

**General-Purpose AC Servo
MELSERVO-J3**
**Servo Amplifier <MR-J3-11KB to MR-J3-22KB>
Servo Motor <HA-LP Series>**

The servo amplifiers, large capacity (11 to 22kW), 200V series have now been added to the MELSERVO-J3 series SSCNET III compatible (new high-speed serial bus).

The 22kW servo amplifier has been downsized from the existing model (25% smaller compared to MR-J2S), allowing the users' system more compact.

The compatible servo motors, low-inertia HA-LP series, are equipped with a high-resolution absolute encoder 262144p/rev as standard specifications.

Typically suitable for the following applications: injection-molding machines, semiconductor manufacturing devices, large material handling systems and printing machines.

The servo amplifiers, MR-J3-11KB to 22KB and the servo motors, HA-LP series also conform to the global standards (EN, UL, cUL standards).


■ Servo amplifier specifications

Servo amplifier model		MR-J3-11KB	MR-J3-15KB	MR-J3-22KB
Main circuit power supply	Voltage / frequency (Note 1)	3-phase 200 to 230VAC 50/60Hz (Note 2)		
	Permissible voltage fluctuation	3-phase 170 to 253VAC		
	Permissible frequency fluctuation	±5% maximum		
Control circuit power supply	Voltage / frequency	1-phase 200 to 230VAC 50/60Hz		
	Permissible voltage fluctuation	1-phase 170 to 253VAC		
	Permissible frequency fluctuation	±5% maximum		
	Power consumption (W)	45		
Interface power supply		24VDC ±10% (required current capacity: 150mA (Note 4))		
Regenerative resistor/tolerable regenerative power (W) (Note 3)	With standard accessory (Note 5)		500 (800)	850 (1300)
	Optional regeneration unit	MR-RB5E	500 (800)	—
		MR-RB9P	—	850 (1300)
		MR-RB9F	—	850 (1300)
Control system		Sine-wave PWM control / current control system		
Dynamic brake		External option		
Safety features		Overcurrent shutdown, regeneration overvoltage shutdown, overload shutdown (electronic thermal), servo motor overheat protection, encoder fault protection, regeneration fault protection, undervoltage / sudden power outage protection, overspeed protection, excess error protection		
Structure		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/s ² maximum		
Mass (kg [lb])		18 (40)	18 (40)	19 (42)

Notes: 1. Rated output and rated speed of the servo motor used in combination with the servo amplifier are as indicated when using the power supply voltage and frequency listed.

2. For torque characteristics when combined with a servo motor, refer to "Servo motor torque characteristics" on page 2 and 3 of this brochure.

3. The values in () indicate when cooling fans (approx. 1.0m³/min, □92×2 units) are installed and the parameter No. PA02 is changed.

4. 150mA is the value when all of the input/output points are used. The current capacity can be stepped down according to the number of input/output points in use.

5. The servo amplifier (MR-J3-□KB-PX) without enclosed regenerative resistors is also available for the servo amplifiers MR-J3-11KB to 22KB.

Servo motor specifications

Servo motor series		HA-LP 1000r/min series (Low inertia, large capacity)					
Servo motor model		HA-LP801(B)	HA-LP12K1(B)	HA-LP15K1	HA-LP20K1	HA-LP25K1	
Servo amplifier model		MR-J3-11KB		MR-J3-15KB	MR-J3-22KB		
Servo motor	Power facility capacity (Note 1) (kVA)	12	18	22	30	38	
	Continuous running duty	Rated output (kW)	8.0	12	15	20	25
		Rated torque (N•m [oz•in])	76.4 (10800)	115 (16300)	143 (20200)	191 (27000)	239 (33800)
	Maximum torque (N•m [oz•in])	229 (32400)	344 (48700)	415 (58800)	477 (67500)	597 (84500)	
	Rated speed (r/min)	1000					
	Maximum speed (r/min)	1200					
	Permissible instantaneous speed (r/min)	1380					
	Power rate at continuous rated torque (kW/s)	265	445	373	561	528	
	Rated current (A)	42	61	83	118	118	
	Maximum current (A)	126	183	249	295	295	
	Regenerative braking frequency (times/min) (Note 2)	354	264	230	195	117	
	Moment of inertia	Standard	220 (1200)	295 (1610)	550 (3010)	650 (3550)	1080 (5900)
		With electromagnetic brake	293 (1600)	369 (2020)	—	—	—
	Recommended load/motor inertia moment ratio	10 times the servo motor's inertia moment maximum (Note 3)					
	Speed/position detector	18-bit encoder (Resolution per encoder/servo motor rotation: 262144p/rev)					
	Attachments	Oil seal					
	Insulation class	Class F					
Structure	Totally enclosed ventilated (protection level: IP44) (Note 4)						
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 (Note 5)		X: 11.7m/s ² Y: 29.4m/s ²		X: 9.8m/s ² Y: 9.8m/s ²			
	Mass (kg [lb])	95 (210)	115 (255)	160 (355)	180 (400)	230 (510)	
Cooling fan	Power supply	Voltage, frequency	3-phase 200 to 220VAC/50Hz 3-phase 200 to 230VAC/60Hz				
		Input (W)	32 (50Hz)/ 40 (60Hz)	45 (50Hz)/ 63 (60Hz)	120 (50Hz)/ 175 (60Hz)		
Rated current (A)		0.30 (50Hz)/ 0.25 (60Hz)	0.32 (50Hz)/ 0.35 (60Hz)	0.65 (50Hz)/ 0.80 (60Hz)			

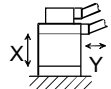
Notes: 1. The power facility capacity varies depending on the power supply's impedance.

