Panasonic
ideas for life

AC Servo
MINAS A5 series
2009/10
Catalog

High performance, multi function and easy use, all advanced.

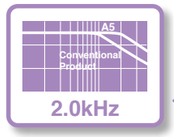
DIGITAL AC SERVO MOTOR & DRIVER

MINAS A5

AUDIN - 8, avenue de la malle - 51370 Saint Brice Courcelles - Tel : 03.26.04.20.21 - Fax : 03.26.04.28.20 - Web : http: www.audin.fr - Email : info@audin.fr

1 Quick

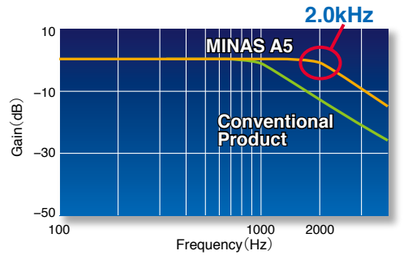
2.0 kHz frequency response



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.**

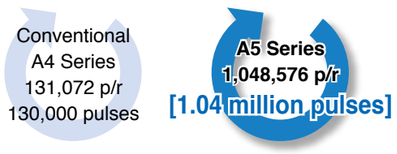


20 bits/revolution, 1.04 million pulses

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.

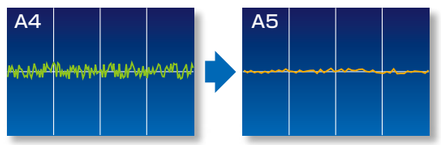


Low cogging torque (Excluding MSMD, MHMD type)

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.**



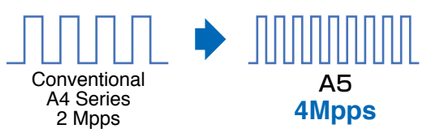
Vibration reduced to only **1/8**

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.



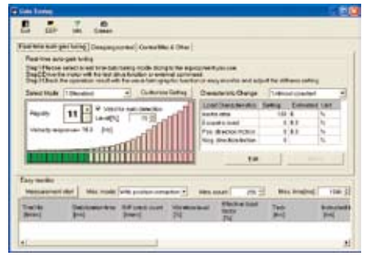
2 Smart

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 will be completed automatically after several operations. When the response is adjusted, **simple tuning** is supported with a change of 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.

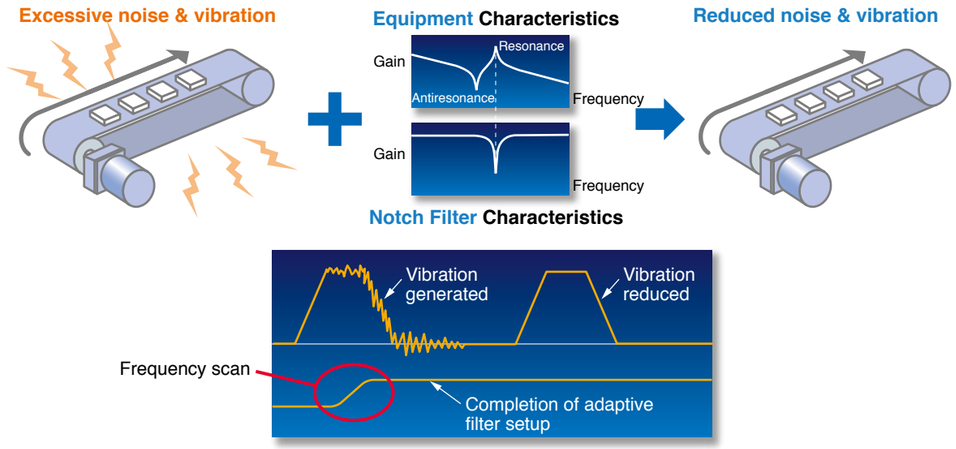


Manual/Auto Notch Filters

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.)



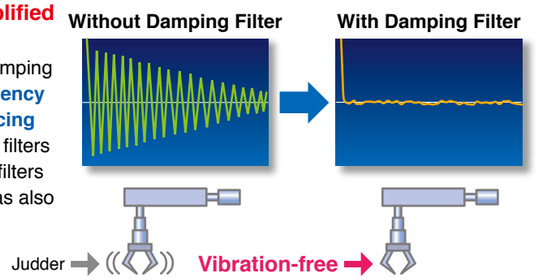
Manual/Auto Damping Filter

Damping filter

Example application: Chip mounters, food processing machinery, robots, general production machinery, etc.

