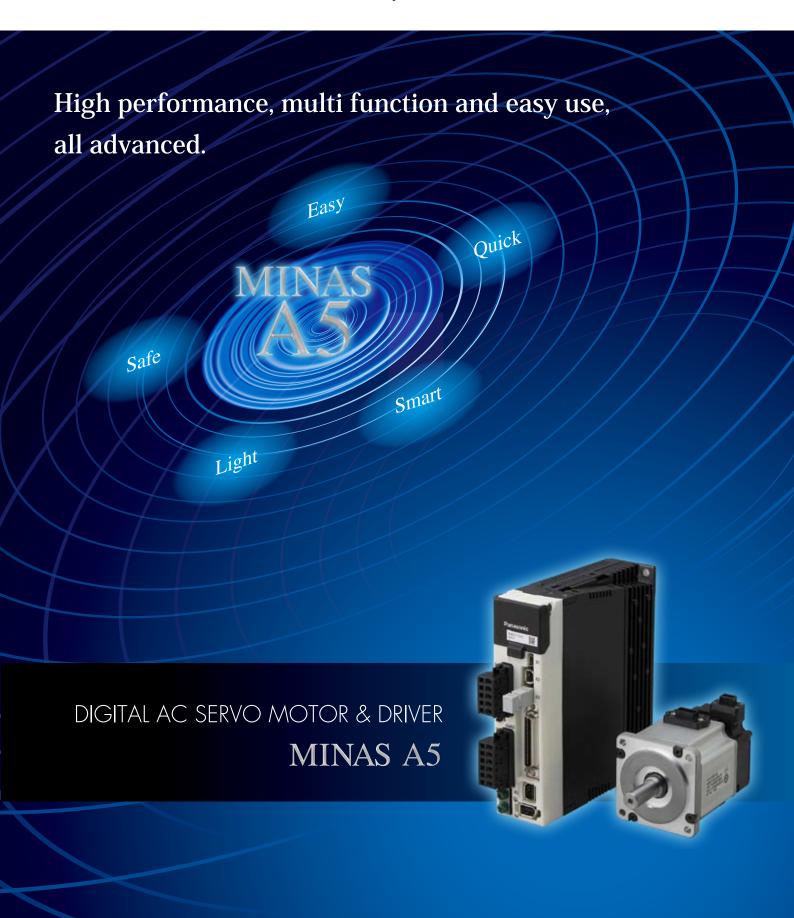


http://www.eusens.com/



Large step ahead for system motion.

Series

A small step for axis.



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



- Innovative core
- · Innovative encoder

- Low noise
- IP67 enclosure rating

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Connector kit
Battery for absolute encoder
Mounting bracket
Reactor
External regenerative resister
Surge absorber for motor brake
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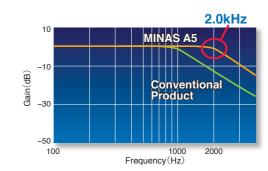


2.0 kHz frequency response

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





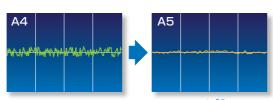
Low cogging torque (Excluding MSMD, MHMD type)

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



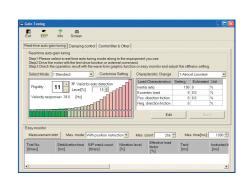
Highly Functional Real-time Auto-Gain Tuning

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

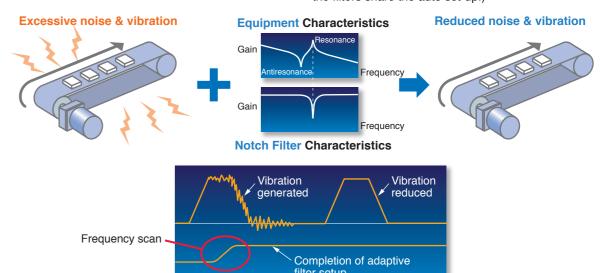
Manual/Auto Notch Filters

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.)







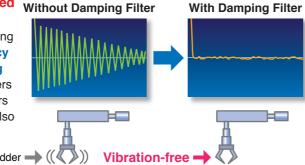
Manual/Auto Damping Filter

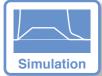
Example application

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

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

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.



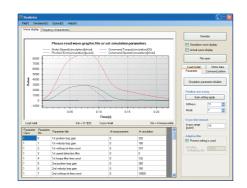


Motion Simulation

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.



Light



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

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





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.



	[Example
2kW	MSM 1k
M.	MOMOL

amples	for	MSM	or	MDM	1

	A4 Series	A5 Series	Weight Reduction
MSM 1kW	4.5kg	3.5kg	▲ 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





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



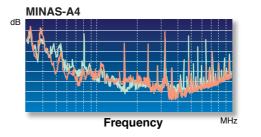
Low noise

Example application

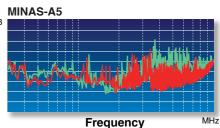
Semiconductor and LCD production equipment, etc. general production machinery for export to the European market

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 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.





Protection against dust

· Protected against dust penetration when in full contact

Protection against water

 Protection against temporary immersion in water

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.

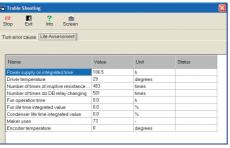
Encoder Temperature Monitor

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.

•	• Seve	RE		H		? hto			11.52.05 🖽 🕽		
			M	ADHT12	97 09010	001		Phy	rical Output Logical Output		
Pin	Code		Men	rol State	VMve	Unit			Output signal	Ph	Dolle
OI	NOT		Command pos	ition deviati	un -004	Commen		P	Extensi braka relesse output	10	SPK-OFF
OR .	POF		Actual speed		-516	ofee	7		Decreased behavior orbat.	12	257
25	6-021		Torque comm	ed be	-025	x		12	Seno-Ready output	34	9-901
v	GAN		LowEnvilo		1.2		-	P	Seno-Namoutset	36	AM
28	DN4						=1		Positionine complete output	30	NP.
25 5	RY-ON						1		Taque in-linit output	40	TLC
30	OL.						1	Ш	(CPR) Switch ESM output	CK.	RDI MOS
9 .	RLDA						1 1				
20 0	90004-0		Exercia ton	9004 1019			_				
39	291	•			_ 0	ounter RS	ī				Faced Output
Whe	Dist		Status	74mber	Message			8	ooder / Ertenal soule	Vhlee	Det
4.81	٧		Era	ao	Normal action		1	Single		56	DE Encoder unit
-1	v		Thrine	00	Normal sotion			MAP	for data		0 Reddin
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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).

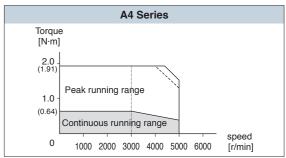
SEMI F47

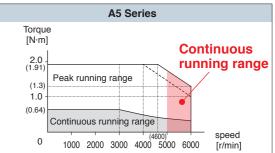
- Includes a function in compliance with the SEMI F47 standard for voltage sag immunity under no load or light load.
- Ideal for the semiconductor and LCD industries.
 Notes:
- 1) Excluding the single-phase 100-V type.
- Please verify the actual compliance of your machine with the F47 standard for voltage 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)	Sony Manufacturing Systems Corporation	SL700/PL101-RP	0.1	10
		SL710/PL101-RP	0.1	10
		AT573A	0.05	2
0 : 1 =	Mitutoyo Corporation	ST771A(L)	0.5	5
Serial Type (Absolute)		ST773A(L)	0.1	4
	Sony Manufacturing Systems Corporation	SR77	0.01	3.3
	Sony Manufacturing Systems Corporation	SR87	0.01	3.3

^{*} 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.

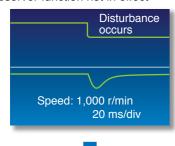
Parameter Initialization

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

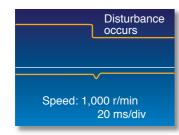
Disturbance Observer

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.

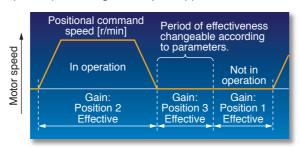
3-Step Gain

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
	EMC Directives	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

* When export this product, follow statutory provisions of the destination country.

* A5E series doesn't correspond to the functional safety standard.

MEMO	

Motor Line-up

	Line-up														
				Low i	nertia				Middle	inertia		H	ligh i	nertia	
		MSMD (Small type		MSMD (Small type) MSME (Small type)			ME e type)	MD	ME	MGN Low spo High torqu	eed/ \	МНМ	0	МН	IME
N	Motor			2											
Rated output (kW)		0.05	0.1 0.4 75	0.05	0.1 0.4 75	1.0 2.0 4.0	1.5 3.0 5.0	1.0 2.0 4.0	1.5 3.0 5.0	0.9 2.0 3.0)	0.2 0.4 0.75		1.0 2.0 4.0	1.5 3.0 5.0
Rated rotational speed (Max. speed) (r/min)		3000 (For 75 3000 (50W [^]	30 (60		For 4.0kW	(5000) and 5.0kW (4500)	20 (30		100 (200	-	3000 (50 For 750) 3000 (45	W		000
Rotary	20-bit incremental			C	0		0			0		0			O
encoder	17-bit absolute			C	0					0		0)
Enclosure		IP65 (*)		IP67 (*)		IP67 (*)		IP67 (*)		IP67 (*)		IP65 (*)	IP6	7 (*)
Features		Leadwi Small c Suitabl high sp applica Suitabl applica	capacity le for beed ation le for all	pacity odicity for high speed application on output Suitable for all applications		Middle capacity Suitable for the machines di- rectly 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 suitable machine with spa limitation	and for s ce	Leadwire Small cap Suitable f low stiffne machines belt driver	oacity or ess with	belt dri	ty le for ffness nes with iven, rge load
Applications		Bonder Semico equipm Packing etc	onductor nent	productiones	on	SMT ma Food m LCD produce equipm	achines	Convey Robots Machir etc		Conveyo Robots Textile machine etc		• Conveyor • Robots	rs .	Convey Robots LCD manufa equipm etc	acturing

^(*) Except for output shaft, and connector.

Driver and Motor Combination

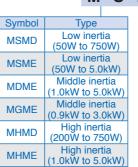
	Driver					Motor				
Frame	Part No.	MSMD	MSME	MSME		MDME	MGME		MHMD	MHME
	MADHT1105	MSMD5AZ***	MSME5AZ***							
	MADHT1107	MSMD011 ***	MSME011 ***		Motor (S	released.)				
A-Frame	MADHT1505	MSMD5AZ***	MSME5AZ***		• MDME	• MDME 7.5kW, 11kW, 15kW				
	WIADHI 1505	MSMD012***	MSME012***		• MHME	7.5kW				
	MADHT1507	MSMD022***	MSME022***		• MGME			MHMD022***		
D =	MBDHT2110	MSMD021***	MSME021***		1	1.5kW, 2.5kW, 4.			MHMD021***	
B -Frame	MBDHT2510	MSMD042***	MSME042***		• Motor v	-		MHMD042***		
0-	MCDHT3120	MSMD041 ***	MSME041 ***		100W, 200W, 400W, 7		'50W		MHMD041 ***	
C-Frame	MCDHT3520	MSMD082***	MSME082***						MHMD082***	
	MDDHT3530					MDME102***				MHME102***
	MDDHT2412					MDME104***				MHME104***
D	MDDUTEE40			MSME102***		MDME152***	MGME092	***		MHME152***
D -Frame	MDDHT5540			MSM	E152***					
	MDDUTO400			MSMI	E104***	MDME154***	MGME094	***		MHME154***
	MDDHT3420			MSM	E154***					
	MEDHT7364			MSMI	E202***	MDME202***				MHME202***
E-Frame	MEDHT4430			MSMI	E204***	MDME204***				MHME204***
	MFDHTA390			MSMI	E302***	MDME302***	MGME202	***		MHME302***
	MFDHT5440			MSMI	E304***	MDME304***	MGME204	***		MHME304***
	MEDUTDOAG			MSMI	E402***	MDME402***	MGME302	***		MHME402***
⊢ -Frame	MFDHTB3A2			MSMI	E502***	MDME502***				MHME502***
				MSMI	E404***	MDME404***	MGME304	***		MHME404***
	MFDHTA464			MSMI	E504***	MDME504***				MHME504***

^{*} A5E series (dedicated for position control) drivers are also used in combination with motors show above.

MINAS A 5

Model Designation

Servo Motor



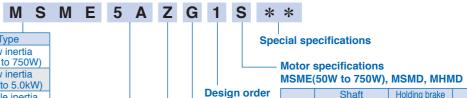
Motor rated output

violor rated output											
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

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

* S: can be used in incremental.



1 : Standard

	S	haft	Holding	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

M S M E 0 1 1 G 3 1 N **Motor rated output**

Z

Voltage specifications Symbol Specifications 100V 200V

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

			motor	ated outp
Symbol	Type		Symbol	Rated output
MSME	Low in	ertia	01	100W
IVISIVIE	(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
G	Incremental	20-bit	1,048,576	5
S	Absolute	17-bit	131.072	7

Gear ratio, gear type

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

Current detector

Symbol Current rating

5A 7.5A

10A

12A 20A 30A 40A

64A 90A 120A

current rating

Motor structure

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

Servo Driver

Standard type	M	A	D	Н	Т	1	5	0	5	*	*	*	Special specifications
Positioning type	M	Α	D	Н	Т	1	5	0	5	E	*	*	Special specifications

Frame symbol

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

current rating

bol	Frame		Symbol	Current ra
DΗ	Frame A		T1	10A
DH	Frame B		T2	15A
DΗ	Frame C		T3	30A
DH	Frame D		T4	35A
DΗ	Frame E		T5	50A
DH	Frame F		T7	75A
		'	TA	100A
			TB	150A

Power device Max.

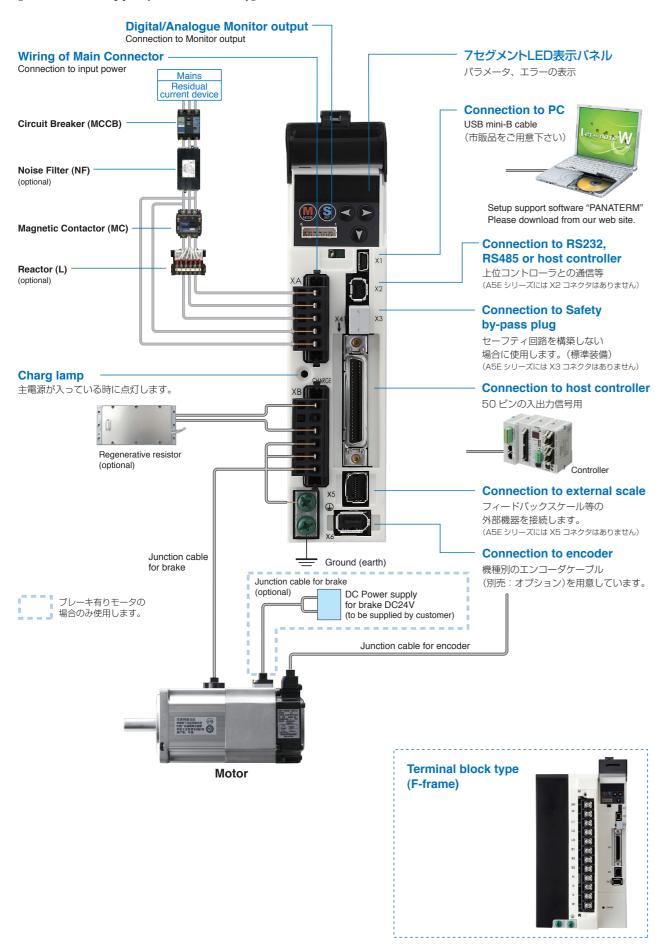
101
10A
15A
30A
35A
50A
75A
100A
150A

└ Only position control

Supply voltage					
specifica			10		
Symbol	Specifications	ı	12		
39111001	Single phase, 100V		20		
3	3-phase, 200V		30		
3			40		
4	3-phase, 400V		64		
5	Single/3-phase, 200V	l	90		
			A2		

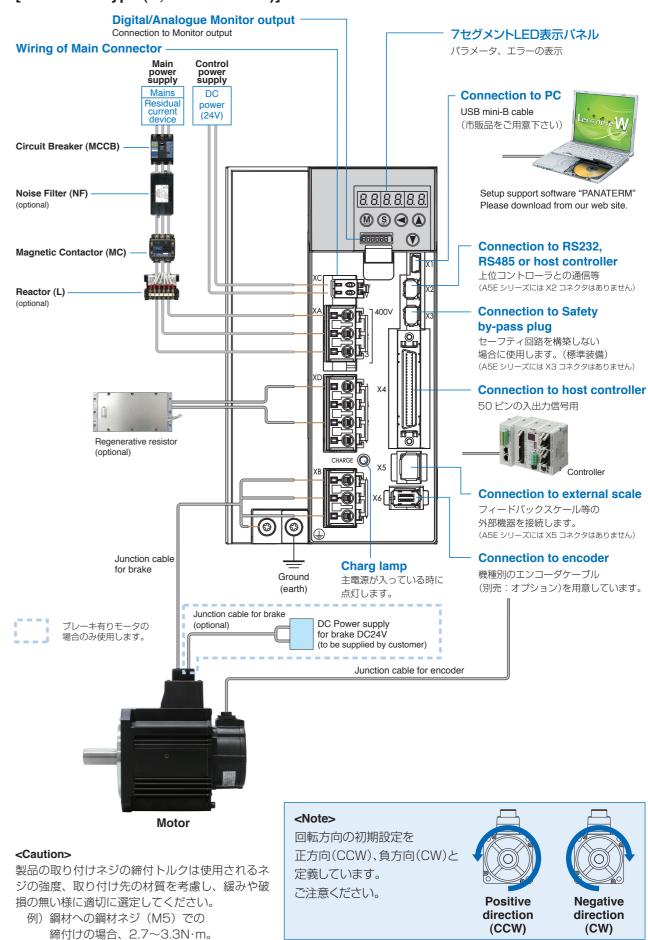
MINAS A 5 Overall Wiring

[Connector type (A to E-frame)]



12

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





Driver and List of Applicable Peripheral Equipments

Driver	Applicable motor	Voltage	Rated output	Required Power at the rated load	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. 0.4kVA		DV0P4190					
MADH	MSME MHMD	Single/3-phase, 200V	50W to 200W	approx.		DV0P4190 DV0P1450					
	MSMD	Single phase, 100V	200W	approx. 0.5kVA	10A	DV0P4190			0.75mm²/ AWG18 to 2.0mm²/ AWG14		
MBDH	MSME MHMD	Single/3-phase, 200V	400W	approx. 0.9kVA		DV0P4190 DV0P1450		20A			
MCDH	MSMD MSME	Single phase, 100V	400W	approx. 0.9kVA		DV0P4190					
WICDH	MHMD	Single/3-phase, 200V	750W	approx. 1.3kVA						0.75mm²/ AWG18	
	MDME MHME		1.0kW	approx. 1.8kVA	15A						Connec
	MGME		900W	approx. 1.8kVA		DV0P4190					ction t
	MSME	Single/3-phase, 200V	1.0kW	approx. 1.8kVA	20A	DV0P1450		30A			o exclu
	MHME MDME		1.5kW	approx.							sive c
MDDH	MSME		1.5844	2.3kVA							Connection to exclusive connector
	MSME		1 0141						2.0mm ² /		
	MDME		1.0kW approx. 1.8kVA					AWG14	0.521		
	MGME	3-phase, 400V	0.9kW		10A	DV0PM20050		20A		0.5mm²/ AWG	
	MSME	400 V								20~24	
	MDME		1.5kW	1.5kW approx. 2.3kVA							
	MHME MDME MSME MHME	3-phase, 200V	2.0kW	approx. 3.3kVA	30A	DV0P1450	DV0P1460	60A		0.75mm ² / AWG18	_
MEDH	MSME MDME MHME	3-phase, 400V	2.0kW	approx. 3.3kVA	15A	DV0PM20050		30A		0.5mm ² / AWG 20~24	_
	MGME		2.0kW	approx. 3.8kVA						20'024	
	MDME			J.OKVA							
	MHME		2 UF/V	approx.				60A			
	MSME	3.0kW 4.5kVA				3.5mm ² / AWG12					
	MGME	3-phase,			50A	DV0P1450					
	MDME MHME	200V	4.0kW	approx.							
	MSME		4.0100	6kVA							
	MDME							100A	2		11mm or smaller
	MHME		5.0kW	approx. 7.5kVA					5.3mm²/ AWG10		
MFDH	MSME MGME		2.0kW	approx.						0.75mm²/ AWG18	φ _{5.3} Terminal
			2.UKVV	3.8kVA							block M5
	MSME MDME										CIVI
	MGME		3.0kW	approx. 4.5kVA							
	MHME	3-phase,	l-nhase					3.5mm ² /			
	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 1.6mm² or less, use an earth cable with a diameter of 2.0mm² (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).

			LIOTIS																				
		Motor		I			Driver		Power	Eno	oder o	ooblo	Motor		nal parts				• Options				
M	otor series	Power	Output	Part No.	Rating/ Spec.	Part No.	Part No. (Positioning	Frame	capacity	20-b		17-bit	without	cable with	Brake cable	Regenerative	Reactor	Noise	Title	構成品名	Part No.	Pa	
101	Jior Scries	supply	(W)	Note) 1	(page)	(Standard type)	type)	Traine	(atrated load)	Increme Note)	ental At	bsolute Note) 2	brake Note) 2	brake Note) 2	Note) 2	resistor	ricaciói	filter	Interface cable Interface Conn		DV0P4360 DV0P4350	11 11	
			50	MSMD5AZ_1 *		MADHT1105	MADHT1105E	A-frame	Approx. 0.4kVA	,		,	,	,		DV0P4280	DV0P227			A to Single	DV0PM20032	2 12	
		Single phase 100V	100	MSMD011 1 *	_	MADHT1107	MADHT1107E		Approx. 0.4kVA								D V OI ZZI	DV0P4170	Connector	D-frame row type /100V/\ Double	DVODMOOOO	. 4	
	MSMD		200 400	MSMD021_1 * MSMD041_1 *		MBDHT2110 MCDHT3120	MBDHT2110E MCDHT3120E									DV0P4283 DV0P4282	DV0P228	DV0PM20042	for Power Supply Input	\200V / row type			
	(Leadwire) type		50	MSMD5AZ⊡1 *		MADHT1505	MADHT1505E		Approx. 0.5kVA				MFMCA 0**0EED	_	MFMCB 0**0GET	DV0P4281			Connection	E-frame (200V) D-frame (400V)			
	3000r/min	Single phase/ 3-phase	Single phase/ 3-phase	100	MSMD012_1 *		MADHT1505	MADHT1505E	A-frame		0 02		0	0 0222		0 002.	D V 01 4201	DV0P220	DVODMOSSAS		E-frame (400V)		_
	000017111111	200V	200 400	MSMD022_1 * MSMD042_1 *		MADHT1507 MBDHT2510	MADHT1507E MBDHT2510E	B-frame	Approx. 0.5kVA Approx. 0.9kVA							DV0P4283		DV0PM20042	Connector for Control Power	D, E-frame	D) (0D) (000=0		
			750	MSMD082□1 *		MCDHT3520	MCDHT3520F	C-frame	Approx. 1 3kVA								DV0P221		Supply Input Connection	(400V)	DV0PM20053	17	
			50	MSME5AZ 1 *		MADHT1105	MADHT1105E	A-frame	Approx. 0.4kVA							DV0P4280	DV0P227	D)/0D4470	Connector	A to D-frame	DV0PM20034	. 12	
		Single phase 100V	100 200	MSME011 1 * MSME021 1 *	_	MADHT1107 MBDHT2110	MADHT1107E MBDHT2110E		Approx. U.4K VA							DV/0P4283		DV0P4170	for Motor Connection	E-frame (200V)		_	
	MSME		400	MSME041_1 *		MCDHT3120	MCDHT3120E			MEE		45504	MENAGA		MEMOR	DV0P4282	DV0P228	DV0PM20042	Connector for	D-frame (400V) E-frame	DV0PM20054 DV0PM20045		
Low	3000r/min		50	MSME5AZ 1 *		MADHT1505	MADHT1505E		Approx. 0.5kVA				MFMCA 0**0NJD	_	MFMCB 0**0PJT	DV0P4281			Regenerative	D-frame (400V)			
Į,	30001/111111	Single phase/ 3-phase	100 200	MSME012 1 * MSME022 1 *		MADHT1505 MADHT1507	MADHT1505E MADHT1507E	A-frame	Approx. 0.5kVA Approx. 0.5kVA							DV0P220	DV0PM20042	Resistor	(,	DV0P4290	1		
inertia		200V	400	MSME042_1 *		MBDHT2510	MBDHT2510E	B-frame								DV0P4283		D V 01 1V120042			DV0P4380	1	
_			750	MSME082_1 *		MCDHT3520	MCDHT3520E	C-frame									DV0P221		Connector Kit f	for	DV0PM20035 DV0PM20036		
		Single phase/ 3-phase 200V	1000 1500	MSME102_1 * MSME152_1 *		MDDHT5540 MDDHT5540	MDDHT5540E MDDHT5540E	D-frame	Approx. 1.8kVA Approx. 2.3kVA				MFMCD	MFMCA		DV0P4284	DV0P222	DV0P4220	Motor/Encoder	Connection	DV0PM20037		
		200 V	2000	MSME202_1*		MEDHT7364	MEDHT7364E	E-frame					0**2ECD	0**2FCD		DV0P4285	DV0P223	DV0PM20043			DV0PM20038		
		3-phase 200V	3000	MSME302□1 *	_	MFDHTA390	MFDHTA390E		Approx. 4.5kVA				MEMCA	MEMCA			DV0P224		Connector Kit f	for	DV0PM20039		
	MSME	0 phase 200 v	4000	MSME402 1 *		MFDHTB3A2	MFDHTB3A2E	F-frame				MFMCA 0**3ECT		DV0P428 × 2 in paral	x 2 in parallel	DV0P225	DV0P3410	Motor/Brake C	onnection	DV0PM20040			
	3000r/min		5000 1000	MSME502_1 * MSME104_1 *	_	MFDHTB3A2 MDDHT3420	MFDHTB3A2E MDDHT3420E	_	Approx. 7.5kVA Approx. 1.8kVA	0**0E	CA M TD 0*	##0ETE			_		_			RS485, RS232 Safety	DV0PM20024 DV0PM20025		
	00001/111111		1500	MSME154_1 *		MDDHT3420	MDDHT3420E	D-frame	Approx. 2.3kVA					CD MFMCE CD 0**2FCD		DV0PM20048			Connector		DV0PM20026		
			2000	MSME204 1 *		MEDHT4430	MEDHT4430E	E-frame					0 2200	0 2.05		DV0PM20049	_	_	Connector	Encoder	DV0PM20010	1	
		·	3000 4000	MSME304_1 * MSME404_1 *		MFDHT5440 MFDHTA464	MFDHT5440E MFDHTA464E	F-frame	Approx. 4.5kVA Approx. 6.8kVA					MFMCA		DV0PM20049				Analog Monitor Signal	DV0PM20031	12	
			5000	MSME504_1 *		MFDHTA464	MFDHTA464E	, namo	Approx. 7.5kVA				0**3ECT	0**3FCT		x 2 in parallel				solute Encoder	DV0P2990	12	
		Single phase/ 3-phase	1000	MDME102_1*		MDDHT3530	MDDHT3530E	D-frame	Approx. 1.8kVA				MFMCD	2ECD 0**2FCD FMCA MFMCA 3ECT 0**3FCT FMCD MFMCE		DV0P4284	DV0P222	DV0P4220	Battery Box	A-frame	DV0P4430 DV0PM20027	12	
		200V	1500 2000	MDME152_1 * MDME202_1 *		MDDHT5540 MEDHT7364	MDDHT5540E MEDHT7364E	F-frame	Approx. 2.3kVA									DV0PM20043	Mounting	B-frame	DV0PM20028	3 12	
		3-phase 200V	3000	MDME302 1 *		MFDHTA390	MFDHTA390E	L-IIaille	Approx. 4.5kVA				0**3ECT 0		_		DV0P224	D V 01 1V120040	bracket	C-frame	DV0PM20029		
	моме		4000	MDME402_1 *		MFDHTB3A2	MFDHTB3A2E	F-frame								DV0P4285 × 2 in parallel	DV0P225	DV0P3410		D-frame	DV0PM20030 MFECA0**0EA		
	MDME		5000 1000	MDME502_1 * MDME104_1 *		MFDHTB3A2 MDDHT2412	MFDHTB3A2E MDDHT2412E		Approx. 7.5kVA Approx. 1.8kVA			MFECA 0**0ETE MFMCD					_			without Buttery Box	MFECA0**0MJ		
Middle	2000r/min		1500	MDME154_1 *		MDDHT3420	MDDHT3420E	D-frame	Approx. 2.3kVA	0 02	.10		MFMCD			DV0PM20048			Junction Cable for Encoder		MFECA0**0ET		
dle		3-phase 400V	2000	MDME204□1 *		MEDHT4430	MEDHT4430E	E-frame	Approx. 3.3kVA				0**2ECD 0**2FCE MFMCA 0**3ECT 0**3FC1	U ZFCD		DV0PM20049	_	_	Tor Encoder	with	MFECA0**0MJ		
inertia		0 phase 400 v	3000	MDME304 1 *	_	MFDHT5440	MFDHT5440E	C 6	Approx. 4.5kVA							DV0PM20049				Mullery box	MFECA0**0ET	E 1	
tia			4000 5000	MDME404_1 * MDME504_1 *		MFDHTA464 MFDHTA464	MFDHTA464E MFDHTA464E	r-irame	Approx. 7.5kVA							x 2 in parallel					MFMCA0**0EE		
		Single phase/ 3-phase 200V	900	MGME092□1 *	57	MDDHT5540	MDDHT5540E	D-frame					MFMCD0**2ECD	MFMCA0**2FCD				DV0P4220		without Brake	MFMCD0**2E0		
	MGME	3-phase 200V	2000	MGME202 1 *		MFDHTA390	MFDHTA390E	F-frame	Approx. 3.8kVA				MFMCA 0**3ECT	MFMCA 0**3ECT		DV0P4285	UV0P224	DV0P3410	Junction Cable for Motor		MFMCE0**2EC		
	1000r/min		3000 900	MGME302_1 * MGME094_1 *		MFDHTB3A2 MDDHT3420	MFDHTB3A2E MDDHT3420E		Approx. 4.3KVA			11		MFMCE0**2FCD	_	DV0PM20048		JP224	•	IOI IVIOLOI		MFMCA0**3EC	
	10001/111111	3-phase 400V	2000	MGME204 1 *	_	MFDHT5440	MFDHT5440E	F-frame	Approx. 3.8kVA				MFMCA	MFMCA		DV0PM20049	_	_		with Brake	MFMCE0**2FC	CD 1	
			3000	MGME304 1 *		MFDHTA464	MFDHTA464E		Approx. 4.5KVA				0**3ECT	0**3FCT		x 2 in parallel		DV0D44=0			MFMCA0**3FC		
	MHMD	Single phase 100V	200 400	MHMD021_1 * MHMD041_1 *		MBDHT2110 MCDHT3120	MBDHT2110E MCDHT3120E									DV0P4283 DV0P4282	DV0P228	DV0P4170 DV0PM20042	Junction Cable	for Brake	MFMCB0**0PJ		
	(Leadwire) type	0: 1 1 /0 1	200	MHMD022_1 *	_	MADHT1507	MADHT1507E						MFMCA 0**0EED	_	MFMCB 0**0GET	D V 01 4202	DV0P220	D VOI IVIZOUTZ		50Ω 25W	DV0P4280	1:	
	3000r/min	Single phase/ 3-phase 200V	400	MHMD042 1 *		MBDHT2510	MBDHT2510E			0 01	AIVI	ULAL	0 OLLD		0 UGLI	DV0P4283	DV0P221	DV0PM20042		100Ω 25W 25Ω 50W	DV0P4281 DV0P4282	1: 1:	
	30001/111111	Cinala abass / O abass	750 1000	MHMD082_1 * MHME102_1 *		MCDHT3520 MDDHT3530	MCDHT3520E MDDHT3530E	C-frame	Approx. 1.3kVA Approx. 1.8kVA				MEMOD	NATNACA			2 7 01 22 1		External	50Ω 50W	DV0F4282	12	
_		Single phase/ 3-phase 200V	1500	MHME152_1*	_	MDDHT5540	MDDHT5540E	D-frame	Approx. 2.3kVA					MFMCA 0**2FCD		DV0P4284	DV0P222	DV0P4220	Regenerative Resistor	30Ω 100W	DV0P4284	12	
High inertia			2000	MHME202 1 *	62	MEDHT7364	MEDHT7364E	E-frame	Approx. 3.3kVA				MFMCE0**2ECD	MFMCE0**2FCD		DV0P4285		DV0PM20043		20Ω 130W 120Ω 35W	DV0P4285 DV0PM20048	12 12	
ine		3-phase 200V	3000	MHME302 1 *	_	MFDHTA390	MFDHTA390E	E 4	Approx. 4.5kVA					MFMCA		DV0P4285	DV0P224	DV0D0440			DV0PM20048		
rtia	MHME	-	4000 5000	MHME402_1 * MHME502_1 *		MFDHTB3A2 MFDHTB3A2	MFDHTB3A2E MFDHTB3A2E		Approx. 7.5kVA	MFF	CA M	1FFCA	0**3ECT			× 2 in parallel	DV0P225	DV0P3410	Reactor	DV0P220, DV0 DV0P223, DV0	P221, DV0P222	2,	
	2000r/min		1000	MHME104_1 *		MDDHT2412	MDDHT2412E	D.fromo	Approx. 1.8kVA			**0ETE	MFMCD	MEMOE	_	DV0PM20048			1 ICACIUI	DV0P227, DV0	P228	, 14	
			1500	MHME154_1 *		MDDHT3420	MDDI113420L		Approx. Z.JKVA			_	0**2ECD	MFMCE 0**2FCD					Noise Filter	DV0P4170, DV0 DV0P4220, DV		1	
		3-phase 400V	2000 3000	MHME204 1 * MHME304 1 *		MEDHT4430 MFDHT5440	MEDHT4430E MFDHT5440E	∟ -frame	Approx. 3.3kVA Approx. 4.5kVA				MFMCE0**2ECD			DV0PM20048	_	_		DV0P3410			
			4000	MHME404_1 *		MFDHTA464	MFDHTA464E	F-frame					MFMCA 0**3ECT			DV0PM20049 × 2 in parallel			Surge	Single phase 3-phase (200V)		10	
			5000	MHME504□1 *	103	MFDHTA464	MFDHTA464E		Approx. 7.5kVA				U ULUI	0 0101		^ = III paraliel			absorber	3-phase (200V)	DV0PM20050) 10	
note)	1 Rotary enco	oder specifications:	Motor s	specification: *	(refer to	P.13)				note)2	2 Cabl	le lengtl	h: ** (03	3: 3m, 05: 5	im, 10: 10	m, 20: 20m)		Noise Filter for	Signal Lines	DV0P1460	10	