2. The regenerative braking frequency shows the permissible frequency for decelerating the motor without a load from the rated speed to a stop when the regenerative resistor (GRZG400-□Ω) is used. The regenerative resistor is supplied with the servo amplifier as a standard accessory. The value applies when the parameter No. PA02 is changed, and cooling fans (approx. 1.0m³/min, □92×2 units) are installed.

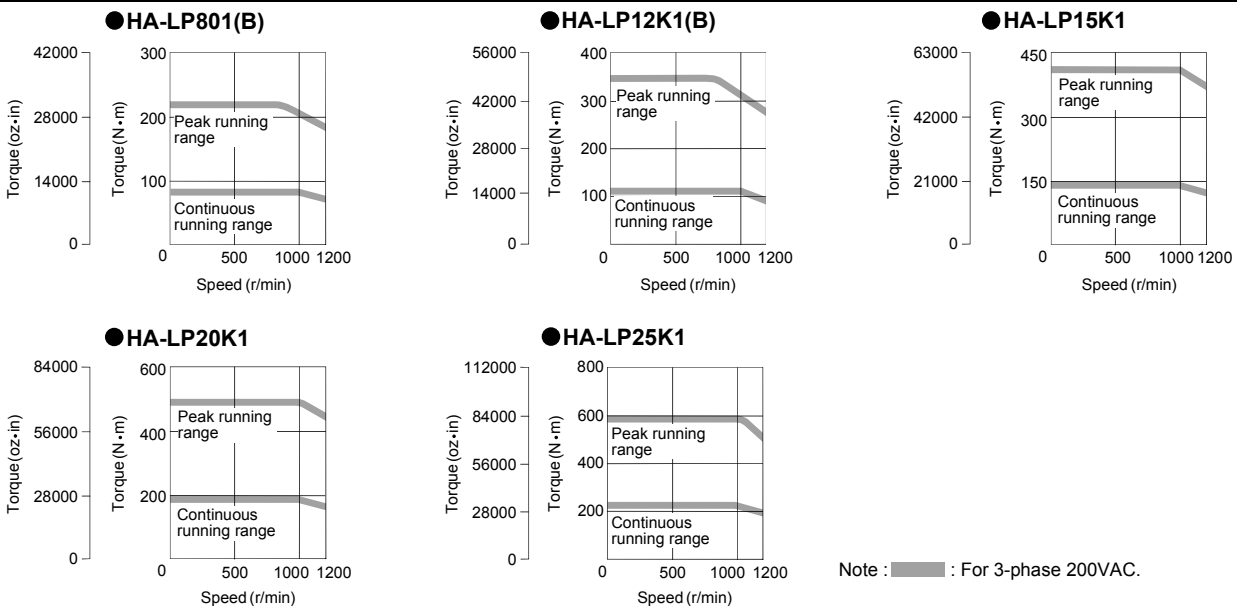
3. Contact Mitsubishi if the load/motor of inertia moment ratio exceeds the value in the table.

4. The shaft-through portion is excluded.

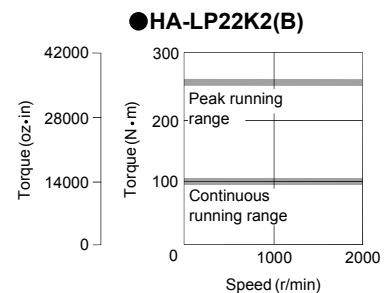
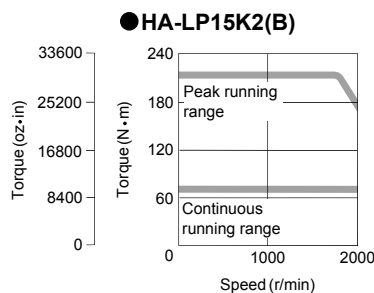
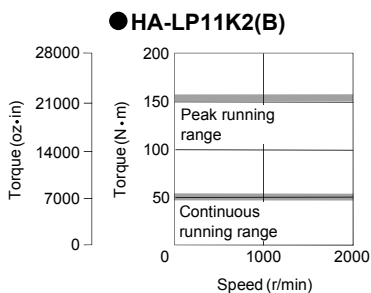
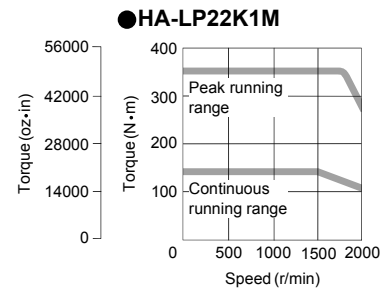
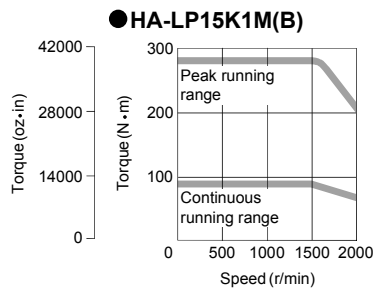
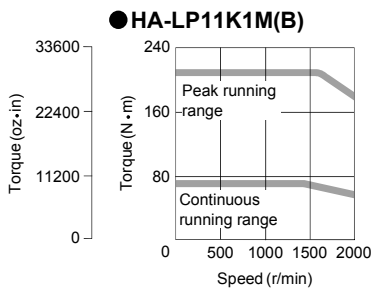
5. The vibration direction is shown in the right-side diagram. The numeric value indicates the maximum value of the component (commonly the bracket in the opposite direction of the motor shaft). Fretting of the bearing occurs easily when the motor stops, so maintain vibration to approximately one-half of the allowable value.



