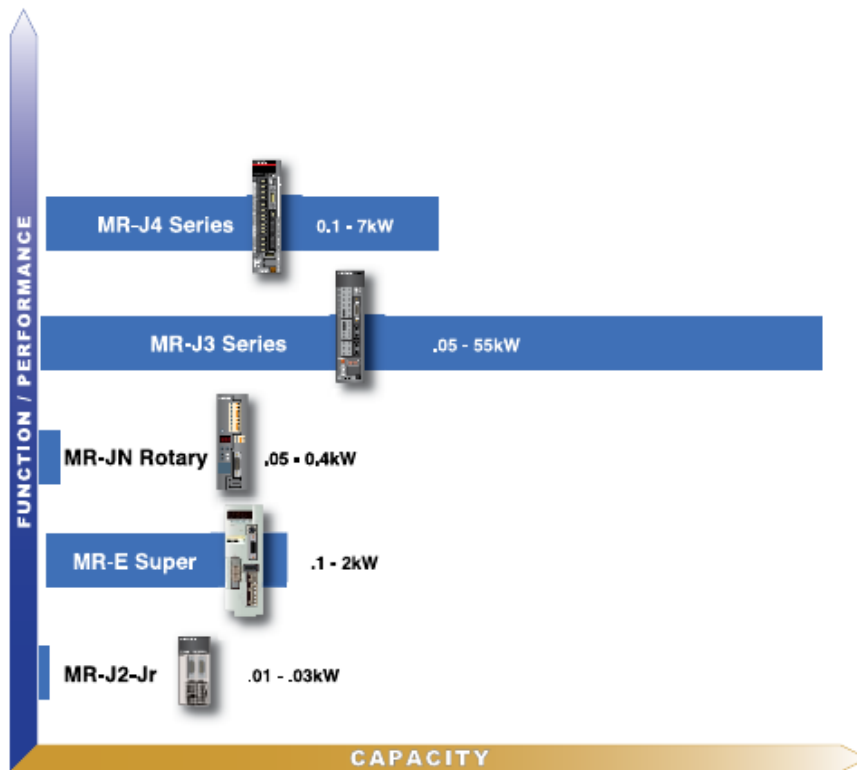


Servomotors and Amplifiers



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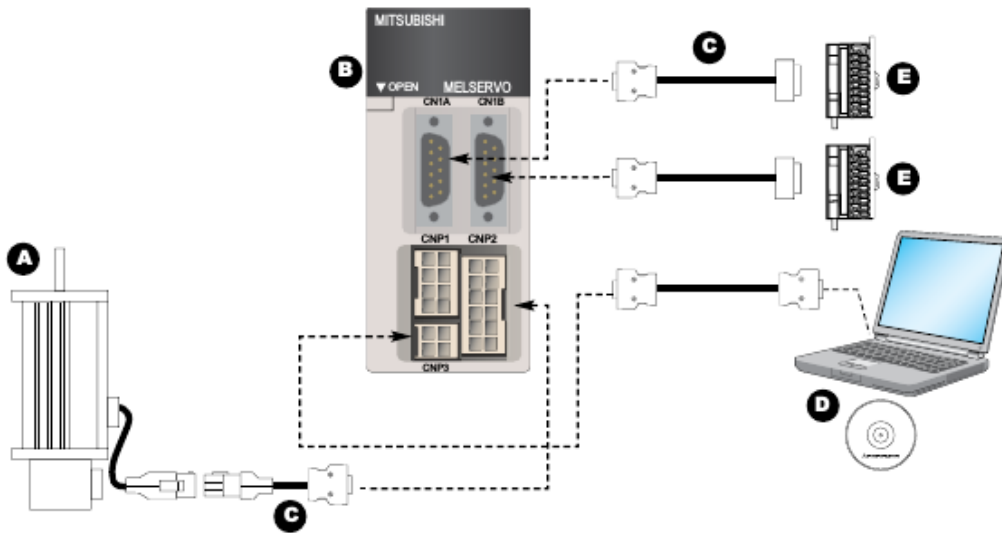
Note: Refer to the Motion Controller section of this catalog for the MR-MQ100 Single Axis Motion Controller.

Stock Product: Stock product is product MEAU makes every effort to have on hand for immediate shipment. There may be instances when we are out of stock due to unexpected large requirements. All stock product will be indicated in this book by an "S" in the Stocked Item columns/rows.

