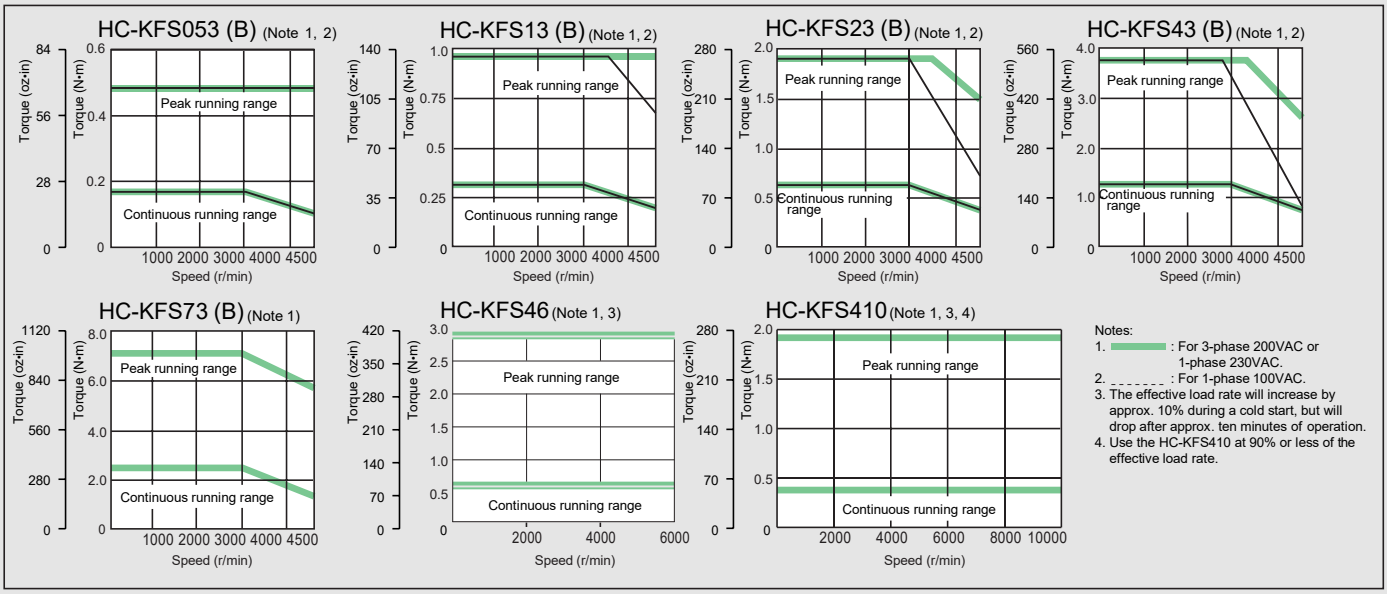
Motor Specifications and Characteristics

HC-KFS series servo motor specifications

Servo motor series			HC-KFS series (Low inertia, small capacity)					HC-KFS Ultra-high velocity series (Low inertia, small capacity)	
Models / Specifications		Servo motor model HC-KFS	053 (B)	13 (B)	23 (B)	43 (B)	73 (B)	46	410
		Servo-amp model (Note 9) MR-J2S-	10A (1)/B (1)/CP (1)/CL (1)		20A (1)/B (1)/CP (1)/CL (1)	40A (1)/B (1)/CP (1)/CL (1)	70A/B/CP/CL(Note 10)	70A/B/CP/CL-U005	70A/B/CP/CL-U006
Servo motor	Power facility capacity (Note 2) (kVA)		0.3	0.3	0.5	0.9	1.3	0.9	0.9
	Continuous running duty	Rated output (W)	50	100	200	400	750	400	
		Rated torque (N·m [oz·in])	0.16 (22.7)	0.32 (45.3)	0.64 (90.6)	1.3 (184.1)	2.4 (339.8)	0.64 (90.6)	0.38 (53.8)
	Maximum torque (N·m [oz·in])		0.48 (68.0)	0.95 (134.5)	1.9 (269.0)	3.8 (538.1)	7.2 (1019.5)	2.87 (406.4)	1.91 (270.5)
	Rated speed (r/min)		3000					6000	10000
	Maximum speed (r/min)		4500					6000	10000
	Permissible instantaneous speed (r/min)		5175					6900	11500
	Power rate at continuous rated torque (kW/s)		4.78	12.1	15.8	36.7	37.7	6.4	3.1
	Rated current (A)		0.83	0.71	1.1	2.3	5.8	2.9	2.9
	Maximum current (A)		2.5	2.2	3.4	6.9	18.6	12.9	14.5
	Regenerative braking frequency (times/min) (Note 3, 4)	With no options	(Note 5)	(Note 5)	(Note 5)	220	190	110	55
		MR-RB032 (30W)	(Note 5)	(Note 5)	(Note 5)	660	280	160	80
		MR-RB12 (100W)	—	—	(Note 5)	2200	940	550	275
		MR-RB32 (300W)	—	—	—	—	2800	1650	825
	Moment of inertia J ($\times 10^{-4}$kg·m^2) [J (oz·in^2)]	Standard	0.053 (0.29)	0.084 (0.459)	0.260 (1.422)	0.460 (2.515)	1.51 (8.255)	0.64 (3.499)	0.47 (2.569)
		With electromagnetic brake	0.056 (0.306)	0.087 (0.476)	0.310 (1.695)	0.510 (2.788)	1.635 (8.938)	—	—
	Recommended load/motor inertia moment ratio (Note 6)		Max. 15 times		Max. 24 times	Max. 22 times	Max. 15 times		
	Speed/position detector		17-bit encoder (Resolution per encoder/servo motor rotation: 131072 p/rev)						
	Attachments		—						
	Structure		Totally enclosed non ventilated (protection level: IP55) (Note 1, 7)						
	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 (Note 8)	1000m (3280ft) or less above sea level; X: 49m/s^2 Y: 49m/s^2					1000m (3280ft) or less above sea level; X, Y: 19.6m/s^2	
	Mass (kg [lb])	Standard	0.4 (0.88)	0.53 (1.17)	0.99 (2.18)	1.45 (3.19)	3.0 (6.61)	1.5 (3.30)	1.5 (3.30)
		With electromagnetic brake	0.75 (1.65)	0.89 (1.96)	1.6 (3.53)	2.1 (4.63)	4.0 (8.81)	—	—

Notes: 1. If used in location such as actual site of machinery where oil or water may contact the product, special specifications apply, so contact Mitsubishi.
2. The power facility capacity varies depending on the power supply's impedance.
3. The regenerative braking frequency shows the permissible frequency when the motor without a load decelerates from the rated speed to 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 in 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 regeneration heating value (W) while operating. Provisions must be made to keep the generated heat below the tolerable regenerative power (W). Optimal regenerative resistor varies for each system. Select the most suitable regenerative resistor by using the Servo Support software. Refer to the section "Options ● Optional regeneration unit" in this catalog for details on the tolerable regenerative power (W).
4. The regenerative braking frequency of the 600W or smaller servo amplifier may fluctuate with the affect of the power voltage due to the large energy ratio charged to the electrolytic capacitor in the servo amplifier.
5. 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 within the value in the table above.
6. The value is a ratio of load inertia moment to motor inertia moment. Contact Mitsubishi if the load/motor of inertia moment ratio exceeds the value in the table.
7. The shaft-through portion and connector for cable terminal are excluded.
8. 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.
9. MR-J2S-MCP (1)-S084 is also compatible. The compatible motor is the same as MR-J2S-MCP (1).
10. The HC-KFS series 750W is compatible with the following amplifier software version.
A type: Version A4 or above B type: Version A3 or above

HC-KFS series servo motor torque characteristics

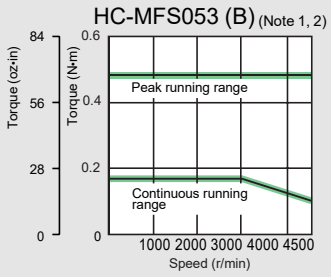


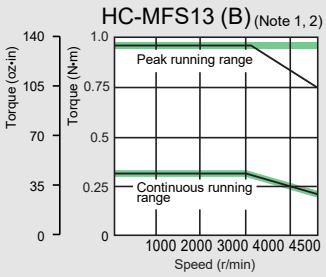
HC-MFS series servo motor specifications

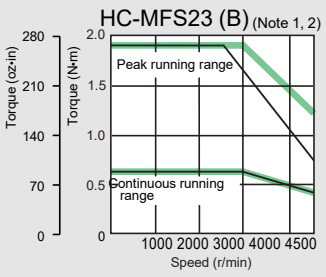
Servo motor series			HC-MFS series (Ultra-low inertia, small capacity)				
Models		Servo motor model HC-MFS	053 (B)	13 (B)	23 (B)	43 (B)	73 (B)
Specifications		Servo-amp model (Note 9) MR-J2S-	10A (1)/B (1)/CP (1)/CL (1)		20A(1)/B(1)/CP(1)/CL(1)	40A(1)/B(1)/CP(1)/CL(1)	70A/B/CP/CL
Servo motor	Power facility capacity (Note 2) (kVA)		0.3	0.3	0.5	0.9	1.3
	Continuous running duty	Rated output (W)	50	100	200	400	750
		Rated torque (N·m [oz·in])	0.16 (22.7)	0.32 (45.3)	0.64 (90.6)	1.3 (184.1)	2.4 (339.8)
	Maximum torque (N·m [oz·in])		0.48 (68.0)	0.95 (134.5)	1.9 (269.0)	3.8 (538.1)	7.2 (1019.5)
	Rated speed (r/min)		3000				
	Maximum speed (r/min)		4500				
	Permissible instantaneous speed (r/min)		5175				
	Power rate at continuous rated torque (kW/s)		13.47	34.13	46.02	116.55	94.43
	Rated current (A)		0.85		1.5	2.8	5.1
	Maximum current (A)		2.6		5.0	9.0	18
	Regenerative braking frequency (times/min) (Note 3, 4)	With no options	(Note 5)	(Note 5)	(Note 5)	1010	400
		MR-RB032 (30W)	(Note 5)	(Note 5)	(Note 5)	3000	600
		MR-RB12 (100W)	—	—	(Note 5)	(Note 5)	2400
		MR-RB32 (300W)	—	—	—	—	(Note 5)
	Moment of inertia J ($\times 10^{-4}$ kg·m^2) [J (oz·in^2)]	Standard	0.019 (0.104)	0.03 (0.164)	0.088 (0.481)	0.143 (0.782)	0.6 (3.28)
		With electromagnetic brake	0.022 (0.12)	0.032 (0.175)	0.136 (0.743)	0.191 (1.044)	0.725 (3.963)
	Recommended load/motor inertia moment ratio		30 times the servo motor's inertia moment maximum (Note 6)				
	Speed/position detector		17-bit encoder (Resolution per encoder/servo motor rotation: 131072 p/rev)				
	Attachments		—				
	Structure		Totally enclosed non ventilated (protection level: IP55) (Note 1, 7)				
	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 (Note 8)	1000m (3280ft) or less above sea level; X, Y: 49 m/s^2				
	Mass (kg [lb])	Standard	0.4 (0.88)	0.53 (1.17)	0.99 (2.18)	1.45 (3.19)	3.0 (6.61)
		With electromagnetic brake	0.75 (1.65)	0.89 (1.96)	1.6 (3.53)	2.1 (4.63)	4.0 (8.81)