Servo motor torque characteristics (Note)



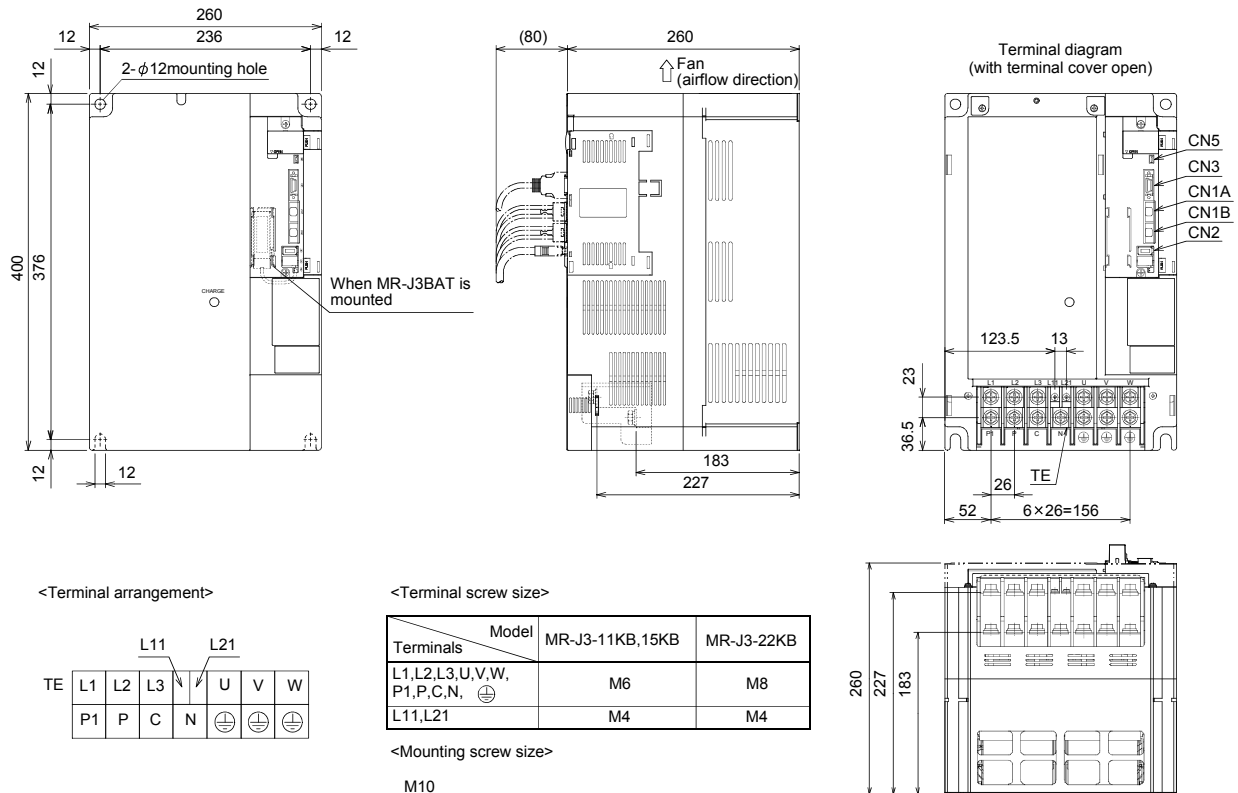
HA-LP 1500r/min series (Low inertia, large capacity)			HA-LP 2000r/min series (Low inertia, large capacity)		
HA-LP11K1M(B)	HA-LP15K1M(B)	HA-LP22K1M	HA-LP11K2(B)	HA-LP15K2(B)	HA-LP22K2(B)
MR-J3-11KB	MR-J3-15KB	MR-J3-22KB	MR-J3-11KB	MR-J3-15KB	MR-J3-22KB
16	22	33	16	22	33
11	15	22	11	15	22
70.0 (9910)	95.5 (13500)	140 (19800)	52.5 (7430)	71.6 (10100)	105 (14900)
210 (29700)	286 (40500)	350 (49600)	158 (22400)	215 (30400)	263 (37200)
1500			2000		
2000			2000		
2300			2300		
223	309	357	263	233	374
65	87	126	63	77	112
195	261	315	189	231	280
158	191	102	186	144	107
220 (1200)	295 (1610)	550 (3010)	105 (574)	220 (1200)	295 (1610)
293 (1600)	369 (2020)	–	113 (618)	293 (1600)	369 (2020)
10 times the servo motor's inertia moment maximum (Note 3)					
18-bit encoder (Resolution per encoder/servo motor rotation: 262144p/rev)					
Oil seal					
Class F					
Totally enclosed ventilated (protection level: IP44) (Note 4)					
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 or less above sea level					
X: 11.7m/s ² Y: 29.4m/s ²		X, Y: 9.8m/s ²	X: 11.7m/s ² Y: 29.4m/s ²		
95 (210)	115 (255)	160 (355)	55 (125)	95 (210)	115 (255)
130 (290)	150 (335)	–	70 (155)	130 (290)	150 (335)
3-phase 200 to 220VAC/50Hz 3-phase 200 to 230VAC/60Hz			1-phase 200 to 220VAC/50Hz 1-phase 200 to 230VAC/60Hz	3-phase 200 to 220VAC/50Hz 3-phase 200 to 230VAC/60Hz	
32 (50Hz)/ 40 (60Hz)		45 (50Hz)/ 63 (60Hz)	42 (50Hz)/ 54 (60Hz)	32 (50Hz)/ 40 (60Hz)	
0.30 (50Hz)/ 0.25 (60Hz)		0.32 (50Hz)/ 0.35 (60Hz)	0.21 (50Hz)/ 0.25 (60Hz)	0.30 (50Hz)/ 0.25 (60Hz)	