	100V	Main	circuit	Single phase, 100 to 120V +10% 50/60Hz -15%							
		Control circuit		Single phase, 100 to 120V +10% -15% 50/60Hz							
		Main	A to D-frame	Single/3-phase, 200 to 240V +10%							
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%							
W	ithstand 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)							
En	nvironment	hun	nidity	Both operating and storage : 20 to 85%RH or less (free from condensation)							
		Altitude		Lower than 1000m							
		Vibration		5.88m/s² or less, 10 to 60Hz (No continuous use at resonance frequency)							
Co	ontrol meth	nod		IGBT PWM Sinusoidal wave drive							
Er	Encoder feedback			17-bit (131072 resolution) absolute encoder, 7-wire serial 20-bit (1048576 resolution) incremental encoder, 5-wire serial							
Er Fe	Feedback scale feedback			A/B phase, initialization signal defferential input. Manufacturers that support serial communication scale: Mitsutoyo Corp. Sony Manufacturing Systems Corp.							
	Input			General purpose 10 inputs The function of general-purpose input is selected by parameters.							
	gnal	Output		General purpose 6 outputs The function of general-purpose input is selected by parameters.							
	nalog	In	put	3 inputs (16Bit A/D : 1 input, 12Bit A/D : 2 inputs)							
	Digital gnal	Output		3 outputs (Analog monitor: 2 output, Digital monitor: 1 output)							
Pı	ulse	In	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.							
się	gnal	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.							
	mmunication ction	RS	232	1 : 1 communication to a host with RS23 interface is enabled.							
iuii		RS	485	1 : n communication up to 15 axes to a host with RS485 interface is enabled.							
Sa	afety functi	on		Used for IEC61800-5-2: STO.							
Fr	ont panel			(1) 5 keys (MODE, SET, UP, DOWN, SHIFT) (2) LED (6-digit) (3) Analog monitor output (2ch) (4) Digital monitor output (1ch)							
Re	egeneratio	n		A, B-frame: no built-in regenerative resistor (external resistor only) C to F-frame: Built-in regenerative resistor (external resistor is also enabled.)							
Dy	ynamic 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							

$\overline{}$				(d) Deviation assumes along (f) Command mules inhibition				
		Control in	put	(1) Deviation counter clear (2) Command pulse inhibition(3) Command dividing gradual increase switching(4) Damping control switching etc.				
		Control ou	ıtput	Positioning complete (In-position) etc.				
			Max. command pulse frequency	Exclusive interface for Photo-coupler: 500kpps Exclusive interface for line driver: 4Mpps				
	Posit	Dulco	Input pulse signal format	Differential input. Selectable with parameter. ((1) Positive and Negative direction, (2) A and B-phase, (3) Command and direction)				
	Position control	Pulse 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 Torque limit command input		Individual torque limit for both positive and negative direction is enabled. (3V/rated torque)				
		Instantane Observer	eous Speed	Available				
		Damping	Control	Available				
		Control in	'	(1) Selection of internal velocity setup 1(2) Selection of internal velocity setup 2(3) Selection of internal velocity setup 3(4) Speed zero clamp etc.				
		Control ou	•	Speed arrival etc.				
		Analaa	Velocity command input	Speed command input can be provided by means of analog voltage. Parameters are used for scale setting and command polarity.				
	Vel	Analog input	Torque limit	Individual torque limit for both positive and negative direction is enabled. (3V/rated				
	ocit		command input	torque)				
	/ co	Internal velocity command		Switching the internal 8speed is enabled by command input.				
	Velocity control	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-speed clamp		0-clamp of internal velocity command with speed zero clamp input is enabled.				
		Instantaneous Speed Observer		Available				
ä		Velocity Control filter		Available				
Function	Torque control	Control input		Speed zero clamp, Torque command sign input etc.				
٦		Control ou		Speed arrival etc. Speed command input can be provided by means of analog voltage.				
		Analog input	Torque command input	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		(1) Deviation counter clear (2) Command pulse inhibition(3) Command dividing gradual increase switching (4) Damping control switching etc.				
		Control output		Full-closed positioning complete etc.				
			Max. command pulse frequency	Exclusive interface for Photo-coupler: 500kpps Exclusive interface for line driver: 4Mpps				
	Ful-	Pulse	Input pulse signal format	Differential input. Selectable with parameter. ((1) Positive and Negative direction, (2) A and B-phase, (3) Command and direction)				
	Full-closed control	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.				
	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 of pulse	f encoder feedback	Set up of any value is enabled (encoder pulses count is the max.).				
	on	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.				
		Traceabili	ty of alarm data	The alarm data history can be referred to.				

	100V	Main	circuit	Single phase, 100 to 120V +10% 50/60Hz -15%						
	100 V	Control circuit		Single phase, 100 to 120V +10% 50/60Hz						
		Main	A to D-frame	Single/3-phase, 200 to 240V +10% 50/60Hz						
Input power	0001/	circuit	E to F-frame	3-phase, 200 to 230V +10% 50/60Hz						
ower	200V	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						
	.001	Control circuit	D to F-frame	DC 24V ± 15%						
Wit	thstand vo		1 -mame	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)						
Env	vironment	humidity		Both operating and storage : 20 to 85%RH or less (free from condensation)						
Liviloriiion		Altitude		Lower than 1000m						
Vibration			ation	5.88m/s² or less, 10 to 60Hz (No continuous use at resonance frequency)						
Control method				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						
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	In	put	3 inputs (16Bit A/D : 1 input, 12Bit A/D : 2 inputs)						
sigi	igital nal	Ou	tput	3 outputs (Analog monitor: 2 output, Digital monitor: 1 output)						
Pul	lse	ln	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.						
sigi	nal	Ou	itput	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	nmunication tion	U	SB	Connection with PC etc.						
	fety functi	on		Used for IEC61800-5-2: STO.						
Fro	ont panel			(1) 5 keys (MODE, SET, UP, DOWN, SHIFT) (2) LED (6-digit) (3) Analog monitor output (2ch) (4) Digital monitor output (1ch)						
Re	generatio	n		A, B-frame: no built-in regenerative resistor (external resistor only) C to F-frame: Built-in regenerative resistor (external resistor is also enabled.)						
Dyı	namic bra	ke		Built-in						
Col	Control mode			Position control						

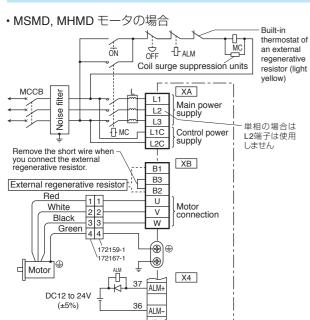
		Control inp	out	(1) Deviation counter clear (2) Command pulse inhibition(3) Command dividing gradual increase switching(4) Damping control switching etc.		
		Control ou	tput	Positioning complete (In-position) etc.		
	P		Max. command pulse frequency	Exclusive interface for Photo-coupler: 500kpps Exclusive interface for line driver: 4Mpps		
	Position control	Pulse input	Input pulse signal format	Differential input. Selectable with parameter. ((1) Positive and Negative direction, (2) A and B-phase, (3) Command and direction)		
	ontrol		input	input	Electronic gear (Division/ Multiplication of command pulse)	Process command pulse frequency × 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 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 of pulse	encoder feedback	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.		
		TUTICUOTI	Soft error	Excess position deviation, command pulse division error, EEPROM error etc.		
	Traceability of alarm data		y of alarm data	The alarm data history can be referred to.		

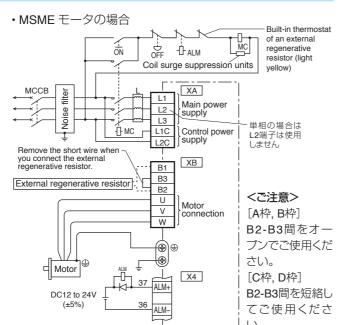
of an external regenerative resistor

(light yellow)

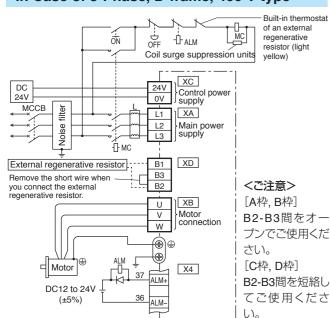
Ground NC

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





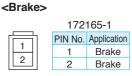
<Brake>

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

· When the motors of <MSMD, MHMD> are used, they are connected as shown below. Connector: Made by Tyco Electronics AMP

<Motor>

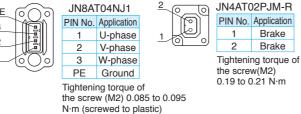
2 1	PIN No.	Application
- - 	1	U-phase
4 3	2	V-phase
	3	W-phase
	4	Ground



22

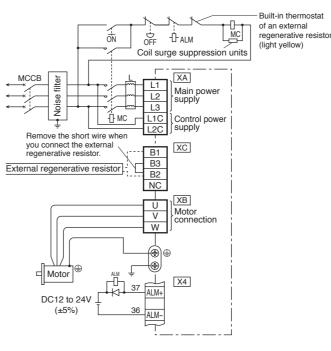
 When the motors of <MSME (50 W to 750 W)> are used, they are connected as shown below. Connector: Made by Japan Aviation Electronics Industry, Ltd.

<Motor> JN8AT04NJ1 PIN No. Application U-phase V-phase 3 W-phase PE Ground

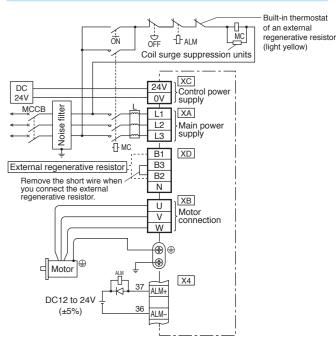


^{*} Be sure to use only the screw supplied with the connector, to avoid damage.

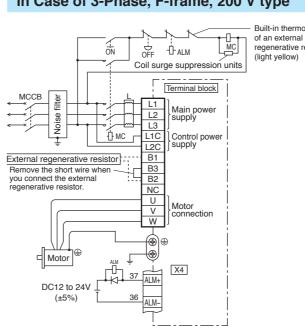
In Case of 3-Phase, E-frame, 200 V type



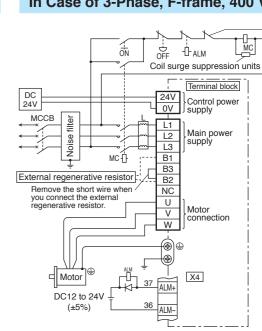
In Case of 3-Phase, E-frame, 400 V type



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







• 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.

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





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

Application				
Application				
U-phase				
V-phase				
W-phase				
Ground				

<with Brake>

Go	H A
(FO	OI OB
\QE	ß ĉ
II 04\/-2E	20-18PF-F

ê	O D	ĉ
L04V-2E2	20-	18PE-B-R

N No.	Application					
G	Brake					
Н	Brake	/				
Α	NC	DO				
F	U-phase	/3				
I	V-phase	`				
В	W-phase	JL04V-2				
E	Ground					
D	Ground					
С	NC					

	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
04V-2E24-11PE-B-R	F	W-phase
	G	Ground
		Cuarrad

<remarks></remarks>	Do not conne	ect anything to NC.
VI TOTTICATION	Do not conne	ot arry triming to rivo.

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。

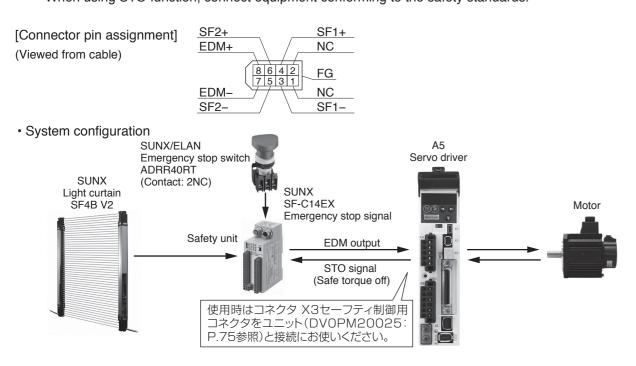
When STO function operates, the servo driver turns off the servo ready output signal (S-RDY) and enters

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

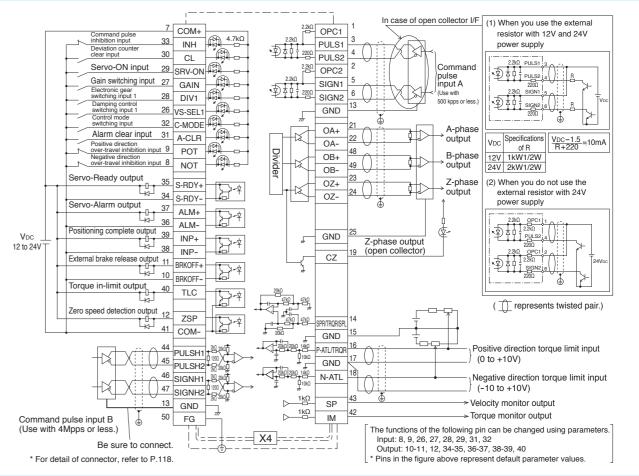
セーフティ回路を構築しない場合は、付属のセーフティバイパスプラグをご使用ください。

Safety precautions

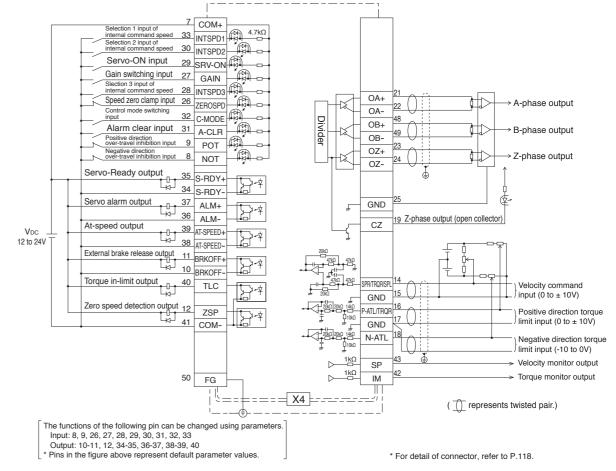
- · When using the STO function, be sure to perform equipment risk assessment to ensure that the system conforms to the safety requirements.
- · Even while the STO function is working, the following potential safety hazards exist. Check safety in risk assessment.
- The motor may move when eternal force (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.



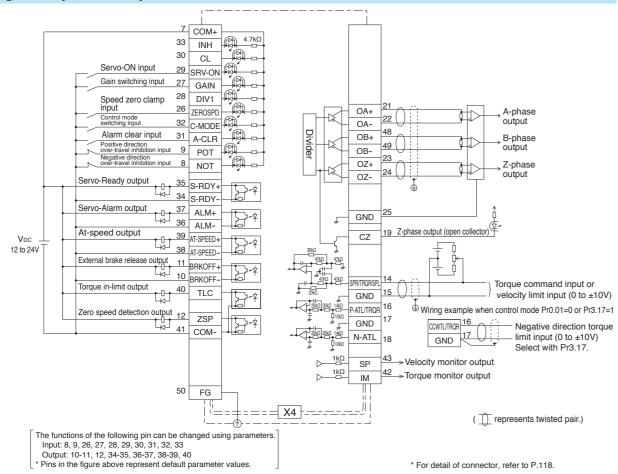
Wiring Example of Position Control Mode



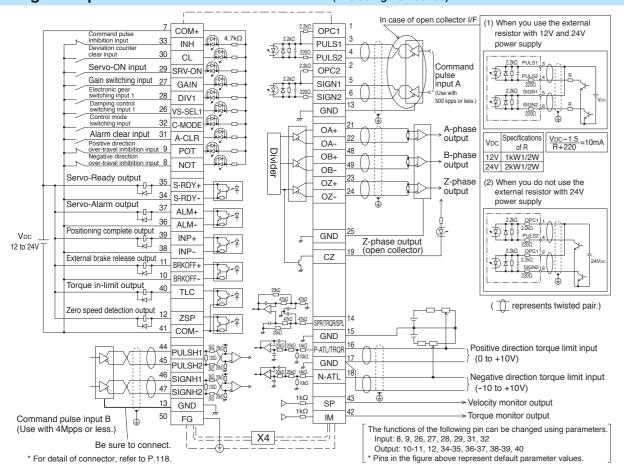
Wiring Example of Velocity Control Mode (Excluding A5E Series)



Wiring Example of Torque Control Mode (Excluding A5E Series)



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

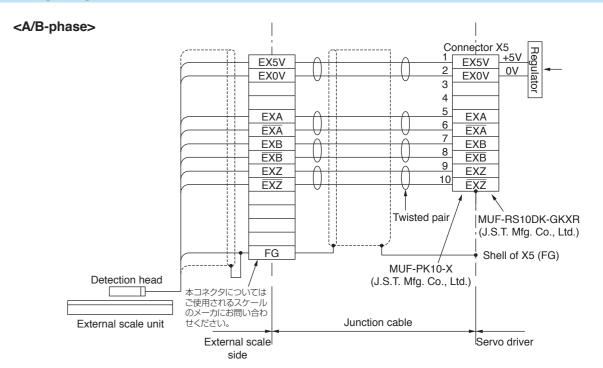


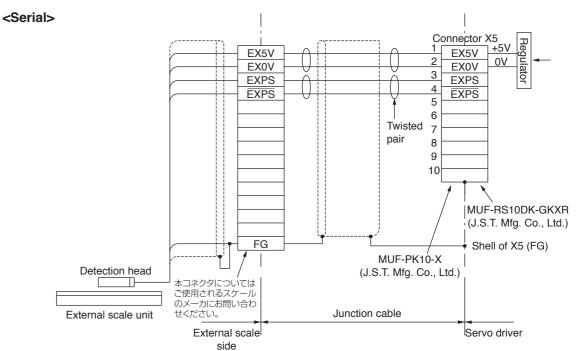
Applicable external scale

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

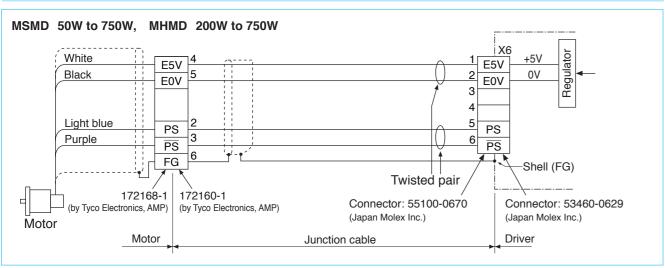
- · Mitutoyo Corp.
 - ST771A(L), ST773A(L), AT573A
- · Sony Manufacturing Systems Corp. SR75, SR85, SR77, SR87, SL700 · PL101-RP, SL710 · PL101-RP
- * For the details of the external scale product, contact each company.

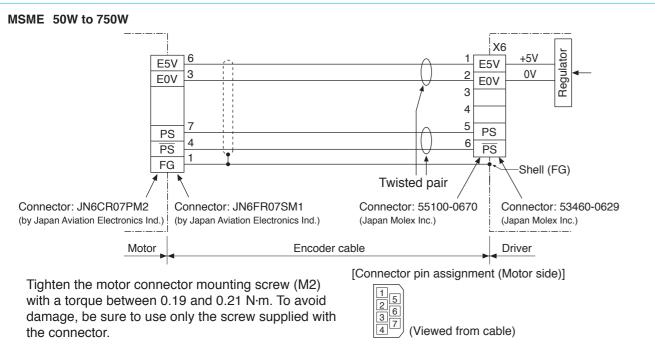
Wiring Diagram of X5

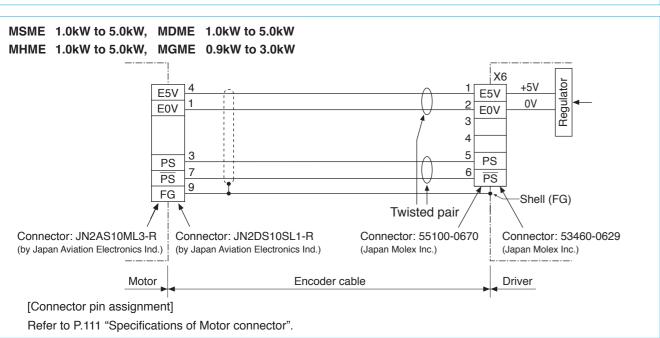




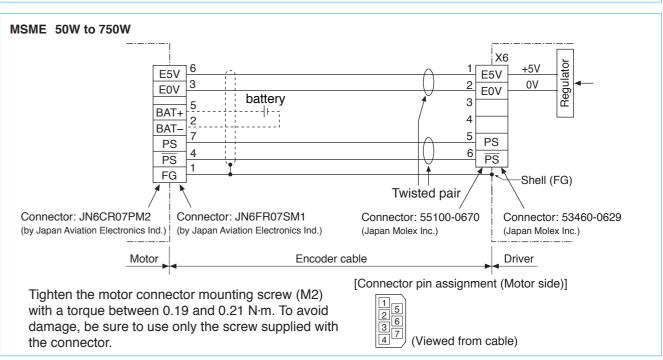
In case of 20-bit incremental encoder

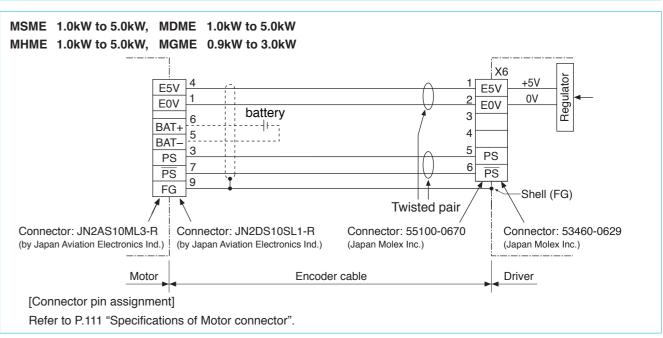






In case of 17-bit absolute encoder MSMD 50W to 750W, MHMD 200W to 750W 1X6 White E5V E5V Black 0V 2 E0V E0V Twisted pair battery Red BAT+ PS Pink PS BAT-Light blue PS -Shell (FG) Purple PS Yellow/Green FG Connector: 55100-0670 Connector: 53460-0629 (Japan Molex Inc.) (Japan Molex Inc.) 172169-1 172161-1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

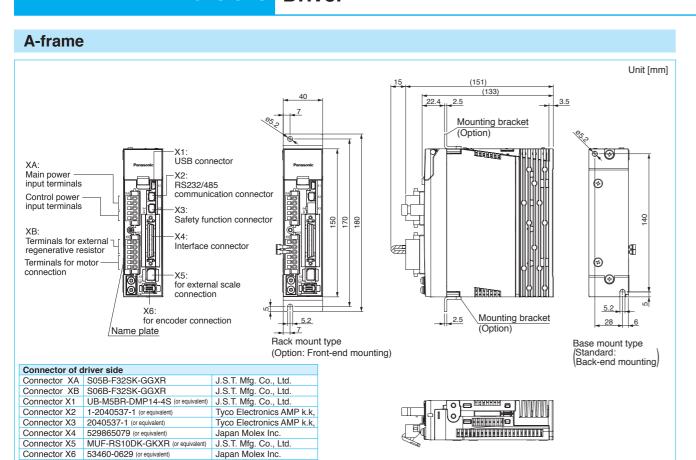




Japan Molex Inc.