Non-Stock Product: Non-stock product is product supplied on an "as-needed" basis. Standard lead times of 12 - 16 weeks apply, product is non-returnable and non-cancelable. Product listed as non-stock may change to stock product subject to increases in sales and usage. All non-stock product will be indicated in this book by a dash "-" in the Stocked Item columns/rows.

MR-J2-JR Servomotors and Amplifiers

The ultimate servo system using the latest in servo technology operating at 24VDC input with: patented Real-Time Adaptive Tuning; RS-232C serial interface for Windows based set-up speed, positioning, and torque modes; low acoustic noise and a built-in parameter unit.



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A. MR-J2-JR Servomotors

Servomotor Selection

HC-AQ0 35 D

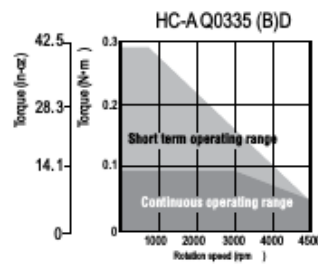
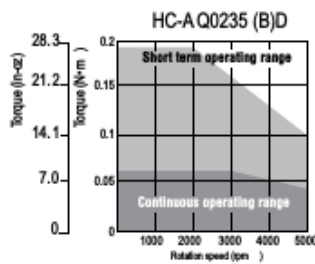
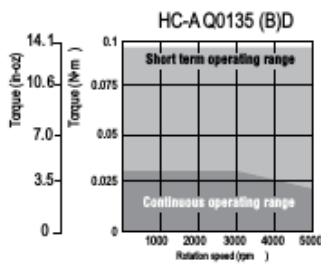
Symbol	Description
1	10 Watts
2	20 Watts
3	30 Watts

Symbol	Description
None	No brake installed
B	With an electromagnetic brake installed

Model Number	HC-AQ0135	HC-AQ0235	HC-AQ0335
Stocked Item	-	-	S (Non-B only)
Continuous Characteristics (*1, *2)	Rated Output kW	0.01	0.02
	Rated Torque N·m (oz·in)	0.0318 (4.503)	0.0637 (9.021)
Rated Speed (*1)	r/min	3000	
Maximum Speed	r/min	5000	4500
Instantaneous Permissible Speed	r/min	5750	5175
Maximum Torque	N·m (oz·in)	0.0955 (13.524)	0.191 (27.048)
Power at Continuous Rated Torque	kW/s	2.0	5.6
Inertia Moment (*4)	J [x 10 ⁴ kg·m ²]	0.0050	0.0072
	WK ² [oz·in ²]	0.027	0.039
Recommended Ratio of Load Inertia Moment to Servomotor Shaft Inertia Moment	30 times or less		
Power Supply Capacity	Refer to "Power supply capacity and generated loss of servo amplifier" in the Servo Amplifier Instruction Manual		
Rated Current (Maximum Current) (A)	2.4 (7.7)	2.4 (7.7)	2.3 (7.4)
Speed/Position Detector	Encoder (resolution: 8192 pulses/rev)		
Accessory	Encoder		
Insulation Class	Class B		
Structure	Totally-enclosed self-cooling (protection type: IP55 (*6))		
Environmental Conditions (*5)	Refer to Section 2.1 in the Servomotor Instruction Manual		
Weight kg (lb) (*3)	0.19 (0.419)	0.22 (0.485)	0.25 (0.551)

Notes:

- When the power supply voltage drops, we cannot guarantee the output and rated speed.
- 80% ED: Indicates the condition in which operation time at rated torque accounts for 80% and the other no load time accounts for 20% in a single operation cycle.
- When the servomotor is equipped with reduction gear or electromagnetic brake, refer to the corresponding outline dimension drawing. For the EN Standard and UL/cUL Standard compliant models, please contact Mitsubishi.
- If the load inertia moment ratio exceeds the indicated value, please contact Mitsubishi.
- When the equipment is to be used in places where it is subjected to oil and/or water, such as on machine field sites, optional features apply to the equipment.
- Except for the shaft-through portion and connector end.