Servo amplifier dimensions

(Unit : mm)

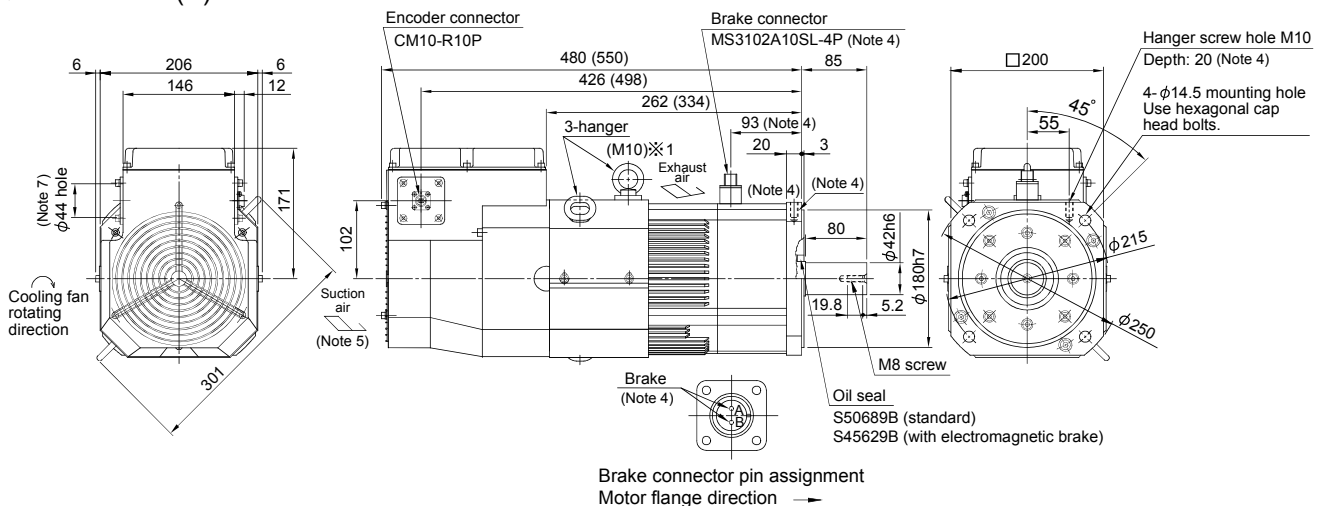
MR-J3-11KB, 15KB, 22KB



Servo motor dimensions

(Unit : mm)

HA-LP11K2(B)



※1. When the motor is used without a hanger, plug the thread hole with a bolt of M10×20 or shorter.

※2. The terminal block on the terminal box housing consists of M6 screws for the motor power supply (U, V, W), M4 screws for the cooling fan (BU, BV) and for the thermal protector (OHS1, OHS2).

Notes: 1. Use a friction coupling to fasten a load.

2. For dimensions where there is no tolerance listed, use general tolerance.

3. Dimensions inside () are for the models with an electromagnetic brake.

4. Only for the models with an electromagnetic brake. The electromagnetic brake terminals do not have the polarity.

5. Leave a clearance of at least 100mm between the motor's suction side and wall.

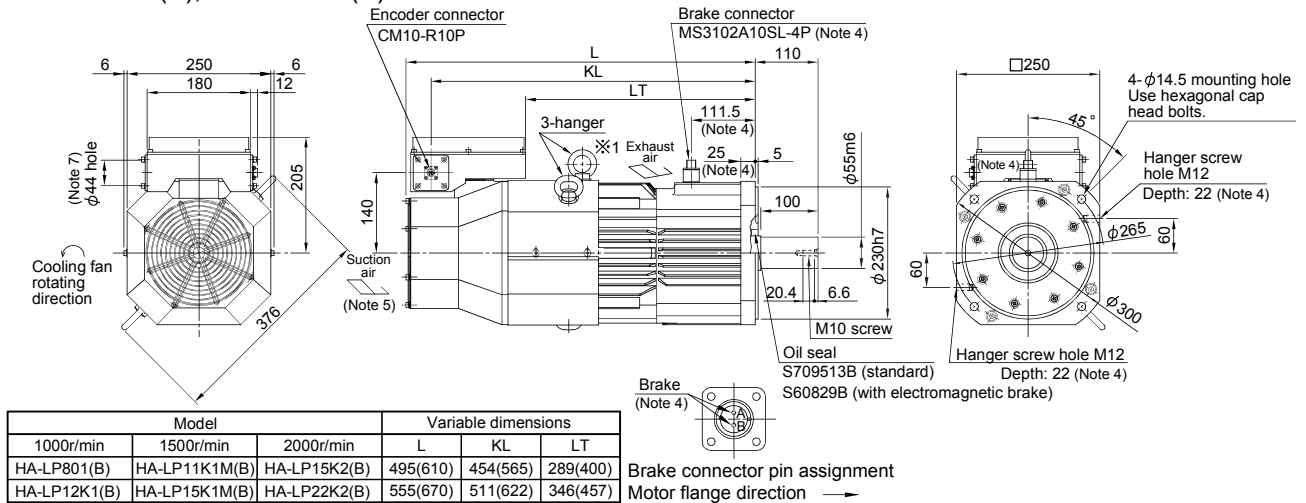
6. Leave a clearance of at least 150mm between the motor's suction side and wall.