Equipped with a damping filter featuring simplified 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.



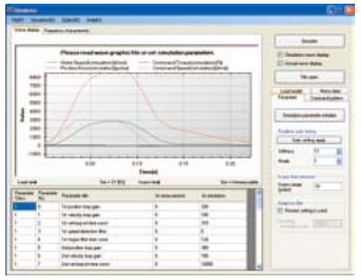
Motion Simulation

Simulation

Example application: General production machinery, etc.

Equipped with a simplified machine simulation function.

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



3 Light

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

New structure
Innovative core
Innovative encoder

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.**

[Examples for MSM or MDM]

	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

4 Safe

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

Safe torque off

Example application: Semiconductor and LCD production equipment, etc.

Complies with the latest European safety standards.

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

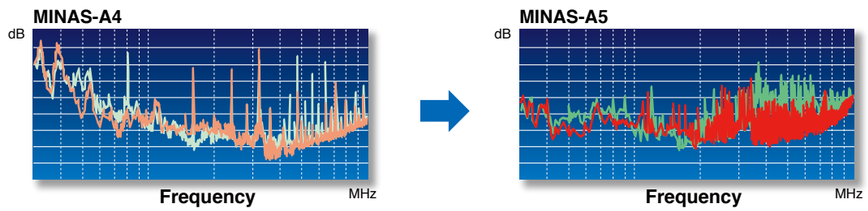
Low noise

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)

IP67

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

IP67 enclosure rating for increased environmental resistance

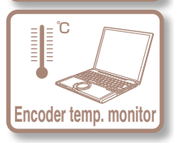
Our improved motor seals and direct-mount connectors in the motor power supply and encoder input-output areas contribute to this unit's IP67 enclosure rating.

Adoption of direct-mount connector

IP67
- Protection against dust
  - Protected against dust penetration when in full contact
- Protection against water
  - Protection against temporary immersion in water

IP65: MSMD, MHMD series

5 Easy



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.

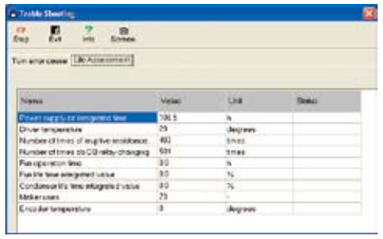
Encoder Temperature Monitor

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).

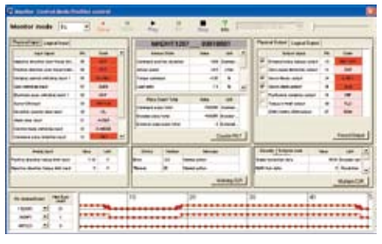
Other New Function

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.



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 Panasonic□s exclusive format) for supported scales (see table below).

SEMI F47

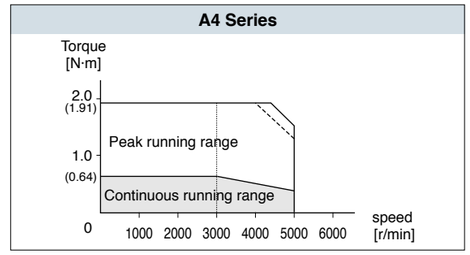
- Includes a function in compliance with the SEMI F47 standard for voltage sag immunity under no load or light load.
- Ideal for the semiconductor and LCD industries.

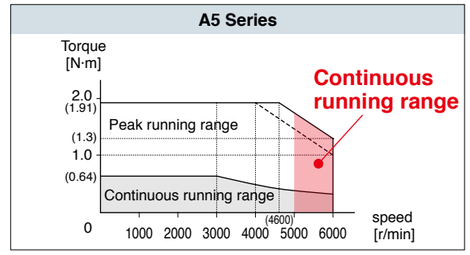
Notes:
1) Excluding the single-phase 100-V type.
2) Please verify the actual compliance of your machine with the F47 standard for voltage sag immunity.

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 speed after 4 × multiplication: 4 Mpps	
Serial Type (Incremental)	Sony Manufacturing Systems Corporation	SR75	0.01	3.3
		SR85	0.01	3.3
		SL700/PL101-RP	0.1	10
		SL710/PL101-RP	0.1	10
Serial Type (Absolute)	Mitutoyo Corporation	AT573A	0.05	2
		ST771A(L)	0.5	5
		ST773A(L)	0.1	4
	Sony Manufacturing Systems Corporation	SR77	0.01	3.3
		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.

