSME	042G1	042S1
Mode		A5 series	MBDH	T2510
Applicable driver *2	No.	A5E series	MBDH	Г2510Е
	Fran	ne symbol	B-fra	ame
Power supply capacit	y	(kVA)	0.	.9
Rated output		(W)	40	00
Rated torque		(N·m)	1.	.3
Momentary Max. pea	k torqu	ıe (N·m)	3.	.8
Rated current		(A(rms))	2.	.4
Max. current		(A(o-p))	10.2	
Regenerative brake	With	out option	No limi	t Note)2
frequency (times/min) Note)	DV	0P4283	No limit Note)2	
Rated rotational spee	ed	(r/min)	30	00
Max. rotational speed	d	(r/min)	60	00
Moment of inertia	With	out brake	0.2	26
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	th brake	0.2	28
Recommended momentatio of the load and t			30 times	s or less
Rotary encoder speci	ification	Note)5	20-bit Incremental	17-bit Absolute
Resolut	tion per	single turn	1,048,576	131,072

• Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.) Do not use this for braking the motor in motion.

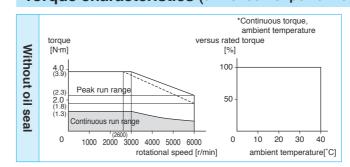
	,
Static friction torque (N·m)	1.27 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

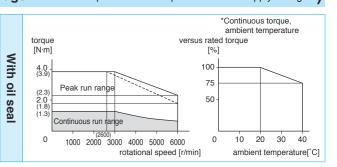
#### • Permissible load (For details, refer to P.104)

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

- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.30.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

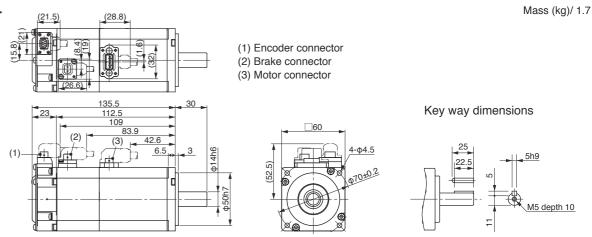
## Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)





#### **Dimensions**

<With Brake>



\* For the dimensions of without brake, refer to the left page.

		AC2	00V		
Motor model *1 MSME			082G1	082S1	
	Model	A5 series	MCDH	T3520	
Applicable driver *2	No.	A5E series	MCDH	Г3520E	
	Fran	ne symbol	C-fra	ame	
Power supply capacit	У	(kVA)	1.	3	
Rated output		(W)	75	50	
Rated torque		(N·m)	2.	4	
Momentary Max. pea	k torqu	e (N·m)	7.	.1	
Rated current		(A(rms))	4.	4.1	
Max. current	Max. current		17.4		
Regenerative brake	Without option		No limit Note)2		
frequency (times/min) Note)	DV	0P4283	No limit Note)2		
Rated rotational spee	d	(r/min)	3000		
Max. rotational speed	l	(r/min)	6000		
Moment of inertia	With	out brake	0.87		
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	th brake	0.0	97	
Recommended moment of inertia ratio of the load and the rotor			20 times	s or less	
Rotary encoder speci	ficatior	Note)5	20-bit Incremental	17-bit Absolute	
Resolut	ion per	single turn	1,048,576	131,072	

• Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

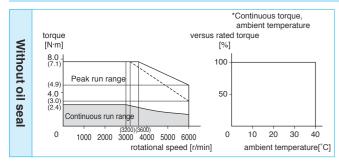
Static friction torque (N·m)	2.45 or more
Engaging time (ms)	70 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.42
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

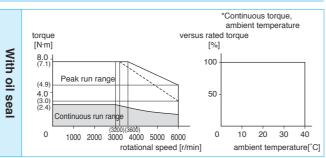
#### • Permissible load (For details, refer to P.104)

		Radial load P-direction (N)	686
	During assembly  During operation	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 5, refer to P.104.
- · Dimensions of Driver, refer to P.31.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

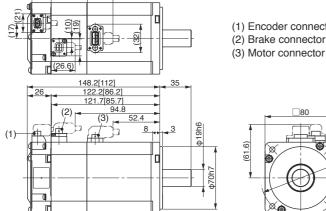
#### Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)





#### **Dimensions**

<With Brake>



(1) Encoder connector

(2) Brake connector

Key way dimensions

M5 depth 10

Mass (kg)/ Without brake: 2.3

With brake: 3.1

\* Figures in [ ] represent the dimensions of 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**

			AC2	00V
Motor model *1 MSME			102G1□	102S1
	Model	A5 series	MDDHT5540	
Applicable driver *2	No.	A5E series	MDDHT5540E	
	Frame symbol		D-frame	
Power supply capacit	у	(kVA)	1.	.8
Rated output		(W)	1.	.0
Rated torque		(N·m)	3.	18
Momentary Max. peal	k torqu	ie (N·m)	9.	55
Rated current		(A(rms))	6.	.6
Max. current		(A(o-p))	28	
Regenerative brake	Without option		No limit Note)2	
frequency (times/min) Note)1	DV0P4284		No limit Note)2	
Rated rotational spee	d	(r/min)	3000	
Max. rotational speed		(r/min)	5000	
Moment of inertia	With	out brake	2.03	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	th brake	2.35	
Recommended mome ratio of the load and the			15 times	s or less
Rotary encoder speci	ficatior	Note)5	20-bit Incremental	17-bit Absolute
Resolut	ion per	single turn	1,048,576	131,072

• Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

,	,
Static friction torque (N·m)	7.8 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

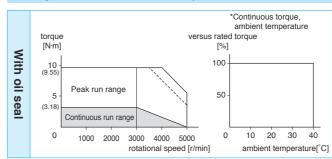
• Permissible load (For details, refer to P.104)

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

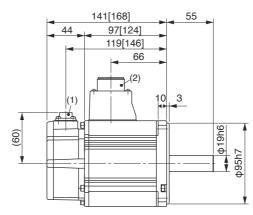
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.32.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type".

Detail of model designation, refer to P.11.

#### Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



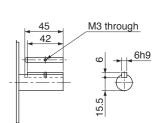
#### **Dimensions**



**100** 

Mass (kg)/ Without brake: 3.5 With brake: 4.5

Key way dimensions



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

		AC2	00V		
Motor model *1		152G1	152S1		
Model A5 series			MDDHT5540		
Applicable driver *2	No.	A5E series	MDDHT5540E		
	Fran	ne symbol	D-fr	D-frame	
Power supply capacit	у	(kVA)	2	.3	
Rated output		(W)	1.	.5	
Rated torque		(N·m)	4.	77	
Momentary Max. pea	k torqu	ıe (N·m)	14	.3	
Rated current		(A(rms))	8.2		
Max. current		35			
Regenerative brake	Without option		No limit Note)2		
frequency (times/min) Note)1	DV0P4284		No limit Note)2		
Rated rotational spee	d	(r/min)	30	3000	
Max. rotational speed		(r/min)	5000		
Moment of inertia	With	out brake	2.84		
of rotor ( $\times 10^{-4}$ kg·m <sup>2</sup> )	Wi	th brake	3.17		
Recommended moment of inertia ratio of the load and the rotor Note)3			15 times	s or less	
Rotary encoder speci	ficatior	Note)5	20-bit Incremental	17-bit Absolute	
Resolut	ion per	r single turn	1,048,576	131,072	

#### • Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

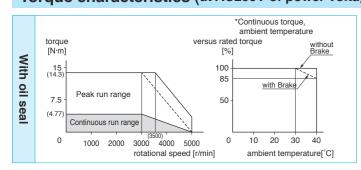
Static friction torque (N·m)	7.8 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.81±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

#### • Permissible load (For details, refer to P.104)

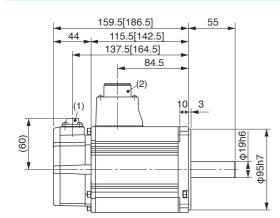
	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
document	Thrust load B-direction (N)	686
During operation	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196

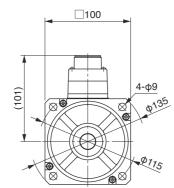
- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.32.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

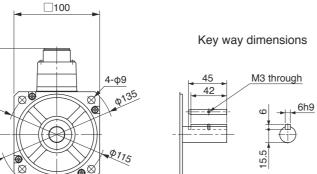
#### Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



#### **Dimensions**







Mass (kg)/ Without brake: 4.4

With brake: 5.4

- (1) Encoder connector
- (2) Motor/Brake connector
- \* Figures in [ ] represent the dimensions of 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**

		AC2	200V	
Motor model *1		MSME	202G1□	202S1
	Model	A5 series	MEDH	T7364
Applicable driver *2	No.	Io. A5E series MEDHT73		Г7364Е
	Fran	ne symbol	E-frame	
Power supply capacity	y	(kVA)	3.	.3
Rated output		(W)	2	.0
Rated torque		(N·m)	6.5	37
Momentary Max. peal	k torqu	ıe (N·m)	19	).1
Rated current		(A(rms))	11.3	
Max. current		(A(o-p))	48	
Regenerative brake	Without option		No limit Note)2	
frequency (times/min) Note)1	DV0P4285		No limit Note)2	
Rated rotational spee	d	(r/min)	3000	
Max. rotational speed		(r/min)	5000	
Moment of inertia	With	out brake	3.68	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	th brake	4.01	
Recommended moment of inertia ratio of the load and the rotor Note)3			15 times	s or less
Rotary encoder speci	fication	Note)5	20-bit Incremental	17-bit Absolute
Resolut	ion per	r single turn	1,048,576	131,072

• Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.) Do not use this for braking the motor in motion.

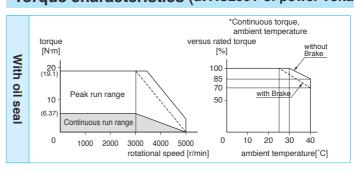
1	,
Static friction torque (N·m)	7.8 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.81±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.104)

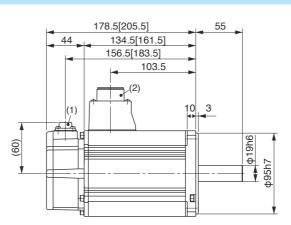
During assembly	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
docombry	Thrust load B-direction (N)	686
During	Radial load P-direction (N)	490
operation	Thrust load A, B-direction (N)	196

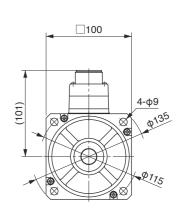
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.33.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

#### Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



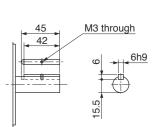
#### **Dimensions**





Mass (kg)/ Without brake: 5.3 With brake: 6.3

Key way dimensions



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

		AC2	00V	
Motor model *1		302G1□	302S1	
	Model	A5 series	MFDHTA390	
Applicable driver *2	No.	A5E series	MFDHTA390E	
	Fran	ne symbol	F-frame	
Power supply capacit	у	(kVA)	4.	5
Rated output		(W)	3.	0
Rated torque		(N·m)	9.	55
Momentary Max. pea	k torqu	ıe (N·m)	28	.6
Rated current		(A(rms))	18.1	
Max. current		77		
Regenerative brake	Without option		No limit Note)2	
frequency (times/min) Note)1	DV0P4285×2		No limit Note)2	
Rated rotational spee	d	(r/min)	3000	
Max. rotational speed		(r/min)	5000	
Moment of inertia	Without brake		6.50	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	th brake	7.85	
Recommended moment of inertia ratio of the load and the rotor Note)3		15 times	s or less	
Rotary encoder speci	ficatior	Note)5	20-bit Incremental	17-bit Absolute
Resolut	ion per	r single turn	1,048,576	131,072

#### • Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

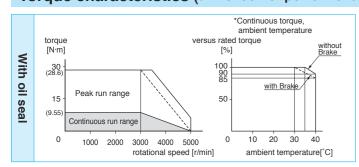
Static friction torque (N·m)	11.8 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.81±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

#### • Permissible load (For details, refer to P.104)

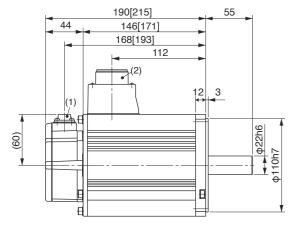
	<b>.</b> .	Radial load P-direction (N)	980
	During assembly	Thrust load A-direction (N)	588
	docombry	Thrust load B-direction (N)	686
	During operation	Radial load P-direction (N)	490
		Thrust load A, B-direction (N)	196

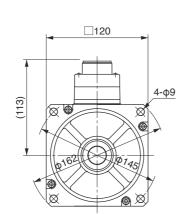
- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

## Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



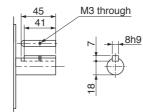
#### **Dimensions**





Mass (kg)/ Without brake: 8.3 With brake: 9.4

Key way dimensions



- (1) Encoder connector
- (2) Motor/Brake connector
- \* Figures in [ ] represent the dimensions of 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**

			AC2	200V	
Motor model *1		MSME	402G1□	402S1	
	Model	A5 series	MFDH	TB3A2	
Applicable driver *2	No.	A5E series	MFDHTB3A2E		
	Fran	ne symbol	F-fr	F-frame	
Power supply capac	ity	(kVA)	6	.0	
Rated output		(W)	4	.0	
Rated torque		(N·m)	12	2.7	
Momentary Max. pe	ak torqu	ue (N·m)	38	3.2	
Rated current		(A(rms))	19.6		
Max. current		(A(o-p))	83		
Regenerative brake	With	out option	No limit Note)2		
frequency (times/min) Note	)1 DV0	)P4285×2	No limit Note)2		
Rated rotational spe	ed	(r/min)	3000		
Max. rotational spee	d	(r/min)	45	00	
Moment of inertia	With	nout brake	12.9		
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	ith brake	14	1.2	
Recommended moment of inertia ratio of the load and the rotor Note)3			15 times	s or less	
Rotary encoder spec	cificatio	ns Note)5	20-bit Incremental	17-bit Absolute	
Resolu	ution pe	r single turn	1,048,576	131,072	

• Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.) Do not use this for braking the motor in motion.

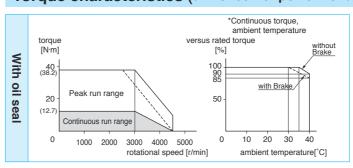
Static friction torque (N·m)	16.1 or more
Engaging time (ms)	110 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.90±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.104)

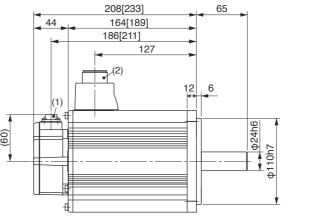
Б.	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
docombry	Thrust load B-direction (N)	686
During operation	Radial load P-direction (N)	784
	Thrust load A, B-direction (N)	343

- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

## Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



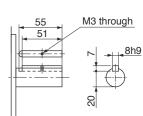
#### **Dimensions**



□130

Mass (kg)/ Without brake: 11.0 With brake: 12.6

Key way dimensions



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

		AC2	00V	
Motor model *1		502G1□	502S1	
	Model	A5 series	MFDH.	TB3A2
Applicable driver *2	No.	A5E series	MFDHTB3A2E	
	Fran	ne symbol	F-fra	ame
Power supply capacit	у	(kVA)	7.	5
Rated output		(W)	5.	.0
Rated torque		(N·m)	15	5.9
Momentary Max. peal	k torqu	e (N·m)	47	'.7
Rated current		(A(rms))	24.0	
Max. current		(A(o-p))	102	
Regenerative brake	Without option		357	
frequency (times/min) Note)1	DV0P4285×2		No limit Note)2	
Rated rotational spee	d	(r/min)	3000	
Max. rotational speed		(r/min)	4500	
Moment of inertia	With	out brake	17.4	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	th brake	18.6	
Recommended moment of inertia ratio of the load and the rotor Note)3			15 times	s or less
Rotary encoder speci	ficatior	Note)5	20-bit Incremental	17-bit Absolute
Resolut	ion per	single turn	1,048,576	131,072

#### • Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

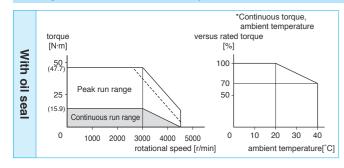
Static friction torque (N·m)	16.1 or more
Engaging time (ms)	110 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.90±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

#### • Permissible load (For details, refer to P.104)

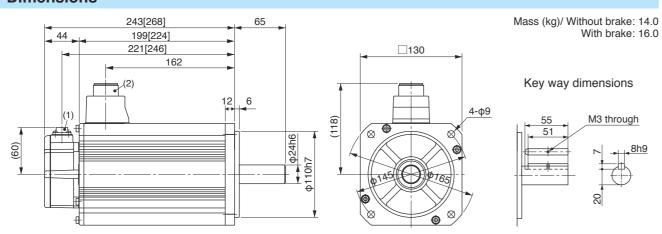
	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
assembly	Thrust load B-direction (N)	686
During operation	Radial load P-direction (N)	784
	Thrust load A, B-direction (N)	343

- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

#### Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



#### **Dimensions**



- (1) Encoder connector
- (2) Motor/Brake connector
- \* Figures in [ ] represent the dimensions of 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**

			AC2	200V
Motor model *1		MDME	102G1□	102S1
	Model	A5 series	MDDHT3530	
Applicable driver *2	No. A5E series		MDDHT3530E	
	Fran	ne symbol	D-frame	
Power supply capacity	у	(kVA)	1.	.8
Rated output		(W)	1.	.0
Rated torque		(N·m)	4.	77
Momentary Max. peal	k torqu	e (N·m)	14	1.3
Rated current		(A(rms))	5.7	
Max. current		(A(o-p))	24	
Regenerative brake	Without option		No limit Note)2	
frequency (times/min) Note)1	DV0P4284		No limi	t Note)2
Rated rotational spee	d	(r/min)	2000	
Max. rotational speed		(r/min)	3000	
Moment of inertia	With	out brake	4.60	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	th brake	5.90	
Recommended moment of inertia ratio of the load and the rotor Note)3			10 times	s or less
Rotary encoder speci	fication	Note)5	20-bit Incremental	17-bit Absolute
Resolut	ion per	single turn	1,048,576	131,072

• Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.) Do not use this for braking the motor in motion.

,	,
Static friction torque (N·m)	4.9 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	70 or less
Exciting current (DC) (A)	0.59±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

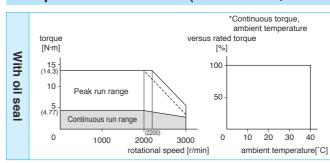
• Permissible load (For details, refer to P.104)

	<b>.</b>	Radial load P-direction (N)	980
	During assembly	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

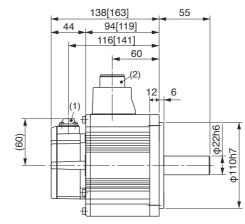
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.32.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type".

Detail of model designation, refer to P.11.

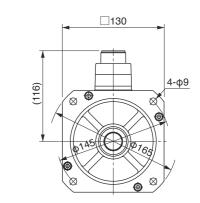
#### Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



#### **Dimensions**



(1) Encoder connector



Key way dimensions

Mass (kg)/ Without brake: 5.2

With brake: 6.7

- (2) Motor/Brake connector
- \* Figures in [ ] represent the dimensions of with brake.

Motor Specifications 200V MDME 2.0kW [Middle inertia, Middle capacity]

#### **Specifications**

		AC2	00V	
Motor model *1 MDME			152G1□	152S1
Model A5 series			MDDHT5540	
Applicable driver *2	No.	A5E series	MDDHT5540E	
	Fran	ne symbol	D-fra	ame
Power supply capacit	у	(kVA)	2.	.3
Rated output		(W)	1.	5
Rated torque		(N·m)	7.	16
Momentary Max. pea	k torqu	e (N·m)	21	.5
Rated current		(A(rms))	9.4	
Max. current		(A(o-p))	40	
Regenerative brake	Without option		No limit Note)2	
frequency (times/min) Note)1	DV0P4284		No limit Note)2	
Rated rotational spee	d	(r/min)	2000	
Max. rotational speed		(r/min)	3000	
Moment of inertia	With	out brake	6.7	70
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	th brake	7.99	
Recommended moment of inertia ratio of the load and the rotor Note)3		10 times	s or less	
Rotary encoder speci	ficatior	Note)5	20-bit Incremental	17-bit Absolute
Resolut	ion per	single turn	1,048,576	131,072

#### • Brake specifications (For details, refer to P.105) /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.104)

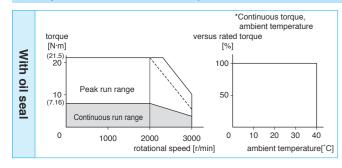
	Radial load P-direction (N)	980
During assembly  During operation	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196

- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.32.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

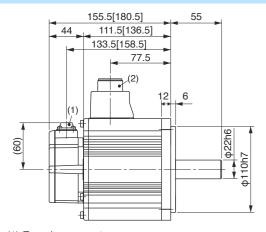
Mass (kg)/ Without brake: 6.7

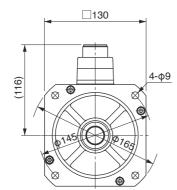
With brake: 8.2

#### Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



#### **Dimensions**





Key way dimensions 41

- (1) Encoder connector
- (2) Motor/Brake connector
- \* Figures in [ ] represent the dimensions of 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**

			AC200V		
Motor model *1		MDME	202G1	202S1	
	Model	A5 series	MEDH	T7364	
Applicable driver *2	No.	A5E series	MEDHT7364E		
	Fran	ne symbol	E-frame		
Power supply capacit	у	(kVA)	3.	3	
Rated output		(W)	2.	.0	
Rated torque		(N·m)	9.9	55	
Momentary Max. pea	k torqu	ie (N·m)	28	3.6	
Rated current		(A(rms))	11	.5	
Max. current		(A(o-p))	4	9	
Regenerative brake	Without option		No limit Note)2		
frequency (times/min) Note)1	DV	OP4285	No limit Note)2		
Rated rotational spee	d	(r/min)	20	00	
Max. rotational speed	l	(r/min)	30	00	
Moment of inertia	With	out brake	8.72		
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	th brake	10.0		
Recommended mome ratio of the load and t			10 times	s or less	
Rotary encoder speci	fication	Note)5	20-bit Incremental	17-bit Absolute	
Resolut	ion per	single turn	1,048,576	131,072	

• Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.) Do not use this for braking the motor in motion.

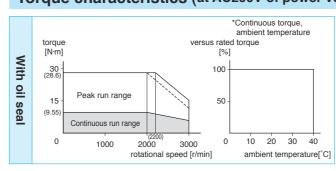
(20 not doo and for braining and motor in motorin )				
Static friction torque (N·m)	13.7 or more			
Engaging time (ms)	100 or less			
Releasing time (ms) Note)4	50 or less			
Exciting current (DC) (A)	0.79±10%			
Releasing voltage (DC) (V)	2 or more			
Exciting voltage (DC) (V)	24±2.4			

• Permissible load (For details, refer to P.104)

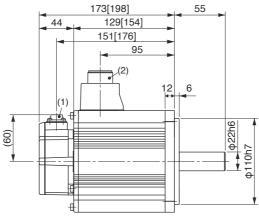
		Radial load P-direction (N)	980
	During assembly	Thrust load A-direction (N)	588
	docombry	Thrust load B-direction (N)	686
	During operation	Radial load P-direction (N)	490
		Thrust load A, B-direction (N)	196

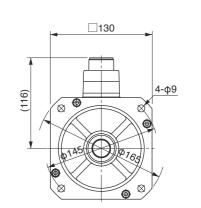
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.33.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

#### Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



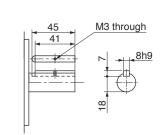
#### **Dimensions**





Mass (kg)/ Without brake: 8.0 With brake: 9.5

Key way dimensions



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

		AC2	00V	
Motor model *1		302G1□	302S1□	
	Model	A5 series	MFDH	TA390
Applicable driver *2	No.	A5E series	MFDHTA390E	
	Frame symbol		F-frame	
Power supply capacit	y	(kVA)	4.	.5
Rated output		(W)	3.	.0
Rated torque		(N·m)	14	.3
Momentary Max. peal	k torqu	e (N·m)	43	3.0
Rated current (A(rms))			17.4	
Max. current		(A(o-p))	74	
Regenerative brake	Without option No limit Note)2		t Note)2	
frequency (times/min) Note)1	DV0P4285×2		No limit Note)2	
Rated rotational spee	d	(r/min)	2000	
Max. rotational speed		(r/min)	3000	
Moment of inertia	With	out brake	12.9	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	With brake		14.2	
Recommended moment of inertia ratio of the load and the rotor Note)3		10 times	s or less	
Rotary encoder speci	ficatior	Note)5	20-bit Incremental	17-bit Absolute
Resolut	ion per	single turn	1,048,576	131,072

#### • Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

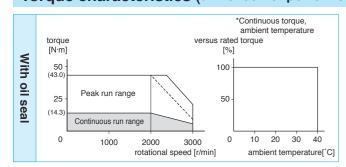
Static friction torque (N·m)	16.2 or more
Engaging time (ms)	110 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.90±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

#### • Permissible load (For details, refer to P.104)

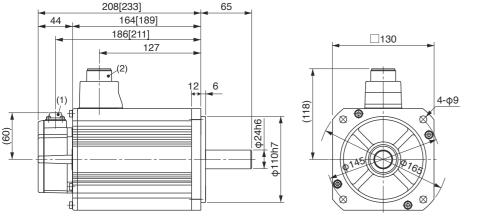
		Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588	
	Thrust load B-direction (N)	686	
	During	Radial load P-direction (N)	784
	operation	Thrust load A, B-direction (N)	343

- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

#### Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



#### **Dimensions**



Key way dimensions

Mass (kg)/ Without brake: 11.0

With brake: 12.6

- (1) Encoder connector
- (2) Motor/Brake connector
- \* Figures in [ ] represent the dimensions of 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**

			AC200V		
Motor model *1		MDME	402G1□	402S1	
	Model	A5 series	MFDH.	TB3A2	
Applicable driver *2	No.	A5E series	MFDHTB3A2E		
	Fran	ne symbol	F-frame		
Power supply capacit	у	(kVA)	6.	6.0	
Rated output		(W)	4.	.0	
Rated torque		(N·m)	19	).1	
Momentary Max. pea	k torqu	ie (N·m)	57	'.3	
Rated current		(A(rms))	21	.0	
Max. current		(A(o-p))	8	9	
Regenerative brake	Without option		No limit Note)2		
frequency (times/min) Note)1	DV0P4285×2		No limit Note)2		
Rated rotational spee	d	(r/min)	20	00	
Max. rotational speed	l	(r/min)	30	00	
Moment of inertia	With	out brake	37.6		
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )		th brake	38.6		
Recommended mome ratio of the load and t			10 times	s or less	
Rotary encoder speci	fication	Note)5	20-bit Incremental	17-bit Absolute	
Resolut	Resolution per single turn			131,072	

• Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.) Do not use this for braking the motor in motion.

	,
Static friction torque (N·m)	24.5 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.3±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

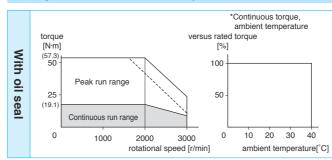
• Permissible load (For details, refer to P.104)

	<b>.</b> .	Radial load P-direction (N)	1666
	During assembly	Thrust load A-direction (N)	784
ľ	accombiy	Thrust load B-direction (N)	980
	During operation	Radial load P-direction (N)	784
(		Thrust load A, B-direction (N)	343

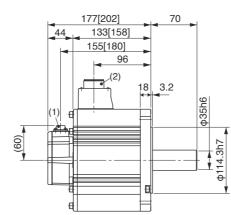
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type".

Detail of model designation, refer to P.11.

#### Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



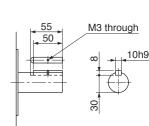
#### **Dimensions**



□176

Mass (kg)/ Without brake: 15.5 With brake: 18.7

Key way dimensions



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

		AC2	00V	
Motor model *1 MDME			502G1□	502S1
	Model	A5 series	MFDH.	TB3A2
Applicable driver *2	No.	A5E series	MFDHT	B3A2E
	Fran	ne symbol	F-fra	ame
Power supply capacit	у	(kVA)	7.	.5
Rated output		(W)	5.	.0
Rated torque		(N·m)	23	3.9
Momentary Max. peal	k torqu	ıe (N⋅m)	71	.6
Rated current (A(rms)) Max. current (A(o-p))		25.9		
		110		
Regenerative brake	Without option		120	
frequency (times/min) Note)1	DV0P4285×2		No limit Note)2	
Rated rotational spee	d	(r/min)	2000	
Max. rotational speed		(r/min)	3000	
Moment of inertia	With	out brake	48.0	
of rotor ( $\times 10^{-4}$ kg·m <sup>2</sup> )	Wi	th brake	48.8	
Recommended moment of inertia ratio of the load and the rotor Note)3		10 times	s or less	
Rotary encoder speci	fication	Note)5	20-bit Incremental	17-bit Absolute
Resolut	ion per	r single turn	1,048,576	131,072

#### • Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

Static friction torque (N·m)	24.5 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.3±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

#### • Permissible load (For details, refer to P.104)

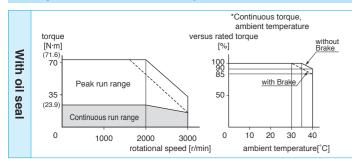
		Radial load P-direction (N)	1666
During assembly	Thrust load A-direction (N)	784	
	Thrust load B-direction (N)	980	
	During	Radial load P-direction (N)	784
	operation	Thrust load A, B-direction (N)	343

- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

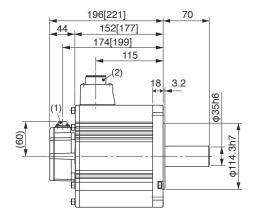
Mass (kg)/ Without brake: 18.6

With brake: 21.8

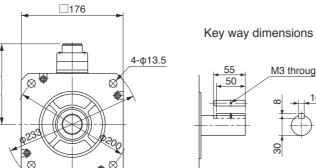
#### Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



#### **Dimensions**



4-φ13.5



- (1) Encoder connector
- (2) Motor/Brake connector
- \* Figures in [ ] represent the dimensions of 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**

			AC2	00V
Motor model *1		MGME	092G1	092S1
	Model A5 series		MDDHT5540	
Applicable driver *2	No.	A5E series	MDDHT5540E	
	Fran	Frame symbol D-frame		ame
Power supply capacity	y	(kVA)	1.8	
Rated output		(W)	0.	.9
Rated torque		(N·m)	8.8	59
Momentary Max. peal	k torqu	ıe (N·m)	19	.3
Rated current		(A(rms))	7.6	
Max. current (A(o-p))			24	
Regenerative brake	Without option		No limit Note)2	
frequency (times/min) Note)1	DV0P4284		No limit Note)2	
Rated rotational speed (r/min)		1000		
Max. rotational speed		(r/min)	2000	
Moment of inertia	With	out brake	6.70	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	With brake		7.99	
Recommended moment of inertia ratio of the load and the rotor Note)3		10 times	s or less	
Rotary encoder specifications Note)5		20-bit Incremental	17-bit Absolute	
Resolut	ion per	single turn	1,048,576	131,072

• Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.) Do not use this for braking the motor in motion.

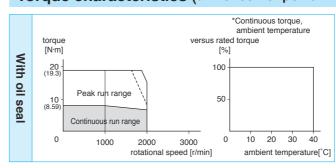
	,
Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.104)

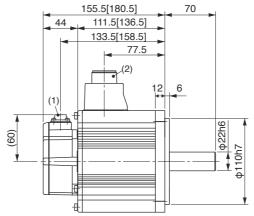
Radial load P-direction (N)	980
Thrust load A-direction (N)	588
Thrust load B-direction (N)	686
Radial load P-direction (N)	686
Thrust load A, B-direction (N)	196
	Thrust load A-direction (N) Thrust load B-direction (N) Radial load P-direction (N)

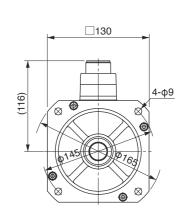
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.32.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

## Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



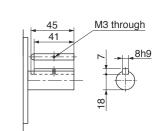
#### **Dimensions**





Mass (kg)/ Without brake: 6.7 With brake: 8.2

Key way dimensions



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

MGME

A5E series Frame symbol

(kVA)

(W)

(N·m)

(N·m)

(A(rms))

(A(o-p))

(r/min)

(r/min)

Without option

Without brake

With brake

Resolution per single turn

Model A5 series

No.

**Specifications** 

Motor model \*1

Rated output

Rated torque

Rated current

Max. current

Regenerative brake

Rated rotational speed

Max. rotational speed

Moment of inertia

of rotor ( $\times 10^{-4}$ kg·m<sup>2</sup>)

Applicable driver \*2

Power supply capacity

Momentary Max. peak torque

frequency (times/min) Note)1 DV0P4285×2

Recommended moment of inertia

ratio of the load and the rotor

Rotary encoder specifications

302S1

**AC200V** 

MFDHTB3A2

MFDHTB3A2E

F-frame

4.5

3.0

28.7

71.7

22.6

80 No limit Note)2

No limit Note)2

1000

2000 48.4

49.2

10 times or less

20-bit

Incremental

1.048.576

302G1

/This brake will be released when it is energized.) Do not use this for braking the motor in motion.

• Brake specifications (For details, refer to P.105)

Static friction torque (N·m)	58.8 or more
Engaging time (ms)	150 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	1.4±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

#### • Permissible load (For details, refer to P.104)

During assembly	Radial load P-direction (N)	2058
	Thrust load A-direction (N)	980
	Thrust load B-direction (N)	1176
During	Radial load P-direction (N)	1470
operation	Thrust load A, B-direction (N)	490

- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type".

