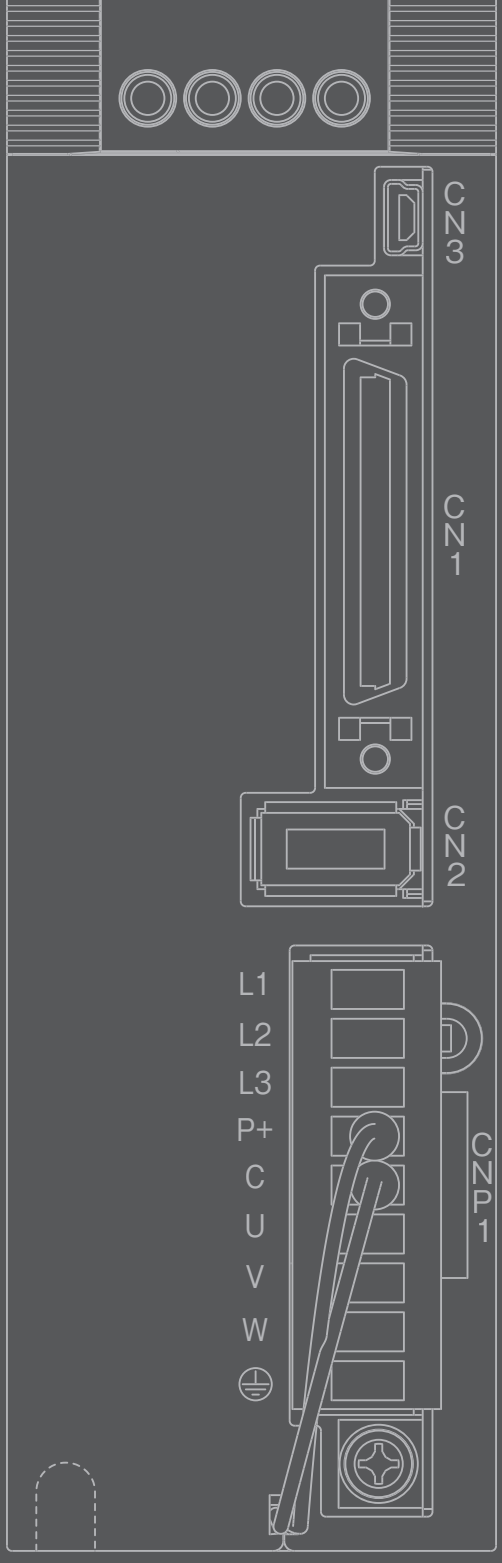
1



Servo Amplifiers

Servo Amplifier Model Designation

M R - J E - 1 0 A

Mitsubishi general-purpose AC servo amplifier MELSERVO-JE Series

Symbol	Interface
A	General-purpose

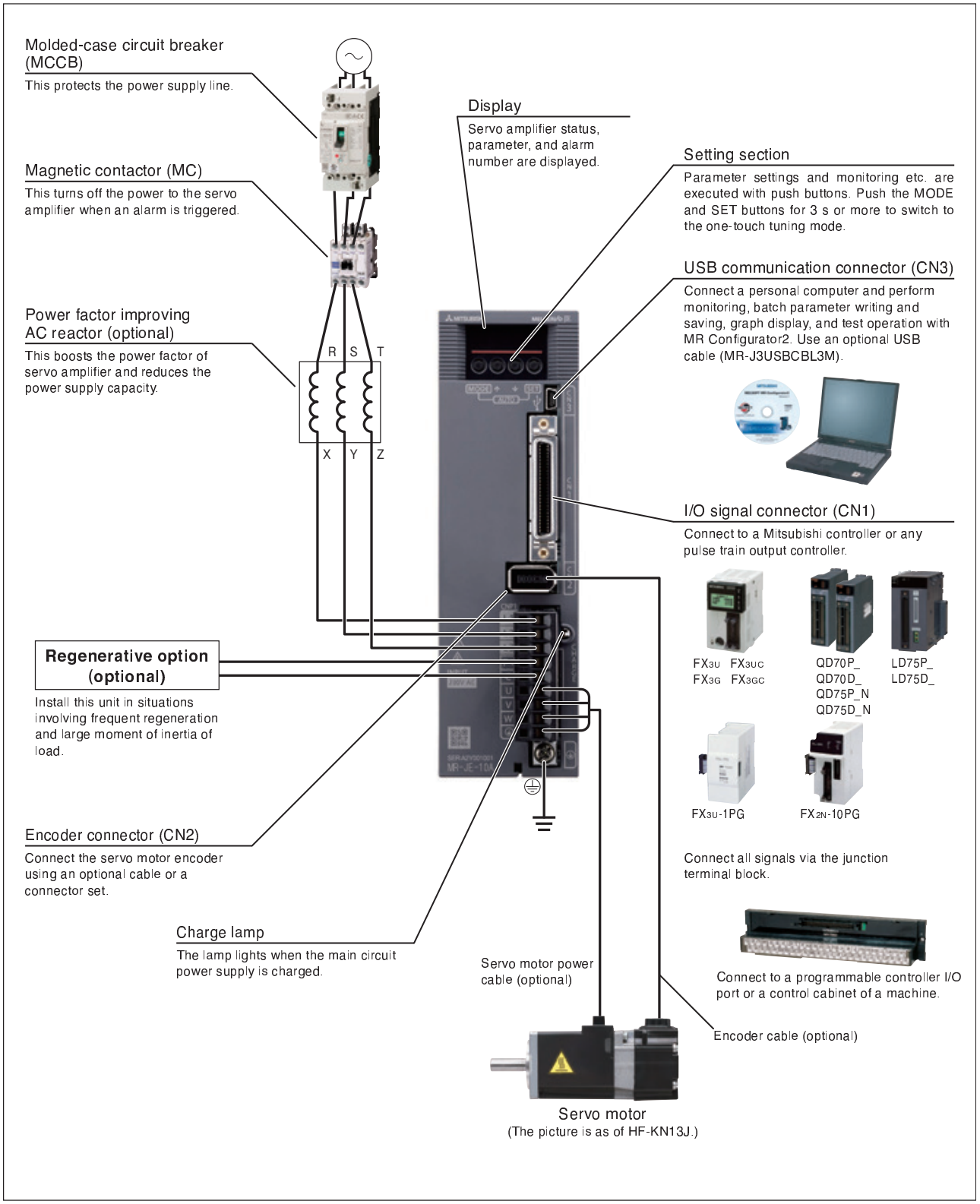
Symbol	Rated output [kW]
10	0.1
20	0.2
40	0.4
70	0.75
100	1
200	2
300	3

Combinations of Servo Amplifier and Servo Motor

Servo amplifier	Servo motor	
	HF-KN series	HF-SN series
MR-JE-10A	HF-KN13J	-
MR-JE-20A	HF-KN23J	-
MR-JE-40A	HF-KN43J	-
MR-JE-70A	HF-KN73J	HF-SN52J
MR-JE-100A	-	HF-SN102J
MR-JE-200A	-	HF-SN152J, HF-SN202J
MR-JE-300A	-	HF-SN302J

MR-JE-A Connections with Peripheral Equipment (Note 1)

Peripheral equipment is connected to MR-JE-A as described below. Connectors, cables, options, and other necessary equipment are available so that users can set up the servo amplifier easily and start using it right away.



Notes: 1. The connection with the peripheral equipment is an example for MR-JE-100A or smaller servo amplifier. Refer to "MR-JE-_A Servo Amplifier Instruction Manual" for the actual connections.