B. MR-J2-JR Amplifiers

Amplifier Selection

MR-J2-03 5

Symbol	Description
A	Analog Speed, Analog Torque and Pulse Train Position
B	SSCNET high speed serial network
C	Built-in motion control (point table)

Model Number		MR-J2-03A5	MR-J2-03B5	MR-J2-03C5
Stocked Item		S	-	-
Circuit Power Supply (Note)	Voltage	21.6 to 30VDC (instantaneous permissible voltage 34V)		
	Power Supply Capacity	HC-AQ0135D	Continuous 0.8A, Max. 2.4A	
		HC-AQ0235D	Continuous 1.6A, Max. 4.8A	
	HC-AQ0335D	Continuous 2.4A, Max. 7.2A		
Control Circuit Power Supply (Note)		24VDC+10% 200mA (400mA when using the servomotor equipped with electromagnetic brakes)		
System		Sine-wave PWM control, current control system		
Dynamic Brake		Built-in		
Protective Functions		Overcurrent shut-off, regenerative overvoltage shut-off, overload shut-off, (electronic thermal relay), servomotor overheat protection, encoder fault protection, undervoltage, instantaneous power failure protection, overspeed protection, excessive error protection		
Speed Frequency Response		250Hz or more		
Structure		Open (IP00)		
Environment	Ambient Temperature	Operation °C (°F)	0 to +55 (non-freezing) (32 to +131 (non-freezing))	
		Storage °C (°F)	-20 to +65 (non-freezing) (-4 to +149 (non-freezing))	
	Ambient Humidity	Operation (Storage)	90%RH or less (non-condensing)	
	Atmosphere		Indoors (no direct sunlight), Free from corrosive gas, flammable gas, oil mist, dust and dirt	
	Altitude		Max. 1000m (3280 ft) above sea level	
	Vibration	m/s ² (ft/s ²)	5.9 or less (19.4 or less)	
Weight	kg (lb)	0.2 (0.44)		

Note: To comply with the low voltage directive, use a reinforced insulation stabilizing power supply.

C. Cables

Motor Type	Power/Encoder Cable Length	Power/Encoder Cable Model Number	Stocked Item
HC-AQ0135D or HC-AQ0135BD	2 Meter	MR-JRCBL2M-H	S
HC-AQ0135D or HC-AQ0135BD	5 Meter	MR-JRCBL5M-H	-
HC-AQ0135D or HC-AQ0135BD	10 Meter	MR-JRCBL10M-H	-
HC-AQ0235D or HC-AQ0235BD	2 Meter	MR-JRCBL2M-H	S
HC-AQ0235D or HC-AQ0235BD	5 Meter	MR-JRCBL5M-H	-
HC-AQ0235D or HC-AQ0235BD	10 Meter	MR-JRCBL10M-H	-
HC-AQ0335D or HC-AQ0335BD	2 Meter	MR-JRCBL2M-H	S
HC-AQ0335D or HC-AQ0335BD	5 Meter	MR-JRCBL5M-H	-
HC-AQ0335D or HC-AQ0335BD	10 Meter	MR-JRCBL10M-H	-

D. Software

Description	Model Number	Stocked Item
Windows Communication Software	MR-CONFIGURATOR	S
Communication Cable	MR-JRPCATCBL3M	S