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

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



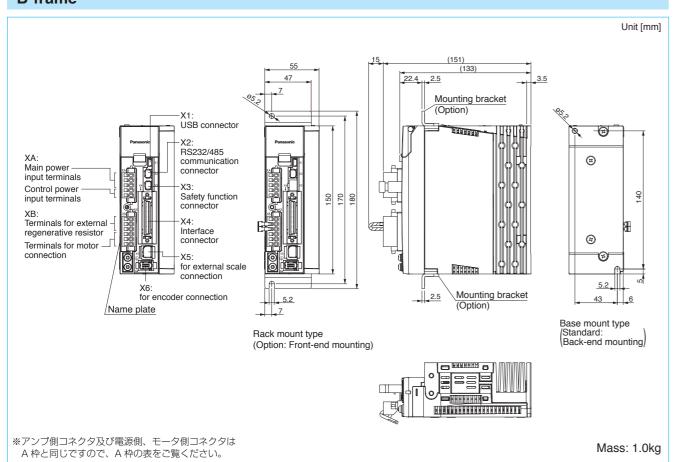
B-frame

Connector X7 530140610 (or equivalent)

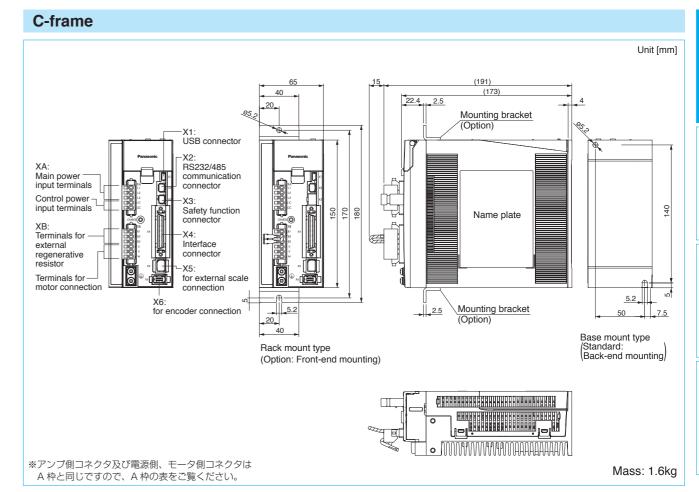
Connector XA 05JFAT-SAXGF

Connector XB 06JFAT-SAXGF

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



30



31

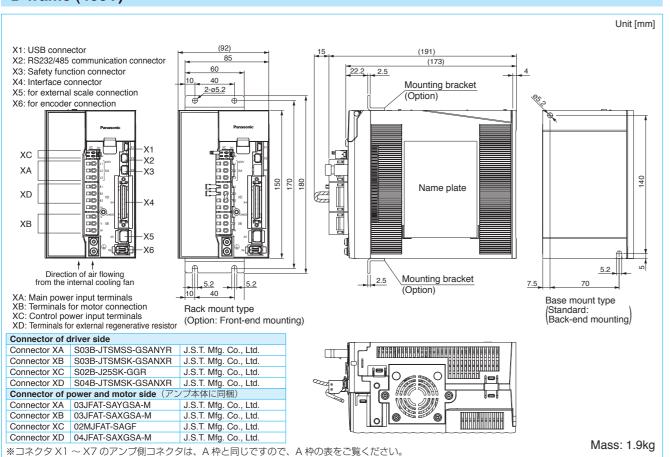
Mass: 0.8kg

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。

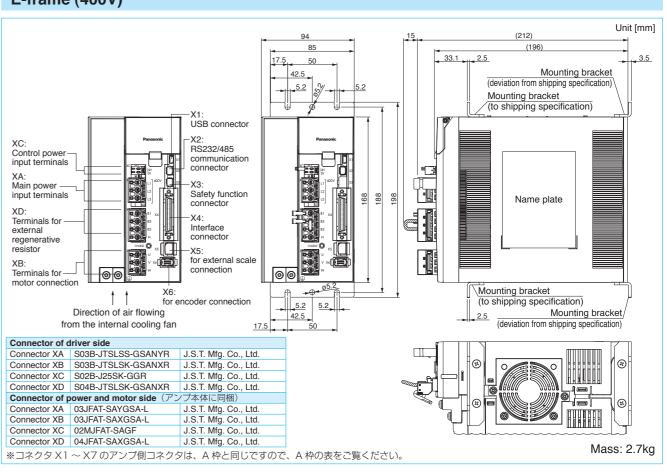


E-frame (200V) 33.1 2.5 _ 3.5 Mounting bracket 42.5 (deviation from shipping specification 5.2 Mounting bracket (to shipping specification) USB connector -X2: RS232/485 XA: Main power – communication input terminals Control power input terminals Safety function Name plate connector Terminals for Interface 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 $(\mathcal{F}$ プ本体に同梱) 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

E-frame (400V)

*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。

Mass: 1.8kg



x5 **()**

Direction of air flowing

from the internal cooling fan

X3: Safety function connector

X5: for external scale connection

X4: Interface connector

X6: for encoder connection

X2: RS232/485 communication connector

※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。

X1: USB connector

0

42.7 ... 2.5

Mounting bracket

(deviation from shipping specif

(to shipping specification) Mounting bracket (deviation from shipping specifical

Mass: 4.8kg

Mounting bracket (to shipping specification)

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



Small capacity type

[MSME (50W to 750W)]

- MHME 7.5kW

[MSME (1.0kW to 5.0kW)]

Motor (Scheduled to be released.)

- MDME 7.5kW, 11kW, 15kW
- 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 humidity		20% to 85% RH (free from condensation)	
Vibration	Motor only	Lower than 49m/s ² (5G) at running, 24.5m/s ² (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.)	
(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)

Positive direction

Negative direction

(CW)

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

F-frame (400V)

F-frame (200V)

Main power

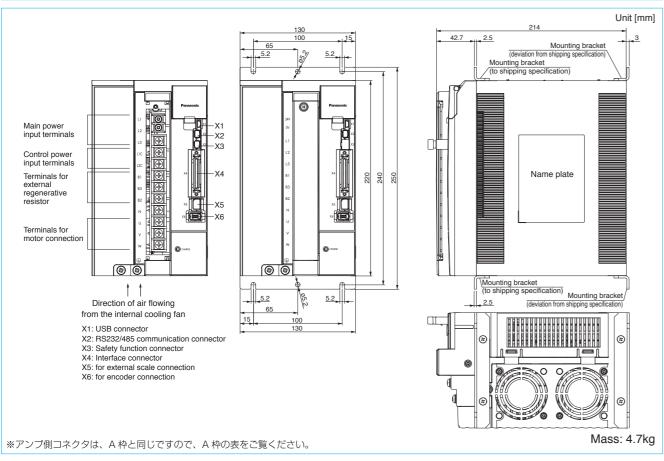
Control power

input terminals

Terminals for

Terminals for motor connect

external regenerative resistor



34

		AC1	00V	
Motor model *1		MSME	5AZG1□	5AZS1
	Model	A5 series	MADHT1105	
Applicable driver *2	No.	A5E series	MADHT1105E	
	Fran	ne symbol	A-frame	
Power supply capacit	у	(kVA)	0.	4
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	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	l	(r/min)	6000	
Moment of inertia	With	out brake	0.025	
of rotor (×10 ⁻⁴ kg·m ²)	Wi	th brake	0.027	
Recommended moment of inertia ratio of the load and the rotor Note)3		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.

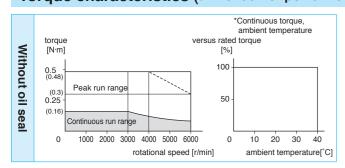
Static friction torque (N·m)	0.29 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.3
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

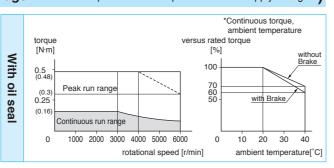
• Permissible load (For details, refer to P.104)

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

- · For details of Note 1 to Note 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.>)

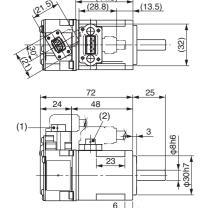




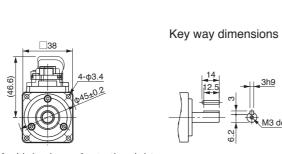
Dimensions

<Cautions>

Mass (kg)/ 0.32 <Without Brake>



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



For the dimensions of with brake, refer to the right page 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	ıe (N·m)	0.4	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	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 ⁻⁴ kg·m ²)	Wi	th brake	0.027	
Recommended moment of inertia ratio of the load and the rotor Note)3		30 times	s or less	
Rotary encoder speci	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)	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	

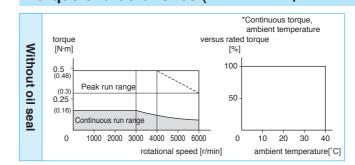
• Permissible load (For details, refer to P.104)

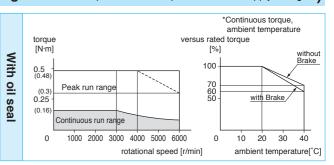
During assembly	Radial load P-direction (N)	147
	Thrust load A-direction (N)	88
accombiy	Thrust load B-direction (N)	117.6
During operation	Radial load P-direction (N)	68.6
	Thrust load A, B-direction (N)	58.8

- For details of Note 1 to Note 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".

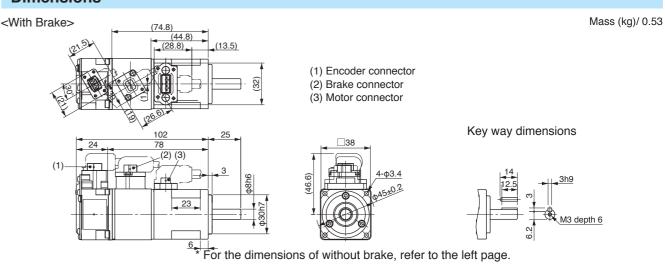
Detail of model designation, refer to P.11.

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





Dimensions



			AC1	00V
Motor model *1 MSME		011G1	011S1 <u></u>	
	Model	A5 series	MADH	T1107
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	ie (N·m)	0.9	95
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)1	DV0P4280		No limit Note)2	
Rated rotational spee	d	(r/min)	3000	
Max. rotational speed		(r/min)	6000	
Moment of inertia	With	out brake	0.0)51
of rotor (×10 ⁻⁴ kg·m ²)	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	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.

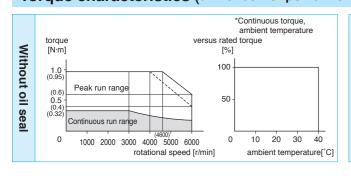
Static friction torque (N·m)	0.29 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.3
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

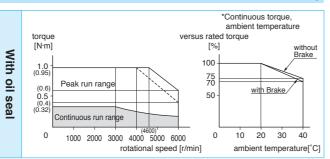
• Permissible load (For details, refer to P.104)

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

- · For details of Note 1 to Note 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.

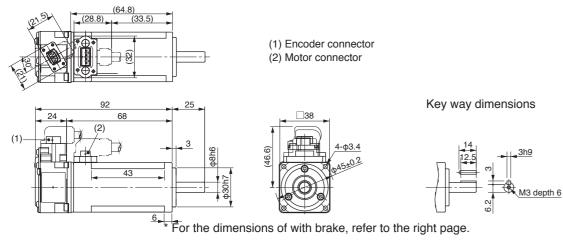
Torque characteristics (at AC100V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)





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	00V
Motor model *1 MSME			012G1	012S1
	Model	A5 series	A5 series MADHT1505	
Applicable driver *2	No.	A5E series	MADHT1505E	
	Frame symbol		A-frame	
Power supply capacit	у	(kVA)	0	5
Rated output		(W)	10	00
Rated torque		(N·m)	0.5	32
Momentary Max. pea	k torqu	e (N·m)	0.9	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	DV0P4280		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 ⁻⁴ kg·m ²)	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	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.

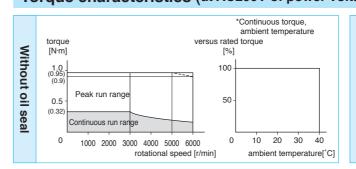
	,
Static friction torque (N·m)	0.29 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.3
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

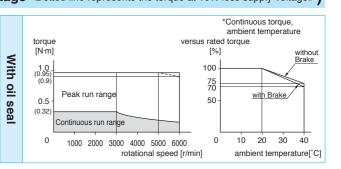
• Permissible load (For details, refer to P.104)

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

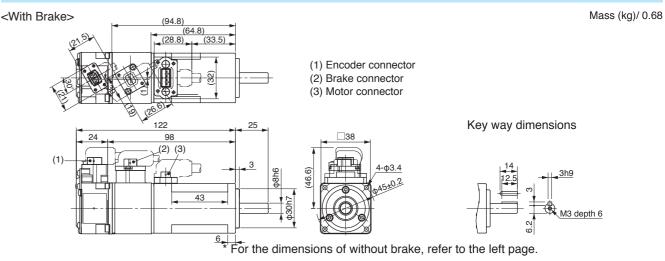
- For details of Note 1 to Note 5, refer to P.104.
- Dimensions of Driver, refer to P.30.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

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





Dimensions



			AC1	00V
Motor model *1		MSME	021G1□	021S1
Model A5 series		MBDHT2110		
Applicable driver *2	No.	A5E series	MBDH.	Γ2110E
	Frame symbol			ame
Power supply capacit	y	(kVA)	0.	5
Rated output		(W)	20	00
Rated torque		(N·m)	0.0	64
Momentary Max. peal	k torqu	e (N·m)	1.9	91
Rated current (A(rms)) Max. current (A(o-p))			2.5	
			10.6	
Regenerative brake	Without option		No limit Note)2	
frequency (times/min) Note)1	DV	0P4283	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 ⁻⁴ kg·m²) With brake Recommended moment of inertia ratio of the load and the rotor Note)3		th brake	0.16	
		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.

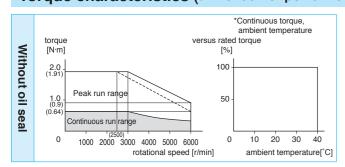
Static friction torque (N·m)	1.27 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

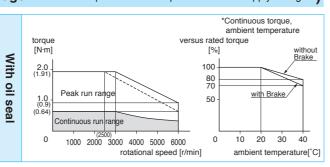
• Permissible load (For details, refer to P.104)

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

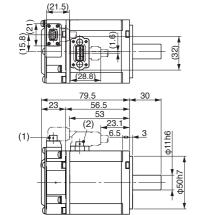




Key way dimensions

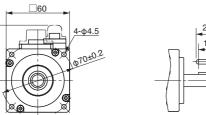
Dimensions

Mass (kg)/ 0.82 <Without Brake>





(1) Encoder connector



* 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		022G1	022S1	
	Model	A5 series	MADHT1507	
Applicable driver *2	No.	No. A5E series MADHT15		Г1507Е
	Frame symbol		A-frame	
Power supply capacity	у	(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))	1.5	
Max. current		(A(o-p))	6.5	
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)	6000	
Moment of inertia	With	out brake	0.	14
of rotor (×10 ⁻⁴ kg·m ²) Wi		th brake	0.16	
Recommended moment of inertia ratio of the load and the rotor Note)3			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)	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

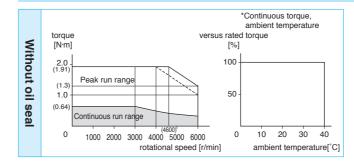
• Permissible load (For details, refer to P.104)

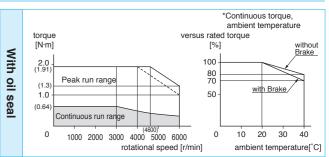
	Radial load P-direction (N)	392
During assembly	Thrust load A-direction (N)	147
assembly	Thrust load B-direction (N)	196
During	Radial load P-direction (N)	245
operation	Thrust load A, B-direction (N)	98

- 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.

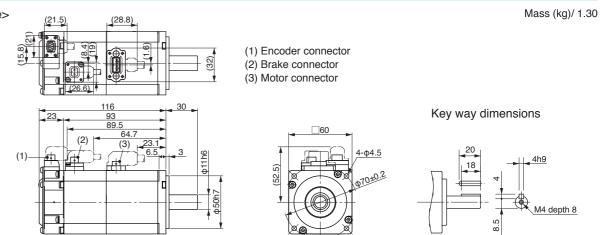
Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)





Dimensions

<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	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. peal	k torqu	ıe (N·m)	3.	3.8	
Rated current		(A(rms))	4.6		
Max. current (A(o-p		(A(o-p))	19.5		
Regenerative brake	Without option		No limit Note)2		
frequency (times/min) Note)1	DV0P4282		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 ⁻⁴ kg·m ²)	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	fication	1S 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.

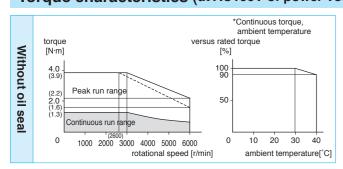
Static friction torque (N·m)	1.27 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

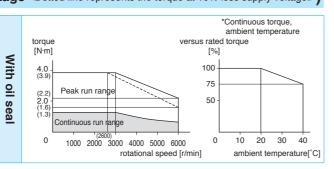
• Permissible load (For details, refer to P.104)

	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.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.

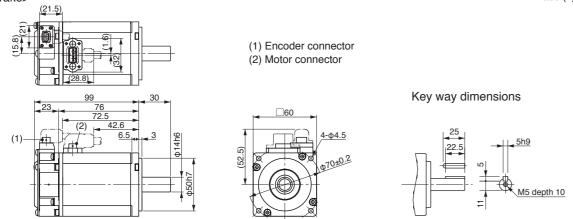
Torque characteristics (at AC100V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)





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		042G1	042S1	
	Model	A5 series	MBDH	T2510
Applicable driver *2	No.	A5E series	MBDHT2510E	
	Fran	ne symbol	B-frame	
Power supply capacity	y	(kVA)	0.9	
Rated output		(W)	40	00
Rated torque		(N·m)	1.	.3
Momentary Max. peal	k torqu	ıe (N·m)	3.	.8
Rated current		(A(rms))	2.4	
Max. current		(A(o-p))	10.2	
Regenerative brake	Without option		No limit Note)2	
frequency (times/min) Note)1	DV0P4283		No limit Note)2	
Rated rotational spee	d	(r/min)	30	00
Max. rotational speed		(r/min)	6000	
Moment of inertia	With	out brake	0.26	
of rotor (×10 ⁻⁴ kg·m ²)	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.

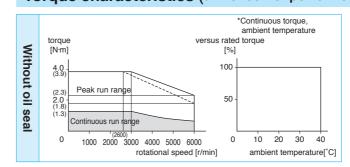
,	,
Static friction torque (N·m)	1.27 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

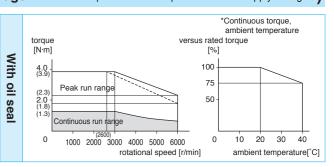
• Permissible load (For details, refer to P.104)

	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.>)

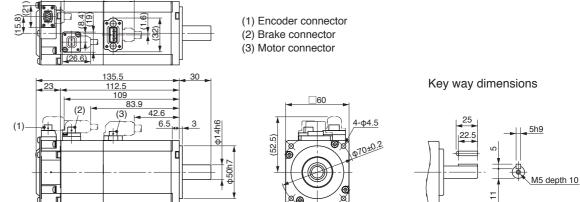




Dimensions

<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.	Г3520Е	
	Frame symbol		C-frame		
Power supply capacit	у	(kVA)	1.	.3	
Rated output		(W)	75	50	
Rated torque	Rated torque		2.4		
Momentary Max. pea	Momentary Max. peak torque (N·m)			7.1	
Rated current	Rated current (A(rms))		4.1		
Max. current		(A(o-p))	17	.4	
Regenerative brake	Without option		No limit Note)2		
frequency (times/min) Note)1	DV0P4283		No limit Note)2		
Rated rotational spee	d (r/min) 300		00		
Max. rotational speed		(r/min)	6000		
Moment of inertia	With	out brake	0.87		
of rotor (×10 ⁻⁴ kg·m ²)	Wi	th brake	0.9	97	
Recommended moment of inertia ratio of the load and the rotor Note)3			20 times	s or less	

• 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
	documbry	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:
- *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.>)

17-bit

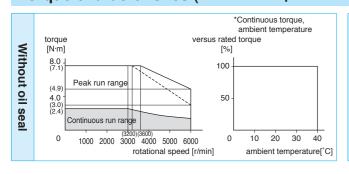
Absolute

131.072

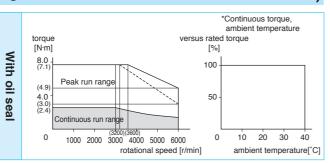
20-bit

Incremental

1,048,576



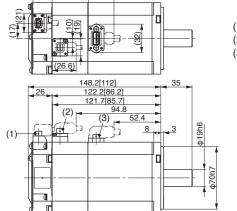
Resolution per single turn



Dimensions

Rotary encoder specifications

<With Brake>



(1) Encoder connector

(2) Brake connector (3) Motor connector

M5 depth 10

Key way dimensions

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

			AC200V	
Motor model *1		MSME	102G1□	102S1
	Model	A5 series	MDDH	T5540
Applicable driver *2	No.	A5E series	A5E series MDDHT554	
	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	k torqu	e (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 ⁻⁴ kg·m ²)	Wi	th brake	2.35	
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	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.

7.8 or more
50 or less
15 or less
0.81±10%
2 or more
24±2.4

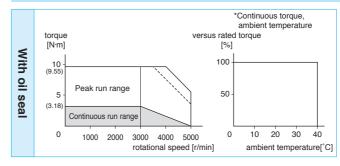
• Permissible load (For details, refer to P.104)

	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

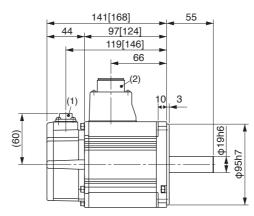
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.32.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type".

Detail of model designation, refer to P.11.

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



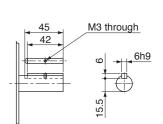
Dimensions



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 MSME			152G1□	152S1	
	Model	A5 series	MDDH	T5540	
Applicable driver *2	No.	A5E series	MDDHT5540E		
	Frame symbol		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	ie (N·m)	14	14.3	
Rated current		(A(rms))	8.2		
Max. current	(A(o-p))		35		
Regenerative brake	Without option		No limit Note)2		
frequency (times/min) Note)1	DV0P4284		No limit Note)2		
Rated rotational spee	d	(r/min)	3000		
Max. rotational speed		(r/min)	5000		
Moment of inertia	Without brake		2.84		
of rotor (×10 ⁻⁴ kg·m ²)	With brake		3.17		
Recommended moment of inertia ratio of the load and the rotor Note)3		15 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.

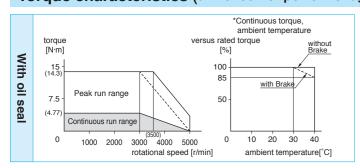
Static friction torque (N·m)	7.8 or more	
Engaging time (ms) 50 or less		
Releasing time (ms) Note)4	15 or less	
Exciting current (DC) (A)	0.81±10%	
Releasing voltage (DC) (V)	2 or more	
Exciting voltage (DC) (V)	24±2.4	

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

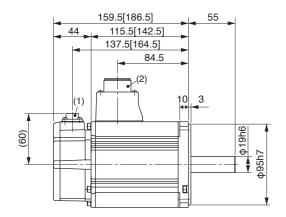
During assembly	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
accombiy	Thrust load B-direction (N)	686
During	Radial load P-direction (N)	490
operation	Thrust load A, B-direction (N)	196

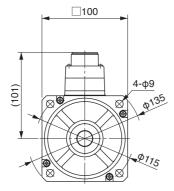
- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.32.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

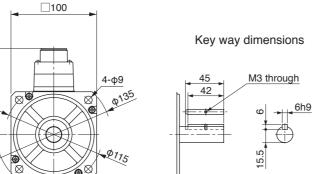
Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



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

	A			C200V	
Motor model *1 MS		MSME	202G1	202S1	
	Model	A5 series	MEDHT7364		
Applicable driver *2	No.	A5E series	MEDHT7364E		
	Fran	ne symbol	E-frame		
Power supply capacity	y	(kVA)	3.	3	
Rated output		(W)	2.	.0	
Rated torque		(N·m)	6.3	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	Without brake		3.68		
of rotor (×10 ⁻⁴ kg·m ²)	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 specif	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.

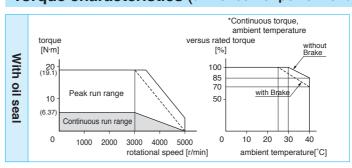
,	,
Static friction torque (N·m)	7.8 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.81±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

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

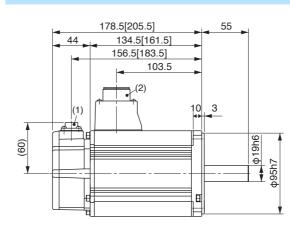
		Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588	
	Thrust load B-direction (N)	686	
	During	Radial load P-direction (N)	490
operation	Thrust load A, B-direction (N)	196	

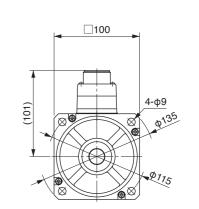
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.33.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

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



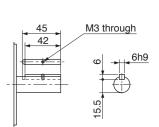
Dimensions





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 MSME			302G1□	302S1
	Model	A5 series	MFDHTA390	
Applicable driver *2	No.	A5E series	MFDHTA390E	
	Frame 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	3.6
Rated current		(A(rms))	18.1	
Max. current		(A(o-p))	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 ⁻⁴ kg·m ²)	With 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.

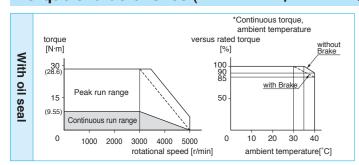
Static friction torque (N·m)	11.8 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.81±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

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

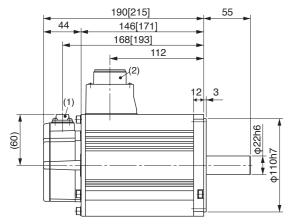
During assembly	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
During	Radial load P-direction (N)	490
operation	Thrust load A, B-direction (N)	196

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



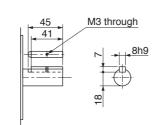
Dimensions



□120

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	MFDHTB3A2	
Applicable driver *2	No.	A5E series	MFDHTB3A2E	
	Frame symbol		F-frame	
Power supply capacit	у	(kVA)	6.	.0
Rated output		(W)	4.	.0
Rated torque		(N·m)	12	2.7
Momentary Max. pea	k torqu	e (N·m)	38	3.2
Rated current		(A(rms))	19.6	
Max. current		(A(o-p))	83	
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)	30	00
Max. rotational speed	l (r/min)		45	00
Moment of inertia	With	out brake 12.9		2.9
of rotor (×10 ⁻⁴ kg·m ²)	Wi	th brake	14.2	
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.

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

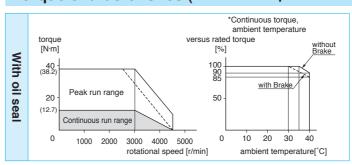
• Permissible load (For details, refer to P.104)

During assembly	Radial load P-direction (N)	980
	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

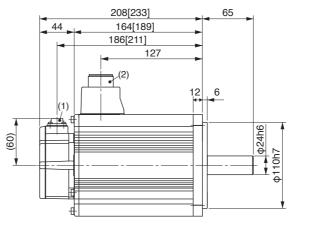
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type".

Detail of model designation, refer to P.11.

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



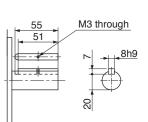
Dimensions



□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 MSME			502G1□	502S1	
	Model	A5 series	MFDHTB3A2		
Applicable driver *2	No.	A5E series	MFDHTB3A2E		
	Frame symbol		F-frame		
Power supply capacit	у	(kVA)	7.	5	
Rated output		(W)	5	0	
Rated torque		(N·m)	15	i.9	
Momentary Max. peal	k torqu	ıe (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	7.4	
of rotor ($\times 10^{-4}$ kg·m ²)	Wi	th brake	e 18.6		
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.

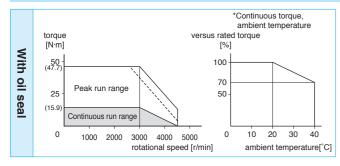
Static friction torque (N·m)	16.1 or more	
Engaging time (ms)	110 or less	
Releasing time (ms) Note)4 50 or lea		
Exciting current (DC) (A)	0.90±10%	
Releasing voltage (DC) (V)	2 or more	
Exciting voltage (DC) (V)	24±2.4	

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

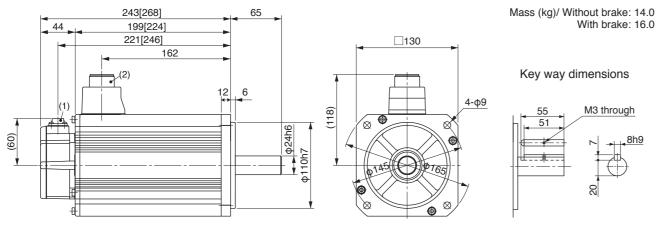
During assembly	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
During	Radial load P-direction (N)	784
operation	Thrust load A, B-direction (N)	343

- · 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



- (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	
М		A5 series	MDDH	T3530	
Applicable driver *2	No.	A5E series	MDDH.	MDDHT3530E	
	Frame symbol		D-frame		
Power supply capacit	у	(kVA)	1.8		
Rated output		(W)	1.	.0	
Rated torque		(N·m)	4.	77	
Momentary Max. pea	k torqu	e (N·m)	14	l.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 limit 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 ⁻⁴ kg·m ²)	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

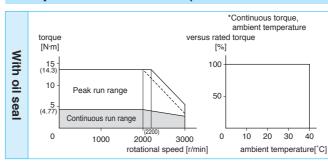
• Permissible load (For details, refer to P.104)

	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

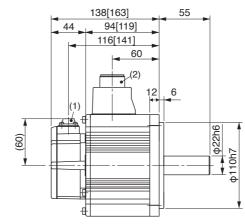
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.32.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type".