## Detail of model designation, refer to P.11.

#### **Specifications**

			AC2	200V
Motor model *1	Motor model *1 MGME		202G1	202S1
	Model	A5 series	MFDH	TA390
Applicable driver *2	No.	A5E series	MFDH1	TA390E
	Fran	ne symbol	F-fra	ame
Power supply capacit	у	(kVA)	3.	.8
Rated output		(W)	2	.0
Rated torque		(N·m)	19	).1
Momentary Max. pea	k torqu	ie (N·m)	47.7	
Rated current (A(rms))		17.0		
Max. current (A(o-p))		60		
Regenerative brake Without optic		out option	No limit Note)2	
frequency (times/min) Note)1	DV0P4285×2		No limit Note)2	
Rated rotational speed (r/min)		1000		
Max. rotational speed		(r/min)	2000	
Moment of inertia	Moment of inertia Without brake		30.3	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> ) With brake		31.4	
Recommended moment of inertia ratio of the load and the rotor Note)3		10 times or less		
Rotary encoder speci	Rotary encoder specifications Note)5		20-bit Incremental	17-bit Absolute
Resolution per single turn			1,048,576	131,072

#### • Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.) Do not use this for braking the motor in motion.

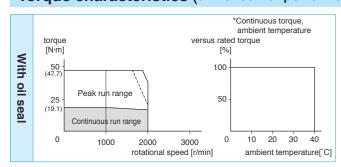
Static friction torque (N·m)	24.5 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.3±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

#### • Permissible load (For details, refer to P.104)

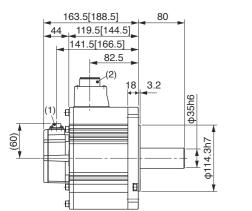
During assembly	Radial load P-direction (N)	1666
	Thrust load A-direction (N)	784
	Thrust load B-direction (N)	980
During	Radial load P-direction (N)	1176
operation	Thrust load A, B-direction (N)	490

- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

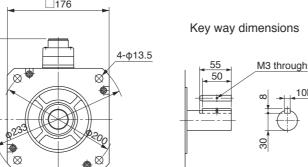
#### Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



# **Dimensions**



□176 4-φ13.5



Mass (kg)/ Without brake: 14.0

With brake: 17.5

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

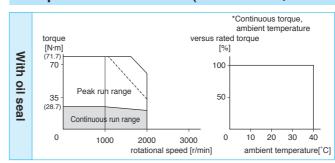
#### <Cautions> Reduce the moment of inertia ratio if high speed response operation is required. Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

# Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)

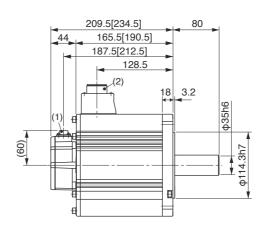
17-bit

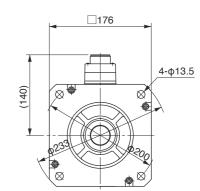
Absolute

131.072



#### **Dimensions**





Key way dimensions 50

Mass (kg)/ Without brake: 20.0

With brake: 23.5

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

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## **Specifications**

				AC2	V00
Motor model *1 MHME			102G1		102S1
	Model A5 series		r	MDDHT3530	
Applicable driver *2	No.	A5E series	M	IDDHT	3530E
	Fran	ne symbol		D-frame	
Power supply capacit	у	(kVA)		1.	8
Rated output		(W)		1.	0
Rated torque		(N·m)		4.7	77
Momentary Max. peal	k torqu	ie (N·m)		14	.3
Rated current		(A(rms)		5.7	
Max. current (A(o-p))				24	
Regenerative brake	egenerative brake Witho			83	
frequency (times/min) Note)1	DV	OP4284	N	No limit Note)2	
Rated rotational speed (r/min)			2000		
Max. rotational speed		(r/min)		3000	
Moment of inertia	With	out brake		24.7	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	tor (×10 <sup>-4</sup> kg·m <sup>2</sup> ) With brake			26.0	
Recommended moment of inertia ratio of the load and the rotor Note)3		5	times	or less	
Rotary encoder specifications Note)5		20-bit Increme		17-bit Absolute	
Resolut	Resolution per single turn		1,048,5	76	131,072

#### • Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

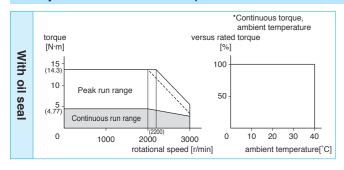
Static friction torque (N·m)	4.9
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	70 or less
Exciting current (DC) (A)	0.59±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

#### • Permissible load (For details, refer to P.104)

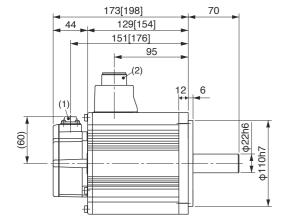
During assembly During operation	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196

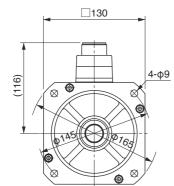
- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.32.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

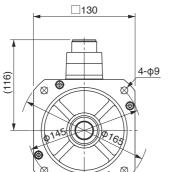
#### Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)

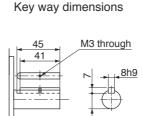


#### **Dimensions**









Mass (kg)/ Without brake: 6.7

With brake: 8.1

- (1) Encoder connector
- (2) Motor/Brake connector
- \* Figures in [ ] represent the dimensions of 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**

				AC2	200V	
Motor model *1 MHME		152G1□	152S1			
		Model	A5 series	MDDHT5540		
Applicable drive	r *2	No.	A5E series	MDDHT5540E		
		Frame symbol		D-frame		
Power supply ca	apacit	y	(kVA)	2.	2.3	
Rated output			(W)	1.	.5	
Rated torque			(N·m)	7.	16	
Momentary Max	c. peal	k torqu	ıe (N·m)	21	.5	
Rated current			(A(rms))	9.4		
Max. current			(A(o-p))	40		
Regenerative bra	ake	Without option		22		
frequency (times/min) Note)1		DV0P4284		130		
Rated rotational speed (r/min)		2000				
Max. rotational	speed		(r/min)	3000		
Moment of inert	ia	With	hout brake 37.1		'.1	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )		Wi	th brake	38.4		
Recommended moment of inertia ratio of the load and the rotor Note)3		5 times	or less			
Rotary encoder specifications Note		Note)5	20-bit Incremental	17-bit Absolute		
		single turn	1,048,576	131,072		

• Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.) Do not use this for braking the motor in motion.

1	,
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

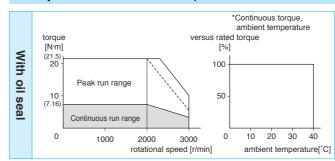
• Permissible load (For details, refer to P.104)

	Radial load P-direction (N)	980
During assembl	Thrust load A-direction (N)	588
GOOGITIO	Thrust load B-direction (N)	686
During	Radial load P-direction (N)	490
operatio	Thrust load A, B-direction (N)	196

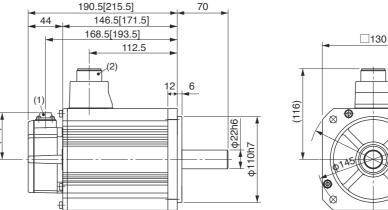
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.32.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type".

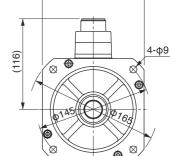
Detail of model designation, refer to P.11.

#### Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



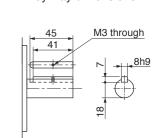
#### **Dimensions**





Mass (kg)/ Without brake: 8.6 With brake: 10.1

Key way dimensions



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

			AC2	00V
Motor model *1 MHME			202G1	202S1
	Model	A5 series	MEDHT7364	
Applicable driver *2	No.	A5E series	MEDHT7364E	
	Fram	ne symbol	E-frame	
Power supply capacit	у	(kVA)	3.	3
Rated output		(W)	2.	0
Rated torque		(N·m)	9.5	55
Momentary Max. peal	k torqu	e (N·m)	28	.6
Rated current		(A(rms))	11.1	
Max. current (A(o-p))			47	
Regenerative brake	Without option		45	
frequency (times/min) Note)1	DV0P4285		142	
Rated rotational spee	d	(r/min)	2000	
Max. rotational speed		(r/min)	3000	
Moment of inertia	Without brake		57.8	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	With brake		59.6	
Recommended moment of inertia ratio of the load and the rotor Note)3		5 times	or less	
Rotary encoder specifications Note)5		Note)5	20-bit Incremental	17-bit Absolute
Resolution per single turn		single turn	1,048,576	131,072

#### • Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

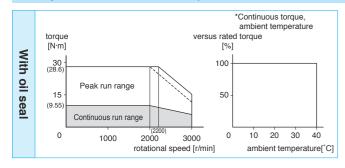
Static friction torque (N·m)	24.5 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.3±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

#### • Permissible load (For details, refer to P.104)

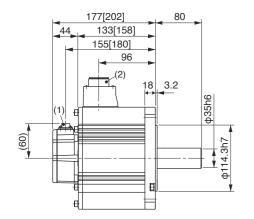
	Radial load P-direction (N)	1666
During assembly	Thrust load A-direction (N)	784
docombry	Thrust load B-direction (N)	980
During	Radial load P-direction (N)	784
operation	Thrust load A, B-direction (N)	343

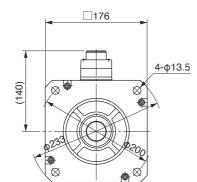
- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.33.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

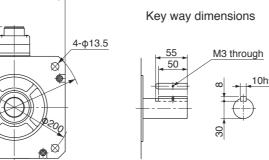
#### Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



#### **Dimensions**







Mass (kg)/ Without brake: 12.2

With brake: 15.5

- (1) Encoder connector
- (2) Motor/Brake connector
- \* Figures in [ ] represent the dimensions of 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**

			AC2	200V
Motor model *1		MHME	302G1□	302S1□
	Model	A5 series	MFDHTA390	
Applicable driver *2	No.	A5E series	MFDHTA390E	
	Fran	ne symbol	F-frame	
Power supply capac	ity	(kVA)	4	.5
Rated output		(W)	3	.0
Rated torque		(N·m)	14	l.3
Momentary Max. pe	ak torqu	ue (N·m)	43	3.0
Rated current		(A(rms))	16.0	
Max. current (A(o-p))			68	
Regenerative brake	With	out option	19	
frequency (times/min) Note	)1 DV0	)P4285×2	142	
Rated rotational spe	ed	(r/min)	2000	
Max. rotational spee	d	(r/min)	3000	
Moment of inertia	With	nout brake	90.5	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	ith brake	92.1	
Recommended moment of inertia ratio of the load and the rotor Note)3			5 times	or less
Rotary encoder specifications Note)5		20-bit Incremental	17-bit Absolute	
Resolution per single turn		1,048,576	131,072	

• Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.) Do not use this for braking the motor in motion.

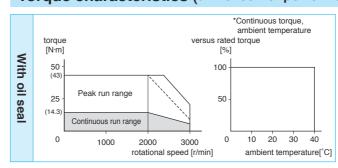
,	,
Static friction torque (N·m)	24.5 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.3±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.104)

	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

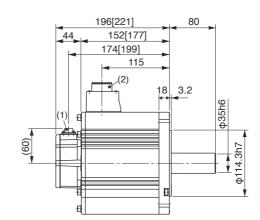
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

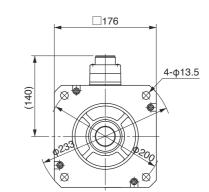
## Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



#### **Dimensions**

(1) Encoder connector





Key way dimensions 50

Mass (kg)/ Without brake: 16.0

With brake: 19.2

(2) Motor/Brake connector \* Figures in [ ] represent the dimensions of with brake.

			AC2	00V
Motor model *1 MHME			402G1□	402S1□
	Model A5 series		MFDHTB3A2	
Applicable driver *2	No.	A5E series	MFDHT	B3A2E
	Fran	ne symbol	F-frame	
Power supply capacit	у	(kVA)	6.	0
Rated output		(W)	4.	0
Rated torque		(N·m)	19	.1
Momentary Max. pea	k torqu	ie (N·m)	57.3	
Rated current		(A(rms))	21.0	
Max. current (A(o-p))			89	
Regenerative brake	Without option		17	
frequency (times/min) Note)1	DV0P4285×2		125	
Rated rotational spee	d	(r/min)	2000	
Max. rotational speed		(r/min)	3000	
Moment of inertia	Without brake		112	
of rotor ( $\times 10^{-4} \text{kg} \cdot \text{m}^2$ )	Wi	th brake	114	
Recommended moment of inertia ratio of the load and the rotor Note)3		5 times	or less	
Rotary encoder speci	ficatior	Note)5	20-bit Incremental	17-bit Absolute
Resolution per single turn			1,048,576	131,072

#### • Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

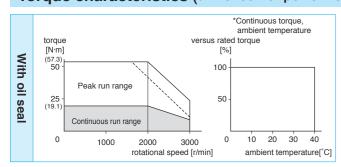
Static friction torque (N·m)	24.5 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.3±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

#### • Permissible load (For details, refer to P.104)

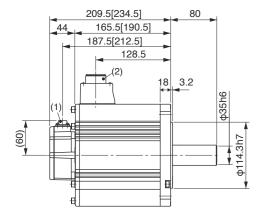
During assembly	Radial load P-direction (N)	1666
	Thrust load A-direction (N)	784
	Thrust load B-direction (N)	980
During	Radial load P-direction (N)	784
operation	Thrust load A, B-direction (N)	343

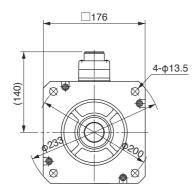
- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

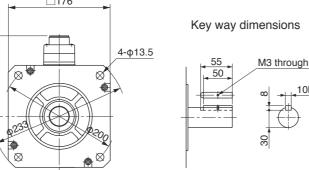
## Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



#### **Dimensions**







Mass (kg)/ Without brake: 18.6

With brake: 21.8

- (1) Encoder connector
- (2) Motor/Brake connector
- \* Figures in [ ] represent the dimensions of 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**

			AC200V			
Motor model *1			МНМЕ	502G1□	502S1	
		Model	A5 series	MFDHTB3A2		
Applicable driver	*2	No.	A5E series	MFDHT	B3A2E	
		Frame symbol		F-frame		
Power supply ca	pacit	у	(kVA)	7.	.5	
Rated output			(W)	5	.0	
Rated torque			(N·m)	23	3.9	
Momentary Max	. peal	k torqu	e (N·m)	71	71.6	
Rated current		(A(rms))		25.9		
Max. current		(A(o-p))		110		
Regenerative bra	ke	Without option		10		
frequency (times/min	) Note)1	DV0P4285×2		76		
Rated rotational	spee	d (r/min)		2000		
Max. rotational s	peed	(r/min)		3000		
Moment of inertia	a	Without brake		162		
of rotor ( $\times 10^{-4}$ kg·m <sup>2</sup> )		With brake		164		
Recommended moment of inertia ratio of the load and the rotor $$\rm No$$				5 times or less		
Rotary encoder	ficatior	Note)5	20-bit Incremental	17-bit Absolute		
Re	esolut	ion per single turn		1,048,576	131,072	

• Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.) Do not use this for braking the motor in motion.

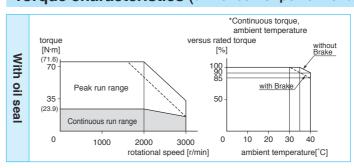
Static friction torque (N·m)	24.5 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.3±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4
Exciting current (DC) (A) Releasing voltage (DC) (V)	1.3±10% 2 or more

• Permissible load (For details, refer to P.104)

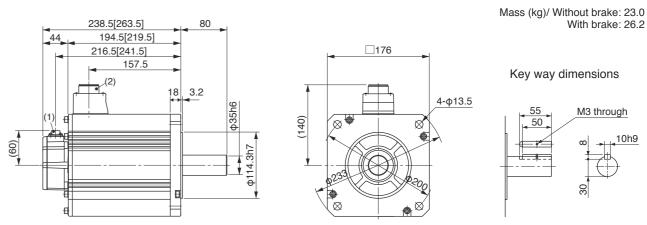
	During assembly	Radial load P-direction (N)	1666
		Thrust load A-direction (N)	784
ľ		Thrust load B-direction (N)	980
	During operation	Radial load P-direction (N)	784
(		Thrust load A, B-direction (N)	343

- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

## Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



#### **Dimensions**



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

Max. rotational speed

of rotor (×10<sup>-4</sup>kg·m<sup>2</sup>)

Recommended moment of inertia

ratio of the load and the rotor

Rotary encoder specifications

Moment of inertia

• Brake specifications (For details, refer to P.105) /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 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.3
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

#### • Permissible load (For details, refer to P.104)

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

- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.30.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

# **Specifications**

58.8

Motor model *1 MSMD		AC1	00V	
		MSMD	5AZG1□	5AZS1□
	Model	A5 series	MADH	IT1105
Applicable driver *2	No.	A5E series	MADH	T1105E
	Fran	ne symbol	A-fr	ame
Power supply capacity (kVA)		(kVA)	0.5	
Rated output Rated torque		(W)	0.16	
		(N·m)		
Momentary Max. pea	k torqu	,	0.48	
Rated current		(A(rms))	1	.1
Max. current		(A(o-p))	4	.7
Regenerative brake	With	out option	No lim	it Note)2
frequency (times/min) Note)1	DV	'0P4280	No lim	it Note)2
Rated rotational spee	ed	(r/min)	30	00

- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.30.

operation Thrust load A, B-direction (N)

- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

## Torque characteristics (at AC100V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)

17-bit

Absolute

131.072

5000

0.025

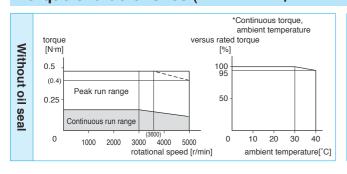
0.027

30 times or less

20-bit

Incrementa

1.048.576

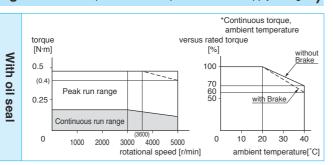


(r/min)

Without brake

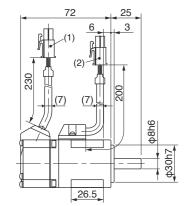
With brake

Resolution per single turn



#### **Dimensions**

Mass (kg)/ 0.32 <Without Brake>



(1) Encoder connector (2) Motor connector

Key way dimensions

\* For the dimensions of 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.

## Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)

17-bit

Absolute

131.072

Motor Specifications 200V MSMD 50W [Low inertia, Small capacity]

**AC200V** 

MADHT1505

MADHT1505E

A-frame

50

0.16

0.48

1.1

4.7 No limit Note)2

No limit Note)2

3000

5000

0.025

0.027

30 times or less

20-bit

Incremental

1.048.576

5AZS1

5AZG1

MSMD

A5E series

(kVA)

(W)

(N·m)

(N·m)

(A(rms))

(A(o-p))

(r/min)

(r/min)

Without option

DV0P4281

Without brake

With brake

Resolution per single turn

Model A5 series

Frame symbol

No.

Motor model \*1

Rated output

Rated torque

Rated current

Max. current

Regenerative brake

frequency (times/min) Note)1

Rated rotational speed

Max. rotational speed

of rotor ( $\times 10^{-4}$ kg·m<sup>2</sup>)

Recommended moment of inertia

ratio of the load and the rotor

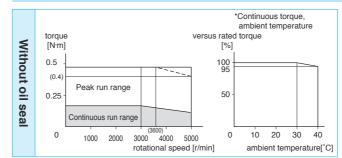
Rotary encoder specifications

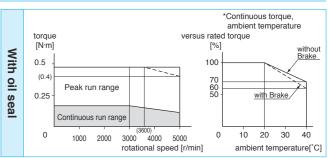
Moment of inertia

Applicable driver \*2

Power supply capacity

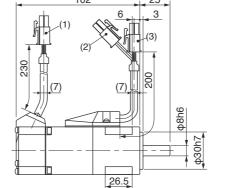
Momentary Max. peak torque





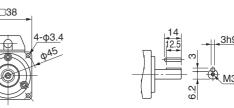
#### **Dimensions**

Mass (kg)/ 0.53 <With Brake>



- (1) Encoder connector
- (2) Brake connector
- (3) Motor connector

#### Key way dimensions



\* For the dimensions of without brake, refer to the left page.

			AC100V	
Motor model *1	MSMD	011G1□	011S1 <u></u>	
	Model	A5 series	MADHT1107	
Applicable driver *2	No.	A5E series	MADHT1107E	
	Fran	ne symbol	A-frame	
Power supply capacit	у	(kVA)	0.	.4
Rated output		(W)	10	00
Rated torque		(N·m)	0.3	32
Momentary Max. pea	k torqu	ıe (N·m)	0.9	95
Rated current		(A(rms))	1.	.7
Max. current		(A(o-p))	7.2	
Regenerative brake	With	out option	No limit Note)2	
frequency (times/min) Note)1	DV0P4280		No limit Note)2	
Rated rotational spee	d	(r/min)	3000	
Max. rotational speed	l	(r/min)	5000	
Moment of inertia	With	out brake	0.051	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	th brake	0.054	
Recommended moment of inertia ratio of the load and the rotor Note)3			30 times	s or less
Rotary encoder speci	ficatior	Note)5	20-bit Incremental	17-bit Absolute
Resolution per single turn			1,048,576	131,072

#### • Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

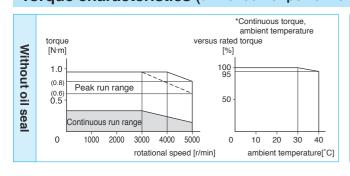
Static friction torque (N·m)	0.29 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.3
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

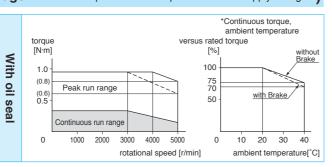
#### • Permissible load (For details, refer to P.104)

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

- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.30.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

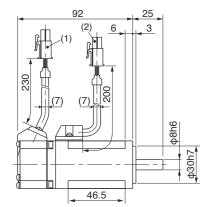
#### Torque characteristics (at AC100V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)





#### **Dimensions**

Mass (kg)/ 0.47 <Without Brake>



- (1) Encoder connector
- (2) Motor connector

Key way dimensions

\* For the dimensions of 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**

		AC200V		
Motor model *1		MSMD	012G1	012S1
	Model	A5 series	MADHT1505	
Applicable driver *2	No.	A5E series	MADH	Г1505Е
	Frame symbol		A-frame	
Power supply capacit	у	(kVA)	0.	5
Rated output		(W)	10	00
Rated torque		(N·m)	0.3	32
Momentary Max. pea	k torqu	ıe (N·m)	0.0	95
Rated current		(A(rms))	1.	1
Max. current		(A(o-p))	4.7	
Regenerative brake	Without option		No limit Note)2	
frequency (times/min) Note)1	DV0P4281		No limit Note)2	
Rated rotational spee	d	(r/min)	3000	
Max. rotational speed		(r/min)	5000	
Moment of inertia	Without brake		0.051	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	With brake		0.054	
Recommended mome ratio of the load and to		30 times or less		
Rotary encoder speci	ficatior	Note)5	20-bit Incremental	17-bit Absolute
Resolut	single turn	1,048,576	131,072	

• Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.) Do not use this for braking the motor in motion.

(20 mor door time for breaking time motor)	, , , ,
Static friction torque (N·m)	0.29 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.3
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

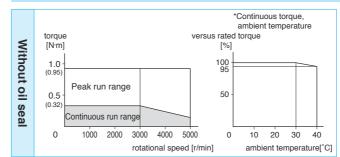
#### • Permissible load (For details, refer to P.104)

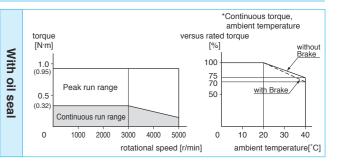
During assembly	Radial load P-direction (N)	147
	Thrust load A-direction (N)	88
	Thrust load B-direction (N)	117.6
During operation	Radial load P-direction (N)	68.6
	Thrust load A, B-direction (N)	58.8

- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.30.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type".

Detail of model designation, refer to P.11.

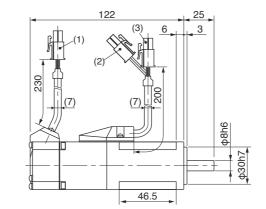
## Torque characteristics (at AC200V of power voltage)





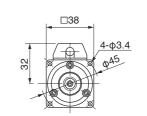
#### **Dimensions**

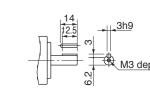
<With Brake> Mass (kg)/ 0.68



- (1) Encoder connector
- (2) Brake connector
- (3) Motor connector

#### Key way dimensions





\* For the dimensions of without brake, refer to the left page.

		AC100V		
Motor model *1		MSMD	021G1	021S1
	Model	A5 series	MBDH	T2110
Applicable driver *2	No.	A5E series	MBDHT2110E	
	Fran	ne symbol	B-frame	
Power supply capacit	У	(kVA)	0.	.5
Rated output		(W)	20	00
Rated torque		(N·m)	0.0	64
Momentary Max. pea	k torqu	ie (N·m)	1.9	91
Rated current		(A(rms))	2.5	
Max. current		(A(o-p))	10.6	
Regenerative brake	Without option		No limit Note)2	
frequency (times/min) Note)1	DV0P4283		No limit Note)2	
Rated rotational spee	d	(r/min)	3000	
Max. rotational speed	l	(r/min)	5000	
Moment of inertia	Without brake		0.14	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	With brake		0.16	
Recommended moment of inertia ratio of the load and the rotor Note)3		30 times	s or less	
Rotary encoder specifications Note)5		20-bit Incremental	17-bit Absolute	
Resolution per single turn		1,048,576	131,072	

#### • Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

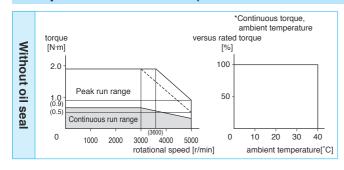
Static friction torque (N·m)	1.27 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

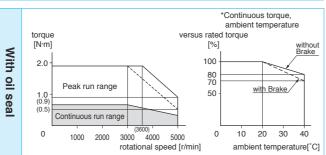
#### • Permissible load (For details, refer to P.104)

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 5, refer to P.104.
- · Dimensions of Driver, refer to P.30.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

# Torque characteristics (at AC100V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)

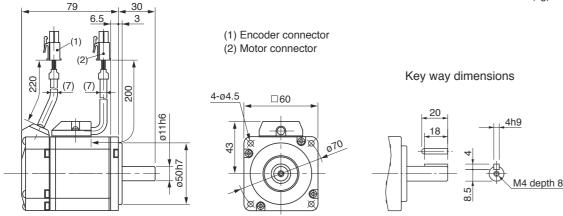




#### **Dimensions**

<Without Brake>

Mass (kg)/ 0.82



<sup>\*</sup> For the dimensions of 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**

			AC2	00V
Motor model *1		MSMD	022G1	022S1
	Model	A5 series	MADH	T1507
Applicable driver *2	No.	A5E series	MADH	Г1507Е
	Fran	ne symbol	A-frame	
Power supply capacit	y	(kVA)	0.5	
Rated output		(W)	20	00
Rated torque		(N·m)	0.0	64
Momentary Max. pea	k torqu	ıe (N·m)	1.9	91
Rated current		(A(rms))	1.6	
Max. current		(A(o-p))	6.9	
Regenerative brake	Without option		No limit Note)2	
frequency (times/min) Note)	DV0P4283		No limit Note)2	
Rated rotational spee	ed	(r/min)	3000	
Max. rotational speed	d	(r/min)	5000	
Moment of inertia	With	out brake	0.14	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )		th brake	0.16	
Recommended moment of inertia ratio of the load and the rotor Note)3			30 times	s or less
Rotary encoder specifications Note)5		Note)5	20-bit Incremental	17-bit Absolute
Resolution per single turn			1,048,576	131,072

• Brake specifications (For details, refer to P.105) /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

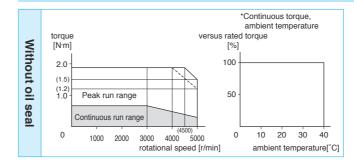
#### • Permissible load (For details, refer to P.104)

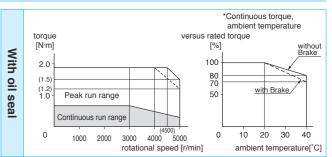
	Radial load P-direction (N)	392
During assembly	Thrust load A-direction (N)	147
accombiy	Thrust load B-direction (N)	196
During	Radial load P-direction (N)	245
operation	Thrust load A, B-direction (N)	98

- For details of Note 1 to Note 5, refer to P.104.
- Dimensions of Driver, refer to P.30.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type".

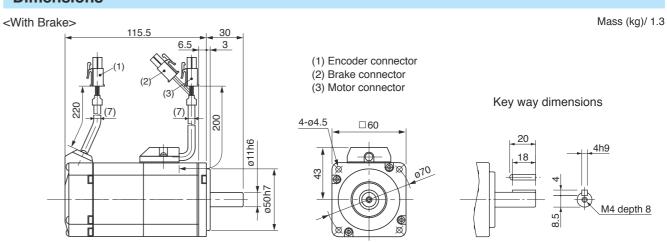
Detail of model designation, refer to P.11.

# Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)





#### **Dimensions**



\* For the dimensions of without brake, refer to the left page.

			AC1	00V	
Motor model *1 MSMD			041G1	041S1	
	Model	A5 series	MCDHT3120		
Applicable driver *2	No.	A5E series	MCDHT3120E		
	Frame symbol		C-frame		
Power supply capacit	у	(kVA)	0.	.9	
Rated output		(W)	40	00	
Rated torque		(N·m)	1.	.3	
Momentary Max. peal	k torqu	e (N·m)	3.	.8	
Rated current		(A(rms))	4.6		
Max. current		(A(o-p))	19.5		
Regenerative brake	Without option		No limi	No limit Note)2	
frequency (times/min) Note)1	DV0P4282		No limit Note)2		
Rated rotational spee	d	(r/min)	3000		
Max. rotational speed		(r/min)	5000		
Moment of inertia	With	out brake	0.2	26	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	th brake	0.28		
Recommended moment of inertia ratio of the load and the rotor Note)3		30 times	s or less		
Rotary encoder speci	ficatior	Note)5	20-bit Incremental	17-bit Absolute	
Resolut	ion per	single turn	1,048,576	131,072	

#### • Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

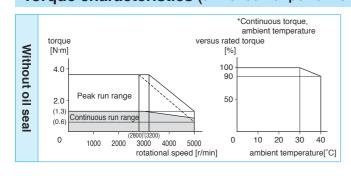
Static friction torque (N·m)	1.27 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

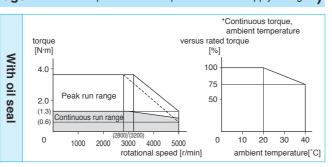
#### • Permissible load (For details, refer to P.104)

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 5, refer to P.104.
- · Dimensions of Driver, refer to P.31.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

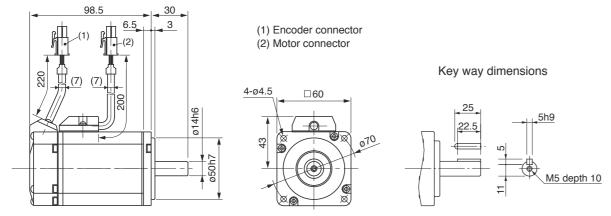
# Torque characteristics (at AC100V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)





#### **Dimensions**

Mass (kg)/ 1.2 <Without Brake>



<sup>\*</sup> For the dimensions of 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**

			AC2	00V	
Motor model *1		MSMD	042G1	042S1	
	Model	A5 series	MBDH	T2510	
Applicable driver *2	No.	A5E series	MBDHT2510E		
	Frame symbol		B-frame		
Power supply capacit	у	(kVA)	0.	0.9	
Rated output		(W)	40	00	
Rated torque		(N·m)	1.	3	
Momentary Max. pea	k torqu	ie (N·m)	3.	8	
Rated current		(A(rms))	2.6		
Max. current		(A(o-p))	11.0		
Regenerative brake	Without option		No limit Note)2		
frequency (times/min) Note)1	DV0P4283		No limit Note)2		
Rated rotational spee	d	(r/min)	3000		
Max. rotational speed		(r/min)	5000		
Moment of inertia	With	out brake	0.26		
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	th brake	0.28		
Recommended moment of inertia ratio of the load and the rotor Note)3		30 times	s or less		
Rotary encoder specifications No.		Note)5	20-bit Incremental	17-bit Absolute	
Resolut	ion per	single turn	1,048,576	131,072	

• Brake specifications (For details, refer to P.105) /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

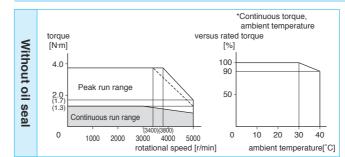
#### • Permissible load (For details, refer to P.104)

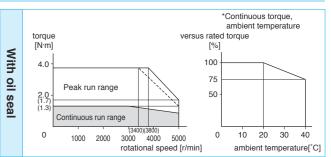
	During assembly  During operation	Radial load P-direction (N)	392
		Thrust load A-direction (N)	147
		Thrust load B-direction (N)	196
		Radial load P-direction (N)	245
		Thrust load A, B-direction (N)	98

- For details of Note 1 to Note 5, refer to P.104.
- Dimensions of Driver, refer to P.30.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type".

Detail of model designation, refer to P.11.

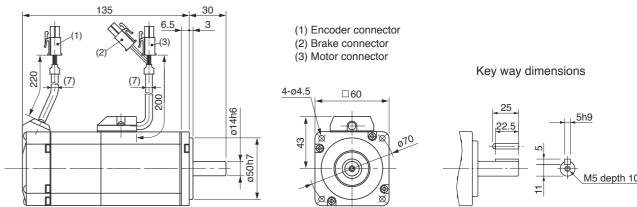
# Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)





#### **Dimensions**

<With Brake> Mass (kg)/ 1.7



\* For the dimensions of without brake, refer to the left page.

			AC2	200V	
Motor model *1 MSMD			082G1□	082S1	
	Model	A5 series	MCDHT3520		
Applicable driver *2	No.	A5E series	MCDHT3520E		
	Fran	ne symbol	C-frame		
Power supply capacit	У	(kVA)	1.	.3	
Rated output		(W)	75	50	
Rated torque		(N·m)	2	.4	
Momentary Max. pea	k torqu	ie (N·m)	7.	.1	
Rated current		(A(rms))	4.0		
Max. current	Max. current (A(o-p))			17.0	
Regenerative brake	Without option		No limit Note)2		
frequency (times/min) Note)1	DV0P4283		No limit Note)2		
Rated rotational spee	d	(r/min)	3000		
Max. rotational speed	l	(r/min)	4500		
Moment of inertia	With	out brake	0.8	87	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	th brake	0.97		
Recommended moment of inertia ratio of the load and the rotor Note)3		20 times	s or less		
Rotary encoder speci	fication	Note)5	20-bit Incremental	17-bit Absolute	
Resolut	Resolution per single turn		1,048,576	131,072	

• Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

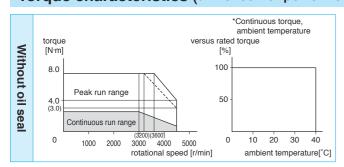
Static friction torque (N·m)	2.45 or more
Engaging time (ms)	70 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.42
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

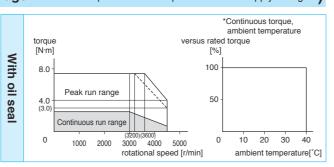
#### • Permissible load (For details, refer to P.104)

	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

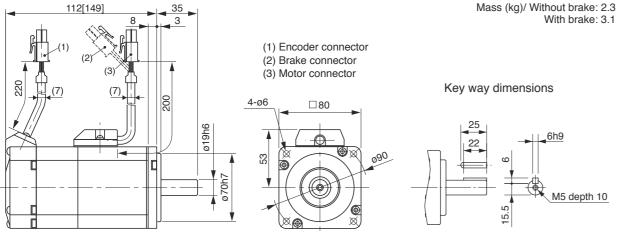
- For details of Note 1 to Note 5, refer to P.104.
- Dimensions of Driver, refer to P.31.
- \*1 Rotaly encoder specifications:  $\Box$
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

# Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)





### **Dimensions**



\* Figures in [ ] represent the dimensions of with brake.

MEMO

# Motor Specifications 200V MHMD 200W [High inertia, Small capacity]

# **Specifications**

			AC1	00V
Motor model *1 MHMD			021G1	021S1
	Model	A5 series	MBDH	T2110
Applicable driver *2	No.	A5E series	MBDHT2110E	
	Fran	ne symbol	B-frame	
Power supply capacit	у	(kVA)	0	5
Rated output		(W)	20	00
Rated torque		(N·m)	0.0	64
Momentary Max. pea	k torqu	ıe (N·m)	1.9	91
Rated current		(A(rms))	2.5	
Max. current (A(o-p))		(A(o-p))	10.6	
Regenerative brake	Without option		No limit Note)2	
frequency (times/min) Note)1	DV0P4283		No limit Note)2	
Rated rotational spee	d	(r/min)	3000	
Max. rotational speed		(r/min)	5000	
Moment of inertia	With	out brake	0.42	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	th brake	0.45	
Recommended moment of inertia ratio of the load and the rotor Note)3		10 times	s or less	
Rotary encoder specifications Note)5		20-bit Incremental	17-bit Absolute	
Resolution per single turn		r single turn	1,048,576	131,072

#### • Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

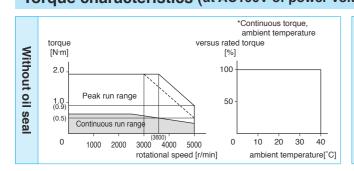
Static friction torque (N·m)	1.27 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

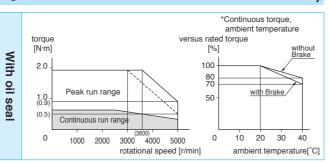
#### • Permissible load (For details, refer to P.104)

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

- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.30.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

# Torque characteristics (at AC100V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)

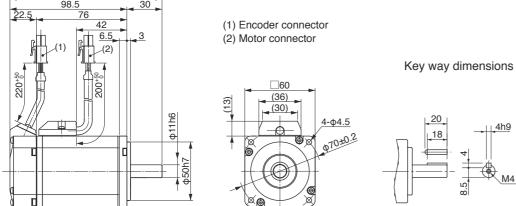




#### **Dimensions**

<Without Brake>

Mass (kg)/ 0.96



\* For the dimensions of with brake, refer to the right page.