Manuals

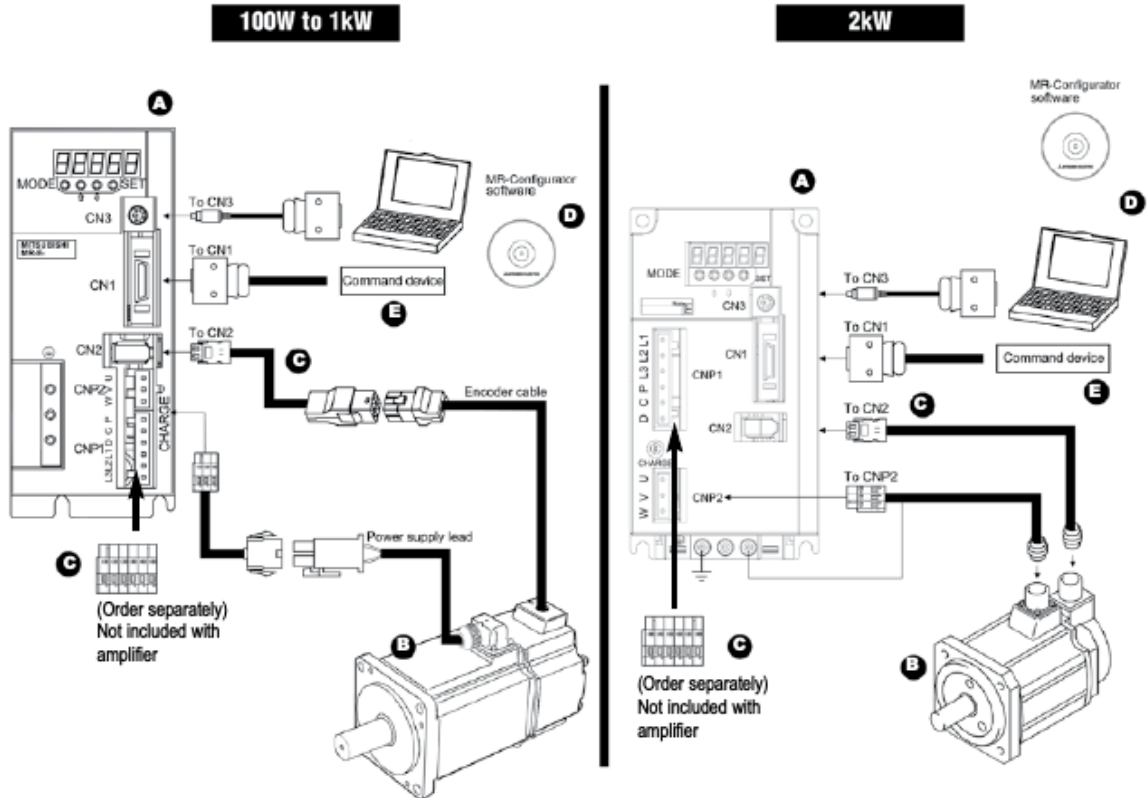
Description	Model Number	Stocked Item
MR-J2-03A5 Instruction Manual	SH(NA)3200	MEAU.com
MR-J2-03B5 Instruction Manual	SH(NA)030005	MEAU.com
MR-J2-03C5 Instruction Manual	SH(NA)3209	MEAU.com
Servomotor Instruction Manual	SH(NA)3181	MEAU.com

E. System Options

Description	Model Number	Stocked Item
Terminal Block	MR-TB20	S
Terminal Block Cable 0.5 Meter	MR-J2TBL05M	S
Terminal Block Cable 1.0 Meter	MR-J2TBL1M	S
Encoder Connector Kit (instead of MR-JRCBL_M-H Cable)	MR-JRCNM	-
CN1-I/O Connector Kit (contains 2 connectors, one each for CN1A & CN1B)	MR-J2CN1	S
CN1-I/O Pigtail Cables (one each optional for CN1A & CN1B)	MR-CCN1CBL-3M (3m length)	S
	MR-CCN1CBL-5M (5m length)	

MR-E Super Servomotors and Amplifiers

High performance and compact, the MR-E Super is an excellent choice for applications up to 2kW. The MR-E Super is available in pulse-train position or analog speed/torque models. The amplifier features Mitsubishi Electric's legendary auto-tuning and vibration suppression functions, a 400Hz analog frequency response, and accepts pulse commands up to 500kHz. The motors are low to medium inertia up to 4500rpm and are equipped with a 131,072 pulse per revolution encoder. Set-up and diagnosis is made easy with the MR-Configurator Windows® based software.



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A. MR-E Super Amplifiers

Amplifier Selection

MR-E-□□-KH003

Mitsubishi E-Series
general purpose AC
Servo Amplifier

Super Series

Symbol	Description
A	General Pulse Train Interface
AG	Analog Input Interface

Conforms to
the following
standards: EN,
UL, cUL

Symbol	Compatible Motor	
	HF-KE□□(B)W1-S100	HF-SE□□(B)W1-S100
10	13	-
20	23	-
40	43	-
70	73	52
100	-	102
200	-	152, 202