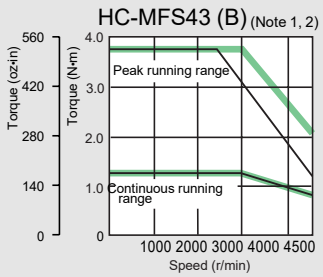
Notes:1. If used in location such as actual site of machinery where oil or water may contact the product, special specifications apply, so contact Mitsubishi.
2. The power facility capacity varies depending on the power supply's impedance.
3. The regenerative braking frequency shows the permissible frequency when the motor without a load decelerates from the rated speed to 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 in 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 regeneration heating value (W) while operating. Provisions must be made to keep the generated heat below the tolerable regenerative power (W). Optimal regenerative resistor varies for each system. Select the most suitable regenerative resistor by using the Servo Support software. Refer to the section "Options ● Optional regeneration unit" in this catalog for details on the tolerable regenerative power (W).
4. The regenerative braking frequency of the 600W or smaller servo amplifier may fluctuate with the affect of the power voltage due to the large energy ratio charged to the electrolytic capacitor in the servo amplifier.
5. 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 30 times or less.
6. Contact Mitsubishi if the load/motor of inertia moment ratio exceeds the value in the table.
7. The shaft-through portion and connector for cable terminal are excluded.
8. 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.
9. MR-J2S-MCP (1)-S084 is also compatible. The compatible motor is the same as MR-J2S-MCP (1).

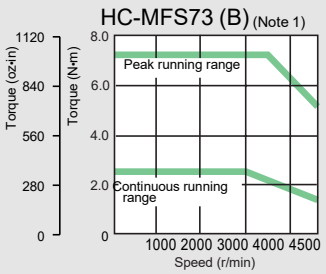
HC-MFS series servo motor torque characteristics











Notes:
1. ——— : For 3-phase 200VAC or 1-phase 230VAC.
2. - - - - - - - : For 1-phase 100VAC.

Motor Specifications and Characteristics

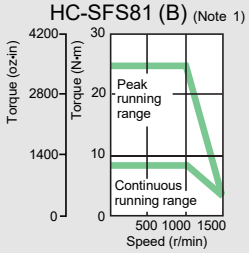
HC-SFS series servo motor specifications (200VAC type)

Servo motor series			HC-SFS1000 r/min series (Medium inertia, medium capacity)				HC-SFS2000 r/min series		
Models / Specifications		Servo motor model HC-SFS	81 (B)	121 (B)	201 (B)	301 (B)	52 (B)	102 (B)	152 (B)
		Servo-amp model (Note 7) MR-J2S-	100A/B/CP/CL (Note 8)	200A/B/CP/CL (Note 8)		350A/B/CP/CL (Note 8)	60A/B/CP/CL	100A/B/CP/CL	200A/B/CP/CL
Servo motor	Power facility capacity (Note 1) (kVA)		1.5	2.1	3.5	4.8	1.0	1.7	2.5
	Continuous running duty	Rated output (kW)	0.85	1.2	2.0	3.0	0.5	1.0	1.5
		Rated torque (N·m [oz·in])	8.12 (1149.8)	11.5 (1628.4)	19.1 (2704.6)	28.6 (4049.8)	2.39 (338.4)	4.78 (676.8)	7.16 (1013.9)
	Maximum torque (N·m [oz·in])		24.4 (3455.0)	34.4 (4871.0)	57.3 (8113.7)	85.9 (12163.4)	7.16 (1013.9)	14.4 (2039.0)	21.6 (3058.6)
	Rated speed (r/min)		1000				2000		
	Maximum speed (r/min)		1500	1200			3000		
	Permissible instantaneous speed (r/min)		1725	1380			3450		
	Power rate at continuous rated torque (kW/s)		32.9	30.9	44.5	81.3	8.7	16.7	25.6
	Rated current (A)		5.1	7.1	9.6	16	3.2	6	9
	Maximum current (A)		15.3	21.3	28.8	48	9.6	18	27
	Regenerative braking frequency (times/min) (Note2,3)	With no options	140	240	100	84	56	54	136
		MR-RB032 (30W)	220	—	—	—	165	80	—
		MR-RB12 (100W)	740	—	—	—	560	270	—
		MR-RB30 (300W)	—	730	330	250	—	—	408
		MR-RB31 (300W)	—	—	—	—	—	—	—
		MR-RB32 (300W)	2220	—	—	—	—	810	—
		MR-RB50 (500W) (Note 6)	—	1216	550	430	—	—	680
		MR-RB51 (500W) (Note 6)	—	—	—	—	—	—	—
	Moment of inertia J ($\times 10^{-4}$kg·m^2) [J (oz·in^2)]	Standard	20.0 (109)	42.5 (232)	82.0 (448)	101 (552)	6.6 (36.1)	13.7 (74.9)	20.0 (109)
		With electromagnetic brake	22.0 (120)	52.5 (287)	92.0 (503)	111 (607)	8.6 (47.0)	15.7 (85.8)	22.0 (120)
	Recommended load/motor inertia moment ratio		15 times the servo motor's inertia moment maximum (Note 4)						
	Speed/position detector		17-bit encoder (Resolution per encoder/servo motor rotation: 131072 p/rev)						
	Attachments		Oil seal						
	Structure		Totally enclosed non ventilated (protection level: IP65)						
	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 (3280ft) or less above sea level						
		Vibration (Note 5)	X,Y : 24.5m/s^2	X : 24.5m/s^2 Y : 49m/s^2		X : 24.5m/s^2 Y : 29.4m/s^2	X,Y : 24.5m/s^2		
	Mass (kg [lb])	Standard	9 (19.8)	12 (26.4)	19 (41.9)	23 (50.7)	5 (11.0)	7 (15.4)	9 (19.8)
		With electromagnetic brake	11 (24.2)	18 (39.7)	25 (55.1)	29 (63.9)	7 (15.4)	9 (19.8)	11 (24.2)

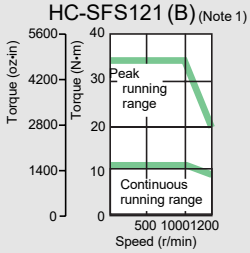
Notes:1. The power facility capacity varies depending on the power supply's impedance.
2. The regenerative braking frequency shows the permissible frequency when the motor without a load decelerates from the rated speed to stop. When a load is connected; however, the value will be the table value/(m+1), where m=the load inertia moment/the motor inertia moment. When the operating speed exceeds the rated speed, the regenerative braking frequency is in 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 regeneration heating value (W) while operating. Provisions must be made to keep the generated heat below the tolerable regenerative power (W). Optimal regenerative resistor varies for each system. Select the most suitable regenerative resistor by using the Servo Support software. Refer to the section "Options
● Optional regeneration unit" in this catalog for details on the tolerable regenerative power (W).
3. The regenerative braking frequency of the 600W or smaller servo amplifier may fluctuate with the affect of the power voltage due to the large energy ratio charged to the electrolytic capacitor in the servo amplifier.
4. Contact Mitsubishi if the load/motor of inertia moment ratio exceeds the value in the table.

HC-SFS series servo motor torque characteristics (200VAC type)

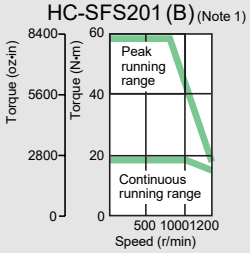
HC-SFS81 (B) (Note 1)



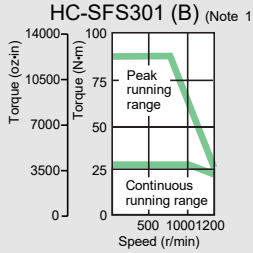
HC-SFS121 (B) (Note 1)



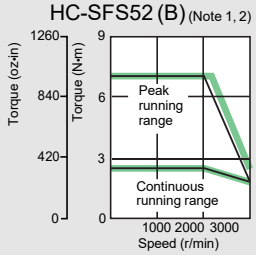
HC-SFS201 (B) (Note 1)



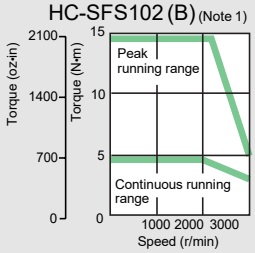
HC-SFS301 (B) (Note 1)



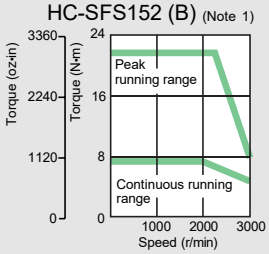
HC-SFS52 (B) (Note 1, 2)



HC-SFS102 (B) (Note 1)



HC-SFS152 (B) (Note 1)

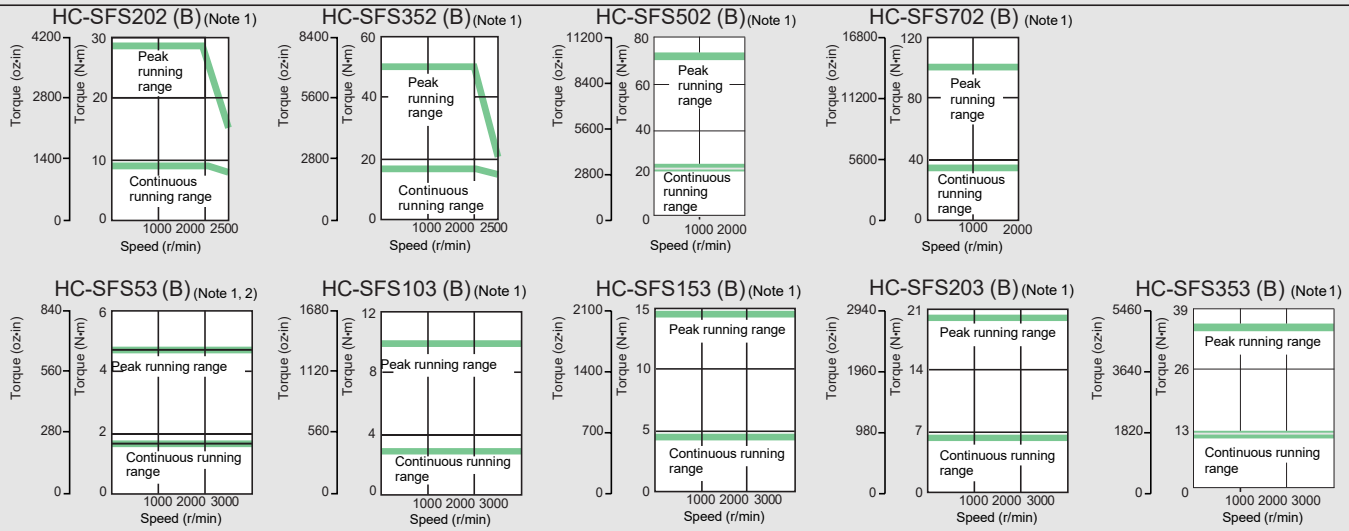


Notes:
1. ——— : For 3-phase 200VAC.
2. - - - - - - - : For 1-phase 230VAC.

