Special Order Product

200 V MHME 5.0 kW [High inertia, Middle capacity]

• Please contact us for more information.

Specifications

			AC200 V	
Motor model *1	IP65		MHME502GC□M	MHME502SC□M
	IP67		–	–
Applicable driver *2	Model No.	A5Ⅱ series	MFDKTB3A2	
		A5ⅡE series	MFDKTB3A2E	–
	Frame symbol		F-frame	
Power supply capacity (kVA)			7.5	
Rated output (W)			5000	
Rated torque (N·m)			23.9	
Momentary Max. peak torque (N·m)			71.6	
Rated current (A(rms))			25.9	
Max. current (A(o-p))			110	
Regenerative brake frequency (times/min) Note)1	Without option		10	
	DV0P4285×2		76	
Rated rotational speed (r/min)			2000	
Max. rotational speed (r/min)			3000	
Moment of inertia of rotor (×10^{-4} kg·m^2)	Without brake		162	
	With brake		164	
Recommended moment of inertia ratio of the load and the rotor Note)3			5 times or less	
Rotary encoder specifications Note)5			20-bit Incremental	17-bit Absolute
	Resolution per single turn		1048576	131072

• Brake specifications (For details, refer to P.183)

(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

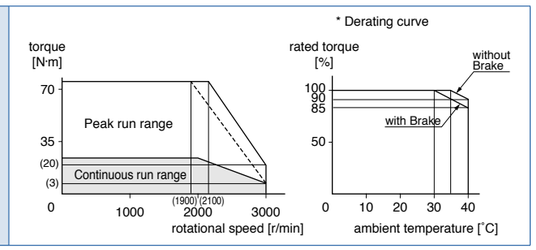
• Permissible load (For details, refer to P.183)

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

• For details of Note 1 to Note 5, refer to P.182, P.183.
• Dimensions of Driver, refer to P.45.
*1 Motor specifications: □
*2 The product that the end of driver model designation has “E” is “Position control type”. Detail of model designation, refer to P.152.

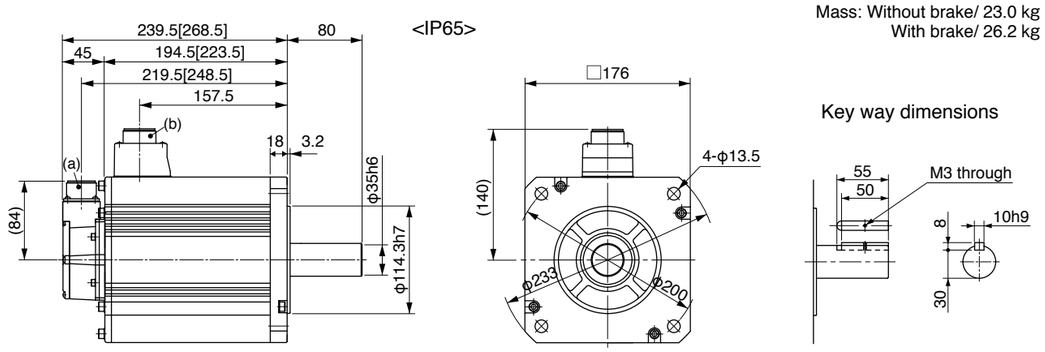
Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)

With oil seal



Dimensions

Mass: Without brake/ 23.0 kg
With brake/ 26.2 kg



(a) Encoder connector
(b) Motor/Brake connector

* Figures in [ ] represent the dimensions with brake.

[Unit: mm]

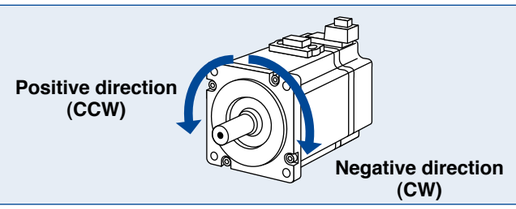
<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