Servo Standard Specifications

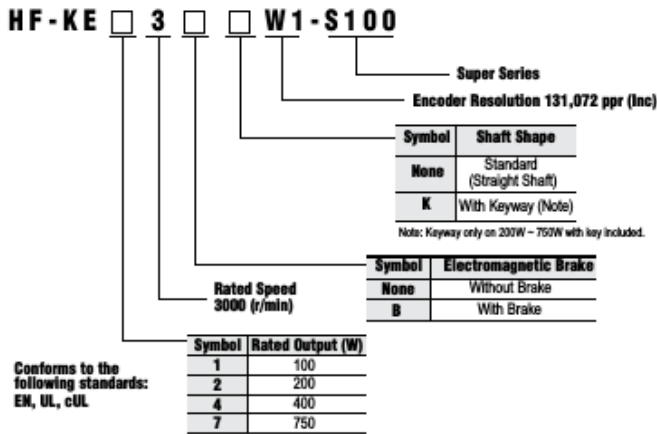
Servo Amplifier Model		MR-E-10A-KH003	MR-E-20A-KH003	MR-E-40A-KH003	MR-E-70A-KH003	MR-E-100A-KH003	MR-E-200A-KH003
		MR-E-10AG-KH003	MR-E-20AG-KH003	MR-E-40AG-KH003	MR-E-70AG-KH003	MR-E-100AG-KH003	MR-E-200AG-KH003
Stocked Item		S	S	S	S	S	S
Power Supply	Voltage/Frequency (*1)	3-phase 200 to 230VAC 50/60Hz or 1-phase 230VAC 50/60Hz				3-phase 200 to 230VAC 50/60Hz	
	Permissible Voltage Fluctuation	For 3-phase 200 to 230VAC: 3-phase 170 to 253VAC For 1-phase 230VAC: 1-phase 207 to 253VAC				3-phase 170 to 253VAC	
	Permissible Frequency Fluctuation	±5% maximum					
Control System		Sine-wave PWM control/current control system					
Dynamic Brake		Built-in					
Built-In Regenerative Resistor		None			Installed		
Safety Features		Overcurrent shutdown, regeneration overvoltage shutdown, overload shutdown (electronic thermal), encoder fault protection, regeneration fault protection, undervoltage/sudden power outage protection, overspeed protection, excess error protection					
A Type Amps	Position Control Mode	Maximum Input Pulse Frequency	1Mpps (when using differential receiver), 200 kpps (when using open collector)				
		Positioning Feedback Pulse	Resolution per encoder/servomotor rotation: 131072 p/rev				
		Command Pulse Multiple	Electronic gear A/B multiple, A: 1 to 65535, B: 1 to 65535, 1/50 < A/B < 50				
	Speed Control Mode	Positioning Complete Width Setting	0 to ±10000 pulses (command pulse unit)				
		Excess Error	±2.5 rotations				
		Torque Limit	Set by parameters				
AG Type Amps	Speed Control Mode	Speed Control Range	Internal speed command 1:5000				
		Speed Fluctuation Rate	±0.01% maximum (load fluctuation 0 to 100%) 0% (power fluctuation ±10%)				
		Torque Limit	Set by parameters				
	Torque Control Mode	Speed Control Range	Analog speed command 1:2000, internal speed command 1:5000				
		Analog Speed Command Input	0 to ±10VDC / rated speed				
Structure		Self-cooling open (IP00)				Fan cooling open (IP00)	
Environment	Ambient Temperature		0 to 55°C (32 to 131°F) (non-freezing), storage: -20 to 65°C (-4 to 149°F) (non-freezing)				
	Ambient Humidity		90% RH maximum (non-condensing), storage: 90% RH maximum (non-condensing)				
	Atmosphere		Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust				
	Elevation		1000m or less above sea level				
	Vibration		5.9m/s² maximum				
Weight kg (lb)		0.7 (1.5)	0.7 (1.5)	1.1 (2.4)	1.7 (3.7)	1.7 (3.7)	2.0 (4.4)

Note:

- Rated output and rated speed of a servomotor are applicable when the servo amplifier, combined with the servomotor, is operated within the specified power supply voltage and frequency. The torque drops when the power supply voltage is less than specified.

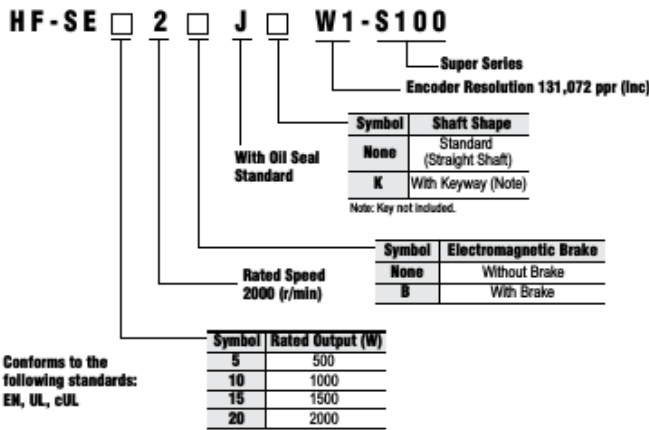
B. MR-E Super Servomotors

Servomotor Selection





Stocked Motors

Model Number
HF-KE13W1-S100
HF-KE13BW1-S100
HF-KE23KW1-S100
HF-KE23BKW1-S100
HF-KE43KW1-S100
HF-KE43BKW1-S100
HF-KE73KW1-S100
HF-KE73BKW1-S100