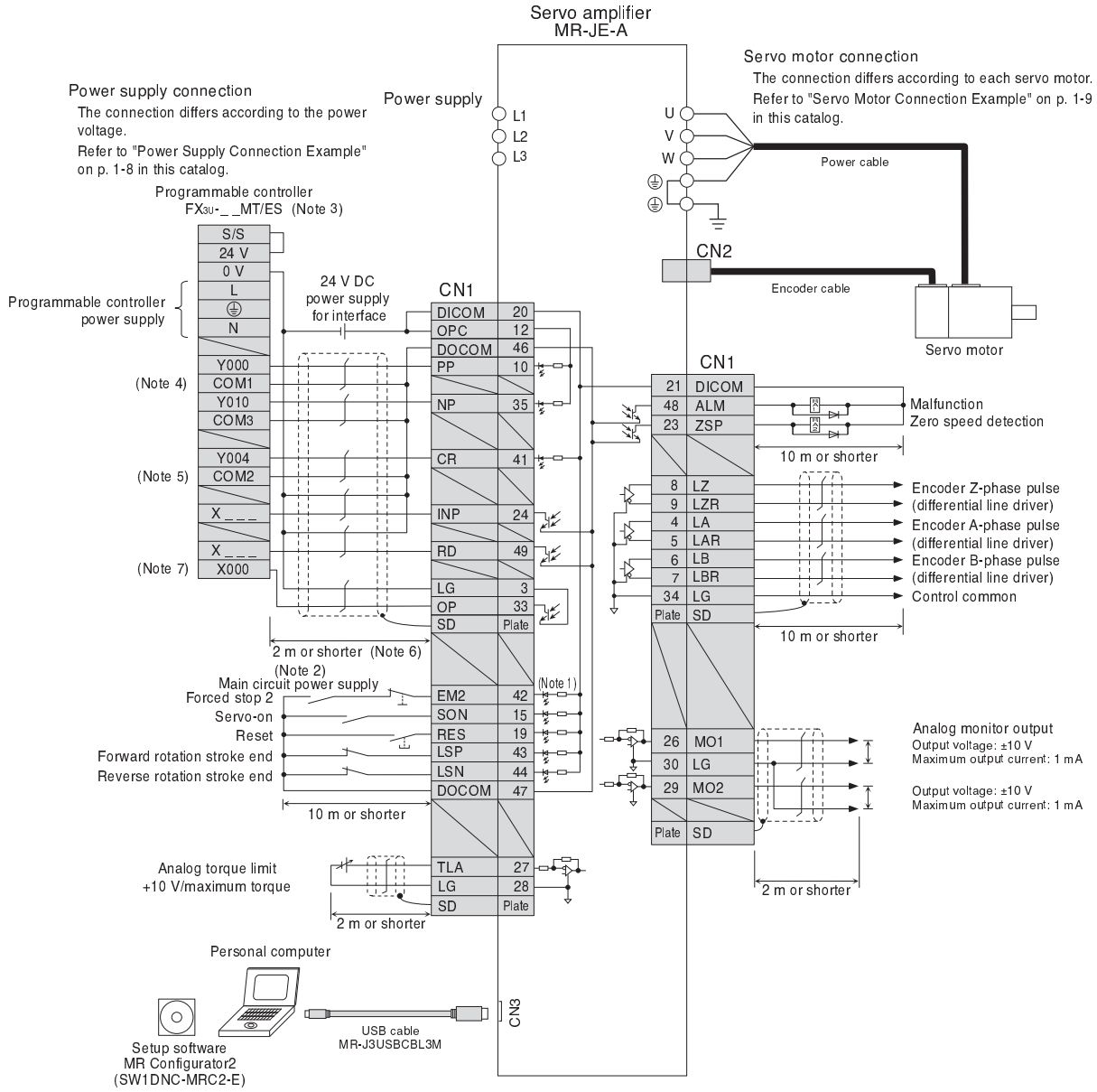
MR-JE-A (General-Purpose Interface) Specifications

Servo amplifier model MR-JE-		10A	20A	40A	70A	100A	200A	300A
Output	Rated voltage	3-phase 170 V AC						
	Rated current [A]	1.1	1.5	2.8	5.8	6.0	11.0	11.0
Power supply input	Voltage/frequency (Note 1)	3-phase or 1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz				3-phase 200 V AC to 240 V AC, 50 Hz/60 Hz		
	Rated current [A]	0.9	1.5	2.6	3.8	5.0	10.5	14.0
	Permissible voltage fluctuation	3-phase or 1-phase 170 V AC to 264 V AC				3-phase 170 V AC to 264 V AC		
	Permissible frequency fluctuation	±5% maximum						
Interface power supply		24 V DC ± 10% (required current capacity: 0.3 A)						
Control method		Sine-wave PWM control/current control method						
Tolerable regenerative power of the built-in regenerative resistor (Note 2, 3) [W]		-	-	10	20	20	100	100
Dynamic brake		Built-in (Note 4)						
Communication function		USB: Connect a personal computer (MR Configurator2 compatible)						
Encoder output pulse		Compatible (A/B/Z-phase pulse)						
Analog monitor		2 channels						
Position control mode	Maximum input pulse frequency	4 Mpps (when using differential receiver), 200 kpps (when using open-collector)						
	Positioning feedback pulse	Encoder resolution: 131072 pulses/rev						
	Command pulse multiplying factor	Electronic gear A/B multiple, A: 1 to 16777215, B: 1 to 16777215, 1/10 < A/B < 4000						
	Positioning complete width setting	0 pulse to ±65535 pulses (command pulse unit)						
	Error excessive	±3 rotations						
	Torque limit	Set by parameters or external analog input (0 V DC to +10 V DC/maximum torque)						
Speed control mode	Speed control range	Analog speed command 1:2000, internal speed command 1:5000						
	Analog speed command input	0 V DC to ±10 V DC/rated speed (Speed at 10 V is changeable with [Pr. PC12].)						
	Speed fluctuation rate	±0.01% maximum (load fluctuation 0% to 100%), 0% (power fluctuation: ±10%) ±0.2% maximum (ambient temperature: 25 °C ± 10 °C) only when using analog speed command						
	Torque limit	Set by parameters or external analog input (0 V DC to +10 V DC/maximum torque)						
Torque control mode	Analog torque command input	0 V DC to ±8 V DC/maximum torque (input impedance: 10 kΩ to 12 kΩ)						
	Speed limit	Set by parameters or external analog input (0 V DC to ± 10 V DC/rated speed)						
Protective functions		Overcurrent shut-off, regenerative overvoltage shut-off, overload shut-off (electronic thermal), servo motor overheat protection, encoder error protection, regenerative error protection, undervoltage protection, instantaneous power failure protection, overspeed protection, error excessive protection						
Compliance to standards		Refer to "Conformity with global standards and regulations" on p. 13 in this catalog.						
Structure (IP rating)		Natural cooling, open (IP20)					Force cooling, open (IP20)	
Close mounting		Possible (Note 5)						
Environment	Ambient temperature	0 °C to 55 °C (non-freezing), storage: -20 °C to 65 °C (non-freezing)						
	Ambient humidity	90 %RH maximum (non-condensing), storage: 90 %RH maximum (non-condensing)						
	Ambience	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust						
	Altitude	1000 m or less above sea level						
	Vibration resistance	5.9 m/s^2 at 10 Hz to 55 Hz (directions of X, Y and Z axes)						
Mass [kg]		0.8	0.8	0.8	1.5	1.5	2.1	2.1

Notes: 1. Rated output and speed of a servo motor are applicable when the servo amplifier, combined with the servo motor, is operated within the specified power supply voltage and frequency.
2. Select the most suitable regenerative option for your system with our capacity selection software.
3. Refer to "Regenerative Option" in this catalog for the tolerable regenerative power [W] when regenerative option is used.
4. When using the built-in dynamic brake, refer to "MR-JE-_A Servo Amplifier Instruction Manual" for the permissible load to motor inertia ratio.
5. When the servo amplifiers are closely mounted, keep the ambient temperature within 0 °C to 45 °C, or use them with 75% or less of the effective load ratio.

MR-JE-A Standard Wiring Diagram Example: Position Control Operation

Connecting to FX_{3U} (position servo, incremental)