Detail of model designation, refer to P.11.

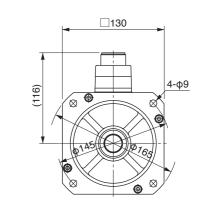
Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



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.

		AC2	00V	
Motor model *1		152G1□	152S1	
	Model	A5 series	MDDH	T5540
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	ie (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	Without brake		6.70	
of rotor (×10 ⁻⁴ kg·m ²)	Wi	th brake	7.99	
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
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.

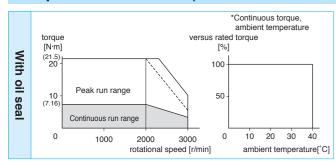
Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

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

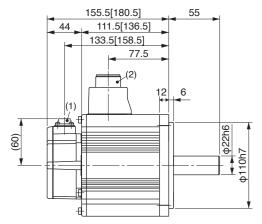
	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
assembly	Thrust load B-direction (N)	686
During	Radial load P-direction (N)	490
operation	Thrust load A, B-direction (N)	196

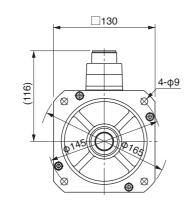
- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.32.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

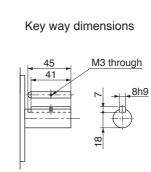
Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



Dimensions







Mass (kg)/ Without brake: 6.7

With brake: 8.2

- (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		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	ıe (N·m)	28	.6
Rated current		(A(rms))	11.5	
Max. current		(A(o-p))	49	
Regenerative brake	Without option		No limit Note)2	
frequency (times/min) Note):	DV0P4285		No limit Note)2	
Rated rotational spee	ed	(r/min)	2000	
Max. rotational speed	I	(r/min)	3000	
Moment of inertia	With	out brake	8.72	
of rotor (×10 ⁻⁴ kg·m ²)	Wi	th brake	10.0	
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	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)	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

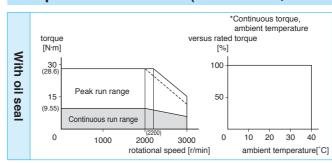
• Permissible load (For details, refer to P.104)

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

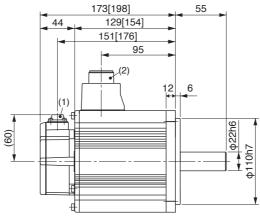
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.33.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type".

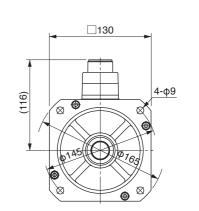
Detail of model designation, refer to P.11.

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



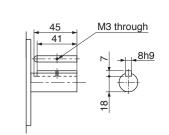
Dimensions





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

Key way dimensions



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

Motor Specifications 200V MDME 4.0kW [Middle inertia, Middle capacity]

Specifications

		AC2	00V	
Motor model *1 MDME			302G1□	302S1□
	Model A5 se		MFDHTA390	
Applicable driver *2	No.	A5E series	MFDHTA390E	
	Fran	ne symbol	F-frame	
Power supply capacit	y	(kVA)	4.	5
Rated output		(W)	3	.0
Rated torque		(N·m)	14	.3
Momentary Max. peal	Momentary Max. peak torque (N·m)			3.0
Rated current		(A(rms))	17.4	
Max. current		(A(o-p))	74	
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)	2000	
Max. rotational speed		(r/min)	30	00
Moment of inertia	With	out brake	ke 12.9	
of rotor ($\times 10^{-4}$ kg·m ²)	Wi	th brake	14.2	
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
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.

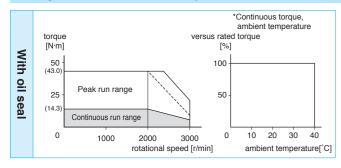
Static friction torque (N·m)	16.2 or more
Engaging time (ms)	110 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.90±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

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

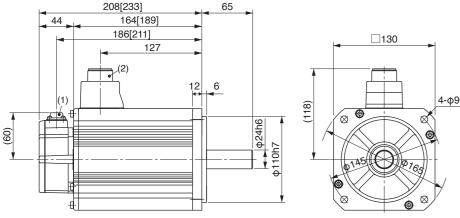
During assembly	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
accombiy	Thrust load B-direction (N)	686
During	Radial load P-direction (N)	784
operation	Thrust load A, B-direction (N)	343

- · 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 AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)

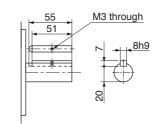


Dimensions



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.

<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.	.0	
Rated output		(W)	4.	.0	
Rated torque		(N·m)	19).1	
Momentary Max. pea	k torqu	ıe (N·m)	57	7.3	
Rated current		(A(rms))	21.0		
Max. current	(A(o-p))		89		
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)	2000		
Max. rotational speed		(r/min)	3000		
Moment of inertia	Without brake		37.6		
of rotor (×10 ⁻⁴ kg·m ²)	Wi	th brake	38.6		
Recommended moment of inertia ratio of the load and the rotor $$\tt 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.

,
24.5 or more
80 or less
25 or less
1.3±10%
2 or more
24±2.4

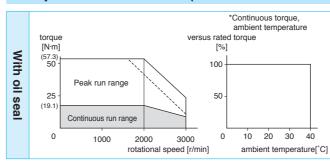
• Permissible load (For details, refer to P.104)

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

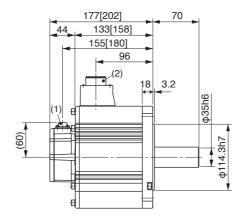
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type".

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

Key way dimensions 50

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

55

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

Mass (kg)/ Without brake: 15.5

With brake: 18.7

Motor Specifications 200V MGME 0.9kW [Middle inertia, Middle capacity]

Specifications

		AC2	00V	
Motor model *1		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. peak torque (N·m)			71	.6
Rated current (A(rms))			25	i.9
Max. current (A(o-p))			11	0
Regenerative brake	Without option 120		20	
frequency (times/min) Note)1	DV0P4285×2 No limit No		t Note)2	
Rated rotational spee	d	(r/min)	2000	
Max. rotational speed		(r/min)	30	00
Moment of inertia	With	out brake	48	3.0
of rotor (×10 ⁻⁴ kg·m ²)	Wi	th brake	48	3.8
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	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.

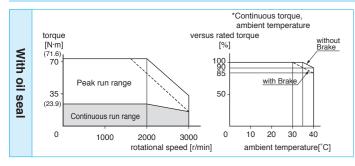
Static friction torque (N·m)	24.5 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.3±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

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

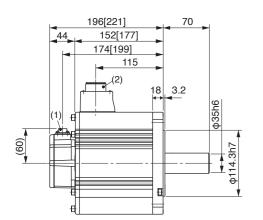
	Radial load P-direction (N)	1666
During assembly	Thrust load A-direction (N)	784
document	Thrust load B-direction (N)	980
During	Radial load P-direction (N)	784
operation	Thrust load A, B-direction (N)	343

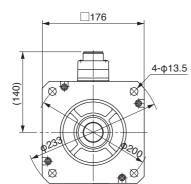
- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

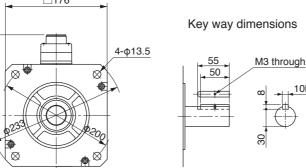
Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



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

				00V
Motor model *1		MGME	092G1□	092S1
	Model	A5 series	MDDH	T5540
Applicable driver *2	No.	A5E series	MDDH	Γ5540E
	Fran	ne symbol	D-fra	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	e (N·m)	19	.3
Rated current		(A(rms))	7.	.6
Max. current		(A(o-p))	2	4
Regenerative brake	Without option No limit Note)2		t Note)2	
frequency (times/min) Note)1	DV	OP4284	No limit Note)2	
Rated rotational spee	d	(r/min)	1000	
Max. rotational speed		(r/min)	20	00
Moment of inertia	With	out brake	6.1	70
of rotor (×10 ⁻⁴ kg·m ²)	Wi	th brake	7.99	
Recommended mome ratio of the load and the		10 times	s or less	
Rotary encoder specif	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.

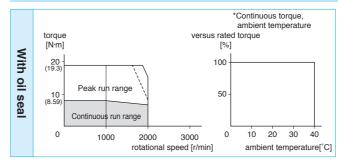
1	,
Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

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

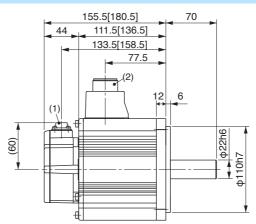
Radial load P-direction (N)	980
Thrust load A-direction (N)	588
Thrust load B-direction (N)	686
Radial load P-direction (N)	686
Thrust load A, B-direction (N)	196
	Thrust load A-direction (N) Thrust load B-direction (N) Radial load P-direction (N)

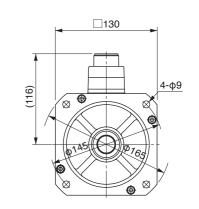
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.32.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

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



Dimensions





Key way dimensions

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.

		AC2	00V	
Motor model *1		202G1	202S1	
	Model	A5 series	MFDH	TA390
Applicable driver *2 No.	No.	A5E series	MFDHTA390E	
	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. peak torque (N·m)			47	7.7
Rated current (A(rms))			17	.0
Max. current (A(o-p))			6	0
Regenerative brake	Without option No limit Note)2		t Note)2	
frequency (times/min) Note)1	DV0	P4285×2	No limit Note)2	
Rated rotational spee	d	(r/min)	1000	
Max. rotational speed		(r/min)	20	00
Moment of inertia	Moment of inertia Without brake		30	.3
of rotor (×10 ⁻⁴ kg·m ²)	Wi	th brake	31	.4
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.

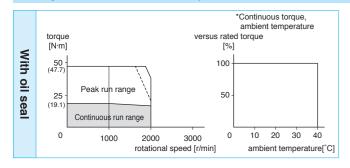
Static friction torque (N·m)	24.5 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.3±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

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

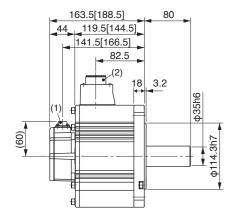
During		Radial load P-direction (N)	1666
	During assembly	Thrust load A-direction (N)	784
	accombiy	Thrust load B-direction (N)	980
	During	Radial load P-direction (N)	1176
	operation	Thrust load A, B-direction (N)	490

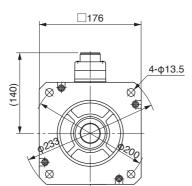
- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

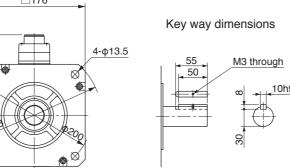
Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



Dimensions







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.

Specifications

			AC200V		
Motor model *1		MGME	302G1□	302S1□	
Mod		A5 series	MFDH	TB3A2	
Applicable driver *2	No.	A5E series	MFDHT	B3A2E	
	Fran	ne symbol	F-fr	ame	
Power supply capac	ity	(kVA)	4	.5	
Rated output		(W)	3	.0	
Rated torque		(N·m)	28	3.7	
Momentary Max. pea	ak torqu	ue (N·m)	71	.7	
Rated current		(A(rms))	22	2.6	
Max. current		(A(o-p))	80		
Regenerative brake	With	out option	No lim	t Note)2	
frequency (times/min) Note	DVC	DV0P4285×2 No limit Note)2		t Note)2	
Rated rotational spe	ed	(r/min)	1000		
Max. rotational spee	d	(r/min)	20	00	
Moment of inertia	With	out brake	48	3.4	
of rotor (×10 ⁻⁴ kg·m ²)	Wi	th brake	49.2		
Recommended moment of inertia ratio of the load and the rotor Note)3			10 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.

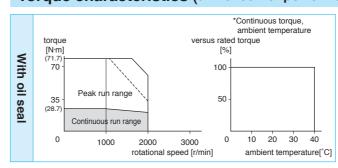
1	,
Static friction torque (N·m)	58.8 or more
Engaging time (ms)	150 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	1.4±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

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

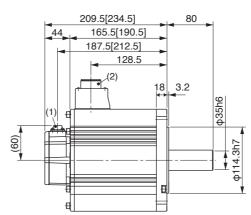
. .	Radial load P-direction (N)	2058
During assembly	Thrust load A-direction (N)	980
assembly	Thrust load B-direction (N)	1176
During	Radial load P-direction (N)	1470
operation	Thrust load A, B-direction (N)	490

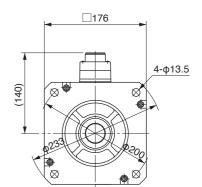
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

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



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.

Motor model *1 MHME					AC2	00V
				102G1		102S1
	Model	A5 s	eries	М	DDH.	T3530
Applicable driver *2	No.	A5E	series	MDDHT3530E		3530E
	Fran	ne sy	mbol	D-frame		
Power supply capacit	y		(kVA)		1.8	8
Rated output			(W)		1.0	0
Rated torque (N·m)				4.7	7	
Momentary Max. peak torque (N·m)			(N·m)		14.	.3
Rated current (A(rms))			rms))	5.7		
Max. current	(A	(o-p))	24			
Regenerative brake	Without option		83			
frequency (times/min) Note)1	DV0P4284		No limit Note)2			
Rated rotational spee	d	(1	r/min)	2000		
Max. rotational speed		(1	r/min)		300	00
Moment of inertia	With	out b	rake	ke 24.7		.7
of rotor (×10 ⁻⁴ kg·m ²)	With brake		26.0			
Recommended moment of in- ratio of the load and the rotor			Note)3	5 times or less		or less
Rotary encoder speci	ficatior	าร	Note)5	20-bit Increment	tal	17-bit Absolute
Resolut	ion per	r singl	e turn	1,048,57	6	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.

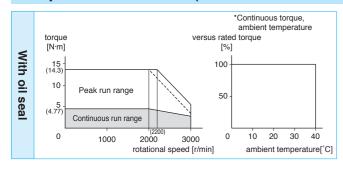
Static friction torque (N·m)	4.9
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	70 or less
Exciting current (DC) (A)	0.59±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

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

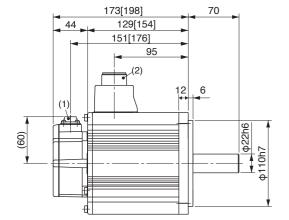
	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
accombiy	Thrust load B-direction (N)	686
During operation	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196

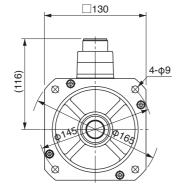
- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.32.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

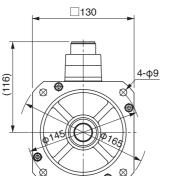
Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)

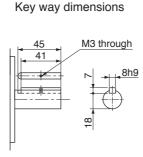


Dimensions









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

	AC200V				
Motor model *1		МНМЕ	152G1□	152S1	
	Model	A5 series	MDDH	T5540	
Applicable driver *2	No.	A5E series	MDDHT5540E		
	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	ie (N·m)	21	.5	
Rated current		(A(rms))	9.4		
Max. current		(A(o-p))		0	
Regenerative brake	Without option		22		
frequency (times/min) Note)1	DV0P4284		130		
Rated rotational spee	d	(r/min)	20	2000	
Max. rotational speed	l	(r/min)	30	00	
Moment of inertia	With	out brake	37.1		
of rotor (×10 ⁻⁴ kg·m ²)	Wi	th brake	38.4		
Recommended mome ratio of the load and t			5 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.

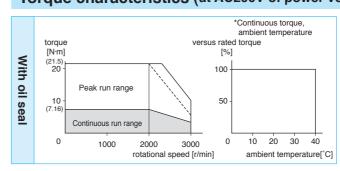
,	,
Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

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

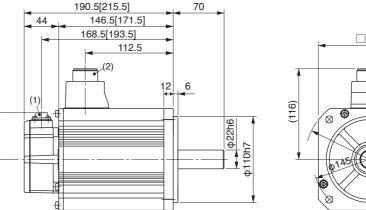
. .	Radial load P-direction (N)	980
During assembly	Thrust load A-direction (N)	588
assembly	Thrust load B-direction (N)	686
During	Radial load P-direction (N)	490
operation	Thrust load A, B-direction (N)	196

- For details of Note 1 to Note 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.>)



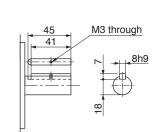
Dimensions



130

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

		AC2	00V	
Motor model *1 MHME			202G1	202S1
	Model	A5 series	MEDH	T7364
Applicable driver *2	No.	A5E series	MEDHT7364E	
	Fran	ne symbol	E-fra	ame
Power supply capacit	у	(kVA)	3.	3
Rated output		(W)	2.	.0
Rated torque (N·m)			9.9	55
Momentary Max. peak torque (N·m)			28	3.6
Rated current (A(rms))			11.1	
Max. current		(A(o-p))	(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	With	out brake	57	'.8
of rotor (×10 ⁻⁴ kg·m ²)	Wi	th brake	59.6	
Recommended moment of inertia ratio of the load and the rotor Note)3		5 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.

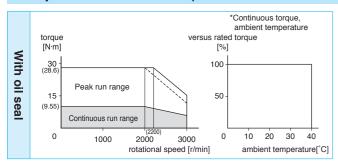
Static friction torque (N·m)	24.5 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.3±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

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

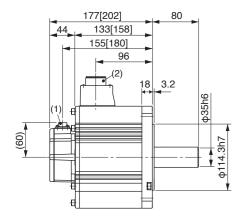
-	. .	Radial load P-direction (N)	1666
	During assembly	I hrust load A direction (NI)	784
	accorning	Thrust load B-direction (N)	980
	During operation	Radial load P-direction (N)	784
		Thrust load A, B-direction (N)	343

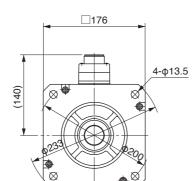
- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.33.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

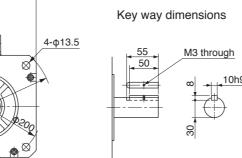
Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



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		МНМЕ	302G1□	302S1
	Model	A5 series	MFDH	TA390
Applicable driver	*2 No.	A5E series	MFDHTA390E	
F		ne symbol	F-frame	
Power supply cap	acity	(kVA)	4.5	
Rated output		(W)	3.	.0
Rated torque		(N·m)	14	.3
Momentary Max.	peak torqu	ıe (N·m)	43	3.0
Rated current		(A(rms))	16	5.0
Max. current		(A(o-p))	68	
Regenerative brak	e With	out option	19	
frequency (times/min)	Note)1 DVC)P4285×2	142	
Rated rotational s	speed	(r/min)	20	00
Max. rotational sp	eed	(r/min)	30	00
Moment of inertia	With	out brake	90.5	
of rotor (×10 ⁻⁴ kg·r	m²) Wi	th brake	92.1	
Recommended moment of ratio of the load and the ro			5 times or less	
Rotary encoder s	pecification	Note)5	20-bit Incremental	17-bit Absolute
Res	solution 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

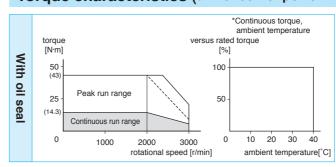
• Permissible load (For details, refer to P.104)

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

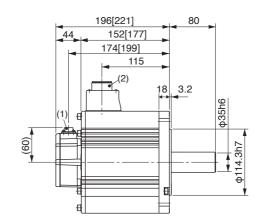
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type".

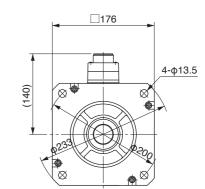
Detail of model designation, refer to P.11.

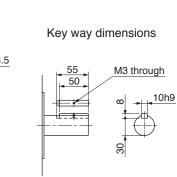
Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



Dimensions







Mass (kg)/ Without brake: 16.0

With brake: 19.2

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

			AC2	200V
Motor model *1 MHME			402G1□	402S1
	Model	A5 series	MFDHTB3A2	
Applicable driver *2	No.	A5E series	MFDHTB3A2E	
	Fran	ne symbol	F-frame	
Power supply capacit	y	(kVA)	6.	.0
Rated output		(W)	4.	.0
Rated torque		(N·m)	19).1
Momentary Max. peal	k torqu	ie (N·m)	57	7.3
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	With	out brake	112	
of rotor (×10 ⁻⁴ kg·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 specifications Note)5		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.

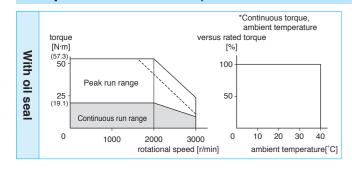
Static friction torque (N·m)	24.5 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.3±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

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

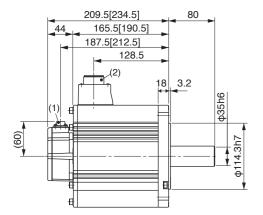
		Radial load P-direction (N)	1666
During assembly	Thrust load A-direction (N)	784	
	Thrust load B-direction (N)	980	
	During operation	Radial load P-direction (N)	784
		Thrust load A, B-direction (N)	343

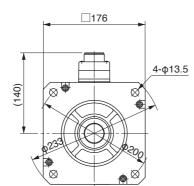
- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

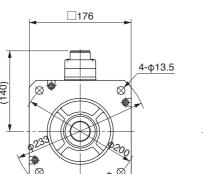
Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)

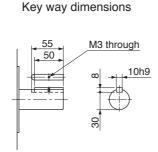


Dimensions









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

			AC2	00V
Motor model *1		МНМЕ	502G1□	502S1
	Model	A5 series	MFDH.	ТВЗА2
Applicable driver *2	No.	A5E series	MFDHTB3A2E	
	Fran	ne symbol	F-frame	
Power supply capaci	ty	(kVA)	7.	5
Rated output		(W)	5.	0
Rated torque		(N·m)	23	.9
Momentary Max. pea	ak torqu	ıe (N·m)	71	.6
Rated current		(A(rms))	25.9	
Max. current		(A(o-p))	110	
Regenerative brake	With	out option	10	
frequency (times/min) Note	1 DVC	P4285×2	76	
Rated rotational speed (r/min)			20	00
Max. rotational spee	d	(r/min)	30	00
Moment of inertia	With	ithout brake 162		32
of rotor ($\times 10^{-4}$ kg·m ²)	Wi	th brake	164	
Recommended moment of inertia ratio of the load and the rotor Note)3			5 times	or less
Rotary encoder specification		Note)5	20-bit Incremental	17-bit Absolute
Resolu	ition pe	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.

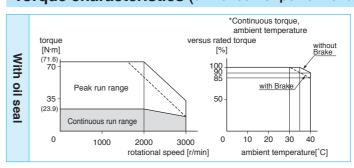
Static friction torque (N·m)	24.5 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	25 or less
Exciting current (DC) (A)	1.3±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

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

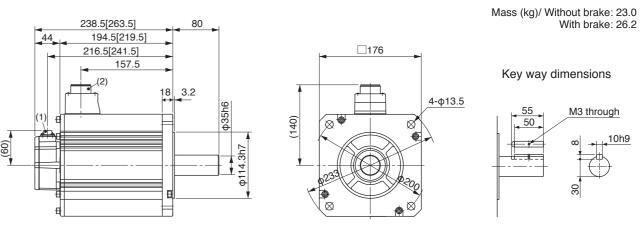
	During assembly During operation	Radial load P-direction (N)	1666
		Thrust load A-direction (N)	784
		Thrust load B-direction (N)	980
		Radial load P-direction (N)	784
		Thrust load A, B-direction (N)	343

- 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.

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.

			AC1	00V
Motor model *1		5AZG1□	5AZS1□	
Mo		A5 series	MADH	T1105
Applicable driver *2	No.	A5E series	MADHT1105E	
	Fran	ne symbol	A-frame	
Power supply capacit	y	(kVA)	0.	.5
Rated output		(W)	5	0
Rated torque		(N·m)	0.	16
Momentary Max. pea	k torqu	e (N·m)	0.4	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)	5000	
Moment of inertia	With	out brake	0.025	
of rotor (×10 ⁻⁴ kg·m ²)	Wi	th brake	0.027	
Recommended moment of inertia ratio of the load and the rotor Note)3		30 times 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.

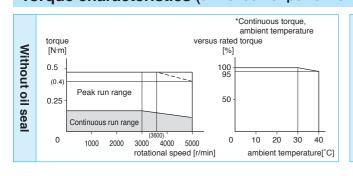
Static friction torque (N·m)	0.29 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.3
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

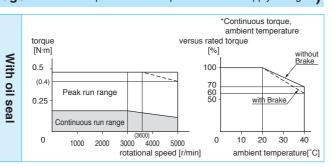
• Permissible load (For details, refer to P.104)

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

- · For details of Note 1 to Note 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.

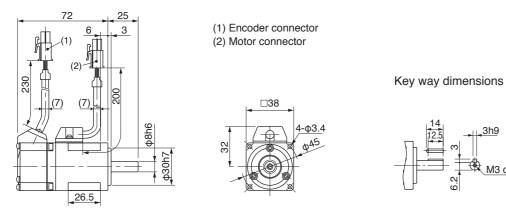
Torque characteristics (at AC100V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)





Dimensions

Mass (kg)/ 0.32 <Without Brake>



* 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 MSMD				5AZG1□	5AZS1□	
		Model	A5	series	MADH	T1505
Applicable dr	ver *2	No.	A5	E series	MADHT1505E	
		Fran	Frame symbol		A-frame	
Power supply	capacit	у		(kVA)	0.	.5
Rated output				(W)	5	0
Rated torque				(N·m)	0.	16
Momentary M	lax. pea	k torqu	e	(N·m)	0.4	48
Rated current	t		(/	A(rms))	1.1	
Max. current			(A(o-p))	4.7	
Regenerative	brake	Without option		option	No limit Note)2	
frequency (times	/min) Note)1	DV0P4281		1281	No limit Note)2	
Rated rotation	nal spee	d		(r/min)	3000	
Max. rotation	al speed			(r/min)	5000	
Moment of in	ertia	With	out	brake	0.0)25
of rotor (×10	⁴kg·m²)	Wi	With brake		0.027	
Recommended moment of inertia ratio of the load and the rotor Note)3			30 times	s or less		
Rotary encoder specifications		าร	Note)5	20-bit Incremental	17-bit Absolute	
	Resolut	ion per	sin	gle 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.

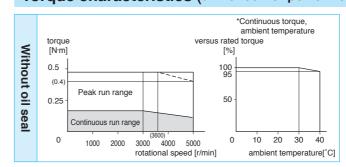
Static friction torque (N·m)	0.29 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.3
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

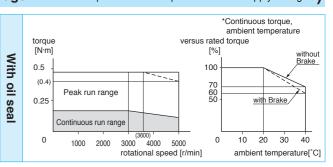
• Permissible load (For details, refer to P.104)

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

- For details of Note 1 to Note 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.

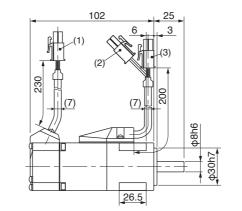
Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)





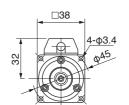
Dimensions

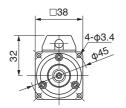
<With Brake> Mass (kg)/ 0.53

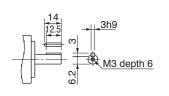


- (1) Encoder connector
- (2) Brake connector
- (3) Motor connector

Key way dimensions







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

A COOON

Specifications

			AC100V	
Motor model *1 MSMD			011G1	011S1
	Model	A5 series	MADHT1107	
Applicable driver *	2 No .	A5E series	MADHT1107E	
	Fran	ne symbol	A-frame	
Power supply capa	acity	(kVA)	0.4	
Rated output (W)			100	
Rated torque		(N·m)	0.3	32
Momentary Max. p	eak torqu	ie (N·m)	0.95	
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) No	ote)1 DV	'0P4280	No limit Note)2	
Rated rotational speed (r/min)		3000		
Max. rotational speed (r/min)		(r/min)	5000	
Moment of inertia	With	out brake	0.051	
of rotor (×10 ⁻⁴ kg·m	²) Wi	th brake	0.054	
Recommended moment of inertia ratio of the load and the rotor Note)3		30 times or less		
Rotary encoder specifications Note)5		20-bit Incremental	17-bit Absolute	
Resolution per s		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.

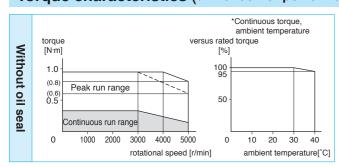
Static friction torque (N·m)	0.29 or more
Engaging time (ms)	35 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.3
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

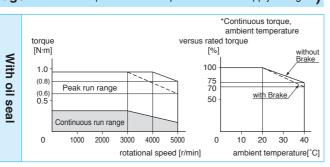
• Permissible load (For details, refer to P.104)

	Radial load P-direction (N)	147
During assembly During operation	Thrust load A-direction (N)	88
	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.