Environmental Conditions

Item		Conditions
Ambient temperature *1		0 ˚C to 40 ˚C (free from freezing)
Ambient humidity		20 % to 85 % RH (free from condensation)
Storage temperature *2		–20 ˚C to 65 ˚C (Max.temperature guarantee: 80 ˚C for 72 hours free from condensation*5)
Storage humidity		20 % to 85 % RH (free from condensation*5)
Vibration	Motor only	50 W to 5.0 kW : Lower than 49 m/s^2 (5 G) at running, 24.5 m/s^2 (2.5 G) at stall 6.0 kW to 15.0 kW : Lower than 24.5 m/s^2 (2.5 G) at running, 24.5 m/s^2 (2.5 G) at stall
Impact	Motor only	Lower than 98 m/s^2 (10 G)
Enclosure rating (Motor only)	IP65 *3	MSMD, MHMD, MSMJ, MHMJ (except rotating portion of output shaft and readwire end.)
		M * ME (IP65 motor: 0.9 kW or more) (except rotating portion of output shaft and connecting pin part of the motor connector and the encoder connector)
	IP67 *3*4	M * ME IP67 motor (except rotating portion of output shaft and connecting pin part of the motor connector and the encoder connector)
Altitude		Lower than 1000 m

*1 Ambient temperature to be measured at 5 cm away from the motor.
*2 Permissible temperature for short duration such as transportation.
*3 These motors conform to the test conditions specified in EN standards (EN60529, EN60034-5). Do not use these motors in application where water proof performance is required such as continuous wash-down operation.
*4 This condition is applied when the connector mounting screw are tightened to the recommended tightening torque.
*5 Air containing water vapor will become saturated with water vapor as the temperature falls, causing dew.

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



Notes on [Motor specification] page

Note) 1. **[At AC100 V of power voltage]**
Regenerative brake frequency represents the frequency of the motor's stops from the rated speed with deceleration without load.
- If the load is connected, frequency will be defines as 1/(m+1), where m=load moment of inertia/ rotor moment of inertia.
- When the motor speed exceeds the rated speed, regenerative brake frequency is in inverse proportion to the square of (running speed/rated speed).
- Power supply voltage is AC115 V (at 100 V of the main voltage).
  If the supply voltage fluctuates, frequency is in inverse proportion to the square of (Running supply voltage/115) relative to the value in the table.
- When regeneration occurs continuously such cases as running speed frequently changes or vertical feeding, consult us or a dealer.

[At AC200 V of power voltage]
Regenerative brake frequency represents the frequency of the motor's stops from the rated speed with deceleration without load.
- If the load is connected, frequency will be defines as 1/(m+1), where m=load moment of inertia/ rotor moment of inertia.
- When the motor speed exceeds the rated speed, regenerative brake frequency is in inverse proportion to the square of (running speed/rated speed).
- Power supply voltage is AC230 V (at 200 V of the main voltage).
  If the supply voltage fluctuates, frequency is in inverse proportion to the square of (Running supply voltage/230) relative to the value in the table.
- When regeneration occurs continuously such cases as running speed frequently changes or vertical feeding, consult us or a dealer.

[At AC400 V of power voltage]

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

- If the load is connected, frequency will be defines as 1/(m+1), where m=load moment of inertia/ rotor moment of inertia.
- When the motor speed exceeds the rated speed, regenerative brake frequency is in inverse proportion to the square of (running speed/rated speed).
- Power supply voltage is AC460 V (at 400 V 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.

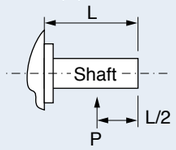
Note) 5. The 17-bit absolute encoder can also be used as a 17-bit incremental encoder.

Permissible Load at Output Shaft

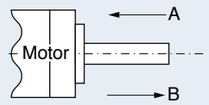
The radial load is defined as a load applied to the output shaft in the right-angle direction. This load is generated when the gear head is coupled to the machine using a chain, belt, etc., but not when the gear head is directly connected to the coupling. As shown in the right figure, the permissible 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.

Radial load (P) direction



Thrust load (A and B) direction



Built-in Holding Brake

In the applications where the motor drives the vertical axis, this brake would be used to hold and prevent the work (moving load) from falling by gravity while the power to the servo is shut off.

Use this built-in brake for "Holding" purpose only, that is to hold the stalling status. Never use this for "Brake" purpose to stop the load in motion.