Motor Specifications and Characteristics

(Medium inertia, medium capacity)				HC-SFS3000 r/min series (Medium inertia, medium capacity)				
202 (B)	352 (B)	502 (B)	702 (B)	53 (B)	103 (B)	153 (B)	203 (B)	353 (B)
200A/B/CP/CL	350A/B/CP/CL	500A/B/CP/CL (Note 9)	700A/B/CP/CL (Note 9)	60A/B/CP/CL (Note 10)	100A/B/CP/CL (Note 10)	200A/B/CP/CL (Note 10)		350A/B/CP/CL (Note 10)
3.5	5.5	7.5	10.0	1.0	1.7	2.5	3.5	5.5
2.0	3.5	5.0	7.0	0.5	1.0	1.5	2.0	3.5
9.55 (1352.3)	16.7 (2364.7)	23.9 (3384.2)	33.4 (4729.4)	1.59 (225.1)	3.18 (450.3)	4.78 (676.8)	6.37 (902.0)	11.1 (1571.8)
28.5 (4035.6)	50.1 (7094.2)	71.6 (10138.6)	100 (14160)	4.77 (675.4)	9.55 (1352.3)	14.3 (2024.9)	19.1 (2704.6)	33.4 (4729.4)
2000				3000				
2500		2000		3000				
2875		2300		3450				
21.5	34.1	56.5	69.7	3.8	7.4	11.4	9.5	15.1
11	17	26	35	3.2	5.3	8.6	10.4	16.4
33	51	84	105	9.6	15.9	25.8	31.2	49.2
64	31	39	32	25	24	82	24	14
—	—	—	—	73	36	—	—	—
—	—	—	—	250	120	—	—	—
192	95	90	—	—	—	250	70	42
—	—	—	57	—	—	—	—	—
—	—	—	—	—	360	—	—	—
320	158	150	—	—	—	410	110	70
—	—	—	95	—	—	—	—	—
42.5 (232)	82.0 (448)	101(552)	160 (875)	6.6 (36.1)	13.7 (74.9)	20.0 (109)	42.5 (232)	82.0 (448)
52.5 (287)	92.0 (503)	111 (607)	170 (929)	8.6 (47.0)	15.7 (85.8)	22.0 (120)	52.5 (287)	92.0 (503)
15 times the servo motor's inertia moment maximum (Note 4)								
17-bit encoder (Resolution per encoder/servo motor rotation: 131072 p/rev)								
Oil seal								
Totally enclosed non ventilated (protection level: IP65)								
0 to 40°C (32 to 104°F) (non freezing), storage: −15 to 70°C (5 to 158°F) (non freezing)								
80% RH maximum (non condensing), storage: 90% RH maximum (non condensing)								
Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, or dust								
1000m (3280ft) or less above sea level								
X : 24.5m/s^2 Y : 49m/s^2		X : 24.5m/s^2 Y : 29.4m/s^2		X,Y : 24.5m/s^2			X : 24.5m/s^2 Y : 49m/s^2	
12 (26.4)	19 (41.9)	23 (50.7)	32 (70.5)	5 (11)	7 (15.4)	9 (19.8)	12 (26.4)	19 (41.9)
18 (39.7)	25 (55.1)	29 (63.9)	38 (83.7)	7 (15.4)	9 (19.8)	11 (24.2)	18 (39.7)	25 (55.1)

5. 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.
6. Install a cooling fan (approx. 1.0m^3/min, ⌀92).
7. MR-J2S-MCP-S084 is also compatible. The compatible motor is the same as MR-J2S-MCP.
8. The HC-SFS 1000r/min series is compatible with the following amplifier software version:
   A type: Version A1 or above
9. The HC-SFS 2000r/min series 5.0kW/7.0kW is compatible with the following amplifier software version:
   A type, B type: Version B0 or above
10. The HC-SFS 3000r/min series is compatible with the following amplifier software version:
    A type: Version A1 or above

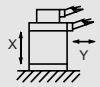


Motor Specifications and Characteristics

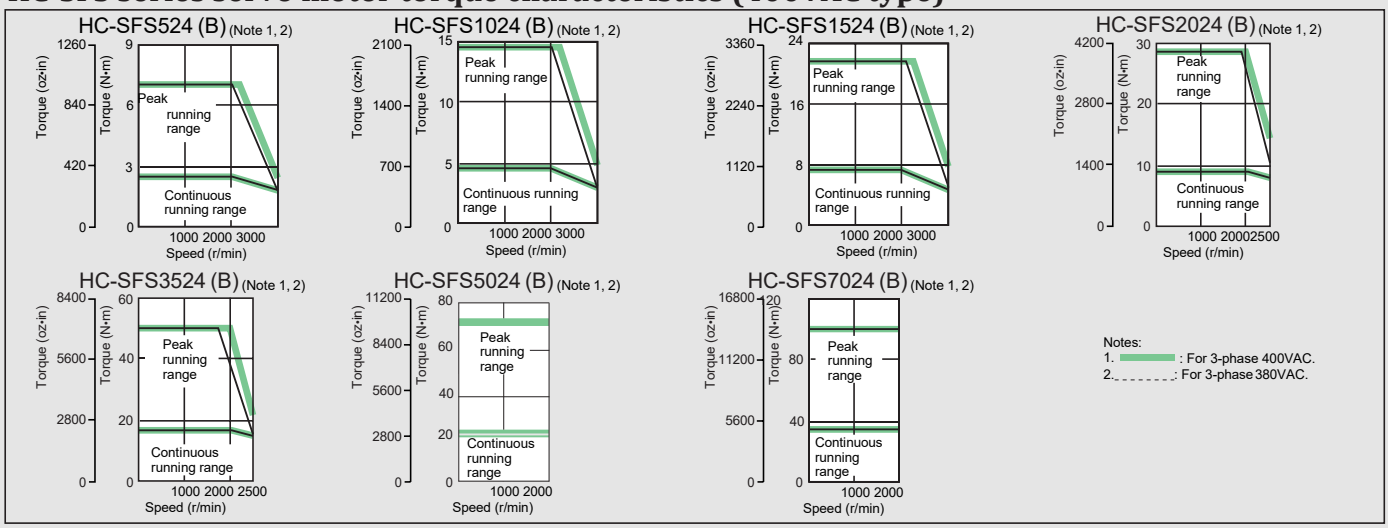
HC-SFS series servo motor specifications (400VAC type)

Servo motor series			HC-SFS2000 r/min series (Medium inertia, medium capacity)						
Models / Specifications		Servo motor model HC-SFS	524 (B)	1024 (B)	1524 (B)	2024 (B)	3524 (B)	5024 (B)	7024 (B)
		Servo-amp model MR-J2S-	60A4/B4	100A4/B4	200A4/B4		350A4/B4	500A4/B4	700A4/B4
Servo motor	Power facility capacity (Note 1) (kVA)		1.0	1.7	2.5	3.5	5.5	7.5	10.0
	Continuous running duty	Rated output (kW)	0.5	1.0	1.5	2.0	3.5	5.0	7.0
		Rated torque (N·m [oz·in])	2.39 (338.4)	4.78 (676.8)	7.16 (1013.9)	9.55 (1352.3)	16.7 (2364.7)	23.9 (3384.2)	33.4 (4729.4)
	Maximum torque (N·m [oz·in])		7.16 (1013.9)	14.4 (2039.0)	21.6 (3058.6)	28.5 (4035.6)	50.1 (7094.2)	71.6 (10138.6)	100 (14160)
	Rated speed (r/min)		2000						
	Maximum speed (r/min)		3000			2500		2000	
	Permissible instantaneous speed (r/min)		3450			2875		2300	
	Power rate at continuous rated torque (kW/s)		8.7	16.7	25.6	21.5	34.1	56.5	69.7
	Rated current (A)		1.5	2.8	4.4	5.4	8.6	14	17
	Maximum current (A)		4.5	8.4	13.2	16.2	25.8	42	51
	Regenerative braking frequency (times/min) (Note 2, 3)	With no options	56	54	136	64	31	39	32
		MR-RB1L-4 (100W)	560	—	—	—	—	—	—
		MR-RB3M-4 (300W)	—	810	—	—	—	—	—
		MR-RB3H-4 (300W)	—	—	408	192	—	—	—
		MR-RB5H-4 (500W) (Note 6)	—	—	680	320	—	—	—
		MR-RB3G-4 (300W)	—	—	—	—	95	90	—
		MR-RB5G-4 (500W) (Note 6)	—	—	—	—	158	150	—
		MR-RB34-4 (300W)	—	—	—	—	—	—	57
		MR-RB54-4 (500W) (Note 6)	—	—	—	—	—	—	95
	Moment of inertia J ($\times 10^{-4}$kg·m^2) [J (oz·in^2)]	Standard	6.6 (36.1)	13.7 (74.9)	20.0 (109)	42.5 (232)	82.0 (448)	101 (552)	160 (875)
		With electromagnetic brake	8.6 (47.0)	15.7 (85.8)	22.0 (120)	52.5 (287)	92.0 (503)	111 (607)	170 (929)
	Recommended load/motor inertia moment ratio		15 times the servo motor's inertia moment maximum (Note 4)						
	Speed/position detector		17-bit encoder (Resolution per encoder/servo motor rotation: 131072 p/rev)						
	Attachments		Oil seal						
	Structure		Totally enclosed non ventilated (protection level: IP65)						
	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 (3280ft) or less above sea level						
		Vibration (Note 5)	X,Y : 24.5m/s^2			X : 24.5m/s^2 Y : 49m/s^2		X : 24.5m/s^2 Y : 29.4m/s^2	
	Mass (kg [lb])	Standard	5 (11.0)	7 (15.4)	9 (19.8)	12 (26.4)	19 (41.9)	23 (50.7)	32 (70.5)
		With electromagnetic brake	7 (15.4)	9 (19.8)	11 (24.2)	18 (39.7)	25 (55.1)	29 (63.9)	38 (83.7)