Stocked Motors

Model Number
HF-SE52JKW1-S100
HF-SE52BJKW1-S100
HF-SE102JKW1-S100
HF-SE102BJKW1-S100
HF-SE152JKW1-S100
HF-SE152BJKW1-S100
HF-SE202JKW1-S100
HF-SE202BJKW1-S100

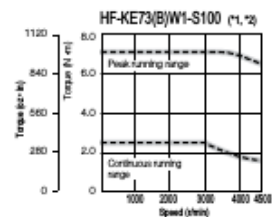
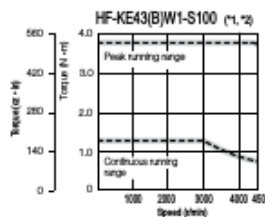
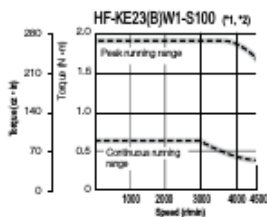
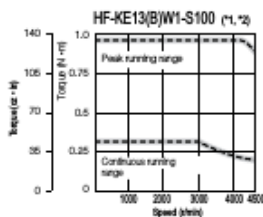
	Motor Series	Rated Speed (Max. r/min)	Rated Output Capacity (kW)	Servomotor Brake (B)	EN	UL, cUL	Protective Rating	Features	Application Examples
Small Capacity	 HF-KE Super Series	3000 (4500)	4 Types 0.1, 0.2, 0.4, 0.75	Yes	Yes	Yes	IP55 Excluding the shaft-through portion and connector	Stable control from low speeds to high speeds allows compliance with a variety of applications.	Belt Drive; Robots; Mounters; Sewing Machines; X-Y Tables; Food Processing Machines
Medium Capacity	 HF-SE Super Series	2000 (3000)	4 Types 0.5, 1.0, 1.5, 2.0	Yes	Yes	Yes	IP65 Excluding the shaft-through portion		Material Handling Systems; Robots; X-Y Tables

MR-E HF-KE Super 3000 r/min Series Servomotor Specifications

Servomotor Model	HF-KE13W1-S100	HF-KE23W1-S100	HF-KE43W1-S100	HF-KE73W1-S100	
Servomotor Model with Brake	HF-KE13BW1-S100	HF-KE23BW1-S100	HF-KE43BW1-S100	HF-KE73BW1-S100	
Compatible Servo Amplifier Model	MR-E-10A-KH003	MR-E-20A-KH003	MR-E-40A-KH003	MR-E-70A-KH003	
Compatible Servo Amplifier with Analog Input Interface	MR-E-10AG-KH003	MR-E-20AG-KH003	MR-E-40AG-KH003	MR-E-70AG-KH003	
Power Facility Capacity (kVA) (*1)	0.3	0.5	0.9	1.3	
Continuous Running Duty	Rated Output (W)	100	200	400	
	Rated Torque (N·m [oz·in])	0.32 (45.3)	0.64 (90.6)	1.3 (184)	2.4 (340)
Maximum Torque (N·m [oz·in])	0.95 (135)	1.9 (269)	3.8 (538)	7.2 (1020)	
Rated Speed (r/min)	3000				
Maximum Speed (r/min)	4500				
Permissible Instantaneous Speed (r/min)	5175				
Power Rate At Continuous Rated Torque (kW/s)	11.5	16.9	38.6	39.9	
Rated Current (A)	0.8	1.4	2.7	5.2	
Maximum Current (A)	2.4	4.2	8.1	15.6	
Regenerative Braking Frequency (Times/Min.) (*2, *3)	With No Options	(*4)	(*4)	249	
	MR-RB032 (30W)	(*4)	(*4)	747	
	MR-RB12 (100W)	-	(*4)	2490	
	MR-RB32 (300W)	-	-	2100	
Moment Of Inertia J (x10 ⁻⁴ kg·m ²) [J (oz·in ²)]	Standard	0.088 (0.481)	0.24 (1.31)	0.42 (2.30)	1.43 (7.82)
	With Electromagnetic Brake	0.090 (0.492)	0.31 (1.69)	0.50 (2.73)	1.63 (8.91)
Recommended Load/Motor Inertia Moment Ratio	Maximum of 15 times the servomotor's inertia moment (*5)				
Speed/Position Detector	Incremental encoder (resolution per servomotor rotation: 131072 p/rev)				
Structure	Totally enclosed non ventilated (protection level: IP55) (*6)				
Environment	Ambient Temperature	0 to 40°C (32 to 104°F) (non-freezing), storage: -15 to 70°C (5 to 158°F) (non-freezing)			
	Ambient Humidity	80% RH maximum (non-condensing), storage: 90% RH maximum (non-condensing)			
	Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust			
	Elevation/Vibration (*7)	1000m or less above sea level; X: 49m/s ² Y: 49m/s ²			
Weight kg (lb)	Standard	0.56 (1.3)	0.94 (2.1)	1.5 (3.3)	2.9 (6.4)
	With Electromagnetic Brake	0.86 (1.9)	1.6 (3.6)	2.1 (4.7)	3.9 (8.6)