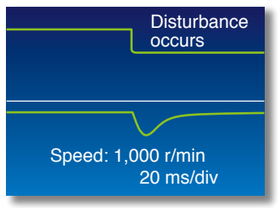
Parameter Initialization

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

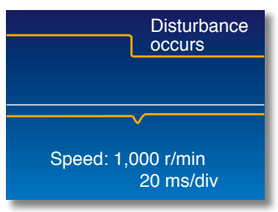
Disturbance Observer

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

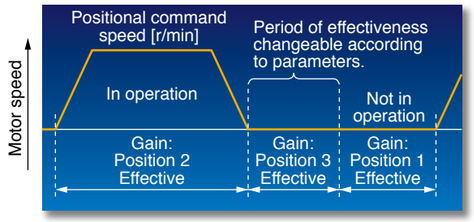
The Torque Feed Forward function performs a comparison with feedback and calculates the amount of torque to add to the necessary torque command in the command for actuation.

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
EC Directives	EMC Directives	EN55011 EN61000-6-2 IEC61800-3	—
	Low-Voltage Directives	EN61800-5-1	EN60034-1 EN60034-5
	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/ Driver and Motor Combination

Motor Line-up

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

(*) Except for output shaft, and connector.

Driver and Motor Combination

Driver		Motor						
Frame	Part No.	MSMD	MSME	MSME	MDME	MGME	MHMD	MHME
A-Frame	MADHT1105	MSMD5AZ✻✻✻	MSME5AZ✻✻✻					
	MADHT1107	MSMD011✻✻✻	MSME011✻✻✻					
	MADHT1505	MSMD5AZ✻✻✻	MSME5AZ✻✻✻					
		MSMD012✻✻✻	MSME012✻✻✻					
	MADHT1507	MSMD022✻✻✻	MSME022✻✻✻				MHMD022✻✻✻	
B-Frame	MBDHT2110	MSMD021✻✻✻	MSME021✻✻✻				MHMD021✻✻✻	
	MBDHT2510	MSMD042✻✻✻	MSME042✻✻✻				MHMD042✻✻✻	
C-Frame	MCDHT3120	MSMD041✻✻✻	MSME041✻✻✻				MHMD041✻✻✻	
	MCDHT3520	MSMD082✻✻✻	MSME082✻✻✻				MHMD082✻✻✻	
D-Frame	MDDHT3530				MDME102✻✻✻			MHME102✻✻✻
	MDDHT2412				MDME104✻✻✻			MHME104✻✻✻
	MDDHT5540			MSME102✻✻✻	MDME152✻✻✻	MGME092✻✻✻		MHME152✻✻✻
				MSME152✻✻✻				
	MDDHT3420			MSME104✻✻✻	MDME154✻✻✻	MGME094✻✻✻		MHME154✻✻✻
				MSME154✻✻✻				
E-Frame	MEDHT7364			MSME202✻✻✻	MDME202✻✻✻			MHME202✻✻✻
	MEDHT4430			MSME204✻✻✻	MDME204✻✻✻			MHME204✻✻✻
F-Frame	MFDHTA390			MSME302✻✻✻	MDME302✻✻✻	MGME202✻✻✻		MHME302✻✻✻
	MFDHT5440			MSME304✻✻✻	MDME304✻✻✻	MGME204✻✻✻		MHME304✻✻✻
	MFDHTB3A2			MSME402✻✻✻	MDME402✻✻✻	MGME302✻✻✻		MHME402✻✻✻
				MSME502✻✻✻	MDME502✻✻✻			MHME502✻✻✻
	MFDHTA464			MSME404✻✻✻	MDME404✻✻✻	MGME304✻✻✻		MHME404✻✻✻
				MSME504✻✻✻	MDME504✻✻✻			MHME504✻✻✻

Motor (Scheduled to be released.)
- MDME 7.5kW, 11kW, 15kW
- MHME 7.5kW
- MGME 4.5kW, 6.0kW
- MFME 1.5kW, 2.5kW, 4.5kW
- Motor with Gear Reduce: 100W, 200W, 400W, 750W

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

Model Designation

Servo Motor

M S M E 5 A Z G 1 S ✻ ✻

Symbol	Type
MSMD	Low inertia (50W to 750W)
MSME	Low inertia (50W to 5.0kW)
MDME	Middle inertia (1.0kW to 5.0kW)
MGME	Middle inertia (0.9kW to 3.0kW)
MHMD	High inertia (200W to 750W)
MHME	High inertia (1.0kW to 5.0kW)

Motor 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
08	750W	40	4.0kW
09	0.9kW	50	5.0kW

Voltage specifications

Symbol	Specifications
1	100V
2	200V
4	400V
Z	100V/200V common (50W only)

Rotary encoder specifications

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.