7. Make sure that oil, water and dust, etc., will not enter the motor from the lead-in hole.

Servo motor dimensions

(Unit : mm)

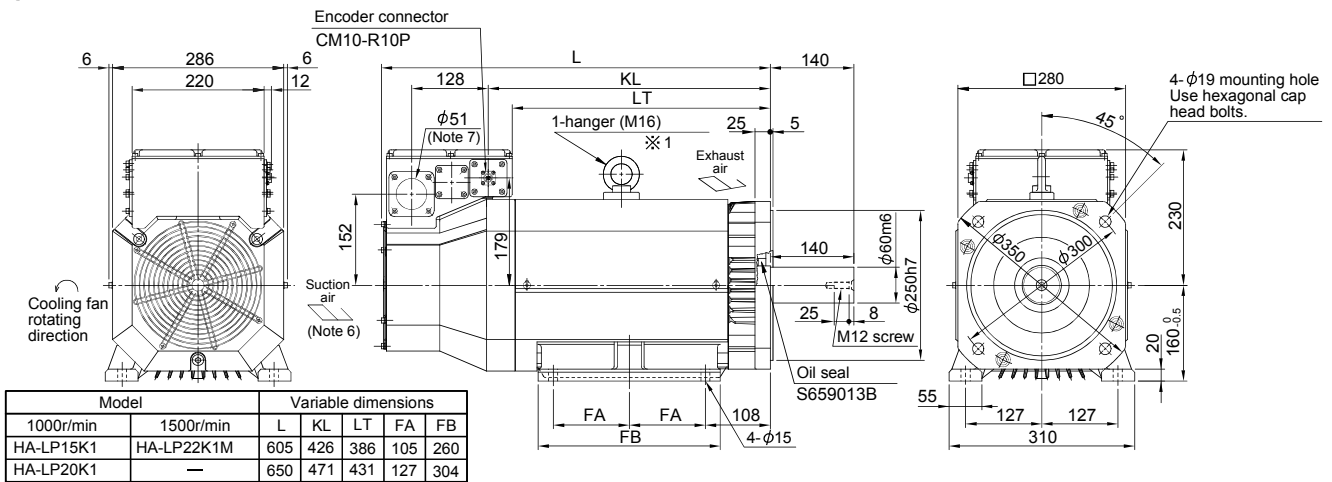
- HA-LP801(B), HA-LP12K1(B)
- HA-LP11K1M(B), HA-LP15K1M(B)
- HA-LP15K2(B), HA-LP22K2(B)



※1. When the motor is used without a hanger, plug the thread hole with a bolt of M12×20 or shorter.

※2. The terminal block on the terminal box housing consists of M8 screws for the motor power supply (U, V, W), M4 screws for the cooling fan (BU, BV, BW) and for the thermal protector (OHS1, OHS2).

- HA-LP15K1, HA-LP20K1
- HA-LP22K1M

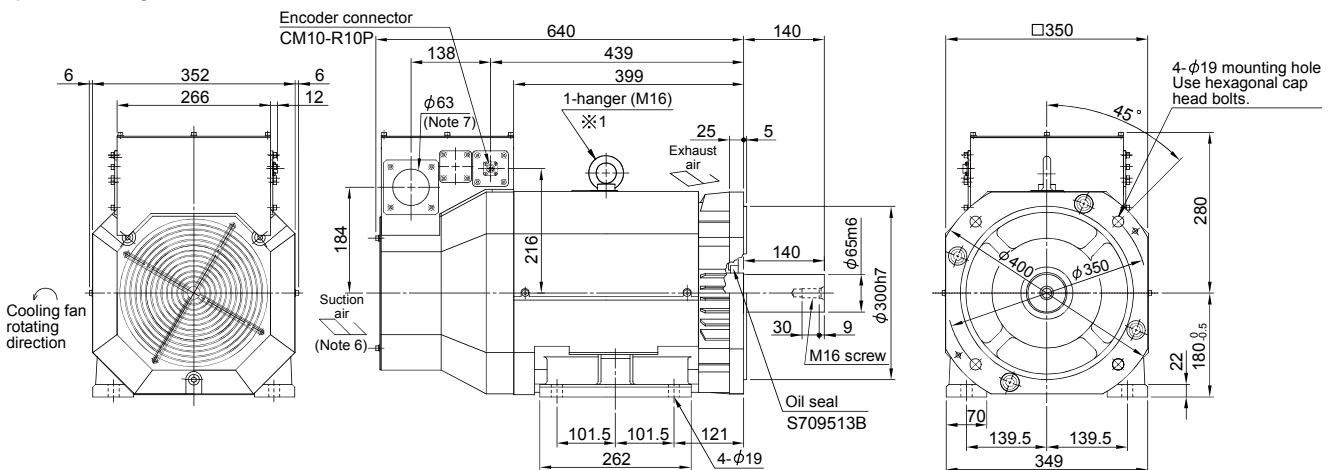


※1. When the motor is used without a hanger, plug the thread hole with a bolt of M16×20 or shorter.

※2. The terminal block on the terminal box housing consists of M8 screws for the motor power supply (U, V, W), M4 screws for the cooling fan (BU, BV, BW) and for the thermal protector (OHS1, OHS2).

※3. When mounting the motor, keep the motor shaft horizontal and its legs downward. Mount the motor either at the legs or the flange.

- HA-LP25K1



※1. When the motor is used without a hanger, plug the thread hole with a bolt of M16×20 or shorter.

※2. The terminal block on the terminal box housing consists of M10 screws for the motor power supply (U, V, W), M4 screws for the cooling fan (BU, BV, BW) and for the thermal protector (OHS1, OHS2).