Notes: 1. The power facility capacity varies depending on the power supply's impedance.
2. The regenerative braking frequency shows the permissible frequency when the motor without a load decelerates from the rated speed to 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 in 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 regeneration heating value (W) while operating. Provisions must be made to keep the generated heat below the tolerable regenerative power (W). Optimal regenerative resistor varies for each system. Select the most suitable regenerative resistor by using the Servo Support software. Refer to the section "Options ● Optional regeneration unit" in this catalog for details on the tolerable regenerative power (W).
3. The regenerative braking frequency of the 600W or smaller servo amplifier may fluctuate with the affect of the power voltage due to the large energy ratio charged to the electrolytic capacitor in the servo amplifier.
4. Contact Mitsubishi if the load/motor of inertia moment ratio exceeds the value in the table.
5. 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.
6. Install a cooling fan (approx. 1.0m^3/min, M92).
7. The HC-SFS series 400V is compatible with the following amplifier software version:
• For 0.5kW to 2.0kW, A type: Version A2 or above • For 7.0kW, A type: Version A1 or above



HC-SFS series servo motor torque characteristics (400VAC type)

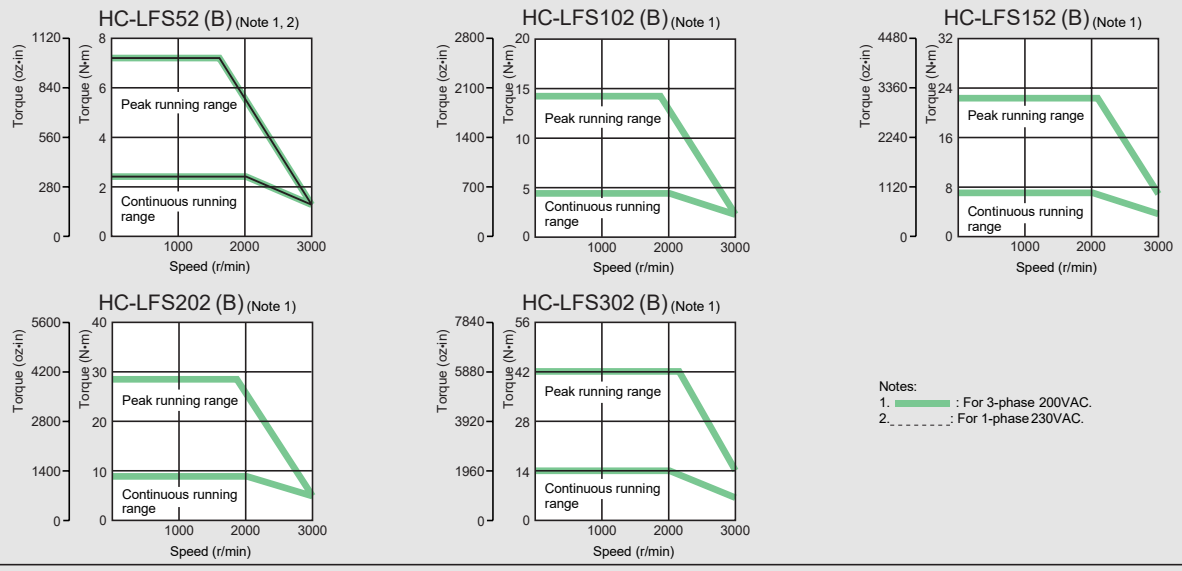


HC-LFS series servo motor specifications

Servo motor series			HC-LFS series (Low inertia, medium capacity)				
Models		Servo motor model HC-LFS	52 (B)	102 (B)	152 (B)	202 (B)	302 (B)
Specifications		Servo-amp model (Note 7) MR-J2S-	60A/B/CP/CL (Note 8)	100A/B/CP/CL (Note 8)	200A/B/CP/CL (Note 8)	350A/B/CP/CL (Note 8)	500A/B/CP/CL (Note 8)
Servo motor	Power facility capacity (Note 1) (kVA)		1.0	1.7	2.5	3.5	4.8
	Continuous running duty	Rated output (kW)	0.5	1.0	1.5	2.0	3.0
		Rated torque (N·m [oz·in])	2.39 (338.4)	4.78 (676.8)	7.16 (1013.9)	9.55 (1352.3)	14.3 (2024.9)
	Maximum torque (N·m [oz·in])		7.16 (1013.9)	14.4 (2039.0)	21.6 (3058.6)	28.5 (4035.6)	42.9 (6074.6)
	Rated speed (r/min)		2000				
	Maximum speed (r/min)		3000				
	Permissible instantaneous speed (r/min)		3450				
	Power rate at continuous rated torque (kW/s)		17.9	49.7	80.1	41.5	56.8
	Rated current (A)		3.2	5.9	9.9	14	23
	Maximum current (A)		9.6	18	30	42	69
	Regenerative braking frequency (times/min) (Note 2, 3)	With no options	115	160	425	120	70
		MR-RB032 (30W)	340	235	—	—	—
		MR-RB12 (100W)	1150	800	—	—	—
		MR-RB30 (300W)	—	—	1270	370	215
		MR-RB32 (300W)	—	2410	—	—	—
		MR-RB50 (500W) (Note 6)	—	—	2120	615	355
	Moment of inertia J ($\times 10^{-4}$ kg·m^2) [J (oz·in^2)]	Standard	3.2 (17.5)	4.6 (25.1)	6.4 (35.0)	22 (120)	36 (197)
		With electromagnetic brake	5.2 (28.4)	6.6 (36.1)	8.4 (45.9)	32 (175)	46 (251)
	Recommended load/motor inertia moment ratio		10 times the servo motor's inertia moment maximum (Note 4)				
	Speed/position detector		17-bit encoder (Resolution per encoder/servo motor rotation: 131072 p/rev)				
	Attachments		Oil seal				
	Structure		Totally enclosed non ventilated (protection level: IP65)				
	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 (Note 5)	1000m (3280ft) or less above sea level/X: 9.8m/s^2 Y: 24.5m/s^2			1000m (3280ft) or less above sea level/X: 19.6m/s^2 Y: 49m/s^2	
	Mass (kg [lb])	Standard	6.5 (14.3)	8.0 (17.6)	10.0 (22.0)	21 (46.3)	28 (61.7)
		With electromagnetic brake	9.0 (19.8)	10.5 (23.1)	12.5 (27.5)	27 (59.5)	34 (74.9)

Notes:1. The power facility capacity varies depending on the power supply's impedance.
2. The regenerative braking frequency shows the permissible frequency when the motor without a load decelerates from the rated speed to 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 in 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 regeneration heating value (W) while operating. Provisions must be made to keep the generated heat below the tolerable regenerative power (W). Optimal regenerative resistor varies for each system. Select the most suitable regenerative resistor by using the Servo Support software. Refer to the section "Options ● Optional regeneration unit" in this catalog for details on the tolerable regenerative power (W).
3. The regenerative braking frequency of the 600W or smaller servo amplifier may fluctuate with the affect of the power voltage due to the large energy ratio charged to the electrolytic capacitor in the servo amplifier.
4. Contact Mitsubishi if the load/motor of inertia moment ratio exceeds the value in the table.
5. 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.
6. Install a cooling fan (approx. 1.0m^3/min, M92).
7. MR-J2S-MCP-S084 is also compatible. The compatible motor is the same as the MR-J2S-MCP.
8. The HC-LFS series is compatible with the following amplifier software version:
A type, B type: Version B3 or above CP type: Version A2 or above

HC-LFS series servo motor torque characteristics



Motor Specifications and Characteristics

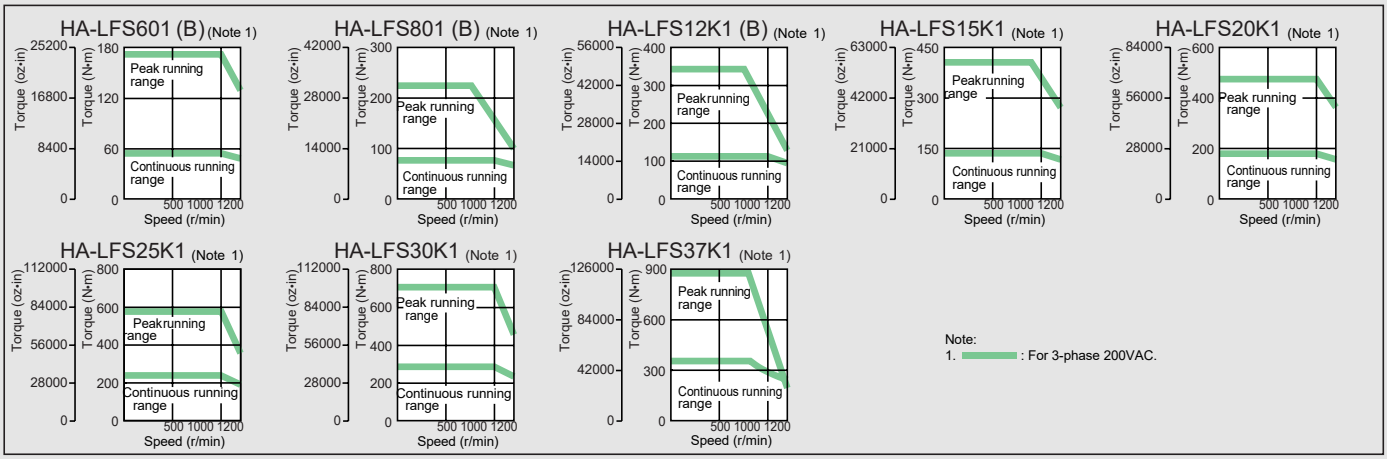
HA-LFS 1000r/min series servo motor specifications (200VAC type)