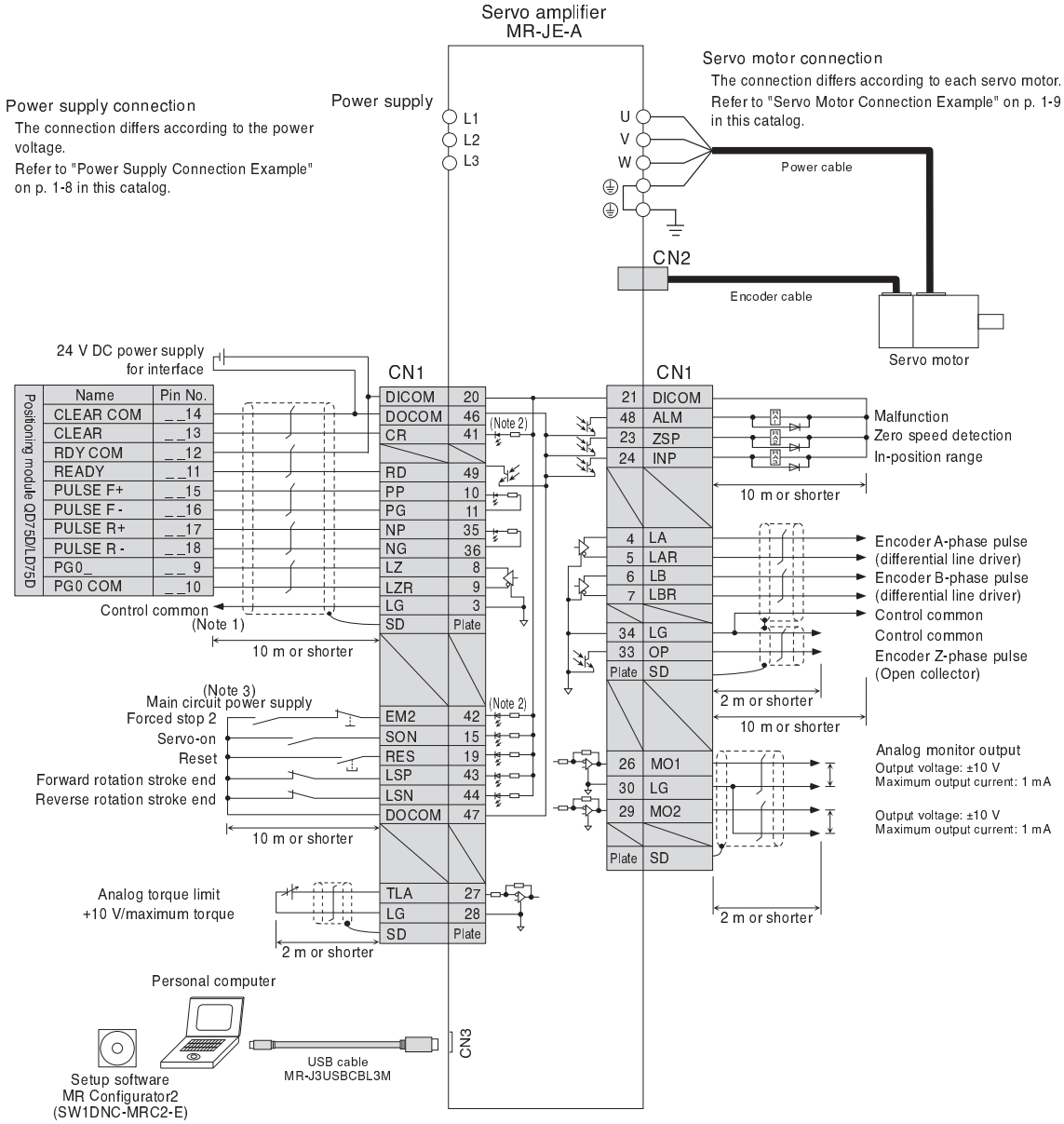


Notes: 1. This is for sink wiring. Source wiring is also possible.
2. Create a circuit to turn off EM2 when the main circuit power is turned off to prevent an unexpected restart of the servo amplifier.
3. Select the number of input/output points of the programmable controller according to your system.
4. The signal is COM0 for FX_{3U}-16MT/ES.
5. The signal is COM4 for FX_{3U}-16MT/ES.
6. It is recommended that the connection be 2 m or shorter because an open-collector system is used.
7. Select from the range of X000 to X007.

⚠ Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

MR-JE-A Standard Wiring Diagram Example: Position Control Operation

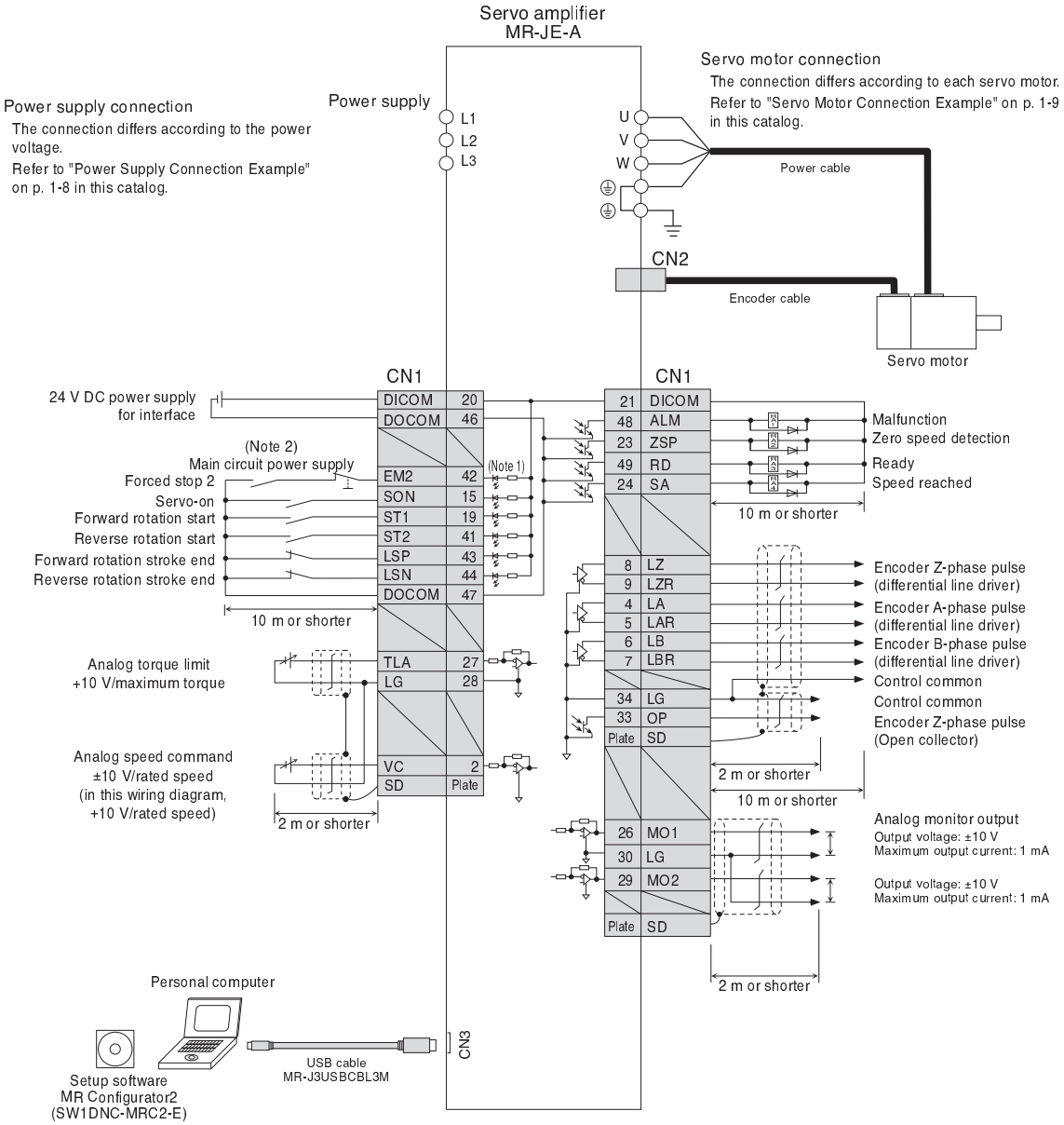
Connecting to QD75D/LD75D (position servo, incremental)



Notes: 1. This connection is not necessary for QD75D/LD75D positioning module. Note that the connection between LG and control common terminal is recommended for some positioning modules to improve noise immunity.
2. This is for sink wiring. Source wiring is also possible.
3. Create a circuit to turn off EM2 when the main circuit power is turned off to prevent an unexpected restart of the servo amplifier.

⚠ Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

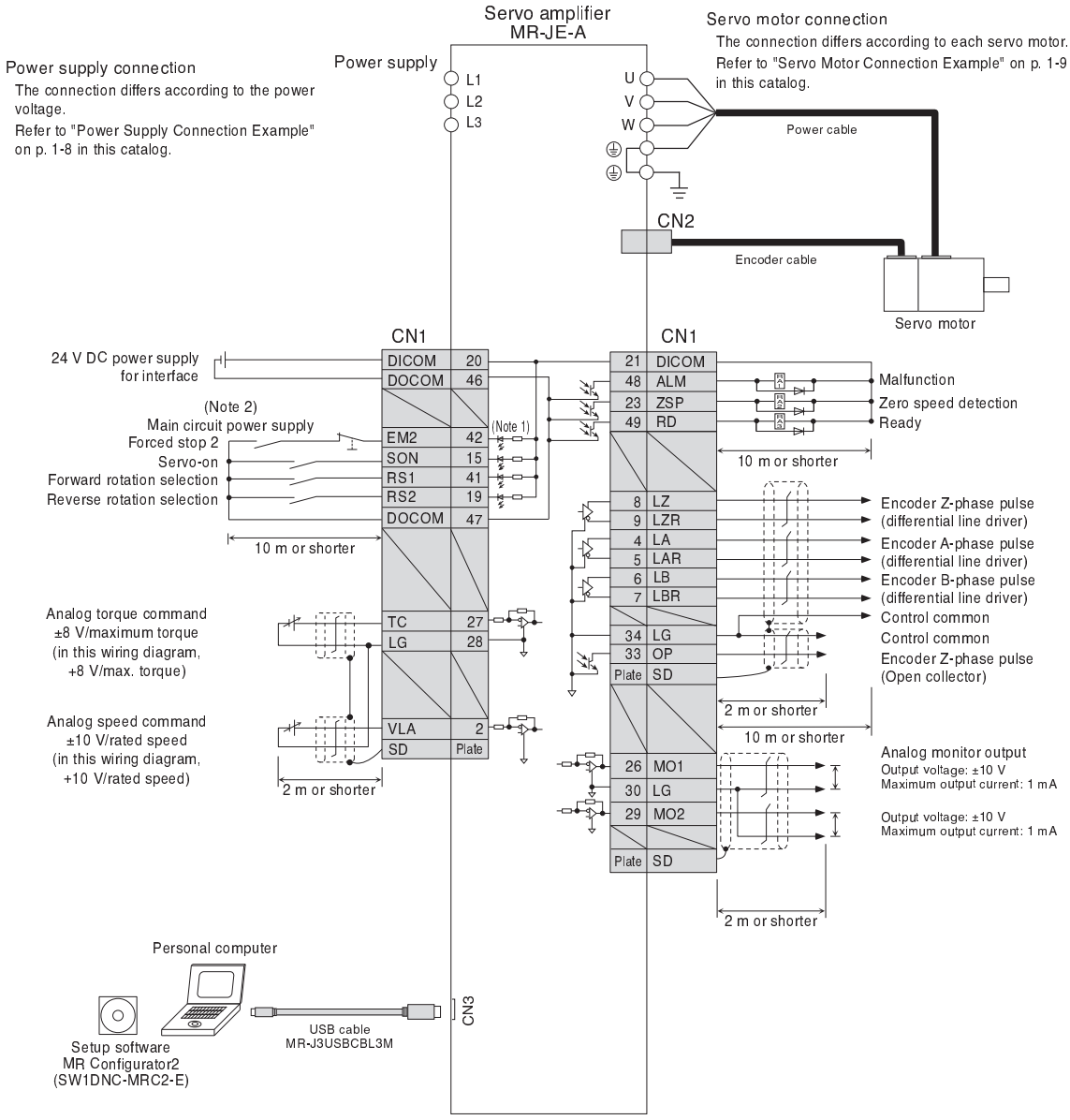
MR-JE-A Standard Wiring Diagram Example: Speed Control Operation



Notes: 1. This is for sink wiring. Source wiring is also possible.
2. Create a circuit to turn off EM2 when the main circuit power is turned off to prevent an unexpected restart of the servo amplifier.