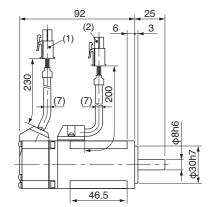
Torque characteristics (at AC100V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



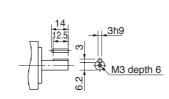


Dimensions

Mass (kg)/ 0.47 <Without Brake>



- (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 driv	ver *2 No	No. A5E series		MADHT1505E		
		Frame symbol		A-frame		
Power supply	capacit	y	(kVA)	0.5		
Rated output			(W)	10	100	
Rated torque			(N·m)	0.3	32	
Momentary Ma	ax. peal	k torqu	e (N·m)	0.0	95	
Rated current			(A(rms))	1.1		
Max. current			(A(o-p))	4.7		
Regenerative brake frequency (times/min) Note)1		Without option		No limit Note)2		
		DV0P4281		No limit Note)2		
Rated rotational speed (r/min)		3000				
Max. rotationa	l speed		(r/min)	50	00	
Moment of ine		With	out brake	0.051		
of rotor (×10 ⁻⁴ kg·m ²)		Wi	th brake	0.054		
Recommended moment of inertia ratio of the load and the rotor Note)3		30 times or less				
Rotary encoder specifications Note)5		20-bit Incremental	17-bit Absolute			
	Resolut	solution 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.

0.29 or more
35 or less
20 or less
0.3
1 or more
24±1.2

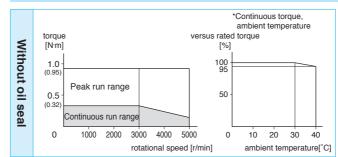
• Permissible load (For details, refer to P.104)

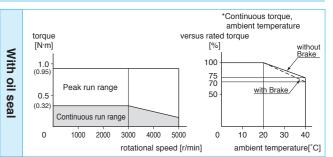
During assembly		Radial load P-direction (N)	147
	Thrust load A-direction (N)	88	
	During operation	Thrust load B-direction (N)	117.6
		Radial load P-direction (N)	68.6
		Thrust load A, B-direction (N)	58.8

- 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.

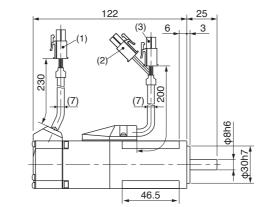
Torque characteristics (at AC200V of power voltage)





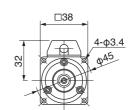
Dimensions

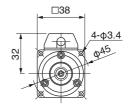
<With Brake> Mass (kg)/ 0.68

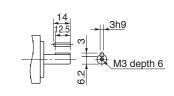


- (1) Encoder connector
- (2) Brake connector
- (3) Motor connector

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	
	Frame 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		(r/min)	5000	
Moment of inertia	Without brake		0.14	
of rotor (×10 ⁻⁴ kg·m ²)	Wi	th brake	0.16	
Recommended moment of inertia ratio of the load and the rotor Note)3		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.

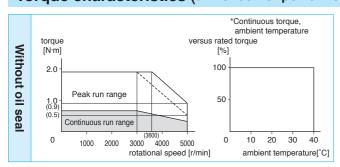
Static friction torque (N·m)	1.27 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

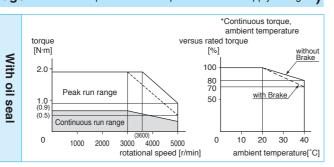
• Permissible load (For details, refer to P.104)

		Radial load P-direction (N)	392
During assembly	Thrust load A-direction (N)	147	
	Thrust load B-direction (N)	196	
	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.>)

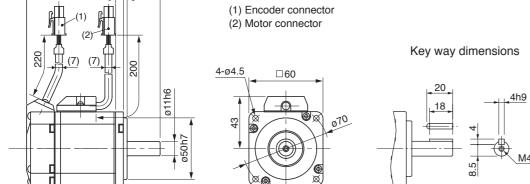




Dimensions

<Without Brake>

Mass (kg)/ 0.82 (1) Encoder connector (2) Motor connector



^{*} 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	MADHT1507E	
	Fran	ne symbol	A-frame	
Power supply capaci	ty	(kVA)	0.	.5
Rated output		(W)	20	00
Rated torque		(N·m)	0.0	64
Momentary Max. pea	ık torqı	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	t	(r/min)	5000	
Moment of inertia	With	out brake	0.14	
of rotor (×10 ⁻⁴ kg·m ²) W		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		20-bit Incremental	17-bit Absolute	
Resolu	tion 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.

1	,
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

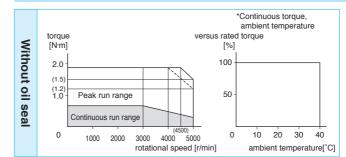
• Permissible load (For details, refer to P.104)

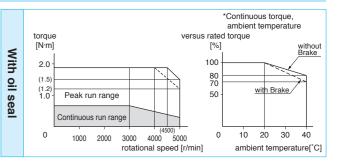
	Radial load P-direction (N)	392
During assembly	Thrust load A-direction (N)	147
accombiy	Thrust load B-direction (N)	196
During	Radial load P-direction (N)	245
operation	Thrust load A, B-direction (N)	98

- 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.

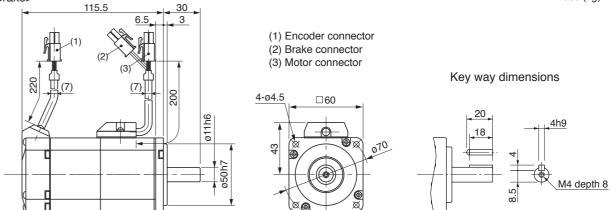
Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)





Dimensions

Mass (kg)/ 1.3 <With Brake>



^{*} For the dimensions of without brake, refer to the left page.

			AC1	00V
Motor model *1 MSMD			041G1□	041S1
	Model	A5 series	MCDH	T3120
Applicable driver *2	No.	A5E series	MCDHT3120E	
	Frame symbol		C-frame	
Power supply capacit	y	(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))	19.5	
Regenerative brake	Without option		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	0.26	
of rotor ($\times 10^{-4}$ kg·m ²)	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	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.

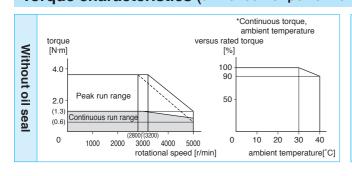
Static friction torque (N·m)	1.27 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

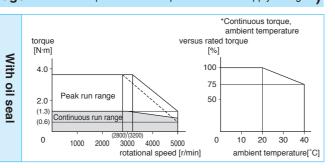
• Permissible load (For details, refer to P.104)

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

- · For details of Note 1 to Note 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.

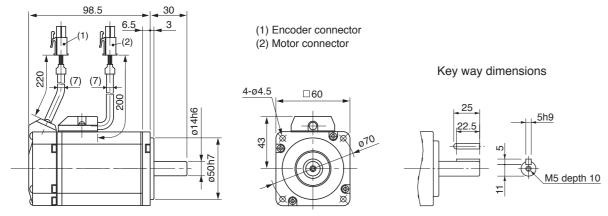
Torque characteristics (at AC100V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)





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		MSMD	042G1	042S1
	Model	A5 series	MBDHT2510	
Applicable driver *2	No.	A5E series	MBDHT2510E	
	Fran	ne symbol	B-frame	
Power supply capaci	ty	(kVA)	0.	.9
Rated output		(W)	40	00
Rated torque		(N·m)	1.	.3
Momentary Max. pea	ık torqu	ıe (N·m)	3.	.8
Rated current		(A(rms))	2.6	
Max. current		(A(o-p))	11.0	
Regenerative brake	With	out option	No limit Note)2	
frequency (times/min) Note)	1 DV	/0P4283	No limit Note)2	
Rated rotational spee	ed	(r/min)	3000	
Max. rotational speed	b	(r/min)	5000	
Moment of inertia	With	out brake	0.26	
of rotor ($\times 10^{-4} \text{kg} \cdot \text{m}^2$)	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 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)	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

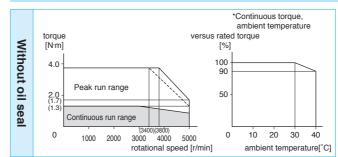
• Permissible load (For details, refer to P.104)

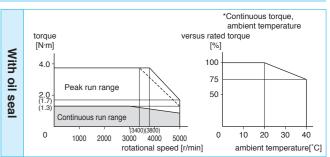
	During assembly During operation	Radial load P-direction (N)	392
		Thrust load A-direction (N)	147
		Thrust load B-direction (N)	196
		Radial load P-direction (N)	245
		Thrust load A, B-direction (N)	98

- 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.

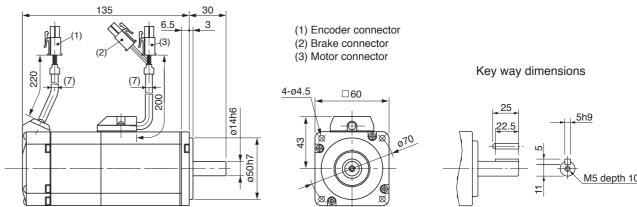
Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)





Dimensions

<With Brake> Mass (kg)/ 1.7



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

			AC200V		
Motor model *1 MSMD		082G1	082S1		
	Model	A5 series	MCDH	T3520	
Applicable driver *2	No.	A5E series	MCDH.	Г3520E	
	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.	7.1	
Rated current (A(rms))		4.0			
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		(r/min)	4500		
Moment of inertia	With	out brake	0.8	87	
of rotor (×10 ⁻⁴ kg·m ²)	Wi	th brake	0.97		
Recommended moment of inertia ratio of the load and the rotor Note)3		20 times or less			
Rotary encoder speci	ficatior	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.

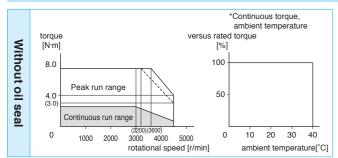
Static friction torque (N·m)	2.45 or more
Engaging time (ms)	70 or less
Releasing time (ms) Note)4	20 or less
Exciting current (DC) (A)	0.42
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

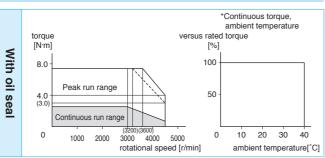
• Permissible load (For details, refer to P.104)

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

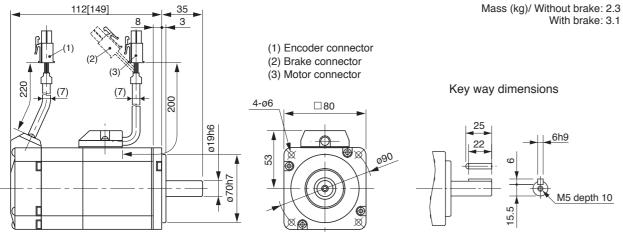
- For details of Note 1 to Note 5, refer to P.104.
- Dimensions of Driver, refer to P.31.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

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





Dimensions



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

MEMO

			AC100V	
Motor model *1 MHMD		021G1	021S1	
	Model A5 series		MBDHT2110	
Applicable driver *2	No.	A5E series	MBDHT2110E	
	Frame symbol		B-frame	
Power supply capacit	у	(kVA)	0.	.5
Rated output		(W)	20	00
Rated torque		(N·m)	0.0	64
Momentary Max. peal	k torqu	e (N·m)	1.91	
Rated current (A(rms))		(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		(r/min)	5000	
Moment of inertia	With	out brake	0.42	
of rotor ($\times 10^{-4}$ kg·m ²)	Wi	th brake	0.45	
Recommended moment of inertia ratio of the load and the rotor Note)3		10 times 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.

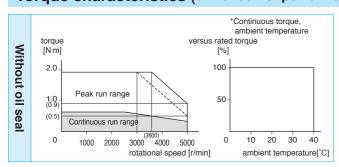
Static friction torque (N·m)	1.27 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.36
Releasing voltage (DC) (V)	1 or more
Exciting voltage (DC) (V)	24±1.2

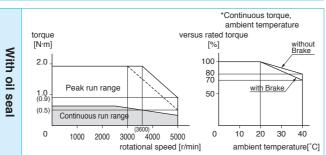
• Permissible load (For details, refer to P.104)

During assembly	Radial load P-direction (N)	392	
	Thrust load A-direction (N)	147	
	Thrust load B-direction (N)	196	
D	During operation	Radial load P-direction (N)	245
op		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.>)

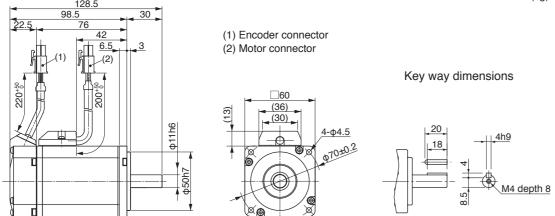




Dimensions

<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	00V
Motor model *1		MHMD	022G1	022S1
	Model	A5 series	MADHT1507	
Applicable driver *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 Max. pea	k torqu	ie (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)1	DV0P4283		No limit Note)2	
Rated rotational speed (r/m		(r/min)	3000	
Max. rotational speed		(r/min)	50	00
Moment of inertia	With	out brake	0.42	
of rotor (×10 ⁻⁴ kg·m ²)	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			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)	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)

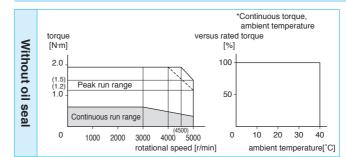
	Radial load P-direction (N)	392
During assembly	Thrust load A-direction (N)	147
accombiy	Thrust load B-direction (N)	196
During	Radial load P-direction (N)	245
operation	Thrust load A, B-direction (N)	98

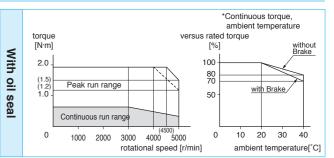
- For details of Note 1 to Note 5, refer to P.104.
- Dimensions of Driver, refer to P.30.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type".

Detail of model designation, refer to P.11.

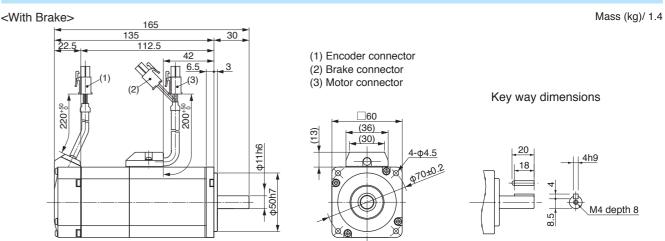
Torque characteristics (at AC200V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)

With





Dimensions



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

		AC100V			
Motor model *1 MHMD		041G1□	041S1 <u></u>		
	Model	A5 series	MCDH	T3120	
Applicable driver *2	No.	A5E series	MCDHT3120E		
	Fran	ne symbol	C-frame		
Power supply capacit	y	(kVA)	0.	0.9	
Rated output		(W)	40	00	
Rated torque		(N·m)	1.	3	
Momentary Max. pea	k torqu	e (N·m)	3.	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		0P4282	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 ⁻⁴ kg·m ²)	Wi	th brake	0.70		
Recommended moment of inertia ratio of the load and the rotor Note)3		10 times or less			
Rotary encoder speci	ficatior	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)	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

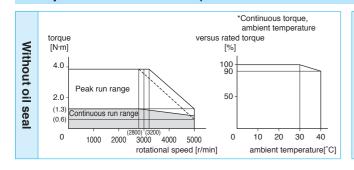
• Permissible load (For details, refer to P.104)

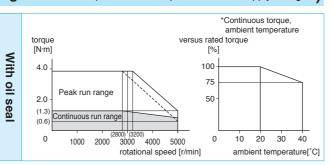
During assembly During operation	Radial load P-direction (N)	392
	Thrust load A-direction (N)	147
	Thrust load B-direction (N)	196
	Radial load P-direction (N)	245
	Thrust load A, B-direction (N)	98

- · 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".

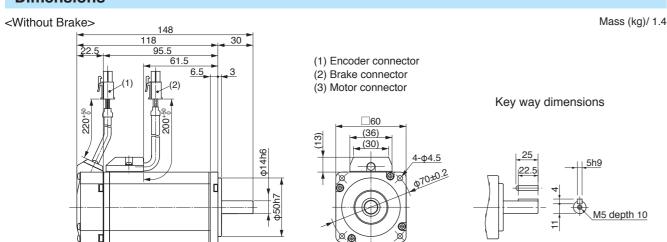
Detail of model designation, refer to P.11.

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





Dimensions



* 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	042G1	042S1	
	Model	A5 series	MBDH	MBDHT2510	
Applicable driver *2	No.	A5E series	MBDH	Γ2510E	
	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	ıe (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		t 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 ⁻⁴ kg·m ²)	Wi	th brake	0.70		
Recommended moment of inertia ratio of the load and the rotor N			10 times	s or less	
Rotary encoder specificat		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

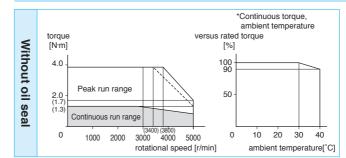
• Permissible load (For details, refer to P.104)

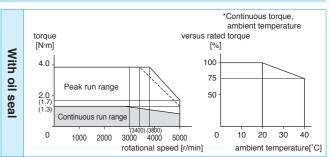
	During assembly During operation	Radial load P-direction (N)	392
		Thrust load A-direction (N)	147
		Thrust load B-direction (N)	196
		Radial load P-direction (N)	245
		Thrust load A, B-direction (N)	98

- 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".

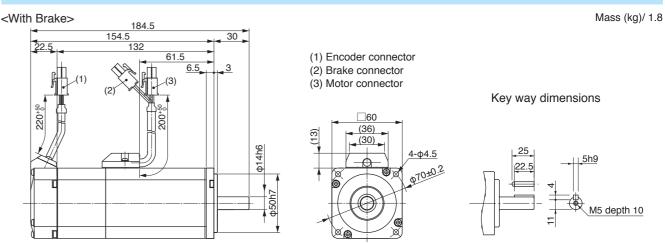
Detail of model designation, refer to P.11.

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





Dimensions



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

		AC2	00V	
Motor model *1 MHMD			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	k torqu	ıe (N⋅m)	7.	.1
Rated current		(A(rms))	4.0	
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		(r/min)	4500	
Moment of inertia	With	out brake	1.51	
of rotor (×10 ⁻⁴ kg·m ²)	Wi	th brake	1.61	
Recommended moment of inertia ratio of the load and the rotor Note)3		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.

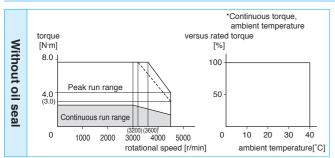
Static friction torque (N·m)	2.45 or more	
Engaging time (ms)	70 or less	
Releasing time (ms) Note)4	20 or less	
Exciting current (DC) (A)	0.42	
Releasing voltage (DC) (V)	1 or more	
Exciting voltage (DC) (V)	24±1.2	

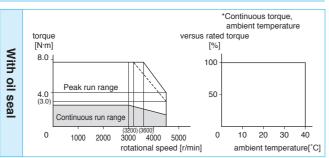
• Permissible load (For details, refer to P.104)

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	

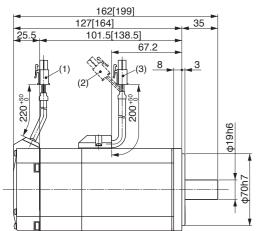
- For details of Note 1 to Note 5, refer to P.104.
- Dimensions of Driver, refer to P.31.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

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

Motor Specifications 400V MSME 1.5kW [Low inertia, Middle capacity]

Specifications

			AC4	00V
Motor model *1 MSME			104G1□	104S1
N		A5 series	MDDHT3420	
Applicable driver *2	No.	A5E series	MDDH	Г3420Е
	Fran	ne symbol	D-frame	
Power supply capacit	y	(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))	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)	5000	
Moment of inertia	Without brake		2.03	
of rotor (×10 ⁻⁴ kg·m ²)	Wi	th 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
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.

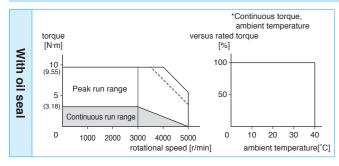
Static friction torque (N·m)	7.8 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.81±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

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

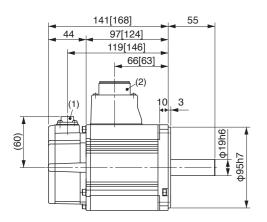
During assembly During operation	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196

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

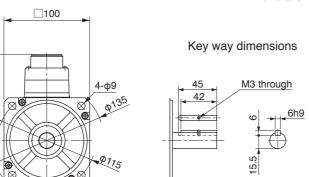
Torque characteristics (at AC400V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



Dimensions



100 101)[(103)]



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	V00V
Motor model *1 MSME			154G1□	154S1
Mode		A5 series	MDDHT3420	
Applicable driver *2	No.	A5E series	MDDHT3420E	
	Fran	ne symbol	D-frame	
Power supply capacity	у	(kVA)	2	.3
Rated output		(W)	1.	.5
Rated torque		(N·m)	4.	77
Momentary Max. peal	k torqu	e (N·m)	14	1.3
Rated current		(A(rms))	4.2	
Max. current		(A(o-p))	18	
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 ⁻⁴ kg·m ²)		th brake	3.17	
Recommended moment of inertia ratio of the load and the rotor Note)3		0 times	or less	
Rotary encoder speci	Rotary encoder specifications Note		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)	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

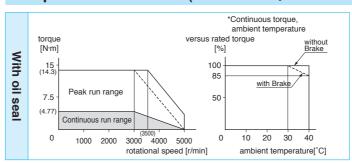
• Permissible load (For details, refer to P.104)

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

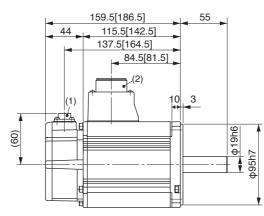
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.32.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type".

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.>)



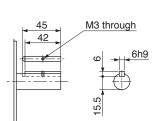
Dimensions



□100

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.

Motor Specifications 400V MSME 3.0kW [Low inertia, Middle capacity]

Specifications

		AC4	.00V	
Motor model *1 MSME			204G1	204S1
Model A5		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)	6.0	37
Momentary Max. pea	k torqu	e (N·m)	19).1
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	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 ⁻⁴ kg·m ²)	Wi	th brake	rake 4.01	
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.

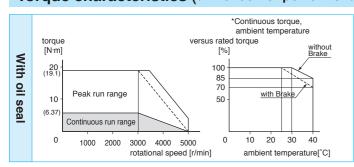
Static friction torque (N·m)	7.8 or more
Engaging time (ms)	50 or less
Releasing time (ms) Note)4	15 or less
Exciting current (DC) (A)	0.81±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

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

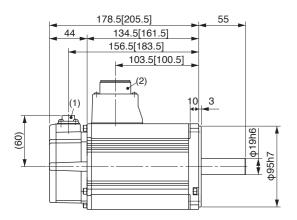
		Radial load P-direction (N)	980
	During assembly	Thrust load A-direction (N)	588
	accorning	Thrust load B-direction (N)	686
	During	Radial load P-direction (N)	490
	operation	Thrust load A, B-direction (N)	196

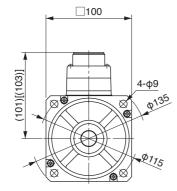
- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.33.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

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



Dimensions





Key way dimensions

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

			AC4	100V	
Motor model *1		MSME	304G1□	304S1□	
	Model	A5 series	MFDH	T5440	
Applicable driver *2	No.	A5E series	MFDHT5440E		
	Fran	ne symbol	F-frame		
Power supply capac	ity	(kVA)	4	.5	
Rated output		(kW)	3	.0	
Rated torque		(N·m)	9.	55	
Momentary Max. pe	ak torqu	ue (N·m)	28	3.6	
Rated current		(A(rms))	9.2		
Max. current		(A(o-p))	3	39	
Regenerative brake	With	out option	No limit Note)2		
frequency (times/min) Note	DV0F	PM20049×2	No limit Note)2		
Rated rotational spe	ed	(r/min)	3000		
Max. rotational spee	ed	(r/min)	5000		
Moment of inertia	With	out brake	6.50		
of rotor (×10 ⁻⁴ kg·m ²)	Wi	th brake	7.85		
Recommended moment of ratio of the load and the rol			0 times	or less	
Rotary encoder spe	cificatio	ns Note)5	20-bit Incremental	17-bit Absolute	
Resol	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.

1	,
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

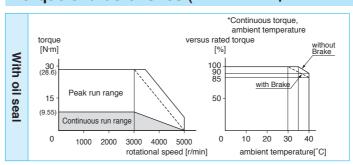
• Permissible load (For details, refer to P.104)

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

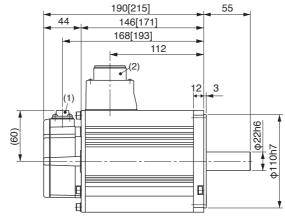
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type".

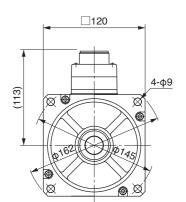
Detail of model designation, refer to P.11.

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



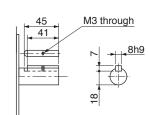
Dimensions





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.

		AC4	00V	
Motor model *1 MSME		404G1□	404S1	
	Model	A5 series	MFDH	TA464
Applicable driver *2	No.	A5E series	MFDHT	Γ A 464E
	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	3.2
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 ($\times 10^{-4}$ kg·m ²)	With brake		14.2	
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.

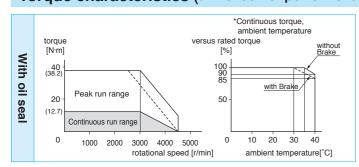
Static friction torque (N·m)	16.1 or more
Engaging time (ms)	110 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.90±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

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

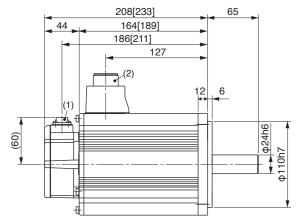
- 1	. .	Radial load P-direction (N)	980
	During assembly	Thrust load A-direction (N)	588
	docernory	Thrust load B-direction (N)	686
	During	Radial load P-direction (N)	784
	operation	Thrust load A, B-direction (N)	343

- · 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



□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

		AC4	·00V		
Motor model *1		MSME	504G1□	504S1□	
	Model	A5 series	MFDH	TA464	
Applicable driver *2	No.	A5E series	MFDHTA464E		
	Frame symbol		F-fra	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	7.7	
Rated current		(A(rms))	12.0		
Max. current		(A(o-p))	5	1	
Regenerative brake	Without option		357		
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	it brake 17.4		
of rotor (×10 ⁻⁴ kg·m ²)	Wi	Vith brake 18.6		3.6	
Recommended moment of inert 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.

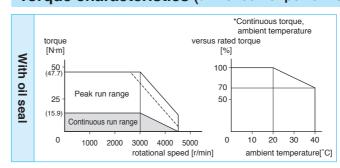
,	,
Static friction torque (N·m)	16.1 or more
Engaging time (ms)	110 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.90±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

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

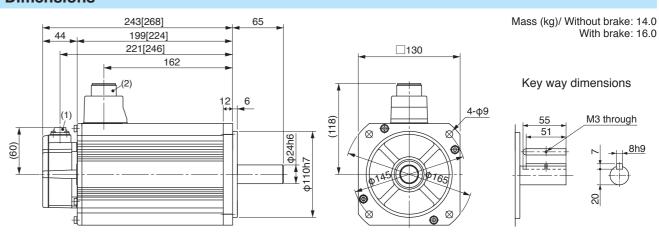
During assembly	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
accombiy	Thrust load B-direction (N)	686
During operation	Radial load P-direction (N)	784
	Thrust load A, B-direction (N)	343

- 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	.00V	
Motor model *1	Motor model *1 MDME			104S1	
	Model	A5 series	MDDHT2412		
Applicable driver *2	No.	A5E series	MDDHT2412E		
	Fram	ne symbol	D-frame		
Power supply capacit	у	(kVA)	1.	.8	
Rated output		(W)	1.	.0	
Rated torque		(N·m)	4.	77	
Momentary Max. peal	k torqu	e (N·m)	14	14.3	
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	With	out brake	4.60		
of rotor (×10 ⁻⁴ kg·m ²)	Wit	th brake	5.90		
Recommended moment of inertia ratio of the load and the rotor Note)3		0 times	or less		
Rotary encoder speci	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.

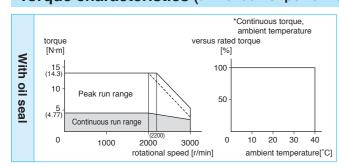
Static friction torque (N·m)	4.9 or more
Engaging time (ms)	80 or less
Releasing time (ms) Note)4	70 or less
Exciting current (DC) (A)	0.59±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

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

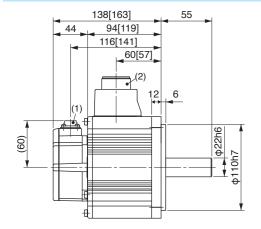
During assembly During operation	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196

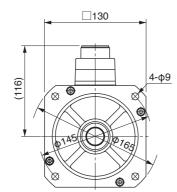
- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.32.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

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



Dimensions





Key way dimensions

41

Mass (kg)/ Without brake: 5.2

With 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	V00V
Motor model *1 MDME			154G1□	154S1
	Model	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)	7.	16
Momentary Max. peal	k torqu	ıe (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	DV0PM20048		No limit Note)2	
Rated rotational speed (r/min)		(r/min)	2000	
Max. rotational speed		(r/min)	3000	
Moment of inertia	With	out brake	6.70	
of rotor (×10 ⁻⁴ kg·m ²) With bral		th brake	7.99	
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.