※3. When mounting the motor, keep the motor shaft horizontal and its legs downward. Mount the motor either at the legs or the flange.

Options

● Regenerative resistor (standard accessory):

Supplied with the servo amplifier

Model	Applicable servo amplifier	Fig.
GRZG400-1.5Ω	MR-J3-11KB	A
GRZG400-0.9Ω	MR-J3-15KB	
GRZG400-0.6Ω	MR-J3-22KB	

● Optional regeneration unit

Model	Applicable servo amplifier	Fig.
MR-RB5E	MR-J3-11KB	B
MR-RB9P	MR-J3-15KB	
MR-RB9F	MR-J3-22KB	


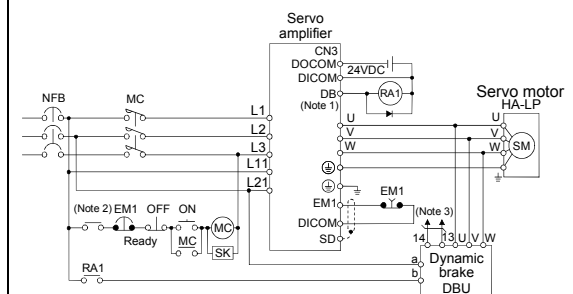
External dimensions (Unit: mm)	Connections																																					
<p>●GRZG400-1.5Ω, GRZG400-0.9Ω, GRZG400-0.6Ω : Standard accessory (Note 1, 5)</p> <p style="text-align: right;">Mounting screw size : M8</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Model</th> <th rowspan="2">Qty.</th> <th rowspan="2">Tolerable regenerative power (W)</th> <th rowspan="2">With fan (W)</th> <th rowspan="2">Resistance value(Ω)</th> <th colspan="3">Variable dimensions (mm)</th> <th rowspan="2">Mass/unit kg(lb)</th> </tr> <tr> <th>A</th> <th>C</th> <th>K</th> </tr> </thead> <tbody> <tr> <td>GRZG400-1.5Ω</td> <td>4</td> <td>500</td> <td>800</td> <td>6 (1.5Ω×4)</td> <td>10</td> <td>5.5</td> <td>39</td> <td rowspan="3" style="text-align: center;">0.8 (1.8)</td> </tr> <tr> <td>GRZG400-0.9Ω</td> <td>5</td> <td>850</td> <td>1300</td> <td>4.5 (0.9Ω×5)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>GRZG400-0.6Ω</td> <td>5</td> <td>850</td> <td>1300</td> <td>3 (0.6Ω×5)</td> <td>16</td> <td>8.2</td> <td>46</td> </tr> </tbody> </table>	Model	Qty.	Tolerable regenerative power (W)	With fan (W)	Resistance value(Ω)	Variable dimensions (mm)			Mass/unit kg(lb)	A	C	K	GRZG400-1.5Ω	4	500	800	6 (1.5Ω×4)	10	5.5	39	0.8 (1.8)	GRZG400-0.9Ω	5	850	1300	4.5 (0.9Ω×5)				GRZG400-0.6Ω	5	850	1300	3 (0.6Ω×5)	16	8.2	46	<p>Do not disconnect the short bar. Leave a space of 70mm or more between each resistor.</p> <p style="text-align: center;">Fan (1.0m³/min, □92×2 units)</p> <p>Note: By installing a thermal sensor, create a safety circuit that shuts off the main circuit power supply when abnormal overheating occurs.</p>
Model						Qty.	Tolerable regenerative power (W)	With fan (W)		Resistance value(Ω)	Variable dimensions (mm)			Mass/unit kg(lb)																								
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GRZG400-1.5Ω	4	500	800	6 (1.5Ω×4)	10	5.5	39	0.8 (1.8)																														
GRZG400-0.9Ω	5	850	1300	4.5 (0.9Ω×5)																																		
GRZG400-0.6Ω	5	850	1300	3 (0.6Ω×5)	16	8.2	46																															
<p>●MR-RB5E, MR-RB9P, MR-RB9F (Note 5)</p> <p style="text-align: center;"><Terminal arrangement> TE1 G4 G3 C P</p> <p style="text-align: center;">Terminal screw size : M5 Mounting screw size : M8</p> <p style="text-align: right;">Fan mounting screw (4-M3)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Model</th> <th>Tolerable regenerative power (W)</th> <th>With fan (W)</th> <th>Resistance value(Ω)</th> <th>Description</th> <th>Mass kg (lb)</th> </tr> </thead> <tbody> <tr> <td>MR-RB5E</td> <td>500</td> <td>800</td> <td>6</td> <td>GRZG400-1.5Ω×4</td> <td>10 (22)</td> </tr> <tr> <td>MR-RB9P</td> <td>850</td> <td>1300</td> <td>4.5</td> <td>GRZG400-0.9Ω×5</td> <td rowspan="2" style="text-align: center;">11 (24)</td> </tr> <tr> <td>MR-RB9F</td> <td>850</td> <td>1300</td> <td>3</td> <td>GRZG400-0.6Ω×5</td> </tr> </tbody> </table>	Model	Tolerable regenerative power (W)	With fan (W)	Resistance value(Ω)	Description	Mass kg (lb)	MR-RB5E	500	800	6	GRZG400-1.5Ω×4	10 (22)	MR-RB9P	850	1300	4.5	GRZG400-0.9Ω×5	11 (24)	MR-RB9F	850	1300	3	GRZG400-0.6Ω×5	<p>Do not disconnect the short bar.</p> <p style="text-align: center;">Thermal sensor The contact between G3 and G4 opens at 100 ± 5°C (212 ± 41°F).</p> <p style="text-align: center;">Create a safety circuit that shuts off the main circuit power supply when the thermal sensor activates.</p> <p>Note: Create a sequence that turns off the magnetic contactor (MC) when abnormal overheating occurs.</p>														
Model	Tolerable regenerative power (W)	With fan (W)	Resistance value(Ω)	Description	Mass kg (lb)																																	
MR-RB5E	500	800	6	GRZG400-1.5Ω×4	10 (22)																																	
MR-RB9P	850	1300	4.5	GRZG400-0.9Ω×5	11 (24)																																	
MR-RB9F	850	1300	3	GRZG400-0.6Ω×5																																		