Design order
1 : Standard

Special specifications

Motor specifications
MSME(50W to 750W), MSMD, MHMD

Symbol	Shaft		Holding brake		Oil seal	
	Round	Key-way, center tap	without	with	without	with
A	●		●		●	
B	●			●	●	
C	●		●			●
D	●			●		●
S		●	●		●	
T		●		●	●	
U		●	●			●
V		●		●		●

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

Symbol	Shaft		Holding brake		Oil seal	
	Round	Key-way	without	with	without	with
C	●		●			●
D	●			●		●
G		●	●			●
H		●		●		●

Motor with reduction gear

M S M E 0 1 1 G 3 1 N

Symbol	Type
MSME	Low inertia (50W to 750W)

Motor rated output

Symbol	Rated output
01	100W
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

* S: can be used in incremental.

Gear ratio, gear type

Symbol	Gear reduction ratio	Motor output (W) 100	200	400	750	Gear type
1N	1/5	●	●	●	●	For high accuracy
2N	1/9	●	●	●	●	
3N	1/15	●	●	●	●	
4N	1/25	●	●	●	●	

Motor structure

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

Servo Driver

Standard type M A D H T 1 5 0 5 ✻ ✻ ✻ — **Special specifications**

Positioning type M A D H T 1 5 0 5 E ✻ ✻ — **Special specifications**

Only position control

Frame symbol

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

Power device Max. current rating

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

Supply voltage specifications

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

Current detector current rating

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

Table of Part Numbers and Options

Motor					Driver			Power capacity (atrated load)		Optional parts								
Motor series		Power supply	Output (W)	Part No. Note) 1	Part No. (Standard type)	Part No. (Positioning type)	Frame			Encoder cable		Motor cable		Brake cable Note) 2	Regenerative resistor	Reactor	Noise filter	
										20-bit Incremental Note) 2	17-bit Absolute Note) 2	without brake Note) 2	with brake Note) 2					
Low inertia	MSMD (Leadwire type) 3000r/min	Single phase 100V	50	MSMD5AZ□1＊	MADHT1105	MADHT1105E	A-frame	Approx. 0.4kVA		MFECA 0**0EAM	MFECA 0**0EAE	MFMCA 0**0EED	—	MFMCB 0**0GET	DV0P4280	DV0P227	DV0P4170	
			100	MSMD011□1＊	MADHT1107	MADHT1107E		Approx. 0.4kVA										
			200	MSMD021□1＊	MBDHT2110	MBDHT2110E	B-frame	Approx. 0.5kVA							DV0P4283	DV0P228		
			400	MSMD041□1＊	MCDHT3120	MCDHT3120E	C-frame	Approx. 0.9kVA							DV0P4282		DV0PM20042	
		Single phase/ 3-phase 200V	50	MSMD5AZ□1＊	MADHT1505	MADHT1505E	A-frame	Approx. 0.5kVA							DV0P4281	DV0P220		
			100	MSMD012□1＊	MADHT1505	MADHT1505E		Approx. 0.5kVA										
			200	MSMD022□1＊	MADHT1507	MADHT1507E		Approx. 0.5kVA									DV0PM20042	
			400	MSMD042□1＊	MBDHT2510	MBDHT2510E	B-frame	Approx. 0.9kVA							DV0P4283	DV0P221		
			750	MSMD082□1＊	MCDHT3520	MCDHT3520E	C-frame	Approx. 1.3kVA										