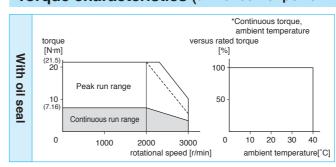
• Permissible load (For details, refer to P.104)

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

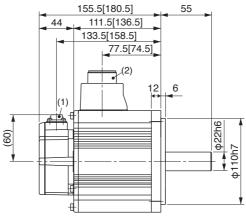
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.32.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type".

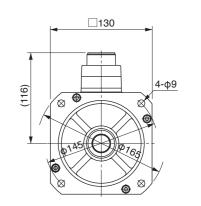
Detail of model designation, refer to P.11.

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



Dimensions

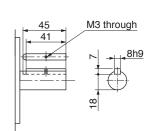




With brake: 8.2

Mass (kg)/ Without brake: 6.7

Key way dimensions



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

			AC4	.00V
Motor model *1 MDME			204G1	204S1
	Model	A5 series	MEDHT4430	
Applicable driver *2	No.	A5E series	MEDHT4430E	
	Fran	ne symbol	E-frame	
Power supply capacit	y	(kVA)	3.	3
Rated output		(W)	2	.0
Rated torque		(N·m)	9.	55
Momentary Max. peal	k torqu	e (N·m)	28	3.6
Rated current	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	With	out brake	8.	72
of rotor (×10 ⁻⁴ kg·m ²)	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	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.

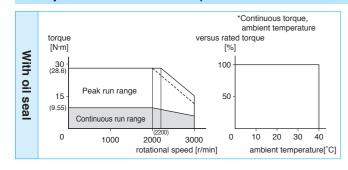
Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

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

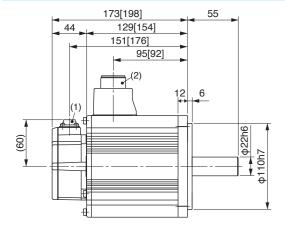
During assembly During operation	Radial load P-direction (N)	980
	Thrust load A-direction (N)	588
	Thrust load B-direction (N)	686
	Radial load P-direction (N)	490
	Thrust load A, B-direction (N)	196

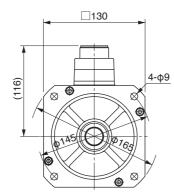
- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.33.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

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



Dimensions





41

Key way dimensions

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	V00V	
Motor model *1 MDME			304G1□	304S1□
	Model A5 series		MFDHT5440	
Applicable driver *2	No.	A5E series	MFDHT5440E	
	Frame symbol		F-frame	
Power supply capacity	у	(kVA)	4.	.5
Rated output		(W)	3	.0
Rated torque		(N·m)	14	1.3
Momentary Max. peal	k torqu	e (N·m)	43	3.0
Rated current		(A(rms))	8.7	
Max. current		(A(o-p))	37	
Regenerative brake	Without option		No limit Note)2	
frequency (times/min) Note)1	DV0PM20049×2		No limit Note)2	
Rated rotational speed (r/min)		(r/min)	2000	
Max. rotational speed		(r/min)	3000	
Moment of inertia	With	out brake	12.9	
of rotor (×10 ⁻⁴ kg·m ²)		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
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)	16.2 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

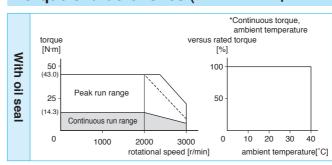
• Permissible load (For details, refer to P.104)

Radial load P-direction (N)	980
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
	Thrust load A-direction (N) Thrust load B-direction (N) Radial load P-direction (N)

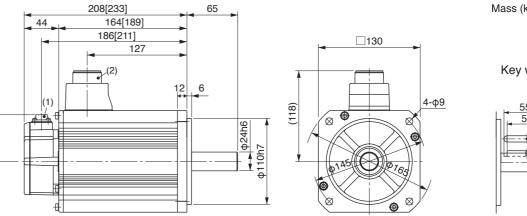
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type".

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

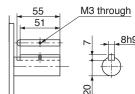


- (1) Encoder connector
- (2) Motor/Brake connector
- * Figures in [] represent the dimensions of with brake.

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

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

Key way dimensions



Motor Specifications 400V MDME 5.0kW [Middle inertia, Middle capacity]

Specifications

			AC4	00V
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. pea	k torqu	ıe (N⋅m)	57	7.3
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 ⁻⁴ kg·m ²) 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
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)

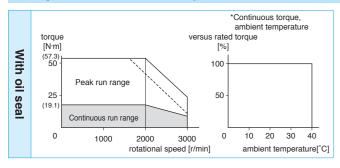
During assembly	Radial load P-direction (N)	1666	
	Thrust load A-direction (N)	784	
assembly		Thrust load B-direction (N)	980
	During	Radial load P-direction (N)	784
	operation	Thrust load A, B-direction (N)	343

- · For details of Note 1 to Note 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.

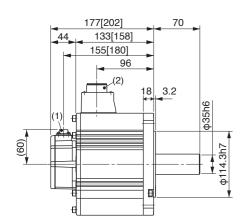
Mass (kg)/ Without brake: 15.5

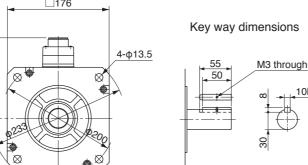
With brake: 18.7

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	00V		
Motor model *1		MDME	504G1□	504S1	
	Model	A5 series	MFDH	TA464	
Applicable driver *2	No.	A5E series	MFDHT	A464E	
	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. pe	ak torqu	ue (N·m)	71	.6	
Rated current		(A(rms))	13	13.0	
Max. current		(A(o-p))	55		
Regenerative brake	With	out option	120		
frequency (times/min) Note	DV0F	M20049×2	No limit Note)2		
Rated rotational spe	ed	(r/min)	20	00	
Max. rotational spee	d	(r/min)	3000		
Moment of inertia	With	out brake	48.0		
of rotor (×10 ⁻⁴ kg·m ²)		th brake	48	48.8	
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	
Resolu	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

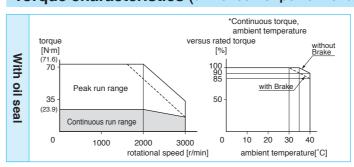
• Permissible load (For details, refer to P.104)

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

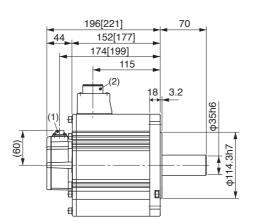
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type".

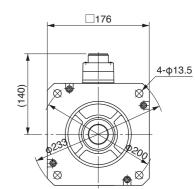
Detail of model designation, refer to P.11.

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



Dimensions





Key way dimensions 50

- (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.

Mass (kg)/ Without brake: 18.6 With brake: 21.8

1.048.576

AC400V Motor model *1 MGME 204G1 204S1 Model A5 series MFDHT5440 No. MFDHT5440E Applicable driver *2 A5E series Frame symbol F-frame (kVA) Power supply capacity Rated output (W) 2.0 Rated torque (N·m) 19.1 Momentary Max. peak torque (N·m) 47.7 Rated current (A(rms)) 8.5 Max. current (A(o-p)) 30 No limit Note)2 Without option Regenerative brake frequency (times/min) Note)1 DV0PM20049×2 No limit Note)2 Rated rotational speed (r/min) 1000 Max. rotational speed (r/min) 2000 30.3 Without brake Moment of inertia of rotor ($\times 10^{-4}$ kg·m²) With brake 31.4 Recommended moment of inertia 0 times or less ratio of the load and the rotor 20-bit 17-bit Rotary encoder specifications Absolute Incremental

• 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)	1176
operat	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

			AC4	00V
Motor model *1 MGME			094G1	094S1
	Model	A5 series	MDDHT3420	
Applicable driver *2	No.	A5E series	MDDHT3420E	
	Fran	ne symbol	D-frame	
Power supply capacit	у	(kVA)	1	.8
Rated output		(W)	0	.9
Rated torque		(N·m)	8.	59
Momentary Max. pea	k torqu	ıe (N·m)	19).3
Rated current		(A(rms))	3.8	
Max. current (A(o-p))		12		
Regenerative brake Without		out option	No lim	t Note)2
frequency (times/min) Note)1	DV0	PM20048	No limit Note)2	
Rated rotational spee	d	(r/min)	10	00
Max. rotational speed	l	(r/min)	2000	
Moment of inertia Withou		out brake	6.70	
of rotor (×10 ⁻⁴ kg·m ²) With brake		th brake	7.99	
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 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.

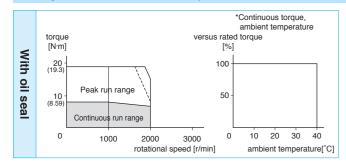
Static friction torque (N·m)	13.7 or more
Engaging time (ms)	100 or less
Releasing time (ms) Note)4	50 or less
Exciting current (DC) (A)	0.79±10%
Releasing voltage (DC) (V)	2 or more
Exciting voltage (DC) (V)	24±2.4

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

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

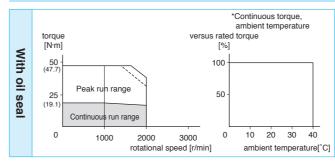
- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.32.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

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



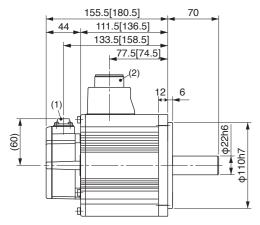
Torque characteristics (at AC400V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)

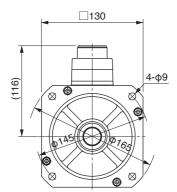
131.072

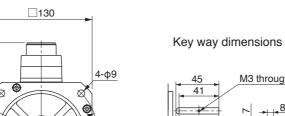


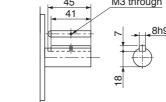
Resolution per single turn

Dimensions







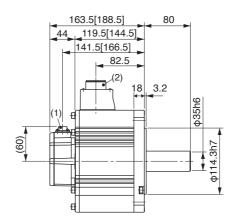


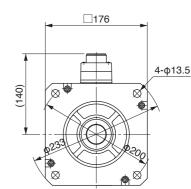
Mass (kg)/ Without brake: 6.7

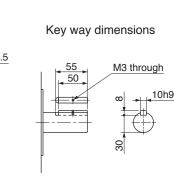
With brake: 8.2

- (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.

Dimensions







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.

		AC4	.00V	
Motor model *1 MGME		304G1□	304S1□	
	Model	A5 series	MFDH	TA464
Applicable driver *2	No.	A5E series	MFDHTA464E	
	Frame symbol		F-frame	
Power supply capacit	y	(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 ⁻⁴ kg·m ²)	Wi	th brake	49.2	
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
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.

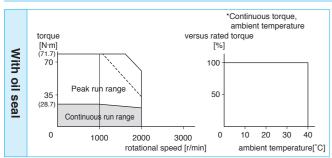
Static friction torque (N·m)	58.8 or more	
Engaging time (ms)	150 or less	
Releasing time (ms) Note)4	50 or less	
Exciting current (DC) (A)	1.4±10%	
Releasing voltage (DC) (V)	2 or more	
Exciting voltage (DC) (V)	24±2.4	

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

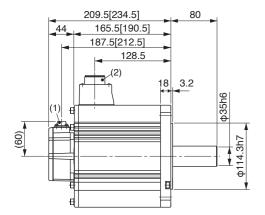
l		Radial load P-direction (N)	2058
During assembly	Thrust load A-direction (N)	980	
	Thrust load B-direction (N)	1176	
	During Radial load P-direction (1470
operation		Thrust load A, B-direction (N)	490

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

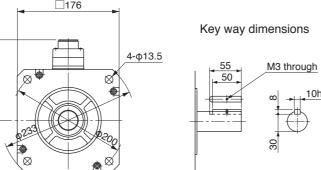
Torque characteristics (at AC400V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



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

MHME

A5E series

(kVA)

(N·m)

(W)

Model A5 series

Frame symbol

No.

Specifications

Motor model *1

Rated output

Rated torque

Applicable driver *2

Power supply capacity

of rotor (×10⁻⁴kg·m²)

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

4.9 or more

80 or less

70 or less

0.59±10%

2 or more

24±2.4

588

686

490

196

/This brake will be released when it is energized.)

Do not use this for braking the motor in motion.

Static friction torque (N·m)

Releasing time (ms) Note)4

Releasing voltage (DC) (V)

Exciting current (DC) (A)

Engaging time (ms)

assembly

During

Specifications

		AC4	00V	
Motor model *1 MHME		154G1	154S1 <u></u>	
	Model	A5 series	MDDHT3420	
Applicable driver *2	No.	A5E series	MDDH.	Г3420Е
	Frame symbol		D-frame	
Power supply capacity	y	(kVA)	2	.3
Rated output		(W)	1	.5
Rated torque		(N·m)	7.	16
Momentary Max. peal	k torqu	ıe (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	DV0PM20048		130	
Rated rotational spee	d	(r/min)	2000	
Max. rotational speed		(r/min)	3000	
Moment of inertia	With	out brake	37.1	
of rotor (×10 ⁻⁴ kg·m ²)		th brake	38.4	
Recommended moment of inertia ratio of the load and the rotor Note)3		0 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)	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	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
	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.

Exciting voltage (DC) (V) 14.3 Momentary Max. peak torque (N·m) • Permissible load (For details, refer to P.104) 2.9 Rated current (A(rms)) 12 Max. current (A(o-p)) During

Regenerative brake	Without option	83
requency (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	24.7

With brake

Recommended moment of inertia ratio of the load and the rotor Note)3		0 times or less	
Rotary encoder specifications	Note)5	20-bit	17-

ed moment of inertia ad and the rotor Note)3		0 times or less	
der specifications Not	te)5	20-bit Incremental	17-bit Absolute
Resolution per single t	urn	1,048,576	131,072

AC400V

MDDHT2412

MDDHT2412E

D-frame

1.8

1.0

4.77

26.0

104S1

104G1

· For details of Note 1 to Note 5, refer to P.104.

Radial load P-direction (N)

Thrust load A-direction (N)

Thrust load B-direction (N)

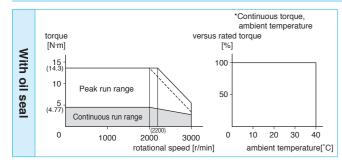
Radial load P-direction (N)

· Dimensions of Driver, refer to P.32.

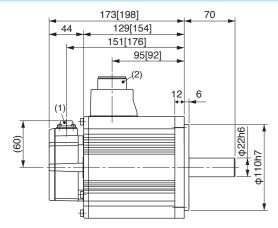
operation Thrust load A, B-direction (N)

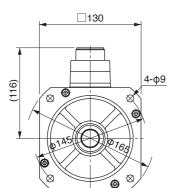
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

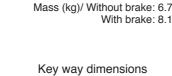
Torque characteristics (at AC400V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)

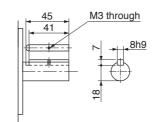


Dimensions



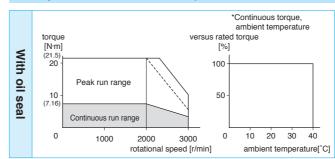




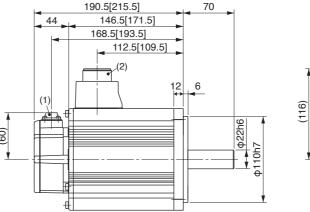


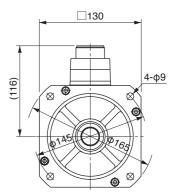
- (1) Encoder connector
- (2) Motor/Brake connector
- * Figures in [] represent the dimensions of with brake.
- <Cautions> Reduce the moment of inertia ratio if high speed response operation is required. Dimensions are subject to change without notice. Contact us or a dealer for the latest information. Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

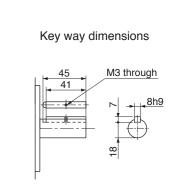
Torque characteristics (at AC400V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



Dimensions







Mass (kg)/ Without brake: 8.6

With brake: 10.1

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

		AC4	00V	
Motor model *1 MHME			204G1	204S1
	Model	A5 series	MEDHT4430	
Applicable driver *2	No.	A5E series	MEDHT4430E	
	Frame 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	e (N·m)	28	3.6
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	Without brake		57.8	
of rotor (×10 ⁻⁴ kg·m ²)	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	Rotary encoder specifications 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.

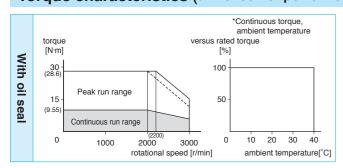
Static friction torque (N·m)	24.5 or more		
Engaging time (ms)	80 or less		
Releasing time (ms) Note)4	25 or less		
Exciting current (DC) (A)	1.3±10%		
Releasing voltage (DC) (V)	2 or more		
Exciting voltage (DC) (V)	24±2.4		

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

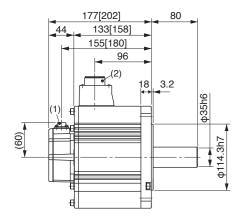
During assembly	Radial load P-direction (N)	1666
	Thrust load A-direction (N)	784
	Thrust load B-direction (N)	980
During	Radial load P-direction (N)	784
operation	Thrust load A, B-direction (N)	343

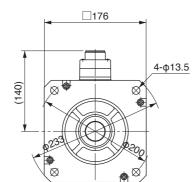
- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.33.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

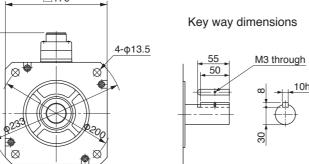
Torque characteristics (at AC400V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



Dimensions







Mass (kg)/ Without brake: 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

		AC4	00V		
Motor model *1		МНМЕ	304G1□	304S1	
	Model	A5 series	MFDHT5440		
Applicable driver *2	No.	A5E series	MFDH	Г5440E	
	Fran	ne symbol	F-frame		
Power supply capaci	ty	(kVA)	4.	.5	
Rated output		(W)	3.	.0	
Rated torque		(N·m)	14	.3	
Momentary Max. pea	k torqu	ie (N·m)	43	3.0	
Rated current		(A(rms))	8.0		
Max. current		(A(o-p))	34		
Regenerative brake	Without option		19		
frequency (times/min) Note)	DV0P	M20049×2	142		
Rated rotational spee	ed	(r/min)	2000		
Max. rotational speed	d	(r/min)	3000		
Moment of inertia	With	out brake	90.5		
of rotor (×10 ⁻⁴ kg·m ²)	Wi	th brake	92.1		
Recommended mom			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)	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

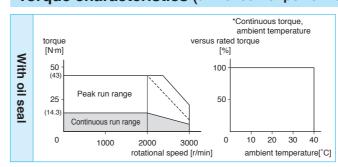
• Permissible load (For details, refer to P.104)

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

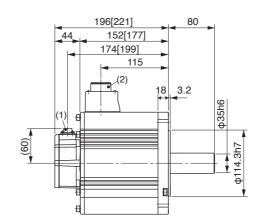
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type".

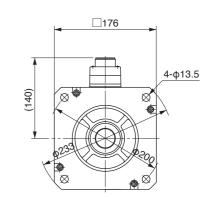
Detail of model designation, refer to P.11.

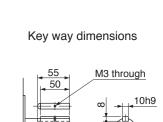
Torque characteristics (at AC400V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



Dimensions







Mass (kg)/ Without brake: 16.0

With brake: 19.2

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

Motor Specifications 400V MHME 3.0kW [High inertia, Middle capacity]

Specifications

			AC4	00V		
Motor model *1		МНМЕ	404G1□	404S1		
	Model	A5 series	MFDHTA464			
Applicable driver *2	No.	A5E series	MFDH	Γ A 464 E		
	Fran	ne symbol	F-fr	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	e (N·m)	57	7.3		
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	l	(r/min)	3000			
Moment of inertia	With	out brake	112			
of rotor ($\times 10^{-4}$ kg·m ²)	With brake		114			
Recommended mome ratio of the load and t			0 times 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.

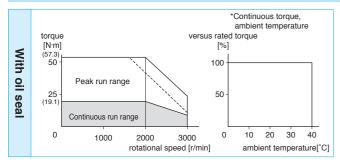
Static friction torque (N·m)	24.5 or more		
Engaging time (ms)	80 or less		
Releasing time (ms) Note)4	25 or less		
Exciting current (DC) (A)	1.3±10%		
Releasing voltage (DC) (V)	2 or more		
Exciting voltage (DC) (V)	24±2.4		

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

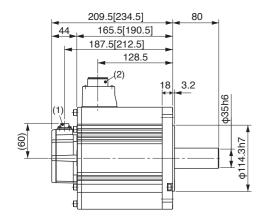
During assembly	Radial load P-direction (N)	1666
	Thrust load A-direction (N)	784
	Thrust load B-direction (N)	980
During	Radial load P-direction (N)	784
operation	Thrust load A, B-direction (N)	343

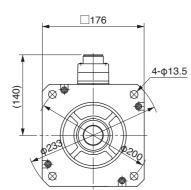
- · For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type". Detail of model designation, refer to P.11.

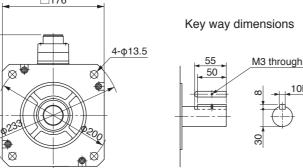
Torque characteristics (at AC400V of power voltage < Dotted line represents the torque at 10% less supply voltage.>)



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

		AC400V				
Motor model *1		МНМЕ	504G1□	504S1		
	Model	A5 series	MFDH	TA464		
Applicable driver *2	No.	A5E series	MFDHTA464E			
	Fran	ne symbol	F-fra	F-frame		
Power supply capacit	y	(kVA)	7.	.5		
Rated output		(W)	5.	.0		
Rated torque		(N·m)	23	3.9		
Momentary Max. pea	k torqu	ıe (N⋅m)	71	.6		
Rated current		(A(rms))	13.0			
Max. current		(A(o-p))	55			
Regenerative brake	Without option		10			
frequency (times/min) Note)1	DV0PM20049×2		76			
Rated rotational spee	d	(r/min)	2000			
Max. rotational speed		(r/min)	3000			
Moment of inertia	With	out brake	162			
of rotor (×10 ⁻⁴ kg·m ²)	Wi	th brake	164			
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	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

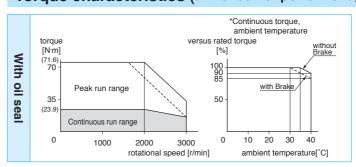
• Permissible load (For details, refer to P.104)

	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

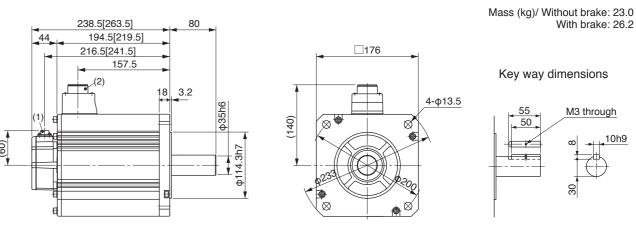
- For details of Note 1 to Note 5, refer to P.104.
- · Dimensions of Driver, refer to P.34.
- *1 Rotaly encoder specifications:
- *2 The product that the end of driver model designation has "E" is "positioning type".

Detail of model designation, refer to P.11.

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.

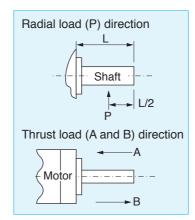
- If the load is connected, frequency will be defines as 1/(m+1), where m=load moment of inertia/ rotor moment of inertia.
- When the motor speed exceeds the rated speed, regenerative brake frequency is in inverse proportion to the square of (running speed/rated speed).
- Power supply voltage is AC460V (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。

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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 ⁻⁴ kg·m²	Engaging time ms	Releasing time ms	Exciting current DC A (at cool-off)	Releasing voltage	Permissible work (J) per one braking	Permissible total work x 10³J	Permissible angular acceleration rad/s ²
	50W, 100W	0.29 or more	0.002	35 or less	20 or less	0.3	DC1V	39.2	4.9	30000
MSMD	200W, 400W	1.27 or more	0.018	50 or less	15 or less	0.36	or more	137	44.1	
	750W	2.45 or more	0.075	70 or less	20 or less	0.42	00.0	196	147	
	50W, 100W	0.29 or more	0.002	35 or less	20 or less	0.3	DC1V	39.2	4.9	
	200W, 400W	1.27 or more	0.018	50 or less	15 or less	0.36	or more	137	44.1	30000
	750W	2.45 or more	0.075	70 or less	20 or less	0.42	00.0	196	147	
MSME	1.0kW, 1.5kW, 2.0kW	7.8 or more	0.33	50 or less	15 or less (100)	0.81	DOOM	392	490	
	3.0kW	11.8 or more		80 or less	(100)		DC2V or more			10000
	4.0kW, 5.0kW	16.1 or more	1.35	110 or less	50 or less (130)	0.9	ormore	1470	2200	
	1.0kW	4.9 or more	1.35	80 or less	70 or less (200)	0.59	DC2V or more	588	780	10000
MDME	1.5kW, 2.0kW	13.7 or more		100 or less	50 or less	0.79		1176	1500	
MIDIME	3.0kW	16.2 or more		110 or less	(130)	0.9		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	4070	0000	5446
	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
МНМЕ	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.)

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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

EC 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).

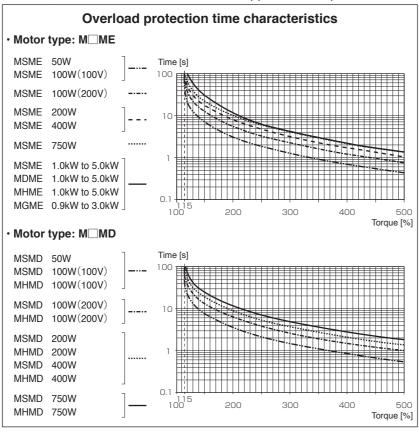
- (1) Use the driver in an environment of Pollution Degree 2 or 1 prescribed in IEC60664-1. (e.g. Install in the control box with IP54 enclosure.)
- (2) Make sure to install a circuit breaker or fuse which are UL recognized (Listed (1) marked) between the power supply and the noise filter.

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).

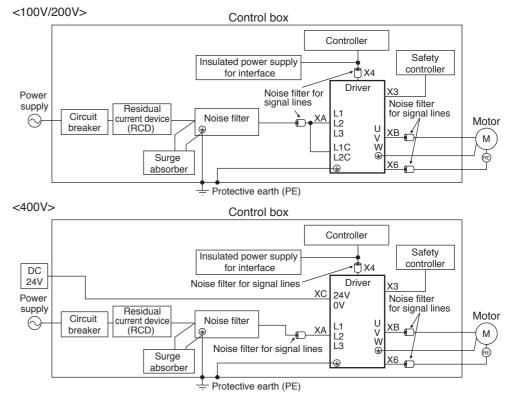


Conformed Standards

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%	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		to 480V	+ 10% - 15%	50/60Hz
400 V type (Control power supply): DC 24V ±15%					

- 7. - 1
- (D to F-frame)
- (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

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.

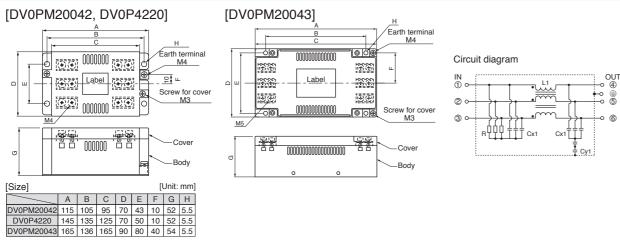
Noise Filter

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.

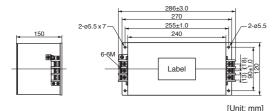
Options

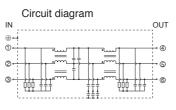
Option part No.	Voltage specifications for driver	Manufacturer's part No.	Applicable driver (frame)	Manufacturer
DV0P4170	Single phase 100V, 200V	SUP-EK5-ER-6	A and B-frame	Okaya Electric Ind.
100.0 ± 2.0 88.0 75.0 2.0 Label 2 - 04.5 x 6.75	Terminal cover (transparent) 53.1±1.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Circuit diagram	ОИТ ОД — ОД —	

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	Cinale phase 100V 000V	10	TDK-Lambda
RTHN-5020	Single phase 100V, 200V 3-phase 200V	30	
RTHN-5030	3-priase 200 v	50	Corp.
FN258L-16-07	2 phase 400V	16	SCHAFFNER
FN258L-30-07	3-phase 400V	30	SCHAFFINER

<Remarks>

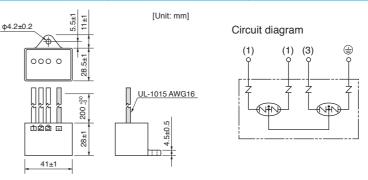
- Select a noise filter of capacity that exceeds the capacity of the power source (also check for load condition).
- · For detailed specification of the filter, contact the manufacturer.