• Output Timing of BRK-OFF Signal

- For the brake release timing at power-on, or braking timing at Servo-OFF/Servo-Alarm while the motor is in motion, refer to the Operating Instructions (Overall).
- With the parameter, Pr4.38 (Setup of mechanical brake action while the motor is in motion), you can set up a time between when the motor enters to a free-run from energized status and when BRK-OFF signal turns off (brake will be engaged), when the Servo-OFF or alarm occurs while the motor is in motion. For details, download a copy of the instruction manual from our website.

<Note>

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

• Specifications of Built-in Holding Brake

Motor series	Motor output	Static friction torque N·m	Rotor inertia $\times 10^{-4}$ kg·m^2	Engaging time ms	Releasing time ms	Exciting current DC A (at cool-off)	Releasing voltage DC V / Exciting voltage DC V	Permissible work (J) per one braking	Permissible total work $\times 10^3$ J	Permissible angular acceleration rad/s^2
MSMD	50 W, 100 W	0.29 or more	0.002	35 or less	20 or less	0.3	1 V or more / 24 ±1.2	39.2	4.9	30000
	200 W, 400 W	1.27 or more	0.018	50 or less	15 or less	0.36		137	44.1	
	750 W	2.45 or more	0.075	70 or less	20 or less	0.42		196	147	
MSME	50 W, 100 W	0.29 or more	0.002	35 or less	20 or less	0.3	1 V or more / 24 ±1.2	39.2	4.9	30000
	200 W, 400 W	1.27 or more	0.018	50 or less	15 or less	0.36		137	44.1	
	750 W(200 V)	2.45 or more	0.075	70 or less	20 or less	0.42		196	147	
	750 W(400 V)	2.5 or more	0.33	50 or less	15 or less (100)	0.7	2 V or more / 24 ±2.4	392	490	10000
	1.0 kW, 1.5 kW, 2.0 kW	7.8 or more				0.81				
	3.0 kW	11.8 or more		80 or less						
	4.0 kW, 5.0 kW	16.2 or more	1.35	110 or less	50 or less (130)	0.9		1470	2200	
MDME	400 W(400 V), 600 W(400 V)	2.5 or more	1.35	50 or less	15 or less	0.7	2 V or more / 24 ±2.4	392	490	10000
	1.0 kW	4.9 or more		80 or less	70 or less (200)	0.59		588	780	
	1.5 kW, 2.0 kW	13.7 or more		100 or less	50 or less (130)	0.79		1176	1500	
	3.0 kW	16.2 or more		110 or less		0.9		1470	2200	
	4.0 kW, 5.0 kW	24.5 or more	4.7	80 or less	25 or less (200)	1.3		1372	2900	5440
	7.5 kW	58.8 or more		150 or less	50 or less	1.4				5000
	11.0 kW, 15.0 kW	100 or more	7.1	300 or less	140 or less	1.08		2000	4000	3000
MFME	1.5 kW	7.8 or more	4.7	80 or less	35 or less	0.83	2 V or more / 24 ±2.4	1372	2900	10000
	2.5 kW	21.6 or more	8.75	150 or less	100 or less	0.75		1470	1500	
	4.5 kW	31.4 or more							2200	
MGME	0.9 kW	13.7 or more	1.35	100 or less	50 or less (130)	0.79	2 V or more / 24 ±2.4	1176	1500	10000
	2.0 kW	24.5 or more	4.7	80 or less	25 or less (200)	1.3		1372	2900	5440
	3.0 kW	58.8 or more		150 or less	50 or less (130)	1.4				
	4.5 kW, 6.0 kW				50 or less					5000
MHMD MSMJ MHMJ	200 W, 400 W	1.27 or more	0.018	50 or less	15 or less	0.36	1 V or more / 24 ±1.2	137	44.1	30000
	750 W	2.45 or more	0.075	70 or less	20 or less	0.42		196	147	
MHME	1.0 kW	4.9 or more	1.35	80 or less	70 or less (200)	0.59	2 V or more / 24 ±2.4	588	780	10000
	1.5 kW	13.7 or more		100 or less	50 or less (130)	0.79		1176	1500	
	2.0 kW～5.0 kW	24.5 or more	4.7	80 or less	25 or less (200)	1.3		1372	2900	5440
	7.5 kW	58.8 or more		150 or less	50 or less	1.4				5000

- 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.)