Notes:

- The power facility capacity varies depending on the power supply's impedance.
- The regenerative braking frequency shows the permissible frequency when the motor, without a load and the optional regeneration unit, decelerates from the rated speed to a stop. When a load is connected; however, the value will be the table value/(m+1), where m—the load inertia moment/the motor inertia moment. When the operating speed exceeds the rated speed, the regenerative braking frequency is inversely proportional to the square of (operating speed/rated speed). If the operating speed changes frequently or when the regeneration is constant (as with vertical feeds), find the regenerative heating value (W) in operation. Provisions must be made to keep this heating value below the tolerable regenerative power (W). Optimal regenerative resistor varies for each system. Refer to the section "Optional Accessories - Regenerative Brake Options" in this catalog for details on the tolerable regenerative power (W).
- The regenerative braking frequency of the 600W or smaller servo amplifier may fluctuate due to the affect of the power voltage since the energy charged by the electrolytic capacitor in the servo amplifier is large.
- There are no limits on regeneration frequency as long as the effective torque is within the rated torque range. However, the load/motor of inertia moment ratio must be 15 times or less.
- Contact Mitsubishi if the load/motor of inertia moment ratio exceeds the value in the table.
- The shaft-through portion and connector for cable terminal are excluded.
- The vibration direction is shown in the right-side diagram. The numeric value indicates the maximum value of the component (commonly the bracket in the opposite direction of the motor shaft). Fretting of the bearing occurs easily when the motor stops, so maintain vibration to approximately one-half of the allowable value.



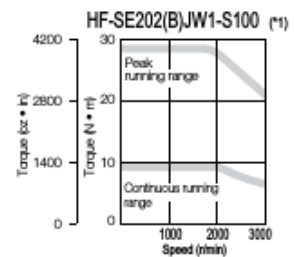
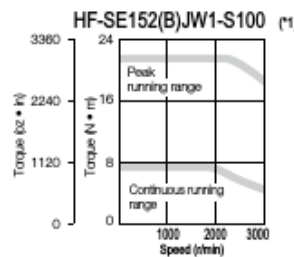
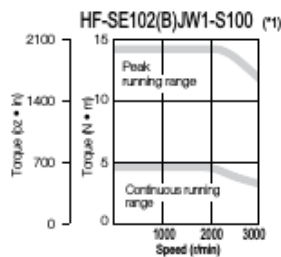
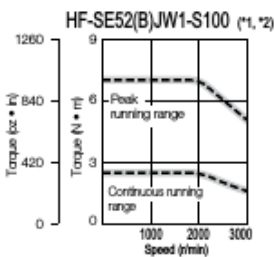
Notes:
 1. ———— : For 3-phase 230VAC.
 2. - - - - - : For 1-phase 230VAC.