⚠ Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

MR-JE-A Standard Wiring Diagram Example: Torque Control Operation

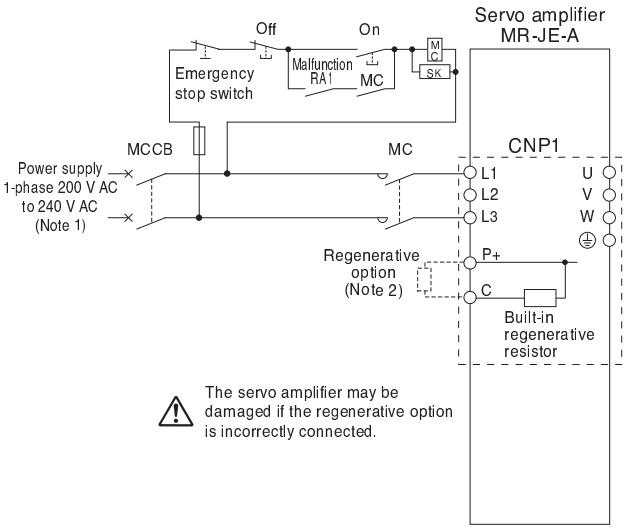


Notes: 1. This is for sink wiring. Source wiring is also possible.
2. Create a circuit to turn off EM2 when the main circuit power is turned off to prevent an unexpected restart of the servo amplifier.

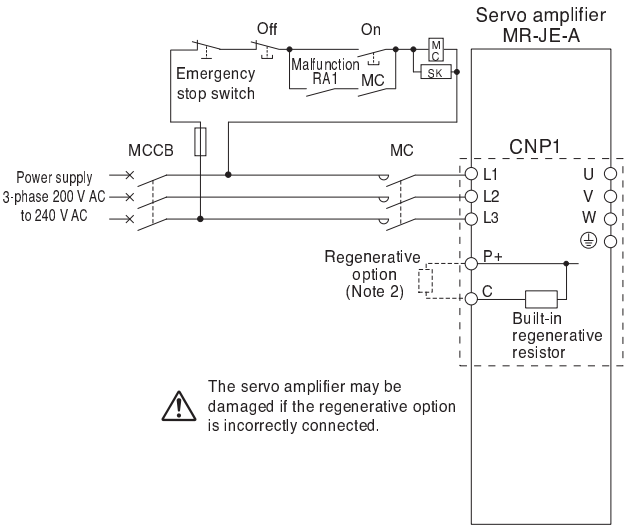
⚠ Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

Power Supply Connection Example

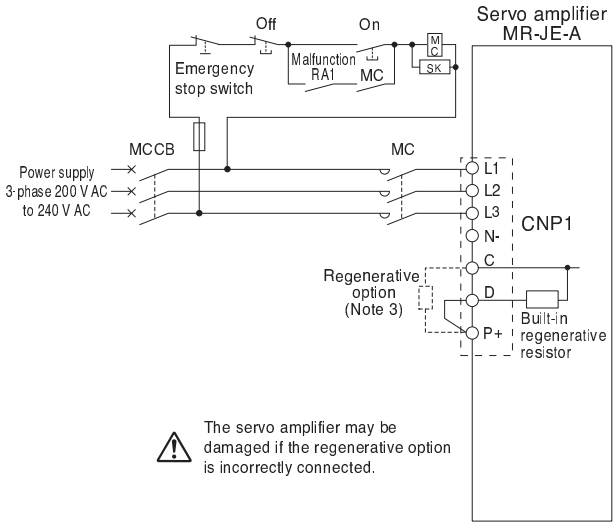
●For 1-phase 200 V AC



●For 3-phase 200 V AC, 1 kW or smaller



●For 3-phase 200 V AC, 2 kW and 3 kW

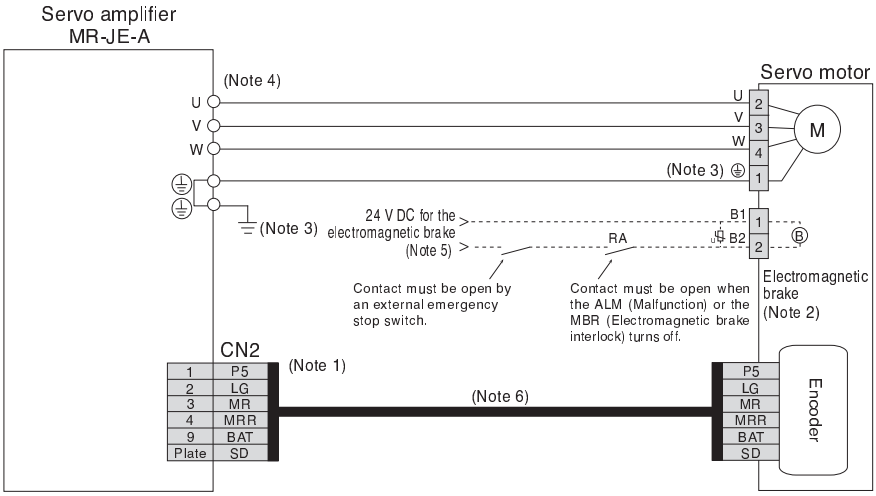


Notes: 1. For 1-phase 200 V AC to 240 V AC, connect the power supply to L1 and L3 terminals. Do not connect anything to L2. The connections are different from MR-E Super series servo amplifiers. Be careful not to make a connection error when replacing MR-E Super with MR-JE.
2. Disconnect the wires for the built-in regenerative resistor (P+ and C) and remove the resistor when connecting the regenerative option externally.
3. Disconnect a short-circuit bar between P+ and D when connecting the regenerative option externally.

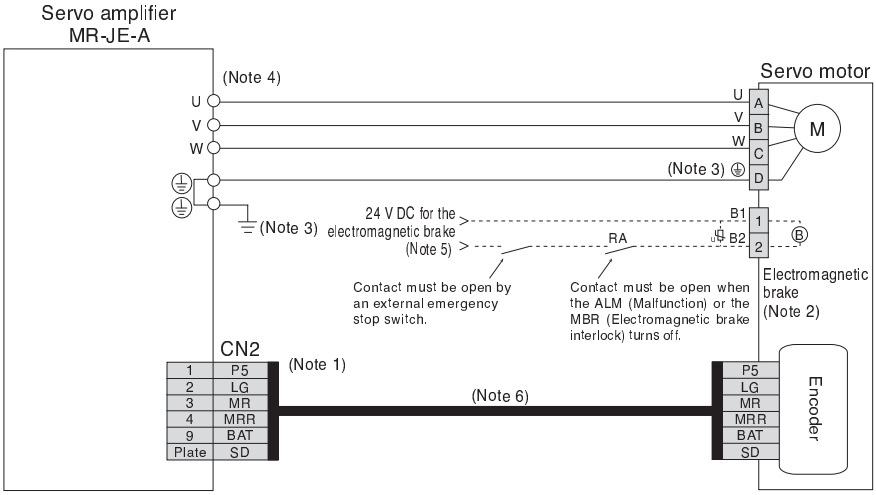
⚠ Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

Servo Motor Connection Example

●For HF-KN series



●For HF-SN series



Notes: 1. The signals shown is applicable when using a two-wire type encoder cable. Four-wire type is also compatible.
2. This is for the servo motor with electromagnetic brake. The electromagnetic brake terminals (B1, B2) do not have polarity.
3. For MR-JE-100A or smaller servo amplifier, connect the grounding terminal of the servo motor to ⏚ of CNP1, and connect the protective earth (PE) terminal (⏚) located on the lower front of the servo amplifier to the cabinet protective earth (PE).
For MR-JE-200A or larger servo amplifier, connect the grounding terminal of the servo motor to the protective earth (PE) terminal (⏚) located on the lower front of the servo amplifier, and connect the other protective earth (PE) terminal (⏚) to the cabinet protective earth (PE).
4. The connector varies depending on the servo amplifier capacities. Refer to "MR-JE-A Dimensions" in this catalog.
5. Do not use the 24 V DC interface power supply for the electromagnetic brake. Provide a dedicated power supply to the electromagnetic brake.
6. Encoder cable is available as an option. Refer to "HF-KN HF-SN Servo Motor Instruction Manual" when fabricating the cables.