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

### **Specifications**

				AC2	200V
Motor model *	:1		MHMD	022G1	022S1
		Model	A5 series	MADHT1507	
Applicable driv	/er *2	No.	A5E series	MADHT1507E	
		Frame symbol		A-frame	
Power supply	capacit	у	(kVA)	0	.5
Rated output			(W)	20	00
Rated torque			(N·m)	0.0	64
Momentary Ma	ax. pea	k torqu	e (N·m)	1.9	91
Rated current			(A(rms))	1.6	
Max. current (A(		(A(o-p))	6.9		
Regenerative brake frequency (times/min) Note)1		Without option		No limit Note)2	
		DV0P4283		No limit Note)2	
Rated rotational speed (r/min)		(r/min)	3000		
Max. rotationa	l speed	l	(r/min)	5000	
Moment of ine	rtia	With	out brake	0.42	
of rotor (×10 <sup>-4</sup> kg·m²) With brak		th brake	0.45		
Recommended moment of inertia ratio of the load and the rotor Note)3		10 times	s or less		
Rotary encoder specification		fication	Note)5	20-bit Incremental	17-bit Absolute
		ion per	single turn	1,048,576	131,072

• Brake specifications (For details, refer to P.105) /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

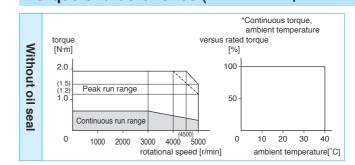
#### • Permissible load (For details, refer to P.104)

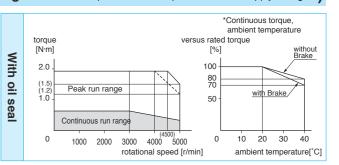
	During assembly	Radial load P-direction (N)	392
		Thrust load A-direction (N)	147
		Thrust load B-direction (N)	196
	During	Radial load P-direction (N)	245
	operation	Thrust load A, B-direction (N)	98

- For details of Note 1 to Note 5, refer to P.104.
- Dimensions of Driver, refer to P.30.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type".

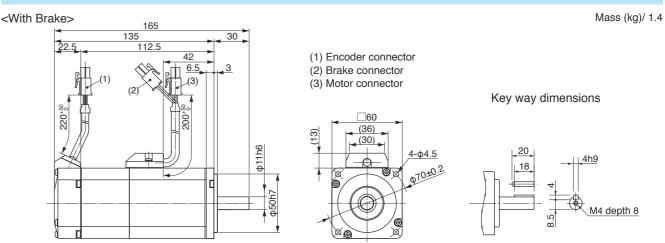
#### Detail of model designation, refer to P.11.

# Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)





#### **Dimensions**



\* For the dimensions of without brake, refer to the left page.

			AC1	00V
Motor model *1		MHMD	041G1	041S1
	Model	A5 series	MCDHT3120	
Applicable driver *2	No.	A5E series	MCDHT3120E	
	Fran	ne symbol	C-fra	ame
Power supply capacit	у	(kVA)	0.	9
Rated output		(W)	40	00
Rated torque		(N·m)	1.	3
Momentary Max. pea	k torqu	e (N·m)	3.	8
Rated current		(A(rms))	4.6	
Max. current (A(o-p))			11	
Regenerative brake	Without option		No limit Note)2	
frequency (times/min) Note)1 DV0P4282		0P4282	No limit Note)2	
Rated rotational speed (r/min)			3000	
Max. rotational speed		(r/min)	5000	
Moment of inertia	With	out brake	0.67	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	th brake	0.70	
Recommended moment of inertia ratio of the load and the rotor Note)3			10 times	s or less
Rotary encoder specifications Note)5		20-bit Incremental	17-bit Absolute	
Resolution per single turn		1,048,576	131,072	

#### • Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

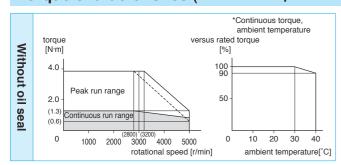
Static friction torque (N·m)	1.27 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

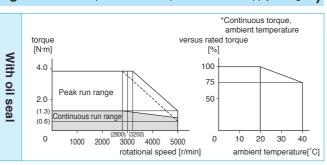
#### • Permissible load (For details, refer to P.104)

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

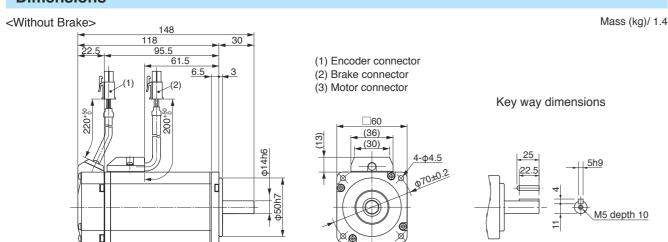
- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.31.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

# Torque characteristics (at AC100V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)





#### **Dimensions**



\* For the dimensions of 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**

			AC2	200V
Motor model *1		MHMD	042G1	042S1
Model		A5 series	MBDHT2510	
Applicable driver *2	No.	A5E series	MBDHT2510E	
	Frame symbol		B-frame	
Power supply capacit	у	(kVA)	0	.9
Rated output		(W)	40	00
Rated torque		(N·m)	1.	.3
Momentary Max. pea	k torqu	e (N·m)	3.	.8
Rated current		(A(rms))	2.6	
Max. current		(A(o-p))	19.5	
Regenerative brake	Without option		No limit Note)2	
frequency (times/min) Note)1	DV0P4283		No limit Note)2	
Rated rotational spee	d	(r/min)	3000	
Max. rotational speed		(r/min)	5000	
Moment of inertia	With	out brake	0.67	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )		th brake	0.70	
Recommended moment of inertia ratio of the load and the rotor Note)3		10 times or less		
Rotary encoder speci	fication	Note)5	20-bit Incremental	17-bit Absolute
Resolution per single turn			1,048,576	131,072

• Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.) Do not use this for braking the motor in motion.

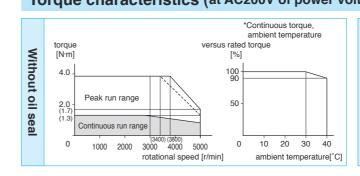
•	,
Static friction torque (N·m)	1.27 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

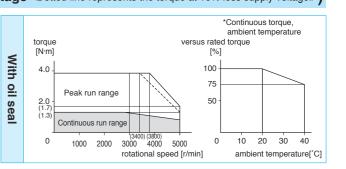
#### • Permissible load (For details, refer to P.104)

	<b>.</b>	Radial load P-direction (N)	392
	During assembly	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

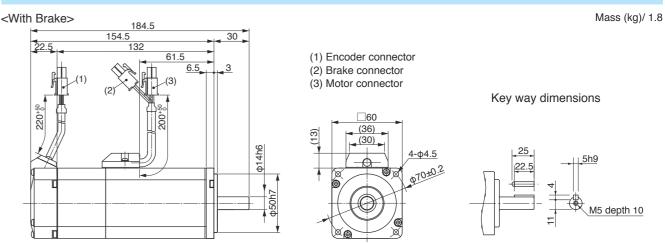
- For details of Note 1 to Note 5, refer to P.104.
- Dimensions of Driver, refer to P.30.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

# Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)





#### **Dimensions**



\* For the dimensions of without brake, refer to the left page.

		AC2	00V	
Motor model *1	otor model *1		082G1□	082S1
	Model	A5 series	MCDH	T3520
Applicable driver *2	No.	A5E series	MCDHT3520E	
	Frame symbol		C-frame	
Power supply capacit	у	(kVA)	1.	.3
Rated output		(W)	75	50
Rated torque		(N·m)	2.	4
Momentary Max. peal	Momentary Max. peak torque (N·m)			.1
Rated current		(A(rms))	4.0	
Max. current		(A(o-p)) 17.0		'.O
Regenerative brake	Without option		No limit Note)2	
frequency (times/min) Note)1	DV0P4283		No limit Note)2	
Rated rotational spee	d	(r/min)	3000	
Max. rotational speed		(r/min)	4500	
Moment of inertia	Without brake		1.51	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	th brake	1.61	
Recommended moment of inertia ratio of the load and the rotor Note)			10 times or less	
Rotary encoder speci	ficatior	Note)5	20-bit Incremental	17-bit Absolute
Resolut	ion per	r single turn	1,048,576	131,072

#### • Brake specifications (For details, refer to P.105) (This brake will be released when it is energized.) Do not use this for braking the motor in motion.

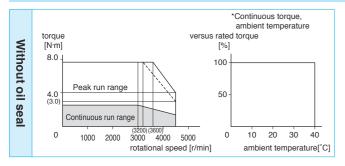
Static friction torque (N·m)	2.45 or more	
Engaging time (ms)	70 or less	
Releasing time (ms) Note)4	20 or less	
Exciting current (DC) (A)	0.42	
Releasing voltage (DC) (V)	1 or more	
Exciting voltage (DC) (V)	24±1.2	

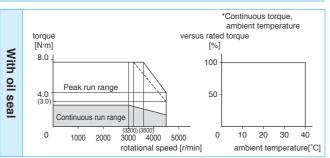
#### • Permissible load (For details, refer to P.104)

		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
opera	operation	Thrust load A, B-direction (N)	147

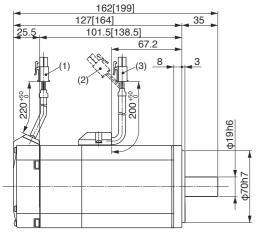
- For details of Note 1 to Note 5, refer to P.104.
- Dimensions of Driver, refer to P.31.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

# Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)





### **Dimensions**



Mass (kg)/ Without brake: 2.5 With brake: 3.5

- (1) Encoder connector (2) Brake connector
- (3) Motor connector
- Key way dimensions

\* Figures in [ ] represent the dimensions of with brake.

MEMO

			AC400V	
Motor model *1	otor model *1 MSME		104G1	104S1
	Model	A5 series	MDDH	T3420
Applicable driver *2	No.	A5E series	MDDHT3420E	
	Fran	ne symbol	D-frame	
Power supply capacit	у	(kVA)	1.	8
Rated output		(W)	1.	.0
Rated torque		(N·m)	3.	18
Momentary Max. peal	Momentary Max. peak torque (N·m)			55
Rated current (A(rms))			3.3	
Max. current		(A(o-p))	14	
Regenerative brake	Without option		No limit Note)2	
frequency (times/min) Note)1	DV0PM20048		No limit Note)2	
Rated rotational spee	d	(r/min)	3000	
Max. rotational speed		(r/min)	50	00
Moment of inertia	With	out brake	2.03	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	With brake		2.35	
Recommended moment of inertia ratio of the load and the rotor Note)3			0 times or less	
Rotary encoder speci	ficatior	Note)5	20-bit Incremental	17-bit Absolute
Resolut	ion per	r single turn	1,048,576	131,072

#### • Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

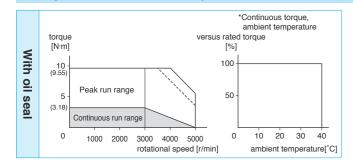
Static friction torque (N·m)	7.8 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.81±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

#### • Permissible load (For details, refer to P.104)

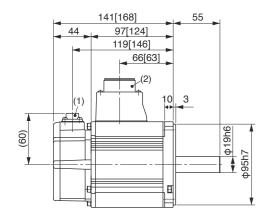
During assembly  During operation	During assembly	Radial load P-direction (N)	980
		Thrust load A-direction (N)	588
		Thrust load B-direction (N)	686
	During	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196	

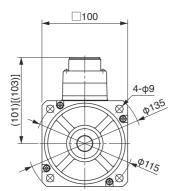
- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.32.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

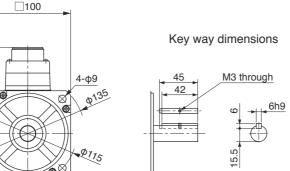
# Torque characteristics (at AC400V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



#### **Dimensions**







Mass (kg)/ Without brake: 3.5

With brake: 4.5

- (1) Encoder connector
- (2) Motor/Brake connector
- \* Figures in [ ] represent the dimensions of 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**

			AC4	.00V
Motor model *1		MSME	154G1□	154S1 <u></u>
Mode		A5 series	MDDHT3420	
Applicable driver *2	No.	A5E series	MDDHT3420E	
	Frame symbol		D-frame	
Power supply capacity	y	(kVA)	2	3
Rated output		(W)	1.	.5
Rated torque		(N·m)	4.	77
Momentary Max. peal	k torqu	e (N·m)	14	.3
Rated current		(A(rms))	4.2	
Max. current		(A(o-p)) 18		8
Regenerative brake	Without option		No limit Note)2	
frequency (times/min) Note)1	DV0PM20048		No limit Note)2	
Rated rotational spee	d	(r/min)	3000	
Max. rotational speed		(r/min)	5000	
Moment of inertia	With	out brake	2.84	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> ) γ		th brake	3.17	
Recommended moment of inertia ratio of the load and the rotor Note)3		0 times	or less	
Rotary encoder specif	fication	Note)5	20-bit Incremental	17-bit Absolute
Resolut	ion per	single turn	1,048,576	131,072

• Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.) Do not use this for braking the motor in motion.

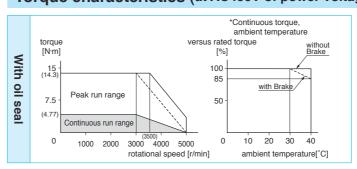
,	,
Static friction torque (N·m)	7.8 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.81±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.104)

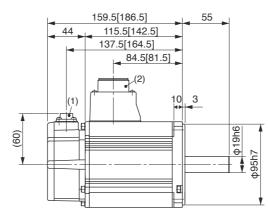
	During assembly	Radial load P-direction (N)	980
		Thrust load A-direction (N)	588
		Thrust load B-direction (N)	686
	During operation	Radial load P-direction (N)	490
		Thrust load A, B-direction (N)	196

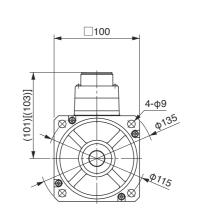
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.32.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

# Torque characteristics (at AC400V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



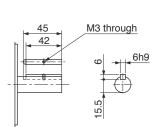
#### **Dimensions**





Mass (kg)/ Without brake: 4.4 With brake: 5.4

Key way dimensions



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

		AC4	V00V		
Motor model *1 MSME			204G1	204S1	
	Model A5 series		MEDH	T4430	
Applicable driver *2	No.	A5E series	MEDH	Γ4430E	
	Fran	ne symbol	E-frame		
Power supply capacit	y	(kVA)	3.	.3	
Rated output		(W)	2.	.0	
Rated torque		(N·m)	6.3	37	
Momentary Max. peal	k torqu	e (N·m)	19	).1	
Rated current	Rated current (A			5.7	
Max. current		(A(o-p))	24		
Regenerative brake	Without option No limit Note)2		t Note)2		
frequency (times/min) Note)1	DV0PM20049		No limit Note)2		
Rated rotational spee	d	(r/min)	3000		
Max. rotational speed		(r/min)	5000		
Moment of inertia	With	out brake	3.68		
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	th brake	4.01		
Recommended moment of inertial ratio of the load and the rotor			0 times or less		
Rotary encoder speci	ficatior	Note)5	20-bit Incremental	17-bit Absolute	
Resolution per single turn			1,048,576	131,072	

#### • Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

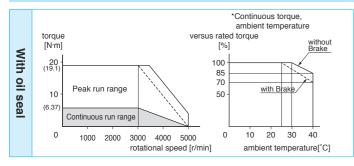
Static friction torque (N·m)	7.8 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.81±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

#### • Permissible load (For details, refer to P.104)

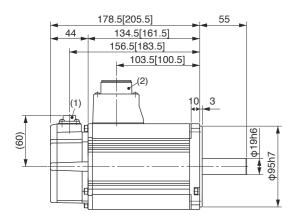
	During assembly  During operation	Radial load P-direction (N)	980
		Thrust load A-direction (N)	588
		Thrust load B-direction (N)	686
		Radial load P-direction (N)	490
		Thrust load A, B-direction (N)	196

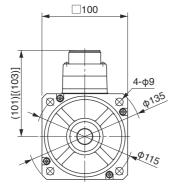
- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.33.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

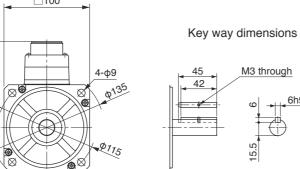
# Torque characteristics (at AC400V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



#### **Dimensions**







Mass (kg)/ Without brake: 5.3

With brake: 6.3

- (1) Encoder connector
- (2) Motor/Brake connector
- \* Figures in [ ] represent the dimensions of 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**

			AC400V		
Motor model *1		MSME	304G1□	304S1	
	Model	A5 series	MFDH	T5440	
Applicable driver *2	No.	A5E series	MFDHT	Γ5440 <b>E</b>	
	Fran	ne symbol	F-fra	ame	
Power supply capaci	ty	(kVA)	4.	.5	
Rated output		(kW)	3.	.0	
Rated torque		(N·m)	9.9	55	
Momentary Max. pea	k torqu	ıe (N·m)	28	3.6	
Rated current		(A(rms))	9.2		
Max. current		(A(o-p))	39		
Regenerative brake	With	out option	No limit Note)2		
frequency (times/min) Note)	DV0P	M20049×2	No limit Note)2		
Rated rotational spec	ed	(r/min)	3000		
Max. rotational speed	t	(r/min)	50	00	
Moment of inertia	With	out brake	6.50		
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	th brake	7.85		
Recommended moment of i ratio of the load and the roto			0 times	or less	
Rotary encoder spec	ification	Note)5	20-bit Incremental	17-bit Absolute	
Resolu	tion per	r single turn	1,048,576	131,072	

• Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.) Do not use this for braking the motor in motion.

,	,
Static friction torque (N·m)	11.8 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

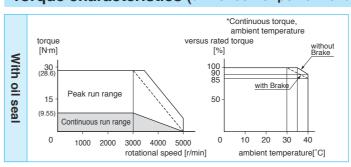
• Permissible load (For details, refer to P.104)

	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

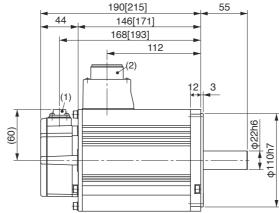
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type".

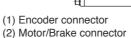
Detail of model designation, refer to P.11.

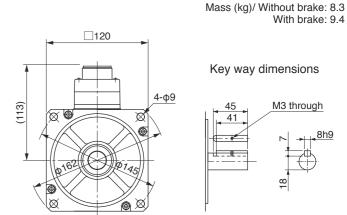
# Torque characteristics (at AC400V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



#### **Dimensions**







Key way dimensions

With brake: 9.4

- \* Figures in [ ] represent the dimensions of with brake.

		AC4	.00V		
Motor model *1 MSME			404G1□	404S1	
	Model	A5 series	MFDH	TA464	
Applicable driver *2 No		A5E series	MFDHT	TA464E	
	Fran	ne symbol	F-fra	ame	
Power supply capacit	у	(kVA)	6.	8	
Rated output		(kW)	4.	0	
Rated torque		(N·m)	12	2.7	
Momentary Max. peal	k torqu	ıe (N·m)	38	38.2	
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	DV0PM20049×2		No limit Note)2		
Rated rotational spee	d	(r/min)	3000		
Max. rotational speed		(r/min)	45	00	
Moment of inertia	With	out brake	12.9		
of rotor ( $\times 10^{-4} \text{kg} \cdot \text{m}^2$ )	Wi	th brake	brake 14.2		
Recommended moment of inertia ratio of the load and the rotor Note)3		0 times	or less		
Rotary encoder speci	ficatior	Note)5	20-bit Incremental	17-bit Absolute	
Resolut	ion per	r single turn	1,048,576	131,072	

#### • Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

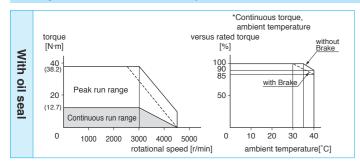
Static friction torque (N·m)	16.1 or more	
Engaging time (ms)	110 or less	
Releasing time (ms) Note)4 50 or less		
Exciting current (DC) (A)	0.90±10%	
Releasing voltage (DC) (V)	2 or more	
Exciting voltage (DC) (V)	24±2.4	

#### • Permissible load (For details, refer to P.104)

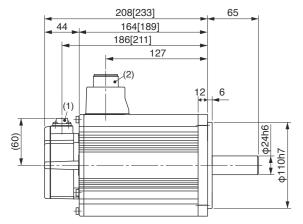
	During assembly  During operation	Radial load P-direction (N)	980
		Thrust load A-direction (N)	588
		Thrust load B-direction (N)	686
		Radial load P-direction (N)	784
		Thrust load A, B-direction (N)	343

- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

### Torque characteristics (at AC400V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



#### **Dimensions**



□130

Key way dimensions

Mass (kg)/ Without brake: 11.0

With brake: 12.6

- (1) Encoder connector
- (2) Motor/Brake connector
- \* Figures in [ ] represent the dimensions of 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**

			AC400V		
Motor model *1		MSME	504G1□	504S1□	
	Model	A5 series	MFDH	TA464	
Applicable driver *2	No.	A5E series	MFDH	TA464E	
	Fran	ne symbol	F-frame		
Power supply capacit	у	(kVA)	7	.5	
Rated output		(kW)	5	.0	
Rated torque		(N·m)	15	5.9	
Momentary Max. pea	k torqu	ie (N·m)	47	<b>'</b> .7	
Rated current		(A(rms))	12.0		
Max. current		(A(o-p)) 51		1	
Regenerative brake		out option	357		
frequency (times/min) Note)1	DV0P	0V0PM20049×2 No limit Note)2		it Note)2	
Rated rotational spee	d	(r/min)	3000		
Max. rotational speed		(r/min)	45	00	
Moment of inertia	With	out brake	17.4		
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	th brake	18.6		
Recommended moment of inertia ratio of the load and the rotor			0 times	or less	
Rotary encoder speci	fication	Note)5	20-bit Incremental	17-bit Absolute	
Resolut	ion per	single turn	1,048,576	131,072	

• Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.) Do not use this for braking the motor in motion.

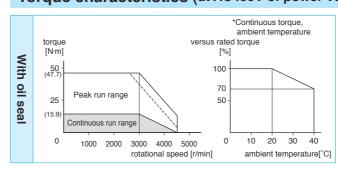
1	,
Static friction torque (N·m)	16.1 or more
Engaging time (ms)	110 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.90±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.104)

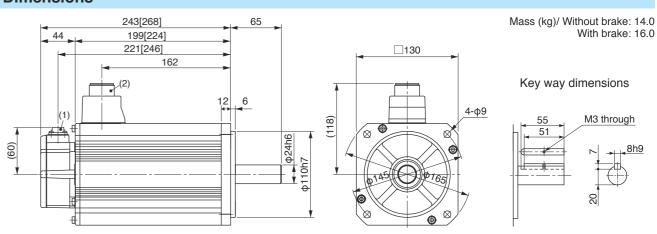
	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
accombiy	Thrust load B-direction (N)	686
During	Radial load P-direction (N)	784
operation	Thrust load A, B-direction (N)	343

- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

# Torque characteristics (at AC400V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



#### **Dimensions**



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

		AC4	.00V	
Motor model *1		104G1□	104S1	
	Model	A5 series	MDDH	T2412
Applicable driver *2	No.	A5E series	MDDHT2412E	
	Fran	ne symbol	D-fr	ame
Power supply capacity	у	(kVA)	1.	8
Rated output		(W)	1.	.0
Rated torque		(N·m)	4.	77
Momentary Max. peal	k torqu	e (N·m)	14	l.3
Rated current		(A(rms))	2.8	
Max. current		(A(o-p))	12	
Regenerative brake	Without option		No limit Note)2	
frequency (times/min) Note)1	DV0PM20048		No limit Note)2	
Rated rotational spee	d	(r/min)	2000	
Max. rotational speed		(r/min)	3000	
Moment of inertia	Without brake		4.60	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	With brake		5.90	
Recommended moment of inertia ratio of the load and the rotor Noi			0 times or less	
Rotary encoder specif	ficatior	IS Note)5	20-bit Incremental	17-bit Absolute
Resolut	ion per	1,048,576	131,072	

#### • Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

Static friction torque (N·m)	4.9 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	70 or less
Exciting current (DC) (A)	0.59±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

#### • Permissible load (For details, refer to P.104)

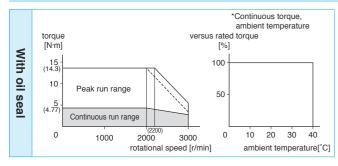
	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
accombiy	Thrust load B-direction (N)	686
During	Radial load P-direction (N)	490
operation	Thrust load A, B-direction (N)	196

- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.32.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

Mass (kg)/ Without brake: 5.2

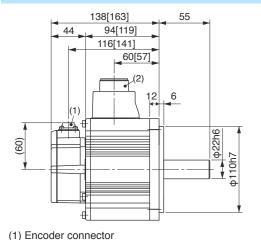
With brake: 6.7

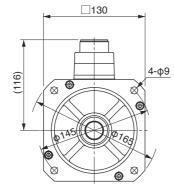
# Torque characteristics (at AC400V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



#### **Dimensions**

(2) Motor/Brake connector





Key way dimensions 41

- \* Figures in [ ] represent the dimensions of 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**

		AC4	.00V	
Motor model *1		MDME	154G1□	154S1 <u></u>
	Model	A5 series	MDDH	T3420
Applicable driver *2	No.	A5E series	MDDHT3420E	
	Fran	ne symbol	D-frame	
Power supply capacit	у	(kVA)	2.	3
Rated output		(W)	1.	.5
Rated torque		(N·m)	7.	16
Momentary Max. pea	k torqu	e (N·m)	21	.5
Rated current		(A(rms))	4.7	
Max. current		(A(o-p))	20	
Regenerative brake	Without option		No limit Note)2	
frequency (times/min) Note)1	DV0	PM20048	No limit Note)2	
Rated rotational spee	d	(r/min)	2000	
Max. rotational speed	l	(r/min)	3000	
Moment of inertia	With	out brake	6.70	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	ith brake 7.99		99
Recommended moment of inertia ratio of the load and the rotor Note)3			0 times	or less
Rotary encoder speci	fication	Note)5	20-bit Incremental	17-bit Absolute
Resolut	ion per	single turn	1,048,576	131,072

• Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.) Do not use this for braking the motor in motion.

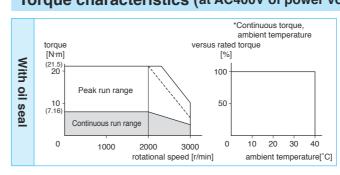
1	,
Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.104)

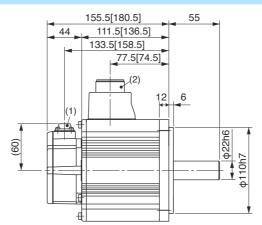
	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
docombry	Thrust load B-direction (N)	686
During	Radial load P-direction (N)	490
operation	Thrust load A, B-direction (N)	196

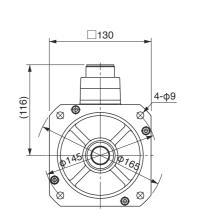
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.32.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

# Torque characteristics (at AC400V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



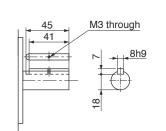
### **Dimensions**





Mass (kg)/ Without brake: 6.7 With brake: 8.2

Key way dimensions



- (1) Encoder connector
- (2) Motor/Brake connector
- \* Figures in [ ] represent the dimensions of 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

With brake: 12.6

# **Specifications**

		AC4	.00V	
Motor model *1 MDME			204G1	204S1
	Model No.	A5 series	MEDH	T4430
Applicable driver *2		A5E series	MEDH	Γ4430E
	Fran	ne symbol	E-frame	
Power supply capacit	у	(kVA)	3.	.3
Rated output		(W)	2	.0
Rated torque		(N·m)	9.	55
Momentary Max. pea	k torqu	ie (N·m)	28	3.6
Rated current (A(rms))			5.9	
Max. current		(A(o-p))	25	
Regenerative brake	Without option		No limit Note)2	
frequency (times/min) Note)1	DV0PM20049		No limit Note)2	
Rated rotational spee	d	(r/min)	2000	
Max. rotational speed		(r/min)	3000	
Moment of inertia	Without brake		8.72	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	th brake	10.0	
Recommended moment of inertia ratio of the load and the rotor Note)3		0 times or less		
Rotary encoder speci	ficatior	Note)5	20-bit Incremental	17-bit Absolute
Resolut	ion per	r single turn	1,048,576	131,072

#### • Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

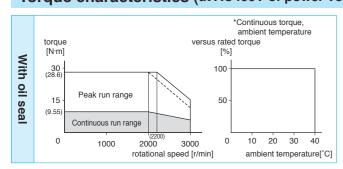
Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

#### • Permissible load (For details, refer to P.104)

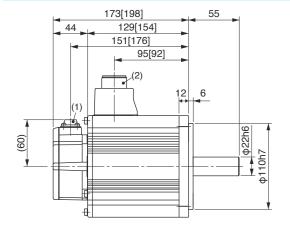
		Radial load P-direction (N)	980
	During assembly	Thrust load A-direction (N)	588
	accombiy	Thrust load B-direction (N)	686
	During	Radial load P-direction (N)	490
	operation	Thrust load A, B-direction (N)	196

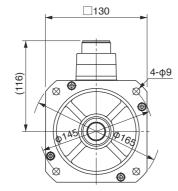
- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.33.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

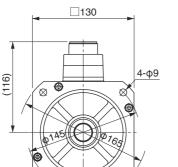
# Torque characteristics (at AC400V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



### **Dimensions**







Key way dimensions 41

Mass (kg)/ Without brake: 8.0

With brake: 9.5

- (1) Encoder connector
- (2) Motor/Brake connector
- \* Figures in [ ] represent the dimensions of 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**

				AC4	00V
Motor model *1 MDME				304G1□	304S1□
		Model	A5 series	MFDH	T5440
Applicable drive	r *2	No.	A5E series	MFDH	5440E
		Fram	ne symbol	F-frame	
Power supply ca	apacit	у	(kVA)	4.	5
Rated output			(W)	3.	0
Rated torque			(N·m)	14	.3
Momentary Max	. peal	k torqu	e (N·m)	43	.0
Rated current			(A(rms))	8.7	
Max. current			(A(o-p))	37	
Regenerative bra	ake	Without option		No limit Note)2	
frequency (times/min	n) Note)1	DV0PM20049×2		No limit Note)2	
Rated rotational	spee	d	(r/min)	2000	
Max. rotational s	speed		(r/min)	3000	
Moment of inerti	ia	With	out brake	rake 12.9	
of rotor (×10 <sup>-4</sup> kg	g·m²)	Wit	th brake	14.2	
Recommended moment of inertia ratio of the load and the rotor Note)3			0 times	or less	
Rotary encoder	speci	ficatior	Note)5	20-bit Incremental	17-bit Absolute
Re	esolut	ion per	single turn	1,048,576	131,072

• Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.) Do not use this for braking the motor in motion.

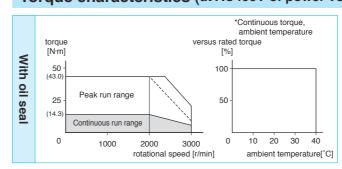
,	,
Static friction torque (N·m)	16.2 or more
Engaging time (ms)	110 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.90±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.104)

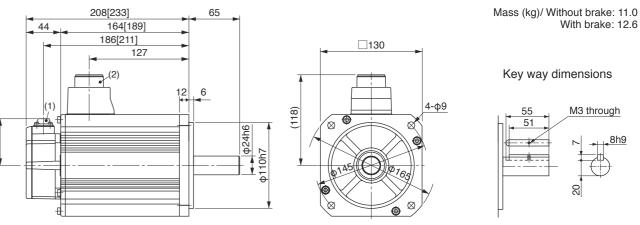
	During assembly During operation	Radial load P-direction (N)	980
		Thrust load A-direction (N)	588
		Thrust load B-direction (N)	686
		Radial load P-direction (N)	784
		Thrust load A, B-direction (N)	343

- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

# Torque characteristics (at AC400V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



#### **Dimensions**



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

		AC4	V00V	
Motor model *1 MDME			404G1□	404S1
	Model	A5 series	MFDH	TA464
Applicable driver *2	No.	A5E series	MFDHTA464E	
	Fran	ne symbol	F-frame	
Power supply capacit	у	(kVA)	6.	8
Rated output		(W)	4.	0
Rated torque		(N·m)	19	.1
Momentary Max. peal	k torqu	ie (N·m)	57	.3
Rated current		(A(rms))	10.6	
Max. current		(A(o-p))	45	
Regenerative brake	Without option		No limit Note)2	
frequency (times/min) Note)1	DV0PM20049×2		No limit Note)2	
Rated rotational spee	d	(r/min)	2000	
Max. rotational speed		(r/min)	3000	
Moment of inertia	With	out brake	37.6	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	With brake		38.6	
Recommended moment of inertia ratio of the load and the rotor Note)3		0 times	or less	
Rotary encoder speci	ficatior	Note)5	20-bit Incremental	17-bit Absolute
Resolut	ion per	r single turn	1,048,576	131,072

#### • Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

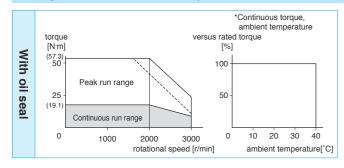
Static friction torque (N·m)	24.5 or more		
Engaging time (ms) 80 or less			
Releasing time (ms) Note)4	(ms) Note)4 25 or less		
Exciting current (DC) (A)	1.3±10%		
Releasing voltage (DC) (V) 2 or more			
Exciting voltage (DC) (V)	24±2.4		

#### • Permissible load (For details, refer to P.104)

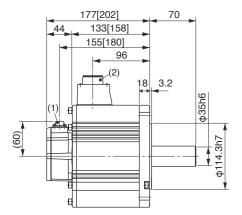
During assembly	Radial load P-direction (N)	1666	
	Thrust load A-direction (N)	784	
	Thrust load B-direction (N)	980	
	During	Radial load P-direction (N)	784
	operation	Thrust load A, B-direction (N)	343

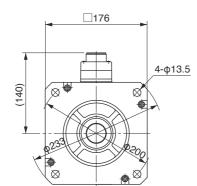
- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

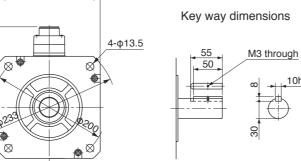
# Torque characteristics (at AC400V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



### **Dimensions**







Mass (kg)/ Without brake: 15.5

With brake: 18.7

- (1) Encoder connector
- (2) Motor/Brake connector
- \* Figures in [ ] represent the dimensions of 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**

		AC400V		
Motor model *1		MDME	504G1□	504S1
	Model	A5 series	MFDH	TA464
Applicable driver *2	No.	A5E series	MFDHTA464E	
	Fran	ne symbol	F-frame	
Power supply capacit	У	(kVA)	7.	5
Rated output		(W)	5.	0
Rated torque		(N·m)	23	.9
Momentary Max. pea	k torqu	ie (N·m)	71	.6
Rated current		(A(rms))	13.0	
Max. current		(A(o-p))	55	
Regenerative brake	Without option 120		20	
frequency (times/min) Note)1	DV0PM20049×2		No limit Note)2	
Rated rotational spee	ed	(r/min)	2000	
Max. rotational speed	I	(r/min)	3000	
Moment of inertia	With	out brake	48.0	
of rotor ( $\times 10^{-4}$ kg·m <sup>2</sup> )	Wi	Vith brake 48.8		.8
Recommended momentatio of the load and t			0 times	or less
Rotary encoder specification		Note)5	20-bit Incremental	17-bit Absolute
Resolut	Resolution per single tu			131,072

• Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.) Do not use this for braking the motor in motion.