	MSME 3000r/min	Single phase 100V	50	MSME5AZ□1＊	MADHT1105	MADHT1105E	A-frame	Approx. 0.4kVA		MFECA 0**0MJD	MFECA 0**0MJE	MFMCA 0**0NJD	—	MFMCB 0**0PJT	DV0P4280	DV0P227	DV0P4170	
			100	MSME011□1＊	MADHT1107	MADHT1107E		Approx. 0.4kVA										
			200	MSME021□1＊	MBDHT2110	MBDHT2110E	B-frame	Approx. 0.5kVA							DV0P4283	DV0P228		
			400	MSME041□1＊	MCDHT3120	MCDHT3120E	C-frame	Approx. 0.9kVA							DV0P4282		DV0PM20042	
		Single phase/ 3-phase 200V	50	MSME5AZ□1＊	MADHT1505	MADHT1505E	A-frame	Approx. 0.5kVA							DV0P4281	DV0P220		
			100	MSME012□1＊	MADHT1505	MADHT1505E		Approx. 0.5kVA										
			200	MSME022□1＊	MADHT1507	MADHT1507E		Approx. 0.5kVA									DV0PM20042	
			400	MSME042□1＊	MBDHT2510	MBDHT2510E	B-frame	Approx. 0.9kVA							DV0P4283	DV0P221		
			750	MSME082□1＊	MCDHT3520	MCDHT3520E	C-frame	Approx. 1.3kVA										
	MSME 3000r/min	Single phase/ 3-phase 200V	1000	MSME102□1＊	MDDHT5540	MDDHT5540E	D-frame	Approx. 1.8kVA		MFECA 0**0ETD	MFECA 0**0ETE	MFMCD 0**2ECD	MFMCA 0**2FCD	—	DV0P4284	DV0P222	DV0P4220	
			1500	MSME152□1＊	MDDHT5540	MDDHT5540E		Approx. 2.3kVA										
		3-phase 200V	2000	MSME202□1＊	MEDHT7364	MEDHT7364E	E-frame	Approx. 3.3kVA							DV0P4285	DV0P223	DV0PM20043	
			3000	MSME302□1＊	MFDHTA390	MFDHTA390E	F-frame	Approx. 4.5kVA				MFMCA 0**3ECT	MFMCA 0**3FCT		DV0P4285 × 2 in parallel	DV0P224		
			4000	MSME402□1＊	MFDHTB3A2	MFDHTB3A2E		Approx. 6.0kVA								DV0P225	DV0P3410	
			5000	MSME502□1＊	MFDHTB3A2	MFDHTB3A2E		Approx. 7.5kVA								—		
		3-phase 400V	1000	MSME104□1＊	MDDHT3420	MDDHT3420E	D-frame	Approx. 1.8kVA				MFMCD 0**2ECD	MFMCE 0**2FCD		DV0PM20048	—	—	
			1500	MSME154□1＊	MDDHT3420	MDDHT3420E		Approx. 2.3kVA										
			2000	MSME204□1＊	MEDHT4430	MEDHT4430E	E-frame	Approx. 3.3kVA							DV0PM20049			
			3000	MSME304□1＊	MFDHT5440	MFDHT5440E	F-frame	Approx. 4.5kVA				MFMCA 0**3ECT	MFMCA 0**3FCT		DV0PM20049 × 2 in parallel			
			4000	MSME404□1＊	MFDHTA464	MFDHTA464E		Approx. 6.0kVA										
			5000	MSME504□1＊	MFDHTA464	MFDHTA464E		Approx. 7.5kVA										
Middle inertia	MDME 2000r/min	Single phase/ 3-phase 200V	1000	MDME102□1＊	MDDHT3530	MDDHT3530E	D-frame	Approx. 1.8kVA		MFECA 0**0ETD	MFECA 0**0ETE	MFMCD 0**2ECD	MFMCA 0**2FCD	—	DV0P4284	DV0P222	DV0P4220	
			1500	MDME152□1＊	MDDHT5540	MDDHT5540E		Approx. 2.3kVA										
		3-phase 200V	2000	MDME202□1＊	MEDHT7364	MEDHT7364E	E-frame	Approx. 3.3kVA							DV0P4285	DV0P223	DV0PM20043	
			3000	MDME302□1＊	MFDHTA390	MFDHTA390E	F-frame	Approx. 4.5kVA				MFMCA 0**3ECT	MFMCA 0**3FCT		DV0P4285 × 2 in parallel	DV0P224		
			4000	MDME402□1＊	MFDHTB3A2	MFDHTB3A2E		Approx. 6.0kVA								DV0P225	DV0P3410	
			5000	MDME502□1＊	MFDHTB3A2	MFDHTB3A2E		Approx. 7.5kVA								—		
		3-phase 400V	1000	MDME104□1＊	MDDHT2412	MDDHT2412E	D-frame	Approx. 1.8kVA				MFMCD 0**2ECD	MFMCE 0**2FCD		DV0PM20048	—	—	
			1500	MDME154□1＊	MDDHT3420	MDDHT3420E		Approx. 2.3kVA										