Surge Absorber

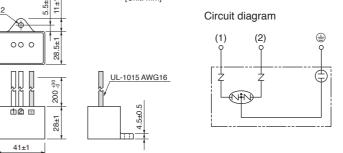
Provide a surge absorber for the primary side of noise filter.

Conformance to

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	[Unit: mm]	cuit diagram	

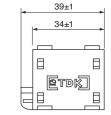


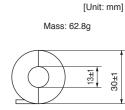
Noise Filter for Signal Lines

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





Residual current device

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

Grounding

to the cables.

- (1) Connect the protective earth terminal ((1)) of the driver and the protective earth terminal (PE) of the control box without fail to prevent electrical shocks.
- (2) Do not make a joint connection to the protective earth terminals (). 2 terminals are provided for protective earth.

<Note>

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

JN4AT02PJM-R

PIN No. Application

1 Brake

* Electromagnetic brake is

a nonpolar device.

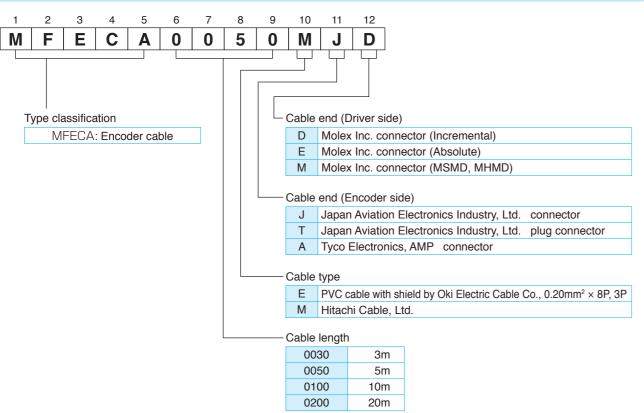
Tightening torque of

0.19 to 0.21 N·m

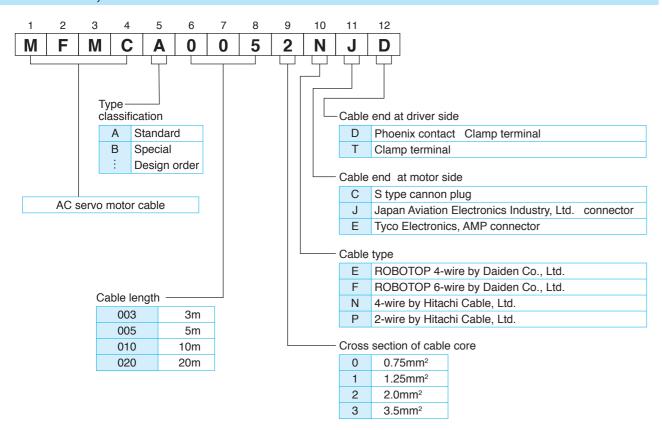
Brake

2

Encoder cable

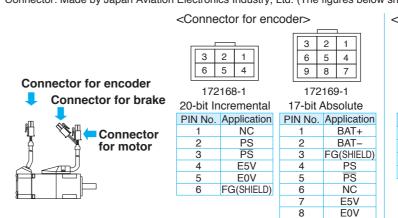


Motor cable, Brake cable



Options Specifications of Motor connector

· When the motors of <MSMD, MHMD> are used, they are connected as shown below. Connector: Made by Japan Aviation Electronics Industry, Ltd. (The figures below show connectors for the motor.)

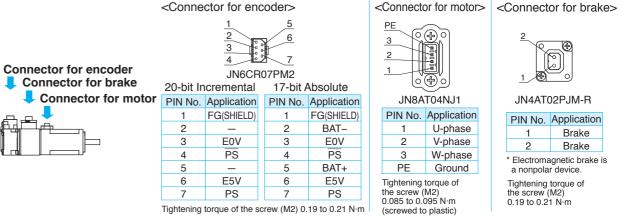


Connector for motor>			Connect	or for brak		
2 1 4 3 172167-1			172165-1			
PIN No.	Application		PIN No.	Application		
1	U-phase		1	Brake		
2 V-phase			2	Brake		
3	W-phase					
4	Ground					

• When the motors of <MSME (50 W to 750 W)> are used, they are connected as shown below.

NC

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

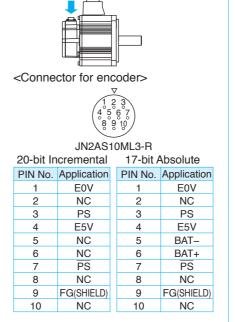


* Be sure to use only the screw supplied with the connector, to avoid damage.

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

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

<Connector for motor>

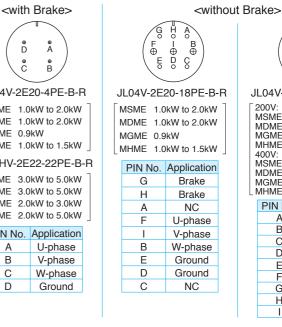


Connector for motor

Connector

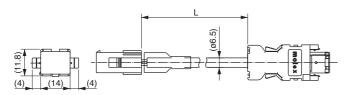
for encoder





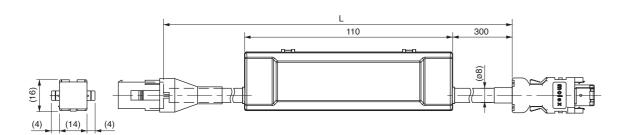
D G G	F H I O
7200V: MSME 3.0 MDME 3.0 MGME 2.0 MHME 2.0 400V: MSME 1.0 MDME 1.0	24-11PE-B-R 0kW to 5.0kW 0kW to 5.0kW 0kW to 3.0kW 0kW to 5.0kW 0kW to 5.0kW 0kW to 5.0kW
	kW to 5.0kW
PIN No.	Application
A	Brake
В	Brake
С	NC
D	U-phase
E	V-phase
F	W-phase
G	Ground
H	Ground
	NC

<Remarks> Do not connect anything to NC.



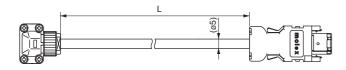
Title	Part No.	Manufacturer	L (m)	Part No.
Connector	55100-0670	Molex Inc	3	MFECA0030EAM
Connector	172160-1	Type Floatronice AMD	5	MFECA0050EAM
Connector pin	170365-1	Tyco Electronics AMP	10	MFECA0100EAM
Cable	0.20mm ² ×3P	Oki Electric Cable Co., Ltd.	20	MFECA0200EAM

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)				



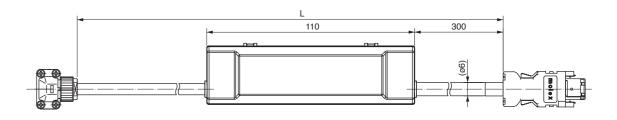
Title	Part No.	Manufacturer	L (m)	Part No.
Connector	55100-0670	Molex Inc	3	MFECA0030EAE
Connector	172161-1	Type Floatronics AMP	5	MFECA0050EAE
Connector pin	170365-1	Tyco Electronics AMP	10	MFECA0100EAE
Cable	0.20mm ² ×4P	Oki Electric Cable Co., Ltd.	20	MFECA0200EAE

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



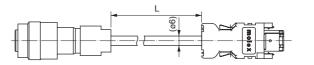
Title	Part No.	Manufacturer	L (m)	Part No.
Connector	55100-0670	Molex Inc	3	MFECA0030MJD
Connector	JN6FR07SM1	Japan Aviation	5	MFECA0050MJD
Connector pin	LY10-C1-A1-10000	Electronics Ind.	10	MFECA0100MJD
Cable	AWG24×4P, AWG22×2P	Hitachi Cable, Ltd.	20	MFECA0200MJD

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



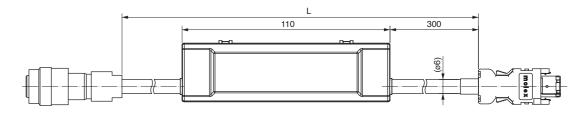
Title	Part No.	Manufacturer	L (m)	Part No.
Connector	55100-0670	Molex Inc	3	MFECA0030MJE
Connector	SMM-003T-P0.5	LC T Mfa Co Ltd	5	MFECA0050MJE
Connector pin	ZMR-02	J.S.T Mfg. Co., Ltd.	10	MFECA0100MJE
Connector	JN6FR07SM1	Japan Aviation	20	MFECA0200MJE
Connector pin	LY10-C1-A1-10000	Electronics Ind.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



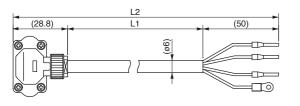
Title	Part No.	Manufacturer	
Connector	55100-0670	Molex Inc	
Connector	ZMR-02	J.S.T Mfg. Co., Ltd.	Γ
Connector pin	SMM-003T-P0.5	J.S.1 Mig. Co., Ltd.	
Connector	JN2DS10SL1-R	Japan Aviation	Γ
Connector pin	JN1-22-22S-PKG100	Electronics Ind.	
Cable	0.2mm ² x3P	Oki Electric Cable Co., Ltd.	

Applicable model MSMD 50W to 750W, MHMD 200W to 750W

Part No. MFMCA0 * * 0EED

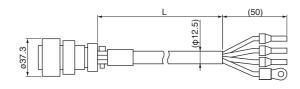
Title	Part No.	Manufacturer	L (m)	Part No.
Connector	172159-1	Type Floatronice AMD	3	MFMCA0030EED
Connector pin	170366-1	Tyco Electronics AMP	5	MFMCA0050EED
Rod terminal	AI0.75-8GY	Phoenix Contact	10	MFMCA0100EED
Nylon insulated round terminal	N1.25-M4	J.S.T Mfg. Co., Ltd.	20	MFMCA0200EED
Cable	ROBO-TOP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

Part No.	MFMCA0 * * 0NJD	Applicable	MSME	50W to 750W	



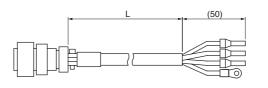
Title	Part No.	Manufacturer	L (m)	Part No.
Connector	JN8FT04SJ1	Japan Aviation	3	MFMCA0030NJD
Connector pin	ST-TMH-S-C1B-3500	Electronics Ind.	5	MFMCA0050NJD
Rod terminal	AI0.75-8GY	Phoenix Contact	10	MFMCA0100NJD
Nylon insulated round terminal	N1.25-M4	J.S.T Mfg. Co., Ltd.	20	MFMCA0200NJD
Cable	AWG18×4P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

Pa	art 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	JL04V-6A20-4SE-EB-R Japan Aviation JL04-2022CK(14)-R Electronics Ind.		MFMCD0032ECD
Cable clamp	JL04-2022CK(14)-R			MFMCD0052ECD
Rod terminal	Al2.5-8BU	Phoenix Contact	10	MFMCD0102ECD
Nylon insulated round terminal	N2-M4	J.S.T Mfg. Co., Ltd.	20	MFMCD0202ECD
Cable	ROBO-TOP 600V 2.0mm ²	Daiden Co.,Ltd.		

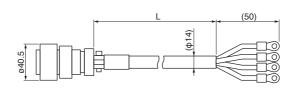
114



Part No. MFMCE0 * * 2ECD

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	Al2.5-8BU	Phoenix Contact	10	MFMCE0102ECD
Nylon insulated round terminal	N2-M4	J.S.T Mfg. Co., Ltd.	20	MFMCE0202ECD
Cable	ROBO-TOP 600V 2.0mm ²	Daiden Co.,Ltd.		

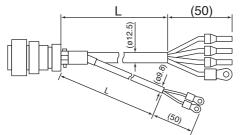
Part No.	MFMCA0 * * 3ECT	Applicable model	MHME	3.0kW to 5.0kW, 3.0kW to 5.0kW, del 200V and 400V	MGME	2.0kW to 3.0kW
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Title	Part No.	Manufacturer	L (m)	Part No.
Straight plug	JL04V-6A22-22SE-EB-R Japan Aviation		3	MFMCA0033ECT
Cable clamp	JL04-2022CK(14)-R	Electronics Ind.	5	MFMCA0053ECT
Nylon insulated round terminal	N5.5-5	J.S.T Mfg. Co., Ltd.	10	MFMCA0103ECT
Cable	ROBO-TOP 600V 3.5mm ²	Daiden Co.,Ltd.	20	MFMCA0203ECT

MFMCA0 * * 2FCD

Part No.

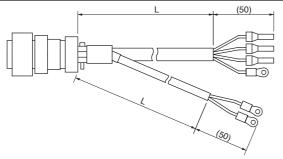


* This cable does not conform to IP67.

		•	
Title		Part No.	Manufacturer
Straight plu	g	JL04V-6A20-18SE-EB-R	Japan Aviation
Cable clam	p	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 Wilg. Co., Ltd.
Cable		ROBO-TOP 600V 0.75mm ² and ROBO-TOP 600V 2.0mm ²	Daiden Co.,Ltd.

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

MHME 2.0kW (200V), Applicable model MSME 1.0kW to 2.0kW (400V), MDME 1.0kW to 2.0kW (400V) Part No. MFMCE0 * * 2FCD MHME 1.0kW to 2.0kW (400V), MGME 0.9kW (400V)



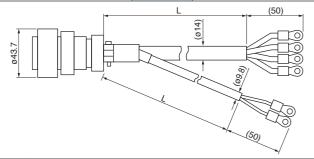
		,		
Title		Part No.	Manufacturer	
Straight plug	g	JL04V-6A24-11SE-EB-R	Japan Aviation	
Cable clam	р	JL04-2428CK(17)-R	Electronics Ind.	
Rod termina	al	AI2.5-8BU	Phoenix Contact	
Nylon insulated	Earth	N2-M4	LC T Mfg Co Ltd	
round terminal Brake		N1.25-M4	J.S.T Mfg. Co., Ltd.	
Cable		ROBO-TOP 600V 0.75mm ² and	Daiden Co.,Ltd.	

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

MFMCA0 * * 3FCT Part No.

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)



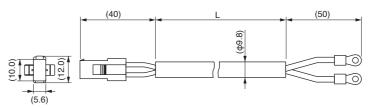
* This cable does not conform to IP67.

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 ² and ROBO-TOP 600V 3.5mm ²	Daiden Co.,Ltd.

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

Options Junction Cable for Brake

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



Title	Part No.	Manufacturer	L (m)	Part No.
Connector	172157-1		3	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 ²	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

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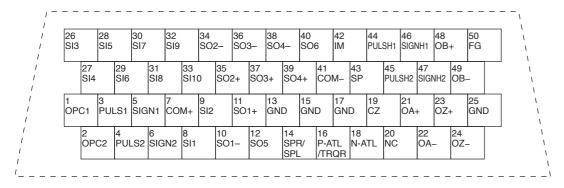
Connector Kit for Interface

Part No. DV0P4350

Components

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

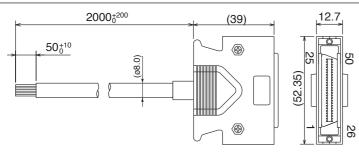
• Pin disposition (50 pins) (viewed from the soldering side)



- 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

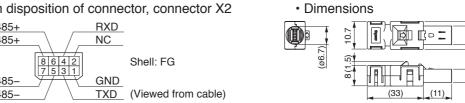
Connector Kit for Communication Cable (for RS485, RS232) (Excluding A5E Series)

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

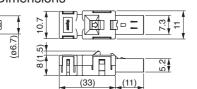
Components

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

· Pin disposition of connector, connector X3







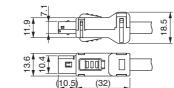
Connector Kit for External Scale (Excluding A5E Series)

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



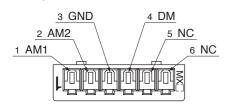
Connector Kit for Analog Monitor Signal

Part No. DV0PM20031

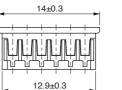
Components

Title	Part No.	Number	Manufacturer	Note	
Connector	510040600	1	Moley Inc	For Connector V7 (C nine)	
Connector pin	500118100	6	Molex Inc	For Connector X7 (6-pins)	

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

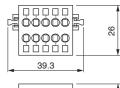
Part No. DV0PM20033 (For A to D-frame: Double row type)

Components

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

Dimensions







Part No. DV0PM20044 (For E-frame)

Components

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

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.	For Connector XA (D-Iranie)

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 (F frame)
Handle lever	.I-FAT-OT-I	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 TMfc 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	J.S.T Mfg. Co., Ltd.	200V: For Connector XC
Handle lever	J-FAT-OT-L	2		400V: For Connector XD ※ジャンパー線も付属しています。

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

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	J.S.T Mfg. Co., Ltd.	For Connector XB
Connector pin	J-FAT-OT	2		※ジャンパー線も付属しています。

120 121

Options Connector Kit

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

Components

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

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 frome)
Handle lever	J-FAT-OT-L	2	J.S.T Mfg. Co., Ltd.	For Connector XB (D-frame)

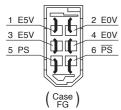
Connector Kit for Motor/Encoder Connection

Dort No	DV0D4200	Applicable	MSMD 50W to 750W, MHMD 200W to 750W
Part No.	rt No. DV0P4290	model	(absolute encoder type)

Components

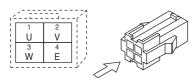
Title	Part No.	Number	Manufacturer	Note
Connector	55100-0670	1	Molex Inc	For Connector X6 (6-pins)
Connector	172161-1	1	Type Floatronics AMD	For junction cable to
Connector pin	170365-1	9	Tyco Electronics AMP	encoder (9-pins)
Connector	172159-1	1	Tyco Electronics AMP	For junction cable to
Connector pin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

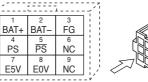
 Pin disposition of connector, connector X6



 Pin disposition of junction cable for motor power

 Pin disposition of junction cable for encoder





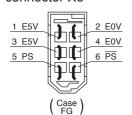
* When you connect the battery for absolute encoder, refer to P.125, "When you make your own cable for 17-bit absolute encoder"

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

Components

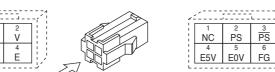
Title	Part No.	Number	Manufacturer	Note
Connector	55100-0670	1	Molex Inc	For Connector X6 (6-pins)
Connector	172160-1	1	Tyco Electronics AMP	For junction cable to encoder (6-pins)
Connector pin	170365-1	6		
Connector	172159-1	1	Tyco Electronics AMP	For junction cable to
Connector pin	170366-1	4		motor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

• Pin disposition of connector, connector X6



· Pin disposition of junction cable for motor power

• Pin disposition of junction cable for encoder





Part No. DV0PM20035

Applicable model MSME 50W	to 750W
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Components

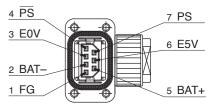
Title	Part No.	Number	Manufacturer	Note	
Connector	55100-0670	1	Molex Inc	For Connector X6 (6-pins)	
Encoder plug connector	JN6FR07SM1	1	Japan Aviation	For junction cable to	
Socket contact	LY10-C1-A1-10000	7	Electronics Ind.	encoder (7-pins)	
Motor plug connector	JN8FT04SJ1	1	Japan Aviation	For junction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

• Pin disposition of connector, • Pin disposition of junction cable connector X3

for motor power

2 V

· 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	DV0PM20036	Applicable	MSME 1.0kW to 2.0kW, MDME 1.0kW to 2.0kW MHME 1.0kW to 1.5kW, MGME 0.9kW	Without
	. D v 01 11120000	model	(All model 200V and 400V commonness)	brake

Components

1 E5V

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-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, del 200V and 400V	MGME	2.0kW to 3.0kW	Without 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-6A22-22SE-EB-R	1	Japan Aviation	For junction cable to	
Cable clamp	JL04-2022CK(14)-R	1	Electronics Ind.	motor power	

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Part No.	DV0PM20038	Applicable model	INDIVIE I UKVV 10 I OKVV INDIVIE U 9KVV	With brake

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-6A20-18SE-EB-R	1	Japan Aviation	For junction cable to	
Cable clamp	JL04-2022CK(14)-R	1	Electronics Ind.	motor power	

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
----------	------------	------------------	---	---------------

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	

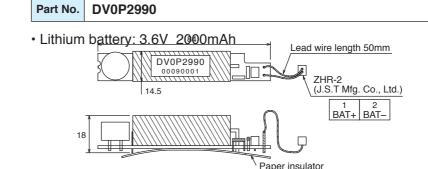
Connector Kit for Motor/Brake Connection

Part No. DV0PM20040

Components

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

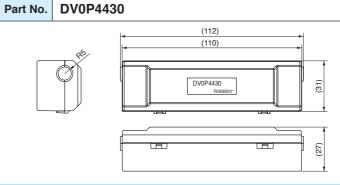
Battery For Absolute Encoder



<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

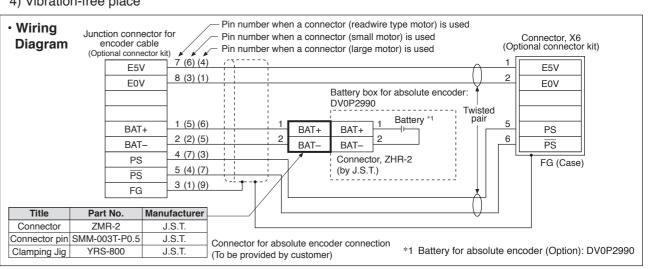


Fig.2 Α F: Center-to-cente

(Mou	unting pitch)	4-H	F—— counting pitch) — G		-to-center d er circular a							
	Part No.	Α	В	С	D	E(Max)	F	G	н	ı	Inductance (mH)	Rated curren (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
Eia 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

155

170

90

84+3/-0

100+3/-0

41±2

46±2

100±2

115±2

55±2

60±2

4-7φ×12

4-7Φ×12

4-5φ×10

4-5Φ×10

M5

M5

M4

M4

0.848

0.557

4.02

2

16

25

5

8

(113)

(113)

66.5±1

160Max

160Max

110Max

66.5±1 | 110Max

150±1

150±1

80±1

80±1

Harmonic restraint

60±1

60±1

55±0.7

55±0.7

DV0P224

DV0P225

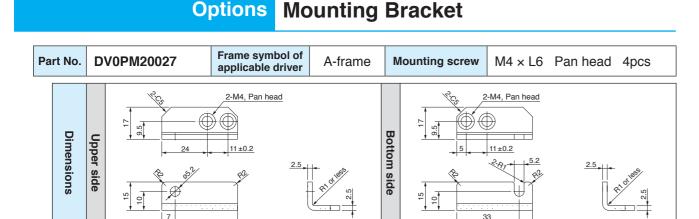
DV0P227

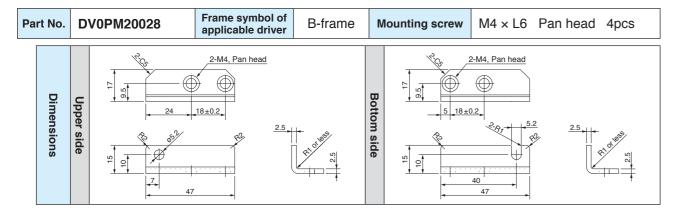
DV0P228

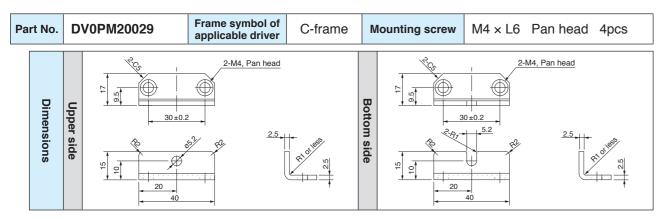
On September, 1994, "Guidelines for harmonic restraint on heavy consumers who receive power through high voltage system or extra high voltage system" and "Guidelines for harmonic restraint on household electrical appliances and general-purpose articles" established by the Agency for Natural Resources 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.







Pa	rt No.	D	V0PM20030	Frame symbol of applicable driver	D-frame	IV	lounting screw	M4 × L6 Pan head 4pcs
	Dimensions	Upper side	5 36±0.2	0.2		Bottom side	19 52 19 52 10	2-M4, Pan head 36±0.2 2.5 101 102 103 103 103 103 103 103

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).

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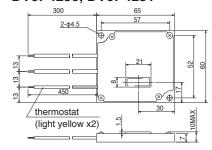
^{*} For application, refer to P.16, 17 "Table of Part Numbers and Options".

			Spe				
Part No.	Manufacturer's	Resistance	Rated power (reference) *				Activation
Part No.	part No.	Resistance	Free air	Free air with 1]	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	1
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]

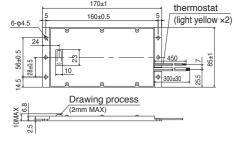
Manufacturer : Iwaki Musen Kenkyusho

* Power with which the driver can be used without activating the built-in thermostat.

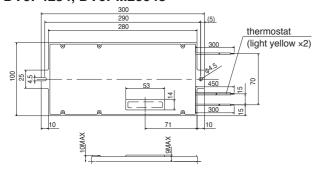
DV0P4280, DV0P4281



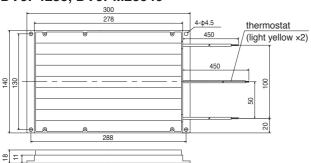
DV0P4282, DV0P4283



DV0P4284, DV0PM20048



DV0P4285, DV0PM20049



		D						
	Power supply							
Frame	Single phase, 100V	Single phase, 200V 3-phase, 200V	3-phase, 400V					
^	DV0D4000	DV0P4281						
Α	DV0P4280							
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>

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Regenerative resistor gets very hot.

Take preventive measures for fire and burns.

Avoid the installation near inflammable objects, and easily accessible place by hand.

	Motor	Part No.	Manufacturer
MSME	50W to 750W	Z15D271	Ishizuka Electronics Co.
MHME	2.0kW to 5.0kW		
MGME	0.9kW to 2.0kW		
MSME	1.0kW to 5.0kW	Z15D151	Ishizuka Electronics Co.
MDME	4.0kW to 5.0kW		
MGME	3.0kW		
MDME	1.0kW to 3.0kW	TND09V-820KB00AAA0	Ninnen Chemi Con Co
MHME	1.0kW to 1.5kW	INDUSV-02UKBUUAAAU	Nippon Chemi_Con Co.

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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	External scale
Sony Manufacturing Systems Corp.	81-3-3490-3920 http://www.sonysms.co.jp/	External Scale

^{*} The above list is for reference only. We may change the manufacturer without notice.

Information

Drive

Moto

Options

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
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Selecting Motor Capacity	F6
Request Sheet for Motor Selection	F12
Connection between Driver and Controller	F20
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Sales Office	F32

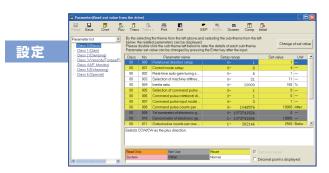
新しくなったセットアップ支援ソフトウェア「PANATERM」のご紹介

■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。

先進機能満載の次世代サポートツール

- · 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)。



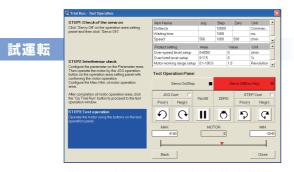
入力し易い階層別パラメータ表示



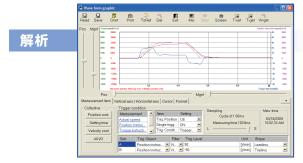
発振時剛性自動低減付きゲイン調 整専用画面追加



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

- 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 256MB or more (512MB recommended)		
	Memory			
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		
Disales	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/

AC servo motor capacity selection software

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

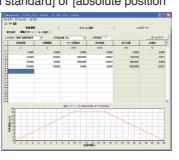
the real machine. To simulate the target machine as practical as possible, use maximum number of parameters available.



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

Option selection software for AC servo motor

Motor capacity AC servo motor capacity selection software

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.