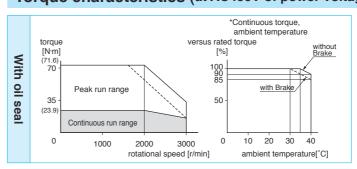
,	,
Static friction torque (N·m)	24.5 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.3±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.104)

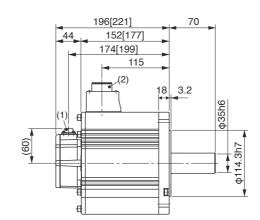
	During assembly During operation	Radial load P-direction (N)	1666
		Thrust load A-direction (N)	784
ľ		Thrust load B-direction (N)	980
		Radial load P-direction (N)	784
(		Thrust load A, B-direction (N)	343

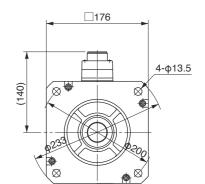
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

# Torque characteristics (at AC400V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



#### **Dimensions**





Key way dimensions 50

Mass (kg)/ Without brake: 18.6

With brake: 21.8

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

		AC4	.00V	
Motor model *1 MGME			094G1	094S1
	Model	A5 series	MDDH	T3420
Applicable driver *2	No.	A5E series	MDDHT3420E	
	Fran	ne symbol	D-frame	
Power supply capacit	y	(kVA)	1.	8
Rated output		(W)	0.	9
Rated torque		(N·m)	8.8	59
Momentary Max. peal	k torqu	e (N·m)	19	.3
Rated current		(A(rms))	3.8	
Max. current		(A(o-p))	12	
Regenerative brake	Without option		No limit Note)2	
frequency (times/min) Note)1	DV0PM20048		No limit Note)2	
Rated rotational spee	d	(r/min)	1000	
Max. rotational speed		(r/min)	2000	
Moment of inertia	With	out brake	6.70	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	th brake	7.99	
Recommended moment of inertia ratio of the load and the rotor Note)3		0 times or less		
Rotary encoder speci	ficatior	Note)5	20-bit Incremental	17-bit Absolute
Resolut	Resolution per single turn			131,072

#### • Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

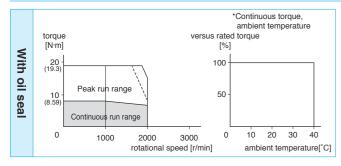
Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

#### • Permissible load (For details, refer to P.104)

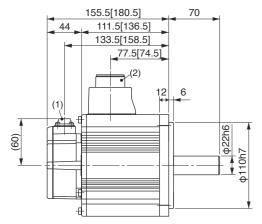
During assembly  During operation	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	686
	Thrust load A, B-direction (N)	196

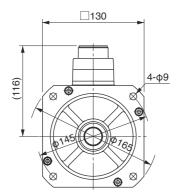
- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.32.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

# Torque characteristics (at AC400V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



#### **Dimensions**





Key way dimensions 41

Mass (kg)/ Without brake: 6.7

With brake: 8.2

- (1) Encoder connector
- (2) Motor/Brake connector
- \* Figures in [ ] represent the dimensions of 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**

			AC4	V00V
Motor model *1		MGME	204G1	204S1
	Model	A5 series	MFDH	T5440
Applicable driver *2	No.	A5E series	MFDH	Г5440Е
	Frame symbol		F-frame	
Power supply capacit	у	(kVA)	3.	.8
Rated output		(W)	2	.0
Rated torque		(N·m)	19	).1
Momentary Max. pea	k torqu	ıe (N·m)	47	7.7
Rated current		(A(rms))	8.5	
Max. current		(A(o-p))	30	
Regenerative brake	Without option		No limit Note)2	
frequency (times/min) Note)1	DV0PM20049×2		No limit Note)2	
Rated rotational spee	d	(r/min)	1000	
Max. rotational speed		(r/min)	2000	
Moment of inertia	Without brake		30.3	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	th brake	31.4	
Recommended mome ratio of the load and to			0 times	or less
Rotary encoder speci	fication	Note)5	20-bit Incremental	17-bit Absolute
Resolut	ion per	r single turn	1,048,576	131,072

• Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.) Do not use this for braking the motor in motion.

,	,
Static friction torque (N·m)	24.5 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.3±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

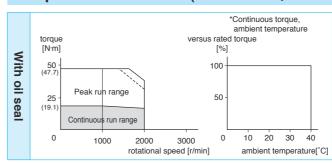
• Permissible load (For details, refer to P.104)

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

- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type".

Detail of model designation, refer to P.11.

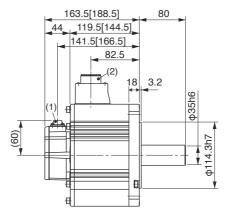
# Torque characteristics (at AC400V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)

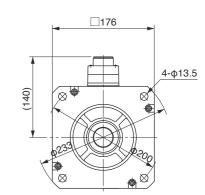


#### **Dimensions**

(1) Encoder connector

(2) Motor/Brake connector





Key way dimensions 50

Mass (kg)/ Without brake: 14.0

With brake: 17.5

\* Figures in [ ] represent the dimensions of with brake.

		AC4	.00V	
Motor model *1 MGME			304G1□	304S1□
	Model A5 series		MFDHTA464	
Applicable driver *2	No.	A5E series	MFDHTA464E	
	Frame symbol		F-frame	
Power supply capacit	у	(kVA)	4.	5
Rated output		(W)	3.	.0
Rated torque		(N·m)	28	3.7
Momentary Max. peal	k torqu	e (N·m)	71	.7
Rated current		(A(rms))	11.3	
Max. current		(A(o-p))	40	
Regenerative brake	Without option		No limit Note)2	
frequency (times/min) Note)1	DV0PM20049×2		No limit Note)2	
Rated rotational spee	d	(r/min)	1000	
Max. rotational speed		(r/min)	2000	
Moment of inertia	With	out brake	48.4	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> ) W		th brake	49.2	
Recommended moment of inertia ratio of the load and the rotor Note)3		0 times	or less	
Rotary encoder speci	ficatior	Note)5	20-bit Incremental	17-bit Absolute
Resolution per single turn		1,048,576	131,072	

• Brake specifications (For details, refer to P.105) (This brake will be released when it is energized.) Do not use this for braking the motor in motion.

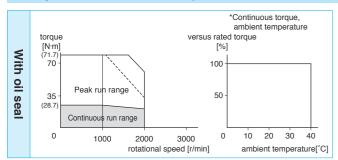
Static friction torque (N·m)	58.8 or more
Engaging time (ms)	150 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	1.4±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.104)

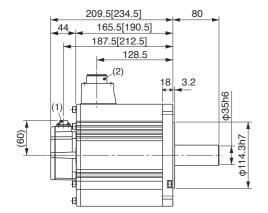
1		Radial load P-direction (N)	2058
During assembly	Thrust load A-direction (N)	980	
ľ	accombiy	Thrust load B-direction (N)	1176
	During	Radial load P-direction (N)	1470
	operation	Thrust load A, B-direction (N)	490

- For details of Note 1 to Note 5, refer to P.104.
- Dimensions of Driver, refer to P.34.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

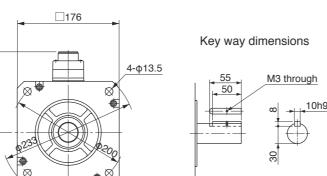
# Torque characteristics (at AC400V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



### **Dimensions**



□176 4-φ13.5 (140)



Mass (kg)/ Without brake: 20.0

With brake: 23.5

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

MEMO

			AC4	.00V
Motor model *1		МНМЕ	104G1□	104S1
	Model	A5 series	MDDHT2412	
Applicable driver *2	No.	A5E series	MDDHT2412E	
	Frame symbol		D-frame	
Power supply capacit	у	(kVA)	1.	.8
Rated output		(W)	1.	.0
Rated torque		(N·m)	4.7	77
Momentary Max. peal	k torqu	ie (N·m)	14	.3
Rated current		(A(rms))	2.9	
Max. current		(A(o-p))	12	
Regenerative brake	Without option		83	
frequency (times/min) Note)1	DV0PM20048		No limit Note)2	
Rated rotational spee	d	(r/min)	2000	
Max. rotational speed		(r/min)	3000	
Moment of inertia	With	out brake	24	.7
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	With brake		26.0	
Recommended moment of inertia ratio of the load and the rotor Note)3		0 times	or less	
Rotary encoder specifications Note)5		Note)5	20-bit Incremental	17-bit Absolute
Resolut	ion per	single turn	1,048,576	131,072

#### • Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

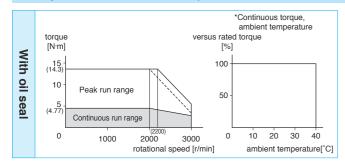
Static friction torque (N·m)	4.9 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	70 or less
Exciting current (DC) (A)	0.59±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

#### • Permissible load (For details, refer to P.104)

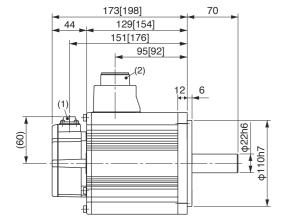
- 1	During assembly	Radial load P-direction (N)	980
		Thrust load A-direction (N)	588
	docombry	Thrust load B-direction (N)	686
	During	Radial load P-direction (N)	490
operation	Thrust load A, B-direction (N)	196	

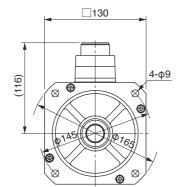
- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.32.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

### Torque characteristics (at AC400V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)

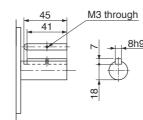


#### **Dimensions**





With brake: 8.1 Key way dimensions



Mass (kg)/ Without brake: 6.7

- (1) Encoder connector
- (2) Motor/Brake connector
- \* Figures in [ ] represent the dimensions of 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**

			AC4	00V
Motor model *1		МНМЕ	154G1□	154S1
	Model	A5 series	MDDHT3420	
Applicable driver *2	No.	A5E series	MDDHT3420E	
	Frame symbol		D-frame	
Power supply capacit	у	(kVA)	2.3	
Rated output		(W)	1.	.5
Rated torque		(N·m)	7.	16
Momentary Max. pea	k torqu	ie (N·m)	21	.5
Rated current		(A(rms))	4.7	
Max. current		(A(o-p))	20	
Regenerative brake	Without option		22	
frequency (times/min) Note)1	DV0	PM20048	130	
Rated rotational spee	d	(r/min)	20	00
Max. rotational speed		(r/min)	30	00
Moment of inertia	With	out brake	37.1	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	th brake	38.4	
Recommended moment of inertia ratio of the load and the rotor Note)3		0 times	or less	
Rotary encoder specifications		Note)5	20-bit Incremental	17-bit Absolute
Resolution per single		single turn	1,048,576	131,072

• Brake specifications (For details, refer to P.105) /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

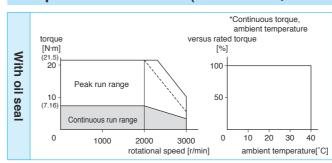
#### • Permissible load (For details, refer to P.104)

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

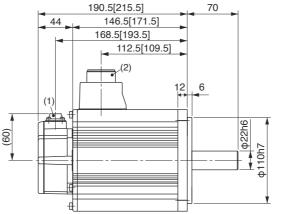
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.32.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type".

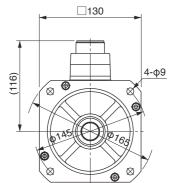
Detail of model designation, refer to P.11.

# Torque characteristics (at AC400V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



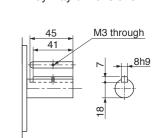
#### **Dimensions**





Mass (kg)/ Without brake: 8.6 With brake: 10.1

Key way dimensions



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

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# **Specifications**

			AC400V	
Motor model *1		МНМЕ	204G1	204S1
	Model	A5 series	MEDH	T4430
Applicable driver *2	No.	A5E series	MEDHT4430E	
	Fran	ne symbol	E-frame	
Power supply capacit	у	(kVA)	3.	3
Rated output		(W)	2.	0
Rated torque		(N·m)	9.	55
Momentary Max. peal	k torqu	ie (N·m)	28	.6
Rated current		(A(rms))	5.5	
Max. current		(A(o-p))	24	
Regenerative brake	Without option		45	
frequency (times/min) Note)1	DV0PM20048		142	
Rated rotational spee	d	(r/min)	2000	
Max. rotational speed		(r/min)	3000	
Moment of inertia	With	out brake	57.8	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	th brake	59.6	
Recommended moment of inertia ratio of the load and the rotor Note)3		0 times	or less	
Rotary encoder speci	fication	Note)5	20-bit Incremental	17-bit Absolute
Resolut	ion per	r single turn	1,048,576	131,072

#### • Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

Static friction torque (N·m)	24.5 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.3±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

#### • Permissible load (For details, refer to P.104)

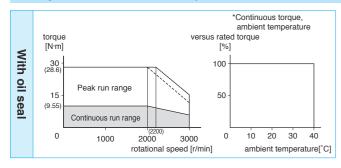
		Radial load P-direction (N)	1666
During assembly	Thrust load A-direction (N)	784	
	Thrust load B-direction (N)	980	
	During	Radial load P-direction (N)	784
	operation	Thrust load A, B-direction (N)	343

- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.33.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

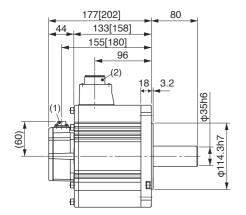
Mass (kg)/ Without brake: 12.2

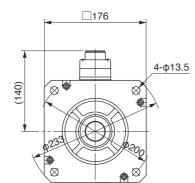
With brake: 15.5

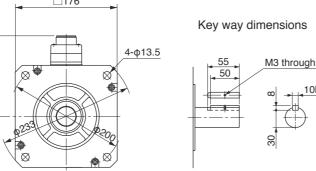
### Torque characteristics (at AC400V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



### **Dimensions**







- (1) Encoder connector
- (2) Motor/Brake connector
- \* Figures in [ ] represent the dimensions of 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**

			AC4	100V
Motor model *1 MHME			304G1□	304S1
	Model	A5 series	MFDHT5440	
Applicable driver *2	No.	A5E series	MFDHT5440E	
	Fran	ne symbol	F-frame	
Power supply capa	city	(kVA)	4	.5
Rated output		(W)	3.	.0
Rated torque		(N·m)	14	1.3
Momentary Max. pe	ak torqu	ıe (N·m)	43	3.0
Rated current		(A(rms))	8.0	
Max. current (A(o-p))		(A(o-p))	34	
Regenerative brake frequency (times/min) Note)1 DV0PM2		out option	19	
		M20049×2	142	
Rated rotational spe	eed	(r/min)	2000	
Max. rotational spe	ed	(r/min)	3000	
Moment of inertia		out brake	90.5	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup>	) Wi	th brake	92.1	
Recommended moment of inertia ratio of the load and the rotor Note)3		0 times	or less	
Rotary encoder spe	cification	Note)5	20-bit Incremental	17-bit Absolute
Reso	ution per	r single turn	1,048,576	131,072

• Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.) Do not use this for braking the motor in motion.

Static friction torque (N·m)	24.5 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.3±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

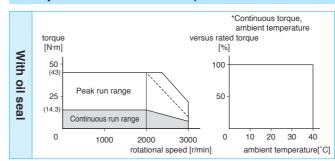
• Permissible load (For details, refer to P.104)

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

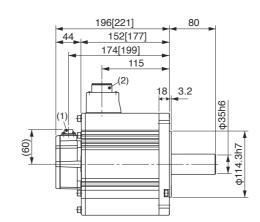
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type".

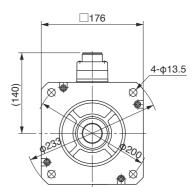
Detail of model designation, refer to P.11.

# Torque characteristics (at AC400V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



#### **Dimensions**





Key way dimensions 50

Mass (kg)/ Without brake: 16.0

With brake: 19.2

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

			AC4	.00V
Motor model *1		МНМЕ	404G1□	404S1□
	Model	A5 series	MFDH	TA464
Applicable driver *2	No.	A5E series	MFDHTA464E	
	Fran	ne symbol	F-frame	
Power supply capacit	у	(kVA)	6.	.8
Rated output		(W)	4.	.0
Rated torque		(N·m)	19	).1
Momentary Max. pea	k torqu	ıe (N⋅m)	57	'.3
Rated current		(A(rms))	10.5	
Max. current		(A(o-p))	45	
Regenerative brake	Without option		17	
frequency (times/min) Note)1	DV0PM20049×2		125	
Rated rotational spee	d	(r/min)	2000	
Max. rotational speed		(r/min)	3000	
Moment of inertia	With	out brake	112	
of rotor ( $\times 10^{-4}$ kg·m <sup>2</sup> )	With brake		114	
Recommended moment of inertia ratio of the load and the rotor Note)3		0 times or less		
Rotary encoder speci	ficatior	Note)5	20-bit Incremental	17-bit Absolute
Resolut	ion per	r single turn	1,048,576	131,072

#### • Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.\ Do not use this for braking the motor in motion.

Static friction torque (N·m)	24.5 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.3±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

#### • Permissible load (For details, refer to P.104)

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

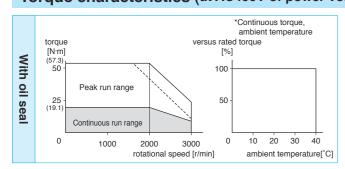
- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

Mass (kg)/ Without brake: 18.6

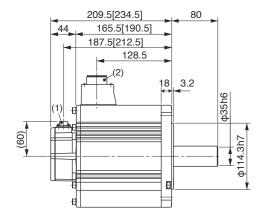
With brake: 21.8

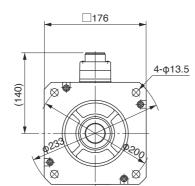
M3 through

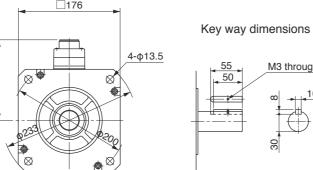
# Torque characteristics (at AC400V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



#### **Dimensions**







- (1) Encoder connector
- (2) Motor/Brake connector
- \* Figures in [ ] represent the dimensions of 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**

			AC4	V00V
Motor model *1		МНМЕ	504G1□	504S1
	Model	A5 series	MFDH	TA464
Applicable driver *2	No.	A5E series	MFDHTA464E	
	Fran	ne symbol	F-frame	
Power supply capac	ity	(kVA)	7.	.5
Rated output		(W)	5	.0
Rated torque		(N·m)	23	3.9
Momentary Max. pea	ak torqu	ıe (N·m)	71	.6
Rated current		(A(rms))	13.0	
Max. current		(A(o-p))	55	
Regenerative brake	With	out option	10	
frequency (times/min) Note	DV0P	M20049×2	76	
Rated rotational spe	ed	(r/min)	2000	
Max. rotational spee	d	(r/min)	3000	
Moment of inertia	With	out brake	162	
of rotor (×10 <sup>-4</sup> kg·m <sup>2</sup> )	Wi	th brake	164	
Recommended moment of inertia ratio of the load and the rotor Note)3			0 times	or less
Rotary encoder spec	cification	Note)5	20-bit Incremental	17-bit Absolute
Resolu	ition pe	r single turn	1,048,576	131,072

• Brake specifications (For details, refer to P.105) /This brake will be released when it is energized.) Do not use this for braking the motor in motion.

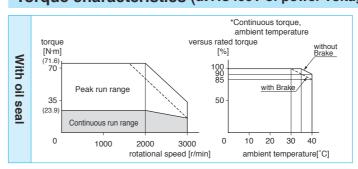
Static friction torque (N·m)	24.5 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.3±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

• Permissible load (For details, refer to P.104)

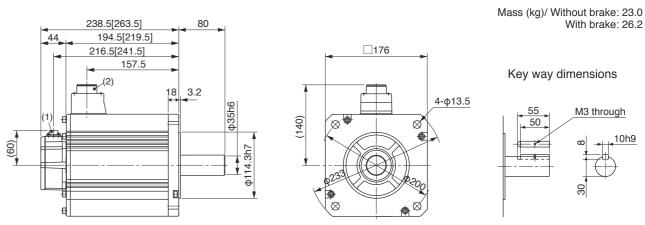
During assembly	Radial load P-direction (N)	1666
	Thrust load A-direction (N)	784
docombry	Thrust load B-direction (N)	980
During	Radial load P-direction (N)	784
operation	Thrust load A, B-direction (N)	343

- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- \*1 Rotaly encoder specifications:
- \*2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

# Torque characteristics (at AC400V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



#### **Dimensions**



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

# 「モータ仕様」ページの注釈について

#### Note) 1. [At AC100V 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 AC115V (at 100V 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 AC200V 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 AC230V (at 200V 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.

#### [At AC400V of power voltage]

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

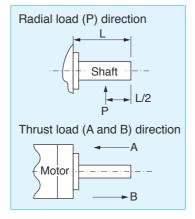
- If the load is connected, frequency will be defines as 1/(m+1), where m=load moment of inertia/ rotor moment of inertia.
- When the motor speed exceeds the rated speed, regenerative brake frequency is in inverse proportion to the square of (running speed/rated speed).
- Power supply voltage is AC460V (at 400V of the main voltage).
- If the supply voltage fluctuates, frequency is in inverse proportion to the square of (Running supply voltage/460) 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.
- Note) 5. 17 ビット アブソリュートエンコーダは、17 ビット インクリメンタルエンコーダとしても使用可能です。

104

#### **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. その詳細については、弊社ホームページから取扱説明書をダウンロードして参照してください。

#### <Note:

- 1. The lining sound of the brake (chattering and etc.) might be generated while running the motor with built-in brake, however this does not affect any functionality.
- 2. Magnetic flux might be generated through the motor shaft while the brake coil is energized (brake is open). Pay an extra attention when magnetic sensors are used nearby the motor.

#### Specifications of Built-in Holding Brake

Motor series	Motor output	Static friction torque N·m	Rotor inertia x 10 <sup>-4</sup> kg·m²	Engaging time ms	Releasing time ms	Exciting current DC A (at cool-off)	Releasing voltage	Permissible work (J) per one braking		Permissible angular acceleration rad/s <sup>2</sup>
	50W, 100W	0.29 or more	0.002	35 or less	20 or less	0.3	DO41/	39.2	4.9	
MSMD	200W, 400W	1.27 or more	0.018	50 or less	15 or less	0.36	DC1V or more	137	44.1	30000
	750W	2.45 or more	0.075	70 or less	20 or less	0.42		196	147	
	50W, 100W	0.29 or more	0.002	35 or less	20 or less	0.3	DO41/	39.2	4.9	
	200W, 400W	1.27 or more	0.018	50 or less	15 or less	0.36	DC1V or more	137	44.1	30000
	750W	2.45 or more	0.075	70 or less	20 or less	0.42	or more	196	147	
MSME	1.0kW, 1.5kW, 2.0kW	7.8 or more	0.33	50 or less	15 or less (100)	0.81	D001/	392	490	
	3.0kW	11.8 or more		80 or less	(100)		DC2V			10000
	4.0kW, 5.0kW	16.1 or more	1.35	110 or less	50 or less (130)	0.9	or more	1470	2200	
	1.0kW	4.9 or more		80 or less	70 or less (200)	0.59		588	780	
MDME	1.5kW, 2.0kW	13.7 or more	1.35	100 or less	50 or less	0.79	DC2V	1176	1500	10000
MDME	3.0kW	16.2 or more		110 or less	(130)	0.9	or more	1470	2200	
	4.0kW, 5.0kW	24.5 or more	4.7	80 or less	25 or less (200)	1.3		1372	2900	5440
	900W	13.7 or more	1.35	100 or less	50 or less (130)	0.79		1176	1500	10000
MGME	2.0kW	24.5 or more	4.7	80 or less	25 or less (200)	1.3	DC2V or more	1070	0000	5440
	3.0kW	58.8 or more	4.7	150 or less	50 or less (130)	1.4		1372	2900	5440
MUMD	200W, 400W	1.27 or more	0.018	50 or less	15 or less	0.36	DC1V	137	44.1	00000
MHMD	750W	2.45 or more	0.075	70 or less	20 or less	0.42	or more	196	147	30000
	1.0kW	4.9 or more	1.05	80 or less	70 or less (200)	0.59		588	780	10000
MHME	1.5kW	13.7 or more	1.35	100 or less	50 or less (130)	0.79	DC2V or more	1176	1500	10000
	2.0kW to 5.0kW	24.5 or more	4.7	or less以下	25 or less (200)	1.3		1372	2900	5440

- Excitation voltage is DC24V±10% (Large type motor) and DC24V±5% (Small type motor).
- Releasing time values represent the ones with DC-cutoff using a varistor.
   Values in ( ) represent those measured by using a diode (V03C by Hitachi, Ltd.)
- · 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.)

105

#### **EC Directives**

The EC 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.

**EC Directives/Conformity to UL Standards** 

However, our AC servos meet the relevant EC Directives for Low Voltage Equipment so that the machine or equipment comprising our AC servos can meet EC Directives.

### **EMC Directives**

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

# **Conformity to UL Standards**

Observe the following conditions of (1) and (2) to make the system conform to UL508C (E164620).

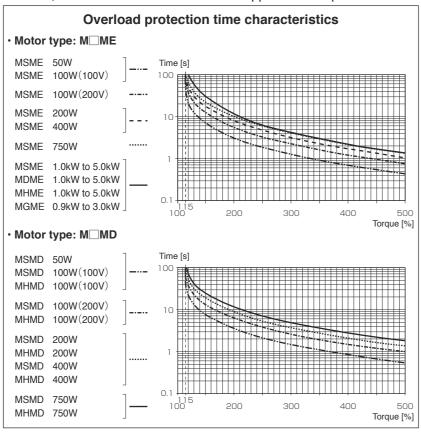
- (1) Use the driver in an environment of Pollution Degree 2 or 1 prescribed in IEC60664-1. (e.g. Install in the control box with IP54 enclosure.)
- (2) Make sure to install a circuit breaker or fuse which are UL recognized (Listed (1) marked) between the power supply and the noise filter.

For rated current of circuit breaker and fuse, refer to P.14 "Driver and List of Applicable Peripheral

Equipments".

Use a copper cable with temperature rating of 75°C or higher.

(3) Over-load protection level
Over-load protective function will
be activated when the effective
current exceeds 115% or more
than the rated current based
on the time characteristics (see
the next page). Confirm that the
effective current of the driver does
not exceed the rated current.
Set up the peak permissible
current with Pr0.13 (Setup of 1st
torque limit) and Pr5.22 (Setup
2nd torque limit).

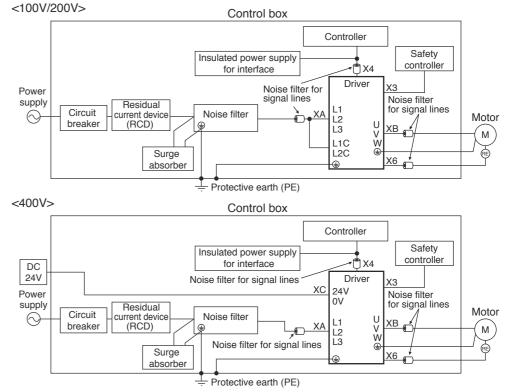


#### **Conformed Standards**

For details, refer to P.9.

#### **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.)



#### <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**

100V type : (A to C-frame)	Single phase, 100V	+ 10% - 15%	to 120V	+ 10% - 15%	50/60Hz
200V type : (A to D-frame)	Single/3-phase, 200V	+ 10% - 15%	to 240V	+ 10% - 15%	50/60Hz
200V type : (E, F-frame)	3-phase, 200V	+ 10% - 15%	to 230V	+ 10% - 15%	50/60Hz
400 V type (Main power (D to F-frame)	supply): 3-phase, 380V	+ 10% - 15%	to 480V	+ 10% - 15%	50/60Hz
400 V type (Control pow	er supply): DC 24V ±15%	0			

- (1) This product is designed to be used in over-voltage category (installation category) III of EN 61800-5-1:2007.
- (2) Use an insulated power supply of DC12 to 24V which has CE marking or complies with EN60950.

#### **Circuit Breaker**

(D to F-frame)

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**

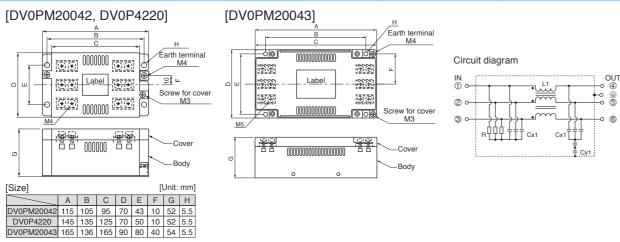
When you install one noise filter at the power supply for multi-axes application, contact to a manufacture of the noise filter. If noise margin is required, connect 2 filters in series to emphasize effectiveness.

**Composition of Peripheral Equipments** 

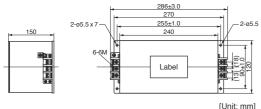
#### Options

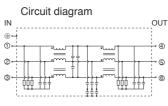
Option part No.	Voltage specifications for driver	Manufacturer's part No.	Applicable driver (frame)	Manufacturer
DV0P4170	Single phase 100V, 200V	SUP-EK5-ER-6	A and B-frame	Okaya Electric Ind.
100.0 ± 2.0 88.0 75.0 2.0 Label 2 - 04.5 x 6.75	Terminal cover (transparent) 53.1±1.0  53.1±1.0  6-M4  (13.0)	Circuit diagram	ОИТ ОИТ ОИТ ОИТ ОИТ ОИТ ОИТ ОИТ	

Option part No.	Voltage specifications for driver	Manufacturer's part No.	Applicable driver (frame)	Manufacturer
	3-phase 200V		A and B-frame	
DV0PM20042	Single phase 100V, 200V 3-phase 200V	3SUP-HU10-ER-6	C-frame	Okaya Electric Ind.
DV0P4220	Single/3-phase 200V	3SUP-HU30-ER-6	D-frame	
DV0PM20043	3-phase 200V	3SUP-HU50-ER-6	E-frame	



Option part No.	Voltage specifications for driver	Manufacturer's part No.	Applicable driver (frame)	Manufacturer
DV0P3410	3-phase 200V	3SUP-HL50-ER-6B	F-frame	Okaya Electric Ind.





# Recommended components

part No.	Voltage specifications for driver	Current rating (A)	Manufacturer	
RTHN-5010	Cingle phase 100V 200V	10	TDK-Lambda	
RTHN-5020	Single phase 100V, 200V 3-phase 200V	30		
RTHN-5030	3-priase 200V	50	Corp.	
FN258L-16-07	2 phase 400V	16	SCHAFFNER	
FN258L-30-07	3-phase 400V	30	SUNAFFINER	

#### <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.

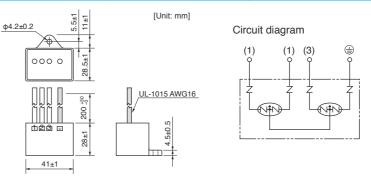
### **Surge Absorber**

Provide a surge absorber for the primary side of noise filter.

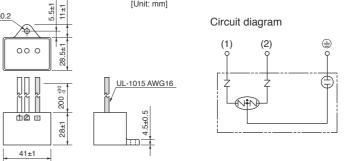
**Conformance to** 

international standards

Option part No.	Voltage specifications for driver	Manufacturer's part No.	Manufacturer	
DV0P1450	3-phase 200V	RAV-781BXZ-4	Okaya Electric Ind	
DV0PM20050	3-phase 400V	RAV-801BXZ-4	Okaya Electric Ind.	



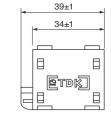
Option part No.	Voltage specifications for driver	Manufacturer's part No.	Manufacturer
DV0P4190	Single phase 100V, 200V	RAV-781BWZ-4	Okaya Electric Ind.
φ4.2±0.2 φ4.2±0.2 φ4.2±0.2	[Unit: mm]	uit diagram	

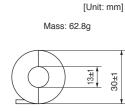


#### **Noise Filter for Signal Lines**

Install noise filters for signal lines to all cables (power cable, motor cable, encoder cable and interface cable)

Option part No.	Manufacturer's part No.	Number	Manufacturer
DV0P1460	ZCAT3035-1330	4	TDK Corp.





Fix the signal line noise filter in place to eliminate excessive stress to the cables.

#### Residual current device

Install a type B Residual current device (RCD) at primary side of the power supply.

# 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 ( $\frac{1}{2}$ ). 2 terminals are provided for protective tive earth.

#### <Note>

For driver and applicable peripheral equipments, refer to P.14 "Driver and List of Applicable Peripheral Equipments"

0

0

5

0

- Cable end (Driver side)

Cable end (Encoder side)

M Hitachi Cable, Ltd.

Cable type

Cable length 0030

0050

0100

0200

2

5

0

**Encoder cable** 

Ε

Type classification

Motor cable, Brake cable

M

C

classification

AC servo motor cable

Cable length

003

005

010

020

A Standard

Design order

3m

5m

10m

20m

B Special

F

C

MFECA: Encoder cable

Α

D Molex Inc. connector (Incremental)

A Tyco Electronics, AMP connector

3m

5m

10m

20m

Cable end at driver side

T Clamp terminal

Cable end at motor side C S type cannon plug

Cable type

0

1

2

3

D Phoenix contact Clamp terminal

E Tyco Electronics, AMP connector

N 4-wire by Hitachi Cable, Ltd.

P 2-wire by Hitachi Cable, Ltd.

Cross section of cable core

0.75mm<sup>2</sup>

1.25mm<sup>2</sup>

2.0mm<sup>2</sup>

3.5mm<sup>2</sup>

E ROBOTOP 4-wire by Daiden Co., Ltd.

ROBOTOP 6-wire by Daiden Co., Ltd.

Japan Aviation Electronics Industry, Ltd., connector

Molex Inc. connector (Absolute)

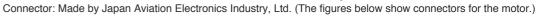
M Molex Inc. connector (MSMD, MHMD)

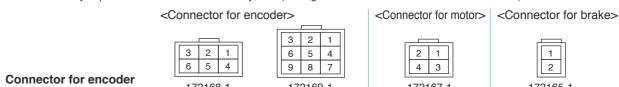
J Japan Aviation Electronics Industry, Ltd. connector T Japan Aviation Electronics Industry, Ltd. plug connector

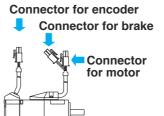
E PVC cable with shield by Oki Electric Cable Co., 0.20mm<sup>2</sup> × 8P, 3P

· When the motors of <MSMD, MHMD> are used, they are connected as shown below.

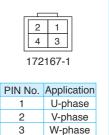
**Options** Specifications of Motor connector





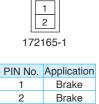


			3	2	1	
3	2 1		6	5	4	
6	5 4		9	8	7	
172	168-1		17	2169	9-1	
)-bit In	cremental	1	7-bit	Abs	solute	
N No.	Application	PII	N No	. Ap	plication	
1	NC		1		BAT+	
2	PS		2		BAT-	
3	PS		3	FG	(SHIELD)	
4	E5V	4			PS	
5	E0V		5		PS	
6	FG(SHIELD)	6			NC	
			7		E5V	
			8		E0V	
		9		NC		



Ground

4



JN4AT02PJM-R

PIN No. Application

2

1 Brake

\* Electromagnetic brake is

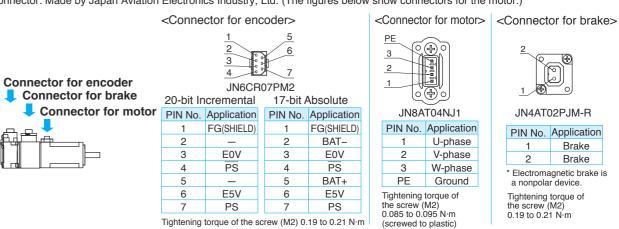
a nonpolar device.