- Notes:
- The servo amplifier (MR-J3-□KB-PX) without enclosed regenerative resistors is available for the servo amplifiers MR-J3-11KB to 22KB.
 - The optional regeneration unit will heat up to approx. 100°C (212°F), so do not directly mount it on a wall susceptible to heat. Use nonflammable wires or provide flame resistant treatment (use silicon tubes, etc.), and wire so that the wires do not contact the optional regeneration unit.
 - Always use twisted wires for the optional regeneration unit, and keep the length as short as possible (5m or shorter).
 - Always use twisted wires for a thermal sensor, and make sure that the sensor does not fail to work properly due to inducted noise.
 - When increasing the regeneration braking frequency, install cooling fans (approx. 1.0m³/min, □92×2 units) and change the parameter No. PA02. The cooling fan must be prepared by user.

● Dynamic brake

When using an 11kW or larger servo amplifier, use these dynamic brakes if the servo motor must be suddenly stopped during a power failure or when the protection circuit functions.

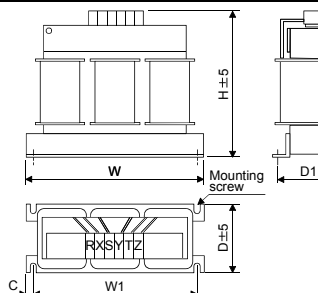
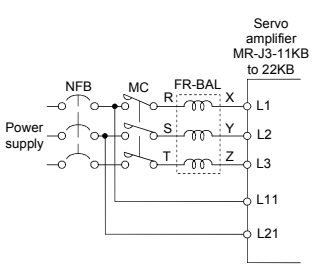
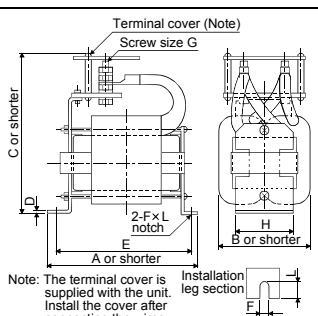
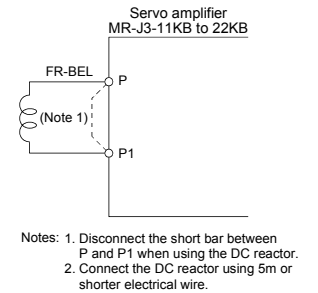
Model	Applicable servo amplifier
DBU-11K	MR-J3-11KB
DBU-15K	MR-J3-15KB
DBU-22K	MR-J3-22KB

External dimensions (Unit: mm)	Connections																																								
 <p>Terminal arrangement (GND) a b 13 14 U V W Screw size : M3.5 Screw size : M4</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Model</th> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>E</th> <th>F</th> <th>G</th> <th>Mass kg (lb)</th> <th>Electrical wire size (mm²)</th> </tr> </thead> <tbody> <tr> <td>DBU-11K</td> <td>200</td> <td>190</td> <td>140</td> <td>20</td> <td>5</td> <td>170</td> <td>163.5</td> <td>2 (4.4)</td> <td>5.5 (AWG10)</td> </tr> <tr> <td>DBU-15K</td> <td>250</td> <td>238</td> <td>150</td> <td>25</td> <td>6</td> <td>235</td> <td>228</td> <td>6 (13)</td> <td>5.5 (AWG10)</td> </tr> <tr> <td>DBU-22K</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Model	A	B	C	D	E	F	G	Mass kg (lb)	Electrical wire size (mm ²)	DBU-11K	200	190	140	20	5	170	163.5	2 (4.4)	5.5 (AWG10)	DBU-15K	250	238	150	25	6	235	228	6 (13)	5.5 (AWG10)	DBU-22K										 <p>Notes : 1. Validate the DB signal with the parameter No. PD07 to PD09. 2. Create an external sequence that turns off the power supply when the servo alarm occurs. 3. The terminals 13 and 14 are a-contact outputs. If the dynamic brake is welded, the terminals 13 and 14 will be opened. So create the external sequence that the servo on signal does not turn on when the terminals 13 and 14 are opened.</p>
Model	A	B	C	D	E	F	G	Mass kg (lb)	Electrical wire size (mm ²)																																
DBU-11K	200	190	140	20	5	170	163.5	2 (4.4)	5.5 (AWG10)																																
DBU-15K	250	238	150	25	6	235	228	6 (13)	5.5 (AWG10)																																
DBU-22K																																									