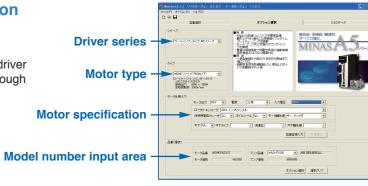
Option selection software for AC servo motor

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/

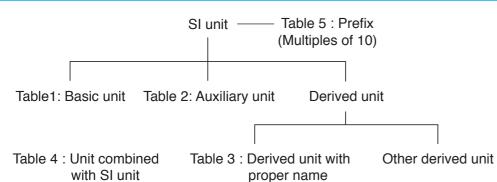


Table1: Basic unit

Quantity	Name of unit	Symbol of unit
Length	meter	m
Weight	kilogram	kg
Time	second	S
Current	ampere	Α
Thermodynamic temperature	kelvin	K
Amount of substance	mol	mol
Luminous intensity	candela	cd

Table 2: Auxiliary unit

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 ⁻¹
Force	newton	N	1N=1kg·m/s ²
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 ⁻¹
Magnetic flux	weber	Wb	1Wb=1V⋅s
Magnetic flux density, Magnetic induction	tesla	Т	1T=1Wb/m ²
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 ²

Table 4: Unit combined with SI unit

Quantity	Name	Symbol of unit
	minute	min
Time	hour	h
	day	d
	degree	•
Plane angle	minute	1
	second	п
Volume	liter	I, L
Weight	ton	t

Table 5: Prefix

Multiples powered	Prefix		
to unit	Name	Symbol	
10 ¹⁸	exa	Е	
10 ¹⁵	peta	Р	
10 ¹²	tera	T	
10 ⁹	giga	G	
10 ⁶	mega	M	
10 ³	kilo	k	
10 ²	hecto	h	
10	deca	da	
10 ⁻¹	deci	d	
10 ⁻²	centi	С	
10 ⁻³	milli	m	
10 ⁻⁶	micro	μ	
10 ⁻⁹	nano	n	
10 ⁻¹²	pico	р	
10 ⁻¹⁵	femto	f	
10 ⁻¹⁸	atto	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 ²	1Gal=10 ⁻² m/s ²
	G	m/s ²	1G=9.806 65m/s ²
Frequency	c/s, c	Hz	1c/s=Hz
Revolving speed, Number of revolutions	rpm	s ^{-1 or} min ⁻¹ , r/min	1rpm=1min ⁻¹
Weight	kgf	-	Same value
Mass	_	kg	Same value
Weight flow rate	kgf/s	-	Same value
Mass flow rate	_	kg/s	Same value
Specific weight	kgf/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 ⁻³ N
Moment of force	kgf-m	N-m	1kgf-m=9.806 N⋅m
Pressure	kgf/cm ²	Pa, bar (2) or kgf/cm ²	1kgf/cm ² =9.806 65 x 10 ⁴ Pa=0.980
	at (Engineering atmospheric pressure)	Pa	665bar
	atm (Atmospheric pressure)	Pa	1at=9.806 65 x 10 ⁴ Pa
	mH2o, mAq	Pa	1atm=1.013 25 x 10 ³ Pa
	mmHg	Pa or mmHg (2)	1mH ₂ O=9.806 65 x 10 ³ Pa
	Torr	Pa	1mmHg=133.322Pa
Stress	kgf/mm²	Pa or N/m ²	1kgf/mm ² =9.806 65 x 10 ⁴ Pa
			=9.806 65 x 10 ⁶ N/m ²
	kgf/cm ²	Pa or N/m ²	1kgf/cm ² =9.806 65 x 10 ⁴ Pa
			=9.806 65 x 10 ⁴ N/m ²
Elastic modulus	kgf/m²	Pa or N/m ²	1kgf/m ² =9.806 65Pa=9.806 65N/m ²
			1kgf/cm ² =9.806 65 x 10 ⁴ N/m ²
Energy, Work	kgf-m	J (joule)	1kgf·m=9.806 65J
	erg	J	1erg=10 ⁷ 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 ⁻² St=1mm ² /s
Thermodynamic temperature	К	K (kelvin)	1K=1K
Temperature interval	deg	K ⁽³⁾	1deg=1K
Amount of heat	cal	J	1cal=4.186 05J
Heat capacity	cal/°C	J/K ⁽³⁾	1cal/°C=4.186 05J/K
Specific heat, Specific heat capacity	cal/ (kgf⋅°C)	cal/ (kgf·K) ⁽³⁾	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	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/m ²	1kcal (h·m²)=1.162 79W/m²
Thermal conductivity	cal/ (h·m·°C)	W/ (m·K) (3)	1kcal (h·m·°C)=1.162 79W/ (m·K)
Coefficient of thermal conductivity	cal/ (h·m²·°C)	W/ (m ² ·K) (3)	1kcal (h·m·°C)=1.162 79W/ (m²·K)
Intensity of magnetic field	Oe	A/m	1Oe=10 ² / (4π)A/m
Magnetic flux	Mx	Wb (weber)	1Mx=10 ⁻³ Wb
			T. Control of the Con

No

- (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.

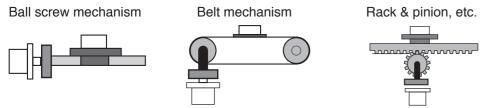
(3) "°C" can be substituted for "K".

Flow of motor selection

1. Definition of mechanism to be driven by motor.

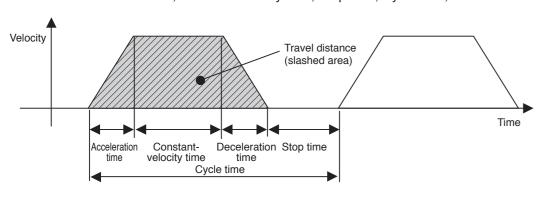
Define details of individual mechanical components (ball screw length, lead and pulley diameters, etc.)

<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 10⁻⁴kg·m²".

4. Calculation of motor velocity

Calculate the motor velocity from the moving distance, acceleration / deceleration time and constant-velocity time.

5. Calculation of torque

Calculate the required motor torque from the load inertia, acceleration/deceleration time and constant-velocity time.

6. Calculation of motor

Select a motor that meets the above 3 to 5 requirements.

1. Torque

(1) Peak torque

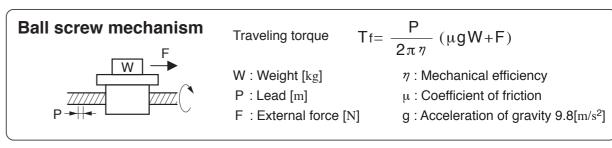
Indicate the maximum torque that the motor requires during operation (mainly in acceleration and deceleration steps). The reference value is 80% or less of the maximum motor torque. If the torque is a negative value, a regenerative discharge resistor may be required.

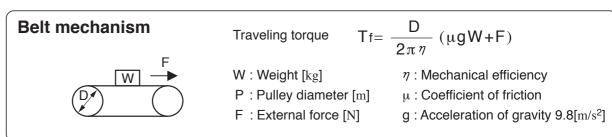
(2) Traveling torque, Stop holding torque

Description on the items related to motor selection

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.

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

 $T_a : Acceleration torque [N \cdot m] \qquad t_a : Acceleration time [s] \qquad t_c : Cycle time [s]$ $T_f : Traveling torque [N \cdot m] \qquad t_b : Constant-velocity time [s] \qquad (Run time + Stop time)$ $T_d : Deceleration torque [N \cdot m] \qquad t_d : Deceleration time [s]$

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.

Selecting Motor Capacity To drive ball screw mechanism

3. Inertia and inertia ratio

Inertia is like the force to retain the current moving condition.

Inertia ratio is calculated by dividing load inertia by rotor inertia.

Generally, for motors with 750 W or lower capacity, the inertia ratio should be "20" or less. For motors with 1000 W or higher capacity, the inertia ratio should be "10" or less.

If you need quicker response, a lower inertia ratio is required

/ For example, when the motor takes several seconds in acceleration step, the inertia ratio can be further \increased.

General inertia calculation method

Shape	J calculation formula	Shape	J calculation formula
Disk	$J = \frac{1}{8} WD^{2} [kg \cdot m^{2}]$ $W : Weight [kg]$ $D : Outer diameter [m]$	Hollow cylinder	$J = \frac{1}{8} W(D^2 + d^2) [kg \cdot m^2]$ $W : Weight [kg]$ $D : Outer diameter [m]$ $d : Inner diameter [m]$
Prism	$J = \frac{1}{12} W (a^{2} + b^{2}) [kg \cdot m^{2}]$ $W : Weight [kg]$ a, b, c : Side length [m]	Uniform rod	$J = \frac{1}{48} W(3D^2 + 4L^2)_{[kg \cdot m^2]}$ $W : Weight [kg]$ $D : Outer diameter [m]$ $L : Length [m]$
Straight rod	$J = \frac{1}{3} WL^{2} [kg \cdot m^{2}]$ $W : Weight [kg]$ $L : Length [m]$	Separated rod	$J = \frac{1}{8} WD^2 + WS^2 [kg \cdot m^2]$ $W : Weight [kg]$ $D : Outer diameter [m]$ $S : Distance [m]$
Reduction gear	Inertia on shaft "a" $J = J_1 + (\frac{n_2}{n_1})^2 J_2[kg \cdot m^2]$ $n_1 : \text{A rotational speed of a shaft } [r/min]$ $n_2 : \text{A rotational speed of b shaft } [r/min]$		
Conveyor	$J = \frac{1}{4} WD^{2} [kg \cdot m^{2}]$ $W : Workpiece weight on conveyor [kg]$ $D : Drum diameter [m]$ * 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 p [kg/m³] x Volume V[m³]

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

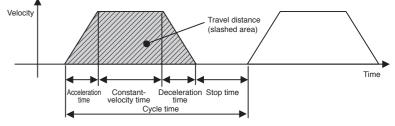
Workpiece weight WA = 10 [kg]Ball screw length BL = 0.5 [m]Ball screw diameter BD = 0.02 [m]Ball screw pitch BP = 0.02 [m]Ball screw efficiency $B\eta = 0.9$

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] $= 16.7 \times 60 = 1002 \text{ [min}^{-1}\text{]} < 3000 \text{ [min}^{-1}\text{]}$ (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 $Ta = \frac{(JL + JM) \times 2\pi N[r/s]}{Acceleration time [s]} + Traveling torque$ $= \frac{(1.73 \times 10^{-4} + 0.17 \times 10^{-4}) \times 2\pi \times 16.7}{0.1} + 0.035$ $= 0.199 + 0.035 = 0.234 [N \cdot m]$

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

= $\sqrt{\frac{0.234^2 \times 0.1 + 0.035^2 \times 0.8 + 0.164^2 \times 0.1}{2}}$
= 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)

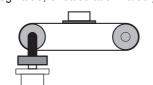
> Pulley diameter PD = 0.05[m]

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]

Constant- Deceleration Stop time velocity time

3. Load inertia JL = JC + JB + JP

= JC +
$$\frac{1}{4}$$
WA × PD² + $\frac{1}{8}$ WP × PD² × 2
= 0 + $\frac{1}{4}$ × 3 × 0.05² + $\frac{1}{8}$ × 0.5 × 0.05² × 2
= 0.00219 = 21.9 × 10⁻⁴ [kg·m²]

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 = 21.9×10^{-4} / 1.31×10^{-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⁻¹] < 3000[min⁻¹] (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
$$T_d = \frac{(JL + JM)\,\times\,2\pi N[\,r/s\,]}{Deceleration\,time[s]} - Traveling\,torque$$

$$= \frac{(21.9\,\times\,10^{-4} + 1.31\,\times\,10^{-4})\,\times\,2\pi\,\times\,7.08}{0.1} - 0.092$$

9. Verification of maximum torque

Acceleration torque $Ta = 1.124[N \cdot m] < 7.1[N \cdot m]$ (Maximum torque of 750 W motor)

 $= 1.032 - 0.092 = 0.94[N \cdot m]$

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)

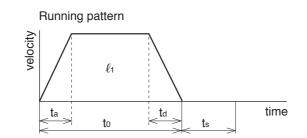
11. Judging from the above calculation result, selection of 750W motor is acceptable.

Customer Service Technical Support Center, Motor Company, Panasonic Corporation

Request for Motor Selection I : Ball screw drive

V:

F:



F Wa

14) Traveling direction (horizontal, vertical etc.)

2. Other data

6) Max. velocity

7) External force

10) Power supply voltage

12) Total length of the ball

13) Lead of the ball screw

11) Diameter of the ball screw

8) Positioning accuracy of the work load

9) Total weight of the work load and the table WA:

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

mm/s

kg

mm

kg

V

mm

mm

mm

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	Motor	side
1) Travel distance of the work load per one cycle	ℓ1:	mm	15) Diameter of the pulley	D ₁ : mn	D2:	mm
2) Cycle time	to:	S	16) Weight of the pulley	W ₁ : kç	y W2:	kg
(Fill in items 3) and 4) if required.)		(or item 17) and 18))			
3) Acceleration time	ta:	s	17) Width of the pulley	L ₁ :	mm	
4) Deceleration time	td:	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			
9) Total weight of the work load and the table	Wa:	kg	ta to	t _d t _s	time	_
10) Power supply voltage		V	F	WA	~ 1	
11) Diameter of the ball screw		mm				
12) Total length o the ball screw		mm				
13) Lead of the ball screw		mm			0	D2(W2
14) Traveling					WM	
			L ₁	D ₁ (V	/ 1)	

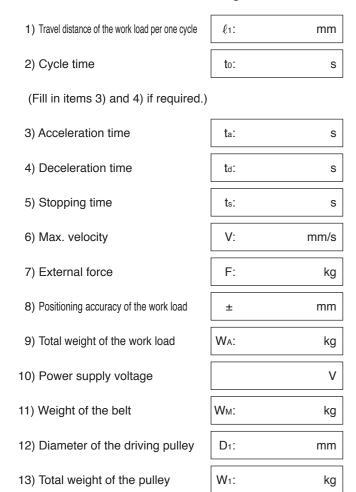
2. Other data

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

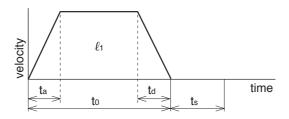
Company name :
Department/Section :
Name :
Name :
Address:
Tel:
Tel .
Fax:
E-mail address:

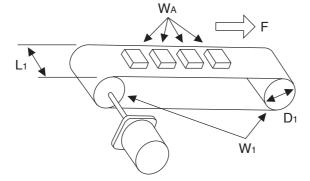
Request for Motor Selection **Ⅲ**: Belt drive

1. Driven mechanism and running data



Running pattern





(or item 14) and 15))

14)Width of the pulley

L1:	mm

15) Material of the pulley

1	
16) 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 IV: Timing pulley + Belt drive

Request Sheet for Motor Selection

1. Driven mechanis	sm and runr	ning	data			N	lotor side	Belt	side
1) Travel distance of the work	load per one cycle	ℓ1:		mm	16) Diameter of the pulley	D3:	mm	D4:	mn
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	18) Width of the pulley	/	L2:	mı	m
4) Deceleration time		t _d :		S	19) Material of the pul	ley			
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	f the work load	±		mm	<u>₹</u>	$ \setminus $			
9) Total weight of the work lo	ad and the table	WA:		kg	Λη (Λη (Λη (Λη (Λη (Λη (Λη (Λη (Λη (Λη (-
10) Power supply voltag	ge			V	ta to	t d t d	ts	time	Э
11) Weight of motor site	e belt	Wm:		kg				4	∑ `
	Motor side	Э	Belt	side			'	WL _	
12) Diameter of the pully	D ₁ :	mm	D2:	mm		WA			
13) Weight of the pulley	W ₁ :	kg	W2:	kg	D2(W2)			9//	
(or item 14) and 15))					W _M <				`
14) Weight of the belt		L ₁ :		mm					
15) Material of the pulle	ey						Î	Ďз(Wз)	
0. Other dete					D ₁ (W ₁)				

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:

ming pulley . Turntable drive

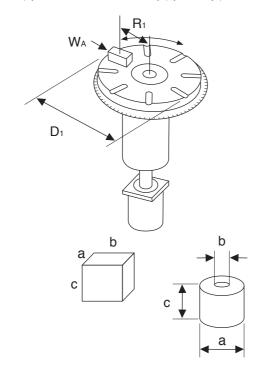
Request for Motor Selection	V	: Turntable drive

Driven mechanism and run	ning da	ata	
1) Travel distance of the work load per one cycle	dı:	deg	14) D
2) Cycle time	to:	S	
(Fill in items 3) and 4) if required.)			
3) Acceleration time	ta:	s	15) N
4) Deceleration time	t _d :	s	
5) Stopping time	ts:	s	
6) Max. rotational speed of the table	v:	deg/s	
(or)	V:	r/s	
7) Positioning accuracy of the work load	±	deg	
8) Weight of one work load	Wa:	kg	
9) Driving radius of the center of gravity of the	R ₁ :	mm	
10) Diameter of the table	D ₁ :	mm	
11) Mass of the table	W1:	kg	
12) Diameter of the table support	T ₁ :	mm	

		Prism			Cylinder
4) Dimensions of the work load	a:		mm	a:	mm
	b:		mm	b:	mm
	c:		mm	c:	mm

15) Number of work loads	pcs
15) Number of work loads	pcs

Running pattern d1 ta to td time



2. Other data

13) Power supply voltage

(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 V I	: Timing pulley + T	urntable	drive		
Driven mechanism and run	nning data		Motor sic	le	Turntal	ole side
1) Travel distance of the work load per one cycle	d1: deg	16) Diameter of the pulley	D ₂ :	mm	D3:	mm
2) Cycle time	to: s	17) Weight of the pulley	W ₂ :	kg	W 3:	kg
(Fill in items 3) and 4) if required.)		(or item 18) and 19))				
3) Acceleration time	ta: s	18) Width of the pulley		L ₁ :		mm
o) Acceleration time	ta. 3] 19) Material of the pulley	,			
4) Deceleration time	td: s					
5) Stopping time	ts: S	20) Weight of the belt		Wm:		kg
6) Max. rotating speed of the table	v: deg/s	Running pattern				
(or)	V: r/s	4				
7) Positioning accuracy of the work load	± deg	d-	'	\		
8) Weight of one work load	Wa: kg	ta to	t _d	t _s	→	time
9) Driving radius of the center of gravity of the	R ₁ : mm		W.	R ₁		
10) Diameter of the table	D ₁ : mm		WA			
11) Mass of the table	W ₁ : kg		D1			
12) Diameter of the table support	T ₁ : mm			••••		
13) Power supply voltage	V	D2(W2)		T) 🚤	

Request Sheet for Motor Selection

(Prism)

2. Other data

14) Dimension of the work load a:

15) Number of work loads

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

mm

mm

pcs

(Cylinder)

mm a:

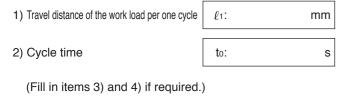
mm b:

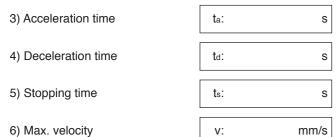
mm c:

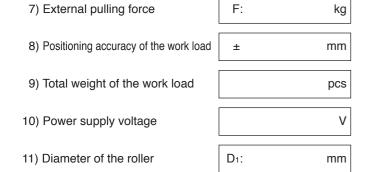
•	<i>5</i> ,
	Company name :
	Department/Section :
	Name :
	Address:
	Tel:
	Fax:
	E-mail address:

Request for Motor Selection VII: Roller feed drive

1. Driven mechanism and running data

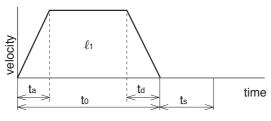


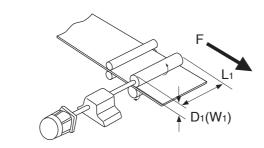




W₁:

Running pattern





(or item 13) and 14))

13)	Width	of the	e roller

L ₁ :	mm

14) Material of the roller

2. Other data

12) Mass of the roller

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

kg

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.)			2
3) Acceleration time	ta:	S	l ₁ γelocity
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	Los Solo
9) Total weight of the work load	WA:	kg	W ₃ & S
10) Power supply voltage		V	D ₃
11) Diameter of the pinion	D3:	mm	
12) Mass of the pinion	W3:	kg	
13) Traveling direction (horizontal, vertical, etc)			

2. Other data

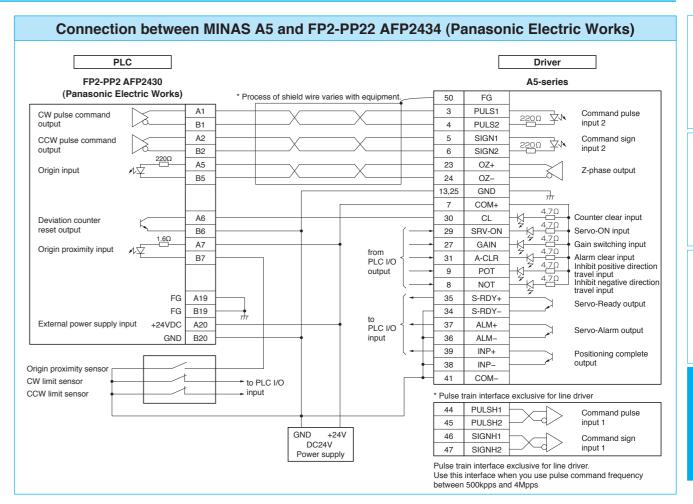
(Fill the details on specific mechanism and its configurations in the following blank.)

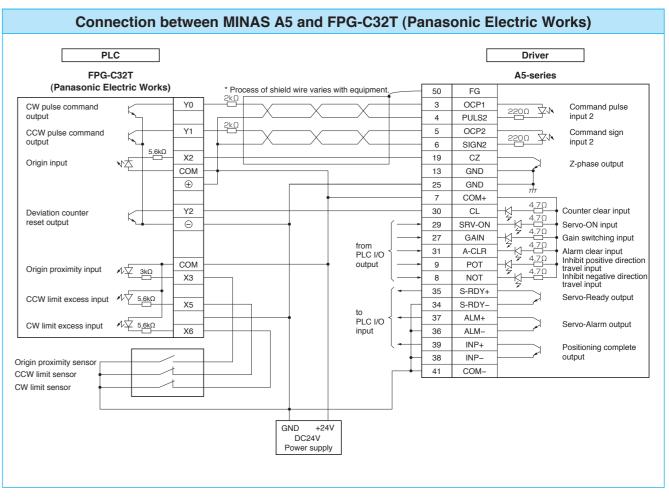
Company name :
Department/Section :
Name :
Address:
Tel:
Fax:
E-mail address:

Connection between MINAS A5 and FP2-PP22 AFP2434 (Panasonic Electric Works) PLC Driver FP2-PP22 AFP2434 A5-series (Panasonic Electric Works) FG 50 3 PULS₁ CW pulse command Command pulse 220Ω ∇Λ PULS2 B1 4 output A2 SIGN1 Command sign CCW pulse co 220Ω 🗘 🗘 B2 SIGN2 output 6 OZ+ 23 Origin input Z-phase output B3 24 OZ-13,25 GND 7 COM+ A7 CL Counter clear input 30 Deviation counte 4.7Ω Servo-ON input B7 29 SRV-ON Gain switching input B4 27 GAIN Origin proximity input 4.7Ω Alarm clear input A5 PLC I/O 31 A-CLR 4.7Ω Inhibit positive direction output 9 POT travel input Limit excess ① travel input Inhibit negative direction travel input 8 NOT 35 S-RDY+ Servo-Ready output Limit excess ⊖ B6 34 S-RDY-External power supply input +24VD0 A20 PLC I/O 37 ALM+ Servo-Alarm output input GND B20 36 ALM-39 INP+ Positioning complete output 38 INP-Origin proximity senso 41 COM-CW limit sensor CCW limit sensor * Pulse train interface exclusive for line driver 44 PULSH1 Command pulse 45 PULSH2 GND +24V 46 SIGNH1 Command sign DC24V 47 SIGNH2 Power supply Pulse train interface exclusive for line driver. Use this interface when you use pulse command frequency

Connection between MINAS A5 and FPG-PP12 AFPG432 (Panasonic Electric Works) PLC Driver FPG-PP12 AFPG432 A5-series (Panasonic Electric Works) 50 FG CW pulse command A1 3 PULS₁ Command pulse B1 4 PULS2 A2 5 SIGN1 Command sign CCW pulse command input 2 output B2 SIGN2 6 A4 23 OZ+ Origin input Z-phase output B3 24 OZ-GND 13,25 7 COM+ Α7 30 CL Counter clear input Deviation counter reset output B7 29 SRV-ON Servo-ON input B4 27 GAIN Gain switching input Origin proximity input A5 PLC I/O 31 A-CLR Alarm clear input Inhibit positive direction 9 POT travel input Inhibit negative direction travel input NOT FG A19 35 S-RDY+ Servo-Ready output S-RDY-B19 34 External power supply input +24VDC 37 A20 PLC I/O ALM+ Servo-Alarm output GND B20 36 ALM-39 INP+ Positioning complete INP-38 Origin proximity sensor 41 COM-CW limit sensor to PLC I/O CCW limit sensor * Pulse train interface exclusive for line driver 44 PULSH1 Command pulse 45 PULSH2 GND SIGNH1 46 Command sign DC24V input 1 Power supply Pulse train interface exclusive for line driver. Use this interface when you use pulse command frequency between 500kpps and 4Mpps

between 500kpps and 4Mpps





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DC24V

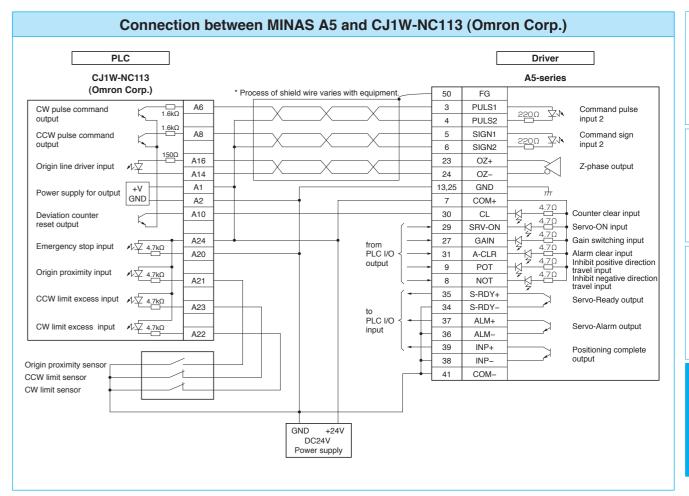
Power supply

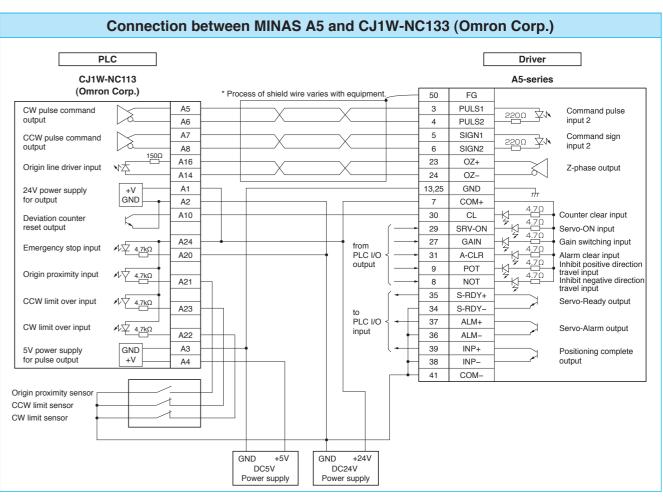
Use this interface when you use pulse command frequency

between 500kpps and 4Mpps

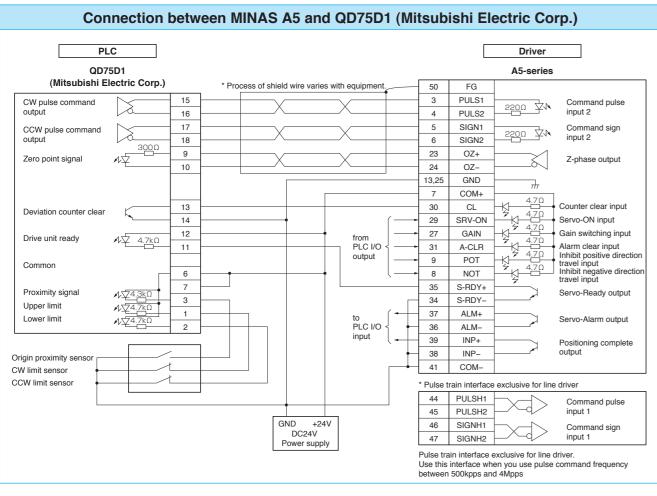
Connection between MINAS A5 and F3NC32-ON/F3NC34-ON (Yokogawa Electric Corp.) PLC Driver F3NC32-ON/F3NC34-ON A5-series (Yokogawa Electric Corp.) 50 FG 3a 3 PULS1 Command pulse Pulse output A 4a 4 PULS2 5a 5 SIGN1 Command sign Pulse output B input 2 6a SIGN2 Encoder Z-phase output + 6 19a 23 OZ+ Z-phase 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 S-RDY-8a 34 limit input PLC I/O 37 ALM+ Servo-Alarm output 36 ALM-9a limit input 39 INP+ Positioning complete Origin input INP-7a 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. DC24V Use this interface when you use pulse command frequency Power supply between 500kpps and 4Mpps

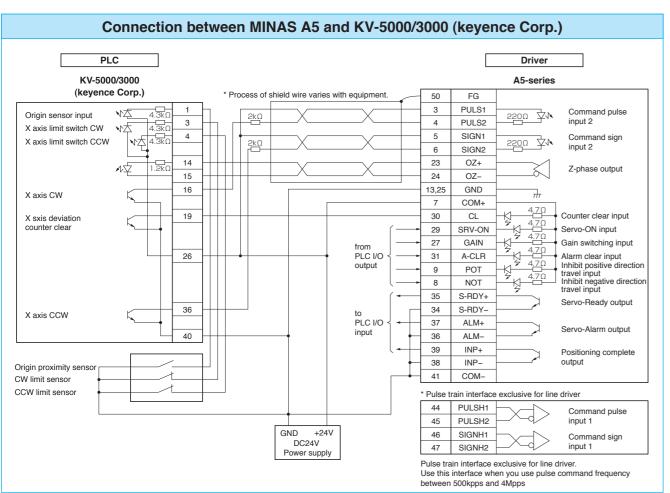
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Sales Office

[Panasonic Sales Office of Motors]

(Sep. 1. 2009)

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				82-2-805-2475
	Soonhan Engineering Co.,Ltd. Zeus Co.,Ltd.	Sungnam	333-11, Sangdaewon-Dong, Jungwon-Ku, Sungnam City, Kyungki-Do, 462-806, Korea	82-31-737-1660
Korea				82-31-732-9188
		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; http://industrial.panasonic.com/ww/i_e/25000/motor_fa_e/motor_fa_e.html

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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.