			2000	MDME204□1＊	MEDHT4430	MEDHT4430E	E-frame	Approx. 3.3kVA							DV0PM20049			
			3000	MDME304□1＊	MFDHT5440	MFDHT5440E	F-frame	Approx. 4.5kVA				MFMCA 0**3ECT	MFMCA 0**3FCT		DV0PM20049 × 2 in parallel			
			4000	MDME404□1＊	MFDHTA464	MFDHTA464E		Approx. 6.0kVA										
			5000	MDME504□1＊	MFDHTA464	MFDHTA464E		Approx. 7.5kVA										
	MGME 1000r/min	Single phase/ 3-phase 200V	900	MGME092□1＊	MDDHT5540	MDDHT5540E	D-frame	Approx. 1.8kVA		MFECA 0**0ETD	MFECA 0**0ETE	MFMCD0**2ECD	MFMCA0**2FCD	—	DV0P4284	DV0P222	DV0P4220	
		3-phase 200V	2000	MGME202□1＊	MFDHTA390	MFDHTA390E	F-frame	Approx. 3.8kVA				MFMCA 0**3ECT	MFMCA 0**3FCT		DV0P4285 × 2 in parallel	DV0P223	DV0P3410	
			3000	MGME302□1＊	MFDHTB3A2	MFDHTB3A2E		Approx. 4.5kVA								DV0P224		
		3-phase 400V	900	MGME094□1＊	MDDHT3420	MDDHT3420E	D-frame	Approx. 1.8kVA				MFMCD0**2ECD	MFMCE0**2FCD		DV0PM20048	—	—	
			2000	MGME204□1＊	MFDHT5440	MFDHT5440E	F-frame	Approx. 3.8kVA				MFMCA 0**3ECT	MFMCA 0**3FCT		DV0PM20049 × 2 in parallel			
			3000	MGME304□1＊	MFDHTA464	MFDHTA464E		Approx. 4.5kVA										
High inertia	MHMD (Leadwire type) 3000r/min	Single phase 100V	200	MHMD021□1＊	MBDHT2110	MBDHT2110E	B-frame	Approx. 0.5kVA		MFECA 0**0EAM	MFECA 0**0EAE	MFMCA 0**0EED	—	MFMCB 0**0GET	DV0P4283	DV0P228	DV0P4170	
			400	MHMD041□1＊	MCDHT3120	MCDHT3120E	C-frame	Approx. 0.9kVA							DV0P4282		DV0PM20042	
		Single phase/ 3-phase 200V	200	MHMD022□1＊	MADHT1507	MADHT1507E	A-frame	Approx. 0.5kVA							DV0P4283	DV0P220	DV0PM20042	
			400	MHMD042□1＊	MBDHT2510	MBDHT2510E	B-frame	Approx. 0.9kVA								DV0P221		
			750	MHMD082□1＊	MCDHT3520	MCDHT3520E	C-frame	Approx. 1.3kVA										
	MHME 2000r/min	Single phase/ 3-phase 200V	1000	MHME102□1＊	MDDHT3530	MDDHT3530E	D-frame	Approx. 1.8kVA		MFECA 0**0ETD	MFECA 0**0ETE	MFMCD 0**2ECD	MFMCA 0**2FCD	—	DV0P4284	DV0P222	DV0P4220	
			1500	MHME152□1＊	MDDHT5540	MDDHT5540E		Approx. 2.3kVA										
		3-phase 200V	2000	MHME202□1＊	MEDHT7364	MEDHT7364E	E-frame	Approx. 3.3kVA				MFMCE0**2ECD	MFMCE0**2FCD		DV0P4285	DV0P223	DV0PM20043	
			3000	MHME302□1＊	MFDHTA390	MFDHTA390E	F-frame	Approx. 4.5kVA				MFMCA 0**3ECT	MFMCA 0**3FCT		DV0P4285 × 2 in parallel	DV0P224		
			4000	MHME402□1＊	MFDHTB3A2	MFDHTB3A2E		Approx. 6.0kVA								DV0P225	DV0P3410	
			5000	MHME502□1＊	MFDHTB3A2	MFDHTB3A2E		Approx. 7.5kVA								—		
		3-phase 400V	1000	MHME104□1＊	MDDHT2412	MDDHT2412E	D-frame	Approx. 1.8kVA				MFMCD 0**2ECD	MFMCE 0**2FCD		DV0PM20048	—	—	
			1500	MHME154□1＊	MDDHT3420	MDDHT3420E		Approx. 2.3kVA				MFMCE0**2ECD			DV0PM20048			
			2000	MHME204□1＊	MEDHT4430	MEDHT4430E	E-frame	Approx. 3.3kVA										
			3000	MHME304□1＊	MFDHT5440	MFDHT5440E	F-frame	Approx. 4.5kVA				MFMCA 0**3ECT	MFMCA 0**3FCT		DV0PM20049 × 2 in parallel			
			4000	MHME404□1＊	MFDHTA464	MFDHTA464E		Approx. 6.0kVA										
			5000	MHME504□1＊	MFDHTA464	MFDHTA464E		Approx. 7.5kVA										