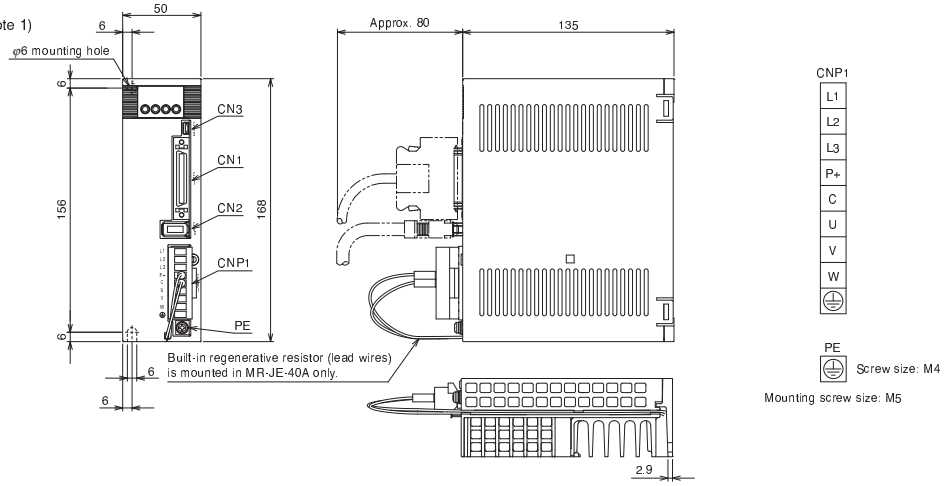
⚠ Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

MR-JE-A Dimensions

●MR-JE-10A (Note 1)

●MR-JE-20A (Note 1)

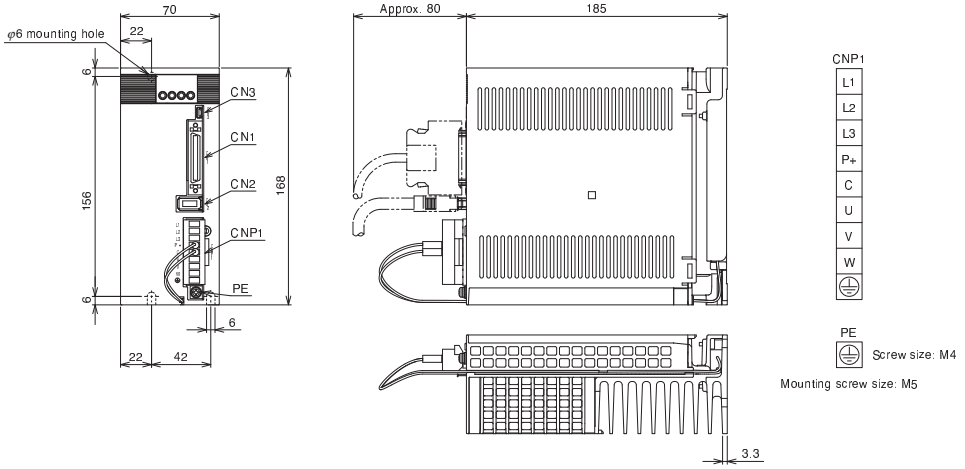
●MR-JE-40A (Note 1)



[Unit: mm]

●MR-JE-70A (Note 1)

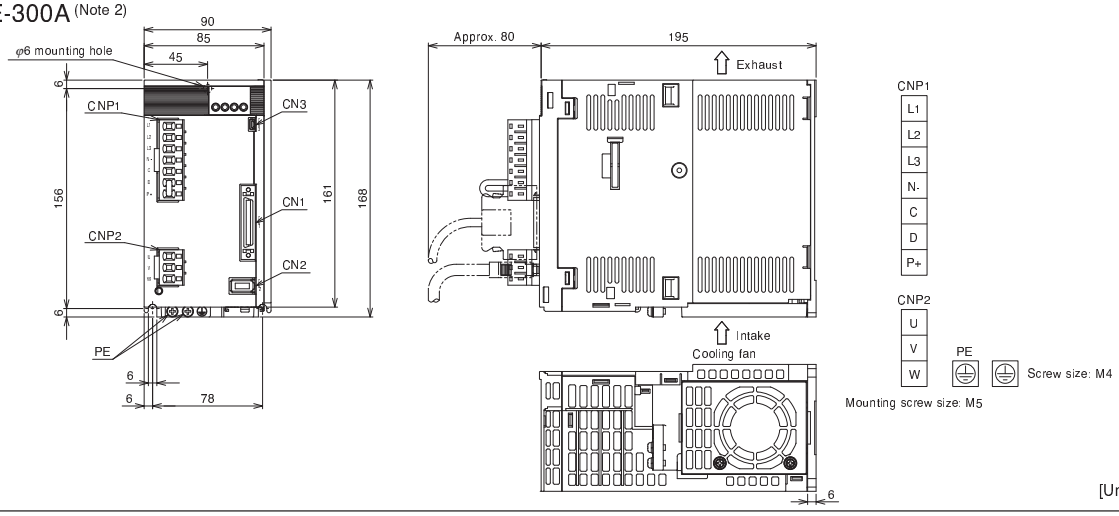
●MR-JE-100A (Note 1)



[Unit: mm]

●MR-JE-200A (Note 2)

●MR-JE-300A (Note 2)

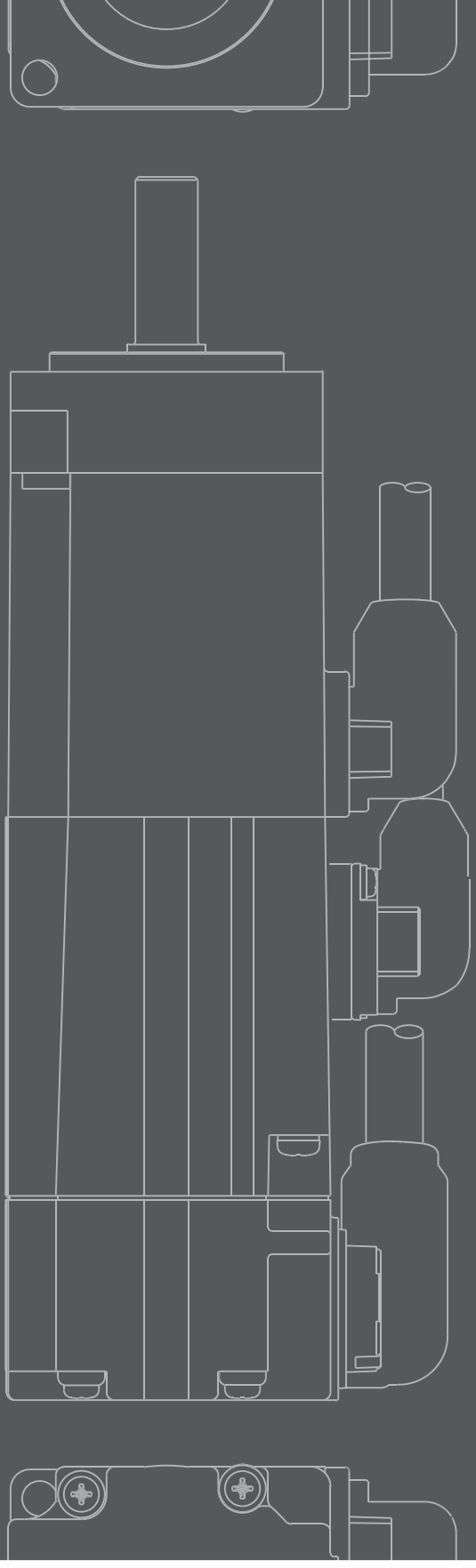


[Unit: mm]

Notes: 1. CNP1 connector (insertion type) is supplied with the servo amplifier.
2. CNP1 and CNP2 connectors (insertion type) are supplied with the servo amplifier.

MEMO

2



Servo Motors

Model Designation

H F - K N 1 3 B J □

Symbol	Shaft end
None	Standard (Straight shaft)
K	Key shaft (with/without key) (Note 4)
D	D-cut shaft (Note 4)

Symbol	Oil seal
J	Installed (Note 5)
None	None (Note 6)

Symbol	Electromagnetic brake
None	None
B	Installed (Note 1)

Symbol	Rated speed [r/min]
2	2000 (Note 2)
3	3000 (Note 3)

Symbol	Rated output [kW]
1 to 7	0.1 to 0.75
10 to 30	1.0 to 3.0

Symbol	Inertia/capacity
HF-KN	Low inertia, small capacity
HF-SN	Medium inertia, medium capacity

Notes: 1. Refer to electromagnetic brake specifications of each servo motor series in this catalog for the available models and detailed specifications.
2. 2000 r/min is for HF-SN series only.
3. 3000 r/min is for HF-KN series only.
4. Refer to special shaft end specifications of each servo motor series in this catalog for the available models and detailed specifications.
5. An oil seal is attached as a standard for all servo motors.
6. Available in HF-KN13 to HF-KN43.