Tightening torque of

0.19 to 0.21 N·m

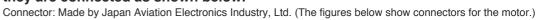
Brake

• When the motors of <MSME (50 W to 750 W)> are used, they are connected as shown below. Connector: Made by Japan Aviation Electronics Industry, Ltd. (The figures below show connectors for the motor.)



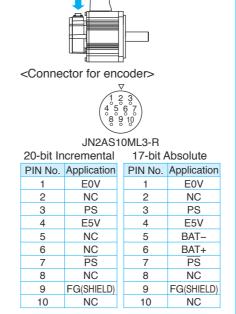
\* Be sure to use only the screw supplied with the connector, to avoid damage.

 When the motors of <MSME (1.0 kW to 5.0 kW), MDME, MGME, MHME> are used, they are connected as shown below.



<Connector for motor>

<with Brake>

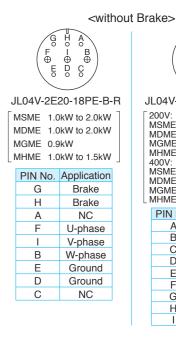


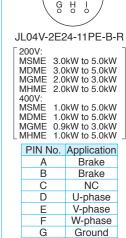
Connector for motor

Connector

for encoder



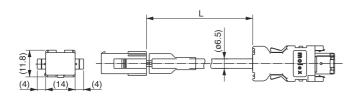




Ground

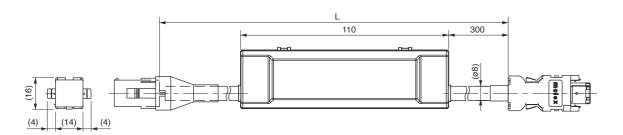
<Remarks> Do not connect anything to NC.





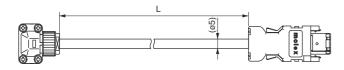
	Title	Part No.	Manufacturer	L (m)	Part No.
	Connector	55100-0670	Molex Inc	3	MFECA0030EAM
	Connector	172160-1	Tugo Flootropico AMD	5	MFECA0050EAM
	Connector pin	170365-1	Tyco Electronics AMP	10	MFECA0100EAM
ĺ	Cable	0.20mm <sup>2</sup> ×3P	Oki Electric Cable Co., Ltd.	20	MFECA0200EAM

Part No.	MFECA0 * * 0EAE	Compatible motor output	MSMD	50W to 750W,	MHMD	200W to 750W
Specifications	For 17-bit absolute encode	er (With battery bo	ox)			



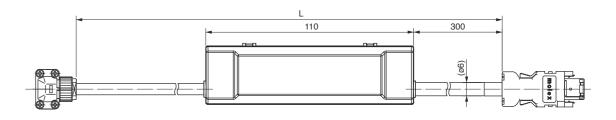
Title	Part No.	Manufacturer	L (m)	Part No.
Connector	55100-0670	Molex Inc	3	MFECA0030EAE
Connector	172161-1	Tyco Electronics AMP	5	MFECA0050EAE
Connector pin	170365-1	Tyco Electronics Aivin	10	MFECA0100EAE
Cable	0.20mm <sup>2</sup> ×4P	Oki Electric Cable Co., Ltd.	20	MFECA0200EAE

Part No.	MFECA0 * * 0MJD	Compatible motor output	MSME	50W to 750W	
Specifications	For 20-bit incremental enc	For 20-bit incremental encoder (Without battery box)			



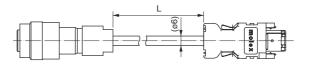
Title	Part No.	Manufacturer	L (m)	Part No.
Connector	55100-0670	Molex Inc	3	MFECA0030MJD
Connector	JN6FR07SM1	Japan Aviation	5	MFECA0050MJD
Connector pin	LY10-C1-A1-10000	Electronics Ind.	10	MFECA0100MJD
Cable	AWG24×4P, AWG22×2P	Hitachi Cable, Ltd.	20	MFECA0200MJD

Part No.	MFECA0 * * 0MJE	Compatible motor output	MSME	50W to 750W
Specifications	For 17-bit absolute encode	er (With battery bo	ox)	



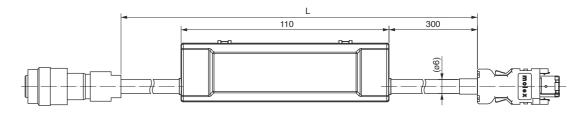
Title	Part No.	Manufacturer	L (m)	Part No.
Connector	55100-0670	Molex Inc	3	MFECA0030MJE
Connector	SMM-003T-P0.5	LC T Mfa Co. Ltd	5	MFECA0050MJE
Connector pin	ZMR-02	J.S.T Mfg. Co., Ltd.	10	MFECA0100MJE
Connector	JN6FR07SM1	Japan Aviation	20	MFECA0200MJE
Connector pin	LY10-C1-A1-10000	Electronics Ind.		
Cable	AWG24 ×4P, AWG22×2P	Hitachi Cable, Ltd.		

Part No.	MFECA0 * * 0ETD	Compatible motor output	0.9kW to 5.0kW	
Specifications	For 20-bit incremental encoder (Without battery box)			

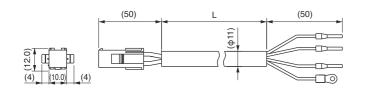


Title	Part No.	Manufacturer	L (m)	Part No.
Connector	55100-0670	Molex Inc	3	MFECA0030ETD
Connector	JN2DS10SL1-R	Japan Aviation	5	MFECA0050ETD
Connector pin	JN1-22-22S-PKG100	Electronics Ind.	10	MFECA0100ETD
Cable	0.2mm <sup>2</sup> ×3P	Oki Electric Cable Co., Ltd.	20	MFECA0200ETD

Part No.	MFECA0 * * 0ETE	Compatible motor output	0.9kW to 5.0kW	
Specifications	For 17-bit absolute encoder (With battery box)			

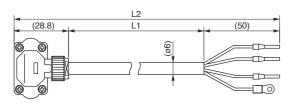


Title	Part No.	Manufacturer	
Title	Part No.	Manufacturer	
Connector	55100-0670	Molex Inc	
Connector	ZMR-02	J.S.T Mfg. Co., Ltd.	
Connector pin	SMM-003T-P0.5	J.S. 1 Wilg. Co., Ltd.	
Connector	JN2DS10SL1-R	Japan Aviation Electronics Ind.	
Connector pin	JN1-22-22S-PKG100		
Cable	0.2mm <sup>2</sup> ×3P	Oki Electric Cable Co., Ltd.	



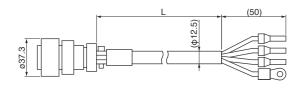
Title	Part No.	Manufacturer	L (m)	Part No.
Connector	172159-1	Type Fleetrenies AMD	3	MFMCA0030EED
Connector pin	170366-1	Tyco Electronics AMP	5	MFMCA0050EED
Rod terminal	AI0.75-8GY	Phoenix Contact	10	MFMCA0100EED
Nylon insulated round terminal	N1.25-M4	J.S.T Mfg. Co., Ltd.	20	MFMCA0200EED
Cable	ROBO-TOP 600V 0.75mm <sup>2</sup>	Daiden Co.,Ltd.		

model World Sov to 700V
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Title	Part No.	Manufacturer	L (m)	Part No.
Connector	JN8FT04SJ1	Japan Aviation	3	MFMCA0030NJD
Connector pin	ST-TMH-S-C1B-3500	Electronics Ind.	5	MFMCA0050NJD
Rod terminal	AI0.75-8GY	Phoenix Contact	10	MFMCA0100NJD
Nylon insulated round terminal	N1.25-M4	J.S.T Mfg. Co., Ltd.	20	MFMCA0200NJD
Cable	AWG18×4P	Hitachi Cable, Ltd.		

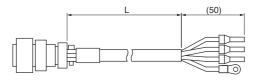
F	Part No.	MFMCD0 * * 2ECD	Applicable model	MSME 1.0kW to 2.0kW, MDME 1.0kW to 2.0kW MHME 1.0kW to 1.5kW, MGME 0.9kW	
			model	(All model 200V and 400V commonness)	



Title	Part No.	Manufacturer	L (m)	Part No.
Connector	JL04V-6A20-4SE-EB-R	V-6A20-4SE-EB-R Japan Aviation		MFMCD0032ECD
Cable clamp	JL04-2022CK(14)-R	Electronics Ind.	5	MFMCD0052ECD
Rod terminal	AI2.5-8BU	Phoenix Contact	10	MFMCD0102ECD
Nylon insulated round terminal	N2-M4	J.S.T Mfg. Co., Ltd.	20	MFMCD0202ECD
Cable	ROBO-TOP 600V 2.0mm <sup>2</sup>	Daiden Co.,Ltd.		

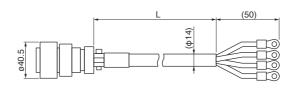
114

Part No. MFMCE0 \* \* 2ECD Applicable model MHME 2.0kW (200V and 400V commonness)



Title	Part No.	Manufacturer	L (m)	Part No.
Straight plug	JL04V-6A22-22SE-EB-R	Japan Aviation	3	MFMCE0032ECD
Cable clamp	JL04-2022CK(14)-R	Electronics Ind.	5	MFMCE0052ECD
Rod terminal	AI2.5-8BU	Phoenix Contact	10	MFMCE0102ECD
Nylon insulated round terminal	N2-M4	J.S.T Mfg. Co., Ltd.	20	MFMCE0202ECD
Cable	ROBO-TOP 600V 2.0mm <sup>2</sup>	Daiden Co.,Ltd.		

Part No.	MFMCA0 * * 3ECT	Applicable model	MHME	3.0kW to 5.0kW, 3.0kW to 5.0kW, del 200V and 400V	MGME	2.0kW to 3.0kW	
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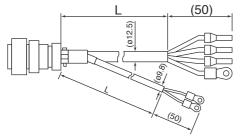


Title	Part No.	Manufacturer	L (m)	Part No.
Straight plug	JL04V-6A22-22SE-EB-R	Japan Aviation		MFMCA0033ECT
Cable clamp	JL04-2022CK(14)-R	Electronics Ind.	5	MFMCA0053ECT
Nylon insulated round terminal	N5.5-5	J.S.T Mfg. Co., Ltd.	10	MFMCA0103ECT
Cable	ROBO-TOP 600V 3.5mm <sup>2</sup>	Daiden Co.,Ltd.	20	MFMCA0203ECT

Part No.

MFMCA0 \* \* 2FCD

Applicable MSME 1.0kW to 2.0kW (200V), MDME 1.0kW to 2.0kW (200V) MHME 1.0kW to 1.5kW (200V) MHME 1.0kW to 1.5kW (200V), MGME 0.9kW (200V)



\* This cable does not conform to IP67.

		·	
Title		Part No.	Manufacturer
Straight plug	g	JL04V-6A20-18SE-EB-R	Japan Aviation
Cable clam	0	JL04-2022CK(14)-R	Electronics Ind.
Rod termina	al	AI2.5-8BU	Phoenix Contact
Nylon insulated	Earth	N2-M4	J.S.T Mfg. Co., Ltd.
round terminal	Brake	N1.25-M4	J.S.1 Mig. Co., Ltd.
Cable		ROBO-TOP 600V 0.75mm <sup>2</sup> and ROBO-TOP 600V 2.0mm <sup>2</sup>	Daiden Co.,Ltd.

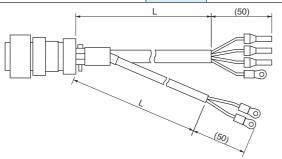
Applicable model

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

MFMCE0 \* \* 2FCD Part No.

MHME 2.0kW (200V),

MSME 1.0kW to 2.0kW (400V), MDME 1.0kW to 2.0kW (400V) MHME 1.0kW to 2.0kW (400V), MGME 0.9kW (400V)



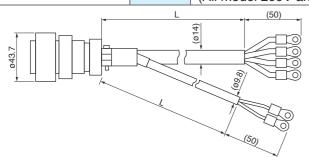
		<u>'</u>	
Title		Part No.	Manufacturer
Straight plug		JL04V-6A24-11SE-EB-R	Japan Aviation
Cable clam	)	JL04-2428CK(17)-R	Electronics Ind.
Rod terminal		AI2.5-8BU	Phoenix Contact
Nylon insulated	Earth	N2-M4	LS T Mfg. Co. Ltd
round terminal	Brake	N1.25-M4	J.S.T Mfg. Co., Ltd.
Cable		ROBO-TOP 600V 0.75mm <sup>2</sup> and ROBO-TOP 600V 2.0mm <sup>2</sup>	Daiden Co.,Ltd.

L (m)	Part No.
3	MFMCE0032FCD
5	MFMCE0052FCD
10	MFMCE0102FCD
20	MFMCE0202FCD

Part No. MFMCA0 \* \* 3FCT

Applicable model

MSME 3.0kW to 5.0kW, MDME 3.0kW to 5.0kW MHME 3.0kW to 5.0kW, MGME 2.0kW to 3.0kW (All model 200V and 400V commonness)

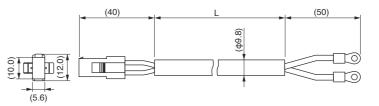


\* This cable does not conform to IP67.

			/
Title		Part No.	Manufacturer
Straight plu	g	JL04V-6A24-11SE-EB-R	Japan Aviation
Cable clam	р	JL04-2428CK(17)-R	Electronics Ind.
Nylon insulated	Earth	N5.5-5	LC T Mfg. Co. Ltd
round terminal	Brake	N1.25-M4	J.S.T Mfg. Co., Ltd.
Cable		ROBO-TOP 600V 0.75mm <sup>2</sup> and BOBO-TOP 600V 3.5mm <sup>2</sup>	Daiden Co.,Ltd.

L (m)	Part No.		
3	MFMCA0033FCT		
5	MFMCA0053FCT		
10	MFMCA0103FCT		
20	MFMCA0203FCT		

Applicable model MSMD 50W to 750W, MHMD 200W to 750W Part No. MFMCB0 \* \* 0GET



Title	Title Part No.		L (m)	Part No.
Connector	172157-1			MFMCB0030GET
Connector pin	170366-1, 170362-1	Tyco Electronics AMP	5	MFMCB0050GET
Nylon insulated round terminal	N1.25-M4	J.S.T Mfg. Co., Ltd.	10	MFMCB0100GET
Cable	ROBO-TOP 600V 0.75mm <sup>2</sup>	Daiden Co.,Ltd.	20	MFMCB0200GET

Part No.	MFMCB0 * * 0PJT	Applicable model	MSME	50W to 750W



Title	Part No.	Manufacturer	L (m)	Part No.
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	Hitachi Cable, Ltd.	20	MFMCB0200PJT

116 117

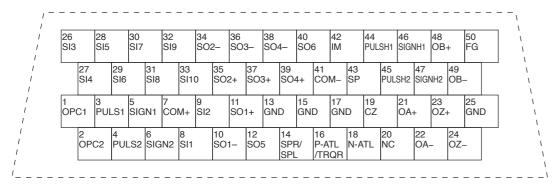
### **Connector Kit for Interface**

Part No. DV0P4350

#### Components

Title	Part No.	Number	Manufacturer	Note
Connector	54306-5011	1	Mala La	For Connector X4
Connector cover	54331-0501	1	Molex Inc	(50-pins)

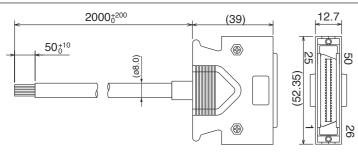
• Pin disposition (50 pins) (viewed from the soldering side)



- 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 wiring example of the connector X4.
- 3) Do not connect anything to NC pins in the above table.

### **Interface Cable**

Part No. DV0P4360



· Table for wiring

This 2 m connector cable contains AWG28 conductors.

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

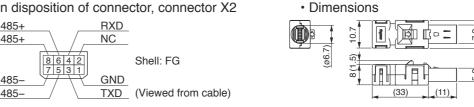
# Connector Kit for Communication Cable (for RS485, RS232) (Excluding A5E Series)

Part No. DV0PM20024

#### Components

Title	Part No.	Manufacturer	Note
Connector	2040008-1	Tyco Electronics AMP	For Connector X2 (8-pins)

Pin disposition of connector, connector X2



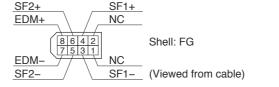
## Connector Kit for Safety (Excluding A5E Series)

Part No. DV0PM20025

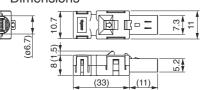
#### Components

Title	Part No.	Manufacturer	Note
Connector	2013595-1	Tyco Electronics AMP	For Connector X3 (8-pins)

• Pin disposition of connector, connector X3







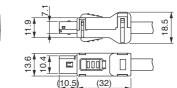
# Connector Kit for External Scale (Excluding A5E Series)

Part No. DV0PM20026

#### · Components

Title	Part No.	Manufacturer	Note
Connector	MUF-PK10K-X	J.S.T Mfg. Co., Ltd.	For Connector X5

#### Dimensions



# **Connector Kit for Encoder**

Part No. DV0PM20010

### Components

Title	Part No.	Manufacturer	Note
Connector	55100-0670	Molex Inc	For Connector X6

#### <Remarks>

Connector X1: use with commercially available cable.

· Configuration of connector X1: USB mini-B



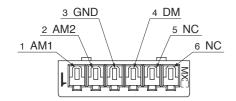
# **Connector Kit for Analog Monitor Signal**

Part No. DV0PM20031

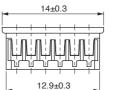
### Components

Title	Part No.	Number	Manufacturer	Note
Connector	510040600	1	Molay Inc	For Connector X7 (6-pins)
Connector pin	500118100	6	Molex Inc	

• Pin disposition of connector, connector X7



#### Dimensions





# **Connector Kit for Power Supply Input**

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

#### Components

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

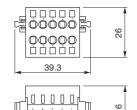
Part No. DV0PM20033 (For A to D-frame: Double row type)

#### 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.	FOI COIIIIeCtoi AA	

#### Dimensions





# Part No. DV0PM20044 (For E-frame)

#### Components

Title	Part No.	Number	Manufacturer	Note	
Connector	05JFAT-SAXGSA-L	1	J.S.T Mfg. Co., Ltd.	For Connector VA (E frame)	
Handle lever	J-FAT-OT-L	2		For Connector XA (E-frame)	

Part No. DV0PM20051 (For D-frame 400V)

#### Components

Title	Part No.	Number	Manufacturer	Note
Connector	03JFAT-SAYGSA-M	1	LC T Mfg. Co. Ltd	For Connector XA (D-frame)
Handle lever	J-FAT-OT-L	2	J.S.T Mfg. Co., Ltd.	

Part No. DV0PM20052 (For E-frame 400V)

#### Components

Title	Part No.	Number	Manufacturer	Note	
Connector	03JFAT-SAYGSA-L	1	LC T Mfg. Co. Ltd	For Connector VA (E frame)	
Handle lever	J-FAT-OT-L	2	J.S.T Mfg. Co., Ltd.	For Connector XA (E-frame)	

# **Connector Kit for Control Power Supply Input**

**Part No. DV0PM20053** (For D, E-frame 400V)

#### Components

Title	Part No.	Number	Manufacturer	Note
Connector	02MJFAT-SAGF	1	LC T Mfg. Co. Ltd	For Connector XC
Handle lever	MJFAT-0T	2	J.S.T Mfg. Co., Ltd.	(D, E-frame)

# **Connector Kit for Regenerative Resistor Connection (E-frame)**

Part No. DV0PM20045 (For E-frame 200V/400V)

#### Components

Title	Part No.	Number	Manufacturer	Note
Connector	04JFAT-SAXGSA-L	1		200V: For Connector XC
Handle lever	J-FAT-OT-L	2	J.S.T Mfg. Co., Ltd.	<b>400V: For Connector XD</b> ※ジャンパー線も付属しています。

Part No. DV0PM20055 (For D-frame 400V)

# $\cdot \ \text{Components}$

Title	Part No.	Number	Manufacturer	Note
Connector	04JFAT-SAXGSA-M	1	LC T Mfg. Co. 14d	For Connector VD
Handle lever	J-FAT-OT-L	2	J.S.T Mfg. Co., Ltd.	For Connector XD

# **Connector Kit for Motor Connection (Driver side)**

Part No. DV0PM20034 (For A to D-frame 100V/200V)

#### Components

Title	Part No.	Number	Manufacturer	Note
Connector	06JFAT-SAXGF	1	LC T Mfa Co. Ltd	For Connector XB
Connector pin	J-FAT-OT	2	J.S.T Mfg. Co., Ltd.	※ジャンパー線も付属しています。

120

Part No. DV0PM20046 (For E-frame 200V/400V)

#### Components

Title	Part No.	Number	Manufacturer	Note
Connector	03JFAT-SAXGSA-L	1	J.S.T Mfg. Co., Ltd.	For Connector XB (E-frame)
Handle lever	J-FAT-OT-L	2		

# Part No. DV0PM20054 (For D-frame 400V)

#### Components

Title	Part No.	Number	Manufacturer	Note
Connector	03JFAT-SAXGSA-M	1	LC T Mfa Co. Ltd	For Connector VP (D frame)
Handle lever	J-FAT-OT-L	2	J.S.T Mfg. Co., Ltd.	For Connector XB (D-frame)

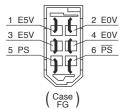
# **Connector Kit for Motor/Encoder Connection**

Dort No.	DV0D4200	Applicable	MSMD 50W to 750W, MHMD 200W to 750W
Part No.		model	(absolute encoder type)

#### Components

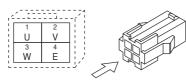
Title	Part No.	Number	Manufacturer	Note
Connector	55100-0670	1	Molex Inc	For Connector X6 (6-pins)
Connector	172161-1	1	Type Floatronics AMD	For junction cable to
Connector pin	170365-1	9	Tyco Electronics AMP	encoder (9-pins)
Connector	172159-1	1	Type Floatronics AMP	For junction cable to
Connector pin	170366-1	4	Tyco Electronics AMP	motor power (4-pins)

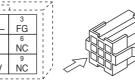
 Pin disposition of connector, connector X6



 Pin disposition of junction cable for motor power

 Pin disposition of junction cable for encoder





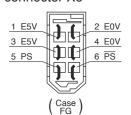
\* When you connect the battery for absolute encoder, refer to P.125, "When you make your own cable for 17-bit absolute encoder"

Part No.	DV0P4380	Applicable	MSMD 50W to 750W, MHMD 200W to 750W
Fait No.	DV0P4380	model	(incremental encoder type)

#### Components

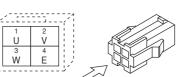
Title	Part No.	Number	Manufacturer	Note
Connector	55100-0670	1	Molex Inc	For Connector X6 (6-pins)
Connector	172160-1	1	Tyco Electronics AMP	For junction cable to encoder (6-pins)
Connector pin	170365-1	6		
Connector	172159-1	1	Tyco Electronics AMP	For junction cable to
Connector pin	170366-1	4		motor power (4-pins)

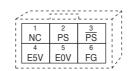
 Pin disposition of connector, connector X6



• Pin disposition of junction cable for motor power

• Pin disposition of junction cable for encoder







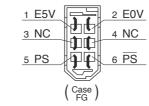
# **Options** Connector Kit

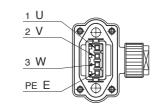
Part No.	DV0PM20035	Applicable model	MSME	50W to 750W
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#### Components

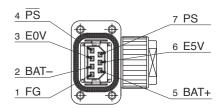
Title	Title         Part No.         N           Connector         55100-0670		Manufacturer	Note	
Connector			Molex Inc	For Connector X6 (6-pins)	
Encoder plug connector	JN6FR07SM1	1	Japan Aviation	For junction cable to	
Socket contact	LY10-C1-A1-10000	7	Electronics Ind.	encoder (7-pins)	
Motor plug connector	JN8FT04SJ1	1	Japan Aviation	For junction cable to motor power (4-pins)	
Socket contact	ST-TMH-S-C1B-3500	4	Electronics Ind.		

• Pin disposition of connector, • Pin disposition of junction cable connector X3 for motor power





· Pin disposition of junction cable for encoder



※インクリメンタルエンコーダの場合は 2ピンと5ピンは使用しません。

Part No.	M20036 Applicable model	MHME 1 OKVV TO 1 5KVV MGME () 9KVV	Vithout orake
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#### Components

Title	Part No.   1		Manufacturer	Note		
Connector			Molex Inc	For Connector X6 (6-pins)		
Encoder connector	JN2DS10SL1-R	1	Japan Aviation	For junction cable to		
Connector pin	JN1-22-22S-PKG100	5	Electronics Ind.	encoder		
Motor connector	JL04V-6A-20-4SE-EB-R	1	Japan Aviation	For junction cable to		
Cable clamp	JL04-2022CK(14)-R	1	Electronics Ind.	motor power		

Part No.	DV0PM20037	Applicable model	MHME	3.0kW to 5.0kW, 2.0kW to 5.0kW, lel 200V and 400V	MGME	2.0kW to 3.0kW	Without brake
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### Components

Title	Title         Part No.         N           Connector         55100-0670		Manufacturer	Note		
Connector			Molex Inc	For Connector X6 (6-pins)		
Encoder connector	JN2DS10SL1-R	1	Japan Aviation	For junction cable to		
Connector pin	JN1-22-22S-PKG100	5	Electronics Ind.	encoder		
Motor connector	JL04V-6A22-22SE-EB-R	1	Japan Aviation	For junction cable to		
Cable clamp	JL04-2022CK(14)-R	1	Electronics Ind.	motor power		

123

#### MSME 1.0kW to 2.0kW, MDME 1.0kW to 2.0kW **Applicable** DV0PM20038 MHME 1.0kW to 1.5kW, MGME 0.9kW Part No. brake (All model 200V)

#### Components

Title	Part No.	Number	Manufacturer	Note	
Connector	55100-0670		Molex Inc	For Connector X6 (6-pins)	
Encoder connector	JN2DS10SL1-R	1	Japan Aviation	For junction cable to	
Connector pin	JN1-22-22S-PKG100	5	Electronics Ind.	encoder	
Motor connector	JL04V-6A20-18SE-EB-R	1	Japan Aviation	For junction cable to motor power	
Cable clamp	JL04-2022CK(14)-R	1	Electronics Ind.		

With

Part No.	DV0PM20039	Applicable model	(200V) MSME 3.0kW to 5.0kW, MDME 3.0kW to 5.0kW MHME 2.0kW to 5.0kW, MGME 2.0kW to 3.0kW (400V) MSME 1.0kW to 5.0kW, MDME 1.0kW to 5.0kW MHME 1.0kW to 5.0kW, MGME 0.9kW to 3.0kW	With brake
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#### Components

Title	Part No.	Number	Manufacturer	Note	
Connector	55100-0670	1	Molex Inc	For Connector X6 (6-pins)	
Encoder connector	JN2DS10SL1-R	1	Japan Aviation	For junction cable to	
Connector pin	JN1-22-22S-PKG100	5	Electronics Ind.	encoder	
Motor connector	JL04V-6A24-11SE-EB-R	1	Japan Aviation	For junction cable to	
Cable clamp	JL04-2428CK(17)-R	1	Electronics Ind.	motor power	

#### **Connector Kit for Motor/Brake Connection**

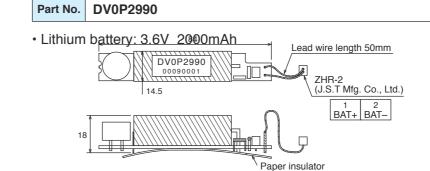
Part No.   DVUPIVIZUU4U	Part No.	DV0PM20040
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#### Components

Title	Part No.	Number	Manufacturer	Note
Connector	JN4FT02SJM-R	1	Japan Aviation	
Handle lever	ST-TMH-S-C1B-3500	2	Electronics Ind.	

# **Options** Battery For Absolute Encoder

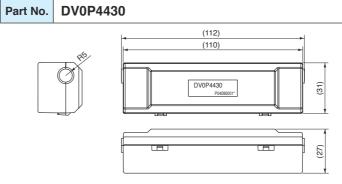
### **Battery For Absolute Encoder**



#### <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**



### When you make your own cable for 17-bit absolute encoder

When you make your own cable for 17-bit absolute encoder, connect the optional battery for absolute encoder, DV0P2060 or DV0P2990 as per the wiring diagram below. Connector of the battery for absolute encoder shall be provided by customer as well.

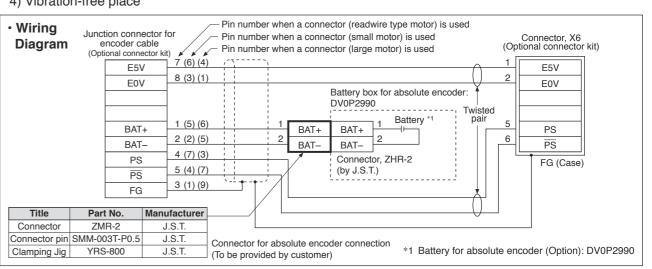
#### <Caution>

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

- 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



# Fig.2 Α distance on slotted hole

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

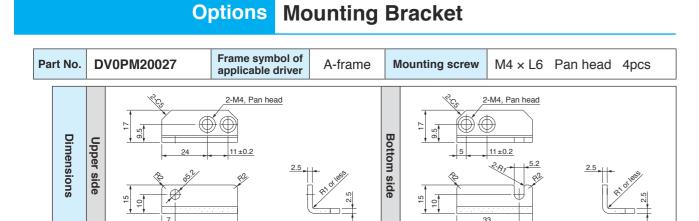
F: Center-to-center distance on outer circular arc

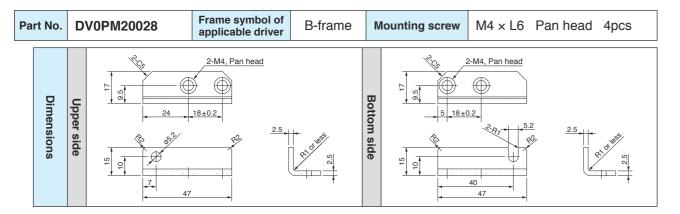
#### Harmonic restraint

On September, 1994, "Guidelines for harmonic restraint on heavy consumers who receive power through high voltage system or extra high voltage system" and "Guidelines for harmonic restraint on household electrical appliances and general-purpose articles" established by the Agency for Natural Resources and Energy of the Ministry of Economy, Trade and Industry (the ex-Ministry of International Trade and Industry). According to those guidelines, the Japan Electrical Manufacturers' Association (JEMA) have prepared technical documents (procedure to execute harmonic restraint: JEM-TR 198, JEM-TR 199 and JEM-TR 201) and have been requesting the users to understand the restraint and to cooperate with us. On January, 2004, it has been decided to exclude the general-purpose inverter and servo driver from the "Guidelines for harmonic restraint on household electrical appliances and general-purpose articles". After that, the "Guidelines for harmonic restraint on household electrical appliances and general-purpose articles" was abolished on September 6, 2004.

We are pleased to inform you that the procedure to execute the harmonic restraint on general-purpose inverter and servo driver was modified as follows.

- 1. All types of the general-purpose inverters and servo drivers used by specific users are under the control of the "Guidelines for harmonic restraint on heavy consumers who receive power through high voltage system or extra high voltage system". The users who are required to apply the guidelines must calculate the equivalent capacity and harmonic current according to the guidelines and must take appropriate countermeasures if the harmonic current exceeds a limit value specified in a contract demand. (Refer to JEM-TR 210 and JEM-TR 225.)
- 2. The "Guidelines for harmonic restraint on household electrical appliances and general-purpose articles" was abolished on September 6, 2004. However, based on conventional guidelines, JEMA applies the technical documents JEM-TR 226 and JEM-TR 227 to any users who do not fit into the "Guidelines for harmonic restraint on heavy consumers who receive power through high voltage system or extra high voltage system" from a perspective on enlightenment on general harmonic restraint. The purpose of these guidelines is the execution of harmonic restraint at every device by a user as usual to the utmost extent.
- <Remarks> When using a reactor, be sure to install one reactor to one servo driver.





Part No.	D۱	/0PM20029	Frame symbol of applicable driver	C-frame	M	lounting screw	M4 × L6	Pan head 4pcs
Dimensions	Upper side	30 ±0.2	2-M4, Pan head	though 52	Bottom side	20	0±0.2 5.2	M4, Pan head

Par	t No.	. DV0PM20030 Frame symbol of applicable driver D-frame		N	M4 x L6 Pan head 4pcs			
	Dimensions	Upper side	5 36±0.2	0.2	Address 5.5	Bottom side	19 52 52 19 10	2-M4, Pan head  36±0.2  25  25  25  25  25  25  25  25  25

For E and F-frame, you con make a front end and back end mounting by changing the mounting direction of L-shape bracket (attachment).

126

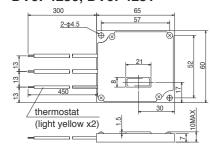
<sup>\*</sup> For application, refer to P.16, 17 "Table of Part Numbers and Options".

		Specifications					
Part No.	Manufacturer's	Resistance	Rat	ted power	(reference	Activation	
Part No.	part No.	nesisiance	Free air	air with fan [W]		temperature of built-in thermostat	
		Ω	[W]	1m/s	2m/s	3m/s	
DV0P4280	RF70M	50	10	25	35	45	
DV0P4281	RF70M	100	10	25	35	45	
DV0P4282	RF180B	25	17	50	60	75	140±5°C B-contact
DV0P4283	RF180B	50	17	50	60	75	Open/Close capacity
DV0P4284	RF240	30	40	100	120	150	(resistance load)
DV0P4285	RH450F	20	52	130	160	200	4A 125VAC 10000 times 2.5A 250VAC 10000 times
DV0PM20048	RF240TF	120	35	80	70	75	
DV0PM20049	RH450FTF	80	65	190	100	110	

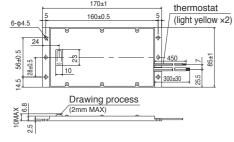
Manufacturer : Iwaki Musen Kenkyusho

\* Power with which the driver can be used without activating the built-in thermostat.

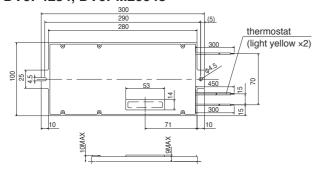
#### DV0P4280, DV0P4281



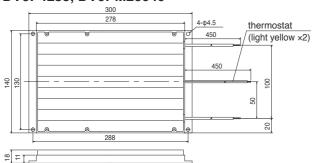
#### DV0P4282, DV0P4283



### DV0P4284, DV0PM20048



### DV0P4285, DV0PM20049



	Power supply						
Frame	Single phase, 100V	Single phase, 200V 3-phase, 200V	3-phase, 400V				
Α	DV0P4280	DV0P4281					
^	D V 01 4200						
В	DV0P4283	DV0P4283	_				
С	DV0P4282						
D		DV0P4284	DV0PM20048				
Е		DV0P4285	DV0PM20049				
F	_	DV0P4285 × 2 in parallel	DV0PM20049 × 2 in parallel				

#### <Remarks>

Thermal fuse is installed for safety. Compose the circuit so that the power will be turned off when the thermostat is activated. 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) Install a fan for a forced cooling if necessary.

#### <Caution>

128

Regenerative resistor gets very hot.

Take preventive measures for fire and burns.