Servo motor series			HA-LFS 1000r/min series (Low inertia, medium capacity to large capacity)							
Models / Specifications	Servo motor model HA-LFS		601 (B)	801 (B)	12K1 (B)	15K1	20K1	25K1	30K1	37K1 (Note 1)
	Servo-amp model MR-J2S-		700A/B/CP/CL (-U058) (Note 8, 9)	11KA/B (Note 10)		15KA/B (Note 10)	22KA/B (Note 10)		30KA/B (Note 10)	37KA/B (Note 10)
	Converter unit model		—	—		—	—		MR-HP30KA	
Servo motor	Power facility capacity (Note 2) (kVA)		8.6	12	18	22	30	38	48	59
	Continuous running duty	Rated output (kW)	6.0	8.0	12	15	20	25	30	37 (75%ED)
		Rated torque (N·m [oz·in])	57.3 (8113.7)	76.4 (10818.2)	115 (16284)	143 (20248.8)	191 (27045.6)	239 (33842.4)	286 (40497.6)	353 (49984.8)
	Maximum torque (N·m [oz·in])		172 (24355.2)	229 (32426.4)	344 (48710.4)	415 (58764)	477 (67543.2)	597 (84535.2)	716 (101385.6)	883 (125032.8)
	Rated speed (r/min)		1000							
	Maximum speed (r/min)		1200							
	Permissible instantaneous speed (r/min)		1380							
	Power rate at continuous rated torque (kW/s)		313	265	445	373	561	528	626	668
	Rated current (A)		34	42	61	83	118	118	154	188
	Maximum current (A)		102	126	183	249	295	295	385	470
	Regenerative braking frequency (times/min) (Note 3)	With no options	158	—	—	—	—	—	—	—
		MR-RB31 (300W)	278	—	—	—	—	—	—	—
		MR-RB51 (500W) (Note 4)	464	—	—	—	—	—	—	—
		GRZG400-2Ω (4 units), MR-RB65 (800W) (Note 5)	—	354	264	—	—	—	—	—
		GRZG400-1Ω (5 units), MR-RB66 (1300W) (Note 5)	—	—	—	230	—	—	—	—
		GRZG400-0.8Ω (5 units), MR-RB67 (1300W) (Note 5)	—	—	—	—	195	117	—	—
		MR-RB139 (1300W)	—	—	—	—	—	—	97	68
		MR-RB137 (3900W)	—	—	—	—	—	—	290	203
		MR-RB34-4 (300W)	—	—	—	—	—	—	—	—
		MR-RB54-4 (500W)	—	—	—	—	—	—	—	—
		GRZG400-5Ω (4 units), MR-RB6B-4 (800W) (Note 5)	—	—	—	—	—	—	—	—
		GRZG400-2.5Ω (5 units), MR-RB60-4 (1300W) (Note 5)	—	—	—	—	—	—	—	—
		GRZG400-2Ω (5 units), MR-RB6K-4 (1300W) (Note 5)	—	—	—	—	—	—	—	—
		MR-RB136-4 (1300W)	—	—	—	—	—	—	—	—
		MR-RB138-4 (3900W)	—	—	—	—	—	—	—	—
	Moment of inertia J ($\times 10^{-4}$kg·m^2) [J (oz·in^2)]	Standard	105 (574.0)	220 (1202.7)	295 (1612.6)	550 (3006.6)	650 (3553.3)	1080 (5903.9)	1310 (7161.2)	1870 (10222.5)
		With electromagnetic brake	113 (617.7)	293 (1601.7)	369 (2017.2)	—	—	—	—	—
	Recommended load/motor inertia moment ratio		10 times the servo motor's inertia moment maximum (Note 6)							
	Speed/position detector		17-bit encoder (Resolution per encoder/servo motor rotation: 131072 p/rev)							
	Attachments		Oil seal							
	Structure		Totally enclosed ventilated (protection level: IP44)							
	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 (3280ft) or less above sea level							
		Vibration (Note 7)	X: 11.7m/s^2 Y: 29.4m/s^2			X: 9.8m/s^2 Y: 9.8m/s^2			X:9.8m/s^2	Y:9.8m/s^2
	Mass (kg [lb])	Standard	55 (121.2)	95 (209.3)	115 (253.4)	160 (352.5)	180 (396.6)	230 (506.7)	250 (550.8)	335 (738)
		With electromagnetic brake	70 (154.2)	126 (277.6)	146 (321.7)	—	—	—	—	—
Cooling fan	Power	Voltage, frequency	1-phase 200 to 220VAC/50Hz 1-phase 200 to 230VAC/60Hz	3-phase 200 to 220VAC/50Hz 3-phase 200 to 230VAC/60Hz						
		Input (W)	42 (50Hz)/54 (60Hz)	32 (50Hz)/ 40 (60Hz)		45 (50Hz)/63 (60Hz)		120 (50Hz)/175 (60Hz)	120 (50Hz)/175 (60Hz)	
	Rated current (A)		0.21 (50Hz)/0.25 (60Hz)	0.30 (50Hz)/0.25 (60Hz)		0.32 (50Hz)/0.35 (60Hz)		0.65 (50Hz)/0.80 (60Hz)	0.65 (50Hz)/0.80 (60Hz)	

Notes:
1. Make sure that the effective torque is 75% or less of the 37kW capacity during the power factor improvement. Always use a DC reactor (MR-DCL37K).
2. The power facility capacity varies depending on the power supply's impedance.
3. The regenerative braking frequency shows the permissible frequency when the motor without a load decelerates from the rated speed to 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 in 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 regeneration heating value (W) while operating. Provisions must be made to keep the generated heat below the tolerable regenerative power (W). Optimal regenerative resistor varies for each system. Select the most suitable regenerative resistor by using the Servo Support software. Refer to the section "Options ● Optional regeneration unit" in this catalog for details on the tolerable regenerative power (W).
4. Install a cooling fan (approx. 1.0m^3/min, M92).
5. The values apply when the parameter No.0 (for the MR-J2S-A type) or No.2 (for the MR-J2S-B type) is changed, and cooling fans (approx. 1.0m^3/min, M92 x 2 units) are installed. The GRZG400-MΩ is a standard accessory.
6. Contact Mitsubishi if the load/motor of inertia moment ratio exceeds the value in the table.

3-phase 200 to 230VAC 50/60Hz 62 76 60 85 0.18 0.17 0.22 0.22

HA-LFS 1000r/min series servo motor torque characteristics (200VAC type)

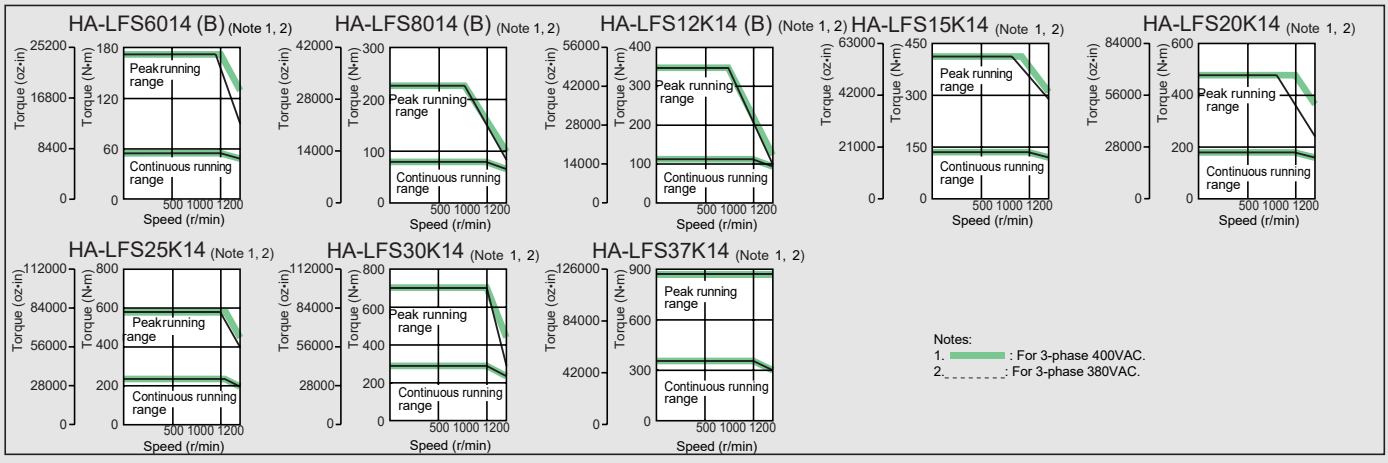


HA-LFS 1000r/min series servo motor specifications (400VAC type)

	HA-LFS 1000r/min series (Low inertia, medium capacity to large capacity)							
	6014 (B)	8014 (B)	12K14 (B)	15K14	20K14	25K14	30K14	37K14
	700A4/B4-U071	11KA4/B4 (Note 10)	11KA4/B4 (Note 10)	15KA4/B4 (Note 10)	22KA4/B4 (Note 10)	30KA4/B4 (Note 10)	30KA4/B4 (Note 10)	37KA4/B4 (Note 10)
	—	—		—	—	MR-HP55KA4		
	8.6	12	18	22	30	38	48	59
	6.0	8.0	12	15	20	25	30	37
	57.3 (8113.7)	76.4 (10818.2)	115 (16284)	143 (20248.8)	191 (27045.6)	239 (33842.4)	286 (40497.6)	353 (49984.8)
	172 (24355.2)	229 (32426.4)	344 (48710.4)	415 (58764)	477 (67543.2)	597 (84535.2)	716 (101385.6)	883 (125032.8)
	1000							
	1200							
	1380							
	313	265	445	373	561	528	626	668
	17	20	30	40	55	70	77	95
	51	60	90	120	138	175	193	238
	158	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—
	278	—	—	—	—	—	—	—
	464	—	—	—	—	—	—	—
	—	354	264	—	—	—	—	—
	—	—	—	230	—	—	—	—
	—	—	—	—	195	—	—	—
	—	—	—	—	—	118	97	68
	—	—	—	—	—	354	290	203
	105 (574.0)	220 (1202.7)	295 (1612.6)	550 (3006.6)	650 (3553.3)	1080 (5903.9)	1310 (7161.2)	1870 (10222.5)
	113 (617.7)	293 (1601.7)	369 (2017.2)	—	—	—	—	—
	10 times the servo motor's inertia moment maximum (Note 6)							
	17-bit encoder (Resolution per encoder/servo motor rotation: 131072 p/rev)							
	Oil seal							
	Totally enclosed ventilated (protection level: IP44)							
	0 to 40°C (32 to 104°F) (non freezing), storage: –15 to 70°C (5 to 158°F) (non freezing)							
	80% RH maximum (non condensing), storage: 90% RH maximum (non condensing)							
	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust							
	1000m (3280ft) or less above sea level							
	X: 11.7m/s² Y: 29.4m/s²			X: 9.8m/s² Y: 9.8m/s²				
	55 (121.2)	95 (209.3)	115 (253.4)	160 (352.5)	180 (396.6)	230 (506.7)	250 (550.8)	335 (738)
	70 (154.2)	126 (277.6)	146 (321.7)	—	—	—	—	—
	1-phase 200 to 220VAC/50Hz 1-phase 200 to 230VAC/60Hz	3-phase 380 to 420VAC 50/60Hz		3-phase 380 to 460VAC 50/60Hz				
	42 (50Hz)/54 (60Hz)	55 (50Hz)/75 (60Hz)		65 (50Hz)/85 (60Hz)		110 (50Hz)/150 (60Hz)		
	0.21 (50Hz)/0.25 (60Hz)	0.12 (50Hz)/0.11 (60Hz)		0.12 (50Hz)/0.14 (60Hz)		0.20 (50Hz)/0.22 (60Hz)		