Combinations of Servo Motor and Servo Amplifier

Servo motor		Servo amplifier
HF-KN series	HF-KN13(B)J	MR-JE-10A
	HF-KN23(B)J	MR-JE-20A
	HF-KN43(B)J	MR-JE-40A
	HF-KN73(B)J	MR-JE-70A
HF-SN series	HF-SN52(B)J	MR-JE-70A
	HF-SN102(B)J	MR-JE-100A
	HF-SN152(B)J	MR-JE-200A
	HF-SN202(B)J	MR-JE-200A
	HF-SN302(B)J	MR-JE-300A

HF-KN Series (Low Inertia, Small Capacity) Specifications

Servo motor model HF-KN			13(B)J	23(B)J	43(B)J	73(B)J
Compatible servo amplifier model			Refer to "Combinations of Servo Motor and Servo Amplifier" on p. 2-1 in this catalog.			
Power supply capacity *1		[kVA]	0.3	0.5	0.9	1.3
Continuous running duty	Rated output	[W]	100	200	400	750
	Rated torque (Note 3)	[N•m]	0.32	0.64	1.3	2.4
Maximum torque		[N•m]	0.95	1.9	3.8	7.2
Rated speed		[r/min]	3000			
Maximum speed		[r/min]	4500			
Permissible instantaneous speed		[r/min]	5175			
Power rate at continuous rated torque	Standard	[kW/s]	11.5	16.9	38.6	39.9
	With electromagnetic brake	[kW/s]	11.3	13.1	32.5	35.0
Rated current		[A]	0.8	1.3	2.7	4.8
Maximum current		[A]	2.4	3.9	8.1	14
Regenerative braking frequency *2, *3		[times/min]	(Note 4)	(Note 4)	249	140
Moment of inertia J	Standard	[× 10^{-4} kg•m^2]	0.088	0.24	0.42	1.43
	With electromagnetic brake	[× 10^{-4} kg•m^2]	0.090	0.31	0.50	1.63
Recommended load to motor inertia ratio (Note 1)			15 times or less			
Speed/position detector			Incremental 17-bit encoder (resolution: 131072 pulses/rev)			
Oil seal			Installed. Without oil seal is also available.			Installed
Insulation class			130 (B)			
Structure			Totally enclosed, natural cooling (IP rating: IP65) (Note 2)			
Environment *4	Ambient temperature		0 °C to 40 °C (non-freezing), storage: -15 °C to 70 °C (non-freezing)			
	Ambient humidity		80 %RH maximum (non-condensing), storage: 90 %RH maximum (non-condensing)			
	Ambience		Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust			
	Altitude		1000 m or less above sea level			
	Vibration resistance *5		X: 49 m/s^2 Y: 49 m/s^2			
Vibration rank			V10 *7			
Compliance to standards			Refer to "Conformity with global standards and regulations" on p. 13 in this catalog.			
Permissible load for the shaft *6	L	[mm]	25	30	30	40
	Radial	[N]	88	245	245	392
	Thrust	[N]	59	98	98	147
Mass	Standard	[kg]	0.6	1.2	1.6	3.1
	With electromagnetic brake	[kg]	0.8	1.6	2.0	4.1

Notes: 1. Contact your local sales office if the load to motor inertia ratio exceeds the value in the table.
2. The shaft-through portion is excluded. Refer to the asterisk 8 of "Annotations for Servo Motor Specifications" on p. 2-6 in this catalog for the shaft-through portion.
3. When unbalanced torque is generated, such as in a vertical lift machine, it is recommended that the unbalanced torque of the machine be kept under 70% of the servo motor rated torque.
4. When the servo motor decelerates to a stop from the rated speed, the regenerative frequency will not be limited if the effective torque is within the rated torque range. Note that the recommended load to motor inertia ratio is 15 times or less.

Refer to "Annotations for Servo Motor Specifications" on p. 2-6 in this catalog for the asterisks 1 to 7.

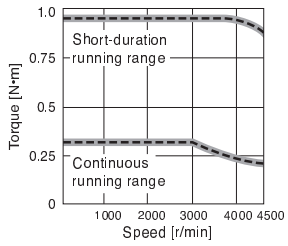
HF-KN Series Electromagnetic Brake Specifications (Note 1)

Servo motor model HF-KN		13BJ	23BJ	43BJ	73BJ
Type		Spring actuated type safety brake			
Rated voltage		24 V DC $^{0}_{-10}$ %			
Power consumption	[W] at 20 °C	6.3	7.9	7.9	10
Electromagnetic brake static friction torque	[N•m]	0.32	1.3	1.3	2.4
Permissible braking work	Per braking [J]	5.6	22	22	64
	Per hour [J]	56	220	220	640
Electromagnetic brake life (Note 2)	Number of brakings [Times]	20000	20000	20000	20000
	Work per braking[J]	5.6	22	22	64

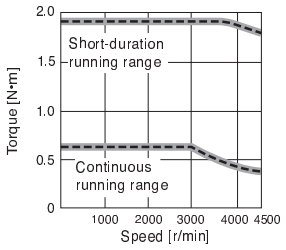
Notes: 1. The electromagnetic brake is for holding. It should not be used for deceleration applications.
2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until the readjustment is needed.

HF-KN Series Torque Characteristics (Note 3, 4)

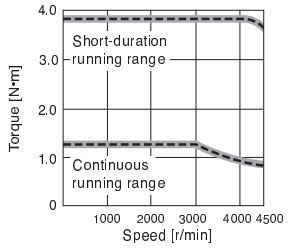
HF-KN13(B)J (Note 1, 2)



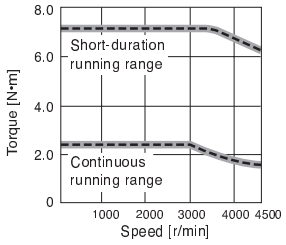
HF-KN23(B)J (Note 1, 2)



HF-KN43(B)J (Note 1, 2)



HF-KN73(B)J (Note 1, 2)

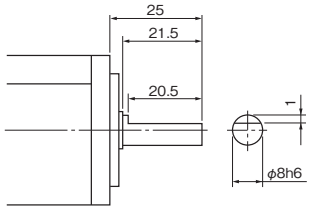


Notes: 1. ▬ : For 3-phase 200 V AC.
2. - - - - : For 1-phase 230 V AC.
3. Torque drops when the power supply voltage is below the specified value.
4. The value is for reference.

HF-KN Series Special Shaft End Specifications

Motors with the following specifications are also available.

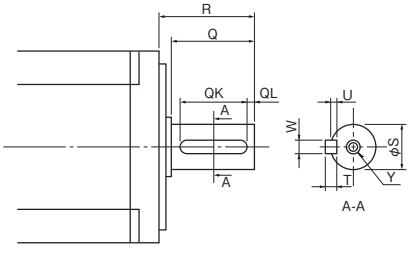
D-cut shaft (Note 1): 100 W



[Unit: mm]

Key shaft (with key) (Note 1, 2): 200 W, 400 W, and 750 W

Model		Variable dimensions								
		T	S	R	Q	W	QK	QL	U	Y
HF-KN	23(B)JK, 43(B)JK	5	14h6	30	27	5	20	3	3	M4 screw Depth: 15
	73(B)JK	6	19h6	40	37	6	25	5	3.5	M5 screw Depth: 20



[Unit: mm]

Notes: 1. The servo motors with special shaft end are not suitable for frequent start/stop applications.
2. 2 round end key is attached.

HF-SN Series (Medium Inertia, Medium Capacity) Specifications

Servo motor model HF-SN			52(B)J	102(B)J	152(B)J	202(B)J	302(B)J
Compatible servo amplifier model			Refer to "Combinations of Servo Motor and Servo Amplifier" on p. 2-1 in this catalog.				
Power supply capacity *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 (Note 3)	[N•m]	2.39	4.77	7.16	9.55	14.3
Maximum torque		[N•m]	7.16	14.3	21.5	28.6	42.9
Rated speed		[r/min]	2000				
Maximum speed		[r/min]	3000				2500
Permissible instantaneous speed		[r/min]	3450				2875
Power rate at continuous rated torque	Standard	[kW/s]	9.34	19.2	28.8	23.8	35.1
	With electromagnetic brake	[kW/s]	6.87	16.3	25.6	19.0	30.1
Rated current		[A]	2.9	6.0	8.6	9.0	11
Maximum current		[A]	8.7	18	26	27	33
Regenerative braking frequency *2, *3		[times/min]	120	62	152	71	28
Moment of inertia J	Standard	[× 10^{-4} kg•m^2]	6.1	11.9	17.8	38.3	58.5
	With electromagnetic brake	[× 10^{-4} kg•m^2]	8.3	14.0	20.0	47.9	68.1
Recommended load to motor inertia ratio (Note 1)			15 times or less				
Speed/position detector			Incremental 17-bit encoder (resolution: 131072 pulses/rev)				
Oil seal			Installed				
Insulation class			155 (F)				
Structure			Totally enclosed, natural cooling (IP rating: IP67) (Note 2)				
Environment *4	Ambient temperature		0 °C to 40 °C (non-freezing), storage: -15 °C to 70 °C (non-freezing)				
	Ambient humidity		80 %RH maximum (non-condensing), storage: 90 %RH maximum (non-condensing)				
	Ambience		Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust				
	Altitude		1000 m or less above sea level				
	Vibration resistance *5		X: 24.5 m/s^2 Y: 24.5 m/s^2			X: 24.5 m/s^2 Y: 49 m/s^2	
Vibration rank			V10 *7				
Compliance to standards			Refer to "Conformity with global standards and regulations" on p. 13 in this catalog.				
Permissible load for the shaft *6	L	[mm]	55	55	55	79	79
	Radial	[N]	980	980	980	2058	2058
	Thrust	[N]	490	490	490	980	980
Mass	Standard	[kg]	4.8	6.5	8.3	12	15
	With electromagnetic brake	[kg]	6.7	8.5	10.3	18	21

Notes: 1. Contact your local sales office if the load to motor inertia ratio exceeds the value in the table.
2. The shaft-through portion is excluded. Refer to the asterisk 8 of "Annotations for Servo Motor Specifications" on p. 2-6 in this catalog for the shaft-through portion.
3. When unbalanced torque is generated, such as in a vertical lift machine, it is recommended that the unbalanced torque of the machine be kept under 70% of the servo motor rated torque.