**Avoid the installation near** inflammable objects, and easily accessible place by hand.

otor	Part No.	Manufacturer
)W to 750W	Z15D271	Ishizuka Electronics Co.
kW to 5.0kW		
kW to 2.0kW		
kW to 5.0kW	Z15D151	Ishizuka Electronics Co.
kW to 5.0kW		
kW		
kW to 3.0kW	TNIDOON OOOKDOON AND	Niggrap Ohami Oan Oa
kW to 1.5kW	INDU9V-820KB00AAA0	Nippon Chemi_Con Co.
	otor  OW to 750W  kW to 5.0kW  kW to 2.0kW  kW to 5.0kW  kW to 5.0kW  kW to 3.0kW  kW to 1.5kW	DW to 750W  Z15D271  kW to 5.0kW  kW to 5.0kW  Z15D151  kW to 5.0kW  kW to 5.0kW  TND09V-820KB00AAA0

129

# **Options** List of Peripheral Equipments

Manufacturer	Tel No. / Home Page	Peripheral components	
Automation Controls Company Panasonic Electric Works, Co.,Ltd	81-6-6908-1131 http://panasonic-denko.co.jp/ac	Circuit breaker Surge absorber	
Iwaki Musen Kenkyusho Co., Ltd.	81-44-833-4311 http://www.iwakimusen.co.jp/	Regenerative resistor	
Nippon Chemi-Con Co.	81-3-5436-7711 http://www.chemi_con.co.jp/	Surge absorber	
Ishizuka Electronics Corp.	81-3-3621-2703 http://www.semitec.co.jp/	for holding brake	
TDK Corp.	81-3-5201-7229 http://www.tdk.co.jp/	Noise filter for signal lines	
Okaya Electric Industries Co. Ltd.	81-3-4544-7040 http://www.okayatec.co.jp/	Surge absorber Noise filter	
Japan Aviation Electronics Industry, Ltd.	81-3-3780-2717 http://www.jae.co.jp		
Sumitomo 3M	81-3-5716-7290 http://www.mmmco.jp		
Tyco Electronics AMP k.k,	81-44-844-8111 http://www.tycoelectronics.com/ japan/amp	Connector	
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_i.html		
Daiden Co., Ltd.	81-3-5805-5880 http://www.dyden.co.jp/	Cable	
Mitutoyo Corp.	81-44-813-8236 http://www.mitutoyo.co.jp	Estample and -	
Sony Manufacturing Systems Corp.	81-3-3490-3920 http://www.sonysms.co.jp/	External scale	

<sup>\*</sup> The above list is for reference only. We may change the manufacturer without notice.

# **Information**

Drive

Motor

Options

Information

### Contents

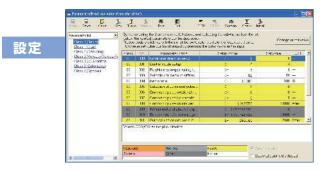
Setup support software "PANATERM"	F2
Motor capacity selection software	
AC servo motor capacity selection software	F3
Option selection software for AC servo motor	F3
Guide to the International System of Units (SI)	F4
Selecting Motor Capacity	F6
Request Sheet for Motor Selection	F12
Connection between Driver and Controller	F20
Index (Alphabetical order)	F25
Sales Office	F32

# 先進機能満載の次世代サポートツール

新しくなったセットアップ支援ソフトウェア「PANATERM」のご紹介

### ■パソコン上で監視·設定·解析

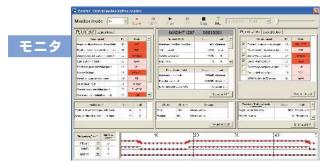
- ・USB通信により、アンプ・パソコン間のアクセスが高速に。
- · 4言語対応(日·英·中·韓)。
- · Windows Vista、Windows XP (SP3) 対応(現行32ビット版のみ)。



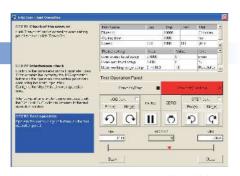
入力し易い階層別パラメータ表示



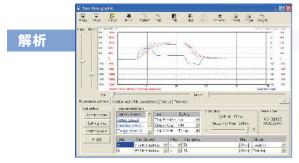
発振時剛性自動低減付きゲイン調 整専用画面追加



録再機能装備のユニバーサルモニタ



動作範囲制限で安心な試運転機能搭載



測定対象が大幅増加高機能波形グラフィック

### その他

試運転

- 周波数特性測定
- ・トラブルシュート
- ・アナログ入力調整
- ·Z相サーチ機能
- ・アラームモニタ
- ・外部ツール使用による機能拡張

Hardware configuration		
	CPU	Pentium 100MHz or more
	Memory	256MB or more (512MB recommended)
Personal computer	Hard disk capacity	Vacancy of 512MB or more recommended
Computer	OS	Windows® XP SP3, Windows® Vista SP1 (Japanese/US/Chinese version) ※64bit版Windows(x64)には非対応
	serial communication port	USB port
Diamless	Resolution	1024 × 768pix or more (desirably 1024 × 768)
Display	Number of colors	24bit colors (TrueColor) or more

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

http://panasonic.co.jp/motor/

# selection software

Motor capacity 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

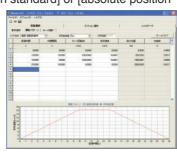
the real machine. To simulate the target machine as practical as possible, use maximum number of parameters available.



#### 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,

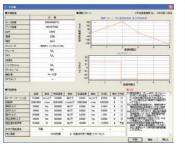
which will be appropriate to use with your machine. Select the motor that is best suitable for your machine application.



#### Details of motor

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

determination are displayed and may be printed out.



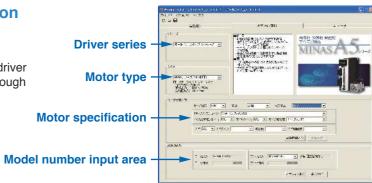
# Option selection software for AC servo motor

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://panasonic.co.jp/motor/

# - Table 5 : Prefix SI unit ---(Multiples of 10) Table 1: Basic unit Table 2: Auxiliary unit Derived unit

Table 4 : Unit combined with SI unit

Table 3 : Derived unit with proper name

Other derived unit

# Table1: Basic unit

Quantity	Name of unit	Symbol of unit
Length	meter	m
Weight	kilogram	kg
Time	second	S
Current	ampere	A
Thermodynamic temperature	kelvin	K
Amount of substance	mol	mol
Luminous intensity	candela	cd

**Table 2: Auxiliary unit** 

Organization of the system of units

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	1Hz=1s <sup>-1</sup>
Force	newton	N	1N=1kg·m/s <sup>2</sup>
Pressure, Stress	pascal	Pa	1Pa=1N/m²
Energy, Work, Amount of heat	joule	J	1J=1N·m
Amount of work, Work efficiency, Power, Electric power	watt	W	1W=1J/s
Electric charge, Amount of electricity	coulomb	С	1C=1A·s
Electric potential, Potential difference, Voltage, Electromotive force	volt	V	1V=1J/C
Electrostatic capacity, Capacitance	farad	F	1F=1C/V
Electric resistance	ohm	Ω	1Ω=1V/A
Electric conductance	siemens	S	1S=1Ω <sup>-1</sup>
Magnetic flux	weber	Wb	1Wb=1V⋅s
Magnetic flux density, Magnetic induction	tesla	Т	1T=1Wb/m <sup>2</sup>
Inductance	henry	Н	1H=1Wb/A
Degree centigrade (Celsius)	degree centigrade (Celsius) / degree	°C	t°C=(t+273.15)K
Luminous flux	lumen	lm	1lm=1cd·sr
Illuminance	lux	lx	1lx=1lm/m <sup>2</sup>

# Table 4: Unit combined with SI unit

Quantity	Name	Symbol of unit
	minute	min
Time	hour	h
	day	d
	degree	۰
Plane angle	minute	,
	second	п
Volume	liter	I, L
Weight	ton	t

# **Table 5: Prefix**

Multiples powered	Prefix	
to unit	Name	Symbol
10 <sup>18</sup>	exa	Е
10 <sup>15</sup>	peta	Р
1012	tera	T
10 <sup>9</sup>	giga	G
10 <sup>6</sup>	mega	M
10 <sup>3</sup>	kilo	k
10 <sup>2</sup>	hecto	h
10	deca	da
10 <sup>-1</sup>	deci	d
10 <sup>-2</sup>	centi	С
10 <sup>-3</sup>	milli	m
10 <sup>-6</sup>	micro	μ
10 <sup>-9</sup>	nano	n
10 <sup>-12</sup>	pico	р
10 <sup>-15</sup>	femto	f
10 <sup>-18</sup>	atto	a

Quantity	Symbol of conventional unit	Symbol of SI unit and compatible unit	Conversion value
Length	μ (micron)	μ m	1μ=1μm (micrometer)
Acceleration	Gal	m/s <sup>2</sup>	1Gal=10 <sup>-2</sup> m/s <sup>2</sup>
	G	m/s <sup>2</sup>	1G=9.806 65m/s <sup>2</sup>
Frequency	c/s, c	Hz	1c/s=Hz
Revolving speed, Number of revolutions	rpm	s <sup>-1 or</sup> min <sup>-1</sup> , r/min	1rpm=1min <sup>-1</sup>
Weight	kgf	-	Same value
Mass	_	kg	Same value
Weight flow rate	kgf/s	-	Same value
Mass flow rate	_	kg/s	Same value
Specific weight	kgf/m³	-	Same value
Density	_	kg/m³	Same value
Specific volume	m³/kgf	m³/kg	Same value
Load	kgf	N	1kgf=9.806 65N
Force	kgf	N	1kgf=9.806 65N
	dyn	N	1dyn=10 <sup>-3</sup> N
Moment of force	kgf-m	N-m	1kgf-m=9.806 N·m
Pressure	kgf/cm <sup>2</sup>	Pa, bar (2) or kgf/cm <sup>2</sup>	1kgf/cm <sup>2</sup> =9.806 65 x 10 <sup>4</sup> Pa=0.980
	at (Engineering atmospheric pressure)	Pa	665bar
	atm (Atmospheric pressure)	Pa	1at=9.806 65 x 10 <sup>4</sup> Pa
	mH2o, mAq	Pa	1atm=1.013 25 x 10 <sup>3</sup> Pa
	mmHg	Pa or mmHg (2)	1mH <sub>2</sub> O=9.806 65 x 10 <sup>3</sup> Pa
	Torr	Pa	1mmHg=133.322Pa
Stress	kgf/mm²	Pa or N/m <sup>2</sup>	1kgf/mm <sup>2</sup> =9.806 65 x 10 <sup>4</sup> Pa
			=9.806 65 x 10 <sup>6</sup> N/m <sup>2</sup>
	kgf/cm <sup>2</sup>	Pa or N/m <sup>2</sup>	1kgf/cm <sup>2</sup> =9.806 65 x 10 <sup>4</sup> Pa
			=9.806 65 x 10 <sup>4</sup> N/m <sup>2</sup>
Elastic modulus	kgf/m²	Pa or N/m <sup>2</sup>	1kgf/m <sup>2</sup> =9.806 65Pa=9.806 65N/m <sup>2</sup>
			1kgf/cm <sup>2</sup> =9.806 65 x 10 <sup>4</sup> N/m <sup>2</sup>
Energy, Work	kgf-m	J (joule)	1kgf⋅m=9.806 65J
3,7	erg	J	1erg=10 <sup>7</sup> J
Work efficiency, Power	kgf-m/s	W (watt)	1kgf-m/s=9.806 65W
,,	PS	W	1PS=0.735 5kW
Viscosity	PP	Ps-s	1P=0.1Pa-s
Kinetic viscosity	St	mm²/s	10 <sup>-2</sup> St=1mm <sup>2</sup> /s
Thermodynamic temperature	K	K (kelvin)	1K=1K
Temperature interval	deg	K <sup>(3)</sup>	1deg=1K
Amount of heat	cal	J	1cal=4.186 05J
Heat capacity	cal/°C	J/K <sup>(3)</sup>	1cal/°C=4.186 05J/K
Specific heat, Specific heat capacity	cal/ (kgf·°C)	cal/ (kgf⋅K) <sup>(3)</sup>	1cal/ (kgf·°C)=4.186 05J/ (kg·K)
Entropy	cal/K	J/K	1cal/K=4.186 05J/K
Specific entropy	cal/ (kgf·K)	J/(kg·K)	1cal/ (kgf·K)=4.186 05J/ (kg·K)
Internal energy (Enthalpy)	cal (kgi k)	J	1cal=4.186 05J
Specific internal energy (Specific enthalpy)	cal/kgf	J/kg	1cal/kgf=4.186 05J/kg
Heat flux	cal/h	W	1kcal/h=1.162 79W
Heat flux density	cal/ (h·m²)	W/m²	1kcal (h·m²)=1.162 79W/m²
Thermal conductivity	cal/ (h·m·°C)	W/ (m·K) <sup>(3)</sup>	1kcal (h·m·°C)=1.162 79W/ (m·K)
Coefficient of thermal conductivity	cal/ (h·m²·°C)	W/ (m <sup>2</sup> ·K) <sup>(3)</sup>	1kcal (h·m·°C)=1.162 79W/ (m²·K)
	` ′	A/m	1Oe=10 <sup>2</sup> / (4π)A/m
Intensity of magnetic field	Oe My		1Mx=10 <sup>-3</sup> Wb
Magnetic flux	Mx	Wb (weber)	1Gs=10 <sup>-4</sup> T
Magnetic flux density	Gs,G	T (tesla)	105-10 1

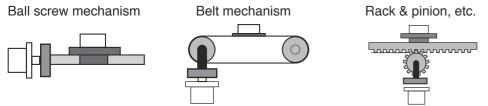
- (1) Applicable to liquid pressure. Also applicable to atmospheric pressure of meteorological data, when "bar" is used in international standard.
- (2) Applicable to scale or indication of blood pressure manometers.
- (3) "°C" can be substituted for "K".

# Flow of motor selection

#### 1. Definition of mechanism to be driven by motor.

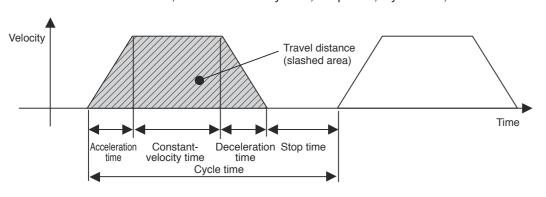
Define details of individual mechanical components (ball screw length, lead and pulley diameters, etc.)

#### <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<sup>-4</sup>kg·m<sup>2</sup>".

#### 4. Calculation of motor velocity

Calculate the motor velocity from the moving distance, acceleration / deceleration time and constant-velocity time.

#### 5. Calculation of torque

Calculate the required motor torque from the load inertia, acceleration/deceleration time and constant-velocity time.

#### 6. Calculation of motor

Select a motor that meets the above 3 to 5 requirements.

### Description on the items related to motor selection

#### 1. Torque

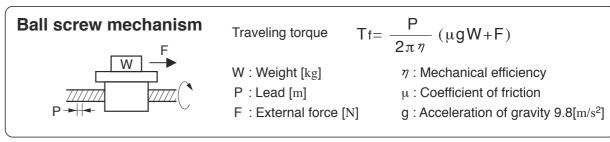
#### (1) Peak torque

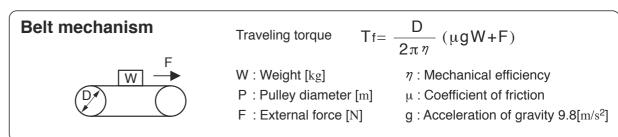
Indicate the maximum torque that the motor requires during operation (mainly in acceleration and deceleration steps). The reference value is 80% or less of the maximum motor torque. If the torque is a negative value, a regenerative discharge resistor may be required.

#### (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





#### (3) Effective torque

Indicates a root-mean-square value of the total torque required for running and stopping the motor per unit time. The reference value is approx. 80% or less of the rated motor torque.

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

Ta: Acceleration torque [N·m] ta: Acceleration time [s] tc: Cycle time [s] Tf: Traveling torque [N·m] tb: Constant-velocity time [s] (Run time + Stop time) Td: Deceleration torque [N·m] td: Deceleration time [s]

#### 2. Motor velocity

#### Maximum velocity

Maximum velocity of motor in operation: The reference value is the rated velocity or lower value. When the motor runs at the maximum velocity, you must pay attention to the motor torque and temperature rise. For actual calculation of motor velocity, see "Example of motor selection" described later. Inertia ratio is calculated by dividing load inertia by rotor inertia.

Generally, for motors with 750 W or lower capacity, the inertia ratio should be "20" or less. For motors with 1000 W or higher capacity, the inertia ratio should be "10" or less.

If you need quicker response, a lower inertia ratio is required

/ For example, when the motor takes several seconds in acceleration step, the inertia ratio can be further \increased.

## General inertia calculation method

Shape	J calculation formula	Shape	J calculation formula
Disk	$J = \frac{1}{8} WD^{2} [kg \cdot m^{2}]$ $W : Weight [kg]$ $D : Outer diameter [m]$	Hollow cylinder	$J = \frac{1}{8} W(D^2 + d^2) [kg \cdot m^2]$ $W : Weight [kg]$ $D : Outer diameter [m]$ $d : Inner diameter [m]$
Prism	$J = \frac{1}{12} W (a^{2} + b^{2}) [kg \cdot m^{2}]$ $W : Weight [kg]$ a, b, c : Side length [m]	Uniform rod	$J = \frac{1}{48} W(3D^2 + 4L^2)_{[kg \cdot m^2]}$ $W : Weight [kg]$ $D : Outer diameter [m]$ $L : Length [m]$
Straight rod	$J = \frac{1}{3} WL^{2} [kg \cdot m^{2}]$ $W : Weight [kg]$ $L : Length [m]$	Separated rod	$J = \frac{1}{8} WD^2 + WS^2 [kg \cdot m^2]$ $W : Weight [kg]$ $D : Outer diameter [m]$ $S : Distance [m]$
Reduction gear	Inertia on shaft "a" $J = J_1 + (\frac{n_2}{n_1})^2 J_2[kg \cdot m^2]$ $n_1 : \text{A rotational speed of a shaft } [r/min]$ $n_2 : \text{A rotational speed of b shaft } [r/min]$		
Conveyor	$J = \frac{1}{4} WD^{2} [kg \cdot m^{2}]$ $W : Workpiece weight on conveyor [kg]$ $D : Drum diameter [m]$ * 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  $\rho$  [kg/m<sup>3</sup>] x Volume V[m<sup>3</sup>]

Density of each material

Iron  $\rho = 7.9 \times 10^3 \, [\text{kg/m}^3]$ 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

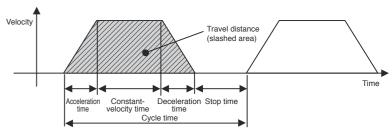
Workpiece weight WA = 10 [kg]Ball screw length BL = 0.5 [m]Ball screw diameter BD = 0.02 [m]Ball screw pitch BP = 0.02 [m]Ball screw efficiency  $B\eta = 0.9$ 

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:

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 0.3[m]



 $BW = \rho \times \pi \times \left(\frac{BD}{2}\right)^2 \times BL = 7.9 \times 10^3 \times \pi \times \left(\frac{0.02}{2}\right)^2 \times 0.5$ 3. Ball screw weight

 $JL = JC + JB = JC + \frac{1}{8}BW \times BD^2 + \frac{WA \cdot BP^2}{4\pi^2}$ 4. Load inertia  $= 0.00001 + (1.24 \times 0.02^{2}) / 8 + 10 \times 0.02^{2} / 4\pi^{2}$  $= 1.73 \times 10^{-4} [\text{kg} \cdot \text{m}^2]$ 

5. Provisional motor selection

In case of 200 W motor :  $JM = 0.17 \times 10^{-4} [kg \cdot m^2]$ 

6. Calculation of inertia ratio

JL / JM =  $1.73 \times 10^{-4} / 0.17 \times 10^{-4}$  Therefore, the inertia ratio is "10.2" (less than "20") (In case of 100 W motor:  $JM = 0.064 \times 10^{-4}$  Therefore, the inertia ratio is "27.0".)

7. Calculation of maximum velocity (Vmax)

 $\frac{1}{2}$  × Acceleration time × Vmax + Constant-velocity time × Vmax +  $\frac{1}{2}$  × Deceleration time × Vmax = Travel distance

$$\frac{1}{2} \times 0.1 \times \text{Vmax} + 0.8 \times \text{Vmax} + \frac{1}{2} \times 0.1 \times \text{Vmax} = 0.3$$
  
 $0.9 \times \text{Vmax} = 0.3$   
 $= 0.3 / 0.9 = 0.334 \text{ [m/s]}$ 

8. Calculation of motor velocity (N [r/min]) Ball screw lead per resolution: BP = 0.02 [m]

N = 0.334 / 0.02 = 16.7 [r/s] $= 16.7 \times 60 = 1002 \text{ [min}^{-1]} < 3000 \text{ [min}^{-1]}$  (Rated velocity of 200W motor)

9. Calculation of torque

Traveling torque  $Tf = \frac{BP}{2\pi B n} (\mu gWA + F) = \frac{0.02}{2\pi \times 0.9} (0.1 \times 9.8 \times 10 + 0)$ Acceleration torque  $Ta = \frac{(JL + JM) \times 2\pi N[r/s]}{Acceleration time [s]} + Traveling torque$  $= \frac{(1.73 \times 10^{-4} + 0.17 \times 10^{-4}) \times 2\pi \times 16.7}{0.1} + 0.035$  $= 0.199 + 0.035 = 0.234 [N \cdot m]$ 

F9

## **Selecting Motor Capacity** Example of motor selection

# Deceleration torque $Td = \frac{(JL + JM) \times 2\pi N[r/s]}{Deceleration time [s]}$ - Traveling torque $=\frac{(1.73\times10^{-4}+0.17\times10^{-4})\times2\pi\times16.7}{0.1}-0.035$ $= 0.199 - 0.035 = 0.164 [N \cdot m]$

10. Verification of maximum torque

Acceleration torque =  $Ta = 0.234 [N \cdot m] < 1.91 [N \cdot m]$  (Maximum torque of 200 W motor)

11. Verification of effective torque

Trms = 
$$\sqrt{\frac{\text{Ta}^2 \times \text{ta} + \text{Tf}^2 \times \text{tb} + \text{Td}^2 \times \text{td}}{\text{tc}}}$$
  
=  $\sqrt{\frac{0.234^2 \times 0.1 + 0.035^2 \times 0.8 + 0.164^2 \times 0.1}{2}}$   
= 0.065 [N·m] < 0.64 [N·m] (Rated torque of 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 =3[kg] (including belt)

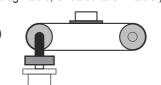
> Pulley diameter PD = 0.05[m]

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

Mechanical efficiency  $B \eta = 0.8$ 

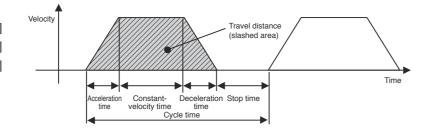
Jc = 0 (Direct connection to motor shaft) Coupling inertia

Belt mechanism inertia JB 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 × PD<sup>2</sup> +  $\frac{1}{8}$ WP × PD<sup>2</sup> × 2  
= 0 +  $\frac{1}{4}$  × 3 × 0.05<sup>2</sup> +  $\frac{1}{8}$  × 0.5 × 0.05<sup>2</sup> × 2  
= 0.00219 = 21.9 × 10<sup>-4</sup> [kg·m<sup>2</sup>]

4. Provisional motor selection

In case of 750 W motor :  $JM = 1.31 \times 10^{-4} \, [kg \cdot m^2]$ 

5. Calculation of inertia ratio

JL / JM =  $21.9 \times 10^{-4}$  /  $1.31 \times 10^{-4}$  Therefore, the inertia ratio is "16.7" (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 = 1.11 / 0.157 = 7.08[r/s]  
= 7.08 × 60 = 424.8[min<sup>-1</sup>] < 3000[min<sup>-1</sup>] (Rated velocity of 750 W motor)

8. Calculation of torque

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

$$= 0.092[\,N\cdot m\,]$$
Acceleration torque 
$$T_a = \frac{(JL + JM)\,\times\,2\pi N[\,r/s\,]}{Acceleration\,time[s]} + Traveling\,torque$$

$$= \frac{(21.9\,\times\,10^{-4} + 1.31\,\times\,10^{-4})\,\times\,2\pi\,\times\,7.08}{0.1} + 0.092$$

$$= 1.032 + 0.092 = 1.124[\,N\cdot m\,]$$
Deceleration torque 
$$T_d = \frac{(JL + JM)\,\times\,2\pi N[\,r/s\,]}{Deceleration\,time[s]} - Traveling\,torque$$

$$= \frac{(21.9\,\times\,10^{-4} + 1.31\,\times\,10^{-4})\,\times\,2\pi\,\times\,7.08}{0.1} - 0.092$$

$$= 1.032 - 0.092 = 0.94[\,N\cdot m\,]$$

9. Verification of maximum torque

Acceleration torque  $Ta = 1.124[N \cdot m] < 7.1[N \cdot m]$  (Maximum torque of 750 W motor)

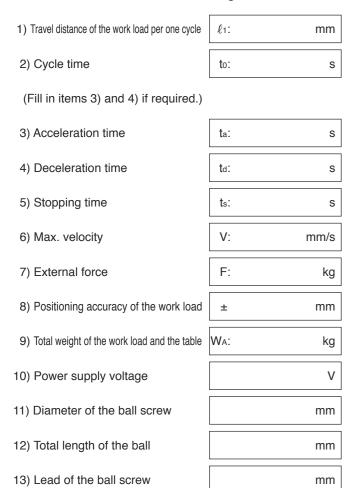
10. Verification of effective torque

Trms = 
$$\sqrt{\frac{\text{Ta}^2 \times \text{ta} + \text{Tf}^2 \times \text{tb} + \text{Td}^2 \times \text{td}}{\text{tc}}}$$
  
=  $\sqrt{\frac{1.124^2 \times 0.1 + 0.092^2 \times 0.8 + 0.94^2 \times 0.1}{2}}$   
= 0.333 [N·m] < 2.4 [N·m] (Rated torque of 750 W motor)

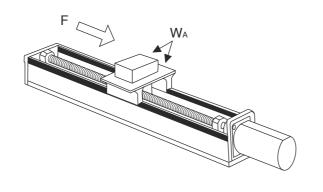
11. Judging from the above calculation result, selection of 750W motor is acceptable.

# Request for Motor Selection I: Ball screw drive

#### 1. Driven mechanism and running data



# Running pattern time **t**d



14) Traveling direction (horizontal, vertical etc.)

#### 2. Other data

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

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

#### Request for Motor Selection II: Timing pulley + Ball screw drive

1. Driven mechanism and ru	nning data			Motor side	Moto	or side
1) Travel distance of the work load per one cycle	ℓ1:	mm	15) Diameter of the pulley	D <sub>1</sub> : mr	n D2:	mm
2) Cycle time	to:	S	16) Weight of the pulley	W <sub>1</sub> : k	g W <sub>2</sub> :	kg
(Fill in items 3) and 4) if required.)	)		(or item 17) and 18))			
3) Acceleration time	ta:	S	17) Width of the pulley	L1:	mm	
4) Deceleration time	ta:	S	18) Material of the pulley			
5) Stopping time	ts:	s	19) Weight of the belt	WM:	kg	
6) Max. velocity	V:	mm/s	Running pattern			
7) External force	F:	kg				
8) Positioning accuracy of the work load	±	mm	νelocity ℓ1			
9) Total weight of the work load and the table	WA:	kg	ta to	t <sub>d</sub> t <sub>s</sub>	time	— e
10) Power supply voltage		V	F	WA		
11) Diameter of the ball screw		mm				
12) Total length o the ball screw		mm				
13) Lead of the ball screw		mm			(0)	<b>▼</b> D2(W2)
14) Traveling					WM	
			L <sub>1</sub>	D1(\	V <sub>1</sub> )	

#### 2. Other data

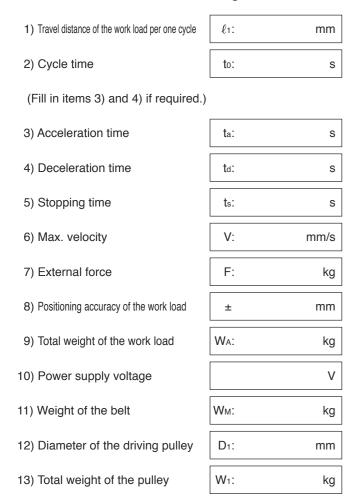
,	
	Company name :
	Department/Section :
	Name
	Name :
	Address:
	Tel:
	161.
	Fax:
	E-mail address:

**Customer Service Technical Support Center,** 

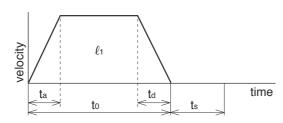
**Motor Company, Panasonic Corporation** 

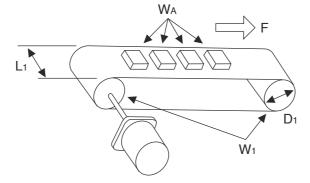
## Request for Motor Selection **Ⅲ**: Belt drive

#### 1. Driven mechanism and running data



#### Running pattern





(or	item	1/1	and	15))	
(OI	пепп	14)	anu	10))	

4 4	\ \ A /: -  A   -	- 4 41	
14	)Width	or the	pulley

L <sub>1</sub> :	m

5)	Material	of	the	pulley
----	----------	----	-----	--------

16) Traveling direction	
/harizantal vartical ata \	
(horizontal, vertical etc.)	

#### 2. Other data

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

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

### Request for Motor Selection IV: Timing pulley + Belt drive

**Request Sheet for Motor Selection** 

. Driven mechanis	m and runnir	ng c	lata			N	lotor side	Belt	side
1) Travel distance of the work lo	oad per one cycle	ℓ1:		mm	16) Diameter of the pulley	D3:	mm	D4:	mı
2) Cycle time		to:		s	17) Weight of the pulley	W3:	kg	W4:	k
(Fill in items 3) and 4)	if required.)				(or item 18) and 19)	)			
3) Acceleration time		ta: s		s	18) Width of the pulley		L2:	mı	n
4) Deceleration time		ta: s		s	19) Material of the pulle				
5) Stopping time		ts:		s	20) Weight of the belt		WL:	k	g
6) Max. velocity		V:		mm/s	21) Traveling direction (horizontal, vertical				
7) External force	F:			kg	Running pattern				
8) Positioning accuracy of	the work load	±		mm	<u></u> <u>}</u> <u>ℓ</u> 1				
9) Total weight of the work load and the table		WA:		kg	ν elocity	\			
0) Power supply voltag	e			V	ta to	<b>t</b> d≪	ts >	tim	Э
1) Weight of motor site	belt V	<b>V</b> м:		kg				/	\( \frac{\lambda}{\lambda} \)
	Motor side		Belt si	de			\	<b>N</b> Ļ	L
2) Diameter of the pully	D <sub>1</sub> : m	nm	D <sub>2</sub> :	mm		WA	'		
3) Weight of the pulley	W1:	kg	W2:	kg	D <sub>2</sub> (W <sub>2</sub> )			<b>]</b> //	D4(W
(or item 14) and 15))	_				W <sub>M</sub>				D4( <b>*</b> *
4) Weight of the belt		L <sub>1</sub> :		mm	VVIM				
5) Material of the pulley	,						Ī	) Эз(Wз)	
Other data					D <sub>1</sub> (W <sub>1</sub> )				

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

mm

mm

pcs

# **Request Sheet for Motor Selection**

Request for Motor Selection VI: Timing pulley + Turntable drive

Request for Motor Selection	V	:	Turntable drive	
-----------------------------	---	---	-----------------	--

Driven mechanism and run	ning o	data		Prism			Cylinder
1) Travel distance of the work load per one cycle	dı:	deg	14) Dimensions of the work load	a:	mm	a:	
2) Cycle time	to:	s		b:	mm	b:	
(Fill in items 3) and 4) if required.)				c:	mm	c:	
3) Acceleration time	t <sub>a</sub> :	S	15) Number of work loa	ads			
4) Deceleration time	t <sub>d</sub> :	S	Running pattern				
5) Stopping time	ts:	S					
6) Max. rotational speed of the table	v:	deg/s	velocity	dı \	\		
(or)	V:	r/s	ta to	o td	ts		time
7) Positioning accuracy of the work load	±	deg		L R₁			
B) Weight of one work load	WA:	kg	Wa				
9) Driving radius of the center of gravity of the	R <sub>1</sub> :	mm	_				
0) Diameter of the table	D <sub>1</sub> :	mm	D <sub>1</sub>			1	
1) Mass of the table	W <sub>1</sub> :	kg					
2) Diameter of the table support	T <sub>1</sub> :	mm			7		
3) Power supply voltage		V					
			a c	b	_	<b>b</b>	<b> </b>

### 1. Driven mechanism and running data

- 1) Travel distance of the work load per one cycle | d1: deg 16)
- S 2) Cycle time
- (Fill in items 3) and 4) if required.)