● Power factor improvement reactor

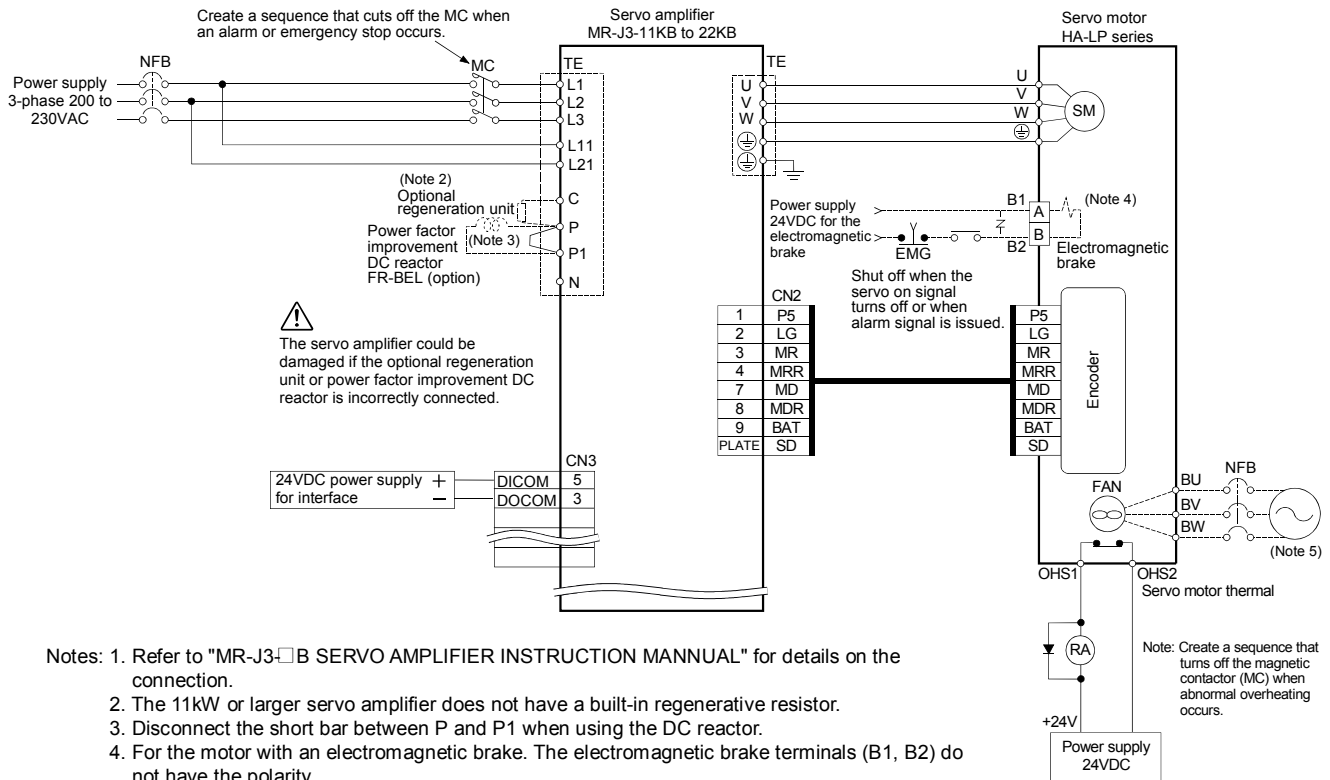
Type	Model	Applicable servo amplifier	Fig.
AC reactor	FR-BAL-15K	MR-J3-11KB	A
	FR-BAL-22K	MR-J3-15KB	
	FR-BAL-30K	MR-J3-22KB	

Type	Model	Applicable servo amplifier	Fig.
DC reactor	FR-BEL-15K	MR-J3-11KB	B
	FR-BEL-22K	MR-J3-15KB	
	FR-BEL-30K	MR-J3-22KB	

External dimensions (Unit: mm)	Connections																																																												
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Model		Variable dimensions (mm)											Mounting screw size	Mass kg(lb)	Electrical wire size (mm ²)																																														
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Standard wiring diagram

● Connection of main circuit and control circuit power supplies and CN2 connector (Note 6)



Electrical wires, circuit breakers, magnetic contactors

Servo amplifier	Circuit breaker	Magnetic contactor	Electrical wire size (mm ²) (Note 1)						
			L1,L2,L3,⊕	L11,L21	U,V,W,⊕	P,C (Note 2)	B1,B2	BU,BV,BW	OHS1,OHS2
MR-J3-11KB	100A frame 100A	S-N65	14 (AWG6)	1.25 (AWG16)	22 (AWG4)	5.5 (AWG10)	1.25 (AWG16)	2 (AWG14)	1.25 (AWG16)
MR-J3-15KB	225A frame 125A	S-N95	22 (AWG4)		30 (AWG2)				
MR-J3-22KB	225A frame 175A	S-N125	50 (AWG1/0)		60 (AWG2/0)				

- Notes:
1. The wires in the above table are assumed to use 600V polyvinyl chloride electrical wire having a length of 30m. Use a wire with the above size or larger.
 2. Connect a reactor or an optional regeneration unit using 5m or shorter length electrical wire. For electrical wire size suitable for the power factor improvement DC reactor, refer to the "Power factor improvement reactor" on page 7 in this brochure.

Model configurations

● For servo amplifier

MR - J3 - □ B

Symbol	Compatible motor (HA-LP)
11K	801, 12K1, 11K1M, 11K2
15K	15K1, 15K1M, 15K2
22K	20K1, 25K1, 22K1M, 22K2

※ Conforms to EN, UL and cUL standards.

SSCNET III compatible

● For servo motor

HA - LP □ 2 B □

Symbol	Rated output (kW)
80	8
11K to 25K	11 to 25

※ Conforms to EN, UL and cUL standards.

Symbol	Shaft end
None	Standard (Straight shaft)
K	Key way

Symbol	Electromagnetic brake
None	None
B	Installed (Note)

Note: For the compatible models, refer to the "Servo motor model" in the Servo motor specifications on page 2 and 3 in this brochure.

Symbol	Rated speed (r/min)
1	1000
1M	1500
2	2000