Refer to "Annotations for Servo Motor Specifications" on p. 2-6 in this catalog for the asterisks 1 to 7.

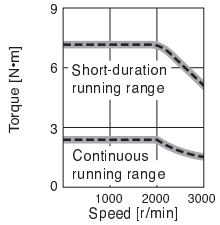
HF-SN Series Electromagnetic Brake Specifications (Note 1)

Servo motor model HF-SN		52BJ	102BJ	152BJ	202BJ	302BJ
Type		Spring actuated type safety brake				
Rated voltage		24 V DC $^{0}_{-10}$%				
Power consumption	[W] at 20 °C	20	20	20	34	34
Electromagnetic brake static friction torque	[N•m]	8.5	8.5	8.5	44	44
Permissible braking work	Per braking [J]	400	400	400	4500	4500
	Per hour [J]	4000	4000	4000	45000	45000
Electromagnetic brake life (Note 2)	Number of brakings [Times]	20000	20000	20000	20000	20000
	Work per braking [J]	200	200	200	1000	1000

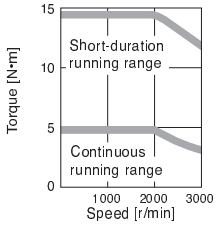
Notes: 1. The electromagnetic brake is for holding. It should not be used for deceleration applications.
2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until the readjustment is needed.

HF-SN Series Torque Characteristics (Note 3, 4)

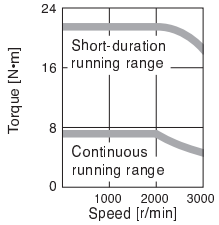
HF-SN52(B)J (Note 1, 2)



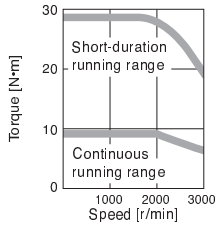
HF-SN102(B)J (Note 1)



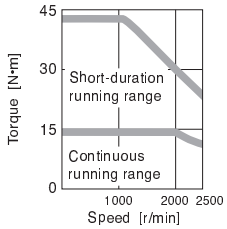
HF-SN152(B)J (Note 1)



HF-SN202(B)J (Note 1)



HF-SN302(B)J (Note 1)



Notes: 1. ——— : For 3-phase 200 V AC.
2. - - - - : For 1-phase 230 V AC.
3. Torque drops when the power supply voltage is below the specified value.
4. The value is for reference.

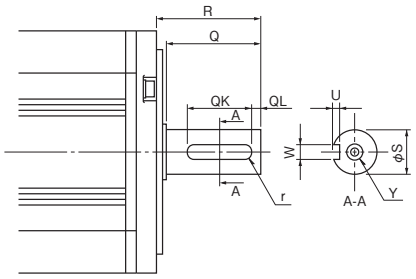
HF-SN Series Special Shaft End Specifications

Motors with the following specifications are also available.

Key shaft (without key) (Note 1, 2)

Model		Variable dimensions								
		S	R	Q	W	QK	QL	U	r	Y
HF-SN	52(B)JK, 102(B)JK, 152(B)JK	24h6	55	50	8 $^{0}_{-0.036}$	36	5	4 $^{+0.2}_{0}$	4	M8 screw Depth: 20
	202(B)JK, 302(B)JK	35 $^{+0.010}_{0}$	79	75	10 $^{0}_{-0.036}$	55	5	5 $^{+0.2}_{0}$	5	

Notes: 1. The servo motors with special shaft end are not suitable for frequent start/stop applications.
2. A key is not supplied with the servo motor. The key shall be installed by the user.



[Unit: mm]

Annotations for Servo Motor Specifications

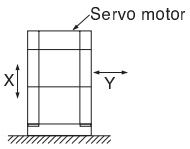
*1. The power supply capacity varies depending on the power supply impedance.

*2. The regenerative braking frequency shows the permissible frequency when the servo motor, without a load and a regenerative option, 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 = Moment of inertia of load/Moment of inertia of servo motor.
When the operating speed exceeds the rated speed, the regenerative braking frequency is inversely proportional to the square of (operating speed/rated speed). Take measures to keep the regenerative power [W] during operation below the tolerable regenerative power [W]. Use caution, especially when the operating speed changes frequently or when the regeneration is constant (as with vertical feeds). Select the most suitable regenerative option for your system with our capacity selection software.
Refer to "Regenerative Option" in this catalog for the tolerable regenerative power [W] when regenerative option is used.

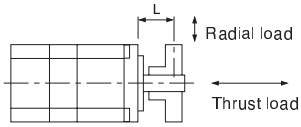
*3. For 400 W or smaller servo amplifier, the regenerative braking frequency may change affected by the power supply voltage due to the large ratio of the energy charged into the electrolytic capacitor in the servo amplifier.

*4. In the environment where the servo motor is exposed to oil mist, oil and/or water, a standard specification servo motor may not be usable. Contact your local sales office for more details.

*5. The vibration direction is shown in the diagram below. The numerical value indicates the maximum value of the component (commonly the bracket in the opposite direction of the servo motor shaft).
Fretting more likely occurs on the bearing when the servo motor stops. Thus, maintain vibration level at approximately one-half of the allowable value.

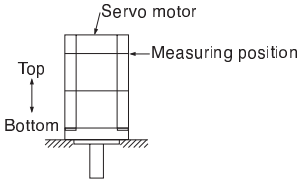


*6. Refer to the diagram below for the permissible load for the shaft. Do not apply a load exceeding the value specified in the table on the shaft. The values in the table are applicable when each load is applied singly.

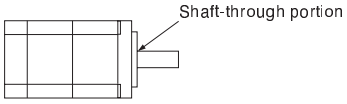


L: Distance between the flange mounting surface and the center of load

*7. V10 indicates that the amplitude of the servo motor itself is 10 μm or less. The following shows mounting posture and measuring position of the servo motor during the measurement:

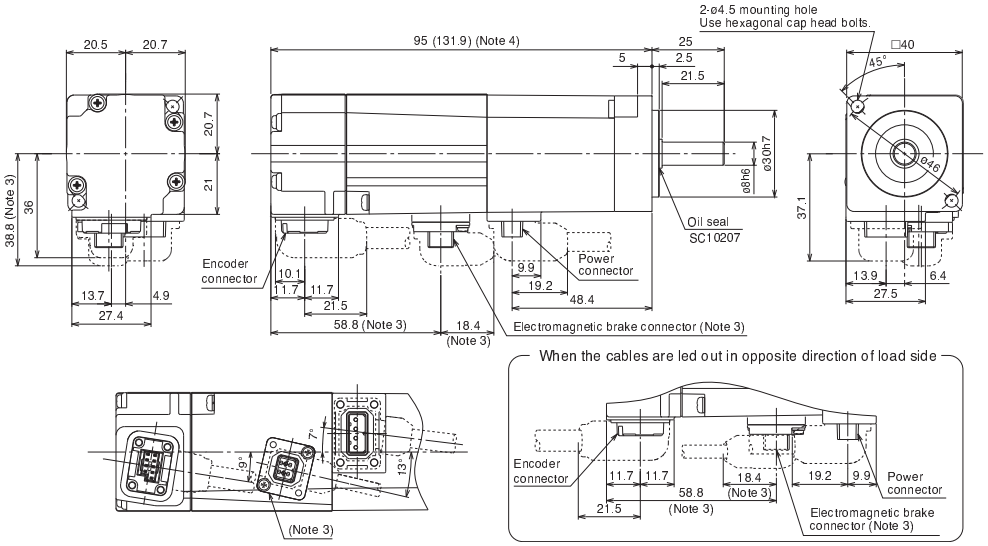


*8. Refer to the diagram below for shaft-through portion.



HF-KN Series Dimensions (Note 1, 5)

●HF-KN13(B)J



Power connector

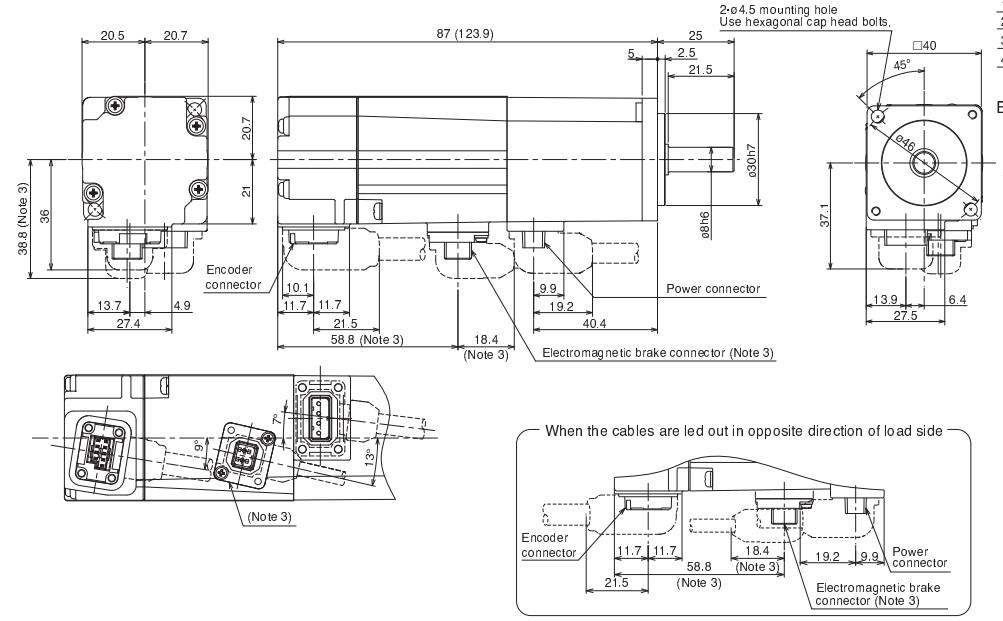
Pin No.	Signal name
1	⏚ (PE)
2	U
3	V
4	W