4) Deceleration time

3) Acceleration time ta: S

td:

- ts: 5) Stopping time
- 6) Max. rotating speed of the table deg/s (or) V: r/s
- 7) Positioning accuracy of the work load deg
- 8) Weight of one work load kg

9) Driving radius of the center of gravity of the R1:

- 10) Diameter of the table D<sub>1</sub>: mm
- W1: 11) Mass of the table kg
- 12) Diameter of the table support T<sub>1</sub>: mm
- V 13) Power supply voltage

	(Prism)		(Cyli	inder)
14) Dimension of the work load	a:	mm	a:	mm
	b:	mm	b:	mm
	c:	mm	C:	mm
		1		

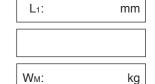
15) Number of work loads

			Turntable side	
6) Diameter of the pulley	D2:	mm	D3:	mm
7) Weight of the pulley	W2:	kg	Wз:	kg
(or item 18) and 19))				

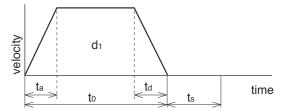
18) Width of the pulley

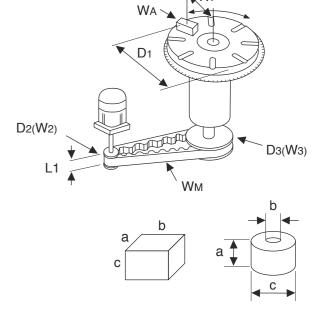
19) Material	of the	pulley
--------------	--------	--------

20) Weight of the belt



Running pattern





#### 2. Other data

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

pcs

mm

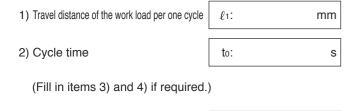
Company name :
Department/Section :
Name :
Address:
Tel:
Fax:
E-mail address:

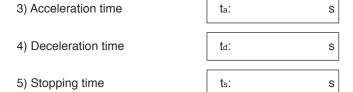
#### 2. Other data

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

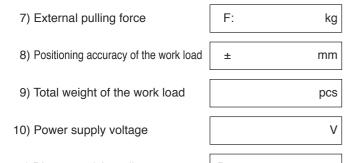
# Request for Motor Selection VII: Roller feed drive

#### 1. Driven mechanism and running data



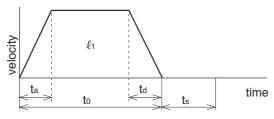


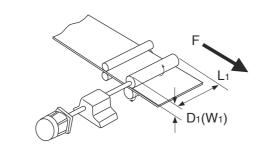
v:





#### Running pattern





(or item 13) and 14))

<ol><li>Width of the roller</li></ol>	3)	Width	of	the	roller	
---------------------------------------	----	-------	----	-----	--------	--

L <sub>1</sub> :	mm

#### 14) Material of the roller

#### 2. Other data

6) Max. velocity

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

mm/s

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

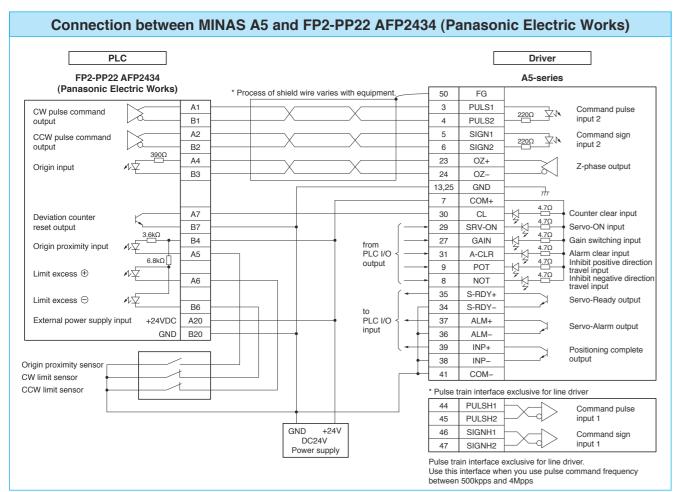
#### Request for Motor Selection VIII: Driving with Rack & Pinion

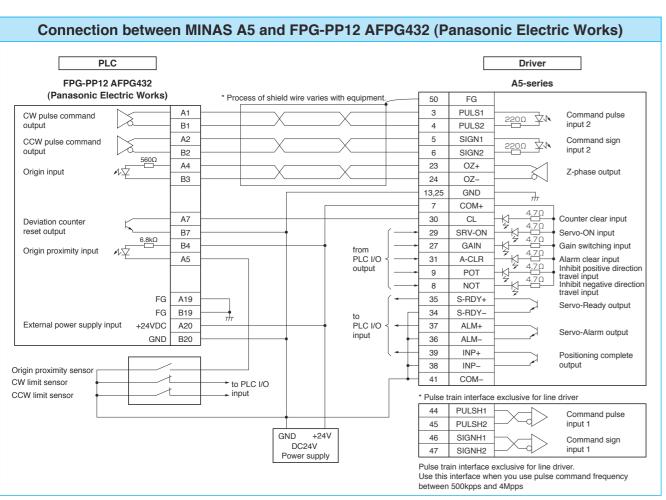
**Request Sheet for Motor Selection** 

1. Driven mechanism and running	data		
1) Travel distance of the work load per one cycle	ℓ1:	mm	
2) Cycle time	to:	S	Running pattern
(Fill in items 3) and 4) if required.)			
3) Acceleration time	ta:	S	Value of the state
4) Deceleration time	td:	S	ta to time
5) Stopping time	ts:	s	∕ WA
6) Max. velocity	V:	mm/s	•
7) External force	F:	kg	F C
8) Positioning accuracy of the work load	±	mm	Lower
9) Total weight of the work load	WA:	kg	W <sub>3</sub> &
10) Power supply voltage		V	D3
11) Diameter of the pinion	D3:	mm	
12) Mass of the pinion	W3:	kg	
13) Traveling direction (horizontal, vertical, etc)			

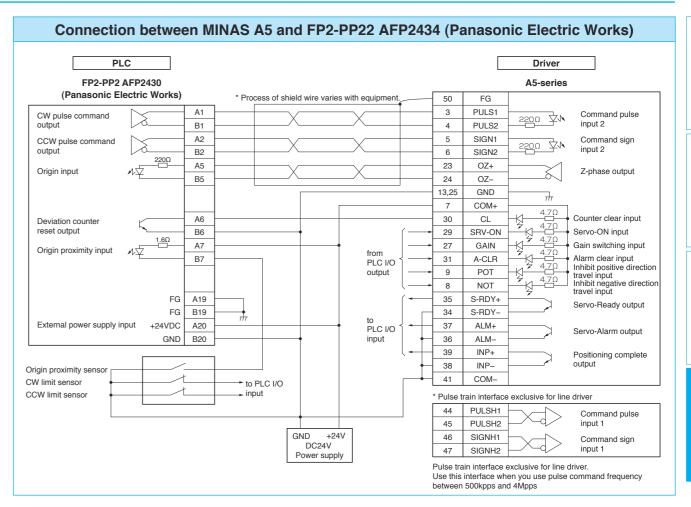
#### 2. Other data

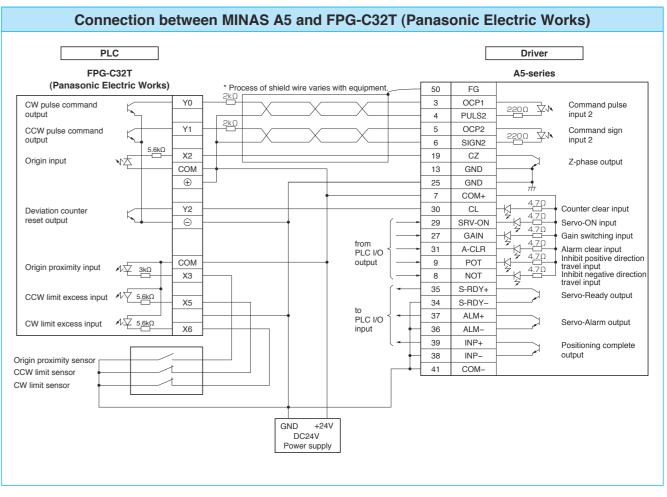
Company name :
Department/Section :
Name :
Address:
Tel:
Fax:
E-mail address:



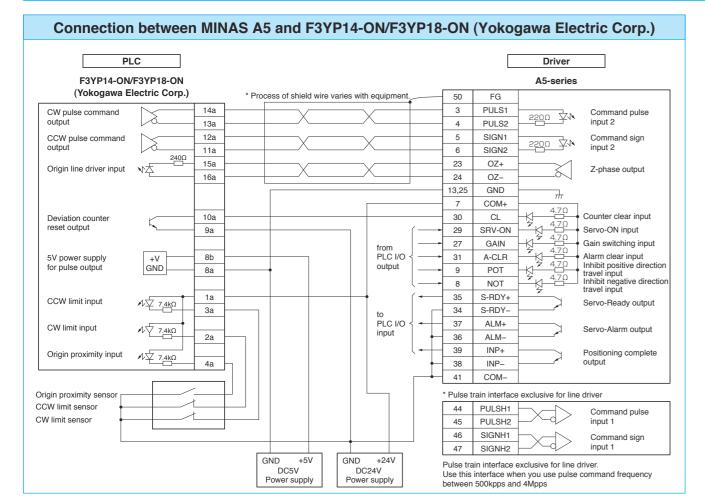


F20



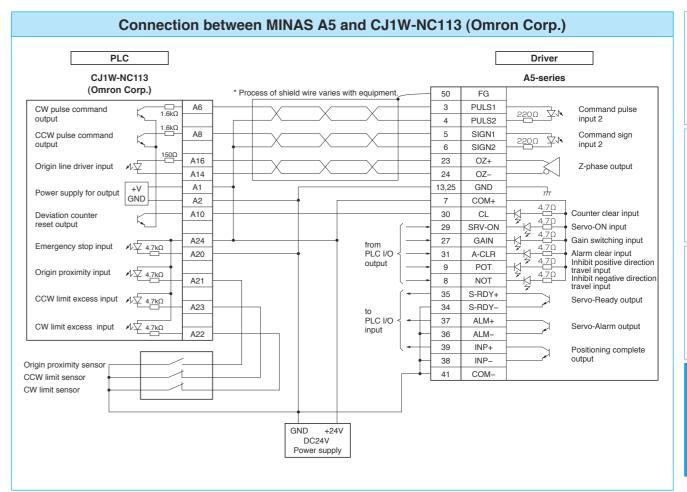


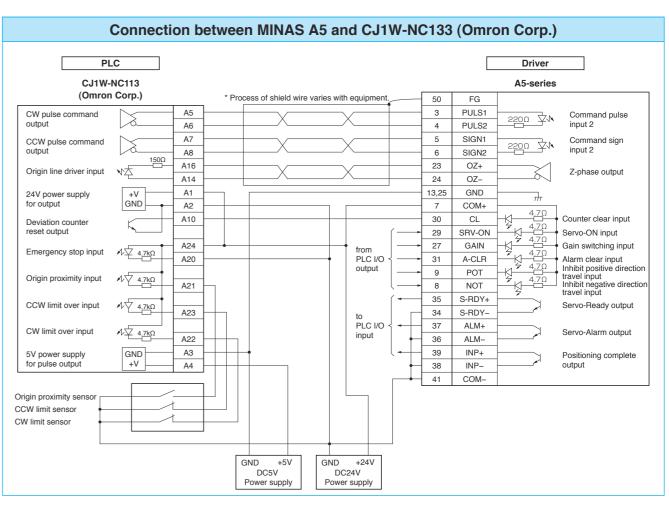
F21



#### Connection between MINAS A5 and F3NC32-ON/F3NC34-ON (Yokogawa Electric Corp.) PLC Driver F3NC32-ON/F3NC34-ON A5-series (Yokogawa Electric Corp.) 50 FG 3a 3 PULS<sub>1</sub> Command pulse Pulse output A 4a 4 PULS2 5a 5 SIGN1 Command sign Pulse output B input 2 6a SIGN2 6 Encoder Z-phase output + 19a 23 OZ+ Z-phase output Encoder Z-phase output 24 OZ-20a GND 13,25 7 COM+ 14a 30 CL Counter clear input Deviation counter reset output 29 SRV-ON Servo-ON input External power supply 24VDC input 1a 27 GAIN Gain switching input External power supply 24VDC input 1b PLC I/O 31 A-CLR Alarm clear input Inhibit positive direction 9 POT travel input Inhibit negative direction travel input NOT Contact point input COM 35 S-RDY+ Servo-Ready output 8a 34 S-RDYlimit input 37 PLC I/O ALM+ Servo-Alarm output 36 ALM-9a limit input 39 INP+ Positioning complete Origin input 7a INP-38 41 COM-Origin proximity senso \* Pulse train interface exclusive for line driver CCW limit sensor 44 PULSH1 Command pulse CW limit sensor 45 PULSH2 SIGNH1 46 Command sign +24V GND Pulse train interface exclusive for line driver. Use this interface when you use pulse command frequency Power supply between 500kpps and 4Mpps

F22





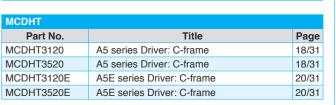
20/30

20/30

MADHT

MBDHT2110E

MBDHT2510E

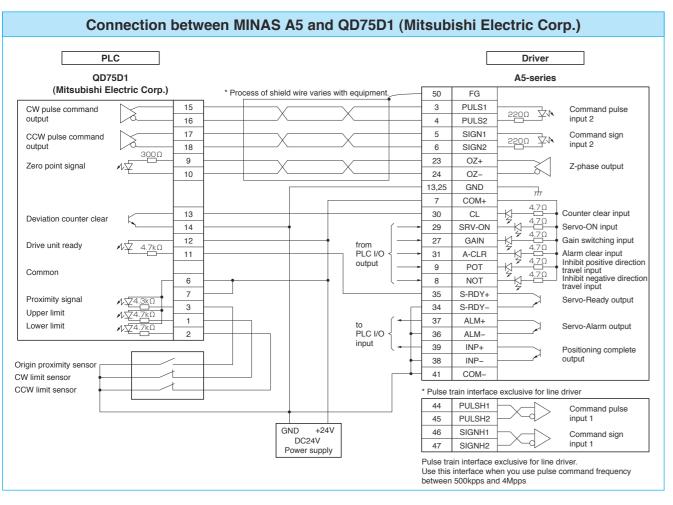


A5E series Driver: B-frame

A5E series Driver: B-frame

MDDHT		
Part No.	Title	Page
MDDHT3530	A5 series Driver: D-frame	18/32
MDDHT5540	A5 series Driver: D-frame	18/32
MDDHT3530E	A5E series Driver: D-frame	20/32
MDDHT5540E	A5E series Driver: D-frame	20/32

MDME (Middle ine	ertia)	
Part No.	Title	Page
MDME102G1C	MDME 1.0kW Incremental encoder	51
MDME102G1D	MDME 1.0kW Incremental encoder	51
MDME102G1G	MDME 1.0kW Incremental encoder	51
MDME102G1H	MDME 1.0kW Incremental encoder	51
MDME102S1C	MDME 1.0kW Incremental encoder	51
MDME102S1D	MDME 1.0kW Incremental encoder	51
MDME102S1G	MDME 1.0kW Incremental encoder	51
MDME102S1H	MDME 1.0kW Incremental encoder	51
MDME104G1C	MDME 1.0kW Incremental encoder	88
MDME104G1D	MDME 1.0kW Incremental encoder	88
MDME104G1G	MDME 1.0kW Incremental encoder	88
MDME104G1H	MDME 1.0kW Incremental encoder	88
MDME104S1C	MDME 1.0kW Absolute encoder	88
MDME104S1D	MDME 1.0kW Absolute encoder	88
MDME104S1G	MDME 1.0kW Absolute encoder	88
MDME104S1H	MDME 1.0kW Absolute encoder	88
MDME152G1C	MDME 1.5kW Incremental encoder	52
MDME152G1D	MDME 1.5kW Incremental encoder	52
MDME152G1G	MDME 1.5kW Incremental encoder	52
MDME152G1H	MDME 1.5kW Incremental encoder	52
MDME152S1C	MDME 1.5kW Absolute encoder	52
MDME152S1D	MDME 1.5kW Absolute encoder	52
MDME152S1G	MDME 1.5kW Absolute encoder	52
MDME152S1H	MDME 1.5kW Absolute encoder	52
MDME154G1C	MDME 1.5kW Incremental encoder	89
MDME154G1D	MDME 1.5kW Incremental encoder	89
MDME154G1G	MDME 1.5kW Incremental encoder	89
MDME154G1H	MDME 1.5kW Incremental encoder	89
MDME154S1C	MDME 1.5kW Absolute encoder	89
MDME154S1D	MDME 1.5kW Absolute encoder	89
MDME154S1G	MDME 1.5kW Absolute encoder	89
MDME154S1H	MDME 1.5kW Absolute encoder	89
MDME202G1C	MDME 2.0kW Incremental encoder	53
MDME202G1D	MDME 2.0kW Incremental encoder	53
MDME202G1G	MDME 2.0kW Incremental encoder	53



PL	.C								Driver	
KV-500 (keyence			_						A5-series	
(keyence	- ' '	_	Process of sh	ield wire varies wi	th equipment.	-	50	FG		
Origin sensor input	VΔ 4.3kΩ		2kΩ	$\overline{}$	$\overline{}$		3	PULS1	2 <u>20</u> 0 \$\dagger{\Pi}\$	Command pulse
axis limit switch CW	4.3kn						4	PULS2		input 2
axis limit switch CCW	4.3kΩ 4		2kΩ	X	$\overline{}$		5	SIGN1	2 <u>20</u> 0 \$\dag{\dag{\dag{\dag{\dag{\dag{\dag{	Command sign input 2
							6	SIGN2		iiiput 2
	1.2kΩ 1			$\overline{}$	$\overline{}$		23	OZ+		Z-phase output
	1						24	OZ-		
( axis CW	1	6	_				13,25	GND COM+	- 777	
	1	-					30	CCIVI+	4.70	Counter clear input
sxis deviation		9			(	,	29	SRV-ON	4.70	Servo-ON input
							27	GAIN	4.7Ω	Gain switching input
					from PLC I/O <		31	A-CLR	4.70	Alarm clear input
	-	<u> </u>			output		9	POT	4.70	Inhibit positive direction
							8	NOT	4.70	travel input Inhibit negative directio
					(	` <b>_</b>	35	S-RDY+	- 3	travel input
	3	6			.		34	S-RDY-		Servo-Ready output
( axis CCW		<u> </u>			to PLC I/O <	-	37	ALM+	<u> </u>	
	4			<b>→</b>	input	$\downarrow$	36	ALM-	ار الر <u>ــــــــــــــــــــــــــــــــــــ</u>	Servo-Alarm output
		_					39	INP+		Positioning complete
in provinsity conce		$\neg$			,	_	38	INP-		output
jin proximity sensor					Г		41	COM-		
W limit sensor							* Dulas t	voin interfece	e exclusive for line	driver
							44	PULSH1	Exclusive for fine	
				+			45	PULSH2		Command pulse input 1
			ſ	GND +24V			45	SIGNH1		•
				DC24V			47	SIGNH2		Command sign input 1

DV0P		_
Part No.	Title	Page
DV0P1450	Surge absorber (3-phase)	109
DV0P1460	Noise Filter for Signal Lines	109
DV0P220	Reactor	127
DV0P221	Reactor	127
DV0P222	Reactor	127
DV0P223	Reactor	127
DV0P224	Reactor	127
DV0P225	Reactor	127
DV0P227	Reactor	127
DV0P228	Reactor	127
DV0P2990	Battery For Absolute Encoder	125
DV0P3410	Noise Filter	108
DV0P4170	Noise Filter	108
DV0P4190 DV0P4220	Surge absorber (Single phase)  Noise Filter	109 108
DV0P4280 DV0P4281	External Regenerative Resistor: 50Ω 25W External Regenerative Resistor: 100Ω 25W	128 128
	3	_
DV0P4282	External Regenerative Resistor: 25Ω 50W	128 128
DV0P4283 DV0P4284	External Regenerative Resistor: 50Ω 50W	128
DV0P4284 DV0P4285	External Regenerative Resistor: 30Ω100W	128
DV0P4285 DV0P4290	External Regenerative Resistor: 20Ω130W Connector Kit for Motor/Encoder Connection	
DV0P4290 DV0P4350	Interface Connector	122 118
DV0P4360	Interface cable  Connector Kit for Motor/Encoder Connection	118
DV0P4380 DV0P4430		122 125
	Battery Box	
DV0PM20010	Connector Kit: Encoder	119
DV0PM20021 DV0PM20022	Operation manual (Japanese)	_
DV0PM20022 DV0PM20023	Operation manual (English)  Operation manual (Chinese (simplified))	_
DV0PM20023 DV0PM20024		
DV0PM20024 DV0PM20025	Connector Kit: RS485, 232 Connector Kit: Safety	119 119
DV0PM20025	Connector Kit: Salety  Connector Kit: External Scale	119
DV0PM20026 DV0PM20027		126
DV0PM20027 DV0PM20028	Mounting bracket: A-frame  Mounting bracket: B-frame	126
DV0PM20028	Mounting bracket: B-frame	126
DV0PM20030	Mounting bracket: O-frame	126
DV0PM20030	Connector Kit: Analog Monitor Signal	120
D V 01   W 2003	Connector for Power Supply Input Connection	120
DV0PM20032	(A to D-frame (Single row type))  Connector for Power Supply Input Connection	120
DV0PM20033	(A to D-frame (Double row type))	120
DV0PM20034	Connector for Motor Connection (A to D-frame)	121
DV0PM20035	Connector Kit for Motor/Encoder Connection	123
DV0PM20036	Connector Kit for Motor/Encoder Connection	123
DV0PM20037	Connector Kit for Motor/Encoder Connection	123
DV0PM20038	Connector Kit for Motor/Encoder Connection	123
DV0PM20039	Connector Kit for Motor/Encoder Connection	124
DV0PM20040	Connector Kit for Motor/Brake Connection	124
DV0PM20042	Noise Filter	108
DV0PM20043	Noise Filter	108
DV0PM20044	Connector for Power Supply Input Connection (E-frame)	120
DV0PM20045	Connector for Regenerative Resistor (E-frame 200V/400V 共用)	121
DV0PM20046	Connector for Motor Connection (E-frame 200V/400V 共用)	122
DV0PM20048	External Regenerative Resistor: 120Ω 240W	128
DV0PM20049	External Regenerative Resistor: 80Ω 450W	128
DV0PM20050	Surge absorber	109
DV0PM20051	Connection (D-frame 400V)	121
DV0PM20052	Connector for Power Supply Input Connection (E-frame 400V)	121
DV0PM20053	Connector for Control Power Supply Input Connection (D,E-frame 400V)	121
DV0PM20054	Connector for Motor Connection (D-frame 400V)	122
	Connector for Regenerative Resistor	121

F24

MDME (Middle ine	Title	Pag
MDME202G1H	MDME 2.0kW Incremental encoder	53
MDME202S1C	MDME 2.0kW Absolute encoder	53
MDME202S1D	MDME 2.0kW Absolute encoder	53
MDME202S1G	MDME 2.0kW Absolute encoder	53
MDME202S1H	MDME 2.0kW Absolute encoder	53
MDME204G1C	MDME 2.0kW Incremental encoder	90
MDME204G1D	MDME 2.0kW Incremental encoder	90
	MDME 2.0kW Incremental encoder	
MDME204G1G		90
MDME204G1H	MDME 2.0kW Incremental encoder	90
MDME204S1C	MDME 2.0kW Absolute encoder  MDME 2.0kW Absolute encoder	90
MDME204S1D MDME204S1G		90
	MDME 2.0kW Absolute encoder	90
MDME204S1H	MDME 2.0kW Absolute encoder	90
MDME302G1C	MDME 3.0kW Incremental encoder	54
MDME302G1D	MDME 3.0kW Incremental encoder	54
MDME302G1G	MDME 3.0kW Incremental encoder	54
MDME302G1H	MDME 3.0kW Incremental encoder	54
MDME302S1C	MDME 3.0kW Absolute encoder	54
MDME302S1D	MDME 3.0kW Absolute encoder	54
MDME302S1G	MDME 3.0kW Absolute encoder	54
MDME302S1H	MDME 3.0kW Absolute encoder	54
MDME304G1C	MDME 3.0kW Incremental encoder	91
MDME304G1D	MDME 3.0kW Incremental encoder	91
MDME304G1G	MDME 3.0kW Incremental encoder	91
MDME304G1H	MDME 3.0kW Incremental encoder	91
MDME304S1C	MDME 3.0kW Absolute encoder	91
MDME304S1D	MDME 3.0kW Absolute encoder	91
MDME304S1G	MDME 3.0kW Absolute encoder	91
MDME304S1H	MDME 3.0kW Absolute encoder	91
MDME402G1C	MDME 4.0kW Incremental encoder	55
MDME402G1D	MDME 4.0kW Incremental encoder	55
MDME402G1G	MDME 4.0kW Incremental encoder	55
MDME402G1H	MDME 4.0kW Incremental encoder	55
MDME402S1C	MDME 4.0kW Absolute encoder	55
MDME402S1D	MDME 4.0kW Absolute encoder	55
MDME402S1G	MDME 4.0kW Absolute encoder	55
MDME402S1H	MDME 4.0kW Absolute encoder	55
MDME404G1C	MDME 4.0kW Incremental encoder	92
MDME404G1D	MDME 4.0kW Incremental encoder	92
MDME404G1G	MDME 4.0kW Incremental encoder	92
MDME404G1H	MDME 4.0kW Incremental encoder	92
MDME404S1C	MDME 4.0kW Absolute encoder	92
MDME404S1D	MDME 4.0kW Absolute encoder	92
MDME404S1G	MDME 4.0kW Absolute encoder	92
MDME404S1H	MDME 4.0kW Absolute encoder	92
MDME502G1C	MDME 5.0kW Incremental encoder	56
MDME502G1D	MDME 5.0kW Incremental encoder	56
MDME502G1G	MDME 5.0kW Incremental encoder	56
MDME502G1H	MDME 5.0kW Incremental encoder	56
MDME502S1C	MDME 5.0kW Absolute encoder	56
MDME502S1D	MDME 5.0kW Absolute encoder	56
MDME502S1G	MDME 5.0kW Absolute encoder	56
MDME502S1H	MDME 5.0kW Absolute encoder	56
MDME504G1C	MDME 5.0kW Incremental encoder	93
MDME504G1D	MDME 5.0kW Incremental encoder	93
MDME504G1G	MDME 5.0kW Incremental encoder	93
MDME504G1H	MDME 5.0kW Incremental encoder	93
MDME504G1H	MDME 5.0kW Incremental encoder  MDME 5.0kW Absolute encoder	93
	MDME 5.0kW Absolute encoder  MDME 5.0kW Absolute encoder	93
MDME504S1D	MDME 5.0kW Absolute encoder  MDME 5.0kW Absolute encoder	_
MDME504S1G MDME504S1H	MDME 5.0kW Absolute encoder  MDME 5.0kW Absolute encoder	93
	WILMULE OF TRANSPORTED FUCULAR	9.3

MEDHT		
Part No.	Title	Page
MEDHT7364	A5 series Driver: E-frame	18/32
MEDHT7364E	A5E series Driver: E-frame	20/32

MFDHT		
Part No.	Title	Page
MFDHTA390	A5 series Driver: F-frame	18/34
MFDHTB3A2	A5 series Driver: F-frame	18/34
MFDHTA390E	A5E series Driver: F-frame	20/34
MFDHTB3A2E	A5E series Driver: F-frame	20/34

MFECA		
Part No.	Title	Page
MFECA0030EAE	Encoder Cable (with Buttery Box)	112
MFECA0030EAM	Encoder Cable (without Buttery Box)	112
MFECA0030ETD	Encoder Cable (without Buttery Box)	113
MFECA0030ETE	Encoder Cable (with Buttery Box)	113
MFECA0030MJD	Encoder Cable (without Buttery Box)	112
MFECA0030MJE	Encoder Cable (with Buttery Box)	113
MFECA0050EAE	Encoder Cable (with Buttery Box)	112
MFECA0050EAM	Encoder Cable (without Buttery Box)	112
MFECA0050ETD	Encoder Cable (without Buttery Box)	113
MFECA0050ETE	Encoder Cable (with Buttery Box)	113
MFECA0050MJD	Encoder Cable (without Buttery Box)	112
MFECA0050MJE	Encoder Cable (with Buttery Box)	113
MFECA0100EAE	Encoder Cable (with Buttery Box)	112
MFECA0100EAM	Encoder Cable (without Buttery Box)	112
MFECA0100ETD	Encoder Cable (without Buttery Box)	113
MFECA0100ETE	Encoder Cable (with Buttery Box)	113
MFECA0100MJD	Encoder Cable (without Buttery Box)	112
MFECA0100MJE	Encoder Cable (with Buttery Box)	113
MFECA0200EAE	Encoder Cable (with Buttery Box)	112
MFECA0200EAM	Encoder Cable (without Buttery Box)	112
MFECA0200ETD	Encoder Cable (without Buttery Box)	113
MFECA0200ETE	Encoder Cable (with Buttery Box)	113
MFECA0200MJD	Encoder Cable (without Buttery Box)	112
MFECA0200MJE	Encoder Cable (with Buttery Box)	113

MFMCA		
Part No.	Title	Page
MFMCA0030EED	Motor Cable (without Brake)	114
MFMCA0030NJD	Motor Cable (without Brake)	114
MFMCA0032FCD	Motor Cable (with Brake)	116
MFMCA0033ECT	Motor Cable (without Brake)	115
MFMCA0033FCT	Motor Cable (with Brake)	116
MFMCA0050EED	Motor Cable (without Brake)	114
MFMCA0050NJD	Motor Cable (without Brake)	114
MFMCA0052FCD	Motor Cable (with Brake)	116
MFMCA0053ECT	Motor Cable (without Brake)	115
MFMCA0053FCT	Motor Cable (with Brake)	116
MFMCA0100EED	Motor Cable (without Brake)	114
MFMCA0100NJD	Motor Cable (without Brake)	114
MFMCA0102FCD	Motor Cable (with Brake)	116
MFMCA0103ECT	Motor Cable (without Brake)	115
MFMCA0103FCT	Motor Cable (with Brake)	116
MFMCA0200EED	Motor Cable (without Brake)	114
MFMCA0200NJD	Motor Cable (without Brake)	114
MFMCA0202FCD	Motor Cable (with Brake)	116
MFMCA0203ECT	Motor Cable (without Brake)	115
MFMCA0203FCT	Motor Cable (with Brake)	116

MFMCB		
Part No.	Title	Page
MFMCB0030GET	Brake Cable	117
MFMCB0030PJT	Brake Cable	117
MFMCB0050GET	Brake Cable	117
MFMCB0050PJT	Brake Cable	117
MFMCB0100GET	Brake Cable	117
MFMCB0100PJT	Brake Cable	117
MFMCB0200GET	Brake Cable	117
MFMCB0200PJT	Brake Cable	117

MFMCD		
Part No.	Title	Page
MFMCD0032ECD	Motor Cable (without Brake)	114
MFMCD0052ECD	Motor Cable (without Brake)	114
MFMCD0102ECD	Motor Cable (without Brake)	114
MFMCD0202ECD	Motor Cable (without Brake)	114

MFMCE		
Part No.	Title	Page
MFMCE0032ECD	Motor Cable (without Brake)	115
MFMCE0032FCD	Motor Cable (with Brake)	116
MFMCE0052ECD	Motor Cable (without Brake)	115
MFMCE0052FCD	Motor Cable (with Brake)	116
MFMCE0102ECD	Motor Cable (without Brake)	115
MFMCE0102FCD	Motor Cable (with Brake)	116
MFMCE0202ECD	Motor Cable (without Brake)	115
MFMCE0202FCD	Motor Cable (with Brake)	116

MGME (Middle inertia: Low speed/ High torque type)				
Part No.	Title	Page		
MGME092G1C	MGME 0.9kW Incremental encoder	57		
MGME092G1D	MGME 0.9kW Incremental encoder	57		
MGME092G1G	MGME 0.9kW Incremental encoder	57		
MGME092G1H	MGME 0.9kW Incremental encoder	57		
MGME092S1C	MGME 0.9kW Absolute encoder	57		
MGME092S1D	MGME 0.9kW Absolute encoder	57		
MGME092S1G	MGME 0.9kW Absolute encoder	57		
MGME092S1H	MGME 0.9kW Absolute encoder	57		
MGME094G1C	MGME 0.9kW Incremental encoder	94		
MGME094G1D	MGME 0.9kW Incremental encoder	94		
MGME094G1G	MGME 0.9kW Incremental encoder	94		
MGME094G1H	MGME 0.9kW Incremental encoder	94		
MGME094S1C	MGME 0.9kW Absolute encoder	94		
MGME094S1D	MGME 0.9kW Absolute encoder	94		
MGME094S1G	MGME 0.9kW Absolute encoder	94		
MGME094S1H	MGME 0.9kW Absolute encoder	94		
MGME202G1C	MGME 2.0kW Incremental encoder	58		
MGME202G1D	MGME 2.0kW Incremental encoder	58		
MGME202G1G	MGME 2.0kW Incremental encoder	58		
MGME202G1H	MGME 2.0kW Incremental encoder	58		
MGME202S1C	MGME 2.0kW Absolute encoder	58		
MGME202S1D	MGME 2.0kW Absolute encoder	58		
MGME202S1G	MGME 2.0kW Absolute encoder	58		
MGME202S1H	MGME 2.0kW Absolute encoder	58		
MGME204G1C	MGME 2.0kW Incremental encoder	95		
MGME204G1D	MGME 2.0kW Incremental encoder	95		
MGME204G1G	MGME 2.0kW Incremental encoder	95		
MGME204G1H	MGME 2.0kW Incremental encoder	95		
MGME204S1C	MGME 2.0kW Absolute encoder	95		
MGME204S1D	MGME 2.0kW Absolute encoder	95		
MGME204S1G	MGME 2.0kW Absolute encoder	95		
MGME204S1H	MGME 2.0kW Absolute encoder	95		
MGME302G1C	MGME 3.0kW Incremental encoder	59		
MGME302G1D	MGME 3.0kW Incremental encoder	59		
MGME302G1G	MGME 3.0kW Incremental encoder	59		
MGME302G1H	MGME 3.0kW Incremental encoder	59		
MGME302S1C	MGME 3.0kW Absolute encoder	59		
MGME302S1D	MGME 3.0kW Absolute encoder	59		
MGME302S1G	MGME 3.0kW Absolute encoder	59		
MGME302S1H	MGME 3.0kW Absolute encoder	59		
MGME304G1C	MGME 3.0kW Incremental encoder	96		
MGME304G1D	MGME 3.0kW Incremental encoder	96		
MGME304G1G	MGME 3.0kW Incremental encoder	96		
MGME304G1H	MGME 3.0kW Incremental encoder	96		
MGME304S1C	MGME 3.0kW Absolute encoder	96		
MGME304S1D	MGME 3.0kW Absolute encoder	96		
MGME304S1G	MGME 3.0kW Absolute encoder	96		
MGME304S1H	MGME 3.0kW Absolute encoder	96		

MHMD (High iner	tia)	
Part No.	Title	Page
MHMD021G1A	MHMD 200W Incremental encoder	76
MHMD021G1B	MHMD 200W Incremental encoder	76
MHMD021G1C	MHMD 200W Incremental encoder	76
MHMD021G1D	MHMD 200W Incremental encoder	76
MHMD021G1S	MHMD 200W Incremental encoder	76
MHMD021G1T MHMD021G1U	MHMD 200W Incremental encoder MHMD 200W Incremental encoder	76 76
MHMD021G1V	MHMD 200W Incremental encoder	76
MHMD021G1V	MHMD 200W Absolute encoder	76
MHMD021S1B	MHMD 200W Absolute encoder	76
MHMD021S1C	MHMD 200W Absolute encoder	76
MHMD021S1D	MHMD 200W Absolute encoder	76
MHMD021S1S	MHMD 200W Absolute encoder	76
MHMD021S1T	MHMD 200W Absolute encoder	76
MHMD021S1U	MHMD 200W Absolute encoder	76
MHMD021S1V	MHMD 200W Absolute encoder	76
MHMD022G1A	MHMD 200W Incremental encoder	77
MHMD022G1B	MHMD 200W Incremental encoder	77
MHMD022G1C MHMD022G1D	MHMD 200W Incremental encoder MHMD 200W Incremental encoder	77 77
MHMD022G1D	MHMD 200W Incremental encoder	77
MHMD022G1T	MHMD 200W Incremental encoder	77
MHMD022G1U	MHMD 200W Incremental encoder	77
MHMD022G1V	MHMD 200W Incremental encoder	77
MHMD022S1A	MHMD 200W Absolute encoder	77
MHMD022S1B	MHMD 200W Absolute encoder	77
MHMD022S1C	MHMD 200W Absolute encoder	77
MHMD022S1D	MHMD 200W Absolute encoder	77
MHMD022S1S	MHMD 200W Absolute encoder	77
MHMD022S1T	MHMD 200W Absolute encoder	77
MHMD022S1U	MHMD 200W Absolute encoder	77
MHMD022S1V	MHMD 200W Absolute encoder	77
MHMD041G1A MHMD041G1B	MHMD 400W Incremental encoder  MHMD 400W Incremental encoder	78 78
MHMD041G1C	MHMD 400W Incremental encoder	78
MHMD041G1D	MHMD 400W Incremental encoder	78
MHMD041G1S	MHMD 400W Incremental encoder	78
MHMD041G1T	MHMD 400W Incremental encoder	78
MHMD041G1U	MHMD 400W Incremental encoder	78
MHMD041G1V	MHMD 400W Incremental encoder	78
MHMD041S1A	MHMD 400W Absolute encoder	78
MHMD041S1B	MHMD 400W Absolute encoder	78
MHMD041S1C	MHMD 400W Absolute encoder	78
MHMD041S1D MHMD041S1S	MHMD 400W Absolute encoder	78
MHMD041S1S	MHMD 400W Absolute encoder  MHMD 400W Absolute encoder	78 78
MHMD041S1U	MHMD 400W Absolute encoder	78
MHMD041S1V	MHMD 400W Absolute encoder	78
MHMD042G1A	MHMD 400W Incremental encoder	79
MHMD042G1B	MHMD 400W Incremental encoder	79
MHMD042G1C	MHMD 400W Incremental encoder	79
MHMD042G1D	MHMD 400W Incremental encoder	79
MHMD042G1S	MHMD 400W Incremental encoder	79
MHMD042G1T	MHMD 400W Incremental encoder	79
MHMD042G1U	MHMD 400W Incremental encoder	79
MHMD042G1V	MHMD 400W Absolute encoder	79
MHMD042S1A MHMD042S1B	MHMD 400W Absolute encoder MHMD 400W Absolute encoder	79 79
MHMD042S1C	MHMD 400W Absolute encoder	79
MHMD042S1D	MHMD 400W Absolute encoder	79
MHMD042S1S	MHMD 400W Absolute encoder	79
MHMD042S1T	MHMD 400W Absolute encoder	79
MHMD042S1U	MHMD 400W Absolute encoder	79
MHMD042S1V	MHMD 400W Absolute encoder	79
MHMD082G1A	MHMD 750W Incremental encoder	80
MHMD082G1B	MHMD 750W Incremental encoder	80
MHMD082G1C	MHMD 750W Incremental encoder	80