7. 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.
8. MR-J2S-MCP-S084 is also compatible. The compatible motor is the same as MR-J2S-MCP.
9. -U058 is attached to the CL type only.
10. The HA-LFS 1000r/min series is compatible with the following amplifier software version:
    - For 6kW (200V)
      A type: Version B5 or above B type: Version B4 or above
      CP type: Version A3 or above
    - For 25kW or 30kW (200V)
      A type: Version A2 or above B type: Version A5 or above
    - For 15kW (200V)
      B type: Version A4 or above
    - For 37kW (200V), 8kW to 30kW (400V)
      A type, B type: Version B2 or above
    - For 20kW (200V)
      A type: Version A3 or above B type: Version A6 or above
    - For 37kW (400V)
      A type: Version A3 or above B type: Version B0 or above

HA-LFS 1000r/min series servo motor torque characteristics (400VAC type)



Motor Specifications and Characteristics

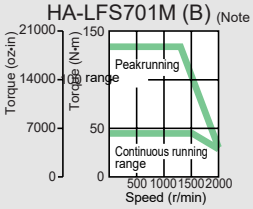
HA-LFS 1500r/min series servo motor specifications (200VAC type)

Servo motor series			HA-LFS 1500r/min series (Low inertia, medium capacity to large capacity)					
Specifications \ Models	Servo motor model HA-LFS		701M (B)	11K1M (B)	15K1M (B)	22K1M	30K1M	37K1M (Note 1)
	Servo-amp model MR-J2S-		700A/B/CP/CL(-U059) (Note 8, 9)	11KA/B (Note 10)	15KA/B (Note 10)	22KA/B (Note 10)	30KA/B (Note 10)	37KA/B (Note 10)
	Converter unit model		—	—	—	—	MR-HP30KA	
Servo motor	Power facility capacity (Note 2) (kVA)		10	16	22	33	48	59
	Continuous running duty	Rated output (kW)	7.0	11	15	22	30	37 (75% ED)
		Rated torque (N·m [oz·in])	44.6 (6315.4)	70.0 (9912)	95.5 (13522.8)	140 (19824)	191 (27045.6)	236 (33417.6)
	Maximum torque (N·m [oz·in])		134 (18974.4)	210 (29736)	286 (40497.6)	350 (49560)	477 (67543.2)	589 (83402.4)
	Rated speed (r/min)		1500					
	Maximum speed (r/min)		2000					
	Permissible instantaneous speed (r/min)		2300					
	Power rate at continuous rated torque (kW/s)		189	223	309	357	561	514
	Rated current (A)		37	65	87	126	174	202
	Maximum current (A)		111	195	261	315	435	505
	Regenerative braking frequency (times/min) (Note 3)	With no options	70	—	—	—	—	—
		MR-RB31 (300W)	124	—	—	—	—	—
		MR-RB51 (500W) (Note 4)	206	—	—	—	—	—
		GRZG400-2Ω (4 units), MR-RB65 (800W) (Note 5)	—	158	—	—	—	—
		GRZG400-1Ω (5 units), MR-RB66 (1300W) (Note 5)	—	—	191	—	—	—
		GRZG400-0.8Ω (5 units), MR-RB67 (1300W) (Note 5)	—	—	—	102	—	—
		MR-RB139 (1300W)	—	—	—	—	87	52
		MR-RB137 (3900W)	—	—	—	—	260	156
		MR-RB34-4 (300W)	—	—	—	—	—	—
		MR-RB54-4 (500W)	—	—	—	—	—	—
		GRZG400-5Ω (4 units), MR-RB6B-4 (800W) (Note 5)	—	—	—	—	—	—
		GRZG400-2.5Ω (5 units), MR-RB60-4 (1300W) (Note 5)	—	—	—	—	—	—
		GRZG400-2Ω (5 units), MR-RB6K-4 (1300W) (Note 5)	—	—	—	—	—	—
		MR-RB136-4 (1300W)	—	—	—	—	—	—
		MR-RB138-4 (3900W)	—	—	—	—	—	—
	Moment of inertia J (×10^{-4}kg·m^2) [J (oz·in^2)]	Standard	105 (574.0)	220 (1202.7)	295 (1612.6)	550 (3006.6)	650 (3553.3)	1080 (5903.9)
		With electromagnetic brake	113 (617.7)	293 (1601.7)	369 (2017.2)	—	—	—
	Recommended load/motor inertia moment ratio		10 times the servo motor's inertia moment maximum (Note 6)					
	Speed/position detector		17-bit encoder (Resolution per encoder/servo motor rotation: 131072 p/rev)					
	Attachments		Oil seal					
	Structure		Totally enclosed ventilated (protection level: IP44)					
	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 (3280ft) or less above sea level					
		Vibration (Note 7)	X: 11.7m/s^2 Y: 29.4m/s^2			X: 9.8m/s^2 Y: 9.8m/s^2		
	Mass (kg [lb])	Standard	55 (121.2)	95 (209.3)	115 (253.4)	160 (352.5)	180 (396.6)	230 (506.7)
		With electromagnetic brake	70 (154.2)	126 (277.6)	146 (321.7)	—	—	—
Cooling fan	Power	Voltage, frequency	1-phase 200 to 220VAC/50Hz 1-phase 200 to 230VAC/60Hz	3-phase 200 to 220VAC/50Hz 3-phase 200 to 230VAC/60Hz				
		Input (W)	42 (50Hz)/54 (60Hz)	32 (50Hz)/40 (60Hz)		45 (50Hz)/63 (60Hz)		120 (50Hz)/175 (60Hz)
	Rated current (A)		0.21 (50Hz)/0.25 (60Hz)	0.30 (50Hz)/0.25 (60Hz)		0.32 (50Hz)/0.35 (60Hz)		0.65 (50Hz)/0.80 (60Hz)

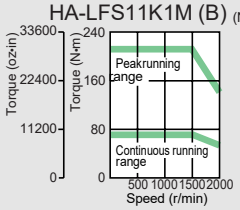
Notes:1. Make sure that the effective torque is 75% or less of the 37kW capacity during the power factor improvement. Always use a DC reactor (MR-DCL37K).
2. The power facility capacity varies depending on the power supply's impedance.
3. The regenerative braking frequency shows the permissible frequency when the motor without a load decelerates from the rated speed to 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 in 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 regeneration heating value (W) while operating. Provisions must be made to keep the generated heat below the tolerable regenerative power (W). Optimal regenerative resistor varies for each system. Select the most suitable regenerative resistor by using the Servo Support software. Refer to the section "Options ● Optional regeneration unit" in this catalog for details on the tolerable regenerative power (W).
4. Install a cooling fan (approx. 1.0m^3/min, M92).
5. The values apply when the parameter No.0 (for the MR-J2S-A type) or No.2 (for the MR-J2S-B type) is changed, and cooling fans (approx. 1.0m^3/min, M92 x 2 units) are installed. The GRZG400-MΩ is a standard accessory.
6. Contact Mitsubishi if the load/motor of inertia moment ratio exceeds the value in the table.

HA-LFS 1500r/min series servo motor torque characteristics (200VAC type)

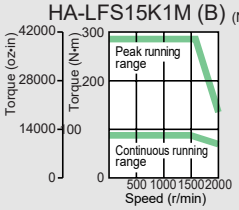
HA-LFS701M (B) (Note 1, 2)



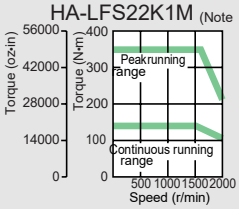
HA-LFS11K1M (B) (Note 1)



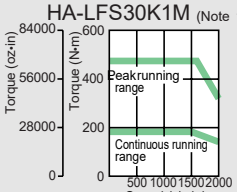
HA-LFS15K1M (B) (Note 1)



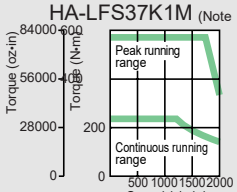
HA-LFS22K1M (Note 1)



HA-LFS30K1M (Note 1)



HA-LFS37K1M (Note 1)



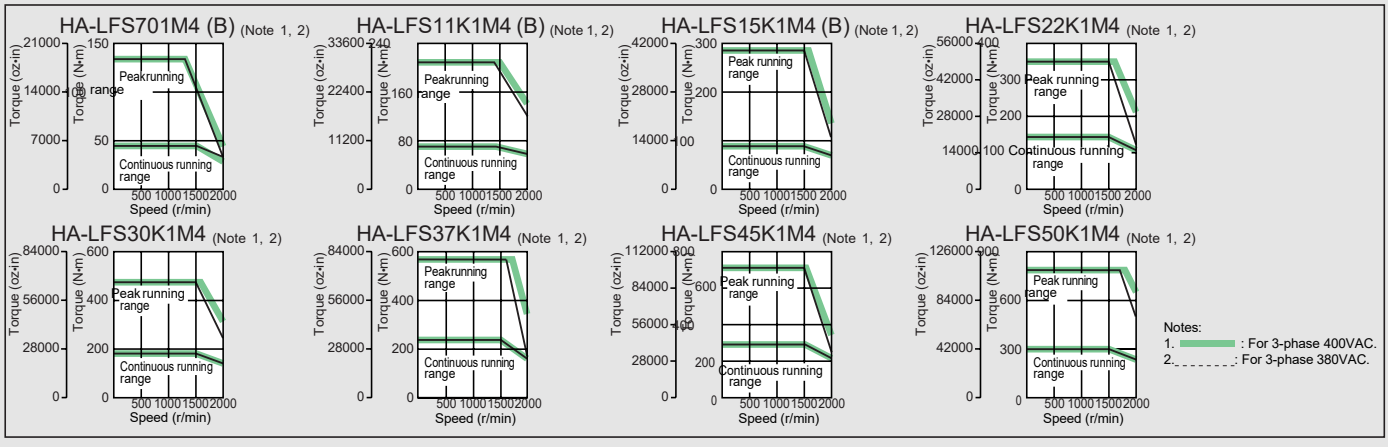
Notes:
1. ▬ : For 3-phase 200VAC.
2. The torque characteristics are anticipated values.