note)1 Rotary encoder specifications: □ Motor specification: ＊ (refer to P.13)

note)2 Cable length: ** (03: 3m, 05: 5m, 10: 10m, 20: 20m)

・Options

Title	構成品名		Part No.
Interface cable			DV0P4360
Interface Connector			DV0P4350
Connector for Power Supply Input Connection	A to D-frame (100V/200V)	Single row type	DV0PM20032
		Double row type	DV0PM20033
	E-frame (200V)		DV0PM20044
	D-frame (400V)		DV0PM20051
	E-frame (400V)		DV0PM20052
Connector for Control Power Supply Input Connection	D, E-frame (400V)		DV0PM20053
Connector for Motor Connection	A to D-frame		DV0PM20034
	E-frame (200V)		DV0PM20046
	D-frame (400V)		DV0PM20054
Connector for Regenerative Resistor	E-frame		DV0PM20045
	D-frame (400V)		DV0PM20055
Connector Kit for Motor/Encoder Connection			DV0P4290
			DV0P4380
			DV0PM20035
			DV0PM20036
			DV0PM20037
			DV0PM20038
			DV0PM20039
Connector Kit for Motor/Brake Connection			DV0PM20040
Connector	RS485, RS232		DV0PM20024
	Safety		DV0PM20025
	External Scale		DV0PM20026
	Encoder		DV0PM20010
	Analog Monitor Signal		DV0PM20031
Battery For Absolute Encoder			DV0P2990
Battery Box			DV0P4430
Mounting bracket	A-frame		DV0PM20027
	B-frame		DV0PM20028
	C-frame		DV0PM20029
	D-frame		DV0PM20030
Junction Cable for Encoder	without Buttery Box		MFECA0**0EAM
			MFECA0**0MJD
			MFECA0**0ETD
	with Buttery Box		MFECA0**0EAE
			MFECA0**0MJE
			MFECA0**0ETE
Junction Cable for Motor	without Brake		MFMCA0**0EED
			MFMCA0**0NJD
			MFMCD0**2ECD
			MFMCE0**2ECD
			MFMCA0**3ECT
	with Brake		MFMCA0**2FCD
			MFMCE0**2FCD
			MFMCA0**3FCT
Junction Cable for Brake			MFMCB0**0GET
			MFMCB0**0PJT
External Regenerative Resistor	50Ω 25W		DV0P4280
	100Ω 25W		DV0P4281
	25Ω 50W		DV0P4282
	50Ω 50W		DV0P4283
	30Ω 100W		DV0P4284
	20Ω 130W		DV0P4285
	120Ω 80W		DV0PM20048
	80Ω 190W		DV0PM20049
Reactor	DV0P220, DV0P221, DV0P222, DV0P223, DV0P224, DV0P225, DV0P227, DV0P228		
Noise Filter	DV0P4170, DV0PM20042 DV0P4220, DV0PM20043 DV0P3410		
Surge absorber	Single phase		DV0P4190
	3-phase(200V)		DV0P1450
	3-phase(400V)		DV0PM20050
Noise Filter for Signal Lines			DV0P1460

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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ISO14001 Certificate division
CERTIFICATE OF APPROVAL ISO14001

ISO9001 Certificate division
CERTIFICATE OF APPROVAL ISO9001

The contents of this catalog apply to the products as of Oct. 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.

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