F26 F27

Part No.	Title	Page
MHMD082G1D	MHMD 750W Incremental encoder	80
MHMD082G1S	MHMD 750W Incremental encoder	80
MHMD082G1T	MHMD 750W Incremental encoder	80
MHMD082G1U	MHMD 750W Incremental encoder	80
MHMD082G1V	MHMD 750W Incremental encoder	80
MHMD082S1A	MHMD 750W Absolute encoder	80
MHMD082S1B	MHMD 750W Absolute encoder	80
MHMD082S1C	MHMD 750W Absolute encoder	80
MHMD082S1D	MHMD 750W Absolute encoder	80
MHMD082S1S	MHMD 750W Absolute encoder	80
MHMD082S1T	MHMD 750W Absolute encoder	80
MHMD082S1U	MHMD 750W Absolute encoder	80
MHMD082S1V	MHMD 750W Absolute encoder	80

Part No. MHME102G1C MHME102G1D	Title  MHME 1.0kW Incremental encoder	Page 60
		60
MHME102G1D		00
	MHME 1.0kW Incremental encoder	60
MHME102G1G	MHME 1.0kW Incremental encoder	60
MHME102G1H	MHME 1.0kW Incremental encoder	60
MHME102S1C	MHME 1.0kW Absolute encoder	60
MHME102S1D	MHME 1.0kW Absolute encoder	60
MHME102S1G	MHME 1.0kW Absolute encoder	60
MHME102S1H	MHME 1.0kW Absolute encoder	60
MHME104G1C	MHME 1.0kW Incremental encoder	98
MHME104G1D	MHME 1.0kW Incremental encoder	98
MHME104G1G	MHME 1.0kW Incremental encoder	98
MHME104G1H	MHME 1.0kW Incremental encoder	98
MHME104S1C	MHME 1.0kW Absolute encoder	98
MHME104S1D	MHME 1.0kW Absolute encoder	98
MHME104S1G	MHME 1.0kW Absolute encoder	98
MHME104S1H	MHME 1.0kW Absolute encoder	98
MHME152G1C	MHME 1.5kW Incremental encoder	61
MHME152G1D	MHME 1.5kW Incremental encoder	61
MHME152G1G	MHME 1.5kW Incremental encoder	61
MHME152G1H	MHME 1.5kW Incremental encoder	
		61
MHME152S1C	MHME 1.5kW Absolute encoder	61
MHME152S1D	MHME 1.5kW Absolute encoder	61
MHME152S1G	MHME 1.5kW Absolute encoder	61
MHME152S1H	MHME 1.5kW Absolute encoder	61
MHME154G1C	MHME 1.5kW Incremental encoder	99
MHME154G1D	MHME 1.5kW Incremental encoder	99
MHME154G1G	MHME 1.5kW Incremental encoder	99
MHME154G1H	MHME 1.5kW Incremental encoder	99
MHME154S1C	MHME 1.5kW Absolute encoder	99
MHME154S1D	MHME 1.5kW Absolute encoder	99
MHME154S1G	MHME 1.5kW Absolute encoder	99
MHME154S1H	MHME 1.5kW Absolute encoder	99
MHME202G1C	MHME 2.0kW Incremental encoder	62
MHME202G1D	MHME 2.0kW Incremental encoder	62
MHME202G1G	MHME 2.0kW Incremental encoder	62
MHME202G1H	MHME 2.0kW Incremental encoder	62
MHME202S1C	MHME 2.0kW Absolute encoder	62
MHME202S1D	MHME 2.0kW Absolute encoder	62
MHME202S1G	MHME 2.0kW Absolute encoder	62
MHME202S1H	MHME 2.0kW Absolute encoder	62
MHME204G1C	MHME 2.0kW Incremental encoder	100
MHME204G1D	MHME 2.0kW Incremental encoder	100
MHME204G1G	MHME 2.0kW Incremental encoder	100
MHME204G1H	MHME 2.0kW Incremental encoder	100
MHME204S1C	MHME 2.0kW Absolute encoder	100
MHME204S1D	MHME 2.0kW Absolute encoder	100
MHME204S1G	MHME 2.0kW Absolute encoder	100
MHME204S1H	MHME 2.0kW Absolute encoder	100
MHME302G1C	MHME 3.0kW Incremental encoder	63
MHME302G1D	MHME 3.0kW Incremental encoder	63
MHME302G1G	MHME 3.0kW Incremental encoder	63

MHME (High inert	ja)	
Part No.	Title	Page
MHME302G1H	MHME 3.0kW Incremental encoder	63
MHME302S1C	MHME 3.0kW Absolute encoder	63
MHME302S1D	MHME 3.0kW Absolute encoder	63
MHME302S1G	MHME 3.0kW Absolute encoder	63
MHME302S1H	MHME 3.0kW Absolute encoder	63
MHME304G1C	MHME 3.0kW Incremental encoder	101
MHME304G1D	MHME 3.0kW Incremental encoder	101
MHME304G1G	MHME 3.0kW Incremental encoder	101
MHME304G1H	MHME 3.0kW Incremental encoder	101
MHME304S1C	MHME 3.0kW Absolute encoder	101
MHME304S1D	MHME 3.0kW Absolute encoder	101
MHME304S1G	MHME 3.0kW Absolute encoder	101
MHME304S1H	MHME 3.0kW Absolute encoder	101
MHME402G1C	MHME 4.0kW Incremental encoder	64
MHME402G1D	MHME 4.0kW Incremental encoder	64
MHME402G1G	MHME 4.0kW Incremental encoder	64
MHME402G1H	MHME 4.0kW Incremental encoder	64
MHME402S1C	MHME 4.0kW Absolute encoder	64
MHME402S1D	MHME 4.0kW Absolute encoder	64
MHME402S1G	MHME 4.0kW Absolute encoder	64
MHME402S1H	MHME 4.0kW Absolute encoder	64
MHME404G1C	MHME 4.0kW Incremental encoder	102
MHME404G1D	MHME 4.0kW Incremental encoder	102
MHME404G1G	MHME 4.0kW Incremental encoder	102
MHME404G1H	MHME 4.0kW Incremental encoder	102
MHME404S1C	MHME 4.0kW Absolute encoder	102
MHME404S1D	MHME 4.0kW Absolute encoder	102
MHME404S1G	MHME 4.0kW Absolute encoder	102
MHME404S1H	MHME 4.0kW Absolute encoder	102
MHME502G1C	MHME 5.0kW Incremental encoder	65
MHME502G1D	MHME 5.0kW Incremental encoder	65
MHME502G1G	MHME 5.0kW Incremental encoder	65
MHME502G1G	MHME 5.0kW Incremental encoder	65
MHME502S1C	MHME 5.0kW Absolute encoder	65
MHME502S1C	MHME 5.0kW Absolute encoder	65
MHME502S1D	MHME 5.0kW Absolute encoder	65
MHME502S1H	MHME 5.0kW Absolute encoder	65
MHME504G1C	MHME 5.0kW Incremental encoder	103
MHME504G1D		
MHME504G1D MHME504G1G	MHME 5.0kW Incremental encoder MHME 5.0kW Incremental encoder	103
MHME504G1G MHME504G1H	MHME 5.0kW Incremental encoder  MHME 5.0kW Incremental encoder	103
MHME504S1C	MHME 5.0kW Absolute encoder	103
MHME504S1D	MHME 5.0kW Absolute encoder	103
MHME504S1G MHME504S1H	MHME 5.0kW Absolute encoder MHME 5.0kW Absolute encoder	103
IVIDIVIESU451H	IVITIVIE 5.UKW ADSOIULE ETICOGET	103

MSMD (Low inert	ia)	
Part No.	Title	Page
MSMD011G1A	MSMD 100W Incremental encoder	68
MSMD011G1B	MSMD 100W Incremental encoder	68
MSMD011G1C	MSMD 100W Incremental encoder	68
MSMD011G1D	MSMD 100W Incremental encoder	68
MSMD011G1S	MSMD 100W Incremental encoder	68
MSMD011G1T	MSMD 100W Incremental encoder	68
MSMD011G1U	MSMD 100W Incremental encoder	68
MSMD011G1V	MSMD 100W Incremental encoder	68
MSMD011S1A	MSMD 100W Absolute encoder	68
MSMD011S1B	MSMD 100W Absolute encoder	68
MSMD011S1C	MSMD 100W Absolute encoder	68
MSMD011S1D	MSMD 100W Absolute encoder	68
MSMD011S1S	MSMD 100W Absolute encoder	68
MSMD011S1T	MSMD 100W Absolute encoder	68
MSMD011S1U	MSMD 100W Absolute encoder	68
MSMD011S1V	MSMD 100W Absolute encoder	68
MSMD012G1A	MSMD 100W Incremental encoder	69
MSMD012G1B	MSMD 100W Incremental encoder	69
MSMD012G1C	MSMD 100W Incremental encoder	69

MSMD (Low inert Part No.	Title	Page
MSMD012G1D	MSMD 100W Incremental encoder	69
MSMD012G1S	MSMD 100W Incremental encoder	69
MSMD012G1T	MSMD 100W Incremental encoder	69
MSMD012G1U	MSMD 100W Incremental encoder	69
MSMD012G1V	MSMD 100W Incremental encoder	69
MSMD012S1A	MSMD 100W Absolute encoder	69
MSMD012S1B	MSMD 100W Absolute encoder	69
MSMD012S1B	MSMD 100W Absolute encoder	69
MSMD01251C	MSMD 100W Absolute encoder	69
MSMD01251D MSMD012S1S	MSMD 100W Absolute encoder	
		69
MSMD012S1T	MSMD 100W Absolute encoder	69
MSMD012S1U	MSMD 100W Absolute encoder	69
MSMD012S1V	MSMD 100W Absolute encoder	69
MSMD021G1A	MSMD 200W Incremental encoder	70
MSMD021G1B	MSMD 200W Incremental encoder	70
MSMD021G1C	MSMD 200W Incremental encoder	70
MSMD021G1D	MSMD 200W Incremental encoder	70
MSMD021G1S	MSMD 200W Incremental encoder	70
MSMD021G1T	MSMD 200W Incremental encoder	70
MSMD021G1U	MSMD 200W Incremental encoder	70
MSMD021G1V	MSMD 200W Incremental encoder	70
MSMD021S1A	MSMD 200W Absolute encoder	70
MSMD021S1B	MSMD 200W Absolute encoder	70
MSMD021S1C	MSMD 200W Absolute encoder	70
MSMD021S1D	MSMD 200W Absolute encoder	70
MSMD021S1S	MSMD 200W Absolute encoder	70
MSMD021S1T	MSMD 200W Absolute encoder	70
MSMD021S1U	MSMD 200W Absolute encoder	70
MSMD021S1V	MSMD 200W Absolute encoder	70
MSMD022G1A	MSMD 200W Incremental encoder	71
MSMD022G1B	MSMD 200W Incremental encoder	71
MSMD022G1C	MSMD 200W Incremental encoder	71
MSMD022G1D	MSMD 200W Incremental encoder	71
MSMD022G1S	MSMD 200W Incremental encoder	71
MSMD022G1T	MSMD 200W Incremental encoder	71
MSMD022G1U	MSMD 200W Incremental encoder	71
MSMD022G1V	MSMD 200W Incremental encoder	71
MSMD022S1A	MSMD 200W Absolute encoder	71
MSMD022S1A	MSMD 200W Absolute encoder	71
MSMD022S1B	MSMD 200W Absolute encoder	71
MSMD022S1C	MSMD 200W Absolute encoder	
		71
MSMD022S1S	MSMD 200W Absolute encoder	71
MSMD022S1T	MSMD 200W Absolute encoder	71
MSMD022S1U	MSMD 200W Absolute encoder	71
MSMD022S1V	MSMD 200W Absolute encoder	71
MSMD041G1A	MSMD 400W Incremental encoder	72
MSMD041G1B	MSMD 400W Incremental encoder	72
MSMD041G1C	MSMD 400W Incremental encoder	72
MSMD041G1D	MSMD 400W Incremental encoder	72
MSMD041G1S	MSMD 400W Incremental encoder	72
MSMD041G1T	MSMD 400W Incremental encoder	72
MSMD041G1U	MSMD 400W Incremental encoder	72
MSMD041G1V	MSMD 400W Incremental encoder	72
MSMD041S1A	MSMD 400W Absolute encoder	72
MSMD041S1B	MSMD 400W Absolute encoder	72
MSMD041S1C	MSMD 400W Absolute encoder	72
MSMD041S1D	MSMD 400W Absolute encoder	72
MSMD041S1S	MSMD 400W Absolute encoder	72
MSMD041S1T	MSMD 400W Absolute encoder	72
MSMD041S1U	MSMD 400W Absolute encoder	72
MSMD041S1V	MSMD 400W Absolute encoder	72
MSMD042G1A	MSMD 400W Incremental encoder	73
MSMD042G1B	MSMD 400W Incremental encoder	73
MSMD042G1B	MSMD 400W Incremental encoder	73
MSMD042G1C	MSMD 400W Incremental encoder	73
MSMD042G1S	MSMD 400W Incremental encoder	73

MSMD (Low inerti	a)	
Part No.	Title	Page
MSMD042G1U	MSMD 400W Incremental encoder	73
MSMD042G1V	MSMD 400W Incremental encoder	73
MSMD042S1A	MSMD 400W Absolute encoder	73
MSMD042S1B	MSMD 400W Absolute encoder	73
MSMD042S1C	MSMD 400W Absolute encoder	73
MSMD042S1D	MSMD 400W Absolute encoder	73
MSMD042S1S	MSMD 400W Absolute encoder	73
MSMD042S1T	MSMD 400W Absolute encoder	73
MSMD042S1U	MSMD 400W Absolute encoder	73
MSMD042S1V	MSMD 400W Absolute encoder	73
MSMD082G1A	MSMD 750W Incremental encoder	74
MSMD082G1B	MSMD 750W Incremental encoder	74
MSMD082G1C	MSMD 750W Incremental encoder	74
MSMD082G1C	MSMD 750W Incremental encoder	74
MSMD082G1S	MSMD 750W Incremental encoder	74
MSMD082G1T	MSMD 750W Incremental encoder	74
MSMD082G1U	MSMD 750W Incremental encoder	74
MSMD082G1V	MSMD 750W Incremental encoder	74
MSMD082S1A	MSMD 750W Incremental encoder	74
		74
MSMD082S1B MSMD082S1C	MSMD 750W Absolute encoder MSMD 750W Absolute encoder	
		74
MSMD082S1D	MSMD 750W Absolute encoder	74
MSMD082S1S	MSMD 750W Absolute encoder	74
MSMD082S1T	MSMD 750W Absolute encoder	74
MSMD082S1U	MSMD 750W Absolute encoder	74
MSMD082S1V	MSMD 750W Absolute encoder	74
MSMD5AZG1A	MSMD 50W Incremental encoder	66,67
MSMD5AZG1B	MSMD 50W Incremental encoder	66,67
MSMD5AZG1C	MSMD 50W Incremental encoder	66,67
MSMD5AZG1D	MSMD 50W Incremental encoder	66,67
MSMD5AZG1S	MSMD 50W Incremental encoder	66,67
MSMD5AZG1T	MSMD 50W Incremental encoder	66,67
MSMD5AZG1U	MSMD 50W Incremental encoder	66,67
MSMD5AZG1V	MSMD 50W Incremental encoder	66,67
MSMD5AZS1A	MSMD 50W Absolute encoder	66,67
MSMD5AZS1B	MSMD 50W Absolute encoder	66,67
MSMD5AZS1C	MSMD 50W Absolute encoder	66,67
MSMD5AZS1D	MSMD 50W Absolute encoder	66,67
MSMD5AZS1S	MSMD 50W Absolute encoder	66,67
MSMD5AZS1T	MSMD 50W Absolute encoder	66,67
MSMD5AZS1U	MSMD 50W Absolute encoder	66,67
MSMD5AZS1V	MSMD 50W Absolute encoder	66,67

MSME (Low inert	ia)	
Part No.	Title	Page
MSME011G1A	MSME 100W Incremental encoder	38
MSME011G1B	MSME 100W Incremental encoder	38
MSME011G1C	MSME 100W Incremental encoder	38
MSME011G1D	MSME 100W Incremental encoder	38
MSME011G1S	MSME 100W Incremental encoder	38
MSME011G1T	MSME 100W Incremental encoder	38
MSME011G1U	MSME 100W Incremental encoder	38
MSME011G1V	MSME 100W Incremental encoder	38
MSME011S1A	MSME 100W Absolute encoder	38
MSME011S1B	MSME 100W Absolute encoder	38
MSME011S1C	MSME 100W Absolute encoder	38
MSME011S1D	MSME 100W Absolute encoder	38
MSME011S1S	MSME 100W Absolute encoder	38
MSME011S1T	MSME 100W Absolute encoder	38
MSME011S1U	MSME 100W Absolute encoder	38
MSME011S1V	MSME 100W Absolute encoder	38
MSME012G1A	MSME 100W Incremental encoder	39
MSME012G1B	MSME 100W Incremental encoder	39
MSME012G1C	MSME 100W Incremental encoder	39
MSME012G1D	MSME 100W Incremental encoder	39
MSME012G1S	MSME 100W Incremental encoder	39
MSME012G1T	MSME 100W Incremental encoder	39

F28 F29

MSME (Low inert		
Part No.	Title	Page
MSME012G1U	MSME 100W Incremental encoder	39
MSME012G1V	MSME 100W Incremental encoder	39
MSME012S1A	MSME 100W Absolute encoder	39
MSME012S1B	MSME 100W Absolute encoder	39
MSME012S1C	MSME 100W Absolute encoder	39
MSME012S1D	MSME 100W Absolute encoder	39
MSME012S1S	MSME 100W Absolute encoder	39
MSME012S1T	MSME 100W Absolute encoder	39
MSME012S1U	MSME 100W Absolute encoder	39
MSME012S1V	MSME 100W Absolute encoder	39
MSME021G1A	MSME 200W Incremental encoder	40
MSME021G1B	MSME 200W Incremental encoder	40
MSME021G1C	MSME 200W Incremental encoder	40
MSME021G1D	MSME 200W Incremental encoder	40
MSME021G1S	MSME 200W Incremental encoder	40
MSME021G1T	MSME 200W Incremental encoder	40
MSME021G1U	MSME 200W Incremental encoder	40
MSME021G1V	MSME 200W Incremental encoder	40
MSME021S1A	MSME 200W Absolute encoder	40
MSME021S1B	MSME 200W Absolute encoder	40
MSME021S1C	MSME 200W Absolute encoder	40
MSME021S1D	MSME 200W Absolute encoder	40
MSME021S1S	MSME 200W Absolute encoder	40
MSME021S1T	MSME 200W Absolute encoder	40
MSME021S1U	MSME 200W Absolute encoder	40
MSME021S1V	MSME 200W Absolute encoder	40
MSME022G1A	MSME 200W Incremental encoder	41
MSME022G1B	MSME 200W Incremental encoder	41
MSME022G1C	MSME 200W Incremental encoder	41
MSME022G1D	MSME 200W Incremental encoder	41
MSME022G1S	MSME 200W Incremental encoder	41
MSME022G1T	MSME 200W Incremental encoder	41
MSME022G1U	MSME 200W Incremental encoder	41
MSME022G1V	MSME 200W Incremental encoder	41
MSME022S1A	MSME 200W Absolute encoder	41
MSME022S1B	MSME 200W Absolute encoder	41
MSME022S1C	MSME 200W Absolute encoder	41
MSME022S1D	MSME 200W Absolute encoder	41
MSME022S1S	MSME 200W Absolute encoder	41
MSME022S1T	MSME 200W Absolute encoder	41
MSME022S1U	MSME 200W Absolute encoder	41
MSME022S1V	MSME 200W Absolute encoder	41
MSME041G1A	MSME 400W Incremental encoder	42
MSME041G1B	MSME 400W Incremental encoder	42
MSME041G1C	MSME 400W Incremental encoder	42
MSME041G1D	MSME 400W Incremental encoder	42
MSME041G1S	MSME 400W Incremental encoder	42
MSME041G1T	MSME 400W Incremental encoder	42
MSME041G1U	MSME 400W Incremental encoder	42
MSME041G1V	MSME 400W Incremental encoder	42
MSME041S1A	MSME 400W Absolute encoder	42
MSME041S1B	MSME 400W Absolute encoder	42
MSME041S1C	MSME 400W Absolute encoder	42
MSME041S1D	MSME 400W Absolute encoder	42
MSME041S1S	MSME 400W Absolute encoder	42
MSME041S1T	MSME 400W Absolute encoder	42
MSME041S1U	MSME 400W Absolute encoder	42
MSME041S1V	MSME 400W Absolute encoder	42
MSME042G1A	MSME 400W Incremental encoder	43
MSME042G1B	MSME 400W Incremental encoder	43
MSME042G1C	MSME 400W Incremental encoder	43
MSME042G1D	MSME 400W Incremental encoder	43
MSME042G1S	MSME 400W Incremental encoder	43
MSME042G1T	MSME 400W Incremental encoder	43
MSME042G1U	MSME 400W Incremental encoder	43
MSME042G1V	MSME 400W Incremental encoder	43
	MSME 400W Absolute encoder	43

MSME (Low iner	tia)	
Part No.	Title	Page
MSME042S1B	MSME 400W Absolute encoder	43
MSME042S1C	MSME 400W Absolute encoder	43
MSME042S1D	MSME 400W Absolute encoder	43
MSME042S1S	MSME 400W Absolute encoder	43
MSME042S1T	MSME 400W Absolute encoder	43
MSME042S1U	MSME 400W Absolute encoder	43
MSME042S1V	MSME 400W Absolute encoder	43
MSME082G1A	MSME 750W Incremental encoder	44
MSME082G1B	MSME 750W Incremental encoder	44
MSME082G1C	MSME 750W Incremental encoder	44
MSME082G1D	MSME 750W Incremental encoder	44
MSME082G1S	MSME 750W Incremental encoder	44
MSME082G1T	MSME 750W Incremental encoder	44
MSME082G1U	MSME 750W Incremental encoder	44
MSME082G1V	MSME 750W Incremental encoder	44
MSME082S1A	MSME 750W Absolute encoder	44
MSME082S1B	MSME 750W Absolute encoder	44
MSME082S1C	MSME 750W Absolute encoder	44
MSME082S1D	MSME 750W Absolute encoder	44
MSME082S1S	MSME 750W Absolute encoder	44
MSME082S1T	MSME 750W Absolute encoder	44
MSME082S1U	MSME 750W Absolute encoder	44
MSME082S1V	MSME 750W Absolute encoder	44
MSME102G1C	MSME 1.0kW Incremental encoder	45
MSME102G1D	MSME 1.0kW Incremental encoder	45
MSME102G1G	MSME 1.0kW Incremental encoder	45
MSME102G1H	MSME 1.0kW Incremental encoder	45
MSME102S1C	MSME 1.0kW Absolute encoder	45
MSME102S1D	MSME 1.0kW Absolute encoder	45
MSME102S1G	MSME 1.0kW Absolute encoder	45
MSME102S1H	MSME 1.0kW Absolute encoder	45
MSME104G1C	MSME 1.0kW Incremental encoder	82
MSME104G1D	MSME 1.0kW Incremental encoder	82
MSME104G1G	MSME 1.0kW Incremental encoder	82
MSME104G1H	MSME 1.0kW Incremental encoder	82
MSME104S1C	MSME 1.0kW Absolute encoder	82
MSME104S1D	MSME 1.0kW Absolute encoder	82
MSME104S1G	MSME 1.0kW Absolute encoder	82
MSME104S1H	MSME 1.0kW Absolute encoder	82
MSME152G1C	MSME 1.5kW Incremental encoder MSME 1.5kW Incremental encoder	46
MSME152G1D	MSME 1.5kW Incremental encoder	46
MSME152G1G		46
MSME152G1H	MSME 1.5kW Incremental encoder MSME 1.5kW Absolute encoder	46
MSME152S1C MSME152S1D		46
MSME152S1D MSME152S1G	MSME 1.5kW Absolute encoder  MSME 1.5kW Absolute encoder	46 46
MSME152S1H	MSME 1.5kW Absolute encoder  MSME 1.5kW Absolute encoder	46
MSME152S1H MSME154G1C	MSME 1.5kW Absolute encoder  MSME 1.5kW Incremental encoder	83
MSME154G1D	MSME 1.5kW Incremental encoder	
MSME154G1D	MSME 1.5kW Incremental encoder	83
MSME154G1H	MSME 1.5kW Incremental encoder	83
MSME154G1H MSME154S1C	MSME 1.5kW Incremental encoder  MSME 1.5kW Absolute encoder	83
MSME154S1D	MSME 1.5kW Absolute encoder	83
MSME154S1G	MSME 1.5kW Absolute encoder	83
MSME154S1H	MSME 1.5kW Absolute encoder	83
MSME202G1C	MSME 2.0kW Incremental encoder	47
MSME202G1D	MSME 2.0kW Incremental encoder	47
MSME202G1G	MSME 2.0kW Incremental encoder	47
MSME202G1H	MSME 2.0kW Incremental encoder	47
MSME202S1C	MSME 2.0kW Absolute encoder	47
MSME202S1D	MSME 2.0kW Absolute encoder	47
MSME202S1G	MSME 2.0kW Absolute encoder	47
MSME202S1H	MSME 2.0kW Absolute encoder	47
MSME204G1C	MSME 2.0kW Incremental encoder	84
MSME204G1D	MSME 2.0kW Incremental encoder	84
MSME204G1G	MSME 2.0kW Incremental encoder	84
MSME204G1H	MSME 2.0kW Incremental encoder	84

MSME204G1H MSME 2.0kW Incremental encoder

Part No.	a) Title	Page
MSME204S1C	MSME 2.0kW Absolute encoder	84
MSME204S1D	MSME 2.0kW Absolute encoder	84
MSME204S1G	MSME 2.0kW Absolute encoder	84
MSME204S1H	MSME 2.0kW Absolute encoder	84
MSME302G1C	MSME 3.0kW Incremental encoder	48
MSME302G1D	MSME 3.0kW Incremental encoder	48
MSME302G1G	MSME 3.0kW Incremental encoder	48
MSME302G1H	MSME 3.0kW Incremental encoder	48
MSME302S1C	MSME 3.0kW Absolute encoder	48
MSME302S1D	MSME 3.0kW Absolute encoder	48
MSME302S1G	MSME 3.0kW Absolute encoder	48
MSME302S1H	MSME 3.0kW Absolute encoder	48
MSME304G1C	MSME 3.0kW Incremental encoder	85
MSME304G1D	MSME 3.0kW Incremental encoder	85
MSME304G1G	MSME 3.0kW Incremental encoder	85
MSME304G1H	MSME 3.0kW Incremental encoder	85
MSME304S1C	MSME 3.0kW Absolute encoder	85
MSME304S1D	MSME 3.0kW Absolute encoder	85
MSME304S1G	MSME 3.0kW Absolute encoder	85
MSME304S1H	MSME 3.0kW Absolute encoder	85
MSME402G1C	MSME 4.0kW Incremental encoder	49
MSME402G1D	MSME 4.0kW Incremental encoder	49
MSME402G1G	MSME 4.0kW Incremental encoder	49
MSME402G1H	MSME 4.0kW Incremental encoder	49
MSME402S1C	MSME 4.0kW Absolute encoder	49
MSME402S1D	MSME 4.0kW Absolute encoder	49
MSME402S1G	MSME 4.0kW Absolute encoder	49
MSME402S1H	MSME 4.0kW Absolute encoder	49
MSME404G1C	MSME 4.0kW Incremental encoder	86
MSME404G1D	MSME 4.0kW Incremental encoder	86
MSME404G1G	MSME 4.0kW Incremental encoder	86
MSME404G1H	MSME 4.0kW Incremental encoder	86
MSME404S1C	MSME 4.0kW Absolute encoder	86
MSME404S1D	MSME 4.0kW Absolute encoder	86
MSME404S1G	MSME 4.0kW Absolute encoder	86
MSME404S1H	MSME 4.0kW Absolute encoder	86
MSME502G1C	MSME 5.0kW Incremental encoder	50
MSME502G1D	MSME 5.0kW Incremental encoder	50
MSME502G1D	MSME 5.0kW Incremental encoder	
		50
MSME502G1H	MSME 5.0kW Incremental encoder	50
MSME502S1C	MSME 5.0kW Absolute encoder	50
MSME502S1D	MSME 5.0kW Absolute encoder	50
MSME502S1G	MSME 5.0kW Absolute encoder	50
MSME502S1H	MSME 5.0kW Absolute encoder	50
MSME504G1C	MSME 5.0kW Incremental encoder	87
MSME504G1D	MSME 5.0kW Incremental encoder	87
MSME504G1G	MSME 5.0kW Incremental encoder	
		87
MSME504G1H	MSME 5.0kW Incremental encoder	87
MSME504S1C	MSME 5.0kW Absolute encoder	87
MSME504S1D	MSME 5.0kW Absolute encoder	87
MSME504S1G	MSME 5.0kW Absolute encoder	87
MSME504S1H	MSME 5.0kW Absolute encoder	87
MSME5AZG1A	MSME 50W Incremental encoder	36,37
MSME5AZG1B	MSME 50W Incremental encoder	36,37
MSME5AZG1C	MSME 50W Incremental encoder	36,37
MSME5AZG1D	MSME 50W Incremental encoder	36,37
MSME5AZG1S	MSME 50W Incremental encoder	36,37
MSME5AZG1T	MSME 50W Incremental encoder	36,37
MSME5AZG1U	MSME 50W Incremental encoder	36,37
	MSME 50W Incremental encoder	36,37
MSME5AZG1V	MSME 50W Absolute encoder	36,37
MSME5AZG1V MSME5AZS1A		36,37
MSME5AZS1A	MSME 50W Absolute encoder	
MSME5AZS1A MSME5AZS1B	MSME 50W Absolute encoder	
MSME5AZS1A MSME5AZS1B MSME5AZS1C	MSME 50W Absolute encoder	36,37
MSME5AZS1A MSME5AZS1B MSME5AZS1C MSME5AZS1D	MSME 50W Absolute encoder MSME 50W Absolute encoder	36,37 36,37
MSME5AZS1A MSME5AZS1B MSME5AZS1C	MSME 50W Absolute encoder	36,37

MSME (Low inertia)			
Part No.	Title	Page	
MSME5AZS1V	MSME 50W Absolute encoder	36,37	

F30

84

## **Sales Office**

### [Panasonic Sales Office of Motors]

(Sep. 1. 2009)

Country	Company Name	City	Address	TEL
				FAX
U.S.A.	Panasonic Industrial Company(PIC)	New Jersey	Two Panasonic Way Secaucus, New Jersey 07094 U.S.A.	1-201-348-5356
				1-201-392-4315
		California	2033 Gateway Place, Suite 200 San Jose, CA 95110, U.S.A.	1-408-487-9536
				1-408-436-8037
Spain	Panasonic Electric Works Espana S.A.	Madrid	Barajas Park, San Severo 20, 28042 Madrid,Spain	34-91-329-3875
				34-91-329-2976
Germany	Panasonic Electric Works Europe AG	Munich	Rudolf-Diesel-Ring 2, 83607 Holzkirchen, Germany	49-8024-648-0
				49-8024-648-555
Italy	Panasonic Electric Works Italia srl	Verona	Via del Commercio 3-5 (Z.I. Ferlina), 37012 Bussolengo (VR), Italy	39-045-6752711
				39-045-6700444
United	Panasonic Electric Works UK Ltd.	Milton Keynes	Sunrise Parkway,Linford Wood, Milton Keynes, MK14 6 LF, the United Kingdom	44-1908-231-555
Kingdom				44-1908-231-599
Taiwan	Panasonic Industrial Sales (Taiwan) Co., Ltd.(PIST)	Taipei	12F, No.9, SongGao Rd., Taipei 110, Taiwan, R.O.C.	886-2-2757-1878
				886-2-2757-1907
Singapore	Panasonic Industrial Singapore(PICS)	Singapore	300 Beach Road #16-01 The Concourse Singapore 199555	65-6390-3727
				65-6390-3834
China	Panasonic Industrial (China) Co.,Ltd.(PICN)	Shanghai	Floor 7, China Insurance Building, 166 East Road LuJiaZui PuDong New District, Shanghai, China	86-21-3855-2442
				86-21-3855-2375
	Panasonic Shun Hing Industrial Sales (Hong kong) Co., Ltd.	Hong kong	Level 33, Office Tower, Langham Place, 8 Argyle Street, Mongkok, Kin.,Hong Kong	852-2529-7322
				852-2598-9743
	Panasonic Shun Hing Industrial Sales (Shenzhen) Co., Ltd.	Shenzhen	6th Floor, Excellence Times Square, #4068 Yitian Road, Futian District, Shenzhen, China	86-755-8255-8551
				86-755-8255-8668
India	Panasonic Industrial Asia Pte Ltd. (PIAI)	New Delhi	510, E-Block, International Trade Tower, Nehru Place, New Delhi	91-11-26292870
				91-11-26292878

#### [Distributor]

Country	Company Name	City	Address	TEL
				FAX
Korea	YOUNG IL Electric Co.,Ltd.	Seoul	3Fr-, Young-il, 982-4, Shi-heung 3 Dong, Keum-cheon Ku, Seoul, Korea	82-2-805-2471
				82-2-805-2475
	Soonhan Engineering Co.,Ltd.	Sungnam	333-11, Sangdaewon-Dong, Jungwon-Ku, Sungnam City, Kyungki-Do, 462-806, Korea	82-31-737-1660
				82-31-732-9188
	Zeus Co.,Ltd.	Osan	163-1, Busan-Dong, Osan-City, Kyunggi-Do, 447-050, Korea	82-31-377-9500
				82-31-378-8660

#### **Cautions for Proper Use**

- This product is intended to be used with a general industrial product, but not designed or manufactured to be used in a machine or system that may cause personal death when it is failed.
- Installation, wiring, operation, maintenance, etc., of the equipment should be done by qualified and experienced personnel.
- 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 to 3.3 N·m.
- Install a safety equipments or apparatus in your application, when a serious accident or loss of property is expected due to the failure of this product.
- Consult us if the application of this product is under such special conditions and environments as nuclear energy control, aerospace, transportation, medical equipment, various safety equipments or equipments which require a lesser air contamination.
- We have been making the best effort to ensure the highest quality of the products, however, application of exceptionally larger external noise disturbance and static electricity, or failure in input power, wiring and components may result in unexpected action. It is highly recommended that you make a fail-safe design and secure the safety in the operative range.
- If the motor shaft is not electrically grounded, it may cause an electrolytic corrosion to the bearing, depending on the condition of the machine and its mounting environment, and may result in the bearing noise. Checking and verification by customer is required.
- Failure of this product depending on its content, may generate smoke of about one cigarette. Take this into consideration when the application of the machine is clean room related.
- Please be careful when using in an environment with high concentrations of sulfur or sulfric gases, as sulfuration can lead to disconnection from the chip resistor or a poor contact connection.
- Take care to avoid inputting a supply voltage which significantly exceeds the rated range to the power supply of this product. Failure to heed this caution may result in damage to the internal parts, causing smoking and/or a fire and other trouble.
- 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.
- Read and observe the instruction manual without fail for proper usage of the products.

Repair

Consult to the dealer from whom you have purchased this product for details of repair work.

When the product is incorporated to the machine you have purchased, consult to the machine manufacturer or its dealer.

URL

Electric data of this product (Instruction Manual, CAD data) can be download from the following web site; <a href="http://industrial.panasonic.com/ww/i\_e/25000/motor\_fa\_e/motor\_fa\_e.html">http://industrial.panasonic.com/ww/i\_e/25000/motor\_fa\_e/motor\_fa\_e.html</a>

Contact to :

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ISO14001 Certificate division CERTIFICATE OF APPROVAL ISO14001





ISO9001 Certificate division
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The contents of this catalog apply to the products as of Sep. 1, 2009.

- 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.