MR-E HF-SE Super 2000 r/min Series Servomotor Specifications

Servomotor Model	HF-SE52JW1-S100	HF-SE102JW1-S100	HF-SE152JW1-S100	HF-SE202JW1-S100	
Servomotor Model With Brake	HF-SE52BJW1-S100	HF-SE102BJW1-S100	HF-SE152BJW1-S100	HF-SE202BJW1-S100	
Compatible Servo Amplifier Model	MR-E-70A-KH003	MR-E-100A-KH003	MR-E-200A-KH003		
Compatible Servo Amplifier with Analog Input Interface	MR-E-70AG-KH003	MR-E-100AG-KH003	MR-E-200AG-KH003		
Power Facility Capacity (kVA) (*1)	1.0	1.7	2.5	3.5	
Continuous Running Duty	Rated Output (kW)	1.0	1.5	2.0	
	Rated Torque (N·m [oz·in])	2.39 (338)	4.77 (675)	7.16 (1010)	9.55 (1350)
Maximum Torque (N·m [oz·in])	7.16 (1010)	14.3 (2020)	21.5 (3040)	28.6 (4050)	
Rated Speed (r/min)	2000				
Maximum Speed (r/min)	3000				
Permissible Instantaneous Speed (r/min)	3450				
Power Rate At Continuous Rated Torque (kW/s)	9.34	19.2	28.8	23.8	
Rated Current (A)	2.9	5.3	8.0	10	
Maximum Current (A)	8.7	15.9	24	30	
Regenerative Braking Frequency (Times / Min) (*2, *3)	With No Options	120	62	152	71
	MR-RB032 (30W)	180	93	-	-
	MR-RB12 (100W)	600	310	-	-
	MR-RB30 (300W)	-	-	456	213
	MR-RB32 (300W)	1800	930	-	-
MR-RB50 (500W)	-	-	760	355	
Moment Of Inertia J (x10 ⁻⁴ kg · m ²) [J (oz · in ²)]	Standard	6.1 (33.4)	11.9 (65.1)	17.8 (97.3)	38.3 (209)
	With Electromagnetic Brake	8.3 (45.4)	14.0 (76.5)	20.0 (109)	47.9 (262)
Recommended Load / Motor Inertia Moment Ratio	Maximum of 15 times the servomotor's inertia moment (*4)				
Speed / Position Detector	Incremental encoder (resolution per servomotor: 131072 p/rev)				
Attachments	Oil seal				
Structure	Totally enclosed non ventilated (protection level: IP65) (*5)				
Environment	Ambient Temperature	0 to 40°C (32 to 104°F) (non-freezing), storage: -15 to 70°C (5 to 158°F) (non-freezing)			
	Ambient Humidity	80% RH maximum (non-condensing), storage: 90% RH maximum (non-condensing)			
	Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust			
	Elevation	1000m or less above sea level			
	Vibration (*6)	X, Y: 24.5m/s ²		X: 24.5m/s ² • Y: 49m/s ²	
Weight kg (lb)	Standard	4.8 (11)	6.5 (15)	8.3 (19)	12 (27)
	With Electromagnetic Brake	6.7 (15)	8.5 (19)	11 (25)	18 (40)

Notes:

- The power facility capacity varies depending on the power supply's impedance.
- The regenerative braking frequency shows the permissible frequency when the motor, without a load and the optional regeneration unit, decelerates from the rated speed to a stop. When a load is connected; however, the value will be the table value/(m+1), where m=the load inertia moment/the motor inertia moment. When the operating speed exceeds the rated speed, the regenerative braking frequency is inversely proportional to the square of (operating speed/rated speed). If the operating speed changes frequently or when the regeneration is constant (as with vertical feeds), find the regenerative heating value (W) in operation. Provisions must be made to keep this heating value below the tolerable regenerative power (W). Optimal regenerative resistor varies for each system. Refer to the section "Optional Accessories • Regenerative Brake Options" in this catalog for details on the tolerable regenerative power (W).
- The regenerative braking frequency of the 600W or smaller servo amplifier may fluctuate due to the affect of the power voltage since the energy charged by the electrolytic capacitor in the servo amplifier is large.
- Contact Mitsubishi if the load/motor of inertia moment ratio exceeds the value in the table.
- The shaft-through portion is excluded.
- The vibration direction is shown in the right-side diagram. The numeric value indicates the maximum value of the component (commonly the bracket in the opposite direction of the motor shaft). Fretting of the bearing occurs easily when the motor stops, so maintain vibration to approximately one-half of the allowable value.



Notes:

- : For 3-phase 200VAC.
- - - : For 1-phase 230VAC.