HA-LFS 1500r/min series servo motor specifications (400VAC type)

	HA-LFS 1500r/min series (Low inertia, medium capacity to large capacity)							
	701M4 (B)	11K1M4 (B)	15K1M4 (B)	22K1M4	30K1M4	37K1M4	45K1M4	50K1M4
	700A4/B4-U073	11KA4/B4 (Note 10)	15KA4/B4 (Note 10)	22KA4/B4 (Note 10)	30KA4/B4 (Note 10)	37KA4/B4 (Note 10)	45KA4/B4 (Note 10)	55KA4/B4 (Note 10)
	—	—	—	—	MR-HP55KA4			
	10	16	22	33	48	59	71	80
	7.0	11	15	22	30	37	45	50
	44.6 (6315.4)	70.0 (9912)	95.5 (13522.8)	140 (19824)	191 (27045.6)	236 (33417.6)	286 (40497.6)	318 (45028.8)
	134 (18974.4)	210 (29736)	286 (40497.6)	350 (49560)	477 (67543.2)	589 (83402.4)	716 (101385.6)	796 (112713.6)
	1500							
	2000							
	2300							
	189	223	309	357	561	514	626	542
	18	31	41	63	87	101	128	143
	54	93	123	158	218	253	320	358
	70	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—
	124	—	—	—	—	—	—	—
	206	—	—	—	—	—	—	—
	—	158	—	—	—	—	—	—
	—	—	191	—	—	—	—	—
	—	—	—	102	—	—	—	—
	—	—	—	—	87	52	43	30
	—	—	—	—	260	156	129	90
	105 (574.0)	220 (1202.7)	295 (1612.6)	550 (3006.6)	650 (3553.3)	1080 (5903.9)	1310 (7161.2)	1870 (10222.5)
	113 (617.7)	293 (1601.7)	369 (2017.2)	—	—	—	—	—
	10 times the servo motor's inertia moment maximum (Note 6)							
	17-bit encoder (Resolution per encoder/servo motor rotation: 131072 p/rev)							
	Oil seal							
	Totally enclosed ventilated (protection level: IP44)							
	0 to 40°C (32 to 104°F) (non freezing), storage: –15 to 70°C (5 to 158°F) (non freezing)							
	80% RH maximum (non condensing), storage: 90% RH maximum (non condensing)							
	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust							
	1000m (3280ft) or less above sea level							
	X: 11.7m/s² Y: 29.4m/s²			X: 9.8m/s² Y: 9.8m/s²				
	55 (121.2)	95 (209.3)	115 (253.4)	160 (352.5)	180 (396.6)	230 (506.7)	250 (550.8)	335 (738)
	70 (154.2)	126 (277.6)	146 (321.7)	—	—	—	—	—
	1-phase 200 to 220VAC/50Hz 1-phase 200 to 230VAC/60Hz	3-phase 380 to 420VAC 50/60Hz		3-phase 380 to 460VAC 50/60Hz				
	42 (50Hz)/54 (60Hz)	55 (50Hz)/75 (60Hz)		65 (50Hz)/85 (60Hz)		110 (50Hz)/150 (60Hz)		
	0.21 (50Hz)/0.25 (60Hz)	0.12 (50Hz)/0.11 (60Hz)		0.12 (50Hz)/0.14 (60Hz)		0.20 (50Hz)/0.22 (60Hz)		

7. 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.
8. MR-J2S-MCP-S084 is also compatible. The compatible motor is the same as MR-J2S-MCP.
9. -U059 is attached to the CL type only.
10. The HA-LFS 1500r/min series is compatible with the following amplifier software version:
    - For 7kW (200V)
      A type, B type: Version B6 or above CP type: Version A4 or above
    - For 37kW (200V)
      A type: Version A3 or above B type: Version B0 or above
    - For 30kW (200V)
      B type: Version A4 or above
    - For 11kW or larger (400V)
      A type, B type: Version B2 or above

HA-LFS 1500r/min series servo motor torque characteristics (400VAC type)



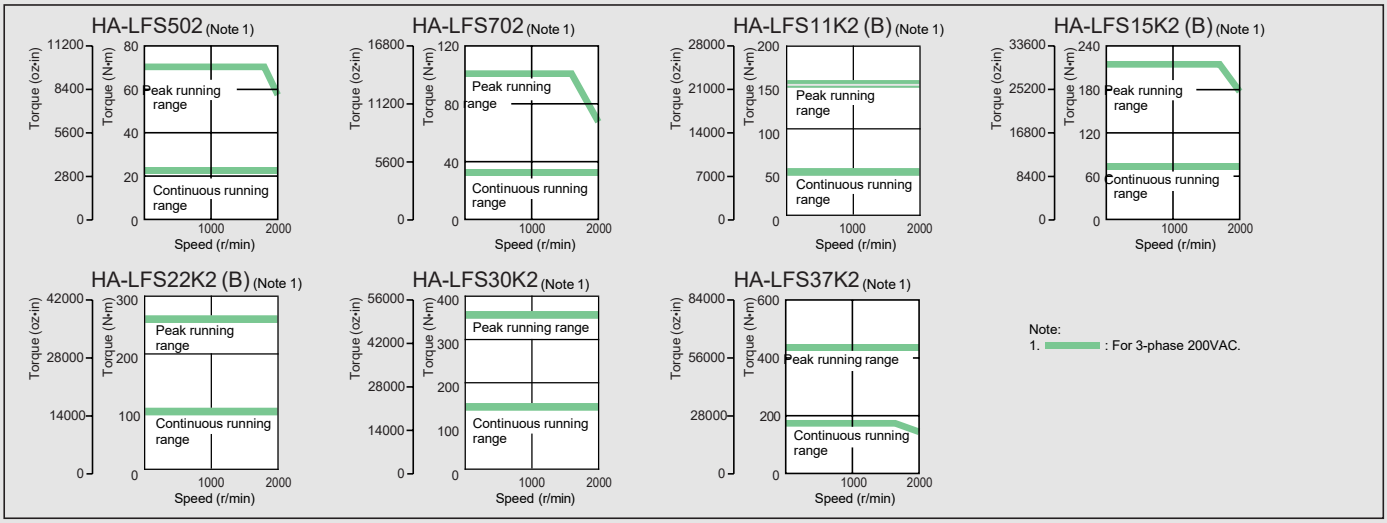
Motor Specifications and Characteristics

HA-LFS 2000r/min series servo motor specifications (200VAC type)

Servo motor series			HA-LFS 2000r/min series (Low inertia, medium capacity to large capacity)						
Models / Specifications		Servo motor model HA-LFS	502	702	11K2 (B)	15K2 (B)	22K2 (B)	30K2	37K2 (Note1)
		Servo-amp model MR-J2S-	500A/B/CP/CL (Note 8, 9)	700A/B/CP/CL (Note 8, 9)	11KA/B (Note 9)	15KA/B (Note 9)	22KA/B (Note 9)	30KA/B (Note 9)	37KA/B (Note 9)
		Converter unit model	—	—	—	—	—	MR-HP30KA	
Servo motor	Power facility capacity (Note 2) (kVA)		7.5	10.0	16	22	33	48	59
	Continuous running duty	Rated output (kW)	5.0	7.0	11	15	22	30	37 (75%ED)
		Rated torque (N·m [oz·in])	23.9 (3384.2)	33.4 (4729.4)	52.5 (7434)	71.6 (10138.6)	105 (14868)	143 (20248.8)	177 (25063.2)
	Maximum torque (N·m [oz·in])		71.6 (10138.6)	100 (14160)	158 (22372.8)	215 (30444)	263 (37240.8)	358 (50692.8)	442 (62587.2)
	Rated speed (r/min)		2000						
	Maximum speed (r/min)		2000						
	Permissible instantaneous speed (r/min)		2300						
	Power rate at continuous rated torque (kW/s)		77.2	118	263	233	374	373	480
	Rated current (A)		25	34	63	77	112	166	204
	Maximum current (A)		75	102	189	231	280	415	510
	Regenerative braking frequency (times/min) (Note 3)	With no options	50	50	—	—	—	—	—
		MR-RB30 (300W)	120	—	—	—	—	—	—
		MR-RB31 (300W)	—	95	—	—	—	—	—
		MR-RB50 (500W) (Note4)	200	—	—	—	—	—	—
		MR-RB51 (500W) (Note4)	—	160	—	—	—	—	—
		GRZG400-2Ω (4 units), MR-RB65 (800W) (Note5)	—	—	186	—	—	—	—
		GRZG400-1Ω (5 units), MR-RB66 (1300W) (Note5)	—	—	—	144	—	—	—
		GRZG400-0.8Ω (5 units), MR-RB67 (1300W) (Note 5)	—	—	—	—	107	—	—
		MR-RB139 (1300W)	—	—	—	—	—	58	49
		MR-RB137 (3900W)	—	—	—	—	—	174	147
		GRZG400-5Ω (4 units), MR-RB6B-4 (800W) (Note 5)	—	—	—	—	—	—	—
		GRZG400-2.5Ω (5 units), MR-RB60-4 (1300W) (Note 5)	—	—	—	—	—	—	—
		GRZG400-2Ω (5 units), MR-RB6K-4 (1300W) (Note 5)	—	—	—	—	—	—	—
		MR-RB136-4 (1300W)	—	—	—	—	—	—	—
		MR-RB138-4 (3900W)	—	—	—	—	—	—	—
	Moment of inertia J (×10⁻⁴kg·m²) [J (oz·in²)]	Standard	74.0 (404.5)	94.2 (515.0)	105 (574.0)	220 (1202.7)	295 (1612.6)	550 (3006.6)	650 (3553.3)
		With electromagnetic brake	—	—	113 (617.7)	293 (1601.7)	369 (2017.2)	—	—
	Recommended load/motor inertia moment ratio		10 times the servo motor's inertia moment maximum (Note 6)						
	Speed/position detector		17-bit encoder (Resolution per encoder/servo motor rotation: 131072 p/rev)						
	Attachments		Oil seal						
	Structure		Totally enclosed non ventilated (protection level: IP65)		Totally enclosed ventilated (protection level: IP44)				
	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 (3280ft) or less above sea level						
		Vibration (Note 7)	X : 11.7m/s² Y : 29.4m/s²					X : 9.8m/s² Y : 9.8m/s²	
	Mass (kg [lb])	Standard	28 (61.7)	35 (77.1)	55 (121.2)	95 (209.3)	115 (253.4)	160 (352.5)	180 (396.6)
		With electromagnetic brake	—	—	70 (154.2)	126 (277.6)	146 (321.7)	—	—
Cooling fan	Power	Voltage, frequency	—	—	1-phase 200 to 220VAC/50Hz 1-phase 200 to 230VAC/60Hz	3-phase 200 to 220VAC/50Hz 3-phase 200 to 230VAC/60Hz			
		Input (W)	—	—	42 (50Hz)/54 (60Hz)	32 (50Hz)/40 (60Hz)		45 (50Hz)/63 (60Hz)	
	Rated current (A)		—	—	0.21 (50Hz)/0.25 (60Hz)	0.30 (50Hz)/0.25 (60Hz)		0.32 (50Hz)/0.35 (60Hz)	

Notes: 1. Make sure that the effective torque is 75% or less of the 37kW capacity during the power factor improvement. Always use a DC reactor (MR-DCL37K).
2. The power facility capacity varies depending on the power supply's impedance.
3. The regenerative braking frequency shows the permissible frequency when the motor without a load decelerates from the rated speed to 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 in 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 regeneration heating value (W) while operating. Provisions must be made to keep the generated heat below the tolerable regenerative power (W). Optimal regenerative resistor varies for each system. Select the most suitable regenerative resistor by using the Servo Support software. Refer to the section "Options ● Optional regeneration unit" in this catalog for details on the tolerable regenerative power (W).
4. Install a cooling fan (approx. 1.0m³/min, M92).