Electromagnetic brake connector (Note 2)

Pin No.	Signal name
1	B1
2	B2

[Unit: mm]

●HF-KN13(B)



Power connector

Pin No.	Signal name
1	⏚ (PE)
2	U
3	V
4	W

Electromagnetic brake connector (Note 2)

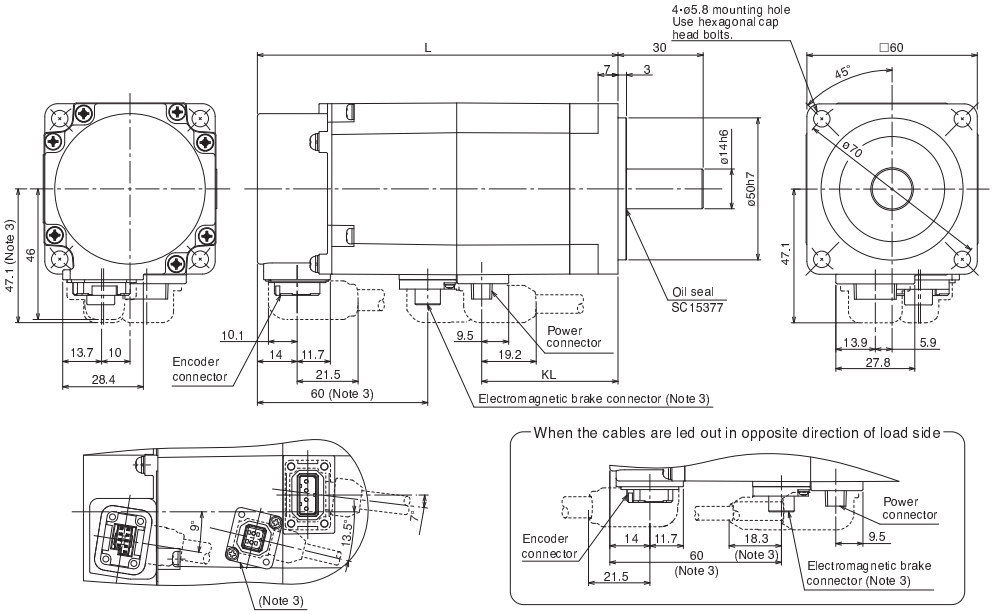
Pin No.	Signal name
1	B1
2	B2

[Unit: mm]

Notes: 1. For dimensions without tolerance, general tolerance applies.
2. The electromagnetic brake terminals (B1, B2) do not have polarity.
3. Only for the models with electromagnetic brake.
4. Dimensions in brackets are for the models with electromagnetic brake.
5. Use a friction coupling to fasten a load.

HF-KN Series Dimensions (Note 1, 5)

●HF-KN23(B)J, HF-KN43(B)J



Power connector

Pin No.	Signal name
1	⏚ (PE)
2	U
3	V
4	W

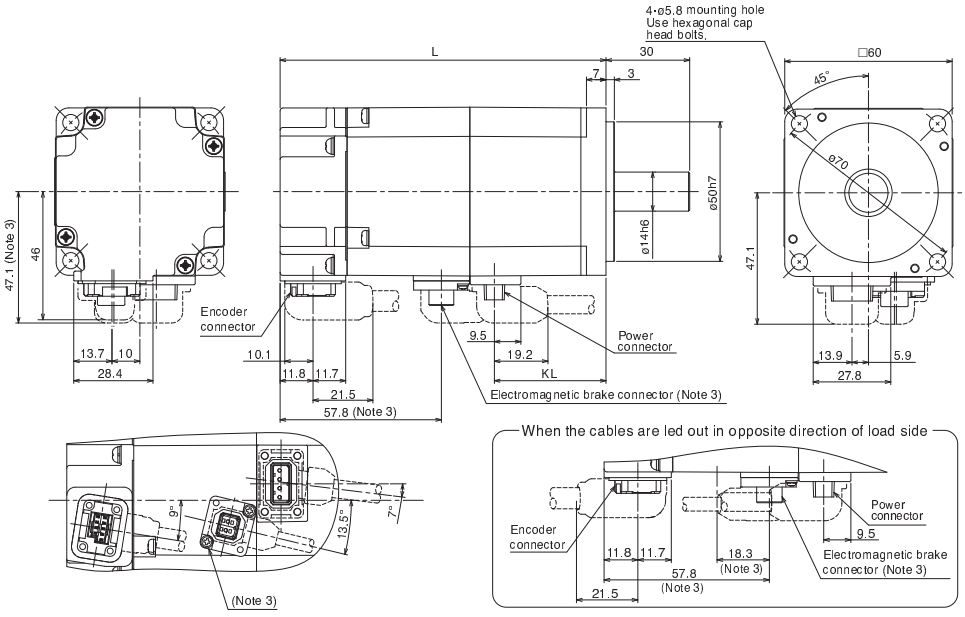
Electromagnetic brake connector (Note 2)

Pin No.	Signal name
1	B1
2	B2

Model	Variable dimensions (Note 4)	
	L	KL
HF-KN23(B)J	98.4 (127)	48
HF-KN43(B)J	120.4 (149)	70

[Unit: mm]

●HF-KN23(B), HF-KN43(B)



Power connector

Pin No.	Signal name
1	⏚ (PE)
2	U
3	V
4	W

Electromagnetic brake connector (Note 2)

Pin No.	Signal name
1	B1
2	B2

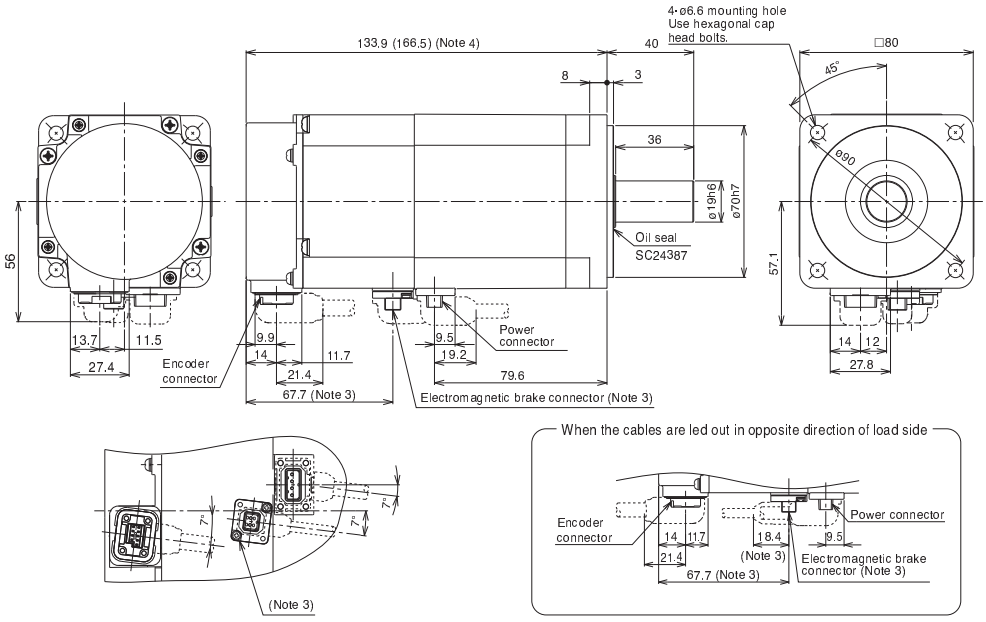
Model	Variable dimensions (Note 4)	
	L	KL
HF-KN23(B)	88.2 (116.8)	40
HF-KN43(B)	110.2 (138.8)	62

[Unit: mm]

Notes: 1. For dimensions without tolerance, general tolerance applies.
2. The electromagnetic brake terminals (B1, B2) do not have polarity.
3. Only for the models with electromagnetic brake.
4. Dimensions in brackets are for the models with electromagnetic brake.
5. Use a friction coupling to fasten a load.

HF-KN Series Dimensions (Note 1, 5)

●HF-KN73(B)J



Power connector

Pin No.	Signal name
1	⏚ (PE)
2	U
3	V
4	W

Electromagnetic brake connector (Note 2)

Pin No.	Signal name
1	B1
2	B2

[Unit: mm]

Notes: 1. For dimensions without tolerance, general tolerance applies.
2. The electromagnetic brake terminals (B1, B2) do not have polarity.
3. Only for the models with electromagnetic brake.
4. Dimensions in brackets are for the models with electromagnetic brake.
5. Use a friction coupling to fasten a load.