HA-LFS 2000r/min series servo motor torque characteristics (200VAC type)

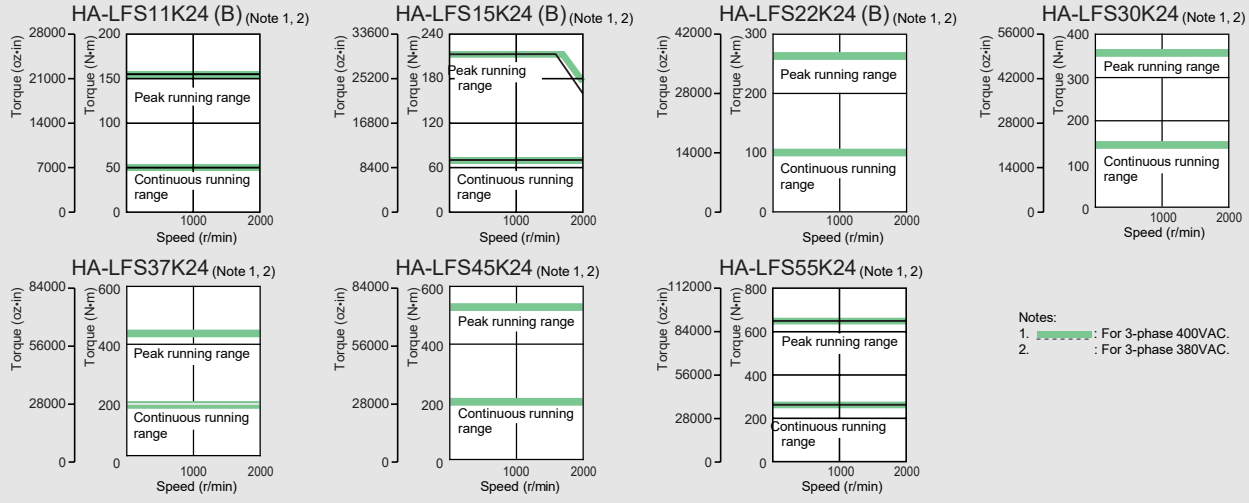


HA-LFS 2000r/min series servo motor specifications (400VAC type)

	HA-LFS 2000r/min series (Low inertia, medium capacity to large capacity)						
	11K24 (B)	15K24 (B)	22K24 (B)	30K24	37K24	45K24	55K24
	11KA4/B4 (Note 9)	15KA4/B4 (Note 9)	22KA4/B4 (Note 9)	30KA4/B4 (Note 9)	37KA4/B4 (Note 9)	45KA4/B4 (Note 9)	55KA4/B4 (Note 9)
	—	—	—	MR-HP55KA4			
	16	22	33	48	59	71	87
	11	15	22	30	37	45	55
	52.5 (7434)	71.6 (10138.6)	105 (14868)	143 (20248.8)	177 (25063.2)	215 (30444)	263 (37240.8)
	158 (22372.8)	215 (30444)	263 (37240.8)	358 (50692.8)	442 (62587.2)	537 (76039.2)	657 (93031.2)
	2000						
	2000						
	2300						
	263	233	374	373	480	427	526
	32	40	57	83	102	131	143
	96	120	171	208	255	328	358
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	186	—	—	—	—	—	—
	—	144	—	—	—	—	—
	—	—	107	—	—	—	—
	—	—	—	58	49	30	24
	—	—	—	174	147	89	73
	105 (574.0)	220 (1202.7)	295 (1612.6)	550 (3006.6)	650 (3553.3)	1080 (5903.9)	1310 (7161.2)
	113 (617.7)	293 (1601.7)	369 (2017.2)	—	—	—	—
	10 times the servo motor's inertia moment maximum (Note 6)						
	17-bit encoder (Resolution per encoder/servo motor rotation: 131072 p/rev)						
	Oil seal						
	Totally enclosed ventilated (protection level: IP44)						
	0 to 40°C (32 to 104°F) (non freezing), storage: –15 to 70°C (5 to 158°F) (non freezing)						
	80% RH maximum (non condensing), storage: 90% RH maximum (non condensing)						
	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust						
	1000m (3280ft) or less above sea level						
	X : 11.7m/s² Y : 29.4m/s²			X : 9.8m/s² Y : 9.8m/s²			
	55 (121.2)	95 (209.3)	115 (253.4)	160 (352.5)	180 (396.6)	230 (506.7)	250 (550.8)
	70 (154.2)	126 (277.6)	146 (321.7)	—	—	—	—
	1-phase 200 to 220VAC/50Hz 1-phase 200 to 230VAC/60Hz	3-phase 380 to 420VAC 50/60Hz		3-phase 380 to 460VAC 50/60Hz			
	42 (50Hz)/54 (60Hz)	55 (50Hz)/75 (60Hz)		65 (50Hz)/85 (60Hz)		110 (50Hz)/150 (60Hz)	
	0.21 (50Hz)/0.25 (60Hz)	0.12 (50Hz)/0.11 (60Hz)		0.12 (50Hz)/0.14 (60Hz)		0.20 (50Hz) /0.22 (60Hz)	

5. The values apply when the parameter No. 0 (for the MR-J2S-A type) or No. 2 (for the MR-J2S-B type) is changed, and cooling fans (approx. 1.0m³/min, M92 x 2 units) are installed. The GRZG400-MΩ is a standard accessory.
6. Contact Mitsubishi if the load/motor of inertia moment ratio exceeds the value in the table.
7. 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.
8. MR-J2S-MCP-S084 is also compatible. The compatible motor is the same as MR-J2S-MCP.
9. The HA-LFS 2000r/min series is compatible with the following amplifier software version:
   - For 5kW, 7kW (200V) A type, B type: Version B0 or above
   - For 30kW, 37kW (200V) or 45kW (400V) B type: Version A3 or above
   - For 15kW (400V) A type, B type: Version B2 or above
   - For 11kW, 22kW or 55kW (400V) B type: Version A4 or above

HA-LFS 2000r/min series servo motor torque characteristics (400VAC type)

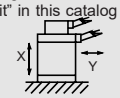


Motor Specifications and Characteristics

HC-RFS series servo motor specifications

Servo motor series			HC-RFS series (Ultra-low inertia, medium capacity)				
Specifications	Models	Servo motor model HC-RFS	103 (B)	153 (B)	203 (B)	353 (B)	503 (B)
		Servo-amp model MR-J2S- (Note 6)	200A/B/CP/CL		350A/B/CP/CL	500A/B/CP/CL (Note 7)	
Servo motor	Power facility capacity (Note 1) (kVA)		1.7	2.5	3.5	5.5	7.5
	Continuous running duty	Rated output (kW)	1.0	1.5	2.0	3.5	5.0
		Rated torque (N·m [oz·in])	3.18 (450.3)	4.78 (676.8)	6.37 (902.1)	11.1 (1571.8)	15.9 (2251.4)
	Maximum torque (N·m [oz·in])		7.95 (1125.7)	11.9 (1685.0)	15.9 (2251.4)	27.9 (3950.6)	39.7 (5621.5)
	Rated speed (r/min)		3000				
	Maximum speed (r/min)		4500				
	Permissible instantaneous speed (r/min)		5175				
	Power rate at continuous rated torque (kW/s)		67.4	120	176	150	211
	Rated current (A)		6.1	8.8	14	23	28
	Maximum current (A)		18.4	23.4	37	58	70
	Regenerative braking frequency (times/min) (Note 2)	With no options	1090	860	710	174	125
		MR-RB30 (300W)	3270	2580	2130	401	288
		MR-RB50 (500W) (Note 5)	5450	4300	3550	669	479
	Moment of inertia J ($\times 10^{-4}$ kg·m^2) [J (oz·in^2)]	Standard	1.5 (8.2)	1.9 (10.4)	2.3 (12.6)	8.6 (47.0)	12.0 (65.6)
		With electromagnetic brake	1.85 (10.1)	2.25 (12.3)	2.65 (14.5)	11.8 (64.5)	15.5 (84.7)
	Recommended load/motor inertia moment ratio		5 times the servo motor's inertia moment maximum (Note 3)				
	Speed/position detector		17-bit encoder (Resolution per encoder/servo motor rotation: 131072 p/rev)				
	Attachments		Oil seal				
	Structure		Totally enclosed non ventilated (protection level: IP65)				
	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 (Note 4)	1000m (3280ft) or less above sea level; X: 24.5 m/s^2, Y: 24.5 m/s^2				
	Mass (kg [lb])	Standard	3.9 (8.6)	5.0 (11.0)	6.2 (13.7)	12 (26.4)	17 (37.5)
		With electromagnetic brake	6.0 (13.2)	7.0 (15.4)	8.3 (18.3)	15 (33.0)	21 (46.3)

Notes:1. The power facility capacity varies depending on the power supply's impedance.
2. The regenerative braking frequency shows the permissible frequency when the motor without a load decelerates from the rated speed to 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 in 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 regeneration heating value (W) while operating. Provisions must be made to keep the generated heat below the tolerable regenerative power (W). Optimal regenerative resistor varies for each system. Select the most suitable regenerative resistor by using the Servo Support software. Refer to the section "Options ● Optional regeneration unit" in this catalog for details on the tolerable regenerative power (W).
3. Contact Mitsubishi if the load/motor of inertia moment ratio exceeds the value in the table.
4. 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.
5. Install a cooling fan (approx. 1.0m^3/min, M92).
6. MR-J2S-MCP-S084 is also compatible. The compatible motor is the same as MR-J2S-MCP.
7. The HC-RFS series 3.5kW/5.0kW is compatible with the following amplifier software version:
A type, B type: Version B0 or above



HC-RFS series servo motor torque characteristics